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D120 Stepping Motor controller

Instruction manual

V e r 2 . 0

Suruga Seiki. Co. Ltd

O S T Division

I N D E X

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Thank you for purchasing our products.

For proper use, please read the instruction manual before usage.

After reading, keep it at the place where it could be found all the time.

1 . introduction

1. 1 main features

D 1 2 0 series stepping motor controller driver uses 5-phase built-in pentagon drivers with control axes number from 1-6. Drive axes are interchangeable (simultaneous drive not possible) . When connected to an external expansion driver pack of the D 1 3 Series, control is possible from up to a maximum of 1 2 axes. This hi-cost performing controller is designed for external control and is without an operating panel.

Connecting the D 7 0 0 · D 9 0 0 handy terminal to let you operate motors from the palm of your hand.

All settings are backed up in memory. Controllers have a switch-able display for check settings. In D 1 2 0, built-in driver uses normal full-half step switch-able type and D 1 2 0MS uses Built-in micro-step driver (Max. 250 div., 16 steps) to execute low vibration · precision position Decision.

Optionally, selection of built-in driver for each axis is possible.

There are five types of built-in drivers as follows.

- A type driver : 0. 7 5 A / phase micro-step driver
- B type driver : 0. 7 5 A / phase normal type (full / half step switch-able) driver
- D type driver : 0. 7 5 A / phase normal type driver with D C 2 4 V output for electromagnetic brake
- E type driver : 0. 7 5 A / phase micro-step driver with D C 2 4 V output for electromagnetic brake
- F type driver : 1. 4 A / phase micro-step driver with D C 2 4 V output for electromagnetic brake

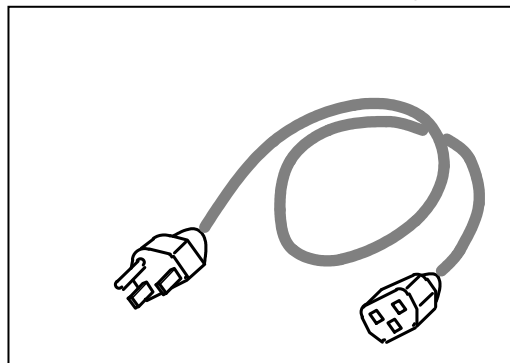
※ D C 2 4 V output for electromagnetic brake cancel provided electromagnetic brake when the controller is applied by the power supply.

By the case of F type driver, only 1 axis connected with the controller is possible.

1. 2 before the usage

<attachment>

Confirm the following attachment to the product.

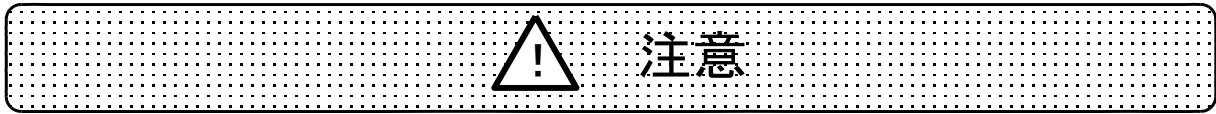


Power supply cable (1 piece)

1. 3 for the safety of use

read the following cautions before usage.

⊘ Mark means prohibition.



Please observe the following attentions. If not, hurt or the physical damage might happen.

• Wiring

D 1 2 0 stepping motor controller is equipped with a range of connectors for connection to external equipment. Connection to these connectors should be made before power is turn on.

For information, each individual connectors I/O circuitry is explained in appropriate places of the instruction manual. So check to be sure that wiring is correct before use.

※Control for products except motorized stage,holder of our company is prohibited.

• AC plug

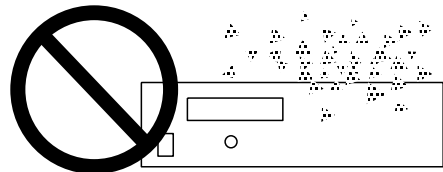
D 1 2 0stepping motor controller use a 3-prong(grounded) AC plug.

Be sure to plug it into a wall outlet outfitted with a grounding electrode(compliant with Class-3 grounding)。

• Use environment

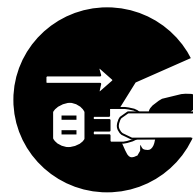
Avoid use in hostile environments such as the following.

- in a place in which air is thick lint or dust(in particular,are-borne metal particulates)
- in direct or strong sunlight
- near an open flame
- in a place of heavy vibration
- in a place where water or oil splashes
- unstable place with a tilt



• Maintenance and storage

Turn off the power supply and store the unit in a safe Place when not using a long period to prevent fire disaster Or electric shock.



• about the power supply

This product is for Japan domestic uses so do not connect it with outlet except AC 100V.

• disassemblment/ remodeling

disassemblment/ remodeling and improper repair is prohibited for these are dangerous for the reason of electric shock

If abnormal, contact sales group of OST division of our company.





注意

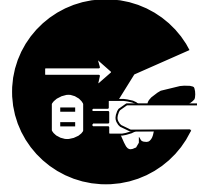
- the demand for repair

On the following occasions, turn off the power supply and plug off.
Then ask sales group of OST division of our company to repair.

If used continuously, it becomes the reason of prevent fire disaster,
electric shock or hurt.

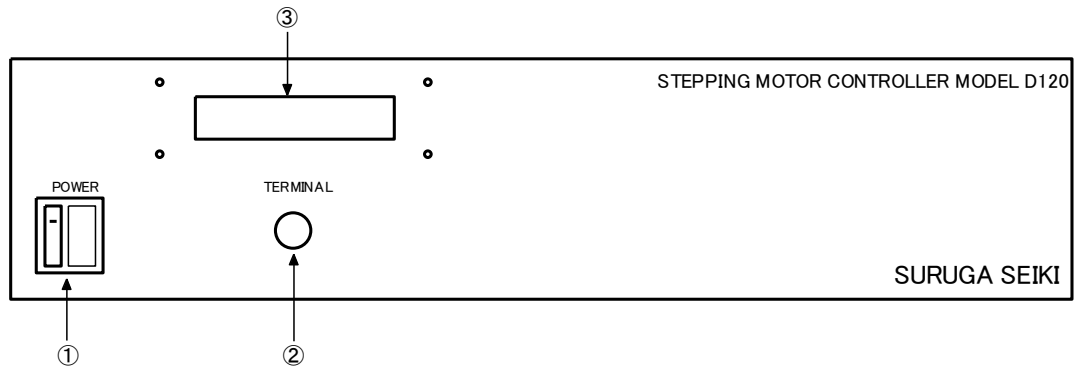
- abnormal sound or stinky, smoke occurs
- electric cord is hurt
- spill on the unit or extraneous substance enters the body.
- unit is dropped and cabinet is hurt.

※For inquires, please turn toP. 83。



1. 4 part names and functions

1. 4. 1 front panel



① POWER

Turns power to the controller ON-OFF (Fuse holder is built-in).

(Method for fuse change, refer to 2. 15. 3 fuse change)

When turned on, SW operation part lights in orange color.

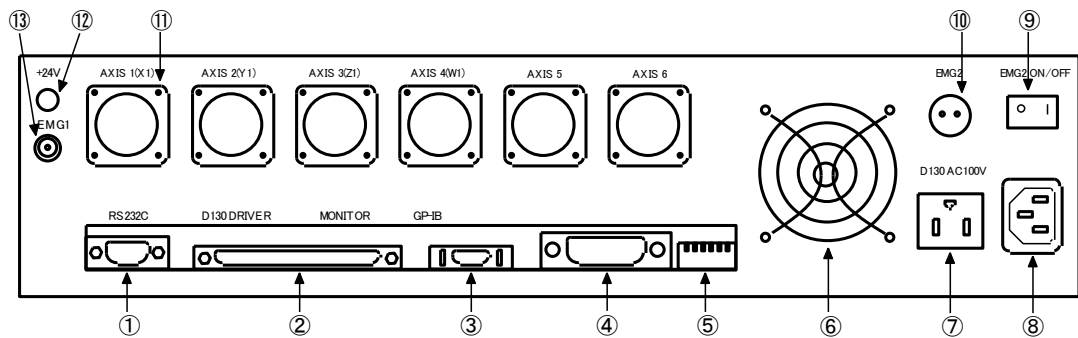
② TERMINAL

Connector port for the handy terminal. When plugged in here by the connector of handy terminal D700 or D900, the handy terminal power originates from controller and be used to operate equipment.

③ DISPLAY

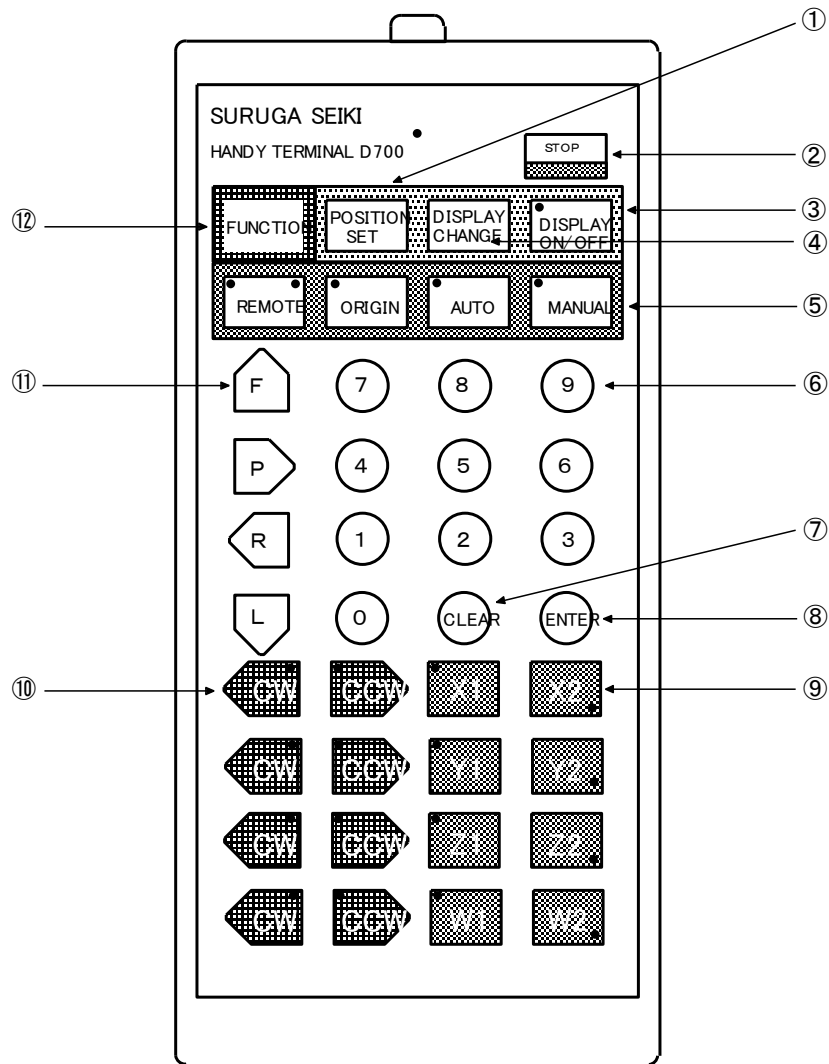
2 line 20-character fluorescent display. 4 types of displays are possible.

1. 4. 2 rear panel



- ① RS 2 3 2 C connector
RS 2 3 2 C interface port.
- ② D 1 3 0 DRIVER
Connector for connecting D130 External Expansion Driver Pack.
- ③ MON I T O R connector
Output driving pulse · axis selection signal and action signal.
- ④ G P – I B connector
G P – I B interface port.
- ⑤ DIP SW
setting of command mode when in R E M O T E M O D E, set the G P – I B addresses.
(refer to 2. 12. 4. Setting of DIP SW)
- ⑥ F A N motor
Fan motor for air-cooling in side panel.
- ⑦ D 1 3 0 O U T L E T
Outlet for connecting extended driver pack D130, providing AC 100V power supply.
attention : **do not connect with equipment except D 1 3 0**
- ⑧ N O I S E F I L T E R I N L E T
Noise filter for A C 1 0 0 V 5 0 / 6 0 H z power supply. (Inlet type)
- ⑨ E M G 2 O N / O F F S W
Switchover valid/invalid of the external input control for EMG2 connector.
- ⑩ E M G 2 connector
Power ON/OFF by external control input.
- ⑪ stage connection connector
connector for A X I S 1 ~ A X I S 6, using the attached cables of motorized stage to connect the equipment with the motorized stage.
- ⑫ + 2 4 V O U T P U T connector
output + 2 4 V to cancel electric-magnet break.
attention : do not connect with load above 5 0 0 m A.
- ⑬ E M G 1 connector
Motors will stops by mechanical limit of all axes and directions by external input.

1. 4. 3 handy terminal D700 (option)



①Position set key

Used to arbitrarily set axis position in the LOCAL mode.

②STOP

Emergency stop key, effective in all modes.

③Display ON/OFF key

Effective in all modes, switches the display change.
When display OFF, LED lights.

④Display change key

Effective in all modes, switches the display screen.

⑤Mode switch key

Effective in all modes for mode switch. Under selection, LED lights.
Pushed under action, switch to emergence stop mode for all axes.

⑥Ten key

Effective in the LOCAL mode, used as parameter setting • memory SW setting numeric Value setting input key.

⑦Clear key

Clears input miss of parameter setting・memory setting in the LOCAL modes.

⑧ Enter key

Effective in the LOCAL modes, used as parameter setting・memory SW setting Registration key.

⑨ Axis specify key

Effective in the LOCAL modes, specify the axis of the parameter setting・memory SW Setting. LED of the selected axis lights.

⑩ CW・CCW key

Effective in the LOCAL modes, start SW towards CW・CCW direction. Under action, LED of the movement direction lights.

⑪ F key・cursor

Effective in the LOCAL modes, used to set speed(F), pulse(P), acceleration and deceleration(R), start speed(L). when function key is held, it becomes cursor.

⑫ Function key

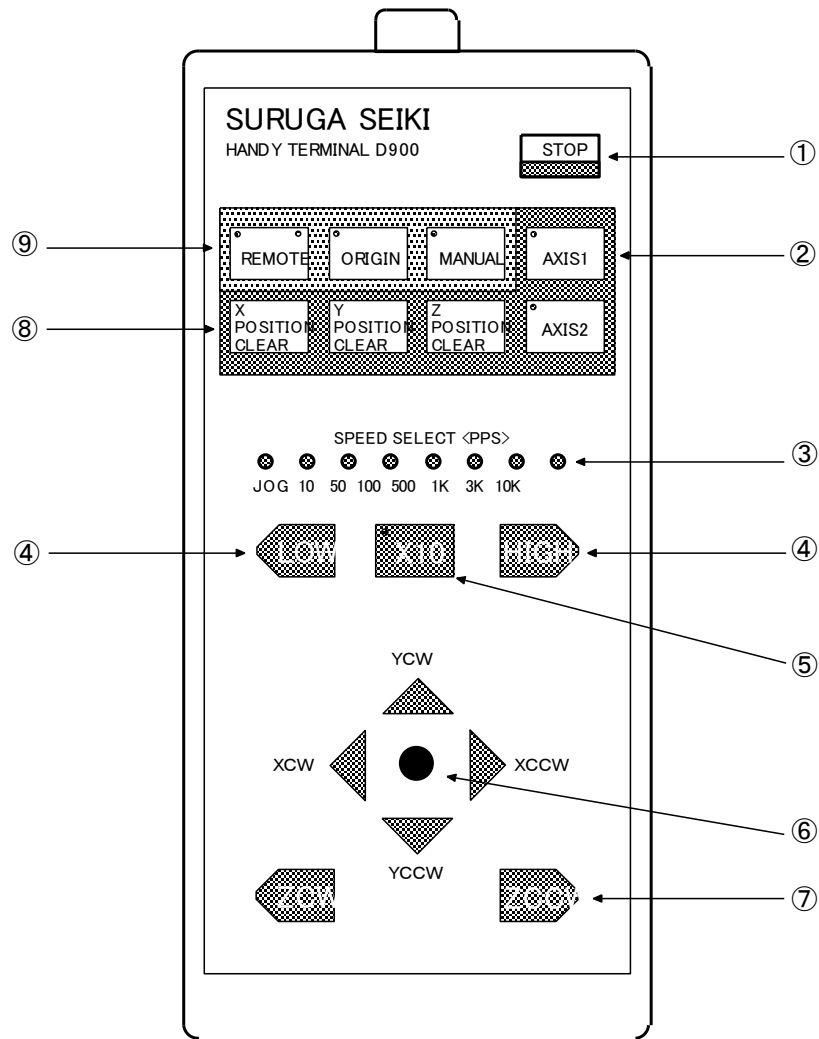
When function key is continuously pushed and ten-key is pushed, memory SW is read out, when function key is held, push the F key then it becomes cursor when the content of memory SW could be changed.

【axis selection operation by handy terminal D700】

Selection axis	Key operation	Display
A 1	X 1 pushed	X 1 upper-left LED lights
A 2	Y 1 pushed	Y 1 upper-left LED lights
A 3	Z 1 pushed	Z 1 upper-left LED lights
A 4	W 1 pushed	W 1 upper-left LED lights
A 5	FUNCTION is held, push X 1 or X 2	X 1 upper-left X 2 upper-right LED lights
A 6	FUNCTION is held, push Y 1 or Y 2	Y 1 upper-left Y 2 upper-right LED lights
A 7	X 2 pushed	X 2 upper-left LED lights
A 8	Y 2 pushed	Y 2 upper-left LED lights
A 9	Z 2 pushed	Z 2 upper-left LED lights
A 1 0	W 2 pushed	W 2 upper-left LED lights
A 1 1	FUNCTION is held, push Z 1 or Z 2	Z 1 upper-left Z 2 upper-right LED lights
A 1 2	FUNCTION is held, push W 1 or W 2	W 1 upper-left W 2 upper-right LED lights

※When LED of the axis specify key lights, CW・CCW which are on the left side become effective.

1. 4. 4 Joystick terminal D 9 0 0 (option)



① STOP

Emergency stop key, effective in all modes.

② AXIS key

When AXIS 1 key selected, select D 1 2 0のAXIS 1 as axis and AXIS 2 as Y axis, をY軸に、AXIS 3 as Z axis; when AXIS 2 key selected, select extended driver D 1 3 0's AXIS 7 as

X axis, AXIS 8 as Y axis and AXIS 9 as Z axis.

③ Driving speed selection LED

Display the speed selected by LOW · HIGH key.

④ LOW · HIGH key

Effective in the LOCAL modes. select driving speed of D 9 0 0.

⑤ Tenfold key

Effective in the LOCAL modes. tenfold driving speed of D 9 0 0 and LED lights.

⑥ Joystick

Effective in the LOCAL modes. Start SW in CW · CCW direction of X/Y axis.

⑦ ZCW · ZCCW key

Effective in the LOCAL modes. Start SW in CW · CCW direction of Z axis.

⑧ Position clear key

Effective in the LOCAL modes. Clear the current position of each axis to zero.

⑨ Mode switch key

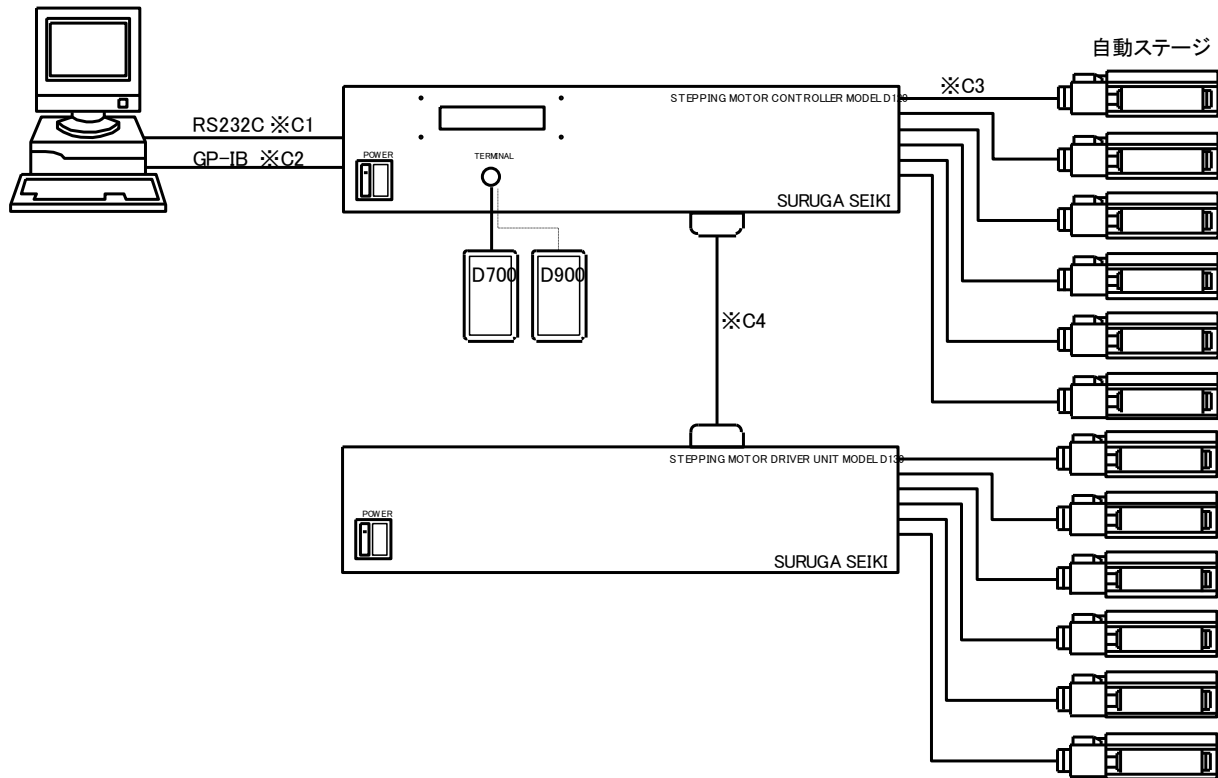
Effective in all modes, used for mode switch. Under selection, LED lights.

