Touch Panel Teaching
CON-PTA, CON-PDA,
CON-PGA, CON-PGAS

Operation Manual Fourteenth Edition

IAI America, Inc.

Please Read Before Use

Thank you for purchasing our product.

This Operation Manual explains the handling methods, structure and maintenance of this product, among others, providing the information you need to know to use the product safely.

Before using the product, be sure to read this manual and fully understand the contents explained herein to ensure safe use of the product.
The CD or DVD that comes with the product contains Operation Manuals for IAI products.
When using the product, refer to the necessary portions of the applicable operation manual by printing them out or displaying them on a PC.

After reading the Operation Manual, keep it in a convenient place so that whoever is handling this product can reference it quickly when necessary.

[Important]

- This Operation Manual is original.
- The product cannot be operated in any way unless expressly specified in this Operation Manual. IAI shall assume no responsibility for the outcome of any operation not specified herein.
- Information contained in this Operation Manual is subject to change without notice for the purpose of product improvement.
- If you have any question or comment regarding the content of this manual, please contact the IAI sales office near you.
- Using or copying all or part of this Operation Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Table of Contents

Safety Guide

"Safety Guide" has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it before the operation of this product.

Safety Precautions for Our Products

The common safety precautions for the use of any of our robots in each operation.

No.	Operation Description	Description
1	Model Selection	● This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications. 1) Medical equipment used to maintain, control or otherwise affect human life or physical health. 2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility) 3) Important safety parts of machinery (Safety device, etc.) ● Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product. ● Do not use it in any of the following environments. 1) Location where there is any inflammable gas, inflammable object or explosive 2) Place with potential exposure to radiation 3) Location with the ambient temperature or relative humidity exceeding the specification range 4) Location where radiant heat is added from direct sunlight or other large heat source 5) Location where condensation occurs due to abrupt temperature changes 6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid) 7) Location exposed to significant amount of dust, salt or iron powder 8) Location subject to direct vibration or impact ● For an actuator used in vertical orientation, select a model which is equipped with a brake. If selecting a model with no brake, the moving part may drop when the power is turned OFF and may cause an accident such as an injury or damage on the work piece.

No.	Operation Description	Description
2	Transportation	● When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane. ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● When in transportation, consider well about the positions to hold, weight and weight balance and pay special attention to the carried object so it would not get hit or dropped. ● Transport it using an appropriate transportation measure. The actuators available for transportation with a crane have eyebolts attached or there are tapped holes to attach bolts. Follow the instructions in the operation manual for each model. ● Do not step or sit on the package. ● Do not put any heavy thing that can deform the package, on it. ● When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work. ● When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit. ● Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength. ● Do not get on the load that is hung on a crane. ● Do not leave a load hung up with a crane. ● Do not stand under the load that is hung up with a crane.
3	Storage and Preservation	● The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation. ● Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.
4	Installation and Start	(1) Installation of Robot Main Body and Controller, etc. ● Make sure to securely hold and fix the product (including the work part). A fall, drop or abnormal motion of the product may cause a damage or injury. Also, be equipped for a fall-over or drop due to an act of God such as earthquake. ● Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life. ● When using the product in any of the places specified below, provide a sufficient shield. 1) Location where electric noise is generated 2) Location where high electrical or magnetic field is present 3) Location with the mains or power lines passing nearby 4) Location where the product may come in contact with water, oil or chemical droplets

No.	Operation Description	Description
4	Installation and Start	(2) Cable Wiring ● Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. ● Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error. ● Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. ● When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction. ● Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product. ● Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire.
		(3) Grounding ● The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation. ● For the ground terminal on the AC power cable of the controller and the grounding plate in the control panel, make sure to use a twisted pair cable with wire thickness 0.5mm^2 (AWG20 or equivalent) or more for grounding work. For security grounding, it is necessary to select an appropriate wire thickness suitable for the load. Perform wiring that satisfies the specifications (electrical equipment technical standards). ● Perform Class D Grounding (former Class 3 Grounding with ground resistance 100Ω or below).

No.	Operation Description	Description
4	Installation and Start	(4) Safety Measures ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot's movable range. When the robot under operation is touched, it may result in death or serious injury. ● Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation. ● Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product. ● Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input. ● When the installation or adjustment operation is to be performed, give clear warnings such as "Under Operation; Do not turn ON the power!" etc. Sudden power input may cause an electric shock or injury. ● Take the measure so that the work part is not dropped in power failure or emergency stop. ● Wear protection gloves, goggle or safety shoes, as necessary, to secure safety. ● Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire. ● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.
5	Teaching	● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well. ● When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. ● When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. ● Place a sign "Under Operation" at the position easy to see. ● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.

No.	Operation Description	Description
6	Trial Operation	● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation. ● When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation. ● Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc. ● Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.
7	Automatic Operation	● Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence. ● Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication. ● Make sure to operate automatic operation start from outside of the safety protection fence. ● In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product. ● When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.

No.	Operation Description	Description
8	Maintenance and Inspection	● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well. ● When the work is to be performed inside the safety protection fence, basically turn OFF the power switch. ● When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. ● When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. ● Place a sign “Under Operation” at the position easy to see. ● For the grease for the guide or ball screw, use appropriate grease according to the Operation Manual for each model. ● Do not perform the dielectric strength test. Failure to do so may result in a damage to the product. ● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. ● The slider or rod may get misaligned OFF the stop position if the servo is turned OFF. Be careful not to get injured or damaged due to an unnecessary operation. ● Pay attention not to lose the cover or untightened screws, and make sure to put the product back to the original condition after maintenance and inspection works. Use in incomplete condition may cause damage to the product or an injury. * Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.
9	Modification and Dismantle	● Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.
10	Disposal	● When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste. ● When removing the actuator for disposal, pay attention to drop of components when detaching screws. ● Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.
11	Other	● Do not come close to the product or the harnesses if you are a person who requires a support of medical devices such as a pacemaker. Doing so may affect the performance of your medical device. ● See Overseas Specifications Compliance Manual to check whether complies if necessary. ● For the handling of actuators and controllers, follow the dedicated operation manual of each unit to ensure the safety.

Alert Indication

The safety precautions are divided into “Danger”, “Warning”, “Caution” and “Notice” according to the warning level, as follows, and described in the Operation Manual for each model.

Level	Degree of Danger and Damage	Symbol
Danger	This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.	Danger
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	Warning
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.	Caution
Notice	This indicates lower possibility for the injury, but should be kept to use this product properly.	Notice

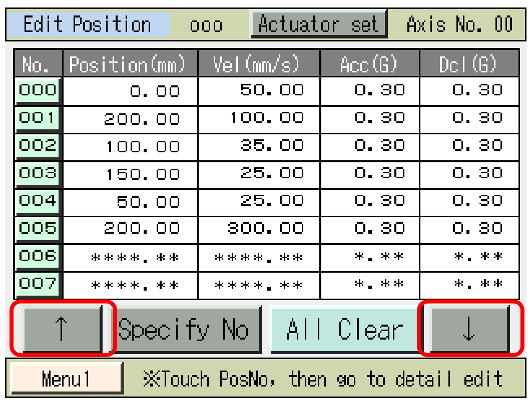
Handling Precautions

- In this touch panel teaching, the language to be displayed can be changed.
  Refer to the following for how to change it.
  - CON related controllers 5.1 Displayed Language Change
  - SEP related controllers 6.1 Displayed Language Change
  - MEC related controllers 7.1 Displayed Language Change

- Be careful not to apply mechanical shocks on this touch-panel teaching pendant CON-PTA/CON-PDA/CON-PGA/CON-PGAS. Failure may occur.

- When operating this touch-panel teaching pendant CON-PTA/CON-PDA/CON-PGA/CON-PGAS, be sure to hold the teaching pendant to prevent the cables from receiving unnecessary tensile loads.

- For CON related controllers, do not touch [↑] key or [↓] key too fast to switch the windows in the table to edit the position data.
  ‘0’ is occasionally shown to the data values that are already registered.
  The data is not lost even though ‘0’ is displayed. Touch [↑] key and [↓] key to switch the window and come back, and you will find the data showing the right values.



Position Data Table

Caution

- This touch-panel teaching pendant CON-PTA/CON-PDA/CON-PGA/CON-PGAS is exclusively designed for use with IAI controllers. Never connect it to other equipment.
  Failure may occur.

Product Check

This product, if adopting a standard configuration, consists of the parts listed below.

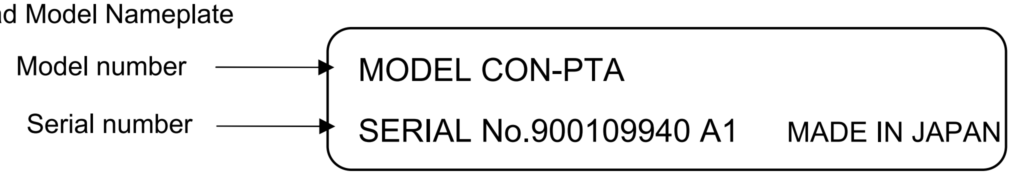
1. Component (excluding options)

No.	Product name	Model number	Remarks
1	Teaching pendant	Refer to "How to Read Model Nameplate" and "How to Read Model Number."	
Accessories			
2	Touch pen	Built into teaching pendant	
3	First step guide		
4	Operation manual (CD/DVD)		
5	Safety guide		

2. Operation manual related to this product, stored in the CD/DVD

No.	Name	Control number
1	Operation manual for touch-panel teaching pendant CON-PTA/CON-PDA/CON-PGA/CON-PGAS	ME0295
2	Operation manual for actuator integrated with ERC2 controller (PIO type)	ME0158
3	Operation manual for actuator integrated with ERC2 controller (SIO type)	ME0159
4	Operation manual for actuator integrated with ERC3 controller	ME0297
5	Operation manual for PCON-CA controller	ME0289
6	Operation manual for PCON-C/CG/CF controller	ME0170
7	Operation manual for PCON-CY controller	ME0156
8	Operation manual for PCON-SE controller	ME0163
9	Operation manual for PCON-PL/PO controller	ME0164
10	Operation manual for ACON-C/CG controller	ME0176
11	Operation manual for ACON-CY controller	ME0167
12	Operation manual for ACON-SE controller	ME0171
13	Operation manual for ACON-PL/PO controller	ME0166
14	Operation manual for ACON-CA/DCON-CA controller	ME0326
15	Operation manual for SCON controller	ME0161
16	Operation manual for SCON-CA controller	ME0243
17	Operation manual for ROBONET	ME0208
18	Operation manual for ASEP/PSEP/DSEP controller	ME0267
19	Operation manual for PMEC/AMEC controller	ME0245
20	Operation manual for MSEP controller	ME0299
21	Operation manual for MSCON controller	ME0306

3. How to Read Model Nameplate



4. How to Read Model Number

CON – PTA – C – ENG

<Model number>
- CON-PTA: Standard type
- CON-PDA: With deadman type
- CON-PGA: With safety category 4 type
- CON-PGAS: With safety category 4 type

<Display color>
C: TFT Color LCD Type

<Option>
- Not specified: Screens are displayed in Japanese. (Display can be changed to English or Chinese)
- ENG: Screens are displayed in English. (Display can be changed to Japanese or Chinese)
- CHI: Screens are displayed in Chinese. (Display can be changed to Japanese or English)

Supported Models

The table below lists supported models.

List of Supported Models

Controller model	
ERC2[*1]	PCON-CYB
ERC3	PCON-PLB
RCP6S	PCON-POB
ACON	SCON-C
ACON-CA	SCON-CA
ACON-CB	SCON-CAL/CGAL
ACON-CYB	SCON-CB
ACON-PLB	RACON
ACON-POB	RPCON
DCON-CA	ASEP
DCON-CB	PSEP
DCON-CYB	DSEP
DCON-PLB	MSEP
DCON-POB	AMEC
PCON	PMEC
PCON-CA	MSCON
PCON-CB	MCON

*1 Whether or not ERC2 is supported can be checked on the sticker attached to the left side face of the cover (as viewed from the rear).

Information on sticker

I/O type	Not supported	Supported
NP	NP U5 M	NP T1 **4904, 4905, 6302**
PN	PN U3 M	PN T1 **4904, 4905, 6302**

Note that touch-panel teaching pendants can be connected to ERC2 controllers of SIO type via a SIO converter regardless of their version.

1. Basic Specification

This touch-panel teaching pendant is a display operation unit you can use to display or edit data saved in the controller as a result of communication with the controller (parameter data, position data, etc.). This unit is used for checking teaching alarms or performing other tasks in an offline state when no host PLC, etc., is connected.

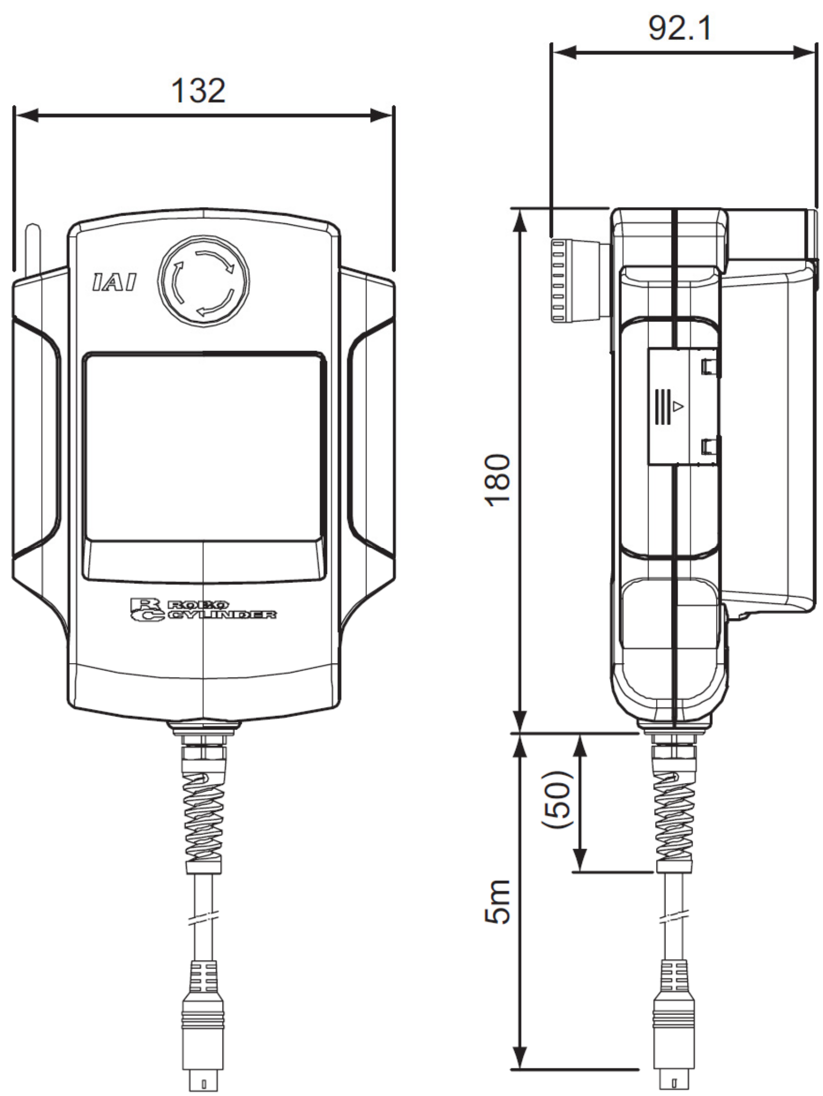
Item	Specifications
Screen	TFT Color LCD Type
Font	Japanese Bitmap Font Gothic Fonts supplied by LIM Corporation Ltd. are used.
Power supply voltage range	DC24V ±10% (supply than the controller)
Power consumption	3.6 W or less (150 mA or less)
Ambient operating temperature, humidity	Temperature 0 to 40°C, humidity 20 to 85% RH (non-condensing)
Ambient storage temperature, humidity	Temperature -20 to 60°C, humidity 10 to 85% RH (non-condensing)
Vibration resistance	10 to 55 Hz (5-minute period) (Test Condition) 0.35 mm in X, Y and Z directions for 50 minutes
Impact resistance	(Test Condition) 9.8 m/s^2 or more, applied 4 times each in X, Y and Z directions
Environmental resistance	IP 40 or equivalent
Dimension	180 mm (H) × 132 mm (W) × 92.1 mm (D)
Weight	CON-PTA : Approx. 570 g (including 5 m of cable) CON-PDA/PGA/PGAS : Approx. 600 g (including 5 m of cable)
Cable length	5 m (standard)
Accessories	Touch pen
Recommended SD Memory Card (Note 1)	SD, SDHC (manufactured by Toshiba) 1G to 8G byte

Note 1 Secure Digital card is a registered trademark for SD-3C, LLC and SDA.

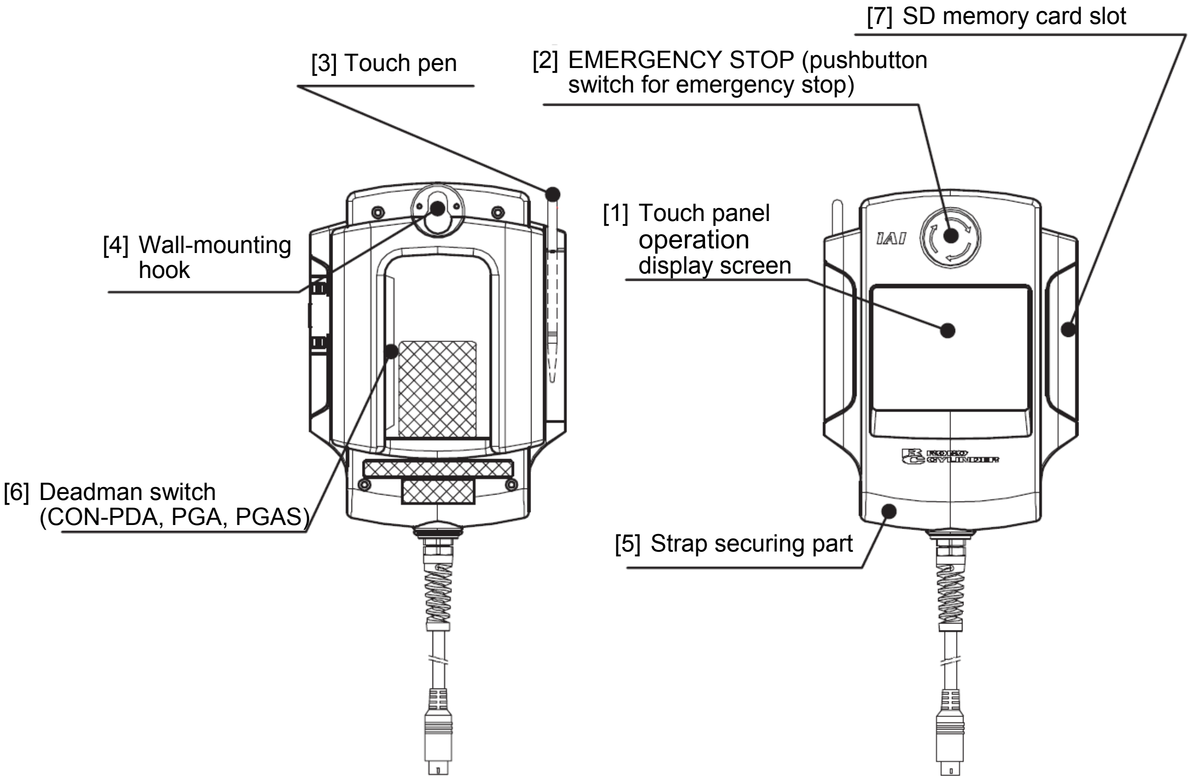
Language Change

Model	Display Language (in Delivery)	Available Language
CON-PTA-C	English	Japanese or Chinese

External Dimensions



2. Explanation of Each Part



[1] Touch-panel operation display screen
The screen consists of a TFT Color LCD Type and a touch panel.
Various settings that have been edited or taught are displayed.
To operate the screen, use a finger or the touch pen to touch (Note 1) desired parts of the touch panel.

(Note 1) In a use of the LCD display for a long term, the brightness may drop.
To maximize the life of the LCD display, remove it from the controller when it is not in use.
Set the turn-off time in the environment setting so it automatically turns OFF.

(Note 2) This touch panel is of analog resistance membrane type, so do not touch two or more locations on the screen at the same time.
If two or more locations are touched at the same time, the centers of all touched locations may respond and trigger multiple operations.

(Note 3) When operating the touch panel, do not apply a force exceeding 0.5 N.
If any greater force is applied, the touch panel may be damaged.

(Note 4) The life of touch panel is approx. 1 million touches at the same location. (Assuming a use environment of 25°C)

[2] EMERGENCY STOP (Pushbutton switch for emergency stop)
This switch actuates an emergency stop.

[3] Touch pen
This touch pen is used to touch the touch-panel operation display screen.

[4] Wall-mounting hook
This hook is used to mount the touch panel on a wall.

[5] Strap securing part
This part is used to attach a strap (optional).

[6] Deadman switch (CON-PDA, PGA, PGAS)
The deadman switch has three conditions corresponding to three levels. The meaning of ON/OFF in each condition is explained below.

Level 1	Switch OFF	The hand is off the switch, or the switch is pressed with a very small force.
Level 2	Switch ON	The switch is pressed with an appropriate force.
Level 3	Switch OFF	The switch is pressed with a strong force.

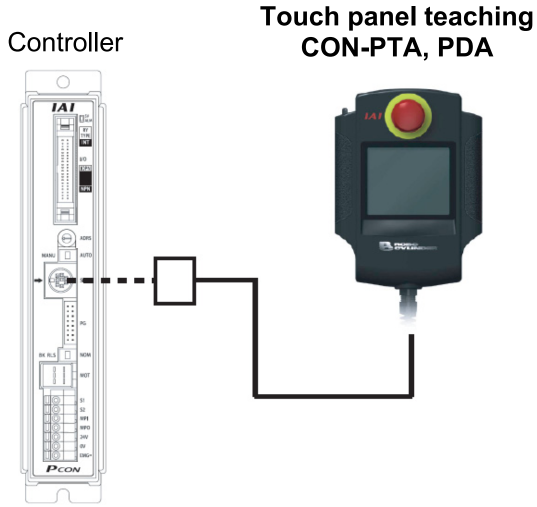
When the switch is ON, the servo can be turned ON.
When the switch is OFF, the drive source is cut off and the servo remains OFF.
Even when the switch is OFF, operation is still possible in modes where the servo need not be ON (such as in the edit mode).

[7] SD memory card slot
It is a slot to insert the Secure Digital cards.

3. Connection and Disconnection to/from Controller

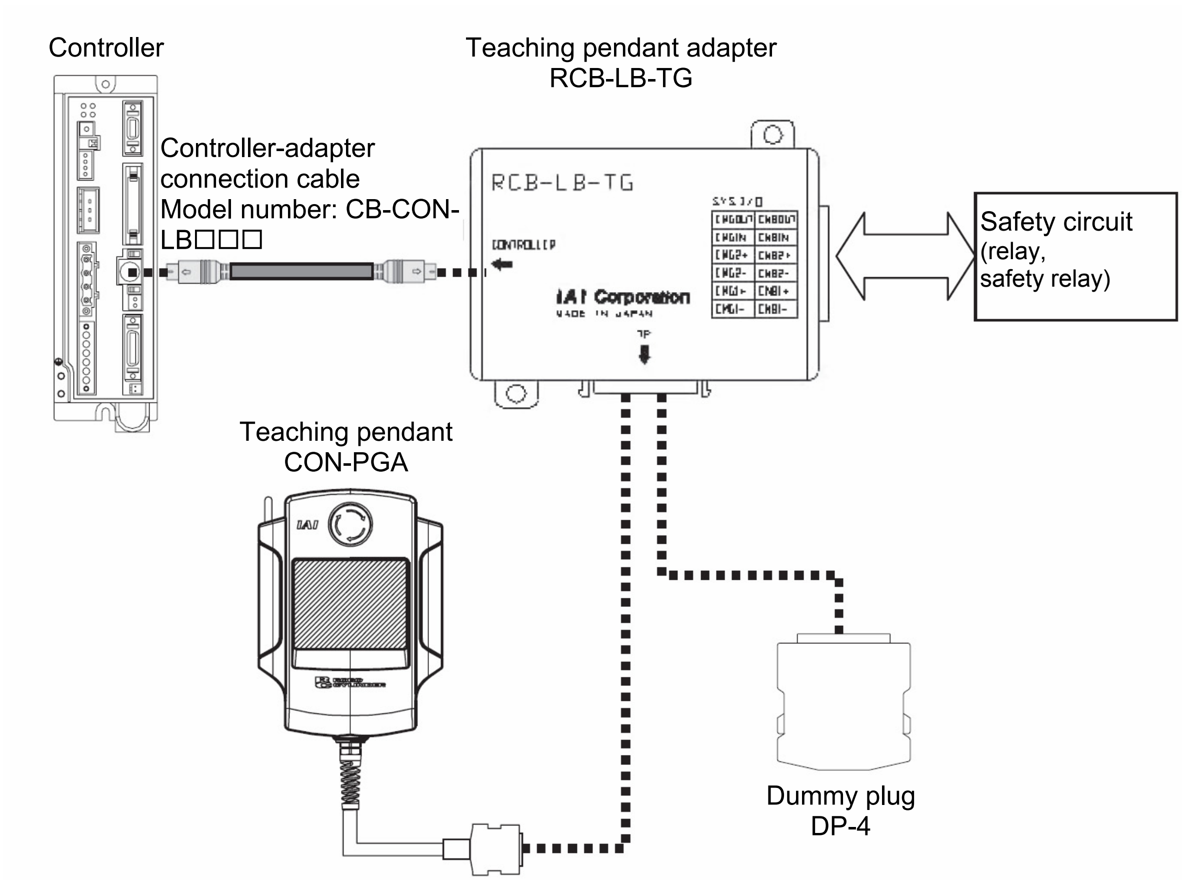
Make sure to turn OFF the power to the controller before inserting/removing Touch Panel Teaching CON-PTA.

⚠ Caution: • It may cause to malfunction if the teaching is put in or taken out while the power is ON. • Make sure to check the matching position of the connector to ensure not to apply load in wrong direction while the connector is put in or taken out. Do not attempt to put in the connector forcefully when it does not go smoothly. Doing so may cause to malfunction.



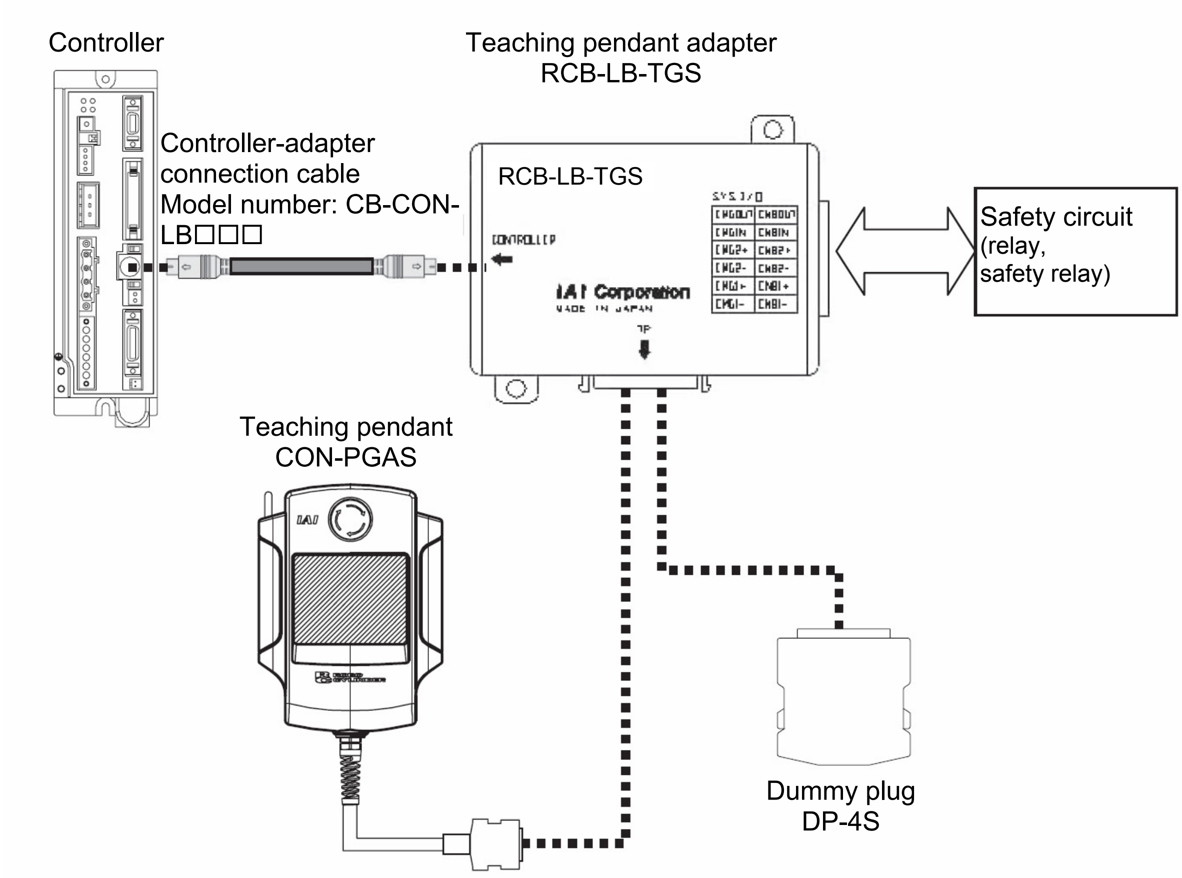
4. Connection of CON-PGA/PGAS and Controller

[Connection of CON-PGA and RCB-LB-TG]



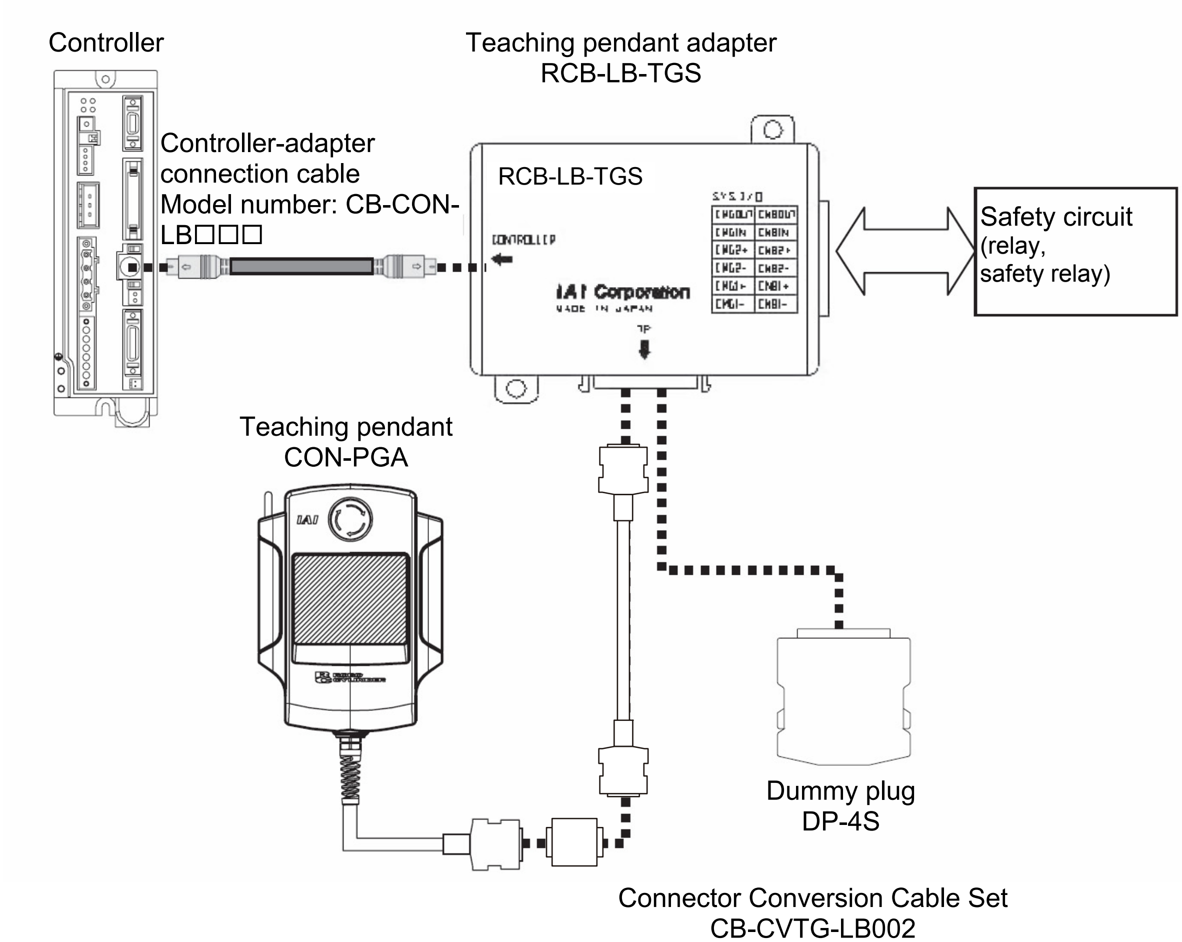
⚠ Caution: While the teaching pendant CON-PGA is not connected, be sure to connect the dummy plug DP-4 to the teaching pendant adapter.

[Connection of CON-PGAS and RCB-LB-TGS]



⚠ Caution: While the teaching pendant CON-PGAS is not connected, be sure to connect the dummy plug DP-4S to the teaching pendant adapter.

[Connection of CON-PGA and RCB-LB-TGS]



⚠ Caution: While the teaching pendant CON-PGA is not connected, be sure to connect the dummy plug DP-4S to the teaching pendant adapter.

5. Operation of CON Related Controllers

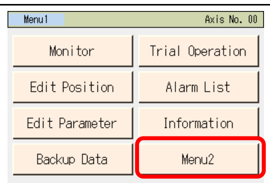
CON related controllers: ERC2, ERC3, ACON, ACON-CA, DCON-CA, PCON, SCON-C, SCON-CA, SCON-CAL/CGAL, RACON, RPCON and MSCON

5.1 Displayed Language Change

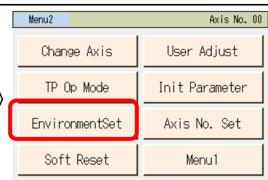
The language can be changed by following the steps below.
For the operations after the language change, please refer to the operation manual written in each language.

Model: CON-PTA-C　CON-PTA-C-ENG

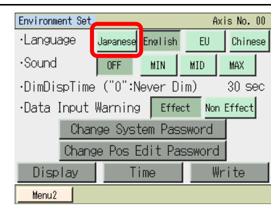
Display change from English to Japanese



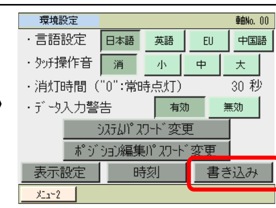
Touch [Menu2] in Menu1.



Touch [EnvironmentSet] in Menu2.

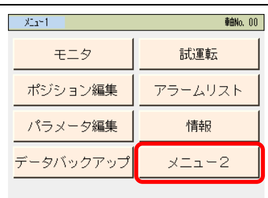


Touch [Japanese].

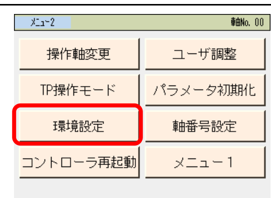


Touch [書き込み].

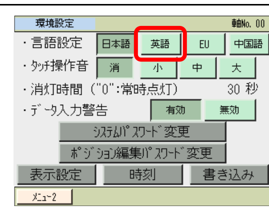
Display change from Japanese to English



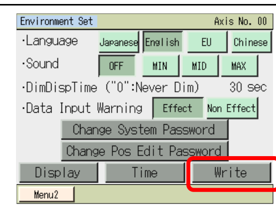
Touch [メニュー2] in メニュー1.



Touch [環境設定] in メニュー2.



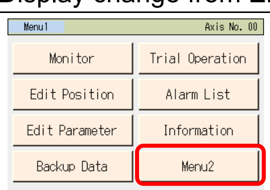
Touch [英語].



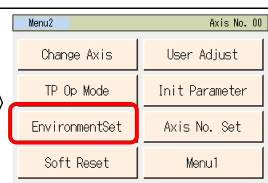
Touch [Write].

Model: CON-PTA-C　CON-PTA-C-CHI

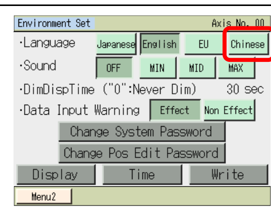
Display change from English to Chinese



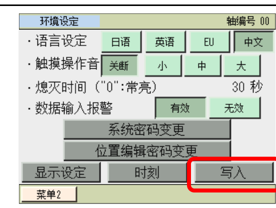
Touch [Menu2] in Menu1.



Touch [EnvironmentSet] in Menu2.

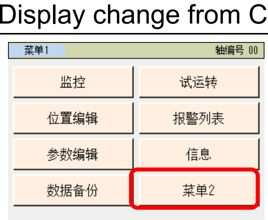


Touch [Chinese].

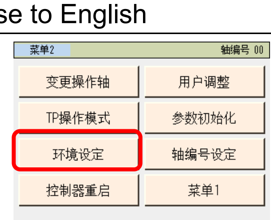


Touch [写入].

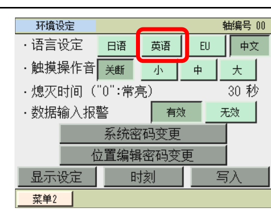
Display change from Chinese to English



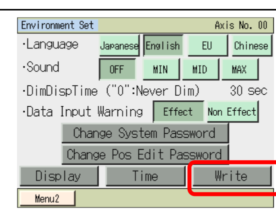
Touch [菜単2] in Menu1.



Touch [环境设定] in Menu2.



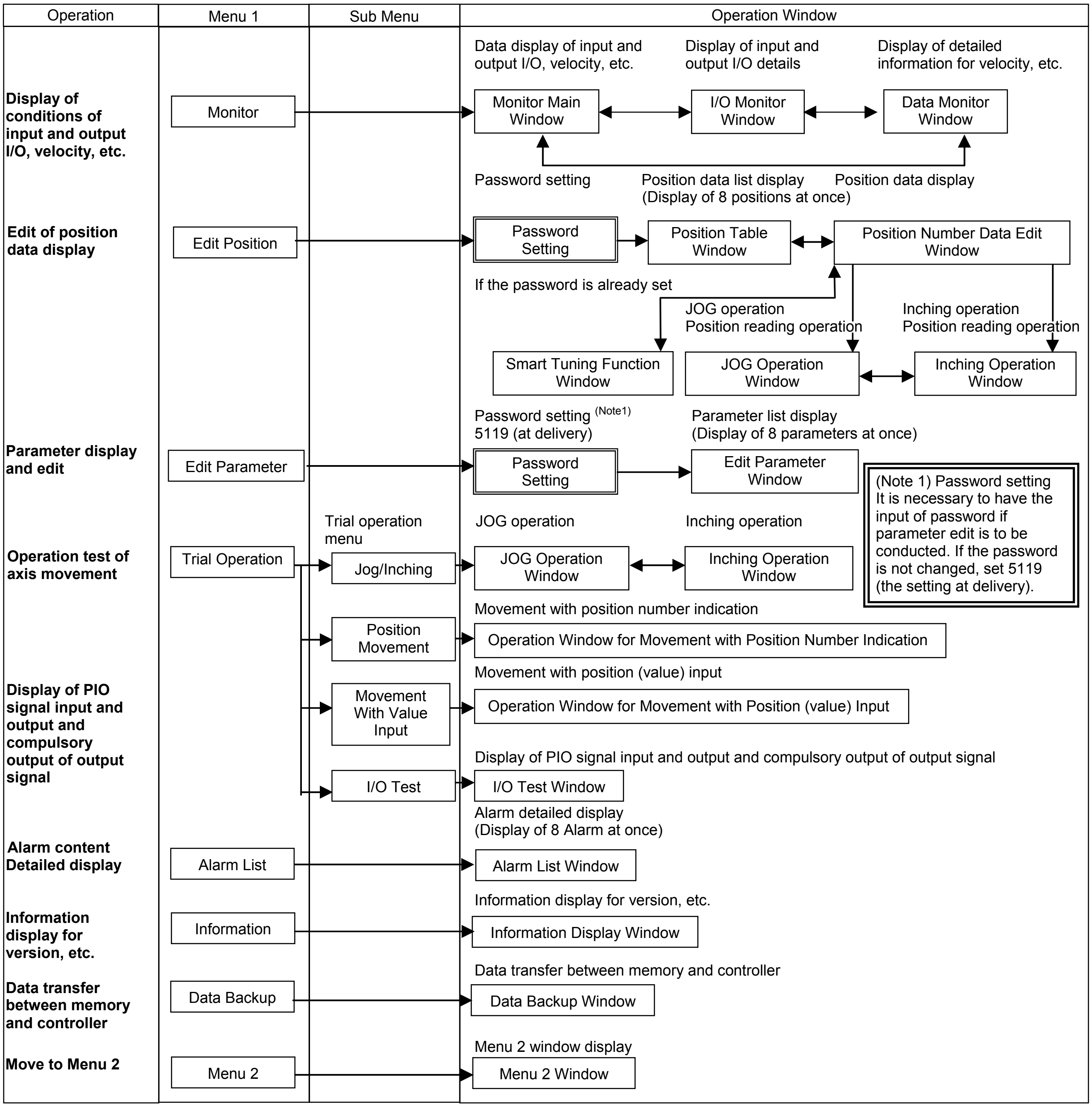
Touch [英語].



Touch [Write].

5.2 Operating Menu

Operating menu when the touch-panel teaching pendant CON-PTA is connected to a CON controller is shown.

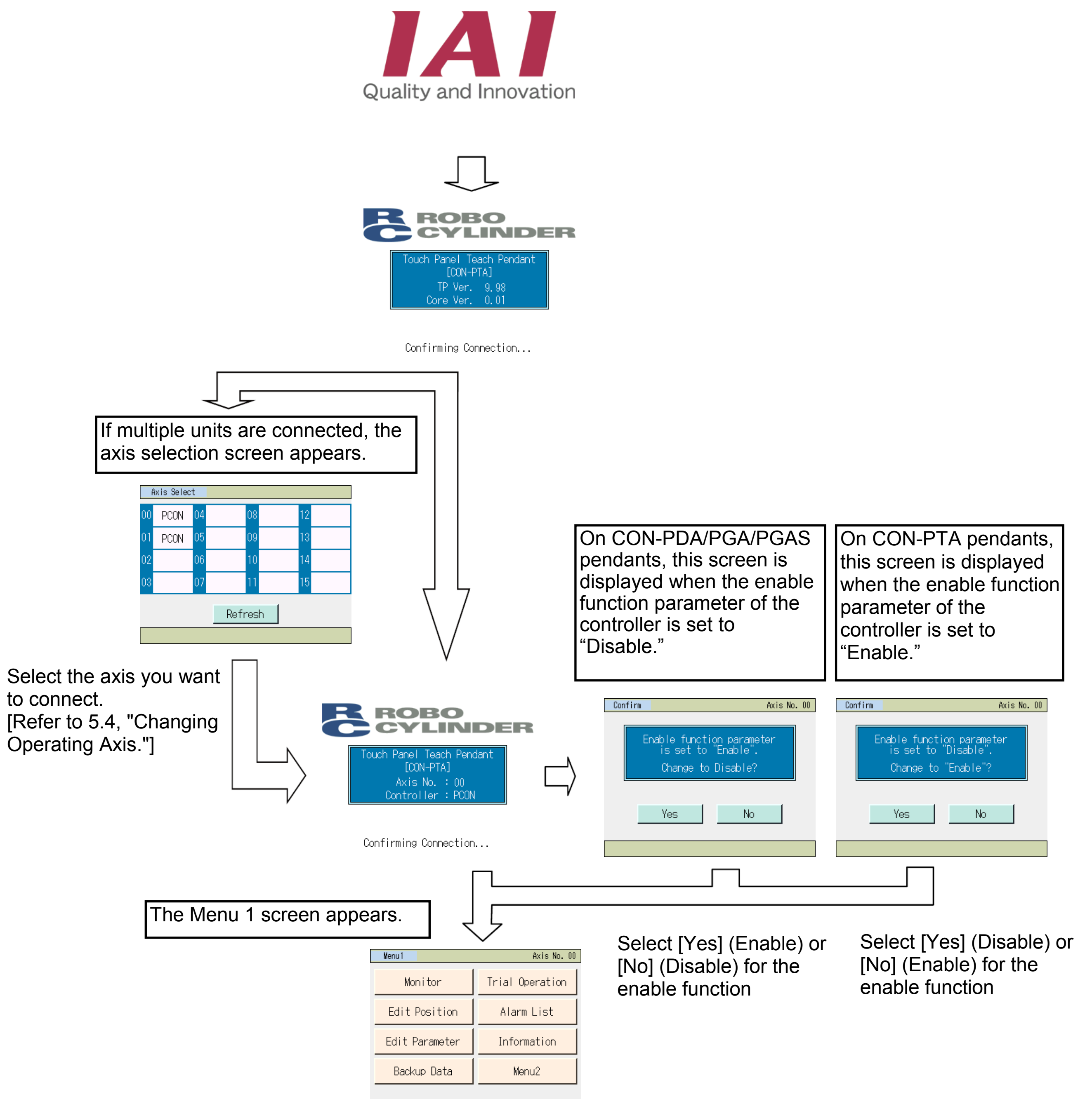


Operation	Menu 2	Sub Menu	Operation Window
Select/change connected axis controller	Change of Operated axis		Select/change connected axis controller → Operated Axis Change Window
Controller reboot	Controller Reboot		Controller reboot → Controller Reboot
Select TP Operation Mode (Monitor 1, Monitor 2, Teach 1 and Teach 2)	TP Operation Mode		TP operation mode select → TP Operation Mode Window
Operations such as execution of home-return operations	User Adjustment		Password setting(Note2) 5119 (at delivery) → Password Setting Operations such as execution of home-return operation → User Adjustment Window
Parameter Initializing	Parameter Initializing		Parameter Initializing Changing parameter back to that when the product was delivered → Parameter Initializing Window
Setting of Controller Axis Numbers	Axis No. Setting		Password setting(Note2) 5119 (at delivery) → Password Setting Setting of controller axis numbers → Axis No. Setting
Environment of Language Setting, Touch Sound Setting, etc.	Global		Language setting, touch operation sound setting, window sleeping time → Global Window System password change → System Password Change Window Position editing password change → Position Editing Password Change Window Display settings (contrast and brightness changes) → Display Setting Window Clock settings → Clock setting Window
Move to Menu 1	Menu 1		Menu 1 window display → Menu 1 Window

(Note 2) Password setting
Input of password are necessary when having a user adjustment and axis number settings. If the password is not changed, set 5119 (the setting at delivery).

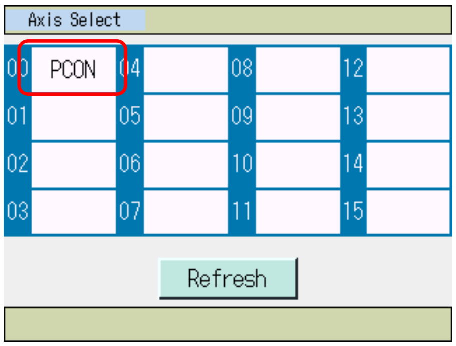
5.3 Initial Screen

Upon connection to the controller, power is supplied to the touch-panel teaching pendant and processing starts.
When the power is turned on, the IAI logo is displayed for approx. 1 second on the operation display screen (hereinafter referred to as " operation screen") of the touch-panel teaching pendant, after which version information is displayed.

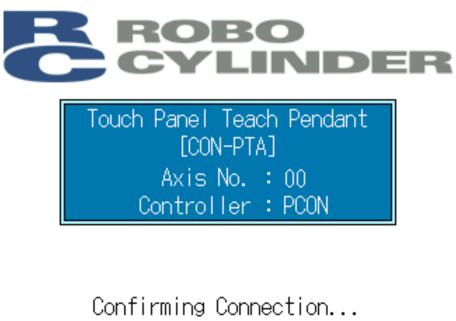


5.4 Changing Operating Axis

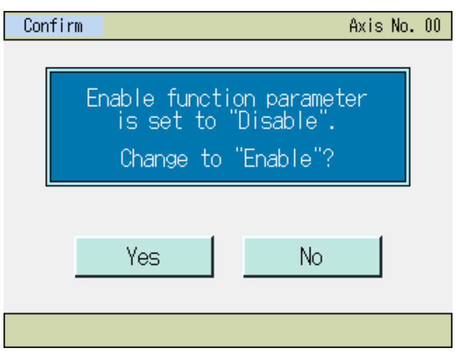
If multiple controllers are connected to the communication line, the axis selection screen appears.
This screen also appears when [Change Axis] is touched on the Menu 2 screen.
If only one controller is connected, you need not select an axis.



