


MITSUBISHI

General Purpose AC SERVO

MELSERVO-J2-C-S100

- Specifications -

 **MITSUBISHI ELECTRIC CO.**
NAGOYA – WORKS

SH(NA)3197B

- Contents
- 1. Summary
- 2. Specification listing
- 3. Typical wiring example
- 4. Terminal blocks
- 5. Program language specifications
- 6. Automatic program-operation
- 7. Manual-operations
- 8. Zero point return operations
- 9. Display
- 10. Parameters
- 11. Set-up S/W
- 12. Serial communication (RS-232C / 485)
- 13. Trouble shooting

1. Summary

This installation guide describes installation of the 1 axis positioning controller amplifier

MR-J2-□□ C-S100 and how to program operation.

[The dimension of the amplifiers and applied servo motors are same as the standard MR-J2-C series spec]

(1) Functions

- 1) Simple language for program operation. (Maximum 60 steps programming with Windows based S/W)
- 2) RS-232C/485 Serial Communication (separate communication available)
- 3) Zero point return by : DOG method, Count method, Data set method, Stopper method and SON Point method.
- 4) Incremental and Absolute commands.
- 5) Absolute position detection system.
- 6) Manual pulse generator input.
- 7) Acceleration and Deceleration can be set with individual leaner carve.
- 8) S-pattern acceleration / deceleration time.
- 9) Maximum delay time of 3 ms (or less) from start signal input to motor movement.

<Model definition>

Servo amplifier

MR - J2 - □□ C - S100

Amplifier Capacity

10 :	50/100W
20 :	200W
40 :	400W
60 :	600W
70 :	700W
100 :	1kW
200 :	2kW
350 :	3.5kW

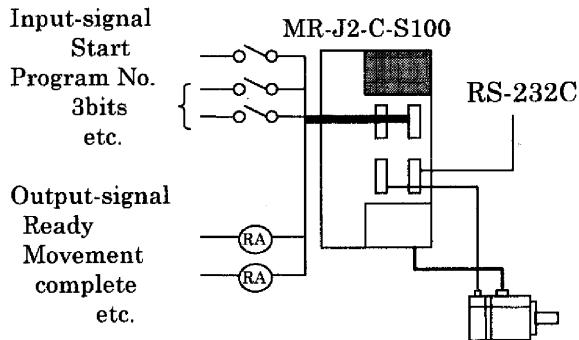
<Program operation>



- Programming and monitoring by Windows™ based S/W

Program example.

TIMES(3)	Program count command
STC(100)	Acceleration / Deceleration time 100[msec]
SPN(2000)	Motor speed 2000[r/min.]
MOV(5000)	Move command 5000[$\times 10^5 \mu\text{m}$]
SYNC(1)	Waiting for external signal to switch ON
:	:
STOP	Program stop



- The program will be transmitted to MR-J2-C-S100 via serial communication.
- Program number can select by external "PS" switches.
 - Program execution by "ST1" input or via serial communication
- Delay time is 3 ms(or less) after Start signal input to motor movement.

2. Specification listing

(1) Programming

Operating	<ul style="list-style-type: none"> - Simple programming language (Programming with Setup S/W). - Programming capacity : Up to 8 programs , 60 steps Max.
Positioning command input	<ul style="list-style-type: none"> - Setting by Simple programming language. - Movement setting range at 1 point : $\pm 1 (\mu\text{m}) \sim \pm 999.999(\text{mm})$.
Speed command input	<ul style="list-style-type: none"> - Speed and Acc/Dec times setting by simple programming language. - S-pattern Acc/Dec time can set by parameter 14.
System	<ul style="list-style-type: none"> - Absolute / Incremental.
Automatic operation mode	<ul style="list-style-type: none"> - Setting by programming language.

(2) Manual operation mode

JOG	External input switch or RS-232C / 485 communication
Manual pulse generator	Manual operation by manual pulse generator. <ul style="list-style-type: none"> - Input pulse : 90 degree differential phase pulse. (A / B) Open corrector type ----- times 4 - Max. Input pulse frequency : 200 kpps - Command pulse times : Times 1 , 10 or 100 (Parameter No.01)

(3) Zero point return mode

DOG method	The Zero point is the first Z-phase point after the DOG turns OFF. <ul style="list-style-type: none"> - Zero point address setting - Zero point shift value setting - Zero point return direction setting - Automatic back feed on DOG - Automatic back stroke function (for securing stroke)
Count method	The Zero point is the Encoder pulse count after DOG turns ON. <ul style="list-style-type: none"> - Zero point address setting. - Zero point shift value setting. - Zero point return direction setting. - Automatic back feed on DOG . - Automatic back stroke function (for securing stroke).
Data set method	Zero point return without DOG switch. <ul style="list-style-type: none"> - Setting any position by manual operation. - Zero point address setting.
Stopper method	Zero point return at stopper position of stroke. <ul style="list-style-type: none"> - Zero point address setting .
SON Point method	The Zero point is set when SON signal turns ON. <ul style="list-style-type: none"> - Zero point address setting.

Positioning control function	<ul style="list-style-type: none"> - Absolute position detection system. - S/W stroke limit. - Backlash compensation function. - Prevent the over-travel by external limit switch. - Override with external analog signal.
------------------------------	---

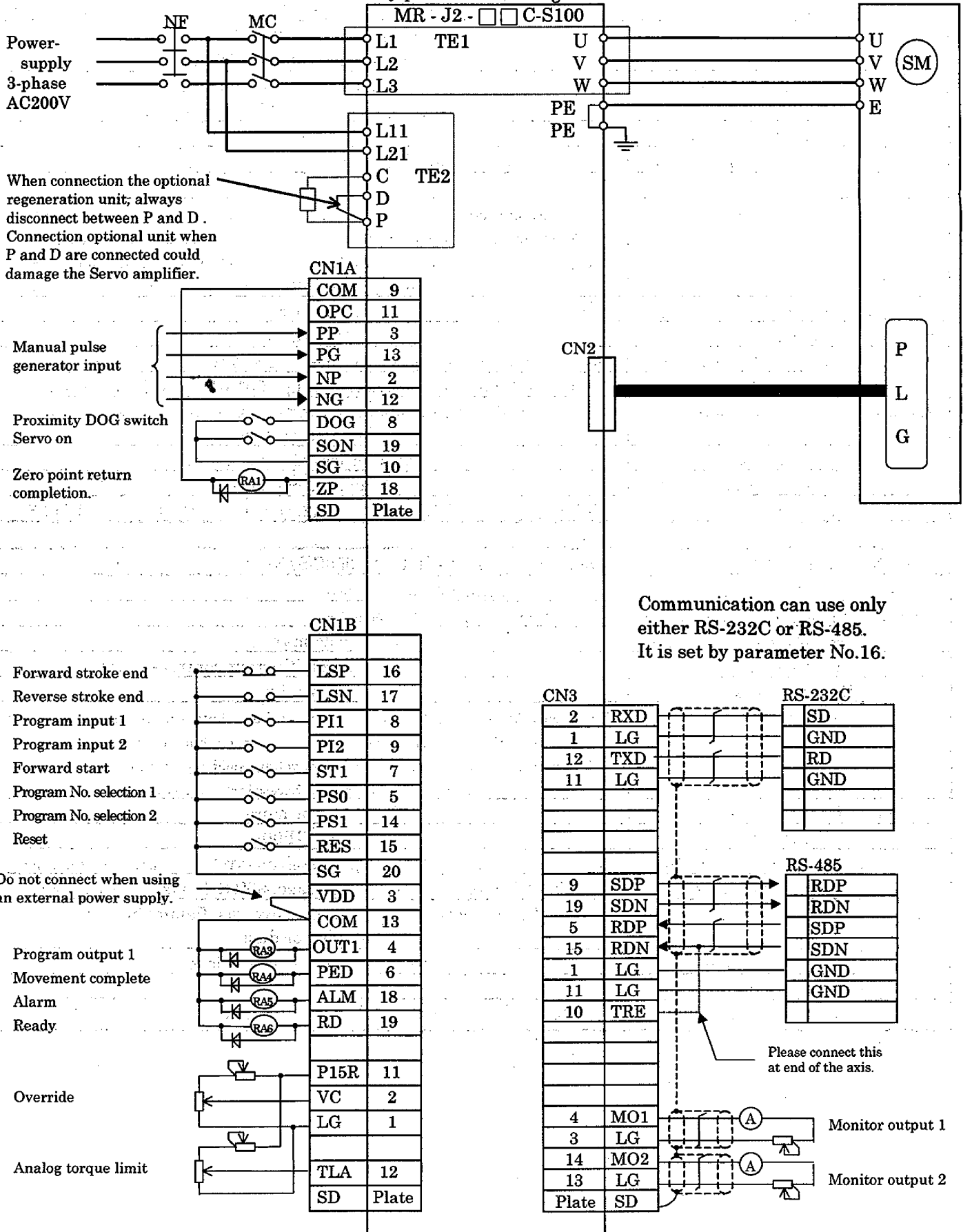
(4) Servo amplifier

Servo-amp model MR-J2-		10C-S100	20C-S100	40C-S100	60C-S100	70C-S100
Power supply	Voltage/Frequency	3-phase AC200V~230V, 50/60Hz or single-phase 230VAC, 50/60Hz				
	Permissible voltage fluctuation.	3-phase AC170V~253V, 50/60Hz or single-phase 207~253VAC, 50/60Hz				
	Permissible frequency fluctuation	± 5% max.				
Control system		Sinusoidal PWM control / Current control system				
Dynamic brake		Internally				
Safety features		Excess current shutdown, Regeneration excess voltage shutdown, Excess load shutdown (electronic thermal), Servo motor overheat protection, Encoder error protection, Regeneration error protection, Insufficient voltage/sudden power outage protection, Excess speed protection, Excess error protection				
Speed frequency response		250Hz or more				
Structure		Open (IP00)				
Environment	Ambient temperature	0~+55°C (32 to 131°F)(avoid freezing), storage: -20~+65°C (-4 to 149°F) (avoid freezing)				
	Ambient humidity	90%RH max. (avoid freezing), storage: 90%RH max. (avoid freezing)				
	Atmosphere	Inside control panel : no corrosive gas, flammable gas, Oil mist, or dust				
	Elevation	1000m or less above sea level				
	Oscillation	5.9m/s ² {0.6G} max.				
Weight kg/(lb.)		0.7(1.7)	0.7(1.7)	1.1(2.4)	1.1(2.4)	1.7(3.8)

Servo-amp model MR-J2-		100C-S100	200C-S100	350C-S100		
Power supply	Voltage/Frequency	3-phase AC200V ~230V, 50/60Hz				
	Permissible voltage fluctuation.	3-phase AC170V~253V, 50/60Hz				
	Permissible frequency fluctuation	±5% max.				
Control system		Sinusoidal PWM control / Current control system				
Dynamic brake		Internally				
Safety features		Excess current shutdown, Regeneration excess voltage shutdown, Excess load shutdown (electronic thermal), Servo motor overheat protection, Encoder error protection, Regeneration error protection, Insufficient voltage/sudden power outage protection, Excess speed protection, Excess error protection				
Speed frequency response		250Hz or more				
Structure		Open (IP00)				
Environment	Ambient temperature	0~+55°C(32 to 131°F)(avoid freezing), storage: -20~+65°C (-4 to 149°F) (avoid freezing)				
	Ambient humidity	90%RH max. (avoid freezing), storage: 90%RH max. (avoid freezing)				
	Atmosphere	Inside control panel : no corrosive gas, flammable gas, oil mist, or dust				
	Elevation	1000m or less above sea level				
	Oscillation	5.9m/s ² {0.6G} max.				
Weight kg/(lb.)		1.7(3.8)	2.0(4.4)	2.0(4.4)		

3. Typical wiring example

-Some terminal function can be different by parameter setting-



Note) Input / output function signals can be changed by the Setup-S/W.



Caution

1. Do not reverse the diode's direction. Connection it backwards could cause the amplifier to malfunction so that signals are not output and emergency stop and other safety circuit are inoperable.
2. The emergency stop switch must be installed.

Notice


3. When using the regenerative brake option, always disconnect between P and D.
4. CN1A, CN1B, CN2 and CN3 have the same sharp. Wrong connection of the connectors will lead to a fault. Connect them correctly.
5. Make sure that the sum of current flowing to external relays dose not exceed 80mA. If it exceed 80mA, supply interface power from an external source.

Memorandum

6. When starting operation, always connect the external emergency stop signal(EMG) and forward/reverse run stroke end signal(LSP/LSN)with SG .(b contact)
7. Signals with the same name are connected inside.
8. Malfunction (ALM) signals are turned ON during normal operation when no alarms have been triggered.
9. Connect the shield wire securely to the plate inside the connector(ground plate)

4. Terminal blocks

(1) Main circuit terminal block / Control circuit terminal block

Signals	Symbols	Terminals	Descriptions
Main circuit power supply	L1,L2,L3	TE1	Main circuit power supply input terminals MR-J2-□□ C-S100 : Connect 3-phase AC 200 ~ 230V/50, 60Hz or Single-phase 230VAC,50/60Hz
Servo motor output	U,V,W	TE1	Servo motor power output terminals Connect to the servo motor power supply terminals (U, V, W).
Control circuit power supply	L11,L21	TE2	Control circuit power supply input terminals L11 and L21 should be in phase with L1 and L2, respectively. MR-J2-□□ C-S100: Single-phase 200 ~ 230VAC, 50/60Hz
Regenerative brake option	P,C,D	TE2	Regenerative brake option connection terminals P and D are factory-connected. When using the regenerative brake option, always remove wiring from across P-D and connect the regenerative brake option across P-C.
N	—	—	Not connect.
Protective earth	PE		Ground terminal Connect this terminal to the protective earth (PE) terminals of the servo motor and control box for grounding.

(2) CN1A

Signals	Symbols	Connector Pin No.	Functions / Applications
Digital I/F power supply input	COM	9	Used to output 24VDC for input interface. Digital interface power supply input terminal. Connect the positive terminal of the 24VDC(200mA or more) external power supply.
Open corrector power input	OPC	11	When using a pulse train in the open collector from the Manual pulse generator, supply this terminal with the positive(+) power of 24VDC.
Digital I/F common	SG	10, 20	Common terminal for VDD and COM. Pins are connected internally. (24VDC common). Separated from LG.
power supply	P15R	4	Used to output 15VDC.
Control common	LG	1	Common terminal for 15VDC, 5VDC.
Forward run pulse train	PP	3	Used to enter a forward command pulse train.
	PG	13	Open collector system , Differential receiver system.
Reverse run pulse train	NP	2	Used to enter a reverse command pulse train.
	NG	12	Open collector system , Differential receiver system.
Proximity DOG	DOG	8	Proximity DOG signal input terminal.(DOG-SG)
Zero point return completion	ZP	18	Zero point return completion output terminal. ZP-SG are connected when Zero point return completed. In the absolute position detection system, ZP-SG are connected when SON is ON and the controller is ready to operate.
Servo ON	SON	19	Connect SON-SG to switch on the base circuit and make the servo amplifier ready to operate (Servo-ON). Disconnect SON-SG to shut off the base circuit (Servo-OFF) and coast the servo motor.
Shield	SD	Plate	Connect the external conductor of the shield cable.

(3) CN1B

Signals	Symbols	Connector Pin No.	Functions / Applications																																				
I/F internal power supply	VDD	3	Driver's power terminal for digital interface. Outputs 24V±10% between 24V commons SG. Connect to Vin when not using an external power supply. Do not allow the sum of current for the command unit and input/output relay drive to exceed 80mA.																																				
Digital I/F power supply input	COM	13	Used to output 24VDC for input interface. Digital interface power supply input terminal. Connect the positive terminal of the 24VDC(200mA or more) external power supply.																																				
power supply	P15R	11	Used to output 15VDC.																																				
Digital I/F common	SG	10,20	Common terminal for VDD and COM. Pins are connected internally. (24VDC common). Separated from LG.																																				
Control common	LG	1	Common terminal for 15VDC, 5VDC.																																				
Forward run stroke end	LSP	16	Forward run stroke end input terminal. The forward run stroke end signal must be ON to run the servo motor (CW direction). Connecting LSP and SG makes the unit operable in a CW direction, but inoperable in a CCW direction.																																				
Reverse run stroke end	LSN	17	Reverse run stroke end input terminal. The reverse run stroke end signal must be ON to run the servo motor (CCW direction). Connecting LSP and SG makes the unit operable in a CCW direction, but inoperable in a CW direction.																																				
Program input-1	PI1	8	Program input device terminal - 1. During to running program, signal to commanded SYNC(1).																																				
Program input-2	PI2	9	Program input device terminal - 2. During to running program, signal to commanded SYNC(2).																																				
Forward start	ST1	7	Forward start signal input terminal. In the program operation mode, connection between ST1-SG to start the commanded program number. In the JOG operation mode, connected ST1-SG to runs the motor in the forward JOG operation.																																				
Program No. selection	PS0 PS1	5 14	<p>Program number selection input terminal. DIO and DI1 relationship between signal status and operation are as follows.</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>PS2</th> <th>PS1</th> <th>PS0</th> <th>Selected program No.</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td><td>Program No.1</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>Program No.2</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>Program No.3</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>Program No.4</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>Program No.5</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>Program No.6</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>Program No.7</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>Program No.8</td></tr> </tbody> </table> <p style="margin-left: 20px;">PS2 is not in the factory default. It is necessary to allocate by parameter No.59-63.</p> <p style="margin-left: 20px;">0 : Open 1 : Short</p>	PS2	PS1	PS0	Selected program No.	0	0	0	Program No.1	0	0	1	Program No.2	0	1	0	Program No.3	0	1	1	Program No.4	1	0	0	Program No.5	1	0	1	Program No.6	1	1	0	Program No.7	1	1	1	Program No.8
PS2	PS1	PS0	Selected program No.																																				
0	0	0	Program No.1																																				
0	0	1	Program No.2																																				
0	1	0	Program No.3																																				
0	1	1	Program No.4																																				
1	0	0	Program No.5																																				
1	0	1	Program No.6																																				
1	1	0	Program No.7																																				
1	1	1	Program No.8																																				
Program Output 1	OUT1	4	Program output1 device. OUT1 is device signal when commanded OUTON(1)/OUTOF(1) in the program. It is possible turn on time by Parameter No.54.																																				
Movement complete	PED	6	Movement complete synchronous output device. After the command remaining distance and smoothing reach zero, this signal is output (PED-SG are connected) within the droop pulses set in Parameter No.12.																																				
Malfunction	ALM	18	Malfunction signal output terminal. ALM-SG are disconnected when power is turned off or the protective circuit is activated to shut off the base circuit.																																				
Ready	RD	19	Ready signal output terminal. RD-SG are connected after servo is turned on when there are no malfunction and the unit is operable.																																				
Reset	RES	15	Alarm reset signal input device. Short-circuiting RES-SG causes the malfunction to be rest.																																				
Shield	SD	Plate	Connect to one of the shield wire.																																				

(4) CN3

Signals	Symbols	Connector Pin No.	Functions / Applications
Monitor output	MO1	4	Monitor output signal terminal.
	MO2	14	Analog output of the parameter-set data.
RS-485I/F	SDP	9	RS-485 communication terminal. RS-485 and RS-232C can not use both together, select by parameter No.16.
	SDN	19	
	RDP	5	
	RDN	15	
RS-485 termination resistor	TRE	10	RS-485I/F termination resistor terminal. Connection between TRE and RDN.
RS-232C I/F	TXD	2	RS-232C communication terminal.
	RXD	12	RS-232C and RS-485 can not use both together, select by parameter No.16.
Monitor common	LG	3,13	Control common is used for monitor common.
Shield	SD	Plate	Connect to one of the shield wire.

(5) Function devices

The following devices can be set the external I/O with Windows based S/W(MRZJW3-SETUP51E)
And also available to be set with the communication individually.

Input Terminal Designation: Set by one of following parameters.

- Parameter No.59 for CN1A-8 and CN1A-19
- Parameter No.60 for CN1B-5 and CN1B-7
- Parameter No.61 for CN1B-8 and CN1B-9
- Parameter No.62 for CN1B-14 and CN1B-15
- Parameter No.63 for CN1B-16 and CN1B-17

Output Terminal Designation: Set by one of following parameters.

- Parameter No.66 for CN1A-18 and CN1A-19
- Parameter No.67 for CN1B-6 and CN1B-4
- Parameter No.68 for CN1B-18 and CN1B-19

Terminal CN1A-19 can be set as either Input or Output by Parameter No.58.

Note) The device can be changed without considering setting the parameter No. with set-up S/W.

Input devices

Signals	Symbols	Descriptions																																
None function	—	Nothing function																																
Emergency stop	EMG	Emergency stop input device. Disconnection EMG-SG puts the unit in emergency stop state ; power to the base is cut OFF and the dynamic brake is activated. Short circuiting EMG-SG in the emergency stop state causes the unit to automatically exit the emergency stop state.																																
Servo ON	SON	Preparation for operation signal input device. Short-circuiting SON-SG places the unit in an operable state. Disconnecting these terminals causes power to the base to be cut OFF and the servo motor to enter a free running condition.																																
Reset	RES	Alarm reset signal input device. Short-circuiting RES-SG causes the malfunction to be rest. While the alarm is being reset, power to the base is cut OFF. The following alarm can not be rest. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Display</th> <th>Safety feature name</th> <th>Display</th> <th>Safety feature name</th> </tr> </thead> <tbody> <tr> <td>A. 11</td> <td>Board error 1</td> <td>A. 20</td> <td>Encoder error 2</td> </tr> <tr> <td>A. 12</td> <td>Memory error 1</td> <td>A. 25</td> <td>ABS data loss</td> </tr> <tr> <td>A. 13</td> <td>Clock error</td> <td>A. 30</td> <td>Regeneration error</td> </tr> <tr> <td>A. 15</td> <td>Memory error 1</td> <td>A. 37</td> <td>Parameter error</td> </tr> <tr> <td>A. 16</td> <td>Encoder error 1</td> <td>A. 50</td> <td>Overload 1</td> </tr> <tr> <td>A. 17</td> <td>Board error 2</td> <td>A. 51</td> <td>Overload 2</td> </tr> <tr> <td>A. 18</td> <td>Board error 3</td> <td></td> <td></td> </tr> </tbody> </table> Malfunctions related to Regeneration error and Overloading can not be reset with the alarm rest signal immediately after their occurrence.	Display	Safety feature name	Display	Safety feature name	A. 11	Board error 1	A. 20	Encoder error 2	A. 12	Memory error 1	A. 25	ABS data loss	A. 13	Clock error	A. 30	Regeneration error	A. 15	Memory error 1	A. 37	Parameter error	A. 16	Encoder error 1	A. 50	Overload 1	A. 17	Board error 2	A. 51	Overload 2	A. 18	Board error 3		
Display	Safety feature name	Display	Safety feature name																															
A. 11	Board error 1	A. 20	Encoder error 2																															
A. 12	Memory error 1	A. 25	ABS data loss																															
A. 13	Clock error	A. 30	Regeneration error																															
A. 15	Memory error 1	A. 37	Parameter error																															
A. 16	Encoder error 1	A. 50	Overload 1																															
A. 17	Board error 2	A. 51	Overload 2																															
A. 18	Board error 3																																	
Forward stroke end	LSP	Forward stroke end input device. Connecting LSP and SG makes the unit operable in a CW direction, but inoperable in a CCW direction. To operate in a CCW direction, connect between LSP and SG with a limit switch.																																
Reverse stroke end	LSN	Reverse stroke end input device. Connecting LSN and SG makes the unit operable in a CCW direction, but inoperable in a CW direction. To operate in a CW direction, connect between LSP and SG with a limit switch.																																
Program input	PI1 PI2 PI3	Program input device terminal. During to running program, PI1 is device signal when commanded SYNC(1). During to running program, PI2 is device signal when commanded SYNC(2). During to running program, PI3 is device signal when commanded SYNC(3).																																

