Ezi-MotionGate

CC-Link

PLC Examples (MELSEC-Q)

FASTECH

Fast, Accurate, Smooth Motion Control

Application Plus-R Firmware version : over 6.0.0.00

First edition : December 15, 2011

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www.fastech.co.kr

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Table of examples

※ Before use ※

- Thank you very much for purchasing FASTECH Ezi-MOTIONGATE.
- Ezi-MOTIONGATE is Fieldbus to FASTECH protocol Gateway Unit buit in 32bit high function ARM process.
- The manual containes handling method of Ezi-MOTIONGATE, directions for safety, abnormality diagnosis and measures, specifications, and so on.
- After understanding the manual, please use Ezi-MOTIONGATE safely.
- After reading the manual, please keep it so that those who use the product refer to.

1. Direction for safety

◆ General directions

- The manual can be changed without notification for the convenience of product improvement or specifications change or understanding of the manual itself.
- When you damage or lose the manual, please inquire to the purchasing retail shop or the head office.
- Remodeling the product arbitrarily is beyond our company's guarantee range so our company does not take responsibility of it.

◆ Safety directions

- Before installation, operation, inspection, repair, etc, please fulfill after understanding enough the contents by reading the manual. Also, please use the product after fully understanding safety information and directions.
- The manual divides degree of cautions of safety to **attention** and **warning**.

⚠ Attention:	When handled wrong, when there is a possibility of serious and slight injuries causing risky situation, and when there is a possibility of occurring only property damage.
⚠ Warning:	When handled wrong and when there is a possibility of death or serious injury causing risky situations such as an electric shock and so on.

- Even though the noted contents are in the attention category, it has possibility of causing significant results by situation. Please observe it.

◆ Product status

⚠ **Attention**	Check if the product is damanged or has missing parts. If installing and/or operating abnormal product, there is a risk of machine damange or injuries.

◆ Installation

⚠ **Attention**	Be careful enough on operation. When it falls down, the product can be damaged and if it falls on a foot, it can cause injury. Use nonflammable substance such as metal at the place handling the product. When installing several Ezi-MOTIONGATEs at a closed space, make the temperature under 50℃ by installing cooling device and so on. Overheat can cause fire or other incidents.
⚠ **Warning**	Installation, connection, operation, manipulation, inspection and error diagnosis should be conducted by a qualified person. It can become cause of fire, injury, and equipment damage.

◆ Wiring

⚠ **Attention**	It is necessary to keep the rated range on the power input voltage of drive. It can cause fire or malfunction. Connection should be conducted in accordance with a wiring diagram. It can cause fire or malfunction. .
⚠ **Warning**	Operate after checking the input power is off. It can cause an electronic shock or fire. . The Ezi-MOTIONGATE case is insulated with GND of inner circuit by condenser, so ground connection is necessary. It can cause an electronic shock, fire, or product malfunction.

◆ Operation and set-up change

⚠ **Attention**	When operating driver's protection function, after removing the cause, lift the protection function. Ongoing operation without removing causes brings in malfunction of motor and/or driver becoming cause of injury or device damage. When feeding power to driver, should feed after driver's control inputs turn to all off. It operates motor resulting in injuries or device damange. All values of the Ezi-MOTIONGATE are set up properly when shipped out. Set-up change should be conducted after fully understanding the manual. It can cause machine dmange or product malfunction.

◆ Repair and inspection

⚠ **Warning**	The Ezi-MOTIONGATE should be repaired or inspected after enough time is passed by after cutting power of main circuit. Remaining condenser power can cause an electronic shock. Do not change wiring during applying an electric current. It can cause an electronic shock, product damage, or machine damage. Do not remodel the product. It can cause an electronic shock, product damage, or machine damage, and the product cannot receive A/S from our company.

Directions on installation

1) It should be used indoor and the room temperature should be 0°~55°C for use.

2) When the case goes beyond 50°C, it should radiate heat outward.

3) Should be installed avoiding direct sunlight and magnetic objects.

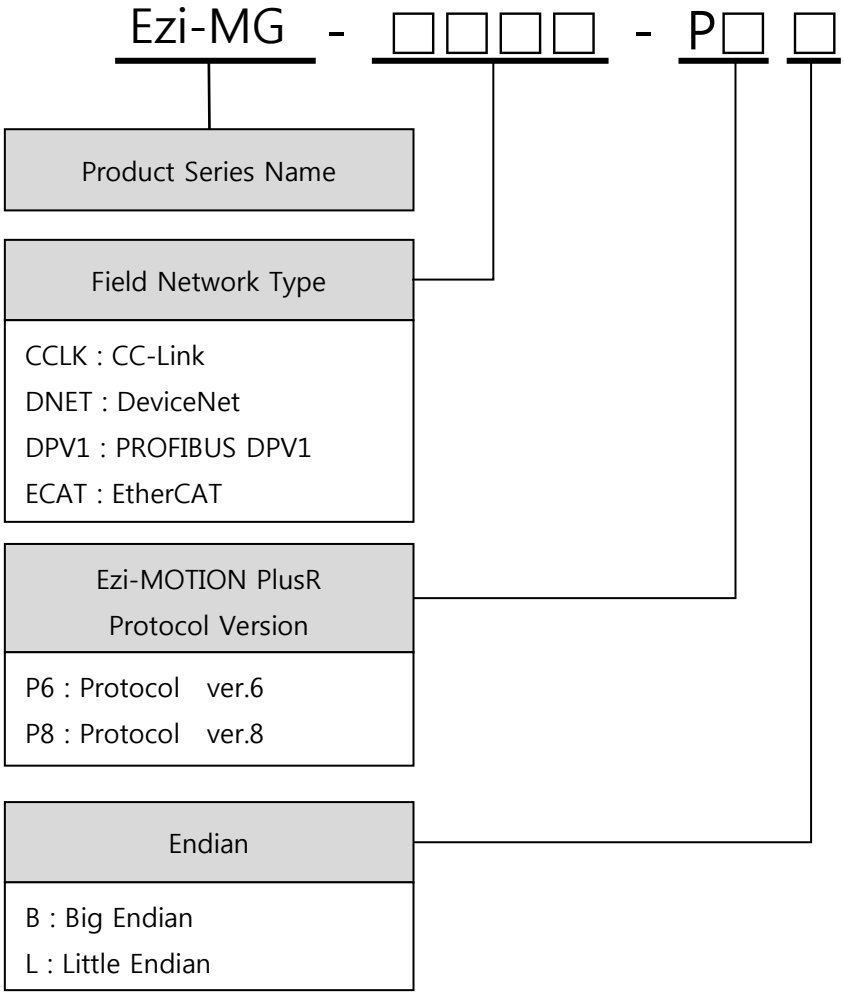
4) When installing more than 2 drivers side by side, it should be installed with space of over 20mm of vertical direction and over 50mm of horizontal direction.

2. Product specifications and size

2.1 Overview

- Ezi-MotionGate(hereunder, MotionGate) is the MotionGate way device controlling motion drive composed of FASTECH RS485 with master by connecting with slave at the industrial network.
- The maximum volume available by connecting MotionGate with slave is the volume supported at the applied industrial network.
- Motor drive(Axis) able to connect in MotionGate can give up to 15 motor IDs every industrial network.

2.2 Product type number



2.3 Product feature table by network

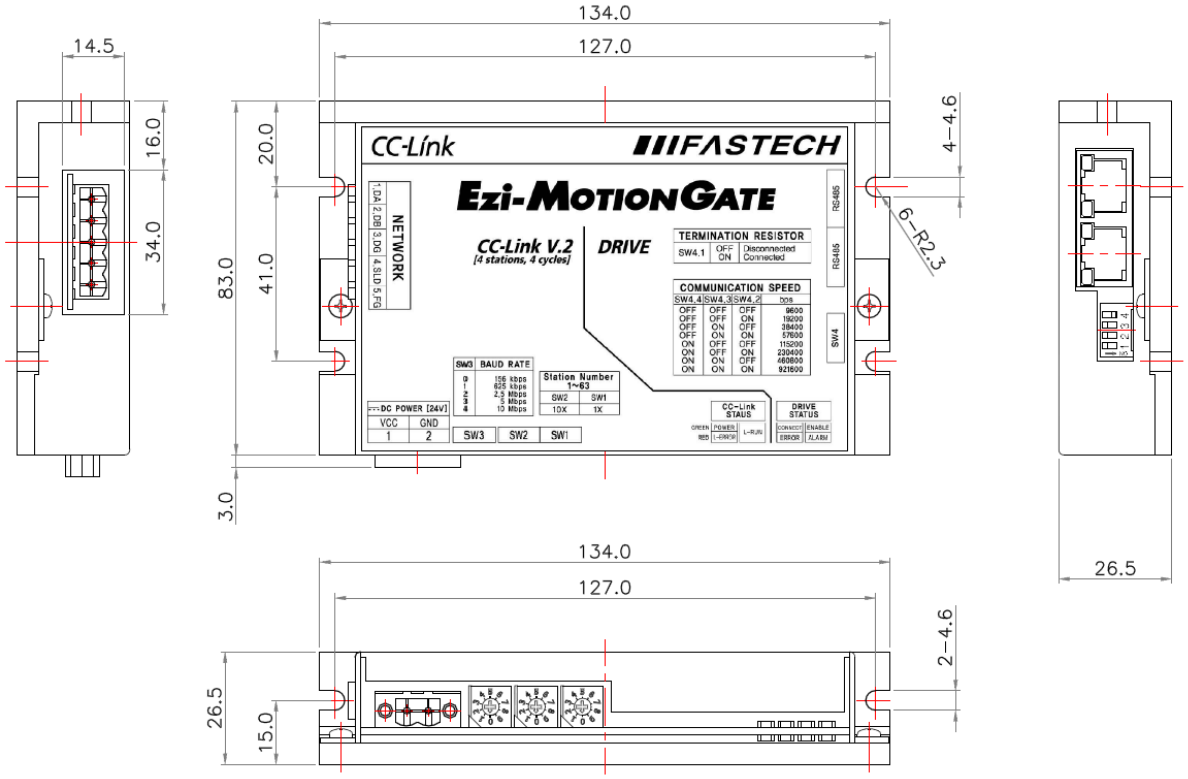
<table>
<tr><td colspan="2" rowspan="2">Network</td><td>Fieldbus</td></tr>
<tr><td>CC-Link</td></tr>
<tr><td colspan="2">Input Voltage</td><td>24VDC ±10%</td></tr>
<tr><td colspan="2">Control Method</td><td>MotionGation able of multi-axis control by using I/O data of the industrial network</td></tr>
<tr><td colspan="2">Multiaxial Control</td><td>4 Station - 13 Axis</td></tr>
<tr><td colspan="2">Current Consumption</td><td>Maximum 500mA</td></tr>
<tr><td rowspan="3">Environment</td><td>Temperature</td><td>Use : 0~55℃
Storage : -27~70℃</td></tr>
<tr><td>Humidity</td><td>Use : 35~85℃ (should not have dew condensation)
Storage : -10~90℃(should not have dew condensation)</td></tr>
<tr><td>Inner Vibration</td><td>0.5G</td></tr>
<tr><td rowspan="2">Function</td><td>Switch Selection</td><td>Network station No. set-up, network Baud-Rate set-up</td></tr>
<tr><td>LED Display</td><td>Network abnormality, master connection abnormality, deriver's Servo On state, deriver's alarm state</td></tr>
<tr><td rowspan="3">Special function</td><td>Jog Control</td><td>4-Speed Step, Speed Ratio</td></tr>
<tr><td>Step Movement Control</td><td>4-Step Distance</td></tr>
<tr><td>Communication Function</td><td>Ezi-STEP Plus-R, Ezi-SERVO Plus-R series</td></tr>
<tr><td colspan="2">FASTECH
RS485</td><td>
<table>
<tr><td>Baud-Rate (bps)</td><td>9600</td><td>19200</td><td>38400</td><td>57600</td><td>115200</td><td>230400</td><td>460800</td><td>92160</td></tr>
<tr><td>Cable Length (m)</td><td>1200</td><td>1150</td><td>1100</td><td>1000</td><td>1000</td><td>880</td><td>550</td><td>300</td></tr>
<tr><td>RJ-45 Connector LED</td><td colspan="8">YELLOW : RS485 transmission state (TX from MOTIONGATE)
GREEN : RS485 reception state (RX to MOTIONGATE)</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Field Network
(Industrial Network)</td><td>Communication speed and cable length in accordance with the specifications of applied network.</td></tr>
</table>

NOTE 1: Cable length is the maximum connecting distance when the network is in the optimal state.

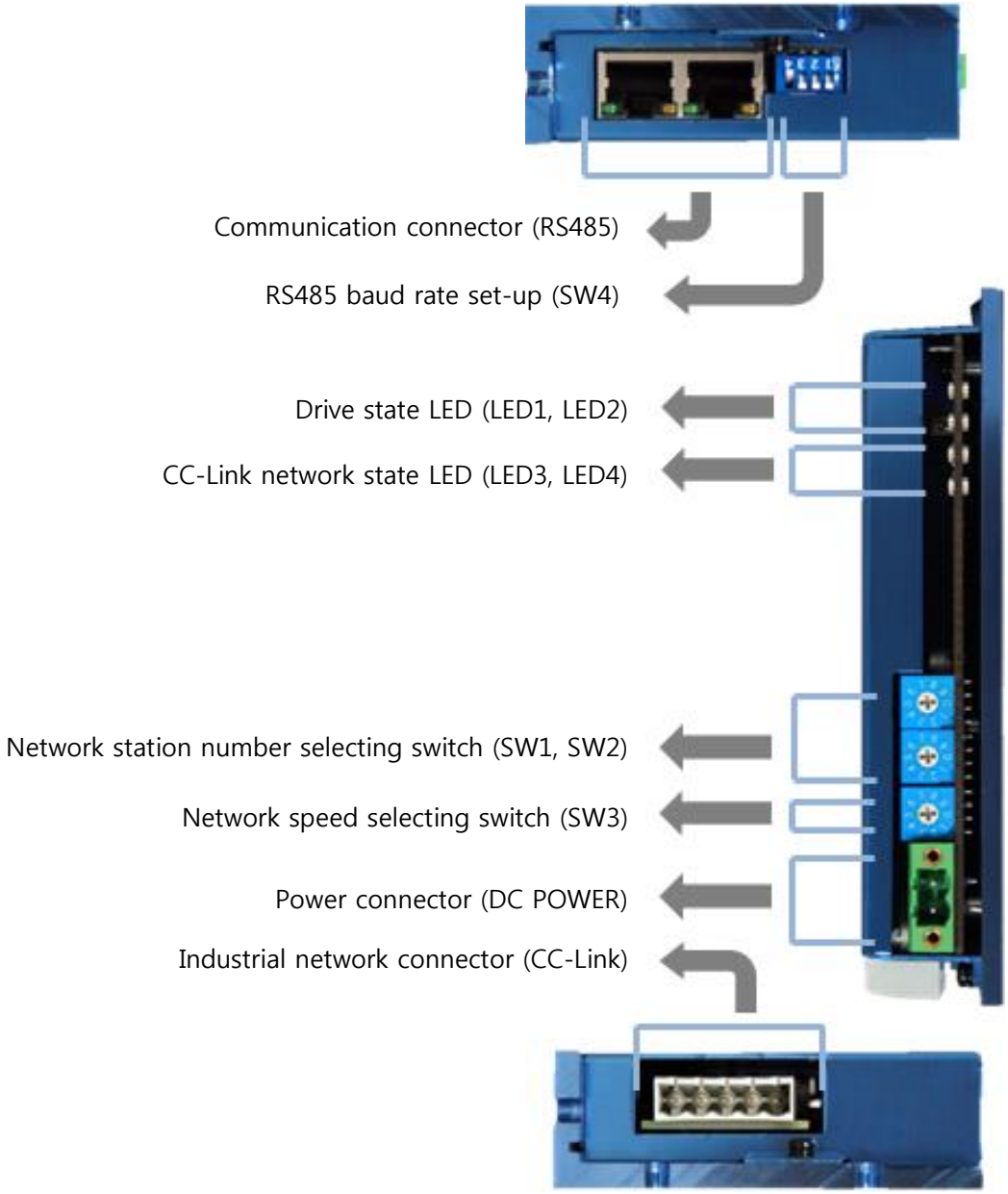
NOTE 2: It observes communication protocol of industrial network.

2.4 Product appearance

2.4.1 Dimension

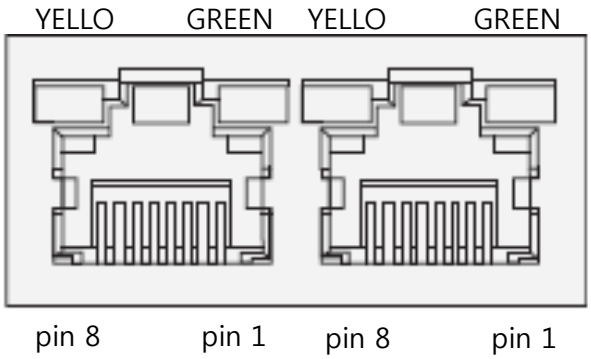


2.4.2 Name of each part



2.4.3 FASTECH RS485 communication access connector

The communication connector is connecting by using RJ-45.



Pin map of communication connector (RS485)

Pin No.	Function
1, 2, 4, 5, 7, 8	GND
3	DATA +
6	DATA -
CASE	Frame GND

Communication connector LED

Display	Color	Luminous Type
RS485 TX	Green	Blinking on transmission of RS485 data
RS485 RX	Yellow	Blinking on receiption of RS485 data

2.4.4 RS485 baud rate set-up and terminating resistance selecting switch (SW4)

SW4 is a switch for the baud rate set-up of RS-485 communication network connected to motor drive. If the MotionGate is connected at the farthest edge of network segment, the terminating resistance can be determined to use.

SW4.1 determines the use of terminating resistance and SW4.2~SW4.4 are used to set up communication speed like following.

SW4.1	SW4.2	SW4.3	SW4.4	Speed baud[bps]
X	OFF	OFF	OFF	9600
X	ON	OFF	OFF	19200
X	OFF	ON	OFF	38400
X	ON	ON	OFF	57600
X	OFF	OFF	ON	115200 *1
X	ON	OFF	ON	230400
X	OFF	ON	ON	460800
X	ON	ON	ON	921600

*1 : Initial set-up value

SW4.1 OFF : Terminating resistance OFF
SW4.1 ON : Terminating resistance ON

⚠Attention	Communication speed set-up values of drive modules connected at a RS485 network should be set up as all identical value.

2.4.5 Status display LED (LED1..LED4)

Status display LED is displayed status with simultaneous operation of LED1~LED4 or single operation under the circumstance.

LED operation display (LED1~LED4)

LED No.	Operation Status	Explanation
LED1 LED2 LED3 LED4	Light-out	Power OFF, time-out state, network non connection
	Green and red simultaneous light-in	Booted state by power supply at the MotionGate Re-booted state by changing station number designating switch or DeviceNet baud rate selecting switch. * With simultaneous light-out of green and red, LED color appears orange.
	Green simultaneous blinking	MotionGate's self-diagnosis state ✓ Connector non-connection ✓ Wrong network baud rate set-up ✓ Wrong network station number designation
LED3 LED4	Green and red simultaneous light-in	Recognition disable state of MotionGate's network device * Contact the head office or retail shop for measures.

Drive status display LED (DRIVE STATUS)

<table>
<tr><th>LED No.</th><th>LED State Information</th><th>LED Name</th><th>Operation State</th><th>Explanation</th></tr>
<tr><td rowspan="3">LED1</td><td rowspan="2">Drive's connection state</td><td rowspan="2">ENABLE (Green)</td><td>Light-in</td><td>Activated motor among connected drives.</td></tr>
<tr><td>Blinking</td><td>Disenabled motors of more than a drive among connected drives.</td></tr>
<tr><td>Drive alarm</td><td>ALARM (Red)</td><td>Blinking</td><td>Alarm state of more than a drive</td></tr>
<tr><td rowspan="7">LED2</td><td rowspan="2">Motor Drive Connection State</td><td>CONNECT (Green)</td><td>Light-in</td><td rowspan="2">Running connection command, the motor drive communicates with MotionGate normally.</td></tr>
<tr><td>ERROR (Red)</td><td>Light-out</td></tr>
<tr><td rowspan="2">Drive Connection State Error</td><td>CONNECT (Green)</td><td>Light-out</td><td rowspan="2">No motor drive running connection command among RS-485 network connected motor drives.
No communication state of motor drive and MotionGate.
No communication with drive
Communication disconnection of RS485 network
Baud rate set-up error</td></tr>
<tr><td>ERROR (Red)</td><td>Light-in</td></tr>
<tr><td rowspan="2">Communication Error</td><td>CONNECT (Green)</td><td>Light-in</td><td rowspan="2">Communication error with motor drive(CRC error occurrence)</td></tr>
<tr><td>ERROR (Red)</td><td>Random Blinking</td></tr>
<tr><td rowspan="2">Multiaxial connection state's communication error</td><td>CONNECT (Green)</td><td>Light-in</td><td rowspan="2">No response to connection command at more than a motor drive connected to RS485
✓ Network disconnection
✓ Abnormality in the topology composition
✓ Run connection command at IP-Map area of not existing motor drive.</td></tr>
<tr><td>ERROR (Red)</td><td>Light-in</td></tr>
</table>

⚠Attention	Drive status display LED should check motor activation state after inspecting communication state of MotionGate and drive.

CC-Link network status display LED (CC-Link STATUS)

No.	LED	Operation State	Content	Measures
LED 3	L RUN (Green)	Light-out	Power OFF	Check power state.
			Non connection of network	Check network cable's connection and upper controller's state.
		Light-in	Normal operation	Normal connection to CC-Link network
	L RUN (Red)	Light-in	Critical error	Due to the suspicion of MotionGate error, inquire to retail shop or head office for repair.
LED 4	L ERROR (Red)	Light-out	Normal operation	No error occurrence
			Power OFF	If L-RUN LED is light-out, check MotionGate's power.
		Light-in	Communication error	Disable communication with upper controller Check CC-Link parameter of upper controller.
		Random Blinking	CRC error, network cable abnormality	There is connection error of network connector or noise occurrence at cable line. Check whether attachment of terminating resistance, network wiring, and frame ground connection.

⚠Attention	Network status LED operates with defined expression by the network status in accordance with the industrial network protocol.

2.4.6 Network station number set-up (SW1, SW2)

It is the rotary switch setting CC-Link network's station number able to designate wanted station number to network in the range of 1~64.

Switch value (SW1)	ID number X10 (10-digit)	Switch number (SW2)	ID number X1 (1 digit)	
0	00	0	0	
1	10	1	1	
2	20	2	2	
3	30	3	3	
4	40	4	4	
5	50	5	5	
6	60	6	6	
7	N.C	7	7	
8	N.C	8	8	
9	N.C	9	9	

2.4.7 Network communication speed set-up (SW3)

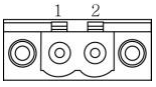
It is the switch setting baud rate of network. It is identical to the network set-up value of the upper controller.

Network communication speed set-up (CC-Link)

Switch value (SW3)	BAUD RATE	
0	156 kbps	
1	625 kbps	
2	2.5 Mbps	
3	5 Mbps	
4	10 Mbps	
5..9	N.C	

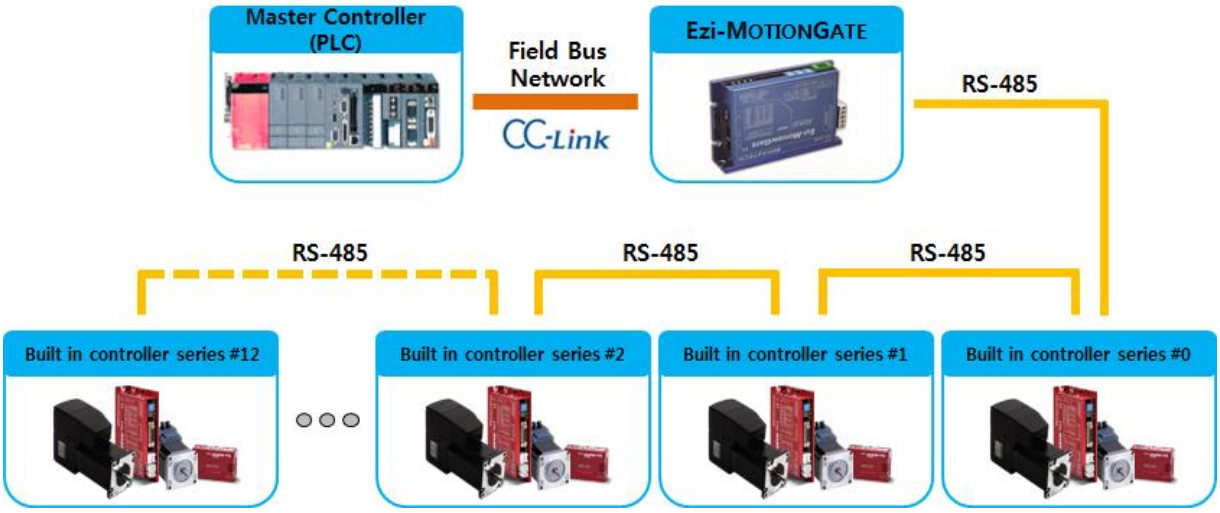
2.4.8 Power connector(DC POWER)

It is the connector to provide power.

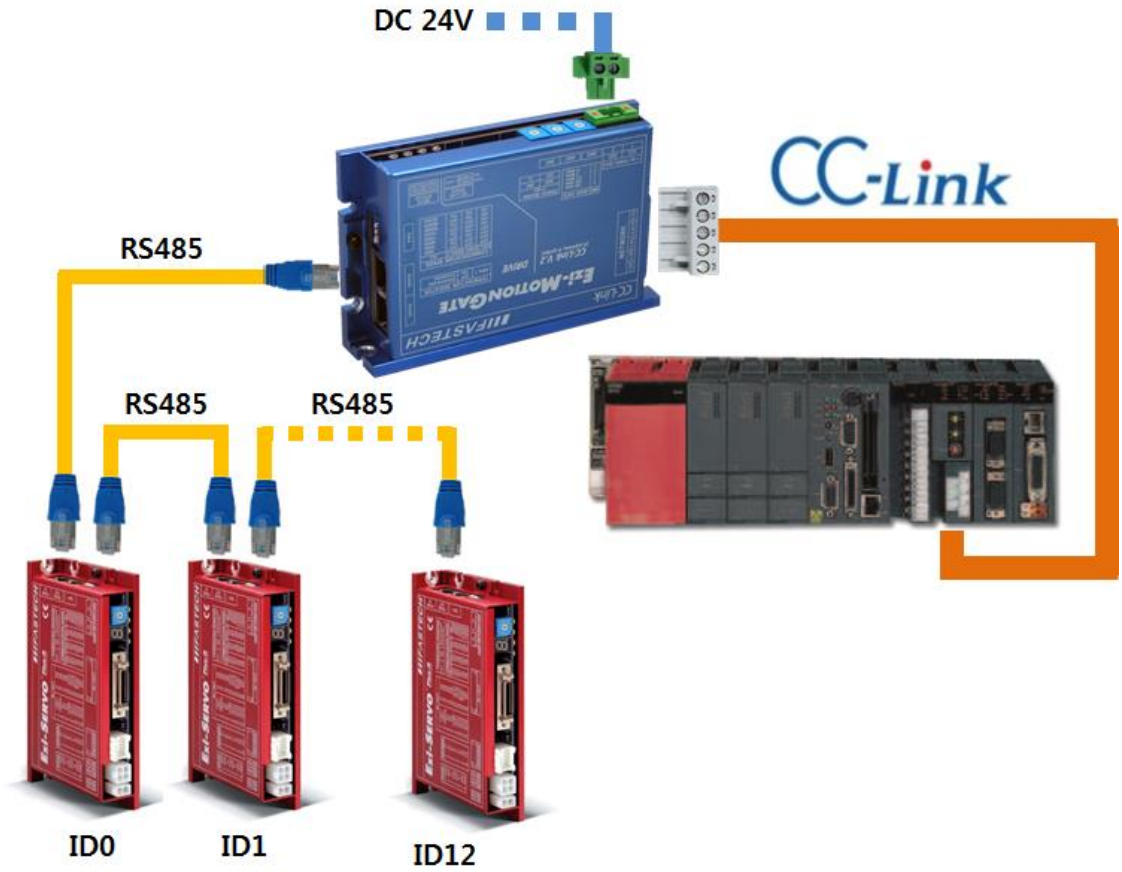
No.	Function	Pin Diagram
1	Input power : 24VDC ± 10%	
2	Input power : GND	

3. Installation and connection method

3.1 System diagram

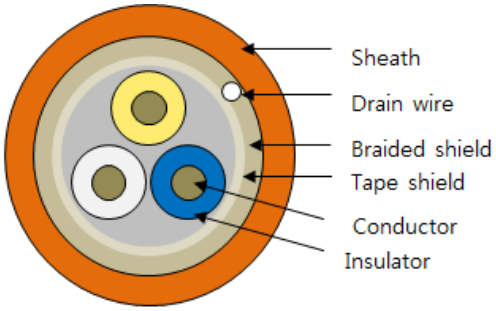
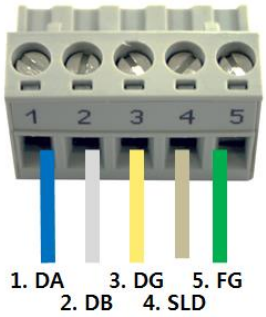


MotionGate wiring diagram



3.2 CC-Link network connection

CC-Link network cable structure

CC-Link network cable	Pin map of CC-Link connector
	

Core wire type	Data name
Blue	DA
White	DB
Yellow	DG
Drain wire or braided shield	SLD

* FG(5.) pin is the case grounding pin, which cannot be included in CC-Link cable.

⚠ **Attention**	FG pin is to put to earth to the cabinet panel case, cable skin or hardwaremetal goods in order to prevent current occurring by electronical abnormality. Not to influence each other by separating running gear, DG, or SG, separate each device and put to earth.

4. Operation principle

4.1 CC-Link network's MotionGate system overview

4.1.1 CC-Link overview

CC-Link is an industrial network composed of RS485's topology. The network is one of fieldbuses with high speed / punctuality and supports maximum 10Mbps of communication speed. And for all the time consistent link scan, it supports cyclic transmission function to acquire punctuality of data.

With such characteristics, it is able to handle bulk data in high speed and fast upper connection of on-site information resulting in effect of enhancing productivity. Also, the topology of RS485 allows simple installation and maintenance.

Item	Specifications
Maximum link score	Ver 1.1 : Remote input and output(RX,RY) - 2048 Bit, Remote register(RWr,RWw) 512 WORD Ver 2.0 : Remote input and output(RX,RY) - 8192bit, Remote register(RWr,RWw) 2048 WORD
Maximum score/ 1station	Remote input and output : each 32 points, remote register 8 WORD
Maximum occupation stations number	4stations occupation(able to expand data volume, per a slave)
Cyclic transmission data size	24Byte/1station
Transient transmission data size	960Byte (Master->Slave 150Byte/Scan, Slave->Master 34Byte/Scan)
Total slave stations number	Maximum 64 stations Different by the number of occupation of a slave. (Maximum 15ea in the case of MotionGate)
Communication speed and cable expansion distance	10Mbps : 100m (Optical repeater use : 4.3 km) 5Mbps: 160m (Optical repeater use : 4.48 km) 2.5Mbps : 400m (Optical repeater use: 5.2 km) 625Kbps : 900m (Optical repeater use : 6.7 km) 156Kbps : 1200m (Optical repeater use: 7.6 km)
Communication method	Broad Casting Pooling

Link score on occupation station

Link Device	CC-Link Ver.1		CC-Link Ver.2 Expansion Cyclic							
			1x set-up		2x set-up		4x set-up		8x set-up	
	1 station	4 stations	1 station	4 stations	1 station	4 stations	1 station	4 stations	1 station	4 stations
Remote input and output (RX,RY)	32 points	128 points	23 points	32 points	32 points	224 points	64 points	448 points	128 points	896 points
Remote register (RWw)	4 points	16 points	4 points	16 points	8 points	32 points	16 points	64 points	32 points	128 points
Remote register (RWr)	4 points	16 points	4 points	16 points	8 points	32 points	16 points	64 points	32 points	128 points

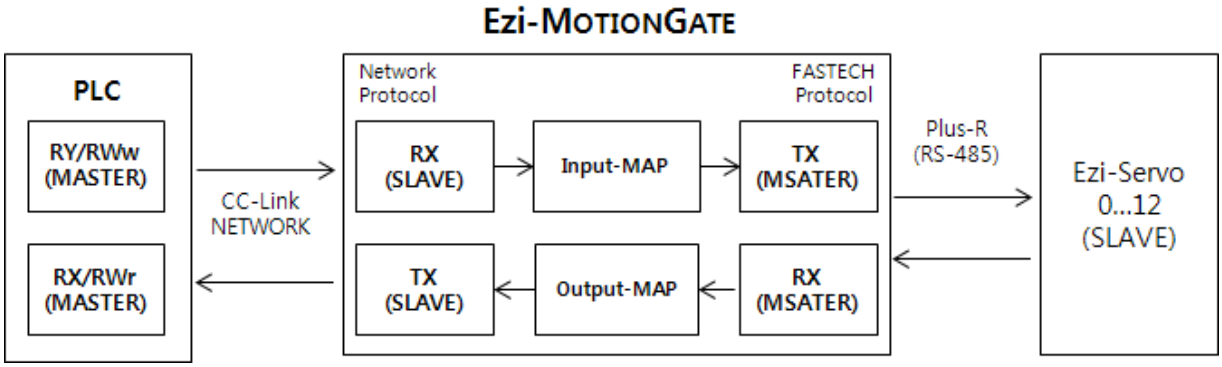
MotionGate's CC-Link network set-up value

CC-Link station type	Ver 2. Remote device station
Expansion cyclic set-up	4x set-up
Occupation station	4 stations occupation
Remote station point	448 points
Remote register	64 words

4.1.2 MotionGate overview and network composition

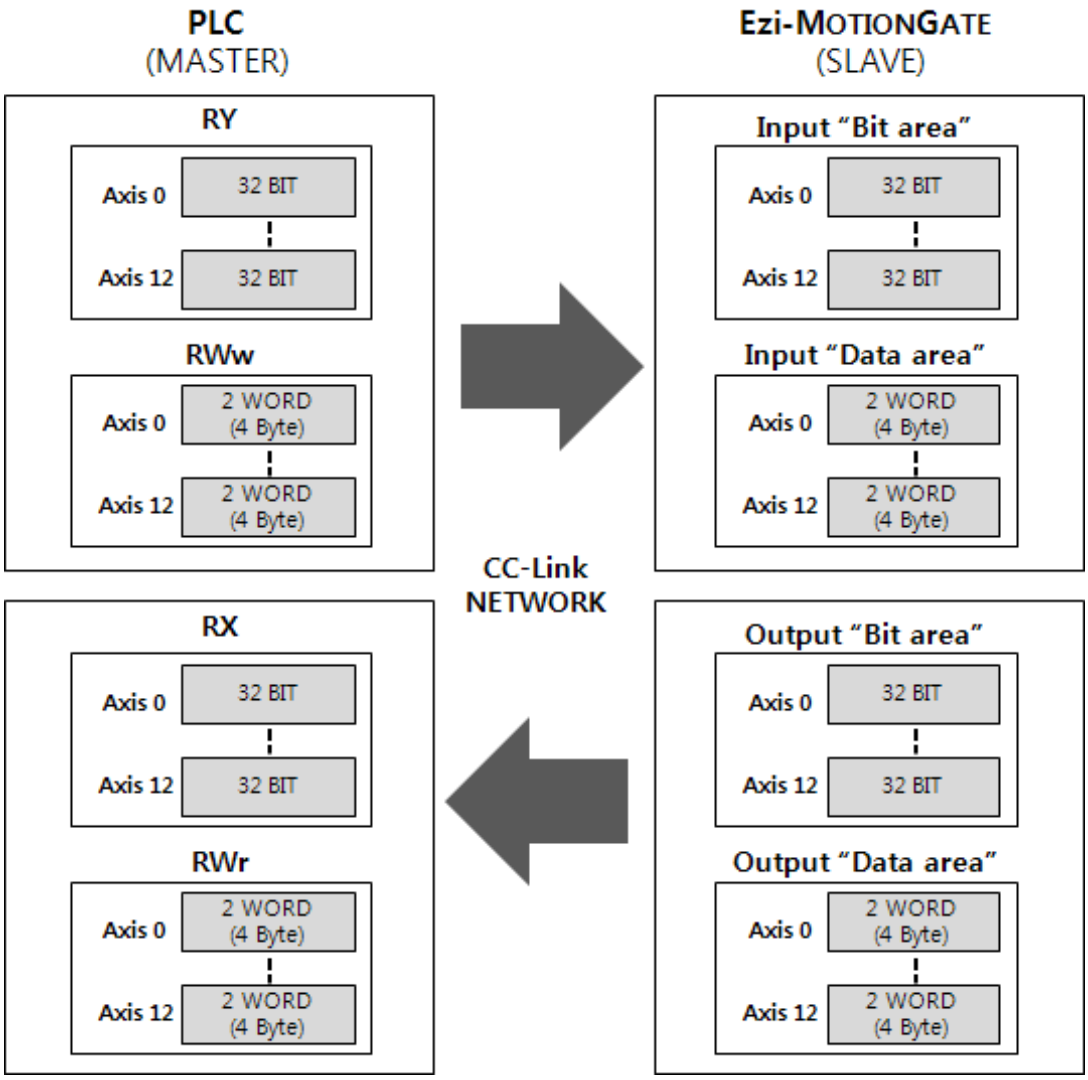
MotionGate used in CC-Link network supports maximum 13ea(Axis 0~12) (differs by the MotionGate supporting each network. Can check quantity confirmation able to support by network at *2.2 Product feature table by network).