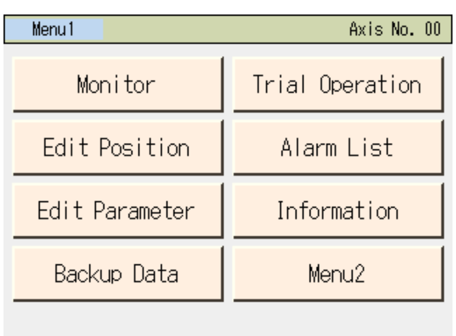
Select and touch the axis you want to connect the touch-panel teaching pendant to.



Connection with the selected controller axis starts.



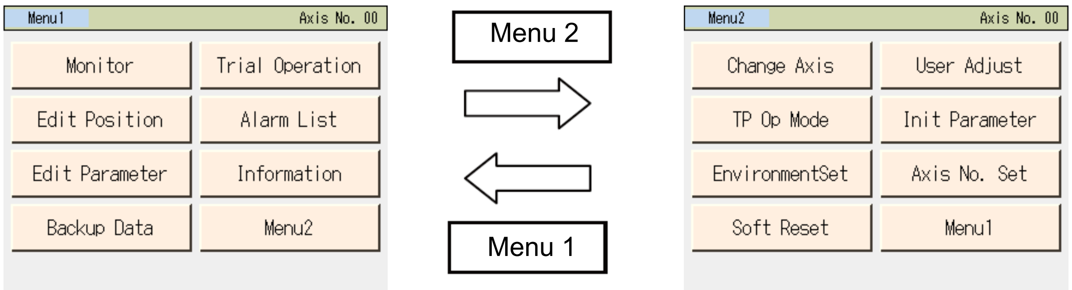
This screen appears when the enable function parameter of the controller, other than CON-PTA, is set to [Disable].
Select and touch [Yes] (Enable) or [No] (Disable) for the enable function.



When connection with the controller is established, the Menu 1 screen appears.

5.5 Menu Selection

Menu 1 Menu 2



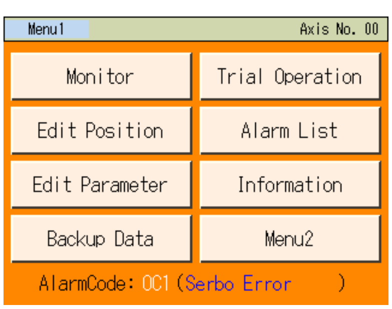
Two menu selection screens, Menu 1 and Menu 2, are available.
Touching [Menu2] on the Menu 1 screen changes the display to the Menu 2 screen.
Touching [Menu1] on the Menu 2 screen changes the display to the Menu 1 screen.
The Menu 1 screen and Menu 2 screen provide seven menu items, respectively. Select and touch one of these items.
The screen changes to the one corresponding to the menu item you have touched.

Menu 1 list

• Monitor	Display the controller status. [Refer to 5.6, "Monitor."]
• Edit Position	Display and edit the position data table. [Refer to 5.7, "Position Editing."]
• Edit Parameter	Display and edit zone boundary+ and other parameters. [Refer to 5.8, "Parameter Editing."]
• Trial operation	Perform operation test for jogging, inching and axis movement. [Refer to 5.9, "Trial Operation."]
• Alarm List	Display alarm details. [Refer to 5.11, "Alarm List."]
• Information	Display controller information such as the version. [Refer to 5.16, "Information Display."]
• Backup Data	Transfer data between SD memory card and the controller. [Refer to 5.18, "Data Backup."]

Menu 2 list

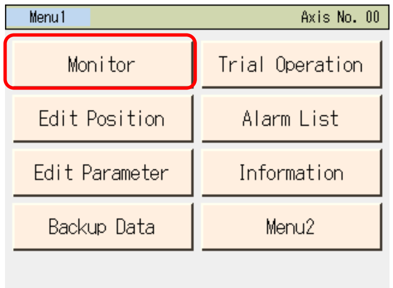
• Change Axis	Select the controller axis to connect the touch-panel teaching pendant to. [Refer to 5.4, "Changing Operating Axis."]
• Soft Reset	Restart the controller. [Refer to 5.12, "Controller Restart."]
• TP Op Mode	Select a desired TP operation mode. [Refer to 5.10, "TP Operation Mode."]
• User Adjust	Execute home return, etc. [Refer to 5.13, "User Adjustment."]
• Init Parameter	Initialize parameters. [Refer to 5.14, "Parameter Initialization."]
• Axis No. Set	Set the axis number of the controller. [Refer to 5.15, "Axis Number Setting."]
• Environment Set	Set the language and touch tone, change the system password, etc. [Refer to 5.17, "Environment Setting."]



When an alarm generates, the corresponding alarm code and message will appear at the bottom of the screen and the backlight color will change to orange. If an emergency stop is detected, the background color will change to red.

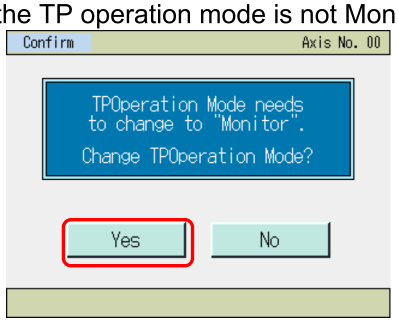
5.6 Monitor

The I/O statuses, current position and other information of the controller connected to the serial communication line are displayed.



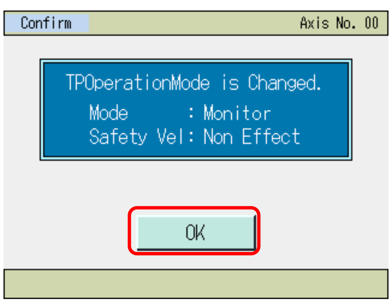
Touch [Monitor] on the Menu 1 screen.

If the TP operation mode is not Monitor Mode 1 or 2, the following message screen appears.



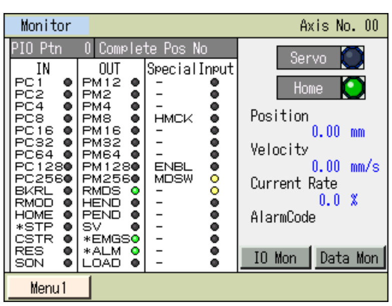
Touch [Yes] to change to Monitor Mode 1 or 2.
If not, touch [No].

(Note) The safety speed does not change.
If the current mode is Teaching Mode 1, it changes to Monitor Mode 1.
If the current mode is Teaching Mode 2, it changes to Monitor Mode 2.



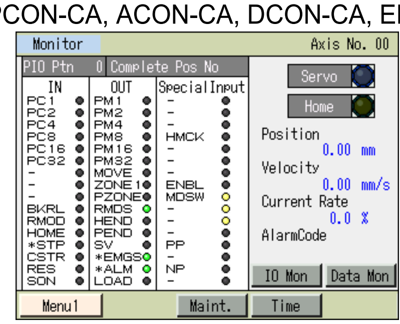
Touch [OK].

Models other than SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 and MSCON

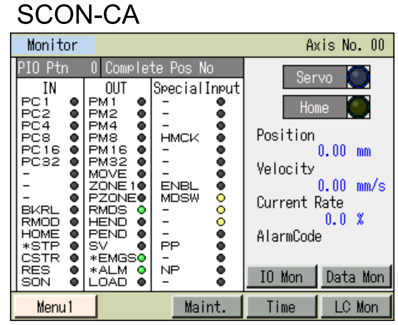


The main monitor screen appears.

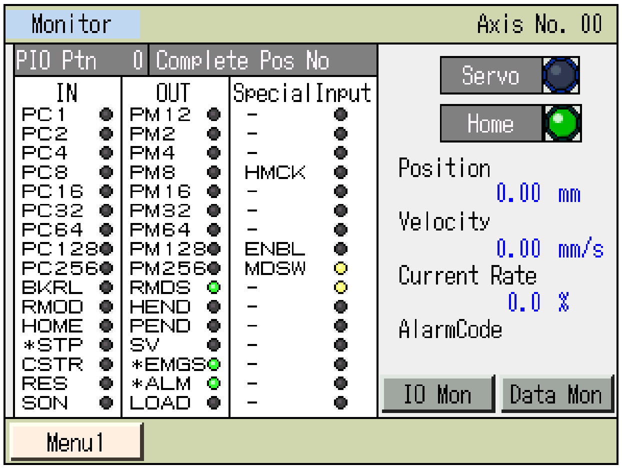
PCON-CA, ACON-CA, DCON-CA, ERC3, MSCON and SCON-CAL/CGAL



SCON-CA



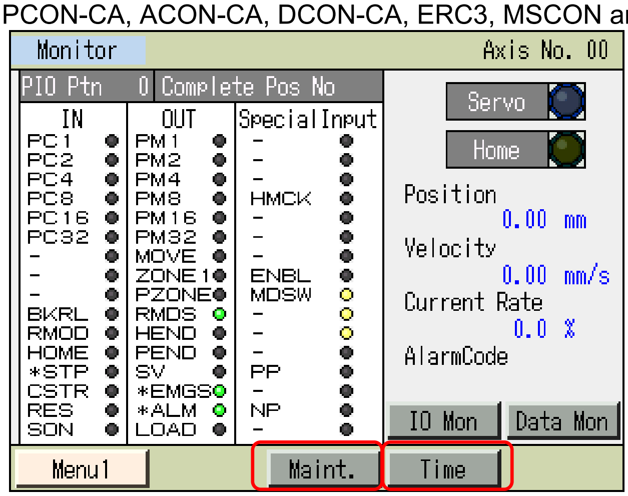
The main monitor screen appears.
Models other than SCON-CA, PCON-CA, ACON-CA, DCON-CA, ERC3 and MSCON



Touching [IO Mon] changes the display to one showing only I/Os.
Touching [Data Mon] changes the display to one showing only the current position, etc.

Touching Axis No. switches to the axis selection screen.

PCON-CA, ACON-CA, DCON-CA, ERC3, MSCON and SCON-CAL/CGAL

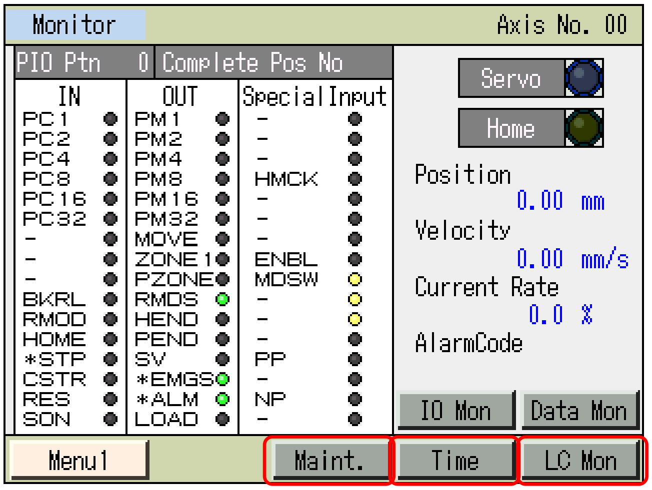


Touching [IO Mon] changes the display to show only I/Os.
Touching [Maintenance] changes the display to show maintenance information.
Touching [Data Mon] changes the display to show data such as the current position and control voltage.

Touching Axis No. switches the screen to one where you can select an axis.

Touching [Time] shows the window for time edit adjustment.

SCON-CA



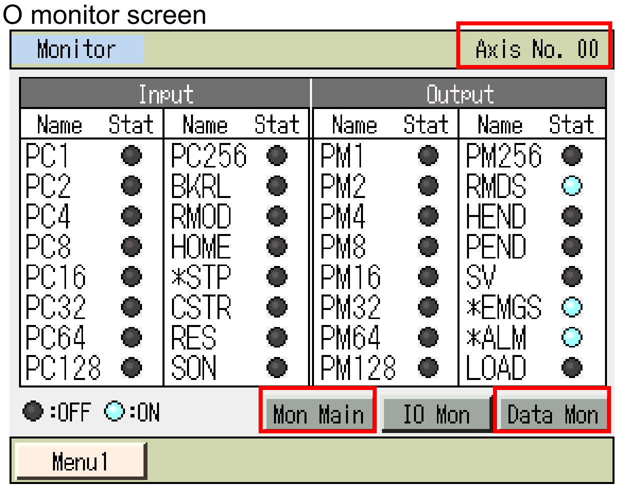
Touching [IO Mon] changes the display to show only I/Os.
Touching [Maintenance] changes the display to show maintenance information.
Touching [Data Mon] changes the display to show data such as the current position and control voltage.
Touching [LC Mon] changes the display to show data such as the current position and force feedback.

Touching Axis No. switches the screen to one where you can select an axis.

[Displayed Items]

• PIO Pattern	The PIO pattern number set to the controller is shown.
• Complete Pos No	The position number achieved upon completion of positioning is shown.
• IN	The status of each input port is shown. ON is lit. OFF is unlit.
• OUT	The status of each output port is shown. ON is lit. OFF is unlit.
• SpecialInput	The statuses of the enable switch, etc., are shown. ON is lit. OFF is unlit. (The displayed items vary depending on the model.)
• Servo	The servo ON status is shown. ON is lit. OFF is unlit.
• Home	The home return status is shown. Lit, if home return has completed.
• Position	The current position is shown.
• Velocity	The speed is shown.
• Current Rate	The command value of electrical current is shown as a percentage of the rated current.
• AlarmCode	The applicable alarm code is shown.

Models other than SCON-C, SCON-CA, SCON-CAL/CGAL and MSCON
IO monitor screen

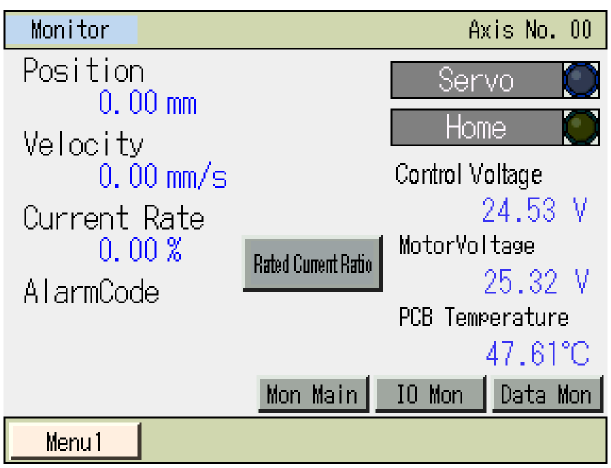


Touching [Mon Main] switches to the main monitor display.
Touching [Data Mon] changes the display to one showing only the current position, etc.

Touching Axis No. switches to the axis selection screen.

- Input — The status of each input port is shown. ON is lit. OFF is unlit.
- Output — The status of each output port is shown. ON is lit. OFF is unlit.

SCON-C, SCON-CA, SCON-CAL/CGAL and MSCON
Data monitor screen



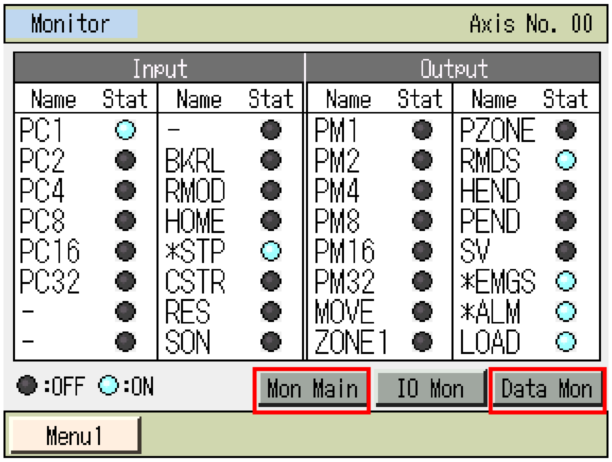
Touching [Mon Main] switches to the main monitor display
Touching [IO Mon] changes the display to one showing only I/Os.

Touching [Axis No.] switches the screen to one where you can select an axis.

Touch [Current] to display [Rated Current Ratio].
Touch [Rated Current Ratio] to display [Current].

- Position — The current position is shown.
- Velocity — The speed is shown.
- Pulse count — The pulse count is shown. Touching [Pulse Count] displays the pulse count. (It is shown on the pulse train control controllers such as PCON-PL/PC.)
- Current Rate — The command value of electrical current is shown as a percentage of the rated current.
- Current — The command value of electrical current is shown. Touch [Current] to display the command value.
- Alarm Code — The applicable alarm code is shown.
- Servo — The servo ON status is shown. ON is lit. OFF is unlit.
- Home — The home return status is shown. Lit, if home return has completed.
- ControlVoltage — The voltage of the control power supply is shown.
- MotorVoltage — The voltage of the motor power supply is shown.
- PCB Temperature — The PCB temperature is shown.

SCON-C
IO monitor screen

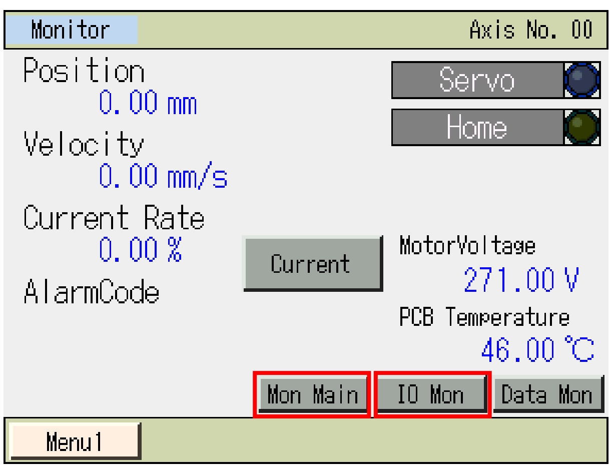


Touching [Mon Main] switches to the main monitor display
Touching [Data Mon] changes the display to show data such as the current position and control voltage.

Touching [Axis No.] switches the screen to one where you can select an axis.

• Input	The status of each input port is shown. ON is lit. OFF is unlit.
• Output	The status of each output port is shown. ON is lit. OFF is unlit.

SCON-C
Data monitor screen



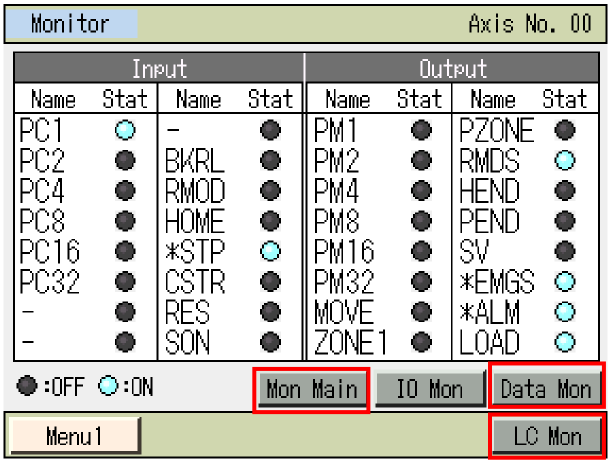
Touching [Mon Main] switches to the main monitor display
Touching [IO Mon] changes the display to one showing only I/Os.

Touching [Axis No.] switches the screen to one where you can select an axis.

Touch [Current] to display [Current Rate].
Touch [Current Rate] to display [Current].

• Position	The current position is shown.
• Velocity	The speed is shown.
• Pulse count	The pulse count is shown. Touching [Pulse Count] displays the pulse count. (The pulse count is shown in the pulse-train control mode.)
• Current Rate	The command value of electrical current is shown as a percentage of the rated current.
• Current	The command value of electrical current is shown. Touch [Current Rate] to display the command value.
• Alarm Code	The applicable alarm code is shown.
• Servo	The servo ON status is shown. ON is lit. OFF is unlit.
• Home	The home return status is shown. Lit, if home return has completed.
• MotorVoltage	The voltage of the motor power supply is shown.
• PCB Temperature	The PCB temperature is shown.

SCON-CA
IO monitor screen

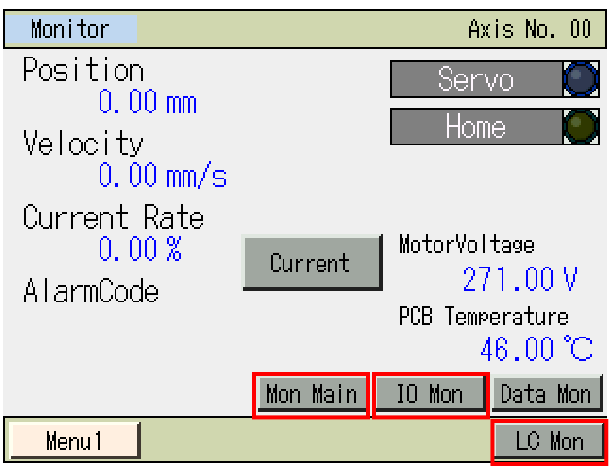


Touching [Mon Main] switches to the main monitor display
Touching [Data Mon] changes the display to show data such as the current position and control voltage.
Touching [LC Mon] changes the display to show data such as the current position and force feedback.

Touching [Axis No.] switches the screen to one where you can select an axis.

- Input — The status of each input port is shown. ON is lit. OFF is unlit.
- Output — The status of each output port is shown. ON is lit. OFF is unlit.

SCON-CA
Data monitor screen



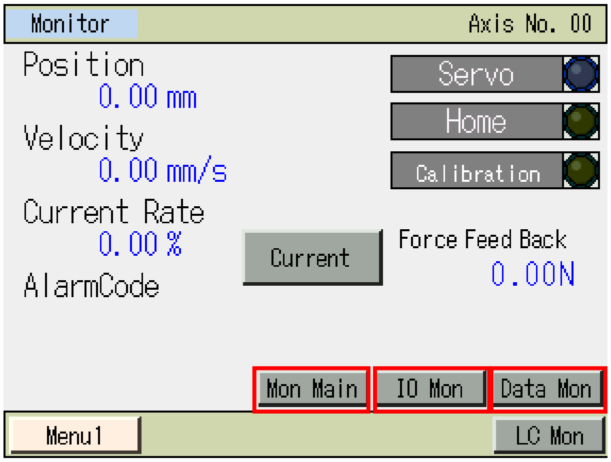
Touching [Mon Main] switches to the main monitor display
Touching [IO Mon] changes the display to one showing only I/Os.
Touching [LC Mon] changes the display to show data such as the current position and force feedback.

Touching [Axis No.] switches the screen to one where you can select an axis.

Touch [Current] to display [Current Rate].
Touch [Current Rate] to display [Current].

- Position — The current position is shown.
- Velocity — The speed is shown.
- Pulse count — The pulse count is shown. Touching [Pulse Count] displays the pulse count. (The pulse count is shown in the pulse-train control mode.)
- Current Rate — The command value of electrical current is shown as a percentage of the rated current.
- Current — The command value of electrical current is shown. Touch [Current Rate] to display the command value.
- AlarmCode — The applicable alarm code is shown.
- Servo — The servo ON status is shown. ON is lit. OFF is unlit.
- Home — The home return status is shown. Lit, if home return has completed.
- MotorVoltage — The voltage of the motor power supply is shown.
- PCB Temperature — The PCB temperature is shown.

SCON-CA
LC monitor screen

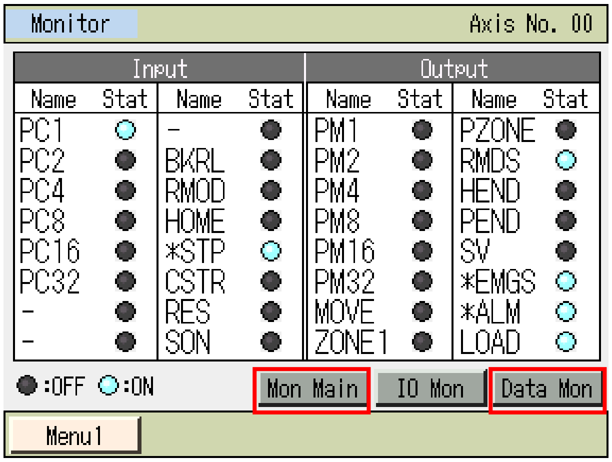


Touching [Mon Main] switches to the main monitor display
Touching [IO Mon] changes the display to one showing only I/Os.
Touching [Data Mon] changes the display to show data such as the current position and control voltage.

Touch [Current] to display [Current Rate].
Touch [Current Rate] to display [Current].

- Position — The current position is shown.
- Velocity — The speed is shown.
- Pulse count — The pulse count is shown. Touching [Pulse Count] displays the pulse count. (The pulse count is shown in the pulse-train control mode.)
- Current Rate — The command value of electrical current is shown as a percentage of the rated current.
- Current — The command value of electrical current is shown. Touch [Current Rate] to display the command value.
- Alarm Code — The applicable alarm code is shown.
- Servo — The servo ON status is shown. ON is lit. OFF is unlit.
- Home — The home return status is shown. Lit, if home return has completed.
- Calibration — The calibration status of the load cell is shown. Lit, if calibration of the load cell has been completed.
- Force feedback — The force feed back from the load cell is shown.

MSCON and SCON-CAL/CGAL
IO monitor screen

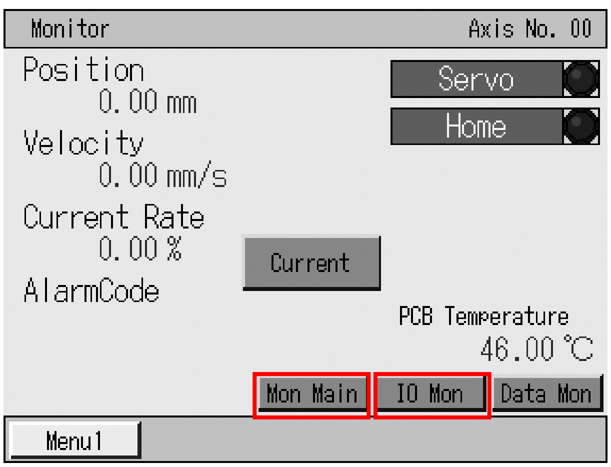


Touching [Mon Main] switches to the main monitor display
Touching [Data Mon] changes the display to show data such as the current position and control voltage.

Touching [Axis No.] switches the screen to one where you can select an axis.

- Input — The status of each input port is shown. ON is lit. OFF is unlit.
- Output — The status of each output port is shown. ON is lit. OFF is unlit.

MSCON and SCON-CAL/CGAL
Data monitor screen



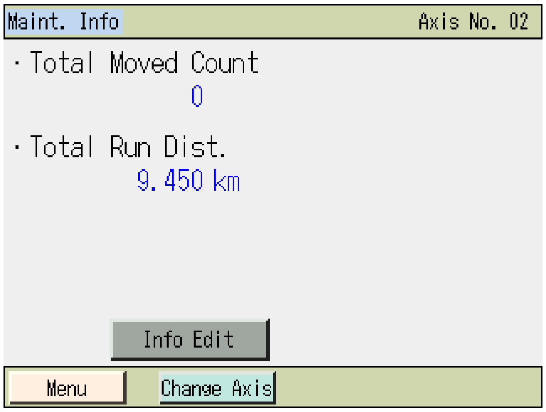
Touching [Mon Main] switches to the main monitor display
Touching [IO Mon] changes the display to one showing only I/Os.

Touching [Axis No.] switches the screen to one where you can select an axis.

Touch [Current] to display [Current Rate].
Touch [Current Rate] to display [Current].

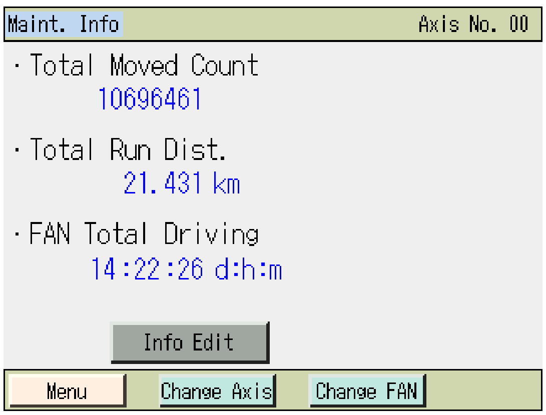
- Position — The current position is shown.
- Velocity — The speed is shown.
- Pulse count — The pulse count is shown. Touching [Pulse Count] displays the pulse count. (The pulse count is shown in the pulse-train control mode.)
- Current Rate — The command value of electrical current is shown as a percentage of the rated current.
- Current — The command value of electrical current is shown. Touch [Current Rate] to display the command value.
- Alarm Code — The applicable alarm code is shown.
- Servo — The servo ON status is shown. ON is lit. OFF is unlit.
- Home — The home return status is shown. Lit, if home return has completed.
- PCB Temperature — The PCB temperature is shown.

SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 and MSCON
Maintenance information screen



Touch [Info Edit] to show the password setting screen. The display is switched to the edit window of the maintenance information.

PCON-CFA



- Total number of movements — The cumulative total number of actuator movements is shown.
- Total travelled distance — The cumulative total distance travelled by the actuator is shown.
- FAN Total Driving Time — Shows the total driving time of the fan on the controller.

The above values can be changed on the maintenance information editing screen.

[Thresholds for Total Number of Movements and Total Travelled Distance]
You can set thresholds for total number of movements and total travelled distance in the parameters specified below, to cause an alarm to generate when each threshold is exceeded.

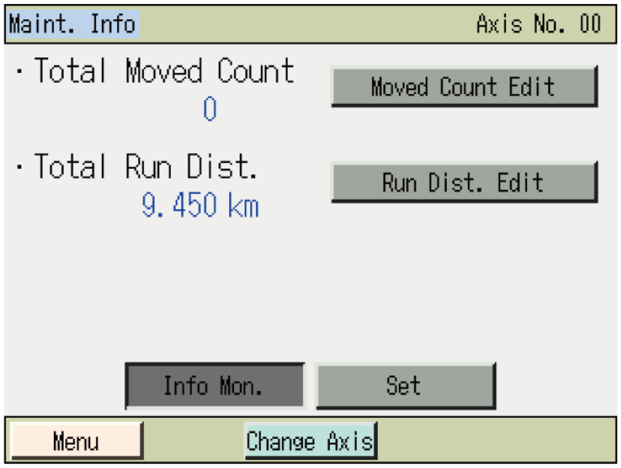
Parameter No.	Name
147	Threshold for total number of movements
148	Threshold for total travelled distance

Message-level alarms

Alarm code	Name	Description
4E	Movements threshold exceeded	This alarm generates when the total number of movements exceeds the threshold set in parameter No. 147.
4F	Travelled distance threshold exceeded	This alarm generates when the total travelled distance exceeds the threshold set in parameter No. 148.

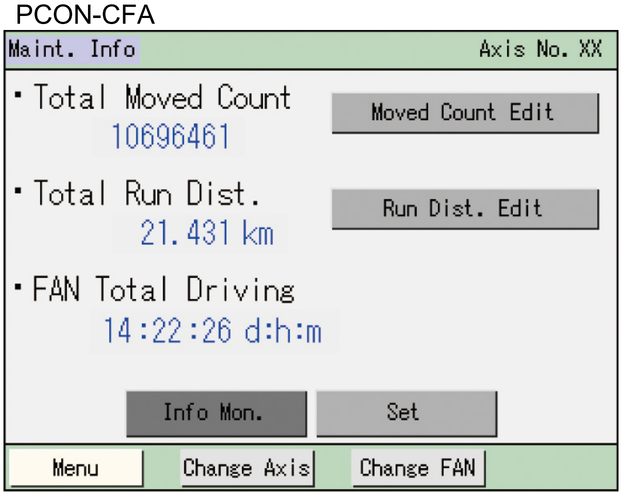
[Example of use for Total Drive Distance Times]
For an instance, it is recommended to have a grease supply on the scraper area every 300km in the regular inspections when the drive distance exceeds 300km within 3 months for RCPW Rod Type Actuator.
(Have a supply every 3 months for those which do not exceed it.)
In this case, set ‘300’ in Parameter No. 148 at the start of the first run, and an alarm notifies that grease supply is required when the drive distance exceeds 300km.
After the grease supply, set multiple numbers of 300, such like 600, 900, in Parameter 148, and the notification continues to be made for the timings of grease supply.

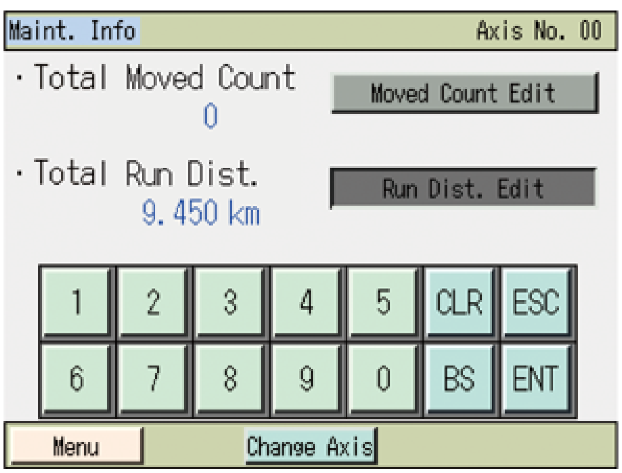
(1) Editing maintenance information
SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 and MSCON



Touching [Moved Count Edit] or [Run Dist. Edit] displays the numeric keys screen.
Enter a desired value and touch [ENT], and the current setting will change to the value you have entered.
Touching [Set] display returns you to the previous maintenance information screen.

PCON-CFA

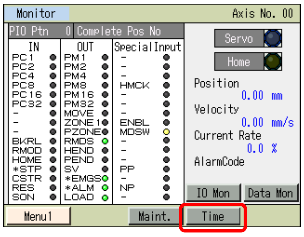




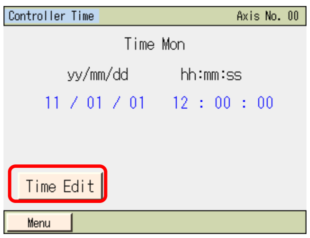
Touching [Info Mon.] without touching [Set] first returns you to the maintenance information screen showing the original value. The setting will not change to the value you have entered.

Time setting on the controller can be done at the SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON.

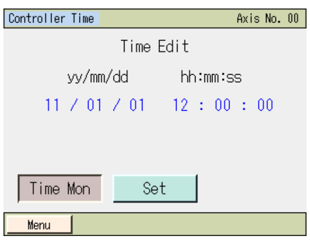
[How to Set Time]



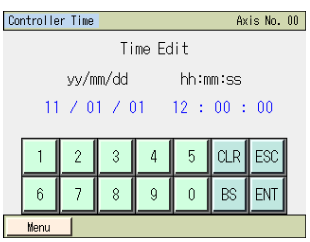
Touching [Time] displays the time setting screen.



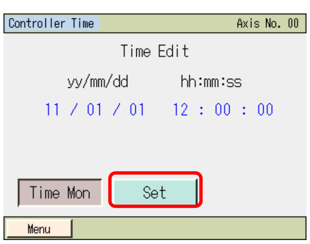
Controller's time is displayed.
Touch [Time Edit].



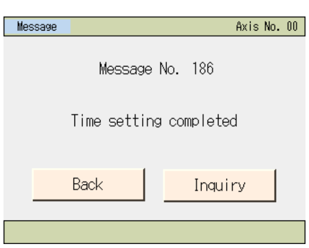
Touch the value of year, month, day, hours, minutes or seconds you want to change.



The numeric key pad appears. Enter a desired value, and then press [ENT].



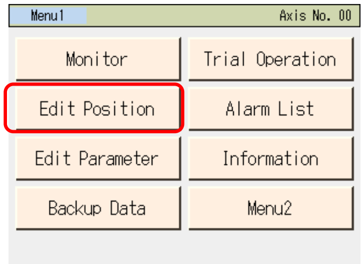
Touch [Set].



The time of the SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, MSCON controller ERC3 PIO Converter is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

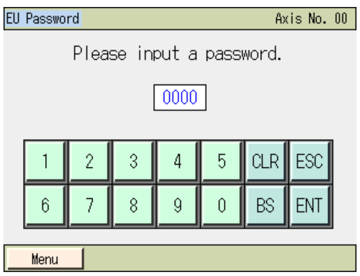
5.7 Position Editing

Set/edit the target position, speed, acceleration, deceleration and other data related to positions. You can move the axis by jogging or inching.



Touch [Edit Position] on the Menu 1 screen.

If a position password is set, the password setting screen appears.

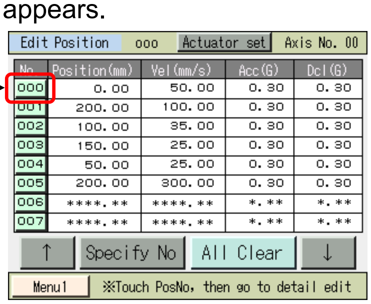


Enter the position password.

The default password is "0000."

A position data table appears.

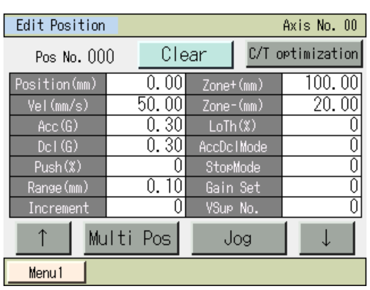
Position No.



Touch Specify No. to set the position number you want to set, and a table showing the position number you have just set appears.

To set data other than the target position, speed, acceleration and deceleration shown in the table, touch other position number such as "000."

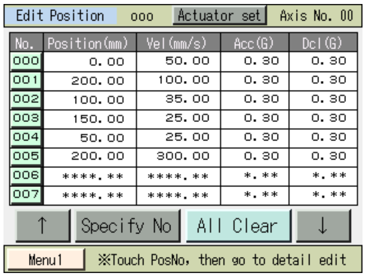
Data of the selected position number appears.



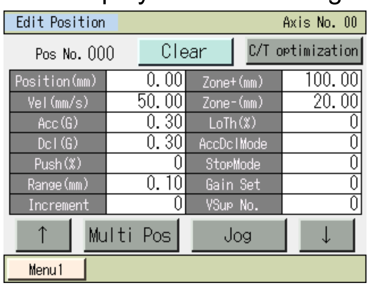
Touching [Multi Pos] returns the screen to the position data table display.

5.7.1 Position Data

Position data table screen



Data display screen showing the selected position number



The items set in the position data table include target position, speed, acceleration, deceleration, push, positioning band, incremental, zone+, zone-, threshold, acceleration/deceleration mode, stop mode and command mode.
The settings of zone+, zone-, threshold, acceleration/deceleration mode and stop mode are enabled or disabled depending on the controller type, as shown in the table.

Model	Zone +/-		Acc/Dcl Mode			Stop mode		Gain set	Vibration Control
			Trapezoid	S-motion	Primary delay	Full Servo	Automatic servo OFF		
ERC2	○	PIO pattern: 3	○	×	×	○	○	×	×
ERC2-SE	○	-	○	×	×	○	×	×	×
ERC3	○	PIO pattern: 2	○	○	○	○	○	×	×
ERC3 PIO Converter	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○	○	○	×	×
PCON-C/CG/CF	○	PIO pattern: 0, 1, 2, 4, 5	○	×	×	○	○	×	×
PCON-CA	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○	○	○	×	×
-CY	○	PIO pattern: 1	○	×	×	○	○	×	×
-SE	○	-	○	×	×	○	×	×	×
ACON-C/CG	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○		○	×	×
-CY	○	PIO pattern: 1	○	○	○		○	×	×
-SE	○	-	○	○	○		×	×	×
ACON-CA	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○		○	○	○
DCON-CA	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○		○	×	×
SCON-C	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○		○	×	×
SCON-CA SCON-CAL/CGAL	○	PIO pattern: 0, 1, 2, 4, 5, 6, 7	○	○	○		○	○	○
MSCON	○	-	○	○	○		○	○	○

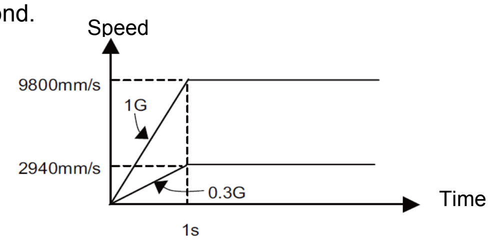
(1) No.
The position data number is shown.

> ⚠ Warning: Be sure to specify absolute coordinates on PCON-C/CG/CF, PCON-CA, ACON-C/CG, ACON-CA, DCON-CA, SCON-C, SCON-CA, SCON-CAL/CGAL, ROBONET, ERC3 PIO Converter, MSCON (Remote I/O mode) controllers of solenoid valve mode 2, or PCON-CY and ACON-CY controllers of solenoid valve mode 1.
> If incremental coordinates are specified on these controllers, a position data error occurs. Also note that completion of push motion cannot be determined when the push is specified if incremental coordinates are specified.

(2) Target position [mm]
Enter the target position to move the actuator to.
- Absolute coordinate specification : Enter the target position you want to move the actuator to, based on the distance from the home. A negative value cannot be entered.
- Incremental coordinate specification: Enter the target position you want to move the actuator to, based on the distance from the current position. A negative value can also be entered.
(Negative direction on displayed coordinate system)

(3) Speed [mm/sec]
Enter the speed at which to move the actuator.
The default value varies depending on the actuator type.
(Note) For SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 and MSCON, an alarm will be displayed if the set value is lower than the minimum velocity.

(4) Acceleration/deceleration [G]
Enter the acceleration/deceleration at which to move the actuator.
Basically you should set acceleration/deceleration not exceeding the rated value shown in the catalog.
The input range permits entry of values larger than the rated value shown in the catalog, but this is because "shorter tact time when the transferring mass is significantly lighter than the rated value" is assumed.
If the load vibrates during acceleration/deceleration to present problems, decrease the value set here.

> (Reference) Acceleration is explained. The same concept applies to deceleration.
> 1 G = 9800 mm/s^2: Acceleration at which the actuator can increase its speed up to 9800 mm/s per second.
> 0.3 G: Acceleration at which the actuator can increase its speed up to 2940 mm/s (9800 mm/s × 0.3) per second.
>
> 
>

(Note) For SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 and MSCON, an alarm will be displayed if the set value exceeds the rated acceleration/deceleration.

> ⚠ Caution: Acceleration/deceleration setting
> (1) Set accelerations/decelerations not exceeding the rated acceleration/deceleration specified in the catalog or this operation manual. If any acceleration/deceleration is set that exceeds the rated acceleration/deceleration, the life of the actuator may be significantly reduced.
> (2) If the actuator or work part receives impact or generates vibration, lower the acceleration/deceleration. If the system is used continuously with the actuator or work part receiving impact or generating vibration, the life of the actuator may be significantly reduced.
> (3) If the load transferred by the actuator is significantly lighter than the rated payload capacity, you may be able to set accelerations/decelerations exceeding the rating. If this is the case, the tact time can be reduced, so contact IAI. When contacting IAI, tell us the weight, shape and installation method of your work part and installation condition (horizontal/vertical) of your actuator.

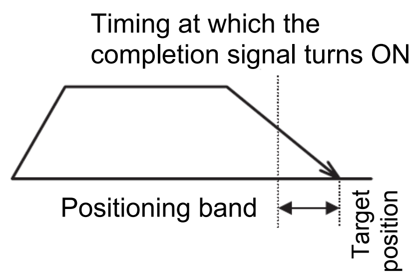
(5) Push
Select "Positioning operation" or "Push-motion operation."
The factory setting is 0.
0 : Normal positioning operation
Other than 0: A current limiting value is indicated, meaning that this is a push-motion operation.

⚠ Caution: With PCON, ACON, ACON-CA, DCON-CA, SCON-C, SCON-CA, SCON-CAL/CGAL, ERC2, ERC3, ROBONET and MSCON controllers, the value entered in the "Push" field may be rounded to a multiple of the controller's minimum resolution. (When data is acquired from the controller)

(6) Positioning band
What this setting means is different between "Positioning operation " and "Push-motion operation."
"Positioning operation":
Define how far before the target position you want to turn the completion signal ON.
The factory setting is 0.1 mm.

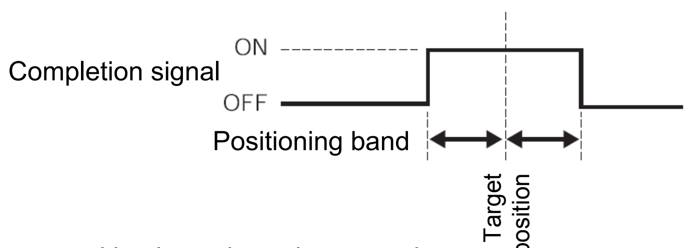
Standard type

Increasing the value of positioning band quickens the start of the next sequence operation, so the tact time can be reduced. Set an optimal value by considering the balance of the entire system.

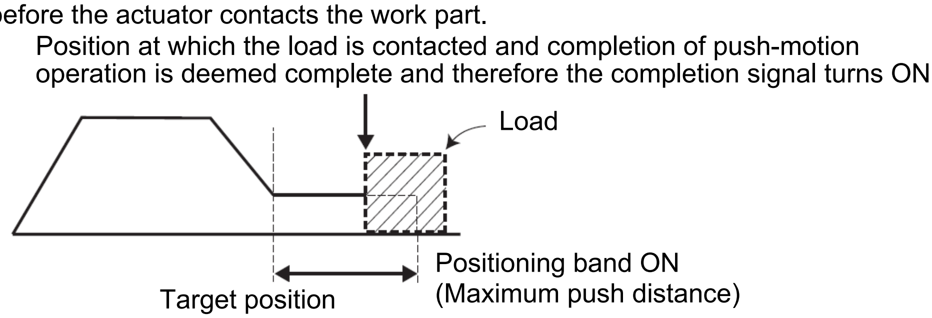


Note that on PCON-C/CG/CF, PCON-CA, ACON-C/CG, ACON-CA, DCON-CA, SCON-C, SCON-CA, SCON-CAL/CGAL, ROBONET, ERC3 PIO Converter and MSCON (Remote I/O mode) controllers of solenoid valve mode 1 or PCON-CY and ACON-CY controllers of solenoid valve mode 1, set the band after which the completion signal turns ON.

PCON-C/CG/CF, PCON-CA, ACON-C/CG, ACON-CA, DCON-CA, SCON-C, SCON-CA, SCON-CAL/CGAL, ROBONET, ERC3 PIO Converter and MSCON (Remote I/O mode) in solenoid valve mode 2, PCON-CY, or ACON-CY in solenoid valve mode 1



"Push-motion operation":
Define the maximum push distance from the target position in push-motion operation.
Set an appropriate positioning band by considering the mechanical variation of the work part, by making sure positioning will not complete before the actuator contacts the work part.



(Note) For PCON-CA and ERC3, a smaller value than the minimum positioning band width cannot be set.

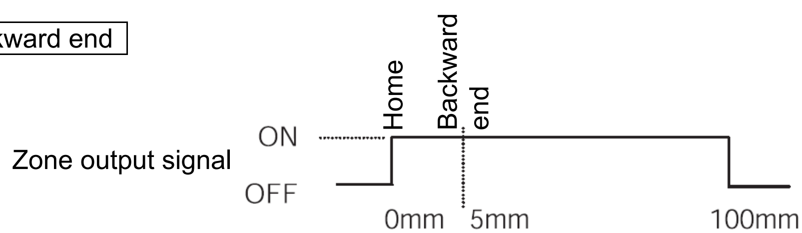
(7) Incremental
Specify absolute coordinates or incremental coordinates.
The factory setting is 0.
0: Absolute coordinate specification
1: Incremental coordinate specification

> ⚠ Warning: Be sure to specify absolute coordinates on PCON-C/CG/CF, PCON-CA, ACON-C/CG, ACON-CA, DCON-CA, SCON-C, SCON-CA, SCON-CAL/CGAL, ROBONET, ERC3 PIO Converter and MSCON (Remote I/O mode) controllers of solenoid valve mode 2, or PCON-CY and ACON-CY controllers of solenoid valve mode 1.
> If incremental coordinates are specified on these controllers, a position data error occurs.