Signals	Symbols	Descriptions																																				
Forward start	ST1	Forward start signal input terminal. In the program operation mode, connection between ST1-SG to start the commanded program number. In the JOG operation mode, connected ST1-SG to runs the motor in the forward JOG operation. (the forward means increasing address direction)																																				
Reverse start	ST2	Reverse JOG start signal input device. In the JOG operation mode, connected ST2-SG to runs the motor in the reverse JOG operation. (the reverse means decreasing address direction)																																				
Automatic / manual selection	MD0	Automatic and manual selection signal input device. Connection MD1-SG to the programming operation mode, disconnection MD1-SG to the JOG operation mode. After changed the mode to the programming operation from the JOG operation, re-command program number operation is necessary.																																				
Proximity DOG	DOG	Proximity DOG switch input device: Short-circuited between DOG-SG, the DOG signal will be ON.																																				
Program No. selection	PS0 PS1 PS2	Program number selection signal input device. During the program operation mode, it is selected when ST1 signal up-edge. PS0,PS1 and PS2 relationship between the select signal and program number are as follows. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>PI2</th> <th>PI1</th> <th>PI0</th> <th>Selected program No.</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>Program No.1</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>Program No.2</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>Program No.3</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>Program No.4</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>Program No.5</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>Program No.6</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>Program No.7</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>Program No.8</td> </tr> </tbody> </table> <p style="text-align: right;">0 : Open 1 : Short</p>	PI2	PI1	PI0	Selected program No.	0	0	0	Program No.1	0	0	1	Program No.2	0	1	0	Program No.3	0	1	1	Program No.4	1	0	0	Program No.5	1	0	1	Program No.6	1	1	0	Program No.7	1	1	1	Program No.8
PI2	PI1	PI0	Selected program No.																																			
0	0	0	Program No.1																																			
0	0	1	Program No.2																																			
0	1	0	Program No.3																																			
0	1	1	Program No.4																																			
1	0	0	Program No.5																																			
1	0	1	Program No.6																																			
1	1	0	Program No.7																																			
1	1	1	Program No.8																																			
Override selection	OVR	Override selection input device. Short-circuit between OVR-SG to operable the external analog override. 0V input 100%, 10V input 200%, -10v input 0%																																				
External torque limit selection	TL0	External torque limit input device. Connection TL0-SG limit the torque to the external analog torque limit level.																																				
Internal torque limit selection	TL1	Internal torque limit input device. Disconnection TL1-SG limit the torque to the parameter No.28(TL1) level, connection TL1-SG limit the torque to the parameter No.29 (TL2) level.																																				
Proportional control	PC	Proportional control input device. Connection PC-SG to the speed amplifier from the proportional integral type to the Proportional type.																																				
Temporary stop/restart	STP	Temporary stop and restart input device. Push-button on the signal across STP-SG to the stop operation, during program operation, and re-push the button to restart operation where it had stopped. During the temporary stopping, short circuited SYNC(1)(2) signals which is ignored. During the temporary stopping, and mode changed from program operation to manual operation that would be cleared movement left distances automatically. During Zero point return operating, temporary stop/restart signals would be ignored.																																				
Manual pulse generator magnification selection	TP0 TP1	Manual pulse generator magnification selection input device. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>TP1</th> <th>TP0</th> <th>Manual pulse generator magnification</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>Parameter setting (Pr-01)</td> </tr> <tr> <td>0</td> <td>1</td> <td>1 - time pulses</td> </tr> <tr> <td>1</td> <td>0</td> <td>10 - time pulses</td> </tr> <tr> <td>1</td> <td>1</td> <td>100 - time pulses</td> </tr> </tbody> </table> <p style="text-align: right;">0 : Open 1 : Short</p>	TP1	TP0	Manual pulse generator magnification	0	0	Parameter setting (Pr-01)	0	1	1 - time pulses	1	0	10 - time pulses	1	1	100 - time pulses																					
TP1	TP0	Manual pulse generator magnification																																				
0	0	Parameter setting (Pr-01)																																				
0	1	1 - time pulses																																				
1	0	10 - time pulses																																				
1	1	100 - time pulses																																				

Output devices

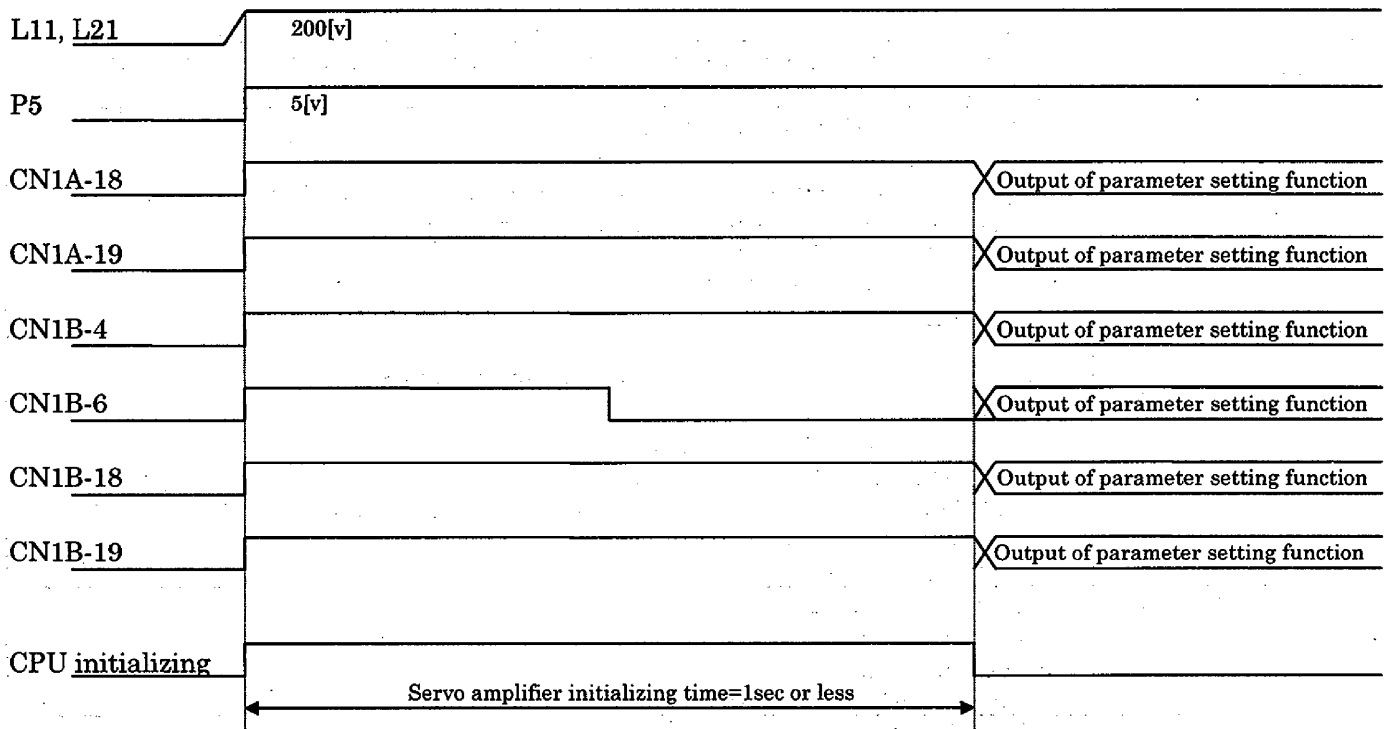
Signals	Symbols	Descriptions
None function	—	Nothing function
Ready	RD	Ready signal output device. RD-SG are connected after servo is turned on when there are no malfunction and the unit is operable.
Malfunction output	ALM	Malfunction signal output device. ALM-SG are disconnected when power is turned OFF or the protective circuit is activated to shut off the base circuit. If everything is normal when the power is turned ON, the connection is made.
Movement complete	PED	After the command remaining distance and smoothing reach zero, this signal is output within the droop pulses set in parameter No.12.
Zero point return complete	ZP	Zero point return complete output device. ZP-SG are connected upon completion of Zero point return. In an absolute position detection system, ZP-SG are connected when the controller is ready to operate. ZP-SG are disconnected when : <ol style="list-style-type: none"> 1) SON is OFF 2) Disconnected EMG-SG 3) RES is ON 4) Alarm has occurred 5) Forward / reverse run limit switch is OFF (LSP/LSN) 6) Never Zero point return operation 7) When never Zero point return operation after occurred A. 25 or A. E3. 8) When never Zero point return operation after changed electronics gear parameter. 9) When never Zero point return operation after changed ABS valid form invalid. 10) When changed ST1 status. 11) During the communication time out.
Position range output	POT	Position range output device. POT-SG are connected when the number of actual position address is in the preset position range. (During the base off and when not complete Zero point return, not output.)
Warning output	WNG	Warning output device. When occurred warning status, the connection between WNG-SG is made.
Battery warning output	BWNG	Battery warning output device. When occurred A. 92 or A. 9F, the connection between BWNG-SG is made.
Torque limit in effect	TLC	Torque limit in effect output device. When the set torque limit is reached, the connection between TLC-SG is made. Not output when the base is turned OFF.
Temporary stopping output	PUS	Temporary stopping output device. When stopping with temporary stop signal, the connection between PUS-GS is made. Output from deceleration start of the temporary stop.
Program output	OUT1 OUT2 OUT3	Program output device. OUT1 is device signal when commanded OUTON(1)/OUTOF(1) in the program. OUT2 is device signal when commanded OUTON(2)/OUTOF(2) in the program. OUT3 is device signal when commanded OUTON(3)/OUTOF(3) in the program.
SYNC synchronous output	SOUT	SYNC synchronous output device. Connecting between SOUT-SG, when waiting for SYNC () command.
Electromagnetic brake interlock	MBR	Electromagnetic brake interlock output device. In the servo-OFF or alarm status, MBR-SG are disconnected.
Dynamic brake interlock	DBR	Dynamic brake interlock output device.

(5) Notes of output signal

If the machine is directly driven by the D-O output device of MR-J2-S100, you need the following attention.

MR-J2-S100 can have 6 output device (CN1A-18, CN1B-14,-6,-18,-19,and reversible device CN1A-19).

As for CN1B-6, during amplifier initializing period, it differ from condition of other output device.



5. Program language specifications

(1) Program language specifications

- The language used in the program operation-edit window will be described below.
- Simple language for program operation (60 steps programming with Setup S/W)
- 8 program numbers within total 60 steps can be selected by external "PS" switches or communication.

Command	Name	Setting (*: Set value)	Setting Range	Unit	Description
SPN	Speed (Motor speed)	SPN(**)	0 ~ Max Speed	r/min	Used to set the command speed given to the motor for positioning. The set value should be not more than the maximum speed of the motor.
STC	Acceleration/ Deceleration time	STC(**)	0~20000	msec	Used to set both the acceleration and deceleration time. (Time required to reach the rated speed of the corresponding servo motor) STA and STB commands can set the acceleration and deceleration time Individually. It can not be changed during command outputting.
STA	Acceleration time	STA(**)	0~20000	msec	Used to set the acceleration time required to reach the rated speed from zero speed. It can not be changed during command outputting.
STB	Deceleration time	STB(**)	0~20000	msec	Used to set the deceleration time required to reach the rated speed from zero speed. It can not be changed during command outputting.
MOV	Move command	MOV(**)	-999999 ~ 999999	$\times 10^{5\text{mm}}$ μm	Movement by set values. Positioning operation is performed with the set Values of the feed rate (SPN) and acceleration /deceleration time (STC) (STA) (STB). No symbol : CCW rotation. -CW rotation. Incremental system or absolute system can select by parameter.
MOVA	Continuous move command	MOVA(**)	-999999 ~ 999999	$\times 10^{5\text{mm}}$ μm	Continuous movement by set values. Incremental system or absolute System can select by parameter. Programming point is after MOV command , otherwise error has occurred. Incremental system or absolute system can select by parameter. MOVA command must be at after MOV command, otherwise error has occurred.
SYNC	Waiting external signal to switch on	SYNC(**)	—	—	Used to hold the next operation until the preset digital input signal (DI) of the servo amplifier switches on. After SOUT output and On-edge signal is valid.
OUTON	External signal ON output	OUTON (**)	—	—	External output device signal turns ON (short).
OUTOF	External signal OFF output	OUTOF (**)	—	—	External output device signal turns OFF (open).
TRIP	Trip point	TRIP (**)	-999999~ 999999	$\times 10^{5\text{mm}}$ μm	When the trip point is reached, the next step will be executed.
COUNT	External Pulse counter	COUNT (**)	-999999~ 999999	pulse	The next step will be executed when external pulse input counter reach set counter value. COUNT(0) is clearing of the pulse counter.
TIM	Dwell command time	TIM(**)	0, 1~2000	$\times 10$ msec	Used to hold the next operation until the preset time elapses. After smoothing 0, started to count up.
ZRT	Zero point return	ZRT	—	—	Zero point return operation. Set to the Zero point return method at parameter No.8.
TIMES	Program repeat Command	TIMES(**)	0, 1~10000	Times	Describe TIMES (setting value) at the head of the program, and STOP at the end of the program. The program will repeat execution number of times. This is not required when the program is to be run only once. The program will be run infinitely when 0 is set. It is not possible to repeatedly run a set part of a program.
STOP	Program end	—	—	—	Program stops signal, and it must be at end of the program. (Required)

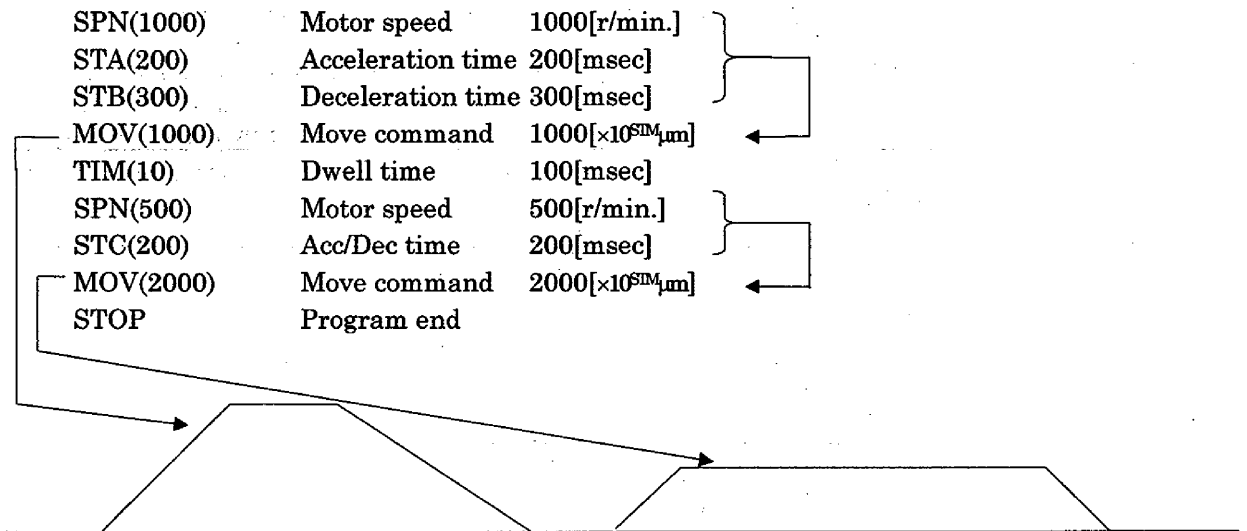
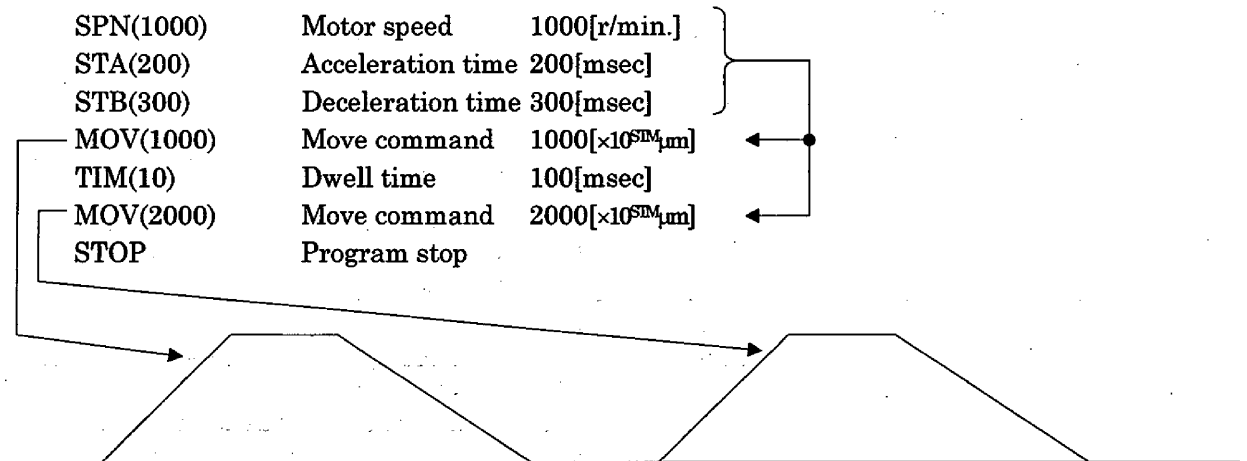
Note)

- 1) SYNC, OUTON, OUTOF, TRIP and COUNT commands are available to be validated during command outputting.
- 2) SPN, STA, STB and STC commands will be validated, when the MOV and MOVA command.
- 3) If you set the parameter by OUTON command. During setting time, this command does not execute following command.

(2) Details of programming languages

1) Positioning command conditions (SPN, STA, STB, STC)

SPN, STC, STA and STB commands will be validated, when the MOV and MOVA commands are executing. The setting numbers will be validated, expect resetting the numbers.

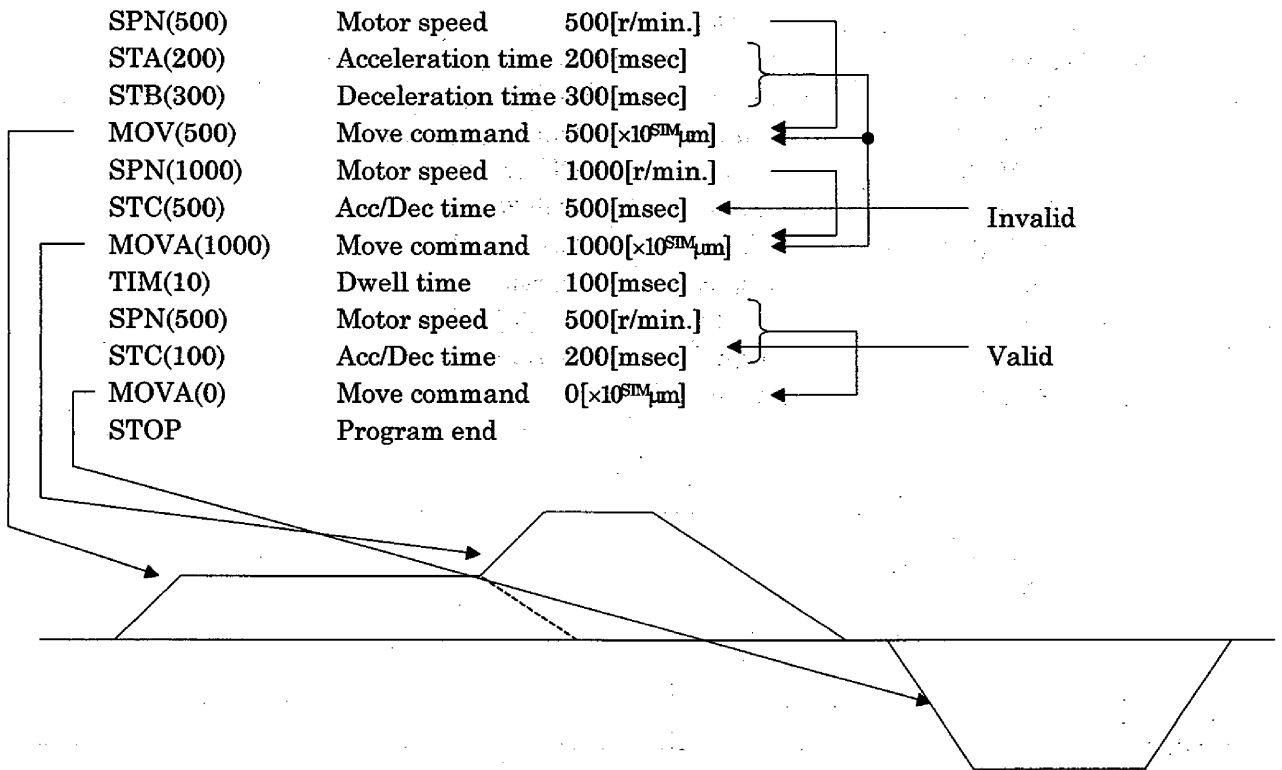
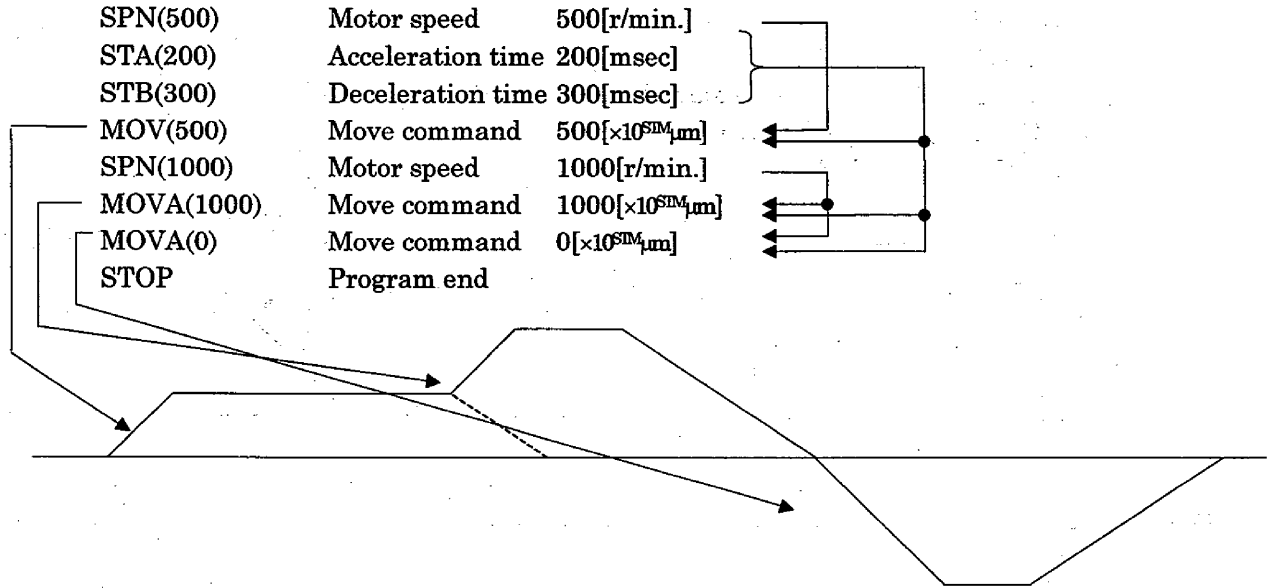


2) Move command (MOV, MOVA)

- MOVA command is continuous movement command of MOV / MOVA command.
- The change speed point of MOVA command is a deceleration begin point of the previous MOV / MOVA command when execution by along.
- The acceleration / deceleration time when continuous operation of MOVA command is execution value of previous MOV / MOVA command.

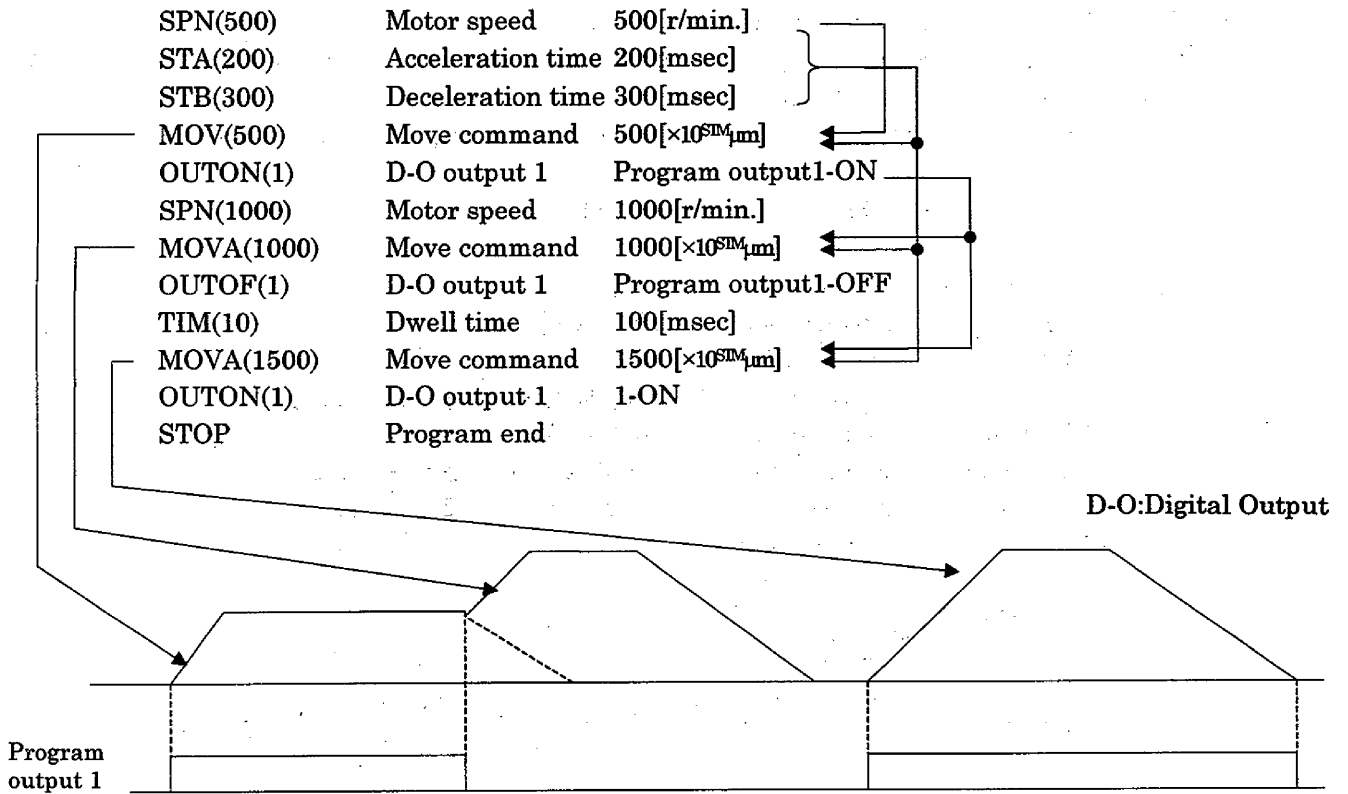
(if programming the MOVA command after the command output completed, setting number will be validated)

- MOVA command is available to programming to by along.



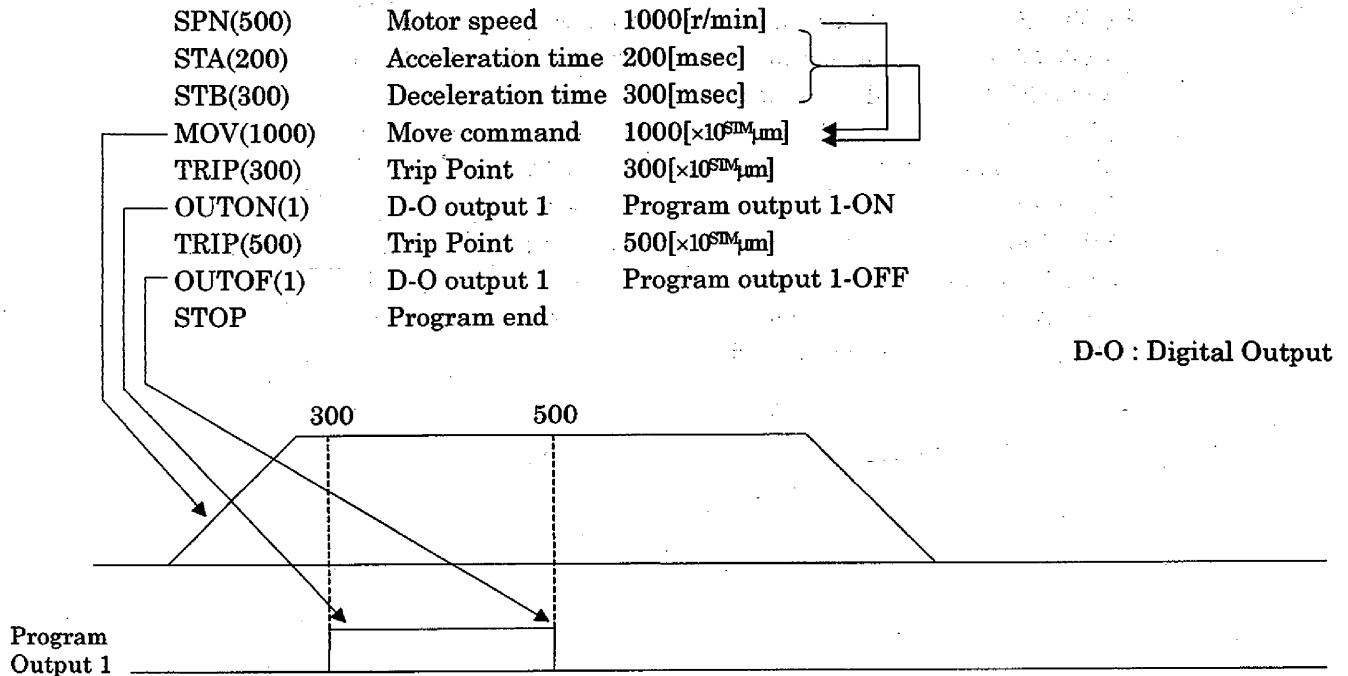
3) Input / Output command (SYNC, OUTON, OUTOF)

- SYNC, OUTON and OUTOF will not be checked the command output complete.