When pushed under action, execute emergence stop of all axes and switch modes.

2. Operation method

2.1 D120 system configuration (interfacing to external devices)

【position decision configuration diagram】



※C1・・・RS232Cケーブル (sell separately)

Ask for D100-R25-2・D100-R9-2。

※C2・・・GP-IBケーブル (sell separately)

Ask for D70-G2。

※C3・・・standard cable (when our motorized stage purchased, attached)

use D70-1・D70-2。

※C4・・・extended cable (when extended driver pack D130 purchased, attached)

use KB-130。

2. 1. 1 Connection with motorized stage

Plug pin type connector of attached standard cable into A X I S 1 ~ A X I S 6 stage connector at the rear panel of D 1 2 0 controller, plug socket side connector of the standard cable into motorized stage.

Attention:

Before the connection with the motorized stage, confirm that D120 controller is shut off with the peripheral device. When the power supply is on, the assembly and disassembly will cause the breakage of the motorized stage so never try it.

Attention:

At option, when built-in drivers are mixed, confirm motor type of the motorized stage And then connect.

Built-in driver type	Motorized stage motor type
A type driver	0. 7 5 A /phase motor type
B type driver	0. 7 5 A /phase motor type
D type driver	0. 7 5 A /phase motor type with electromagnetic brake
E type driver	0. 7 5 A /phase motor type with electromagnetic brake
F type driver	0. 7 5 A /phase motor type with electromagnetic brake 1. 4 A /phase motor type with electromagnetic brake

Attention:

When connect 0.75A/phase motor type motorized stage with F type driver, motor will Be in high temperature and burn injury is afraid so never try it.

Attention:

If motor type with electromagnetic brake is connected with A, B type drivers, Release of electromagnetic brake will not be executed normally.

Attention:

If motorized stage without electromagnetic brake is connected with D · E · F type Driver, limit sensor · origin sensor may not function normally.

【stage connector】

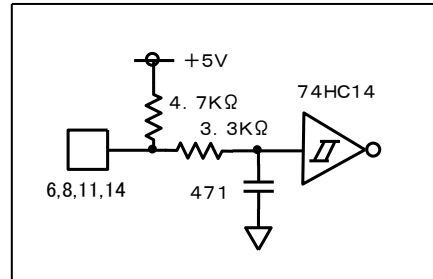
connector Product No : SRCN2A21-16S (JAE)
Adaptable plug : SRCN6A21-16P (JAE)

Pin No

1. Motor connect terminal 5pcs motor lead (blue)
10pcs motor lead (blue+black)
2. Motor connect terminal 5pcs motor lead (red)
10pcs motor lead (red+brown)
3. Motor connect terminal 5pcs motor lead (orange)
10pcs motor lead (orange+purple)
4. Motor connect terminal 5pcs motor lead (green)
10pcs motor lead (green+yellow)
5. Motor connect terminal 5pcs motor lead (black)
10pcs motor lead (white+gray)
6. CW side limit sensor input
7. GND

8. CCW side limit sensor input
9. GND
10. +5V
11. Near to origin sensor input
12. GND / D·E·Ftype adaptable to electromagnetic brake DC 24V (+)
13. +5V / D·E·Ftype adaptable to electromagnetic brake DC 24V (-)
14. Origin sensor input
15. GND
16. Frame ground

<sensor input circuit>



2. 1. 2 Connection with motorized stage

Plug the extended cable attached with D130 into D130 connector at the rear panel of D120 controller, and connect with D130.

Power supply of D130 could be shut off by the D130 service outlet at the rear panel of D120 controller. At this occasion using EMG2 emergence stop control of D120, power supply of D120, D130 could be shut off.

Attention:

When connected with D130, confirm that D120 controller is shut off with peripheral device. While the power supply in on, if the asselement or disassemblment executed, there is an afraid of breakage of the machine.

So

Never try it.

【D130 connector】

connector Product No: DX10A-100S (HRS)
 Adaptable plug : DX40-100P (HRS)
 Adaptable cover : DX-100-CV1 (HRS)

2. 1. 3 Connection with GP-IB interface

By the DIP SW at the rear panel of D120 controller, set the GP-IB address · command mode and Connect GP-IB interface connector with GP-IB port with GP-IB cable.

Attention:

Setting of DIP SW must be executed before the power supply is on. After the power supply is on, Change of DIP SW will be invalid.

Before the connection of cable, confirm that D120 controller is shut off with peripheral device. While the power supply in on, if the asselement or disassemblment executed, there is an afraid of of the breakage of the machine. So never try it.

Set the GP-IB port referring to the instrument manual of each port.

2. 1. 4 Connection with RS232C interface

By the DIP SW at the rear panel of D120 controller, set the command modes. Connect the R232C interface connector (Dsub 9 pin) with RS232C interfaces of PC by RS232C cable.

Attention:

Setting of DIP SW must be executed before the power supply is on. After the power supply is on, Change of DIP SW will be invalid.

Before the connection of cable, confirm that D120 controller is shut off with peripheral device.

While the power supply is on, if the assembly or disassembly is executed, there is a risk of the breakage of the machine. So never try it.

2. 1. 5 Handy terminal connection with D700、D900

Connect terminal connector at the front panel of D120 controller with the connector of D700, D900.

Attention:

Before the connection of handy terminal, confirm that D120 controller is shut off with peripheral device. While the power supply is on, if the assembly or disassembly is executed, there is a risk of the breakage of the machine. So never try it.

2. 1. 6 Connection with emergency stop

On the connection with emergency stop circuit, refer to 2. 2 instruction on emergency Stop connector.

【EMG 1 connector】

connect the emergency stop circuit with EMG 1 connector (31-10:DDK) at the rear Panel of D120 controller.

At the connection of the circuit, first shut off the power supply of D120 controller. After the connection of the emergency stop circuit, set D120 controller power on and before

The driving of motorized stage, confirm the execution of emergency stop circuit. If the emergency stop circuit executes normally, all the axes enter into the status of Mechanical limit detection and mechanical detection mark appears on the screen.
(Main screen)

【EMG 2 connector】

connect the emergency stop circuit with EMG2 connector (RM15TRH-2SA:HRS) at the rear panel of D120 controller.

At the connection of the circuit, first shut off the power supply of D120 controller. After the connection of the emergency stop circuit, set D120 controller power on and before

The driving of motorized stage, confirm the execution of emergency stop circuit. If the emergency stop circuit executes normally, the power supply of D120 controller turns Off.

2. 2 description on emergence stop connector

D120 controller holds two emergence stop connectors of EMG 1 · EMG 2 at the rear panel, and Due to the external signal, control as the stoppage of motor and the power OFF of D120 is possible.

e.

【EMG 1 connector】

To execute control of emergence stop connector of EMG1, it is necessary to set the E1 of memory SW

8

On. Settings of E1 OFF do not function at emergence stop control.

(2. 7 (refer to 2.7 memory SW setting))

Attention:

When memory SW2 of each axis is at the status of LSNO, it is impossible to set memory SW 8

On E1ON.

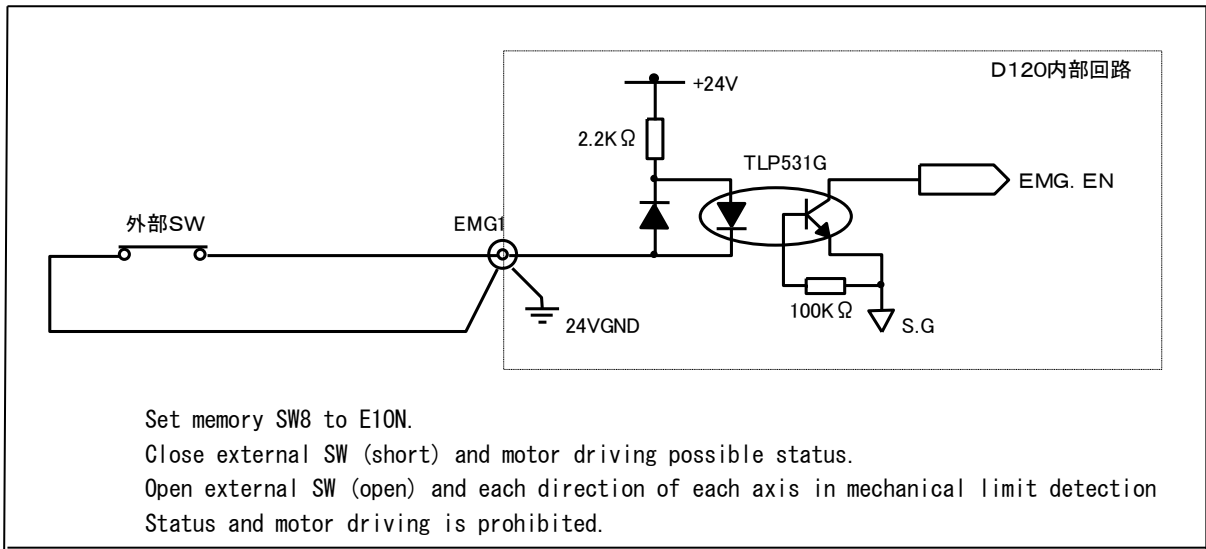
When memory SW8 is at the status of E1ON, it is impossible to set memory SW 2

On LSNO.

Set memory SW8 on E1ON and open the EMG1 connector then becomes the status of Mechanical limit detection and the driving of motor are prohibited.

Connector product No. : 3 1 - 1 0 (D D K) B N C connector

<input circuit · connection sample>



【EMG 2 connector】

To execute emergence stop control of EMG2 connector, it is necessary to set EMG ON/OFF SW at the rear panel to ON. If set on OFF, then emergence stop control will not function.

Set EMG ON/OFF SW at the rear panel on, open the EMG2 connector then power supply of D120 and service power supply of D130 will be off.

Attention:

Service power supply of D130 will not interlock with power supply SW.

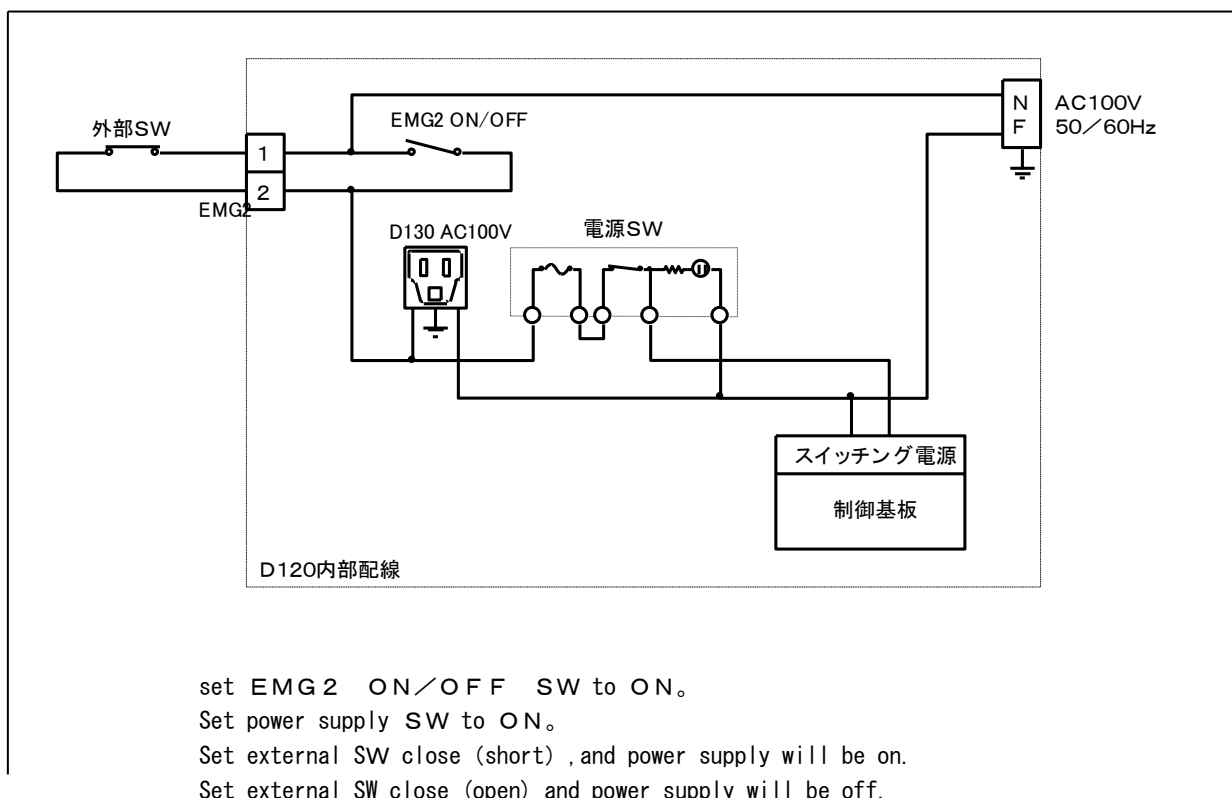
ON・OFF of the service power supply of D130 could not be operated by power supply SW of D120.

Service power supply of D130 should not be connected with equipment except D130.

Connect Product No: RM15TRH-2SA (HRS)

Adaptable plug : RM15TP-2PA (HRS)

<input circuit・connection example>



Attention:

For the contact points capacity of external SW, use those above AC200V 10A.
 Set the EMG ON/OFF SW to ON, then it is open.

2. 3 description on monitor output

D120 controller, through the MONITOR connector at rear panel, send axis selection signal • driving pulse signal • movement signal at CMOS level.

Connector Product No : DX 1 0 – 2 0 S (HRS)
 Adaptable plug : DX 4 0 – 2 0 P (HRS)
 Adaptable cover case : DX 2 0 – CV (HRS)

Pin No

1. Axis selection signal 1
2. Axis selection signal 2
3. Axis selection signal 3
4. Axis selection signal 4
5. CW pulse signal
6. CCW pulse signal
7. Not connected
8. Not connected
9. Not connected
10. Signal in motion
11. Not connected
12. Not connected
13. Not connected
14. Not connected
15. Not connected
16. Not connected
17. +5 V
18. +5 V
19. GND
20. GND

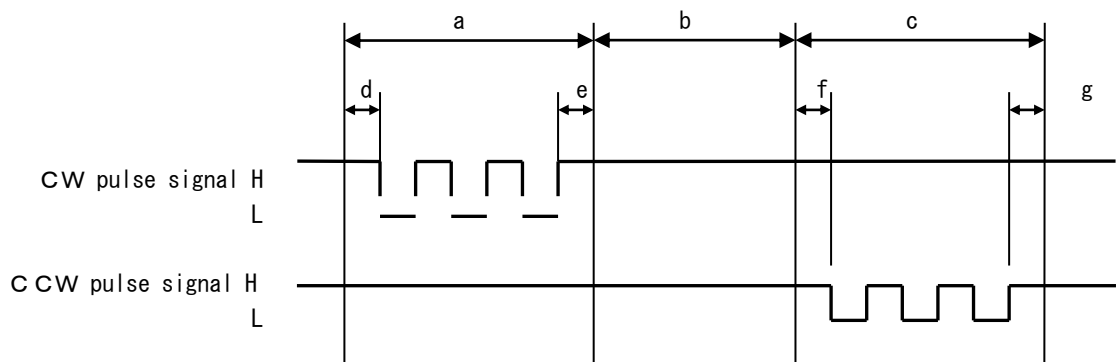
【output signal】

output signals are all 4 HC 2 4 4.

【selection axis and axis selection signal】

Selection axis	selection signal 1	selection signal 2	selection signal 3	selection signal 4
A 1 (X 1)	L	L	L	L
A 2 (Y 1)	H	L	L	L
A 3 (Z 1)	L	H	L	L
A 4 (W 1)	H	H	L	L
A 5	L	L	H	L
A 6	H	L	H	L
A 7 (X 2)	L	H	H	L
A 8 (Y 2)	H	H	H	L
A 9 (Z 2)	L	L	L	H
A 10 (W 2)	H	L	L	H
A 11	L	H	L	H
A 12	H	H	L	H

【pulse signal • output waveform of signal in motion】



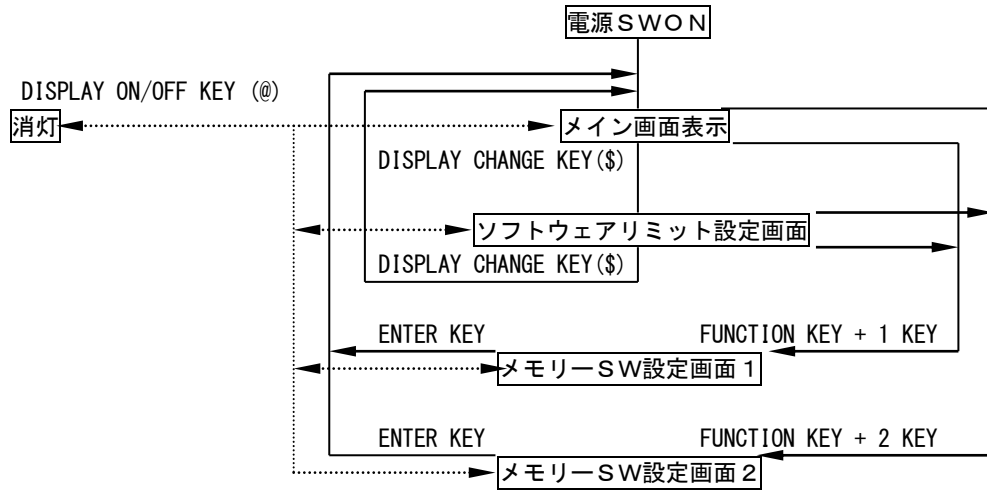


- a. CW side, in motion
- b. At stoppage
- c. CCW side, in motion
- d. Below 22 μ sec
- e. Below 46 μ sec
- f. Below 22 μ sec
- g. Below 46 μ sec

2. 4 Description on display screen

D120 controller has 2-line 20-character fluorescent displays. 4 types of display and display OFF (extinction) can be changed from the handy terminal key and selection of the remote mode Command is possible.

2. 4. 1 Screen configuration



- ※KEY execute the change of display screen by the operation of handy terminal key.
- ※Character in () execute change of display screen by remote mode commands.

2. 4. 2 Main screen

Displayed when powered on.

Selection axis		current position										moving pulse number								
A	1		-	1	2	3	4	5	6	7		P	8	0	0	0	0	0	0	0
F	1	0	0	0	0		L	1	0	0		R	5	0	0		◀	*	▶	

Driving speed (A1-F1), starting speed (A2-F10), acceleration and Deceleration rate (A11-F10), CW mechanical limit detection (A17), Origin detection (A18), CCW mechanical limit detection (A19)

【selection axis】
selection axis displays the current driving possible axis.

Through the switch of axis, selection between A 1 axis~A 1 2 axis is possible.

【current position】

display the current position of the selection axis.
Effective display scope is -8000000~8000000 pulse.

【moving pulse number】

display increment pulse number in AUTO MODE·REMOTE MODE of selection axis.

Setting scope is 0~8000000 pulse.

【driving speed】

Display driving speed of selection axis.
Setting scope is 1~99999PPS.

【acceleration and deceleration rate】

display acceleration and deceleration rate of selection axis.
Setting scope is 0~9999.

4~633 ms/1000PPS (refer to 2. 15. 1 description on acceleration and deceleration rate)

【starting speed】

display starting speed at the selection.
Setting scope is 10~9999PPS.

【CW mechanical limit detection】

selection axis display that mechanical limit is at detection.
When < mark displayed, it is shown that CW software limit is at detection.

【origin detection】

Selection axis execute return-to-origin, if origin is detected, then stop.

【CCW mechanical limit detection】

Selection axis display that mechanical limit is at detection.
When >mark displayed, it is shown that CCW software limit is at detection.

2. 4. 3 Software limit setting screen

About the software limit setting, refer to 2.6 software limit description.
From main screen, displayed when display change key of handy terminal pushed.
From main screen, displayed when remote mode command '\$' is received.

Selection axis		CW software limit setting									CCW software limit setting								
A	1	C	W	(	O	F	F	)	C	C	W	(	O	F	F)	
		8	0	0	0	0	0	0	-	8	0	0	0	0	0	0			

CW software limit value
CCW software limit value

【selection axis】

Selection axis displays current driving possible axis.
By switching the axis, selection between A1 axes to A12 axis is possible.

【CW·CCW software limit setting】

Selection axis shows whether software limit is effective or not.
(OFF) non-stop by software limit.
(ON) stop by software limit.

【CW · CCW software limit value】
 displays software limit setting value of selection axis.
 Setting scope is -8000000~8000000 pulse.

Attention :

At return-to-origin, no stoppage by software limit.
Do not use software limit as the ultimate protection function of the system.
Use mechanical limit as protection of the system.

Even when software setting is OFF, on occasion that driving surpass the effective Display scope (-8000000~8000000) of current position, stop occurs by software limit.

2. 4. 4 Memory SW setting screen 1

About the memory SW setting, refer to 2. 7 memory SW setting.
 Displayed when FUNCTION KEY + 1 KEY pushed at the MANUAL · AUTO · ORIGIN MODE by handy terminal.
 When setting is over, pushENTER KEY of handy terminal and returns to the Main screen.

							memory SW 1					memory SW 3				
M	E	M	O	S	W	1	1	O	R	G	1	3	N	O	N	C
A	X	I	S		A	1	2	L	S	N	C	4	O	N	C	
Selection axis							memory SW 2					memory SW 4				

【selection axis】
 Selection axis shows the current driving possible axis.
 Switching the axis then selection between A1 to A12 axis is possible.

【memory SW 1】
 Display the setting value of selection axis memory SW1 (return-to-origin method).