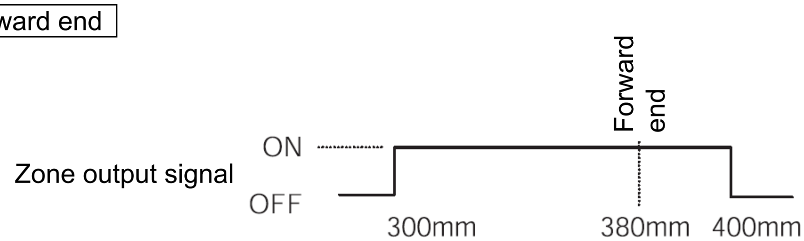
(8) Zone +/-
Define, for the standard type, the zone in which the zone output signal turns ON.
For added flexibility, these parameters can be set differently for each target position.
[Setting example]

No.	Position [mm]	Zone + [mm]	Zone - [mm]	Remarks
0	5.00	100.00	0.00	Backward end
1	380.00	400.00	300.00	Forward end
2	200.00	250.00	150.00	Intermediate position

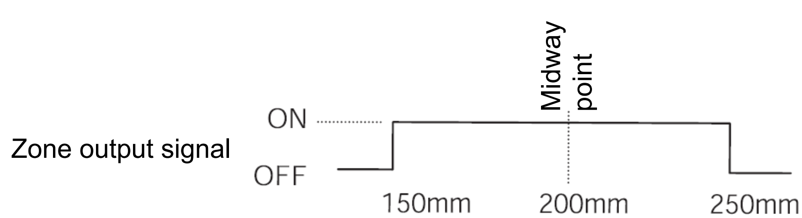
Movement command to backward end



Movement command to forward end



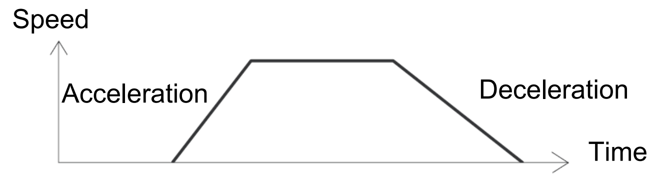
Movement command to intermediate position



(9) Threshold
With SCON-CA, SCON-CAL/CGAL, PCON-CF and PCON-CFA controllers, a load output signal (PIO) is output if the command torque exceeds the value (%) set in "Threshold" inside the verification range.
The verification range is set by "Zone+/Zone-."
It is used to determine if press-fitting action was performed successfully.
* For details, refer to the operation manual for your SCON-CA, SCON-CAL/CGAL, PCON-C/CF and PCON-CA/CFA controller.

(10) Acceleration/deceleration mode
Define the acceleration/deceleration pattern.
The factory setting is 0.
0: Trapezoid pattern
1: S-motion
2: Primary delay filter

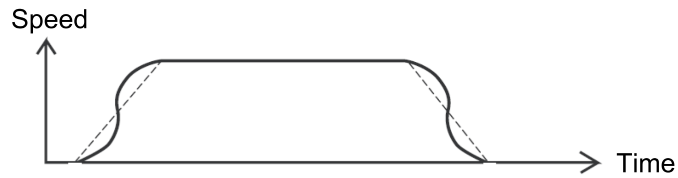
Trapezoid pattern



* Set the acceleration and deceleration in the "Acc" and "Dcl" fields of the position table.

S-motion

The acceleration curve rises gradually at first and then suddenly shoots up in the middle.
Use this mode if you want to set high acceleration/deceleration to meet the required tact time, but want to move the actuator gradually at the start of movement and immediately before stopping.

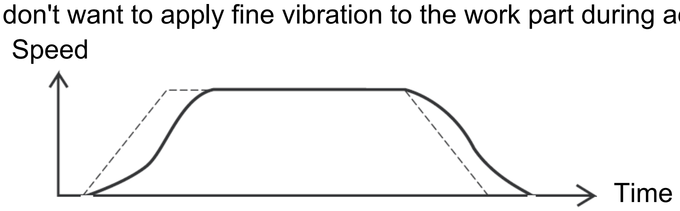


* The S-motion level is set by parameter No. 56 [S-motion ratio setting]. The setting unit is %, while the setting range is 0 to 100.
(The graph above assumes that the parameter is set to 100%.)
If 0 is set, the S-motion control is disabled.
Note that the setting made here is not reflected in jogging or inching feed performed from a PC or teaching pendant.

(Note) This setting is not available on ERC2 and PCON (except for PCON-CA/CFA) controllers. On these controllers, parameter No. 56 is reserved.

Primary delay filter

The acceleration/deceleration curve becomes more gradual than linear acceleration/deceleration (trapezoid pattern).
Use this mode if you don't want to apply fine vibration to the work part during acceleration/deceleration.



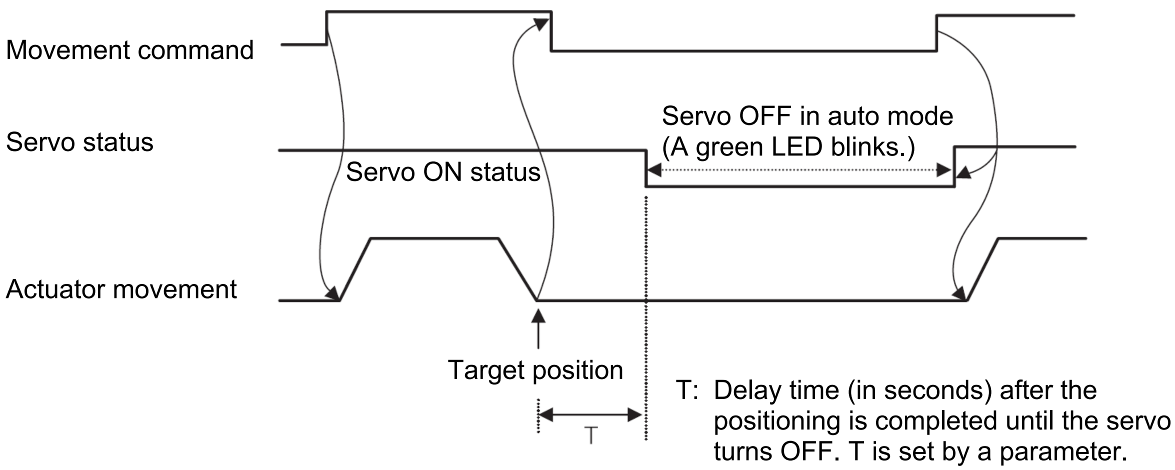
* The primary delay level is set by parameter No. 55 [Primary filter time constant for position commands]. The setting unit is 0.1 msec, while the setting range is 0.0 to 100.0.
If 0 is set, the primary delay filter is disabled.
Note that the setting made here is not reflected in jogging or inching feed performed from a PC or teaching pendant.

(Note) This setting is not available on ERC2 and PCON (except for PCON-CA/CFA) controllers. On these controllers, parameter No. 55 is reserved.

(11) Stop mode
Define the power-saving mode to be used while the actuator is standing by after completion of positioning to the target position set in the "Position" field of the applicable position number.
0: Disable power-saving mode * The factory setting is 0 (Disable).
1: Auto servo OFF mode, with the delay time defined by parameter No. 36
2: Auto servo OFF mode, with the delay time defined by parameter No. 37
3: Auto servo OFF mode, with the delay time defined by parameter No. 38
4: Full servo control mode

Auto servo OFF mode

The servo is turned OFF automatically upon elapse of a specified time after completion of positioning. (Since holding current does not flow, power consumption is reduced.)
When the PLC issues the next movement command, the servo is turned ON and then the actuator starts moving.



(Note) For RACON and RPCON cannot be setting.

Full servo control mode

The holding current can be decreased by servo-controlling the pulse motor.
Although the rate of decrease in holding current varies depending on the actuator model, loading condition, etc., the holding current decreases to approx. one-half to one-quarter.
Note that the servo remains ON, meaning that unwanted position shift does not occur.
The actual holding current can be checked on the current monitor screen of the PC software.

5.7.2 Entering New Data

You can enter new position data in one of four ways.

(1) Numerical input --- Enter position data directly as numerical values from the numerical keypad on the teaching pendant. (Example of entry: P. 49)

(2) Direct teaching --- Turn off the servo control, move the slider by hand to the target position, and then acquire the achieved position (current position) into the position table and specify that position. (Example of entry: P. 57)

(3) Jogging --- Use [Jog+] or [Jog-] to jog the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position. (Example of entry: P. 59)

(4) Inching --- Use [Jog+] or [Jog-] to inch the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position. (Example of entry: P. 61)
Touching [Inching+] or [Inching-] once moves the actuator by the specified feed pitch (0.01, 0.10, 0.50, 1.00 or 5.00 (mm)). Touching and holding the key for 2 seconds will start jogging movement at 1 mm/sec. Thereafter, the speed increases every second. This way, the actuator can be moved more finely than when jogged.

> ⚠ Warning: To enter position data after the power is turned on, or enter position data beforehand using the method of (2), (3) or (4), you must perform home return first. (Increment specification)
> Before home return is completed, jogging/inching is possible only to the mechanical end. Operate the actuator by visually checking for potential interference.

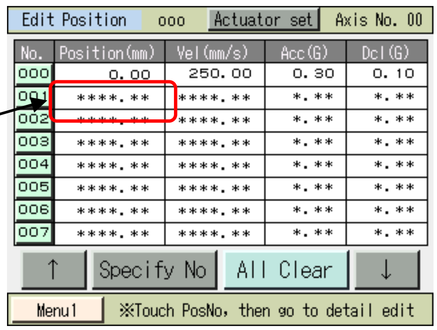
(1) Basic operation

[Data entry on the position data table screen]

You can set the target position, speed, acceleration and deceleration in the position data table.

Touch [↑] and [↓] to display the table showing the desired position data number.
Or, touch [Specify No] and set the desired position data number to display the table.

Touch.



Touch a value in the target position or other field of the desired position data number.
When the numeric keypad appears, key in the desired value and touch [ENT], and the value will be entered.

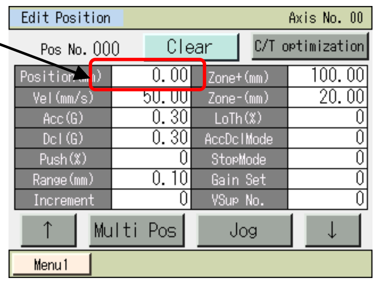
Touching Axis No. switches to the axis selection screen.
Touching [All Clear] clears all position data.
(Example of entry: P. 66)

[Important]

Do not touch [↑] key or [↓] key too fast to switch the windows.
‘0’ is occasionally shown to the data values that are already registered.
The data is not lost even though ‘0’ is displayed. Touch [↑] key and [↓] key to switch the window and come back, and you will find the data showing the right values.

[Data entry on the data display screen of the selected position number]
All items can be set on the data display screen of the selected position number.

Touch.



Touch a value in the target position or other desired field.
When the numeric keypad appears, key in the desired value and touch [ENT], and the value will be entered.

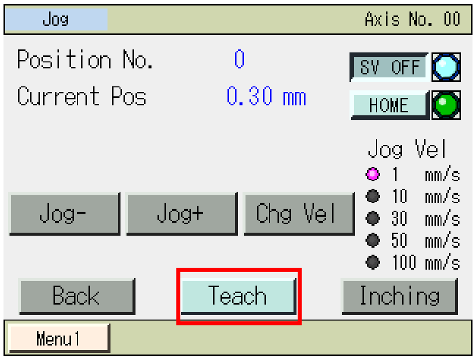
Touch [↑] or [↓] to change to the screen of the previous or next position number.
Touching [Multi Pos] returns the screen to the position data table display.

Touching Axis No. switches to the axis selection screen.

Touching [Jog] changes to the jog operation screen where you can acquire position data via jogging operation.

[Jog operation]

You can acquire position data via jogging operation.

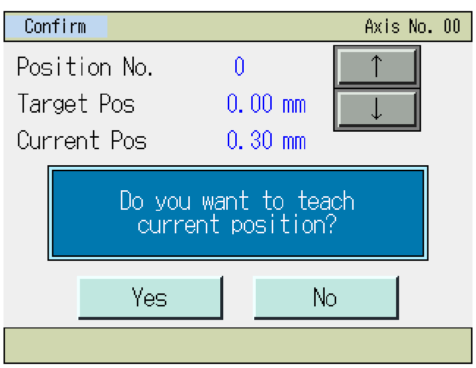


Operation on the jog screen

- [Jog-], [Jog+]: The axis jogs while each button is touched. [Jog-] moves the axis in the negative direction, while [Jog+] moves the axis in the positive direction.
- [SV ON]: Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] while the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME]: Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Chg Vel]: The jog speed changes in the order of 1, 10, 30, 50 and 100 mm/s every time [Chg Vel] is touched.
- [Inching]: Touching [Inching] changes to the inching screen.

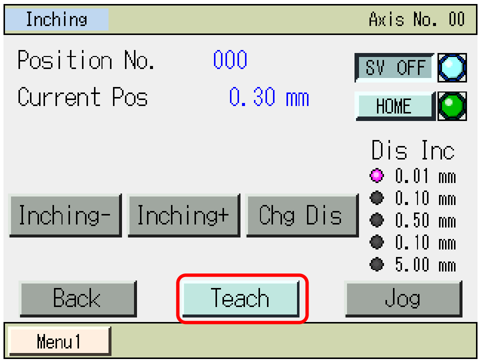
Position acquisition operation

Touch [Teach]. A confirmation screen appears.
You can touch [↑] or [↓] to change the position number.
Touching [Yes] acquires the current position.



[Inching operation]

You can acquire position data via inching operation.

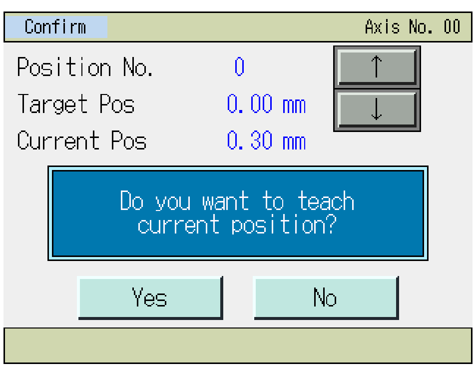


Operation on the inching screen

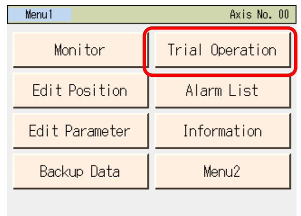
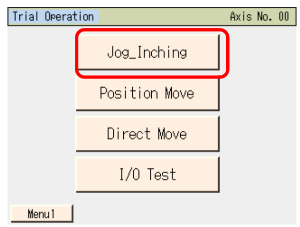
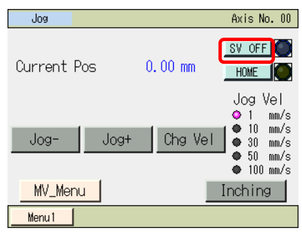
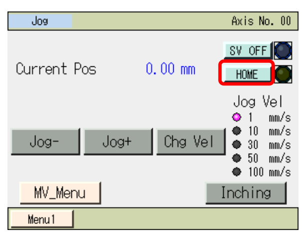
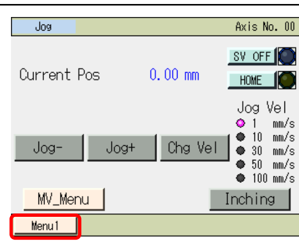
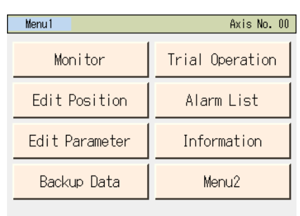
- [Inching-], [Inching+]: Touching each button once moves the axis by inching. [Inching-] moves the axis in the negative direction, while [Inching+] moves the axis in the positive direction.
- [SV ON]: Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] while the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME]: Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Chg Dis]: The inching distance changes in the order of 0.01, 0.10, 0.50, 1.00 and 5.00 mm every time [Chg Dis] is touched.
- [Jog]: Touching [Jog] changes to the jog screen.

Position acquisition operation

Touch [Teach]. A confirmation screen appears.
You can touch [↑] or [↓] to change the position number.
Touching [Yes] acquires the current position.

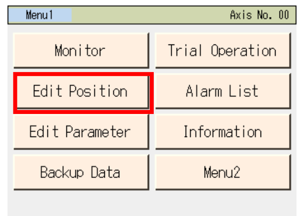
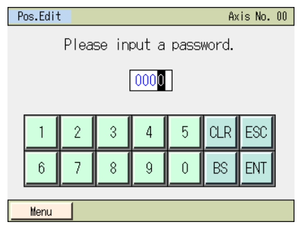
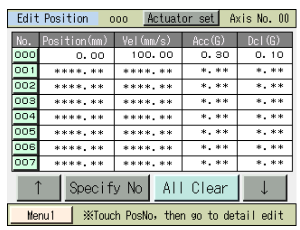
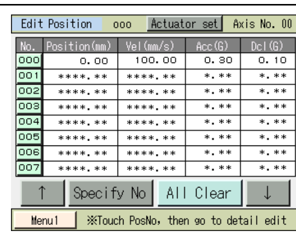
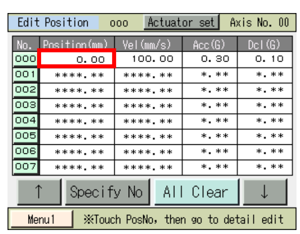
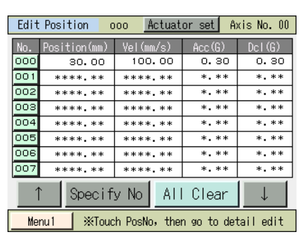


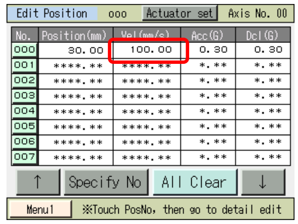
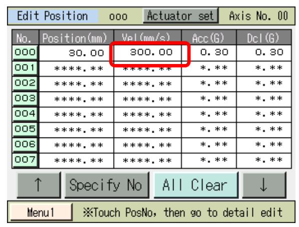
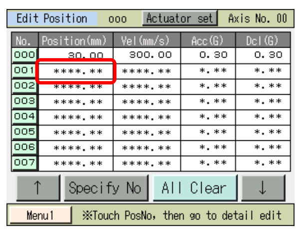
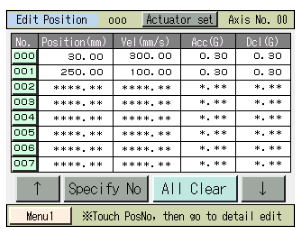
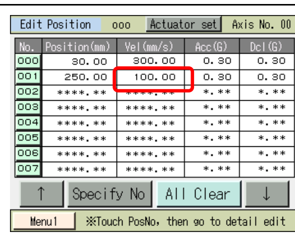
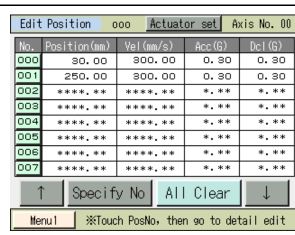
(2) Examples of position setting operations
Respective operation s are explained by giving specific examples.
1) Home return

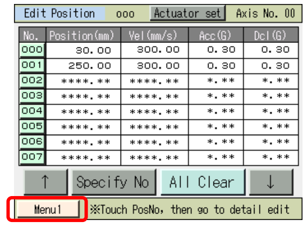
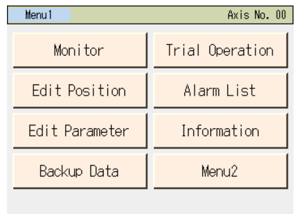
No.	Operation	Screen	Remarks
1	Touch [Trial operation].		
2	Touch [Jog_Inching].		
3	Check the screen and if the servo is off, touch [SV ON].		○ indicating a servo ON status on the screen becomes lit.
4	Touch [HOME].		
5	Touch [Menu1].		
6	The display returns to the Menu 1 screen.		

2) Numerical input

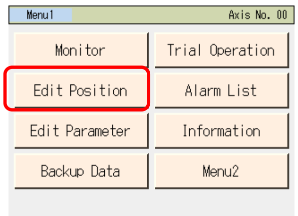
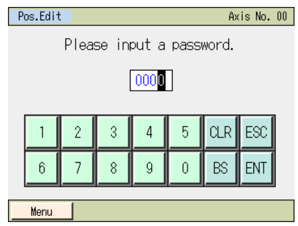
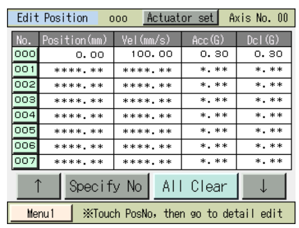
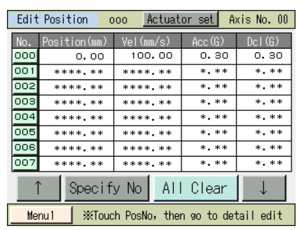
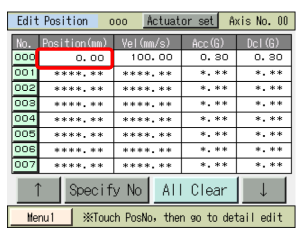
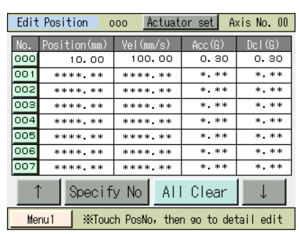
Example 1	Move back and forth between the two points of 30 mm and 250 mm at a speed of 300 mm/sec.

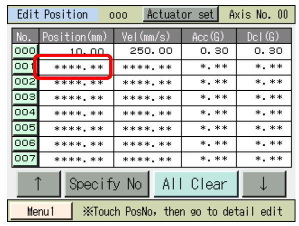
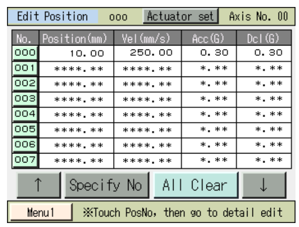
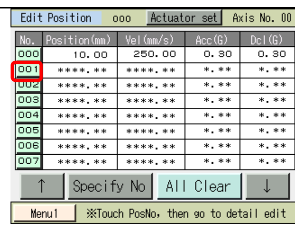
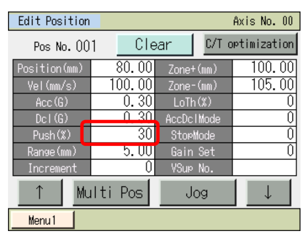
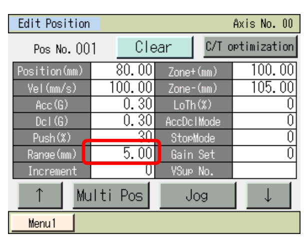
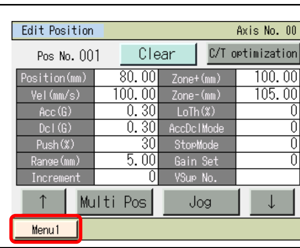
No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Touch the target position of the desired position number. In this example, data is entered for No. 0. When the numerical keypad appears, touch [3], [0] and then touch [ENT].		To reenter the value, touch [ESC].
6			When registering a new position data, the default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. In this example, the default value is 100 mm/s.

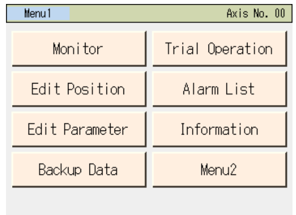
No.	Operation	Screen	Remarks
7	Next, touch the velocity of position No. 0.		
8	When the numerical keypad appears, touch [3], [0], [0] and then touch [ENT].		
9	Next, touch the target position of position No. 1. When the numerical keypad appears, touch [2], [5], [0] and then touch [ENT].		To reenter the value, touch [ESC].
10			When registering a new position data, the default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. In this example, the default value is 100 mm/s.
11	Next, touch the velocity of position No. 1.		
12	When the numerical keypad appears, touch [3], [0], [0] and then touch [ENT].		

No.	Operation	Screen	Remarks
13	Touch [Menu1].		
14			

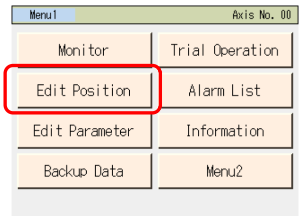
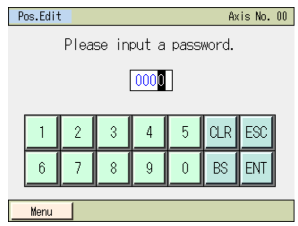
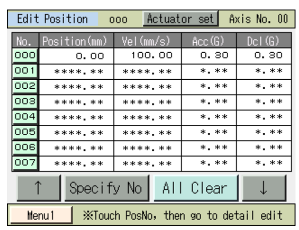
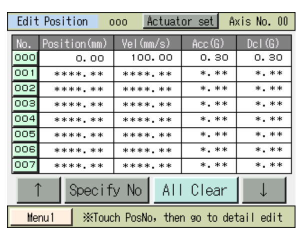
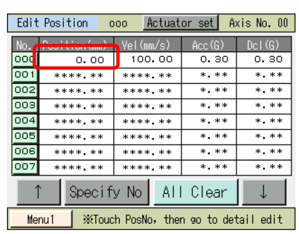
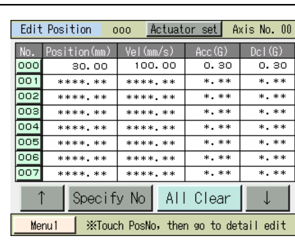
Example 2	Move back and forth between the two positions of 10 mm and 80 mm via push-motion operation (push width: 5 mm).

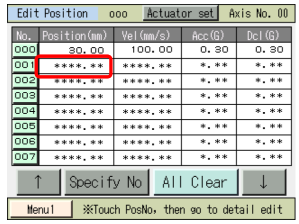
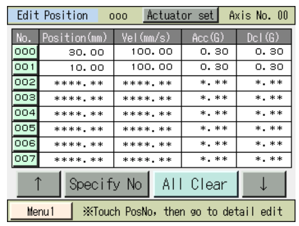
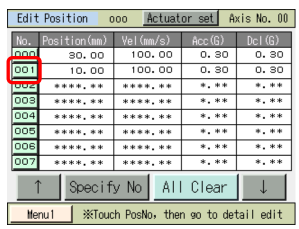
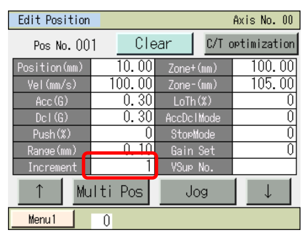
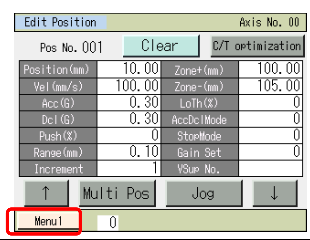
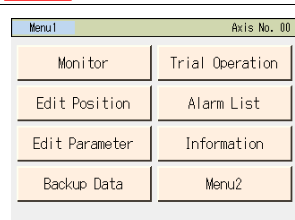
No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Touch the target position of the desired position number. In this example, data is entered for No. 0. When the numeric keypad appears, touch [1], [0] and then touch [ENT].		To reenter the value, touch [ESC].
6			When registering a new position data, the default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. In this example, the default value is 100 mm/s.

No.	Operation	Screen	Remarks
7	Next, touch the target position of position No. 1. When the numeric keypad appears, touch [8], [0] and then touch [ENT].		To reenter the value, touch [ESC].
8			When registering a new position data, the default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. In this example, the default value is 100 mm/s.
9	Next, touch No. "001" of position No. 1.		
10	Touch the value in the Push. When the numerical keypad appears, touch [3], [0] and then touch [ENT].		To reenter the value, touch [ESC].
11	Touch the value for the positioning band. When the numerical keypad appears, touch [5] and then touch [ENT].		To reenter the value, touch [ESC].
12	Touch [Menu1].		

No.	Operation	Screen	Remarks
13			

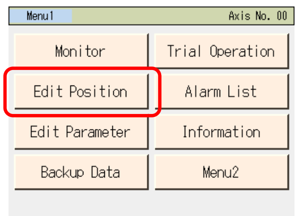
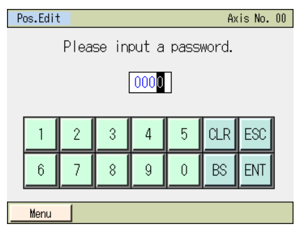
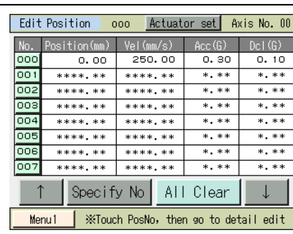
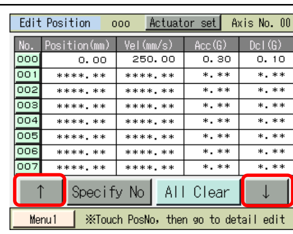
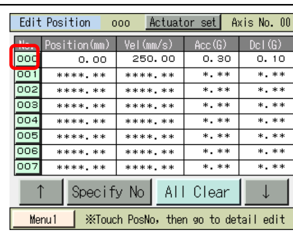
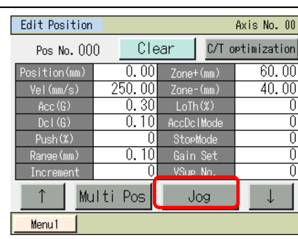
Example 3	Move from 30 mm to 40 mm and to 50 mm by pitch feed based on incremental coordinate specification.

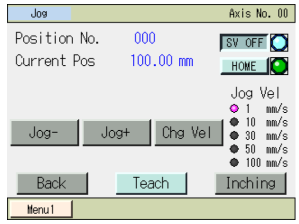
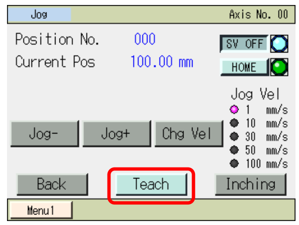
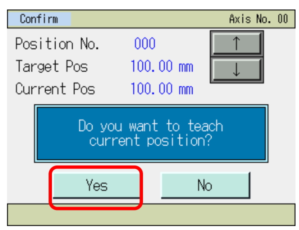
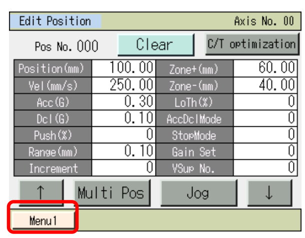
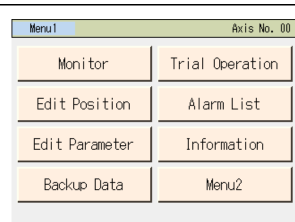
No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Touch the target position of the desired position number. Enter data for No. 0. When the numerical keypad appears, touch [3], [0] and then touch [ENT].		To reenter the value, touch [ESC].
6			When registering a new position data, the default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. In this example, the default value is 100 mm/s.

No.	Operation	Screen	Remarks
7	Next, touch the target position of position No. 1. When the numerical keypad appears, touch [1], [0] and then touch [ENT].		To reenter the value, touch [ESC].
8			When registering a new position data, the default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. In this example, the default value is 100 mm/s.
9	Next, touch No. [001] of position No. 1.		
10	Touch the value for the Increment. When the numerical keypad appears, touch [1] and then touch [ENT].		
11	Touch [Menu1].		
12			

3) Direct teaching (move the slider to the target position and then acquire the achieved position (current position) into the position data table and specify that position)

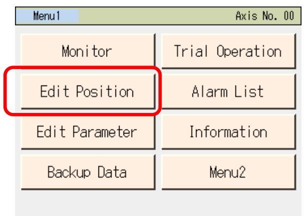
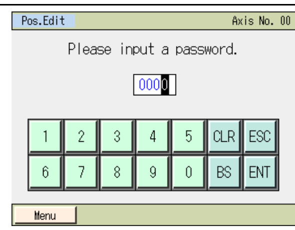
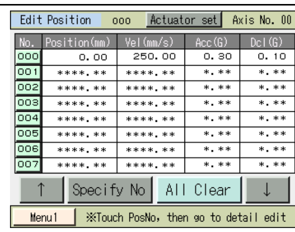
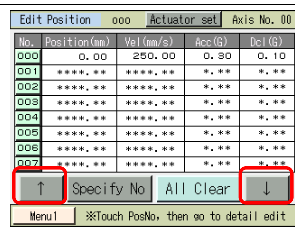
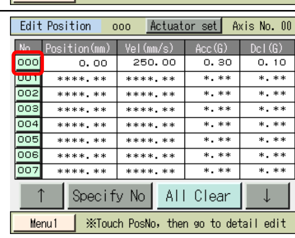
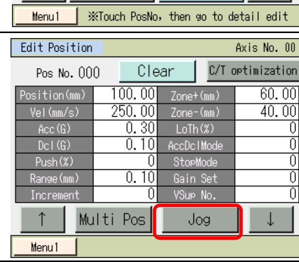
To perform direct teaching immediately after turning on the power, home return must be performed first. (Refer to page 48.) (Incremental specification)

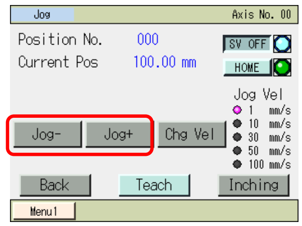
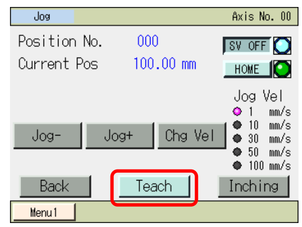
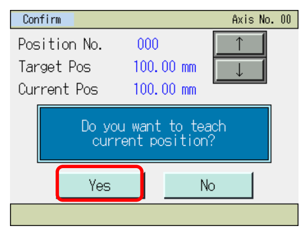
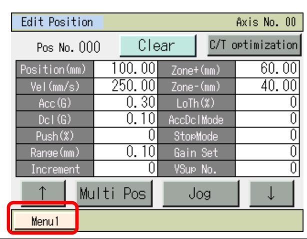
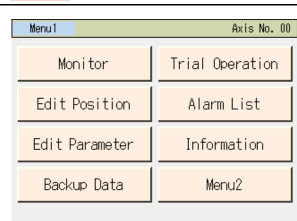
No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		If data is already entered, the current data is overwritten. Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Next, touch No. "000" of position No. 0.		
6	Touch [Jog].		

No.	Operation	Screen	Remarks
7	Manually move the slider to the target position. If the servo is currently on, touch [SV OFF] to turn off the servo.		
8	Touch [Teach].		
9	Touch [Yes].		The default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. (Note) If a position is acquired before home return, the error message "Home return not yet complete" appears. On the error message screen, touch [Back] to return to the jog screen, and then perform home return.
10	Touch [Menu1].		
11			

4) Jogging, Use [Jog+] or [Jog-] to jog the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position.
Note that if the maximum speed is smaller than the specified speed, the speed is clamped at the maximum speed.

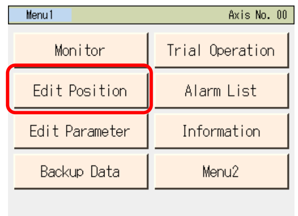
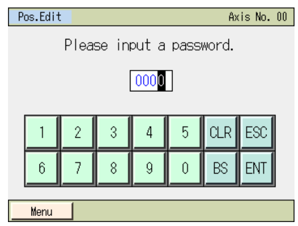
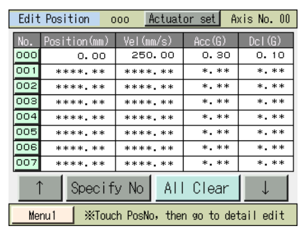
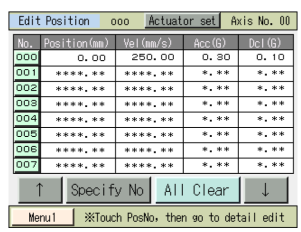
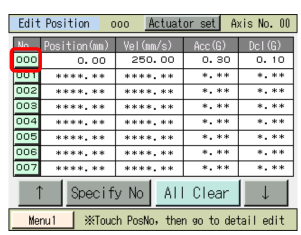
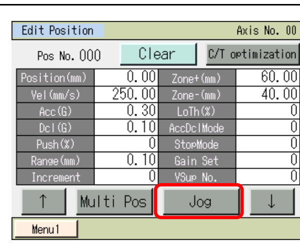
To perform jog operation immediately after turning on the power, home return must be performed first. (Refer to page 48.) (Incremental specification)

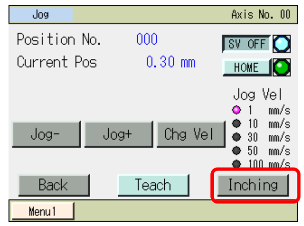
No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		If data is already entered, the current data is overwritten. Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Next, touch No. "000" of position No. 0.		
6	Touch [Jog].		

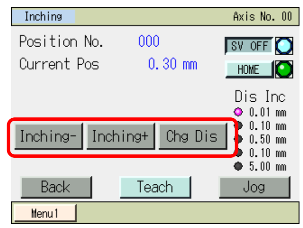
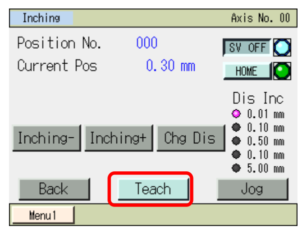
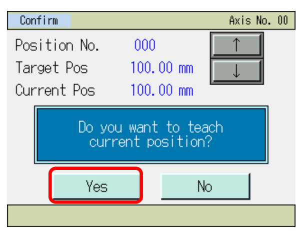
No.	Operation	Screen	Remarks
7	Touch [Chg Vel] to select a desired jog speed. Touch [Jog-] and [Jog+] to move the axis to the target position.		
8	Touch [Teach].		
9	Touch [Yes].		The default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc. (Note) If a position is acquired before home return, the error message "Home return not yet complete" appears. On the error message screen, touch [Back] to return to the jog screen, and then perform home return.
10	Touch [Menu1].		
11			

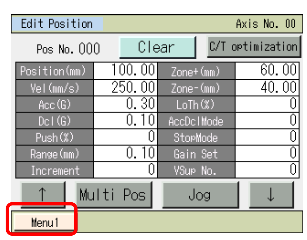
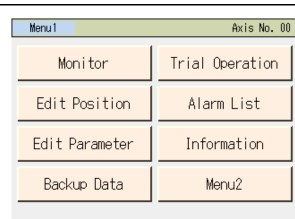
5) Inching, Use [Inching+] or [Inching-] to inch the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position.

> To perform inching operation immediately after turning on the power, home return must be performed first. (Refer to page 48.) (Incremental specification)

No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		If data is already entered, the current data is overwritten. Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Next, touch No. "000" of position No. 0.		
6	Touch [Jog].		

<table>
<tr><th>No.</th><th>Operation</th><th>Screen</th><th>Remarks</th></tr>
<tr><td>7</td><td>Touch [Inching].</td><td>
</td><td></td></tr>
<tr><td>8</td><td>Touch [Chg Dis] to select a desired jog speed.

Touch [Inching-] and [Inching+] to move the axis to the target position.</td><td>
</td><td></td></tr>
<tr><td>9</td><td>Touch [Teach].</td><td>
</td><td></td></tr>
<tr><td>10</td><td>Touch [Yes].</td><td>
</td><td>The default values set by user parameters are automatically entered for the velocity, acceleration, deceleration, etc.

(Note) If a position is acquired before home return, the error message "Home return not yet complete" appears.
On the error message screen, touch [Back] to return to the jog screen, and then perform home return.</td></tr>
<tr><td>11</td><td>Touch [Menu1].</td><td>
</td><td></td></tr>
<tr><td>12</td><td></td><td>
</td><td></td></tr>
</table>

5.7.3 Changing Position Data

You can change all position data by overwriting the current values.
Accordingly, four cases are considered just like when data is entered anew.

(1) Numerical input --- Enter position data directly as numerical values from the numeric keypad.
(2) Direct teaching --- Turn off the servo control, move the slider by hand to the target position, and then acquire the achieved position (current position) into the position data table and specify that position.
(3) Jogging --- Use [Jog+] or [Jog-] to jog the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position.
(4) Inching --- Use [Inching+] or [Inching-] to inch the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position. The axis moves by the specified pitch (0.01, 0.10, 0.50, 1.00 or 5.00 (mm)) every time an arrow key is touched. Thereafter, the speed increases every second. This way, the actuator can be moved more finely than when jogged.

Take note of the following points when performing a data change operation:
* In the case of numerical input, only the items overwritten from the numeric keypad will change.
* In the case of direct teaching, jogging or inching, only the target position will be updated after the current position is acquired. The speed, etc., will remain unchanged.
* Once the position data is cleared, none of the previously set data will remain. Accordingly, the default data values will be applied, other than positions, the next time you register position data.
  To clear the position data table specified for push-motion operation and register data again, be sure to check all position data items and enter necessary data.

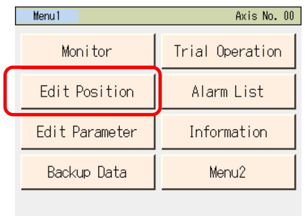
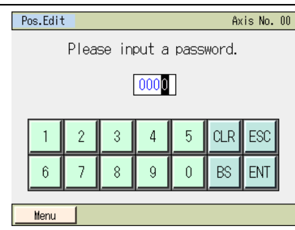
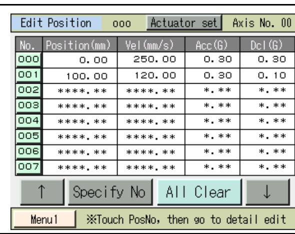
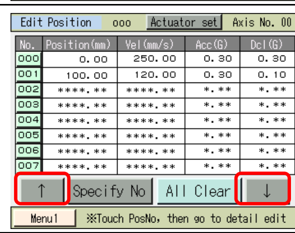
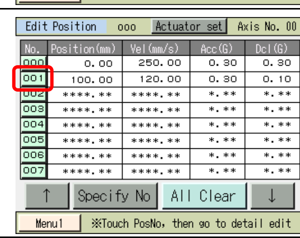
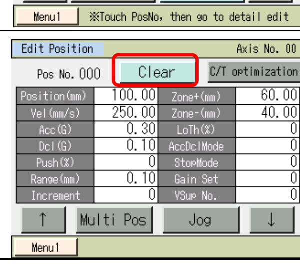
5.7.4 Clearing Position Data, Clearing All Position Data

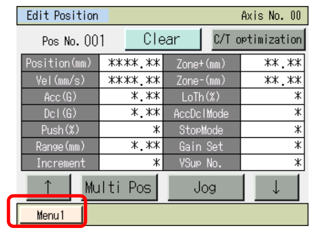
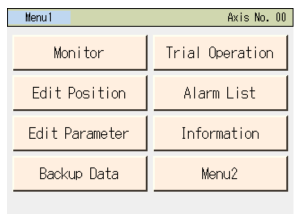
(1) Clearing position data

Position data of the selected position number can be cleared. The position becomes unregistered and an "*" (asterisk) is shown in the fields.

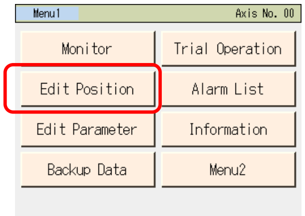
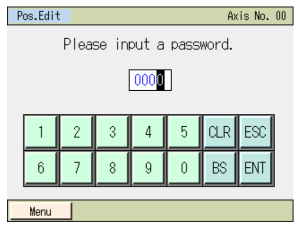
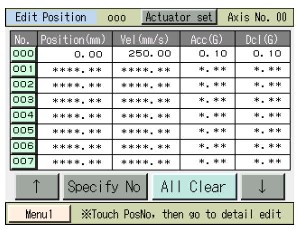
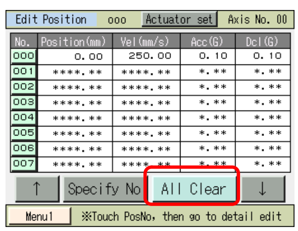
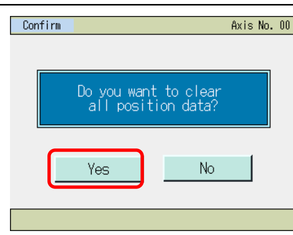
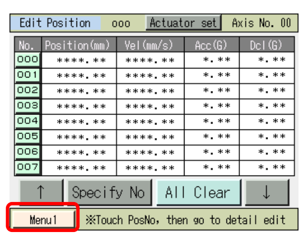
1) Clear (Operation to return a desired position data number to an unregistered condition.)

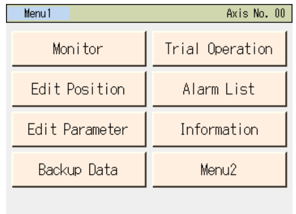
Example	Clear data of position data No. 1.

No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [↑] and [↓] to display the table showing the position number you want to set.		Position data fields in which no data is registered yet contain an "*" (asterisk).
5	Next, touch No. "001" of position No. 1.		
6	Touch [Clear].		

No.	Operation	Screen	Remarks
7	Touch [Yes].		Touching [No] cancels the clear.
8	Touch [Menu1].		The position number data is cleared. An "*" (asterisk) is shown in the fields.
9			

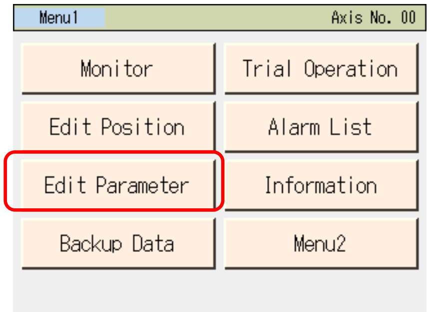
2) All clear (operation to clear all position data)

No.	Operation	Screen	Remarks
1	Touch [Edit Position].		
2	If the password is not "0000," the password screen appears. Input a password.		The default password is "0000."
3	The position data table screen appears.		
4	Touch [All Clear].		
5	Touch [Yes].		Touching [No] cancels the clear.
6	Touch [Menu1].		All position number data is cleared. An "*" (asterisk) is shown in the fields.

No.	Operation	Screen	Remarks
7			

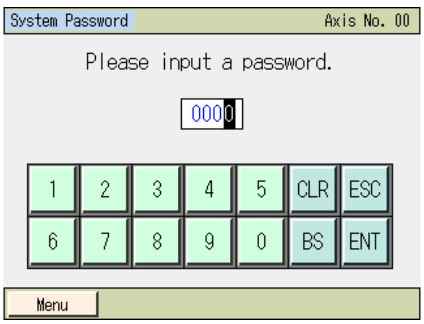
5.8 Parameter Editing

Parameters are displayed and edited.



Touch [Edit Parameter] on the Menu 1 screen.

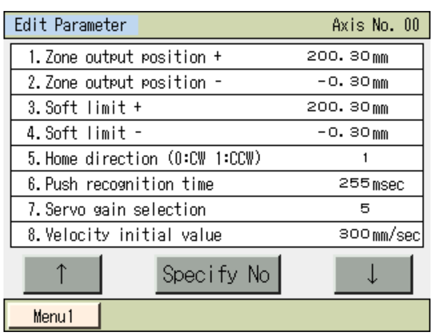
If a system password is set, the password setting screen appears.



Input a system password.

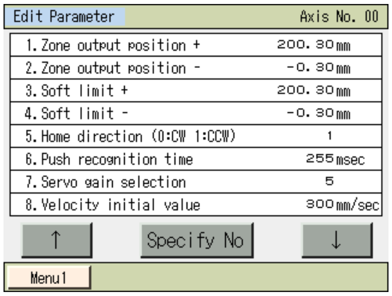
The default password is "5119."
You can set a password on the setting screen.

A user parameter table is displayed.



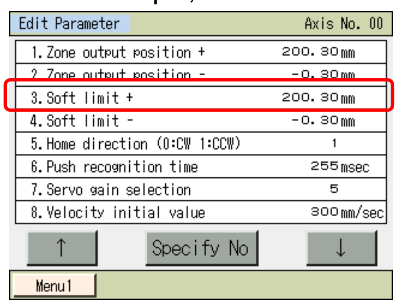
* The types of parameters vary from one controller to another. Refer to the operation Manual for each controller.

(1) Basic operation



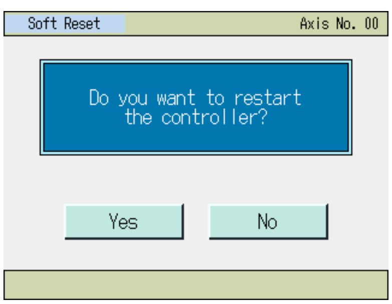
Touch [↑] to return to the previous screen.
Touch [↓] to move to the next screen.
Touch [Specify No] and enter a desired user parameter number, and the screen showing the user parameter you want to set will appear.

In this example, soft limit+ is set.



Touch Soft limit+, and the numeric keypad will appear. Enter a value and then touch [ENT] on the numeric keypad.

Touching [Menu1] opens a confirmation screen with a message asking if you want to restart the controller.

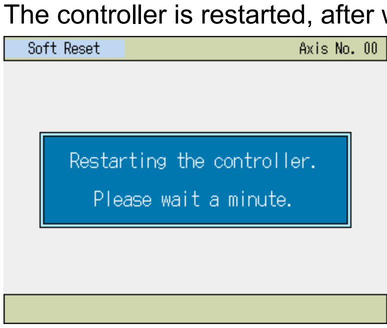


Touch [Yes].

Touch [No] to return to the user parameter screen without restarting the controller or reflecting the parameter you have set. To reflect the parameter you have set, you must restart the controller.

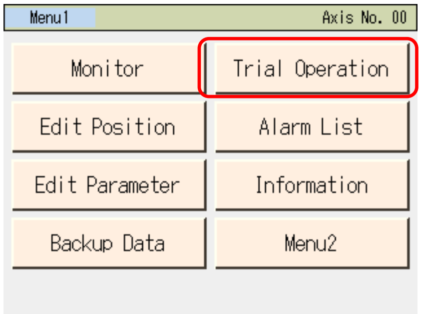
⚠ Caution: If the controller is not restarted, the parameter that has been rewritten does not translate to the intended action.
The parameter will become effective once the controller is restarted or power is reconnected.

The controller is restarted, after which the parameter you have set will be reflected.