Upper controller(PLC) should become master system able to access the memory address of exchange section connected with MotionGate. As the MotionGate recieves remote data of the upper controller from CC-Link network, it controls competent axis to Input-Map of received data. The response data of each axis is composed of Output-Map and transmits remote data to CC-Link network.

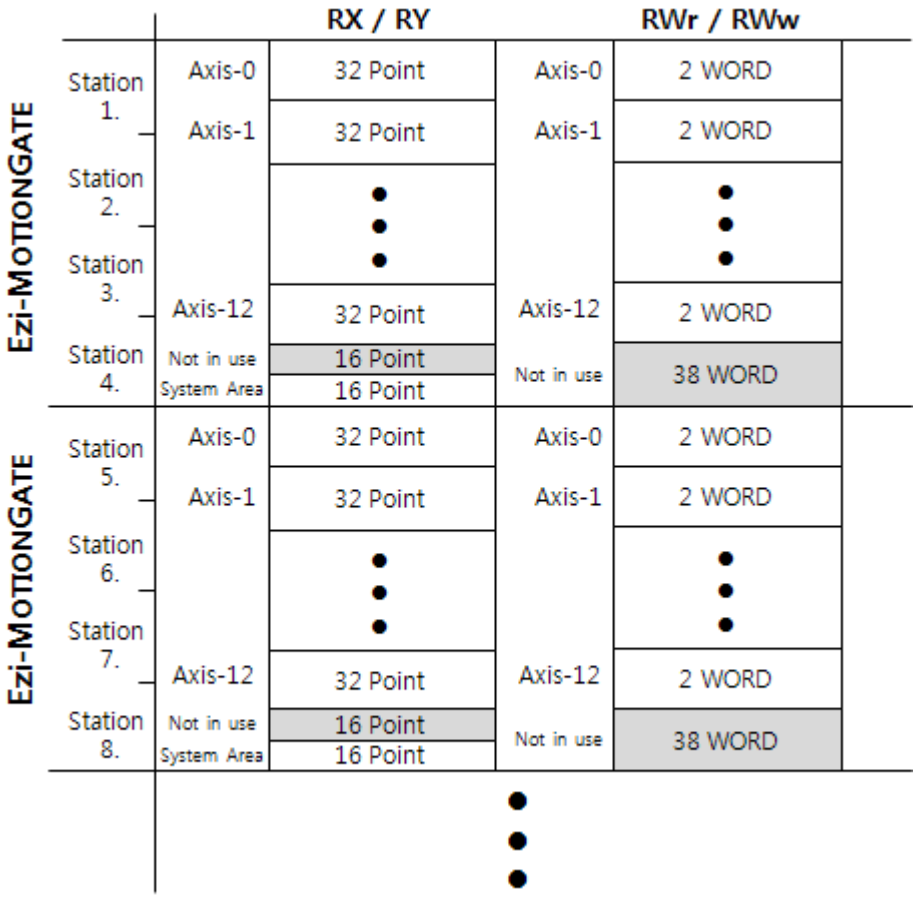


Command on each motor drive connected to MotionGate of CC-Link network uses data composed of IO-Map and commands and requests information. Herein the address area of IO-Map is the area to confirm control command and response information on each axis. IO-Map data composition is divided to bit area composed of 32 bit on an axis and data area composed of 2 WORD(4 Byte).

Upper controller(PLC) can confirm control and response data as the data address area of IO-Map.



MotionGate's IO-Map data address area uses 41 points of remote device(RX, RY) of upper controller and remote register occupies 26 words. However, since there are section on IO-Map and restricted section as CC-Link system area, remote device occupies 448 points and remote register 64 words.



The last 16 points of remote device is used as system area and the remaining bits excluding bits for CC-Link error state and handshacking command[1)] are internal process bits handled in the MotionGate.

MOTIONGATE->PLC		PLC->MOTIONGATE	
Bit Offset	Contents	Bit Offset	Contents
0..7	(reserved)	0..7	(reserved)
8[1)]	Initial Data Processing Request	8[1)]	Initial Data Processing Complete
9	Initial Data Setting Complete	9	Initial Data Setting Request
10	Error Status	10	Error Reset Request
11	Remote READY	11..15	(reserved)
12.. 15	(reserved)		

NOTE : Handshaking command is the bits confirming connection state between MotionGate and upper controller and refer to the command method of example 1 of 5.2. PLC LADDER programming.

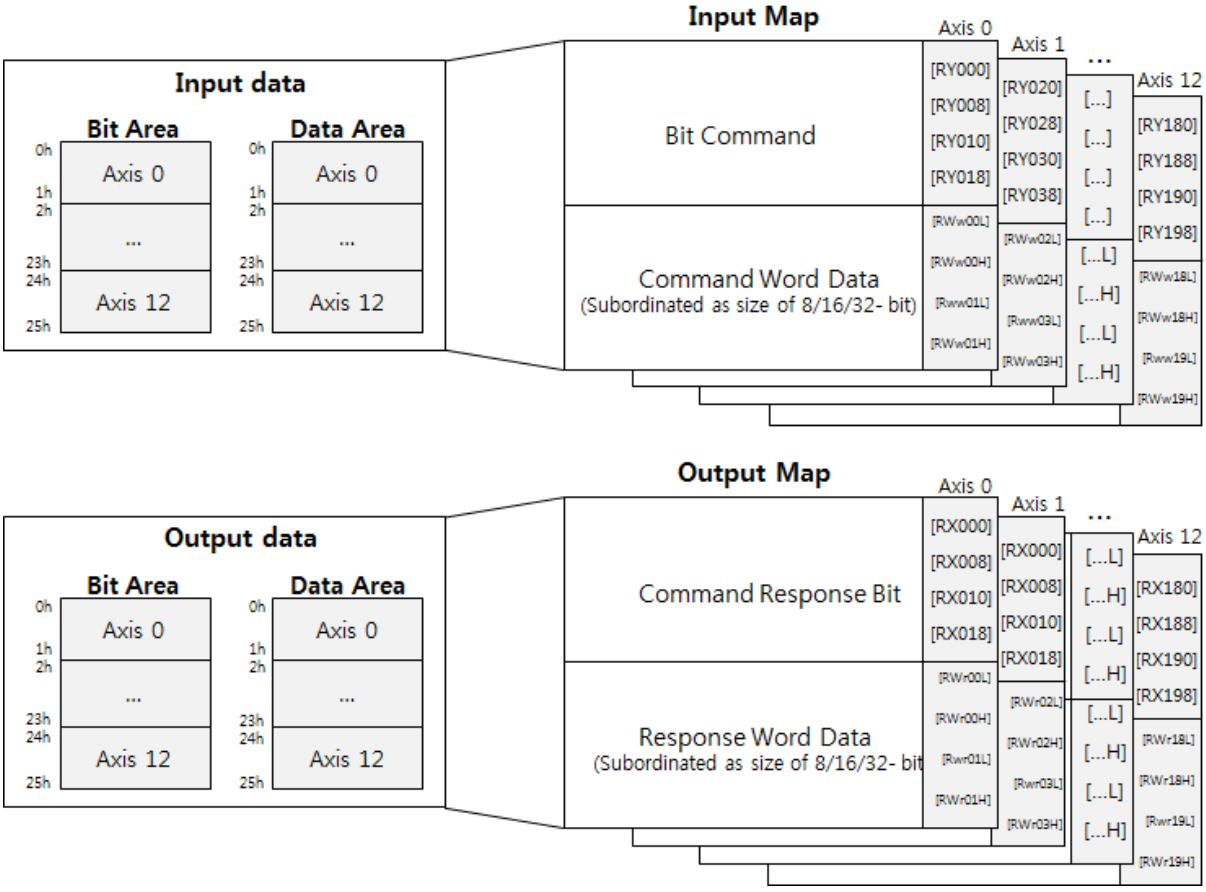
CC-Link device is composed of input and output device in the type of 16bit and register device. IO-Map of 8 byte structure in the device address is used like below address.

n = Input and output device starting address, m = Input and output register starting address

	Axis-0		Axis-1		~	Axis-12	
	Input-Map	**Output-Map**	**Input-Map**	**Output-Map**		**Input-Map**	**Output-Map**
BYTE 0	n+RY000	n+RX000	n+RY020	n+RX020		n+RY170	n+RX170
BYTE 1	n+RY008	n+RX008	n+RY028	n+RX028		n+RY178	n+RX178
BYTE 2	n+RY010	n+RX010	n+RY030	n+RX030		n+RY180	n+RX180
BYTE 3	n+RY018	n+RX018	n+RY038	n+RX038		n+RY188	n+RX188
BYTE 4	m+RWw00L	m+RWr00L	m+RWw02L	m+RWr02L	~	m+RWw24L	m+RWr24L
BYTE 5	m+RWw00H	m+RWr00H	m+RWw02H	m+RWr02H		m+RWw24H	m+RWr24H
BYTE 6	m+RWw01L	m+RWr01L	m+RWw03L	m+RWr03L		m+RWw25L	m+RWr25L
BYTE 7	m+RWw01H	m+RWr01H	m+RWw03H	m+RWr03H		m+RWw25H	m+RWr25H

IO-Map is divided to bit area[0-3] and data area[4-7]. Input-Map's bit area is used as the section for bit command of motor axis and data area is used as the section inputting data information corresponding to bit command. Output-Map's bit area is used as competent axis' status flag or command response bit on control command and the word area is the serction saving data of command directing to Input-Map.

Bit area from the first address to the second address is IO-Map on No. 0 axis connecting to the IO-Map of No.1 axis backward and so IO-Map's structure is continued to 2 byte area as the receiving section of No. 12 axis.



NOTE 1: CC-Link's bit area is noted as 00~0F at the address of 0h as the data of type of 16 bit at an address. Also, 1 word is noted as low byte of 00L and high byte of 00H at the address of 0h as 16 bit data.

NOTE 2: IO-Map data area with two address areas becomes DWORD typed data structure.

4.2 Control command bit area(Input Map) & Status information bit area (Output Map)

Input-Map bit composition

Input-Map is area commanding control of motor drive. With combination of bit on command, it can set up selection of motion control of motor drive and information type or value of PT information and so on.

Input-Map bit area(High 4 byte area)

BYTE offset	BIT	Bit name	level	Description
0	0	CONNECT	Rising Edge	The use of corresponding axis will be determined by setting up this bit. If this bit is set as '1', communication between the corresponding axis will be attempted and if the communication to the corresponding axis is not required, this number should be set as '0'. If it is set as '0', the communication with the corresponding axis is excepted and no command will be executed. If many commands to multiple axes are generated simultaneously, the processing sequence will be started from the low to high number of motor drive. If one event for one axis is completed, the process for the next ID axis will be started. If there is no command or event from corresponding axis, MotionGate will receive the data for the status information and response request from corresponding axis. - Status information of corresponding axis (flags FLAG-define) - Command position (signed long 32-bit) - Actual position (signed long 32-bit) - Position error (signed long 32-bit) - Current driving speed (signed long 32-bit) - Current driving PT number **NOTE 1:** MotionGare executes the Fas_GetAllStatus() function command frequently. **NOTE 2:** Motor control delaying time will be twice more than the number of connected axes in case the motor has the same delaying time.

BYTE offset	BIT	Bit name	level	Description
	1	ENABLE / IGNORED	Rising Edge	SERVO Drive: The status of corresponding axis will be converted to the motion available status. 0 : ServoOFF 1 : ServoON STEP Drive: This bit command will be ignored.
	2	nESTOP	Falling Edge	Stop of execution of motion or all commands. (Emergency stop) * 0: Execute the E-Stop Command, 1: Standby of the E-Stop Command
	3	ALARM_RESET / MOTOR_FREE	Rising / Falling Edge	SERVO Drive: This will be used when releasing the generated alarm (positive edge operation) * Motor free status of step drive will be maintained when MOTOR_FREE bit is maintained as '1' and the step motor alarm reset command will be executed in negative edge when it is changed to '0'.
	4	CMD_START	Rising Edge	Executing 'Speed Override' command when ordering 'Jog Run' command. Use when moving the position or execute the PT drive or executing the original point move command.
	5	-	-	-
	6	-	-	-
	7	MOTION /SETTTING	H/L	A bit that selects the MotionGate Map as motion or set-up. 0: Motion control mode 1: Set-up mode
1	0	CMD_CODE0	H/L	**During Motion control mode** 0000(0): General move (Jog, Step, Zero point move) 0001(1): Relative value move [Incremental Move], Absolute value move [Absolute Move] 0100(4): PT Drive (PT Drive, Single PT Drive) 0111(7): Original point move (Origin) **During set-up mode** 0000(0): No command 0101(5): Verifying the version information 1000(8): Parameter request 1001(9): Parameter write 1010(10): Position informaiton change 1100(12): Alarm log request 1101(13): Alarn log delete 1110(14): Parameter save
	1	CMD_CODE1		
	2	CMD_CODE2		
	3	CMD_CODE3		

BYTE offset	BIT	Bit name	level	Description
	4	RESPONSE_TYPE0	H/L	Define the response format of desired response data from RX section of the corresponding axis. 0000(0): Do not request the response data. 0001(1): Command position 0010(2): Actual position 0011(3): Position error 0100(4): Present speed 0101(5): Driving PT number 1000(8): Currently generated alarm number *** Do not use in set-up mode**
	5	RESPONSE_TYPE1		
	6	RESPONSE_TYPE2		
	7	RESPONSE_TYPE3		
2	0	CANCEL	Rising Edge	General stop of motion
	1	HOLD	Falling Edge	Hold during motion
	2	-	-	-
	3	GO_ZERO_POS	Falling Edge	Move to the designated Zero position from corresponding axis driving (position value: 0)
	4	-JOG_MOV	Falling Edge	Reverse direction JOG drive Input value of data area: speed rate, speed value, speed step number.
	5	+JOG_MOV	Falling Edge	Forward direction JOG drive Input value of data area: speed rate, speed value, speed step number.
	6	-STEP_MOV	Falling Edge	Positive/negative move using inside parameter value (such as position and speed) of MotionGate. Input value of data area: Number of position value (0~3) * This can be redefined by user.
	7	+STEP_MOV	Falling Edge	Increase/decrease of move using inside parameter value (such as position and speed) of MotionGate Input value of word area: Number of position value (0~3) * This can be redefined by user.

BYTE offset	BIT	Bit name	level	Description
3	0	INC/ABS	H/L	A bit that selects either relative value move or absolute value move when the controlling method is position move (CMD_CODE:0001). 0: relative value move 1: absolute value move
	1	-	'	-
	2	SPD_MODE	H/L	Use for the Jog move when controlling method is general motion (CMD_CODE: 0000). 0: Jog drive using input ratio or speed step number 1: Jog drive using input speed
	3	-	'	-
	4	SINGLE_PT	H/L	A bit that selects either general PT drive or single PT drive when controlling method is PT drive (CMD_CODE:0100). 0: general PT drive 1: Single PT drive
	5	-	'	-
	6	-	'	-
	7	-	'	-

NOTE: Input Map is the area where MotionGate is input command with PLC or master.

Output-Map bit composition

Output-Map section has loop-back bit on data flag and bit command. Loop-back bit is the bit responding identically with command event of the corresponding bit, able to confirm whether of bit input of Input-Map. Status flag appears based on data information received by communicating with the corresponding motor drive.

Output-Map bit area (High 4 byte area)

BYTE offset	BIT	Bit name	level	Description	BYTE offset
0	0	CONNECTED	H	status bit	Set this bit a '1' when connected to the Plus-R of corresponding axis
	1	ENABLED MOTOR_FREE (STEP)	H	status bit	Set as '1' when Servo ON of corresponding axis or Step motor is in Normal status. * This will be the response bit for Motor Free command when in STEP Drive status.
	2	ESTOP_RESP	H	Loopback	Set as '1' if the emergency stop command is executed by Loopback bit of nESTOP bit of Input-Map.
	3	ALARM_ERROR	H	status bit	It will be set as '1' automatically when alarm is generated from the motor drive of the corresponding axis. It will be cleared to '0' when alarm is released.
	4	CMD_RESP	H	Loopback	Loopback bit of CMD_START bit of Input-Map.
	5	OUT_RANGE	H	status bit	Set as '1' if the data area value of Input-Map does not match to the corresponding command value.
	6	READY	H	status bit	It will be set as '1' if the command for the current corresponding axis is in operable status. No command is operable if this bit is '0'. **NOTE 1:** If READY bit is set as '1' from the setting mode, other axes are controllable.
	7	SET_MOV_RESP	H/L	Loopback	It will be set as '1' if the data of current Output-Map is in setting mode, and will be cleared to '0' in motion mode.

BYTE offset	BIT	Bit name	level	Description	BYTE offset
	0	CMD_CODE_RESP0	H/L	Loopback	Respond to the types of move command 0000(0): General move (Jog, Step, Zero position move) 0001(1): Relative value move [Incremental Move], Absolute value move [Absolute Move] 0100(2): PT Drive (PT Drive, Single PT Drive) 0111(3): Original point move (Origin)
	1	CMD_CODE_RESP 1	H/L		
	2	CMD_CODE_RESP 2	H/L		
	3	CMD_CODE_RESP 3	H/L		
	4	RESPONSE_TYPE_RESP0	H/L	Loopback	Respond to the response data allocated in Word area. 0000(0): Do not request the response data. 0001(1): Command position 0010(2): Actual position 0011(3): Position error 0100(4): Present speed 0101(5): Driving PT number 1000(8): Currently generated alarm number
	5	RESPONSE_TYPE_RESP1	H/L		
	6	RESPONSE_TYPE_RESP2	H/L		
	7	RESPONSE_TYPE_RESP3	H/L		
2	0	MOTIONNING	H/L	status bit	Set as '1' when corresponding axis is in motion status.
	1	HOLD_RESP	H/L	status bit	Set as '1' when in hold status by the command of HOLD bit during operation.
	2	-			
	3	GO_ORIGIN_RESP	H	status bit	Set as '1' when executing the return to parameter original point of Plus-R of corresponding axis.
	4	-	-		-
	5	JOG_RESP	H	status bit	When corresponding axis is in Jog drive.
	6	-	-		-
	7	STEP_RESP	H	status bit	When corresponding axis is in Step drive.

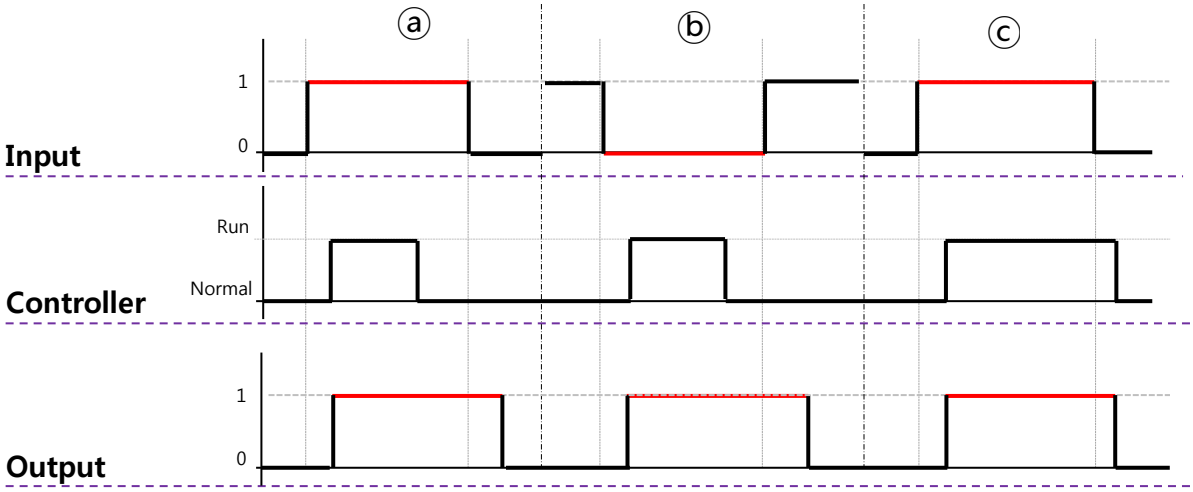
BYTE offset	BIT	Bit name	level	Description	BYTE offset
	0	PT_RUNNING	L/H	status bit	When corresponding axis is in position move.
	1	MOV DIR	L/H	status bit	Displays the rotation direction of motor. 0 : CW(+) 1 : CCW(-) * If FLAG_IN_MOTION bit is set as '1', updated value should be verified. logical operation (FLAG_IN_MOTION &FLAG_nDIR)
	2	INP	L/H	status bit	It will be set as '1' when 'In position' of motor is completed. * This bit is not operable when motor is in STEP status.
	3	ORIGIN_SENSOR	H	status bit	It will be set as '1' when original point sensor is turned ON.
	4	SW_LIMIT_N	H	status bit	It will be set as '1' when '-' direction program limit is exceeded.
	5	SW_LIMIT_P	H	status bit	It will be set as '1' when '+' direction program limit is exceeded.
	6	HW_LIMIT_N	H	status bit	It will be set as '1' when '-' direction limit sensor is turned ON.
	7	HW_LIMIT_P	H	status bit	It will be set as '1' when '+' direction limit sensor is turned ON.

NOTE: Output Map is the area where MotionGAte outputs status information with PLC or Mater.

4.3 IO Map operation order and operation conditions

4.3.1 IO-Map bit command method

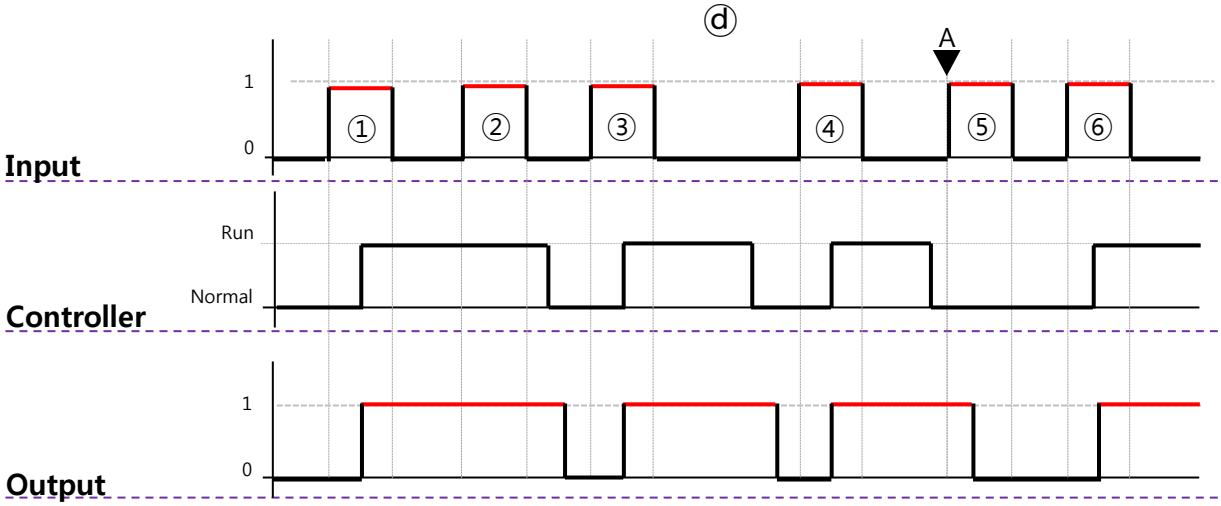
Bit command is divided to abscent edge and descent edge.



Start of ascent edge command of Input is at the point of changing from '0' to '1' like section ⓐ. MotionGate receiving the command delivers the command to the corresponding axis and responds the command with output when the commnad is fulfilled.

Start of descent edge command is at the point of changing from '1' to '0' of input command like sectionⓑ. With the event the MotionGate delivers command to the corresponding axis and responds the commnad with output when the command is fulfilled.

Bit command like sectionⓒ is the ascent edge command of input and as MotionGate delivers the operation command of the corresponding axis, maintains ongoing command until there is a command of descent edge. The order of the command is that when the operation of the corresponding axis operates with the ascent edge of input, it responds with the operation with output. And when the operation of the corresponding axis stops with descent edge command of iput, it responds the operation stop with output.



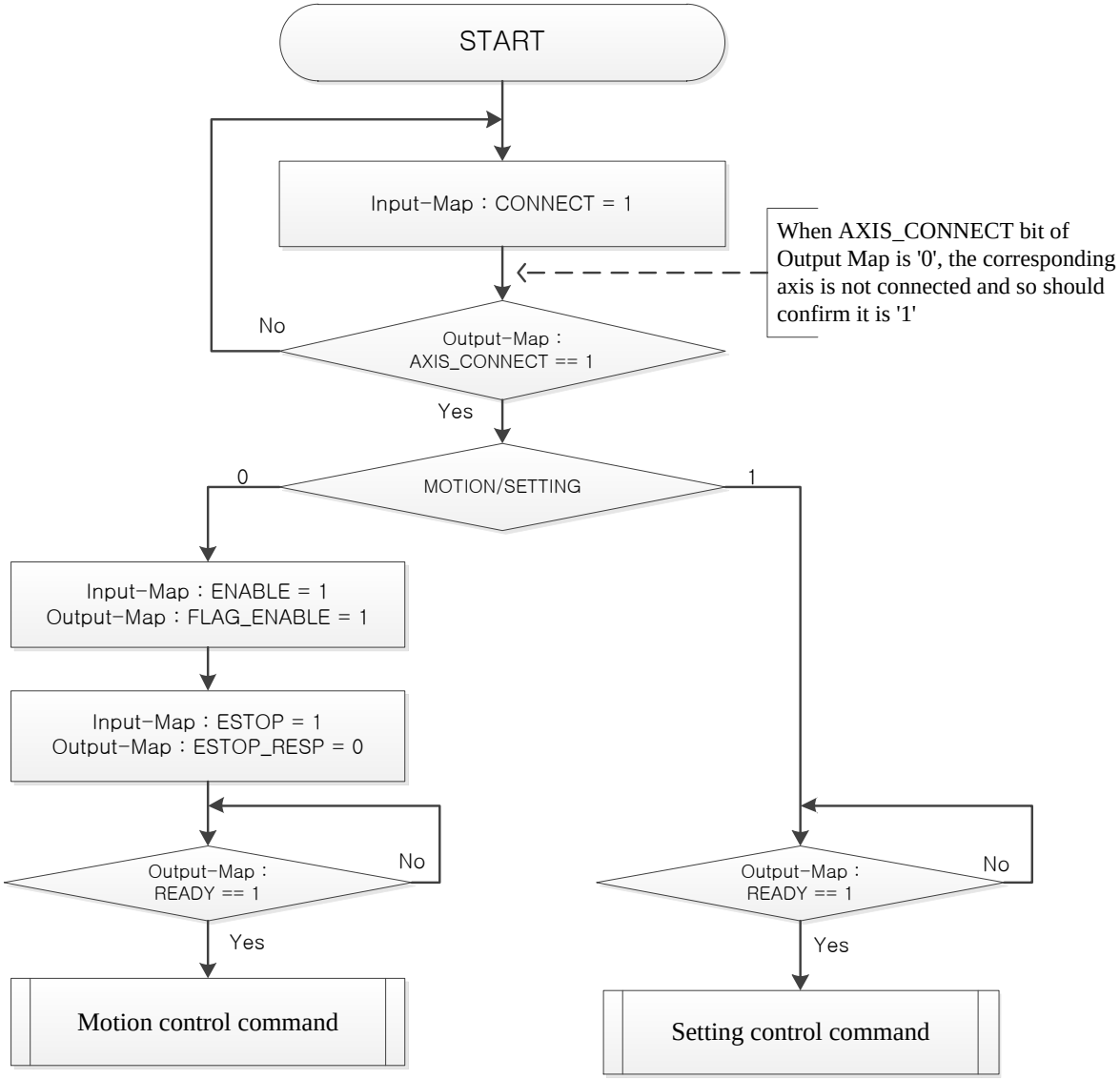
Section ⓓ is the case of continuous operation of input command. In this case, command starts identical to section ⓐ with command①. At this time when the MotionGate is operating, operation isn't conducted with command②. And operation is fulfilled with command③ input after the operation of MotionGate which is operated with command① is completed.

When command⑤ is input at the point A which is before reponse of output and the operation fulfilled with command④ is completed, the input is ignored. However, it operates with command⑥ input after response of output. That is, operation of MotionGate is fulfilled with input command and the input command when there is response of state of completion of operation at output is valid.

4.3.2 IO-Map control command preparation order

When MotionGate fulfills command, below process of order is necessary.

Flowchart 1. Activation conditions of motion and set-up control command



※ MotionGate command

① Fulfill command by setting connect bit of input-map to '1'. <Reference: IO-Map manual *2.2.1>

- CONNECT bit is to select use of the corresponding axis, should be set to '1'.
- Confirm that response state of AXIS_CONNECT bit of Output-Map is '1'.

② Select MOTION/SETTING bit of Input-Map <Reference : IO-Map manual *2.1>

- Select motion control to '0' and setting control to '1'.

③ Motion control set ENABLE bit of Input-Map and ESTAOP bit to '1'. <Reference: IO-Map manual *2.2.1>

- Confirm that Response bit of Output-Map, FLAG_ENABLE bit is '1'.
- Confirm that ESTOP_RESP is '0'.

④ When try to fulfilling command, confirm state of READY bit of Output-Map. <Reference: IO-Map manual * 2.7>

- While our commands are fulfilling, READY bit is maintained as '0'.
- If there is no motion command, READY bit is maintained as '1'.
- On setting command, it is maintained as '0' until the corresponding command is completed.

⑤ Motion control of drive is fulfilled with bit combination of IO-Map on motion command.

<Reference: IO-Map manual *2.1.1, *2.1.2>

- Set up MOTION/SETTING bit of Input-Map to '0'.
- Command fulfillment of motion control should set up "CONNECT= 1, ENABLE=1, nESTOP=1".

⑥ Confirmation and modification on the set-up value of drive and MotionGate is fulfilled with bit combination of IO-Map on setting control. <Reference: IO-Map manual *6. *7. *8. *9>

- Set up MOTION/SETTING bit of Input-Map to '1'.
- Command fulfillment of setting control should set up "CONNECT= 1".

5. IO-Map use examples (for CC-Link)

5.1. MELSOFT GX- developer project set-up

- Main items on setting network parameter

  - RX : It is the area of receiving MotionGate status and response information and Output Map data is applied.

  - RY : It is the section transmitting command on bit combination with MotionGate is Input Map data is applied.

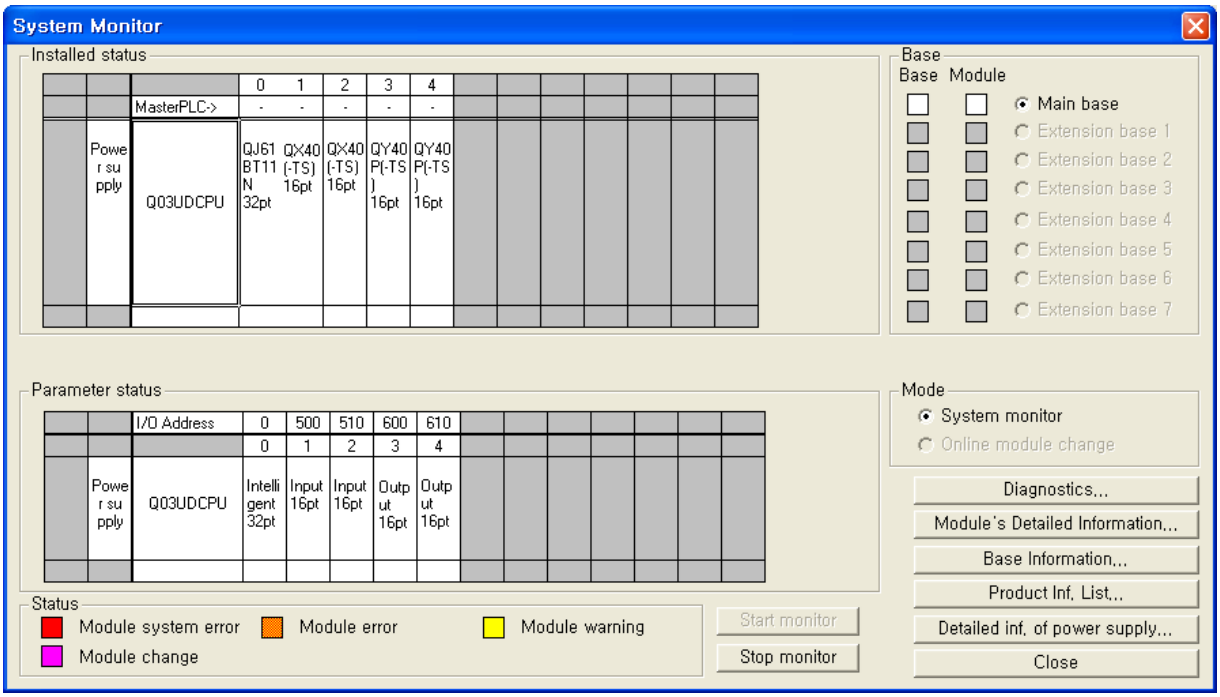
  - RWr : It is used as data area of Output Map of MotionGate.