【memory SW 2】
 Display the setting value of selection axis memory SW2 (mechanical limit input logic)

【memory SW 3】
 Display the setting value of selection axis memory SW3 (near-to-origin sensor input logic)

【memory SW 4】
 Display the setting value of selection axis memory SW4 (origin sensor input logic)

Attention

When in the REMOTE MODE, screen could not be displayed.
 When this screen is displayed, driving of motor is impossible.
 When in action, display of the screen is impossible.

2. 4. 5 Memory SW setting screen 2

About setting of memory SW, refer to 2. 7 memory SW setting.
 In the modes of MANUAL · AUTO · ORIGIN MODE of the handy terminal, displayed when FUNCTION KEY + 2 KEY PUSHED.

After the setting, push ENTER KEY of handy terminal then returns to main screen.

memory SW 5										memory SW 7									
M	E	M	O	S	W	2		5	:	N	A		7	:	1	/	1		
A	X	I		A	1			6	C	D			8	:	E	1	O	F	F
Selection axis							memory SW 6					memory SW 8							

【selection axis】

Selection axis displays current driving possible axis.

By switching the axis, selection of A1 axis to A12 axis is possible.

【memory SW 5】

Display of memory SW5 (no memory SW5 setting value)

【memory SW 6】

Display setting value of memory SW6 of selection axis (current down)

【memory SW 7】

Display setting value of memory SW7 of selection axis (driver division volume)

【memory SW 8】

Display setting value of memory SW8 of selection axis (EMG1 emergence stop)

Attention:

When in the REMOTE MODE, screen is not displayed.

When this screen is displayed, driving of motor is impossible.

When in action, display of the screen is impossible.

2. 5 Description of parameter

D120 controller has four parameters of moving pulse(P)・driving speed (F)・starting speed(L)・Acceleration and deceleration(R) setting. The set parameter is overwritten on RAM and backup by Battery so even the power supply is off, they are still effective.

Attention

If handy terminal D700 is not connected, D120 enters REMOTE MODE and could be set by external control command.

Setting on this occasion, refer to 2.12 REMOTE MODE operation instruction.

It is impossible to set parameter by handy terminal D900.

2. 5. 1 Setting of moving pulse(P)

Set moving pulse(P) in AUTO MODE・REMOTE MODE.

Setting scope is between 0~8 000 000 pulse.

Default setting is 0 at shipment.

Setting is impossible at action.

During the setting, when the driving starts, setting is interrupted and when at stoppage,

Setting becomes possible again.

【setting procedure】

- a. Push DISPLAY CHANGE KEY and becomes main screen.
- b. Push axis indication key then select the setting axis.
- c. Push function key (P)
- d. At the left side of the change parameter of the display screen, → appears then Setting value clears to 0 and enters into the changeable status.

A	1									0	→	P	0						
F	1	0	0	0	0		L	1	0	0		R	5	0	0				

- e. Enter optional numeric value by ten-key.
Ex) When the setting value is 123, enter by the sequence of

1

2

3

- f. Push ENTER KEY and change the setting value.
- g. When CLEAR KEY pushed, no change occurs and returns to the setting value before the change.

※setting of driving volume (P)・position setting・setting of driving speed (F)・setting of starting speed (L)・setting of acceleration and deceleration rate (R) could be made continuously. On this occasion, do the setting before pushing ENTER KEY, when the setting finished, push ENTER KEY at last.

2. 5. 2 setting of driving speed (F)

set the driving speed(F)。

setting scope is 1~99999PPS。When the setting value is 0,modify it to 1。
Default setting at shipment is 1000.

Setting is impossible at action。

During the setting, when the driving starts, setting is interrupted and when at stoppag

e,

Setting becomes possible again.

【setting procedure】

- a. Push DISPLAY CHANGE KEY and turns into main screen。
- b. Push the selection indication key and select the axis to set.
- c. Push function key (F) 。
- d. At the right side of the change parameter of the display screen, → appears then setting value clears to 0 and enters into the changeable status。

A	1									0		P	8	0	0	0	0	0	0
F	0					←	1	0	0			R	5	0	0				

- e. Enter optional numeric value by ten-key.

Ex)When the setting value is 123,enter by the sequence of

1

2

3

- f. Push ENTER KEY and change the setting value。
- g. When CLEAR KEY pushed, no change occurs and returns to the setting value before the change。

※setting of driving volume (P) ・ position setting ・ setting of driving speed (F) ・ setting of starting speed (L) ・ setting of acceleration and deceleration rate (R) could be made Continuously. On this occasion, do the setting before pushing ENTER KEY,when the setting finished, push ENTER KEY at last。

2. 5. 3 setting of starting speed (L)

set starting speed (L) 。

setting scope is 10~9999PPS。When setting value is below 10,modify it to 10。
Default setting at shipment is 100.

Setting is impossible at action。

During the setting, when the driving starts, setting is interrupted and when at stoppag

e,

Setting becomes possible again.

【setting procedure】

- a. Push DISPLAY CHANGE KEY then turns into main screen。
- b. Push the selection indication key and select the axis to set
- c. Push function key (L) 。
- d. At the left side of the change parameter of the display screen, → appears then setting value clears to 0 and enters into the changeable status。

A	1									0		P	8	0	0	0	0	0	0
F	1	0	0	0			→	0				R	5	0	0				

e. Enter optional numeric value by ten-key.

Ex) When the setting value is 123, enter by the sequence of

1

2

3

f. Push ENTER KEY and change the setting value.

g. When CLEAR KEY pushed, no change and returns to the setting value before the change.

※setting of driving volume (P) · position setting · setting of driving speed (F) · setting of starting speed (L) · setting of acceleration and deceleration rate (R) could be made continuously. On this occasion, do the setting before pushing ENTER KEY, when the setting finished, push ENTER KEY at last.

2. 5. 4 setting of acceleration and deceleration rate (R)

set acceleration and deceleration rate (R) .

Setting scope is between 0 to 9999.

4 ~ 633ms / 1000PPS (refer to 2. 15. 1 acceleration and deceleration rate) setting at shipment is 500.

Setting is impossible at action.

During the setting, when the driving starts, setting is interrupted and when at stoppage, Setting becomes possible again.

【setting procedure】

a. Push DISPLAY CHANGE KEY then turns into main screen.

b. Push the selection indication key and select the axis to set.

c. Push function key (R) .

d. At the left side of the change parameter of the display screen, → appears then setting value clears to 0 and enters into the changeable status.

A	1									0		P	8	0	0	0	0	0	0
F	1	0	0	0			L	1	0	0		→	0						

e. Enter optional numeric value by ten-key.

Ex) When the setting value is 123, enter by the sequence of

1

2

3

f. Push ENTER KEY and change the setting value.

g. When CLEAR KEY pushed, no change occurs and returns to the setting value before the change.

※setting of driving volume (P) · position setting · setting of driving speed (F) · setting of starting speed (L) · setting of acceleration and deceleration rate (R) could be made continuously. On this occasion, do the setting before pushing ENTER KEY, when the setting finished, push ENTER KEY at last.

2. 6 Description on software limit

D120 controller could set software limit value in CW・CCW direction of each axis from A1～A12 axes.

Values set are overwritten on RAM, backed up by the battery so even the power supply is off, setting remains effective.

But setting is impossible when the selection axis is in action.

Software limit compares with current position, if

CW driving value of CWソフトウェアリミット ≤ current position

CCW driving value of CCW software limit ≥ current position, set the driving as

Limit for prohibition.

Setting scope is from -8000000～8000000。

Default setting at shipment is software limit stoppage ineffective(OFF)・CW side software limit Value 8000000・CCW side software limit value -8000000。

Attention:

When at return-to-origin, no stoppage at software limit.

Do not use software limit as the ultimate protection function of the system.

Use mechanical limit as protection of the system.

If not connected with handy terminal D700, D120 could be set by external control command in REMOTE MODE.

On this occasion, refer to 2.12 REMOTE MODE operation instruction.

Software limit setting by handy terminal D900 is impossible.

【setting procedure】

- a. Push DISPLAY CHANGE KEY then turns into software limit setting screen.
- b. Push the selection indication key and select the axis to set.
- c. Push cursor key R P。
(during CW side setting, R key, CCW side setting, P key)
- d. At the left side of the change parameter of the display screen, → appears then setting value clears to 0 and enters into the changeable status.

A	1			C	W	(	O	F	F	)		C	C	W	(	O	F	F)
		→		0								-	8	0	0	0	0	0	0

- e. Enter optional numeric value by ten-key.
Ex) When the setting value is 123, enter by the sequence of 1 2 3
- f. Set software limit. if no setting, go straight to h.
- g. Push cursor key F。
(OFF) of software limit setting turns into (on)・(ON) turns into (off)。
At (off), software limit value is ineffective and no stoppage at limit value.
At (on), software limit value is effective and stops at limit value.

A	1			C	W	(	o	n	)		C	C	W	(	o	n)
		→	–	1	2	3					–	8	0	0	0	0	0

- h. Push ENTER KEY and change the setting value.
- i. Push CLEAR KEY and no change occurs, then returns to the setting value before the change.

2. 7 setting of memory SW

D120 controller has 7 memory SW of setting of return-to-origin method・mechanical limit input logic・near-to-origin sensor input logic・origin sensor input logic・current down setting・driver division setting・EMG 1 emergence stop control setting.

Memory SW set is overwritten on RAM and backup by battery. Even the power supply is shut off, remains

Effective.

But when the setting axis is in action, setting is impossible.

Attention:

When not connected with handy terminal D700, D120 turns into REMOTE MODE and could be set by External command.

On this occasion, refer to 2.12 REMOTE MODE operation instruction.

Memory SW setting could not be executed by handy terminal D900.

Setting is impossible during action.

2. 7. 1 Description on return-to-origin method

D120 controller has 7 methods of return-to-origin from ORG 0~ORG 6.

ORG 0 will not return to origin.

Selection of return-to-origin method is made according to ORG(origin sensor)・NORG(near to Origin sensor) of the motorized stage and the has or not of CW/CCWLS (limit sensor)。

<cautions during selection of return-to-origin method>

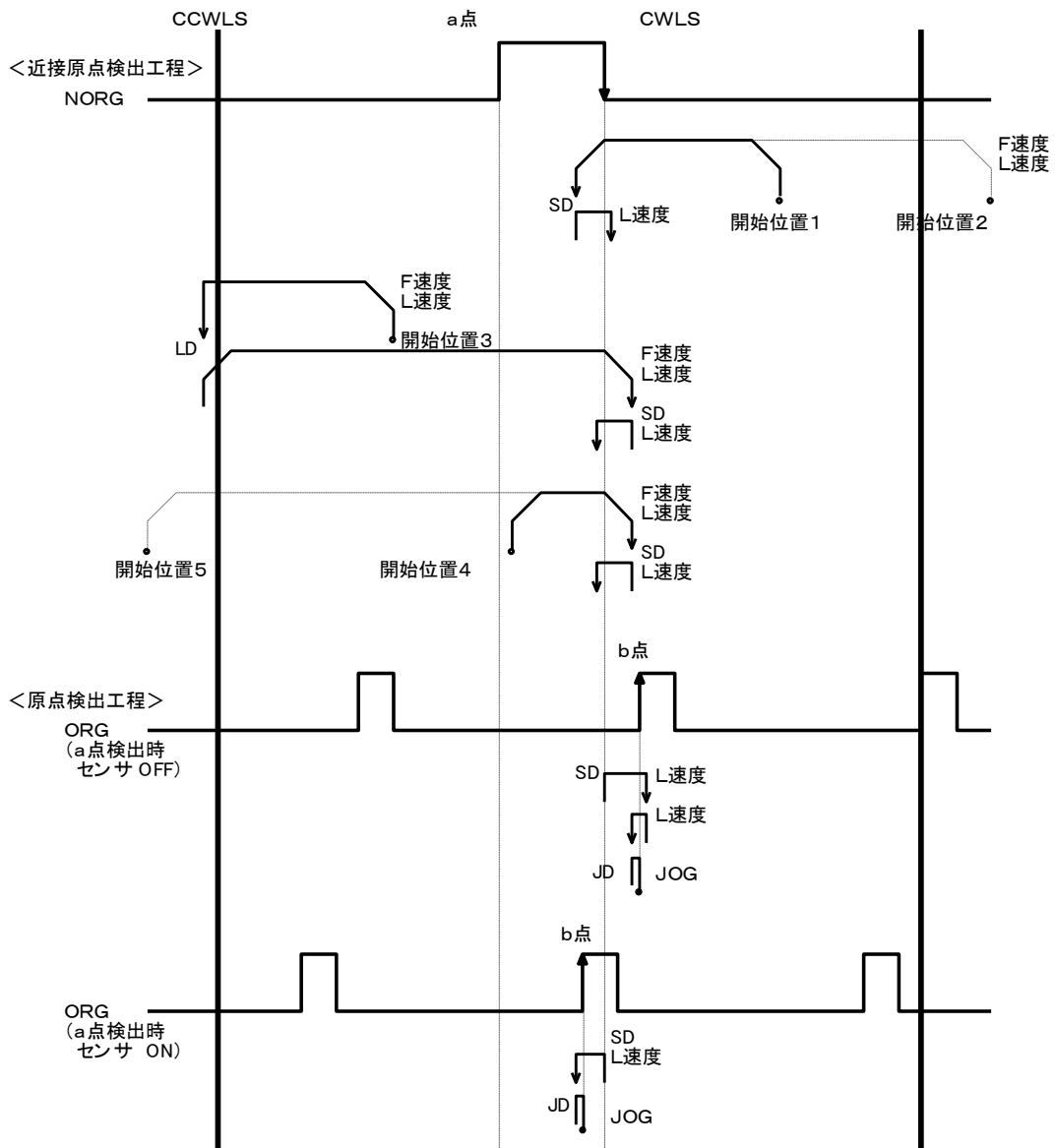
- When return-to-origin method of 【ORG 1】 【ORG 3】 【ORG 5】 selected, Detection sensor supposes on the CCW side and starts in the CCW side and turns Into detection of CW driving.
So when the position decision made in CW side, mechanical backlash will not occur.
- When return-to-origin method of 【ORG 2】 【ORG 4】 【ORG 6】 selected, Detection sensor supposes on the CW side and starts in the CW side and turns Into detection of CCW driving.
So when the position decision made in CCW side, mechanical backlash will not occur.
- Return-to-origin method of our motorized stage
Has NORG、ORG sensor both 【ORG 1】
No NORG, only ORG sensor 【ORG 3】、
No NORG、ORG、has CCWLS sensor, then we recommend 【ORG 5】。

Attention: During return-to-origin, no stoppage at software limit.

【ORG 1】

detect in CCW side, first detect NORG signal in CW side edge (a point), then detect ORG signal in CCW side edge (b point)。

Detection of ORG edge is executed by JD (JOG interval delay time)。



○ : detection start position

● : detection over position

LD : limit detection stop delay time (300 msec)

SD : sensor detection stop delay time (200 msec)

JD : JOG interval delay time calculated by the following formula.

$$JD [msec] = \frac{2000}{L_speed [PPS]} \times 5 \quad (\text{the underline are integers})$$

※ JD are intervals of 5 [msec] from 5 ~ 1000 [msec].

Start position 1 . . . start position between NORG and CWLS.

Start position 2 . . . start position at CWLS detection position.

Start position 3 . . . start position between NORG and CCWLS.

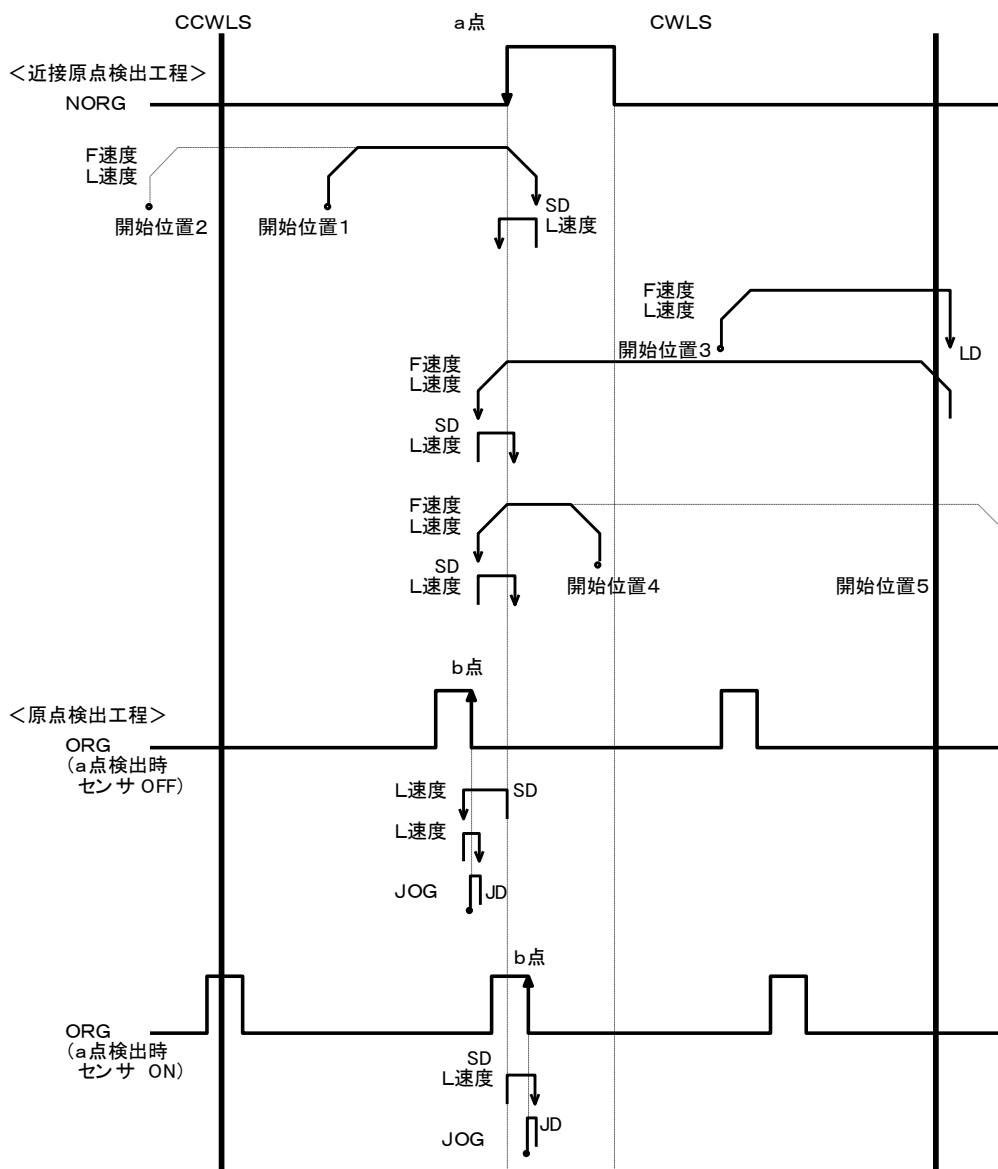
Start position 4 . . . start position at NORG detection position.

Start position 5 . . . start position at CCWLS detection position.

【ORG 2】

detect in CW side, first detect NORG signal in CCW side edge (a point), then detect ORG signal in CW side edge (b point).

Detection of ORG edge is executed by JD (JOG interval delay time).



- : detection start position
- : detection finish position
- LD : limit detection stop delay time (300 msec)
- SD : sensor detection stop delay time (200 msec)
- JD : JOG interval delay time calculated by the following formula.

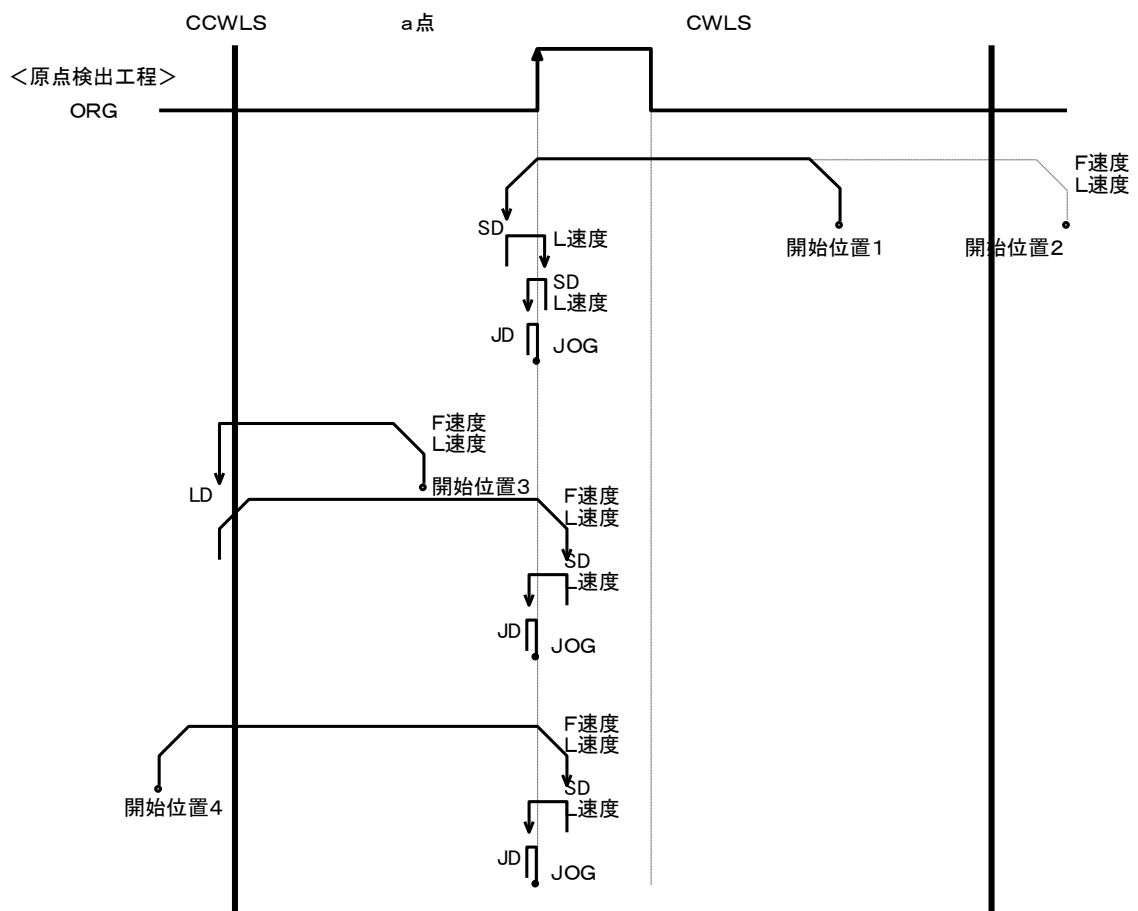
$$JD [msec] = \underline{2000} \div \underline{L \text{ speed} [PPS]} \times 5 \quad (\text{underlined are integer})$$

※ JD are intervals of 5 [msec] from 5 ~ 1000 [msec] .