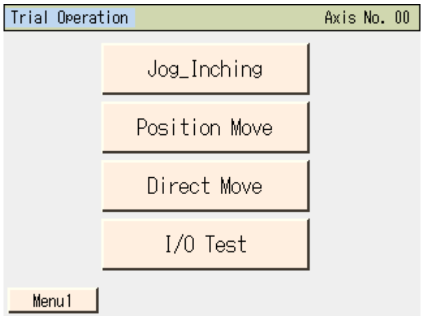
5.9 Trial operation

You can perform jogging/inching operations, move to a position or continuously to multiple positions registered in the position table, or move to a position by specifying the position directly.



Touch [Trial Operation] on the Menu 1 screen.

The movement menu screen appears.



Select and touch [Jog_Inching] or other item you want to operate.

(1) Jog_Inching
Perform jog/inching operation.

(2) Position Move
Move to a position or continuously to multiple positions registered in the position table.

- Move
The actuator moves, in a single step, from the current position to the position corresponding to an arbitrary position data number registered in the position table.

- Continuous
The actuator operates continuously from the specified position data number through successive position data numbers.

* What is continuous movement?
Assume that the following position table has been set. If a continuous movement command is issued from position No. 2, the actuator operates over a group of positions from the position at which the movement command is issued through successive positions where data is available (until the position before the one where no data is registered(*)), such as position No. 2 → No. 3 → No. 1 → No. 2, and so on.

Edit Position ooo Actuator set Axis No. 00

No.	Position(mm)	Vel(mm/s)	Acc(G)	Dcl(G)
000	*	*	*	*
001	100.00	20	0.05	0.05
002	200.00	30	0.11	0.11
003	333.33	100	0.22	0.22
004	*	*	*	*
005	555.55	333	0.22	0.22
006	666.66	444	0.11	0.11
007	777.77	777	0.07	0.07

↑ Specify No All Clear ↓

Menu1 ※Touch PosNo, then go to detail edit

On a touch-panel teaching pendant, continuous movement is only permitted over 64 positions from position No. 000 to 063, 064 to 127, etc.
As shown in the example, the actuator returns to position No. 061 after No. 063 (returns to the beginning of a group of successive positions where position data is entered), and moves continuously.
It does not move from position No. 063 to No. 064.

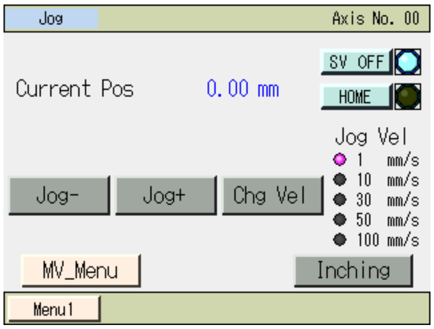
No.	Target position (mm)	Speed (mm/s)
000	*	*
001	100.00	20
	¦	
060	*	*
061	300.00	30
062	400.00	40
063	500.00	50
064	600.00	60
065	700.00	70
	¦	

(3) Direct Move
Target position: Move the actuator by entering a speed from the numerical keypad.

5.9.1 Jog/Inching Operation

[Jog operation]

You can perform jog operation.

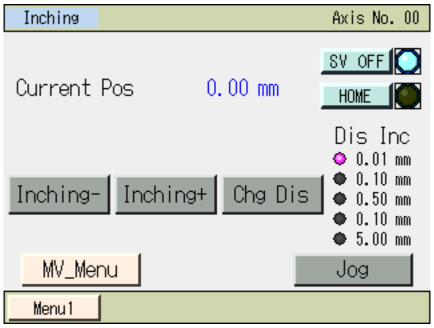


operation on the jog screen

- [Jog-], [Jog+] :The axis jogs while each button is touched. [Jog-] moves the axis in the negative direction, while [Jog+] moves the axis in the positive direction.
- [SV ON] :Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] while the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME] :Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Chg Vel] :The jog speed changes in the order of 1, 10, 30, 50 and 100 mm/s every time [Chg Vel] is touched.
- [Inching] :Touching [Inching] changes to the inching screen.
- [Menu1] :Move to the Menu 1 screen.
- [MV_Menu] :Touch [MV_Menu] menu to return to the test run menu.

[Inching Operation]

You can perform inching operation.

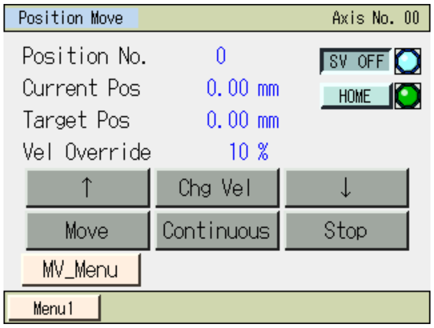


Operation on the jog screen

- [Inching-], [Inching+] :Touching each button once moves the axis by inching. [Inching-] moves the actuator in the negative direction. [Inching+] moves the actuator in the positive direction.
- [SV ON] :Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] when the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME] :Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Chg Dis] :The inching distance changes in the order of 0.01, 0.10, 0.50, 1.00 and 5.00 mm every time [Chg Dis] is touched.
- [Jog] :Touching [Jog] changes to the jog screen.
- [Menu1] :Move to the Menu 1 screen.
- [MV_Menu] :Touch [MV_Menu] menu to return to the test run menu.

5.9.2 Position Movement Operation

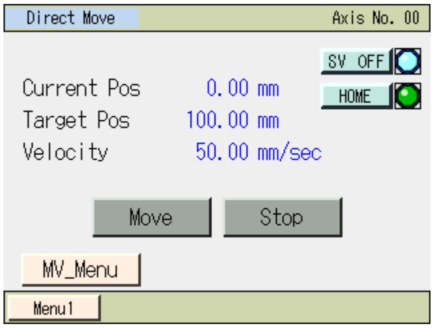
Move to a position or continuously to multiple positions registered in the position table.



- [SV ON] :Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] while the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME] :Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [↑], [↓] :Touch [↑] and [↓] to select a desired position number. The target position of the selected position number appears.
- [Chg Vel] :The speed override changes to 10%, 50% and 100% every time [Chg Vel] is touched.
- [Move] :Touching [Move] moves the axis to the target position. The current position can be checked by the display in Current Pos.
- [Continuous] :Touching [Continuous] moves the axis continuously until Stop is touched.
- [Stop] :Touching [Stop] stops the axis.
- [Menu1] :Move to the Menu 1 screen.
- [MV_Menu] :Touch [MV_Menu] menu to return to the test run menu.

5.9.3 Direct Movement Operation

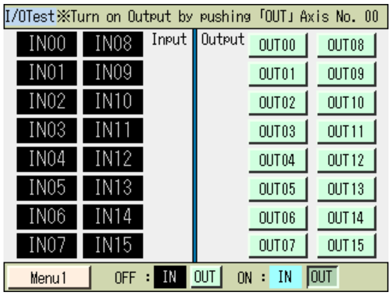
A position is specified directly to move the axis.



- [SV ON] :Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] while the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME] :Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Target Pos] :Touching [Target Pos] displays the numeric keypad. Enter a desired target position and then touch [ENT].
- [Velocity] :Touching [Velocity] displays the numeric keypad. Enter a desired speed and then touch [ENT].
- [Move] :Touching [Move] moves the axis to the target position you have set. The current position can be checked by the display in Current Pos.
- [Stop] :Touching [Stop] stops the axis.
- [Menu1] :Move to the Menu 1 screen.

5.9.4 I/O test

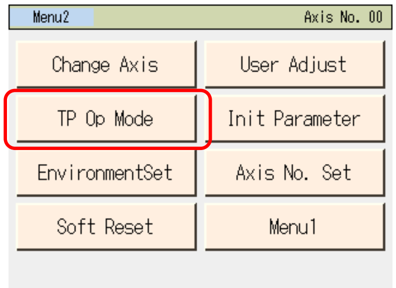
PIO input signals can be monitored.
You can also touch OUT00 to OUT15 to forcibly turn ON/OFF the corresponding output signals.



Touching [Menu 1] switches the screen to [Menu 1].

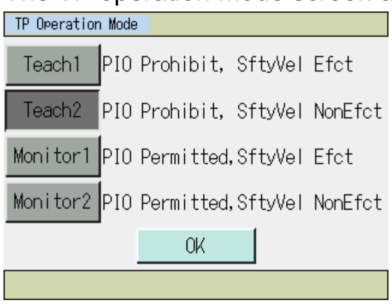
5.10 TP Operation Mode

An operation mode is set if the manual (MANU) mode is selected.



Touch [TP Op Mode] on the Menu 2 screen.

The TP operation mode screen appears.



Select and touch [Teach1] or other desired mode.

Select a manual operation mode from the menu containing the following four items:

- Teach1 (SftyVel Efct/PIO Prohibit)
  PIO Prohibit :You can write position data, parameters, etc., to the controller and issue actuator operation commands.
  SftyVel Efct :The maximum speed corresponds to the safety speed set by a parameter, regardless of the speed specified in the position data table.

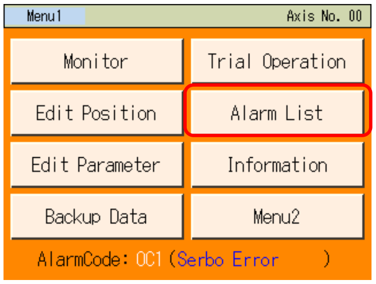
- Teach2 (SftyVel NonEfct / PIO Prohibit)
  PIO Prohibit :You can write position data, parameters, etc., to the controller and issue actuator operation commands.
  SftyVel NonEfct :You can move the actuator at the speed (greater than the safety speed) set in the position data table.

- Monitor1 (SftyVel Efct/PIO Permitted)
  PIO Permitted :Only monitoring is permitted. You cannot write position data, parameters, etc., to the controller or issue actuator operation commands. operation commands (jog, home return, etc.) cannot be issued from the touch panel teaching pendant.
  SftyVel Efct :The maximum speed corresponds to the safety speed set by a parameter, regardless of the speed command from the PLC.

- Monitor2 (SftyVel NonEfct / PIO Permitted)
  PIO Permitted :Only monitoring is permitted. You cannot write position data, parameters, etc., to the controller or issue actuator operation commands. operation commands (jog, home return, etc.) cannot be issued from the touch panel teaching pendant.
  SftyVel NonEfct :You can move the actuator at the speed (greater than the safety speed) according to the command from the PLC.

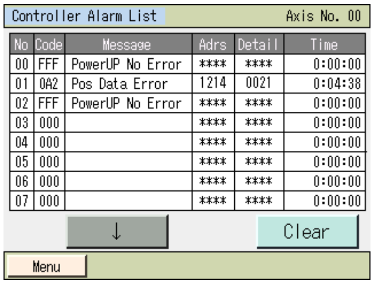
5.11 Alarm List

A list of alarms that may generate after the controller power is turned on is shown. [For alarm details, refer to 8, "Error Display."]



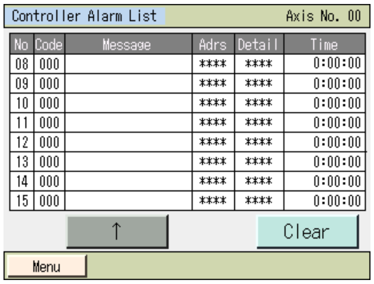
Touch [Alarm List] on the Menu 1 screen.

The controller's alarm list appears. The alarm list consists of pages 0 to 15.
Model other than SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON



No	Code	Message	Adrs	Detail	Time
00	FFF	PowerUP No Error	****	****	0:00:00
01	0A2	Pos Data Error	1214	0021	0:04:38
02	FFF	PowerUP No Error	****	****	0:00:00
03	000		****	****	0:00:00
04	000		****	****	0:00:00
05	000		****	****	0:00:00
06	000		****	****	0:00:00
07	000		****	****	0:00:00

Touching [↓] displays the next page.



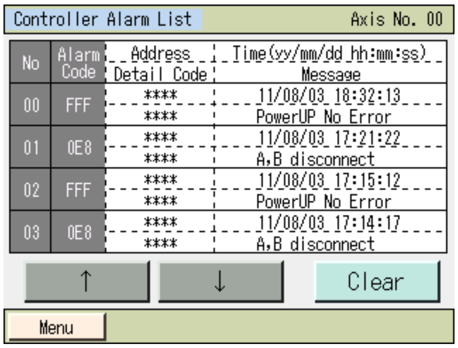
No	Code	Message	Adrs	Detail	Time
08	000		****	****	0:00:00
09	000		****	****	0:00:00
10	000		****	****	0:00:00
11	000		****	****	0:00:00
12	000		****	****	0:00:00
13	000		****	****	0:00:00
14	000		****	****	0:00:00
15	000		****	****	0:00:00

Touching [↑] displays the previous page.

Touching Erase clears all alarm details.

(Note) PowerUP No Error indicates that the controller power was turned on.
It does not indicate an error.
The time of occurrence of each alarm is indicated by an elapsed time from this PowerUP No Error.

SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON

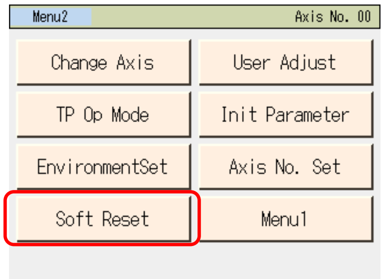


Touch [↑]/[↓] to move through the list.
Touching [Clear] clears all alarms.

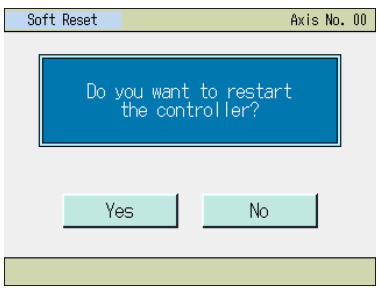
(Note) "PowerUP No Error" indicates that the controller power was turned off. The occurrence time corresponds to the time each error occurred.

5.12 Controller Restart

The controller is restarted.

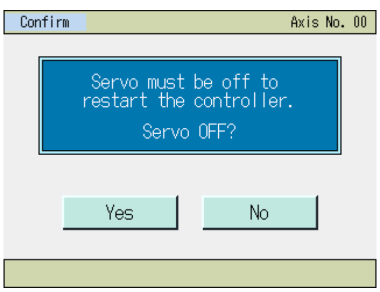


Touch [Soft Reset] on the Menu 2 screen.



Touch [Yes].

Touch [No] to return to the Menu 2 screen without restarting the controller.



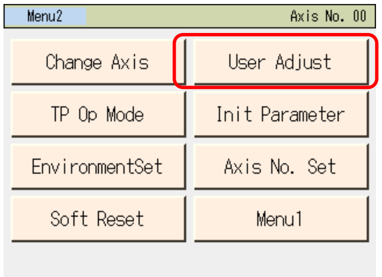
Touch [Yes].

Touch [No] to return to the Menu 1 screen without restarting the controller.

The controller is restarted.

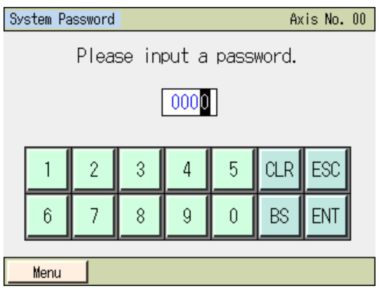
5.13 User Adjustment

You can perform home return, etc.



Touch [User Adjust] on the Menu 2 screen.

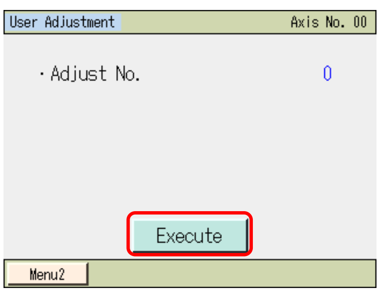
If a system password is set, the password setting screen appears.



Input a system password.

The default password is "5119."
You can set a password on the setting screen.

The user adjustment screen appears.



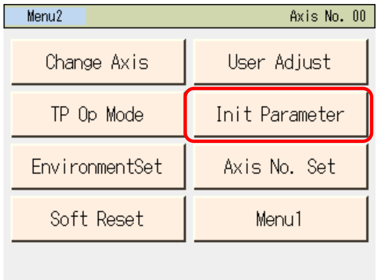
Touch [Adjust No.] and the numeric key pad opens. Set [Adjust No.] and touch [Execute.]
[Adjust No.]

- 1: Home return
  Home return can be performed.
- 2: Axis number setting
  The operation is the same as what you do on the axis number setting screen.
- 3: Alarm list clear
  The operation is the same as what you do on the alarm list screen.
- 4: Controller restart
  The operation is the same as what you do when restarting the controller on the Menu 2 screen.
- 6: Load Cell Calibration
  Perform the load cell calibration on actuator equipped with load cell. (SCON-CA)
- 7: Time setting
  You can move to the time setting screen to set time.
  (SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON)
- 8: Maintenance information
  Maintenance information can be displayed.
  (SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON)

5.14 Parameter Initialization

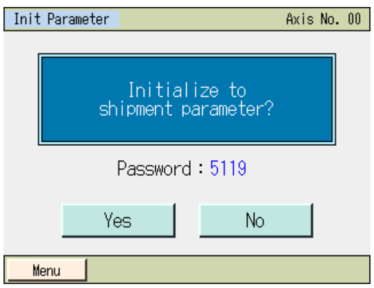
The parameters are reset to their factory default settings (initialized).

> ⚠ Caution: Once the parameters are initialized (to their factory default settings), all parameters the user has set will return to the values set at the factory. Exercise caution.



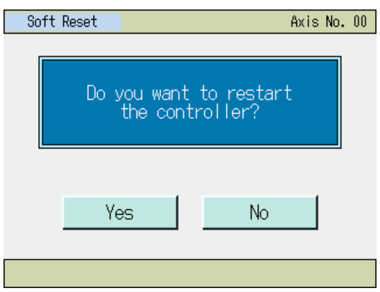
Touch [Init Parameter] on the Menu 2 screen.

If a system password is set, the password setting screen appears.



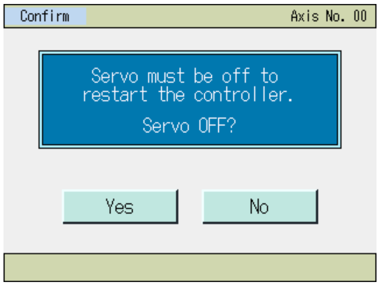
Touching Password displays the numerical keypad.
Input "5119" and touch [ENT].

Touch [Yes].



Touch [Yes].

Touch [No] to return to the Menu 2 screen without restarting the controller.



Touch [Yes].

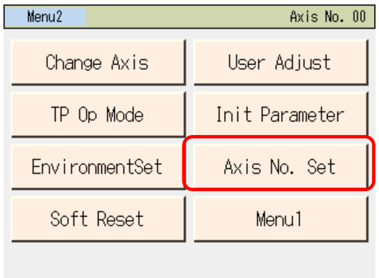
Touch [No] to return to the Menu 1 screen without restarting the controller.

The controller is restarted.

Caution: If the controller is not restarted, the parameters that have been rewritten to their factory settings do not translate to the factory-set operations. The factory settings will become effective once the controller is restarted or power is reconnected.

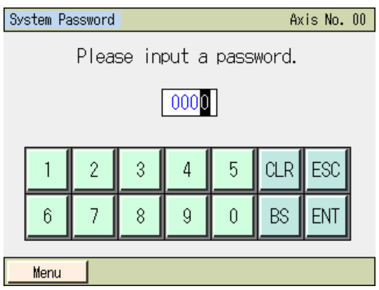
5.15 Axis Number Setting

The axis number of the controller is set.



Touch [Axis No. Set] on the Menu 2 screen.

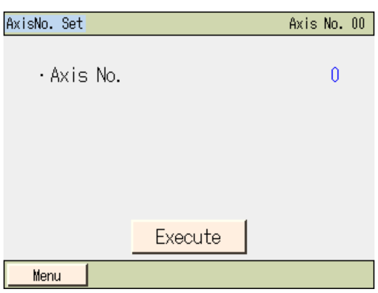
If a system password is set, the password setting screen appears.



Input a system password.

The default password is "5119."
You can set a password on the setting screen.

The axis number setting screen appears.

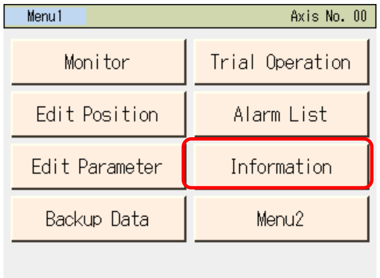


Touching [Axis No.] displays the numerical keypad.
Set a desired axis number and then touch [ENT].

Touch [Execute].

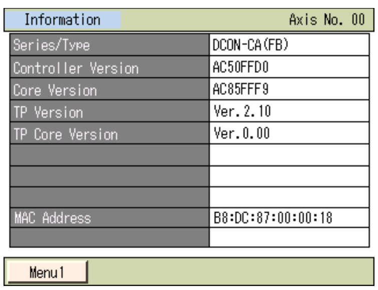
5.16 Information Display

Version and other information of the controller are set.



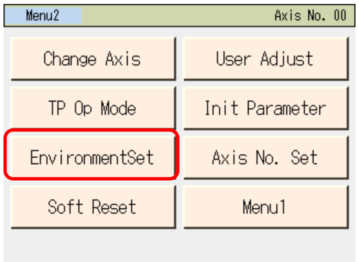
Touch [Information] on the Menu 1 screen.

The information screen appears.



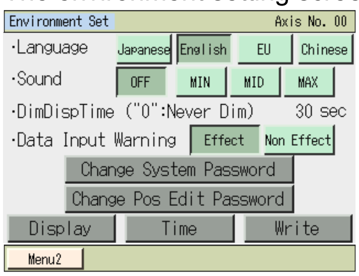
5.17 Environment Setting

You can change or display the language, sound, light off time, change system password, change pos edit password and time setting.



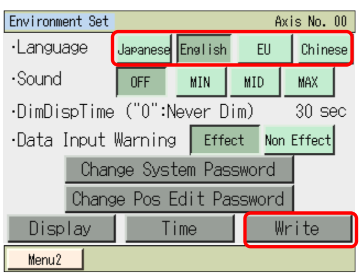
Touch [EnvironmentSet] on the Menu 2 screen.

The environment setting screen appears.



[Language]

You can select a desired language to change to that language.
Display for Japanese/English/EU/Chinese languages setting change (Option model code: ENG)



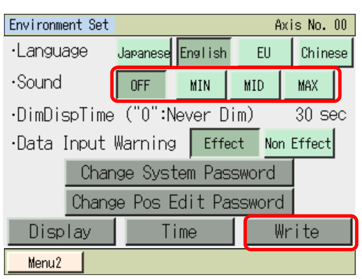
Select and touch [Japanese], etc.

Touch [Write].

(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

[Sound]

You can select whether or not to output a touch tone.



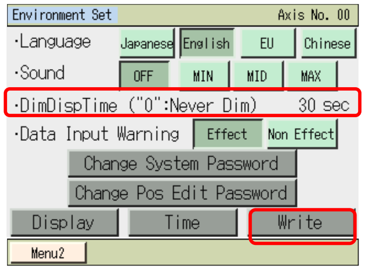
Touch [OFF]. A touch tone is not output.

Touch either of [MAX], [MID] or [MIN]. A touch tone is not output.

Touch [Write].

(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

[Dim Display Time]

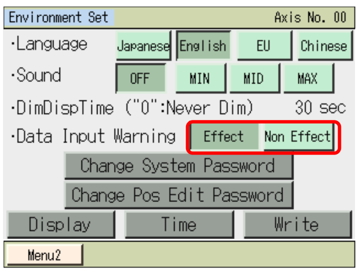


Touching [Dim Display Time] displays the numerical keypad.
Enter a desired time after which the screen light turns off when no operation has been performed, and then touch [ENT].

Touch [Write].

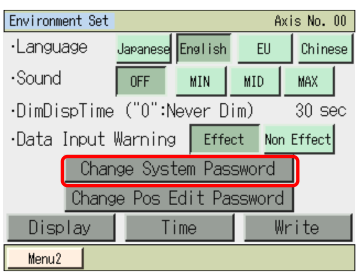
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

[Data Input Warning]



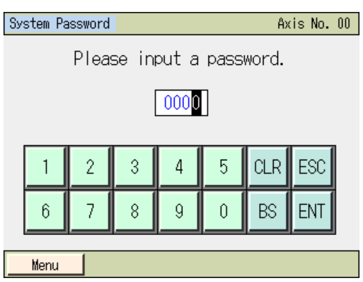
Touch [Effect] to activate it, and an alarm can be generated if a value below the minimum velocity or above the rated acceleration /deceleration is input in the position data.
Even though, it is possible to input a value below the minimum velocity or above the rated acceleration/deceleration.
Touch [Non Effect] to inactivate it, and an alarm will not occur.

[Change System Password]
You can change the system password.

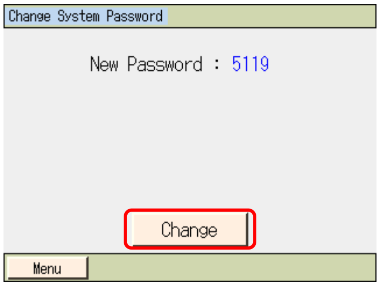


Touch [Change System Password].

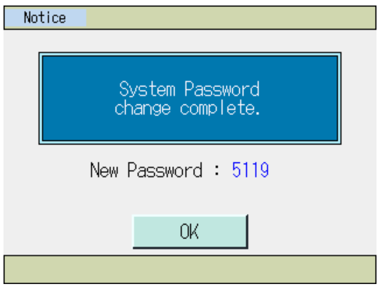
If the system password is set, you must enter the password currently set.



Enter the new password to change to.
Touch [ENT].

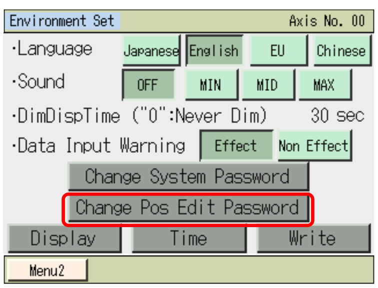


Touch [Change].



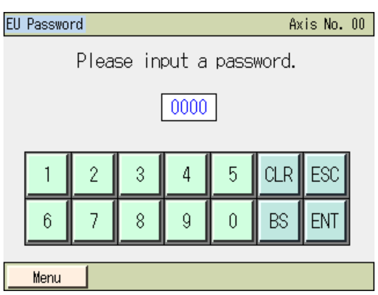
Touch [OK].

[Change Pos Edit Password]



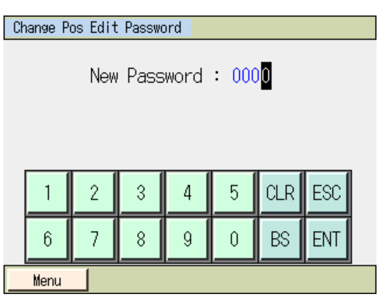
Touch [Change Pos Edit Password].

If the system password function is enabled, you must enter the password currently set.

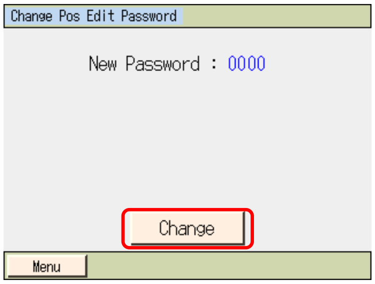


Input a password.
Touch [ENT].

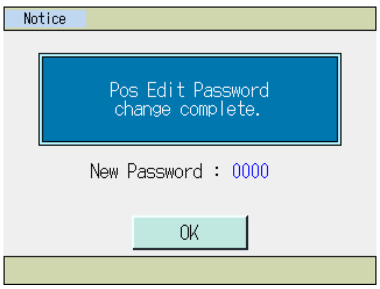
The default password is "5119." You can set a password on the setting screen.



Enter the new password to change to.
Touch [ENT].



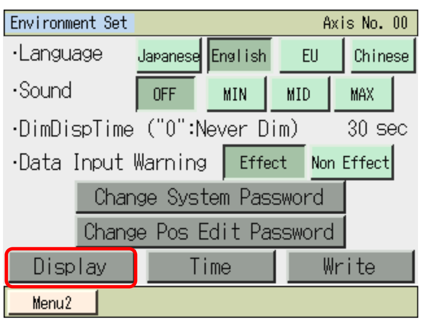
Touch [Change].



Touch [OK].

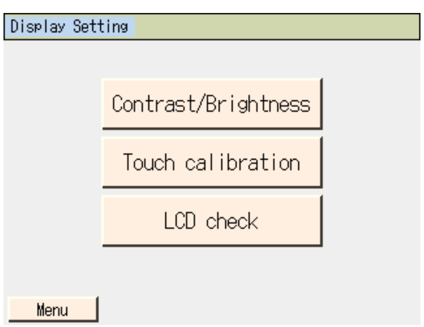
[Display]

Adjustment of contrast and brightness of the screen, position tuning for touch panel and LCD screen check can be performed.



Touch [Display].

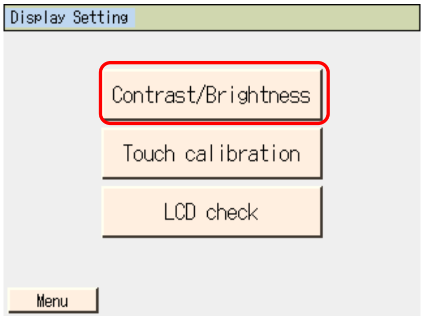
Display menu Window is displayed.



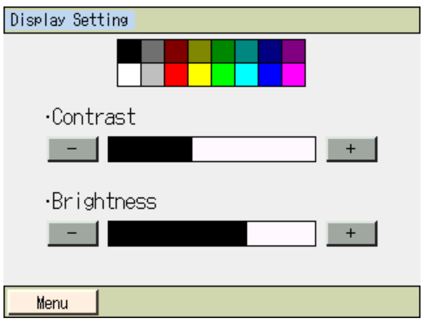
Select Display Setting menu.

Touch [Menu] and the display returns to EnvironmetSet screen.

●Change the Contrast/Brightness



Touch [Contrast/Brightness]

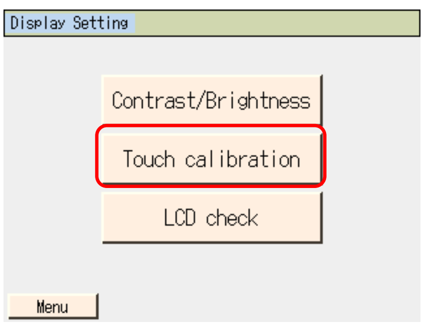


Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

Brightness adjustment
Touch [–] and [+] under Brightness to adjust the brightness of the screen.

Touch [Menu] and the display returns to Display menu screen.

●Touch calibration
A calibration for the position detection of the touch panel is performed.

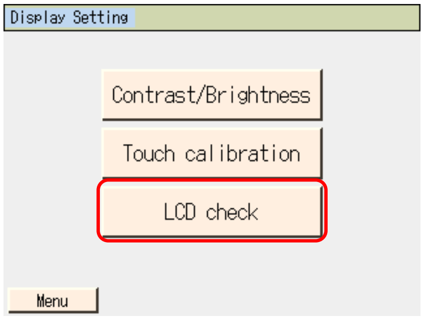


Touch [Touch Calibration].

Touch [・] in the order of 1, 2, 3 and 4.

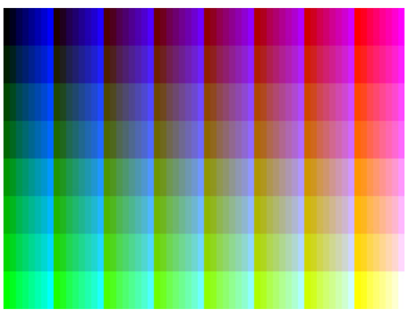
Touch [Menu] and the display returns to Display menu screen.

●LCD Check
LCD display can be checked in the order of Color Pattern, White Only and Black Only.



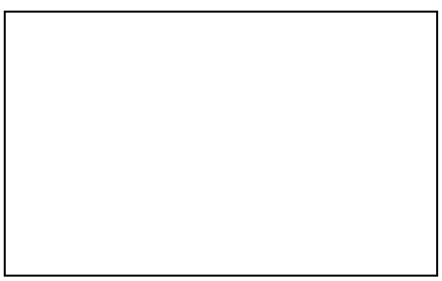
Touch [LCD check].

Color Pattern is displayed



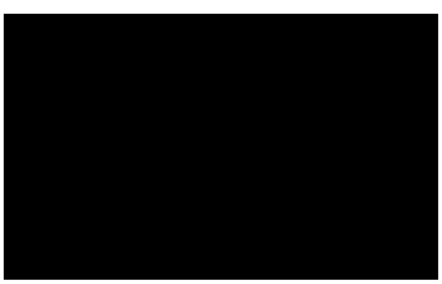
Touch any point on the screen.

White Only is displayed



Touch any point on the screen.

Black Only is displayed

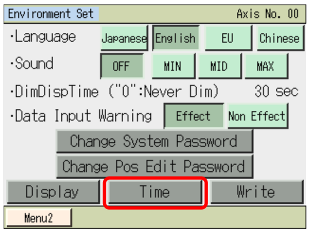


Touch any point on the screen.
The display returns to Display menu screen.

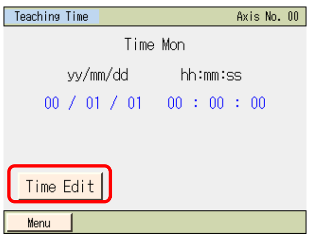
[Time Setting]

You can set the time for CON-PTA/PDA/PGA/PGAS or SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON.

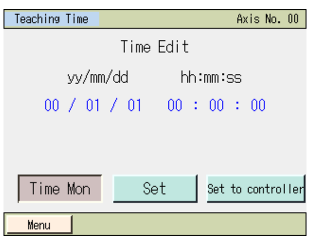
1) Time setting for CON-PTA/PDA/PGA/PGAS.



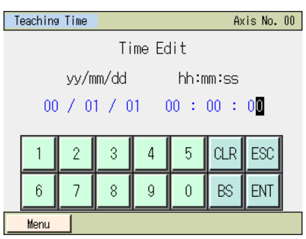
Touch [Time].



The time of teaching CON-PTA/PDA/PGA/PGAS is displayed.
Touch [Time Edit].

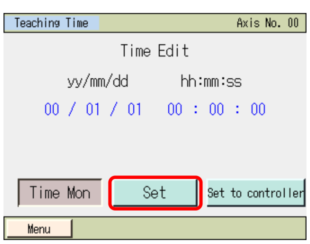


Touch the value of year, month, day, hour, minute or second that is required to be changed.

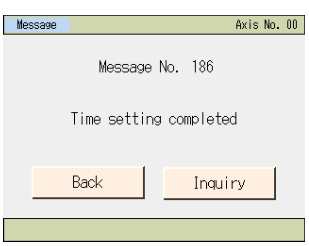


Numeric keys are displayed
Input a value and touch [ENT]

.

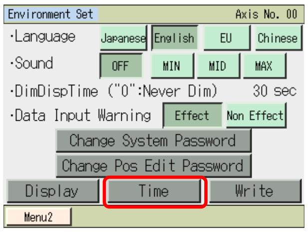


Touch [Set].

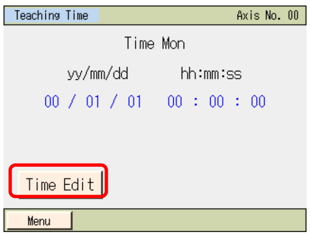


The time of the CON-PTA/PDA/PGA/PGAS is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

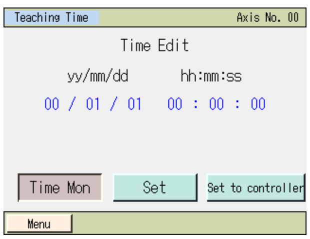
2) Time setting for SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON.



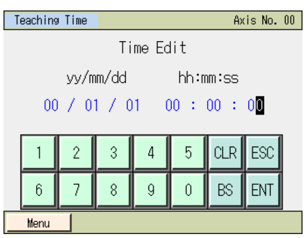
Touch [Time].



Teaching time is displayed.
Touch [Time Edit].

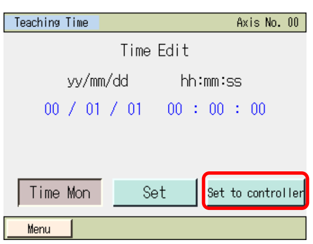


You don't need to change the time in the case of setting the time of the teaching to the controller.
Touch the value of year, month, day, hour, minute or second that is required to be changed.

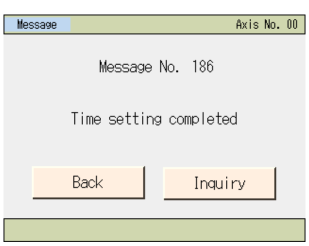


Numeric keys are displayed
Input a value and touch [ENT]

.



Touch [Set to controller].



The time of the SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

5.18 Data Backup

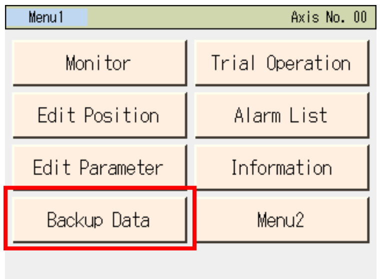
Data is transferred between the Secure Digital memory card in the touch panel teaching pendant and the controller.

(Note) Type of Stored Data
This includes the position data, parameters and alarm list.
It is not applicable to the backup data storable in the RC PC software.
(Note) Extensions of the Stored Data
- The file extensions of the data stored to the Secure Digital card are the same as those dealt in RC PC software, and are compatible. For instance, the position data for the PCON-C controllers is ptpc and the parameters are prpc.
  [Refer to the details of the file extensions in the RC PC Software Instruction Manual]
- The alarm list can only have the backup. It cannot be restored. Data is in a CSV file.

(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. The files existing in other directories other than the specified folders cannot be listed up in the file name list in the file select at the initial setting or restore.
If the folder does not exist, it is automatically created.
- Position Data : \CONPTA\Position\File Name
- Parameter : \CONPTA\Parameter\File Name
- Alarm List : \CONPTA\Alarmlist\File Name

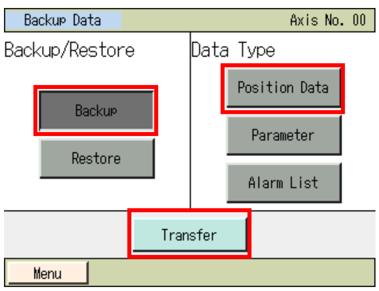
5.18.1 Data Backup of the Controller

The data in the controller is transferred to the Secure Digital memory card for backup.



Touch [Backup Data] on the Menu 1 screen.

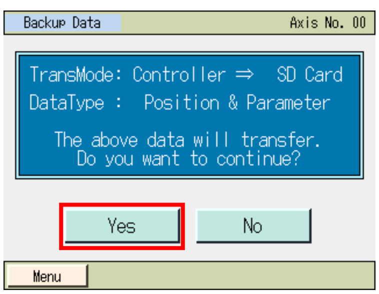
A window for data transfer appears.



Touch [Backup].

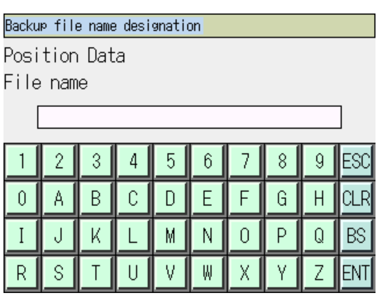
Select the data type for the backup such as [Position Data] and touch it.

Touch [Transfer].

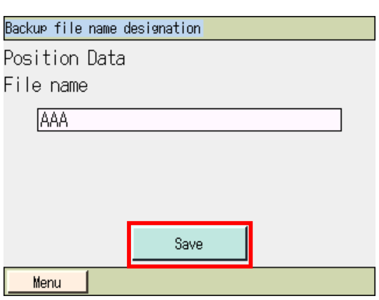


Touch [Yes].

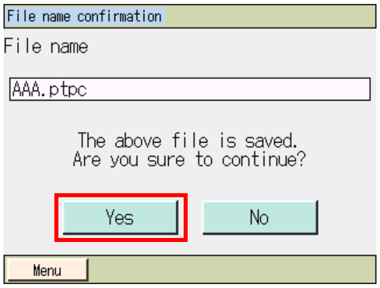
If [No] is touched, the screen goes back to the data backup window.



Numeric keys show up. Input a file name.
The file name is to be typed with 32 characters at maximum in letters and numbers.



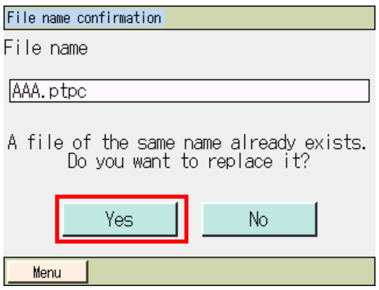
Touch [Save].



The screen below appears if the same name is not found.

Touch [Yes].

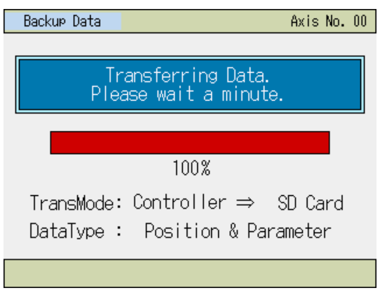
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



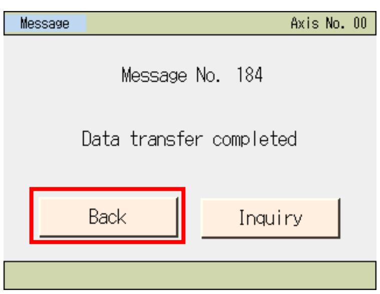
The screen below appears if the same name is not found.

Touch [Yes].

If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



Data transfer screen will be shown.

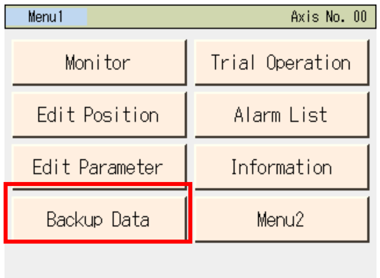


A message to tell the data transfer is complete pops up and the backup process is finished.

Touching [Back] can go back to the Backup Data screen.

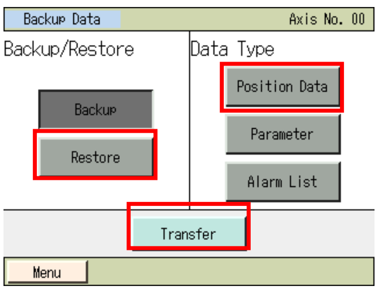
5.18.2 Restore to Controller

Data in the Secure Digital card is transferred to the controller.



Touch [Backup Data] on the Menu 1 screen.

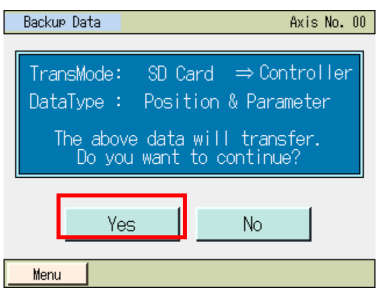
A window for data transfer appears.



Touch [Restore].

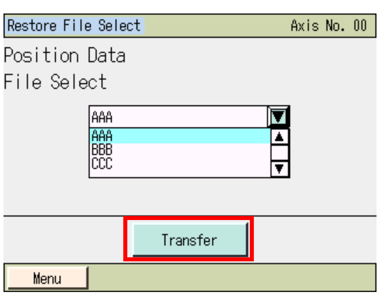
Select the data type to transfer to the controller, such as [Position Data], and touch it.

Touch [Transfer].



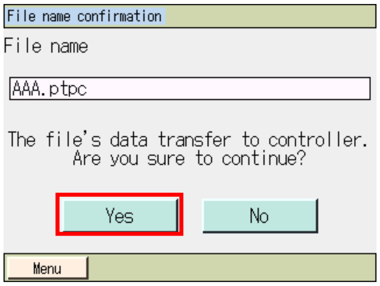
Touch [Yes].

If [No] is touched, the screen goes back to the data backup window.



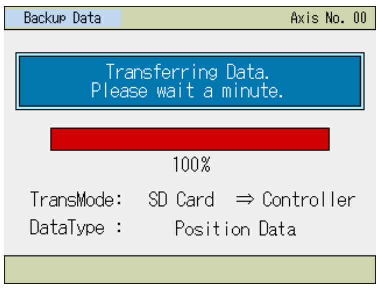
Touch ▲ and ▼ to select a file to transfer to the controller from the list of the backed up file names.

Touch [Transfer].

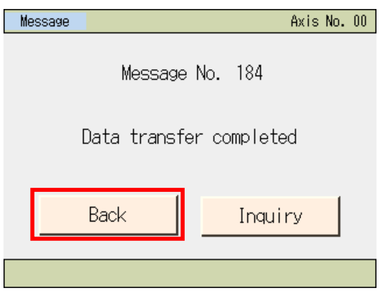


Touch [Yes].

If [No] is touched, the screen goes back to the previous one for the restore file select.



Data transfer screen will be shown.



A message to tell the data transfer is complete pops up and the data transfer process to the controller is finished.

Touching [Back] can go back to the Backup Data screen.

5.19 Smart Tuning Function

With the Smart Tuning Function, the following 2 operations can be performed.

1) Setting of maximum acceleration/deceleration speed considering the indicated transported load and velocity
2) Setting of acceleration/deceleration speed to provide the shortest operation time figured out from the indicated transported load and moving distance

(1) Setting of maximum acceleration/deceleration speed considering the indicated transported load and velocity

It is the function to set the maximum acceleration/deceleration speed available at the indicated transported load and velocity.

(2) Setting of acceleration/deceleration speed to provide the shortest operation time figured out from the indicated transported load and moving distance

It is the function to set the combination of velocity and acceleration/deceleration that provide the shortest operation time for the indicated moving distance in several patterns of selectable combinations of the velocity and acceleration/deceleration with accordance with the transported load.

When 12.0 [Kg] is indicated for the transported load, for an instance, the combination of the velocity and acceleration/deceleration to provide the shortest operation time for each moving distance is as shown below:

1) When 30.00 [mm] is indicated
   ⇒ Velocity and acceleration for shortest operation time : 250.00 [mm/sec], 0.70 [G]
2) When 40.00 [mm] is indicated
   ⇒ Velocity and acceleration for shortest operation time : 300.00 [mm/sec], 0.50 [G]

(Note) The search of the combination of velocity and acceleration/deceleration for the shortest operation time refers to the operation schedule time.

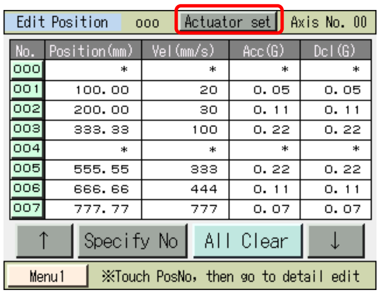
For a reference, the following table shows the list of the operation time for each moving distance.

List of Operation Time for Each Moving Distance

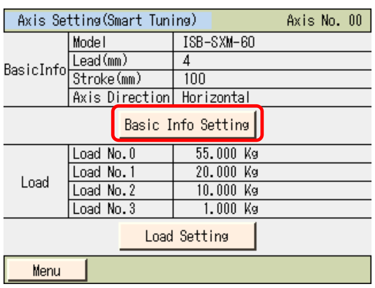
Carrier load [Kg]	Movement distance [mm]	Velocity [mm/sec]	Acceleration/ Deceleration [G]	Operation time [msec]
12.0	30.00	**250.00**	**0.70**	**156**
		300.00	0.50	161
	40.00	250.00	0.70	196
		300.00	**0.50**	**195**

5.19.1 Setting Operation for Max. Acceleration/Deceleration for Indicated Transported Load and Velocity

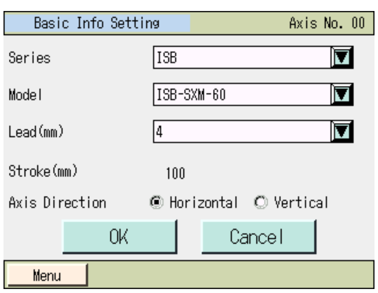
1) Basic Information Settings
   Set the model code, lead stroke and the posture of the applicable actuator in "Setting of Actuator Applicable for Velocity and Acceleration/Deceleration Settings" window.



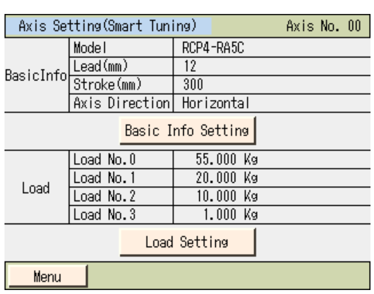
Touch [Actuator set].



Touch [Basic Info Setting].

