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D120 Stepping Motor controller

Instruction manual

Ｖｅｒ２．０

Suruga Seiki.Co.Ltd

ＯＳＴ Division

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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.

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１． introduction

１．１ main features

ＤＩＩＯ 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 Ｄ１３ Series, control is possible fro up to a maximum of１２ axes. This hi-cost performing controller is designed for external control and is without an operating panel.
Connecting the Ｄ７００・Ｄ９００ 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 ＤＩＩＯ,built-in driver uses normal full-half step switch-able type and ＤＩＩＯＭＳ 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.

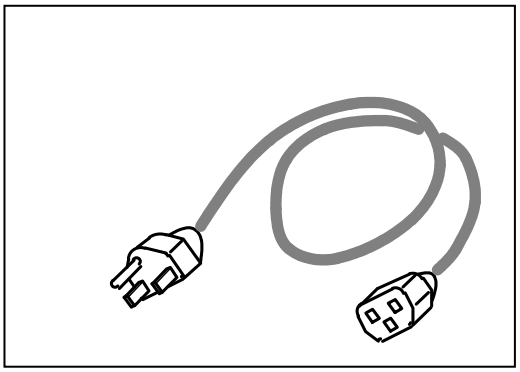
- ● Ａ type driver：０．７５Ａ／phase micro-step driver
- ● Ｂ type driver：０．７５Ａ／phase normal type (full／half step switch-able)driver
- ● Ｄ type driver：０．７５Ａ／phase normal type driver with ＤＣ２４Ｖ output for electromagnetic brake
- ● Ｅ type driver：０．７５Ａ／phase micro-step driver with ＤＣ２４Ｖ output for electromagnetic brake
- ● Ｆtype driver：１．４Ａ／phase micro-step driver with ＤＣ２４Ｖ output for electromagnetic brake

※ＤＣ２４Ｖ output for electromagnetic brake cancel provided electromagnetic brake when the controller is applied by the power supply.
By the case of Ｆtype 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)

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1．３　for the safety of use

read the following cautions before usage.　　Mark means prohibition。

⚠ 注意

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

・Wiring

ＤＩＲＯ 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.

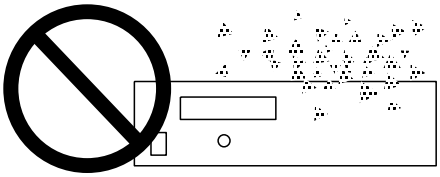
※Control for products except motorized stage,holder of our company is prohibited.

・AC plug

ＤＩＲＯstepping 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)。

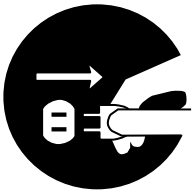
・Use environment

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.

・disassemblement/ remodeling

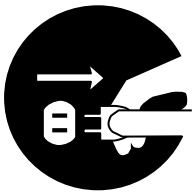
disassemblement/ remodeling and improper repair is prohibited for these are dangerous for the reason of electric shock
If abnormal, contact sales group of OST division of our company.



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⚠ 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.

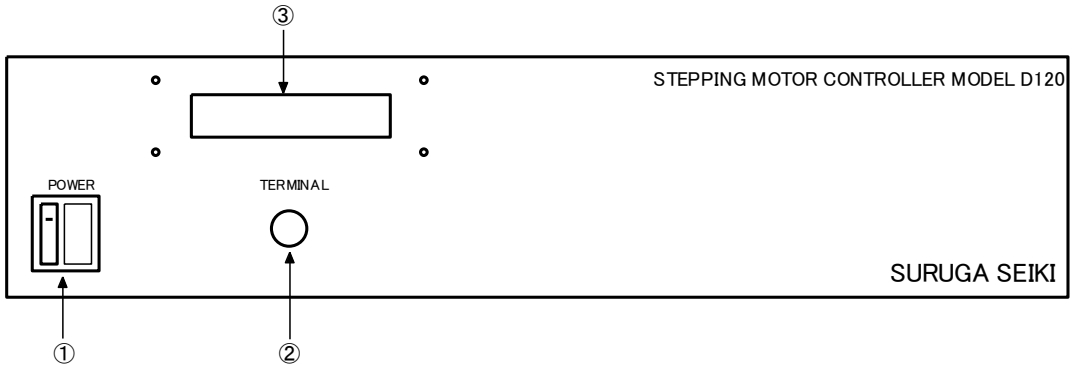
－abnormal sound or stinky, smoke occurs
－electric cord is hurt
－spill on the unit or extraneous substance enters the body.
－unit is dropped and cabinet is hurt.

※For inquires, please turn toＰ．８３。

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１．４　part names and functions

１．４．１　front panel



①ＰＯＷＥＲ

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.

②ＴＥＲＭＩＮＡＬ

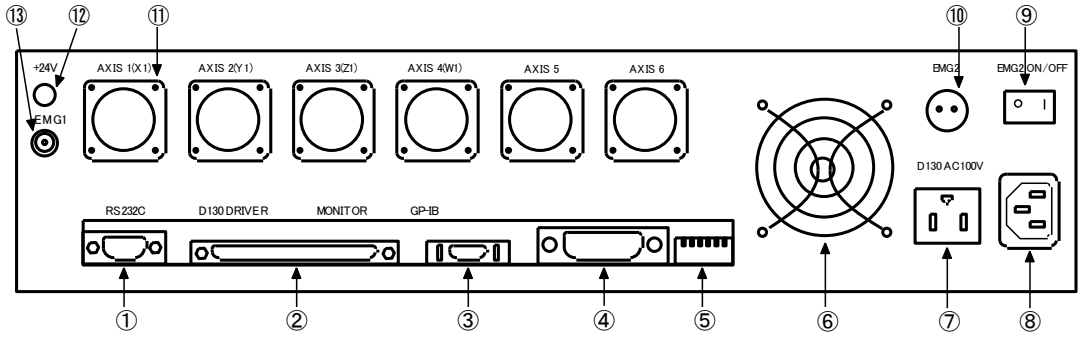
Connector port for the handy terminal。When plugged in here by the connector of handy terminalＤ７００orＤ９００,the handy terminal power originates from controller and be used to operate equipment.

③DISPLAY

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

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１．４．２　rear panel



①ＲＳ２３２Ｃ connector

ＲＳ２３２Ｃ interface port.

②Ｄ１３０ DIVER

Connector for connecting D130 External Expansion Driver Pack.

③ＭＯＮＩＴＯＲ connector

Output driving pulse・axis selection signal and action signal.

④ＧＰ－ＩＢ connector

ＧＰ－ＩＢ interface port.

⑤DIP SW

setting of command mode when in ＲＥＭＯＴＥ　ＭＯＤＥ、set the ＧＰ－ＩＢ addresses.
（refer to ２．12．４．Setting of DIP SW）

⑥ＦＡＮ motor

Fan motor for air-cooling in side panel.

⑦Ｄ１３０ OUTLET

Outlet for connecting extended driver pack D130, providing AC 100V power supply.

attention：**do not connect with equipment except Ｄ１３０**

⑧NOISE FILTER INLET

Noise filter for ＡＣ１００Ｖ　５０／６０Ｈｚ power supply.(Inlet type)

⑨ＥＭＧ２　ＯＮ／ＯＦＦ　ＳＷ

Switchover valid/invalid of the external input control for EMG2 connector.

⑩ＥＭＧ２ connector

Power ON/OFF by external control input。

⑪stage connection connector

connector for ＡＸＩＳ１～ＡＸＩＳ６、using the attached cables of motorized stage to connect the equipment with the motorized stage.

⑫＋２４Ｖ OUTPUT connector

output ＋２４Ｖ to cancel electric-magnet break.

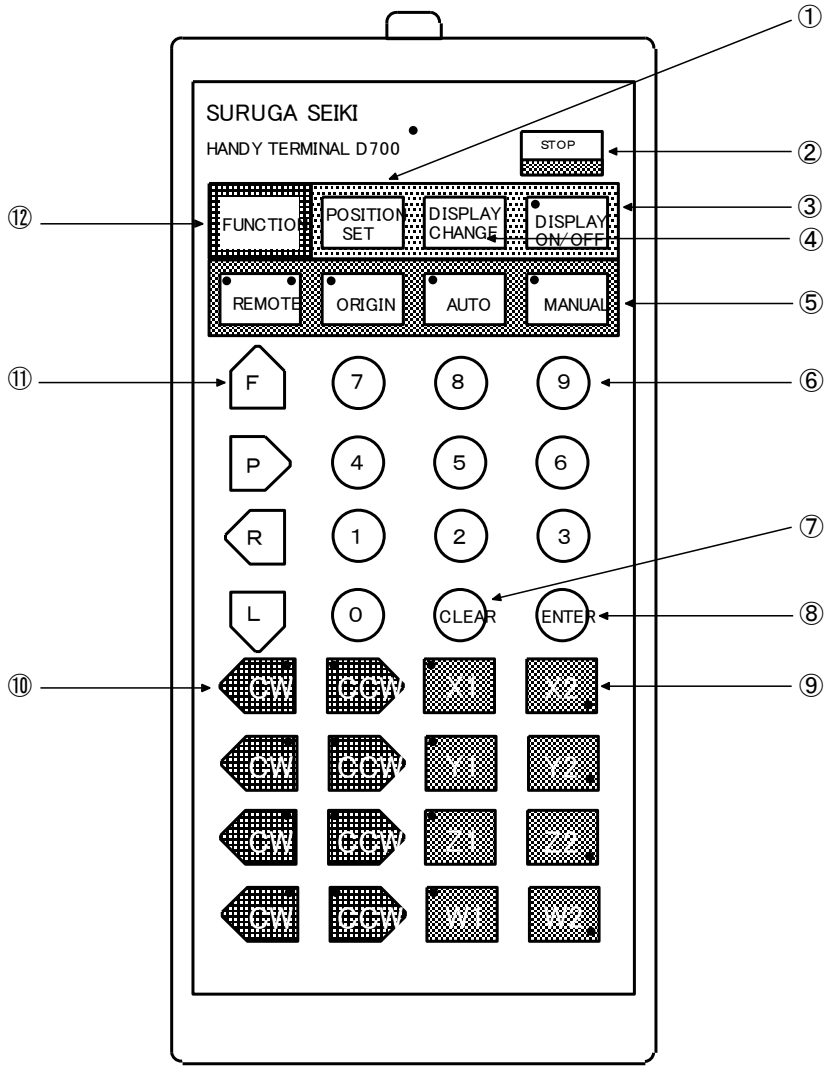
attention：do not connect with load above ５００ｍA.

⑬ＥＭＧ１connector

Motors will stops by mechanical limit of all axes and directions by external input.

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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

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

⑧Enter key

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

⑨Axis specify key

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

⑩ＣＷ・ＣＣＷ key

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

⑪F 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。

⑫Function 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。

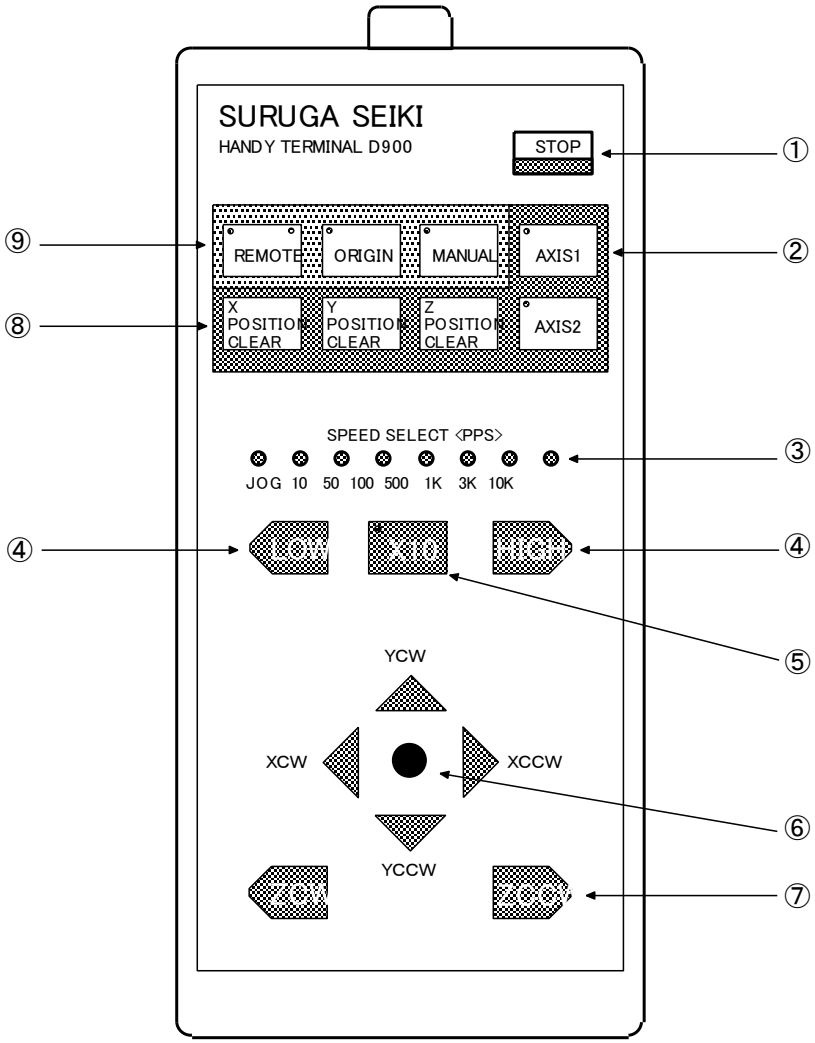
【axis selection operation by handy terminal Ｄ７００】