- Start position 1 . . . start position between NOR G and CCWLS .
- Start position 2 . . . start position at CCWLS detection position .
- Start position 3 . . . start position between NOR G and CWLS .
- Start position 4 . . . start position at NOR G detection position .
- Start position 5 . . . start position at CWLS detection position .

【ORG 3】

detect in CCW side, first detect ORG signal in CCW side edge (a point) .
 Detection of ORG edge is executed by JD (JOG interval delay time) .



- : detection start position
- : detection finish position
- LD : limit detection stop delay time (300 msec)
- SD : sensor detection stop delay time (200 msec)
- JD : JOG interval delay time calculated by the following formula.

$$JD [msec] = \underline{2000} \div L \text{ speed [PPS]} \times 5 \quad (\text{underlined are integer})$$

※JD are intervals of 5 [msec] from 5~1000 [msec]。

Start position 1 . . . start position between ORG and CWLS。

Start position 2 . . . start position at CWLS detection position。

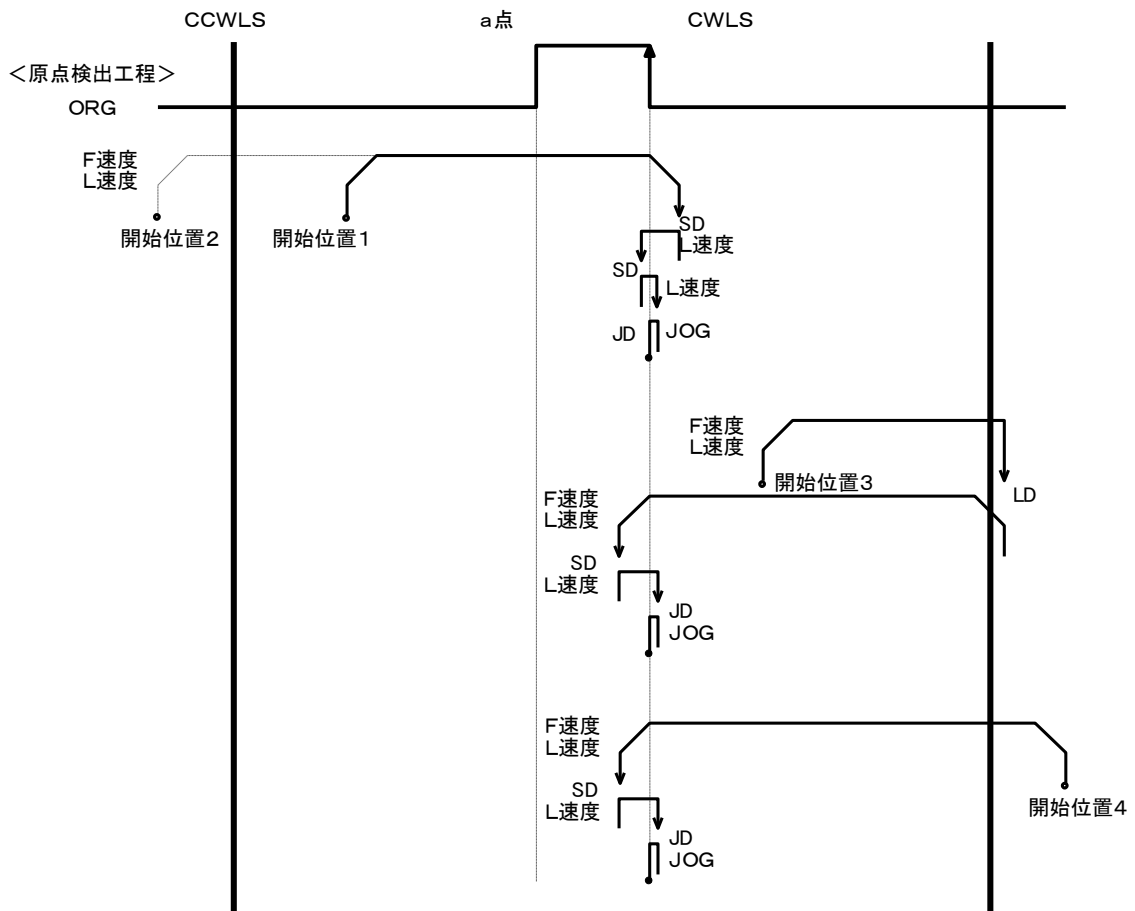
Start position 3 . . . start position between ORG and CCWLS。

Start position 4 . . . start position at CCWLS detection position。

【ORG 4】

detect in CW side, detect ORG signal in CW side edge (a point) .

Detection of ORG edge is executed by JD (JOG interval delay time) 。



○ : detection start position

● : detection finish position

LD : limit detection stop delay time (300msec)

SD : sensor detection stop delay time (200msec)

$$JD [msec] = \underline{2000} \div L \text{ speed [PPS]} \times 5 \quad (\text{underlined are integer})$$

※JD are intervals of 5 [msec] from 5~1000 [msec] 。

Start position 1 . . . start position between ORG and CWLS。

Start position 2 . . . start position at CCWLS detection position。

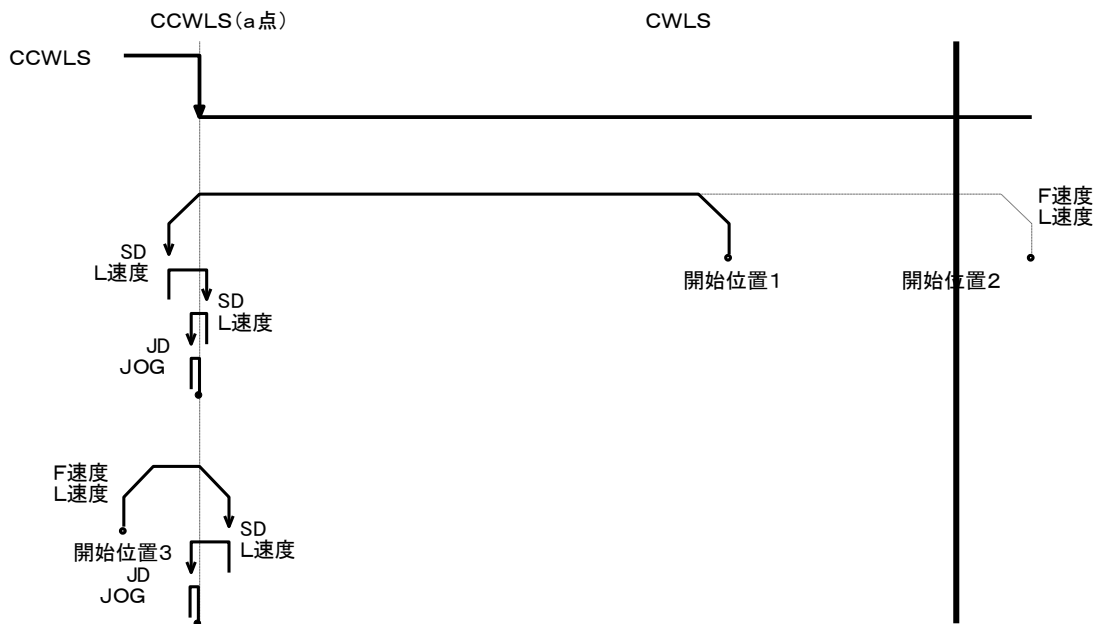
Start position 3 . . . start position between ORG and CWLS。

【ORG 5】

detect in CCW side, detect CCWLSsignal in CW side edge (a point) .
 Detection of CCWLS edge as origin,executed by JD (JOG interval delay time) 。

Attention

ORG is between CWLS-CCWLS, if ORG detected before detection of CCWLS,
 Set CWLS side edge of ORG as origin then execute edge detection.



- : detection start position
- : detection finish position
- SD : sensor detection stop delay time (200 msec)
- JD [msec] = $\frac{2000}{L \text{ speed [PPS]}} \times 5$ (underlined are integer)
- JD are intervals of 5 [msec] from 5~1000 [msec] 。

Start position 1 . . . between CWLS and CCWLS 。

Start position 2 . . . at CWLS detection position 。

Start position 3 . . . at CCWLS detection position 。

Attention:

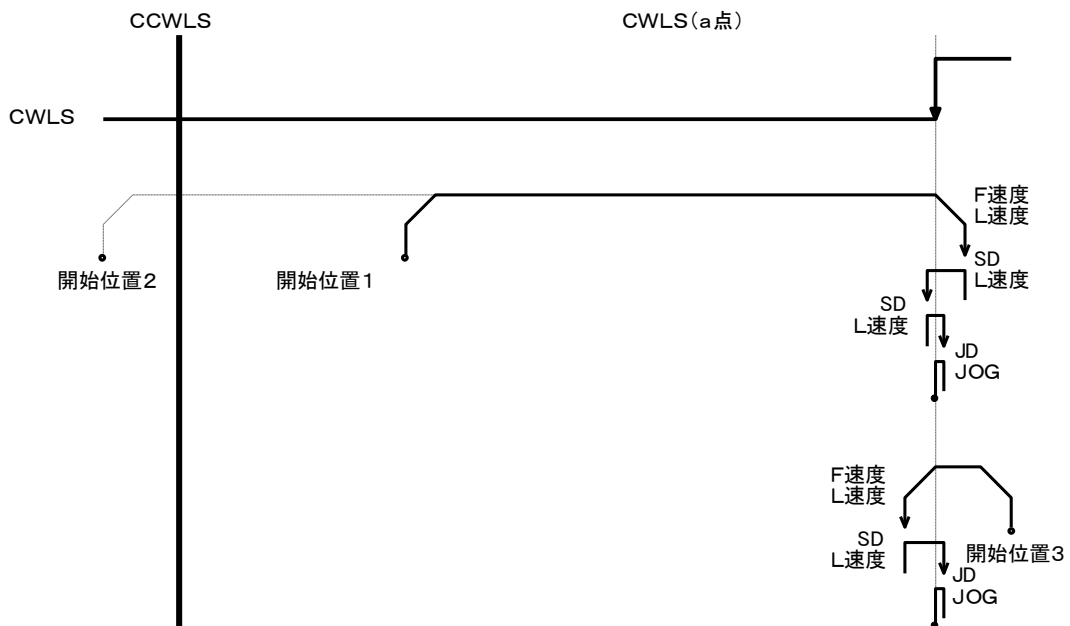
CCWLS stop at return-to-origin turns into deceleration stop.
 Between a point and CCW side limit, thorough distance needed for deceleration to stop.
 There is an afraid of the breakage of mechanic, pay attention to it.

【ORG 6】

detect in CW side, detect CWLS signal in CCW side edge (a point).
 Detection of CWLS edge as origin, executed by JD (JOG interval delay time)。

Attention

ORG is between CWLS-CCWLS, if ORG detected before detection of CWLS,
 Set CWLS side edge of ORG as origin then execute edge detection.



○ : detection open position

● : detection finish position

SD : sensor detection stop delay time (200msec)

$JD [msec] = \frac{2000}{L \text{ speed } [PPS]} \times 5$ (underlined are integer)

JD are intervals of 5 [msec] from 5~1000 [msec]。

Start position 1 . . . between CWLS and CCWLS。

Start position 2 . . . at CCWLS detection position。

Start position 3 . . . at CWLS detection position。

Attention:

CWLS stop at return-to-origin turns into deceleration stop.

Between a point and CW side limit, thorough distance needed for deceleration to stop.

There is an afraid of the breakage of mechanic, pay attention to it.

2. 7. 2 Setting of return-to-origin method

Refer to 2. 7. 1 description on return-to-origin method.

Setting scopes are 7 methods between ORG0~ORG6.

When at ORG0, return-to-origin not executed.

Default setting at shipment is ORG1.

【setting procedure】

- Push axis indication key, switches to the setting axis.
- Hold FUNCTION KEY and push ten-key , memory SW setting screen 1 displayed.
- KEY pushed, at left side of memory SW1 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	1	→	1	O	R	G	1	3	N	O	N	C
A	X	I	S		A	1		2	L	S	N	C	4	O	N	C	

- Push cursor key , make optional setting.
- Push ENTER KEY and change the setting value.

※Memory SW1, 2, 3, 4 could be set continuously.

On this occasion, do all the setting and push ENTER KEY at last.

2. 7. 3 Setting of mechanical limit sensor input logic

Setting scopes are 2 types of LSNC and LSNO.

LSNC . . . input logic is normal close(B point). we set as this at motorized stage connection.

LSNO . . . input logic is normal open(A point).

Default setting at shipment is LSNC.

Attention:

When at the status of E10N, for the setting of memory SW8, setting of LSNO is impossible.

【setting procedure】

- Push axis indication axis and switches to setting axis.
- Hold FUNCTION KEY and push ten-key , memory SW setting screen 1 displayed.
- KEY pushed, at left side of memory SW2 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	1			1	O	R	G	1		3	N	O	N	C
A	X	I	S		A	1		→	2	L	S	N	C		4	O	N	C	

- d. Push cursor key , make optional setting.
- e. Push ENTER KEY and change the setting value.

※Memory SW1, 2, 3, 4 could be set continuously.
On this occasion, do all the setting and push ENTER KEY at last.

2. 7. 4 Setting of near-to-origin sensor input logic
Setting scopes are 2 types of NONC and NONO.
NONC . . . input logic is normal close (B point) . On occasion of our motorized Stages, we set as this.
NONO . . . input logic is normal open(A point).
Default setting at shipment is NONC.

【setting procedure】

- a. Push axis indication axis and switches to setting axis.
- b. Hold FUNCTION KEY and push ten-key , memory SW setting screen 1 displayed.
- c. KEY pushed, at left side of memory SW1 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	1			1	O	R	G	1	→	3	N	O	N	C
A	X	I	S		A	1			2	L	S	N	C		4	O	N	C	

- d. Push cursor key , make optional setting.
- e. Push ENTER KEY and change the setting value.

※Memory SW1, 2, 3, 4 could be set continuously.
On this occasion, do all the setting and push ENTER KEY at last.

2. 7. 5 Setting of origin sensor input logic
Setting scopes are 2 types of ONC and ONO.
ONC . . . input logic is normal close (B point) . On occasion of our motorized stage, we set as this.
ONO . . . input logic is normal open(A point).
Default setting at shipment is ONC.

【setting procedure】

- a. Push axis indication axis and switches to setting axis.
- b. Hold FUNCTION KEY and push ten-key , memory SW setting screen 1 displayed.
- c. KEY pushed, at left side of memory SW1 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	1			1	O	R	G	1		3	N	O	N	C
A	X	I	S		A	1			2	L	S	N	C	→	4	O	N	C	

- d. Push cursor key , make optional setting.
- e. Push ENTER KEY and change the setting value.

※Memory SW1, 2, 3, 4 could be set continuously.

On this occasion, do all the setting and push ENTER KEY at last.

2. 7. 6 Setting of current down control

Setting scopes are 2 types between CD and NCD.

CD At stoppage, execute electric current control of motor.

On this occasion, volume of electric current is 0.75A/phase, at stoppage,

Only 50% of electric current (0.375 A/phase), could decrease heat of motor.

NCD no control for electric current at stoppage.

Default setting at shipment is CD.

【setting procedure】

- a. Push axis indication axis and switches to setting axis.
- b. Hold FUNCTION KEY and push ten-key , memory SW setting screen 2 displayed.
- c. KEY pushed, at left side of memory SW1 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	2		5	:	N	A		7	:	1	/	1		
A	X	I		A	1		→	6	C	D			8	:	E	1	O	F	F

- d. Push cursor key , make optional setting.
- e. Push ENTER KEY and change the setting value.

※Memory SW6, 7, 8 could be set continuously.

On this occasion, do all the setting and push ENTER KEY at last.

2. 7. 7 Setting of driver division number

Setting scope of D120 are 2 types of FULL and HALF. On the occasion of D120MS,

There are 16 types between 1/1~1/250.

Default setting at shipment is FULL for D120, 1/1 for D120 MS.

【setting procedure】

- a. Push axis indication axis and switches to setting axis.
- b. Hold FUNCTION KEY and push ten-key , memory SW setting screen 2 displayed.
- c. KEY pushed, at left side of memory SW7 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	2		5	:	N	A	→	7	:	1	/	1		
A	X	I		A	1			6	C	D			8	:	E	1	O	F	F

- d. Push cursor key , make optional setting.

e. Push ENTER KEY and change the setting value.

※Memory SW6, 7, 8 could be set continuously.

On this occasion, do all the setting and push ENTER KEY at last.

2. 7. 8 Setting of emergence stop control

Refer to 2.2 emergence stop connector instruction.

Setting scopes are 2 types of E1OFF and E1ON.

E1OFF · · · invalidate control input from EMG1 connector.

E1ON · · · validate control input from EMG1 connector.

While connector of EMG1 is open, turns into mechanical limit status of all axes

In all sides and movement prohibited.

Setting at shipment is E1OFF.

Attention:

Setting of memory SW2 of either axis is setting of LSNO, it is impossible to set E1ON.

【setting procedure】

a. Push axis indication axis and switches to setting axis.

b. Hold FUNCTION KEY and push ten-key 2 , memory SW setting screen 2 displayed.

c. 8 KEY pushed, at left side of memory SW8 of the display screen, →mark appears and turns into changeable status.

M	E	M	O	S	W	2		5	:	N	A		7	:	1	/	1		
A	X	I		A	1			6	C	D		→	8	:	E	1	O	F	F

d. Push cursor key F L , make optional setting.

e. Push ENTER KEY and change the setting value.

※Memory SW6, 7, 8 could be set continuously.

On this occasion, do all the setting and push ENTER KEY at last.

2. 8 Special function key

Attention:

In not connected with D700 handy terminal, D120 turns into **REMOTE MODE**.
 On this occasion, refer to **2. 12 REMOTE MODE operation instruction**.
 Operation of special function key by handy terminal is impossible.

2. 8. 1 Position setting

set the current position.

Setting scope is between -8000000~8000000 pulse.

Setting is impossible while in action.

During the setting, when the driving starts, setting is interrupted and when at stoppage, setting becomes possible again.

【setting procedure】

- a. Push DISPLAY CHANGE KEY and turns into main screen.
- b. Push axis indication key and select the setting axis.
- c. Push axis indication key.
- d. Push POSITION SET KEY.
- e. Right side of memory SW8 of the display screen, →mark appears and turns into changeable status.

A	1									0	←	P	8	0	0	0	0	0	0
F	1	0	0	0	0		L	1	0	0		R	5	0	0				

- f. Push ten-key to input optional numeric value
 - g. Push ENTER KEY and change the setting value.
 - h. push CLEAR KEY and no change occurs and back to the setting value before.
- ※Memory SW6, 7, 8 could be set

On this occasion, do all the setting and push ENTER KEY at last.

※setting of pulse volume(P)・position setting・driving speed (F)・starting speed (L)・acceleration and deceleration rate (R) could be set continuously. On this occasion, do all the setting and push ENTER KEY at last.

2. 8. 2 DISPLAY ON/OFF

D120 controller could control display ON/OFF.

When display ON, push DISPLAY ON/OFF KEY, turns into display ON
 And LED at the upper-left of DISPLAY ON/OFF KEY lights out.

2. 8. 3 Motor excitation ON/OFF

D 1 2 0 controller controls motor excitation ON (motor electric current ON) / OFF (electric current OFF) 、 if motor excitation turns into OFF, then motor is free.

Attention:

In the midst of the position decision of motorized stage, when motor excitation is off, There maybe a deviance of the position decision.

In action, impossible to set the motor excitation off.

【setting procedure】

- a. DISPLAY CHANGE KEY を押しメイン画面にします。
- b. Push axis indication key and select the setting axis
- c. Push the axis indication key。
- d. Push key。
- e. setting axis display A on display screen changes into lower case letter a, then turns into the status of motor excitation。

a	1									0		P	8	0	0	0	0	0	0
F	1	0	0	0	0		L	1	0	0		R	5	0	0				

- f. Push axis indication key。
- g. Push key。
- h. setting axis display a on display screen changes into upper case letter A, then turns into the status of motor excitation。

2. 8. 4 Switch of the driving speed (F→f)

D120 controller has setting of driving speed of F speed and f speed, by operating D700 key, switching is possible.

Attention:

In action, switching of the driving speed is impossible.

【setting procedure】

- a. Push DISPLAY CHANGE KEY and turns into main screen。
- b. Push axis indication key and select the selection axis。
- c. Push axis indication key。
- d. Push key。
- e. When driving speed appears on the screen,
 - the F will changes into lower-case f and setting value changed。
 - The f will changes into upper-case F and setting value changed。

A	1									0		P	8	0	0	0	0	0	0
f	1	0					L	1	0	0		R	5	0	0				

2. 8. 5 0 position movement

D 1 2 0 controller could moves to the position(current position) by operating D700 In the MANUAL modes, AUTO modes。

Attention:

During back-to-origin mode or in action, move to 0 position is impossible.

- a. Push axis indication key and select the moving axis
- b. Push axis indication key.
- c. Push key.
- d. Motorized stage moves to 0 position

2. 9 MANUAL MODE operation description

2. 9. 1 handy terminal operation by D700 (option)

1) Turn on power

Before applying power supply SW, confirm the connection of attached cable (with Earth 3P), connection with the peripheral device of the motorized stage, connection With handy terminal D700 (option).