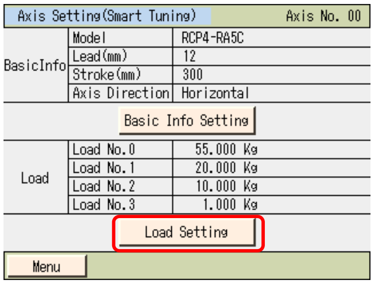


Touch ▼ and ▲ to select the applicable series, model type, lead (mm). For the stroke, numeric keys will appear if touch it. Input a value on the numeric keys.
Select the actuator posture from either horizontal or vertical.
Touch [OK].

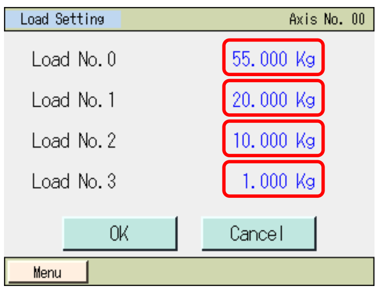


The screen goes back to Basic Information Setting and Transported Load Setting window.

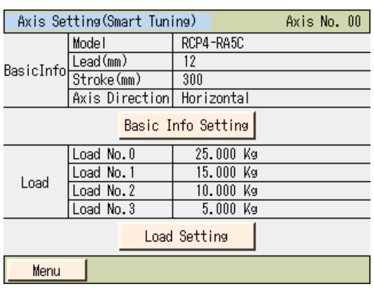
2) Setting of Carrier Load
Set the carrier load.



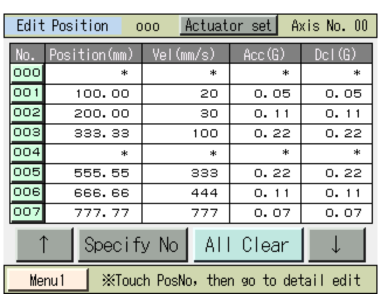
Touch [Load Setting].



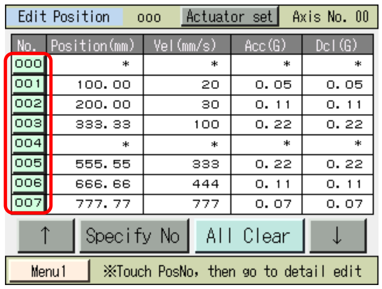
Touch the number input areas for Transported Load No.0 to No.3.
The numeric keys will appear. Set the transported loads.
Touch [OK].



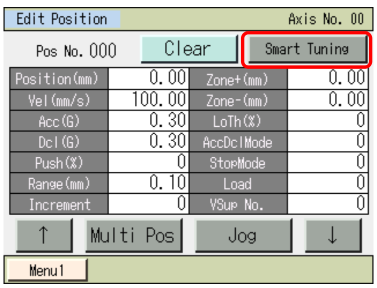
The screen goes back to Basic Information Setting and Transported Load Setting window.
Touch [Menu] to return to Position Edit window.



3) Way to Handle Smart Tuning Function
Set the velocity and carrier load number to the set position number.
Select “Automatically Tune Acceleration from Transported Load and Velocity” from the ways for tuning.



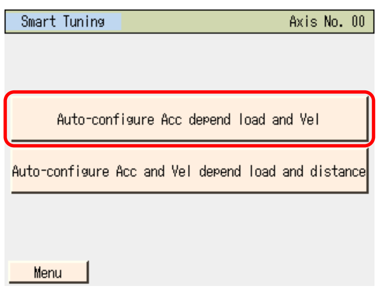
Select the position to have Smart Tuning Function and touch it.



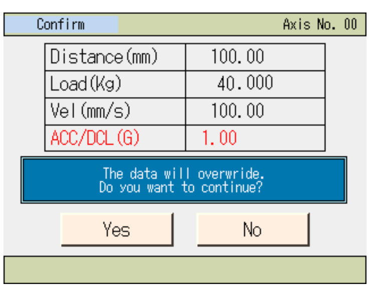
Set the velocity.
Select one from 0 (Transported Load No. 0) to 3 (Transported Load No. 3) and set to the transported load.

Set the necessary items except for acceleration and deceleration such as target position.

Touch [C/T optimization].

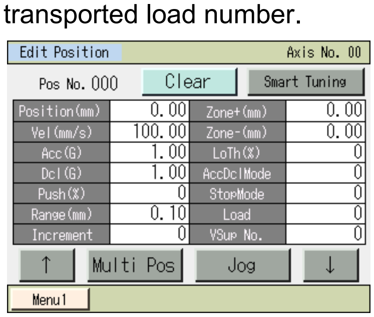


Touch [Auto-configure Acc depend load and Vel].



The confirmation screen appears.
Touch [Yes].

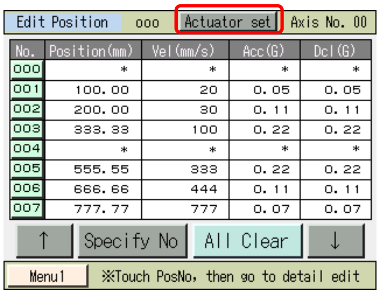
4) Maximum acceleration speed and maximum deceleration speed are set for the indicated velocity and transported load number.



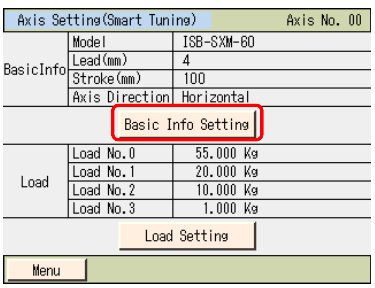
5.19.2 Operation to Automatically Set Velocity and Acceleration Speed from Moving Distance

1) Basic Information Settings

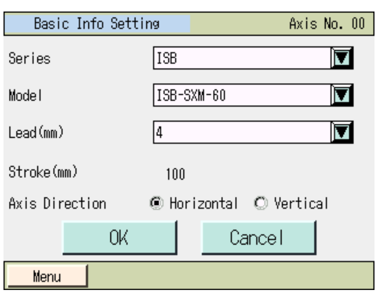
Set the model code, lead stroke and the posture of the applicable actuator in "Setting of Actuator Applicable for Velocity and Acceleration/Deceleration Settings" window.



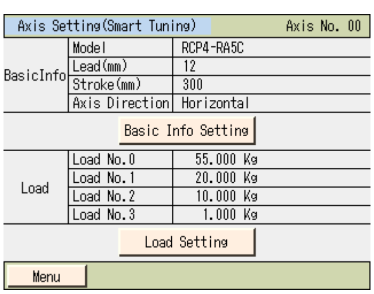
Touch [Actuator set].



Touch [Basic Info Setting].

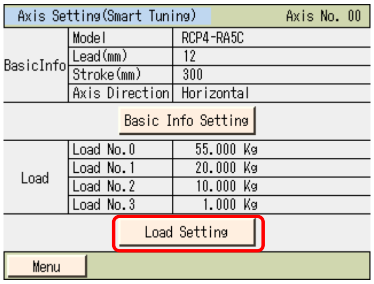


Touch ▼ and ▲ to select the applicable series, model type, lead (mm). For the stroke, numeric keys will appear if touch it. Input a value on the numeric keys.
Select the actuator posture from either horizontal or vertical.
Touch [OK].

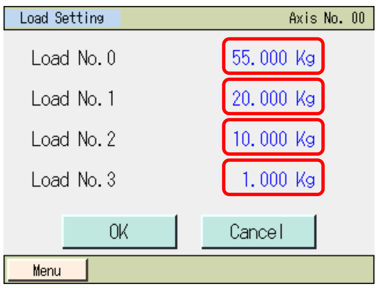


The screen goes back to Basic Information Setting and Transported Load Setting window.

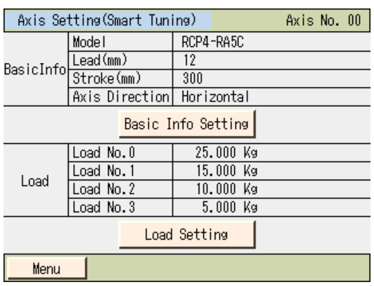
2) Setting of Carrier Load
Set the carrier load.



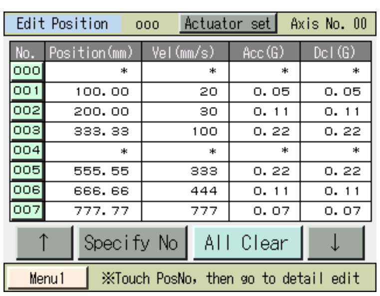
Touch [Load Setting].



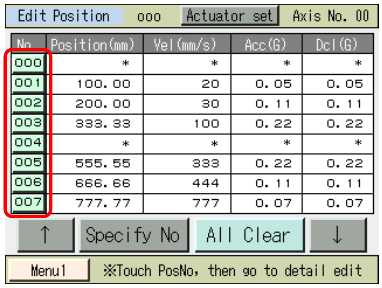
Touch the number input areas for Transported Load No.0 to No.3.
The numeric keys will appear. Set the transported loads.
Touch [OK].



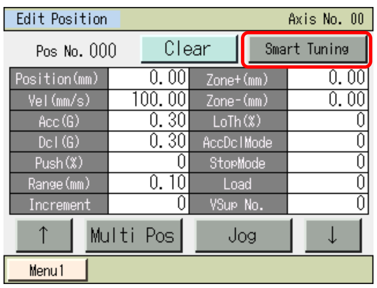
The screen goes back to Basic Information Setting and Transported Load Setting window.
Touch [Menu] to return to Position Edit window.



3) Way to Handle Smart Tuning Function
Set the distance and carrier load number to the set position number.
Select "Automatically Tune Acceleration from Transported Load and Velocity" from the ways for tuning.



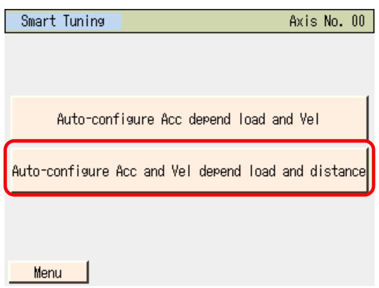
Select the position to have Smart Tuning Function and touch it.



Set the velocity.
Select one from 0 (Transported Load No. 0) to 3 (Transported Load No. 3) and set to the transported load.

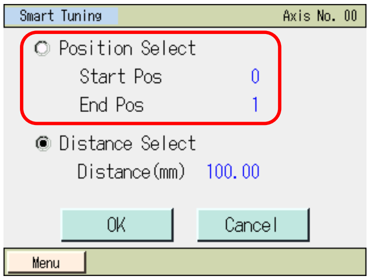
Set the necessary items except for acceleration and deceleration such as target position.

Touch [C/T optimization].



Touch [Auto-configure Acc and Vel depend load and distance].

There are two ways to set up the moving distance.
(Position Select)

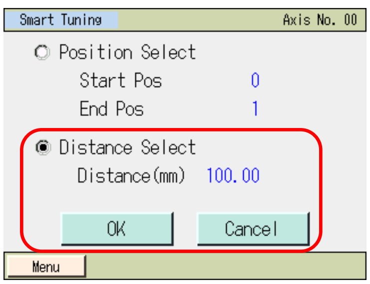


Select Position Select.
Touch the value on the start position and the numeric key will be shown.
Set the Start Pos.

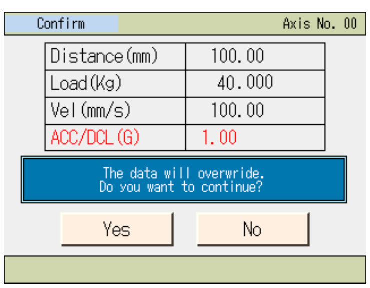
Touch the value on the end position and the numeric key will be shown.
Set the End Pos.

(Note) For the end position, the position number to have Smart Tuning Function is shown. The end position can be changed. However, even if the end position is changed, it is set to the position where Smart Tuning Function is held by the calculation of the velocity, acceleration and deceleration from the distance between the set start position and end position.

(Distance Select)

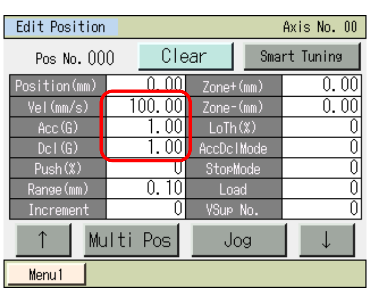


Select Distance Select.
Touch the value on the moving distance and the numeric key will be shown.
Set the Distance.



The confirmation screen appears.
Touch [Yes].

4) The velocity, acceleration and deceleration are set to provide the shortest tact time to run between two points for the indicated transported load number.



6. Operation of SEP Related Controllers

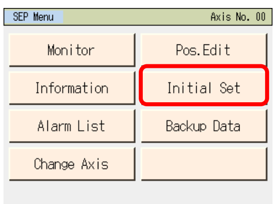
SEP related controllers: ASEP, PSEP, DSEP, MSEP

6.1 Transition of Operating States

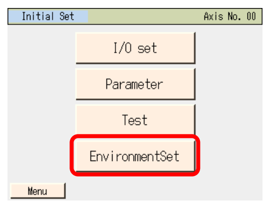
The language can be changed by following the steps below.
For the operations after the language change, please refer to the operation manual written in each language.

Model: CON-PTA-C　CON-PTA-C-ENG

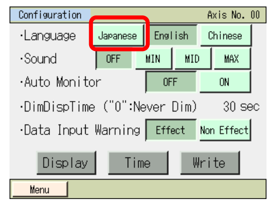
Display change from English to Japanese



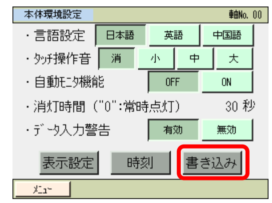
Touch [Initial Set] in SEP Menu.



Touch [EnvironmentSet].

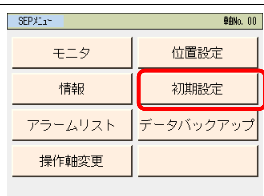


Touch [Japanese].

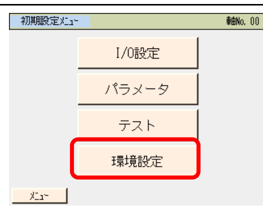


Touch [書き込み].

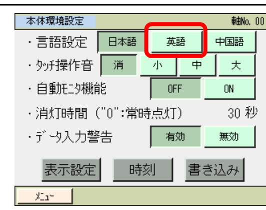
Display change from Japanese to English



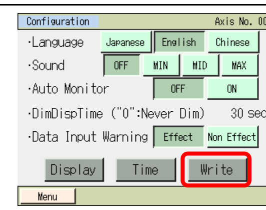
Touch [初期設定] in SEP メニュー.



Touch [環境設定].



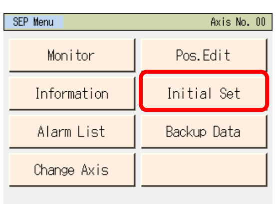
Touch [英語].



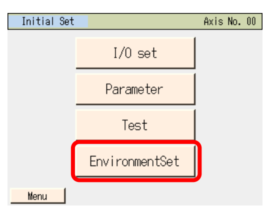
Touch [Write].

Model: CON-PTA-C　CON-PTA-C-CHI

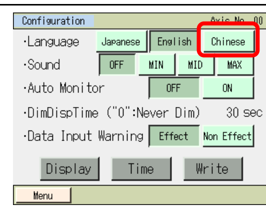
Display change from English to Chinese



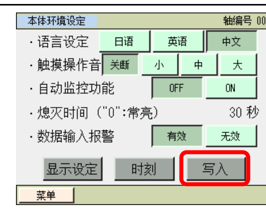
Touch [Initial Set] in SEP Menu.



Touch [EnvironmentSet].

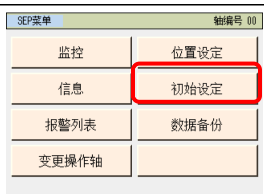


Touch [Chinese].

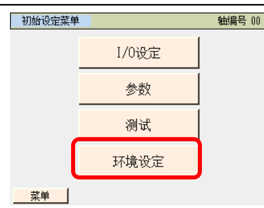


Touch [写入].

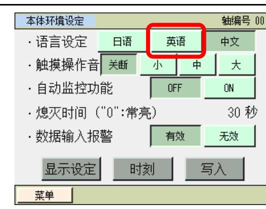
Display change from Chinese to English



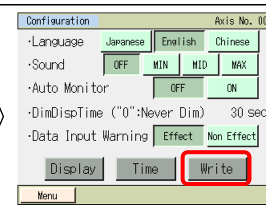
Touch [菜単2] in SEP菜单.



Touch [环境设定].



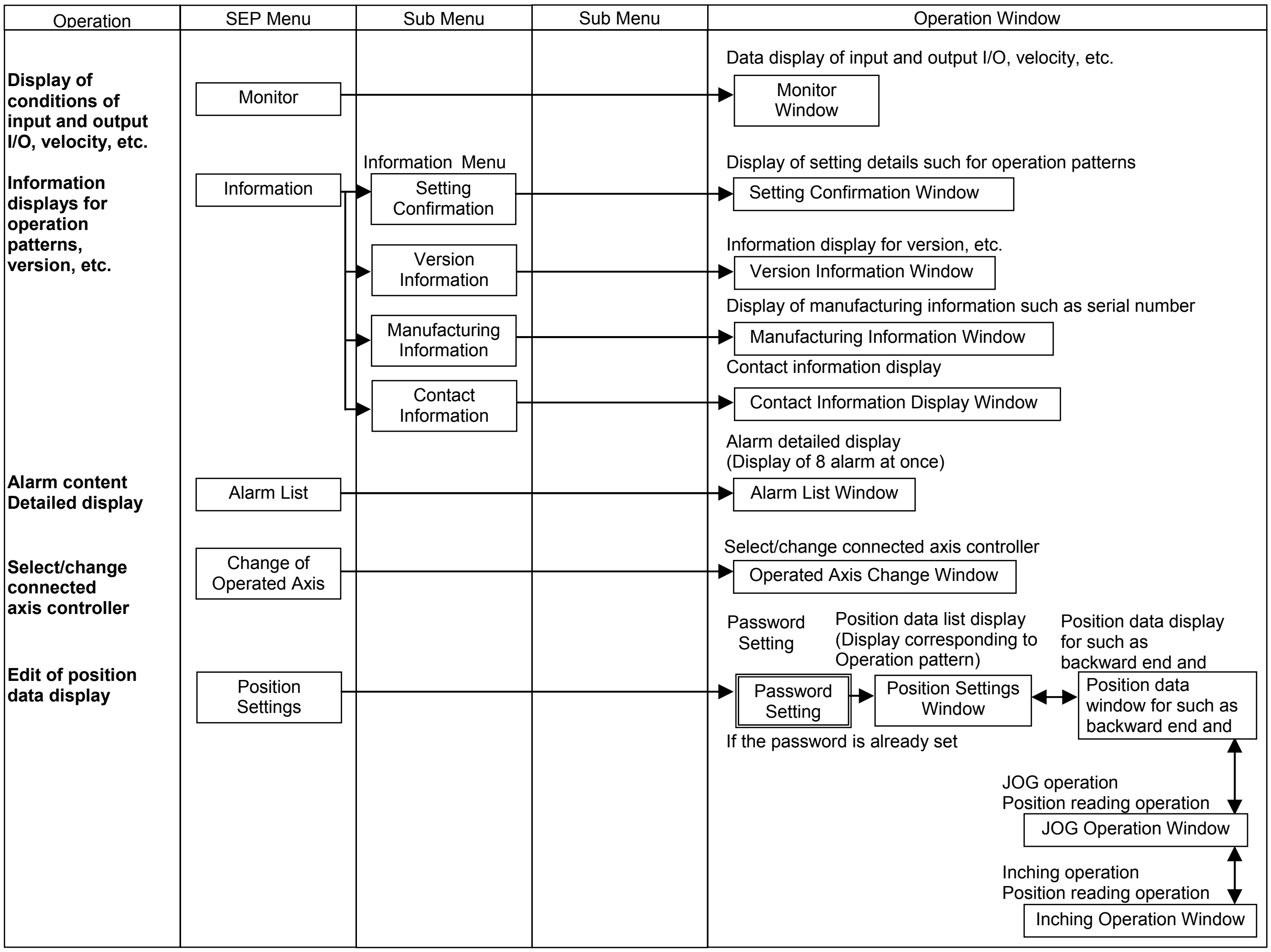
Touch [英語].

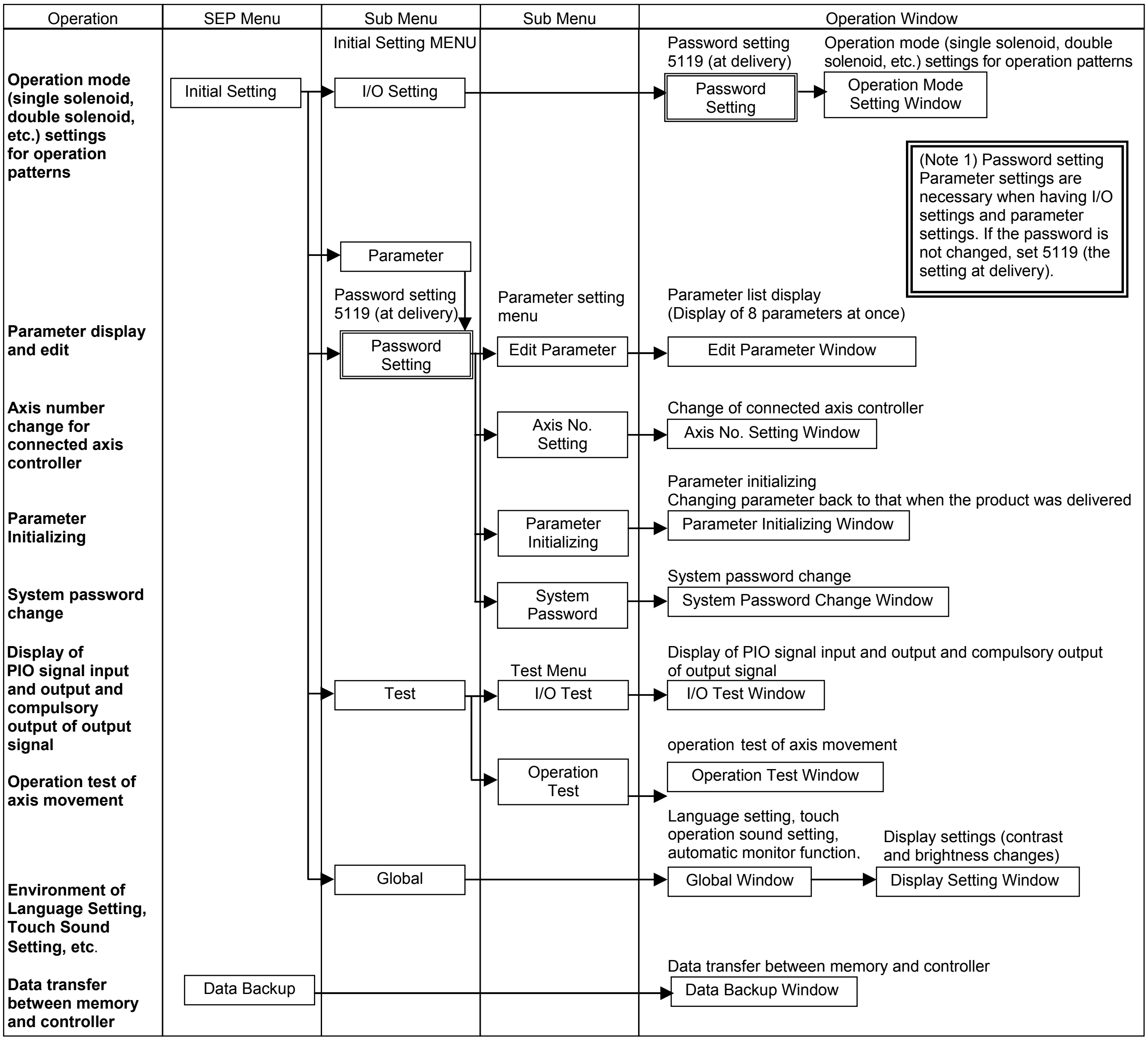


Touch [Write].

6.2 Operating Menu

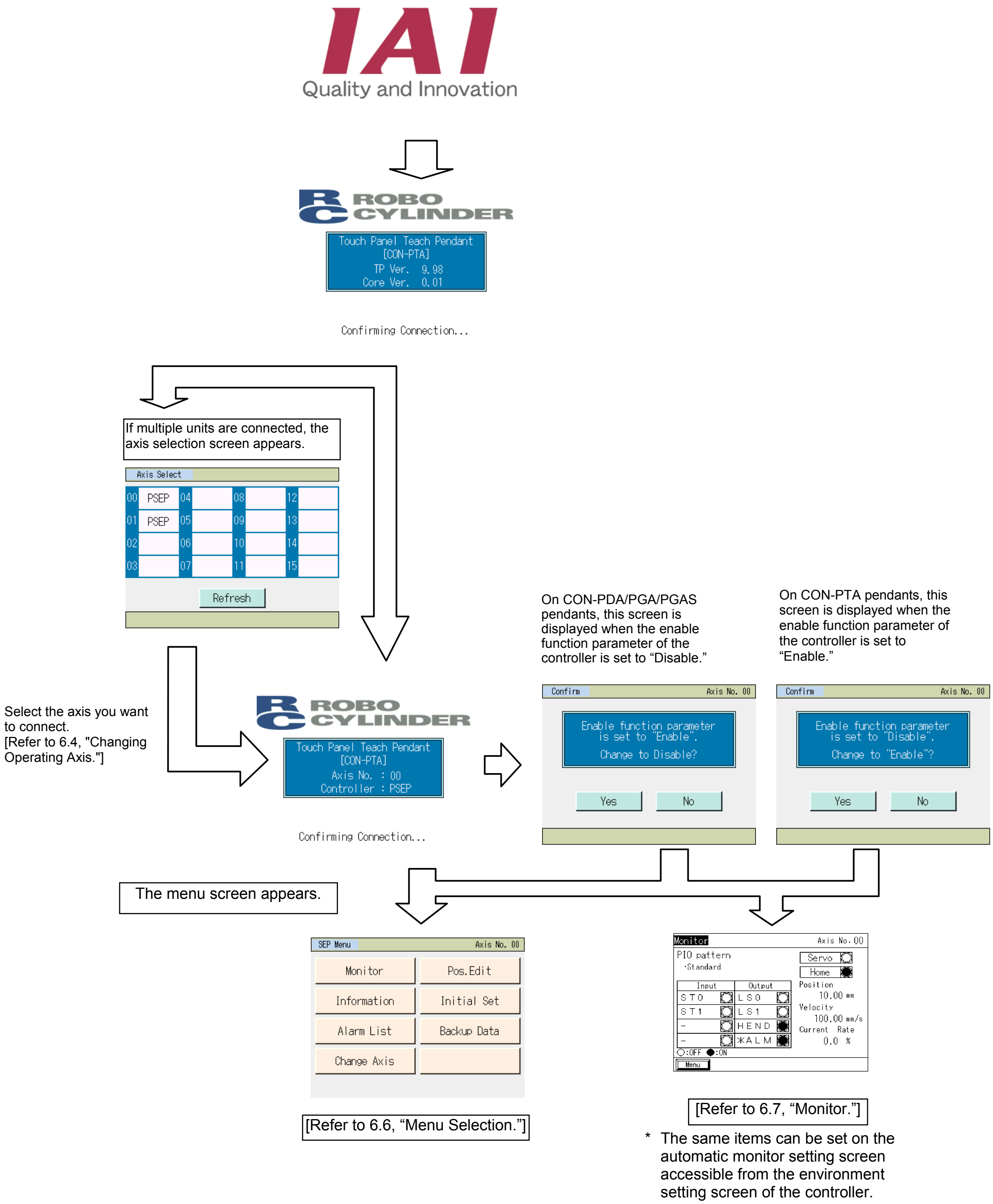
Transition of operating states when the touch-panel teaching pendant CON-PTA is connected to a SEP controller is shown.




Operation
SEP Menu
Sub Menu
Sub Menu
Operation Window
Operation mode (single solenoid, double solenoid, etc.) settings for operation patterns
Initial Setting
Initial Setting MENU
I/O Setting
Password setting 5119 (at delivery)
Password Setting
Operation mode (single solenoid, double solenoid, etc.) settings for operation patterns
Operation Mode Setting Window
(Note 1) Password setting Parameter settings are necessary when having I/O settings and parameter settings. If the password is not changed, set 5119 (the setting at delivery).
Parameter
Password setting 5119 (at delivery)
Parameter display and edit
Password Setting
Parameter setting menu
Edit Parameter
Parameter list display (Display of 8 parameters at once)
Edit Parameter Window
Axis number change for connected axis controller
Axis No. Setting
Change of connected axis controller
Axis No. Setting Window
Parameter Initializing
Parameter Initializing
Parameter initializing Changing parameter back to that when the product was delivered
Parameter Initializing Window
System password change
System Password
System password change
System Password Change Window
Display of PIO signal input and output and compulsory output of output signal
Test
Test Menu
I/O Test
Display of PIO signal input and output and compulsory output of output signal
I/O Test Window
Operation test of axis movement
Operation Test
operation test of axis movement
Operation Test Window
Environment of Language Setting, Touch Sound Setting, etc.
Global
Language setting, touch operation sound setting, automatic monitor function.
Global Window
Display settings (contrast and brightness changes)
Display Setting Window
Data transfer between memory and controller
Data Backup
Data transfer between memory and controller
Data Backup Window

6.3 Initial Screen

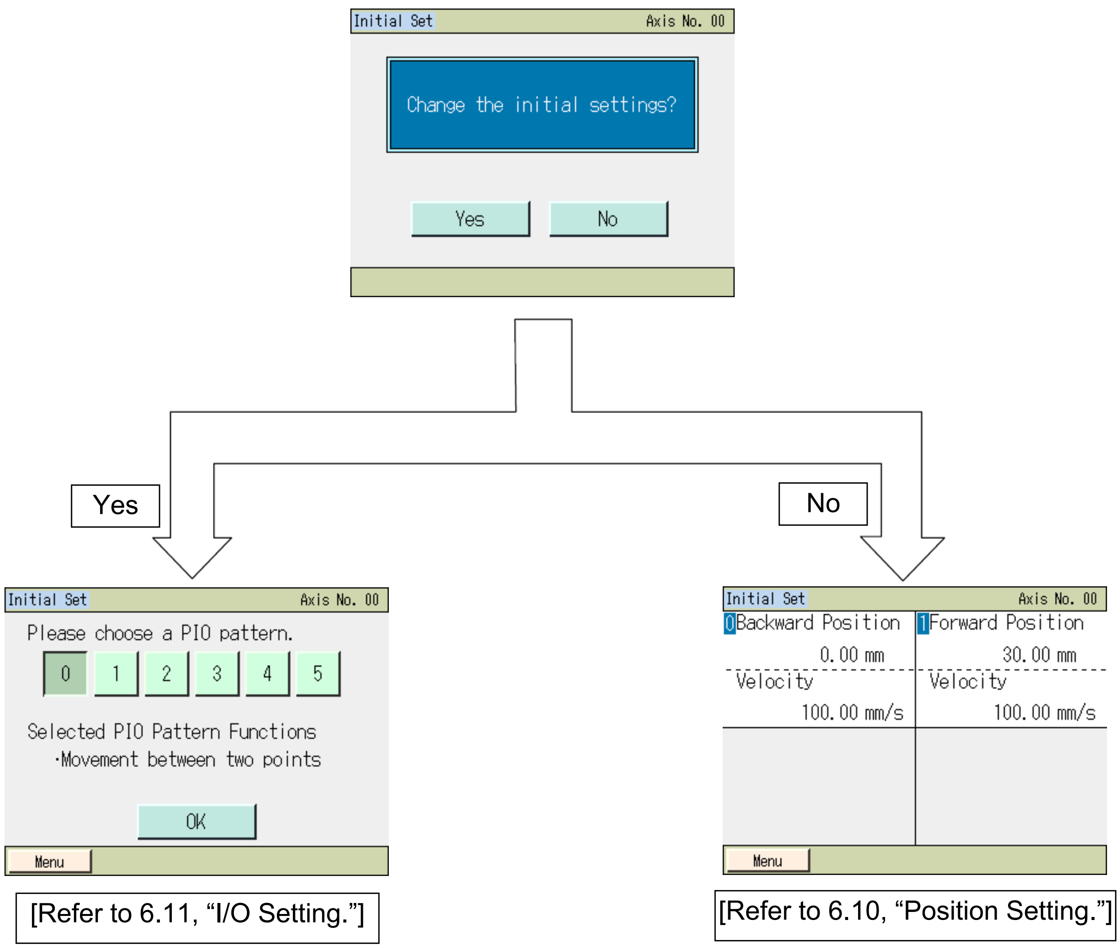
Upon connection to the controller, power is supplied to the touch-panel teaching pendant and processing starts.
When the power is turned on, the IAI logo is displayed for approx. 1 second on the operation display screen (here in after referred to as "operation screen") of the touch-panel teaching pendant, after which version information is displayed.



6.4 Initial Setting

When the power is turned on for the first time after the delivery of the controller, the initial setting screen will appear.

- Select [Yes], and the display will change to the I/O setting screen where you can set the operation pattern (PIO pattern). Select a desired operation pattern and, depending on the selected operation pattern, also set the single-solenoid, double-solenoid or other operation mode.
- Select [No], and the factory set operation pattern, or specifically operation pattern 0 of double-solenoid mode, will remain effective.

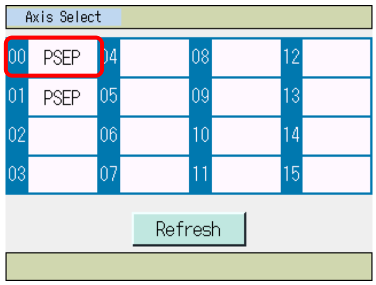


Factory settings

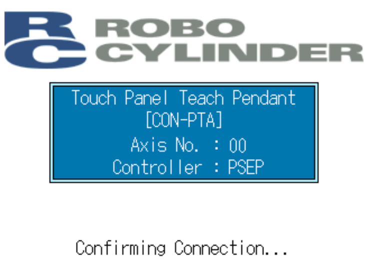
- Operation pattern 0
- Double-solenoid mode with continuous current flow
- No servo control
- Home return MANU
- Output mode LS

6.5 Changing Operating Axis

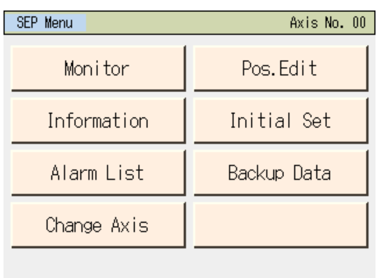
If multiple controllers are connected to the communication line, the axis selection screen appears.
This screen also appears when [Change Operate Axis] is touched on the menu screen.
If only one controller is connected, you need not select an axis.



Select and touch the axis you want to connect the touch-panel teaching pendant to.



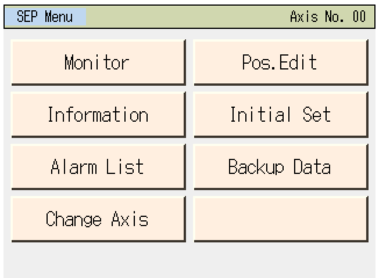
Connection with the selected controller axis starts.



When connection with the controller is established, the SEP menu screen appears.

6.6 Menu Selection

SEP menu

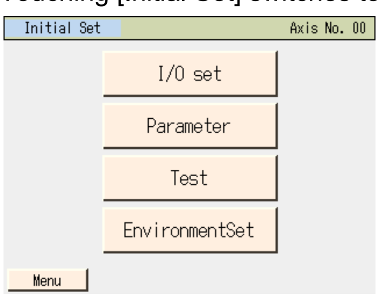


The SEP menu has seven items. Select and touch one of them.
The screen changes to the one corresponding to the menu item you have touched.

Menu list

- Monitor — Display the controller status. [Refer to 6.7, "Monitor."]
- Information — Display the operation pattern, version and other information. [Refer to 6.8, "Information."]
- Alarm List — Display alarm details. [Refer to 6.9, "Alarm List."]
- Change Axis — Select the controller axis to connect the touch-panel teaching pendant to. [Refer to 6.5, "Changing Operating Axis."]
- Pos. Edit — Set the position, push power, push band, etc. Move by jogging. [Refer to 6.10, "Position Setting."]
- Backup Data — Transfer data between the touch-panel teaching pendant and controller. [Refer to 6.15, "Data Backup."]
- Initial Set

Touching [Initial Set] switches to the next selection screen, which is the initial setting screen.



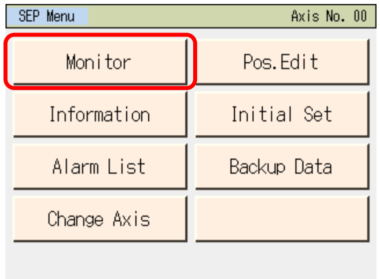
The initial setting screen shows a menu consisting of four items. Select and touch one of them.
The screen changes to the one corresponding to the menu item you have touched.
Touch Menu to return to the previous SEP menu screen.

Initial setting menu list

- I/O Set — Select an operation pattern (PIO pattern 0 to 5), set an operation mode (single solenoid, double solenoid), etc. [Refer to 6.11, "I/O Setting."]
- Parameter — Set parameters such as the default positioning band. [Refer to 6.12, "Parameters."
- Test — Perform I/O tests and operation tests for axis movement. [Refer to 6.13, "Test."]
- EnvironmentSet — Set the environment such as touch tone. [Refer to 6.14, "Environment Setting."]

6.7 Monitor

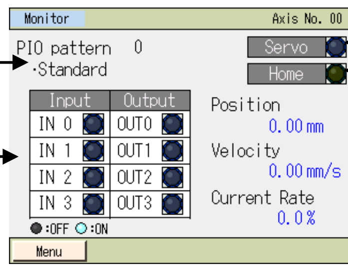
The current position, speed, electrical current and system I/O statuses of the controller are displayed.



Touch [Monitor] on the SEP menu screen.

The operation pattern is indicated.

The I/O statuses of the axis are indicated.
The display varies depending on the operation pattern.



The servo status is indicated.
The home return status is indicated.

The axis position is indicated.

The axis speed is indicated.

The electrical current of the axis is indicated.

Touch [Menu] to return to the SEP menu screen.

I/O display on monitor screen

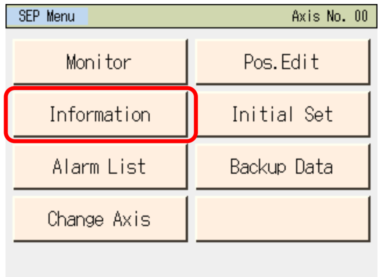
PIO pattern Operation mode	Displayed item				
		IN3 (input)/OUT3 (output)	IN2 (input)/OUT2 (output)	IN1 (input)/OUT1 (output)	IN0 (input)/OUT0 (output)
Standard movement between 2 points: 0 Single solenoid	Input	-/ SON (servo ON signal) *1	-/ RES (reset signal)	-/ *STP (pause signal)	ST0 (move signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Standard movement between 2 points: 0 Double solenoid	Input	-/ SON (servo ON signal) *1	-/ RES (reset signal)	ST1 (forward end movement signal) (-)	ST0 (backward end movement signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Change travel speed: 1 Single solenoid	Input	-/ SON (servo ON signal) *1	SPDC (travel speed switching signal) RES (reset signal)	-/ *STP (pause signal)	ST0 (backward end movement signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Change travel speed: 1 Double solenoid	Input	-/ SON (servo ON signal) *1	SPDC (travel speed switching signal) RES (reset signal)	ST1 (forward end movement signal) (-)	ST0 (backward end movement signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Position data change: 2 Single solenoid	Input	-/ SON (servo ON signal) *1	CN1 (target position switching signal) RES (reset signal)	-/ *STP (pause signal)	ST0 (backward end movement signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Position data change: 2 Double solenoid	Input	-/ SON (servo ON signal) *1	CN1 (target position switching signal) RES (reset signal)	ST1 (forward end movement signal) (-)	ST0 (backward end movement signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Movement by 2 inputs among 3 points: 3	Input	-/ SON (servo ON signal) *1	-/ RES (reset signal)	-/ ST1 (forward end movement signal)	ST0 (movement signal 1)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	LS2 (intermediate position detection signal)/ PE2 (intermediate positioning complete signal)*2	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Movement by 3 inputs among 3 points: 4 Double solenoid	Input	-/ SON (servo ON signal) *1	ST2 (position movement 2) RES (reset signal)	ST1 (forward end movement signal) (-)	ST0 (backward end movement signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	LS2 (intermediate position detection signal)/ PE2 (intermediate positioning complete signal)*2	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2
Continuous back-and-forth operation: 5	Input	-/ SON (servo ON signal) *1	-/ RES (reset signal)	-/ *STP (pause signal)	ASTR (continuous back-and-forth operation signal)
	Output	*ALM (alarm output signal)/ SV (servo ON output signal) *3	HEND (home return complete signal)/ SV (servo ON output signal) *3	LS1 (forward end position detection signal)/ PE1 (forward end positioning complete signal)*2	LS0 (backward end position detection signal)/ PE0 (backward positioning complete signal)*2

The signal name in parentheses indicates the signal state before home return.

*1 If the default I/O setting for servo control is set to "Control", the SON signal applies.
*2 If the default I/O setting for output signal type is set to "Limit Switch", LS is applied. If it is set to "Position End", PE is applied.
*3 When "SV" is selected by the default I/O setting for output selection. In this case, the SV signal applies.
Either OUT2 or OUT3 can be set depending on the operation parameter and operation mode.

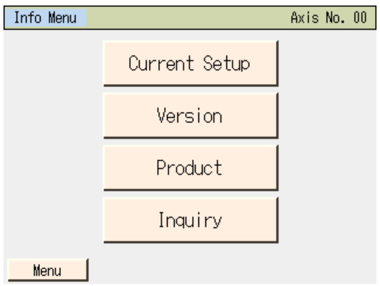
6.8 Information

The operation pattern, version and other information is displayed.



Touch [Information] on the SEP menu screen.

The information selection screen appears.

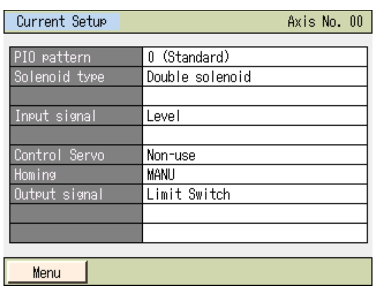


Touch the screen you want to display.

Touch [Menu] to return to the SEP menu screen.

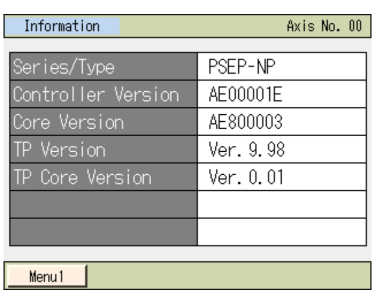
[Current Setup]

You can confirm the operation pattern, operation mode and other information currently set.



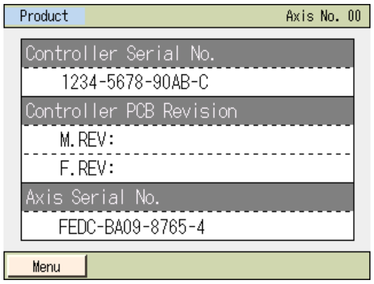
[Version]

You can check the version information, etc.



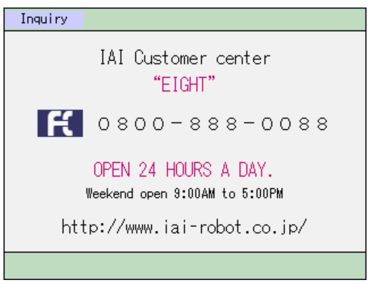
[Product]

You can check the serial number and other manufacturing information.



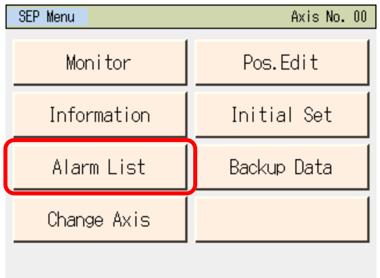
[Inquiry]

You can check how to contact IAI.



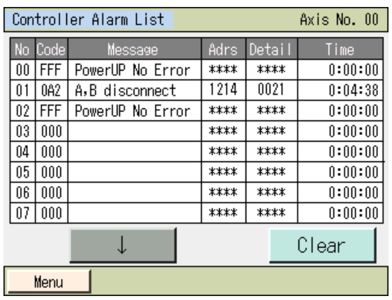
6.9 Alarm List

A list of alarms that may generate after the controller power is turned on is shown. [For alarm details, refer to 8, "Error Display."]

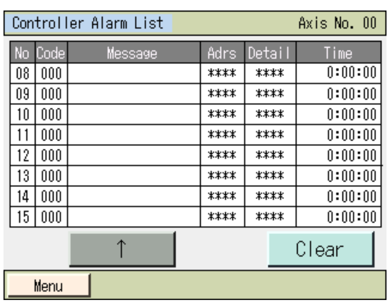


Touch [Alarm List] on the SEP menu screen.

The controller's alarm list appears. The error list consists of errors 0 to 15.



Touching [↓] displays the next page.



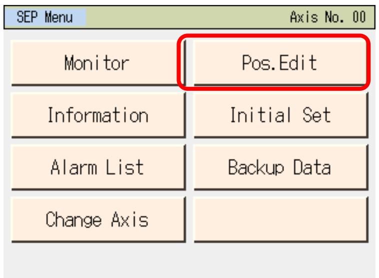
Touching [↑] displays the previous page.

Touching [Erase] clears all alarm details.

(Note) PowerUP No Error indicates that the controller power was turned on.
It does not indicate an error.
The time of occurrence of each alarm is indicated by an elapsed time from this PowerUP No Error.

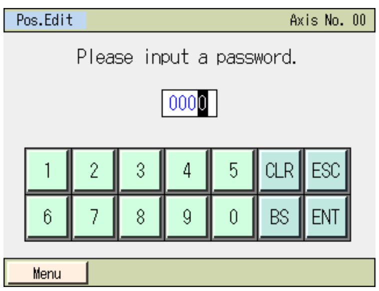
6.10 Position Setting (Setting of Position-related Data, Jog/Inching Operation)

Position-related data, such as position, push power and push band, are set. You can move the axis by jogging or inching.



Touch [Pos. Edit] on the SEP menu screen.

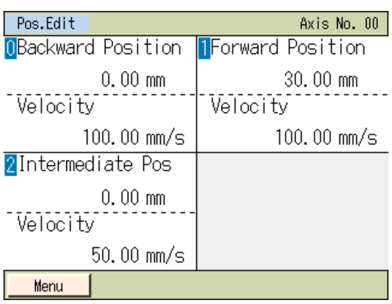
If the password is not "0000," the password entry screen appears before changing to the position setting screen.



Enter a password value from the numeric keypad, and then touch [ENT].

> You can set a password from "Position edit password" on the parameter edit screen.

If the correct password has been entered, the display changes to the screen showing a position setting list. The display varies depending on the operation pattern.



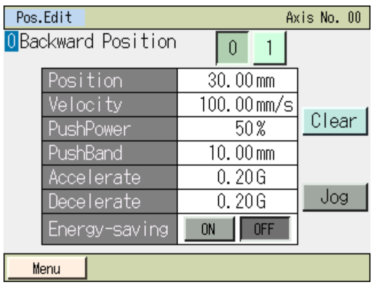
Touch the position you want to set.
Touch [Menu] to return to the SEP menu screen.
The screen shown to the left is an example of operation pattern 3.
The settings of various positions are shown.

Number of positions set

Operation pattern	Move	Number of positions set
Standard movement between 2 points: 0	Movement between two points	2
Change travel speed: 1	Movement between two points	2
Change position: 2	Movement between two points	4
Movement by 2 inputs among 3 points: 3	Movement among two points	3
Movement by 3 inputs among 3 points: 4	Movement among two points	3
Continuous back-and-forth operation: 5	Movement between two points	2
Positioner Mode: 6*1	–	256

*1 It is available to set only for Fieldbus Type of MSEP Controllers.

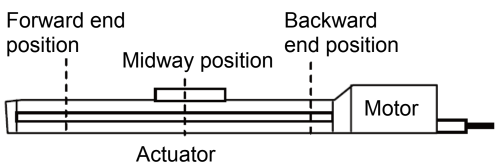
Touching a desired position displays the screen for setting the target position/speed for the position you have touched.
Set the position, speed, push power, push band, acceleration and deceleration.



Touch [Menu] to return to the SEP menu screen.

You can perform jog operation on this setting screen.

[1] Position data
Set position data with which to operate the actuator.