Selection axis	Key operation	Display
Ａ１	[Ｘ１]pushed	[Ｘ１]upper-left ＬＥＤ lights
Ａ２	[Ｙ１]pushed	[Ｙ１]upper-left ＬＥＤ lights
Ａ３	[Ｚ１]pushed	[Ｚ１]upper-left ＬＥＤ lights
Ａ４	[Ｗ１]pushed	[Ｗ１]upper-left ＬＥＤ lights
Ａ５	[ＦＵＮＣＴＩＯＮ]is held,push [Ｘ１]or[Ｘ２]	[Ｘ１]upper-left[Ｘ２]upper-right LED lights
Ａ６	[ＦＵＮＣＴＩＯＮ]is held,push[Ｙ１]or[Ｙ２]	[Ｙ１]upper-left[Ｙ２]upper-right LED lights
Ａ７	[Ｘ２]pushed	[Ｘ２]upper-left ＬＥＤ lights
Ａ８	[Ｙ２]pushed	[Ｙ２]upper-left ＬＥＤ lights
Ａ９	[Ｚ２]pushed	[Ｚ２]upper-left ＬＥＤ lights
Ａ１０	[Ｗ２]pushed	[Ｗ２]upper-left ＬＥＤ lights
Ａ１１	[ＦＵＮＣＴＩＯＮ]is held,push[Ｚ１]or[Ｚ２]	[Ｚ１]upper-left[Ｚ２]upper-right LED lights
Ａ１２	[ＦＵＮＣＴＩＯＮ]is held,push[Ｗ１]or[Ｗ２]	[Ｗ１]upper-left[Ｗ２]upper-right LED lights

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

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１．４．４　Joystick terminal Ｄ９００ (option)



①ＳＴＯＰ

Emergency stop key, effective in all modes。

②ＡＸＩＳ key

When ＡＸＩＳ１ key selected, select Ｄ１２０のＡＸＩＳ１as axis and ＡＸＩＳ２ as Y axis,をＹ軸に、ＡＸＩＳ３ as Z axis; when ＡＸＩＳ２ key selected, select extended driverＤ１３０'s ＡＸＩＳ７ as

X axis,ＡＸＩＳ８ as Y axis and ＡＸＩＳ９ as Z axis。

③Driving speed selection ＬＥＤ

Display the speed selected by ＬＯＷ・ＨＩＧＨ key。

④ＬＯＷ・ＨＩＧＨ key

Effective in the ＬＯＣＡＬ modes. select driving speed of Ｄ９００。

⑤Tenfold key

Effective in the ＬＯＣＡＬ modes. tenfold driving speed of Ｄ９００ and LED lights。

⑥Joystick

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

⑦ＺＣＷ・ＺＣＣＷ key

Effective in the ＬＯＣＡＬ modes. Start SW inＣＷ・ＣＣＷ direction of Z axis。

⑧Position clear key

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

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⑨Mode switch key

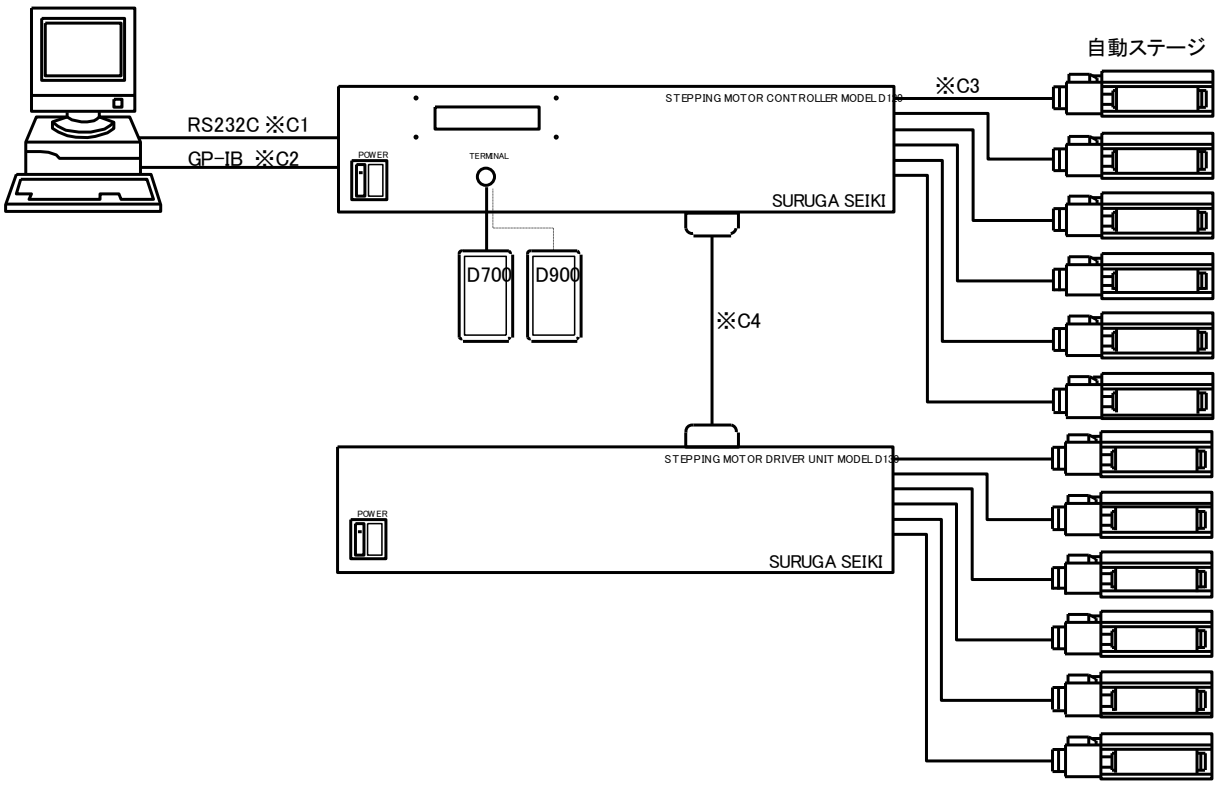
Effective in all modes, used for mode switch。Under selection, LED lights.

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,attatched)

use Ｄ７０－１・Ｄ７０－２。

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

use ＫＢ－１３０。

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２．１．１　Connection with motorized stage

Plug pin type connector of attached standard cable into ＡＸＩＳ１～ＡＸＩＳ６ stage connector at the rear panel of Ｄ１２０ 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 assemblement and disassemblement 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	０．７５Ａ／phase motor type
B type driver	０．７５Ａ／phase motor type
D type driver	０．７５Ａ／phase motor type with electromagnetic brake
E type driver	０．７５Ａ／phase motor type with electromagnetic brake
F type driver	１．４Ａ／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 】

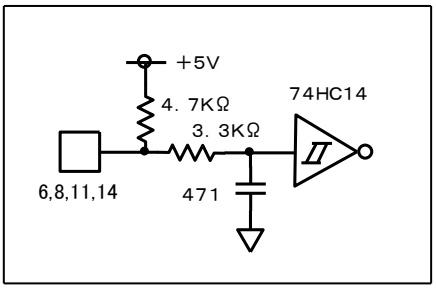
connector Product No：　ＳＲＣＮ２Ａ２１－１６Ｓ（ＪＡＥ）
Adaptable plug　　：　ＳＲＣＮ６Ａ２１－１６Ｐ（ＪＡＥ）

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

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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 ＤＣ２４Ｖ（＋）
13. ＋５Ｖ ／ Ｄ・Ｅ・Ｆtype adaptable to electromagnetic brakeＤＣ２４Ｖ（－）
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,andc onnect 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 asseblement or disassemblement 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 asseblement or disassemblement 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.

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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 asseblement or disassemblement executed, there is an afraid of 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 periphera l device. While the power supply in on, if the asseblement or disassemblement executed, there is an afraid 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 emergence Stop connector.

【ＥＭＧ１connector】

connect the emergence stop circuit withＥＭＧ１connector（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 emergence stop circuit, set D120 controller power on and befor e
The driving of motorized stage, confirm the execution of emergence stop circuit.
If the emergences 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)

【ＥＭＧ２ connector】
connect the emergence stop circuit withＥＭＧ2connector（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 emergence stop circuit, set D120 controller power on and befor e
The driving of motorized stage, confirm the execution of emergence stop circuit.
If the emergence stop circuit executes normally, the power supply of D120 controller turns Off.

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２．２　description on emergance stop connector

D120 controller holds two emergence stop connectors of ＥＭＧ１・ＥＭＧ２ at the rear panel, and Due to the external signal, control as the stoppage of motor and the power OFF of D120 is possible.

【ＥＭＧ１connector】

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:

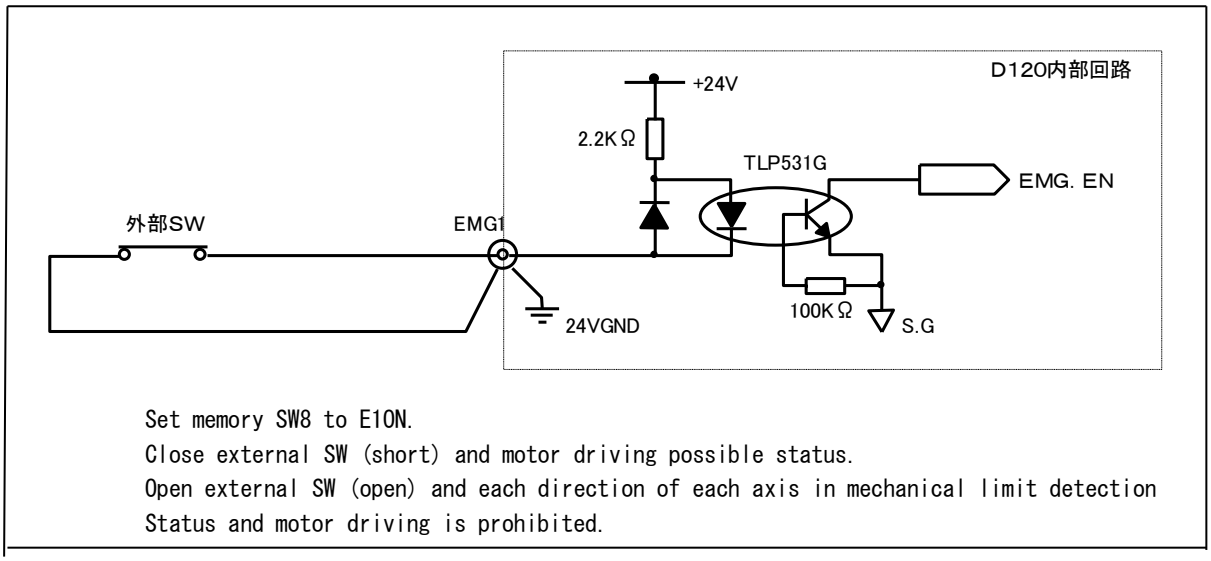
When memory SW2 of each axis is at the status of LSNO, it is impossible to set memory SW 8 On E1ON.

When memory SW8 is at the status of E1ON,it is impossible to set memory SW２ 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.：　３１－１０（ＤＤＫ）　ＢＮＣ connector

＜input circuit ・connection sample＞



Set memory SW8 to E1ON.

Close external SW (short) and motor driving possible status.

Open external SW (open) and each direction of each axis in mechanical limit detection Status and motor driving is prohibited.