2) Mode selection

Upon application of power supply, turns into REMOTE mode and LED on the upper-left Of REMOTE KEY lights.

Push MANUAL KEY and turns into MANUAL mode.

3) Setting of parameter · software limit · memory SW

Refer to 2.5 description of parameter · 2. 6 description of software limit · 2. 7 setting of memory SW.

4) Driving of motorized stage

Push axis indication key and select the driving axis wanted.

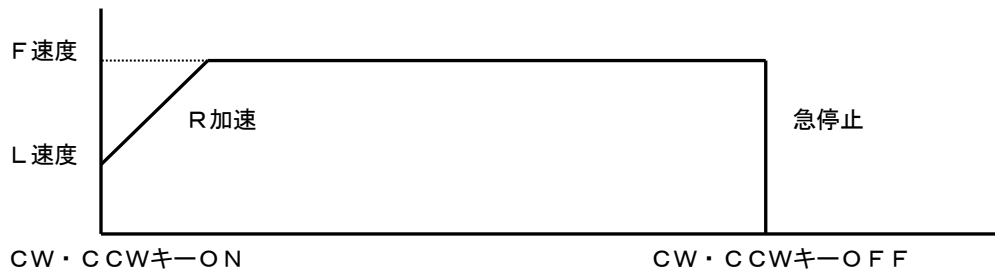
Axis selection	Key operation	Display
A 1	<input type="text" value="X1"/> pushed	<input type="text" value="X1"/> upper-left LED lights
A 2	<input type="text" value="Y1"/> pushed	<input type="text" value="Y1"/> upper-left LED lights
A 3	<input type="text" value="Z1"/> pushed	<input type="text" value="Z1"/> upper-left LED lights
A 4	<input type="text" value="W1"/> pushed	<input type="text" value="W1"/> upper-left LED lights
A 5	<input type="text" value="FUNCTION"/> held and push <input type="text" value="X1"/> or <input type="text" value="X2"/>	<input type="text" value="X1"/> upper-left <input type="text" value="X2"/> upper-right LED lights
A 6	<input type="text" value="FUNCTION"/> held and push <input type="text" value="Y1"/> or <input type="text" value="Y2"/>	<input type="text" value="Y1"/> upper-left <input type="text" value="Y2"/> upper-right LED lights
A 7	<input type="text" value="X2"/> pushed	<input type="text" value="X2"/> upper-left LED lights
A 8	<input type="text" value="Y2"/> pushed	<input type="text" value="Y2"/> upper-left LED lights
A 9	<input type="text" value="Z2"/> pushed	<input type="text" value="Z2"/> upper-left LED lights
A 1 0	<input type="text" value="W2"/> pushed	<input type="text" value="W2"/> upper-left LED lights
A 1 1	<input type="text" value="FUNCTION"/> held and push <input type="text" value="Z1"/> or <input type="text" value="Z2"/>	<input type="text" value="Z1"/> upper-left <input type="text" value="Z2"/> upper-right LED lights
A 1 2	<input type="text" value="FUNCTION"/> held and push <input type="text" value="W1"/> or <input type="text" value="W2"/>	<input type="text" value="W1"/> upper-left <input type="text" value="W2"/> upper-right LED lights

※CW · CCW key at the left side of the indication axis where LED is lighting is effective .

push CW key · CCW key of the axis driving wanted.

In the manual modes when CW · CCW key pushed, executes and LED in the moving side

Lights give off CW · CCW key then turns into emergency stop.



2. 9. 2 handy terminal operation by D900 (option)

1) Turn on power

Before applying power supply SW, confirm the connection of attached cable (with Earth 3P), connection with the peripheral device of the motorized stage, connection With handy terminal D900 (option).

2) Mode selection

Upon application of power supply, turns into REMOTE mode and LED on the upper-left Of REMOTE KEY lights.

Push MANUAL KEY and turns into MANUAL mode.

3) Setting of software limit · memory SW

2. 5 Refer to 2.5 description of software limit · 2.7 description of software SW setting

Attention:

Setting of software memory SW is impossible by handy terminal D900.

4) setting of driving speed

On the occasion driven by handy terminal D900, driving speed (F) · start speed (L) · acceleration and deceleration rate (R) are driven according to the setting of Handy terminal D900.

Upon application of power supply, JOG is selected.

Push LOW · HIGH key, driving speed JOG · 10 · 50 · 100 · 500 · 1K · 3K · 10K <PPS> are selectable.

Driving speed selection LED lights and display the selection speed.

Push ten-fold key, LED at the upper-left of ten-fold key lights and selection speed Ten-folded.

Selection speed	Ten-fold LED extinct			Ten-fold LED lights		
	F speed <PPS>	L speed <PPS>	R (acceleration and deceleration rate)	F 速度 <PPS>	L 速度 <PPS>	R 加減速レイト
10	10	10	500	100	10	500
50	50	50	500	500	50	500
100	100	100	500	1000	100	500
500	500	100	500	5000	100	500
1K	1000	100	500	10000	100	500
3K	3000	100	500	30000	100	500
10K	10000	100	500	100000	100	500

※In JOG, drive at 1 pulse only.

5) selection of driving axis

driving axes of handy terminal D900 has 3 axes of X axis · Y axis · Z axis. According to A X I S 1 · A X I S 2 key, switch the axis selection of X · Y · Z.

Switching of the axis is to push **A X I S 1** **A X I S 2** and make L E D light.

Selection axis		X axis	Y axis	Z axis
A X I S 1	L E D lights	A 1 axis	A 2 axis	A 3 axis
A X I S 2	L E D lights	A 7 axis	A 8 axis	A 9 axis

6) Driving of motorized stage

X axis · Y axis is operated by joystick.

While the joystick falls down, moves in its falling direction, when it comes back Then turns into emergence stop.

Z axis moves while Z C W · Z C C W key is pushed and when Z C W · Z C C W key is Given off, then turns into emergence stop.

7) position clear

Push position clear key and clear the position of the held axis (current position) to 0.

2. 10 A U T O M O D E operation description

2. 10. 1 Handy terminal operation by D 7 0 0 (option)

1) Turn on power

Before applying power supply SW, confirm the connection of attached cable(with Earth 3P), connection with the peripheral device of the motorized stage, connection With handy terminal D700(option).

2) Mode selection

Upon application of power supply, turns into REMOTE mode and LED on the upper-left Of REMOTE KEY lights.

Push AUTO KEY and turns into AUTO mode.

3) Setting of parameter · software limit · memory SW

Refer to 2.5 description of software limit · 2.6 description of software limit · 2.7 description of software SW

4) driving of motorized stage

push the axis indication key and select the driving axis wanted.

Axis selection	Key operation	表示
----------------	---------------	----

A 1	X1 pushed	X1 upper left LED lights
A 2	Y1 pushed	Y1 upper left LED lights
A 3	Z1 pushed	Z1 upper left LED lights
A 4	W1 pushed	W1 upper left LED lights
A 5	FUNCTION held, then push X1 or X2	X1 upper left X2 upper right LED lights
A 6	FUNCTION held, then push Y1 or Y2	Y1 upper left Y2 upper right LED lights
A 7	X2 pushed	X2 upper left LED lights
A 8	Y2 pushed	Y2 upper left LED lights
A 9	Z2 pushed	Z2 upper left LED lights
A 1 0	W2 pushed	W2 upper left LED lights
A 1 1	FUNCTION held, then push Z1 or Z2	Z1 upper left Z2 upper right LED lights
A 1 2	FUNCTION held, then push W1 or W2	W1 upper left W2 upper right LED lights

※CW・CCW key at the left side of the indication axis where LED is lighting is effective .

push CW key・CCW key of the axis driving wanted。

In the auto modes when CW・CCW key pushed, executes and LED in the moving side Lights and moves at P pulse and stop。

5) Suspend

On the occasion of suspension, push STOP key then turns into emergence stop.

2. 11 ORIGIN MODE operation description

2. 11. 1 handy terminal operation by D 7 0 0

1) Turn on power

Before applying power supply SW, confirm the connection of attached cable (with Earth 3P), connection with the peripheral device of the motorized stage, connection With handy terminal D700(option)。

2) Mode selection

Upon application of power supply, turns into REMOTE mode and LED on the upper-left Of REMOTE KEY lights.

Push ORIGIN KEY and turns into ORIGIN mode。

3) setting of parameter・software limit・memory SW

refer to 2.5 description of parameter・2. 6 description of software limit・2.7 setting of memory SW。

4) return-to-origin of motorized stage

push axis indication key return-to-origin wanted and select driving axis。

Axis selection	Key operation作	表示
A 1	X1 pushed	X1 upper left LED lights
A 2	Y1 pushed	Y1 upper left LED lights
A 3	Z1 pushed	Z1 upper left LED lights
A 4	W1 pushed	W1 upper left LED lights
A 5	FUNCTION held and push X1 or X2	X1 upper left X2 upper right LED lights
A 6	FUNCTION held and push Y1 or Y2	Y1 upper left Y2 upper right LED lights
A 7	X2 pushed	X2 upper left LED lights
A 8	Y2 pushed	Y2 upper left LED lights
A 9	Z2 pushed	Z2 upper left LED lights
A 1 0	W2 pushed	W2 upper left LED lights
A 1 1	FUNCTION held and push Z1 or Z2	Z1 upper left Z2 upper right LED lights
A 1 2	FUNCTION held and push W1 or W2	W1 upper left W2 upper right LED lights

※CW・CCW key at the left side of axis indication key where LED lights is effective。

Push C C W key of return-to-origin axis。

Return-to-origin starts and detect the origin sensor then stops,* appears at the Lower right of the main screen.

About the return-to-origin method, refer to 2.7.1 description on return-to-origin method

5) suspend

On the occasion of suspension, push STOP key then turns into emergence stop.

2. 11. 2 handy terminal operation by D 9 0 0 (option)

1) Turn on power

Before applying power supply SW, confirm the connection of attached cable (with Earth 3P), connection with the peripheral device of the motorized stage, connection With handy terminal D700(option)。

2) Mode selection

Upon application of power supply,turns into REMOTE mode and LED on the upper-left Of REMOTE KEY lights.

Push ORIGIN KEY and turns into ORIGIN mode。

3)setting of parameter・software limit・memory SW

refer to 2.5 description of software limit・2. 7 memory SW setting。

4) Setting of driving speed

On the occasion of driving operated by handy terminal D900, driving accords to driving speed (F)・start speed (L)・acceleration and deceleration rate (R) set by handy terminal D900。

Upon the application of power supply, JOG is selected。

Push LOW・HIGH key, driving speed JOG・1 0・5 0・1 0 0・5 0 0・1 K・3 K・1 0 K<PPS> are selectable。

Driving speed selection LED lights and selection speed appears。

Push ten-fold key, then Led of the upper-left ten-fold key lights and selection speed Ten-folded。

Selection speed	Ten-fold LED extinction			Ten-fold LED lights		
	F speed<PPS>	L speed<PPS>	R acceleration , Deceleration rate	F speed <PPS>	L speed <PPS>	R acceleration , Deceleration rate
1 0	1 0	1 0	5 0 0	1 0 0	1 0	5 0 0
5 0	5 0	5 0	5 0 0	5 0 0	5 0	5 0 0
1 0 0	1 0 0	1 0 0	5 0 0	1 0 0 0	1 0 0	5 0 0
5 0 0	5 0 0	1 0 0	5 0 0	5 0 0 0	1 0 0	5 0 0

1 K	1 0 0 0	1 0 0	5 0 0	1 0 0 0 0	1 0 0	5 0 0
3 K	3 0 0 0	1 0 0	5 0 0	3 0 0 0 0	1 0 0	5 0 0
1 0 K	1 0 0 0 0	1 0 0	5 0 0	1 0 0 0 0 0	1 0 0	5 0 0

5) Selection of driving axis

driving axis of handy terminal D900 has 3 axes of X axis · Y axis · Z axis.using A X I S 1 · A X I S 2 key, switches between X · Y · Z axis.

Switching of the axis is pushing A X I S 1 A X I S 2 and make L E D light.

Selection axis		X axis	Y axis	Z axis
A X I S 1	L E D lights	A 1 axis	A 2 axis	A 3 axis
A X I S 2	L E D lights	A 7 axis	A 8 axis	A 9 axis

6)back-to-origin of motorized stage

X axis · Y axis is operated by joystick.

While the joystick falls down in CCW side, starts back-to-origin movement.

Z axis moves while Z C C W key is pushed and starts back-to-origin movement.

Start back-to-origin and detect origin sensor then stop,* appears at the lower right At the main screen.

About the back-to-origin method, refer to 2.7.1 back-to-origin method description.

7) suspend

Upon suspension, push STOP key and turns into emergence stop.

8) position clear

Push position clear key and clear the position of the held axis (current position) to 0.

2. 12 R E M O T E M O D E operation description

D 1 2 0 controller has G P — I B · R S 2 3 2 C interface at the rear panel, could be controlled Externally by computer such as PC.

If R E M O T E mode is selected for input from handy terminal, then key SW is prohibited except STOP key · mode switch key · display change key · display O N / O F F key.

2. 12. 1 connection with computer

On connection with computer, shut off the power of D120 controller and computer then connect.

(if the power supply is on, execution of plug in and out of connector might cause the breakage of machine. (about the communication method, refer to manual of each computer and using language manual)

After finishing the connection of computer, confirm the attached power supply connection(earth 3 P), connection with peripheral device of motorized stage.

Upon application of power supply, turns into R E M O T E mode.

In the modes except R E M O T E mode, among the external commands, only *MODE (mode switch command) Accepted.

To set R E M O T E mode, push R E M O T E key of handy terminal or issue external command of * M O D E 3 .

If R E M O T E key selected, LED at the upper-left side of handy terminal R E M O T E key lights.

If R E N line (Remote Enable) of GP-IB manage line is true (low level) then LED at the upper right Lights.

2. 12. 2 Setting of G P — I B interface

1) Function of GP-IB interface are as follows.

Source handshake	:yes
Accept handshake	: yes
Talk	: yes
listen	: yes
service request	: yes
remote local	: No
parallel poll	: No
device clear	: No
device trigger	: No
controller	: No

2) Delimiter is CR+LF.

3) Addresses could be set to be optional (0 to 30) using the setting of DIP SW.
 Before shipment, the setting is 7 and command mode set by DIP SW
 At shipment, set as D 1 2 0 command setting.

**Attention: Set the DIP SW before the application of power supply. If you set this
 After the power supply on, shut off the power and reset again.**

4) Connect external- controlled computer with this equipment by exclusive cable.
 (exclusive cable D 7 0 - G 2 sell separately)

6) From the external- controlled computer, optional command could be transmitted.
 When the REN (Remote Enable) line of GP-IB management line is true (low level), listener is specified
 and LED of upper right of the REMOTE key.

<command transmission example>

transmit " *MODE 3" (set moving action of D120 to REMOTE mode) by computer.
 Command are all transmitted in ASCII code.
 Both upper case and low-case letters are effective.

							delimiter	
* (2AH)	M (4DH)	O (4FH)	D (44H)	E (45H)	3 (33H)	C R (0DH)	L F (0AH)	

Attention: if command mode is set as D80 command mode, mode changes and the above
 Commands do not function.
 If D80 command mode used, refer to D80 instruction manual.

2. 12. 3 Setting of the RS232C

1) The communicate conditions of RS232C are as follows.

Baud rate: 9600 BPS
 Character length: 8 bits
 Parity check: no parity
 Stop bit: 1 bit
 X parameter: no
 D-sub 9 pin DTE interface ER control

2) The RS232C connector output of D120 controller is as follows.

Connector product No:RDED-9SA-LNA(Hirose Electronics)

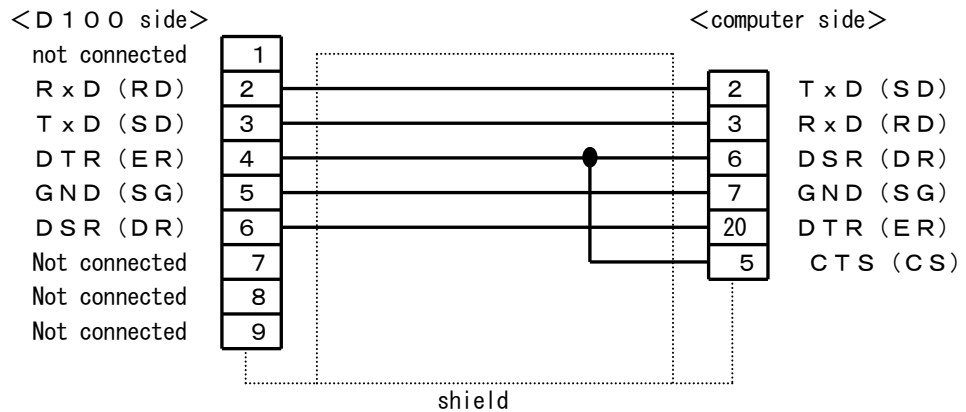
Adaptable plug:HDEB-9P(Hirose Electronics)

Cover case :HDE-CTH(Hirose Electronics)

1	Not connected	
2	R x D (RD)	reception data (input)
3	T x D (SD)	transmission data (output)
4	D T R (ER)	data terminal ready (output)
5	G N D (SG)	signal earth connection
6	D S R (DR)	データセットレディ (input)
7	Not connected	
8	Not connected	
9	Not connected	

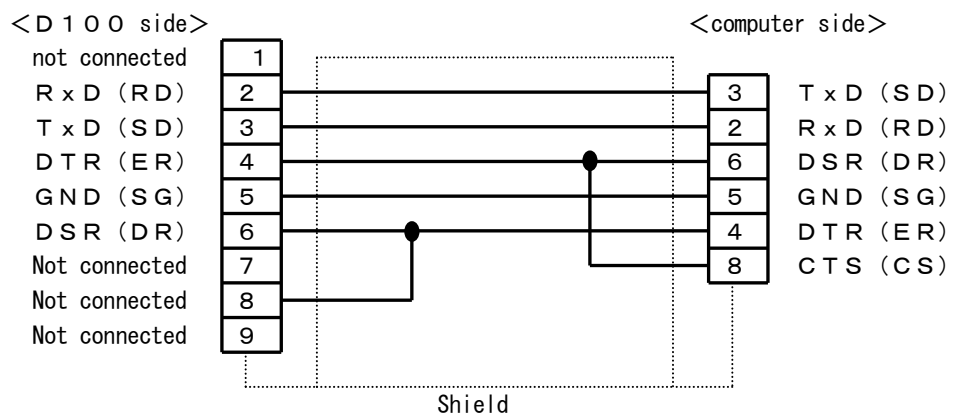
3) Connection cable with computer

【computer with D - s u b 25 pin connector】



※shield fixes the clamp part of plug case.

【computer with D - s u b 9 pin connector】



※ shield fixes the clamp part of plug case.

- 1) Using DIP SW setting to set command modes.
At shipment, D 1 2 0 command mode is set.

Attention:

DIP SW setting should be done before the application of D120 power supply.
If setting is after the power on, then shut off the power and reset again.

- 2) delimiter is CR (0DH) .
- 6) connect external control computer with this equipment by cable.
(exclusive cable D 1 0 0 - R 2 5 - 2 · D 1 0 0 - R 9 - 2 sell seperately)

- 3) transmit optional commands by external control computer.

<command transmission example>

transmit " *MODE3" (set D 1 2 0 moving mode to REMOTE mode) by computer.
Commnads are all transmitted in ASCII code.

for commands both upper case and low case letters are effective.

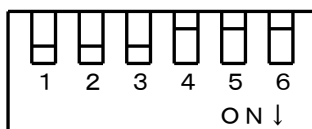
						<u>Delimiter</u>
* (2AH)	M (4DH)	O (4FH)	D (44H)	E (45H)	3 (33H)	CR (0DH)

Attention:

If command mode is set as D80 command mode, transmission procedures and command changes
So the above transmission procedures and command do not function.

Upon using D80 command mode, refer to D80 instruction manual.

2. 12. 4 Setting of DIP SW



At shipment, bit 1, 2, 3 set ON,
4, 5, 6 set OFF

setting at shipment.

bit	ON	OFF
1	GP-IB address setting (plus 1)	GP-IB address setting (plus 0)
2	GP-IB address setting (plus 2)	GP-IB address setting (plus 0)
3	GP-IB address setting (plus 4)	GP-IB address setting (plus 0)
4	GP-IB address setting (plus 8)	GP-IB address setting (plus 0)
5	GP-IB address setting (plus 16)	GP-IB address setting (plus 0)
6	D80 command mode setting	D120 command mode setting

1) Input GP-IB address by bit 1, binary digit.

Setting example: set D120 address to 10.

bit 1	.....OFF	.....	0
bit 2	.....ON	.....	2
bit 3	.....OFF	.....	0
bit 4	.....ON	.....	8
bit 5	.....OFF	.....	0
			10

Attention: effective setting scope of GP-IB address are from 0~30.

2) If using D120 as substitute for D80, use D80 command mode setting.
For other uses, use according to setting of D120 command mode.

Attention

On the occasion of D80 command mode setting, commands of D120 not accepted.
On the occasion of D120 command mode setting, commands of D80 not accepted.
For usage of D80 command mode, refer to the change points from 2.14 D80.

2. 12. 5 List of commands

Command is transmitted with ASCII code.
Uppercase and lowercase characters are both effective.
On case of GP-IB, put delimiter CR (ODH) LF (OAH) after the command.
On case of RS232C, put delimiter CR (ODH) after the command.