Position data

Position Data		[1]	[2]	[3]	[4]	[5]	[6]	[7]
		Position [mm]	Velocity [mm/s]	Accelerate [G]	Decelerate [G]	PushPower [%]	PushBand [mm]	Ecology
[1]	Forward Position	200.00	50.00	0.1	0.1	70	1.00	Valid
[2]	Backward Position	0.00	50.00	0.1	0.1	0	0	Valid
[3]	Midway Position	100.00	50.00	0.1	0.1	0	0	Valid

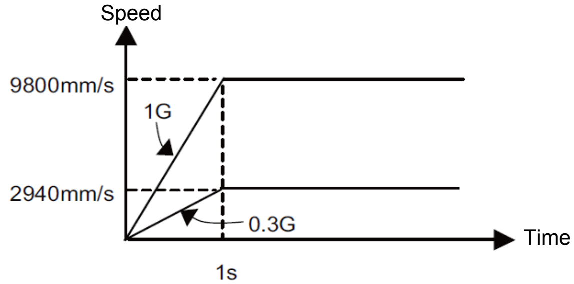
[1] Position (mm)--- Set the position to move the actuator to.
The positions must satisfy the following relationships: Backward position < Intermediate position < Forward position

Operation pattern	Move	Setting position		
		Forward Position	Backward Position	Intermediate Position
Standard movement between 2 points: 0	Movement between two points	○	○	
Change travel speed: 1	Movement between two points	○	○	
Position data change: 2	Movement between two points	○	○	
Movement by 2 inputs among 3 points: 3	Movement among three points	○	○	○
Movement by 3 inputs among 3 points: 4	Movement among three points	○	○	○
Continuous back-and-forth operation: 5	Movement between two points	○	○	

[2] Velocity [mm/s]--- Set the actuator speed.
[3] Accelerate [G] --- Set the actuator acceleration.
The input range permits entry of values greater than what is specified in the catalog.
Refer to the catalog or operation manual of your actuator.

[4] Decelerate [G]--- Set the actuator deceleration. [G]

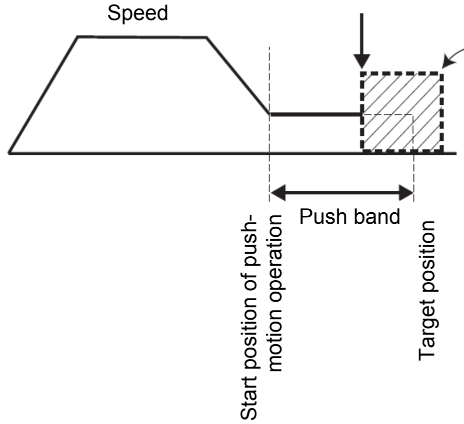
(Reference) Acceleration is explained. The same concept applies to deceleration.
1 G = 9800 mm/s^2: Acceleration at which the actuator can increase its speed up to 9800 mm/s per second.
0.3 G: Acceleration at which the actuator can increase its speed up to 2940 mm/s (9800 mm/s x 0.3) per second.



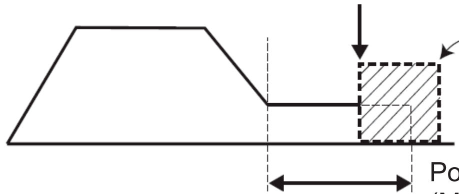
> ⚠ Caution: Acceleration/deceleration setting
> (1) Set accelerations/decelerations not exceeding the rated acceleration/deceleration specified in the catalog or this operation manual. If any acceleration/deceleration is set that exceeds the rated acceleration/deceleration, the life of the actuator may be significantly reduced.
> (2) If the actuator or work part receives impact or generates vibration, lower the acceleration/deceleration. If the system is used continuously with the actuator or work part receiving impact or generating vibration, the life of the actuator may be significantly reduced.
> (3) If the load transferred by the actuator is significantly lighter than the rated payload capacity, you may be able to set accelerations/decelerations exceeding the rating. If this is the case, the tact time can be reduced, so contact IAI. When contacting IAI, tell us the weight, shape and installation method of your work part and installation condition (horizontal/vertical) of your actuator.

[5] Push force [%] --- Set the push torque (current-limiting value) to be used in push-motion operation as a percent (%) value.
Increasing the current-limiting value increases the push force.
If "0" is set, positioning operation is performed.
[For the relationship of push force and current-limiting value, refer to the catalog or the operation manual.

[6] Push band [mm]--- Set the travel during push-motion operation.
Except for CON method pressing in Fieldbus Type of MSEP Controllers, the actuator moves with the speed and the rated torque set in the parameters for the positioning as it is for the normal positioning operation until the remaining movement amount gets into the area set here. Once it gets in the area, the actuator performs a pressing movement to the position of [1].
The speed during push motion operation is 20 mm/s (when parameter number 7 is set as default). Do not specify the setting exceeding 20 mm/s. When the setting in [2] is less than the push-motion speed, push-motion will be performed at the speed of the setting value.



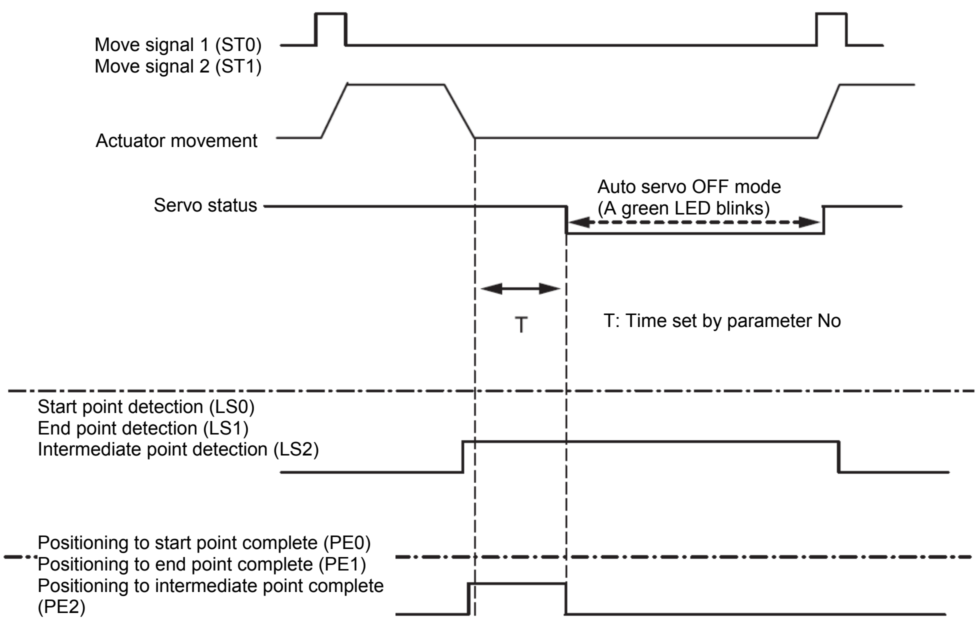
If CON method pressing in Fieldbus Type of MSEP Controllers is selected, the maximum pressing amount in the pressing operation from the target position is defined in Position Mode.
While considering the mechanical inconsistency of the work piece, set the positioning band so the positioning would not end before the work piece gets pressed towards the target.



[7] Ecology... When Ecology is enabled, you can have the motor power (servo) turned off automatically upon elapse of a specified period to save power after completion of positioning. Set the applicable period beforehand using a parameter.

Parameter No.	Parameter name	Initial value	Setting range
10	Auto servo OFF delay time [sec]	1	0 ~ 9999

[Auto servo OFF]
The servo will turn off automatically upon elapse of a specified period after completion of positioning. When the next positioning command is issued, the servo turns on automatically and positioning is performed. Since no holding current flows while the motor is at standstill, power consumption can be reduced.



[Statuses of position detection output signals when the push function is not used]
Even when the servo is turned off, as long as the actuator is positioned within the positioning band (parameter No. 1) the start point detection signal (LS0), end point detection signal (LS1) or intermediate point detection signal (LS2) will turn ON according to the applicable position, just like when a sensor is used. Accordingly, the position detection signal that has turned ON will remain ON after completion of positioning unless the actuator moves.

[Status of position complete signals when the push function is used]
In push-motion operation, the servo does not turn off automatically while the actuator is pushing the work part.
If the actuator has missed the work part, the servo turns off automatically.
Once the servo turns off, a position complete status is lost. Accordingly, the push complete signal 0 (PE0), push complete signal 1 (PE1) and push complete signal 2 (PE2) will all turn OFF regardless of the stop position.

⚠ Caution: No holding torque is applied in the auto servo OFF mode. Since the actuator will move in this condition if an external force is applied, pay due attention to contact and safety when setting any operation involving auto servo OFF.

To change the travel speed for operation pattern (PIO pattern) 1, set the position at which to change the speed, and the new speed, in addition to the position data.

Position setting screen	Speed Chg Pos	
Position Data	[8] Change position [mm]	[9] Change speed [mm]
[0] Forward Position	60.00	30.00
[1] Backward Position	40.00	30.00

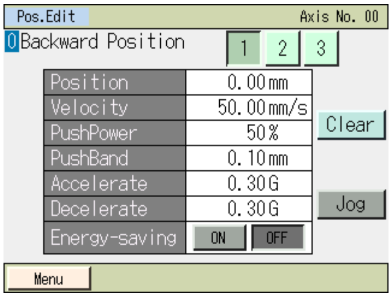
[8] Speed Chg Pos --- Set the position at which to switch the speed while the actuator is moving to the forward end position or backward end position.
[9] Speed Chg Vel --- Set the speed to change to.

To change the position data for operation pattern (PIO pattern) 2, set the new position data for forward end or backward end, in addition to the current position data for forward end position or backward end position.

- If CN1 (Operation switching signal) is OFF, the position data for forward end position becomes [1]: Forward end position.
  If the signal is ON, the position data becomes [3]: Forward end position.
- If CN1 (Operation switching signal) is OFF, the position data for backward end position becomes [0]: Backward end position.
  If the signal is ON, the position data becomes [2]: Backward end position.

Position Data	Position	Velocity	Accelerate	Decelerate	PushPower	PushBand	Ecology
[0]: Backward Position	0.00	50.00	0.1	0.1	0	0	Valid
[1]: Forward Position	200.00	50.00	0.1	0.1	70	1.00	Valid
[2]: Backward Position	10.00	50.00	0.1	0.1	0	0	Valid
[3]: Forward Position	100.00	50.00	0.1	0.1	60	1.00	Valid

[2] Basic operation



Touch the value of the position or other setting item.
When the numeric keypad appears, enter a desired value and then touch [ENT].

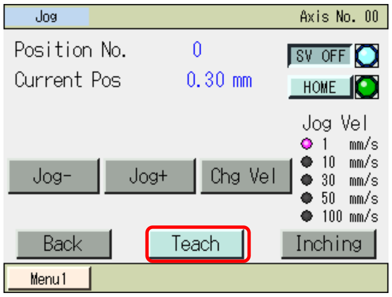
Touching [0], [1] or [2] switches to the corresponding setting screen for 0 (backward end position), 1 (forward end position) or 2 (intermediate position).

(Note) For the position, set a value meeting the condition "Home ≤ Backward end position ≤ Intermediate position ≤ Forward end position."

Touching [Jog] switches to jog operation.

[Jog operation]

You can acquire position data via jogging operation.



Operation on the jog screen

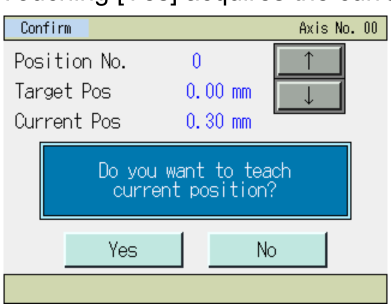
- [Jog-], [Jog+] :The axis jogs while each button is touched. [Jog-] moves the axis in the negative direction, while [Jog+] moves the axis in the positive direction.
- [SV ON] :Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] while the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME] :Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Chg Vel] :The jog speed changes in the order of 1, 10, 30, 50 and 100 mm/s every time [Chg Vel] is touched.
- [Inching] :Touching [Inching] changes to the inching screen.

Position acquisition operation

Touch [Teach]. A confirmation screen appears.

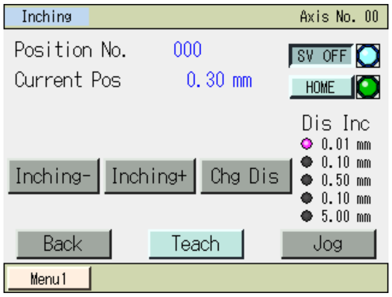
You can touch [↑] or [↓] to change the position number.

Touching [Yes] acquires the current position.



[Inching operation]

You can acquire position data via inching operation.



Operation on the jog screen

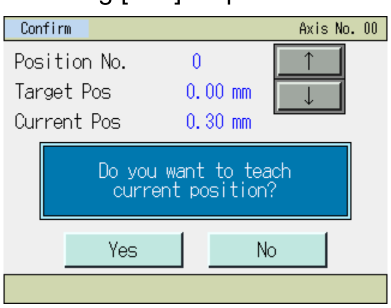
- [Inching-], [Inching+] :Touching each button once moves the axis by inching. [Inching-] moves the actuator in the negative direction. [Inching+] moves the actuator in the positive direction.
- [SV ON] :Touching [SV ON] while the servo is off turns on the axis servo and ○ becomes lit. Touching [SV OFF] when the servo is on turns off the axis servo and ○ becomes unlit.
- [HOME] :Touching [HOME] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- [Chg Dis] :The inching distance changes in the order of 0.01, 0.10, 0.50, 1.00 and 5.00 mm every time [Chg Dis] is touched.
- [Jog] :Touching [Jog] changes to the jog screen.

Position acquisition operation

Touch [Teach]. A confirmation screen appears.

You can touch [↑] or [↓] to change the position number.

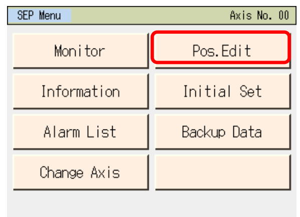
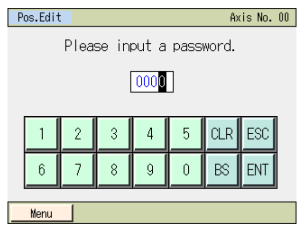
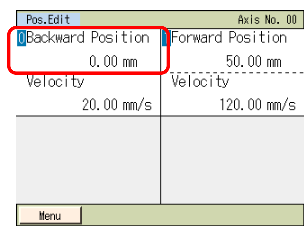
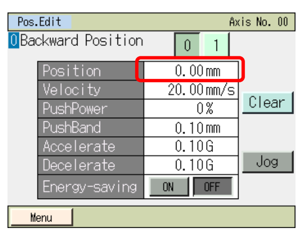
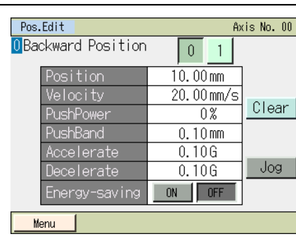
Touching [Yes] acquires the current position.

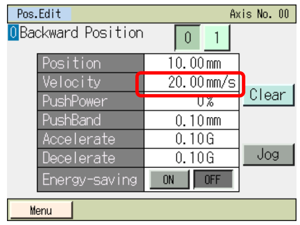
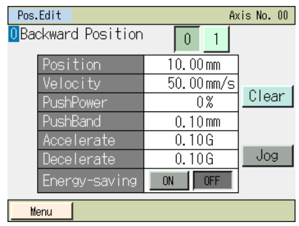
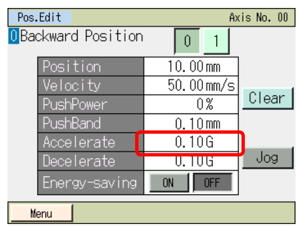
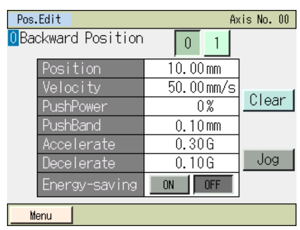
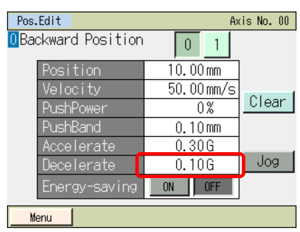
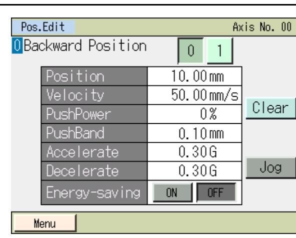


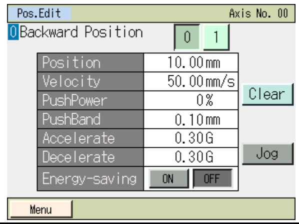
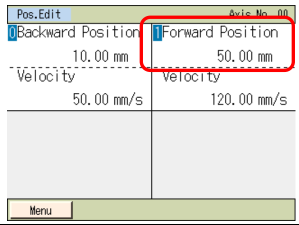
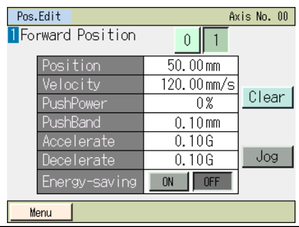
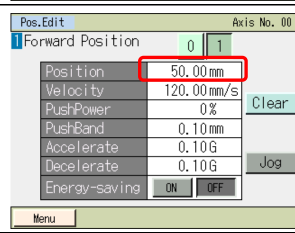
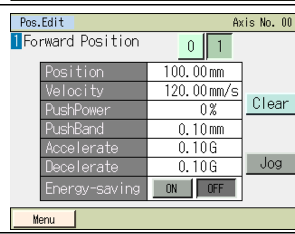
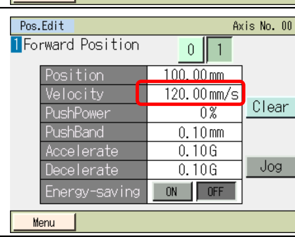
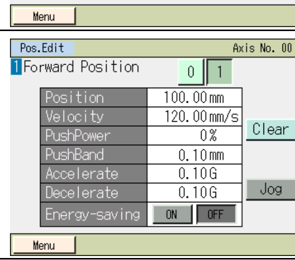
[3] Examples of position setting operations
Respective operations are explained by giving specific examples.

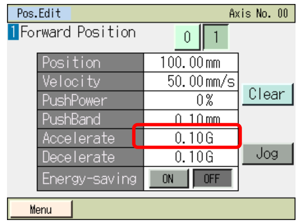
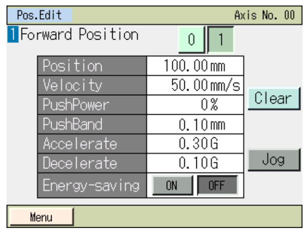
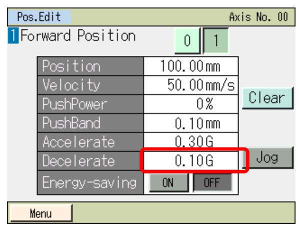
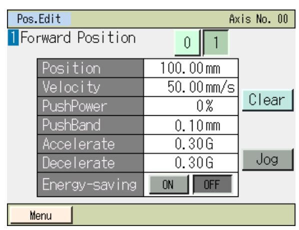
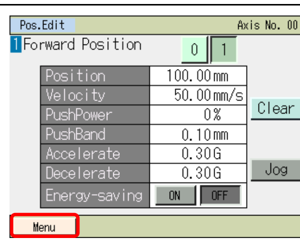
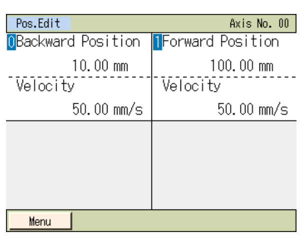
1) Setting of position, speed, acceleration and deceleration
An example of operation mode 0 (standard) is explained.
Set positions to move the actuator back and forth between 10.0 mm and 100.0 mm.

Forward end position: 100.0 mm, backward end position: 10.0 mm, back-and-forth speed: 50 mm/sec, back-and-forth acceleration: 0.3 G, back-and-forth deceleration: 0.3 G

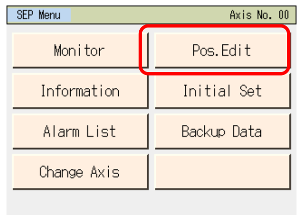
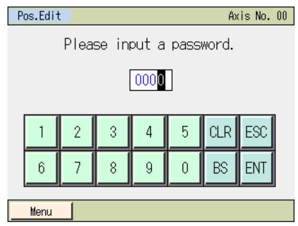
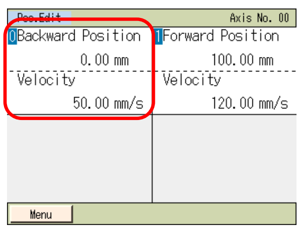
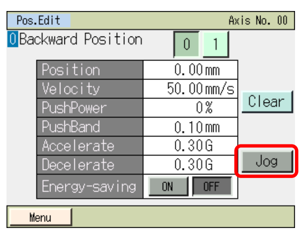
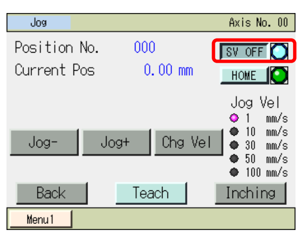
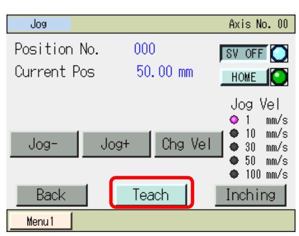
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Pos.Edit].		
2	If the password is other than "0000," the password input screen appears. Input a password.		You can set a password for position specification from "Position edit password" on the parameter edit screen.
3	Set the position, acceleration and deceleration relating to the backward end position. Touch [Backward Position].		Touch [Menu] to return to the SEP menu screen.
4	Touch the value in Position. The numeric keypad appears. Touch [1] and [0], and touch [ENT].		Touch [Menu] to return to the position setting screen.
5	10.00 is shown in Position.		Touch [Menu] to return to the position setting screen.

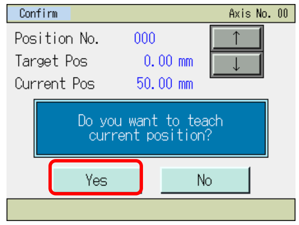
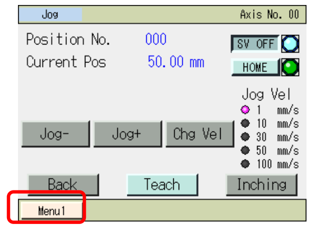
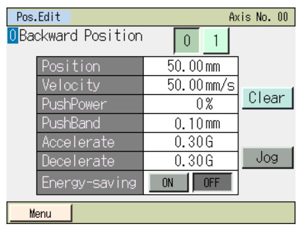
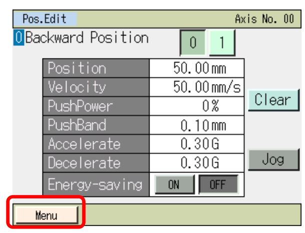
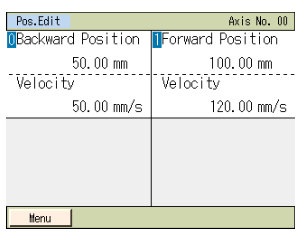
No.	Operation	Screen	Remarks
6	Touch the value in Velocity. The numeric keypad appears. Touch [5] and [0], and touch [ENT].		Touch [Menu] to return to the position setting screen.
7	50.00 is shown in Velocity.		Touch [Menu] to return to the position setting screen.
8	Touch the value in Accelerate. The numeric keypad appears. Touch [0], [.] and [3], and touch [ENT].		Touch [Menu] to return to the position setting screen.
9	0.30 is shown in Accelerate.		Touch [Menu] to return to the position setting screen.
10	Touch the value in Decelerate. The numeric keypad appears. Touch [0], [.] and [3], and touch [ENT].		Touch [Menu] to return to the position setting screen.
11	0.30 is shown in Decelerate.		Touch [Menu] to return to the position setting screen.

No.	Operation	Screen	Remarks
12	Touch [Menu].		
13	Set the position, acceleration and deceleration relating to the forward end position. Touch [Forward Position].		Touch [Menu] to return to the SEP menu screen.
14	The display switches to the forward end screen. Set the position, acceleration and deceleration relating to the forward end position.		Touch [Menu] to return to the position setting screen.
15	Touch the value in Position. The numeric keypad appears. Touch [1], [0] and [0], and touch [ENT].		Touch [Menu] to return to the position setting screen.
16	100.00 is shown in Position.		Touch [Menu] to return to the position setting screen.
17	Touch the value in Velocity. The numeric keypad appears. Touch [5] and [0], and touch [ENT].		Touch [Menu] to return to the position setting screen.
18	50.00 is shown in Velocity.		Touch [Menu] to return to the position setting screen.

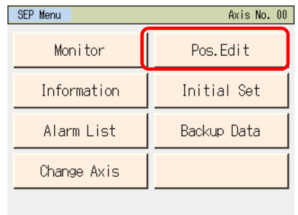
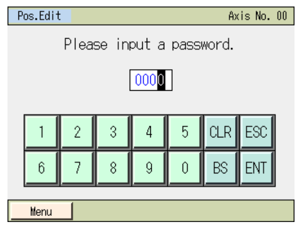
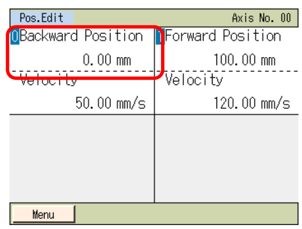
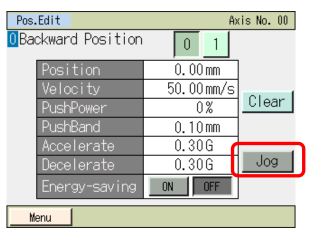
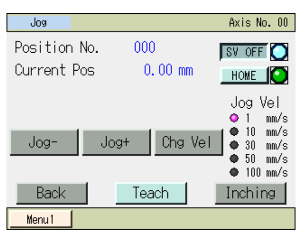
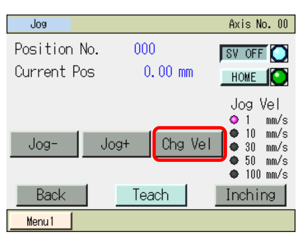
No.	Operation	Screen	Remarks
19	Touch the value in Accelerate. The numeric keypad appears. Touch [0], [.] and [3], and touch [ENT].		Touch [Menu] to return to the position setting screen.
20	0.30 is shown in Accelerate.		Touch [Menu] to return to the position setting screen.
21	Touch the value in Decelerate. The numeric keypad appears. Touch [0], [.] and [3], and touch [ENT].		Touch [Menu] to return to the position setting screen.
22	0.30 is shown in Decelerate.		Touch [Menu] to return to the position setting screen.
23	Touch [Menu].		Touch [Menu] to return to the position setting screen.
24			Touch [Menu] to return to the SEP menu screen.

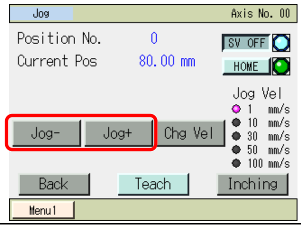
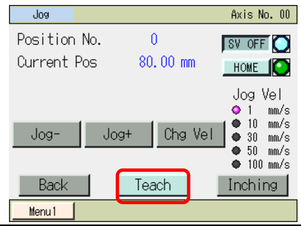
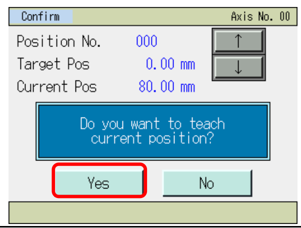
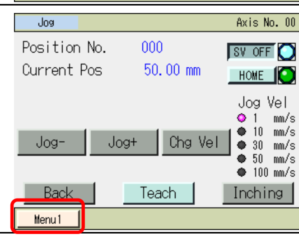
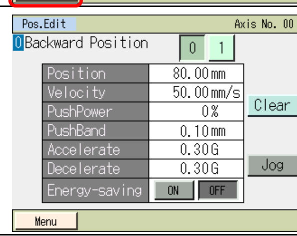
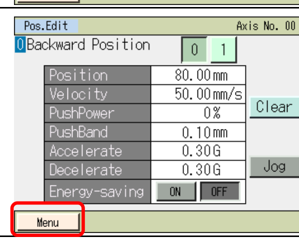
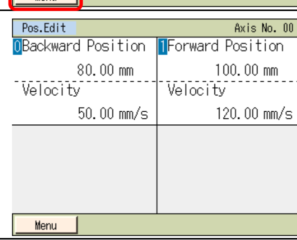
2) Direct teaching (Manually move the slider to the target position and then acquire the achieved position (current position) as the forward end position or backward end position)
An example of operation mode 0 (standard movement between 2 points) is explained.
How to acquire the current position, or 50.0 mm, as the backward end position is explained.

No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Pos.Edit].		
2	If the password is other than "0000," the password input screen appears. Input a password.		You can set a password for position setting from "Position edit password" on the parameter edit screen.
3	Set the position, acceleration and deceleration relating to the backward end position. Touch [Backward Position].		Touch [Menu] to return to the SEP menu screen.
4	Touch [Jog].		Touch [Menu] to return to the position setting screen. * Perform home return if not already completed.
5	If the servo is ON, touch [SV OFF] to turn off the servo.		
6	Manually move the slider or rod to the target position of 50.0 mm. Touch [Teach].		

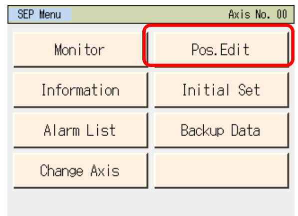
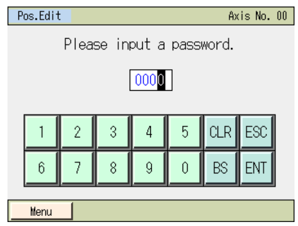
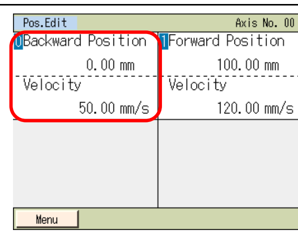
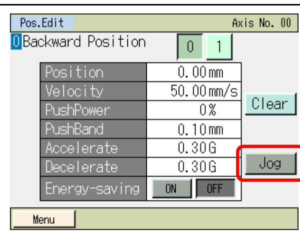
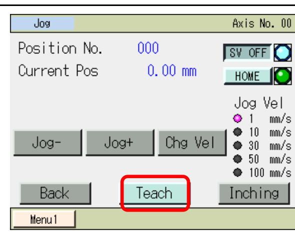
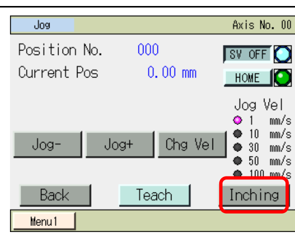
No.	Operation	Screen	Remarks
7	Touch [Yes].		
8	Touch [Menu].		
9	50.00 is shown in Position. It is now confirmed that the position data has been acquired.		Touch [Menu] to return to the position setting screen.
10	Touch [Menu].		Touch [Menu] to return to the position setting screen.
11			Touch [Menu] to return to the SEP menu screen.

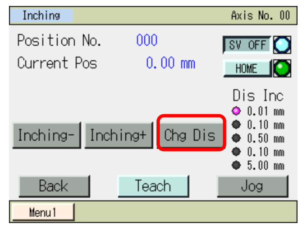
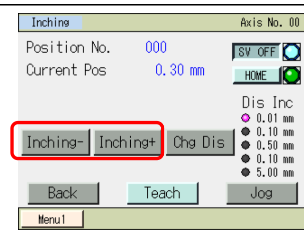
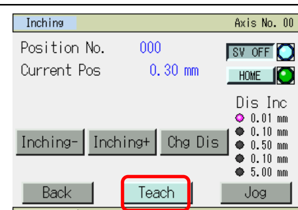
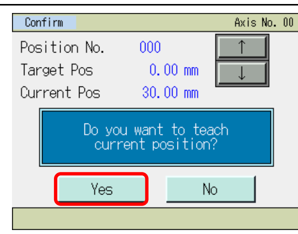
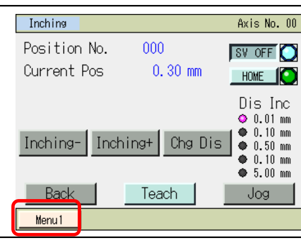
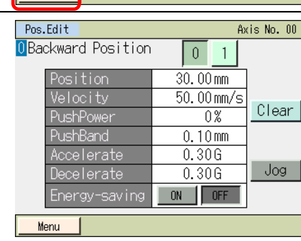
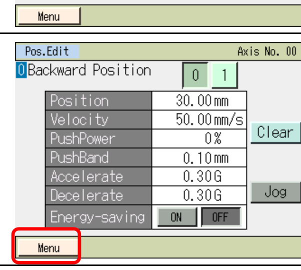
3) Jog (Use the arrow keys [Jog-] and [Jog+] to jog the actuator to the target position and then acquire the achieved position (current position) as the forward end position or backward end position).
An example of operation mode 0 (standard movement between 2 points) is explained.
How to acquire the current position, or 80.0 mm, as the backward end position is explained.

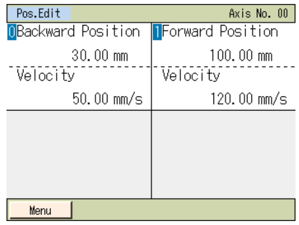
No.	Operation	Screen	Remarks
1	Touch [Pos. Edit] on the SEP menu screen.		
2	If the password is other than "0000," the password input screen appears. Input a password.		You can set a password for position setting from "Position edit password" on the parameter edit screen.
3	Set the position, acceleration and deceleration relating to the backward end position. Touch [Backward Position].		Touch [Menu] to return to the SEP menu screen.
4	Touch [Jog].		Touch [Menu] to return to the position setting screen. * Perform home return if not already completed.
5	If the servo is off, touch [SV ON] to turn on the servo.		
6	Touch [Chg Vel] to set a desired jog speed.		

No.	Operation	Screen	Remarks
7	Use [Jog-] and [Jog+] to move the slider or rod to the target position of 80.0 mm.		
8	Touch [Teach].		
9	Touch [Yes].		
10	Touch [Menu].		
11	80.00 is shown in Position. It is now confirmed that the position data has been acquired.		Touch [Menu] to return to the position setting screen.
12	Touch [Menu].		Touch [Menu] to return to the position setting screen.
13			Touch [Menu] to return to the SEP menu screen.

4) Inching (Use the arrow keys [Inching-] and [Inching+] to inch the actuator to the target position and then acquire the achieved position (current position) as the forward end position or backward end position).
An example of operation mode 0 (standard movement between 2 points) is explained.
How to acquire the current position, or 30.0 mm, as the backward end position is explained.

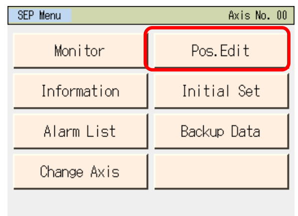
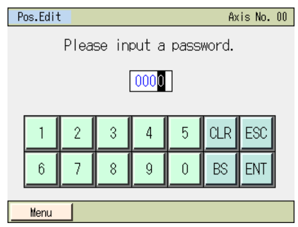
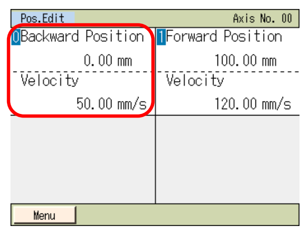
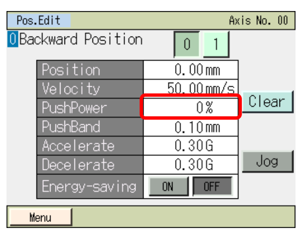
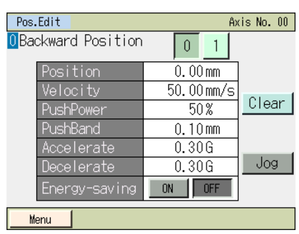
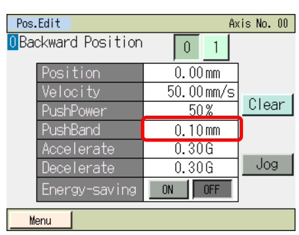
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Pos.Edit].		
2	If the password is other than "0000," the password input screen appears. Input a password.		You can set a password for position setting from "Position edit password" on the parameter edit screen.
3	Set the position, acceleration and deceleration relating to the backward end position. Touch [Backward Position].		Touch [Menu] to return to the SEP menu screen.
4	Touch [Jog].		Touch [Menu] to return to the position setting screen. * Perform home return if not already completed.
5	If the servo is off, touch [SV ON] to turn on the servo.		
6	Touch [Inching]. The display switches to the inching screen.		Touch [Menu] to return to the itemized position setting screen.

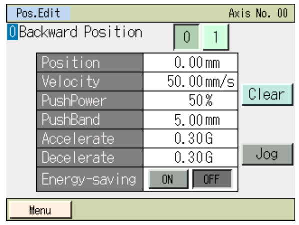
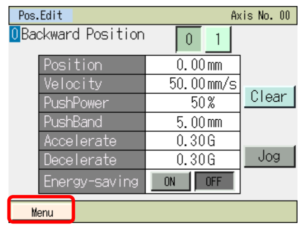
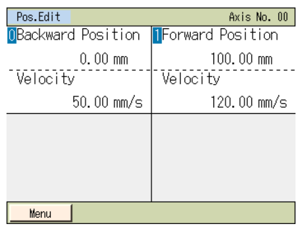
No.	Operation	Screen	Remarks
7	Touch [Chg Dis] and set a desired inching distance.		
8	Use [Inching-] and [Inching+] to move the slider or rod to the target position of 30.0 mm.		
9	Touch [Teach].		
10	Touch [Yes].		
11	Touch [Menu].		
12	30.00 is shown in Position. It is now confirmed that the position data has been acquired.		Touch [Menu] to return to the position setting screen.
13	Touch [Menu].		Touch [Menu] to return to the position setting screen.

No.	Operation	Screen	Remarks
14			Touch [Menu] to return to the SEP menu screen.

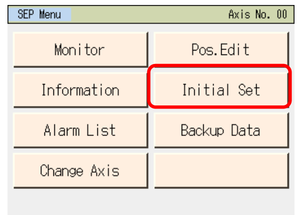
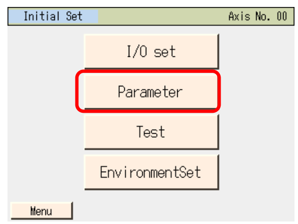
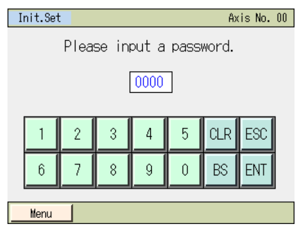
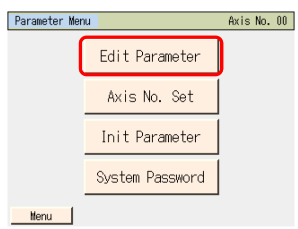
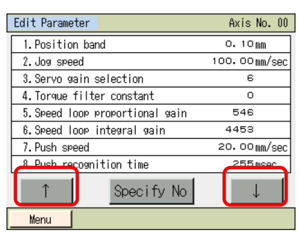
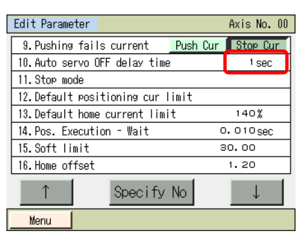
5) Setting of push-motion operation (push power, push band)
An example of operation mode 0 (standard movement between 2 points) is explained.
An example of push-motion operation at the backward end is explained.

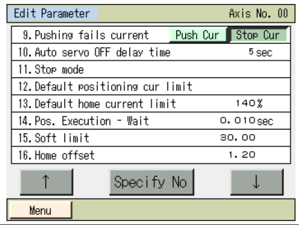
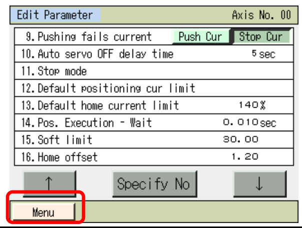
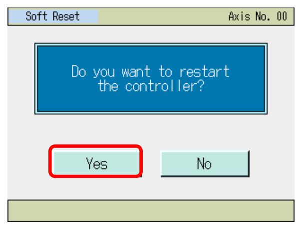
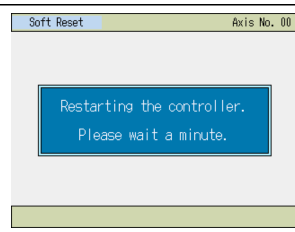
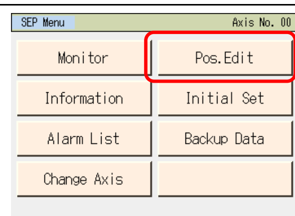
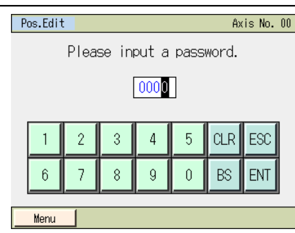
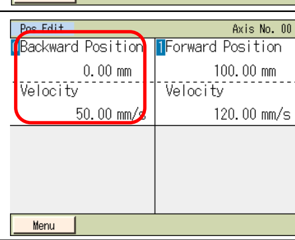
Push power: 50%, push band: 5.0 mm

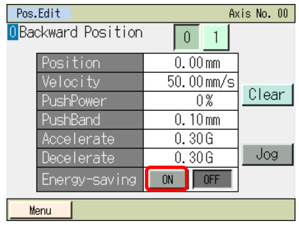
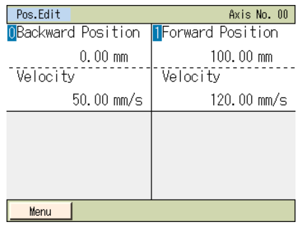
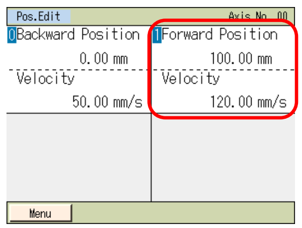
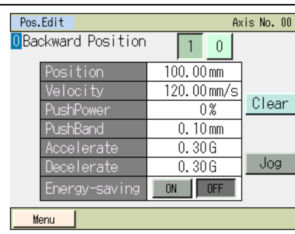
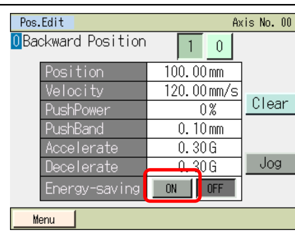
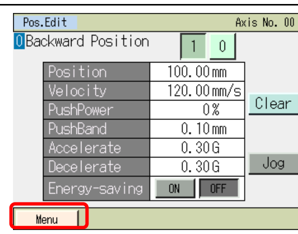
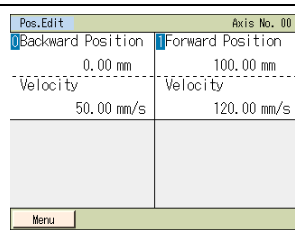
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Pos.Edit].		
2	If the password is other than "0000," the password input screen appears. Input a password.		You can set a password for position setting from "Position edit password" on the parameter edit screen.
3	Set the position, acceleration and deceleration relating to the backward end position. Touch [Backward Position].		Touch [Menu] to return to the SEP menu screen.
4	Touch the value in [PushPower]. The numeric keypad appears. Touch [5] and [0], and touch [ENT].		Touch [Menu] to return to the position setting screen.
5	50 is shown in PushPower.		Touch [Menu] to return to the position setting screen.
6	Touch the value in [PushBand]. The numeric keypad appears. Touch [5], and touch [ENT].		Touch [Menu] to return to the position setting screen.

No.	Operation	Screen	Remarks
7	5.00 is shown in Push Band.		Touch [Menu] to return to the position setting screen.
8	Touch [Menu].		Touch [Menu] to return to the position setting screen.
9			Touch [Menu] to return to the SEP menu screen.

6) Setting of ecology function (automatic servo OFF function)
An example of operation mode 0 (standard) is explained.
How to turn off the servo automatically 5.0 seconds after stopping is explained.

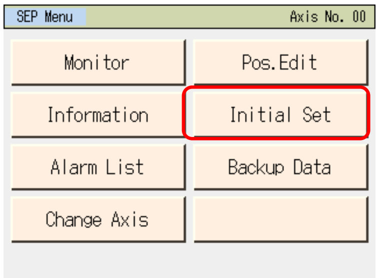
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Initial Set].		
2	Set a desired automatic servo OFF delay time. Touch [Parameter].		
3	Input a password.		The password is "5119" (default setting).
4	Touch [Edit Parameter].		
5	Touch [↑] and [↓] to navigate through the screens until the one for setting the automatic servo OFF delay time is displayed.		
6	Touch the value of automatic servo OFF delay time. The numeric keypad appears. Touch [5], and touch [ENT].		

No.	Operation	Screen	Remarks
7	5 is shown.		
8	Touch [Menu].		
9	Touch [Yes].		Touch [No], and the new setting will not be reflected in the controller until the power is reconnected.
10			
11	The controller is restarted and the SEP menu screen will appear. Touch [Pos.Edit].		
12	If the password is other than "0000," the password input screen appears. Input a password.		You can set a password for position setting with the "Position edit password" parameter on the parameter edit screen.
13	Set the ecology function at the backward end position. Touch [Backward Position].		Touch [Menu] to return to the SEP menu screen.

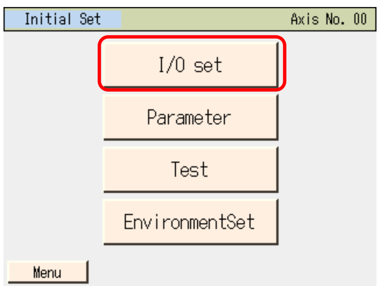
No.	Operation	Screen	Remarks
14	Touch [ON].		Touch [Menu] to return to the position setting screen.
15	Touch [Menu].		Touch [Menu] to return to the position setting screen.
16	Set the ecology function at the forward end position. Touch [Forward Position].		Touch [Menu] to return to the SEP menu screen.
17	The display switches to the forward end screen. Set the ecology function related to the forward end position.		Touch [Menu] to return to the position setting screen.
18	Touch [ON].		Touch [Menu] to return to the position setting screen.
19	Touch [Menu].		Touch [Menu] to return to the position setting screen.
20			Touch [Menu] to return to the SEP menu screen.

6.11 I/O Setting (Setting of Operation Parameters, Etc.)

You can select an operation pattern (PIO pattern) (0 to 5), set an operation mode (single solenoid, double solenoid), etc.



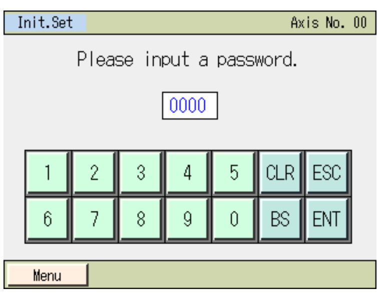
Touch [Initial Set] on the SEP menu screen.



Touch [I/O set]

Touch [Menu] to return to the SEP menu screen.

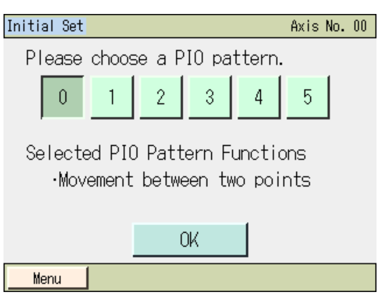
The password entry screen appears before the initial setting screen.



Enter a password value from the numeric keypad, and then touch [ENT].

The password is "5119" (default setting).

If the correct password has been entered, the display changes to the screen for setting the operation pattern.

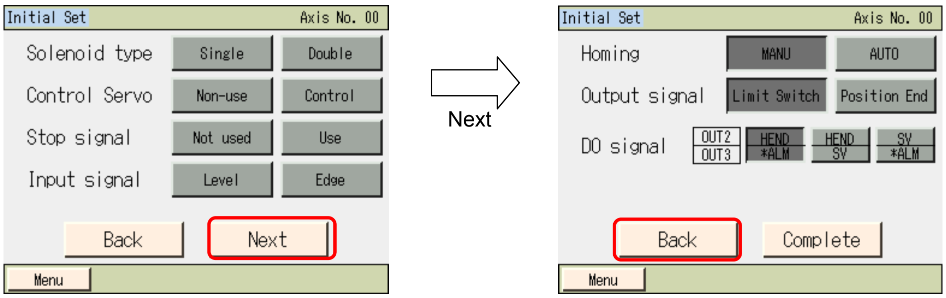


Select and touch one of operation patterns [0] to [5], and then touch [OK].

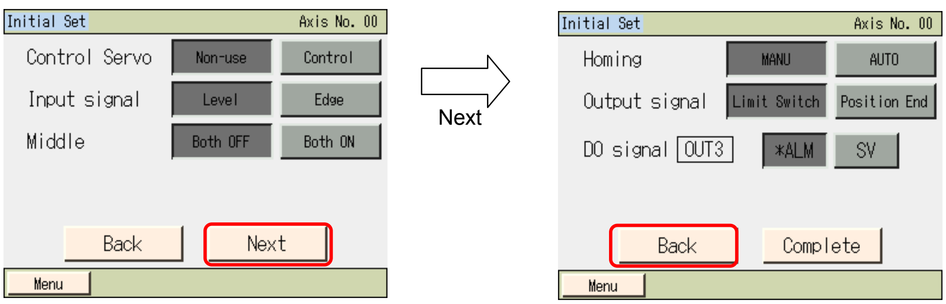
(Note) If connected to Fieldbus Type in MSEP Controllers, [6] (Positioner Mode) is shown.
If selecting [6], it is not necessary to have an operation for the initial setting.
The operation is complete.