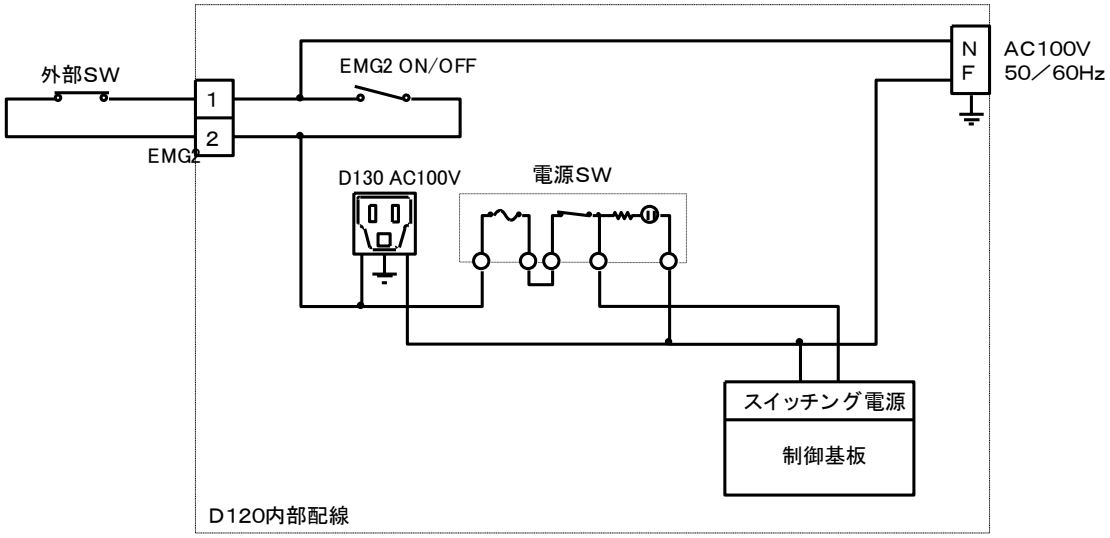
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【ＥＭＧ２connector】

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 functio n.
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＞



set ＥＭＧ２ ＯＮ／ＯＦＦ SW to ＯＮ。
Set power supply ＳＷ to ＯＮ。
Set external SW close (short) ,and power supply will be on.
Set external SW close (open) and power supply will be off.

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.

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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 ： ＤＸ１０－２０Ｓ （ＨＲＳ）
Adaptable plug ： ＤＸ４０－２０Ｐ （ＨＲＳ）
Adaptable cover case ： ＤＸ２０－ＣＶ （ＨＲＳ）

Pin Ｎｏ

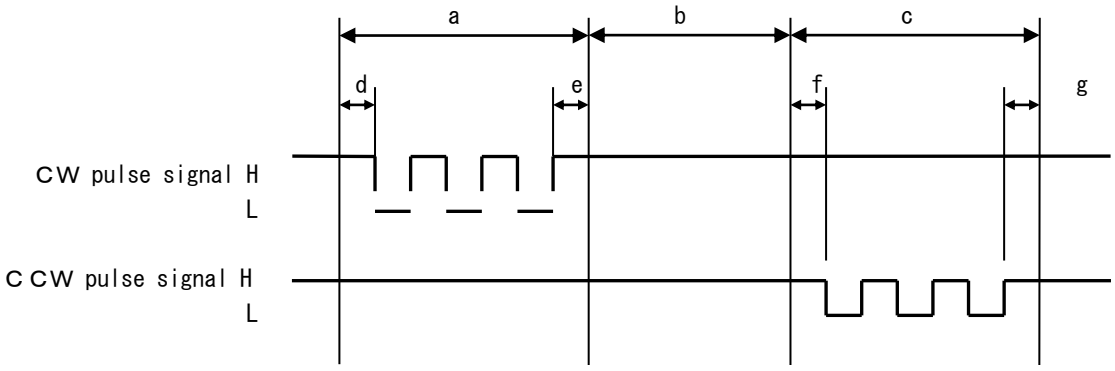
1. Axis selection signal１
2. Axis selection signal 2
3. Axis selection signal 3
4. Axis selection signal 4
5. ＣＷ pulse signal
6. ＣＣＷ pulse signal
7. Not connected
8. Not connected
9. Not connected
10. Signal in motion
11. Not connected
12. Not connected
13. Not connected
14. Not connected
15. Not connected
16. Not connected
17. ＋５Ｖ
18. ＋５Ｖ
19. ＧＮＤ
20. ＧＮＤ

【output signal】
output signals are all ４ＨＣ２４４。

【selection axis and axis selection signal】

Selection axis	selection signal 1	selection signal２	selection signal３	selection signal４
Ａ１（Ｘ１）	Ｌ	Ｌ	Ｌ	Ｌ
Ａ２（Ｙ１）	Ｈ	Ｌ	Ｌ	Ｌ
Ａ３（Ｚ１）	Ｌ	Ｈ	Ｌ	Ｌ
Ａ４（Ｗ１）	Ｈ	Ｈ	Ｌ	Ｌ
Ａ５	Ｌ	Ｌ	Ｈ	Ｌ
Ａ６	Ｈ	Ｌ	Ｈ	Ｌ
Ａ７（Ｘ２）	Ｌ	Ｈ	Ｈ	Ｌ
Ａ８（Ｙ２）	Ｈ	Ｈ	Ｈ	Ｌ
Ａ９（Ｚ２）	Ｌ	Ｌ	Ｌ	Ｈ
Ａ10（Ｗ２）	Ｈ	Ｌ	Ｌ	Ｈ
Ａ11	Ｌ	Ｈ	Ｌ	Ｈ
Ａ12	Ｈ	Ｈ	Ｌ	Ｈ

【pulse signal･output waveform of signal in motion】



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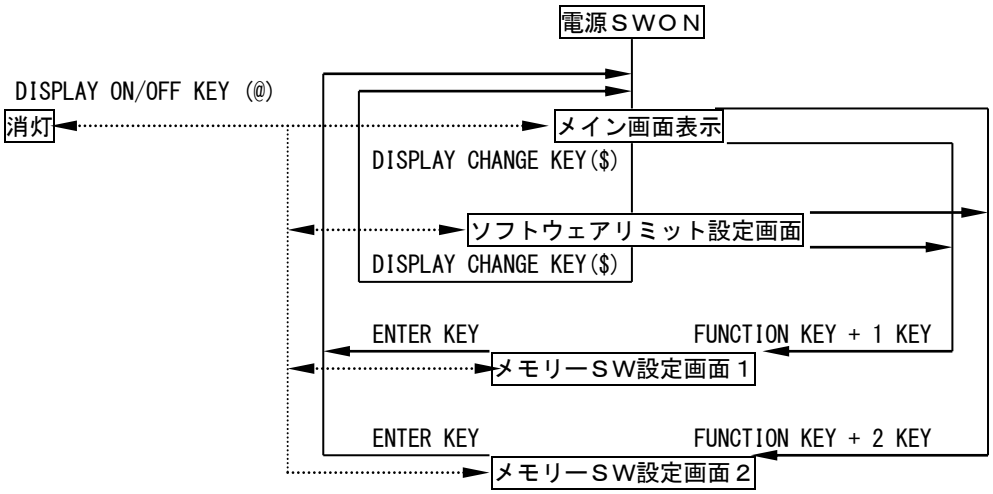


ａ．ＣＷ side, in motion
ｂ．At stoppage
ｃ．ＣＣＷ side, in motion
ｄ．Below ２２μｓｅｃ
ｅ．Below ４６μｓｅｃ
ｆ．Below ２２μｓｅｃ
ｇ．Below ４６μｓｅｃ

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.

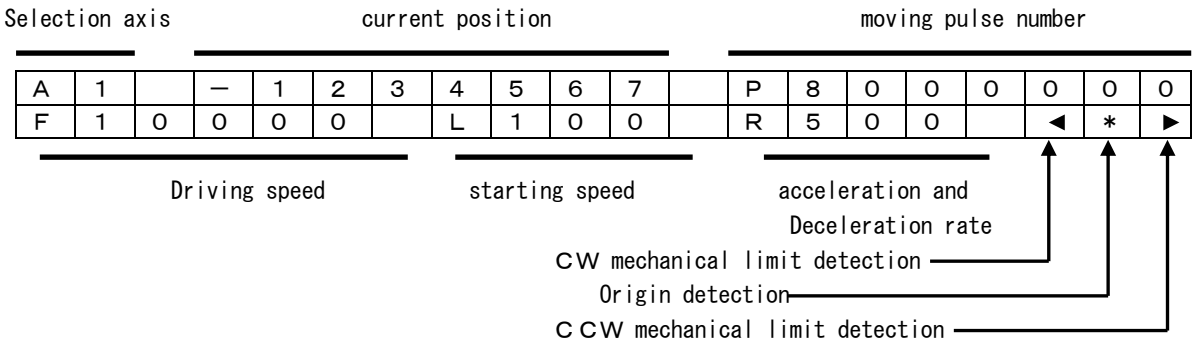
２．４．１ Screen configuration



※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】
selection axis displays the current driving possible axis.

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Through the switch of axis,selection between Ａ１ axis～Ａ１２ axis is possible.

【current position】
display the current position of the selection axis。
Effective display scope is －８０００００００～８０００００００ pulse。

【moving pulse number】
display increment pulse number in ＡＵＴＯ　ＭＯＤＥ・ＲＥＭＯＴＥ　ＭＯＤＥ of selection axis。
Setting scope is ０～８０００００００ pulse。
【driving speed】
Display driving speed of selection axis。
Setting scope is １～９９９９９９ＰＰＳ。

【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。

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【CW・CCW software limit value】
displays software limit setting value of selection axis。
Setting scope is －８０００００００～８０００００００ 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 （－８０００００００～８０００００００）of current position, stop occurs by software limit.

２．４．４ Memory ＳＷ setting screen１

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.

									memoryＳＷ１						memory ＳＷ３				
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 ＳＷ２						memory ＳＷ４				

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

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

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

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

【memory ＳＷ４】
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.

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

								memoryＳＷ５					memory ＳＷ７						
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 ＳＷ６					memoryＳＷ８						

【selection axis】
Selection axis displays current driving possible axis.
By switching the axis, selection of A1 axis to A12 axis is possible.

【memory ＳＷ５】
Display of memory SW5 (no memory SW5 setting value)

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

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

【memory ＳＷ８】
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.

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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 ０～８０００００００ 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。

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２．５．２　setting of driving speed（Ｆ）

set the driving speed(F)。
setting scope is １～９９９９９９ＰＰＳ。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 stoppage,

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 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（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				

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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 ２．15．１acceleration 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。

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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,backuped 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 －８０００００００～８０００００００。

Default setting at shipment is software limit stoppage ineffective(OFF)・CW side software limit Value ８０００００００・ＣＣ Ｗ side software limit value －８０００００００。

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.

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A	1			C	W	(	o	n		)		C	C	W	(	o	n		)
		→	－	1	2	3						－	8	0	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・ＥＭＧ１ emergence stop control setting.
Memory SW set is overwritten on RAM and backup by battery. Even the power supply is shut off, remain s
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 ＯＲＧ０～ＯＲＧ６。
ＯＲＧ０ 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 【ＯＲＧ１】【ＯＲＧ３】【ＯＲＧ５】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 【ＯＲＧ２】【ＯＲＧ４】【ＯＲＧ６】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。

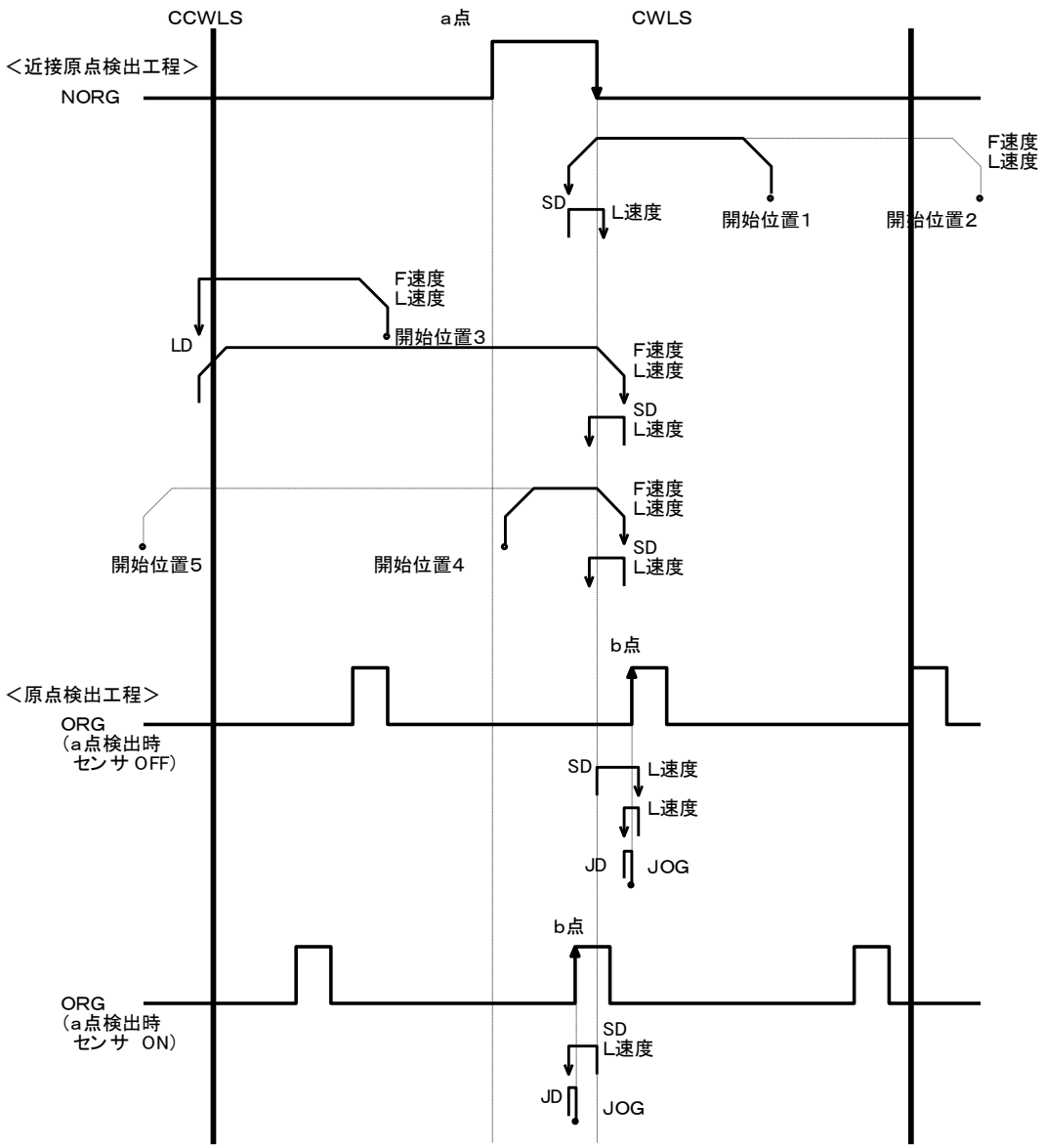
●Return-to-origin method of our motorized stage
Has ＮＯＲＧ、ＯＲＧ sensor both【ＯＲＧ１】
No ＮＯＲＧ,only ＯＲＧ sensor【ＯＲＧ３】、
No ＮＯＲＧ、ＯＲＧ 、has ＣＣＷＬＳ sensor, then we recommend 【ＯＲＧ５】。