  - RWw : It is used as data area of Input Map of MotionGate.

※ The examples of the manual is produced based on PLC like following.

- PLC series : MELSEC-Q
- PLC type : Q03UD
- CC-Link module : QJ61BT11N
- MELSOFT series GX developer 8

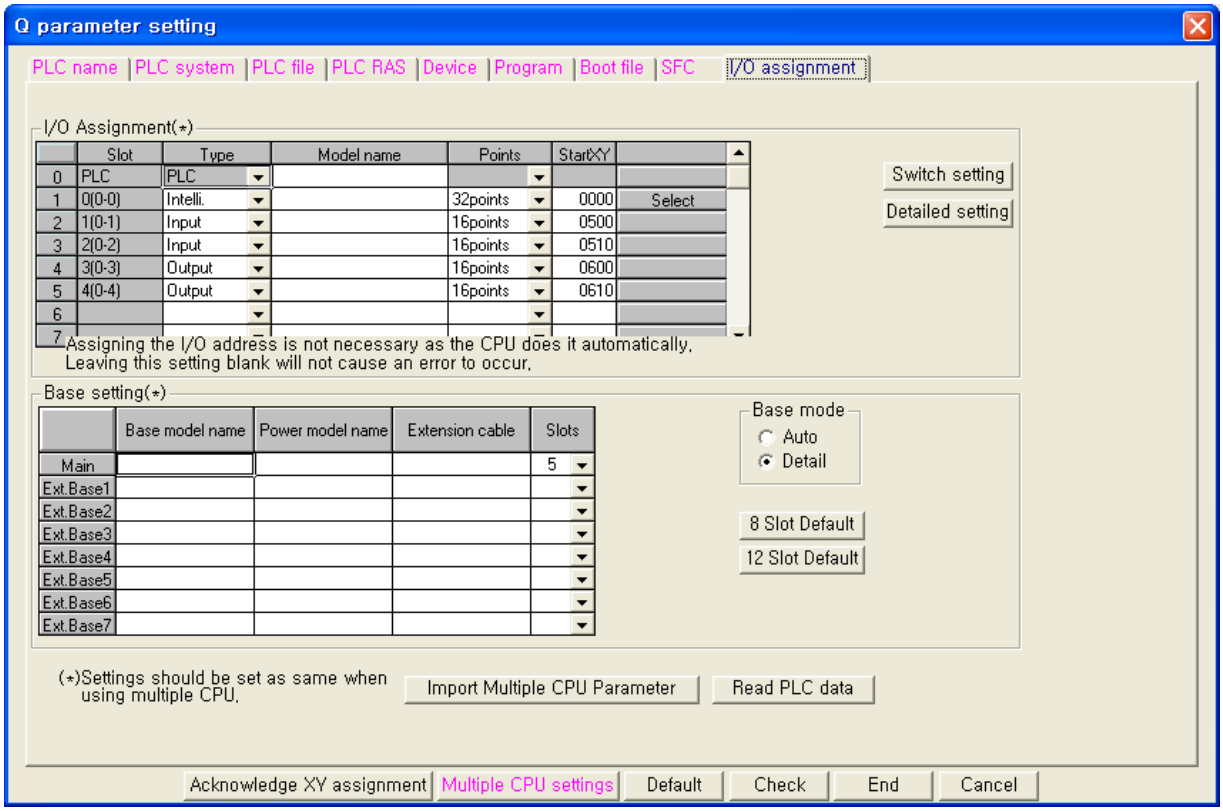
Fig. 5.1 PLC system used in example



■ PLC parameter set-up

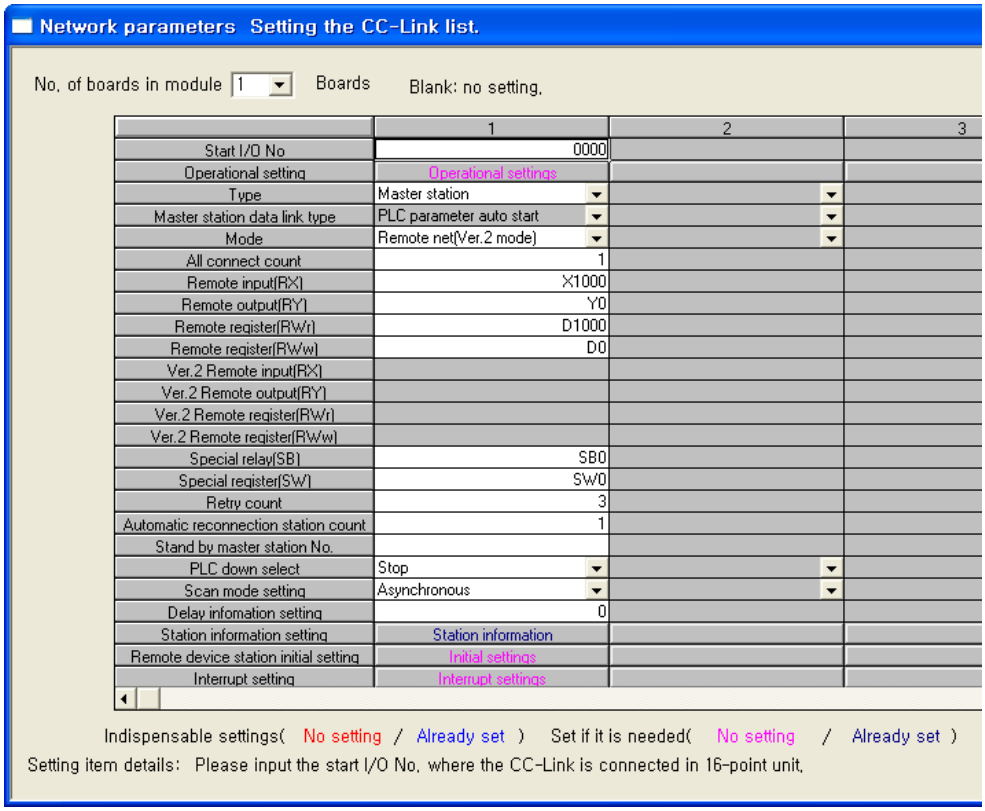
- In the project of PLC program GX developer, PLC parameter set-up sets I/O assignment column like Fig. 5.1.

Fig. 5.1 PLC parameter set-up value



■ CC-Link network parameter set-up

Fig. 5.2 Network parameter on a MotionGate



◆ Essential particulars

- Remote input[RX] refresh device value 『X1000』 is the start position of bitmap area of Output Map.

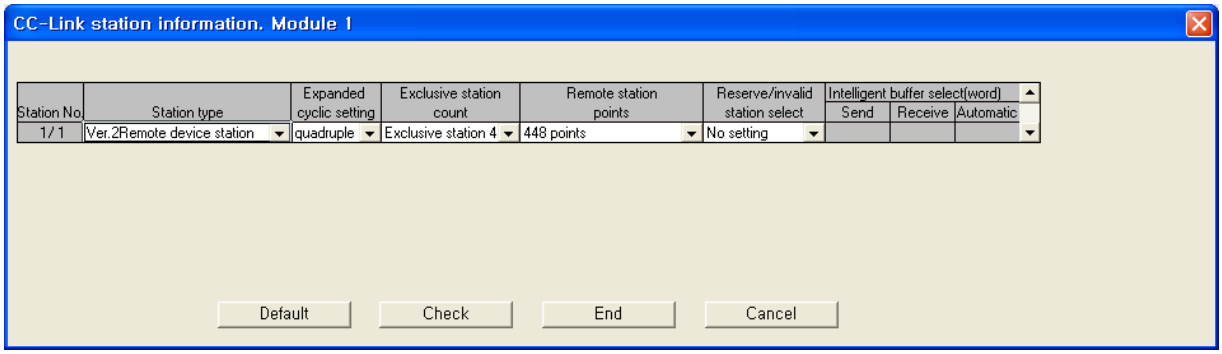
- Remote output[RY] refresh device value 『Y0』 is the start position of bitmap area of Input Map.

- Remote register[RWr] refresh device 『D1000』 is the start position of data area of Output Map.

- Remote register[RWr] refresh device 『D0000』 is the start position of data area of Input Map.

◆ MotionGate station information set-up

Fig. 5.3 MotionGate station information(single connection)



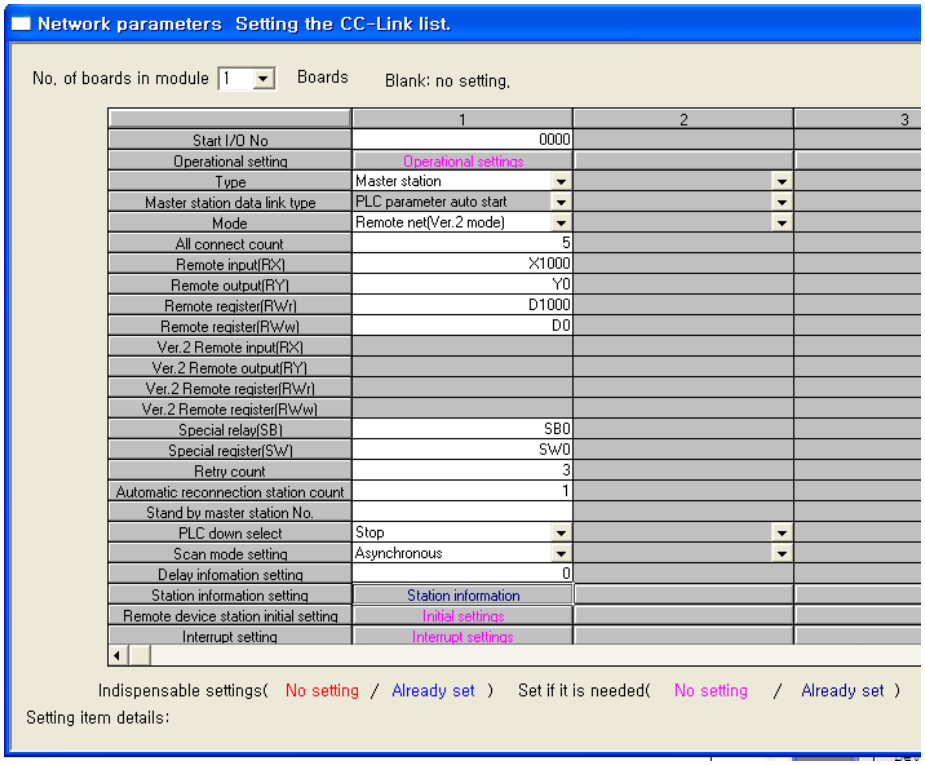
- Cyclic set-up of Ezi-MotionGate CC-Link is 4 times.
- Ezi-MotionGate CC-Link has 4 occupation stations. Hence, since the total connection number of a module able to connect at CC-Linknetwork is 63, the maximum connectable number on connecting only MotionGate is 15ea.
- Ezi-MotionGate CC-Link use remote station point of a piece with 448points.

■ Several MotionGate connecting method

a. PLC parameter set-up is identical to the single connecting method.

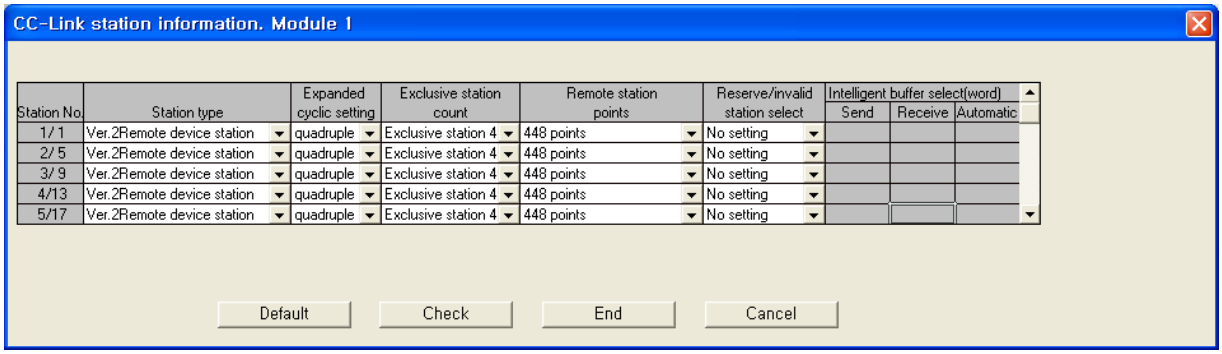
b. Total connection number is changed at the CC-Link network parameter set-up list. (Example sets up 5ea)

Fig. 5. 4 Parameter on connecting 5 MotinGates



c. Station information designates MotionGate set-up value at each page.

Fig. 5.5 MotionGate station information(5ea connection)



d. Station numbers of connected MotionGates are 1, 5, 9, 13, 17 and the equipments connecting to next number from the ahead MotionGate station number(n) have n+4 station number. Therefore, each MotionGate has address like below table.

Table 11.1 Address of contact point of starting connection by CC-Link station number and Handshaking bit

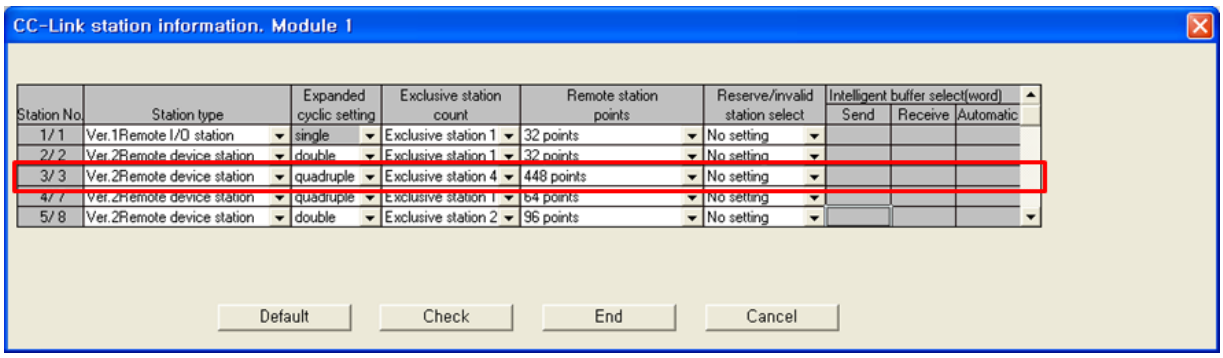
Order	CC-Link Station No.	Input Map Bit Area [RY]		Input Map Data Area [RWw]	Output Map Bit Area [RX]		Output Map Data Area [RWr]
		Map	Handshaking	Map	Map	Handshaking	Map
1	1	0h	1B8h	0h	1000h	1B8h	1000h
2	5	1C0h	378h	40h	11C0h	378h	1040h
3	9	380h	538h	80h	1380h	538h	1080h
4	13	540h	6F8h	C0h	1540h	6F8h	10C0h
5	17	700h	8B8h	100h	1700h	8B8h	1100h
6	21	8C0h	A78h	140h	18C0h	A78h	1140h
7	25	A80h	C38h	180h	1A80h	C38h	1180h
8	29	C40h	DF8h	1C0h	1C40h	DF8h	11C0h
9	33	E00h	FB8h	200h	1E00h	FB8h	1200h
10	37	FC0h	1178h	240h	1FC0h	1178h	1240h
11	41	1180h	1338h	280h	2180h	1338h	1280h
12	45	1340h	14F8h	2C0h	2340h	14F8h	12C0h
13	49	1500h	16B8h	300h	2500h	16B8h	1300h
14	53	16C0h	1878h	340h	26C0h	1878h	1340h
15	57	1880h	1A38h	380h	2880h	1A38h	1380h
16	61	1A40h	1BF8h	3C0h	2A40h	1BF8h	13C0h

NOTE: It is the address value in the case of connecting only MotionGate to a CC-Link network at maximum.

■ Starting contact point on connecting with other equipments at CC-Link network

The following composition is the case that MotionGate is set up as station No. 3 in CC-Link network.

Fig. 5.6 Station information set-up of MotionGate on use combining with diverse equipments



The starting point of connected MotionGate's refresh device is designated by amount of remote station point of ahead station at the point designated at network parameter. Also, address of Handshaking is the point of 1B8h(440) offset from MotionGate's starting point.

Page No.	Station No.	Input Map Bit Area [RY]	Input Map Data Area [RWw]	Output Map Bit Area [RX]	Output Map Data Area [RWr]	Handshaking
1	1	0h	0h	1000h	1000h	-
2	2	20h	20h	1020h	1020h	-
3	3	40h	40h	1040h	1040h	1F8h
4	7	200h	200h	1200h	1200h	-
5	8	240h	240h	1240h	1240h	-

NOTE: The equipment of station No. 1, 2, 7, 8 is address definition on arbitrary equipment without regard to MotionGate.

5.2. PLC LADDER programming example

- Bit area and data area

MotionGate has section like following for bit unit address and word unit(16bit) address regarding mutual data exchange through CC-Link.

- ✓ Remote input(RX)
- ✓ Remote output(RY)
- ✓ Remote input register(RWr)
- ✓ Remote output register(RWw)

Input Map commanded in the manual is used as remote output[RY] and remote output register[RWw] of CC-Link parameter. And Output Map uses remote input[RX] and remote output register[RWr] of CC-Link parameter.

System area used at remote input and output bit area is handled automatically by MotionGate and it is the section inputting status and confirmation data.

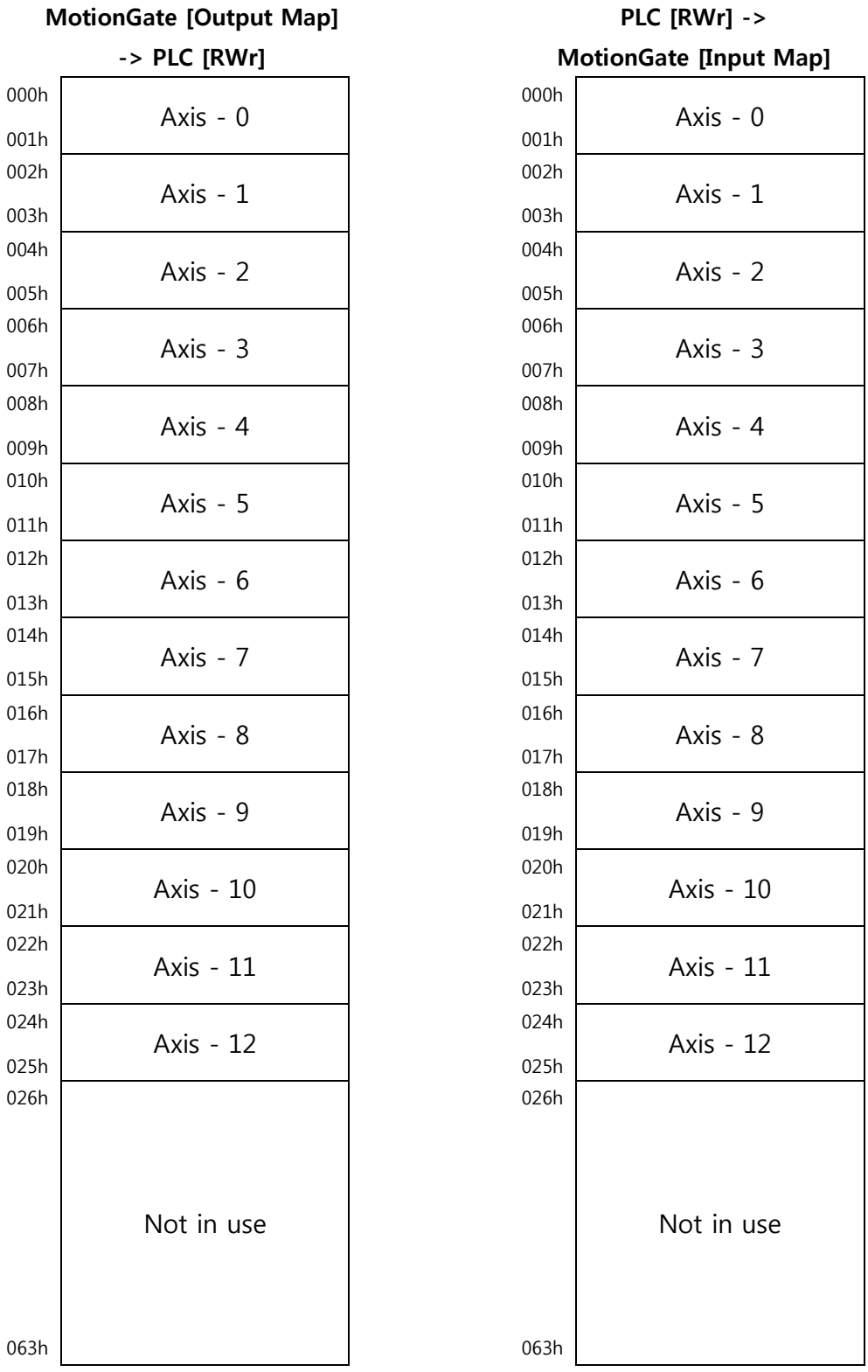
NOTE: Should fulfill Handshaking command in the area.

Fig. 5. 7 Address range of remote input and output area (bit area)

MotionGate [Output Map] -> PLC [RX]		PLC [RY] -> MotionGate [Input Map]	
000h 01Fh	Axis - 0	000h 01Fh	Axis - 0
020h 03Fh	Axis - 1	020h 03Fh	Axis - 1
040h 05Fh	Axis - 2	040h 05Fh	Axis - 2
060h 07Fh	Axis - 3	060h 07Fh	Axis - 3
080h 09Fh	Axis - 4	080h 09Fh	Axis - 4
0A0h 0BFh	Axis - 5	0A0h 0BFh	Axis - 5
0C0h 0DFh	Axis - 6	0C0h 0DFh	Axis - 6
0E0h 0FFh	Axis - 7	0E0h 0FFh	Axis - 7
100h 11Fh	Axis - 8	100h 11Fh	Axis - 8
120h 13Fh	Axis - 9	120h 13Fh	Axis - 9
140h 15Fh	Axis - 10	140h 15Fh	Axis - 10
160h 17Fh	Axis - 11	160h 17Fh	Axis - 11
180h 19Fh	Axis - 12	180h 19Fh	Axis - 12
1A0h 19Fh	Not in use	1A0h 19Fh	Not in use
1A0h 1BFh	Syatem Area	1A0h 1BFh	Syatem Area

NOTE: On actual use, bit address of each axis is offset value on the starting address of remote input and output device set up at CC-Link network parameter.

Fig. 5. 8 Address range of remote input and output register area(data area)

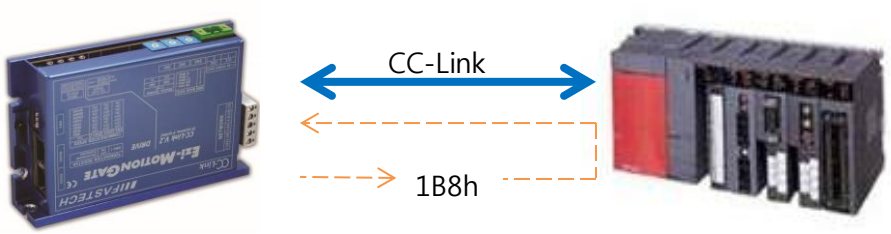


NOTE: On actual use, bit address of each axis is offset value on the starting address of remote register device set up at CC-Link network parameter.

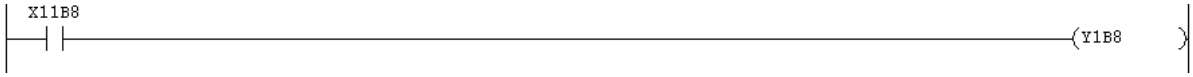
■ Handshaking

MotionGate transmits bit requesting data process to PLC at the beginning. At this time, PLC should transmit data of confiming receipt of bit status to MotionGate. The bit uses remote input and 441th bit of output.

Fig. 5. . Handshaking concept



Ex 1. Ladder program for handshaking



① In the case that starting address of remote input[RX] is X1000 : X11B8

② In the case that starting address of remote output[RY] is Y0000 : Y01B8

Ex 1 is the command inspecting communication status between MotionGate and PLC and without the command MotionGate does not work and so ongoing command should be maintained.

■ CONNECT

CONNECT command uses on determining use of the corresponding axis. Ex 2 is an example on CONNECT command on Axis-1.

Ex 2. Activation command of each axis and response bit confirmation

✓ **Control bit map address**

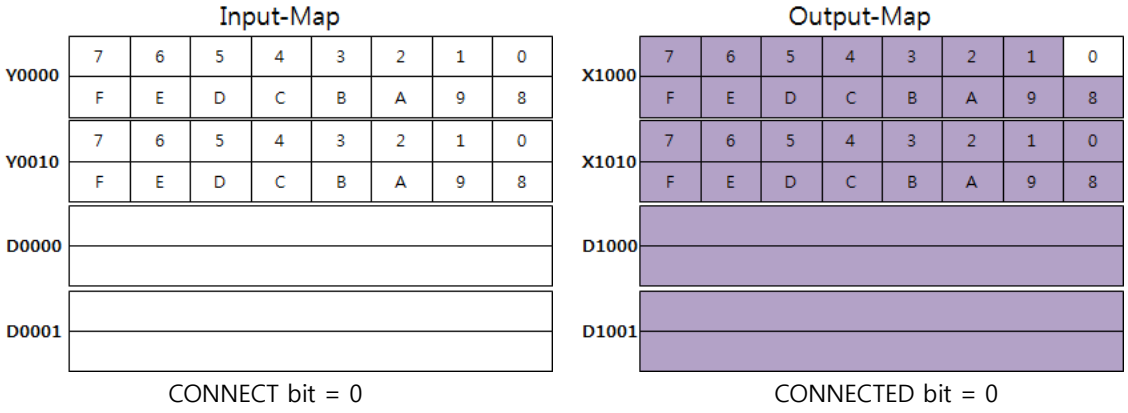
- **Input-Map**
  CONNECT – Y0000
- **Output-Map**
  CONNECTED – Y1000

✓ **Input and output information**

- **Input signal**
  CONNECT - X500
- **Output signal**
  CONNECT RESP - Y600

✓ **IO-Map command and response type**

- **Before fulfilling CONNECT command**



- **After fulfilling CONNECT command**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

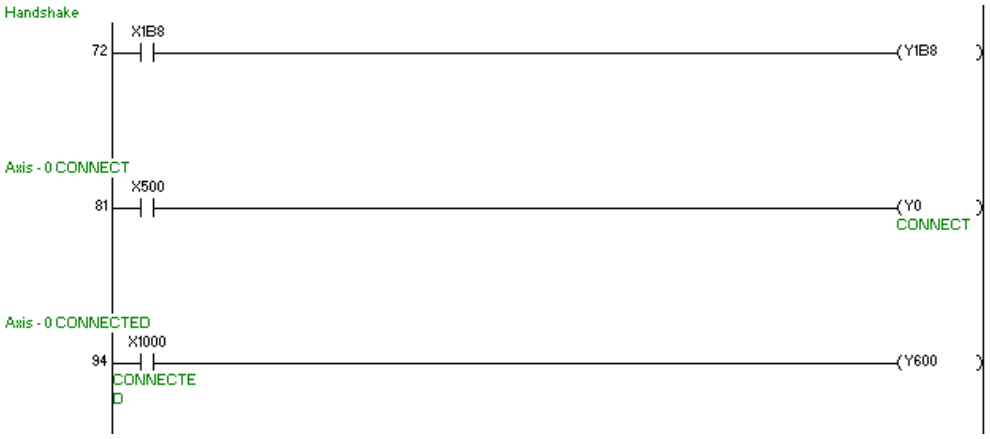
CONNECT bit = 1

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

CONNECTED bit = 1

LADDER



NOTE: Ex 2 is basic example included in examples after Axis-0 and following examples are available in the state that the command is fulfilled.

✓ **Command order**

① Add handshaking command.

② With input of X500, set CONNECT bit(Y0) of Axis-0.

③ On normal connection of Axis-0, response data is outputed.

④ Confirm the response status on the command using Axis-0 by outputing to Y600.

⑤ In the case of no connection, all data register bit of 4 WROD except No.0 bit of D000 is set to 1.

■ ENABLE command and E-ETOP command

ENABLE command operates in the sate of deactivation of E-STOP command. Ex 3 is the example on the motor activation command of Axis-0 and E-STOP command.

Ex 3. Motor activation command and emergency stop command

✓ **Control bit map address**

- **Input-Map**

  ENABLE – Y0001

  E-STOP – Y0002

- **Output-Map**

  ENABLED – Y1001

  E-STOP_RESP – Y1002

✓ **Input and output information**

- **Input signal**

  ENABLE - X501

  E-STOP - X502

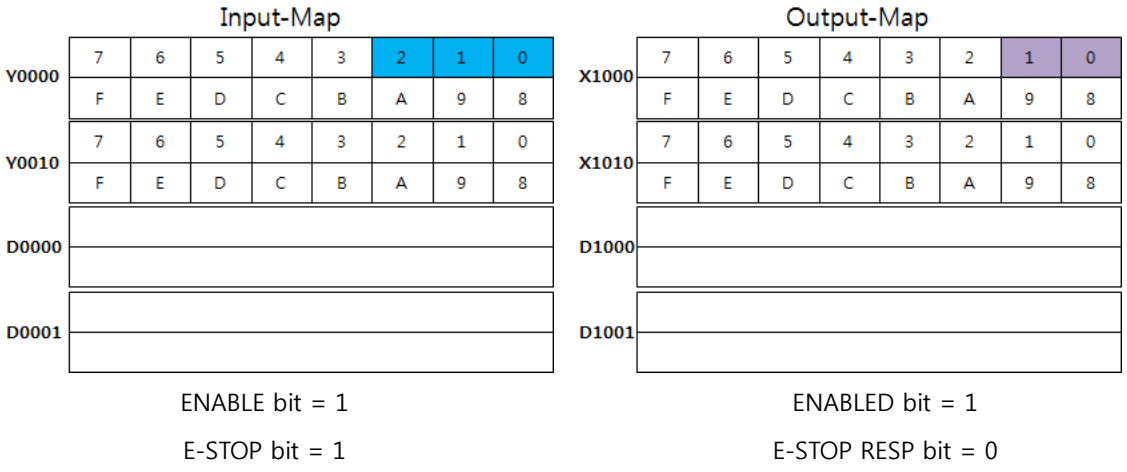
- **Output signal**

  ENABLE RESP - Y601

  E-STOP LoopBack - Y602

✓ **IO-Map command and response type**

- **ENABLE command fulfillment**



ENABLE bit = 1

E-STOP bit = 1

ENABLED bit = 1

E-STOP RESP bit = 0

- **E-STOP command fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

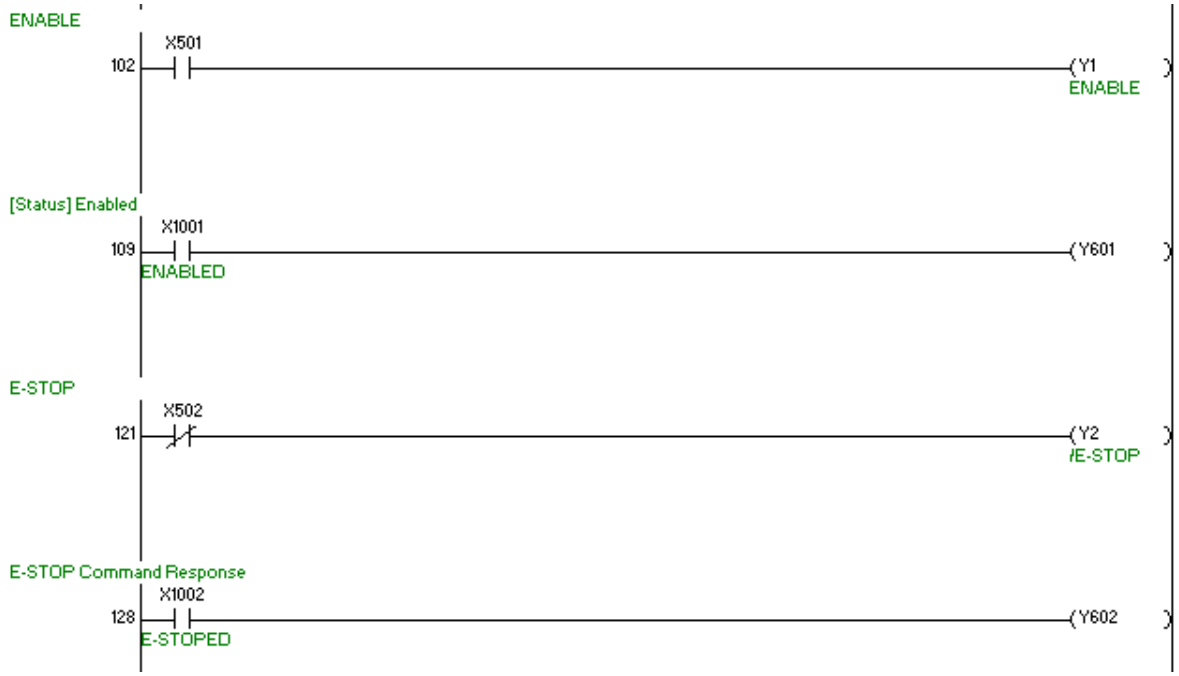
ENABLE bit = 1

E-STOP bit = 0

ENABLED bit = 0

E-STOP RESP bit = 1

✓ **LADDER**



NOTE: Ladder of Ex 3 is the command on Axis-0. The example is included in following examples.

✓ **Command order**

① Motor activation command sets ENABLE bit(Y1) with X501 input.

② In the state of motor activation, status bit, it is output to Y601 in the state of ENABLED bit(X1001) which is the status bit.

③ /E-STOP bit is controlled with N/C input of X502. If X502 input is in the state of close, E-STOPED bit(X1002) becomes inactivated and so even if ENABLE command is fulfilled with X501 at this time, ENABLE command does not operate. Also, all motion control commands are able to command control in the state of activation of /E-STOP command.

■ ALARM status confirmation

Alarm status can be confirmed with ALM/ERR. Ex 4 is the example for confirmation method of Axis-0's alarm status and alarm lift.