The screen corresponding to the selected operation pattern appears.

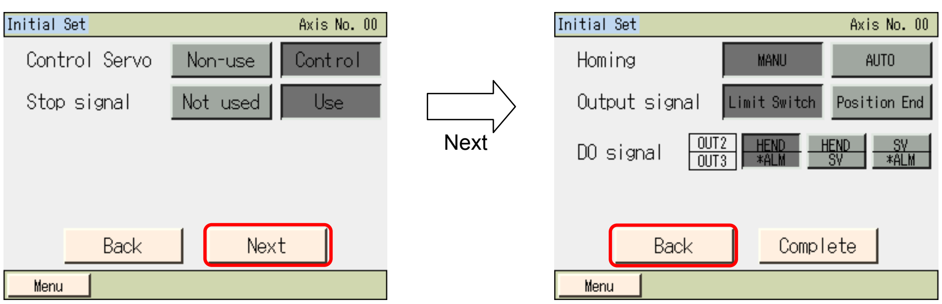
Operation pattern 0 (standard movement between 2 points), operation pattern 1 (change travel speed), operation pattern 2 (change position data)



Operation pattern 3 (movement by 2 inputs among 3 points), operation pattern 4 (movement by 3 inputs among 3 points)



Operation pattern 5 (continuous back-and-forth operation)



The items that can be set vary with each operation mode.

Touch [Back] to return to the operation pattern screen.

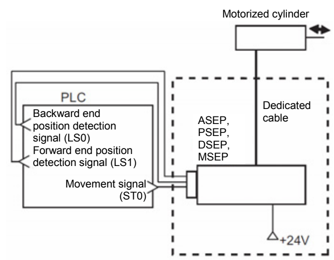
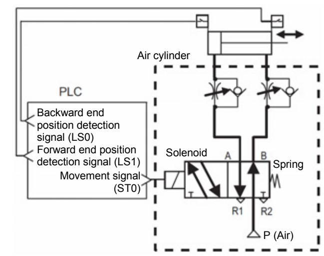
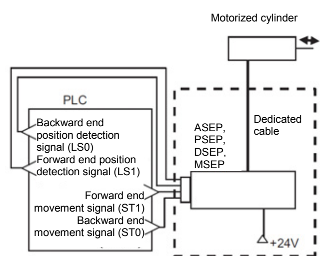
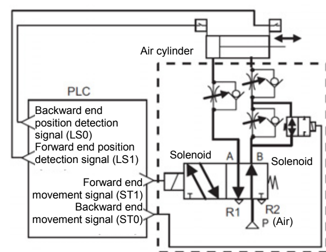
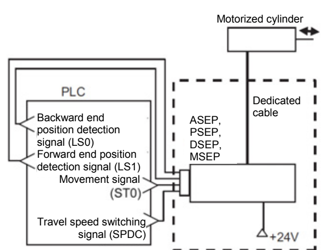
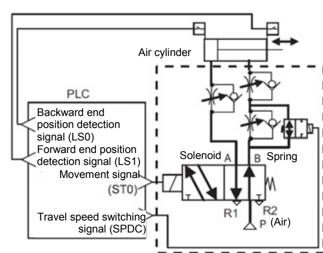
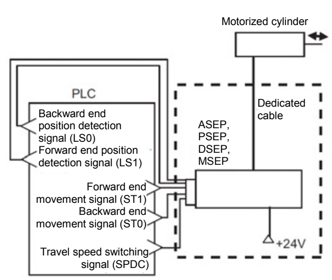
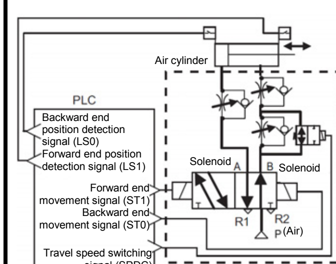
Setting item

Operation pattern	Operation mode	Intermediate position Movement method	Double solenoid type	Pause Signal *STP	Control Servo SON	OUT2, OUT3	OUT3	Home return	DO signal
	Single solenoid/ double solenoid	Both OFF/ Both ON	Level/ Edge	Not used/ Use	Non-use/ Control	HEND,*ALM/ SV,*ALM/ HEND,SV	*ALM/ SV	MANU/ AUTO	Limit switch LS/ Positioning PE
PIO pattern 0 Standard movement between 2 points	○		Double solenoid is selected ○	Single solenoid is selected ○	○	○		○	○
PIO pattern 1 Change travel speed	○		Double solenoid is selected ○	Single solenoid is selected ○	○	○		○	○
PIO pattern 2 Position data change	○		Double solenoid is selected ○	Single solenoid is selected ○	○	○		○	○
PIO pattern 3 Movement by 2 inputs among 3 points		○			○		○	○	○
PIO pattern 4 Movement by 3 inputs among 3 points			○		○		○	○	○
PIO pattern 5 Continuous back-and-forth operation				○	○	○		○	○

For details on each setting item, refer to the operation manual for your "ASEP/PSEP/DSEP controller Operation Manual", "MSEP controller Operation Manual".

Operation pattern

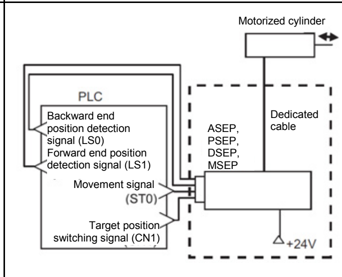
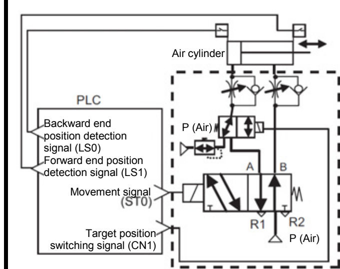
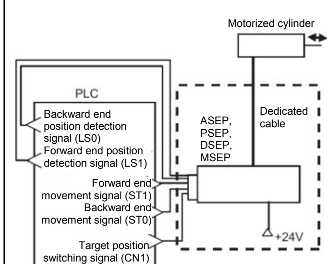
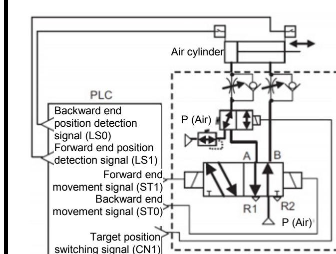
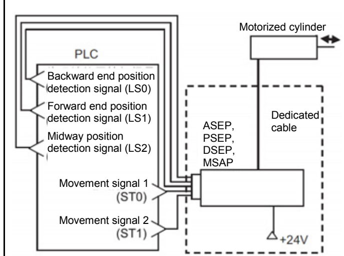
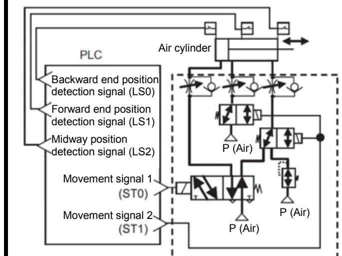
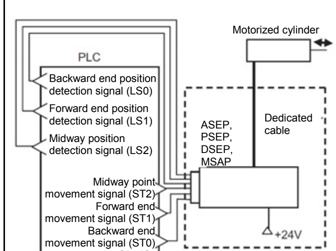
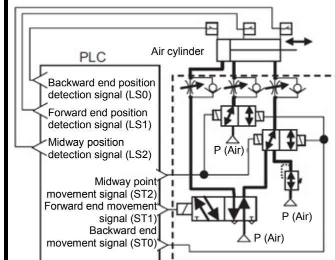
Equivalent air cylinder circuits are shown for your reference.

Operation pattern	Description	Motorized cylinder connection method	Air cylinder circuit (reference)
PIO pattern 0 Single solenoid type (Standard movement between 2 points)	The actuator can be moved between two points using the same control you normally use with an air cylinder. The target position (forward end, backward end) can be set. The travel speed and acceleration/deceleration can be specified. Push-motion operation can also be performed.		
PIO pattern 0 Double solenoid type (Standard movement between 2 points)			
PIO pattern 1 Single solenoid type (Movement between 2 points) (Change travel speed)	The actuator can be moved between two points using the same control you normally use with an air cylinder. The speed can be changed during movement. The target position (forward end, backward end) can be set. The travel speed and acceleration/deceleration can be specified. Push-motion operation can also be performed.		
PIO pattern 1 Double solenoid type (Movement between 2 points) (Change travel speed)			

(Note) The air cylinder circuits are drawn with signal symbols corresponding to those used by ASEP/PSEP/DSEP/MSEP controllers.
For details on signal symbols, refer to your "ASEP/PSEP/DSEP Operation Manual", "MSEP controller Operation Manual".

Operation pattern

Equivalent air cylinder circuits are shown for your reference.

Operation pattern	Description	Motorized cylinder connection method	Air cylinder circuit (reference)
PIO pattern 2 Single solenoid type (Movement between two points) (Position data change)	The actuator can be moved between two points using the same control you normally use with an air cylinder. You can switch between positioning operation and push-motion operation during operation. The target position (forward end, backward end) can be set. The travel speed and acceleration/deceleration can be specified. Push-motion operation can also be performed.		
PIO pattern 2 Double solenoid type (Movement between two points) (Position data change)			
PIO pattern 3 Single solenoid type (Movement by 2 inputs among 3 points)	The actuator can be moved among three points using the same control you normally use with an air cylinder. The target position (forward end, backward end) can be set. The travel speed and acceleration/deceleration can be specified. Push-motion operation can also be performed.		
PIO pattern 4 Double solenoid type (Movement by 3 inputs among 3 points)	The actuator can be moved among three points using the same control you normally use with an air cylinder. The target position (forward end, backward end) can be set. The travel speed and acceleration/deceleration can be specified. Push-motion operation can also be performed.		
PIO pattern 5 (Continuous back-and-forth operation)	The actuator moves back and forth between the two points of forward end and backward end. The target position (forward end, backward end) can be set. The travel speed and acceleration/deceleration can be specified. Push-motion operation can also be performed.		

(Note) The air cylinder circuits are drawn with signal symbols corresponding to those used by ASEP/PSEP/DSEP/MSEP controllers.
For details on signal symbols, refer to your "ASEP/PSEP/DSEP Operation Manual", "MSEP controller Operation Manual".

[1] Types of I/O setting (setting of operation parameters, etc.)

[Operation mode]
Select either the single-solenoid operation mode or double-solenoid operation mode.

[Intermediate move method]
Select whether to move to the intermediate position with both ST0 and ST1 turned ON, or OFF, when operation pattern 3 is set.

[Double solenoid type]
Select either Level or Edge as the condition for turning the double solenoids ON when the double-solenoid type operation mode and operation pattern 4 are set.

[Pause signal *STP]
Select whether to use or not use the pause signal *STP (input to IN2) when the single-solenoid type operation mode and operation pattern 5 are set.

[Servo control SON]
Select whether to use or not use the servo control (IN3 input signal SON (servo ON/OFF control)).

[Output signal selection, operation pattern 0, 1, 2, 5]
When operation pattern 0, 1, 2 or 5 is set, set the OUT2 and OUT3 output signals if you have selected to use the servo control.
Select from the three patterns shown in the table.

	Selection 1	Selection 2	Selection 3
OUT2	HEND (home return complete signal)	SV (servo ON output signal)	HEND (home return complete signal)
OUT3	*ALM (alarm output signal)	*ALM (alarm output signal)	SV (servo ON output signal)

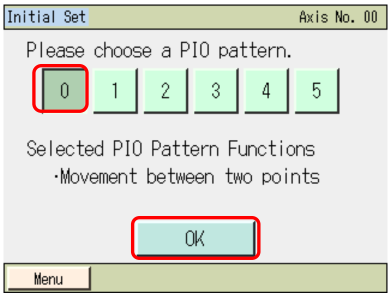
[Output signal selection operation pattern 3, 4]
When operation pattern 3 or 4 is set, set the OUT3 output signal if you have selected to use the servo control.
* Select either ALM (alarm status signal) or SV (servo ON status signal).

[Home return operation]
Select a home return method.
- AUTO: Home return starts when the power is turned on.
- MANU: Home return starts when the first ST0 signal is input following the power on.

[Output signal]
Select the output signal to turn ON when the actuator moves and positioning is completed.
Select either Limit Switch (LS) or Position End (PE).

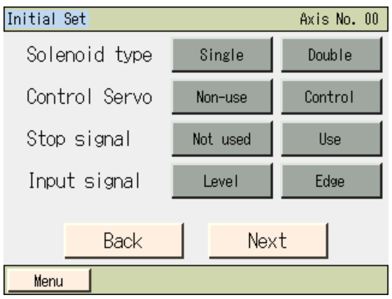
[2] Basic operation

The setting method is explained using an example of operation pattern 0.

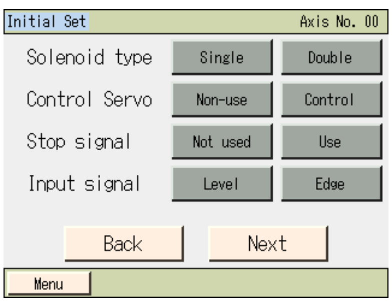


Touch [0] and touch [OK].

Touch [Menu] to return to the initial setting menu screen.

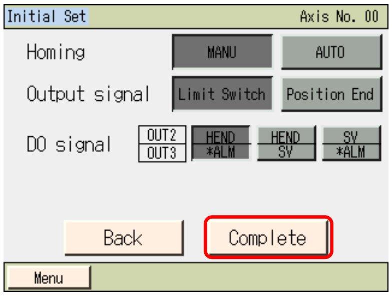


Touch [Menu] to return to the initial setting menu screen.



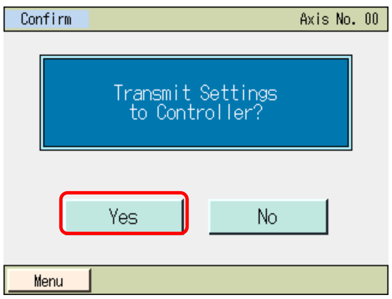
Select and touch either [Single] or [Double].

Hereafter, set one by one the items denoted by a O in the table of setting items (P. 146).
When all items on this screen have been set, touch [Next].



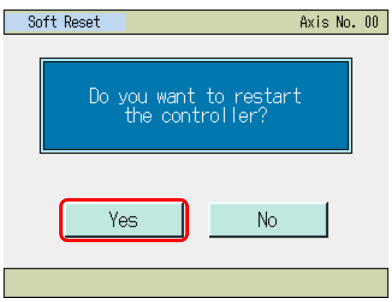
When the setting is complete, touch [Complete].

Touch [Back] to return to the operation pattern selection screen. All settings you have made under the selected operation pattern become invalid.

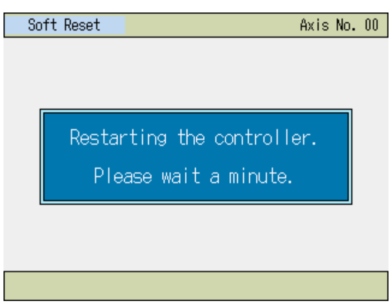


Touch [Yes].

Touch [No] to return to the initial setting screen. All settings you have made under the selected operation pattern become invalid.



Touch [Yes].
The controller is restarted.
The controller operates according to the operation pattern settings you have made.
The display returns to the SEP menu screen.

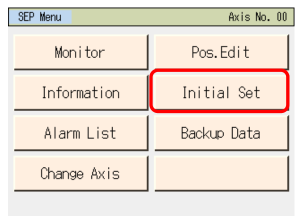
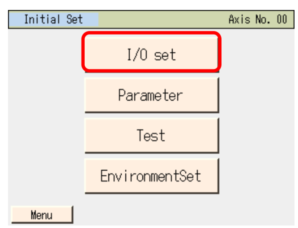
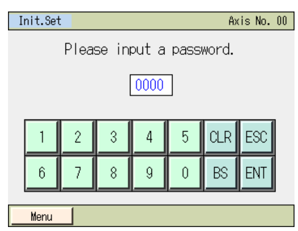
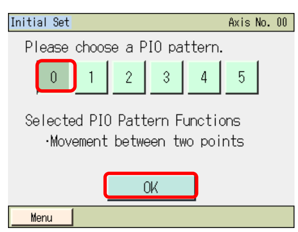
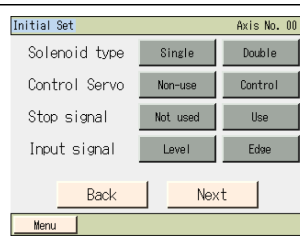


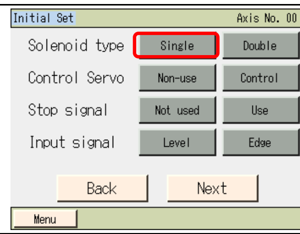
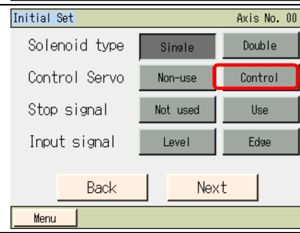
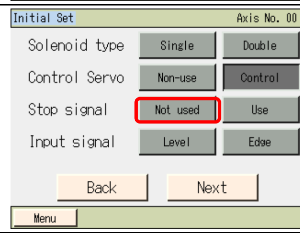
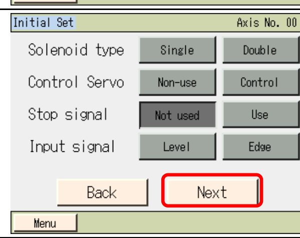
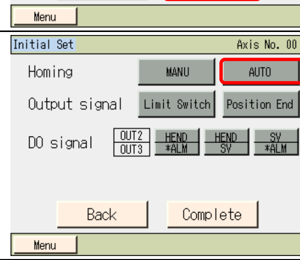
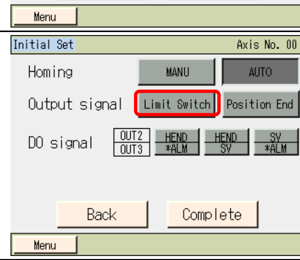
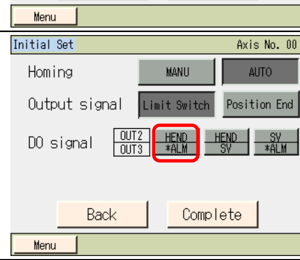
Touch [No], and the controller will not operate according to the operation pattern settings you have made until restarted.

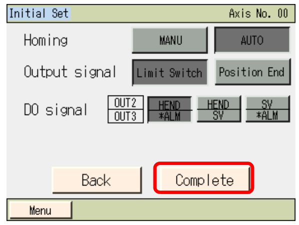
[3] Examples of I/O setting operations
Respective operations are explained by giving specific examples.

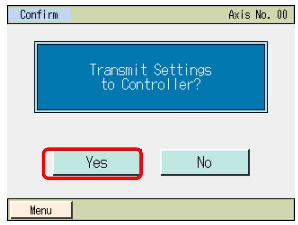
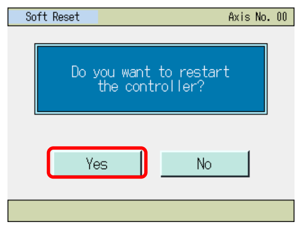
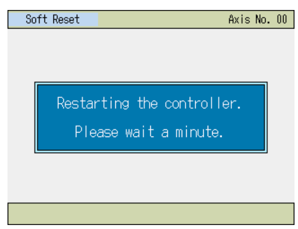
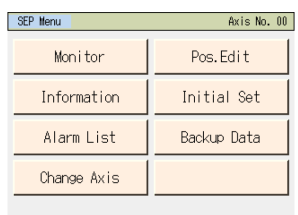
Example of operation mode 0 (standard movement between 2 points) Set as follows:

Operation mode	Single solenoid
Use of pause command (*STP)	Not used
Control Servo	Control
OUT2, OUT3 output signals	OUT2 HEND, OUT3 *ALM
Home	AUTO (start home return upon power on)
DO signal	LS0 (backward end position detection), LS1 (forward end position detection)

No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Initial Set].		
2	Touch [I/O set].		Touch [Menu] to return to the SEP menu screen.
3	Input a password.		The password is "5119" (default setting).
4	Touch [0] and touch [OK]. Operation pattern 0 is selected.		Touch [Menu] to return to the initial setting menu screen.
5			Touch [Menu] to return to the initial setting menu screen.

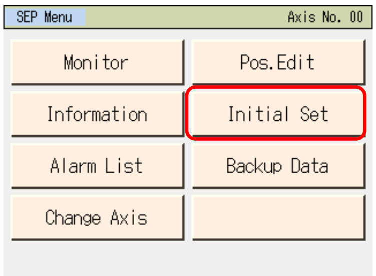
No.	Operation	Screen	Remarks
6	Touch [Single]. The single-solenoid operation mode is selected.		Touch [Menu] to return to the initial setting menu screen.
7	Touch [Control]. Servo control is selected.		Touch [Menu] to return to the initial setting menu screen.
8	Touch [Not used]. Non-use of pause command (*STP) is selected.		Touch [Menu] to return to the initial setting menu screen.
9	Touch [Next].		
10	Touch [AUTO]. AUTO home return is selected.		Touch [Menu] to return to the initial setting menu screen.
11	Touch [LimitSwitch]. LS0 (backward end position detection) and LS1 (forward end position detection) are selected as the output signals.		Touch [Menu] to return to the initial setting menu screen.
12	Touch [HEND*ALM]. HEND and *ALM are selected as the OUT2 and OUT3 outputs.		Touch [Menu] to return to the initial setting menu screen.

<table>
<tr><th>No.</th><th>Operation</th><th>Screen</th><th>Remarks</th></tr>
<tr><td>13</td><td>Touch [Complete].</td><td>
</td><td>Touch [Back] to return to the operation pattern selection screen.

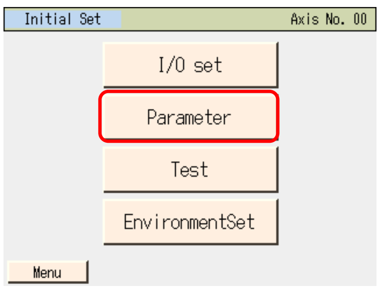
Touch [Menu] to return to the initial setting menu screen.</td></tr>
<tr><td>14</td><td>Touch [Yes].</td><td>
</td><td></td></tr>
<tr><td>15</td><td>Touch [Yes].</td><td>
</td><td>The controller does not operate according to the operation pattern settings you have made until restarted.</td></tr>
<tr><td>16</td><td></td><td>
</td><td></td></tr>
<tr><td>17</td><td></td><td>
</td><td>After the controller has restarted, the display switches to the SEP menu screen.</td></tr>
</table>

6.12 Parameters (Parameter Editing, Axis Number Setting, Parameter Initialization to Factory Default Settings, System Password)

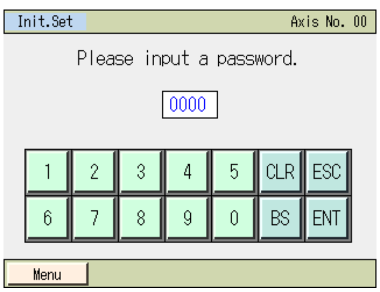
Parameters and axis number are set. You can change the system password or reset the parameters to their factory default settings.



Touch [Initial Set] on the SEP menu screen.

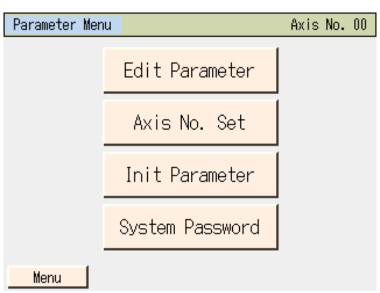


Touch [Parameter].



Enter a password value from the numeric keypad, and then touch [ENT].

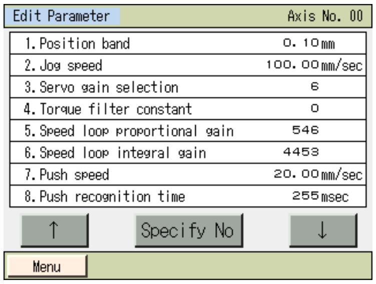
The password is "5119" (default setting).



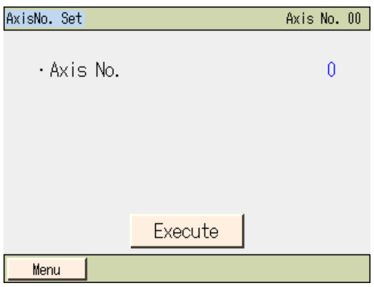
Select and touch [Edit Parameter], [Axis No. Set], [Init. Parameter] or [System Password].

The screen corresponding to the selected menu item appears.

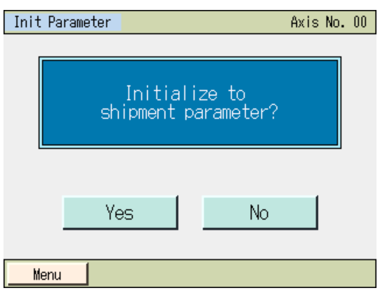
- Edit Parameter: Set 36 types of parameters.



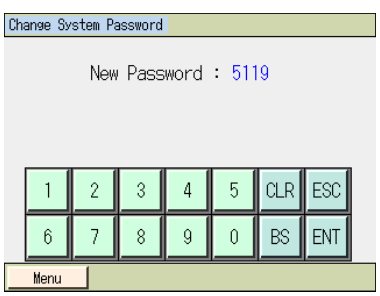
- Axis No. Set: Set the axis number.



- Init Parameter: You can reset the parameters to their factory settings (initialize the parameters).



- Change System Password: You can change the password for parameter editing.



[1] Types of parameter editing
For details on each parameter, refer to the operation manual for your ASEP/PSEP/DSEP controller or MSEP controller.

(Default positioning band)
Set the default positioning band.

(Jog speed)
Set the speed of jog operation.

(Servo gain number)
Set the servo gain number that determines the response of position control loops in servo control.

(Torque filter constant)
Set the torque filter time constant that determines the filter time constant for torque commands in servo control.

(Speed loop proportional gain)
Set the speed loop proportional gain that determines the response of speed control loops in servo control.

(Speed loop integral gain)
Set the speed loop integral gain that determines the response of speed control loops in servo control.

(Push speed)
Set the speed of push-motion operation.

(Push recognition time)
Set the push recognition time to recognize completion of operation after the work part was contacted in push-motion operation.

(Pushing fails current)
Set whether to use the push current or stop current as the current limiting value when the work part was missed in push-motion operation.
For ASEP/DSEP/MSEP (for servo motor), if the stop current is selected when the work part was missed in push-motion operation, the torque limit at the travel current limiting value is set.

(Auto servo OFF delay time)
Set the time until the servo turns off automatically when the ecology function is enabled.

(Stop mode) Displayed for PSEP, MSEP (for pulse motor) controllers
Set whether to implement servo stop based on the full servo control method or complete stop without servo control when the actuator stops.

(Note) When this parameter is changed, the new setting will not be reflected until the position data is written to the controller again.

(Current limiting value while stopped after positioning) Displayed for PSEP, MSEP (for pulse motor) controller
Set the current limiting value to be applied while the actuator is stopped after positioning.

(Current limiting value during home return)
Set the current limiting value to be applied during home return operation.

(Position execution wait time during continuous operation)
Set the stop time after the current movement is completed until the next movement is performed when operation pattern 5 (continuous operation) is set.

(Soft limit)
Set the positive soft limit.

(Home return offset)
Set the offset for home return.

(Home return direction)
Set whether to perform home return in the motor direction or front side direction.
The home return direction cannot be changed for some actuators, such as rod-type actuators.

(Simple Absolute board) Displayed for absolute specification controllers
Set whether to enable or disable this function when the controller is of absolute specification.

(Battery maintenance) Displayed for absolute specification controllers
Set how long the data will be maintained by the absolute battery when the controller is of absolute specification.

(Position edit password)
Set the password for editing position data.

(Zone boundary 1+)
Set the positive side in the area where the zone signal (ZONE1) turns ON.

(Zone boundary 1−)
Set the negative side in the area where the zone signal (ZONE1) turns ON.

(Zone boundary 2+)
Set the positive side in the area where the zone signal (ZONE2) turns ON.

(Zone boundary 2-)
Set the negative side in the area where the zone signal (ZONE2) turns ON.

(PIO inching distance)
Set the inching distance to the inching input command from PLC.

(Total moving count threshold)
An alarm will be generated if the total number of times of movement exceeds the setting value in this parameter.

(Total moving distance threshold)
An alarm will be generated if the total distance of movement exceeds the setting value in this parameter.

(High–output setting)
Set whether using high-output function. However, it is necessary to connect to an actuator (Note 1) applied to the high-output.
Note 1 High-output applicable actuators: RCP4, RCP5 series

(BU speed loop proportional gain)
When the high-output function is set activated, the settings in this parameter get effective for the velocity loop proportional gain.

(BU speed loop integral gain)
When the high-output function is set activated, the settings in this parameter get effective for the velocity loop integrated gain.

(Overload caution load level ratio)
The overload warning (message level) turns on when the set rated current ratio is exceeded.

(Light error alarm output select)
If setting 0, ALM output will be made when the rated current ratio exceeds the value set in the overload level parameter.
If setting 1, an output will also be made even for a message level alarm such as the maintenance information error as well as the overload level result.

(Active / Inactive Axis Select)
When operation is desired with less number of axes than those purchased, set this parameter inactivated to make it defined as an inactive axis so no alarm can be occurred.
This can be utilized when operating with a specific axis for trial run, or can be kept as an axis for future extension.

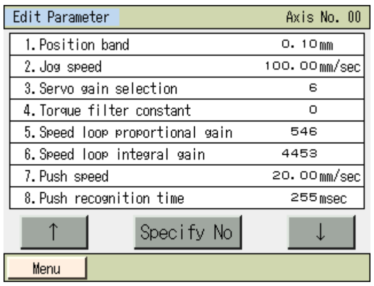
(Excitation Phase Signal Detection Operation Initial Movement Direction)
Excitation detection (Note 1) is executed at the first servo-on after the power is turned on. The direction of detection at this time is to be defined.
It is not necessary to change this setting in ordinary use, however, the direction setting can be changed considering the motor movement in such cases that it is interfered with the mechanical end or peripherals when the power is turned on.
Note 1: Excitation detection is executed when the home-return operation is completed for Simple Absolute Type.

(Excitation Phase Signal Detection Time)
Excitation detection (Note 2) is executed at the first servo-on after the power is turned on. The duration of detection at this time is to be defined.
It is not necessary to change this setting in ordinary use, however, changing this parameter setting could be an effective way to solve when an excitation detection error or an abnormal operation is occurred.
Contact IAI when it is necessary to change this parameter.
Note 2: Excitation detection is executed when the home-return operation is completed for Simple Absolute Type.

(Excitation Detection Type)
Excitation detection (Note 3) is executed at the first servo-on after the power is turned on, and this operation can be made even smoother and quieter with the new method (in our company's comparison).
Note 3: Excitation detection is executed when the home-return operation is completed for Simple Absolute Type.

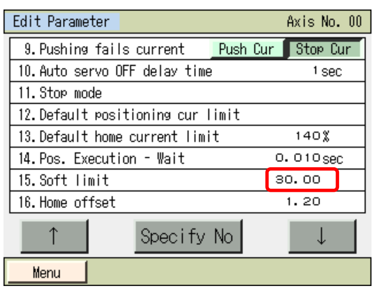
[2] Basic operation
Set parameters.

[Parameter]

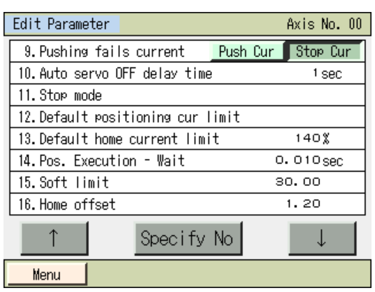


Touch [↑] to return to the previous screen.
Touch [↓] to move to the next screen.
Three screens are available, including one showing the default positioning band and others used to edit position data and password.
Touch [Menu] to return to the parameter menu screen.

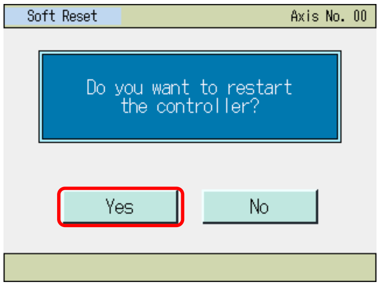
An example of setting a soft limit is explained.
Touch [↑] and [↓] on the displayed screen until the soft limit setting screen appears.



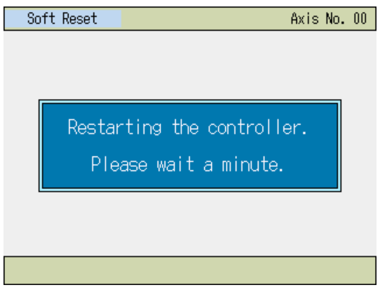
Touch the current value.
When the numeric keypad appears, enter a desired value and then touch [ENT].



Change parameters and touch [Menu] to return to the controller restart screen.

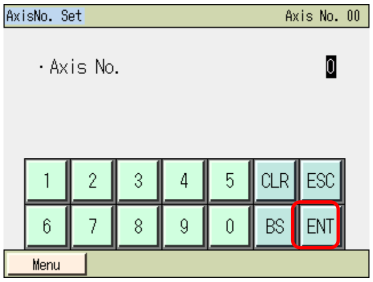


Touch [Yes].
The controller is restarted.
The controller operates according to the operation pattern settings you have made.
The display returns to the initial setting screen.

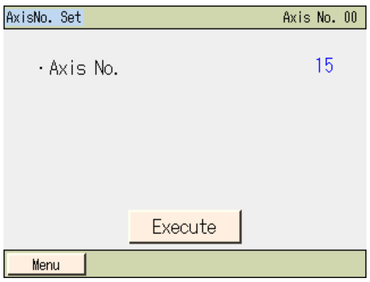


Touch [No], and the controller will not operate according to the operation pattern parameters you have set until restarted.

[Axis No. Set] Set the axis number.

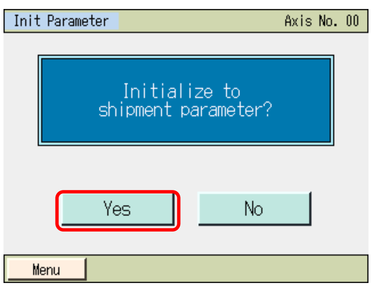


Touch Axis No.
When the numeric keypad appears, enter a desired value and then touch [ENT].



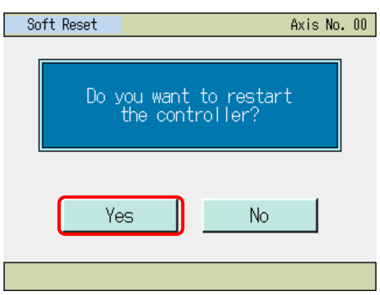
Touch [Execute].
In this example, 15 is set.

[Init Parameter]
The parameters are reset to their factory default settings.



Touch [Yes].

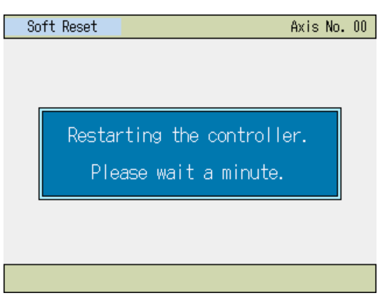
Touch [No] to return to the parameter menu screen without resetting the parameters to their factory default settings.



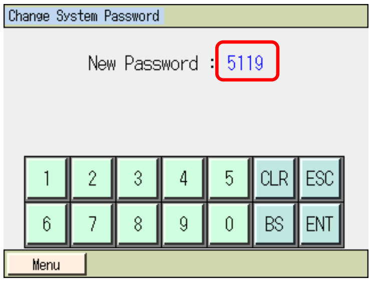
Touch [Yes].

The controller is restarted.
The controller operate according to the factory-set parameters.
The display returns to the initial setting screen.

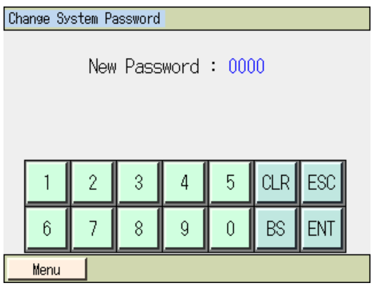
Touch [No], and the controller will not operate according to the factory-set parameters until restarted.



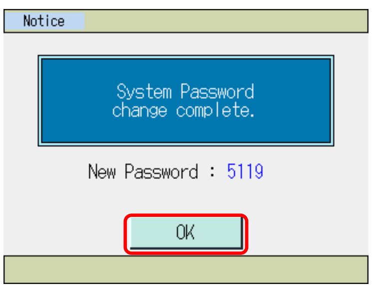
[Change System Password]
Change the password for parameter editing.



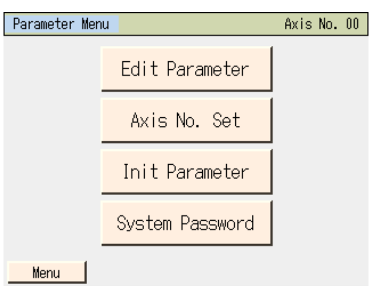
Touch New Password.
When the numeric keypad appears, enter a desired value and then touch [ENT].



Touch [Change].

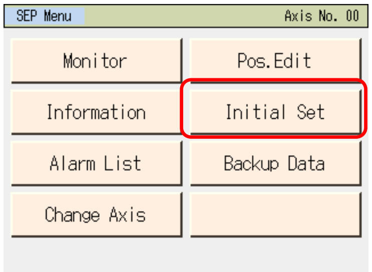


The system password changes.
Touch [OK] to return to the parameter menu screen.

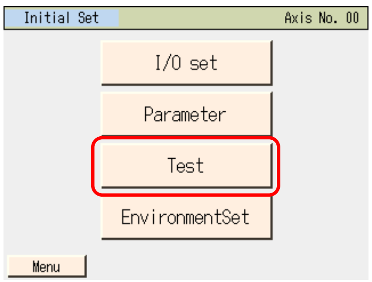


6.13 Test (I/O Tests, Operation Tests for Axis Movement)

You can perform I/O tests and operation tests for axis movement.

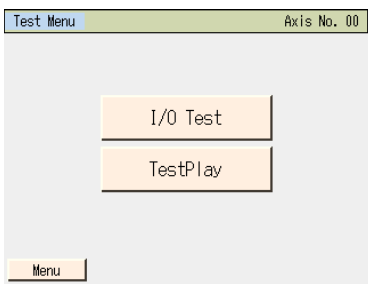


Touch [Initial Set] on the SEP menu screen.



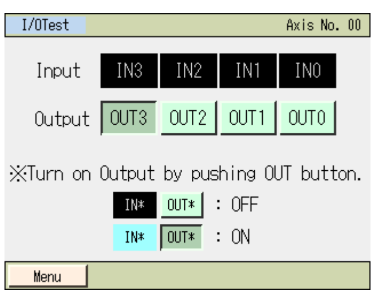
Touch [Test].

Touch [Menu] to return to the SEP menu screen.



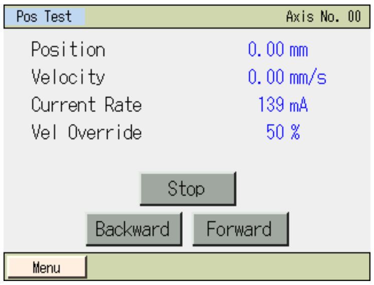
Select and touch either [I/O Test] or [TestPlay].

- I/O Test: PIO input signals can be monitored.
  Also, the output signals can be forcibly turned ON or OFF by touching OUT0, OUT1, OUT2 and OUT3.

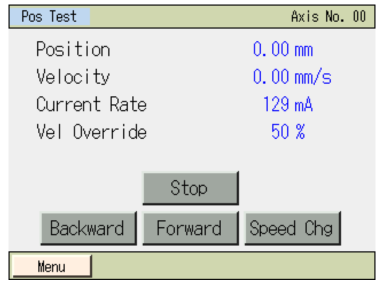


- Pos Test: Operation tests for axis movement can be performed.
  The screen corresponding to the selected operation pattern appears.

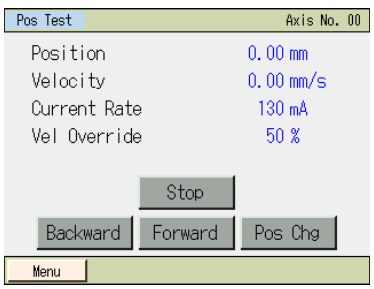
Operation pattern 0
(standard movement between 2 points)



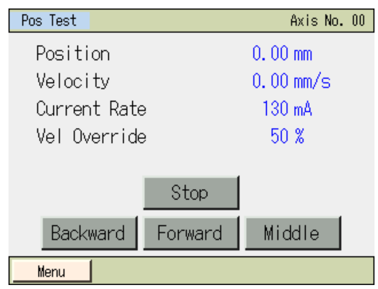
Operation 1 (change travel speed)



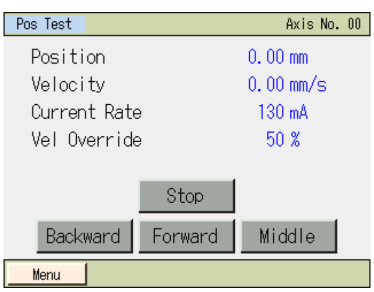
Operation pattern 2 (change position data)



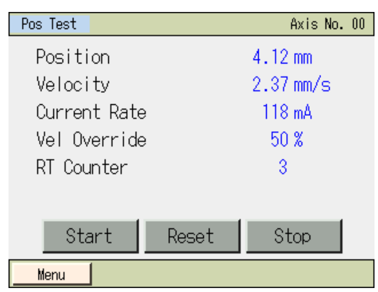
Operation pattern 3
(movement by 2 inputs among 3 points)



Operation pattern 4
(movement by 3 inputs among 3 points)

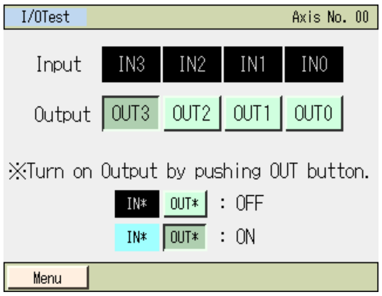


Operation pattern 5
(continuous back-and-forth operation)



[1] Basic operation

[I/O test]



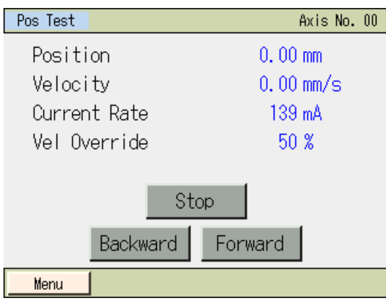
ON/OFF of input signals can be monitored.

The output signals OUT0 to OUT3 can be forcibly output by touching each signal.

Touch [Menu] to return to the test menu screen.

[Pos Test]

The operating method is explained using an example of operation pattern 0.



The current axis position is indicated.

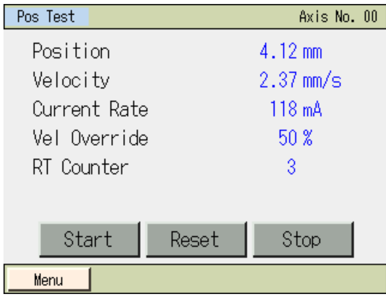
The axis speed is indicated.

The electric rated current ratio/current value of the axis is indicated by a percentage of the rating.

Touch [Menu] to return to the test menu screen.

- Backward :Touching [Backward] moves the actuator backward.
- Forward :Touching [Forward] moves the actuator forward.
- Stop :Touching [Stop] is stopped.
- Vel Override :The speed override changes to 10%, 50% and 100% every time [Vel Override] is touched.

The settings of operation pattern 5 (continuous back-and-forth operation) vary partially from other operation patterns.



The current axis position is indicated.

The axis speed is indicated.

The electric current of the axis is indicated by a percentage of the rating.

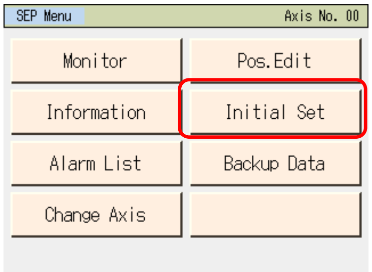
The electric rated current ratio/current value of the axis is indicated by a percentage of the rating.

- Start :Continuous operation stops once the operation test screen appears.
  Touching [Start] causes the actuator to move back and forth continuously at the speed set by the override parameter.
- Stop :Touching [Stop] stops the actuator.
- Reset :Touching [Reset] resets the back-and-forth counter to 0.

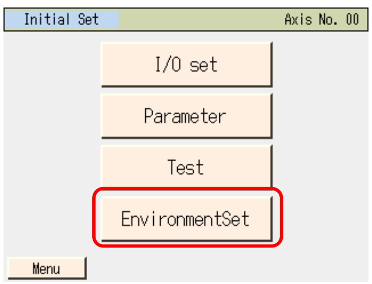
Continuous operation resumes once the operation test screen closes.

6.14 Environment setting (Sound, Language, Auto Monitor, Display (Screen Adjustment))

You can set the sound, language and auto monitor and adjust the screen.



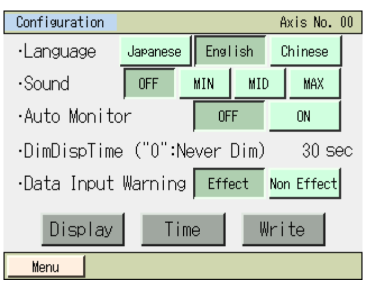
Touch [Initial Set] on the SEP menu screen.



Touch [EnvironmentSet].

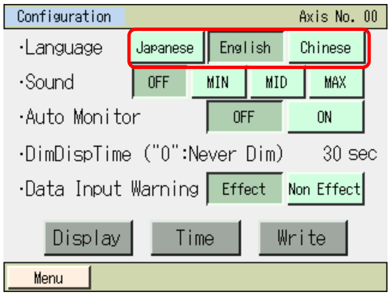
Touch [Menu] to return to the SEP menu screen.

The environment setting screen appears.



[1] Basic operation

- Language: Select Japanese or English as the display language.
  Display for Japanese/English/Chinese languages setting change (Option model code: ENG)

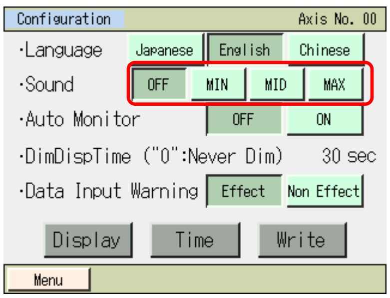


Select and touch [Japanese] or other desired language.

Touch [Write].

(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

- Sound: Set whether to output or not output a touch tone.

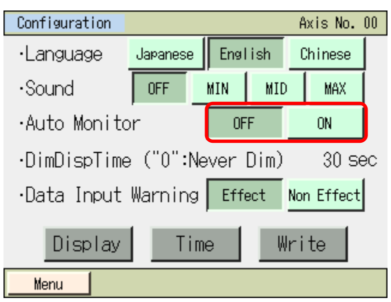


Touch [OFF]. A touch tone is not output.
Touch either of [MAX], [MID] or [MIN]. A touch tone is output.

Touch [Write].

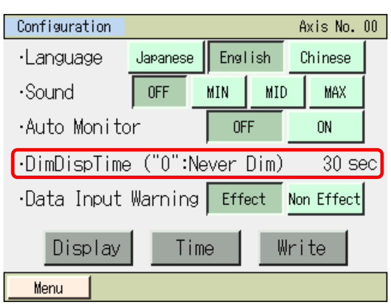
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

- Auto Monitor: You can have the monitor screen appear first after the touch-panel teaching pendant is connected.



Touch [ON] to enable the auto monitor setting.

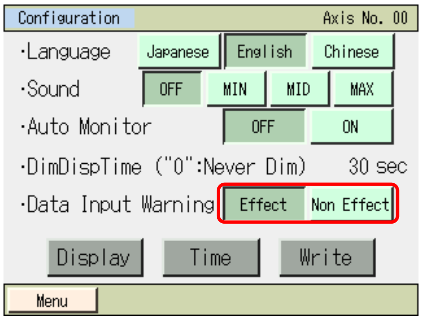
- Dim Display Time: You can set a desired time after which the display of the touch-panel teaching pendant will turn off. If "0 sec" is set, the display will remain lit at all times.



Touch •DimDispTime ("0":Never Dim) 30 sec.