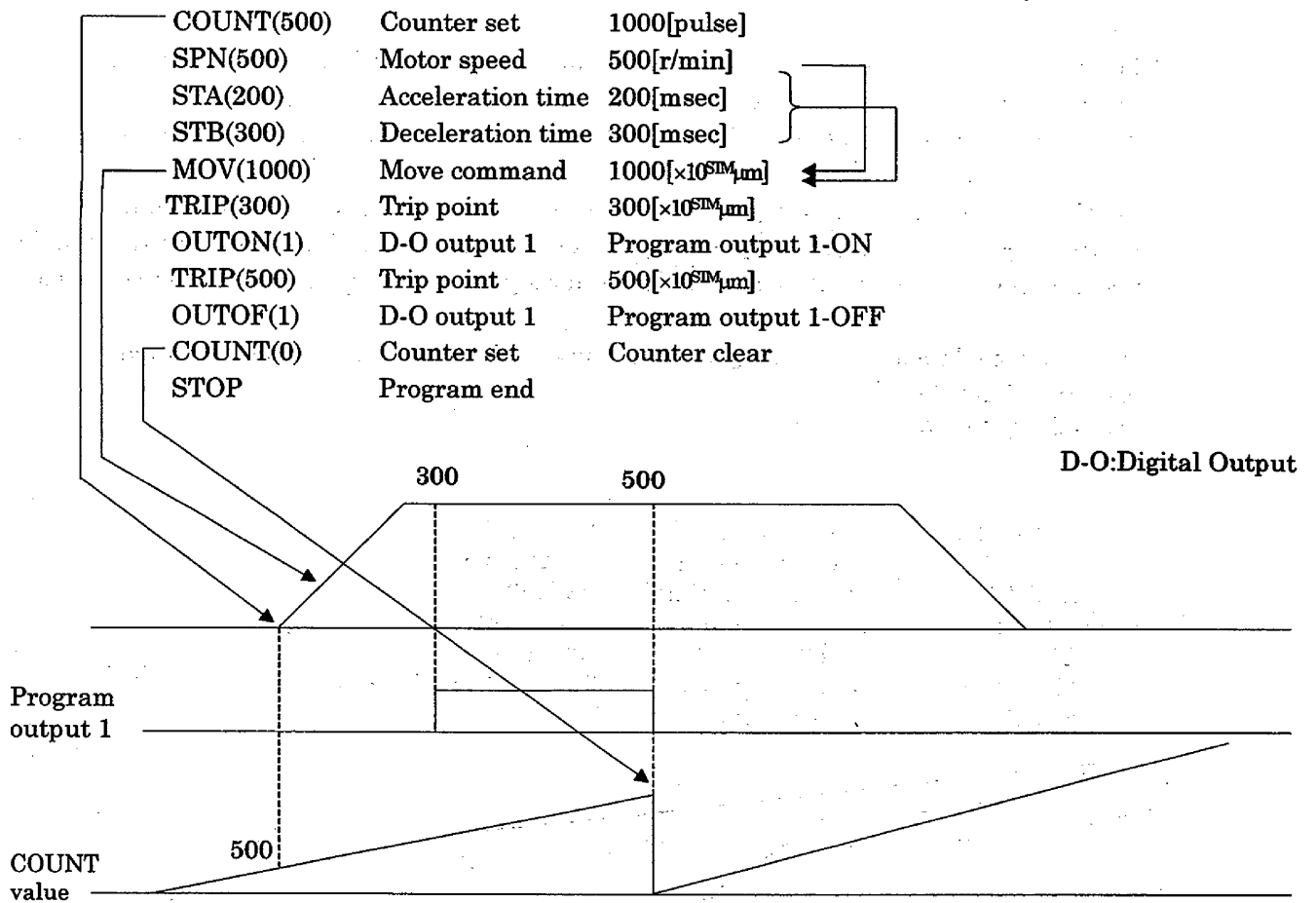
4) Trip Point instruction command (TRIP)

- TRIP command will not be checked the command output complete.



5) External Pulse Count command (COUNT)

- Even if the program is running, COUNT command is valid.



6) Zero point return command (ZRT)

- Set to parameter the Zero point return operation.
- Programming the MOVA command after the ZRT command which will be operated after Zero point return complete, however it would not be continuous operation.

7) Indirect addressing

- The settings of the SPN, STA, STB, STC, MOV, TIM and TIMES commands can each be addressed indirectly.
- The data set by indirect addressing are stored in the general-purpose register (R1, R2, D1, D2) region.
- The general-purpose register (R1, R2, D1, D2) data can be changed by the communication commands during no program execution.
- The general-purpose register (R1, R2, D1, D2) data are cleared when the servo amplifier is powered off.

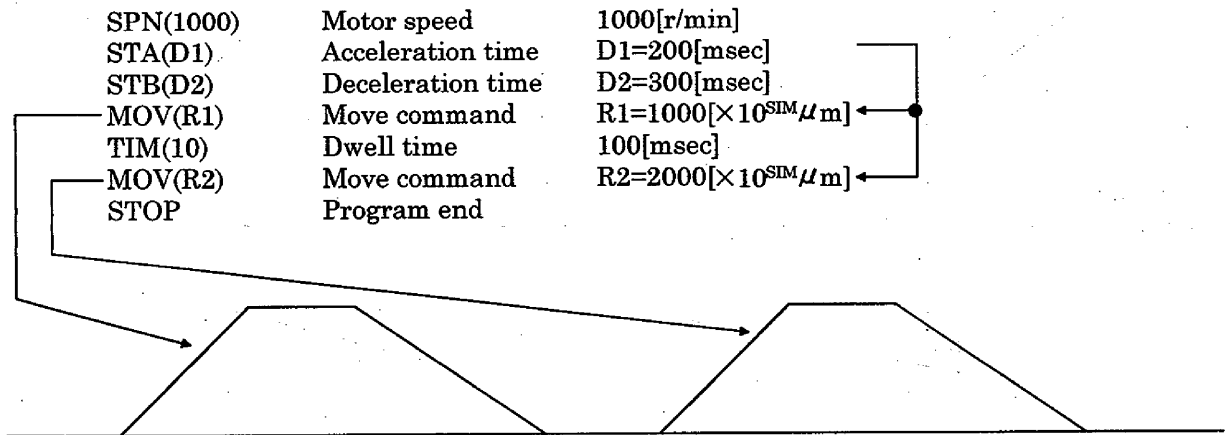
Note that the general-purpose register (R1, R2) data may also be saved on EEP-ROM.

- The setting ranges of the general-purpose register (R1, R2, D1, D2) data depend on those of the corresponding commands with which the general-purpose registers (R1, R2, D1, D2) are used.

If the following data are set to the general-purpose registers before program execution:

R1=1000, R2=2000

D1=200, D2=300

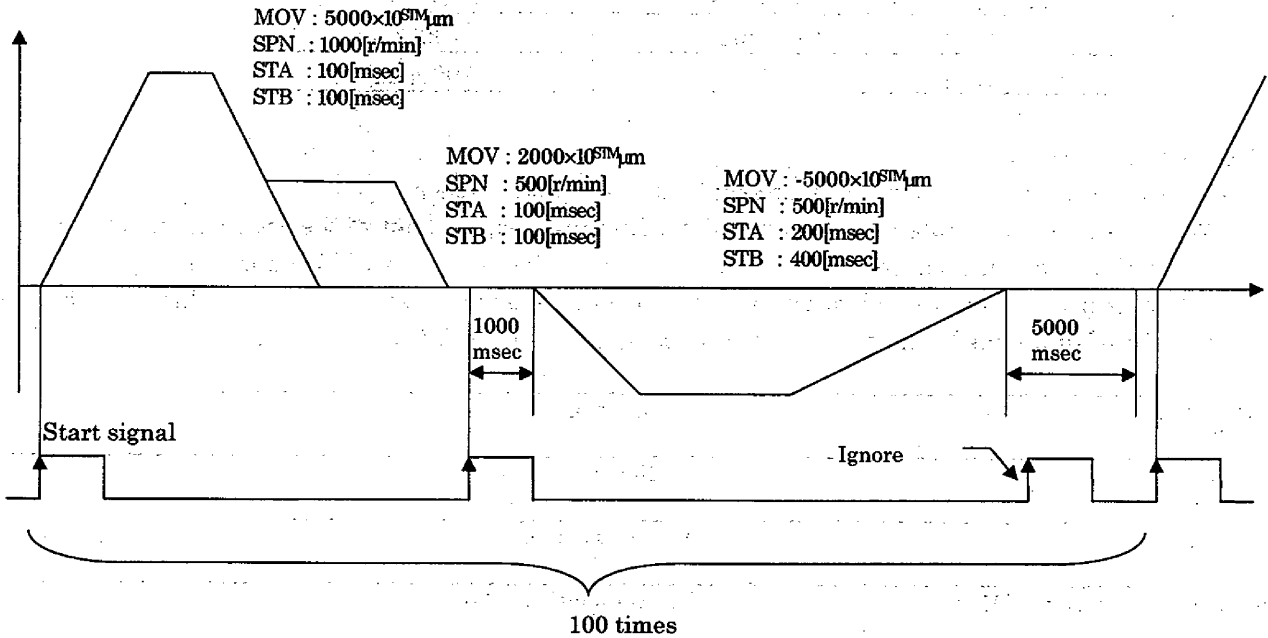


8) Program control (TIMES, STOP)

- TIMES command must be at head of the program and STOP command must be at end of the program. if these commands be at other lines, it will be occurred error.

[Programming example]

TIMES(100)	100[time]	Program repeat numbers
SYNC(1)		Waiting external signal to switch on
STC(100)	100[msec]	Acceleration / Deceleration time
SPN(1000)	1000[r/min.]	Motor speed
MOV(5000)	5000[$\times 10^{SM}\mu m$]	Move command
SPN(500)	500[r/min.]	Motor speed
MOVA(2000)	2000[$\times 10^{SM}\mu m$]	Continuous move command
SYNC(1)		Waiting external signal to switch on
TIM(100)	1000[msec]	Dwell time
SPN(500)	500[r/min.]	Motor speed
STA(200)	200[msec]	Acceleration time
STB(500)	500[msec]	Deceleration time
MOV(-7000)	-7000[$\times 10^{SM}\mu m$]	Move command
TIM(500)	5000[msec]	Dwell time
STOP		Program end



6. Automatic program-operation

(1) Positioning operation with digital input.

1) Parameter setting

- Select the positioning system of absolute or incremental in parameter No.00(STY).

Setting	Positioning system
<input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/>	Absolute
<input type="checkbox"/> <input type="checkbox"/> 1 <input type="checkbox"/>	Incremental

- Set the direction of the motor rotation with address increases in parameter No.01(FTY).

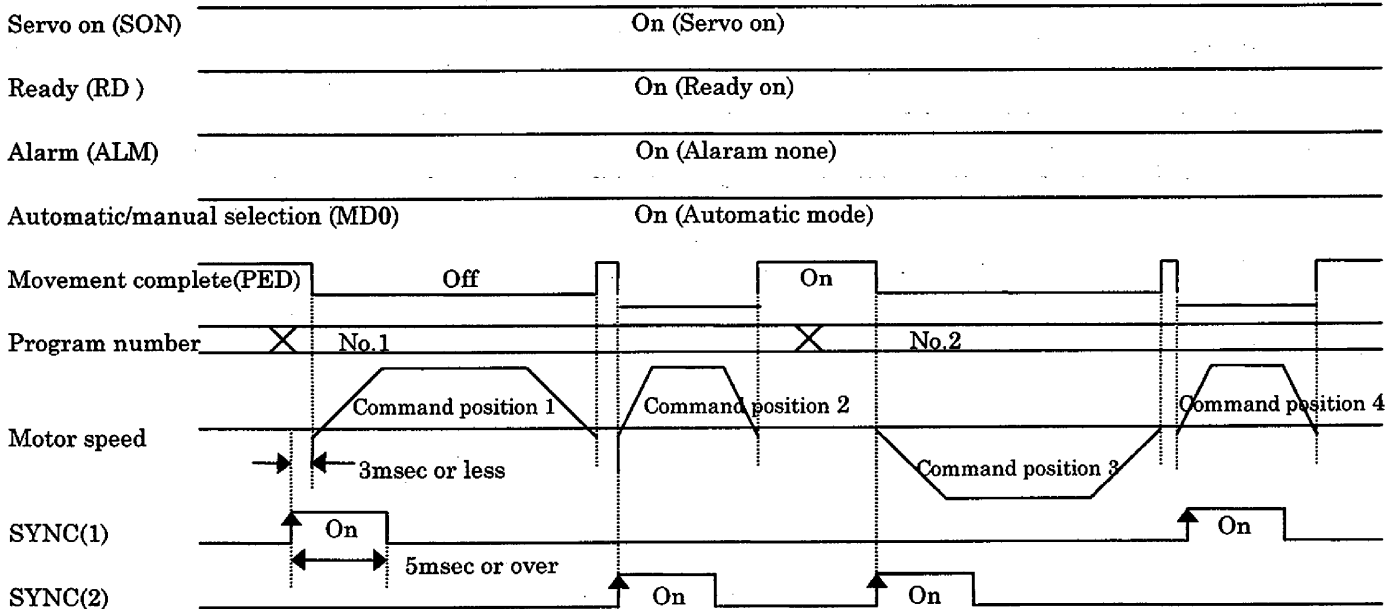
Setting	Rotary directions
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0	CCW direction with address increases
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1	CW direction with address decreases

- Set the magnification of command unit in parameter No.01(FTY).

Setting	Command unit	Moving distance
<input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/>	1-time	1[μ m]
<input type="checkbox"/> <input type="checkbox"/> 1 <input type="checkbox"/>	10-times	10[μ m]
<input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/>	100-times	100[μ m]
<input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/>	1000-times	1000[μ m]

2) Positioning operation

- Select to the program number at external Digital Input switches.
- When using the absolute value command, positioning is carried out to the set position data for which the zero point has been set as the reference by the MOV or MOVA command.
- When using the incremental value command, positioning is carried out to the set data for which the current position has been set as the reference by the MOV or MOVA command.



Notice) Start device must turn on ,whenever program change.

(2) Positioning operation with serial communication

1) Parameter setting

- Select the positioning system of absolute or incremental in parameter No.00(STY).

Setting	Positioning system
<input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/>	Absolute
<input type="checkbox"/> <input type="checkbox"/> 1 <input type="checkbox"/>	Incremental

- Set the direction of the motor rotation with address increases in parameter No.01(FTY).

Setting	Rotary directions
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0	CCW direction with address increases
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1	CW direction with address decreases

- Set the magnification of command unit in parameter No.01(FTY).

Setting	Command unit	Moving distance
<input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/>	1-time	1[μ m]
<input type="checkbox"/> <input type="checkbox"/> 1 <input type="checkbox"/>	10-times	10[μ m]
<input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/>	100-times	100[μ m]
<input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/>	1000-times	1000[μ m]

2) Communication command

- Command to the program number with communication.

Communication D-I valid



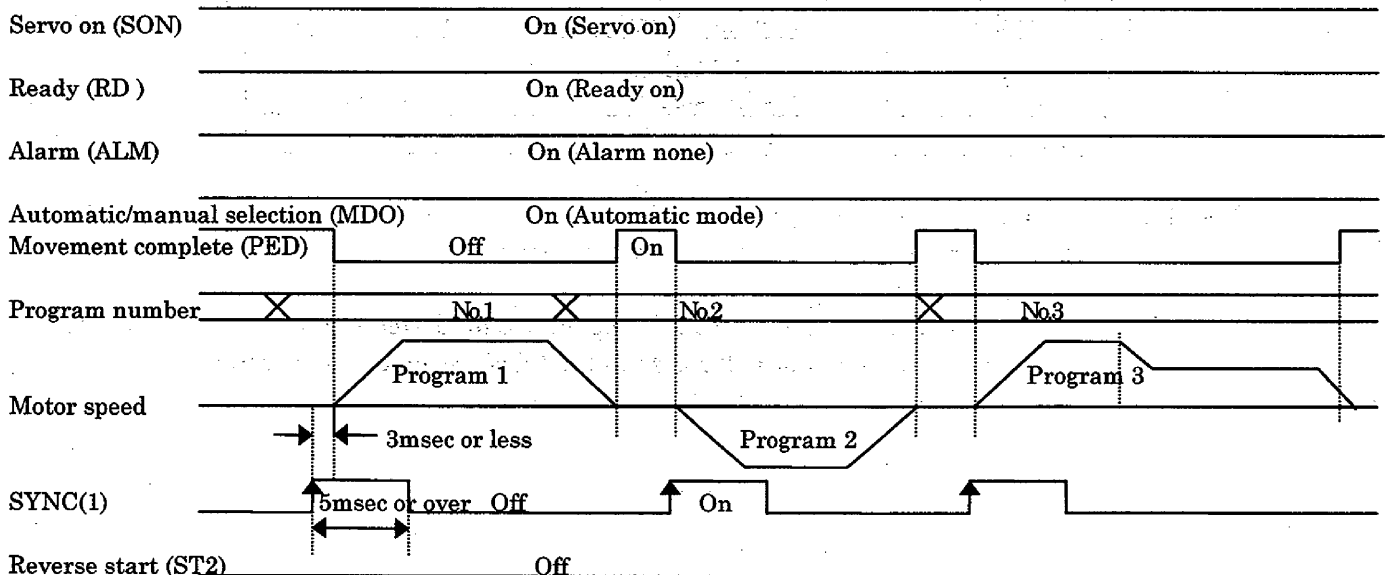
Command to the program number with communication D-I



Start signal input

3) Operation by RS-232C / 485 communication

- When using the absolute value command, positioning is carried out to the set position data for which the zero point has been set as the reference by the MOV or MOVA command.
- When using the incremental value command, positioning is carried out to the set data for which the current position has been set as the reference by the MOV or MOVA command.



7. Manual operations

1) JOG operation

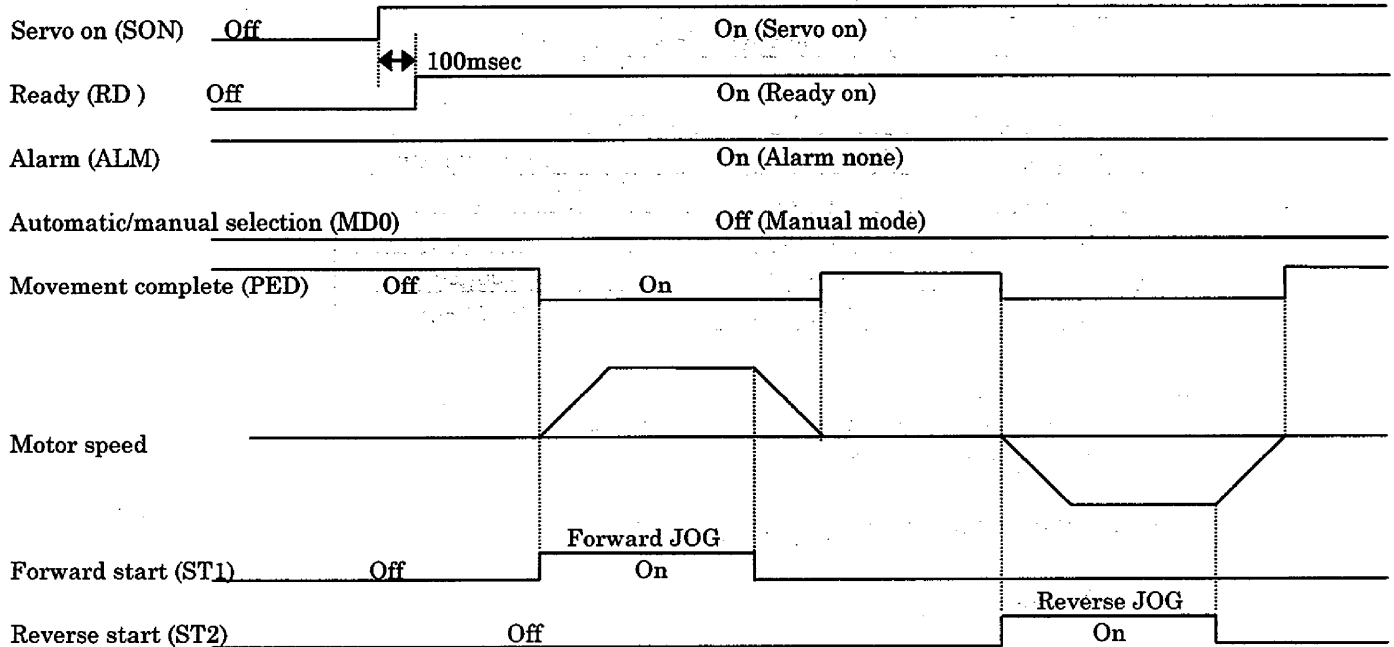
Procedure1 : Set to the JOG speed.

Acceleration and deceleration time is set at Parameter No.40.

S-pattern acceleration/deceleration time is set at parameter No.14(STC)

Procedure2 : External input device of start signal (ST1, ST2) turns on.

• Timing chart



2) The operation with manual pulse generator

Procedure1 : Set the input magnification in parameter No.01(FTY) as follows.

Setting	Command unit	Moving distance
<input type="checkbox"/> 0 <input type="checkbox"/> <input type="checkbox"/>	1-time pulses	1[μ m]
<input type="checkbox"/> 1 <input type="checkbox"/> <input type="checkbox"/>	10-times pulses	10[μ m]
<input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/>	100-times pulses	100[μ m]

Procedure2 : When the manual pulse generator is rotated, the servo motor will rotate.

The servo motor rotation direction can be changed by the "ST1 coordinate system" setting in parameter NO. 1.

When "0" is set and the manual pulse generator is rotated in the CW (forward run) direction, the servo motor will rotate in the CCW (reverse run) direction.

8. Zero point return operations

(1) Zero point return operation

1) Set to the Zero point return operation type selection.

- Zero point return operation type select in parameter No.08(ZTY)

Setting	Zero point return type selection
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0	DOG method
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1	Count method
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 2	Data set method
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 3	Stopper method
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 4	SON point method

- Zero point return direction select in parameter No.08(ZTY)

Setting	Zero point return direction
<input type="checkbox"/> <input type="checkbox"/> 0 <input type="checkbox"/>	Address increases direction
<input type="checkbox"/> <input type="checkbox"/> 1 <input type="checkbox"/>	Address decreases direction

- Proximity DOG input polarity select in parameter No.08(ZTY)

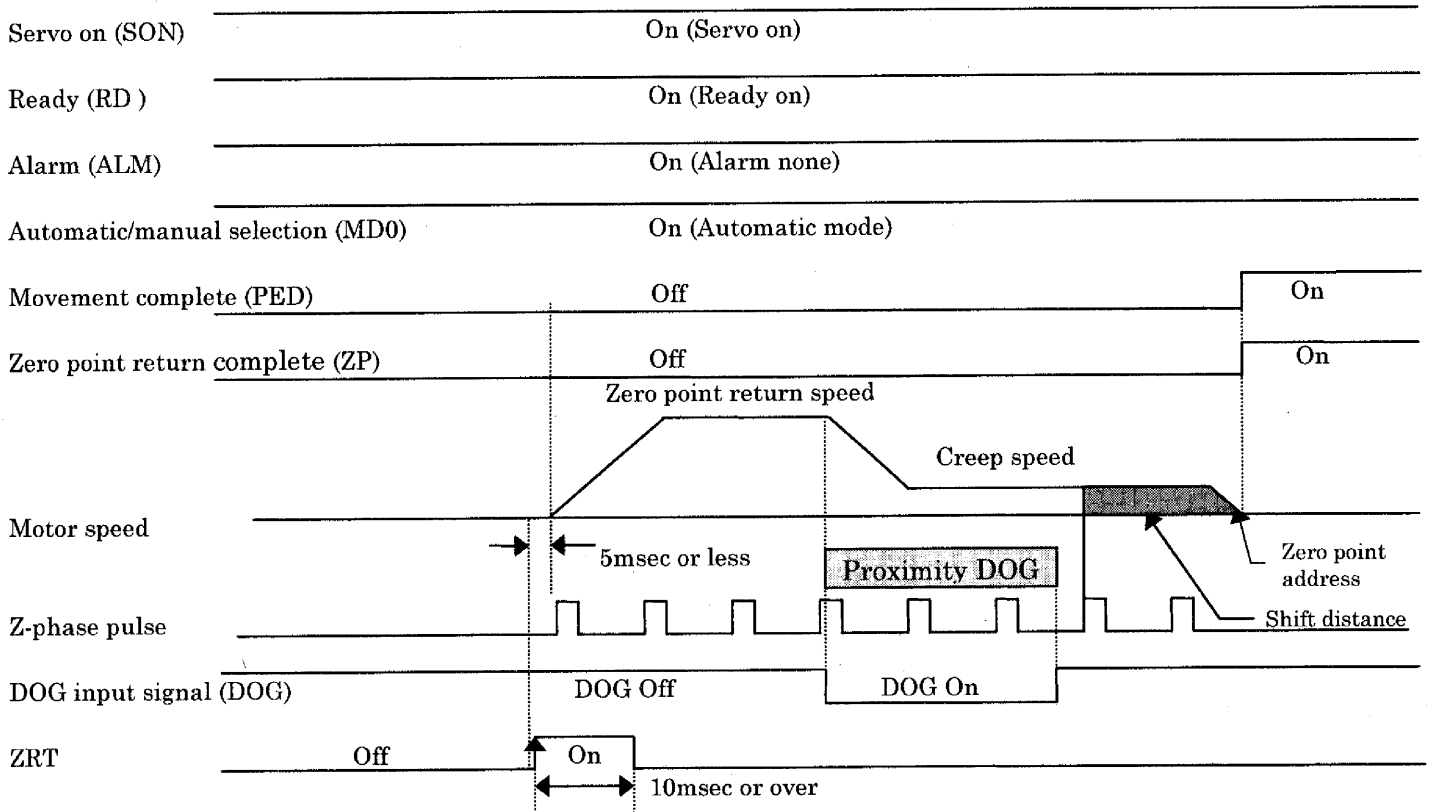
Setting	Proximity DOG input polarity
<input type="checkbox"/> 0 <input type="checkbox"/> <input type="checkbox"/>	DOG is ON at open
<input type="checkbox"/> 1 <input type="checkbox"/> <input type="checkbox"/>	DOG is ON at close

- Set the Zero point return speed in parameter No.09(ZRF)
(DOG method, Count method, Stopper method)
- Set the Zero point return creep speed in parameter No.10(CRF)
(DOG method, Count method)
- Set the Zero point return shift distance in parameter No.11(ZST)
(DOG method, Count method)
- Set the Zero point return position data in parameter No.42(ZPS)
(DOG method, Count method, Stopper method, Data set method, SON point method)
- Set the Moving distance after proximity DOG signal on in parameter No.43(DCT)
(Count method)
- Set the stopper method Zero point return operation stopper time in parameter No.44(ZTM)
(Stopper method)
- Set the Stopper method Zero point return operation torque limit value in parameter No.45(ZTT)
(Stopper method)

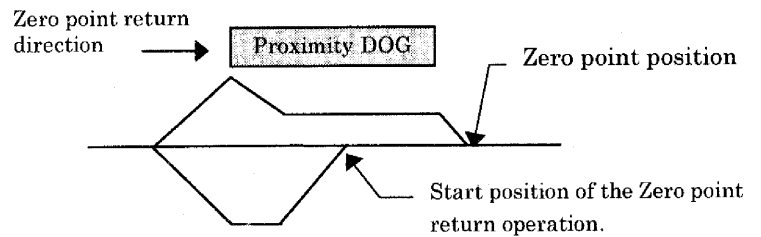
Set the Zero point return operation acceleration/deceleration time constant in parameter No.41(ZTS)
[the parameter 14 (STC) of S-pattern acceleration/deceleration times is invalidated]

(2) DOG method Zero point return operation

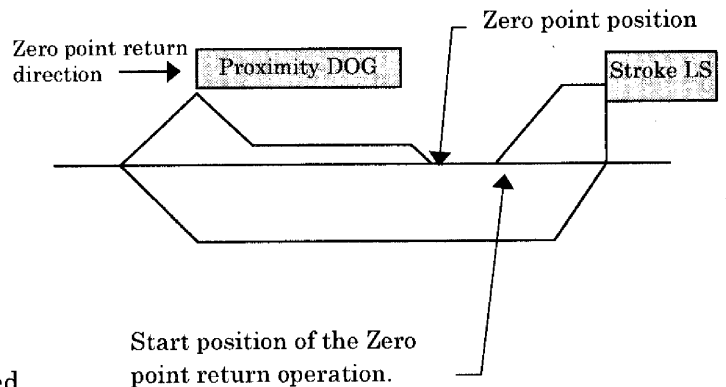
- The timing chart of the Zero point is the first Z-phase pulse after the DOG turns OFF.