Attention:

When the command modes are set as D80 command modes, commands change and do not function.
For usage of D80 command modes, refer to D80 instruction manual.

command	content
A 1~A12	Axis indication
X	A 1 axis indication
Y	A 2 axis indication
Z	A 3 axis indication
X 1	A 1 axis indication
Y 1	A 2 axis indication
Z 1	A 3 axis indication
W 1	A 4 axis indication
X 2	A 7 axis indication
Y 2	A 8 axis indication
Z 2	A 9 axis indication
W 2	A 10 axis indication
# F	Setting of driving speed (F)
# P	Setting of movement pulse volume (P)
# R	setting of acceleration and deceleration rate (R)
# L	the setting of lift speed(L)

#S	Setting of current position (position)
#S-	Setting of current position (-position)
#OG	Return to origin
#UG	Instruction of movement in CW direction
#DG	Instruction of movement in CCW direction
#AG	Absolute position movement
E	Sudden stop
H	Slow down and stop
@	Display screen ON/OFF
\$	Switch display screen
*MODE	Switch the movement modes
*SOF	Prohibition of service request
*SON	Approval of service request
*M	Setting of memory SW
*T	Switch the driving speed (F→f)
*CW	Setting of CW side software limit
*CCW	Setting of CCW side software limit
*LMS	Setting of software limit
*LMR	Reset of software limit
*DON	Excitation on
*DOF	Excitation off
?I	Status request
?F	Driving speed (F) request
?P	Moving pulse (P) request
?R	Request of the setting value of acceleration and deceleration rate
?L	Request of the setting value of lift speed
?S	Request of the current position
?M	Request of memory SW setting value
?CW	Request of CW side software limit setting
?CCW	Request of CCW side software limit setting

1) Command with #, are those of standard driving series.

Before the command with #, the indication of axis is necessary. If the indication of axis lacks, the command would be ignored.

The combined usage of command with X and other command is possible. But if OG·UG·DG command are at the end of character string(in front of delimiter), the combination is impossible.

When used in combined cases, at the start, # should be marked and the following # could be omitted

case)

A 1 #OG	A 1 axis return-to-origin.
A 2 #SOF1000L100R500	Set A 2 axis position to 0, driving speed To 1000, start speed to 100, acceleration and deceleration rate to 500.
A 3 #P200	Set A 3 axis moving volume to 200
A 4 #S-10P100F500UG	Set A 4 axis position to -10, driving speed to 500, moving in CW side.

2) E command and H command are command for stop.

This command should be used separately and could not be combined with other commands.

3) @·\$ are command for display screen setting.

This command should be used separately and could not be combined with other commands.

4) Command with * are those of various setting.

By the case of command with *, the indication of axis is needed except *MODE · *SOF · *SON, if No indication of axis shown, then command is ignored.

This command should be used separately and could not be combined with other commands.

5) Command with? are those of requesting various data.

By the case of command with ?, if the indication of axis is needed, the indication of axis before ? is necessary. Otherwise command ignored.

If command is received then return the requesting data. Upon receiving the requesting data then Send the following command.

This command should be used separately and could not be combined with other commands.

6) if commands are not defined(character not in the list of commands or grammer miss of command), character strings ignored.

2. 12. 6 Description of commands

Command is transmitted with ASCII code.

uppercase and lowercase characters are both effective.

On case of GP-IB, put delimiter CR (ODH) LF (OAH) after the command.

On case of RS232C, put delimiter CR (ODH) after the command.

Attention :

When the command modes are set as D80 command modes, commands change and do not function.

For usage of D80 command modes, refer to D80 instruction manual.

コマンド	Instruction
A1~A12 X1~W2 X, Y, Z, W	Command of axis indication <ul style="list-style-type: none"> · if separately issued, switch the axis. · axis indication are executed of the transmission of the necessary command for axis indication
#F	the setting of driving speed <ul style="list-style-type: none"> · axis indication + #F + numerical value (numerical value means character string of 1 to 9999999) · A1#F1000 · A2#SOP100F500L100R500DG · Command for the setting of driving speed (PPS). Indicate the axis and set the numerical value after F · if value is above 6 digit, the 7th digit is cut off. · If value is 0, then modified to 1 · Driving speed setting command must be sent at stoppage. if sending while At action, then ignored. · switch to the indication axis · the combination with other # command is possible. <p>When used in combined cases, at the start, # should be marked and the following # should be omitted.</p>
#P	Command for the setting of movement pulse volume

	<ul style="list-style-type: none"> • axis indication + #P + numerical value (numerical value means character string of 0 to 800000) • A1#P1000 • A2#SOP100F500L100R500DG • Command for the setting of movement pulse volume. Indicate the axis and set the numerical value after P • if value is above 7 digit, the 8th digit is cut off. • If value is 800000, then modified to 800000 • If value is not input, then set the value to 0 • movement pulse volume setting command must be sent at stoppage. if sending while at action, then ignored • switch to the axis indicated • the combination with other # command is possible. When used in combined cases, at the start, # should be marked And the following # should be omitted.
# R	<p>Command for the setting of acceleration and deceleration rate</p> <ul style="list-style-type: none"> • axis indication + #R + numerical value (numerical value means character string of 1 to 9999) • A1#R100 • A2#SOP100F500L100R500DG • Command for the setting of acceleration and deceleration rate. Indicate the axis and set the numerical value after R. refer to Description of acceleration and deceleration rate. • if value is above 4 digit, the 5th digit is cut off. • If value is not input, then set the value to 0 • acceleration and deceleration rate setting command must be sent at stoppage. if sending while at action, then ignored • switch to the axis indicated • the combination with other # command is possible. When used in combined cases, at the start, # should be marked and the following # should be omitted.
# L	<p>Command for the setting of lift speed</p> <ul style="list-style-type: none"> • axis indication + #L + numerical value (numerical value means character string of 1 to 9999) • A1#L100 • A2#SOP100F500L100R500DG • Command for the setting of lift speed. Indicate the axis and set the numerical value after L • if value is above 4 digit, the 5th digit is cut off. • If value is below 10, modified to 10. • If value is not input, then set the value to 0 • lift speed setting command must be sent at stoppage. if sending while at action, then ignored • Switch to the indicated axis • the combination with other # command is possible. When used in combined cases, at the start, # should be marked and the following # should be omitted.
# S # S -	<p>Command for the setting of current position (position) Command for the setting of current position (minus position)</p> <ul style="list-style-type: none"> • axis indication + #S + numerical value (numerical value means character string of -800000~800000) • A1#S1000 • A2#SOP100F500L100R500DG • Command for the setting of current position. Indicate the axis and set the

	<p>numerical value after S</p> <ul style="list-style-type: none"> • if value is above 7 digit, the 8th digit is cut off. • If value is above 8 0 0 0 0 0 0 10, modified to 8 0 0 0 0 0 0 . • If value is not input, then set the value to 0 • lift speed setting command must be sent at stoppage. if sending while • At action, then ignored • Switch to the indicated axis • the combination with other # command is possible. <p>When used in combined cases, at the start, # should be marked and the following # should be omitted.</p>
# O G	<p>Command for the instruction of return-to-origin movement</p> <ul style="list-style-type: none"> • axis indication + #OG • A 1 # O G • A 2 # F 1 0 0 0 L 1 0 0 O G <ul style="list-style-type: none"> • Command that send the return-to-origin instruction. • Switch to the indicated axis • the combination with other # command is possible. <p>When used in combined cases, at the start, # should be marked and the following # should be omitted.</p> <ul style="list-style-type: none"> • When the return-to-origin movement is over ,GP-IB issues service request and service request is received and considered as finish confirmation. • At the reception of *SOF command, service request will not be issued. • By the case of RS232C, status of ?I command is taken as finish Confirmation
continued # O G	
# U G	<p>Command for the instruction of movement in CW direction</p> <ul style="list-style-type: none"> • axis indication + #UG • A 1 # U G • A 2 # P 1 0 0 0 F 2 0 0 0 U G • Command that indicate the CW moving direction. • switches to the indicated axis. • the combination with other # command is possible. <p>When used in combined cases, at the start, # should be marked and the following # should be omitted.</p> <ul style="list-style-type: none"> • When the movement is over ,GP-IB issues service request and service request is received and considered as finish confirmation. • At the reception of *SOF command, service request will not be issued. • By the case of RS232C, status of ?I command is taken as finish confirmation
# D G	<p>Command for the instruction of movement in CCW direction</p> <ul style="list-style-type: none"> • axis indication + #DG • A 1 # D G • A 2 # P 1 0 0 0 F 2 0 0 0 D G • Command that indicate the CCW moving direction. • switches to the indicated axis. • the combination with other # command is possible. <p>When used in combined cases, at the start, # should be marked and the following # should be omitted.</p> <ul style="list-style-type: none"> • When the movement is over ,GP-IB issues service request and service request is received and considered as finish confirmation. • At the reception of *SOF command, service request will not be issued. • By the case of RS232C, status of ?I command is taken as finish Confirmation
# A G	Absolute position driving

	<ul style="list-style-type: none"> axis indication + # A + numeric value + G (value - 8 0 0 0 0 0 0 ~ 8 0 0 0 0 0 0) A 1 # A 1 0 0 0 G A 2 # S 0 # F 1 0 0 0 L 1 0 0 R 5 0 0 A 2 0 0 G <p>command for occur the driving of absolute position.</p> <ul style="list-style-type: none"> if value is above 7 digit, the 8th digit is cut off. If value is above 8 0 0 0 0 0 0, modified to 8 0 0 0 0 0 0. If value is not input, then set the value to 0 Switch to the indicated axis the combination with other # command is possible. When used in combined cases, at the start, # should be marked and the following # should be omitted. 										
E	<p>Command for sudden stop</p> <ul style="list-style-type: none"> E When this command received, motorized stage takes a sudden stop. While at high-speed movement, the risk of stepping out remains. Use this command separately. It could not be combined with other commands. 										
H	<p>Command for slow down and stop</p> <ul style="list-style-type: none"> H When this command received, motorized stage slows down and stops. Use this command separately. It could not be combined with other commands. 										
@	<p>Display screen ON/OFF</p> <ul style="list-style-type: none"> @ if this command received, display screen (ON) turns into (OFF) and display screen (OFF) turns into (ON). Use this command separately. It could not be combined with other commands. 										
\$	<p>Display screen switch</p> <ul style="list-style-type: none"> \$ if this command received, display screen switches in the sequence of main screen → software limit setting screen → main screen. Use this command separately. It could not be combined with other commands. 										
*MODE	<p>Action mode switch</p> <ul style="list-style-type: none"> *MODE + mode code *MODE 3 actio mode switch command <table border="1"> <thead> <tr> <th>Mode code</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Switches to MANUAL mode</td> </tr> <tr> <td>1</td> <td>Switches to AUTO mode</td> </tr> <tr> <td>2</td> <td>Switches to ORIGIN mode</td> </tr> <tr> <td>3</td> <td>Switches to REMOTE mode</td> </tr> </tbody> </table>	Mode code	Content	0	Switches to MANUAL mode	1	Switches to AUTO mode	2	Switches to ORIGIN mode	3	Switches to REMOTE mode
Mode code	Content										
0	Switches to MANUAL mode										
1	Switches to AUTO mode										
2	Switches to ORIGIN mode										
3	Switches to REMOTE mode										

	<ul style="list-style-type: none"> when this command received at action, stop the moving axis and switches the mode. this command could be received at all modes except REMOTE modes. Use this command separately. It could not be combined with other commands. 																																		
* S O F	<p>Command for prohibition of the occurrence of service request</p> <ul style="list-style-type: none"> *SOF GP-IB prohibits the occurrence of service request. Use this command separately. It could not be combined with other commands 																																		
* S O N	<p>Command for the occurrence approval of service request</p> <ul style="list-style-type: none"> *SON GP-IB issues the approval of the occurrence of service request. <p>After the application of electric power supply, the occurrence of service request is approved. After the usage of *SOF command, this command is effective. Use this command separately. It could not be combined with other commands.</p>																																		
* M	<p>Command for the request of the setting value of memory SW. axis indication + ?M + memory SW indication code</p> <ul style="list-style-type: none"> A 1 * M 1 0 A 3 * M 3 0 A 5 * M 6 0 A 7 * M 8 1 * M 8 1 <ul style="list-style-type: none"> Command for request of the setting value of memory SW. First set indication axis, then *M, then select memory SW indication code and Setting value code. Switching to the indicated axis is not executed. <table border="1" data-bbox="496 1308 1391 1612"> <thead> <tr> <th>Memory SW indication code</th> <th>content</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Setting of return-to-origin method</td> </tr> <tr> <td>2</td> <td>Setting of mechanical limit sensor input logic</td> </tr> <tr> <td>3</td> <td>Setting of near-to-origin sensor input logic</td> </tr> <tr> <td>4</td> <td>Setting of origin sensor input logic</td> </tr> <tr> <td>6</td> <td>Setting of current down control</td> </tr> <tr> <td>7</td> <td>Setting of driver division volume</td> </tr> <tr> <td>8</td> <td>Setting of emergence stop control</td> </tr> </tbody> </table> <p>※memory SW indication code 8 are common for all axes. even axis is not indicated, setting is possible. * M 8 + indication code.</p> <table border="1" data-bbox="496 1709 1391 2011"> <thead> <tr> <th></th> <th>Setting value code</th> <th>content</th> </tr> </thead> <tbody> <tr> <td rowspan="7">1</td> <td>0</td> <td>Set ORG 0</td> </tr> <tr> <td>1</td> <td>Set ORG 1</td> </tr> <tr> <td>2</td> <td>Set ORG 2</td> </tr> <tr> <td>3</td> <td>Set ORG 3</td> </tr> <tr> <td>4</td> <td>Set ORG 4</td> </tr> <tr> <td>5</td> <td>Set ORG 5</td> </tr> <tr> <td>6</td> <td>Set ORG 6</td> </tr> </tbody> </table>	Memory SW indication code	content	1	Setting of return-to-origin method	2	Setting of mechanical limit sensor input logic	3	Setting of near-to-origin sensor input logic	4	Setting of origin sensor input logic	6	Setting of current down control	7	Setting of driver division volume	8	Setting of emergence stop control		Setting value code	content	1	0	Set ORG 0	1	Set ORG 1	2	Set ORG 2	3	Set ORG 3	4	Set ORG 4	5	Set ORG 5	6	Set ORG 6
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2	0	Set mechanical limit sensor input logic to normal Close (B point)
	1	Set mechanical limit sensor input logic to normal Close (A point)
3	0	Set near-to-origin sensor input logic to normal Close (B point)
	1	Set near-to-origin sensor input logic to normal Close (A point)
4	0	Set origin sensor input logic to normal close (B point)
	1	Set origin sensor input logic to normal close (A point)
6	0	Current down control of motor at stoppage
	1	Non-Current down control of motor at stoppage
7	0	D 1 2 0, F U L L ; D 1 2 0 M S, 1 / 1
	1	D 1 2 0, H A L F ; D 1 2 0 M S, 1 / 2
	2	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 2. 5
	3	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 4
	4	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 5
	5	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 8
	6	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 1 0
	7	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 2 0
	8	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 2 5
	9	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 4 0
	1 0	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 5 0
	1 1	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 8 0
	1 2	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 1 0 0
	1 3	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 1 2 5
	1 4	D 1 2 0, ineffecti ve; D 1 2 0 M S, 1 / 2 0 0
	1 5	D 1 2 0 ineffecti ve; D 1 2 0 M S, 1 / 2 5 0
8	0	E 1 O N (EMG 1 control input effective)
	1	E 1 O F F (EMG 1 control input ineffective)
continued		<ul style="list-style-type: none"> • If no setting value code, then command is ineffective. • If setting value code surpasses effective digit numbers, the digit numbers Below effective digit will be cut off. • memory SW setting command must be transmitted at stoppage. While at action, 動 command will be ingored. • use this command seperately. this command could not be combined with other commands. <p>※details of memory SW, refer to 2. 7 memory SW setting.</p>
* T		<p>Driving speed switch (F → f)</p> <ul style="list-style-type: none"> • axis indication+ * T • A 1 * T • command for swithcing driving speed. first put on axis indication then place * T. • switching to the indicated axis will not be executed. • driving speed switch command must be transmitted at stoppage. While at action, command will be ingored. • use this command seperately. this command could not be combined with other commands. <p>※details of driving speed switch, refer to 2.8.4 driving speed switch.</p>

<p>* CW</p>	<p>CW side software limit setting</p> <ul style="list-style-type: none"> • axis indication + * CW+numeric value (value— 8 0 0 0 0 0 0 ~ 8 0 0 0 0 0 0) • A 1 * CW 1 2 3 • A 2 * CW— 1 0 0 0 0 <ul style="list-style-type: none"> • command for setting CW side software limit. • if value is above 7 digit, the 8th digit is cut off. • If value is above 8 0 0 0 0 0 0 ,modified to 8 0 0 0 0 0 0 . • If value is not input, then set the value to 0 • Software limit indication command must be transmitted at stoppage. While at action, command will be ingored. • switch to the indicated axis. • use this command separately and combination with other command is impossible. <p>For details, refer to 2. 6 software limit description.</p>
<p>* CCW</p>	<p>CCW side software limit setting</p> <ul style="list-style-type: none"> • axis indication + * CCW+numeric value (value— 8 0 0 0 0 0 0 ~ 8 0 0 0 0 0 0) • A 1 * CCW 1 2 3 • A 2 * CCW— 1 0 0 0 0 <ul style="list-style-type: none"> • command for setting CCW side software limit. • If value is above 7 digits, the 8th digit is cut off. • If value is above 8 0 0 0 0 0 0 ,modified to 8 0 0 0 0 0 0 . • If value is not input, then set the value to 0 • Software limit indication command must be transmitted at stoppage. While at action, command will be ingored. • switch to the indicated axis. • use this command separately and combination with other command is impossible. <p>For details, refer to 2. 6 software limit description.</p>
<p>* LMS</p>	<p>Software limit setting</p> <ul style="list-style-type: none"> • axis indication+ * LMS • A 1 * LMS <ul style="list-style-type: none"> • command for setting software limit effective. • when software limit turns into effective then stops at limit value. • Software limit setting command must be transmitted at stoppage. While at action, command will be ingored. • switch to the indicated axis. • use this command separately and combination with other command is impossible. The combination with other # command is possible. <p>For details, refer to 2. 6 software limit description.</p>

* LMR	<p>Software limit reset</p> <ul style="list-style-type: none"> • axis indication+ * LMR • A 1 * LMR • command for invalidate software limit。 • when software limit turns into invalid, non-stop at limit value。 • Software limit reset command must be transmitted at stoppage. While at action, command will be ingored。 • switch to the indicated axis. • use this command separately and combination with other command is impossible. <p>For details, refer to 2. 6 software limit description.</p>
* DON	<p>Excitation on</p> <ul style="list-style-type: none"> • axis indication+DON • A 1 *DON • command for excite motor。 • excitation command must be transmitted at stoppage. While at action, command will be ingored。 • no switching to the indicated axis. • use this command separately and combination with other command is impossible. <p>For details, refer to 2.8.3 motor excitation ON/OFF。</p>
* DOF	<p>Excitation off</p> <ul style="list-style-type: none"> • axis indication+DOF • A 1 *DOF • command for maek motor excitation-off。 • Excitation off command must be transmitted at stoppage. While at action, command will be ingored。 • no switching to the indicated axis. • use this command separately and combination with other command is impossible. <p>For details, refer to 2.8.3 motor excitation ON/OFF。</p>

? I	<p>Status request</p> <ul style="list-style-type: none"> • axis indication+ ? I +status code • A 1 ? I A • A 2 ? I B • According to the status code, send 8 Bit binary data of each axis to the demanding party。 <table border="1" data-bbox="531 1688 1380 1794"> <thead> <tr> <th>Status code</th> <th>content</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Demanding status A</td> </tr> <tr> <td>B</td> <td>Demanding status B</td> </tr> </tbody> </table> <p><response of status A ></p> <table border="1" data-bbox="499 1861 1406 1951"> <thead> <tr> <th></th> <th>MSB</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>LSB</th> </tr> </thead> <tbody> <tr> <td>" 1 "</td> <td>In</td> <td>Origin</td> <td>suspend</td> <td>CWLS</td> <td>CCWLS</td> <td>READY</td> <td>CW</td> <td>Excitaton</td> </tr> <tr> <td>" 0 "</td> <td>Action</td> <td>detection</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>on</td> </tr> </tbody> </table>	Status code	content	A	Demanding status A	B	Demanding status B		MSB							LSB	" 1 "	In	Origin	suspend	CWLS	CCWLS	READY	CW	Excitaton	" 0 "	Action	detection						on
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" 0 "	Action	detection						on																										

stoppage						CCW	Excitation off
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In action : movement, " 1 " 、 stoppage " 0 "

Origin detection : after return-to-origin, at stoppage " 1 "

Suspend : in action, stop command · stop by STOP key, " 1 "

CWLS : CW side mechanical limit detection " 1 "

CCWLS : CCW side mechanical limit detection " 1 "

READY : if the demanding axis is at selection, then " 1 "

CW : CW side action or after the action, " 1 " 、
CCW side action or after the action

Excitation on/off : excitation on " 1 " 、 excitation off " 0 "

<response of status B>

	MSB				LSB			
" 1 "	Axis selection	Driver type			software limit CW detection	software limit CCW detection	Software limit CW effective	Software limit CCW Effective
" 0 "	possible							
			0	0				

Axis selection possible : for demanding axis, if driver is loaded then
Axis selection is ok, then " 1 "

Driver type : if driver type of demanding axis is MS type, then " 1 "

Software limit CW detection : at detection in CW side software limit,
Then " 1 "

Software limit CCW detection : at detection in CCW side software limit,
Then " 1 "

Software limit CW effective : if stoppage in CW side software limit
effective, then " 1 "

software limit CCW effective : if stoppage in CCW side software limit
effective, then " 1 "

- delimiter is put with the responding data.
- after the transmitting of command, corresponding data must be received.
For the next command transmission, after receiving the corresponding data
Then transmit.
- switching to the axis indicated is impossible.
- use this command separately and combination with other commands are
impossible.