Ex 4. Alarm status confirmation and alarm lift command

✓ **Conrol bit map address**

- **Input-Map**

  ENABLE – Y0001

  E-STOP – Y0002

  ALARM_RESET – Y0003

- **Output-Map**

  ENABLED – X1001

  E-STOP_RESP – X1002

  ALARM_ERROR –X1003

✓ **Input and output information**

- **Input signal**

  ALM_RST – X503

- **Output signal**

  ALM_STAT – Y603

✓ **IO-Map command and response type**

- **On alarm occurrence**

Input-Map

Y0000	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

X1000	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

ALARM RESET bit = 0

ENABLE bit = 1

E-STOP bit = 1

ALARM bit = 1

ENABLED bit = 0

E-STOP RESP bit = 0

- **Alarm lift command fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

ALARM RESET bit = 1

ENABLE bit = 1

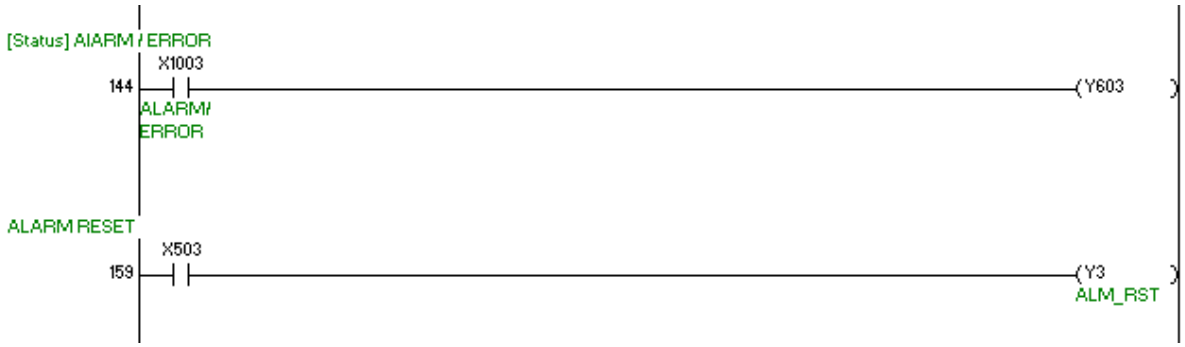
E-STOP bit = 1

ALARM bit = 0

ENABLED bit = 0

E-STOP RESP bit = 0

✓ **LADDER**



NOTE: Ladder of Ex 4 is an added command to Ex 3, omitting Handshaking, CONNECT, ENABLE, E-STOP commands.

✓ **Command order**

① Alarm status is output to Y603 in the state of ALM/ERR bit (X1003).

② Occurred alarm is close input of X503, able to reset the occurred alarm.

③ On alarm occurrence, the motor becomes inactivated and ENABLE bit(X1001) becomes Open state.

■ CANCLE command

Fulfillment cancellation command is used for motion stop, temporary stop command cancellation, PT operation stop. Ex 5 is an example of Axis-0 fulfillment cancellation command.

Ex 5. Fulfillment cancellation command

✓ **Control bit map address**

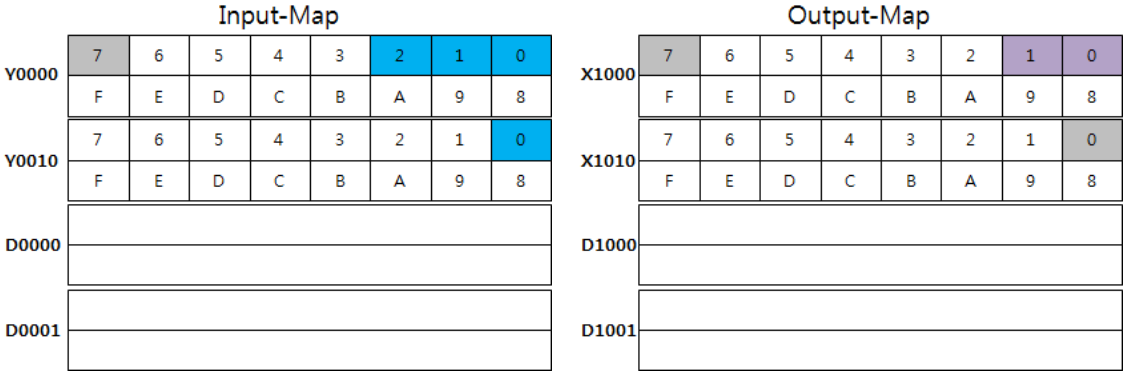
- **Input-Map**
  MOTION/SETTING – Y0007
  CANCLE – Y0010
- **Output-Map**
  MOTION/SETTING_RESP – X1007
  MOTIONING – X1010

✓ **Input and output information**

- **Input signal**
  CANACLE – X504
- **Output signal**
  MOTIONING – Y604

✓ **IO-Map command and response type**

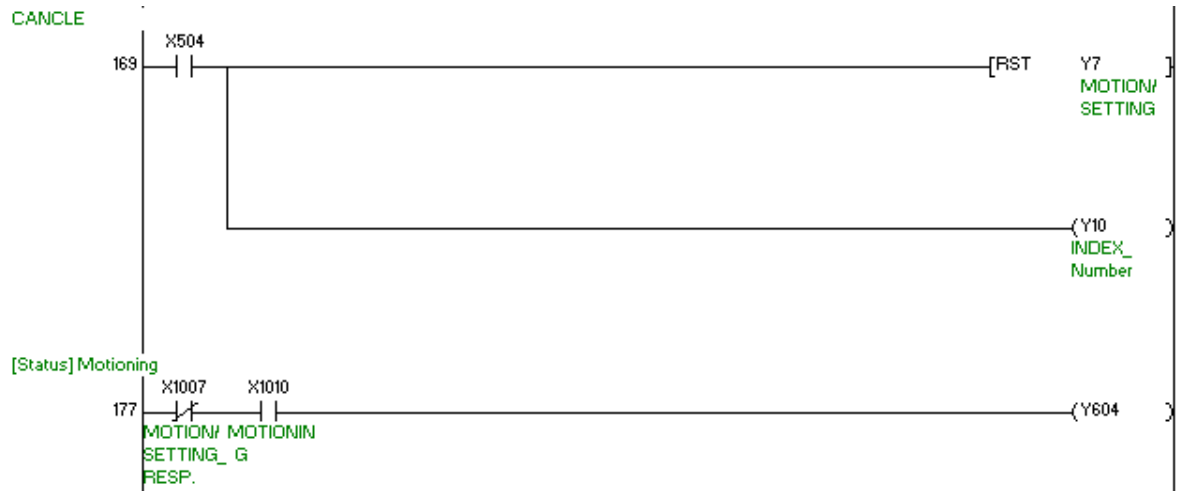
- **CANCLE command fulfillment**



MOTION/SETTING bit = 0
CANCLE bit = 1

MOTION/SETTING_RESP bit = 0
MOTIONING bit = 0

✓ **LADDER**



NOTE: Ladder of Ex 5 is the added command to Ex 4, omitting content of previous example.

✓ **Command order**

① By clearing MOTION/SETTING(Y0007) bit with Close input of X504, IO-Map is switched to the state of motion mode.

② Fulfillment cancellation command is applied when CANCEL bit (Y10) is ON regardless of CMD_CODE value.

③ During fulfillment of Axis-0 motion, MOTIONING bit (X1010) becomes Close state and output to Y604. However, on fulfillment cancellation through X504, MOTIONING bit (X1010) becomes Open state.

* If CANCEL command is input during PT operation, PT operation stops.

■ HOLD command

Temporary stop command stops motion command temporarily and restarts. Ex 6 is an example of Axis – 0 temporary stop command.

Ex 6. Axis – 0 temporary stop command

✓ **Control bit map address**

- **Input-Map**

  MOTION/SETTING – Y0007

  HOLD – Y0011

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  MOTIONING – X1010

  HOLD_RESP – X1011

✓ **Input and output information**

- **Input signal**

  HOLD – X505

- **Output signal**

  MOTIONING – Y604

  HOLD Resp – Y605

✓ **IO-Map command and response type**

- **Motion temporary stop with HOLD command fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
	7	6	5	4	3	2	1	0
Y0010	F	E	D	C	B	A	9	8
D0000								
D0001								

MOTION/SETTING bit = 0

HOLD bit = 1

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
	7	6	5	4	3	2	1	0
X1010	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING_RESP bit = 0

HOLD_RESP bit = 1

MOTIONING bit = 0

- **Motion restart with HOLD command lift**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING bit = 0

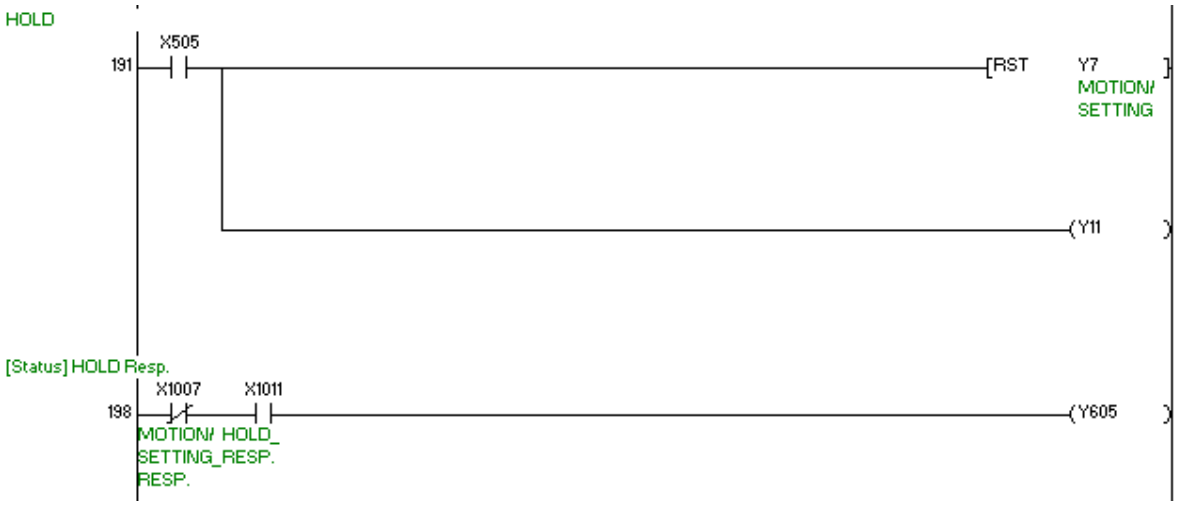
HOLD bit = 0

MOTION/SETTING_RESP bit = 0

HOLD_RESP bit = 0

MOTIONING bit = 1

✓ **LADDER**



NOTE: Ladder of Ex 6 is added command to Ex 5, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING(Y0007) bit with Close input of X505, IO-Map is switched to the state of motion mode.

② Fulfillment cancellation command is applied when HOLD bit(Y0011) is ON regardless of CMD_CODE value.

③ When X505 becomes Open input in the sate of HOLD command fulfillment, HOLD bit (Y0011) is switched to OFF, restarting temporary stop motion.

④ When HOLD command is fulfilled, HOLD_RESP bit(X1011) becomes Close state and output to Y605.

⑤ Operation status by HOLD command can be confirmed with HOLD_RESP. Bit (X1011) in the Close state of MOTION/SETTING_RESP. bit(X1007) received from remote input.

■ RESPONSE TYPE set-up

RESPONSE TYPE(response data set-up) set-up can be confirmed in the state of motion(MOTIONION). Ex 7 is an example on RESPONSE TYPE set-up method of Axis-0.

Ex 7. Response data set-up

✓ **Control bit map address**

- **Input-Map**

  MOTION/SETTING – Y0007

  RESPONSE_TYPE 0~3 – Y00012~Y00015

- **Output-Map**

  MOTION/SETTING_RESP – Y1007

  RESPONSE_TYPE_RESP 0~3 – Y10012~Y100.15

  RESPONSE_DATA – D1000~D1000 (D1000 [1 DWORD])

✓ **Input and output information**

- **Input signal**

  Response Type 0~3

- **Output data(DWORD)**

  Command Position – D2000

  Actual Position – D2002

  Position Error – D2004

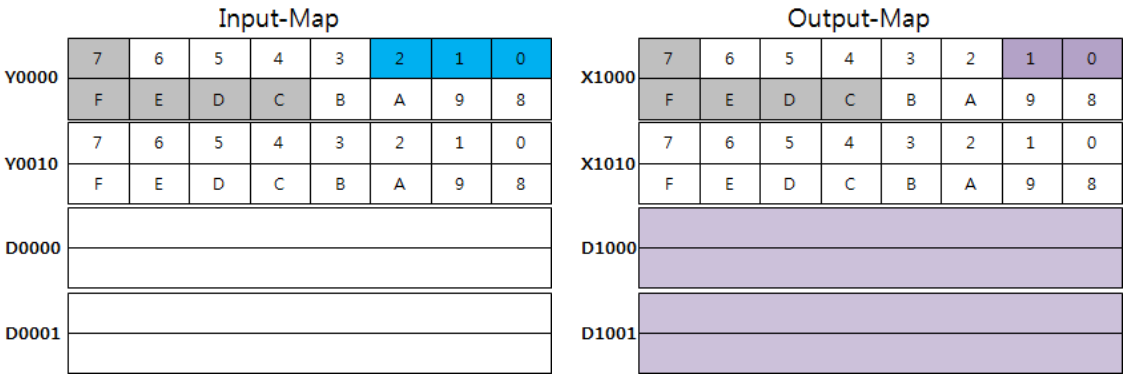
  Actual Velocity – D2006

  Current PT No – D2008

  Current Alarm No – D2010

✓ **IO-Map command and response type**

- **No request of response data**



MOTION/SETTING bit = 0 MOTION/SETTING_RESP bit = 0

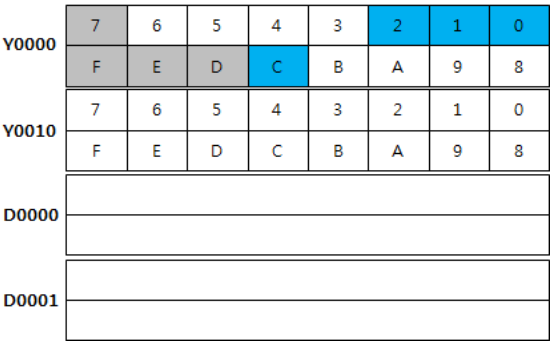
RESPONSE_TYPE 0~3 = 0000b

RESPONSE_TYPE 0~3 = 0000b

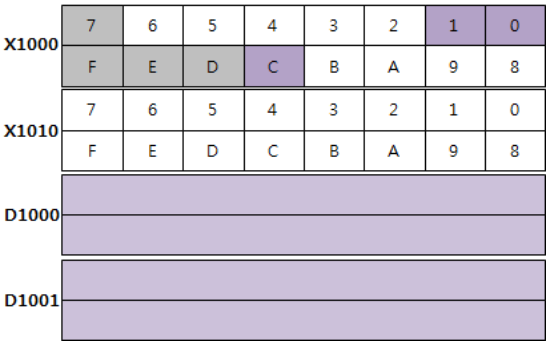
RESPONSE_DATA = 0

- **Request command position value**

Input-Map



Output-Map



MOTION/SETTING bit = 0

RESPONSE_TYPE 0~3 = 0001b

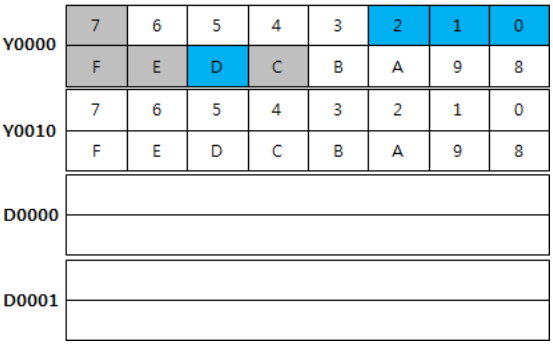
MOTION/SETTING_RESP bit = 0

RESPONSE_TYPE 0~3 = 0001b

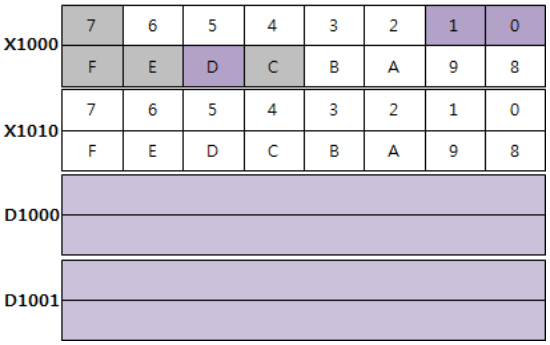
RESPONSE_DATA = Command Position

- **Request actual position value**

Input-Map



Output-Map



MOTION/SETTING bit = 0

RESPONSE_TYPE 0~3 = 0010b

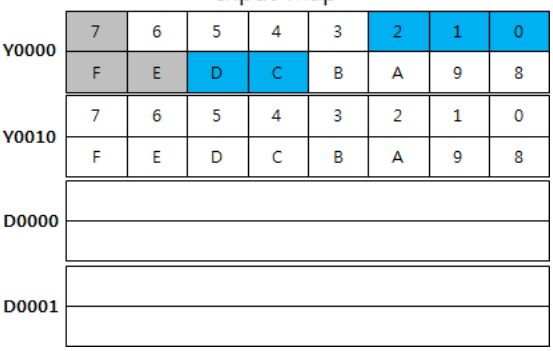
MOTION/SETTING_RESP bit = 0

RESPONSE_TYPE 0~3 = 0010b

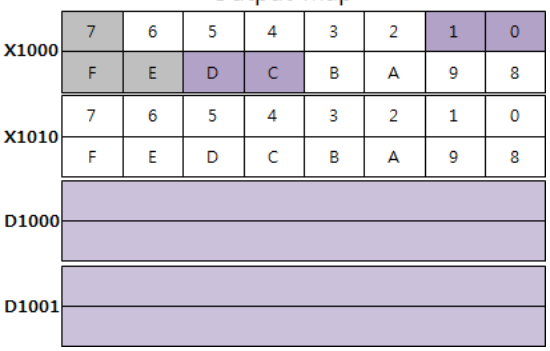
RESPONSE_DATA = Actual Position

- **Request position error value**

Input-Map



Output-Map



MOTION/SETTING bit = 0

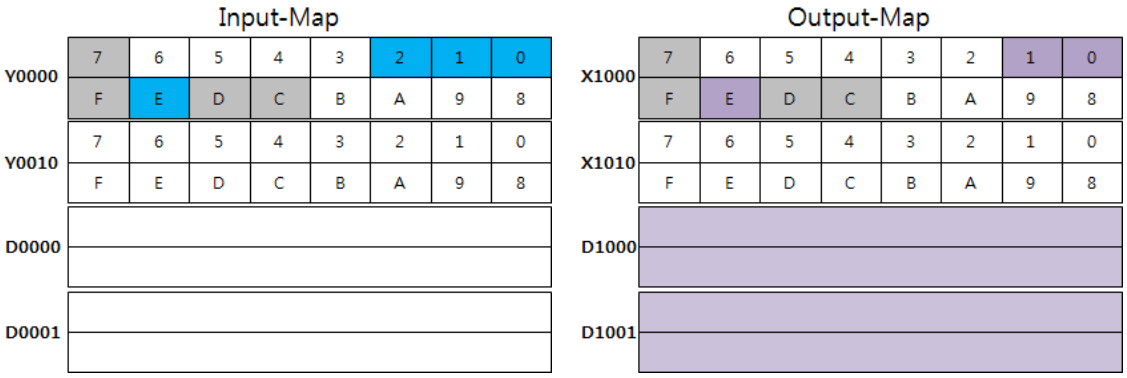
RESPONSE_TYPE 0~3 = 0011b

MOTION/SETTING_RESP bit = 0

RESPONSE_TYPE 0~3 = 0011b

RESPONSE_DATA = Position Error

- **Request actual velocity value**



MOTION/SETTING bit = 0

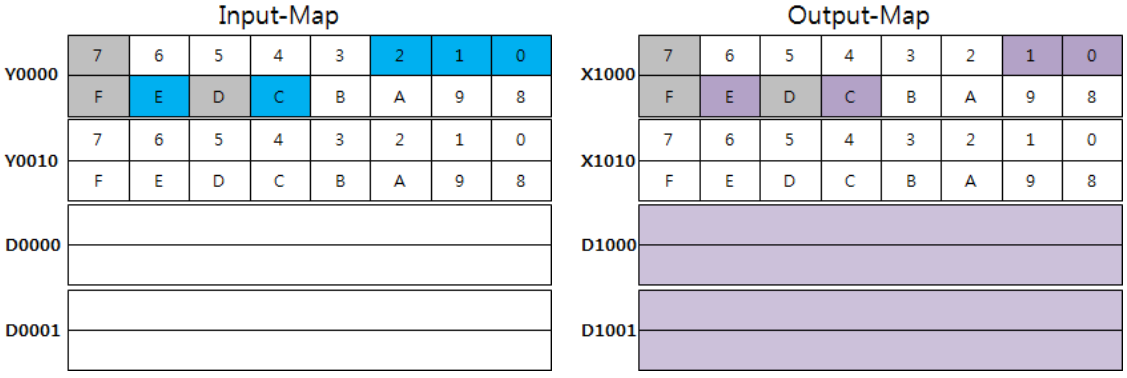
RESPONSE_TYPE 0~3 = 0101b

MOTION/SETTING_RESP bit = 0

RESPONSE_TYPE 0~3 = 0101b

RESPONSE_DATA = Actual Velocity

- **Requesting current PT number request(Current PT No.)**



MOTION/SETTING bit = 0

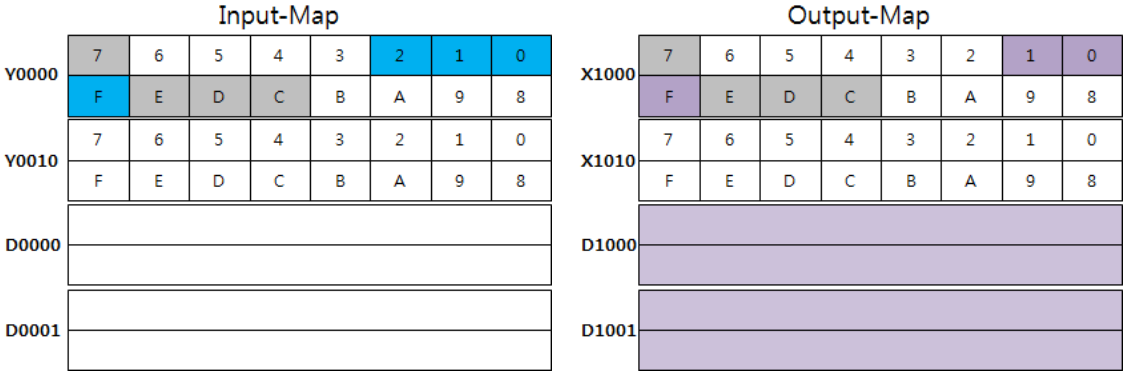
RESPONSE_TYPE 0~3 = 0101b

MOTION/SETTING_RESP bit = 0

RESPONSE_TYPE 0~3 = 0101b

RESPONSE_DATA = Current PT No.

- **Request current alarm infomation**



MOTION/SETTING bit = 0

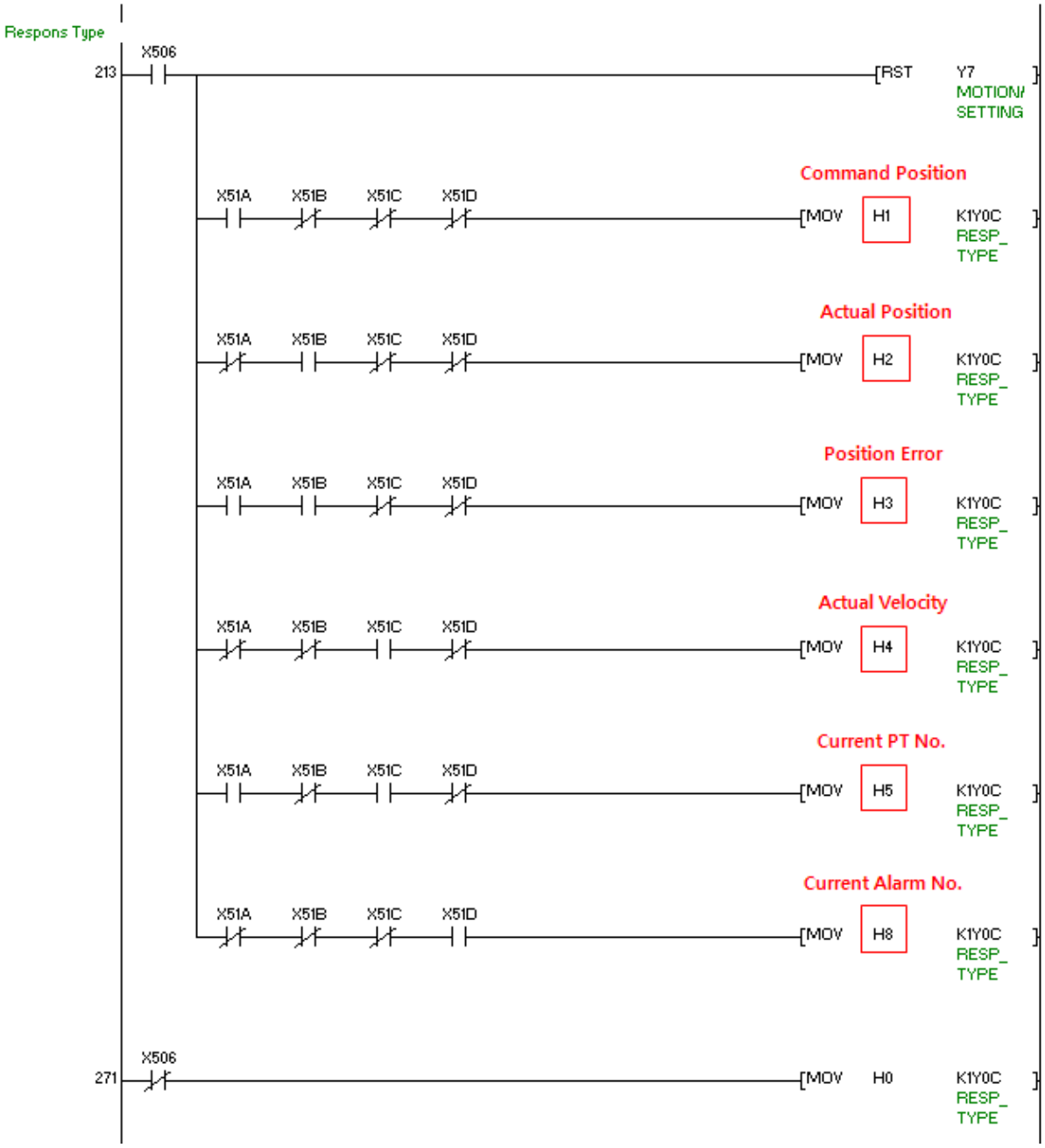
RESPONSE_TYPE 0~3 = 0100b

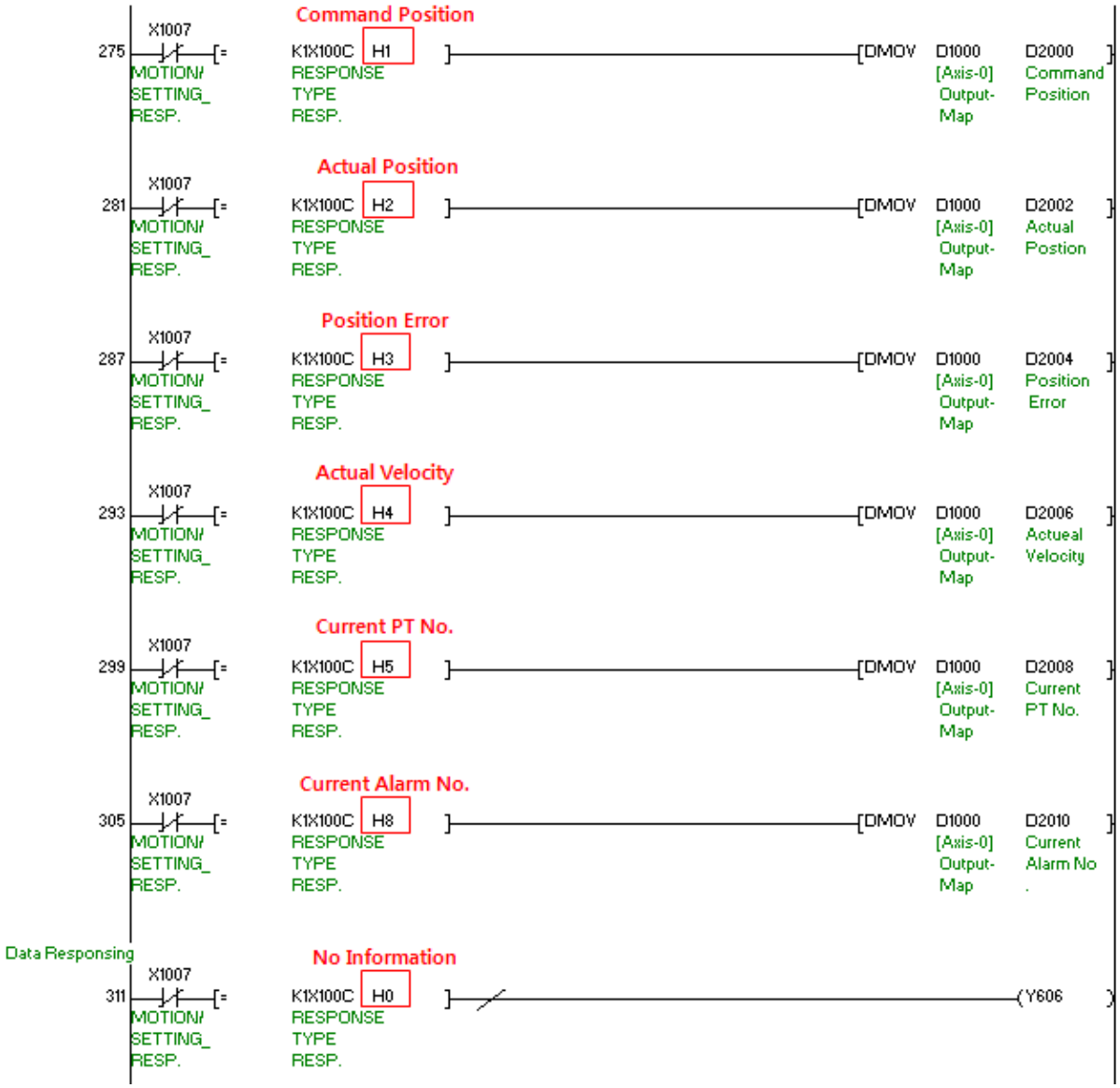
MOTION/SETTING_RESP bit = 0

RESPONSE_TYPE 0~3 = 0100b

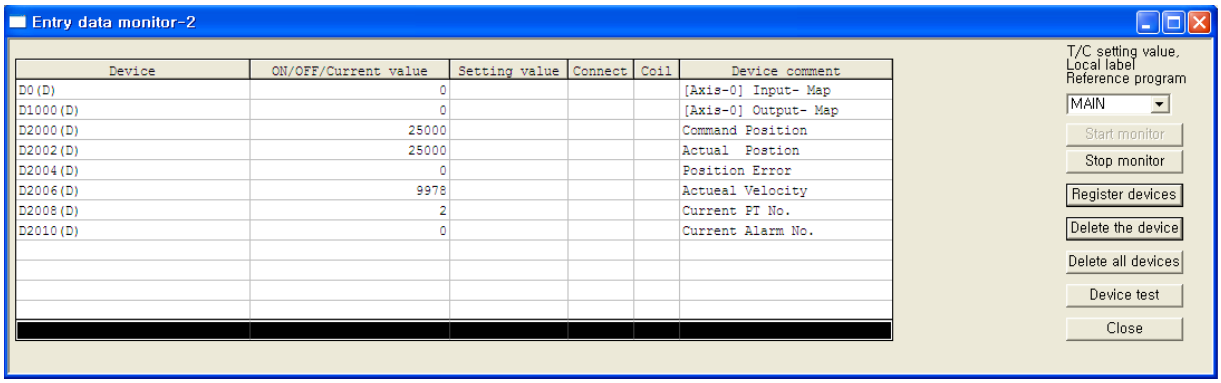
RESPONSE_DATA = Current Alarm Info.

✓ LADDER


Respons Type
213
X506
RST
Y7
MOTION/
SETTING
Command Position
X51A
X51B
X51C
X51D
MOV
H1
K1Y0C
RESP_
TYPE
Actual Position
MOV
H2
Position Error
MOV
H3
Actual Velocity
MOV
H4
Current PT No.
MOV
H5
Current Alarm No.
MOV
H8
271
MOV
H0



NOTE: Ladder of Ex 7 is added command to Ex 6, omitting previous example.



NOTE: It is the monitoring result of data separating response data with Ex 7 command.

✓ **Command order**

① By clearing MOTION/SETTING(Y0007) bit with X506 input, switch IO-Map to motion mode.

② Designate code on data to request to RESPONSE_TYPE area (YC~YF [K1YC])(Ex 6 is the command designating response data code by X51A~X51D input value and saving each response data at D2000~D20010).

③ When in the close state of MOTION/SETTING_RESP. Bit (X1007) received from remote input, RESPONSE_TPYE_RESP. Area (X100C~X100F [K1X100C]) value is identical to the requesting response data code, Axis-0's received data area(D1000) value is classified to requesting response data.

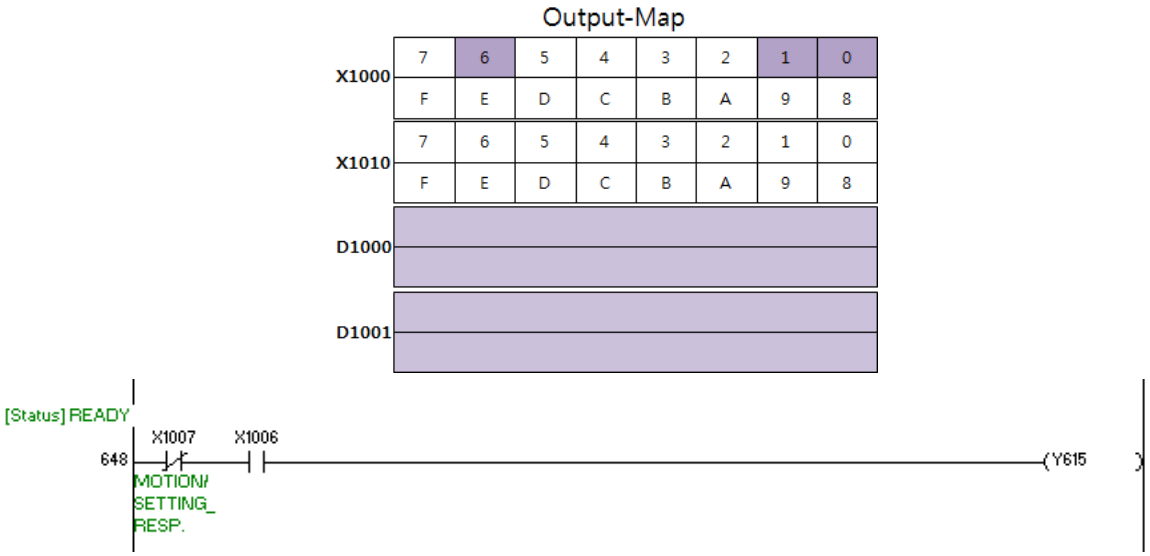
(Device register data of Ex 7 is the data obtained by changing response data form in order, and it is the data obaining following position value, actual position value, position error, operation speed, and PT number in the state of changing No. 1 of PT item to No. 2.)