Zero point return is possible even from above the dog. The axis will move in the reverse direction from the Zero point return direction, and then will return to and decelerate to a stop at the front end of the dog. After that, the normal Zero point return will be carried out automatically.



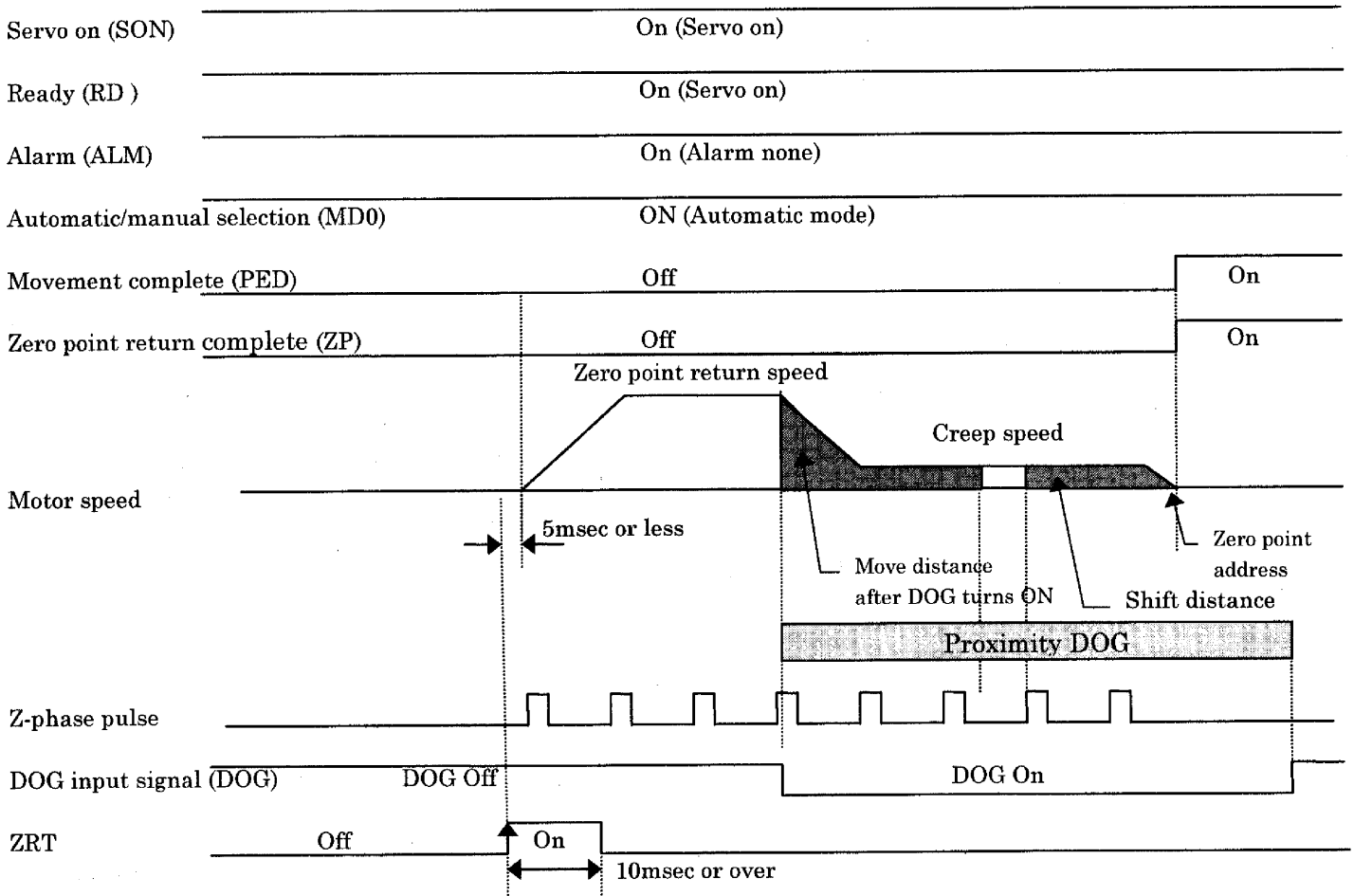
Zero point return is also possible from a position exceeding the dog. In this case, the axis will move once in the Zero point return direction. When the maximum limit switch functions, the rotation direction will reverse, and the axis will return to and decelerate to a stop at the front end of the dog. After that, the normal Zero point return will be carried out automatically.



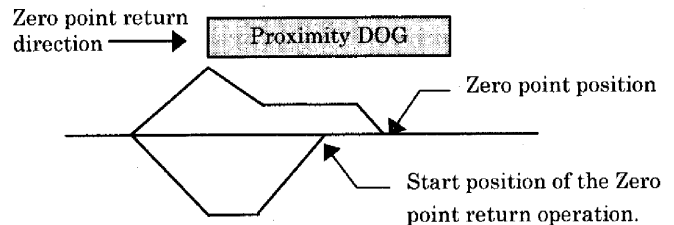
Note) When returning to the Zero point from a position that exceeds the dog, if the dog cannot be detected, the axis will stop at the maximum limit switch in the direction opposite the Zero point return direction. The soft limit is invalid during Zero point return.

(3) Count method Zero point return operation

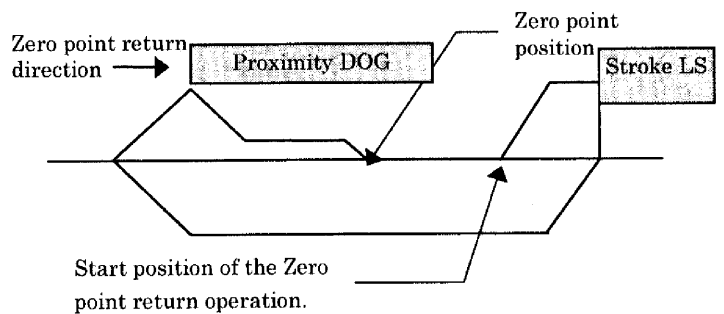
- The timing chart of the Zero point is the Encoder pulse count after DOG turns ON.



Zero point return is possible even from above the dog. The axis will move in the reverse direction from the Zero point return direction, and then will return to and decelerate to a stop at the front end of the dog. After that, the normal Zero point return will be carried out automatically.



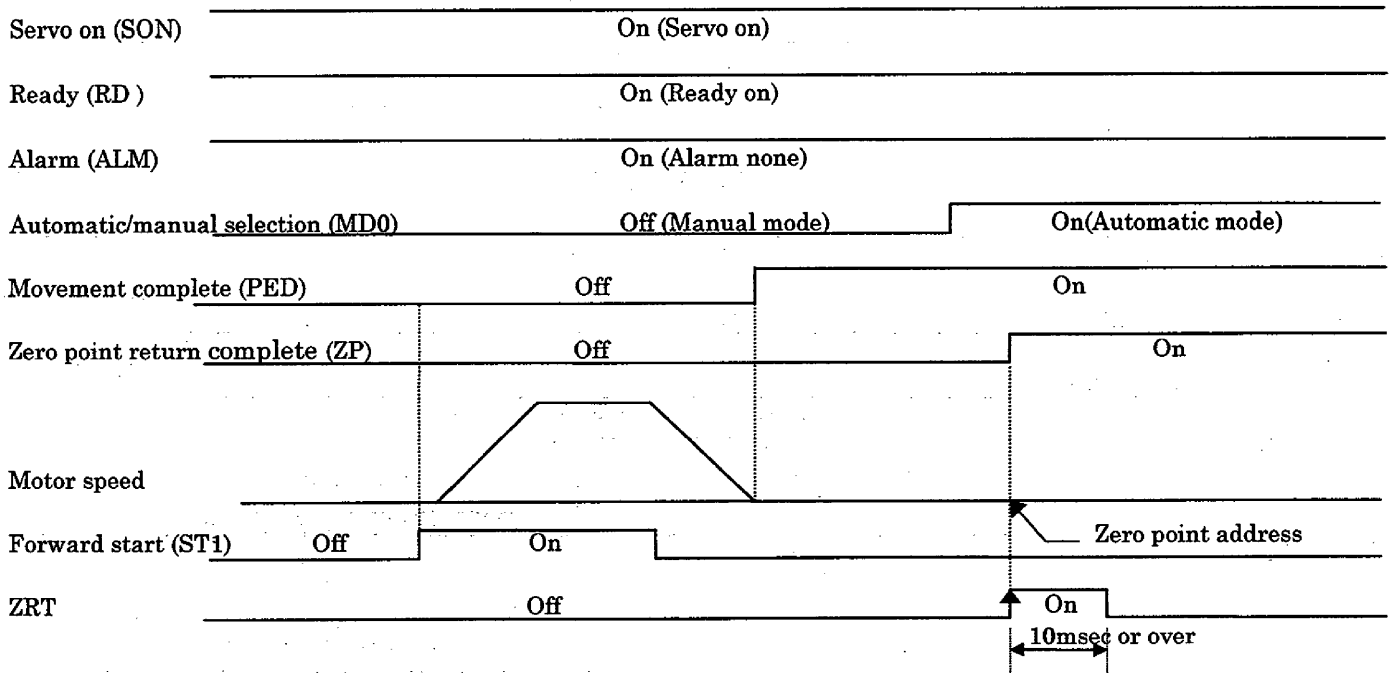
Zero point return is also possible from a position exceeding the dog. In this case, the axis will move once in the Zero point return direction. When the maximum limit switch functions, the rotation direction will reverse, and the axis will return to and decelerate to a stop at the front end of the dog. After that, the normal Zero point return will be carried out automatically.



Note) When returning to the Zero point from a position that exceeds the dog, if the dog cannot be detected, the axis will stop at the maximum limit switch in the direction opposite the Zero point return direction. The soft limit is invalid during Zero point return.

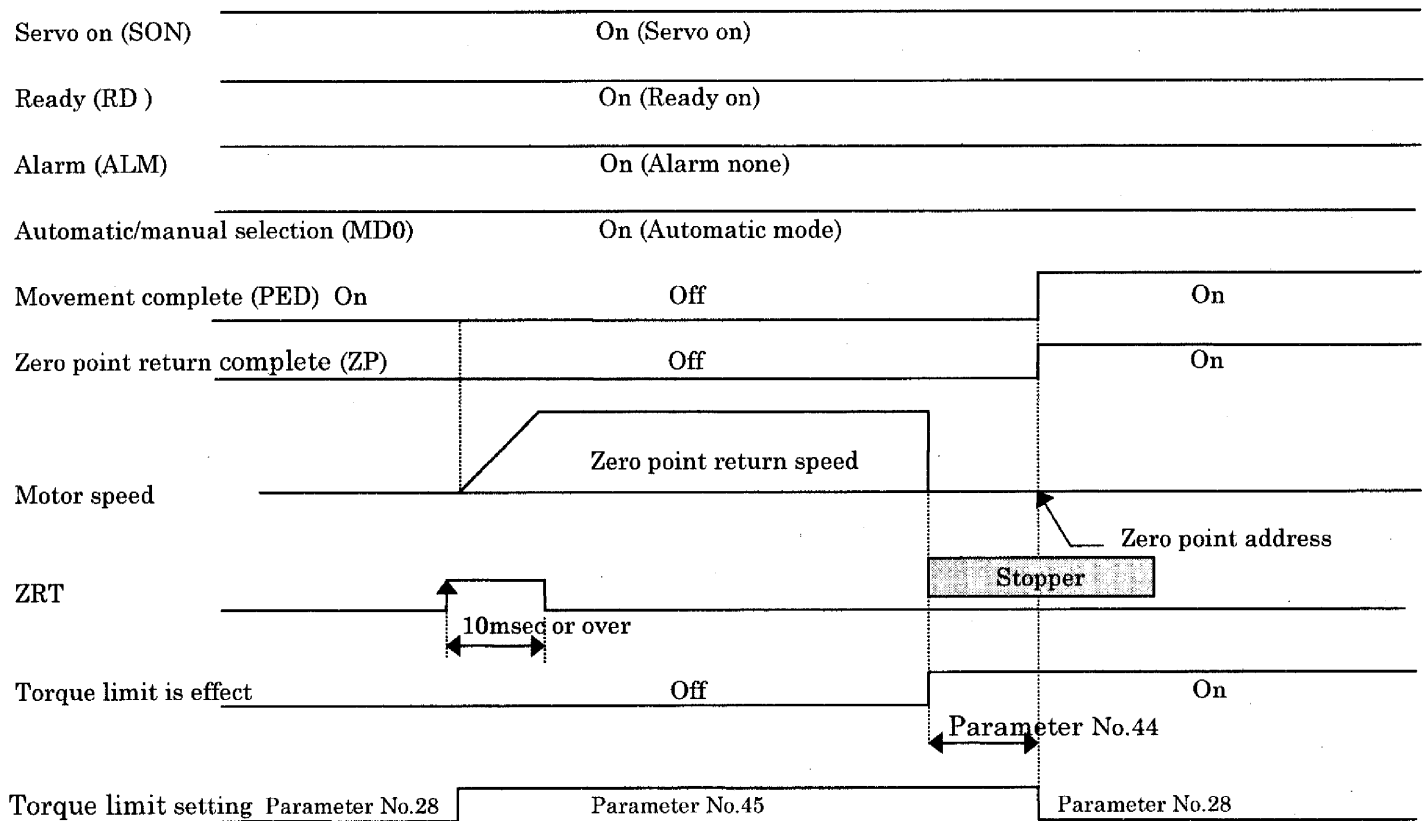
(4) Data set method Zero point return operation

- The timing chart of the Zero point is the data set. (not requires DOG switch)



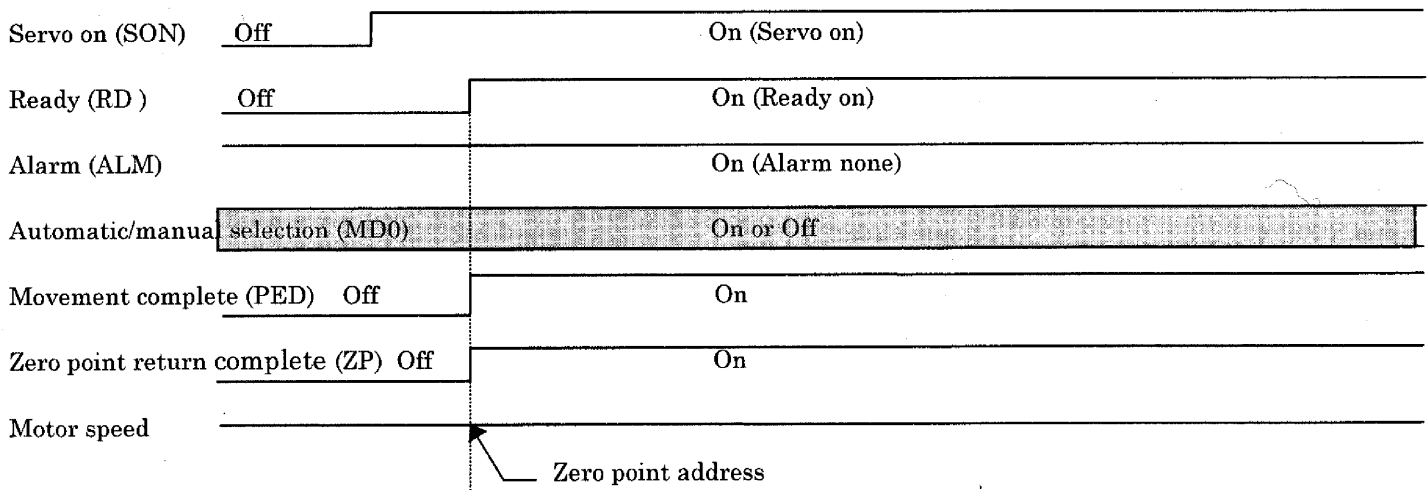
(5) Stopper method Zero point return

- The timing chart of the Zero point return position at stopper position of stroke.



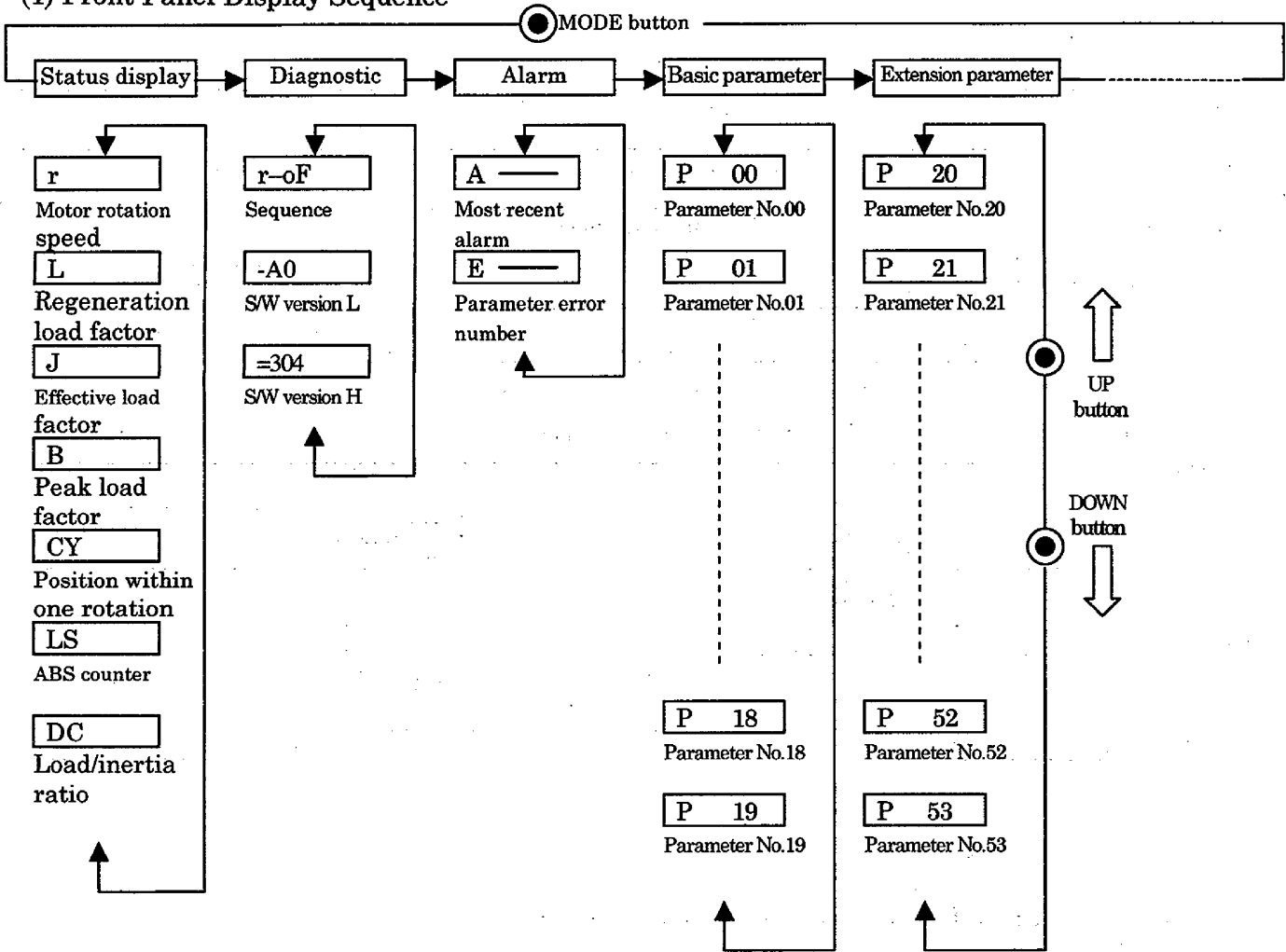
(6) SON point method

- The timing chart of the Zero point return position at SON point method.



9. Display

(1) Front Panel Display Sequence



-**MODE** button to select **Main Category**.
 -**UP/DOWN** button to select **Sub-Category**.
 -**SET** button to **View Display**.

(2) Status display



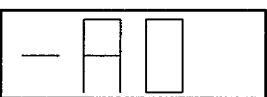
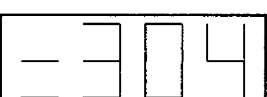
Name	Symbol	Display range	Unit	Description
Servo motor speed	r	-5400 ~ 5400	r/min	The servo motor speed is displayed. When the servo motor is rotating in reverse direction, the decimal points in the upper 3-digits are lit.
Regenerative load factor	L	0 ~ 100	%	The ratio of regenerative power to permissible regenerative power is displayed in % .
Effective load ratio	J	0 ~ 300	%	The continuous effective load torque is displayed. When rated torque is generated, this value is 100%. The effective value for the past 15 seconds is displayed.
Peak load ratio	b	0 ~ 300	%	The peak load torque is displayed. When rated torque is generated, this value is 100%. The peak torque for the past 15 seconds is displayed.
Position within one rotation	CY	0 ~ 9999	pulse	Position within one revolution is display in encoder pulses. When the value exceeds 9999, it begins with 0.
ABS counter	LS	-9999 ~ 9999	rev	Travel value from the Zero point in the absolute position detection system is displayed in terms of the absolute position detection's counter value.
Load/inertia ratio	dc	0.0 ~ 100.0	Times	The estimated ratio of the load inertia moment to the servo motor inertia moment is displayed.

The servo status during operation is shown on the 4-digit, 7-segment LED display. When the required data is selected , the corresponding symbol is displayed. Press the Set button to display that data.


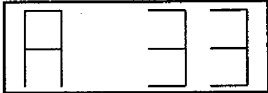
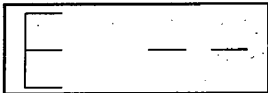

If a negative value is displayed for each status display, the 2, 3 or 4th digit decimal point will light.

Note that if the decimal point display is provided, the decimal point position will not light.

(3) Diagnostic

Name	Display	Description
Sequence		Not ready Indicates that the servo amplifier is being initialized or alarm has occurred.
		Ready Indicates that the servo was switched on after completion of initialization and servo amplifier is ready to operate.
S/W version Low		Indicates the version of the software.
S/W version High		Indicates the system number of the software.

(4) Alarm display

Name	Display	Description
Current alarm		Indicates no occurrence of an alarm.
		Indicates the occurrence of alarm 33 (over voltage) Flickers at occurrence of alarm.
Parameter error		Indicates the occurrence of alarm 37 (parameter error).
		Indicates that the data of parameter No.1 is faulty.

Functions at occurrence of an alarm.

- (1) Any mode screen displays the current alarm.
- (2) The other screen visible during occurrence of an alarm. At this time, the decimal point in the fourth digit flickers.
- (3) To clear any alarm, switch power off, then on or press the **SET** button on the current alarm screen. Note that this should be done after removing the cause of alarm.
- (4) Use parameter No.16 to clear the alarm history.