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

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【ＯＲＧ１】

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）。



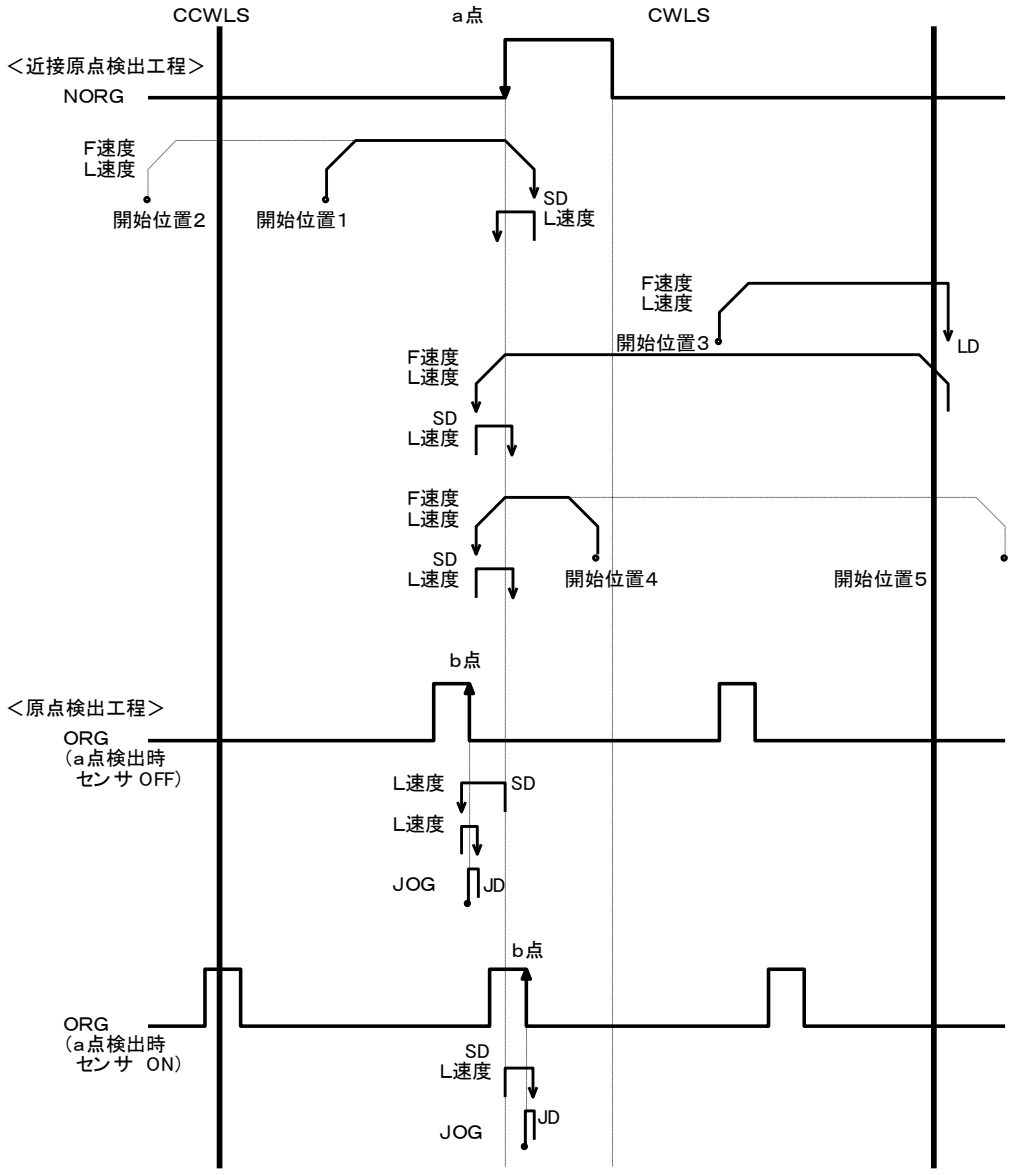
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○　：detection start position
●　：detection over position
ＬＤ：limit detection stop delay time（３００ｍｓｅｃ）
ＳＤ：sensor detection stop delay time（２００ｍｓｅｃ）
ＪＤ：ＪＯＧ interval delay time calculated by the following formula。

ＪＤ［ｍｓｅｃ］＝２０００÷Ｌ speed［ＰＰＳ］×５　(the underline are integers)
※ＪＤ are intervals of 5［ｍｓｅｃ］from ５～１０００［ｍｓｅｃ］。
Start position１・・・start position between ＮＯＲＧ and ＣＷＬＳ。
Start position 2・・・start position at CWLS detection position。

Start position3・・・start position between ＮＯＲＧ and ＣＣＷＬＳ。
Start position 4・・・start position at ＮＯＲＧ detection position。
Start position５・・・start position at ＣＣＷＬＳ detection position。

【ＯＲＧ２】
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）。



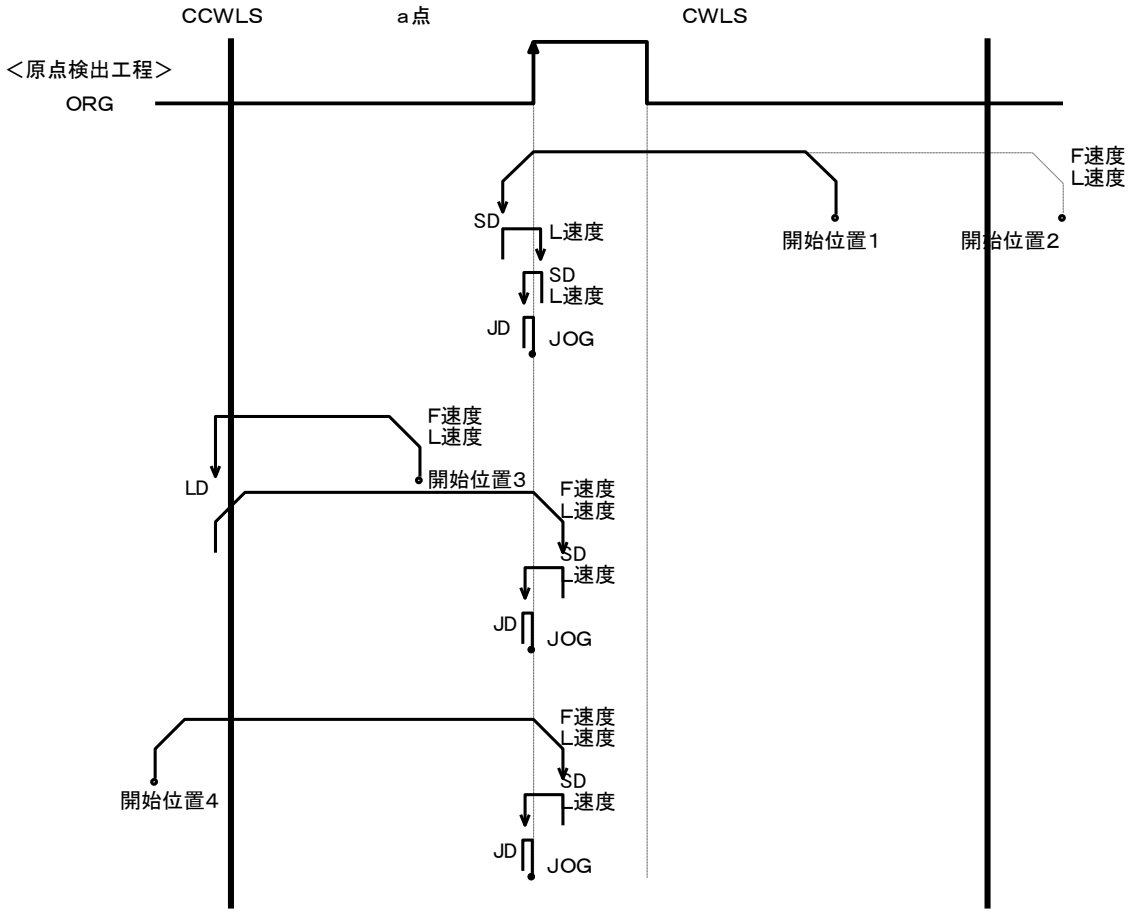
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○　：detection start position
●　：detection finish position
ＬＤ：limit detection stop delay time（３００ｍｓｅｃ）
ＳＤ：sensor detection stop delay time（２００ｍｓｅｃ）
ＪＤ：ＪＯＧ interval delay time calculated by the following formula。

ＪＤ［ｍｓｅｃ］＝２０００÷Ｌ speed［ＰＰＳ］×５　（underlined are integer）
※ＪＤ are intervals of 5［ｍｓｅｃ］from ５～１０００［ｍｓｅｃ］。

Start position１・・・start position between ＮＯＲＧ andＣＣＷＬＳ。
Start position 2・・・start position at CCWLS detection position。
Start position 3・・・start position between ＮＯＲＧ and ＣＷＬＳ。
Start position 4・・・start position at ＮＯＲＧ detection position。
Start position 5・・・start position at ＣＷＬＳ detection position。

【ＯＲＧ３】
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）。

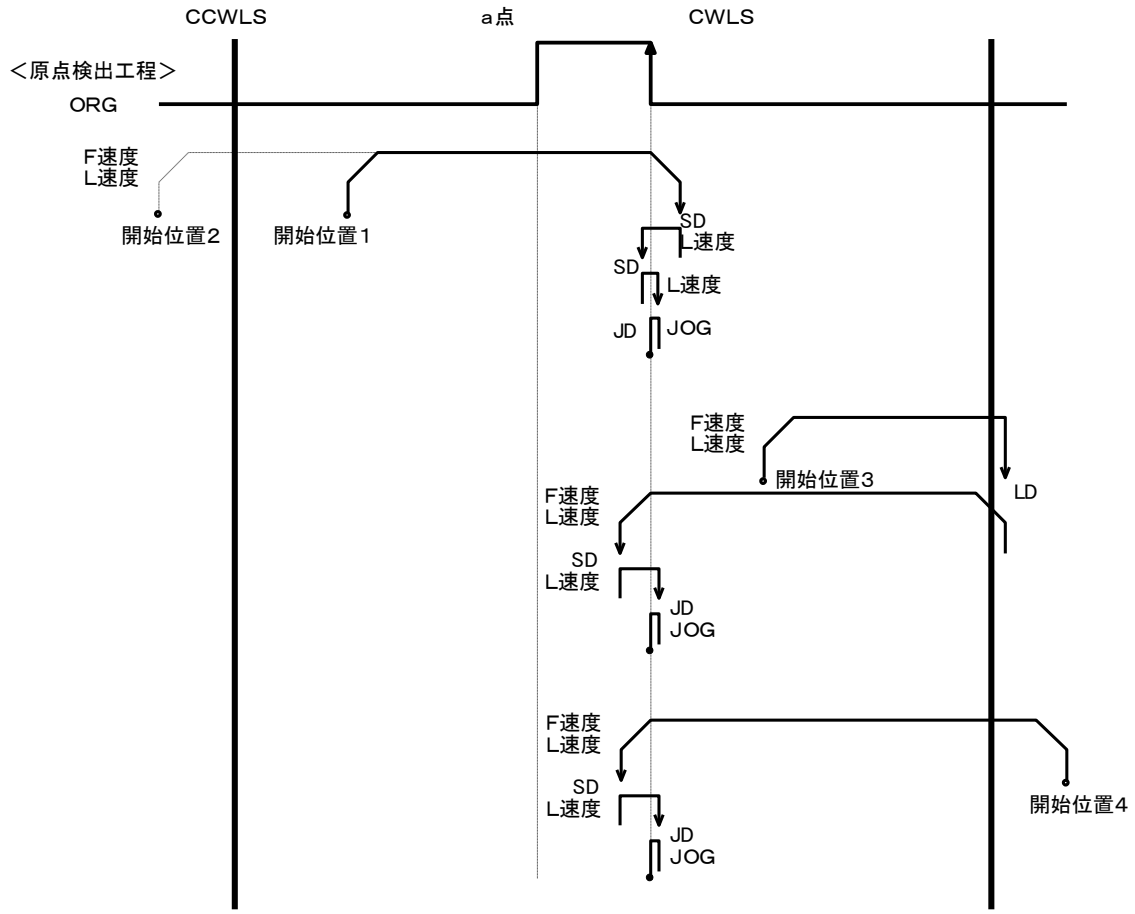


○　：detection start position
●　：detection finish position
ＬＤ：limit detection stop delay time（３００ｍｓｅｃ）
ＳＤ：sensor detection stop delay time（２００ｍｓｅｃ）
ＪＤ：ＪＯＧ interval delay time calculated by the following formula。