■ Status information confirmation

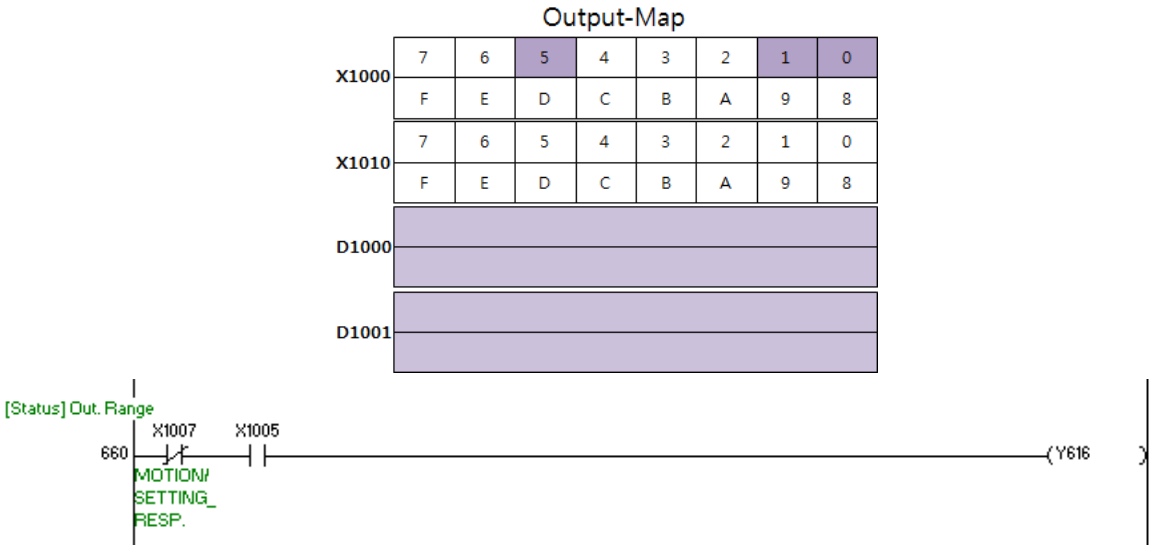
Status information confirmation can be seen in motion mode status(MOTIONION). Ex 8 is the example on the status information confirmation method of Axis-0.

Ex 8. Response data set-up

✓ READY bit : When command on IO-Map is available, it is On.



✓ Out. Range bit : When it is out of data range on command of IO-Map, it is ON.



✓ MOTIONING bit : During motor operation, it is ON.

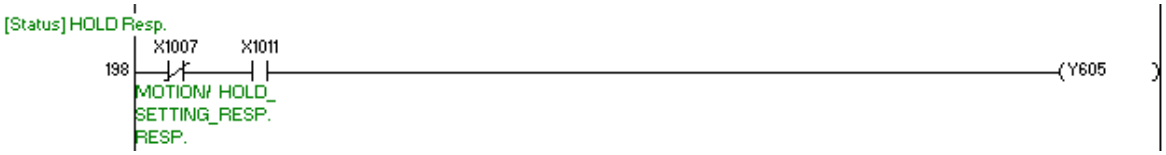
Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

✓ HOLD RESP. bit : When it becomes temporary stop state during operation, it is ON.

Output-Map

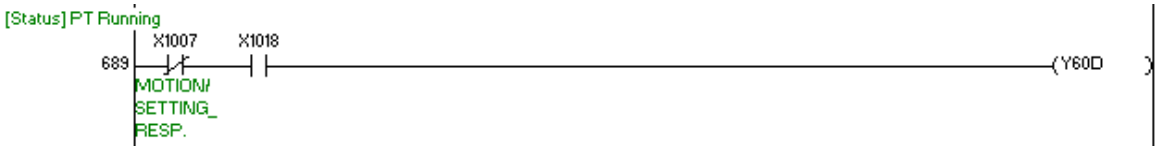
	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								



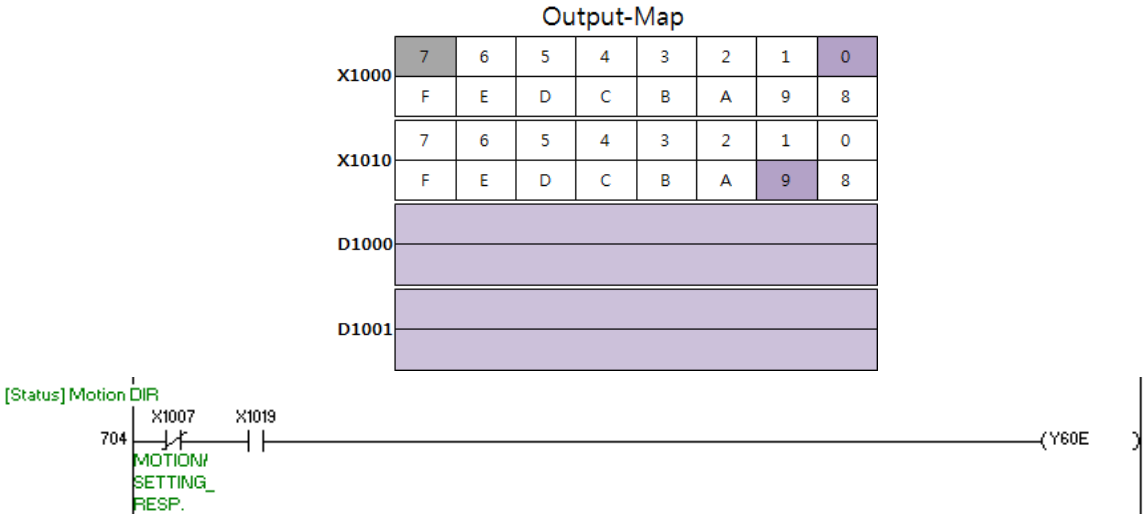
✓ PT RUNNING bit : In the state of PT operation, it is ON.

Output-Map

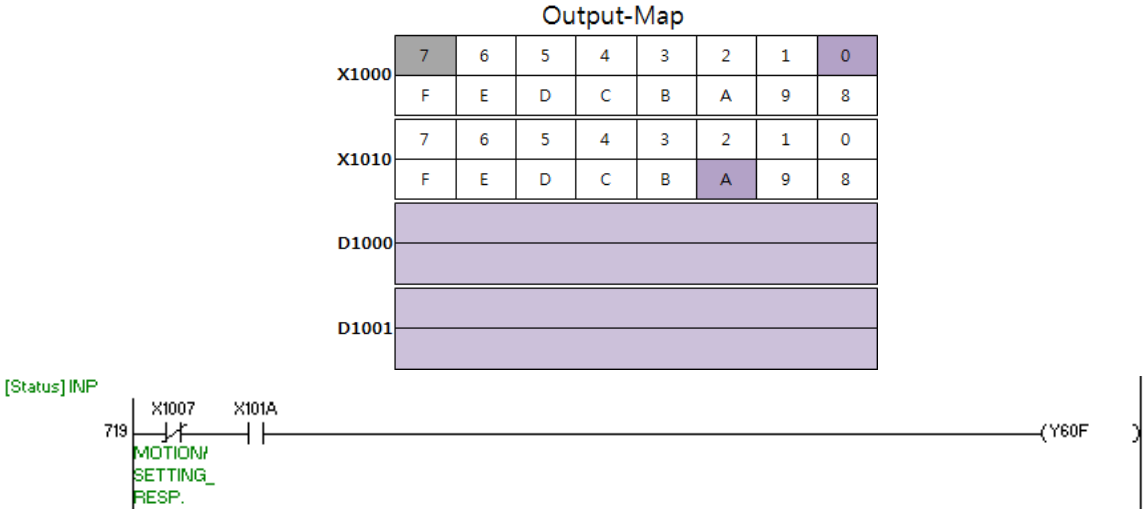
	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								



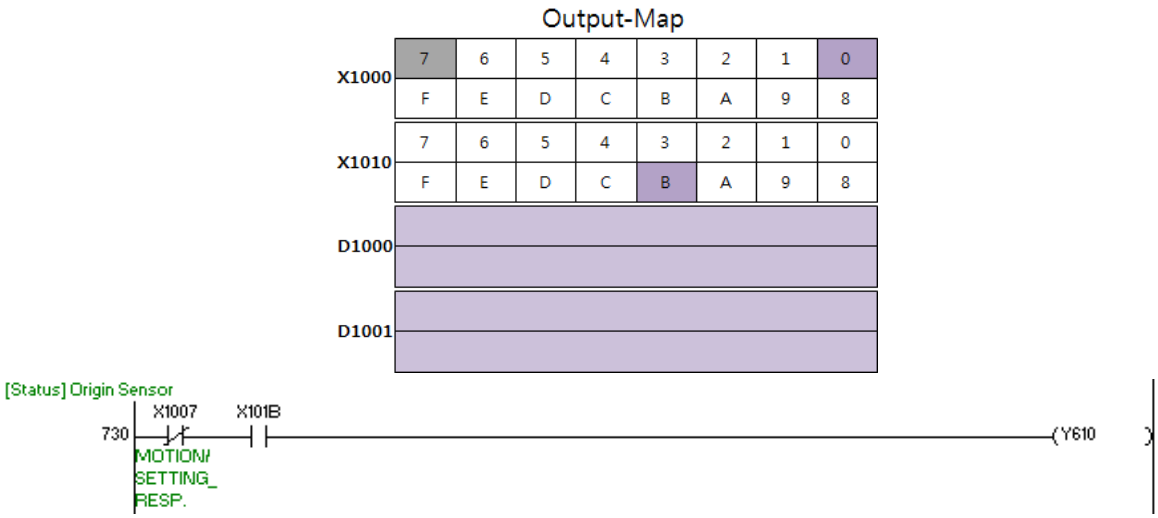
✓ DIR bit : In the state of normal direction of motor rotation direction, it is ON.



✓ INP bit : In the state of completion of inposition, it is ON.



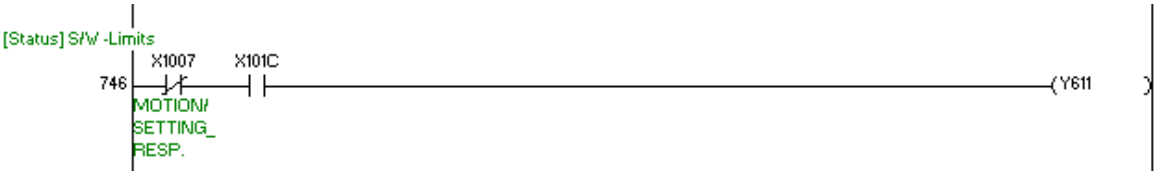
✓ OGRIGIN_SENSOR bit : In the ON state of zero point sensor , it is ON.



✓ S/W -LIMIT bit : In the case of over – direction program limit, it is ON.

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								



✓ S/W +LIMIT bit : In the case of over + direction program limit, it is ON.

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

✓ H/W -LIMIT bit : In the case that – direction limit sensor is ON, it is ON.

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

✓ H/W +LIMIT bit : When +direction limit sensor is ON, it is ON.

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

NOTE: Confirmation of status information is available at motion mode.

■ CMD START command

CMD START command is used as position movement of IO-MAP'S motion mode(MOTION/SETTING = 0), PT operation, zero point movement, and command fulfillment at set-up mode(MOTION/SETTING = 1).

The command is used by composed with PLC circuit of Ex 9 and 10.

Ex 9. CMD START fulfillment method of motion mode

✓ **IO-Map command and response type**

- **Command and response at motion mode**

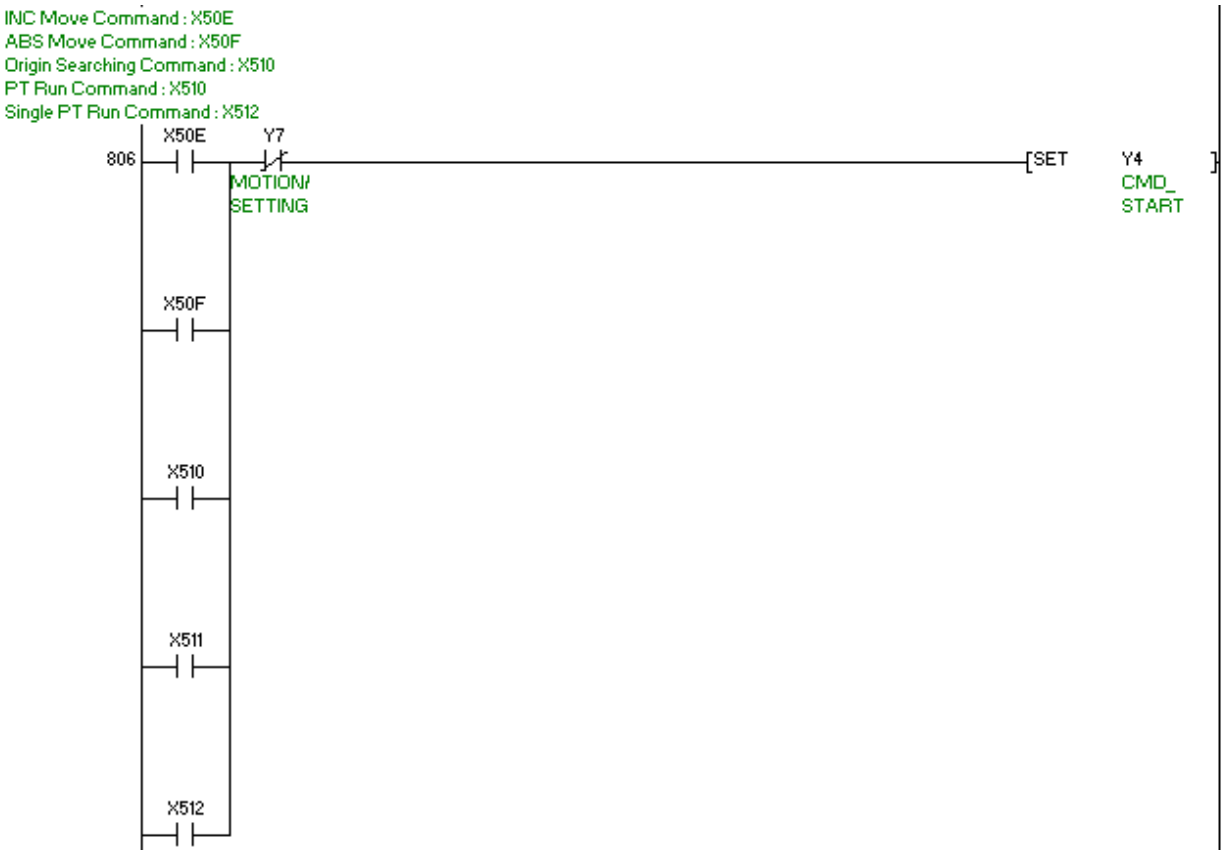
Input-Map

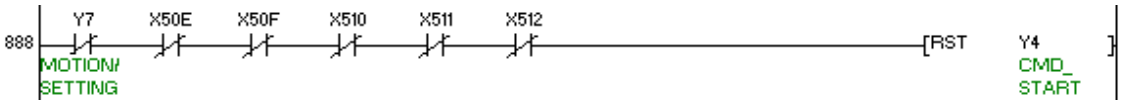
	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

✓ **LADDER**





NOTE : Ladder of Ex 9 is added command at Ex 15, 16, 18, 19, 21 to fulfill the corresponding command.

✓ **Command order**

① Y0007 bit of remote input changed by Open input signal and command selection of the corresponding command sets up CMD_START bit(Y0004) with signal composed of NC state value and AND circuit.

② When input of the corresponding command is closed, it resets CMD_STAR bit (Y0004).

Ex 10. CMD START fulfillment method of set-up mode

✓ IO-Map command and response type

- **Command and response at motion mode**

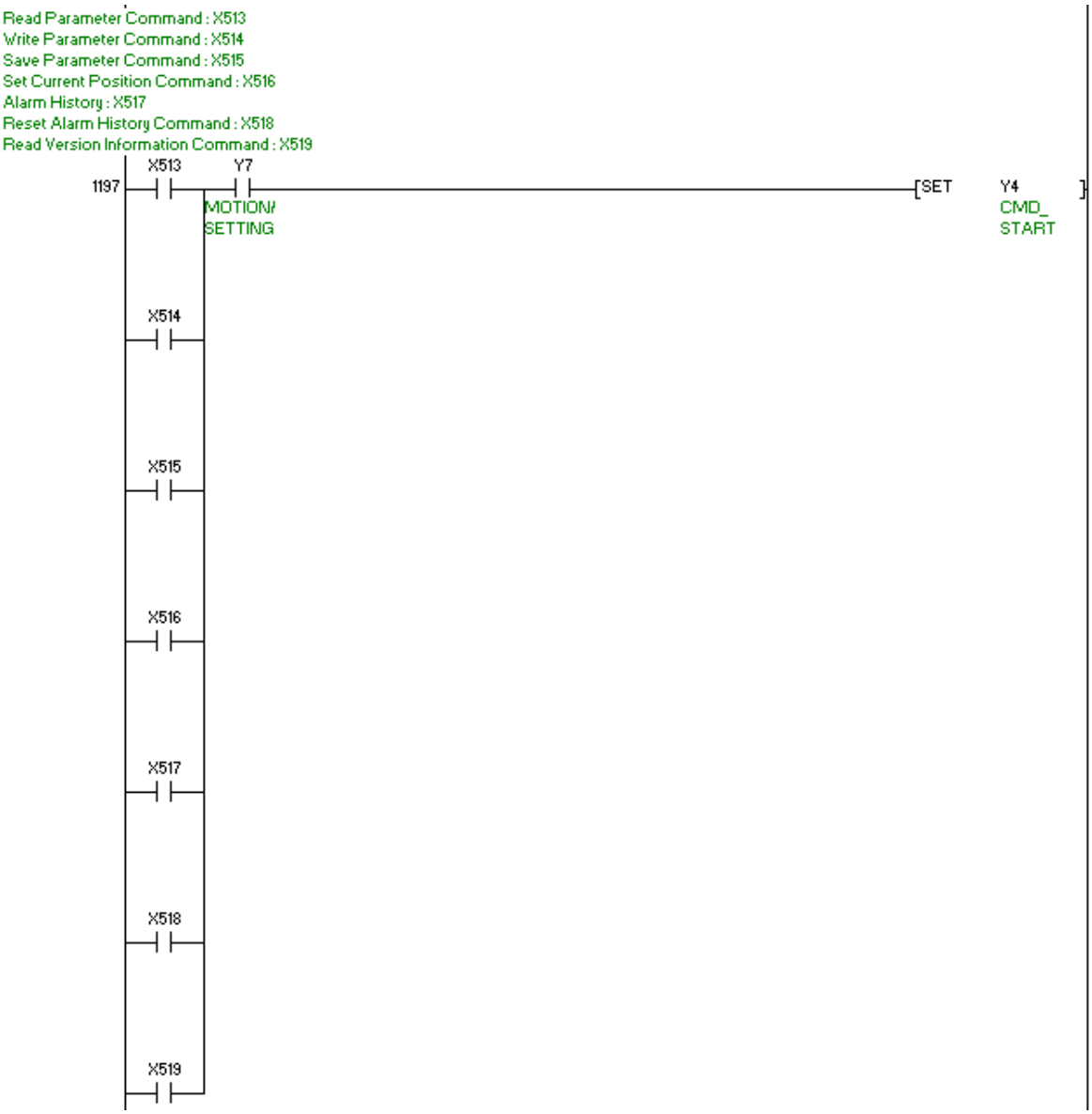
Input-Map

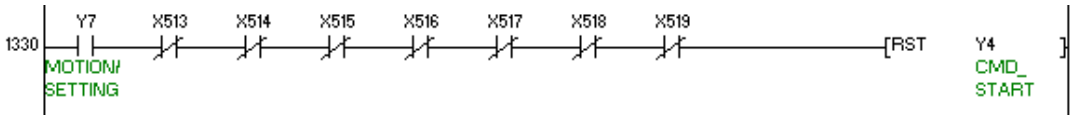
	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

✓ LADDER





NOTE : Ladder of Ex 10 is added command to Ex 15, 16, 18, 19, 21 and it is the ladder necessarily to be added on use the corresponding example in order to fulfill the corresponding command.

✓ **Command order**

① Y0007 bit of remote input changed by Open input signal and command selection of the corresponding command sets CMD_START bit(Y0004) with signal composed of NO state value and And circuit.

② When the corresponding command input is closed, it resets CMD_STAR bit (Y0004).

5.2.1 Jog operation command

Jog operation runs at command code(CMD_CODE) '0' of motion mode(MOTIONION) state. Jog operation command response confirmation of Speed Step Move or Speed Ratio Move and Speed Value is available to confirm with JOG_Resp. Bit.

- JOG Move – Speed Step Move or Speed Ratio Move

Speed Step Move and Speed Ratio Move of jog operation are identical at the operation command method. The operation method is selected with set-up value of MotionGate parameter PN#0104 『Use Jog Speed Ratio』.
Speed Step Move of jog operation is the motion operating jog in the speed stages of 0~3 saved. Speed Ratio Move of jog operation runs with rate of saved parameter's PN#0105 『Move Speed for Jog Move: Ratio』.

Ex 11. Jog operation command of form of Speed Step Move or Speed Ratio Move

✓ **Control bit map address**

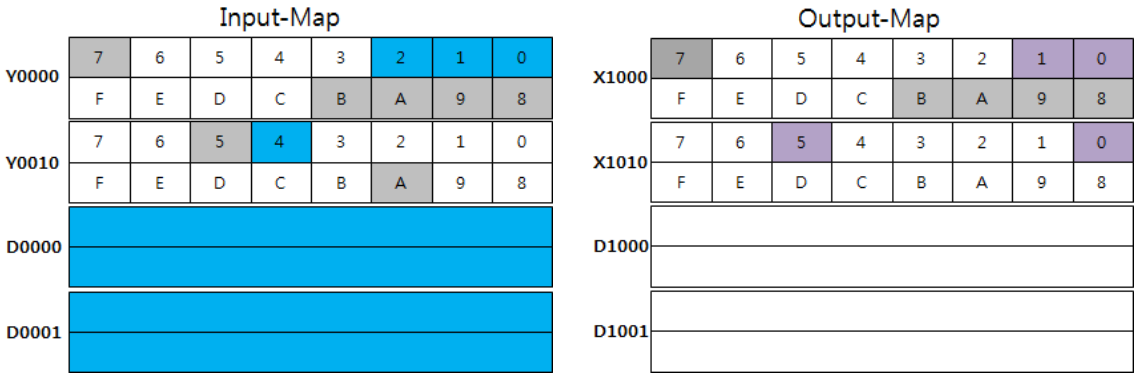
- **Input-Map**
  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  SPD.MODE – Y001A
  -JOG – Y0014
  +JOG – Y0015
  Command Data Area – D0000~D0001 (D0000 [1 DWORD])
- **Output-Map**
  MOTION/SETTING_RESP – X1007
  CMD_CODE_RESP – X1008~X100B
  JOG_RESP – X1015

✓ **Input and output information**

- **Input information**
  JOG-
  JOG+
  JOG Speed Step No. (Input range : 0~3 [DWORD])
  JOG Speed Ratio Value (Input range : 1~255 [DWORD])
- **Output information**
  MOTIONING – Y604
  JOG Resp

✓ IO-Map command and response type

- -JOG command fulfillment



MOTION/SETTING bit = 0

CMD_CODE = 0000b , SPD_MODE bit = 0;

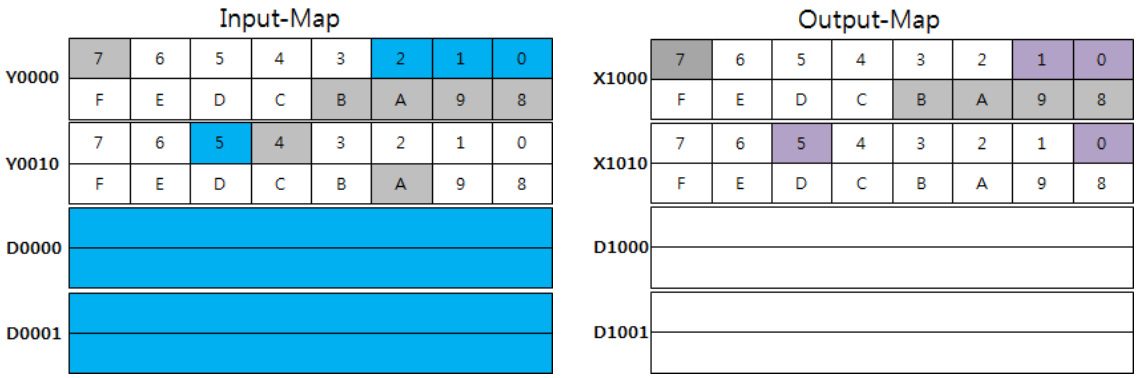
+JOG bit = 0, -JOG bit = 1

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

JOG_RESP bit = 1, MOTIONING bit = 1

- +JOG command fulfillment



MOTION/SETTING bit = 0

CMD_CODE = 0000b , SPD_MODE bit = 0;

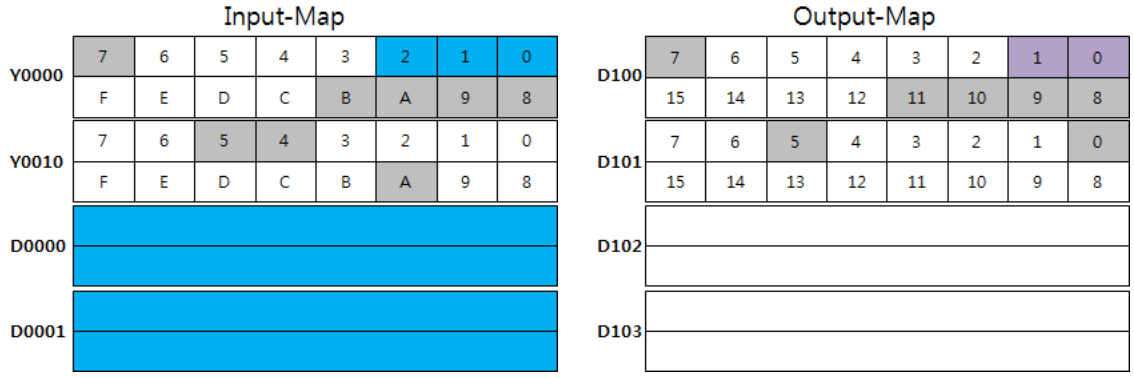
+JOG bit = 1, -JOG bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

JOG_RESP bit = 1, MOTIONING bit = 1

- -JOG , +JOG bit is '0' state.



MOTION/SETTING bit = 0

CMD_CODE = 0000b , SPD_MODE bit = 0;

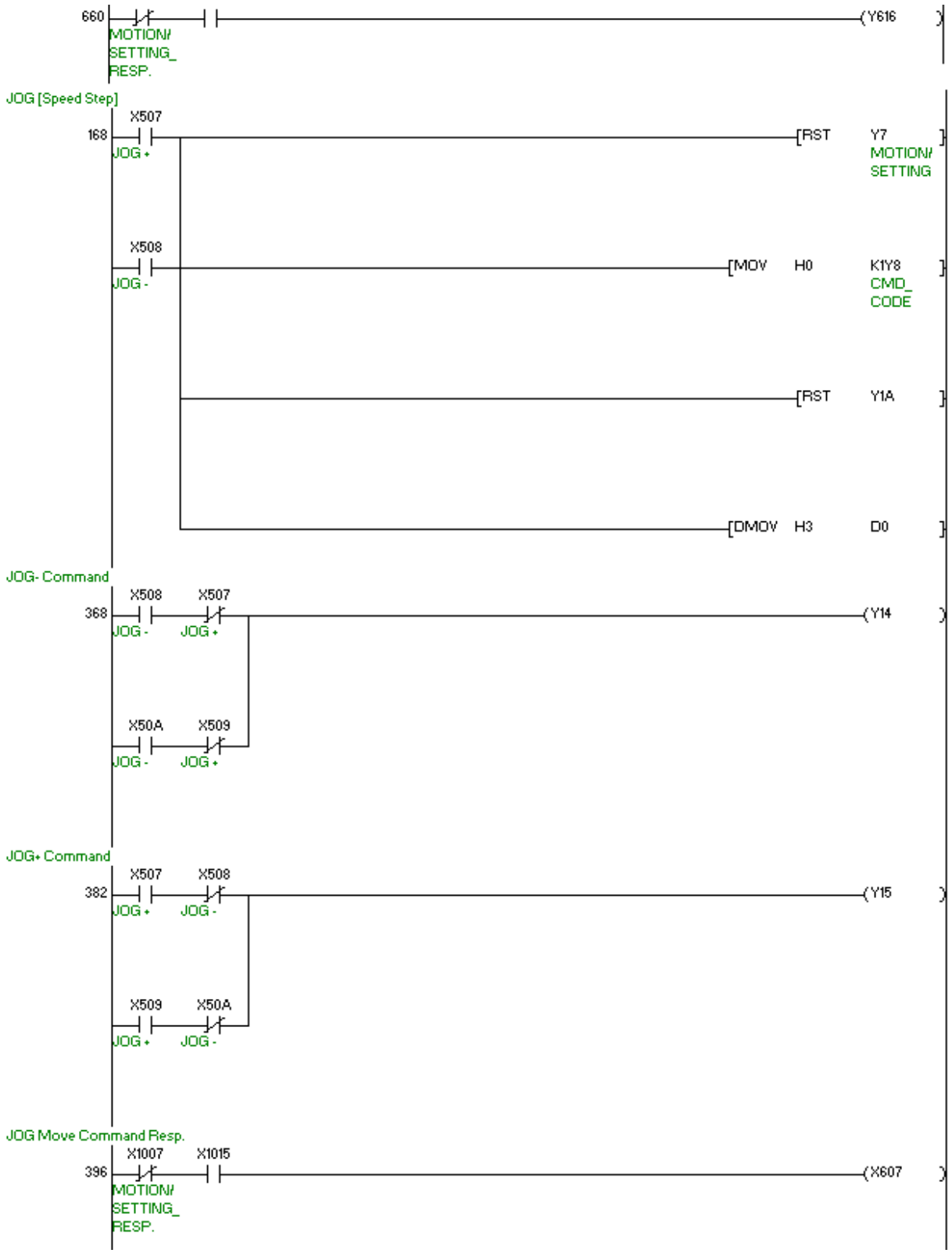
+JOG bit = 0, -JOG bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

JOG_RESP bit = 0, MOTIONING bit = 0

✓ **LADDER**



NOTE 1: Ladder of Ex 11 is added command to Ex 7, omitting previous example.

NOTE 2: If fulfilling Ex 11 at the Sped Ratio Move mode when parameter PN#0104『Use Jog Speed Ratio』value is '1', it operates with the speed of 3% of PN#0105『Move Speed for Jog Move: Ratio』value.

NOTE 3: The example includes Ex 12 command input.

✓ **Command order**

① By clearing MOTION/SETTING(Y0007) bit with X507 or X508 close input, switch IO-Map to motion mode state.

② Input command code '0' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ Clear SPD_MODE bit (Y1A) to '0'.

④ Input Speed Step number to Axis-0 data area (D0000).

(Ex 11 is the ladder inputting Speed Step No. 3 in D0000 area of 'S' of DMOV command.)

⑤ Fulfill command as -JOG bit (Y14) or +JOG bit (Y15) turns ON.

⑥ When X507 or X508 input is open, jog operation stops.

⑦ Response on jog operation command is available to confirm by consisting of NC input of MOTION/SETTING_RESP. Bit (X1007) and AND circuit of JOG_Resp. Bit (X1015).

■ JOG Move – Speed Value Move

Speed Value Move of jog operation is the motion operating jog by applying input value to actual speed. Ex 12 is the example on Speed Value Move of Axis-0 jog operation.