10. Parameters

(1) Parameter listing

	No	Symbol	Name	Initial value	Unit	Mark
Basic parameters	00	*STY	Control mode, Regenerative brake option selection	0000		
	01	*FTY	Feeding system selection	0000		
	02	*OP1	Function selection 1	0000		
	03	ATU	Auto tuning	0102		
	04	*CMX	Electronic gear (command pulse magnification numerator)	1		
	05	*CDV	Electronic gear (command pulse magnification denominator)	1		
	06	PDE	Movement complete output range	100	pulse	
	07	PG1	Position control gain 1	36	rad/s	
	08	*ZTY	Zero point return type	0010		
	09	ZRF	Zero point return speed	500	r/min	
	10	CRF	Zero point return creep speed	10	r/min.	
	11	ZST	Zero point return shift distance	0	μm	
	12		Spare	0		
	13	JOG	JOG speed	100	r/min.	
	14	*STC	S-pattern acceleration/deceleration time constant	0	msec	
	15	*SNO	RS-485 channel number setting	0	ch.	
	16	*BPS	Communication baud-rate selection	0100		
	17	MOD	Analog monitor output selection	0100		
	18	*DMD	Status display selection, Alarm history clear	0000		
19	*BLK	Parameter entry prohibition	0000			

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

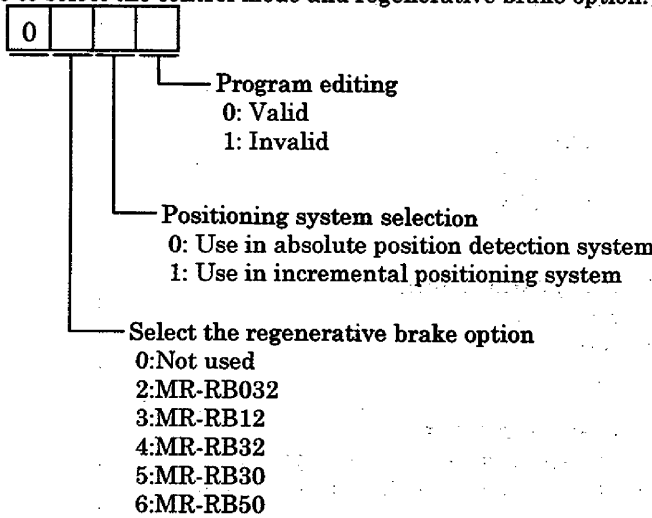
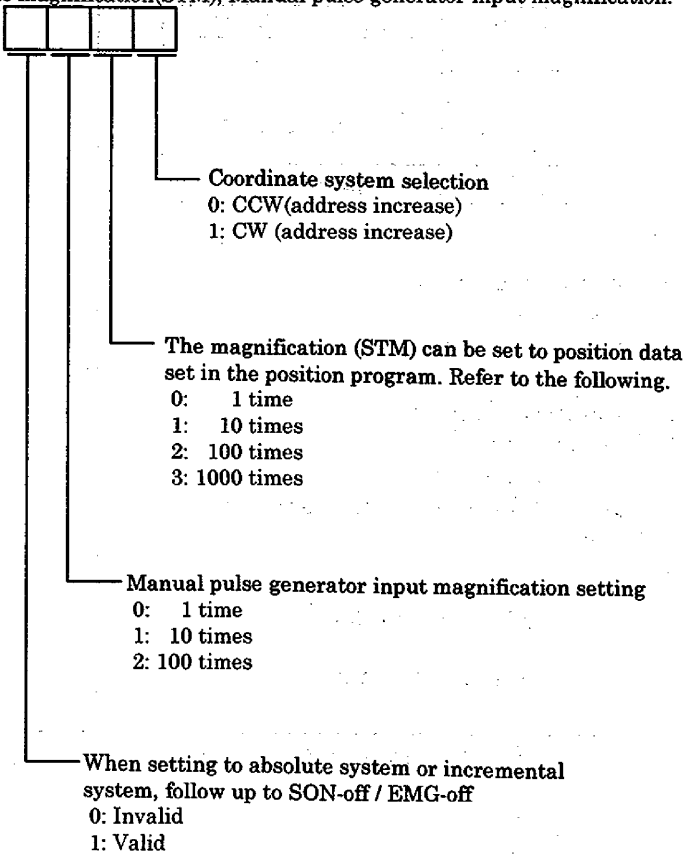
	No	Symbol	Name	Initial value	Unit	Mark
Expansion parameters	20	*OP2	Function selection 2	0000		
	21	*OP3	Spare	0002		
	22	*OP4	Function selection 4	0000		
	23	SIC	Serial communication time-out selection	0	sec	
	24	FFC	Feed forward gain	0	%	
	25	VCO	Analog override offset	0	mV	
	26	TLO	Analog torque limit offset	0	mV	
	27		Spear	0		
	28	TL1	Internal torque limit 1	100	%	
	29	TL2	Internal torque limit 2	100	%	
	30	*BKC	Backlash compensation	0	pulse	
	31	MO1	Analog monitor output 1 offset	0	mV	
	32	MO2	Analog monitor output 2 offset	0	mV	
	33	MBR	Electromagnetic brake sequence output	100	msec	
	34	GD2	Ratio of load inertia moment to servo motor inertia moment	70	0.1-times	
	35	PG2	Position control gain 2	30	rad/s	
	36	VG1	Speed control gain 1	216	rad/s	
	37	VG2	Speed control gain 2	714	rad/s	
	38	VIC	Speed integral compensation	20	msec	
	39	VDC	Speed differential compensation	980		
	40	JTS	JOG operation acceleration/deceleration time constant	100	msec	
	41	ZTS	Zero point return operation acceleration/deceleration time constant	100	msec	
	42	*ZPS	Zero point return position data	0	$\times 10^{SIM} \mu$	
	43	DCT	Moving distance after proximity DOG signal on	1000	$\times 10^{SIM} \mu$	
	44	ZTM	Stopper method Zero point return operation stopper time	100	msec	
	45	ZTT	Stopper method Zero point return operation torque limit value	15	%	
	46	*LP1	Software limit address +high	0	$\times 10^{SIM} \mu m$	
	47	*LP2	Software limit address +low	0		
	48	*LN1	Software limit address -high	0	$\times 10^{SIM} \mu m$	
	49	*LN2	Software limit address -low	0		
	50	*PP1	Position range output address +high	0	$\times 10^{SIM} \mu m$	
	51	*PP2	Position range output address +low	0		
	52	*NP1	Position range output address -high	0	$\times 10^{SIM} \mu m$	
53	*NP2	Position range output address -low	0			

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No	Symbol	Name	Initial value	Unit	Mark
Special parameters	54	OUT1	OUT1 output time selection.	0		
	55	OUT2	OUT2 output time selection.	0		
	56	OUT3	OUT3 output time selection.	0		
	57	*SYC	Selected to program input polarity	0000		
	58	*DIO	Input / Output device selection	0000		
	59	*DI1	Input device selection 1	0209		
	60	*DI2	Input device selection 2	060A		
	61	*DI3	Input device selection 3	1615		
	62	*DI4	Input device selection 4	030B		
	63	*DI5	Input device selection 5	0504		
	64	*DI6	Input device selection 6	0102		
	65	*DI7	Input device selection 7	0000		
	66	*DO1	Output device selection 1	0005		
	67	*DO2	Output device selection 2	110D		
68	*DO3	Output device selection 3	0102			

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

(2) Detailed explanation of the parameters

	No	Symbol	Name and function	Initial value	Unit	Setting range
Basic parameters	00	*STY	<p>Control mode, Regenerative brake option selection Use to select the control mode and regenerative brake option.</p>  <ul style="list-style-type: none"> Program editing 0: Valid 1: Invalid Positioning system selection 0: Use in absolute position detection system 1: Use in incremental positioning system Select the regenerative brake option 0: Not used 2: MR-RB032 3: MR-RB12 4: MR-RB32 5: MR-RB30 6: MR-RB50 	0000		0000h ~ 0611h
	01	*FTY	<p>Feeding system selection The magnification (STM), Manual pulse generator input magnification.</p>  <ul style="list-style-type: none"> Coordinate system selection 0: CCW (address increase) 1: CW (address increase) The magnification (STM) can be set to position data set in the position program. Refer to the following. 0: 1 time 1: 10 times 2: 100 times 3: 1000 times Manual pulse generator input magnification setting 0: 1 time 1: 10 times 2: 100 times When setting to absolute system or incremental system, follow up to SON-off / EMG-off 0: Invalid 1: Valid 	0000		0000h ~ 1231h

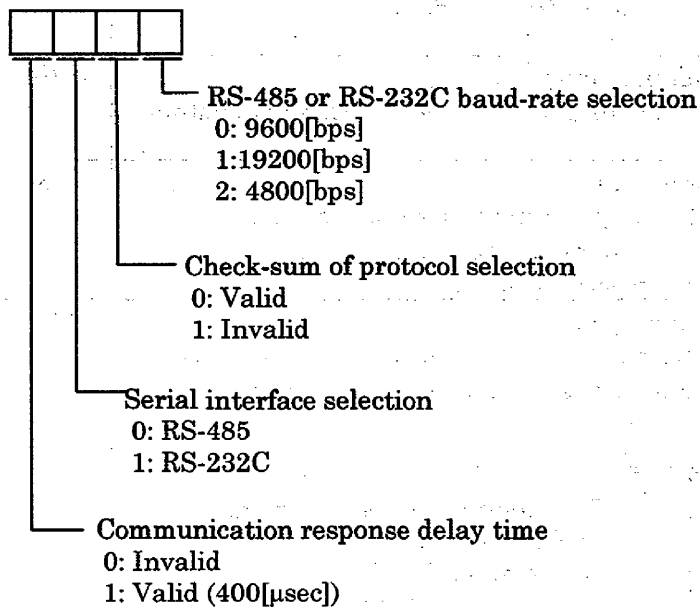
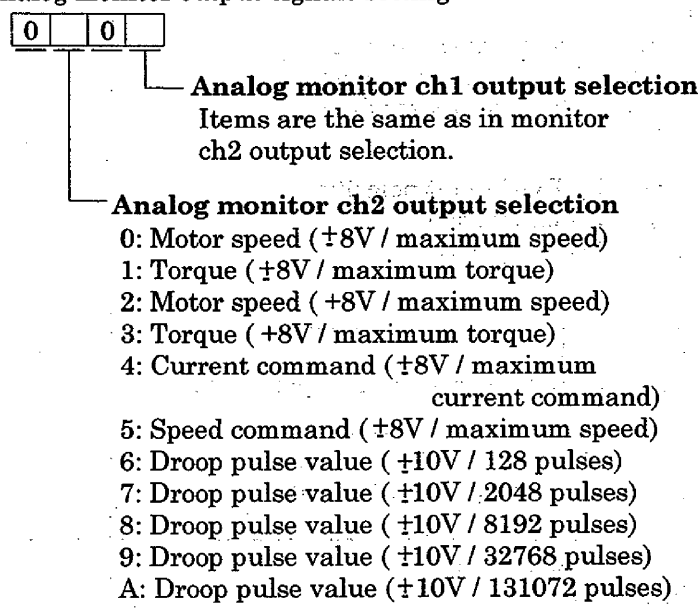
For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No.	Symbol	Name and function	Initial value	Unit	Setting range												
Basic parameters	02	*OP1	Function selection 1 Used to select the input signal filter, CN1B-Pin 19's output signal and absolute position detection system. <div style="margin-top: 10px;"> <p>Input signal filter 0: None 1: 1.77msec 2: 3.55msec</p> <p>Unit of position data 0: mm 1: inch 2: pulse</p> <p>Absolute positioning system 0: Use in incremental positioning system 1: Use in absolute position detection system</p> </div>	0000		0000h ~ 1002h												
	03	ATU	Auto tuning Use to set the response level, etc. for execution of auto tuning. <div style="margin-top: 10px;"> <table border="1" style="margin-left: 20px;"> <caption>Auto tuning response level</caption> <thead> <tr> <th>setting</th> <th>response level</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Low response</td> </tr> <tr> <td>2</td> <td>~</td> </tr> <tr> <td>3</td> <td>Middle response</td> </tr> <tr> <td>4</td> <td>~</td> </tr> <tr> <td>5</td> <td>High response</td> </tr> </tbody> </table> <p>Select the machine 0: Normal 1: Friction is large</p> <p>Auto tuning selection 0: Interpolation axis control (not setting at normally) 1: Executed for both position and speed loops 2: None</p> <p>Setting time to shorten tuning selection 0: Normal 1: Setting time to shorten tuning</p> </div>	setting	response level	1	Low response	2	~	3	Middle response	4	~	5	High response	0102		0001h ~ 1215h
	setting	response level																
1	Low response																	
2	~																	
3	Middle response																	
4	~																	
5	High response																	
04	*CMX	Use to set the multiplier for the command pulse input. Set in the range of $\frac{1}{20} < \frac{CMX}{CDV} < 20$ If set over than $\frac{1}{100} < \frac{CMX}{CDV} < 100$, occurred the parameter error.	1		1~32767													

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

Basic parameters	No.	Symbol	Name and function	Initial value	Unit	Setting range
	05	*CDV	<p>Use to set the divisor for the command pulse input.</p> <p>Setting example. Roll diameter : 50mm Reduction ratio : 3/7 Encoder pulses : 16384pulse</p> $\frac{\text{Encoder pulse (CMX)}}{\text{Moving distance (CDX)}} = \frac{16384}{50 \times \pi \times 3/7 \times 1000} = \frac{7168}{9375\pi}$ $= \frac{7168}{29452}$ <p>Hence, set CMX=7168 and CDV=29452 Note) When the fraction is produced, carry within the setting range and round that fraction off.</p>	1		1~32767
	06	PED	<p>Movement complete output range</p> <p>Used to set the droop pulse range of PED signal output</p>	100	pulse	0~10000
	07	PG1	<p>Position control gain 1</p> <p>Used to set the range for model position loop gain. Increase the gain to raise tracking performance in response to the position command.</p>	36	rad/s	4~1000
	08	*ZTY	<p>Zero point return type</p> <p>Select the Zero point setting method, Zero point return direction and proximity DOG signal input polarity.</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 10px 0; display: flex; align-items: center;"> 0 </div> <ul style="list-style-type: none"> — Zero point return setting mode <ul style="list-style-type: none"> 0: DOG method 1: Count method 2: Data set method 3: Stopper method 4: SON point method — Zero point return direction <ul style="list-style-type: none"> 0: Address increases direction 1: Address decreases direction — Proximity DOG input polarity <ul style="list-style-type: none"> 0: DOG is on by open 1: DOG is on by close 	0014		0000h ~ 0114h
	09	ZRF	<p>Zero point return speed</p> <p>Used to set the servo motor speed for Zero point return.</p>	500	r/min.	0~ Max motor speed
	10	CRF	<p>Zero point return creep speed</p> <p>Used to set the creep speed applied when the proximity DOG signal on.</p>	10	r/min.	0~ Max motor speed
	11	ZST	<p>Zero point return shift distance</p> <p>Used to set the shift distance from the Z-phase pulse detection position in the encoder.</p>	0	μm	0~65535

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No.	Symbol	Name and function	Initial value	Unit	Setting range
Basic parameters	12		Spare	0		
	13	JOG	JOG speed Used to set speed of the JOG speed command.	100	r/min.	0~ Max motor speed
	14	*STC	S-pattern acceleration/deceleration time constant Used to smooth start/stop of the servo motor, S-pattern Acceleration/deceleration time set in the program. Invalid for the Zero point returning.	0	msec	0~100
	15	*SNO	RS-485 channel number setting Set to the channel number of RS-485 multi-drop. If set the same channel number, it is incorrectly.	0	ch.	0~31
	16	*BPS	Communication baud-rate selection Select the baud-rate for the RS-232C or RS-485  <ul style="list-style-type: none"> RS-485 or RS-232C baud-rate selection <ul style="list-style-type: none"> 0: 9600[bps] 1: 19200[bps] 2: 4800[bps] Check-sum of protocol selection <ul style="list-style-type: none"> 0: Valid 1: Invalid Serial interface selection <ul style="list-style-type: none"> 0: RS-485 1: RS-232C Communication response delay time <ul style="list-style-type: none"> 0: Invalid 1: Valid (400[μsec]) 	0100		0000h ~ 1112h
17	MOD	Analog monitor output selection Analog monitor output signals setting  <ul style="list-style-type: none"> Analog monitor ch1 output selection Items are the same as in monitor ch2 output selection. Analog monitor ch2 output selection <ul style="list-style-type: none"> 0: Motor speed (±8V / maximum speed) 1: Torque (±8V / maximum torque) 2: Motor speed (+8V / maximum speed) 3: Torque (+8V / maximum torque) 4: Current command (±8V / maximum current command) 5: Speed command (±8V / maximum speed) 6: Droop pulse value (±10V / 128 pulses) 7: Droop pulse value (±10V / 2048 pulses) 8: Droop pulse value (±10V / 8192 pulses) 9: Droop pulse value (±10V / 32768 pulses) A: Droop pulse value (±10V / 131072 pulses) 	0100		0000h ~ 0A0Ah	

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

No.	Symbol	Name and function	Initial value	Unit	Setting range																		
Basic parameters	18	<p>*DMD Status display selection, Alarm history clear</p> <p>Used to select the status display shown at power on and alarm history clear.</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> <td style="width: 20px;"></td> </tr> </table> <p style="margin-left: 40px;">Selection of status display at power on.</p> <ul style="list-style-type: none"> 0: Motor speed 1: Regeneration load factor 2: Effective load factor 3: Peak load factor 4: Position within one rotation 5: ABS counter 6: Load/inertia ratio <p style="margin-left: 40px;">Selection of status display at the DP-60</p> <ul style="list-style-type: none"> 0: Current position 1: Command position 2: Command remaining distance 3: Program number 4: Feedback pulse accumulation 5: Motor speed 6: Droop pulse 7: Override 8: Torque limit command voltage 9: Regeneration load factor A: Effective load factor B: Peak load factor C: Position within one rotation D: ABS counter E: Load/inertia ratio <p style="margin-left: 40px;">Alarm history clear</p> <ul style="list-style-type: none"> 0: Invalid 1: Valid <p>When alarm history clear is made valid, the alarm history is cleared at next power-on, after the alarm history cleared, the setting is automatically made invalid (reset to 0)</p>	0				0000		0000h ~ 10E6h														
	0																						
19	*BLK	<p>Parameter entry prohibition</p> <p>Used to select the reference and write ranges of the parameters.</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Set value</th> <th>Reference range</th> <th>Write range</th> </tr> </thead> <tbody> <tr> <td>0000</td> <td>No. 0~19</td> <td>No. 0~19</td> </tr> <tr> <td>000A</td> <td>No.19</td> <td>No.19</td> </tr> <tr> <td>000B</td> <td>No. 0~19 No. 20~53</td> <td>No. 0~19</td> </tr> <tr> <td>000C</td> <td>No. 0~19 No. 20~53</td> <td>No. 0~19 No. 20~53</td> </tr> <tr> <td>000E</td> <td>No. 0~19 No. 20~68</td> <td>No. 0~19 No. 20~68</td> </tr> </tbody> </table> <p style="margin-left: 40px;">When use the Setup S/W for read and write of the devices, set"000E".</p>	Set value	Reference range	Write range	0000	No. 0~19	No. 0~19	000A	No.19	No.19	000B	No. 0~19 No. 20~53	No. 0~19	000C	No. 0~19 No. 20~53	No. 0~19 No. 20~53	000E	No. 0~19 No. 20~68	No. 0~19 No. 20~68	0000		0000h ~ FFFFh
Set value	Reference range	Write range																					
0000	No. 0~19	No. 0~19																					
000A	No.19	No.19																					
000B	No. 0~19 No. 20~53	No. 0~19																					
000C	No. 0~19 No. 20~53	No. 0~19 No. 20~53																					
000E	No. 0~19 No. 20~68	No. 0~19 No. 20~68																					

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

Expansion parameters	No.	Symbol	Name and function	Initial value	Unit	Setting range																	
	20	*OP2	Function selection 2 Used to select the torque limit valid direction of the motor rotation and slight vibration suppression control. <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> </div> <ul style="list-style-type: none"> — Selection of torque limit valid to directions 0: CCW/CW both of directions are valid 1: CCW direction is valid 2: CW direction is valid — Slight vibration suppression control 0: Invalid 1: Valid 	0000		0000h ~ 1102h																	
	21	*OP3	Spare	0002																			
	22	*OP4	Function selection 4 <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> </div> <ul style="list-style-type: none"> — Selection of motor stop pattern at LSP/LSN signal off 0: Sudden stop 1: Slow stop — Selection of stop procedure at alarm clear "RES" signal is on. 0: Alarm clear and not base shut off within the edge. 1: Alarm clear and base shut off during the "RES" is on within the edge. — Machine resonance suppression filter <table border="1" style="margin-left: 20px; margin-top: 10px;"> <thead> <tr> <th>Set value</th> <th>Notch frequency[Hz]</th> </tr> </thead> <tbody> <tr><td>0</td><td>Not used</td></tr> <tr><td>1</td><td>1125</td></tr> <tr><td>2</td><td>563</td></tr> <tr><td>3</td><td>375</td></tr> <tr><td>4</td><td>282</td></tr> <tr><td>5</td><td>225</td></tr> <tr><td>6</td><td>188</td></tr> <tr><td>7</td><td>161</td></tr> </tbody> </table>	Set value	Notch frequency[Hz]	0	Not used	1	1125	2	563	3	375	4	282	5	225	6	188	7	161	0000	
Set value	Notch frequency[Hz]																						
0	Not used																						
1	1125																						
2	563																						
3	375																						
4	282																						
5	225																						
6	188																						
7	161																						

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No.	Symbol	Name and function	Initial value	Unit	Setting range
Expansion parameters	23	SIC	Serial communication time-out selection Set to time of serial communication time-out check. Not time-out check at set "0".	0	sec	0~60
	24	FFC	Feed forward gain Used to set the feed forward gain in position control. By setting 100% for constant-speed operation, droop pulses will not be generated. Note that sudden acceleration/deceleration will increase overshoot. (As a guideline, acceleration/deceleration time to/from rated speed is 1 sec. or longer when the set value is 100. When setting this parameter, always turn off the auto-tuning (parameter No. 3)	0	%	0~100
	25	VCO	Analog override offset Used to set the offset voltage of the analog override command.	0	mV	-999~999
	26	TLO	Analog torque limit offset Used to set the offset voltage of the analog torque limit command.	0	mV	-999~999
	27		Spare	0		
	28	TL1	Internal torque limit 1 Set this parameter to limit servo motor-generated torque on the assumption that the maximum torque is 100%. When 0 is set, torque is not produced.	100	%	0~100
	29	TL2	Internal torque limit 2 Set this parameter to limit servo motor-generated torque on the assumption that the maximum torque is 100%. When 0 is set, torque is not produced. Internal torque limit selection signal must be on.	100	%	0~100
	30	*BKC	Backlash compensation Used to set the backlash compensated foe when the Command direction is reversed.	0	pulse	0~1000
	31	MO1	Analog monitor output 1 offset Used to set the offset voltage of the analog monitor ch1 output (MO1).	0	mV	-999 ~ 999
	32	MO2	Analog monitor output 2 offset Used to set the offset voltage of the analog monitor ch2 output (MO2).	0	mV	-999 ~ 999
33	MBR	Electromagnetic brake sequence output Used to set the delay time between when the Electromagnetic brake interlock signal (MBR) switches off and when the base circuit is shut off.	100	msec	0~1000	

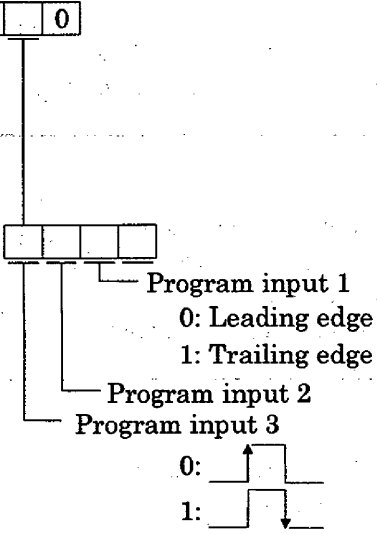


For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

Expansion parameters	No.	Symbol	Name and function	Initial value	Unit	Setting range
	34	GD2	Inertia Ratio of load to motor Used to set the ratio of the load inertia moment to the servo motor inertia moment. Note that when auto tuning is selected, the result of automatically set.	70	×0.1	0~1000
	35	PG2	Position control gain 2 Used to set the gain of the position loop. Set this parameter to increase position response to load disturbance. Higher setting increases the response level but is liable to generate vibration and/or noise. Note that when auto tuning is selected, the result of automatically set.	30	rad/s	1~500
	36	VG1	Speed control gain 1 Normally this parameter setting need not be changed. Higher setting increases the response level but is liable to generate vibration and/or noise. Note that when auto tuning is selected, the result of automatically set.	216	rad/s	20~5000
	37	VG2	Speed control gain 2 Set the parameter when vibration occurs on the machine of low rigidity or large back-rush. Higher setting increases the response level but is liable to generate vibration and/or noise. Note that when auto tuning is selected, the result of automatically set.	714	rad/s	20~8000
	38	VIC	Speed integral compensation Used to set the constant of integral compensation. Note that when auto tuning is selected, the result of automatically set.	20	msec	1~1000
	39	VDC	Speed differential compensation Used to set the differential compensation value.	980		0~1000
	40	JTS	JOG operation acc / dec time constant Used to set the acceleration/deceleration time when JOG operation.	100	msec	1~20000
	41	ZTS	Zero point return operation acc / dec time constant Used to set the acceleration/deceleration time when Zero point return operation.	100	msec	1~20000

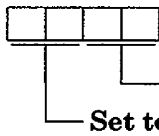
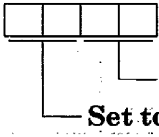
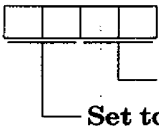
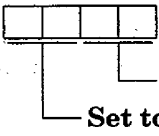
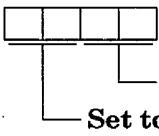
For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

		No.	Symbol	Name and function	Initial value	Unit	Setting range
Expansion parameters		42	*ZPS	Zero point return position data Used to set the current position reached on completion of Zero point return. The actual Zero point position data is 10 ^{STM} times greater than the set value.	0	×10 ^{STM} μm	-32768 ~ 32767
		43	DCT	Moving distance after proximity DOG signal on Used in the count type Zero point return method to set the moving distance after the proximity DOG signal is switched on. Set the value not less than the distance required to decelerate from the Zero point return speed.	1000	×10 ^{STM} μm	0~65535
		44	ZTM	Stopper method Zero point return operation stopper time Used to set the time from pressing the stopper and reaching the parameter No. 45 (ZTT) torque limit to setting the Zero point position while using the stopper method Zero point return.	100	msec	5~1000
		45	ZTT	Stopper method Zero point return operation Torque limit value Used to set the torque limit value for stopper method Zero point return as a percentage (%) in respect to the max. torque.	15	%	1~100
		46 47	*LMP	Software limit address +high Software limit address +low Used to set the software stroke limit address to the Increment side. If the same value as "software limit -" is set, the software limit will be disabled. Set the same sign for No. 46 and 47. If differing signs are set, a parameter error will occur.	0	×10 ^{STM} μm	-999999 ~ 999999
		48 49	*LMN	Software limit address -high Software limit address -low Used to set the software stroke limit address to the decrement side. Parameter No. 50 will be the high-order three digits. If the same value as "software limit +" is set, the software limit will be disabled. Set the same sign for No. 48 and 49. If differing signs are set, a parameter error will occur.	0	×10 ^{STM} μm	-999999 ~ 999999
		50 51	*LPP	Position range output address +high Position range output address +low Used to set the position range output address to the Address increment side. Parameter No. 50 will be the high-order three digits. Set the same sign for No. 50 and 51. If differing signs are set, a parameter error will occur.	0	×10 ^{STM} μm	-999999 ~ 999999
		52 53	*LNP	Position range output address -high Position range output address -low Used to set the position range output address to the Address decrement side. Parameter No. 52 will be the High-order three digits. Set the same sign for No. 52 and 53. If differing signs are set, a parameter error will occur.	0	×10 ^{STM} μm	-999999 ~ 999999