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ＪＤ［ｍｓｅｃ］＝２０００÷Ｌ speed［ＰＰＳ］×５　（ underlined are integer）
※ＪＤ are intervals of 5［ｍｓｅｃ］from ５～１０００［ｍｓｅｃ］。
Start position１・・・start position between ＯＲＧ andＣＷＬＳ。
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。

【ＯＲＧ４】
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］＝２０００÷Ｌ speed［ＰＰＳ］×５　（ underlined are integer）
※ＪＤ are intervals of 5［ｍｓｅｃ］from ５～１０００［ｍｓｅｃ］。
Start position１・・・start position between ＯＲＧ andＣＷＬＳ。
Start position 2・・・start position at CCWLS detection position。
Start position 3・・・start position between ＯＲＧ and CWLS。

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【ＯＲＧ５】

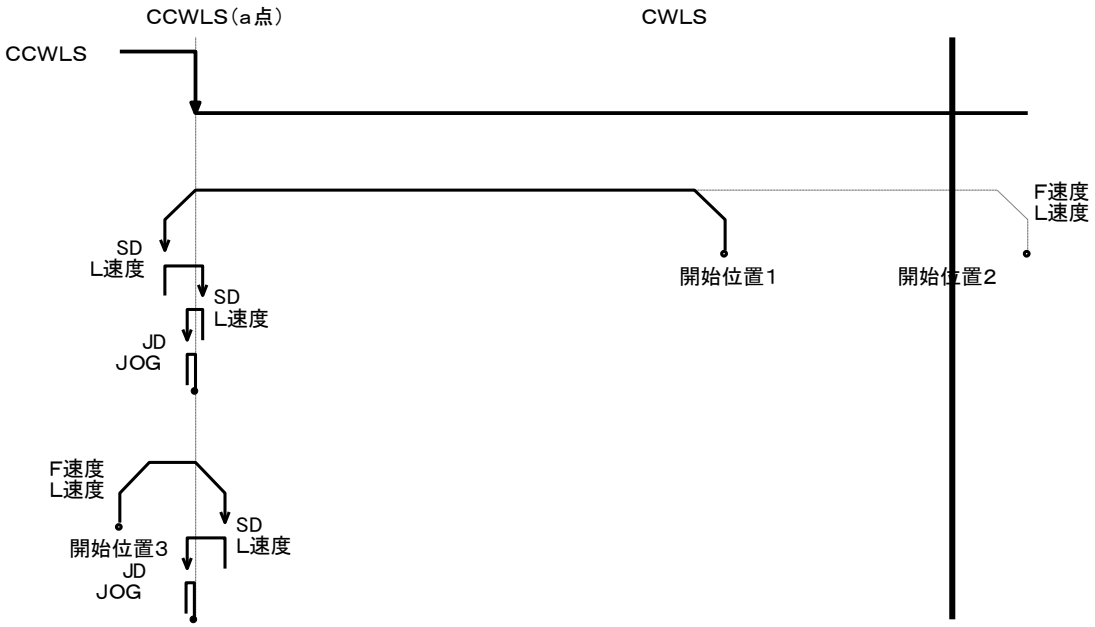
detect in CCW side, detect CCWLSsignal in CW side edge（ａ point）.

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（２００ｍｓｅｃ）

ＪＤ［ｍｓｅｃ］＝２０００÷Ｌ speed［ＰＰＳ］×５　（ underlined are integer）

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

Start position１・・・betweenＣＷＬＳ 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.

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【ＯＲＧ６】

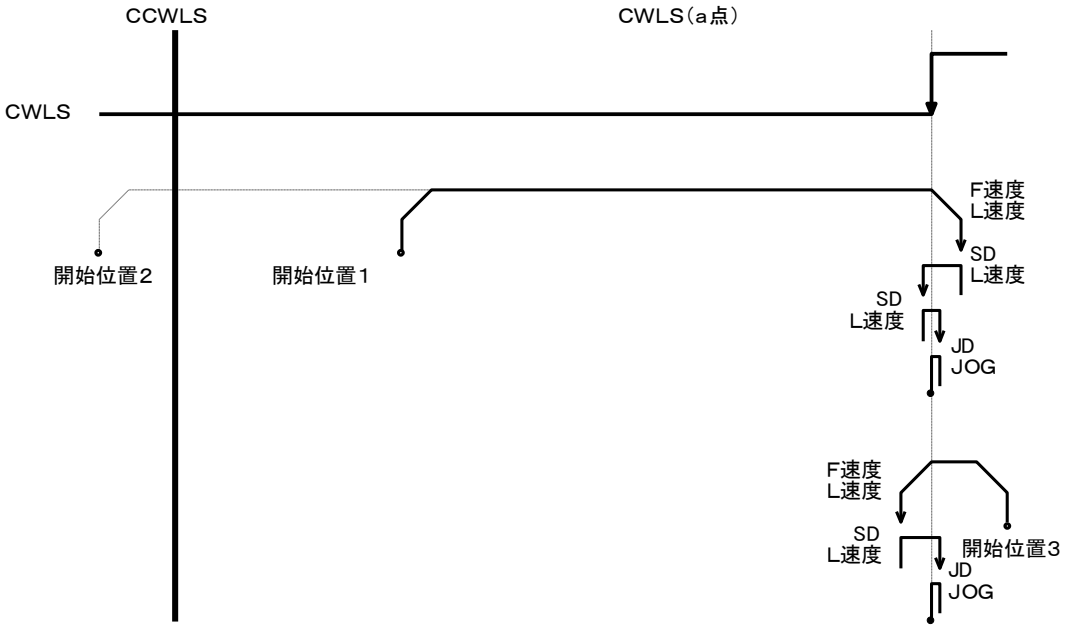
detect in CW side,detect CWLS signal in CCW side edge（ａ point）.

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］＝２０００÷Ｌ speed［ＰＰＳ］×５　（ underlined are integer）

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

Start position１・・・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.

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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 betweenＯＲＧ０～ＯＲＧ６。
When at ＯＲＧ０,return-to-origin not executed.
Default setting at shipment is ORG1。

【setting procedure】

ａ．Push axis indication key, switches to the setting axis.
ｂ．Hold ＦＵＮＣＴＩＯＮ　ＫＥＹ and push ten-key [１] 、memory ＳＷ setting screen 1 displayed.
ｃ．[１] 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 [Ｆ] [Ｌ] 、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。

２．７．３　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 isＬＳＮＣ。

Attention:
When at the status of E1ON,for the setting of memory SW8,setting of LSNO is impossible.

【setting procedure】

ａ．Push axis indication axis and switches to setting axis。
ｂ．Hold ＦＵＮＣＴＩＯＮ　ＫＥＹ and push ten-key [１] 、memory ＳＷ setting screen 1 displayed.
ｃ．[２] ＫＥＹ pushed,at left side of memory SW2 of the display screen,→mark appears and turns into changeable status。

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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 [F] [L] 、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 [1] 、memory ＳＷ setting screen 1 displayed。
c. [3] 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 [F] [L] 、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 [1] 、memory ＳＷ setting screen 1 displayed。
c. [4] 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	

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d. Push cursor key [F] [L] 、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 [2] 、memory ＳＷ setting screen 2 displayed。
c. [6] 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 [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。

２．７．７ 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 [2] 、memory ＳＷ setting screen 2 displayed。
c. [7] 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 [F] [L] 、make optional setting。

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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。

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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－８０００００００～８０００００００ 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

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Ｄ１２０ 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 [9] 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 [0] 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 [3] 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

Ｄ１２０ controller could moves to the position(current position) by operating D700 In the ＭＡＮＵＡＬ modes,ＡＵＴＯ modes。

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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 [7] 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 intoＭＡＮＵＡＬ 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.

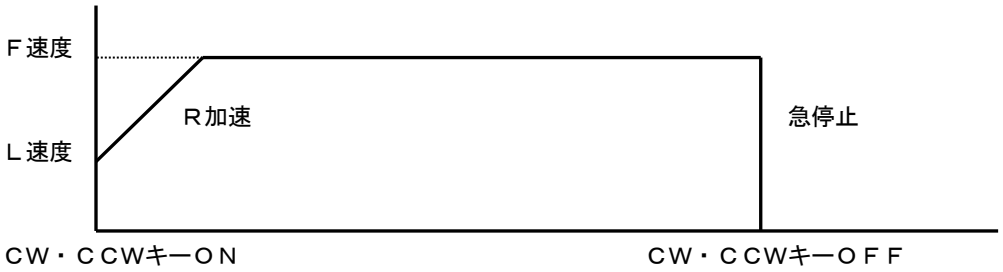
Axis selection	Key operation	Display
Ａ１	[X1] pushed	[X1] upper-left ＬＥＤ lights
Ａ２	[Y1] pushed	[Y1] upper-left ＬＥＤ lights
Ａ３	[Z1] pushed	[Z1] upper-left ＬＥＤ lights
Ａ４	[W1] pushed	[W1] upper-left ＬＥＤ lights
Ａ５	[FUNCTION] held and push [X1] or [X2]	[X1] upper-left [X2] upper-right ＬＥＤ lights
Ａ６	[FUNCTION] held and push [Y1] or [Y2]	[Y1] upper-left [Y2] upper-right ＬＥＤ lights
Ａ７	[X2] pushed	[X2] upper-left ＬＥＤ lights
Ａ８	[Y2] pushed	[Y2] upper-left ＬＥＤ lights
Ａ９	[Z2] pushed	[Z2] upper-left ＬＥＤ lights
Ａ１０	[W2] pushed	[W2] upper-left ＬＥＤ lights
Ａ１１	[FUNCTION] held and push [Z1] or [Z2]	[Z1] upper-left [Z2] upper-right ＬＥＤ lights
Ａ１２	[FUNCTION] held and 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 manual modes when ＣＷ・ＣＣＷ key pushed,executes and LED in the moving side

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Lights.give offＣ Ｗ・ＣＣＷ key then turns into emergance 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 intoＭＡＮＵＡＬ mode。

3)Setting of software limit・memory ＳＷ
２．５Refer to 2.5 description of software limit・2.7 description of softwareSW 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 terminalＤ９００。
Upon application of power supply,JOG is selected.
Push ＬＯＷ・ＨＩＧＨ key、driving speedＪＯＧ・１０・５０・１００・５００・１Ｋ・３ Ｋ・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		
	Ｆspeed<PPS>	Ｌspeed<PPS>	R(acceleration and deceleration rate)	Ｆ速度<PPS>	Ｌ速度<PPS>	R加減速ﾚｰﾄ
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。

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5)selection of driving axis

driving axes of handy terminal D900 has 3 axes of X axis・Ｙ axis・Ｚ axis.According to ＡＸＩＳ１・ＡＸＩＳ２ key,switch the axis selection of Ｘ・Ｙ・Ｚ。

Switching of the axis is to push ＡＸＩＳ１ ＡＸＩＳ２ and make ＬＥＤ light。

Selection axis	Ｘ axis	Ｙ axis	Ｚ axis
ＡＸＩＳ１ ＬＥＤ lights	Ａ１axis	Ａ２ axis	Ａ３axis
ＡＸＩＳ２ ＬＥＤ lights	Ａ７axis	Ａ８ axis	Ａ９axis

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 ＺＣＷ・ＺＣＣＷ key is pushed and when ＺＣＷ・ＺＣＣＷ 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 ＡＵＴＯ ＭＯＤＥ operation description

２．10．１ 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 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

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Ａ１	X1 pushed	X1 upper left LED lights
Ａ２	Y1 pushed	Y1 upper left LED lights
Ａ３	Z1 pushed	Z1 upper left LED lights
Ａ４	W1 pushed	W1 upper left LED lights
Ａ５	FUNCTION held, then push X1 or X2	X1 upper left X2 upper right ＬＥＤ lights
Ａ６	FUNCTION held, then push Y1 or Y2	Y1 upper left Y2 upper right ＬＥＤ lights
Ａ７	X2 pushed	X2 upper left LED lights
Ａ８	Y2 pushed	Y2 upper left LED lights
Ａ９	Z2 pushed	Z2 upper left LED lights
Ａ１０	W2 pushed	W2 upper left LED lights
Ａ１１	FUNCTION held, then push Z1 or Z2	Z1 upper left Z2 upper right ＬＥＤ lights
Ａ１２	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 Ｄ７００