Ex 12. Jog operation command of Speed Value Move form

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  SPD.MODE – Y001A

  -JOG – Y0014

  +JOG – Y0015

  Command Data Area – D0000~D0001 (D0000 [1 DWORD])

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  CMD_CODE_RESP – X1008~X100B

  JOG_RESP – X1015

✓ **Input and output information**

- **Input information**

  JOG-

  JOG+

  JOG Speed Value (Input range : 1~500,000 pps [DWORD])

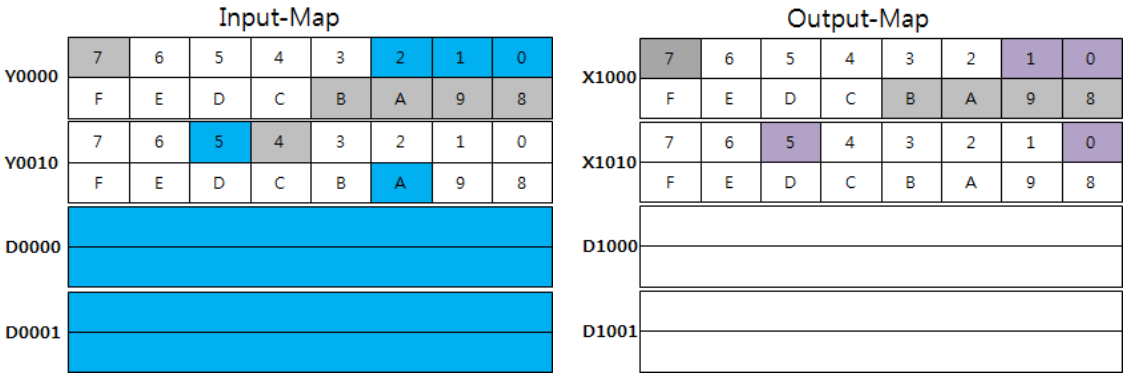
- **Output information**

  MOTIONING – Y604

  JOG Resp

✓ IO-Map command and response type

- -JOG command fulfillment



MOTION/SETTING bit = 0

CMD_CODE = 0000b , SPD_MODE bit = 1;

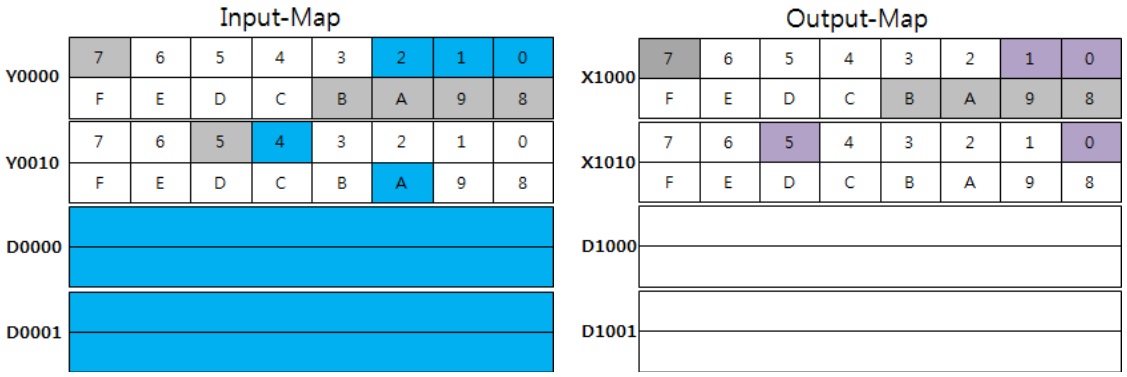
+JOG bit = 0, -JOG bit = 1

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

JOG_RESP bit = 1, MOTIONING bit = 1

- +JOG command fulfillment



MOTION/SETTING bit = 0

CMD_CODE = 0000b , SPD_MODE bit = 1;

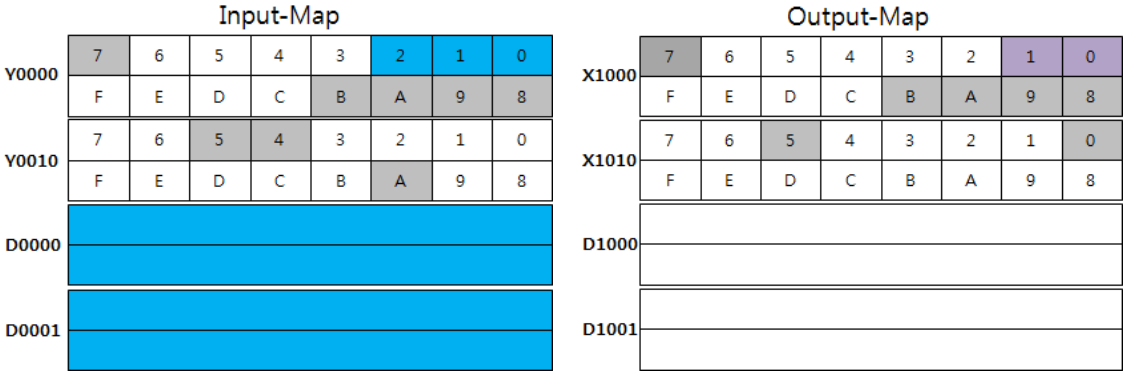
+JOG bit = 1, -JOG bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

JOG_RESP bit = 1, MOTIONING bit = 1

- -JOG , +JOG is in state of '0'



MOTION/SETTING bit = 0

CMD_CODE = 0000b , SPD_MODE bit = 1;

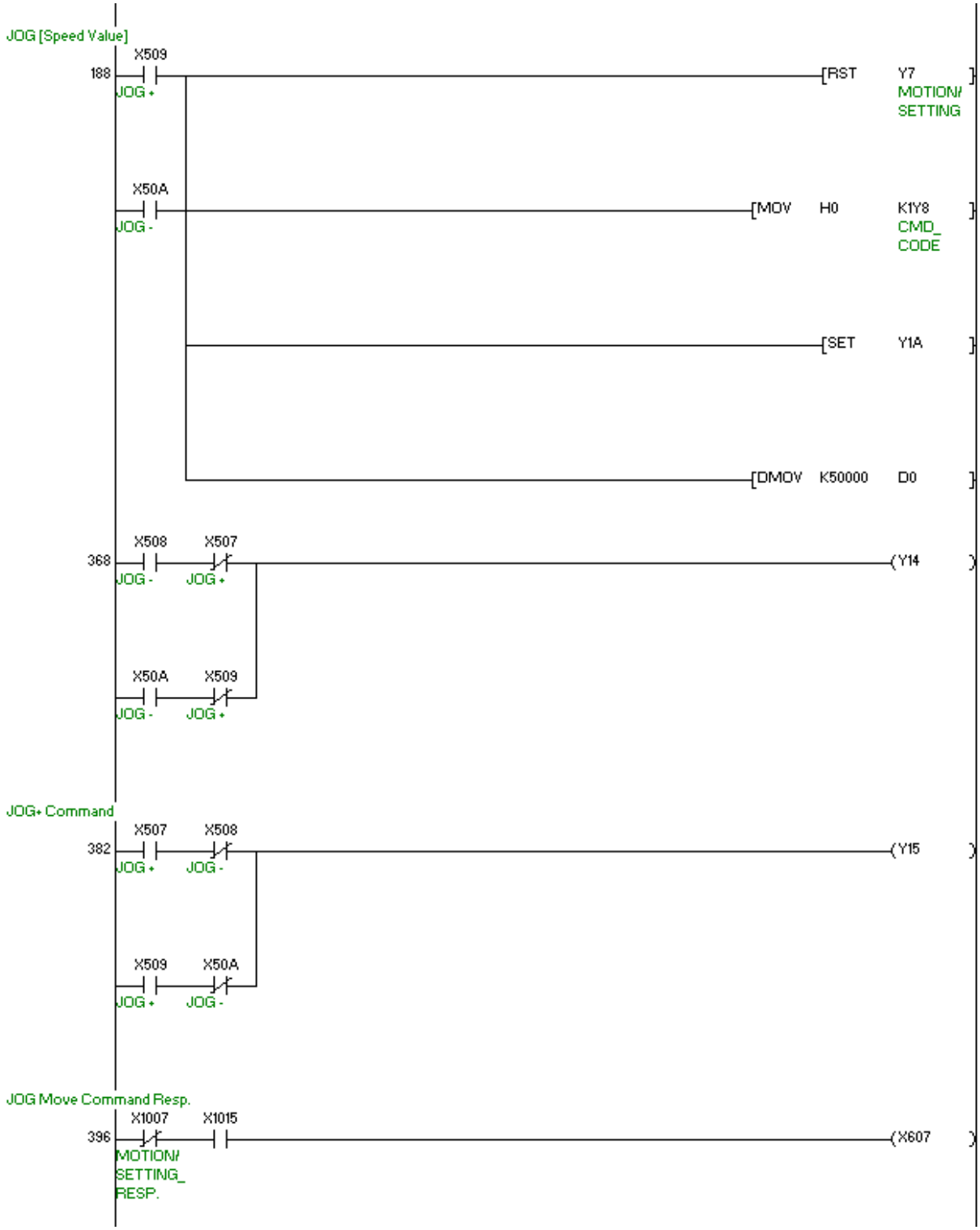
+JOG bit = 0, -JOG bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

JOG_RESP bit = 0, MOTIONING bit = 0

✓ **LADDER**



NOTE 1: Ladder of Ex 12 is added command to Ex11, omitting previous example.

NOTE 2: The example includes command input of Ex 11.

✓ **Command order**

① By clearing MOTION/SETTING(Y0007) bit with Close input of X509 or X50A, switch IO-Map to motion mode state.

② Input command 0 to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ Set SPD_MODE bit (Y1A) to 1.

④ Input jog operation speed value to Axis-0 data area (D0000).

(Ex 12. Is the ladder inputting 50000pps of jog operation speed to D0000 area in 's' of DMOV command.)

⑤ Fuflill command by turnning ON –JOG bit (Y14).

⑥ When input of X509 or X50A is Open, jog operation stops.

⑦ Response on jog operation command can be confirm by consisting of NC input of MOTION/SETTING_RESP. Bit (X1007) and AND circuit of JOG_Resp. Bit (X1015).

※ Speed Override Command Execution

Speed Override command is used to change the value of the jog speed of jog operation.

Ex 13. Speed Override Command Execution Method

✓ **LADDER**

NOTE : Ladder of Ex 13 is added command to Ex12, omitting previous example

NOTE : When switch to 'Speed Step No3' from Command of Ex11, change to [DMOV K3 D0]..

① Speed Override command set the speed value or 'Speed Step No.' to be converted into data area while Jog operation and set the CMD_START bit to '1'..

② To change the speed by convert operating jog mode from Speed Step Move mode to Speed Value Move mode, set the SPD_MOD(Y001A) bit to '1'. Then set the speed value to be converted into data area, and set the CMD_START bit to '1'.

③ To change the speed by convert operating jog mode from Speed Value Move mode to Speed Step Move mode, clear the SPD_MOD(Y001A) bit to '0'. Then set the 'Speed Step No.' to be converted into data area, and set the CMD_START bit to '1'

.

5.2.2 Step movement command

Step movement runs at command code (CMD_CODE) '0' of motion mode(MOTIONION) and moves by designating value of 0~3 of step movement distance number. Ex 13 is the example on Axis-0's step movement.

Ex 14. Step movement command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  -STEP – Y0016

  +STEP – Y0017

  Command Data Area – D0000~D0000 (D0000 [1 DWORD])

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  MOTIONING – X1011

  STEP_RESP – X1015

✓ **Input and output information**

- **Input information**

  STEP- – X50C

  STEP+ – X50B

  STEP Step Distance No. (Input range : 0~3 [DWORD Type])

- **Output range**

  MOTIONING – Y604

  Step Resp – Y608

✓ IO-Map command and response type

- -SETP Move command fulfillment

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING bit = 0

CMD_CODE = 0000b

+STEP bit = 0, -STEP bit = 1

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

STEP_RESP bit = 1, MOTIONING bit = 1

- + SETP Move command fulfillment

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING bit = 0

CMD_CODE = 0000b

+STEP bit = 1, -STEP bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

STEP_RESP bit = 1, MOTIONING bit = 1

- -STEP, +STEP bit is in the state of '0'

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING bit = 0

CMD_CODE = 0000b

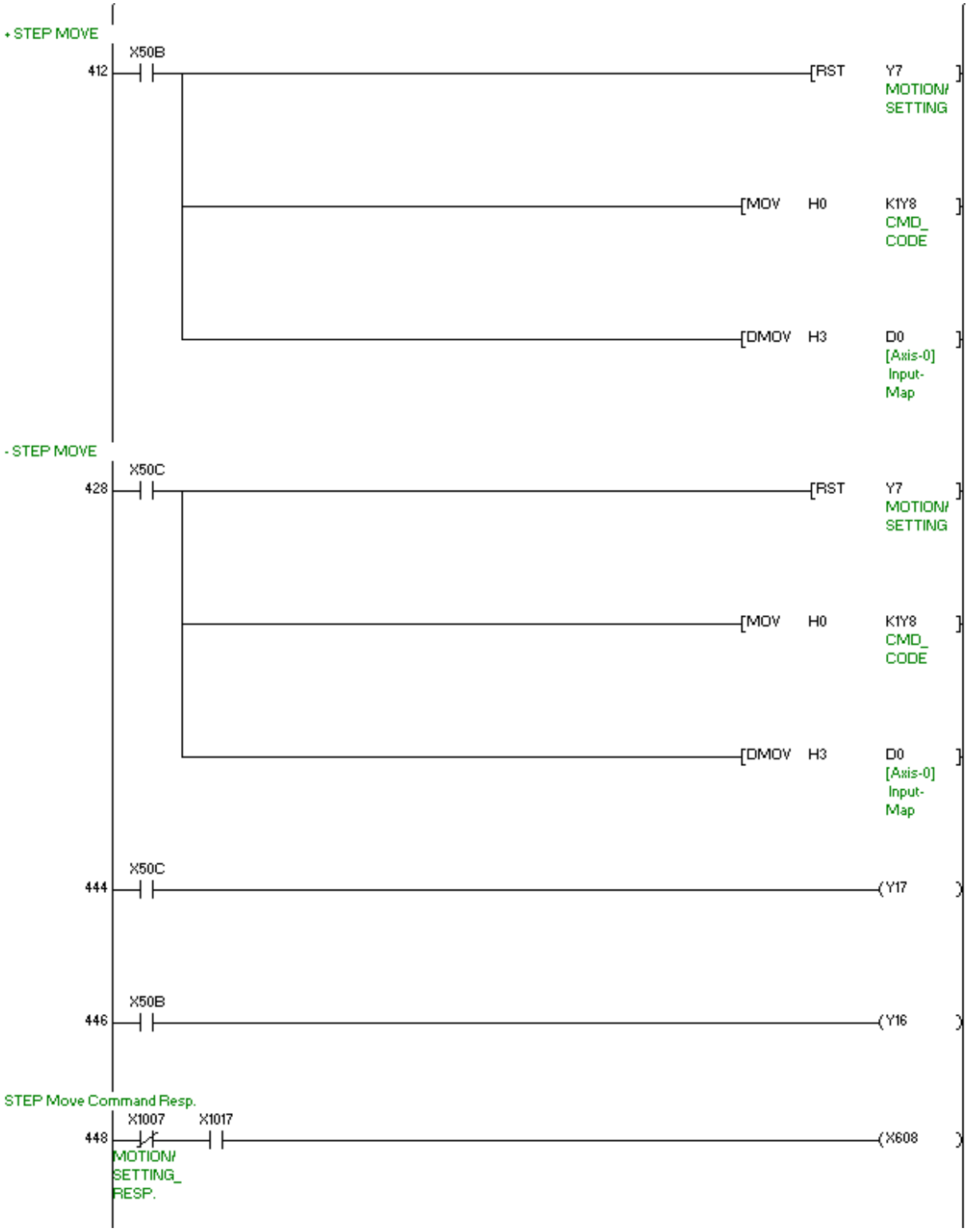
+STEP bit = 0, -STEP bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

STEP_RESP bit = 0, MOTIONING bit = 0

✓ **LADDER**



NOTE 1: Ladder of Ex 13 is added command to Ex 12, omitting previous example.

NOTE 2: Step movement is fulfilled at the command that command fulfillment bit(-STEP, +STEP) becomes ON from OFF and when ordering with —|↑|— (pulse rise) command, it does not operate(due to the difference between PLC step time and CC-Link scan time).

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X50B or X50C, switch IO-Map to motion mode state.

② Input command code '0' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ Input Step Distance number to Axis-0's data area(D0000).

(Ex 13 is the ladder inputting Step Distance Number 3 to D0000 area in 'S' of DMOV command.)

④ By turning ON +SETP bit (Y16) or -STEP bit (Y17), fulfill command.

⑤ Response of step operation command can be confirmed by consisting NC input of MOTION/SETTING_RESP. Bit (X1007) and AND circuit of JOG_Resp. Bit (X1017).

5.2.3 Zero point movement command

Zero point movement runs at command code(CMD_CODE) '0' of motion mode(MOTIONION) state and moves ignoring value of input data (D0000). Ex 14 is the example on the zero point movement of Axis-0.

Ex 15. Zero point movement command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  GO_ZERO_POS – Y0013

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  MOTIONING – X1011

  GO_ZERO_POS_RESP – X1013

✓ **Input and output information**

- **Input information**

  Go Zero Position – X50D

- **Output information**

  MOTIONING – Y604

  Go Zero POS Resp – Y609

✓ **IO-Map command and response type**

- **Zero point movement command fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
	7	6	5	4	3	2	1	0
Y0010	F	E	D	C	B	A	9	8
D0000								
D0001								

MOTION/SETTING bit = 0

CMD_CODE = 0000b

GO_ZERO_POS bit = 1

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
	7	6	5	4	3	2	1	0
X1010	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

GO_ZERO_POS_RESP bit = 1, MOTIONING bit = 1

- **Even if lifting GO_ZERO_POS bit during zeop point movement, the zero point movement state is maintained.**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

MOTION/SETTING bit = 0

CMD_CODE = 0000b

RESPONSE_TYPE = 0001b

0GO_ZERO_POS bit = 0

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

Response Data ≠ 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

RESPONSE_TYPE_RESP = 0001b

GO_ZERO_POS_RESP bit = 1,

MOTIONING bit = 1

- **On setting GO_ZERO_POS bit at the zero point**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

MOTION/SETTING bit = 0

CMD_CODE = 0000b

RESPONSE_TYPE = 0001b

GO_ZERO_POS bit = 0

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

Response Data = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0000b

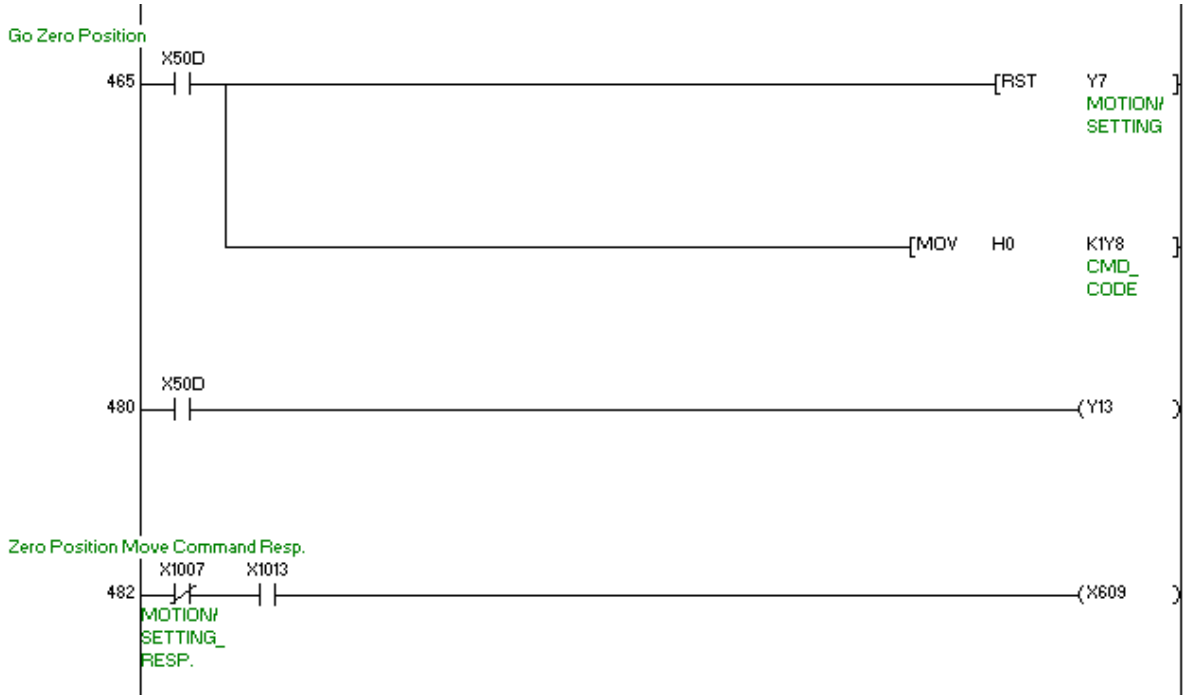
RESPONSE_TYPE_RESP = 0001b

GO_ZERO_POS_RESP bit = 1,

MOTIONING bit = 1

RESPONSE_DATA = Actual Position (0)

✓ **LADDER**



NOTE : Ladder of Ex 14 is added command to Ex 13, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X50D, switch IO-Map to motion mode state.

② Input command code '0' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ By turning ON –SETP bit (Y13), fulfill command.

④ Response on zero point movement command can be confirmed by consisting NC input of MOTION/SETTING_RESP. Bit (X1007) and AND circuit of GO_ZERO_POS_Resp. Bit (X1017).

5.2.4 Position movement command

Relative position movement runs at the command code(CMD_CODE) '1' of motion mode(MOTIONION/SETTING = 0) and move relative value or obsolute value to input data(D0000) for the position value.

■ Relative position movement

Relative position movement is the command of relative movement to input position value. Ex 15 is the example on Axis-0's relative position movement.

Ex 16. Relative position movement command

✓ **Control bit map information**

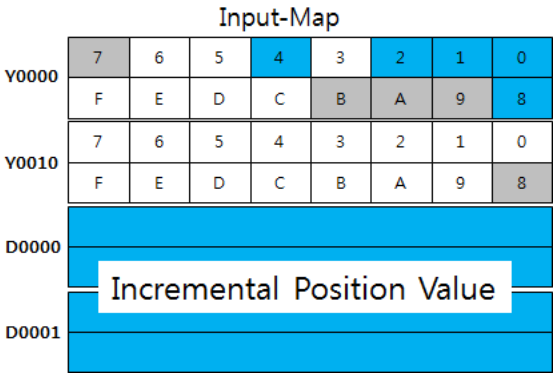
- **Input-Map**
  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  INC/ABS – Y0018
  CMD_START – Y0004
  Command Data Area – D0000~D0001 (D0000 [1 DWORD])
- **Output-Map**
  MOTION/SETTING_RESP – X1007
  CMD_CODE_RESP – X1008~X100B
  MOTIONING – X1011
  CMD_ RESP – X1004

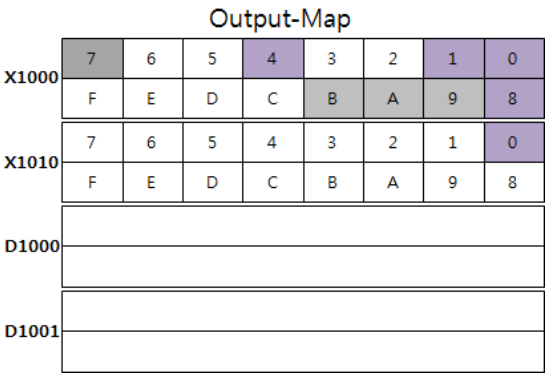
✓ **Input and output information**

- **Input information**
  INC Move – X50E
  Incremental Position (Input range : -2,147,483,648 ~ −2,147,483,647 [DWORD])
- **Output information**
  MOTIONING – Y604
  POS MOV Resp – Y60A *)

✓ IO-Map command and response type

- INC Move command fulfillment





MOTION/SETTING bit = 0

CMD_CODE = 0001b

INC/ABS bit = 0

Command Data = Relative position value

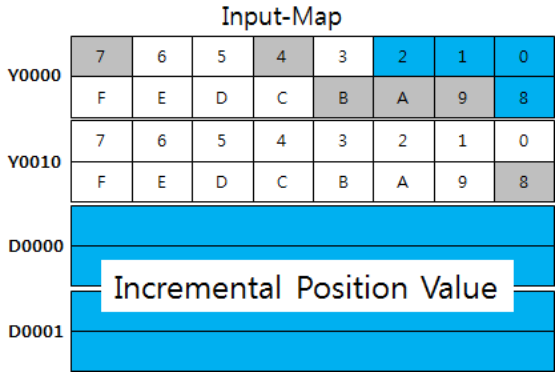
CMD_START bit = 1

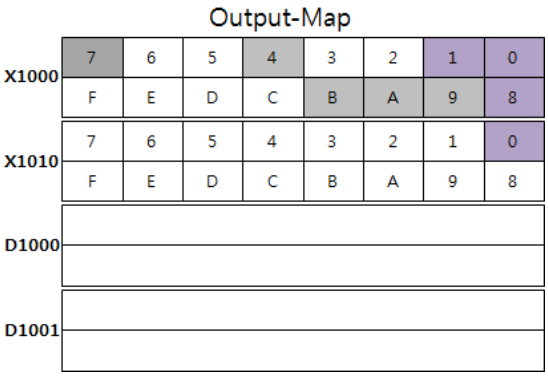
MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0001b

CMD_RESP bit = 1, MOTIONING bit = 1

- Life of CMD_START bit after INC Move command





MOTION/SETTING bit = 0

CMD_CODE = 0001b

INC/ABS bit = 0

Command Data = Relative position value

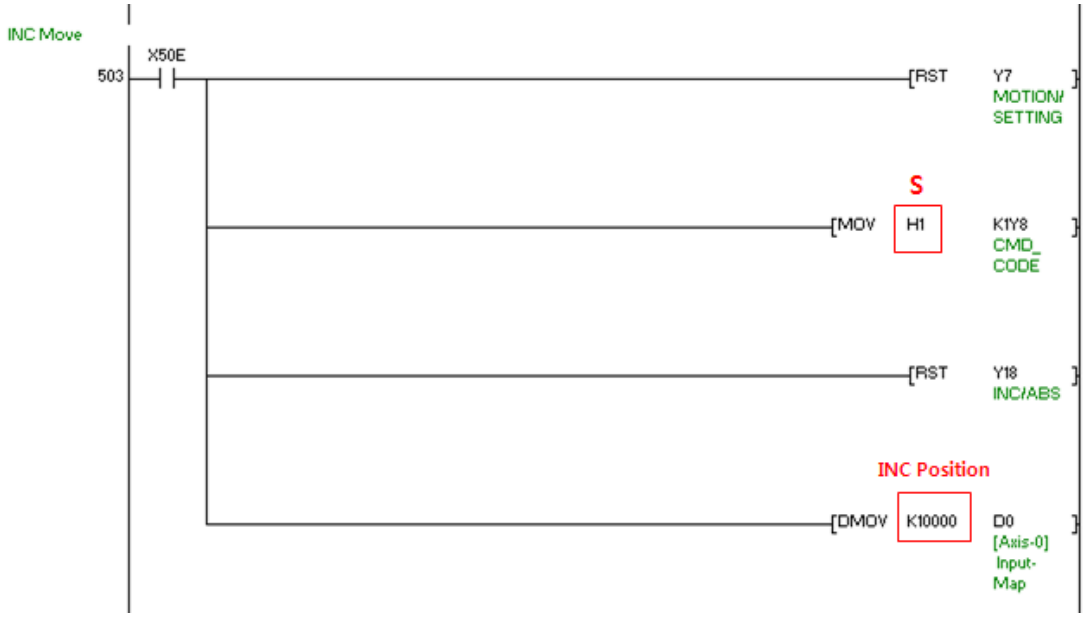
CMD_START bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0001b

CMD_RESP bit = 0, MOTIONING bit = 1

✓ **LADDER**



NOTE : Ladder of Ex 15 is added command to Ex 14, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X50E, switch IO-Map to motion mode state.

② Input command code '1' to CMD_CODE area (Y0008~Y000B [K1Y0008]) in 'S' area with MOV command.

③ Reset INC/ABS bit (Y18).

④ Input relative position value to Axis-0's data area (D0000).

(Ex 14 is the ladder inputting relative position value to D0000 with 10000pulse in 'S' of DMOV command.)

⑤ With reference of Ex 9, fulfill command by turing ON CMD_START bit (Y0004).

■ Absolute position movement

Absolute position movement moves absolute value as the position value at the input data (D0000). Ex 16 is the example on Axis-0's absolute position movement.

Ex 17 Absolute position movement command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  INC/ABS – Y0018

  CMD_START – Y0004

  Command Data Area – D0000~D0002 (D000 [1 DWORD])

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  CMD_CODE_RESP – X1008~X100B

  MOTIONING – X1011

  CMD_ RESP – X1004

✓ **Input and output information**

- **Input information**

  ABS Move - X50F

  Absolute Position (Input range : -2,147,483,648 ~ −2,147,483,647 [DWORD])

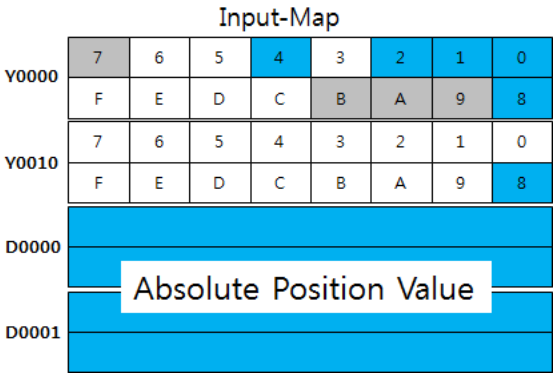
- **Output information**

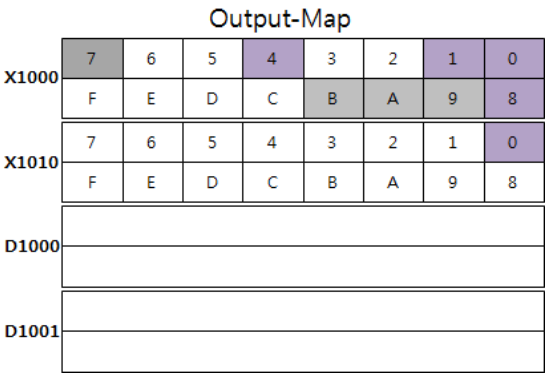
  MOTIONING - Y604

  POS MOV Resp - Y60A

✓ IO-Map command and response type

- ABS Move command fulfillment





MOTION/SETTING bit = 0

CMD_CODE = 0001b

INC/ABS bit = 1

Command Data = Absolute position value

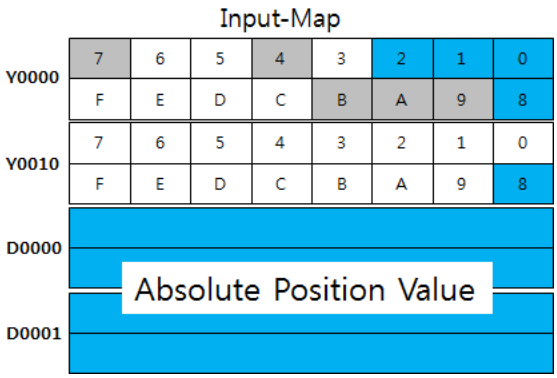
CMD_START bit = 1

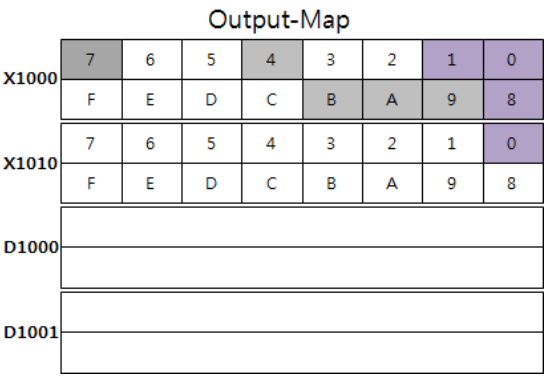
MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0001b

CMD_RESP bit = 1, MOTIONING bit = 1

- Lift of CMD_START bit after ABS Move command





MOTION/SETTING bit = 0

CMD_CODE = 0001b

INC/ABS bit = 1

Command Data = Absolute position value

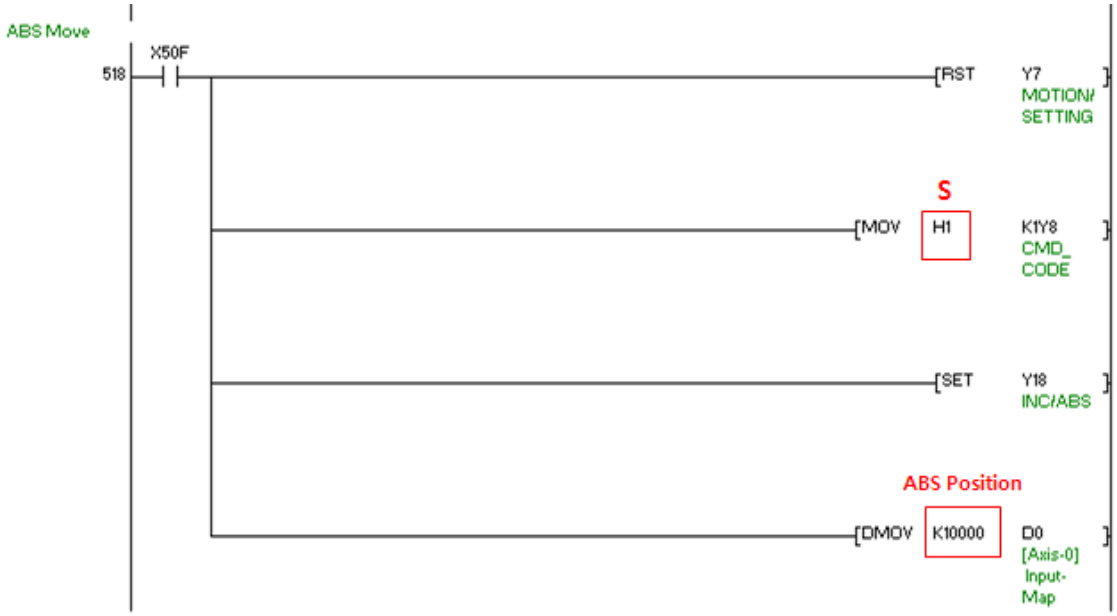
CMD_START bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0001b

CMD_RESP bit = 0, MOTIONING bit = 1

✓ **LADDER**



NOTE : Ladder of Ex 16 is added command to Ex 15, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X50F, switch IO-Map to motion mode state.

② Input command code '1' to CMD_CODE are (Y0008~Y000B [K1Y0008]) in 'S' area with MOV command.

③ Clear INC/ABS bit (Y18).

④ Input absolute position value to Axis-0's data area (D0000).
(Ex 16 is the ladder inputting absolute position value to D0000 with 10000pulse in 'S' of DMOV command.)

⑤ With reference of Ex 9, fulfill command by turning ON CMD_START bit (Y0004).

※ Response confirmation on position movement command

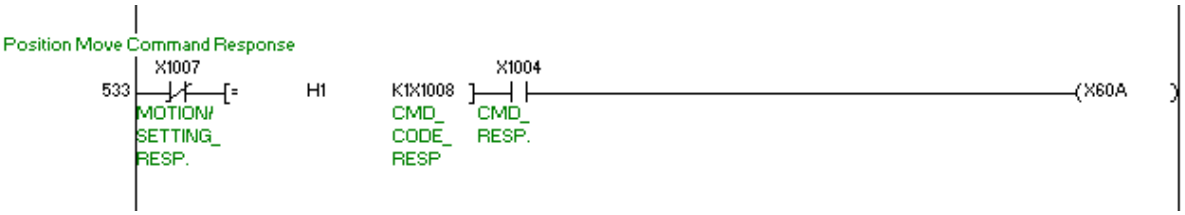
Response bit of position movement command cannot be confirmed with IO-Map like jog operation or step movement and zero movement. Hence, like Ex 17, can confirm with combination of IO-Map.

Ex 18. Response confirmation method on position movement command

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

✓ **LADDER**



NOTE : Ladder of Ex 17 is added command to Ex 16, omitting previous example.

④ Response of position movement command can be confirmed with combination of IO-Map.

▶ Response of position movement command is result value consisting of status value comparing N.C input of MOTION/SETTING_RESP bit (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '1' and AND circuit for CMD_START_RESP(X1004).

5.2.5 PT operation command

PT operation runs command code(CMD_CODE) '4' of motion mode(MOTIONION/SETTING = 0) state and fulfills operation by inputting number of PT item to input data(D0000).

■ General PT operation

General PT operation runs PT operation from input value(D0000). Ex 18 is the example on Axis-0's PT operation command.