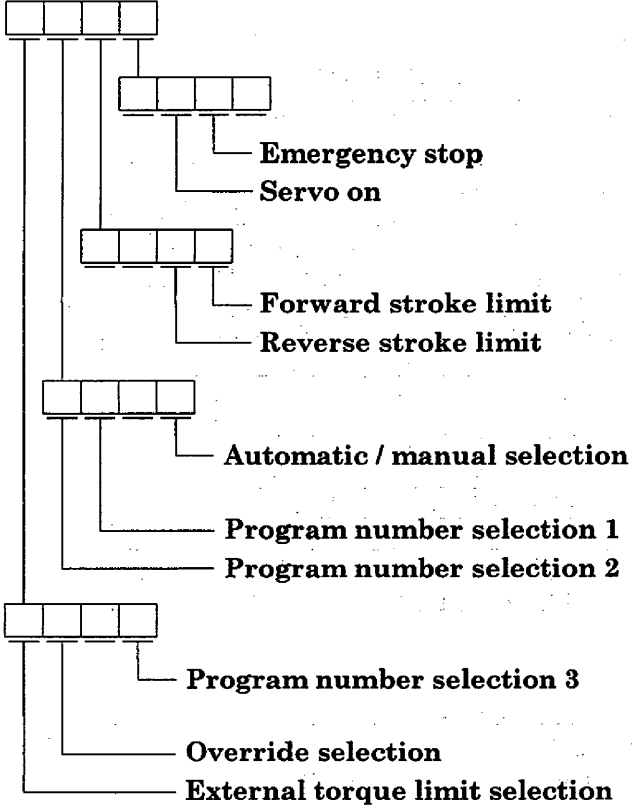
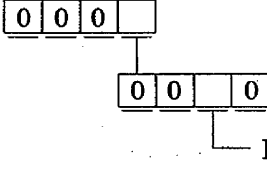
For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No.	Symbol	Name and function	Initial value	Unit	Setting range			
Special parameters	54	OUT1	OUT1 output time selection This parameter turn on OUT1 during the set time. If "0" is set, OUT1 turn on to the OUT OF(1) command	0	10msec	0~ 2000			
	55	OUT2	OUT2 output time selection This parameter turn on OUT2 during the set time. If "0" is set, OUT2 turn on to the OUT OF(2) command	0	10msec	0~ 2000			
	56	OUT3	OUT3 output time selection This parameter turn on OUT3 during the set time. If "0" is set, OUT3 turn on to the OUT OF(3) command	0	10msec	0~ 2000			
	57	*SYC	Selected to program input porality Used to select the device which reverses the program input polarity. <div style="text-align: center;"> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> </table> </div>  <p style="margin-left: 40px;"> Program input 1 0: Leading edge 1: Trailing edge Program input 2 Program input 3 0:  1:  </p>	0	0	0	0000		0000h ~ FFFFh
	0	0	0						
	58	*DIO	Input / Output device selection Used to select the CN1A-19 pin to output device or input device. <div style="text-align: center;"> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;"></td> </tr> </table> </div> <p style="margin-left: 40px;"> CN1A-19pin. 0: Input device 1: Output device External dynamic-brake selection 0: Invalid 1: Valid When selected the external dynamic-brake output at parameter No.62, 63, 64, it must be set "1". Note: Similar Function could be realized with SETUP S/W. </p>		0	0		0000	
	0	0							

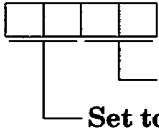
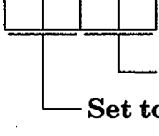
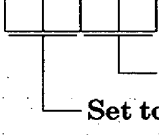
For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

No.	Symbol	Name and function	Initial value	Unit	Setting range																																																								
Special parameters	59	<p>*DI1 Input device selection 1 Used to select the function of CN1A-8 pin and CN1A-19 pin.</p>  <p>Set to the function of CN1A-8pin. Set to the function of CN1A-19pin.</p> <table border="1"> <thead> <tr> <th>Setting</th> <th>Input function</th> <th>Setting</th> <th>Input function</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>No function</td> <td>0D</td> <td>Spare</td> </tr> <tr> <td>01</td> <td>Emergency stop</td> <td>0E</td> <td>Override selection</td> </tr> <tr> <td>02</td> <td>Servo on</td> <td>0F</td> <td>External torque limit</td> </tr> <tr> <td>03</td> <td>Reset</td> <td>10</td> <td>Internal torque limit</td> </tr> <tr> <td>04</td> <td>Forward stroke end</td> <td>11</td> <td>Proportional control</td> </tr> <tr> <td>05</td> <td>Reverse stroke end</td> <td>12</td> <td>Temporally stop/restart</td> </tr> <tr> <td>06</td> <td>Forward start</td> <td>13</td> <td>Manual P.G magnification 1</td> </tr> <tr> <td>07</td> <td>Reverse start</td> <td>14</td> <td>Manual P.G magnification 2</td> </tr> <tr> <td>08</td> <td>Automatic/manual selection</td> <td>15</td> <td>Program input 1</td> </tr> <tr> <td>09</td> <td>Proximity DOG</td> <td>16</td> <td>Program input 2</td> </tr> <tr> <td>0A</td> <td>Program No. selection 1</td> <td>17</td> <td>Program input 3</td> </tr> <tr> <td>0B</td> <td>Program No. selection 2</td> <td>18</td> <td>Spare</td> </tr> <tr> <td>0C</td> <td>Program No. selection 3</td> <td>19</td> <td>Spare</td> </tr> </tbody> </table>	Setting	Input function	Setting	Input function	00	No function	0D	Spare	01	Emergency stop	0E	Override selection	02	Servo on	0F	External torque limit	03	Reset	10	Internal torque limit	04	Forward stroke end	11	Proportional control	05	Reverse stroke end	12	Temporally stop/restart	06	Forward start	13	Manual P.G magnification 1	07	Reverse start	14	Manual P.G magnification 2	08	Automatic/manual selection	15	Program input 1	09	Proximity DOG	16	Program input 2	0A	Program No. selection 1	17	Program input 3	0B	Program No. selection 2	18	Spare	0C	Program No. selection 3	19	Spare	0209		0000h ~ 1F1Fh
	Setting	Input function	Setting	Input function																																																									
	00	No function	0D	Spare																																																									
	01	Emergency stop	0E	Override selection																																																									
	02	Servo on	0F	External torque limit																																																									
03	Reset	10	Internal torque limit																																																										
04	Forward stroke end	11	Proportional control																																																										
05	Reverse stroke end	12	Temporally stop/restart																																																										
06	Forward start	13	Manual P.G magnification 1																																																										
07	Reverse start	14	Manual P.G magnification 2																																																										
08	Automatic/manual selection	15	Program input 1																																																										
09	Proximity DOG	16	Program input 2																																																										
0A	Program No. selection 1	17	Program input 3																																																										
0B	Program No. selection 2	18	Spare																																																										
0C	Program No. selection 3	19	Spare																																																										
		Note : Similar Function could be realized with SETUP S/W																																																											
	60	<p>*DI2 Input device selection 2 Used to select the function of CN1B-5 pin and CN1B-7 pin.</p>  <p>Set to the function of CN1B-5pin. Set to the function of CN1B-7pin.</p>	060A		0000h ~ 1F1Fh																																																								
		Note : Similar Function could be realized with SETUP S/W																																																											
	61	<p>*DI3 Input device selection 3 Used to select the function of CN1B-8 pin and CN1B-9 pin.</p>  <p>Set to the function of CN1B-8pin. Set to the function of CN1B-9pin.</p>	1615		0000h ~ 1F1Fh																																																								
		Note : Similar Function could be realized with SETUP S/W																																																											
	62	<p>*DI4 Input device selection 4 Used to select the function of CN1B-14 pin and CN1B-15 pin.</p>  <p>Set to the function of CN1B-14pin. Set to the function of CN1B-15pin.</p>	030B		0000h ~ 1F1Fh																																																								
		Note : Similar Function could be realized with SETUP S/W																																																											
	63	<p>*DI5 Input device selection 5 Used to select the function of CN1B-16 pin and CN1B-17 pin.</p>  <p>Set to the function of CN1B-16pin. Set to the function of CN1B-17pin.</p>	0504		0000h ~ 1F1Fh																																																								
		Note : Similar Function could be realized with SETUP S/W																																																											

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No.	Symbol	Name and function	Initial value	Unit	Setting range
Special parameters	64	*DI6	<p>Input / Output device selection 6 Selected to the function device signal turns on automatically.</p>  <p style="text-align: right;">0: Invalid 1: Valid</p> <p>Note : Similar Function could be realized with SETUP S/W.</p>	0102		0000h ~ FFFFh
	65	*DI7	<p>Input / Output device selection 7 Selected to the function device signal turns on automatically.</p>  <p style="text-align: right;">0: Invalid 1: Valid</p> <p>Note : Similar Function could be realized with SETUP S/W.</p>	0000		0000h ~ FFFFh

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

	No.	Symbol	Name and function	Initial value	Unit	Setting range																																								
Special parameters	66	*DO1	<p>Output device selection 1 Used to select the function of CN1A-18 pin and CN1A-19 pin.</p>  <p>Set to the function of CN1A-18pin. Set to the function of CN1A-19pin.</p> <table border="1" data-bbox="347 398 1088 707"> <thead> <tr> <th>Setting</th> <th>Output function</th> <th>Setting</th> <th>Output function</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>No function</td> <td>09</td> <td>Warning</td> </tr> <tr> <td>01</td> <td>Ready</td> <td>0A</td> <td>Battery warning</td> </tr> <tr> <td>02</td> <td>Alarm</td> <td>0B</td> <td>Torque limit in effect</td> </tr> <tr> <td>03</td> <td>Spare</td> <td>0C</td> <td>Temporary stopping</td> </tr> <tr> <td>04</td> <td>Spare</td> <td>0D</td> <td>Program output 1</td> </tr> <tr> <td>05</td> <td>Zero point return complete</td> <td>0E</td> <td>Program output 2</td> </tr> <tr> <td>06</td> <td>Electromagnetic brake</td> <td>0F</td> <td>Program output 3</td> </tr> <tr> <td>07</td> <td>Dynamic brake</td> <td>10</td> <td>SYNC synchronous</td> </tr> <tr> <td>08</td> <td>Position range</td> <td>11</td> <td>Movement complete</td> </tr> </tbody> </table> <p>Note : Similar Function could be realized with SETUP S/W.</p>	Setting	Output function	Setting	Output function	00	No function	09	Warning	01	Ready	0A	Battery warning	02	Alarm	0B	Torque limit in effect	03	Spare	0C	Temporary stopping	04	Spare	0D	Program output 1	05	Zero point return complete	0E	Program output 2	06	Electromagnetic brake	0F	Program output 3	07	Dynamic brake	10	SYNC synchronous	08	Position range	11	Movement complete	0005		0000h ~ 1F1Fh
	Setting	Output function	Setting	Output function																																										
	00	No function	09	Warning																																										
01	Ready	0A	Battery warning																																											
02	Alarm	0B	Torque limit in effect																																											
03	Spare	0C	Temporary stopping																																											
04	Spare	0D	Program output 1																																											
05	Zero point return complete	0E	Program output 2																																											
06	Electromagnetic brake	0F	Program output 3																																											
07	Dynamic brake	10	SYNC synchronous																																											
08	Position range	11	Movement complete																																											
	67	*DO2	<p>Output device selection 2 Used to select the function of CN1B-6 pin and CN1B-4 pin.</p>  <p>Set to the function of CN1B-4pin. Set to the function of CN1B-6pin.</p> <p>Note : Similar Function could be realized with SETUP S/W.</p>	110D		0000h ~ 1F1Fh																																								
	68	*DO3	<p>Output device selection 3 Used to select the function of CN1B-18 pin and CN1B-19 pin.</p>  <p>Set to the function of CN1B-18pin. Set to the function of CN1B-19pin.</p> <p>Note : Similar Function could be realized with SETUP S/W.</p>	0102		0000h ~ 1F1Fh																																								

For parameters marked with an asterisk (*), turn the power off after setting and the power back on to complete the setting.

11. Set-up S/W

(1) Set-up software

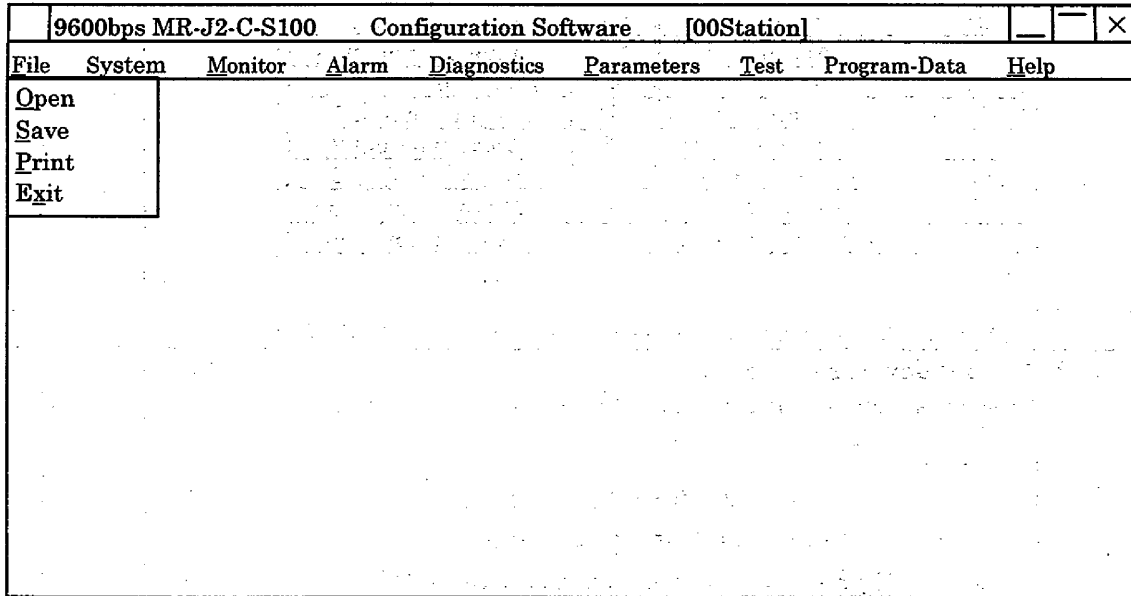
The Set-up S/W of the MR-J2-□□ C-S100 is an exclusive Set-up S/W which has an extension screen within standard Set-up S/W.

(2) Screen

The screen definitions of this Set-up S/W is same as standard version.

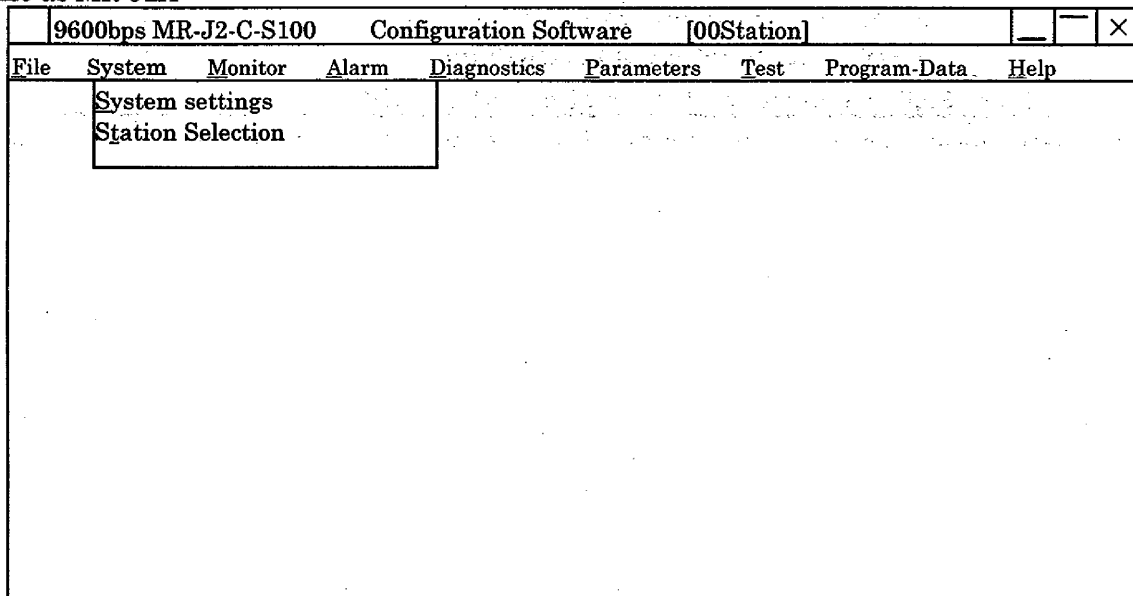
(3) File

Same as MR-J2A



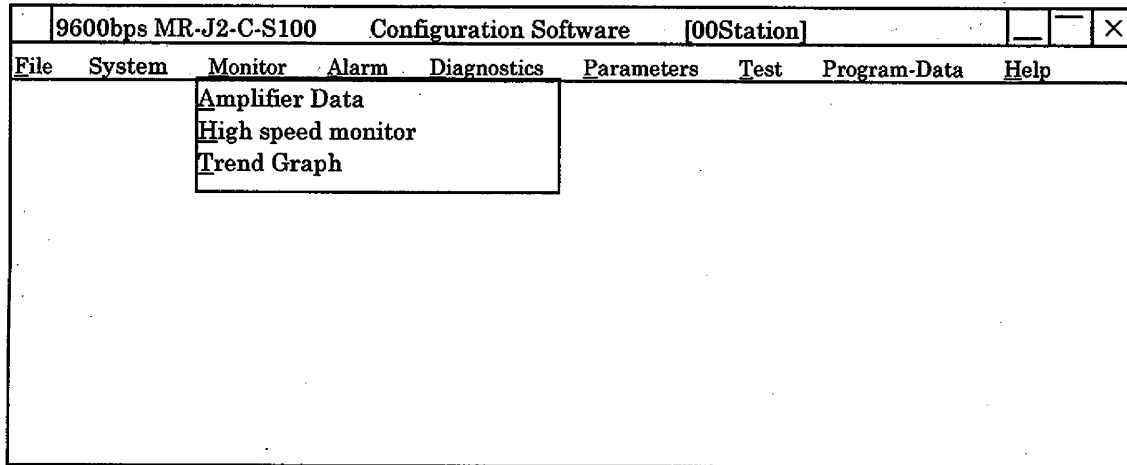
(4) System

Same as MR-J2A



(5) Monitor

Same as MR-J2A

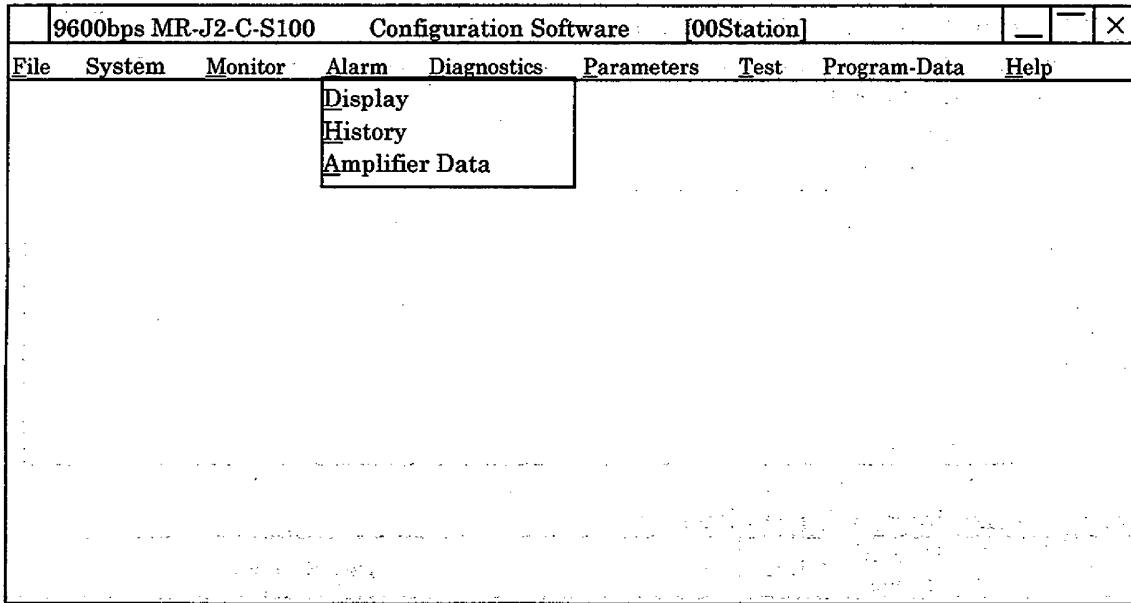


The monitor display items are as followings :

Name	Display range	Unit	Description
Current position	-999999 ~ 999999	mm	The current position from the machine home position of 0 is displayed.
Command position	-999999 ~ 999999	mm	The position data in the program data or setting data to command position is displayed.
Command remaining distance	-999999 ~ 999999	mm	During operation, the remaining distance between current position and command position is display. During the stop, the next fee distance is displayed.
Program number	1~8		The executing program number is displayed.
Feedback pulse accumulation	-9999999 ~ 9999999	pulse	Feedback pulses from the servo motor encoder are counted and displayed. When the value exceeds ± 999999 , it begins with 0. Press the clear button to reset the display value to 0.
Motor speed	-5400 ~ 5400	r/min	The servo motor speed is displayed.
Drop pulse	-9999999 ~ 9999999	pulse	The number of droop pulses in the deviation counter is displayed.
Override	0~200	%	Override setting value at the parameter is displayed. When set to the override invalid, this display is 100%.
Torque limit command voltage	0.00 ~ 10.00	V	Torque limit command voltage is displayed.
Regeneration load factor	0~100	%	The ration of regenerative power to permissible regenerative power is displayed in %.
Effective load factor	0~300	%	The continuous effective load torque is displayed. When rated torque is generated, this value is 100%. The effective value for the past 15 seconds is displayed.
Peak load factor	0~300	%	The peak load torque is displayed. When rated torque is generated, this value is 100%. The peak torque for the past 15 seconds is displayed.
Position within one rotation	0~16383	pulse	Position within one revolution is display in encoder pulses. When the value exceeds 8192 on the HC-FF and HC-MF, it begins with 0. The value exceeds 16384 on other motors.
ABS counter	-32768 ~ 32767	rev	Travel value from the home position in the absolute position detection system is displayed in terms of the absolute position detection's counter value.
Load/inertia ratio	0.0~100.0	times	The estimated ratio of the load inertia moment to the servo motor inertia moment is displayed.