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
Ａ１	X1 pushed	X1 upper left ＬＥＤ lights
Ａ２	Y1 pusehd	Y1 upper left LED lights
Ａ３	Z1 pushed	Z1 upper left LED lights
Ａ４	W1 pushed	W1 upper left LED lights
Ａ５	FUNCTION held and push X1 or X2	X1 upper left X2 upper right ＬＥＤ lights
Ａ６	FUNCTION held and push Y1 or Y2	Y1 upper left Y2 upper right ＬＥＤ lights
Ａ７	X2 pushed	X2 upper left ＬＥＤ lights
Ａ８	Y2 pushed	Y2 upper left LED lights
Ａ９	Z2 pushed	Z2 upper left LED lights
Ａ１０	W2 pushed	W2 upper left LED lights
Ａ１１	FUNCTION held and push Z1 or Z2	Z1 upper left Z2 upper right ＬＥＤ lights
Ａ１２	FUNCTION held and push W1 or W2	W1 upper left W2 upper right ＬＥＤ lights

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

Push CCW 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 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 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 speedJOG・10・50・100・500・1K・3 K・10K＜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
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

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１Ｋ	１０００	１００	５００	１００００	１００	５００
３Ｋ	３０００	１００	５００	３００００	１００	５００
１０Ｋ	１００００	１００	５００	１０００００	１００	５００

5) Selection of driving axis

driving axis of handy terminal D900 has 3 axes of X axis・Ｙ axis・Ｚ axis.using ＡＸＩＳ１・ＡＸＩＳ２ key, switches between Ｘ・Ｙ・Ｚ axis。

Switching of the axis is pushing ＡＸＩＳ１ ＡＸＩＳ２ and make ＬＥＤ light.

Selection axis	X axis	Y axis	Z axis
ＡＸＩＳ１ ＬＥＤ lights	Ａ１ axis	Ａ２ axis	Ａ３axis
ＡＸＩＳ２ ＬＥＤ lights	Ａ７ axis	Ａ８ axis	Ａ９axis

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 ＺＣＣＷ 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 ＲＥＭＯＴＥ ＭＯＤＥ operation description

Ｄ１２０ controller has ＧＰ－ＩＢ・ＲＳ２３２Ｃ interface at the rear panel, could be controlled Externally by computer such as PC.

If REMOTE mode is selected for input from handy terminal,then key SW is prohibited except STOP key・mode switch key・display change key・display ＯＮ／ＯＦＦ 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,executation 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 REMOTE mode.

In the modes except REMOTE mode, among the external commands, only *MODE (mode switch command) Accepted.

To set REMOTE mode, push REMOTE key of handy terminal or issue external command of＊ＭＯＤＥ３。

If ＲＥＭＯＴＥ key selected, LED at the upper-left side of handy terminal REMOTE key lights。

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

２．12．２ Setting of ＧＰ－ＩＢ interface

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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 Ｄ１２０ 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 cableＤ７０－Ｇ２ 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 ” ＊ＭＯＤＥ３” (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)	ＣＲ(0DH)	ＬＦ(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.

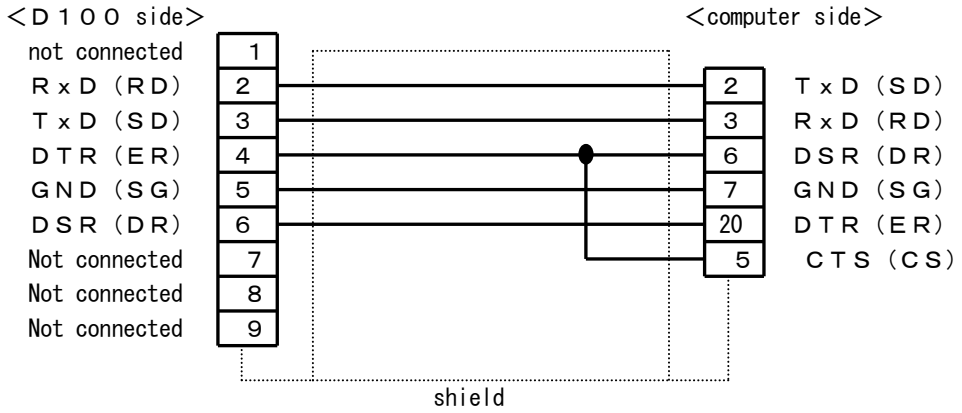
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Connector product No:RDED-9SA-LNA(Hirose Electronics)
Adaptable plug:HDEB-9P(Hirose Electronics)
  Cover case :HDE-CTH(Hirose Electronics)

1	Not connected	
2	ＲｘＤ（ＲＤ）	reception data (input)
3	ＴｘＤ（ＳＤ）	transmission data (output)
4	ＤＴＲ（ＥＲ）	data terminal ready (output)
5	ＧＮＤ（ＳＧ）	signal earth connection
6	ＤＳＲ（ＤＲ）	データセットレディ (input)
7	Not connected	
8	Not connected	
9	Not connected	

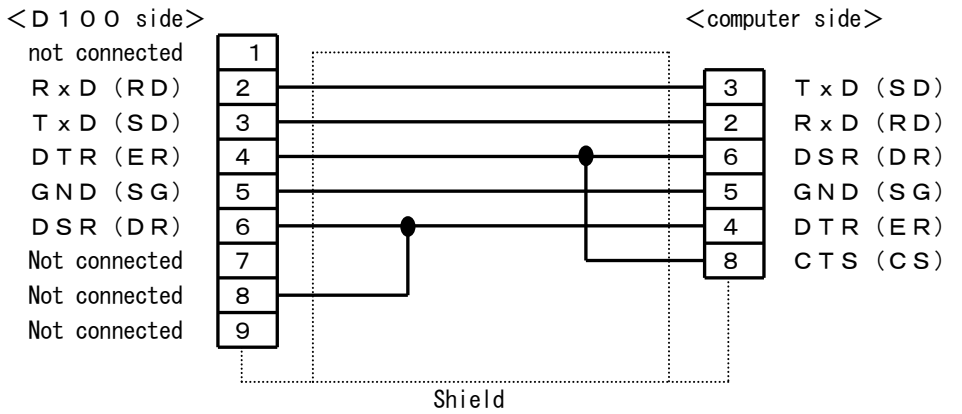
3) Connection cable with computer

【computer with Ｄ－ｓｕｂ２５ pin connector】



※shield fixes the clamp part of plug case.

【computer with Ｄ－ｓｕｂ 9 pin connector】



※ shield fixes the clamp part of plug case.

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1) Using DIP SW setting to set command modes。
At shipment,Ｄ１２０ 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（ＯＤＨ）。

6) connect external control computer with this equipment by cable。
（exclusive cable Ｄ１００－Ｒ２５－２・Ｄ１００－Ｒ９－２ sell seperately)

3) transmit optional commands by external control computer。

＜command tranmission example＞

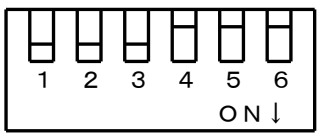
transmit "＊ＭＯＤＥ３" (set Ｄ１２０ moving mode to ＲＥＭＯＴＥ mode)by computer。
Commnads are all transmitted in ＡＳＣＩＩ code。

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

						Delimiter
＊(2AH)	Ｍ(4DH)	Ｏ(4FH)	Ｄ(44H)	Ｅ(45H)	３(33H)	ＣＲ(ODH)

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 shippment,ｂｉｔ１，２，３ set ＯＮ、
４，５，６ set ＯＦＦ

setting at shipment。

ｂｉｔ	ＯＮ	ＯＦＦ
１	ＧＰ－ＩＢ address setting (plus１)	ＧＰ－ＩＢ address setting (plus Ｏ)
２	ＧＰ－ＩＢ address setting (plus 2)	ＧＰ－ＩＢ address setting (plus Ｏ)
３	ＧＰ－ＩＢ address setting (plus 4)	ＧＰ－ＩＢ address setting (plus Ｏ)
４	ＧＰ－ＩＢ address setting (plus 8)	ＧＰ－ＩＢ address setting (plus Ｏ)
５	ＧＰ－ＩＢ address setting (plus 16)	ＧＰ－ＩＢ address setting (plus Ｏ)
６	Ｄ８０ command mode setting	Ｄ１２０ command mode setting

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1) Input ＧＰ－ＩＢ addressby ｂｉｔ１ , binary digit。

Setting example：set Ｄ１２０ address to 10。

ｂｉｔ１・・・・・ＯＦＦ・・・・・	０
ｂｉｔ２・・・・・ＯＮ・・・・・	２
ｂｉｔ３・・・・・ＯＦＦ・・・・・	０
ｂｉｔ４・・・・・ＯＮ・・・・・	８
ｂｉｔ５・・・・・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 delimiterＣＲ（０ＤＨ） ＬＦ （０ＡＨ） after the command。
On case of RS232C,put delimiter ＣＲ（０ＤＨ）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
Ａ１～Ａ12	Axis indication
Ｘ	Ａ１ axis indication
Ｙ	Ａ２ axis indication
Ｚ	Ａ３ axis indication
Ｘ１	Ａ１ axis indication
Ｙ１	Ａ２ axis indication
Ｚ１	Ａ３ axis indication
Ｗ１	Ａ４ axis indication
Ｘ２	Ａ７ axis indication
Ｙ２	Ａ８ axis indication
Ｚ２	Ａ９ axis indication
Ｗ２	Ａ１０ 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)

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＃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 memoryＳＷ
＊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 comm and 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)

Ａ１＃ＯＧ	Ａ１axis return-to-origin。
Ａ２＃Ｓ０Ｆ１０００Ｌ１００Ｒ５００	Set Ａ２ axis position to０,driving speed To １０００,start speed to１００,acceleration and deceleration rate to ５００。
Ａ３＃Ｐ２００	Set Ａ３ axis moving volume to２００
Ａ４＃Ｓ－１０Ｐ１００Ｆ５００ＵＧ	Set Ａ４ 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。

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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 delimiterＣＲ（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 ・ 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 ・ axis indication + #F + numerical value(numerical value means character string of 1 to 9999999) ・ A1#F1000 ・ A2#S0P100F500L100R500DG ・ 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. When used in combined cases, at the start, # should be marked and the following # should be omitted。
＃Ｐ	Command for the setting of movement pulse volume

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	・ axis indication + #P + numerical value(numerical value means character string of 0 to ８０００００００) ・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 ８０００００００,then modified to ８０００００００ ・ 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	Command for the setting of acceleration and deceleration rate ・ 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	Command for the setting of lift speed ・ 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－	Command for the setting of current position(position) Command for the setting of current position(minus position) ・ axis indication + #S + numerical value(numerical value means character string of －８０００００００～８０００００００) ・Ａ１＃Ｓ１０００ ・Ａ２＃ＳＯＰ１００Ｆ５００Ｌ１００Ｒ５００ＤＧ ・ Command for the setting o of current position . Indicate the axis and set the

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	numerical value after S ・ if value is above 7 digit, the 8th digit is cut off. ・ If value is above ８０００００１0, modified to ８０００００． ・ 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.
＃ＯＧ continued ＃ＯＧ	Command for the instruction of return-to-origin movement ・ axis indication + #OG ・ Ａ１＃ＯＧ ・ Ａ２＃Ｆ１０００Ｌ１００ＯＧ ・ Command that send the return-to-origin instruction. ・ 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. ・ 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
＃ＵＧ	Command for the instruction of movement in CW direction ・ axis indication + #UG ・ Ａ１＃ＵＧ ・ Ａ２＃Ｐ１０００Ｆ２０００ＵＧ ・ Command that indicate the CW moving direction. ・switches 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. ・ 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
＃ＤＧ	Command for the instruction of movement in CCW direction ・axis indication + #DG ・Ａ１＃ＤＧ ・Ａ２＃Ｐ１０００Ｆ２０００ＤＧ ・ Command that indicate the CCW moving direction. ・switches 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. ・ 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
＃ＡＧ	Absolute position driving

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<table>
<tr><td></td><td>・ axis indication ＋＃Ａ＋numeric value ＋Ｇ
（value －８０００００００～８０００００００）
・Ａ１＃Ａ１０００Ｇ
・Ａ２＃Ｓ０＃Ｆ１０００Ｌ１００Ｒ５００Ａ２００Ｇ

・ command for occur the driving of absolute position。
・
・ if value is above 7 digit,the 8th digit is cut off.
・ If value is above ８０００００００,modified to ８０００００００.
・ 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.</td></tr>
<tr><td>Ｅ</td><td>Command for sudden stop
・ 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.</td></tr>
<tr><td>Ｈ</td><td>Command for slow down and stop
・ H
・ When this command received, motorized stage slows down and stops.
・ Use this command separately. It could not be combined with other commands.</td></tr>
<tr><td>@</td><td>Display screen ＯＮ／ＯＦＦ