Ex 19. PT operation command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  SINGLE_PT – Y001C

  CMD_START –Y0004

  Command Data Area – D0000~D0001 (D0000 [1 DWORD])

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  CMD_CODE_RESP – X1008~X100B

  MOTIONING – X1011

  CMD_ RESP – X1004

  PT_RUNUNG – X1018

✓ **Input and out informatio**

- **Input information**

  PT Run

  PT No. (Number saving PT item [DWORD Type])

- **Output information**

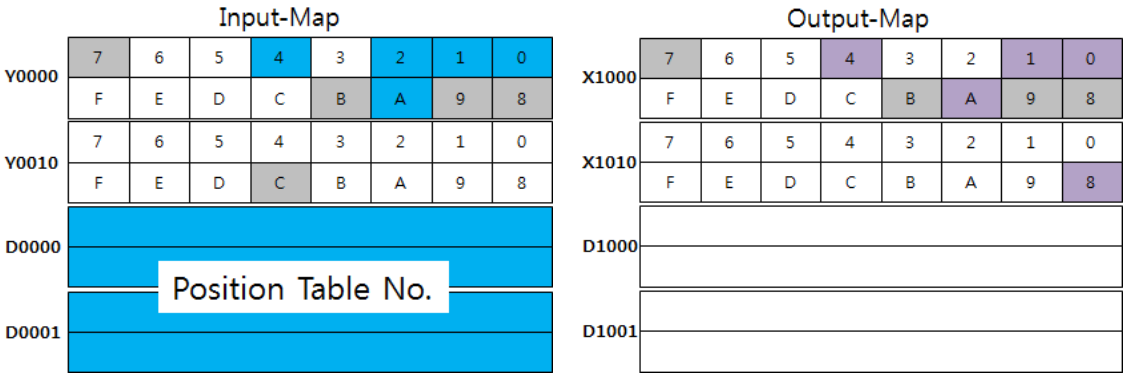
  MOTIONING – Y604

  PT CMD Resp – Y60C

  PT Running – Y60D

✓ IO-Map command and response type

- PT RUN command fulfillment



MOTION/SETTING bit = 0

CMD_CODE = 0100b

SINGLE_PT bit = 0

Command Data = PT number

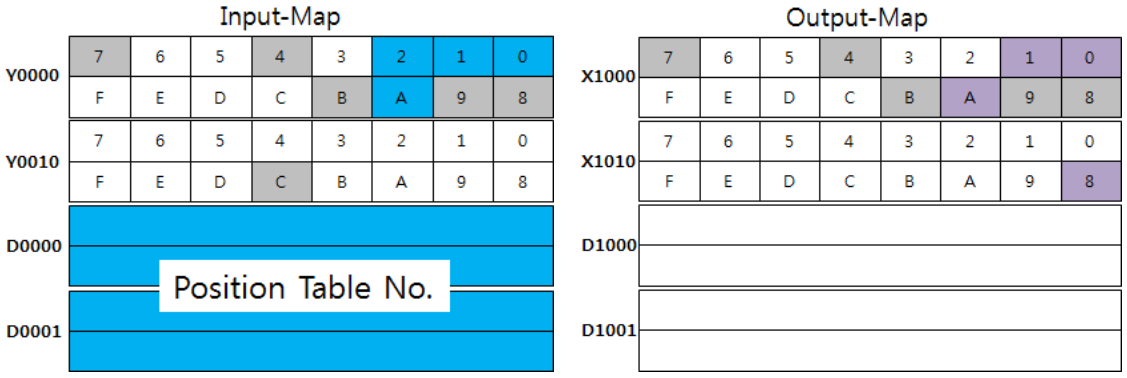
CMD_START bit = 1

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0100b

CMD_RESP bit = 1, PT_RUNNING bit = 1

- Lift of COMD_START bit after PT RUN command



MOTION/SETTING bit = 0

CMD_CODE = 0100b

SINGLE_PT bit = 0

Command Data = PT number

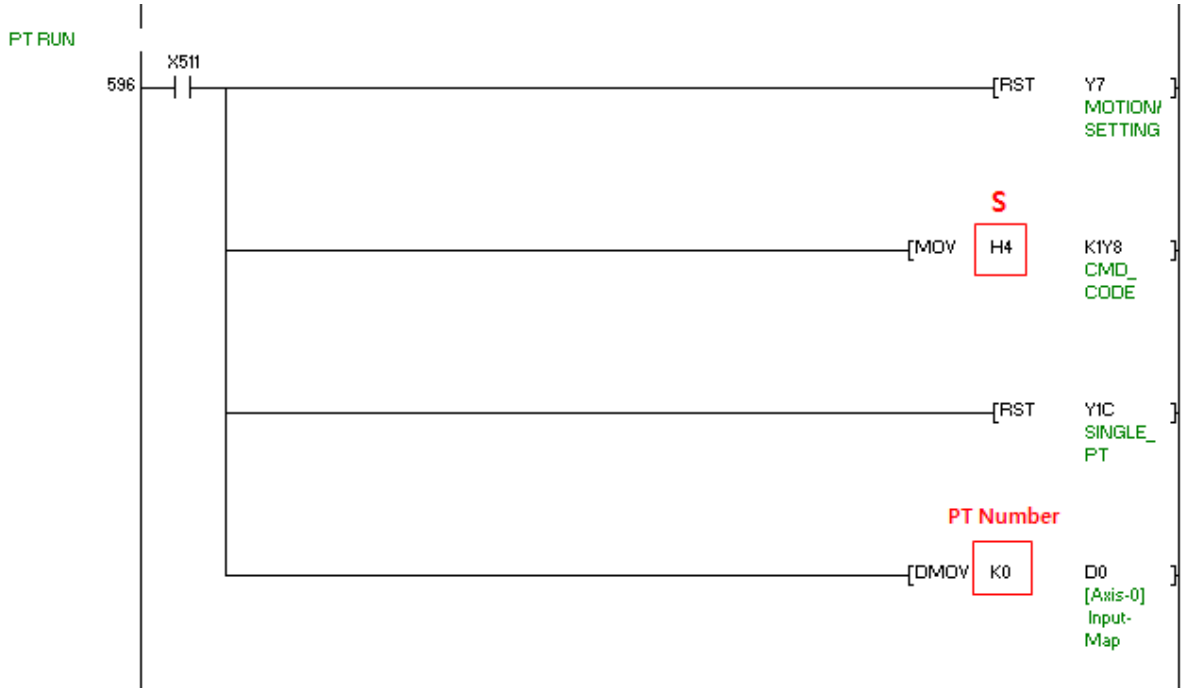
CMD_START bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0100b

CMD_RESP bit = 0, PT_RUNNING bit = 1

✓ **LADDER**



NOTE 1: Ladder of Ex 18 is added command to Ex 17, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X511, switch IO-Map to motion mode state.

② Input command code '4' to CMD_CODE area (Y0008~Y000B [K1Y0008]) with MOV command.

③ Clear SINGLE_PT bit (Y001C).

④ Input PT number to start to Axis-0's data area (D0000).

(Ex 18 is the ladder designating PT number '0' to D0000 in 'S' of DMOV command.

⑤ With reference of Ex 9, fulfill command by turning ON CMD_START bit (Y0004).

■ Single PT operation

Single PT operation runs on a PT item from input value(D0000). Ex 19 is the example on single PT operation of Axis-0.

Ex 20. Single PT operation command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  SINGLE_PT – Y001C

  CMD_START – Y0004

  Command Data Area – Y0000~Y0000 (D0000 [1 DWORD])

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  CMD_CODE_RESP – X1008~X100B

  MOTIONING – X1011

  CMD_ RESP – X1004

  PT_RUNUNG – X1018

✓ **Input and output information**

- **Input information**

  Single PT Run

  PT No. (Number saving PT item [DWORD])

- **Output information**

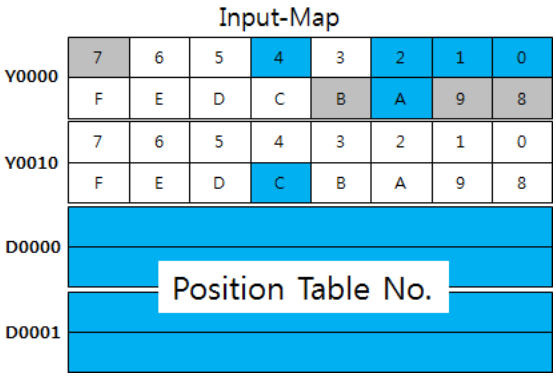
  MOTIONING – Y604

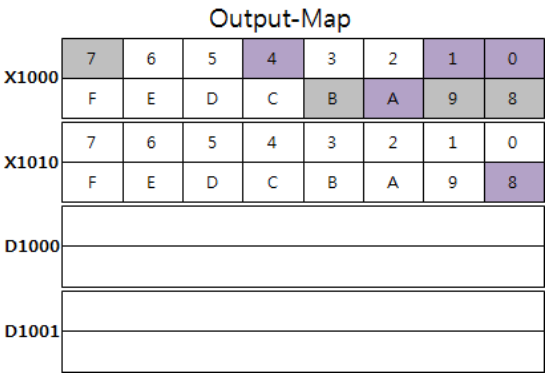
  PT CMD Resp – Y60C

  PT Running – Y60D

✓ IO-Map command and response type

- Single PT RUN command fulfillment





MOTION/SETTING bit = 0

CMD_CODE = 0100b

SINGLE_PT bit = 1

Command Data = PT number

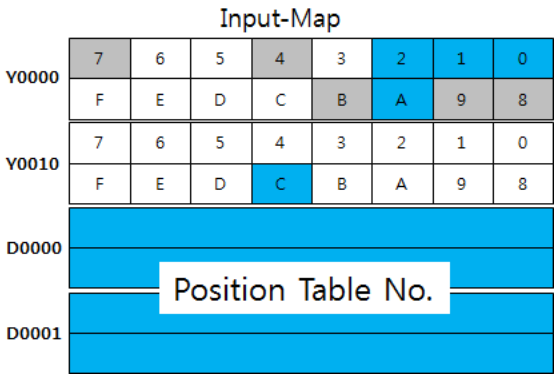
CMD_START bit = 1

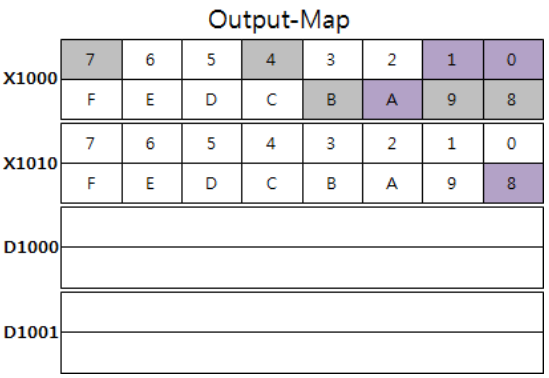
MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0100b

CMD_RESP bit = 1, PT_RUNNING bit = 1

- Lift of CMD_START bit after single PT RUN command





MOTION/SETTING bit = 0

CMD_CODE = 0100b

SINGLE_PT bit = 1

Command Data = PT number

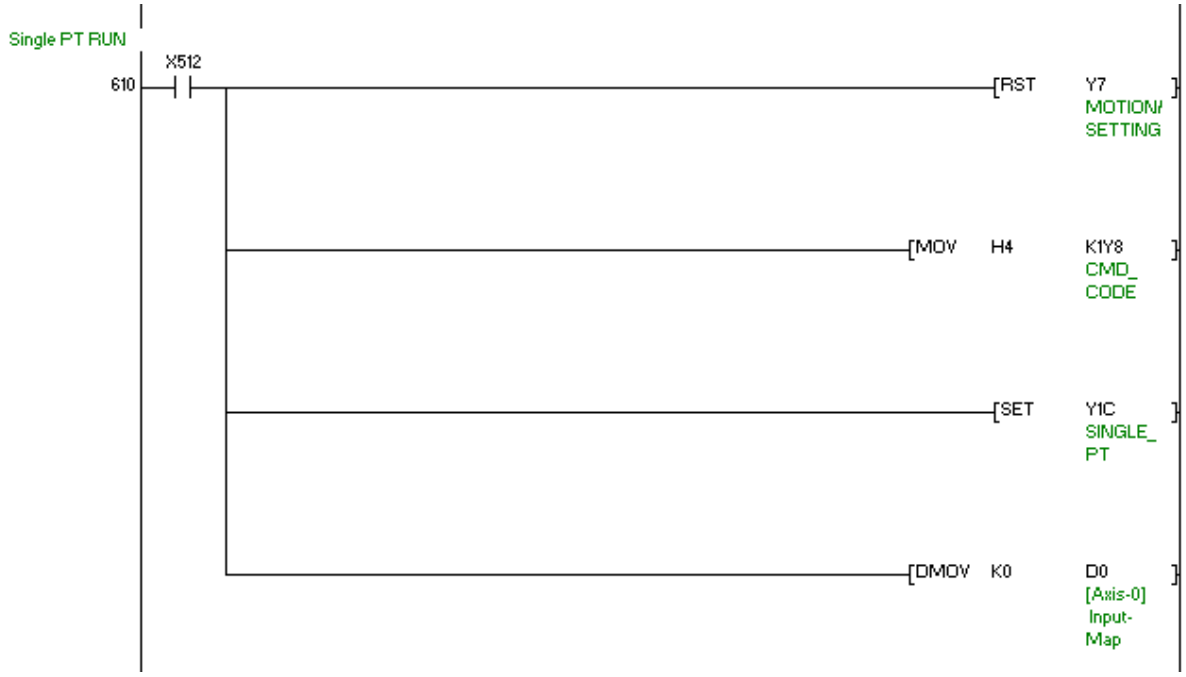
CMD_START bit = 0

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0100b

CMD_RESP bit = 0, PT_RUNNING bit = 1

✓ **LADDER**



NOTE 1: Ladder Ex 19 is added command to Ex 15, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X50F, switch IO-Map to motion mode state.

② Input command code '4' to CMD_CODE area (Y0008~Y000B [K1Y0008]) in 'S' of MOV command.

③ Set SINGLE_PT bit (Y001C).

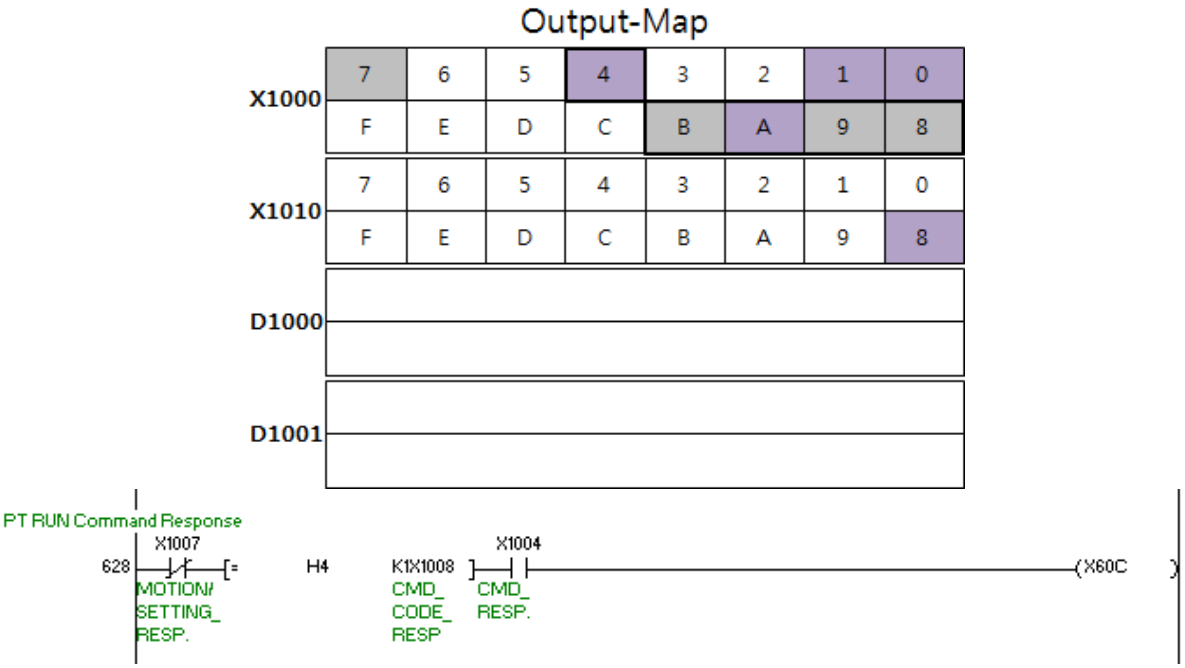
④ Input Pt number to drive to Axis-0's data area (D0000).
(Ex 19 is the data inputting PT number '0' to fulfill at 'S' of DMOV command to D0000 area.)

⑤ With reference Ex9, fulfill command by turring On CMD_START bit (Y0004).

■ Response confirmation on PT operation command

Command response bit of PT operation cannot be confirmed by IO-Map like jog operation or step movement and zero point movement. Hence, like Ex 20, can confirm with combination of IO-Map.

Ex 21. Response confirmation method on position movement command



NOTE : Ladder Ex 20 is added command to Ex 19, omitting previous example.

① Response of PT operation command can be confirmed by combination of IO-Map.

▶ Response of PT operation command is the result value consisting of status value comparing N.C input of MOTION/SETTING_RESP bit (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '4' and AND circuit for CMD_START_RESP(X1004).

5.2.6 Zero point movement command

Zero point movement command operates at command code(CMD_CODE) '7' of motion mode(MOTIONING/SETTING = 0) state and runs without regard to the input value of input data(D0000). Ex 21 is the example on Axis-0's zero movement command.

Ex 22. Zero point movement command

✓ **Control bit map information**

- **Input-Map**
  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  CMD_START – Y0004
- **Output-Map**
  MOTION/SETTING_RESP – X1007
  CMD_CODE_RESP – X1008~X100B
  MOTIONING – X1011
  CMD_ RESP – X1004
  PT_RUNUNG – X1018

✓ **Input and output information**

- **Input information**
  ORIGIN Search – X510
- **Output information**
  MOTIONING – Y604
  Origin Mov Resp – Y60B

✓ **IO-Map command and response type**

- **Zero point movement fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING bit = 0

CMD_CODE = 0111b

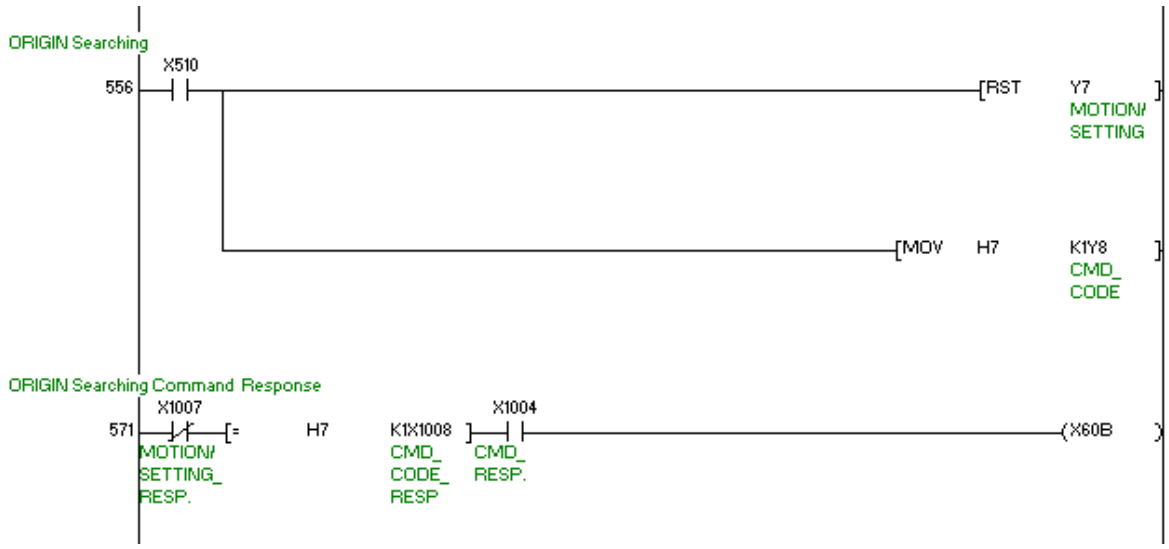
CMD_START bit = 1

MOTION/SETTING_RESP bit = 0

CMD_CODE_RESP = 0111b

CMD_RESP bit = 1, PT_RUNNING bit = 1

✓ **LADDER**



NOTE 1: Ladder Ex 21 is added command to Ex 20, omitting previous example.

✓ **Command order**

① By clearing MOTION/SETTING bit (Y0007) with close input of X50E, switch IO-Map to motion mode state.

② Input command code '7' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ With reference Ex9, fulfill command by turring On CMD_START bit (Y0004).

④ Response of the command can be confirmed by combining IO-Map of zero point command.

▶ Response of position movement command is the result value consisting of status value comparing N.C input of MOTION/SETTING_RESP bit (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '7' and AND circuit for CMD_START_RESP(X1004).

5.2.7 Parameter set-up

Parameter set-up can fulfill confirmation, set-up, and save of parameter on the motor device of the corresponding axis.

- Parameter confirmation command

Parameter confirmation operates at command code(CMD_CODE) '8' of set-up mode (MOTIONION/SETTING=1) state and it is the command requesting parameter value input at index area(K4Y0010). At this time, it operates without regard to input value at input data(D0000). Ex 22 is the example on Axis-0's parameter confirmation command.

Ex 23. Parameter confirmation command

✓ **Control bit map information**

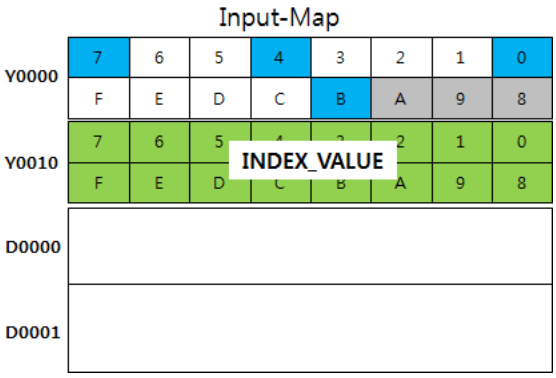
- **Input-Map**
  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  INDEX_VALUE– K4Y0010 (1WORD)
  CMD_START – Y0004
- **Output-Map**
  MOTION/SETTING_RESP – X1007
  CMD_CODE_RESP – X1008~X100B
  INDEX_VALUE_RESP – K4X1010 (1WORD)
  RESPONSE
  CMD_ RESP – X1004

✓ **Input and output information**

- **Input information**
  Read Parameter
- **Output information**
  Read Parameter Value

✓ **IO-Map command and response type**

- **Zero point movement fulfillment**

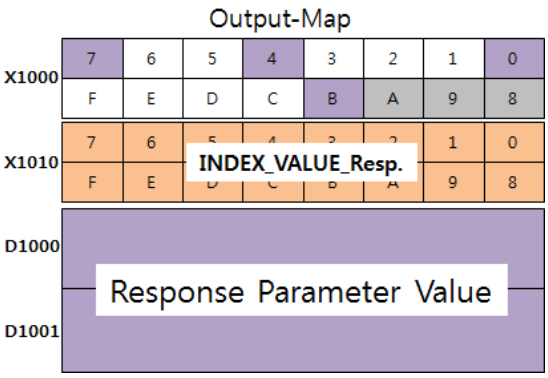


MOTION/SETTING bit = 1

CMD_CODE = 1000b

INDEX_VALUE = Index Value (Parameter No)

CMD_START bit = 1



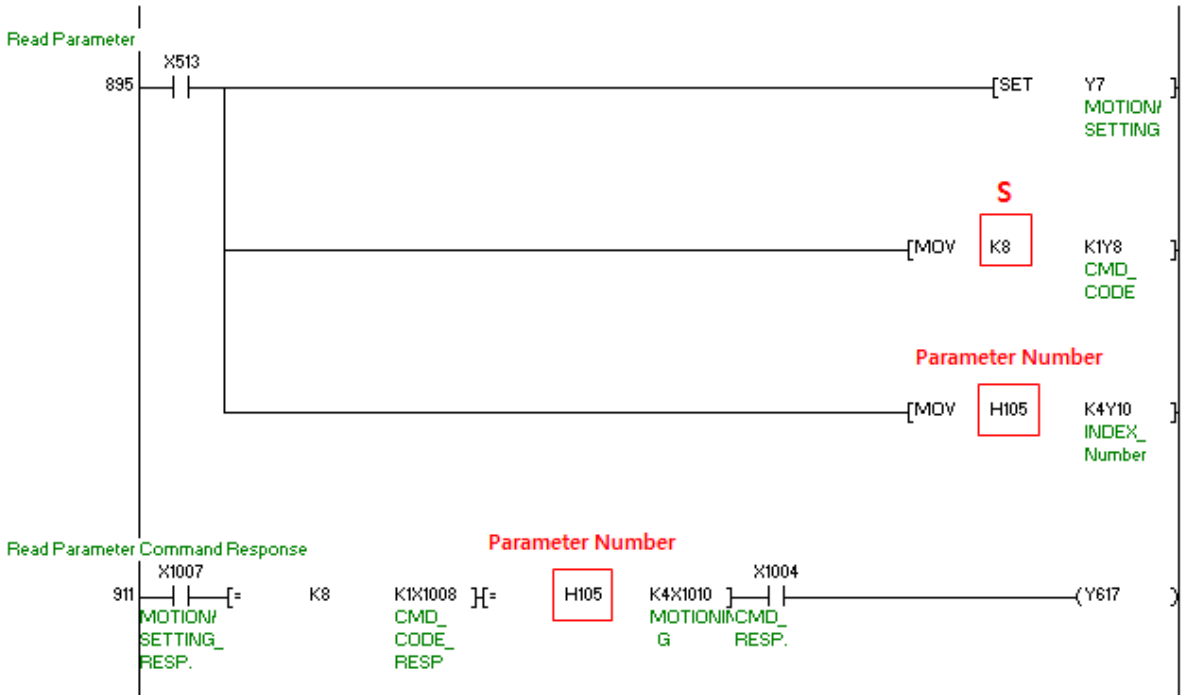
MOTION/SETTING_RESP bit = 1

CMD_CODE_RESP = 1000b

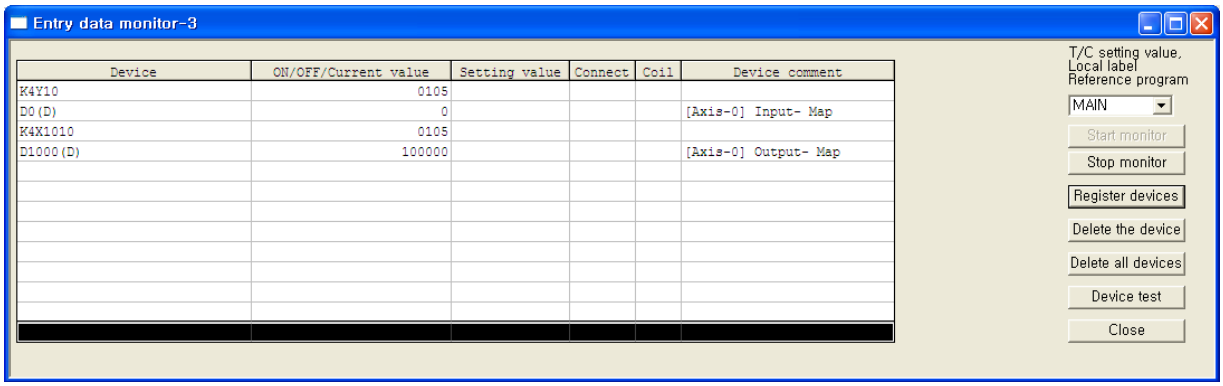
INDEX_VALUE_RESP = Index Value (Parameter No)

CMD_RESP bit = 1

✓ **LADDER**



NOTE 1: Ladder Ex 20 is added command to Ex 21, omitting previous example.



NOTE 2: With the fulfillment of Ex 22, requested parameter value can be obtained.

NOTE 3: Parameter number input to index area at Ex 22 is loop-back to 16 bit data at INDEX_RESP. area(X1010).

✓ **Command order**

① By setting MOTION/SETTING bit (Y00007) with X513's close input, switch IO-Map to set-up mode state.

② Input command code '8' to CMD_CODE area(Y0008~Y000B [K1Y0008]).

③ Input parameter number to (Y0010~Y001F [K4Y0010] in INDEX area.
(Ex 18 is the ladder inputting 105[hex], number of parameter PN#0105 『Move Speed for Step Move』 to 'S' of MOV command.)

④ With reference Ex10, fulfill command by turring On CMD_START bit (Y0004).

⑤ Response of parameter confirmation command can be confirmed with combination of IO-Map.

▶ Response of parameter confirmation command is the status value comparing N.O input of MOTION/SETTING_RESP bit(X1007) and CMD_CODE_RESP 영역(X1008~X100B [K1X1008]) with '8', the status value comparing the value of INDEX_Resp. area(X1010~X101F [K4X1010]) with requested parameter number, and the result value consisting of CMD_START_RESP(X1004) with AND circuit.

■ Parameter change command

Paramter change operates at the command code(CMD_CODE) '9' of set-up mode(MOTIONION/SETTING=1) state and it is the command changing to the designated value at data area(D0000) at the written parameter number in index area(K4Y0010). Ex 23 is the example on parameter changing command of Axis-0.

Ex 24. Parameter changing command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  INDEX_VALUE – K4Y0010 [1 WORD]
  COMMAND_WORD_DATA – D0000~D0001 [1 DWORD]
  CMD_START – Y0004

- **Output-Map**

  MOTION/SETTING_RESP – X1007
  CMD_CODE_RESP – X1008~X100B
  INDEX_VALUE_RESP – K4X1010 (1WORD)
  CMD_ RESP – X1004
  RESPONSE_DATA – D1000~D10000 (D1000 [1 DWORD])

✓ **Input and output information**

- **Input information**

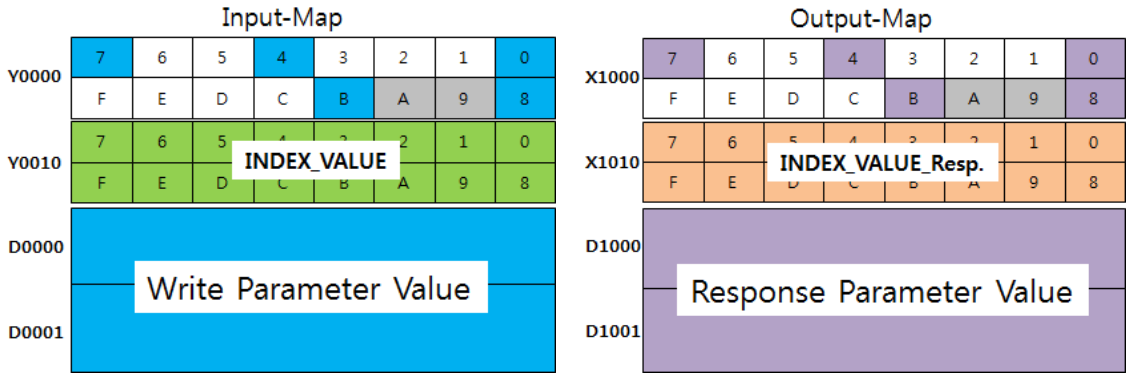
  Write Parameter – X514
  Write Parameter Value

- **Output information**

  Read Parameter Value

✓ IO-Map command and response type

- Parameter value change fulfillment



MOTION/SETTING bit = 1

CMD_CODE = 1001b

INDEX_VALUE = Index Value (Parameter No)

COMMAND_WORD_DATA = Write Parameter Value

CMD_START bit = 1

MOTION/SETTING_RESP bit = 1

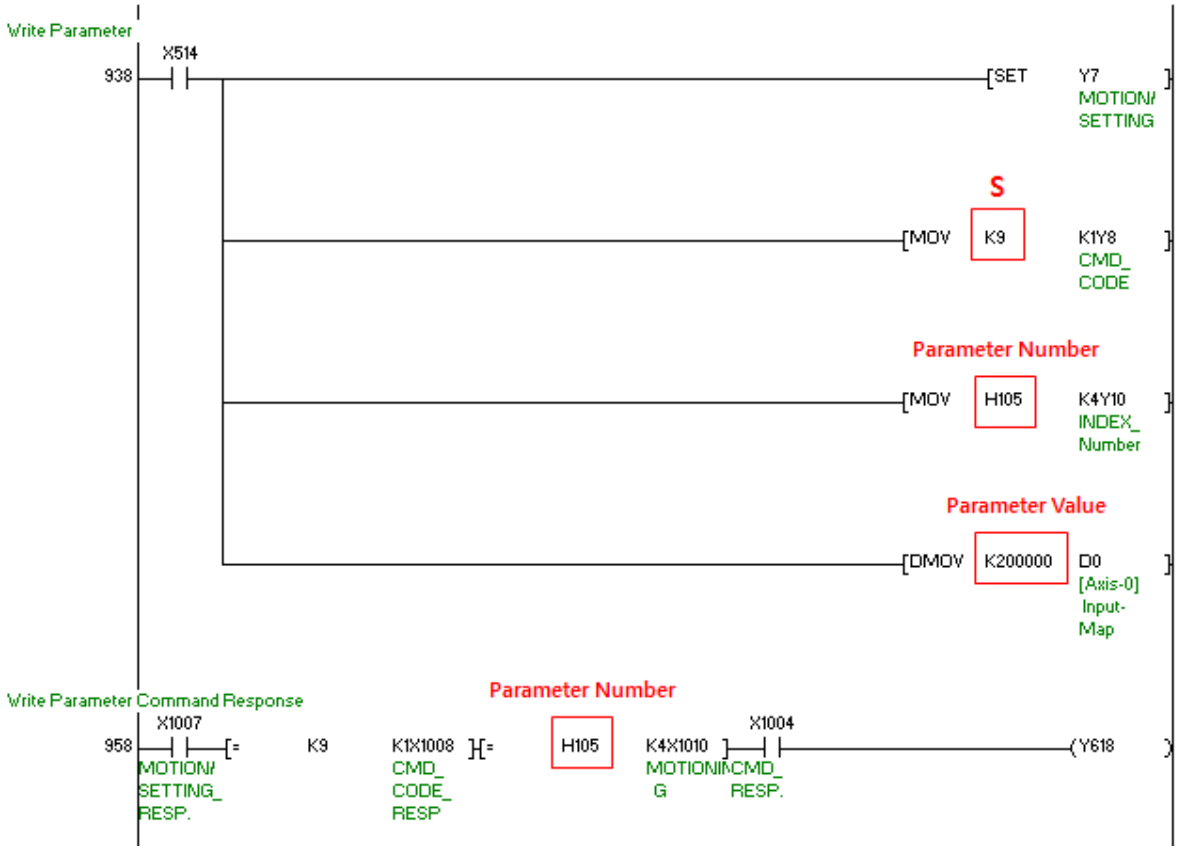
CMD_CODE_RESP = 1001b

INDEX_VALUE_RESP = Index Value (Parameter No)

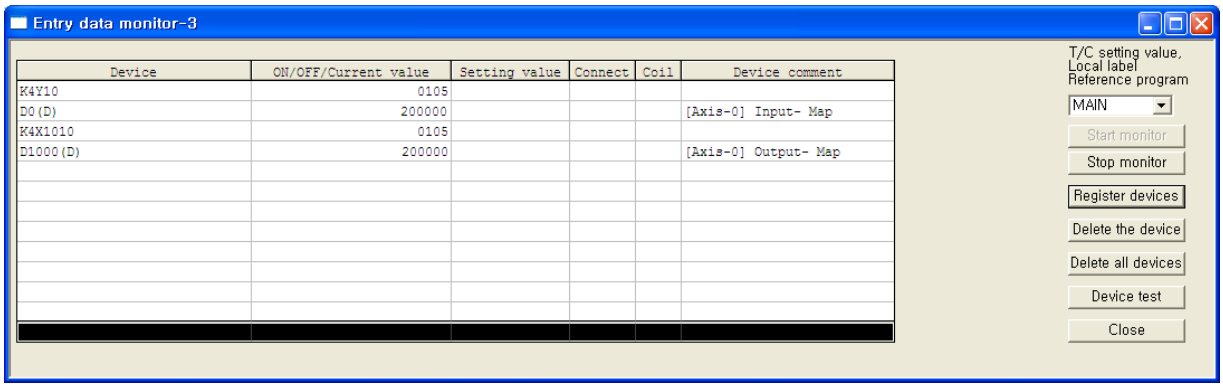
RESPONSE_DATA = Response Parameter Value

CMD_RESP bit = 1

✓ LADDER



NOTE : Ladder Ex 23 is added command to Ex 22, omitting previous example.