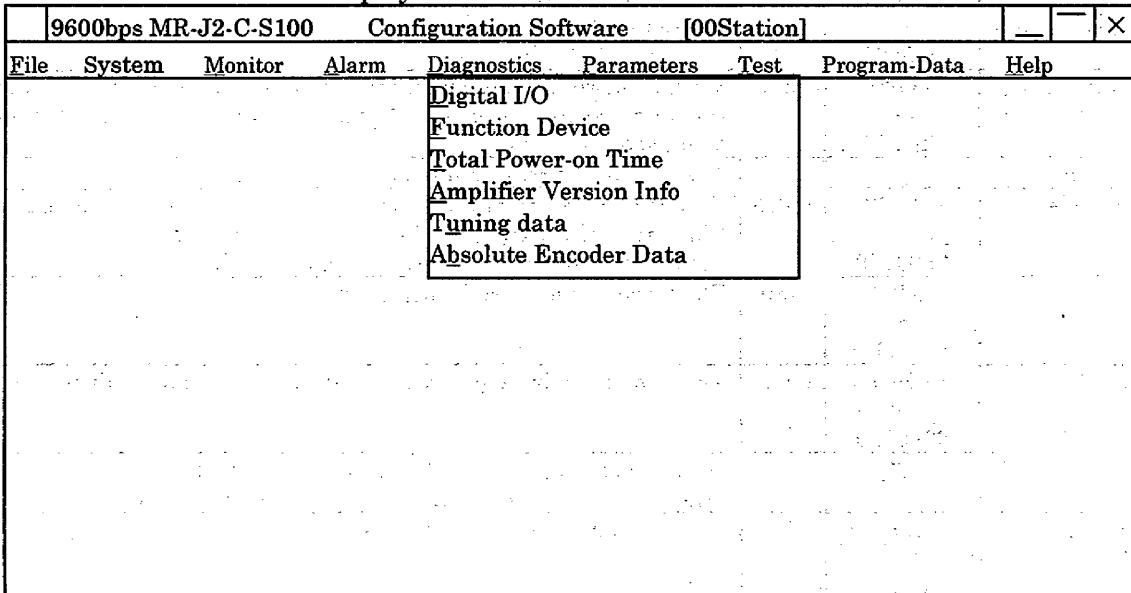
(6) Alarm

Same as MR-J2A



(7) Diagnostic

Added to the function device displays



(8) Parameter

9600bps MR-J2-C-S100 Configuration Software [00Station]

File System Monitor Alarm Diagnostics Parameters Test Program-Data Help

Parameter list
I/O Devices

(9) I/O Device

MR-J2-CX 19200bps Servo Set-up Software

File System Monitor Alarm Diagnostics Parameters Test Program-Data Help

Input device setting		Output device setting	
Function	Input PIN-number	Function	Output PIN-number
EMG : Emergency stop		RD : Ready	CN1B-19
SON : Servo on		ALM : Trouble	CN1B-18
RES : Alarm reset		SPARE	CN1B-6
LSP : Forward rot. stroke	CN1B-16	SPARE	
LSN : Reverse rot. stroke	CN1B-17	ZP : Z phase	CN1A-18
ST1 : Forward rot. start	CN1B-7	MBR : Elec. Brake	
ST2 : Reverse rot. start	CN1A-19	DBR : Dynamic brake	
MDO : Automatic/manual		POT : Position range	
DOG : Proximity DOG	CN1A-8	WNG : Warning	
PS0 : Program selection 1	CN1B-5	BWNG : Battery warning	
PS1 : Program selection 2	CN1B-14	TLC : Limiting torque	
PS2 : Program selection 3	CN1B-15	PUS : Temporary stopping	
SPARE		OUT1 : Output program 1	CN1B-4
OVR : Override		OUT2 : Output program 2	
TL : External torque limit		OUT3 : Output program 3	
TL2 : Internal torque limit		SOUT : Output Sync. Signal	
PC : Proportion control		PED : Moving completed	
STP : Temp. stop/restart			
TP0 : Pulse gen. Mul.1			
TP1 : Pulse gen. Mul.2			
PI1 : Program input1	CN1B-8		
PI2 : Program input2	CN1B-9		
PI3 : Program input3			

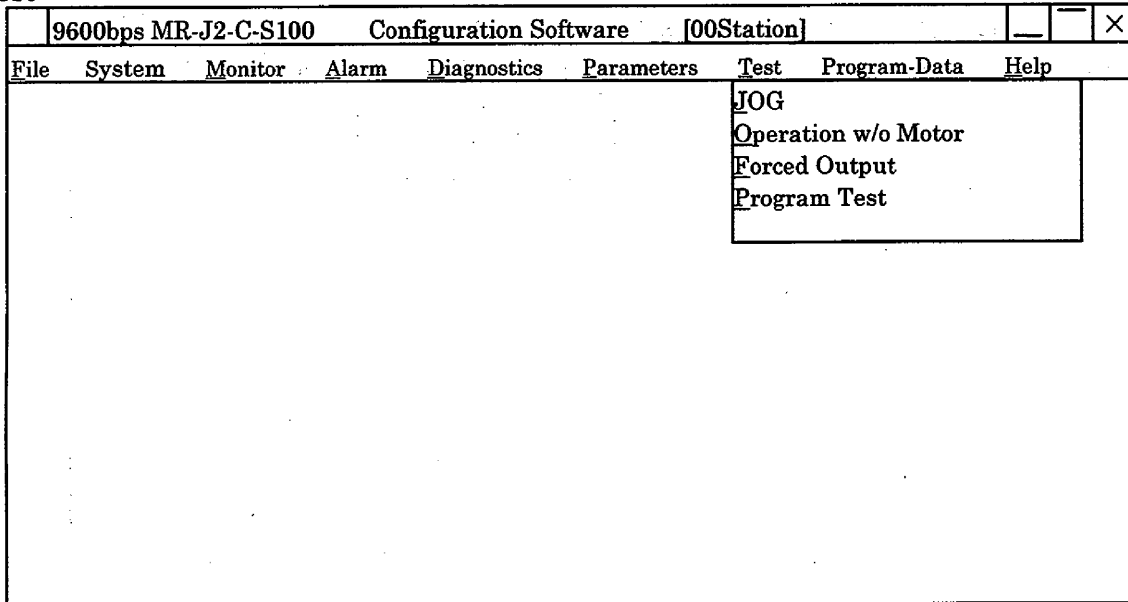
Select CN1A-19
 Input
 Output

Read All
Write All
Set to Default
Close

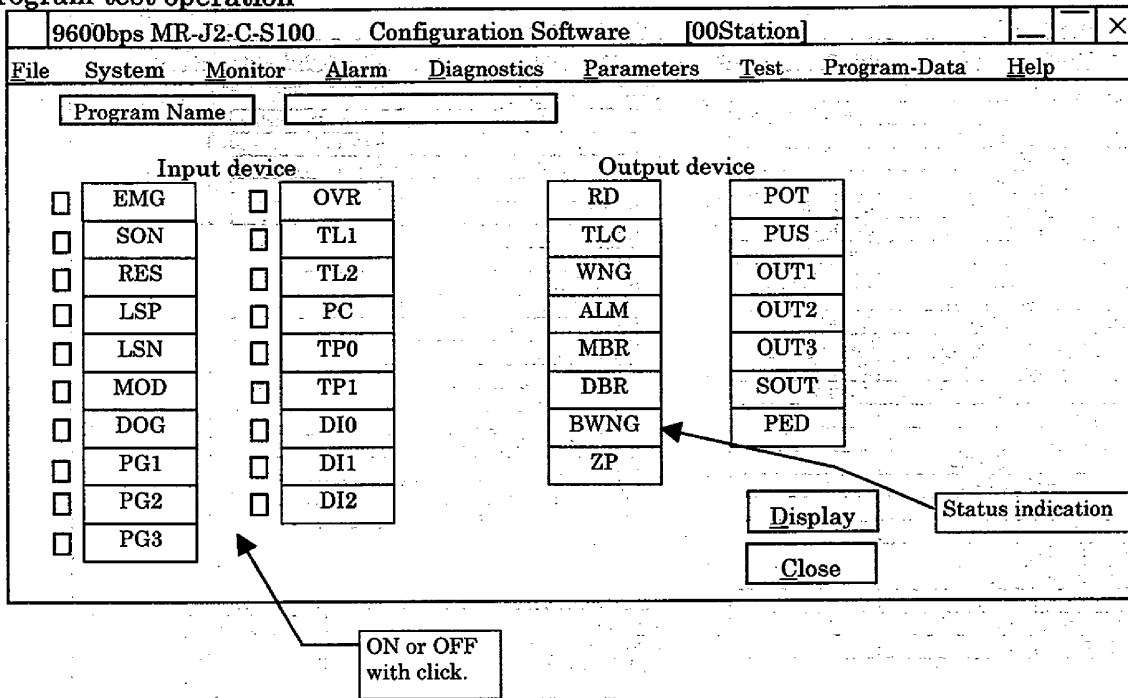
Verify
Free Pins

Help

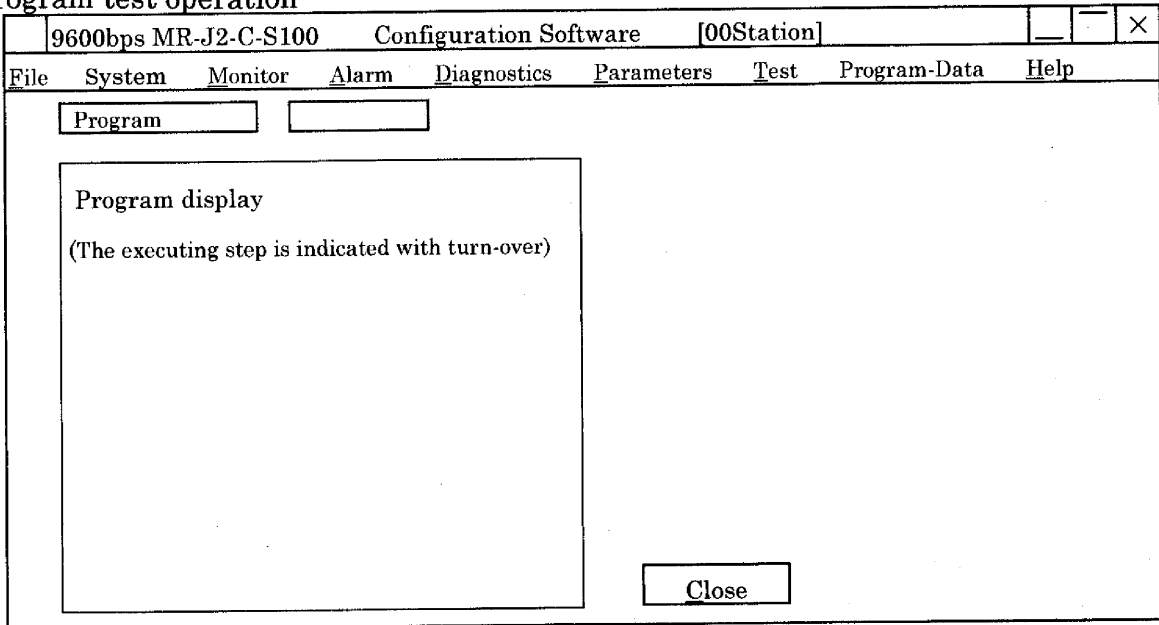
(10) Test



(11) Program test operation

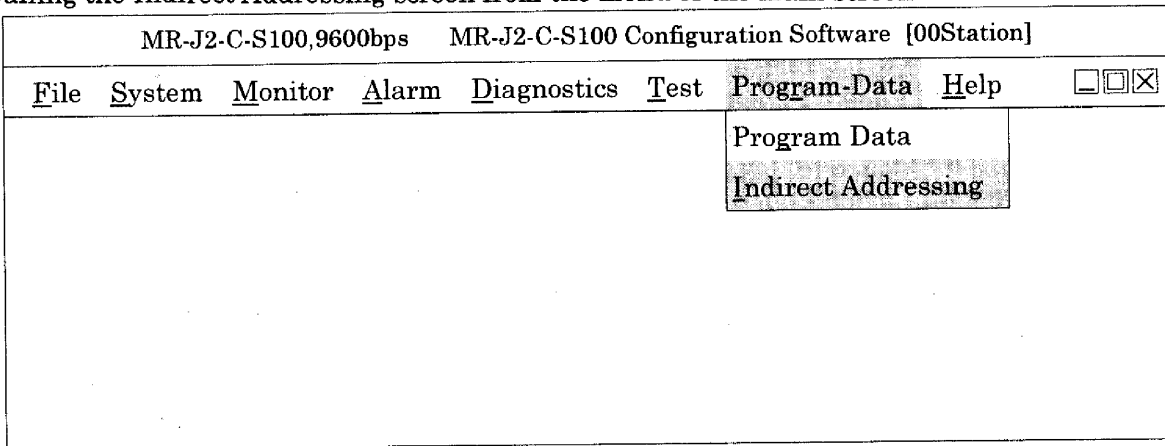


(12) Program test operation



(13) How to call the general-purpose register write screen

1) Calling the Indirect Addressing screen from the menu of the main screen



2) Indirect Addressing screen

Indirect Addressing

D1 : 50 D2 : 200

Register Writing Mode

R1 R2

1000 300000

RAM RAM

EEPROM EEPROM

Read All Write All Close

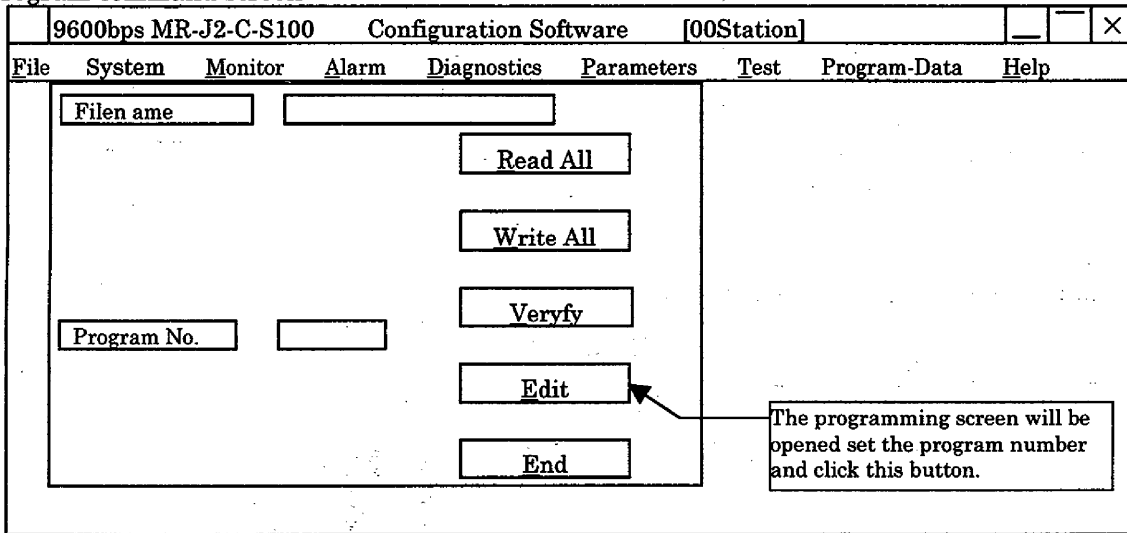
Data input area

- The Indirect Addressing screen is called from the menu.
- Press the Read All button to read the register data from the servo amplifier.
Commands used Rx ... [6D] [Register number]
 Dx ... [6E] [Register number]
- Set any value in the data input field. (Leave the field blank for default value setting)
- In the Register Writing Mode, set the write mode of register Rx. (The default setting is RAM write)
- Press the Write All button to write the data to the servo amplifier. (If all settings are blank, an error occurs.)
Commands used Rx ... [B9] [Register number]
 Dx ... [BA] [Register number]
- Press the Close button to close the Indirect Addressing screen.

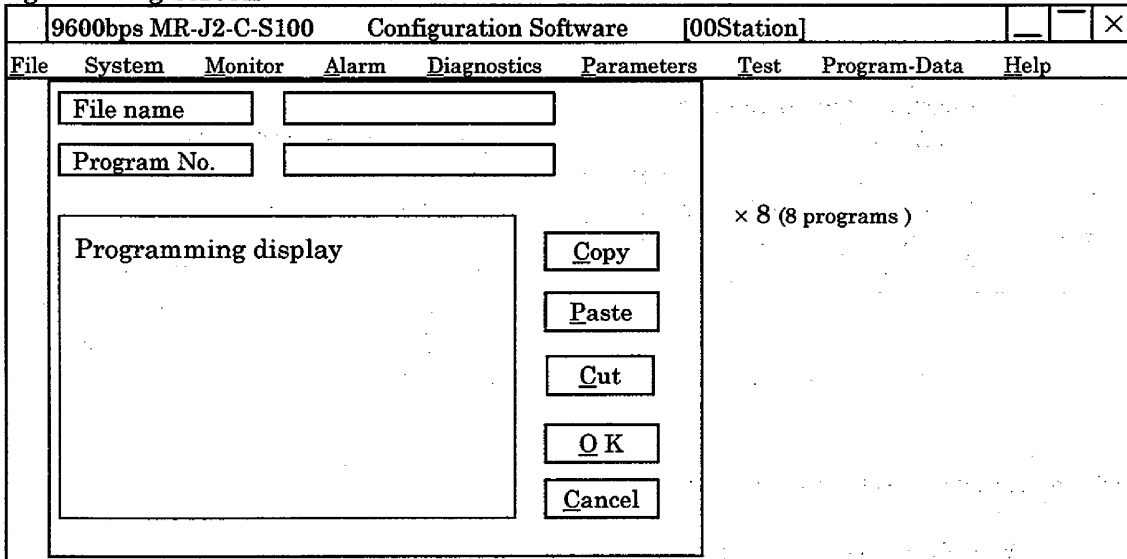
(14) Program data

Set to the program data

Program command screen

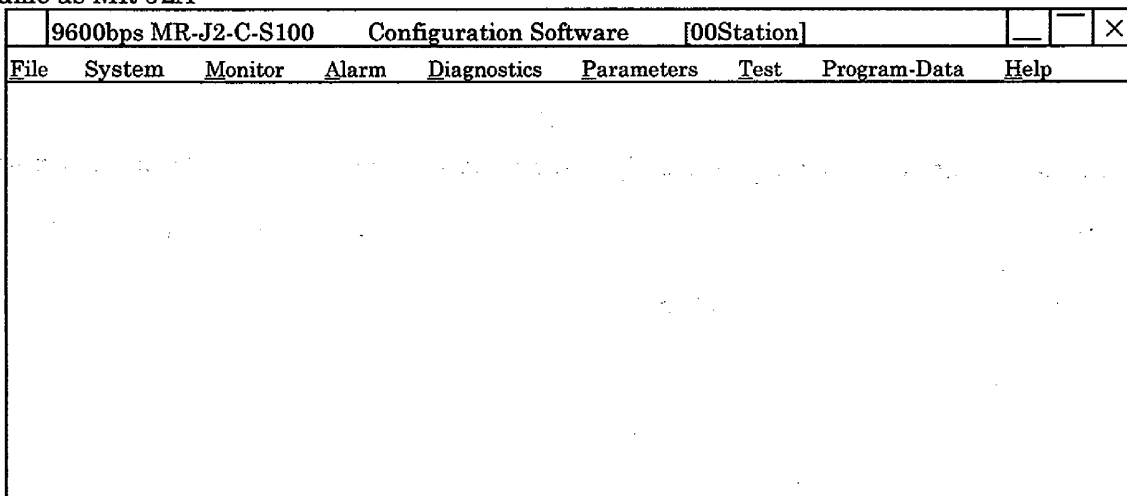


(15) Programming screen



(16) Help

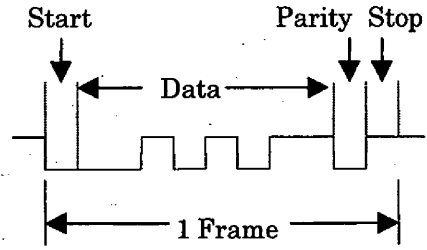
Same as MR-J2A



12. Serial communication (RS-232C / 485)

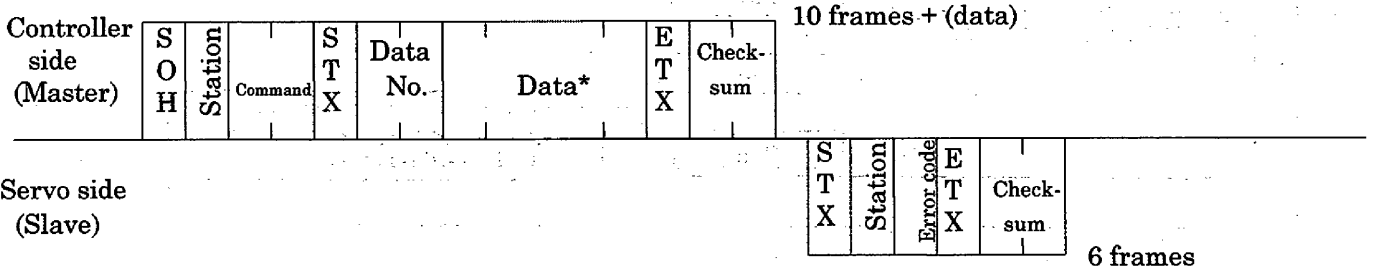
(1) Characteristics

- Baud-rate 4800/9600/19200 asynchronous
- Transfer code
 - Start bit 1bit
 - Data bit 8bit
 - Parity bit 1bit
 - Stop bit 1bit
- Transfer procedure Character method
- Half-duplex communication



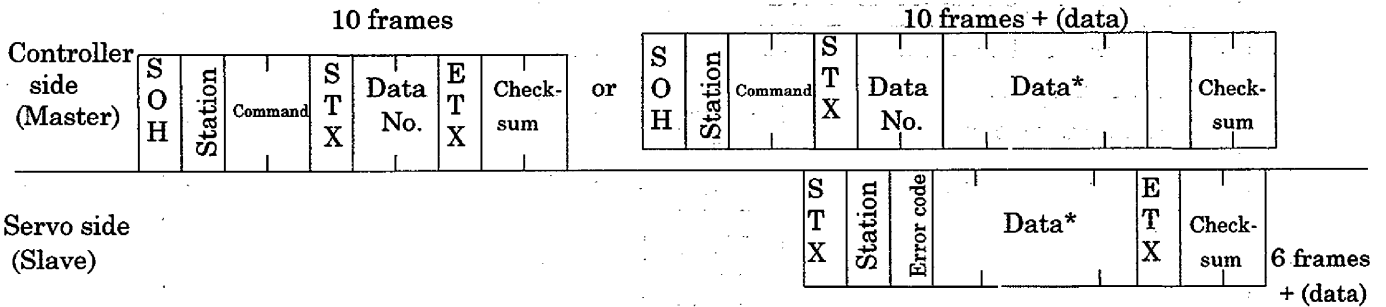
(2) Protocol format

1) When transmitting data from controller to servo

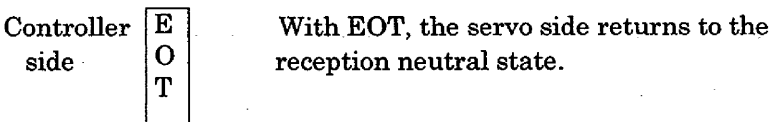


Positive response : Error code = A
 Negative response : Error code = other than A

2) When requesting data from controller to servo

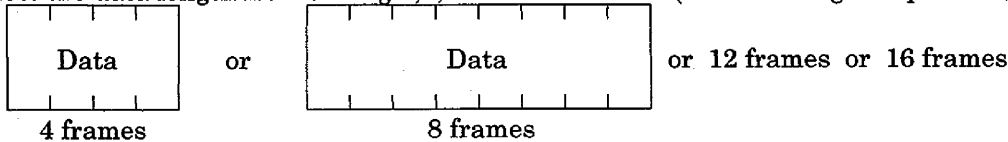


3) Recovery of communication state by time out.



Servo side

* : Data Select the data length from among 4,8,12 and 16 frames. (the data length depends on the command)



(3) Character codes used

1) Control code

Code name	Hexadecimal (ASCII code)	Contents	Conventional key operations at a personal computer or terminal.
SOH	01H	Start of head (communication start)	ctrl + A
STX	02H	Start of text (text start)	ctrl + B
ETX	03H	End of text (text end)	ctrl + C
EOT	04H	End of transmission(communication interruption)	ctrl + D

2) Data code

Use the JIS8 unit codes:

b ₈	0	0	0	0	0	0	0	0
b ₇	0	0	0	0	1	1	1	1
b ₆	0	0	1	1	0	0	1	1
b ₅	0	1	0	1	0	1	0	1

b ₈ b ₇ b ₆ b ₅	b ₄	b ₃	b ₂	b ₁	R/C	0	1	2	3	4	5	6	7
0000	0	0	0	0	0	NUL	DLE	Space	0	@	P	\	p
0001	0	0	0	1	1	SOH	DC ₁	!	1	A	Q	a	q
0010	0	0	1	0	2	STX	DC ₂	"	2	B	R	b	r
0011	0	0	1	1	3	ETX	DC ₃	#	3	C	S	c	s
0100	0	1	0	0	4			\$	4	D	T	d	t
0101	0	1	0	1	5			%	5	E	U	e	u
0110	0	1	1	0	6			&	6	F	V	f	v
0111	0	1	1	1	7			'	7	G	W	g	w
1000	1	0	0	0	8			(	8	H	X	h	x
1001	1	0	0	1	9			)	9	I	Y	i	y
1010	1	0	1	0	10			*	:	J	Z	j	z
1011	1	0	1	1	11			+	;	K	[	k	{
1100	1	1	0	0	12			,	<	L	¥	l	|
1101	1	1	0	1	13			-	=	M	]	m	}
1110	1	1	1	0	14			.	>	N	^	n	□
1111	1	1	1	1	15			/	?	O	_	o	DEL

3) Stations

There are 32 stations from station 0 to station 31. JIS8 unit code are used to designate the station.

Station	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
JIS8 code	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Station	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JIS8 code	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V

Example) For station number "0" (1st axis)
Transfer "00H" as a hexadecimal.

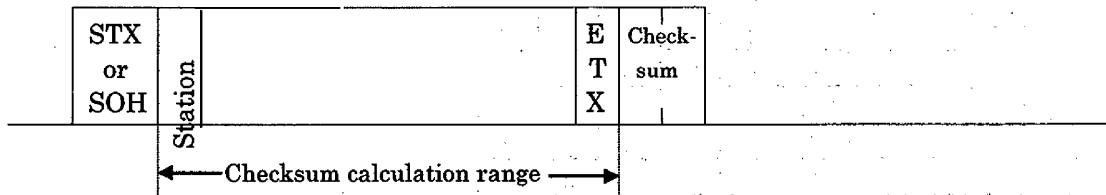
(4) Error code

The error code are used in the following cases, and are transmitted in 1-code lengths.
As the response for when transmitting data from the controller to the servo (slave station), the servo transmits an error code to the controller.

Error code		Error mane	Descriptions	Remarks
Servo normal	Servo alarm			
[A]	[a]	Normal operation	Data transmitted was processed properly.	Positive response
[B]	[b]	Parity error	Parity error occurred in the send data transmitted.	Negative response
[C]	[c]	Checksum error	Checksum error occurred in the send data transmitted.	
[D]	[d]	Character error	Character transmitted is not included in the specifications.	
[E]	[e]	Command error	Command transmitted is not included in the specifications.	
[F]	[f]	Data No. error	Data No. transmitted is not included in the specifications.	

(5) Checksum

Checksum calculation range



To find a checksum to be appended, the hexadecimal numbers of character codes between the one following the first control code and EXT are summed, and the two least significant digits of the checksum are converted into hexadecimal.

(Example)

S							E		
T	[0]	[A]	[1]	[2]	[5]	[F]	T	[5]	[2]
X							X		
	02H	30H	41H	31H	32H	35H	46H	03H	

$$30H + 41H + 31H + 32H + 35H + 46H + 03H = 152H$$

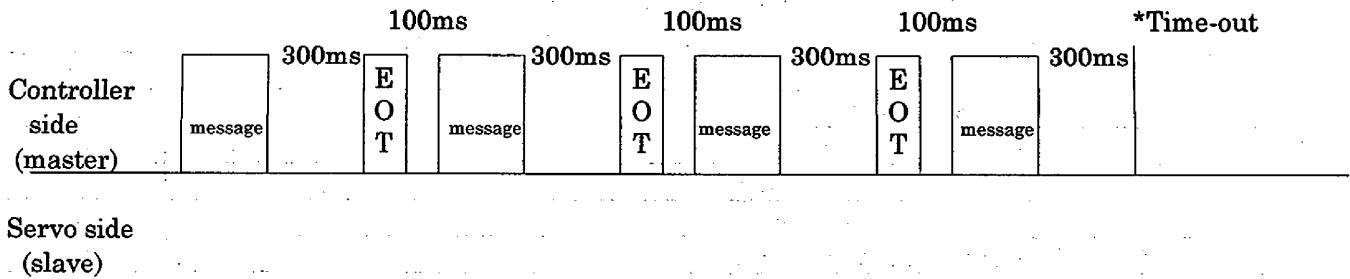
The last two digits, 52, are sent as ASCII code [5][2].

(6) Time-out processing's

If the servo (slave) dose not start the return operation (if STX is not received) after the communication process from the controller (master) is completed, EOT will be transmitted to the master after 300mses.

After waiting another 100msec, the statement will be transmitted again.