? F	Request for driving speed(F) <ul style="list-style-type: none"> • axis indication+ ? F • A 1 ? F <ul style="list-style-type: none"> • command for requesting driving speed (F) 。 Upon receiving commands, transmit to the demanding party in ASCII code Byte by byte from the sequence of high order. • delimiter is put with the responding data. 。 • after the transmitting of command, corresponding data must be received. For the next command transmission, after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible. • use this command separately and combination with other commands are impossible.
? P	Request for moving pulse (P) <ul style="list-style-type: none"> • axis indication+ ? P

	<ul style="list-style-type: none"> • A 1 ? P • command for requesting moving pulse (P) 。 Upon receiving commands,transmit to the demanding party in A S C I I code Byte by byte from the sequence of high order。 • delimiter is put with the responding data。 。 • after the transmitting of command,corresponding data must be received。 For the nest command transmission,after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible。 • use this command seperately and combination with other commands are impossible。
? R	<p>Request for acceleration and deceleration rate (R)</p> <ul style="list-style-type: none"> • axis indication+ ?R • A 1 ?R • command for requesting aacceleration and deceleration rate (R) 。 Upon receiving commands,transmit to the demanding party in A S C I I code Byte by byte from the sequence of high order。 • delimiter is put with the responding data。 。 • after the transmitting of command,corresponding data must be received。 For the nest command transmission,after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible。 • use this command seperately and combination with other commands are impossible。
? L	<p>Request for start speed (L)</p> <ul style="list-style-type: none"> • axis indication+ ? L • A 1 ? L • command for requesting start speed(L)。 Upon receiving commands,transmit to the demanding party in A S C I I code Byte by byte from the sequence of high order。 • delimiter is put with the responding data。 。 • after the transmitting of command,corresponding data must be received。 For the nest command transmission,after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible。 • use this command seperately and combination with other commands are impossible。
? S	<p>Request for current position</p> <ul style="list-style-type: none"> • axis indication+ ? S • A 1 ? S • command for requesting current position。 Upon receiving commands,transmit to the demanding party in A S C I I code Byte by byte from the sequence of high order。

	<p>(if in minus position, then with -)</p> <ul style="list-style-type: none"> • delimiter is put with the responding data.。 • after the transmitting of command, corresponding data must be received. For the next command transmission, after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible. • use this command separately and combination with other commands are impossible. 																																																							
? M	<p>Request for memory SW setting value</p> <ul style="list-style-type: none"> • axis indication+ ? M+memory SW indication code • A 1 ? M 1 • ? M 8 • command for requesting memory SW value. <table border="1"> <thead> <tr> <th>Memory SW Indication code</th> <th>content</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Request for return-to-origin</td> </tr> <tr> <td>2</td> <td>Request for mechanical limit sensor input Logic</td> </tr> <tr> <td>3</td> <td>Request for near-to-origin sensor input logic</td> </tr> <tr> <td>4</td> <td>Request for origin sensor input logic</td> </tr> <tr> <td>6</td> <td>Request for current down control</td> </tr> <tr> <td>7</td> <td>Request for driver division number</td> </tr> <tr> <td>8</td> <td>Request for emergence stop control</td> </tr> </tbody> </table> <p>※memory SW indication code 8 is common for all axes, so even the indication axis is not input, setting is possible. ? M 8。</p> <ul style="list-style-type: none"> • Upon receiving commands, transmit memory SW content indicated by memory Indication code to the demanding party in ASCII code Byte by byte from the sequence of high order. <table border="1"> <thead> <tr> <th></th> <th>responding</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td rowspan="6">1</td> <td>0</td> <td>Setting ofORG0 by return-to-origin method</td> </tr> <tr> <td>1</td> <td>Setting ofORG1 by return-to-origin method</td> </tr> <tr> <td>2</td> <td>Setting ofORG2 by return-to-origin method</td> </tr> <tr> <td>3</td> <td>Setting ofORG3 by return-to-origin method</td> </tr> <tr> <td>4</td> <td>Setting ofORG4 by return-to-origin method</td> </tr> <tr> <td>5</td> <td>Setting ofORG5 by return-to-origin method</td> </tr> <tr> <td rowspan="2">2</td> <td>0</td> <td>Mechanical limit sensor input logic is setting of Normal close(B point)</td> </tr> <tr> <td>1</td> <td>Mechanical limit sensor input logic is setting of Normal close(A point)</td> </tr> <tr> <td rowspan="2">3</td> <td>0</td> <td>Near-to-origin sensor input logic is setting of Normal close(B point)</td> </tr> <tr> <td>1</td> <td>Near-to-origin sensor input logic is setting of Normal close(A point)</td> </tr> <tr> <td rowspan="2">4</td> <td>0</td> <td>Origin sensor input logic is setting of Normal close (B point)</td> </tr> <tr> <td>1</td> <td>Origin sensor input logic is setting of Normal close (A point)</td> </tr> <tr> <td rowspan="2">6</td> <td>0</td> <td>At stoppage, execute motor current down</td> </tr> <tr> <td>1</td> <td>At stoppage, do not execute motor current down</td> </tr> <tr> <td>7</td> <td>0</td> <td>D 1 2 0, F U L L ; D 1 2 0 M S, 1 / 1</td> </tr> </tbody> </table>	Memory SW Indication code	content	1	Request for return-to-origin	2	Request for mechanical limit sensor input Logic	3	Request for near-to-origin sensor input logic	4	Request for origin sensor input logic	6	Request for current down control	7	Request for driver division number	8	Request for emergence stop control		responding	Content	1	0	Setting ofORG0 by return-to-origin method	1	Setting ofORG1 by return-to-origin method	2	Setting ofORG2 by return-to-origin method	3	Setting ofORG3 by return-to-origin method	4	Setting ofORG4 by return-to-origin method	5	Setting ofORG5 by return-to-origin method	2	0	Mechanical limit sensor input logic is setting of Normal close(B point)	1	Mechanical limit sensor input logic is setting of Normal close(A point)	3	0	Near-to-origin sensor input logic is setting of Normal close(B point)	1	Near-to-origin sensor input logic is setting of Normal close(A point)	4	0	Origin sensor input logic is setting of Normal close (B point)	1	Origin sensor input logic is setting of Normal close (A point)	6	0	At stoppage, execute motor current down	1	At stoppage, do not execute motor current down	7	0	D 1 2 0, F U L L ; D 1 2 0 M S, 1 / 1
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10	D 1 2 0 M S, 1 / 5 0																							
11	D 1 2 0 M S, 1 / 8 0																							
		<table border="1"> <tr><td>12</td><td>D 1 2 0 M S, 1 / 1 0 0</td></tr> <tr><td>13</td><td>D 1 2 0 M S, 1 / 1 2 5</td></tr> <tr><td>14</td><td>D 1 2 0 M S, 1 / 2 0 0</td></tr> <tr><td>15</td><td>D 1 2 0 M S, 1 / 2 5 0</td></tr> <tr><td>8</td><td>0 E 1 O N (EMG 1 control input effective) setting</td></tr> <tr><td></td><td>1 E 1 O F F (EMG 1 control input ineffective) setting</td></tr> </table> <ul style="list-style-type: none"> • delimiter is put with the responding data. . • after the transmitting of command, corresponding data must be received. For the next command transmission, after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible. use this command separately and combination with other commands are impossible. 	12	D 1 2 0 M S, 1 / 1 0 0	13	D 1 2 0 M S, 1 / 1 2 5	14	D 1 2 0 M S, 1 / 2 0 0	15	D 1 2 0 M S, 1 / 2 5 0	8	0 E 1 O N (EMG 1 control input effective) setting		1 E 1 O F F (EMG 1 control input ineffective) setting										
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? CW	Demand for CW side software limit setting value																							
	<ul style="list-style-type: none"> • axis indication+ ? CW • A 1 ? CW • command for requesting CW side software limit setting value • Upon receiving commands, transmit to the demanding party in A S C I I code Byte by byte from the sequence of high order. (if in minus position, then with -) • delimiter is put with the responding data. . • after the transmitting of command, corresponding data must be received. For the next command transmission, after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible. use this command separately and combination with other commands are impossible. 																							
? CCW	Request for CCW side software limit setting value																							
	<ul style="list-style-type: none"> • axis indication+ ? CCW • A 1 ? CCW • command for requesting CCW side software limit setting value • Upon receiving commands, transmit to the demanding party in A S C I I code Byte by byte from the sequence of high order. (if in minus position, then with -) • delimiter is put with the responding data. . • after the transmitting of command, corresponding data must be received. For the next command transmission, after receiving the corresponding data Then transmit. • switching to the axis indicated is impossible. use this command separately and combination with other commands are impossible. 																							

	<p>Service request accept action command #UG · #DG · #OG · #AG from GP-IB in the REMOTE modes and then moves, then occurs at stoppage.</p> <p style="text-align: center;">MSB LSB</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>suspend</td> <td>SRQ flag</td> <td></td> <td>Limit stop</td> <td>Stop axis 4</td> <td>Stop axis 3</td> <td>Stop Axis 2</td> <td>Stop Axis 1</td> </tr> <tr> <td>0, 1</td> <td>1</td> <td>0</td> <td>0, 1</td> <td>0, 1</td> <td>0, 1</td> <td>0, 1</td> <td>0, 1</td> </tr> </table> <p>Suspend : by stop demand · STOP key in action, then " 1 "</p> <p>SRQ flag : service request occurs, " 1 "</p> <p>Limit stop : stop by mechanical limit · software limit, then " 1 "</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Stop axis</th> <th>Stop axis 4</th> <th>Stop axis 3</th> <th>Stop axis 2</th> <th>Stop axis 1</th> </tr> </thead> <tbody> <tr><td>A 1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>A 2</td><td>0</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>A 3</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>A 4</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>A 5</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>A 6</td><td>0</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>A 7</td><td>0</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>A 8</td><td>1</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>A 9</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>A10</td><td>1</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>A11</td><td>1</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>A12</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> </tbody> </table> <ul style="list-style-type: none"> · please receive service request. If no receipt, before sending movement · command #UG · #DG · #OG, transmit *SOF command and prohibit the occurrence of service request. 	suspend	SRQ flag		Limit stop	Stop axis 4	Stop axis 3	Stop Axis 2	Stop Axis 1	0, 1	1	0	0, 1	0, 1	0, 1	0, 1	0, 1	Stop axis	Stop axis 4	Stop axis 3	Stop axis 2	Stop axis 1	A 1	0	0	0	1	A 2	0	0	1	0	A 3	0	0	1	1	A 4	0	1	0	0	A 5	0	1	0	1	A 6	0	1	1	0	A 7	0	1	1	1	A 8	1	0	0	0	A 9	1	0	0	1	A10	1	0	1	0	A11	1	0	1	1	A12	1	1	0	0
suspend	SRQ flag		Limit stop	Stop axis 4	Stop axis 3	Stop Axis 2	Stop Axis 1																																																																											
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A12	1	1	0	0																																																																														

2. 12. 7 attention on command operation

in the remote modes, there are commands those do not receive commands to the moving axis and those do.

1) When the setting axis is in movement, ineffective commands.

- # F : setting of driving speed (F)
- # P : setting of driving pulse (P)
- # R : setting of acceleration and deceleration rate (R)
- # L : setting of start speed (L)
- # S : setting of current position
- # OG : return-to-origin
- # UG : CW side movement
- # DG : CCW side movement
- # AG : absolute position movement
- * M : setting of memory SW
- * T : switch of driving speed (F → f)
- * CW : setting of CW side software limit

```

* C C W      : setting of C C W sid esoftware limit
* L M S      : set of software limit
* L M R      : reset of software limit
* D O N      : excitation on
* D O F F    : excitation off

```

2) Acceptable commands in action

```

E          : emergance stop of all axes
H          : slow down of all axes
@          : O N / O F F of display screen
$          : switching of display screen
* M O D E   : swithcing of moving mode
* S O F     : prohibition of the service request occurence
* S O N     : approval of the service request occurance
?          : demanding command

```

2. 13 sample programs

2. 13. 1 G P - I B sample program (1) transmission of command

```

100 '*****
110 '* D 1 2 0 G P - I B サンプルプログラム ( 1 ) コマンドの送信 *
120 '*
130 '*          1 9 9 9 年    5 月  駿河精機 ( 株 ) O S T 事業部    *
140 '*****
150 '
160 CLS
170 PRINT " D 1 2 0 の G P - I B アドレスを 7 にして下さい"
180 PRINT " 準備が出来たら何かキーを押してください"
190 LINE INPUT:A$
200 ISET IFC :ISET REN :CMD DELIM=0 :CMD TIMEOUT=10
210 GOSUB *TIMER
220 PRINT @7;"*MODE3"
230 LINE INPUT "コマンドを入力してください。 E N D または e n d で終了";D$
240 IF D$="END" OR D$="end" THEN END
250 PRINT @7:D$
260 GOTO 230
270 *TIMER
280   FOR I=0 TO 10000
290     NEXT I
300   RETURN

```

【explanation】

Line 2 0 0 makes the initial setting of G P - I B interface。
Line 2 1 0 waits the initial setting of G P - I B interface。

attention) after the execution of I F C (interface clear) 、 after every 5 0 m s e c ,
transmit commnands.

Line 220 switches to REMOTE modes.
Line 250 transmit optional commands. (all commands except ?request commands
Could be transmitted)

2. 13. 2 GP-IB sample program (2) position request

```
100 '*****
110 '* D120 GP-IBサンプルプログラム(2) ポジション要求 *
120 '* *
130 '*          1999年   5月  駿河精機(株)OST事業部 *
140 '*****
150 '
160 CLS
170 PRINT "D120のGP-IBアドレスを7にして下さい"
180 PRINT "準備が出来たら何かキーを押してください"
190 LINE INPUT:A$
200 ISET IFC :ISET REN :CMD DELIM=0 :CMD TIMEOUT=10
210 GOSUB *TIMER
220 PRINT @7;"*MODE3"
230 PRINT @7;"A1?S"
240 INPUT @7:P$
250 PRINT "A 1 軸ポジション="P$ :WBYTE &H3F;
260 PRINT @7;"A2?S"
270 INPUT @7:P$
280 PRINT "A 2 軸ポジション="P$ :WBYTE &H3F;
290 END
300 '
310 *TIMER
320   FOR I=0 TO 10000
330     NEXT I
340   RETURN
```

「explanation」

Line 200 makes the initial setting of GP-IB interface.
Line 210 waits the initial setting of GP-IB interface.

attention) after the execution of IFC (interface clear)、after every 50msec,
transmit commands.

Line 220 switches to REMOTE modes.
Line 230、260 transmit position request commands.
Line 240、270 receive position value.

2. 13. 3 GP-IB sample program (3) status demand

```
100 '*****
```

```

110 '* D120 GP-IBサンプルプログラム(3) ステータス要求 *
120 '*
130 '*          1999年   5月  駿河精機(株)OST事業部 *
140 '*****
150 '
160 CLS
170 PRINT "D120のGP-IBアドレスを7にして下さい"
180 PRINT "準備が出来たら何かキーを押してください"
190 LINE INPUT:A$
200 ISET IFC :ISET REN :CMD DELIM=0 :CMD TIMEOUT=10
210 GOSUB *TIMER
220 PRINT @7;"*MODE3"
230 PRINT @7;"A1?IA"
240 LINE INPUT @7;ST$:ST$=HEX$(ASC(ST$))
250 PRINT "A 1 軸ステータスA="ST$
260 PRINT @7;"A1?IB"
270 LINE INPUT @7;ST$:ST$=HEX$(ASC(ST$))
280 PRINT "A 1 軸ステータスB="ST$
290 PRINT @7;"A2?IA"
300 LINE INPUT @7;ST$:ST$=HEX$(ASC(ST$))
310 PRINT "A 2 軸ステータスA="ST$
320 PRINT @7;"A2?IB"
330 LINE INPUT @7;ST$:ST$=HEX$(ASC(ST$))
340 PRINT "A 2 軸ステータスB="ST$
350 END
360 *TIMER
370   FOR I=0 TO 10000
380     NEXT I
390   RETURN

```

「explanation」

Line 200 makes the initial setting of GP-IB interface.

Line 210 waits the initial setting of GP-IB interface.

attention) after the execution of IFC (interface clear)、after every 50msec, transmit commands.

Line 220 switches to REMOTE modes.

Line 230 transmit status A request command.

Line 240 receives status A and changes received character strings into character codes, Then into hexadecimal numeral and display in line 250.

2. 13. 4 GP-IB sample program (4) stage movement

```

100 '*****
110 '* D120 GP-IBサンプルプログラム(4) ステージ移動 *
120 '*
130 '*          1999年   5月  駿河精機(株)OST事業部 *
140 '*****
150 '
160 CLS
170 PRINT "D120のGP-IBアドレスを7にして下さい"

```

```

180 PRINT "準備が出来たら何かキーを押してください"
190 LINE INPUT:A$
200 ISET IFC :ISET REN :CMD DELIM=0 :CMD TIMEOUT=10
210 PRINT "D 1 2 0 A 1 軸、A 2 軸にモーターを取り付けて下さい"
220 PRINT "CW方向の駆動を行います。準備が出来たら何かキーを押してください"
230 LINE INPUT:A$
240 SRQ ON :ON SRQ GOSUB *POLL1
250 PRINT @7;"*MODE3"
260 PRINT @7;"A1#SOP500F1000R500L100UG" :A1STOP=0
270 PRINT "A 1 軸が1 K P P Sの速度で5 0 0パルス移動中です"
280 IF A1STOP=0 THEN GOTO 280
290 PRINT @7;"A2#SOP500F1000R500L100UG" :A2STOP=0
300 PRINT "A 2 軸が1 K P P Sの速度で5 0 0パルス移動中です"
310 IF A2STOP=0 THEN GOTO 310
320 PRINT "全軸停止しました"
330 END
340 *POLL1
350     POLL 7,ST
360     S=ST AND &HF
370     IF S=1 THEN PRINT "A 1 軸停止" :IF S=1 THEN A1STOP=1
380     IF S=2 THEN PRINT "A 2 軸停止" :IF S=2 THEN A2STOP=1
390     S=ST AND 16 :IF S=16 THEN PRINT "リミット停止"
400     S=ST AND 128 :IF S=128 THEN PRINT "途中停止"
410     RETURN

```

【explanation】

Line 2 0 0 makes initial setting of G P - I B interface initial setting.
Line 2 4 0 controls SRQ (service request) receipt approval.
Line 2 5 0 switches into R E M O T E mode.
Line 2 6 0 gives movement commands and set stop parameters (A 1 S T O P) to 0.
After the finish of movement of each axis, service request issued and subroutine Executed and step parameters of stop axis will be 1.
By line 2 8 0, line 3 1 0, stoppage of each axis confirmed then finish.

2. 13. 5 RS 2 3 2 C sample program (5) transmission of command

```

100 '*****
110 '* D 1 2 0 RS 2 3 2 C サンプルプログラム (5) コマンドの送信 *
120 '* *
130 '*          1 9 9 9 年    5 月  駿河精機 (株) O S T 事業部    *
140 '*****
150 '
160 CLS
170 PRINT "D 1 2 0の通信フォーマットは以下の通りです"
180 PRINT "  1. ボーレート      9 6 0 0 B P S"
190 PRINT "  2. データ長        8 B I T"
200 PRINT "  3. ストップビット    1 B I T"
210 PRINT "  4. パリティ          無し"
220 PRINT "準備が出来たら何かキーを押してください"
230 LINE INPUT:A$
240 OPEN "COM:N81" AS #1

```

```

250 PRINT #1, "*MODE3"
260 PRINT #1, CHR$(&HD);
270 LINE INPUT "コマンドを入力してください。ENDまたはendで終了";D$
280 IF D$="END" OR D$="end" THEN END
290 PRINT #1, D$
300 PRINT #1, CHR$(&HD);
310 GOTO 270

```

【explanation】

line 240 opens RS232C communication file。
Line 250 switches to REMOTE modes。
Line 260 transmit delimiter (CR・ODH)。
attention) after the transmission of commands, transmit delimiter。
Line 290 send optional commands. (transmission of all commands except ?Request
Commands are possible)

2. 13. 6 RS232C sample program (6) position request

```

100 '*****
110 '* D120 RS232Cサンプルプログラム(6) ポジション要求 *
120 '* *
130 '*          1999年   5月   駿河精機(株)OST事業部 *
140 '*****
150 '
160 CLS
170 PRINT "D120の通信フォーマットは以下の通りです"
180 PRINT "  1. ボーレート   9600BPS"
190 PRINT "  2. データ長     8BIT"
200 PRINT "  3. ストップビット 1BIT"
210 PRINT "  4. パリティ     無し"
220 PRINT "準備が出来たら何かキーを押してください"
230 LINE INPUT:A$
240 OPEN "COM:N81" AS #1
250 PRINT #1, "*MODE3"
260 PRINT #1, CHR$(&HD);
270 PRINT #1, "A1?S"
280 PRINT #1, CHR$(&HD);
290 INPUT #1, P$ :PRINT "A 1 軸ポジション="P$
300 PRINT #1, "A2?S"
310 PRINT #1, CHR$(&HD);
320 INPUT #1, P$ :PRINT "A 2 軸ポジション="P$
330 END

```

【explanation】

line 240 opens RS232C communication file。
Line 250 switches to REMOTE modes。
Line 260 transmit delimiter (CR・ODH)。
attention) after the transmission of commands, transmit delimiter。

Line 270、300 transmit position request commands。
Line 290、320 receive position value。