・@

・ 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。</td></tr>
<tr><td>$</td><td>Display screen switch

・$

・if this command received,display screen switches in the sequence of main screer →software limit setting screen→main screen。
・Use this command separately. It could not be combined with other commands。</td></tr>
<tr><td>＊ＭＯＤＥ</td><td>Action mode switch

・＊ＭＯＤＥ＋mode code
・＊ＭＯＤＥ３

・actio mode switch command

<table>
<tr><th>Mode code</th><th>Content</th></tr>
<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>
</table>
</td></tr>
</table>

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<table>
<tr><td></td><td>・ when this command received at action,stop the moving axis and swithces the mode。
・this command could be received at all modes exceptＲＥＭＯＴＥ modes.
・Use this command separately. It could not be combined with other commands。</td></tr>
<tr><td>＊ＳＯＦ</td><td>Command for prohibition of the occurrence of service request

・ *SOF
・ GP-IB prohibits the occurrence of service request.
・ Use this command separately. It could not be combined with other commands</td></tr>
<tr><td>＊ＳＯＮ</td><td>Command for the occurrence approval of service request
・ *SON
・ GP-IB issues the approval of the occurrence of service request.
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.</td></tr>
<tr><td>＊Ｍ</td><td>Command for the request of the setting value of memory SW.
axis indication + ?M + memory SW indication code
・Ａ１＊Ｍ１０
・Ａ３＊Ｍ３０
・Ａ５＊Ｍ６０
・Ａ７＊Ｍ８１
・＊Ｍ８１

・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><tr><td>Memory SW indication code</td><td>content</td></tr><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 emergance stop control</td></tr></table>※memory SW indication code 8 are common for all axes.even axis is not indicated,setting is possible.＊Ｍ８＋indication code。
<table><tr><td></td><td>Setting value code</td><td>content</td></tr><tr><td rowspan="8">1</td><td>0</td><td>Set ＯＲＧ０</td></tr><tr><td>1</td><td>Set ＯＲＧ１</td></tr><tr><td>2</td><td>Set ＯＲＧ２</td></tr><tr><td>3</td><td>Set ＯＲＧ３</td></tr><tr><td>4</td><td>Set ＯＲＧ４</td></tr><tr><td>5</td><td>Set ＯＲＧ５</td></tr><tr><td>6</td><td>Set ＯＲＧ６</td></tr></table></td></tr>
</table>

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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	Ｄ１２０,ＦＵＬＬ;Ｄ１２０ＭＳ,１／１
		1	Ｄ１２０,ＨＡＬＦ;Ｄ１２０ＭＳ,１／２
		2	Ｄ１２０,ineffective;Ｄ１２０ＭＳ,１／２．５
		3	Ｄ１２０,ineffctive;Ｄ１２０ＭＳ,１／４
		4	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／５
		5	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／８
		6	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／１０
		7	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／２０
		8	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／２５
		9	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／４０
		１０	Ｄ１２０, ineffctive;Ｄ１２０ＭＳ,１／５０
		１１	Ｄ１２０,ineffctive;Ｄ１２０ＭＳ,１／８０
		１２	Ｄ１２０,ineffctive;Ｄ１２０ＭＳ,１／１００
		１３	Ｄ１２０,ineffctive;Ｄ１２０ＭＳ,１／１２５
		１４	Ｄ１２０,ineffctive;Ｄ１２０ＭＳ,１／２００
		１５	Ｄ１２０ineffctive;Ｄ１２０ＭＳ,１／２５０
	8	0	Ｅ１ＯＮ （ＥＭＧ１ control input effective)
		1	Ｅ１ＯＦＦ （ＥＭＧ１ control input ineffective)

continued

・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。

※details of memory SW,refer to ２．７ memory ＳＷ setting。

＊Ｔ	Driving speed switch （Ｆ→ｆ） ・axis indication＋＊Ｔ ・Ａ１＊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。 ※details of driving speed switch,refer to 2.8.4 driving speed switch。

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＊ＣＷ	CW side software limit setting ・axis indication ＋＊ＣＷ+numeric value(value－８０００００～８０００００) ・Ａ１＊ＣＷ１２３ ・Ａ２＊ＣＷ－１００００ ・command for settingＣＷ side software limit。 ・ if value is above 7 digit,the 8th digit is cut off. ・ If value is above ８０００００,modified to ８０００００. ・ 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。 For details,refer to ２．６ software limit description。
＊ＣＣＷ	CCW side software limit setting ・axis indication ＋＊CCW+numeric value (value－８０００００～８０００００) ・Ａ１＊CCW１２３ ・Ａ２＊CCW－１００００ ・command for setting CCW side software limit。 ・ If value is above 7 digits, the 8th digit is cut off. ・ If value is above ８０００００,modified to ８０００００. ・ 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. For details,refer to ２．６ software limit description。
＊ＬＭＳ	Software limit setting ・axis indication＋＊ＬＭＳ ・Ａ１＊ＬＭＳ ・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. For details,refer to ２．６ software limit description。

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＊ＬＭＲ	Software limit reset ・axis indication＋＊ＬＭＲ ・Ａ１＊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. For details,refer to ２．６ software limit description。
＊ＤＯＮ	Excitation on ・axis indication＋DON ・Ａ１＊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. For details,refer to 2.8.3 motor excitation ON/OFF。
＊ＤＯＦ	Excitation off ・axis indication＋DOF ・Ａ１＊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. For details,refer to 2.8.3 motor excitation ON/OFF。

？Ｉ	Status request ・axis indication＋？Ｉ＋status code ・Ａ１？ＩＡ ・Ａ２？ＩＢ ・ According to the status code,send 8 Bit binary data of each axis to the demanding party。

Status code	content
A	Demanding status A
B	Demanding status B

＜response of status Ａ＞

	MSB							LSB
”１”	In Action	Origin detection	suspend	CWLS	CCWLS	READY	CW	Excitaton on
”０”								

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stoppage						CCW	Excitaton off

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	software limit CCW	Software limit CW	Software limit CCW
" 0 "	possible				detection	detection	effective	Effective
			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 detetection in ＣＷ side software limit, Then" 1 "
Software limit CCW detection : at detetection in CCW side software limit, Then" 1 "
Software limit CW effective : if stppage in ＣＷ side software limit effective, then" 1 "
software limit CCW effective : if stppage 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 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。

？Ｆ	Request for driving speed(Ｆ) ・axis indication＋？Ｆ ・Ａ１？Ｆ ・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 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。
？Ｐ	Request for moving pulse (Ｐ) ・axis indication＋？Ｐ

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	・Ａ１？Ｐ ・command for requesting moving pulse (P) 。 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 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	Request for aceeleration and deceleration rate (R) ・axis indication＋？R ・Ａ１？R ・command for requesting aceeleration and deceleration rate (R) 。 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 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	Request for start speed (Ｌ) ・axis indication＋？Ｌ ・Ａ１？Ｌ ・command for requesting start speed(L)。 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 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	Request for current position ・axis indication＋？S ・Ａ１？S ・command for requesting current position。 Upon receiving commands,transmit to the demanding party in ＡＳＣＩＩ code Byte by byte from the sequence of high order。

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(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 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。

？M

Request for memory ＳW setting value

・axis indication＋？M＋memory ＳW indication code
・Ａ１？Ｍ１
・？Ｍ８

・command for requesting memory ＳW value。

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 senfor input logic
6	Request for current down control
7	Request for driver division number
8	Request for emergance stop control

※memory ＳW indication code ８ is common for all axes,so even the indication axis is not input,setting is possible。？Ｍ８。

・ 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。

	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
	6	Setting ofＯＲＧ6 by return-to-origin method
2	0	Mechanical limit sensor input logic is setting of Noramal close(B point)
	1	Mechanical limit sensor input logic is setting of Noramal 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	Ｄ１２０,ＦＵＬＬ;Ｄ１２０ＭＳ,１／１

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			1	Ｄ１２０,ＨＡＬＦ;Ｄ１２０ＭＳ,１／２
			2	Ｄ１２０ＭＳ,１／２．５
			3	Ｄ１２０ＭＳ,１／４
			4	Ｄ１２０ＭＳ,１／５
			5	Ｄ１２０ＭＳ,１／８
			6	Ｄ１２０ＭＳ,１／１０
			7	Ｄ１２０ＭＳ,１／２０
			8	Ｄ１２０ＭＳ,１／２５
			9	Ｄ１２０ＭＳ,１／４０
			１０	Ｄ１２０ＭＳ,１／５０
			１１	Ｄ１２０ＭＳ,１／８０
			１２	Ｄ１２０ＭＳ,１／１００
			１３	Ｄ１２０ＭＳ,１／１２５
			１４	Ｄ１２０ＭＳ,１／２００
			１５	Ｄ１２０ＭＳ,１／２５０
		８	０	Ｅ１ＯＮ（ＥＭＧ１ control input effective）setting
			１	Ｅ１ＯＦＦ（ＥＭＧ１control input ineffective）setting

・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 seperately and combination with other commands are impossible。

？ＣＷ	Demand for ＣＷ side software limit setting value ・axis indication＋？ＣＷ ・Ａ１？ＣＷ ・command for requesting ＣＷ side software limit setting value ・Upon receiving commands,transmit to the demanding party in ＡＳＣＩＩ 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 seperately and combination with other commands are impossible。
？ＣＣＷ	Request for ＣＣＷ side software limit setting value ・axis indication＋？ＣＣＷ ・Ａ１？ＣＣＷ ・command for requesting ＣＣＷ side software limit setting value ・Upon receiving commands,transmit to the demanding party in ＡＳＣＩＩ 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 seperately and combination with other commands are impossible。

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Service request accept action command ＃ＵＧ・＃ＤＧ・＃ＯＧ・＃ＡＧ from ＧＰ－ＩＢ in the ＲＥＭＯＴＥ modes and then moves,then occurs at stoppage。

MSB							LSB
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

Suspend : by stop demmand・STOP key in action,then" 1"
SRQ flag : service request occurs," 1"
Limit stop : stop by mechanical limit・software limit,then" 1"

Stop axis	Stop axis 4	Stop axis 3	Stop axis 2	Stop axis 1
Ａ1	0	0	0	1
Ａ2	0	0	1	0
Ａ3	0	0	1	1
Ａ4	0	1	0	0
Ａ5	0	1	0	1
Ａ6	0	1	1	0
Ａ7	0	1	1	1
Ａ8	1	0	0	0
Ａ9	1	0	0	1
Ａ10	1	0	1	0
Ａ11	1	0	1	1
Ａ12	1	1	0	0

・ please receive service request。If no receipt,before sending movement
・ command ＃ＵＧ・＃ＤＧ・＃ＯＧ、transmit ＊ＳＯＦ command and prohibit the occurance of service request。

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 : settng 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

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＊ＣＣＷ　　: setting of ＣＣＷ sid esoftware limit
＊ＬＭＳ　　: set of software limit
＊ＬＭＲ　　: reset of software limit
＊ＤＯＮ　　: excitation on
＊ＤＯＦＦ　: excitation off

２）Acceptable commands in action

Ｅ　　: emergance stop of all axes
Ｈ　　: slow down of all axes
＠　　: ＯＮ／ＯＦＦ of display screen
＄　　: switching of display screen
＊ＭＯＤＥ　: swithcing of moving mode
＊ＳＯＦ　　: prohibition of the service request occurence
＊ＳＯＮ　　: approval of the service request occurance
？　　: demanding command

２．13　sample programs

２．13．１　ＧＰ－ＩＢ sample program（１）transmission of command

```
100 '*****************************************************************
110 '*  Ｄ１２０  ＧＰ－ＩＢサンプルプログラム（１）  コマンドの送信  *
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 LINE INPUT "コマンドを入力してください。ＥＮＤまたはｅｎｄ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 ２００ makes the initial setting of ＧＰ－ＩＢ interface。
Line ２１０ waits the initial setting of ＧＰ－ＩＢ interface。

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

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

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 "Ａ１軸ポジション＝"P$ :WBYTE &H3F;
260 PRINT @7;"A2?S"
270 INPUT @7;P$
280 PRINT "Ａ２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 executation of ＩＦＣ（interface clear）、after every ５０ｍｓｅｃ,
transmit commnands.

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 '*****************************************************************
```


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```
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$))
250 PRINT "Ａ１軸ステータスＡ＝"ST$
260 PRINT @7;"A1?IB"
270 LINE INPUT @7;ST$ :ST$=HEX$(ASC(ST$))
280 PRINT "Ａ１軸ステータスＢ＝"ST$
290 PRINT @7;"A2?IA"
300 LINE INPUT @7;ST$ :ST$=HEX$(ASC(ST$))
310 PRINT "Ａ２軸ステータスＡ＝"ST$
320 PRINT @7;"A2?IB"
330 LINE INPUT @7;ST$ :ST$=HEX$(ASC(ST$))
340 PRINT "Ａ２軸ステータスＢ＝"ST$
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 executation of ＩＦＣ (interface clear)、after every ５０ｍｓｅｃ, transmit commnands.