If there is no response from the slave even after the above operation has been repeated three times, time-out will apply. (communication error)

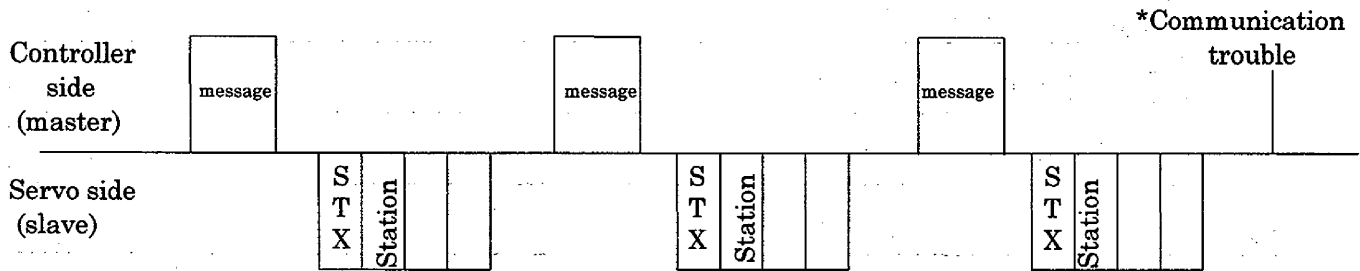


(7) Retry processing's

If an obstacle occurs in the communication between the controller and servo, the error code responded from the servo side will be a not-acknowledge code ([B]~[I], [b]~[I]).

At this time, the controller will transmit the statement that caused the obstacle again as the retry operation. (retry operation)

If the obstacle error code occurs three times or more in succession when the above operation is repeated, a communication error will occur.



If the controller detects an obstacle (check sum, parity, etc.) in the response data from the servo, the controller will transmit the statement that caused the obstacle again.

When the retry operation has been carried out three times, a communication error will occur.

(8) Communication commands

1) Read commands

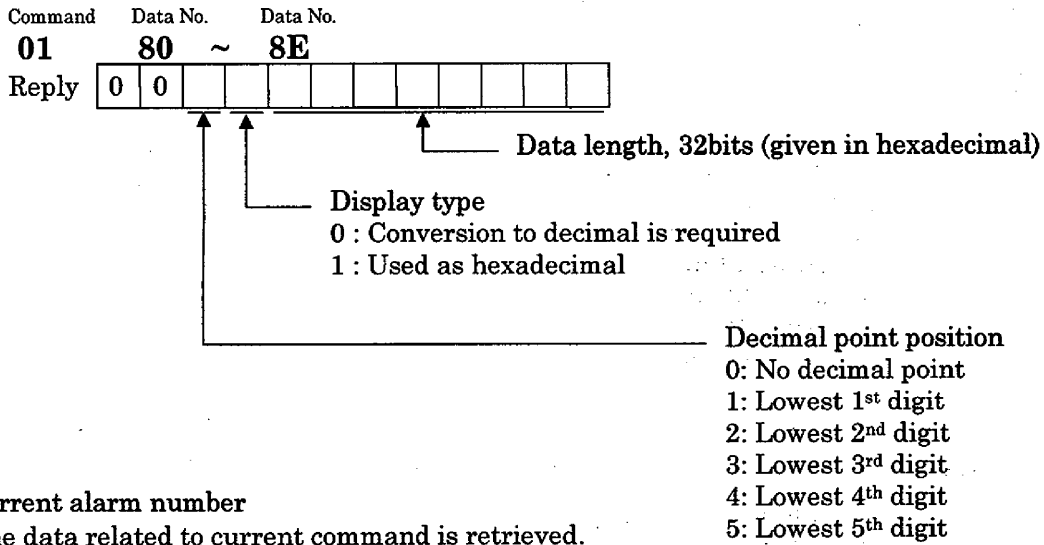
Command	Data No.	Descriptions	Frame length
01	80~8E	Data value and processing information of status display.	12
02	00	Current alarm number	4
02	90	Absolute position of motor end in pulse unit.	8
02	91	Absolute position in command unit.	8
05	00~35	Current value of corresponding parameters(the decimal numbers in data number correspond to the parameter numbers)	8
12	00	Input devices status	8
12	40	External input pin status	8
12	60	Communication-ON device	8
12	80	Output devices status	8
12	C0	External output pin status	8
33	10~15	Alarm number in alarm history	4
33	20~25	Time of alarm occurrence alarm history	8
35	80~8E	Data value an processing information of status display at alarm occurrence.	12
68	00~3F	Program data	8
69	Command number	Minimum value of command argument	8
6A	Command number	Maximum value of command argument	8
6D	Register number	Register (Rx) amount	8
6E	Register number	Register (Dx) amount	8

2) Write command

Command	Data No.	Descriptions	Setting range	Frame length
81	00	Status display data clear	1EA5	4
82	00	Alarm reset	1EA5	4
82	20	Alarm history clear	1EA5	4
84	00~35	Write of corresponding parameters (the decimal number in data number correspond to the parameter number)	Aries according to parameter No.	8
92	60	Communication device input signal		8
B8	00~3F	Program data		8
B9	Register number	Register (Rx) amount		8
BA	Register number	Register (Dx) amount		8

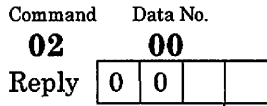
(9) Command

1) Status display read for status display data, its data value and data processing information are return when the data number is transmitted.



2) Current alarm number

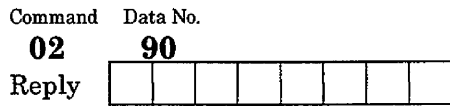
The data related to current command is retrieved.



The alarm number is transmitted as a decimal notation.
 (Example)
 For A.32 : data 0032
 For A.50 : data 0050
 For A. : data 00ff (no alarm)

3) Motor end pulse unit absolute position

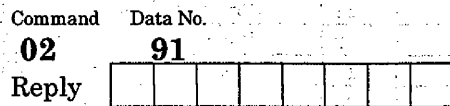
The absolute position is read with the motor end pulse unit.



The absolute position is transmitted with the motor end pulse unit as a hexadecimal notation.
 Conversion from hexadecimal to decimal is required.
 (Example)
 Data 000186a0 will be 100000pulses as the motor end pulse unit.

4) Command unit absolute position.

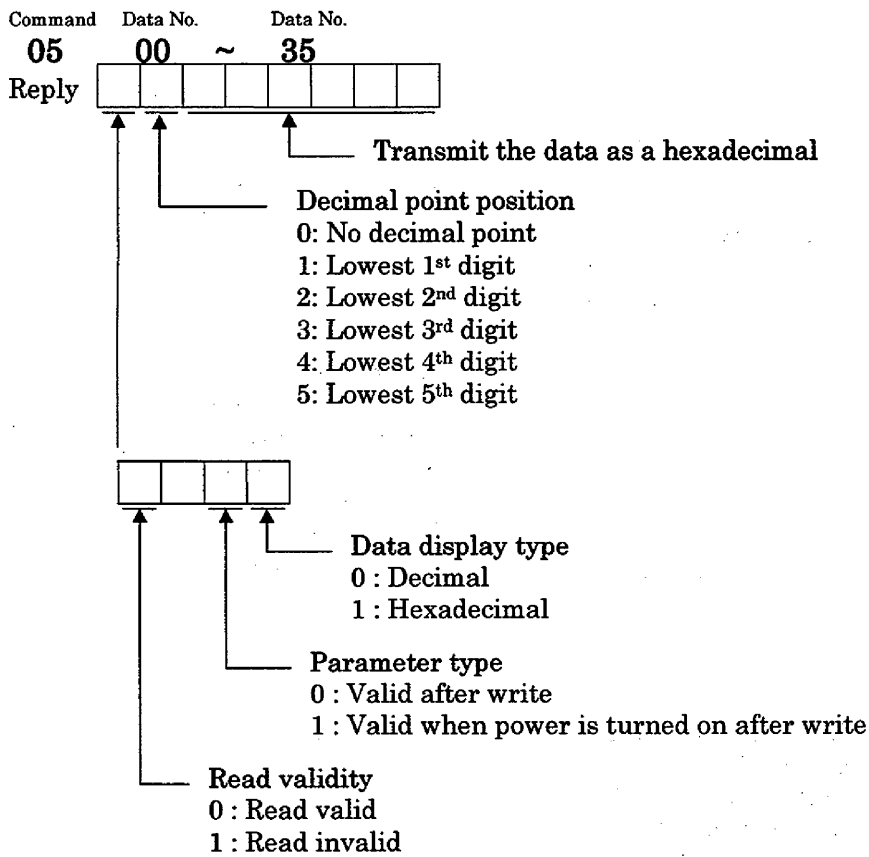
Read the absolute position with the command unit.



The absolute unit is transmitted with the command unit as a hexadecimal notation.
 Conversion from hexadecimal to decimal is required.
 (Example)
 Data 000186A0 will be 100000pulses as the motor end pulse unit.

5) Parameter read

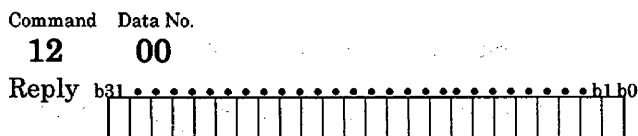
Used to read the servo amplifier's parameter setting value.



Note) The validity information will change according to the setting of the parameter 19(BLK) parameter write prohibit setting(reference range). If reading is invalidated, the parameter data section will be ignored, and will be processed as if it was not readable.

6) Input devices status read

The status of the input devices are read.



Command for each bit is sent to the slave in hexadecimal
 0 : OFF 1 : ON

bit	Signals
0	Servo on (SON)
1	Forward stroke end (LSP)
2	Reverse stroke end (LSN)
3	External torque limit selection (TL)
4	Internal torque limit selection (TL2)
5	Proportional control (PC)
6	Rest (RES)
7	
8	
9	

bit	Signals
10	
11	Forward start (ST1)
12	Reverse start (ST2)
13	
14	
15	
16	Emergency stop (EMG)
17	Automatic/Manual (MDO)
18	Proximity (DOG)
19	Program No. selection 1 (PS0)

bit	Signals
20	Program No. selection 2 (PS1)
21	Program No. selection 3 (PS2)
22	Program No. selection 4 (PS3)
23	Override selection (OVR)
24	Temporary stop/Restart (STP)
25	Manual pulse generator multiplier 1(TP0)
26	Manual pulse generator multiplier 2(TP1)
27	Program input 1 (PI1)
28	Program input 2 (PI2)
29	Program input 3 (PI3)

7) External input pins read

The status of the external input pins are read.

Command Data No.
12 **40**



Command for each bit is sent to the slave in hexadecimal.
0 : OFF **1 : ON**

bit	External input pin	bit	External input pin
0	CN1B-16	5	CN1A-8
1	CN1B-17	6	CN1B-7
2	CN1B-15	7	CN1B-8
3	CN1B-5	8	CN1B-9
4	CN1B-14	9	CN1A-19

8) Communication-ON device read

The status of the communication-on devices are read.

Command Data No.
12 **60**



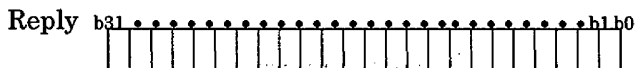
Command for each bit is sent to the slave in hexadecimal.
0 : OFF **1 : ON**

bit	Signals	bit	Signals	bit	Signals
0	Servo on (SON)	10		20	Program No. selection 2 (PS1)
1	Forward stroke end (LSP)	11	Forward start (ST1)	21	Program No. selection 3 (PS2)
2	Reverse stroke end (LSN)	12	Reverse start (ST2)	22	Program No. selection 4 (PS3)
3	External torque limit selection (TL)	13		23	Override selection (OVR)
4	Internal torque limit selection (TL2)	14		24	Temporary stop/Restart (STP)
5	Proportional control (PC)	15		25	Manual pulse generator multiplier 1(TP0)
6	Rest (RES)	16	Emergency stop (EMG)	26	Manual pulse generator multiplier 2(TP1)
7		17	Automatic/Manual (MDO)	27	Program input 1 (PI1)
8		18	Proximity (DOG)	28	Program input 2 (PI2)
9		19	Program No. selection 1 (PS0)	29	Program input 3 (PI3)

9) Output devices status read

The status of the output device status are read.

Command Data No.
12 **80**



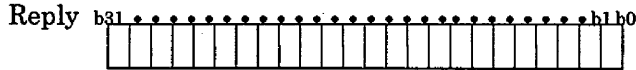
Command for each bit is sent to the slave in hexadecimal.
0 : OFF **1 : ON**

bit	Signals	bit	Signals	bit	Signals
0	Ready (RD)	9		18	Position range (POT)
1		10	Electromagnetic brake (MBR)	19	Temporary stopping (PUS)
2		11	Dynamic brake (DRB)	20	Program output 1 (OUT1)
3	Torque limit in effect (TLC)	12		21	Program output 2 (OUT2)
4		13		22	Program output 3 (OUT3)
5		14		23	SYNC synchronous (SOUT)
6		15	Battery warning (BWNG)	24	Movement complete (PED)
7	Warning output (WNG)	16		25	
8	Alarm (ALM)	17	Z-phase (ZP)	26	

10) External output pins read

The status of the external output pins are read.

Command Data No.
12 **C0**



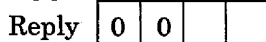
Command for each bit is sent to the slave in hexadecimal.
0 : OFF **1 : ON**

bit	External output pins	bit	External output pins
0	CN1A-19	5	CN1B-18
1	CN1A-18	6	
2	CN1B-19		
3	CN1B-6		
4	CN1B-4		

11) Alarm number in alarm history

The history of alarm which occurred in the past are read.

Command Data No. Data No.
33 **10** ~ **15**

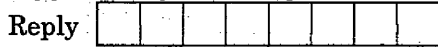


The alarm number is transferred in decimal.
 (Example)
 Data 0032 for A.32
 Data 0052 for A.50
 Data 00FF for A. (None alarm)

12) Alarm occurrence time in alarm history.

The alarm occurrence from time in alarm history which occurred in the past are read.

Command Data No. Data No.
33 **20** ~ **25**



The time is transmitted as a hexadecimal notation.
 Conversion from hexadecimal to decimal is required.
 (Example)
 Data 01F5 indicates that the alarm occurred 501 hours after operation was started.

13) Reading of status display when alarm occurs.

The status display data is read out when an alarm occurs.

The status display data transmits the data value and data machining information when the data number is transmitted.

Command Data No. Data No.
35 **80** ~ **8E**



32-bit length data (hexadecimal notation)

Display type
 0: Conversion to decimal is required
 1: Use as hexadecimal

Decimal point position
 0: No decimal point
 1: Lowest 1st digit
 2: Lowest 2nd digit
 3: Lowest 3rd digit
 4: Lowest 4th digit
 5: Lowest 5th digit

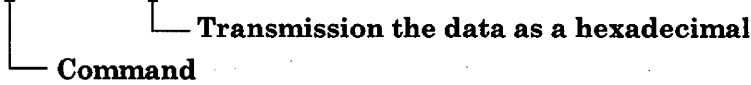
14) Program data read

Used to read the program data.

Command Data No. Data No.
68 **00** ~ **3F**

Reply

--	--	--	--	--	--	--	--



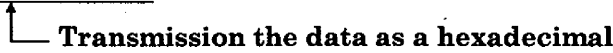
15) General-purpose register read (Rx)

Used to read the general-purpose register (Rx).

Command Data No. Data No.
6D **01** ~ **02**

Reply

--	--	--	--	--	--	--	--



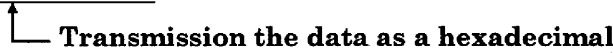
16) General-purpose register read (Dx)

Used to read the general-purpose register (Dx).

Command Data No. Data No.
6E **01** ~ **02**

Reply

--	--	--	--	--	--	--	--



17) Status display data clear

The cumulated status display feedback pulse and cumulated command pulse data is cleared.

Command Data No.
81 **00**

Transmission data

1	E	A	5
---	---	---	---

18) Current alarm reset

The servo amplifier alarm is reset in the same manner as when the terminal RES is input.

Command Data No.
82 **00**

Transmission data

1	E	A	5
---	---	---	---

19) Alarm history clear

The alarm history is cleared.

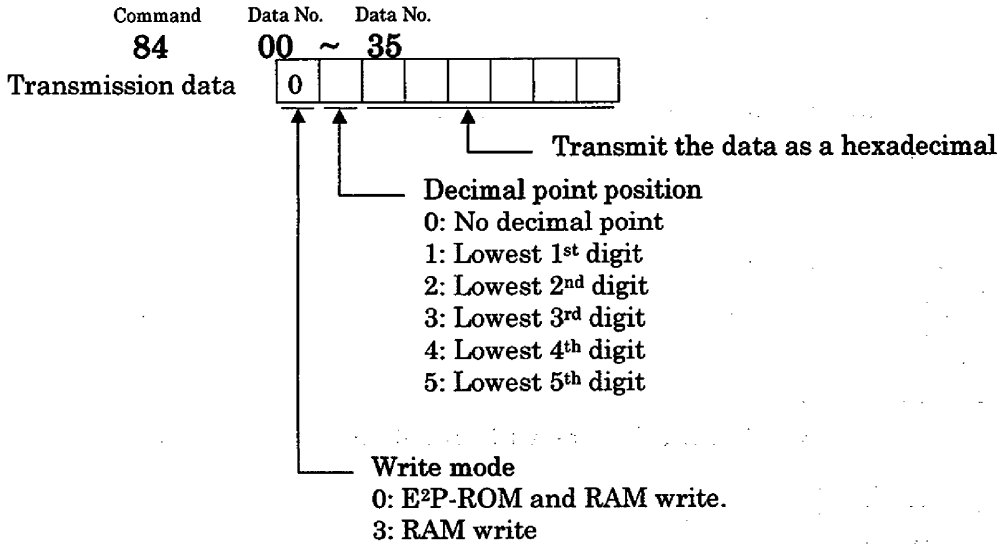
Command Data No.
82 **20**

Transmission data

1	E	A	5
---	---	---	---

20) Parameter write

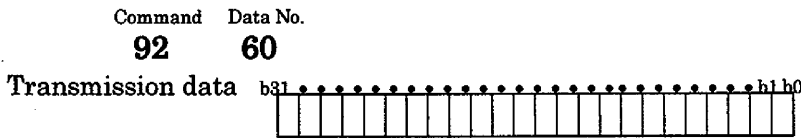
Used to write the parameter setting value in the servo amplifier.
Do not write a value exceeding the setting range.



If the parameters are changed many times with the communication, it must be set "3" and changing the parameters to only RAM data. Otherwise, E²P-ROM error occurrence.

21) Communication-on input device

The signals can be turned ON / OFF forcible.
It will be "OR logic" with the external input signal.



Command for each bit is sent to the slave in hexadecimal.

0 : OFF 1 : ON

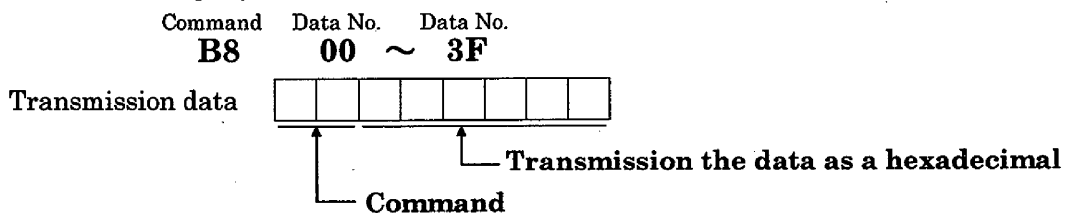
bit	Signals
0	Servo on (SON)
1	Forward stroke end (LSP)
2	Reverse stroke end (LSN)
3	External torque limit selection (TL)
4	Internal torque limit selection (TL2)
5	Proportional control (PC)
6	Rest (RES)
7	
8	
9	

bit	Signals
10	
11	Forward start (ST1)
12	Reverse start (ST2)
13	
14	
15	
16	Emergency stop (EMG)
17	Automatic/Manual (MDO)
18	Proximity (DOG)
19	Program No. selection 1 (PS0)

bit	Signals
20	Program No. selection 2 (PS1)
21	Program No. selection 3 (PS2)
22	
23	Override selection (OVR)
24	Temporary stop/Restart (STP)
25	Manual pulse generator multiplier 1(TP0)
26	Manual pulse generator multiplier 2(TP1)
27	Program input 1 (PI1)
28	Program input 2 (PI2)
29	Program input 3 (PI3)

22) Program data write

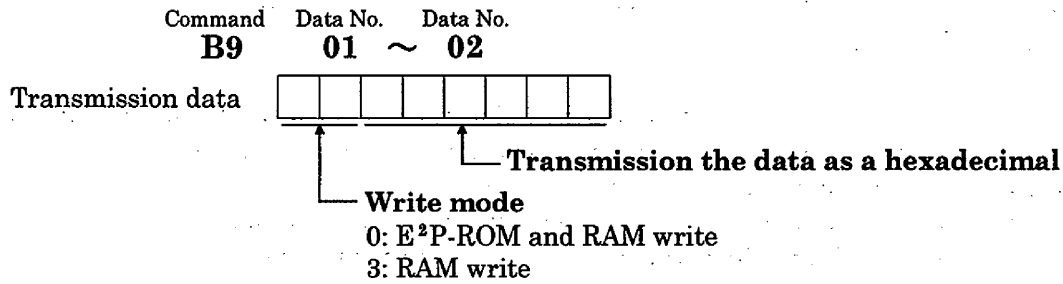
Used to write the program data.



23) General-purpose register write (Rx)

Used to write the general-purpose register (Rx) setting to the servo amplifier.

The value written should not exceed the permissible setting range of the command argument with which the general-purpose register is used.

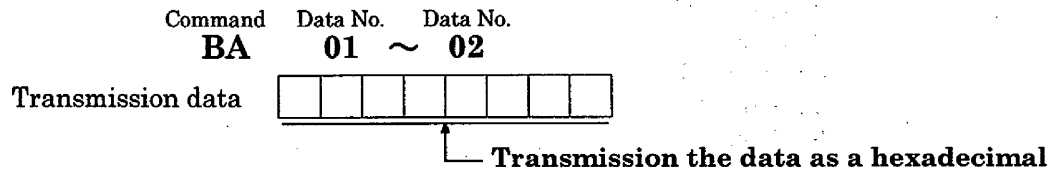


When the general-purpose register (Rx) value is changed frequently through communication, set this value to "3" and change only the data on RAM. Frequent changing of the E²P-ROM value will result in an E²P-ROM fault due to excess of the E²P-ROM write times.

24) General-purpose register write (Dx)

Used to write the general-purpose register (Dx) setting to the servo amplifier.

The value written should not exceed the permissible setting range of the command argument with which the general-purpose register is used.



(10) Group refer command

Set to the group for "n"-axis, the same command can be transferred to the set group.

- Set to the group for the servo amplifiers which is started at same time.
- Set to the response command permission for the group setting a servo amplifier.
- Communicated to the group.

Note) - The group setting and the response command permission must be set with RS485 communication.

- The response command permission must be the group setting a servo amplifier.
- If set to more than 1 servo amplifier, an error is occurred.
- When refer to "*" at the station number, all connecting amplifiers are valid.
- In this case, the responsible amplifier will be set "0" at the station number.

1) Group reference setting

Used to the group reference setting write to the amplifier.

Command Data No.

1F 00

Replay

0		0	
---	--	---	--

- Refer to group
- 0: Group refers is invalid
 - 1 : Group "a"
 - 2 : Group "b"
 - 3 : Group "c"
 - 4 : Group "d"
 - 5 : Group "e"
 - 6 : Group "f"

- Response command permission
- 0 : Response prohibition
 - 1 : Response permission

2) Group reference read

Used to the group reference setting read to the amplifier.

Command Data No.

9F 00

Transmission data

0		0	
---	--	---	--

- Refer to group
- 0: Group refers is invalid
 - 1 : Group "a"
 - 2 : Group "b"
 - 3 : Group "c"
 - 4 : Group "d"
 - 5 : Group "e"
 - 6 : Group "f"

- Response command permission
- 0 : Response prohibition
 - 1 : Response permission

13. Troubleshooting

(1) Alarm and warning list

	Alarm No.	Alarm / Warning	Reset
Alarm	A. 10	Undervoltage	TR C
	A. 11	Board error 1	P
	A.12	Memory error 1	P
	A. 13	Clock error	P
	A. 15	Memory error 2	P
	A. 16	Encoder error 1	P
	A. 17	Board error 2	P
	A. 18	Board error 3	P
	A. 20	Encoder error 2	P
	A. 24	Motor output ground fault	TR C
	A. 25	Absolute position erase	P
	A. 30	Regenerative error	TR C
	A. 31	Over speed	TR C
	A. 32	Over current	TR C
	A. 33	Over voltage	TR C
	A. 35	Command pulse error	TR C
	A. 37	Parameter error	C
	A. 39	Program error	P
	A. 46	Servo motor overheat	TR C
	A. 50	Overload 1	TR C
	A. 51	Overload 2	TR C
	A. 52	Error excessive	TR C
	A. 63	Zero return incomplete	TR C
	A. 64	Zero setting error	TR C
	A. 8A	Communication time-out error	P
	A. 8E	RS485 (232C) communication error	TR C
	A. 92	Open battery cable warning	P
A. 98	Software limit warning	P	
A. 9F	Battery warning	P	
Warning	A. E0	Excessive regenerative load warning	---
	A. E1	Overload warning	---
	A. E3	Absolute position counter warning	---
	A. E6	Servo emergency stop	---
	A. E9	Main circuit off warning	---
	8888	Watchdog	P

TR : Reset by reset signal C : Reset by controller P : Reset by power supply off-on is necessary

Note) When any of the following alarms has occurred, always remove its cause and allow about 30minits for cooling before resuming operation. If operation is repeated by switching control circuit power off, then on to reset the alarm, the servo amplifier, servo motor and regenerative brake option may become faulty.

- Regenerative error (A. 30)
- Overload 1 (A. 50)
- Overload 2 (A. 51)

(2) Detail of alarms and warnings are same as the standard MR-J2-C series specification.

REVISIONS

*The manual number is given on the bottom right of the front cover.

Print Data	*Manual Number	Revision	
	SH(NA)3197-A	First edition	
July, 1999	SH(NA)3197-B	5 (2) 7)	Addition of indirect addressing
		10 (1)	Addition of parameter No. 57 *SYC Selected to program input polarity
		10 (2)	Addition of parameter No. 57 *SYC Selected to program input polarity
		11 (13)	Addition of how to call the general-purpose register write screen
		12 (8) 1)	Addition of commands 68, 69, 6A, 6D, 6E
		12 (8) 2)	Addition of commands B8, B9, BA
		12 (9) 14)	Addition of program data read
		12 (9) 15)	Addition of general-purpose register read (Rx)
		12 (9) 16)	Addition of general-purpose register read (Dx)
		12 (9) 22)	Addition of program data write
		12 (9) 23)	Addition of general-purpose register write (Rx)
		12 (9) 24)	Addition of general-purpose register write (Dx)