NOTE 2: With fulfillment of Ex 23, parameter value changing to D1000 can be obtained.

NOTE 3: Parameter number input at index area in Ex 23 is loop-back to 16 bit data at INDEX_RESP. area(X1010).

✓ Command order

① By setting MOTION/SETTING bit(Y0007) with close input of X514, switch IO-Map to set-up mode state.

② Input command code '9' to CMD_CODE area(Y0008~Y000B [K1Y0008]).

③ Input parameter number at INDEX area(Y0010~Y001F [K4Y0010].
(Ex 23 is the ladder inputting 105[hex], number of parameter PN#0105 『Move Speed for Step Move』 at 'S' of MOV command.)

④ Iput parameter value to change to Axis-0's data area(D0000).
(Ex 23 is the ladder inputting value of 200000pps at 'S' of DMOV command.)

⑤ With reference Ex 10, fulfill command by turring On CMD_START bit (Y0004).

⑥ Response of parameter change command can be confirmed with combination of IO-Map.

▶ Response of parameter change command is the result value consisting of the status value comparing N.O input of MOTION/SETTING_RESP bit(X1007) and CMD_CODE_RESP area(X1008~X100B [K1X1008]) with '9', status value comparing the value of INDEX_Resp. area(X1010~X101F [K4X1010]) and requested parameter number, and AND circuit for CMD_START_RESP(X1004) AND.)

■ Parameter save

Parameter save operates at command code (CMD_CODE) '14' of set-up mode(MOTIONION/SETTING=1) state and saves parameter value in ROM area. Ex 20 is the example on Axis-0 parameter save command.

Ex 25. Parameter save command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  INDEX_VALUE – K4Y0010 [1 WORD]

  CMD_START – Y0004

- **Output-Map**

  MOTION/SETTING_RESP – X1007

  CMD_CODE_RESP – X1008~X100B

  INDEX_VALUE_RESP – K4X1010 (1WORD)

  CMD_ RESP – X1004

✓ **Input and output information**

- **Input information**

  Save Parameter – X515

- **Output information**

  Save Parameter Resp – Y619

✓ **IO-Map command and response type**

- **Parameter save command**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING bit = 1

CMD_CODE = 1110b

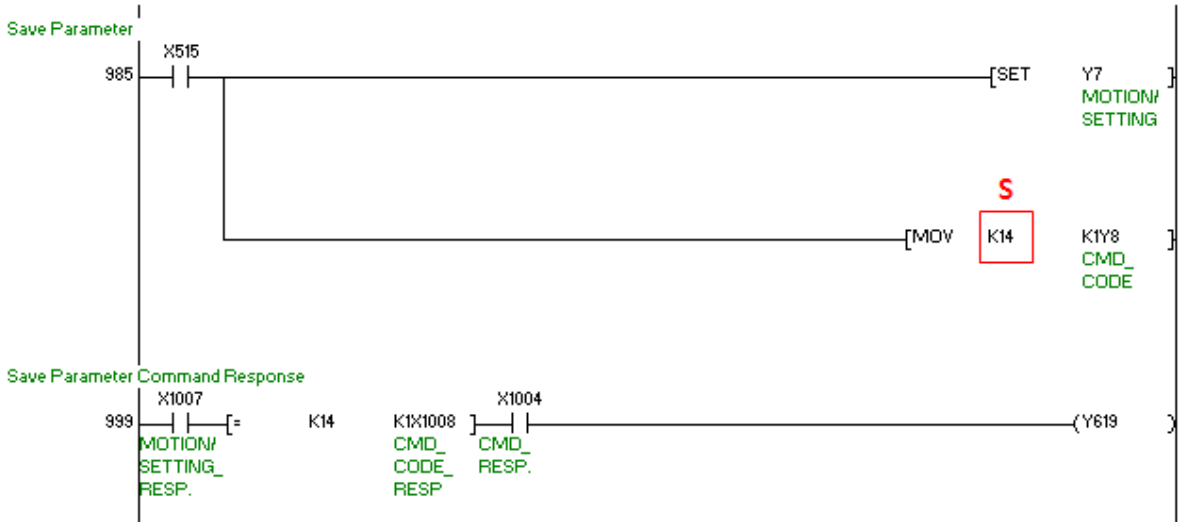
CMD_START bit = 1

MOTION/SETTING_RESP bit = 1

CMD_CODE_RESP = 1110b

CMD_RESP bit = 1

✓ **LADDER**



NOTE 1: Ladder Ex 24 is added command to Ex 23, omitting previous example.

✓ **Command order**

① By setting MOTION/SETTING bit(Y0007) with X515 close input, switch IO-Map to set-up mode state.

② Iput command code '14' to CMD_CODE area(Y0008~Y000B [K1Y0008]).

③ With reference Ex 10, fulfill command by turring On CMD_START bit (Y0004).

④ Response of the command can be confirmed with combination of IO-Map.

▶ Response of parameter save command is the status value comparing N.O input of MOTION/SETTING_RESP bit (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '14' and the result value that CMD_START_RESP(X1004) consists of AND circuit.

5.2.8 Position designation

Position designation command operates at command code (CMD_CODE) '10' of set-up mode(MOTIONION/SETTING=1) state and changes following position value(Command Position). Ex 25 is the example on following position value change command of Axis-0.

Ex 26. Position value change command

✓ **Control bit map information**

- **Input-Map**

  MOTION/SETTING – Y0007

  CMD_CODE – Y0008~Y000B

  COMMAND_WORD_DATA – D000~D000 [0 DWORD]

  CMD_START – Y0004

- **Output-Map**

  MOTION/SETTING_RESP – D100.7

  CMD_CODE_RESP – D100.8~D100.11

  CMD_ RESP – D100.4

  RESPONSE_DATA – D102~D103 (D102 [1 DWORD])

✓ **Input and output informaiton**

- **Input information**

  Set Position – X516

  Set Current Position Data

- **Output information**

  Response Current Position

✓ **IO-Map command and response type**

- **Current position designation command**

Input-Map

Y0000	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000	Set Current Position Value							
D0001								

Output-Map

X1000	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000	Response Current Position							
D1001								

MOTION/SETTING bit = 1

CMD_CODE = 1010b

COMMAND_WORD_DATA = Set Current Position

CMD_START bit = 1

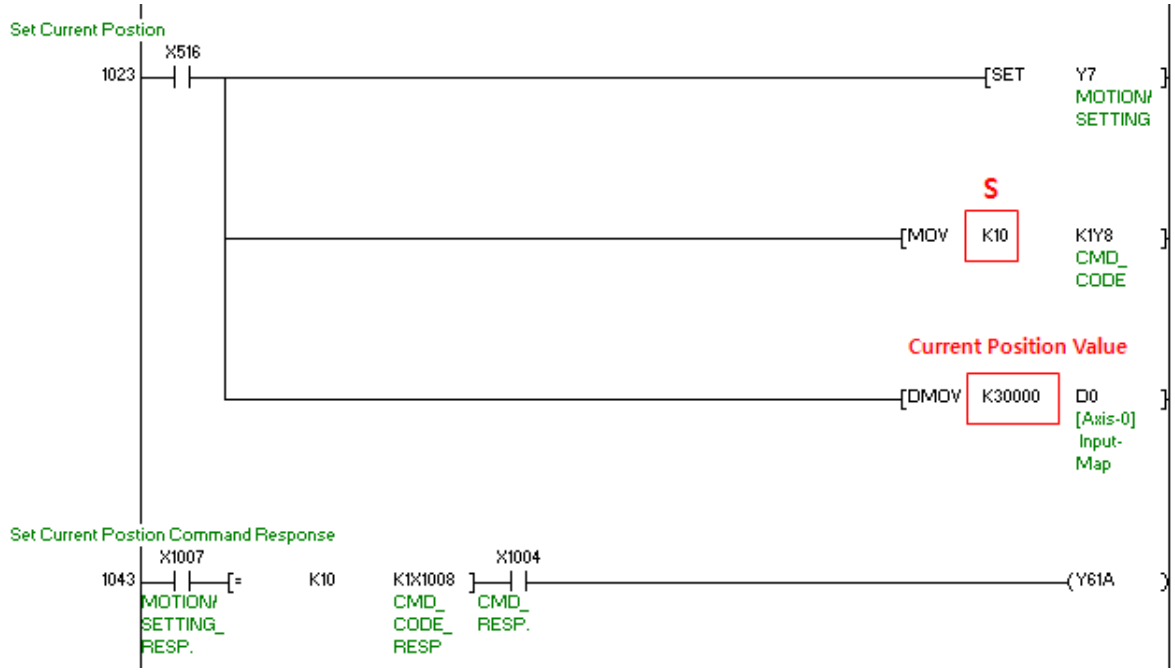
MOTION/SETTING_RESP bit = 1

CMD_CODE_RESP = 1010b

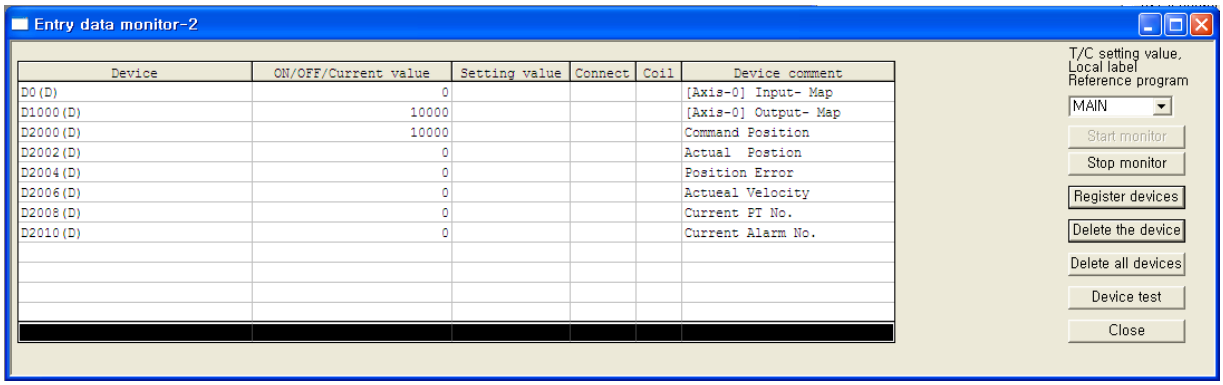
RESPONSE_DATA = Response Current Position

CMD_RESP bit = 1

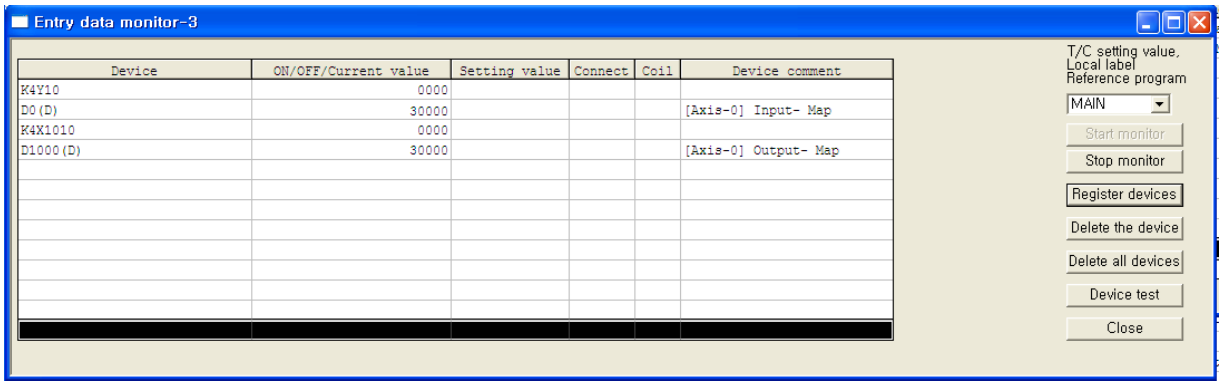
✓ **LADDER**



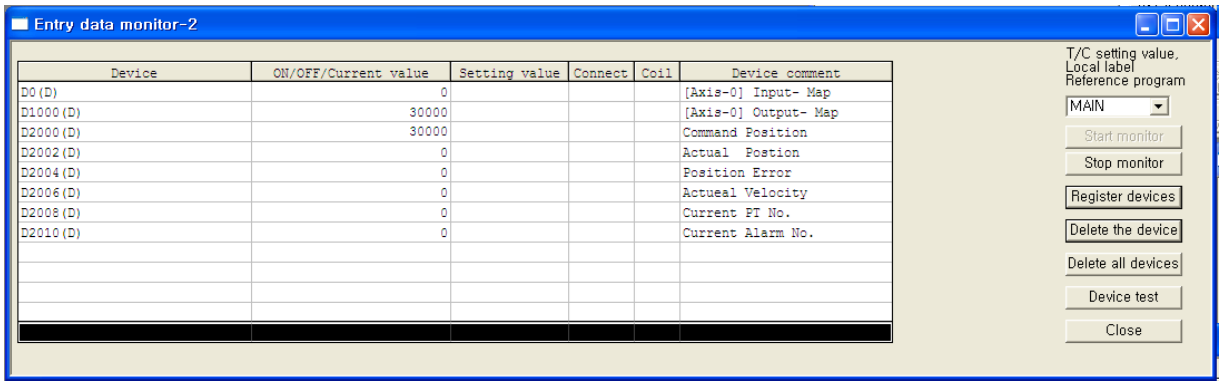
NOTE 1: Ladder Ex 25 is added command to Ex 24, omitting previous example.



NOTE 2: It is the screen monitoring following value of current position by fulfilling Ex 7 before Ex 25 fulfillment.



NOTE 3: Ex 25 fulfillment obtaines following position value changed to D100 area.



NOTE 4: It is the screen monitoring following value of current position by fulfilling Ex 7 after Ex 25 fulfillment.

✓ **Command order**

① By setting MOTION/SETTING bit (Y0007) with X516 close input, switch IO-Map to set-up mode state.

② Input command code '10' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ With reference Ex 10, fulfill command by turring On CMD_START bit (Y0004).

④ Position designation command response can be confirmed with combination of IO-Map.

▶ Response of parameter save command is the status value that MOTION/SETTING_RESP bit compares N.O input of (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '10 and the result value comprising CMD_RESP(X1004) with AND circuit.)

⑤ After fulfilling the command, it can confirm that currently following position value is changed with Response data set-up command of Ex 7.

5.2.9 Alarm history request and initialization

MotionGate can manage 4 alarm histories from the latest alarm.

- Alarm history confirmation

Alarm history request operates command code(CMD_CODE) '12' of set-up mode (MOTIONION/SETTING=1) state and can confirm alarm history occurring at the corresponding axis. Ex 26 is the example on alarm history request of Axis-0.

Ex 27. Alarm history request

✓ **Control bit map information**

- **Input-Map**
  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  CMD_START – Y0004
- **Output-Map**
  MOTION/SETTING_RESP – X1007
  CMD_CODE_RESP – X1008~X100B
  CMD_ RESP – X1004
  RESPONSE_DATA – D1000~D1000 (D1000 [1 DWORD])

✓ **Input and output information**

- **Input information**
  ALM History – X517
- **Output information**
  ALM His Resp – Y61B

✓ **IO-Map command and response type**

- **Alarm history confirmation command fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	F	E	D	C	B	A	9	8
D0000								
D0001								

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	F	E	D	C	B	A	9	8
D1000	1st Last Alarm Code							
	2nd Last Alarm Code							
D1001	3rd Last Alarm Code							
	4th Last Alarm Code							

MOTION/SETTING bit = 1

CMD_CODE = 1100b

CMD_START bit = 1

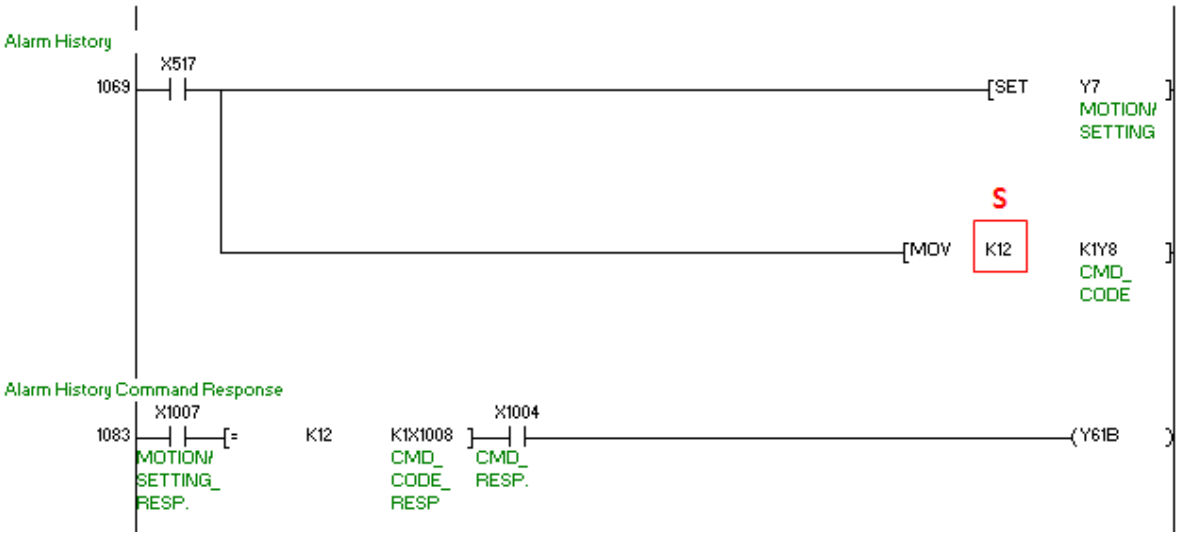
MOTION/SETTING_RESP bit = 1

CMD_CODE_RESP = 1100b

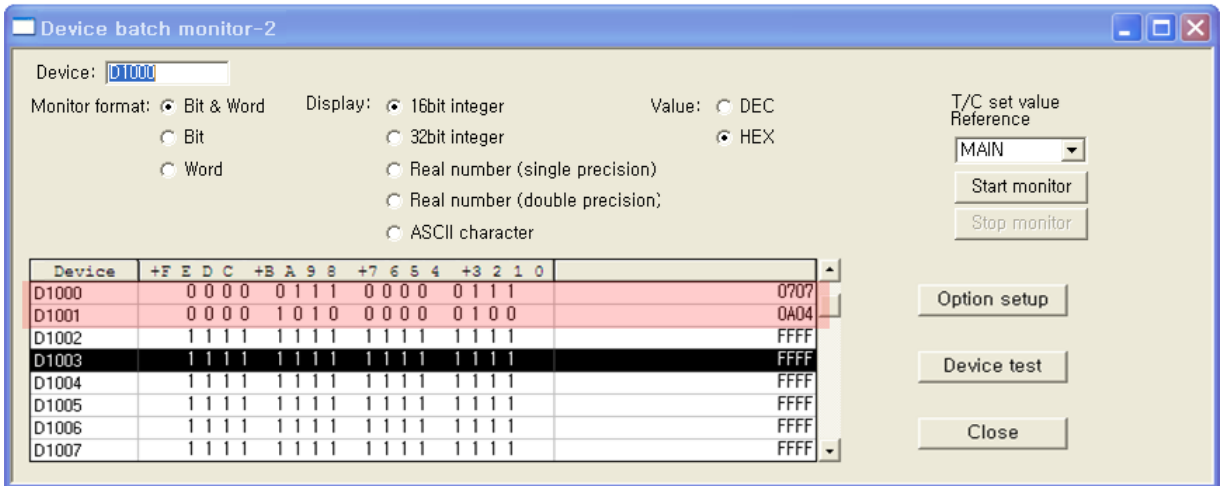
CMD_RESP bit = 1

RESPONSE_DATA = Alarm History

✓ **LADDER**



NOTE 1: Ladder Ex 26 is added command to Ex 25, omitting previous example.



NOTE 2: It is the information of alarm occurred artificially by fulfilling Ex 26.

NOTE 3: Alarm history is saved based on alarm reset command.

✓ **Command order**

① By setting MOTION/SETTING bit (Y0007) with X517 close input, switch IO-Map to set-up mode state.

② Input command code '12' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ With reference Ex 10, fulfill command by turring On CMD_START bit (Y0004).

④ Alarm history confirmation command can be confirmed with combinaton of IO-Map.

▶ Response of parameter save command is the status value that MOTION/SETTING_RESP bit compares N.O input of (X1007) and CMD_CODE_RESP area(X1008~X100B [K1X1008]) with '12' and the result value comprising CMD_RESP(X1004) with AND circuit.)

⑤ Data obtained after fulfilling the command receives 4 data in the form of hexadecimal number.

▶ Data of D1000.0~D1000.7 section (0x07 : motor connection error) is the latest occurring alarm information.

▶ Data of D1000.8~D1000.F section (0x07 : motor connection error) is the second previous information of the latest occurring alarm information.

▶ Data of D1001.0~D1000.7 section (0x04 : overload) is the third previous information of the latest occurring alarm information.

▶ Data of D1001.8~D1000.F section (0x0A : encoder connection error) is the fourth previous information of the latest occurring alarm information.

■ Alarm history initialization

Alarm history initialization operates command code(CMD_CODE) '13' of set-up mode(MOTIONION/SETTING=1) state and can confirm alarm history occurring at the corresponding axis. Ex 27 is the example on Axis-0's alarm history initialization.

Ex 28. Alarm history initialization command

✓ **Control bit map information**

- **Input-Map**
  MOTION/SETTING – Y0007
  CMD_CODE – Y0008~Y000B
  CMD_START – Y0004
- **Output-Map**
  MOTION/SETTING_RESP – Y1007
  CMD_CODE_RESP – Y1008~Y100B
  CMD_ RESP – Y1004

✓ **Input and output information**

- **Input information**
  Reset ALM His – X518
- **Output information**
  ALM His CLR Resp – Y61C

✓ **IO-Map command and response type**

- **Alarm history initialization command fulfillment**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D0000								
D0001								

MOTION/SETTING bit = 1

CMD_CODE = 1110b

CMD_START bit = 1

Output-Map

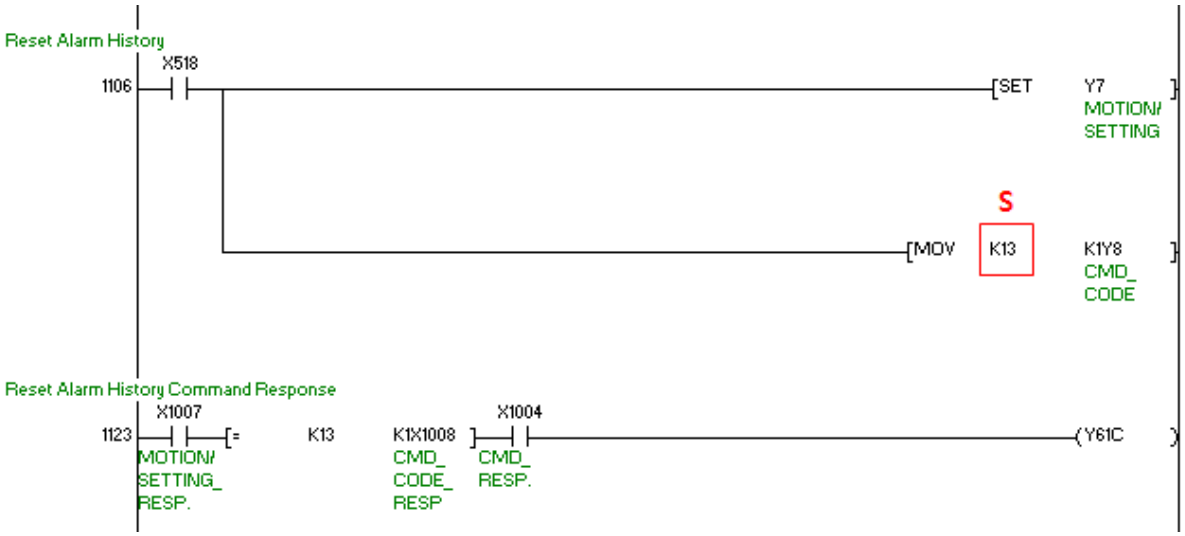
	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
D1000								
D1001								

MOTION/SETTING_RESP bit = 1

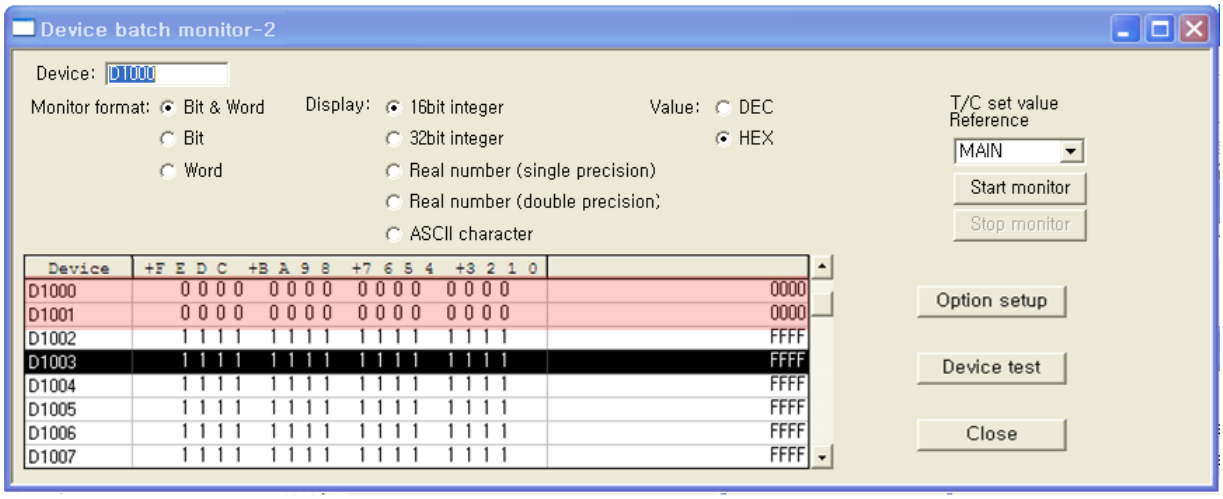
CMD_CODE_RESP = 1110b

CMD_RESP bit = 1

✓ **LADDER**



NOTE 1: Ladder Ex 27 is added command to Ex 26, omitting previous example.



NOTE 2: It is the information confirming alarm history by fulfilling Ex 26 after Ex 27 fulfillment.

✓ **Command order**

① By setting MOTION/SETTING bit (Y0007) with X518 close input, switch IO-Map to set-up mode state.

② Input command code '13' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ With reference Ex 10, fulfill command by turring On CMD_START bit (Y0004).

④ After fulfilling the command, alarm history is cleared to 0x00, 0x00, 0x00, 0x00.

⑤ Alarm history initialization command can be confirmed with combination of IO-Map.

▶ Response of parameter save command is the status value that MOTION/SETTING_RESP bit compares N.O input of (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '12' and the result value comprising CMD_RESP(X1004) with AND circuit.)

5.2.10 MotionGate version confirmation

MotionGate version confirmation command can obtain MotionGate version information no matter which axis command is fulfilled at. With the command it operates command code(CMD_CODE) '5' of set-up(MOTIONION/SETTING=1) able to confirm. Ex 24 is the example on MotionGate version information request method.

Ex 29. MotionGate version information request method

- ✓ **Control bit map information**
  - **Input-Map**
    MOTION/SETTING – Y0007
    CMD_CODE – Y0008~Y000B
    CMD_START – Y0004
  - **Output-Map**
    MOTION/SETTING_RESP – X1007
    CMD_CODE_RESP – X1008~X100B
    CMD_ RESP – X1004

- ✓ **Input and output information**
  - **Input information**
    Read Ver Info – X519
  - **Output information**
    Read Ver Resp – Y61D

✓ **IO-Map command and response type**

- **Version information request command**

Input-Map

	7	6	5	4	3	2	1	0
Y0000	F	E	D	C	B	A	9	8
Y0010	F	E	D	C	B	A	9	8
D0000								
D0001								

MOTION/SETTING bit = 1

CMD_CODE = 0101b

CMD_START bit = 1

Output-Map

	7	6	5	4	3	2	1	0
X1000	F	E	D	C	B	A	9	8
X1010	F	E	D	C	B	A	9	8
D1000	Release No.							
	Bug Fix							
D1001	Minor Version							
	Major Version							

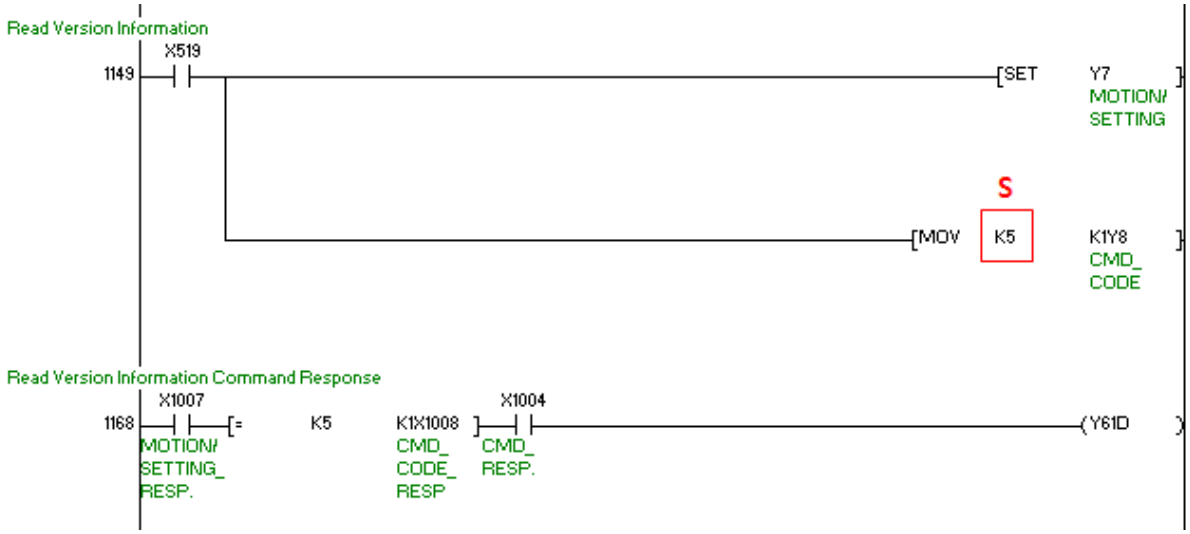
MOTION/SETTING_RESP bit = 1

CMD_CODE_RESP = 0101b

CMD_RESP bit = 1

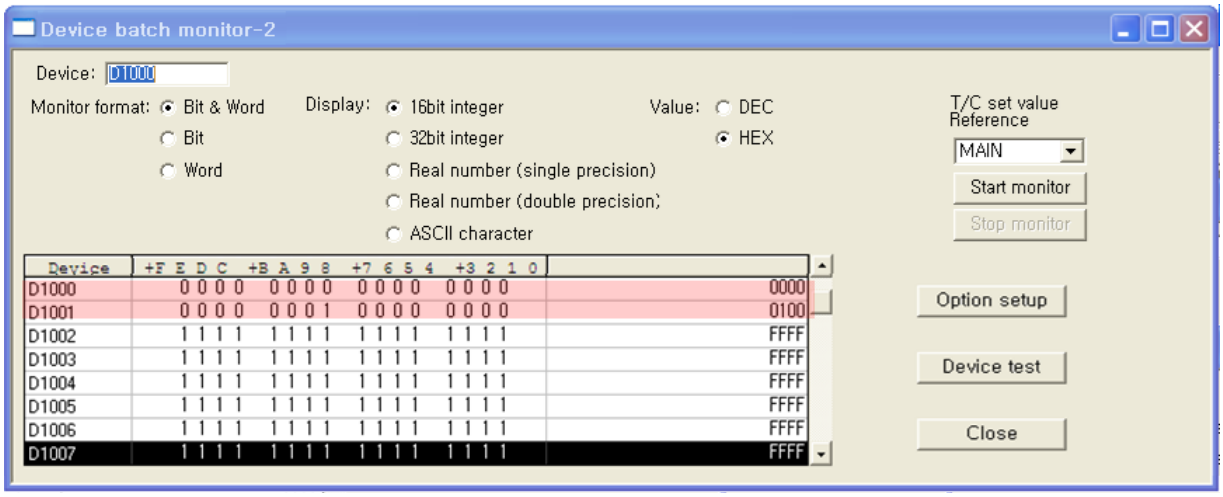
RESPONSE_DATA = Version Information

✓ **LADDER**



NOTE 1: Ladder Ex 28 is added command to Ex 27, omitting previous example.

NOTE 2: Ex 28 receives identical information even if fulfilling version information request command with all axes connecting to the same MotionGate.



✓ Command order

① By setting MOTION/SETTING bit (Y0007) with X50A close input, switch IO-Map to set-up mode state.

② Input command code '5' to CMD_CODE area (Y0008~Y000B [K1Y0008]).

③ With reference Ex 10, fulfill command by turring On CMD_START bit (Y0004).

④ Response of MotionGate version confirmation command can be confirmed with combination of IO-Map.

▶ Response of MotionGate version confirmation command is the status value that MOTION/SETTING_RESP bit, response bit of the corresponding IO-Map compares N.O input of (X1007) and CMD_CODE_RESP area (X1008~X100B [K1X1008]) with '12' and the result value comprising CMD_RESP (X1004) with AND circuit.

⑥ Data obtained after the command fulfillment receives 4 data in the form of hexadecimal number (Version confirmed at Ex 28 is 1.0.0.0.)

▶ Data of D1000.0~D1000.7 section is release number(Release No,).

▶ Data of D1000.8~D1000.F section is bug fixing number(Bug Fix. No.).

▶ Data of D1001.0~D1000.7 section is minor version(Minor Vesion).

▶ Data of D1001.8~D1000.F section is major version(Major Version).

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