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"
```


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```
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 "Ｄ１２０Ａ１軸、Ａ２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#S0P500F1000R500L100UG" :A1STOP=0
270 PRINT "Ａ１軸が１ＫＰＰＳの速度で５００パルス移動中です"
280 IF A1STOP=0 THEN GOTO 280
290 PRINT @7;"A2#S0P500F1000R500L100UG" :A2STOP=0
300 PRINT "Ａ２軸が１ＫＰＰＳの速度で５００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 "Ａ１軸停止" :IF S=1 THEN A1STOP=1
380     IF S=2 THEN PRINT "Ａ２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 ２００ makes initial setting of ＧＰ－ＩＢ interface initial setting。
Line ２４０ controls ＳＲＱ (service request) receipt approval。
Line ２５０ switches into ＲＥＭＯＴＥ mode。
Line ２６０ gives movement commands and set stop parameters (Ａ１ＳＴＯＰ) 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 ２８０, line ３１０,stoppage of each axis confirmed then finish。

２．13．５　ＲＳ２３２Ｃ sample program (５) transmission of command

```
100 '*********************************************************************
110 '*  Ｄ１２０  ＲＳ２３２Ｃサンプルプログラム（５）  コマンドの送信  *
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
```


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```
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・０ＤＨ）。
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 "Ａ１軸ポジション＝"P$
300 PRINT #1,"A2?S"
310 PRINT #1,CHR$(&HD);
320 INPUT #1,P$ :PRINT "Ａ２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・０ＤＨ）。
attention) after the transmission of commands, transmit delimiter。

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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$)) :PRINT "Ａ１軸ステータスＡ＝"S$
300 PRINT #1,"A1?IB"
310 PRINT #1,CHR$(&HD);
320 LINE INPUT #1,S$ :S$=HEX$(ASC(S$)) :PRINT "Ａ１軸ステータスＢ＝"S$
330 PRINT #1,"A2?IA"
340 PRINT #1,CHR$(&HD);
350 LINE INPUT #1,S$ :S$=HEX$(ASC(S$)) :PRINT "Ａ２軸ステータスＡ＝"S$
360 PRINT #1,"A2?IB"
370 PRINT #1,CHR$(&HD);
380 LINE INPUT #1,S$ :S$=HEX$(ASC(S$)) :PRINT "Ａ２軸ステータスＢ＝"S$
390 END
```

【explanation】

line ２４０ opens ＲＳ２３２Ｃ communication file。
Line ２５０ switches to ＲＥＭＯＴＥ modes。
Line ２６０ transmit delimiter（ＣＲ・０ＤＨ）。
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。

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２．13．８　ＲＳ２３２Ｃ sample program（８）stage movement

```
100 '*************************************************************************
110 '*　Ｄ１２０　ＲＳ２３２Ｃサンプルプログラム（８）　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$(&HD);
270 PRINT #1,"A1#S0P500F1000R500L100UG"
280 PRINT #1,CHR$(&HD); :A1STOP=0
290 PRINT "Ａ１軸が１ＫＰＰＳの速度で５００パルス移動中です"
300 GOSUB *A1STOPCK :IF A1STOP=0 THEN GOTO 300
310 PRINT #1,"A2#S0P500F1000R500L100UG"
320 PRINT #1,CHR$(&HD); :A2STOP=0
330 PRINT "Ａ２軸が１ＫＰＰＳの速度で５００パルス移動中です"
340 GOSUB *A2STOPCK :IF A2STOP=0 THEN GOTO 340
350 PRINT "全軸停止しました"
360 END
370 *A1STOPCK
380     PRINT #1,"A1?IA"
390     PRINT #1,CHR$(&HD);
400     LINE INPUT #1,S$ :S=ASC(S$) :S=S AND 128
410     IF S=0 THEN PRINT "Ａ１軸停止" :IF S=0 THEN A1STOP=1
420     RETURN
430 *A2STOPCK
440     PRINT #1,"A2?IA"
450     PRINT #1,CHR$(&HD);
460     LINE INPUT #1,S$ :S=ASC(S$) :S=S AND 128
470     IF S=0 THEN PRINT "Ａ２軸停止" :IF S=0 THEN A2STOP=1
480     RETURN
```

【explanation】

line ２４０ opens ＲＳ２３２Ｃ communication file。
Line ２５０ switches to ＲＥＭＯＴＥ modes。
Line ２６０ transmit delimiter（ＣＲ・０ＤＨ）。
attention) after the transmission of commands, transmit delimiter。

Line 270 sends the movement commands; Line 280 send delimiter and set stop parameter （Ａ１ＳＴＯＰ）to ０。

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

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Is１ then finish。

２．14 change points from Ｄ８０

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, emergance 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.
２．５Refer 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。
２．１２．４ 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 ＲＳ２３２Ｃ cable。

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

２．１４．２ Description on Ｄ８０ command mode

Ｄ８０ 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 Ｄ８０ commands】

	＊	:	prohibition of service request
	＃	:	approval of service request
	@	:	ＯＮ／ＯＦＦ of the display screen
	Ｘ１（Ａ１）	:	axis indication
	Ｙ１（Ａ２）	:	axis indication
	Ｚ１（Ａ３）	:	axis indication
	Ｗ１（Ａ４）	:	axis indication
	Ａ５	:	axis indication
	Ａ６	:	axis indication
	Ｘ２（Ａ７）	:	axis indication
	Ｙ２（Ａ８）	:	axis indication
	Ｚ２（Ａ９）	:	axis indication
	Ｗ２（Ａ１０）	:	axis indication
	Ａ１１	:	axis indication
	Ａ１２	:	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
※attention２	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

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【attention１～６ explanation of commands】

※attention １. Ｄ１２０ 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
・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 １ ２ ３ ４ ５ ６	ＯＲＧ１ (return-to-origin) ＯＲＧ２ ＯＲＧ３ ＯＲＧ４ ＯＲＧ０ ＯＲＧ５ ＯＲＧ６
２	０, １	Same as Ｄ８０
３	０, １	Same as Ｄ８０
４	０, １	Same as Ｄ８０
５	０１～９９	Ｄ８０ 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 Ｄ８０
７	００～１５	Same as Ｄ８０
８	００～９９	Ｄ８０ backlash offset (setting value code do not function and registrate in memory,upon receipt of N command,return back to the demanding party)
９	００～３０	Ｄ８０ 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 Ｄ８０ 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

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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

Ｔｕｄ＝２５．１６５×（６４＋Ｒ）／４００[msec/1000PPS]

Unit of Ｔｕｄ [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 Ｔｕｄ to １００[msec/1000PPS],set the acceleration and deceleration rate Ｒ as follows。

Ｒ＋６４＝４００×Ｔｕｄ／２５．１６５
Ｒ＋６４＝４００×１００／２５．１６５
Ｒ＋６４≒１５９０
Ｒ≒１５９０－６４
Ｒ≒１５２６

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

parameter	Setting scope	Default Setting	unit
Effective display Scope	－８０００００～８０００００	０	Pulse
Driving speed（F）	１～９９９９９	１０００	ＰＰＳ
Moving pulse（P）	０～８０００００	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

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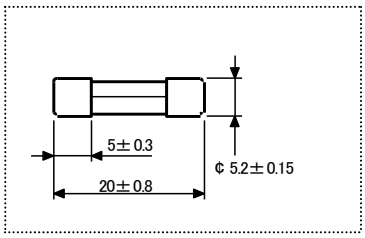
Origin sensor input logic		ＯＮＣ／ＯＮＯ	ＯＮＣ
Current down control		ＣＤ／ＮＣＤ	ＣＤ
Driver division volume D120		ＦＵＬＬ／ＨＡＬＦ	ＦＵＬＬ
	D120MS	１／１～１／２５０	１／１
EMG1 emergance stop control		Ｅ１ＯＦＦ／Ｅ１ＯＮ	Ｅ１ＯＦＦ

Software limit	Setting scope	Default setting	Unit
ＣＷ limit	－８０００００～８０００００	8000000	Pulse
ＣＣＷ limit	－８０００００～８０００００	-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　　¢５．２×２０mm
・terminal　**metal mold**
・fuse rating　normal meltdown　４Ａ　１２５Ｖ　ＡＣ

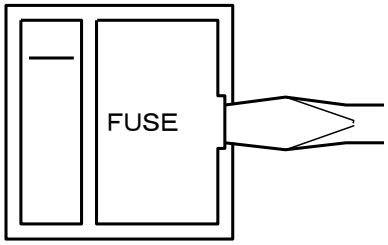
【change procedure】

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。



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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
	ＥＭＧ２ emergance Stop circuit works	ReleaseＥＭＧ２ emergance 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 emergance Stop circuit works	ReleaseＥＭＧ1 emergance 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

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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℃、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）、1axis
(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（－８０００００００～８０００００００）
Output pulse（Ｐ）：　０～８０００００００ 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 ２．15．１Acceleration 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

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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)

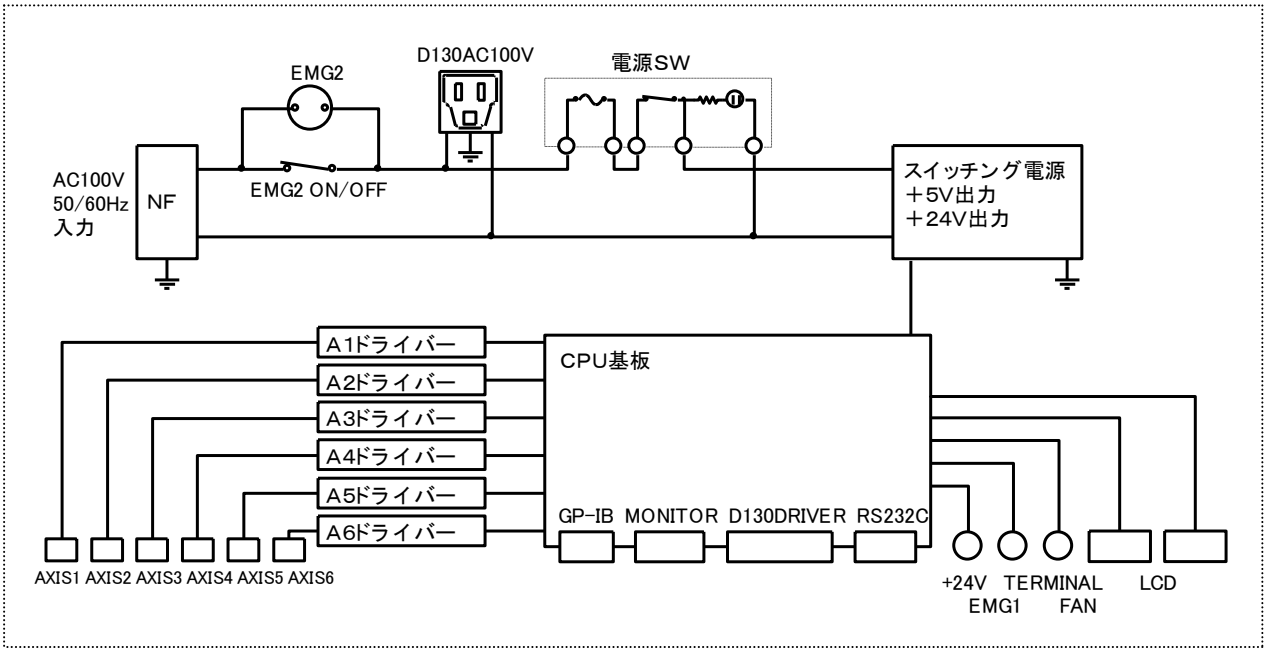
driving capacity：　０．７５Ａ／phase　(with current down function)

３．２．４　option

Ｄ７００ handy terminal

Ｄ９００ handy terminal

３．２．５　Ｄ１２０ block diagram



ＮＦ　　：noise filter inlet ata rear panel

ＥＭＧ２　　：ＥＭＧ２ connector at rear panel

EMG2 ON/OFF：ＥＭＧ２　ＯＮ／ＯＦＦ switch at rear panel

D130 AC100V：Ｄ１３０　ＡＣ１００Ｖ outlet at rear panel

Power ＳＷ　：ＰＯＷＥＲ switch at front panel

ＬＣＤ　　：ffluorescent display tube at front panel

ＦＡＮ　　：fan motor at rear panel

TERMINAL　：ＴＥＲＭＩＮＡＬ connector at front panel

ＥＭＧ１　　：ＥＭＧ１ connector ata rear panel

＋２４Ｖ　　：＋２４Ｖ connector at rear panel

RS232C　　：ＲＳ２３２Ｃ connector at rear panel

D130 DRIVER：Ｄ１３０　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

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

D120 controller save registrated parameter・memory ＳW onＲＡＭ 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．８０。
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 repariment fee is neeed。

《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 repairement basing on the guarantee。

＜contact＞

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

本　　社　〒４２４－８５６６

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ＯＳＴ－Ｄ３０３１－３

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