2. 13. 7 RS232C sample program (7) status request

```
100 '*****
110 '* D120 RS232Cサンプルプログラム(7) ステータス要求 *
120 '*
130 '*          1999年   5月   駿河精機(株)OST事業部   *
140 '*****
150 '
160 CLS
170 PRINT "D120の通信フォーマットは以下の通りです"
180 PRINT "  1. ボーレート      9600BPS"
190 PRINT "  2. データ長      8BIT"
200 PRINT "  3. ストップビット  1BIT"
210 PRINT "  4. パリティ      無し"
220 PRINT "準備が出来たら何かキーを押してください"
230 LINE INPUT:A$
240 OPEN "COM:N81" AS #1
250 PRINT #1,"*MODE3"
260 PRINT #1,CHR$(&HD);
270 PRINT #1,"A1?IA"
280 PRINT #1,CHR$(&HD);
290 LINE INPUT #1,S$:S$=HEX$(ASC(S$)):PRINT "A 1 軸ステータスA="S$
300 PRINT #1,"A1?IB"
310 PRINT #1,CHR$(&HD);
320 LINE INPUT #1,S$:S$=HEX$(ASC(S$)):PRINT "A 1 軸ステータスB="S$
330 PRINT #1,"A2?IA"
340 PRINT #1,CHR$(&HD);
350 LINE INPUT #1,S$:S$=HEX$(ASC(S$)):PRINT "A 2 軸ステータスA="S$
360 PRINT #1,"A2?IB"
370 PRINT #1,CHR$(&HD);
380 LINE INPUT #1,S$:S$=HEX$(ASC(S$)):PRINT "A 2 軸ステータスB="S$
390 END
```

【explanation】

line 240 opens RS232C communication file。
Line 250 switches to REMOTE modes。
Line 260 transmit delimiter (CR・ODH)。
attention) after the transmission of commands, transmit delimiter。

Line 270、270 transmit status A request commands。
Line 290 receives status A and changes character string into character code and
Then into hexadecimal numeral character strings。

2. 13. 8 RS 2 3 2 C sample program (8) stage movement

```

100 '*****
110 '* D 1 2 0 RS 2 3 2 Cサンプルプログラム ( 8 ) ステージ移動 *
120 '* *
130 '*          1 9 9 9 年    5 月  駿河精機 (株) O S T 事業部 *
140 '*****
150 '
160 CLS
170 PRINT "D 1 2 0の通信フォーマットは以下の通りです"
180 PRINT "  1. ボーレート      9 6 0 0 B P S"
190 PRINT "  2. データ長        8 B I T"
200 PRINT "  3. ストップビット    1 B I T"
210 PRINT "  4. パリティ          無し"
220 PRINT "準備が出来たら何かキーを押してください"
230 LINE INPUT:A$
240 OPEN "COM:N81" AS #1
250 PRINT #1,"*MODE3"
260 PRINT #1,CHR$(&HD);
270 PRINT #1,"A1#SOP500F1000R500L100UG"
280 PRINT #1,CHR$(&HD); :A1STOP=0
290 PRINT "A 1 軸が1 K P P Sの速度で5 0 0パルス移動中です"
300 GOSUB *A1STOPCK :IF A1STOP=0 THEN GOTO 300
310 PRINT #1,"A2#SOP500F1000R500L100UG"
320 PRINT #1,CHR$(&HD); :A2STOP=0
330 PRINT "A 2 軸が1 K P P Sの速度で5 0 0パルス移動中です"
340 GOSUB *A2STOPCK :IF A2STOP=0 THEN GOTO 340
350 PRINT "全軸停止しました"
360 END
370 *A1STOPCK
380   PRINT #1,"A1?IA"
390   PRINT #1,CHR$(&HD);
400   LINE INPUT #1,S$ :S=ASC(S$) :S=S AND 128
410   IF S=0 THEN PRINT "A 1 軸停止" :IF S=0 THEN A1STOP=1
420   RETURN
430 *A2STOPCK
440   PRINT #1,"A2?IA"
450   PRINT #1,CHR$(&HD);
460   LINE INPUT #1,S$ :S=ASC(S$) :S=S AND 128
470   IF S=0 THEN PRINT "A 2 軸停止" :IF S=0 THEN A2STOP=1
480   RETURN

```

【explanation】

line 2 4 0 opens RS 2 3 2 C communication file.
Line 2 5 0 switches to REMOTE modes.
Line 2 6 0 transmit delimiter (CR・ODH)。
attention) after the transmission of commands, transmit delimiter.

Line 270 sends the movement commands; Line 280 send delimiter and set stop parameter (A 1 S T O P) to 0.

Line 300, 340 confirm the stoppage of each axis, if the stoppage parameter of each axis

Is 1 then finish.

2. 14 change points from D 8 0

2. 14. 1 change points description

- 1) Change of extended driver series。
D120 stepping motor controller uses photo coupler for connection with extended Drivers to improve reliability for electrical insulating.
- 2) Change of monitor output。
Acceleration signal · deceleration signal · instant speed signal could not be output

Refer to 2.3 instruction of monitor output.
- 3) Change of external emergence stop function。
D120 stepping motor controller has 2 types of emergence stop control, emergence stop Input turns into B point input。
Refer to 2.2 emergence stop connector.
- 4) Change of parameters。
Using LSI change of pulse control, change the setting scope of parameters, Acceleration and deceleration.
2. 5 Refer to 2.5 parameter instruction
- 5) Change of memory SW 。
Change return-to-origin method。
Cancel backlash offset function。
Change setting of GP-IB addresses to DIP SW setting。
Refer to 2.7 memory SW setting.
- 6) Cancellation of machine lock。
Cancel machine lock function and add excitation ON/OFF。
By setting motor to excitation OFF status, free the motor to not to receive Action commands。
Refer to 2.8.3 motor excitation ON/OFF.
- 7) Cancellation of logic limit function。
Cancel the logic limit function and add software limit function。
Using this function, 2 points of software limit in CW side, CCW side could be set。
Refer to 2.6 software limit instruction.
- 8) Command change of REMOTE modes。
With the change of function, change REMOTE mode commands。
Refer to 2.12.5 list of commands。
As the forms of commands, D80 command mode and D120 command are set and could be Chosen by DIP SW。
2. 1 2. 4 Refer to 2.12.4 DIP SW setting。
When using the software of D80, please use the D80 command mode setting。

Attention: since non-function command and function-changed commands exist in D80 commands refer to 2.14.2 D80 command mode and then use.
- 9) Change of RS 2 3 2 C cable.

RS232C function are changed so the wiring of cables change。
Refer to 2.12.3 RS232C interface setting。

2. 1 4. 2 Description on D 8 0 command mode

D 8 0 command mode make application program of D80 act on D120 for users。
If new application will be made, create basing on D120 command mode setting。
In D80 command modes, D120 command and sample programs listed in this instruction Manual will not work。

Refer to D80 instruction manual while using D80 command modes。
Since non-function command and function-changed commands of D80 command exist, look at the following。

【list of D 8 0 commands】

	*	:	prohibition of service request
	#	:	approval of service request
	@	:	ON/OFF of the display screen
	X 1 (A 1)	:	axis indication
	Y 1 (A 2)	:	axis indication
	Z 1 (A 3)	:	axis indication
	W 1 (A 4)	:	axis indication
	A 5	:	axis indication
	A 6	:	axis indication
	X 2 (A 7)	:	axis indication
	Y 2 (A 8)	:	axis indication
	Z 2 (A 9)	:	axis indication
	W 2 (A 1 0)	:	axis indication
	A 1 1	:	axis indication
	A 1 2	:	axis indication
	F	:	setting of driving speed
	P	:	setting of moving pulse volume
	R	:	setting of acceleration and deceleration rate
	L	:	setting of start speed
	S	:	setting of current position
	E	:	emergence stop
	H	:	slow down stop
	?	:	position request
※attention 1	&	:	request for coordinate value
	%	:	status request
※attention 2	M	:	change and registration of memory SW
※attention 3	N	:	memory SW status request
	O	:	return-to-origin command
	U	:	moving direction indication (CW side)
	D	:	moving direction indication (CCW side)
	G	:	moving command
※attention 1	B	:	machine lock
※attention 1	C	:	machine lock release
	T	:	driving speed switch (F→f)
※attention 4	I	:	setting of CW side logic limit
※attention 5	J	:	setting of CCW side logic limit
※attention 6	K	:	release of logic limit
	V	:	return to O position

【attention 1 ~ 6 explanation of commands】

※attention 1. D 1 2 0 will not function by this command

※attention 2. Changing the content of memory SW、M command will function as follows.

M	Change and registration of memory SW		
	<ul style="list-style-type: none"> • M+axis indication+ / +memory SW indication code+setting value code • after M axis indication, memory SW indication code , setting value code , to be a command 		
	Memory SW Indication code	Setting value code	content
	1	0	ORG 1 (return-to-origin)
		1	ORG 2
		2	ORG 3
		3	ORG 4
		4	ORG 0
		5	ORG 5
		6	ORG 6
	2	0, 1	Same as D 8 0
	3	0, 1	Same as D 8 0
	4	0, 1	Same as D 8 0
5	0 1 ~ 9 9	D 8 0 return-to-origin pulse (setting value code do not function and registrate in memory, upon receipt of N command, return back to the demanding party)	
6	0, 1	Same as D 8 0	
7	0 0 ~ 1 5	Same as D 8 0	
8	0 0 ~ 9 9	D 8 0 backlash offset (setting value code do not function and registrate in memory, upon receipt of N command, return back to the demanding party)	
9	0 0 ~ 3 0	D 8 0 GPIB address (setting value code do not function and registrate in memory, upon receipt of N command, return back to the demanding party)	

※attention 3.

By M command, changed and registrated memory SW setting value code should follow D 8 0 N command and return back to the demanding party.

※attention 4 :

At D120, if this command is received, set the current position as CW side software limit And set CCW side software limit as -8000000 to make software limit setting effective.

Attention: when software limit is at back-to-origin, do not function and pay attention.

※Attention 5 :

At D120, if this command is received, set the current position as CCW side software

Limit and set CW side software limit as 8000000 to make software limit setting effective.

Attention:when software limit is at back-to-origin,do not function and pay attention.

※ Attention 6 :

At D120,if this command is received,set the current position as CW side software Limit and set CCW side software limit as -8000000 to make software limit setting ineffective.

2. 15 attached documents

2. 15. 1 description on acceleration and deceleration rate

acceleration and deceleration speed (R) set from start speed (L) to driving speed (F),the acceleration・deceleration attributes.

Acceleration and deceleration constant could be calculated by the following formula

$$T u d = 25.165 \times (64 + R) / 400 \text{ [msec/1000PPS]}$$

Unit of T u d [msec/1000PPS] is the average time for 1000PPS acceleration and deceleration.

Setting scope of acceleration and deceleration is from 0~9999、4~633 [msec/1000PPS].

【setting example】

to make acceleration and deceleration constant T u d to 100 [msec/1000PPS],set the acceleration and deceleration rate R as follows.

$$\begin{aligned} R + 64 &= 400 \times T u d / 25.165 \\ R + 64 &= 400 \times 100 / 25.165 \\ R + 64 &\doteq 1590 \\ R &\doteq 1590 - 64 \\ R &\doteq 1526 \end{aligned}$$

2. 15. 2 list of parameter・memory SW・software limit (default setting at shipment・setting scope)

parameter	Setting scope	Default Setting	unit
Effective display Scope	-8000000~8000000	0	Pulse
Driving speed (F)	1~999999	1000	PPS
Moving pulse (P)	0~8000000	0	Pulse
Start speed (L)	10~9999	100	PPS
Acceleration and Deceleration rate (R)	0~9999	500	-

Memory SW	Setting scope	Default Setting
Return-to-origin method	ORG0~ORG6	ORG1
Mechanical limit sensor input logic	LSNC/LSNO	LSNC
Near-to-origin sensor input logic	NONC/NONO	NONC

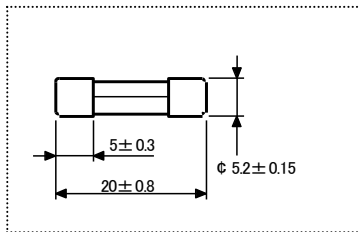
Origin sensor input logic		ONC/ONO	ONC
Current down control		CD/NCD	CD
Driver division volume D120		FULL/HALF	FULL
	D120MS	1/1~1/250	1/1
EMG1 emergence stop control		E1OFF/E1ON	E1OFF

Software limit	Setting scope	Default setting	Unit
CW limit	-8000000~8000000	8000000	Pulse
CCW limit	-8000000~8000000	-8000000	pulse
Effective or ineffective of limit	ON/OFF	OFF	-

2. 15. 3 change of fuse

D120 stepping motor controller power supply fuse enters into fuse hold part at the Right side of front panel power supply SW, when fuse is expired, change with that.

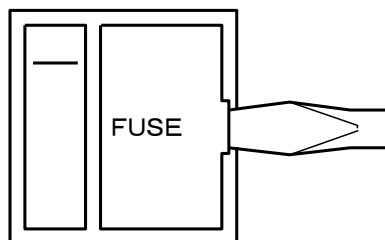
【fuse specification】



- spec $\phi 5.2 \times 20$ mm
- terminal **metal mold**
- fuse rating normal meltdown 4 A 125 V AC

【change procedure】

- 1) put power supply SW to OFF then plug out power supply plug from the outlet.
- 2) As the diagram shown below, open the fuse holder by minus driver.
- 3) change fuse and close the fuse holder.
- 4) plug in power supply plug into outlet and put power supply SW ON and turn on electricity.



3. others

3. 1 before you think as accident

Before calling repairment, first check the following items.

Symptom	cause	action	ref
No power supply	Power supply code Drops out	Plug into the outlet tightly	—
	Fuse expiration	Change the fuse	P. 79
	Wrong wiring	Confirm wiring Connection	P. 13
	EMG 2 emergence Stop circuit works	Release EMG 2 emergence stop circuit	P. 18
Motorized stage Do not work ない	Bad connection of Exclusive cables	Confirm connection of Exclusive cable connector	P. 13
	Occasion of external Control Wiring of I/O cable OK?	Confirm the wiring	P. 49
	EMG1 emergence Stop circuit works	Release EMG1 emergence stop circuit	P. 17
	Setting of software Limit	Confirm the setting of Software limit	P. 27
Power supply lamp・ Operation switch lamp do no light	No lamp light	Call for repairment	P. 83
	Power supply code Drops out	Plug into the outlet tightly	—
Fuse always expire	Hurt and badness of Power supply code	Call for repairment	P. 83

3. 2 Specification

3. 2. 1 General specification

extended dimension : 430 (W) × 100 (H) × 320 (D)
(handle, stand and other projections are not included)

weight : D121 : 4.1kg D121MS : 4.3kg
 D122 : 4.3kg D122MS : 4.6kg
 D123 : 4.5kg D123MS : 4.9kg
 D124 : 4.7kg D124MS : 5.2kg
 D125 : 4.9kg D125MS : 5.5kg
 D126 : 5.1kg D126MS : 5.8kg

Watt : D121 : 105W D121MS : 1110W
 D122 : 115W D122MS : 125W
 D123 : 125W D123MS : 140W
 D124 : 135W D124MS : 155W
 D125 : 145W D125MS : 170W
 D126 : 155W D126MS : 185W

Ambient temperature :
 0~40°C、20~80%RH (without condensation)

power supply : AC100V ±10% 50/60Hz

3. 2. 2 Controller specification

No of control axes : D121・D121MS (マイクロステップドライバータイプ)、1 axis
(simultaneous impossible) D122・D122MS (マイクロステップドライバータイプ)、2 axes
 D123・D123MS (マイクロステップドライバータイプ)、3 axes
 D124・D124MS (マイクロステップドライバータイプ)、4 axes
 D125・D125MS (マイクロステップドライバータイプ)、5 axes
 D126・D126MS (マイクロステップドライバータイプ)、6 axes

Control method : stepping motor open loop control

Position display : pulse display (-8000000~8000000)

Output pulse (P) : 0~8000000 pulse

Setting of driving speed (F) : 1~999999PPS

Setting of start speed (L) : 10~9999PPS

Acceleration and deceleration rate (R) : 0~9999
 4~633 ms/1000PPS
(refer to 2.15.1 Acceleration and deceleration rate description)

software limit setting : 2 points at each axis CW・CCW

mechanical limit detection : 2 points at each axis CW・CCW (NC/NO logic switch possible)

origin setting : mechanical origin detection function 6 ways (NC/NO logic switch possible)

interface : IEEE-488 Std1975 (GP-IB)
 RS-232C DTEインターフェース ER control

Emergency stop function : 2 ways ①power OFF by external input
 ②mechanical limit stoppage of all axes in all sides
 By external input

3. 2. 3 Driver specification

driving system : bipolar constant current pentagon drive system

Excitation system: 4 phase full step, 4-5 phase half step

4 phase excitation (Max 250 Micro-steps, 16 channels for Micro-Steps type)

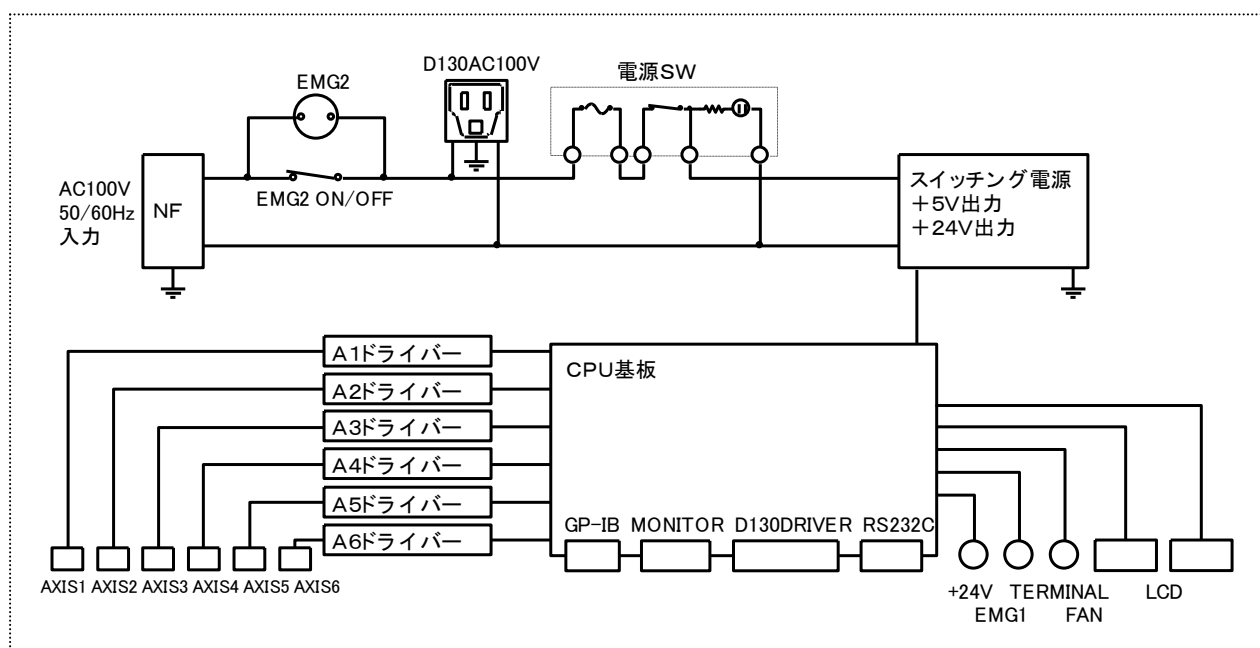
driving capacity : 0.75 A / phase (with current down function)

3. 2. 4 option

D700 handy terminal

D900 handy terminal

3. 2. 5 D120 block diagram



- N F : noise filter inlet at rear panel
- EMG 2 : EMG 2 connector at rear panel
- EMG 2 ON/OFF : EMG 2 ON/OFF switch at rear panel
- D130 AC100V : D 1 3 0 AC 1 0 0 V outlet at rear panel
- Power SW : POWER switch at front panel
- L C D : fluorescent display tube at front panel
- F A N : fan motor at rear panel
- TERMINAL : TERMINAL connector at front panel
- EMG 1 : EMG 1 connector at rear panel
- + 2 4 V : + 2 4 V connector at rear panel
- RS232C : RS 2 3 2 C connector at rear panel
- D130 DRIVER : D 1 3 0 DRIVER connector at rear panel
- MONITOR : MONITOR connector at rear panel
- GP-IB : GP-IB connector at rear panel
- AXIS1~AXIS6 : stage connector at rear panel

3. 2. 6 Battery backup of parameter · memory SW

D120 controller save registrated parameter · memory SW on RAM ande backup by battery.
But current position will be cleared bo 0 when power supply shut off.

3. 3 guarantee and after-service

●About the guarantee

About the inquiry, please check the 8-digit series numbers on inspection · quality guarantee paper or on the side of the product. Our company record the delivery date by series number. guarantee period is 1 year after Delivery. but the following occasions are without the guarantee target and should be charged with repare fee.

- mistake of usage and accident or hurt caused by the remodeling or repair of the party other than our company.
- accident or hurt due to improper handling such as dropping at the transportation or moving
- accident or hurt due to fire damage 、 saltwater damage 、 gas damage 、 abnormal volt or earthquake、 thunder storm, damage by wind and flood and other act of providence
- accident or hurt due to the handling against the methods written in the instruction manual or attentions.

●About the after-service

Before calling the repairment, check the items on P. 8 O。
If still not quite understood, contace our sales group of OST division.

《withing the guarantee period》

if under normal usage according to the instruction manual, repairment is free of charge。
Accident except of the above guarantee item, then repairment fee is needed.

《after the guarantee expiration》

after the repairment if function is held, then according to your needs onerous repair could be taken.

●About the repairment possible period

The minimum period of the mending parts(parts to hold the function) will be at least 1 year. this period is set as reparement possile period. even reparement possile period expires, there are occasions that repairment is possibel, please contact our sales group of OST division. .

※About the accident of this product, our company do not take responsibility except
The promised free-of-charge reparation basing on the guarantee.

<contact>

Suruga Seiki Co. Ltd **OST division** **Sales group**

本 社 〒4 2 4 - 8 5 6 6

静岡県清水市七ツ新屋549-1

TEL 0543-46-3332 FAX 0543-46-1196

東京営業所

〒101-0041

東京都千代田区神田須田町2-2-4

TEL 03-5256-9911 FAX 03-5256-9917

大阪営業所

〒553-0003

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