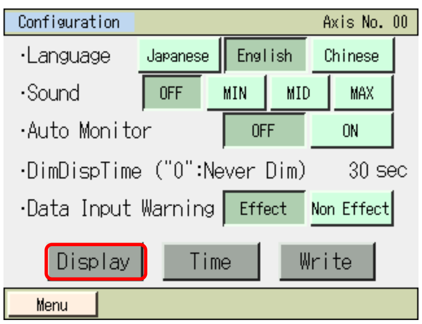
When the numeric keypad is displayed, use the keypad to enter the light off time.
A desired value between 1 and 255 sec can be set.

- Data Input Warning: An alarm can be generated if a value below the minimum velocity or above the rated acceleration/deceleration is input in the position data. Even though, it is possible to input a value below the minimum velocity or above the rated acceleration/deceleration.



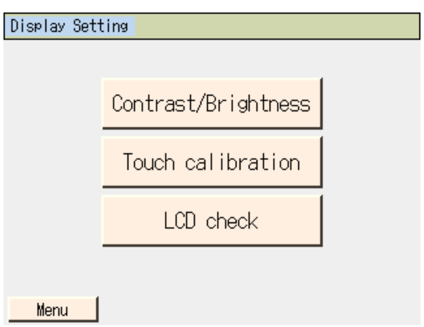
Touch [Effect] to activate it, and an alarm will be generated.
Touch [Non Effect] to inactivate it, and an alarm will not occur.

[Display]
Adjustment of contrast and brightness of the screen, position tuning for touch panel and LCD screen check can be performed.



Touch [Display].

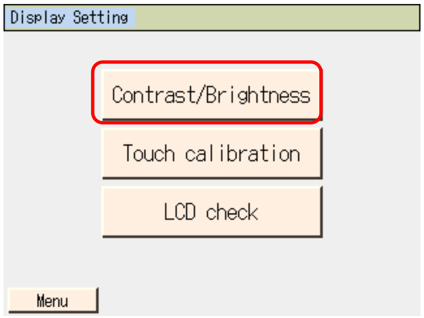
Display menu Window is displayed.



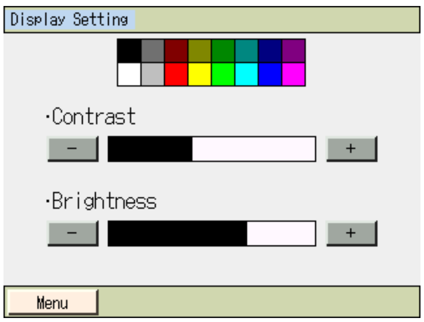
Select Display Setting menu.

Touch [Menu] and the display returns to EnvironmetSet screen.

●Change the Contrast/Brightness



Touch [Contrast/Brightness].

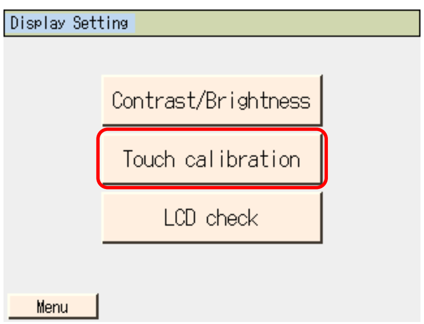


Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

Brightness adjustment
Touch [–] and [+] under Brightness to adjust the brightness of the screen.

Touch [Menu] and the display returns to Display menu screen.

●Touch calibration
A calibration for the position detection of the touch panel is performed.



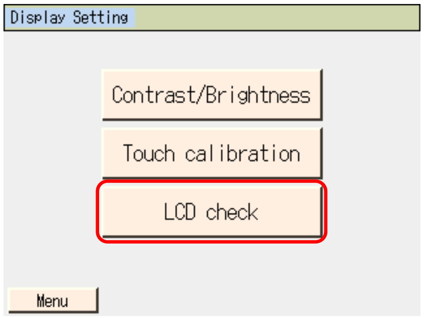
Touch [Touch Calibration].

Touch [・] in the order of 1, 2, 3 and 4.

Touch [Menu] and the display returns to Display menu screen.

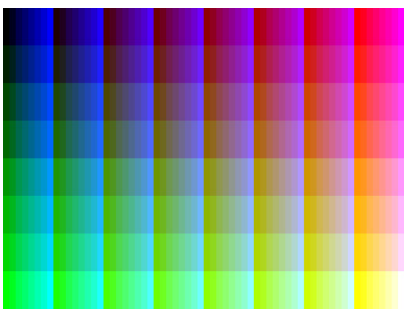
●LCD check

LCD display can be checked in the order of Color Pattern, White Only and Black Only.



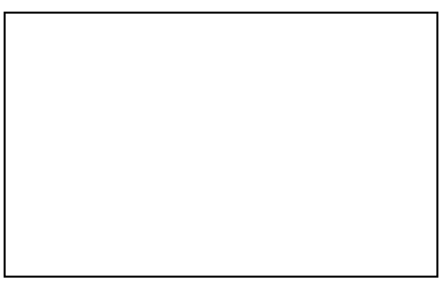
Touch [LCD Check].

Color Pattern is displayed.



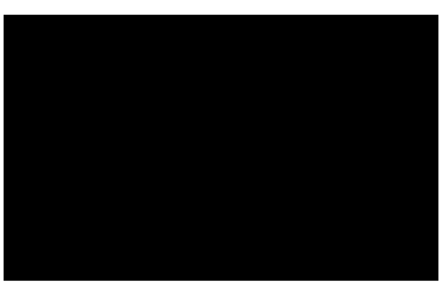
Touch any point on the screen.

White Only is displayed.



Touch any point on the screen.

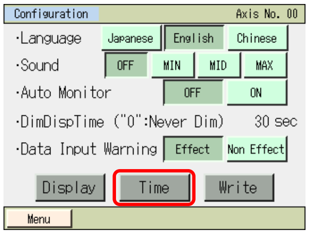
Black Only is displayed.



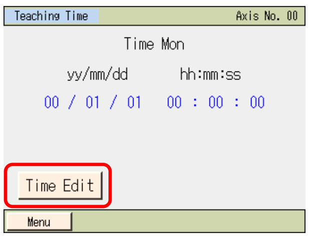
Touch any point on the screen.
The display returns to Display menu screen.

[Time setting]

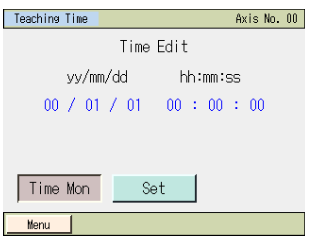
Time setting can be performed for CON-PTA/PDA/PGA/PGAS.



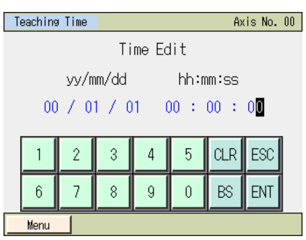
Touch [Time].



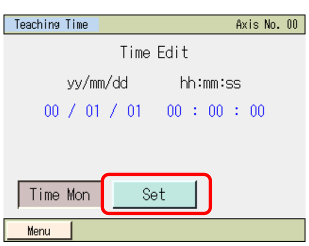
The time of teaching CON-PTA/PDA/PGA/PGAS is displayed.
Touch [Time Edit].



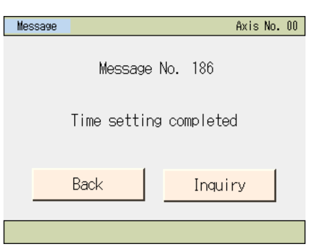
Touch the value of year, month, day, hour, minute or second that is required to be changed.



Numeric keys are displayed.
Input a value and touch [ENT].



Touch [Set].



The time of the CON-PTA/PDA/PGA/PGAS is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

6.15 Data Backup

Data is transferred between the Secure Digital memory card in the touch panel teaching pendant and the controller.

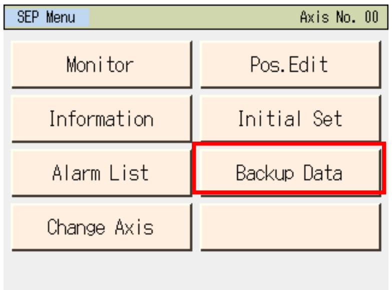
(Note) Type of Stored Data
This includes the position data, parameters and alarm list.
It is not applicable to the backup data storable in the RC PC software.

(Note) Extensions of the Stored Data
- The file extensions of the data stored to the Secure Digital card are the same as those dealt in RC PC software, and are compatible. The position data for the ASEP controllers is ptas and parameters are pras. The position data for the PSEP controllers is ptps and parameters are prps. [Refer to the details of the file extensions in the RC PC Software Instruction Manual]
- The alarm list can only have the backup. It cannot be restored. Data is in a CSV file.

(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. The files existing in other directories other than the specified folders cannot be listed up in the file name list in the file select at the initial setting or restore.
If the folder does not exist, it is automatically created.
- Position Data : \CONPTA\Position\File Name
- Parameter : \CONPTA\Parameter\File Name
- Alarm List : \CONPTA\Alarmlist\File Name

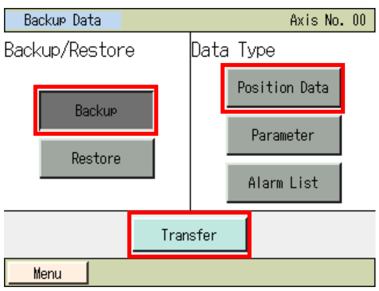
6.15.1 Data Backup of the Controller

The data in the controller is transferred to the Secure Digital memory card for backup.



Touch [Backup Data] on the SEP Menu screen.

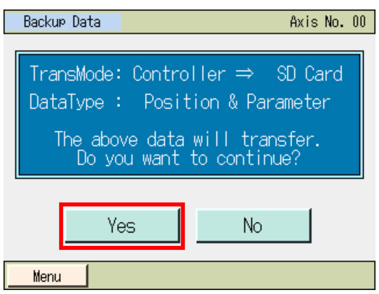
A screen for data transfer appears.



Touch [Backup].

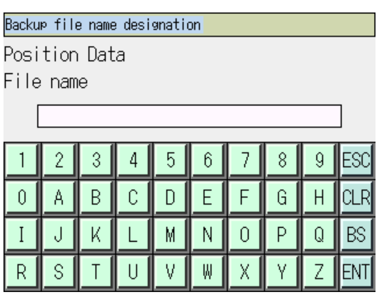
Select the data type for the backup such as [Position Data] and touch it.

Touch [Transfer].

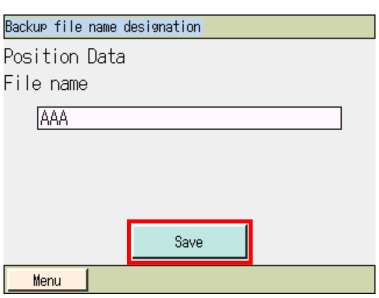


Touch [Yes].

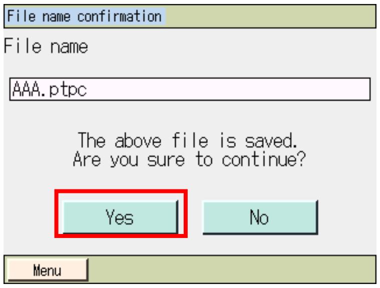
If [No] is touched, the screen goes back to the data backup window.



Numeric keys show up. Input a file name.
The file name is to be typed with 32 characters at maximum in letters and numbers.



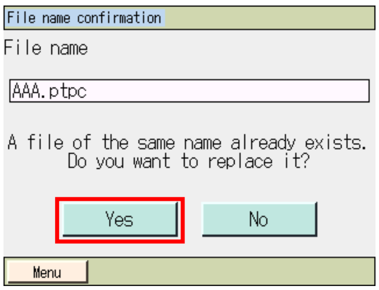
Touch [Save].



The screen below appears if the same name is not found.

Touch [Yes].

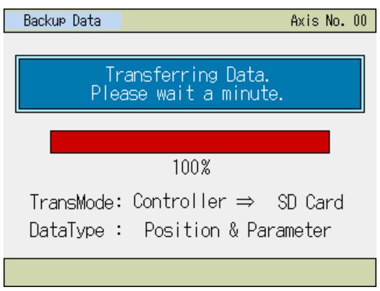
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



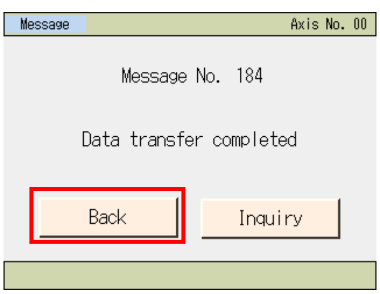
The screen below appears if the same name is not found.

Touch [Yes].

If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



Data transfer screen will be shown.

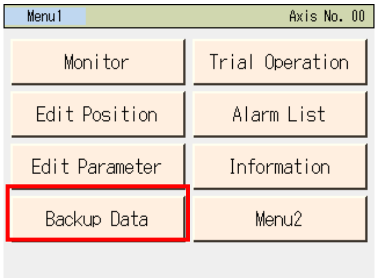


A message to tell the data transfer is complete pops up and the backup process is finished.

Touching [Back] can go back to the Backup Data screen.

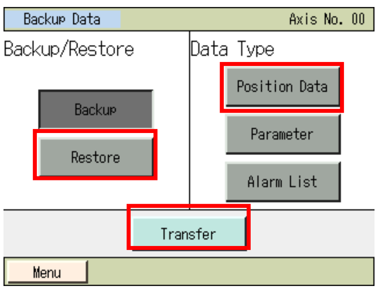
6.15.2 Restore to Controller

Data in the Secure Digital card is transferred to the controller.



Touch [Backup Data] on the Menu 1 screen.

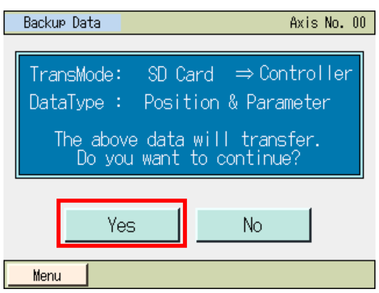
A window for data transfer appears.



Touch [Restore].

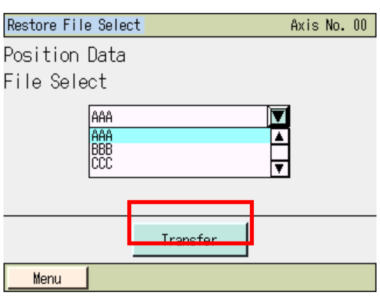
Select the data type to transfer to the controller, such as [Position Data], and touch it.

Touch [Transfer].



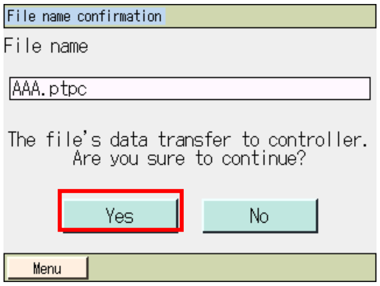
Touch [Yes].

If [No] is touched, the screen goes back to the data backup window.



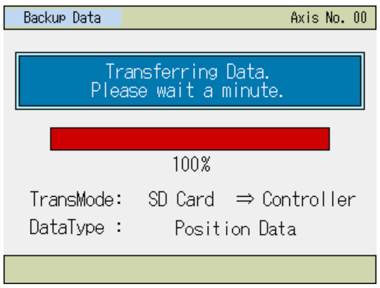
Touch ▲ and ▼ to select a file to transfer to the controller from the list of the backed up file names.

Touch [Transfer].

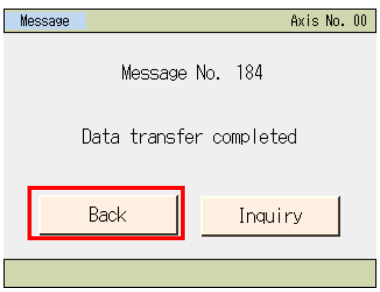


Touch [Yes].

If [No] is touched, the screen goes back to the previous one for the restore file select.



Data transfer screen will be shown.



A message to tell the data transfer is complete pops up and the data transfer process to the controller is finished.

Touching [Back] can go back to the Backup Data screen.

7. Operation of MEC Related Controllers

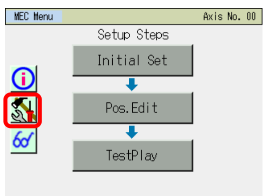
MEC related controllers: PMEC, AMEC and ERC3 (MEC mode)

7.1 Transition of Operating States

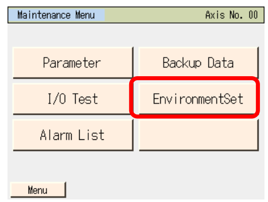
The language can be changed by following the steps below.
For the operation after the language change, please refer to the operation manual written in each language

Model：CON-PTA-C　CON- PTA-C-ENG

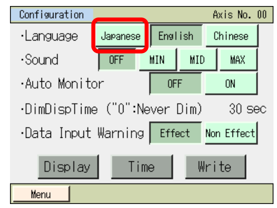
Display change from English to Japanese



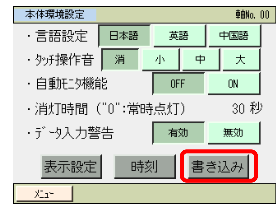
Touch in MEC Menu.



Touch [EnvironmentSet].

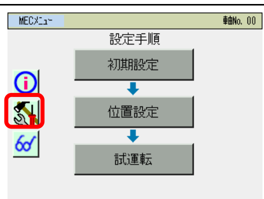


Touch [Japanese].

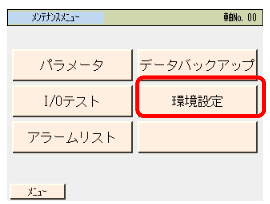


Touch [書き込み].

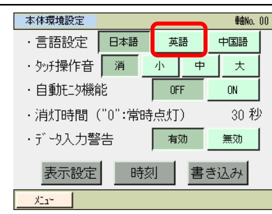
Display change from Japanese to English



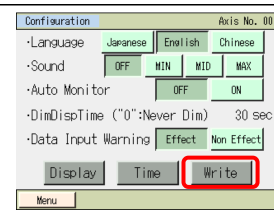
Touch in MECメニュー.



Touch [環境設定].



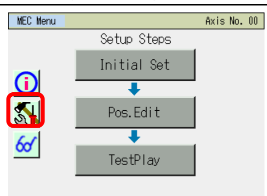
Touch [英語].



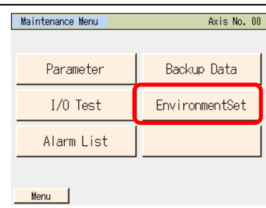
Touch [Write].

Model：CON-PTA-C　CON- PTA-C-CHI

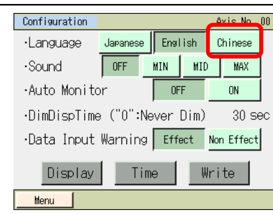
Display change from English to Chinese



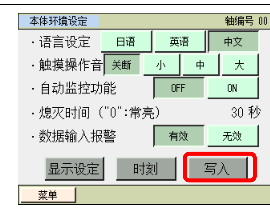
Touch in MEC Menu.



Touch [EnvironmentSet].

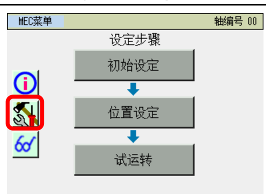


Touch [Chinese].

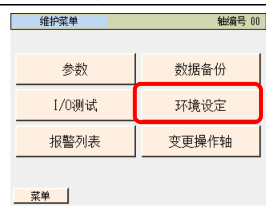


Touch [写入].

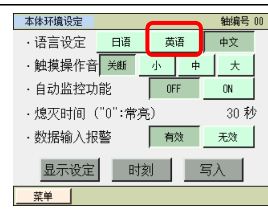
Display change from Chinese to English



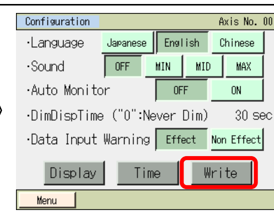
Touch in MEC菜単.



Touch [环境设定].



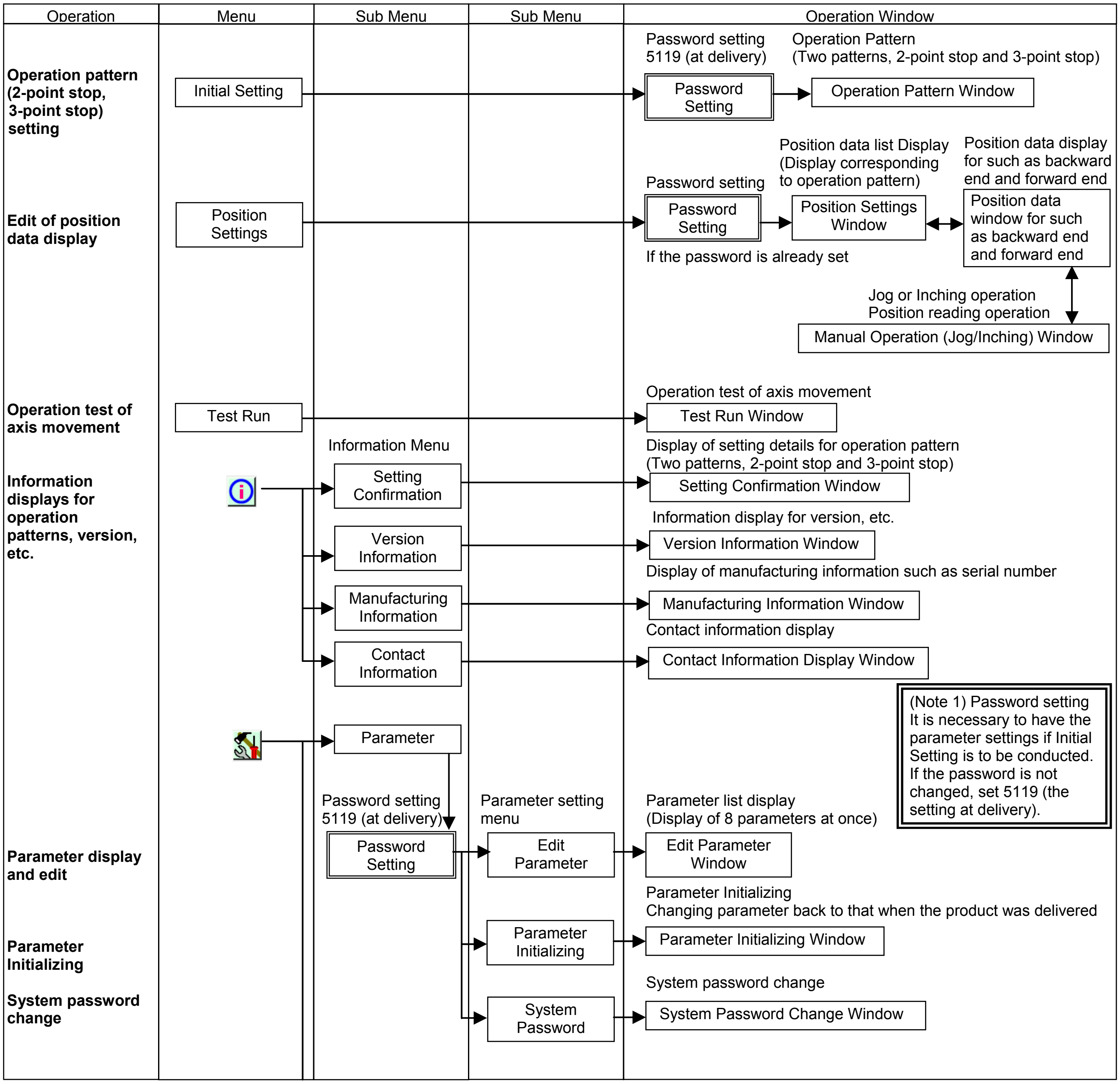
Touch [英語].



Touch [Write].

7.2 Operating Menu

Transition of operating states when the touch-panel teaching pendant CON-PTA is connected to a MEC controller is shown.

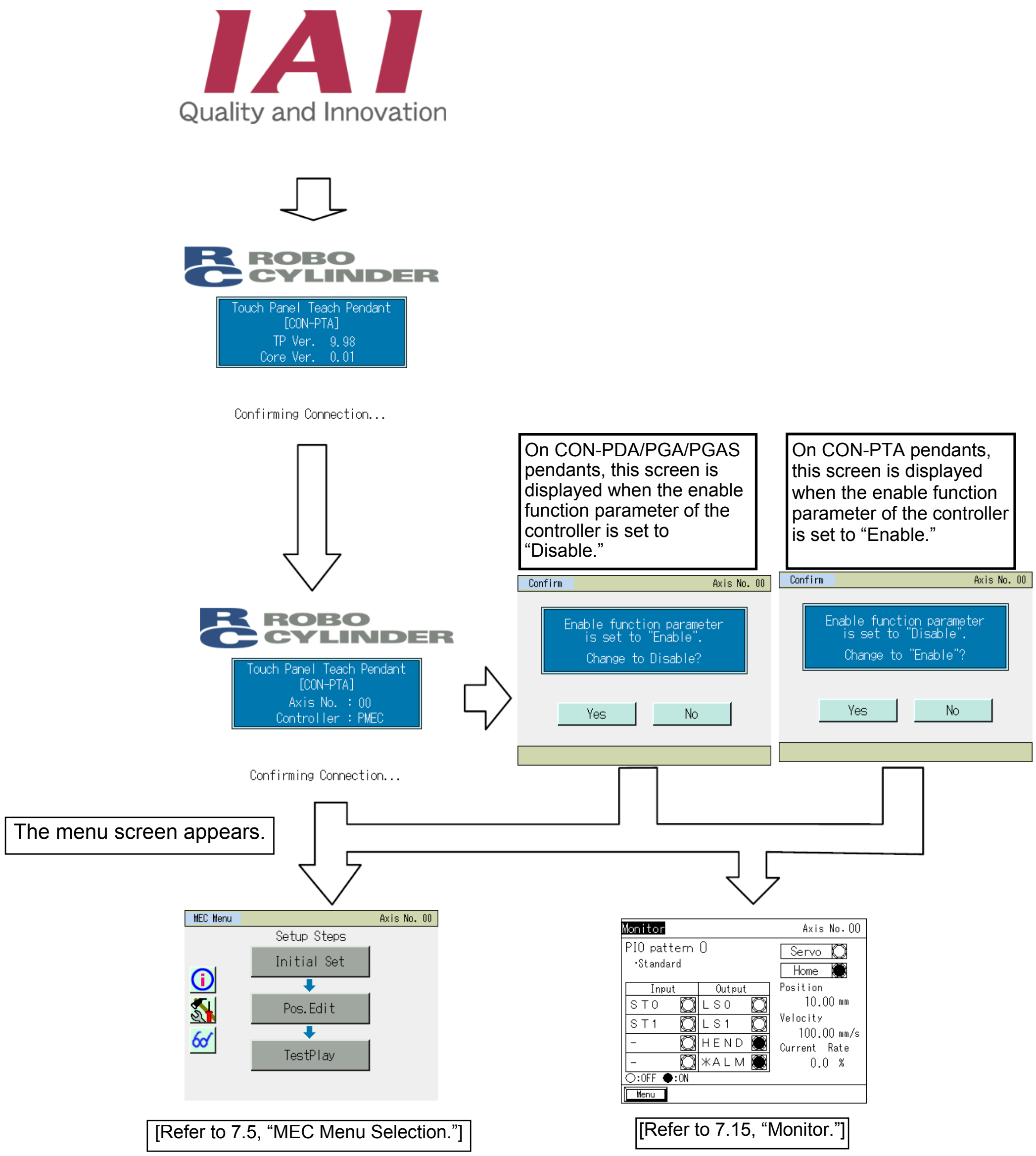


Operation	SEP Menu	Sub Menu	Sub Menu	Operation Window
Display of PIO signal input and output		I/O Test		Display of PIO signal input and output and compulsory output of output signal I/O Test Window
Alarm content detailed display		Alarm List		Alarm detailed display (Display of 8 alarm at once) Alarm List Window
Data transfer between memory and controller		Data Backup		Data transfer between memory and controller Data Backup Window
Environment of Language Setting, Touch Sound Setting, etc.		Global		Language setting, touch operation sound setting, automatic monitor function, window sleeping time Global Window → Display Setting Window Display settings (contrast and brightness changes)
Display of conditions of input and output I/O, velocity,	6σ			Data display of input and output I/O, velocity, etc. Monitor Window

7.3 Initial Screen

Upon connection to the controller, power is supplied to the touch-panel teaching pendant and processing starts.

When the power is turned on, the IAI logo is displayed for approx. 1 second on the operation display screen (hereinafter referred to as "operation screen") of the touch-panel teaching pendant, after which version information is displayed.

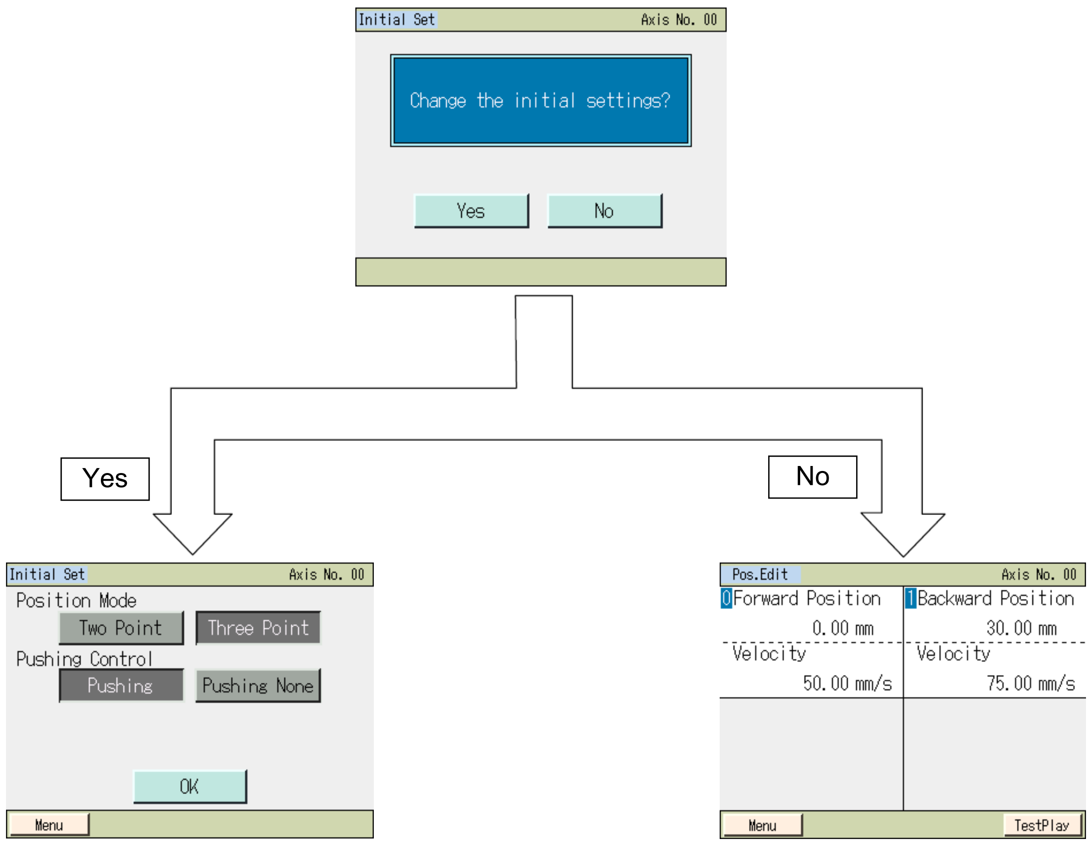


* The same items can be set on the automatic monitor setting screen accessible from the environment setting screen of the controller.

7.4 Initial Setting

When the power is turned on for the first time after the delivery of the controller, the initial setting screen will appear.

- Select [Yes], and the display will change to the initial setting screen where you can set the operation pattern.
- Select [No], and the factory set operation pattern, or specifically the 2-point stopping operation mode, will remain effective.
  The display will switch to the position setting screen.



[Refer to 7.6, "Initial Setting."]

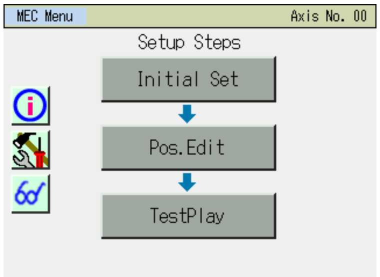
[Refer to 7.7, "Position Setting."]

Factory settings

- Operation pattern: Stopping at 2 points

7.5 MEC Menu Selection

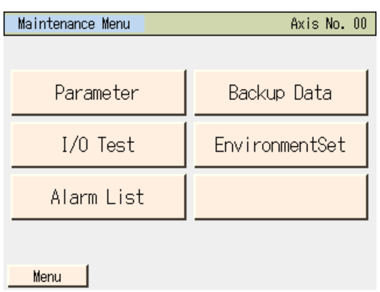
MEC menu



The MEC menu has six items. Select and touch one of them.
The screen changes to the one corresponding to the menu item you have touched.

Menu list

- Initial Set — Set the operation pattern (stopping at 2 points or 3 points). [Refer to 7.6, “Initial Setting.”]
- Pos. Edit — Set the position, push force, push band, etc. The axis can be operated manually. [Refer to 7.7, “Position Setting.”]
- TestPlay — Conduct axis movement operation tests. [Refer to 7.8, “Trial operation.”]
- Information — The operation pattern, version and other information are displayed. [Refer to 7.9, “Information.”]
- Maintenance — Touching switches the display to the maintenance menu screen, which is the next selection screen.



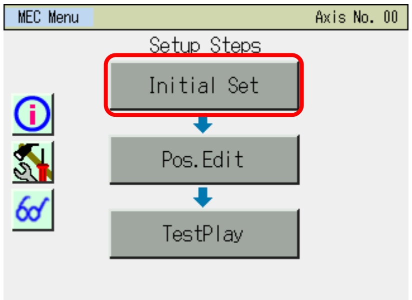
The maintenance screen shows five buttons, so select and touch a desired button.
The display will change to the menu screen corresponding to the button you have touched.
Touch [Menu] to return to the previous MEC menu screen.

Maintenance menu list

- Parameter — Set the default positioning band and other parameters. [Refer to 7.10, “Maintenance – Parameters.”]
- I/O Test — Conduct I/O Tests. [Refer to 7.11, “Maintenance – I/O Tests.”]
- Alarm List — Detail internal information of alarms are displayed. [Refer to 7.12, “Maintenance – Alarm List.”]
- Backup Data — Transfer data between the touch-panel teaching pendant and controller. [Refer to 7.13, “Maintenance – Data Backup.”]
- EnvironmentSet — Set the touch sound and other environment specifications. [Refer to 7.14, “Maintenance-Environment Setting.”]
- Monitor — The controller status is displayed. [Refer to 7.15 “Monitor.”]

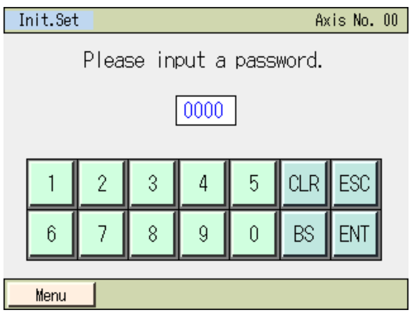
7.6 Initial Setting

Select whether to stop at 2 points or 3 points.



Touch [Initial Set] on the MEC menu screen.

Before the display switches to the initial setting screen, the password entry screen appears if the password is other than “0000.”



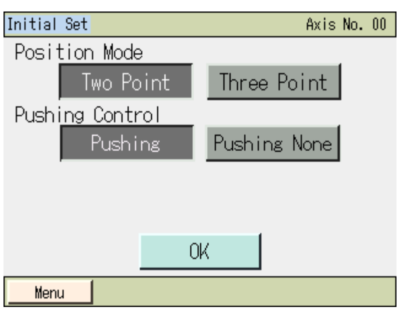
Enter the password using the numeric keypad, and then touch [ENT].

The password is “5119” (factory setting).

You can set a desired password using the “system password” parameter accessible from the maintenance menu.

If the valid password has been set, the display switches to the initial setting screen.

Stopping at 2 points

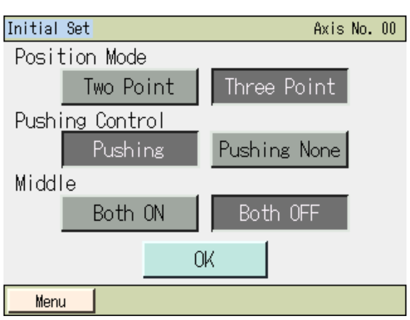


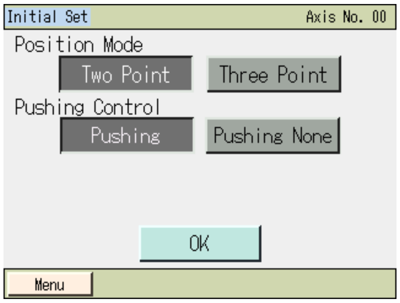
Select and touch either [Two Point] or [Three Point]. To perform positioning operation select and touch [Pushing None]. To perform push-motion operation select and touch [Pushing].
To stop at 3 points, select [Both OFF] or [Both ON] as the position specification method.

(Note) Take note that if push-motion operation is performed and therefore [Pushing None] is selected, the completion signal will not be output.

* If [Pushing None] is selected, LS0 and LS1 (LS2) will be used as output signals. If [Pushing] is selected, PE0 and PE1 (PE2) will be used as output signals.

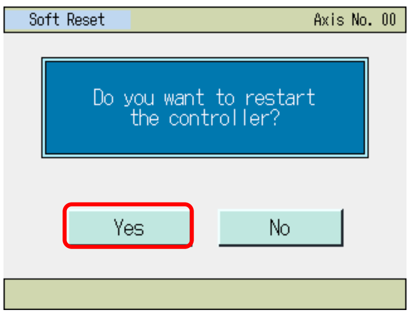
Stopping at 3 points





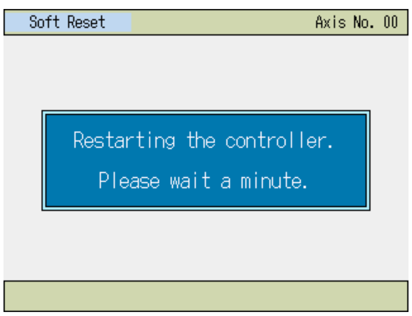
Touch [OK].

Touch [Menu] to return to the MEC menu screen.
All initial settings you have made will be discarded.



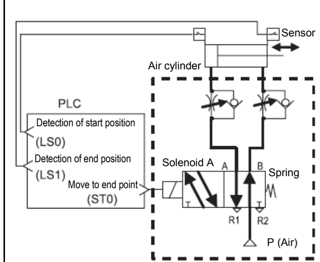
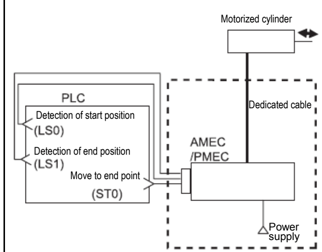
Touch [Yes].
The controller will restart.
After the restart, the controller will operate according to the initial settings you have made.
Return to the MEC menu screen.

If you touch [No], the initial settings you have made will not be reflected until the controller is restarted.

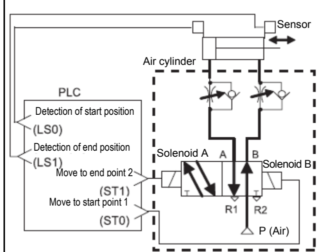
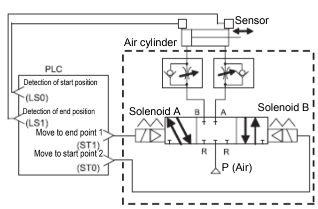
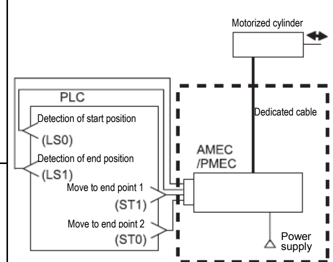
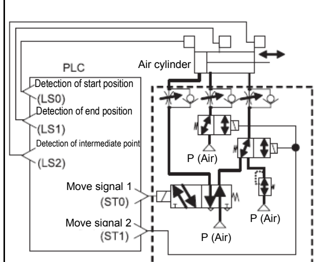
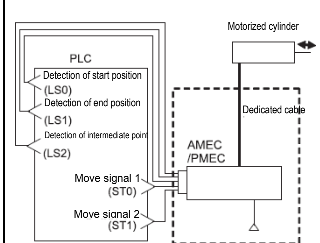


Operation Pattern

PMEC and AMEC and ERC3 (MEC mode) controllers offer two operation patterns.
The table below gives an overview o the Operation specification of each pattern. [For the setting methods, refer to the sections on initial setting and stop position setting.]

<table>
<tr><th colspan="2">Operation pattern</th><th>Description</th><th>Air cylinder circuit (Reference)</th><th>How to connect motorized cylinder</th></tr>
<tr><td>Stopping at 2 points (2-point positioning)</td><td>Movement by 1 input between 2 points [Single-solenoid mode]</td><td>You can move the actuator between 2 points using the same control you would normally use with an air cylinder.
You can set the positions of the end point and start point.
You can specify the moving speed and acceleration/deceleration. You can also specify push-motion Operation. The actuator moves to the end point when the ST0 turns ON, and returns to the start point when the signal turns OFF.</td><td></td><td></td></tr>
<tr><td rowspan="2">Stopping at 3 points (3-point positioning)</td><td>Movement by 2 input between 2 points [Double-solenoid mode]</td><td rowspan="2">You can move the actuator between 2 points using the same control you would normally use with an air cylinder.
You can set the positions of the end point and start point.
You can set the position of an intermediate point and perform positioning to the intermediate point.
You can specify the moving speed and acceleration/deceleration. You can also specify push-motion operation. The actuator moves to the end point when the ST1 turns ON, and moves to the start point when the ST0 turns ON.

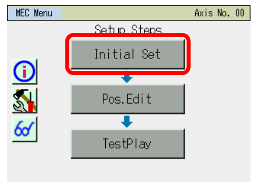
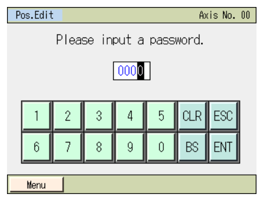
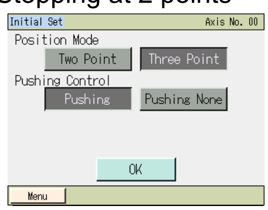
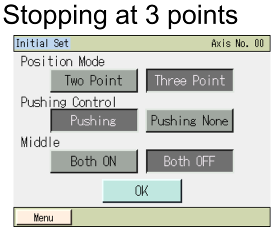
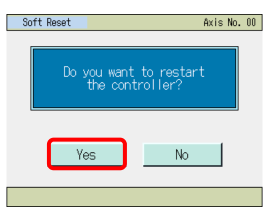
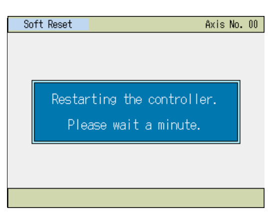
[Intermediate movement mode, both ON]
When both the ST0 and ST1 are turned ON, the actuator will position to and stop at an intermediate point.
When both the ST0 and ST1 are turned OFF, the actuator will stop in the middle of movement.

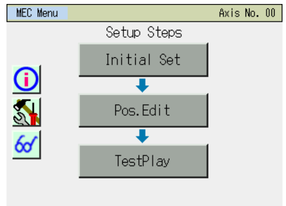
[Intermediate movement mode, both OFF]
When both the ST0 and ST1 are turned OFF, the actuator will position to and stop at an intermediate point.
When both the ST0 and ST1 are turned ON, the actuator will stop in the middle of movement.</td><td>
</td><td></td></tr>
<tr><td>Movement by 2 input between 3 points [3-point positioning]</td><td></td><td></td></tr>
</table>

(Note) The air cylinder circuits are drawn with symbols of signals corresponding to those used by PMEC, AMEC and ERC3 (MEC mode) controllers. For details on signals, refer to the "PMEC, AMEC and ERC3 (MEC mode) operation Manual."

[1] Example of initial setting operation
The operation is explained using specific examples.

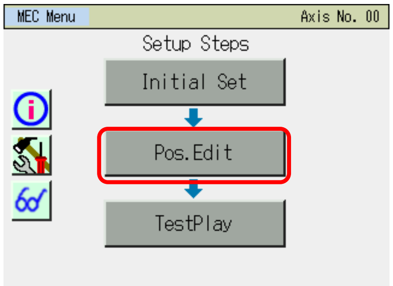
Example of stopping at 2 points Set as follows.

No.	Operation	Screen	Remarks
1	Touch [Initial Set] on the MEC menu screen.		
2	If the password is not "0000," the password entry screen appears. Enter the password, and then touch [ENT].		The password is "5119" (factory setting). A desired password can be set using the "system password" parameter accessible from the maintenance menu.
3	• Touch and select either [Two Point] or [Three Point] based on the number of positioning points. • To perform positioning operation select [Pushing None]. To perform push-motion operation select [Pushing]. • In the case of positioning to the intermediate position in the 3-point stop pattern, select [Both OFF] or [Both ON] for the ST0 and ST1 input signals, and then touch [OK].	Stopping at 2 points  Stopping at 3 points 	Touch [Menu] to return to the first MEC menu screen. (Reference) Factory setting Stop position: [Two Point] Push function: [Pushing None] Intermediate point specification method: [Both ON]
4	Touch [Yes].		To make the specified items effective, you must restart the controller. The settings you have made will not be reflected until the controller is restarted. Touch [No] to return to the previous screen.
5			

No.	Operation	Screen	Remarks
6			Once the controller has restarted, the MEC menu screen appears.

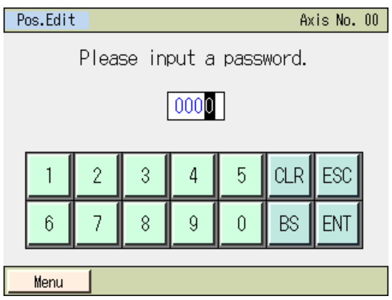
7.7 Position Setting (Position Data Setting and Manual Axis operation (Jogging, Inching))

The position, push force, push band and other position data are set. You can move the actuator by jogging or inching.



Touch [Pos.Edit] on the MEC menu screen.

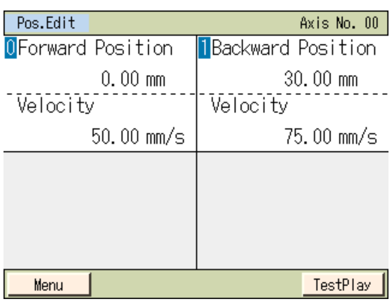
Before the display switches to the position setting screen, the password entry screen appears if the password is other than "0000."



Enter the password using the numeric keypad, and then touch [ENT].

A desired password can be set in the "position data edit password" field of the parameter edit screen.

If the valid password has been set, the display switches to the position setting list screen. The displayed items vary depending on the operation pattern.

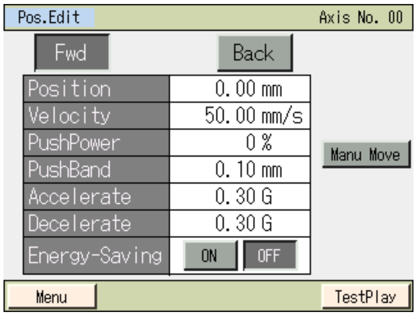


Touch the position you want to set.
Touch [Menu] to return to the MEC menu screen.
The screen shown to the left is an example of stopping at 2 points.
The set value of each position is shown.

Number of positions to be set

Operation pattern	Movement	Number of positions to be set
Stopping at 2 points	Move between 2 points	2
Stopping at 3 points	Move between 3 points	3

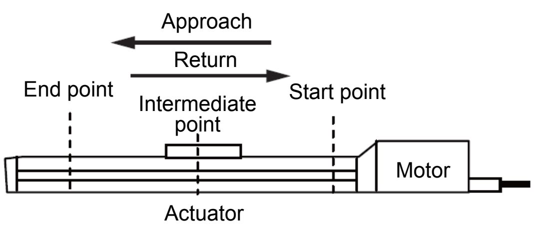
Touch the position you want to set, and the target position/speed setting screen of the touched position will appear.
Set the position, speed, push force, push band, acceleration and deceleration.



Touch [Menu] to return to the MEC menu screen.

You can select jog operation from this setting screen.

[1] Position data
Set the position data used to operate the actuator.



* In the figure, the home is located on the motor side.

Position data

Position data	[1] Position [mm]	[2] Speed [mm/s]	[3] Acceleration [G]	[4] Deceleration [G]	[5] Push force [%]	[6] Push band [mm]	[7] Ecology
[1] End point	200.00	50.00	0.1	0.1	70	1.00	Enabled
[0] Start point	0.00	50.00	0.1	0.1	0	0	Enabled
[2] Intermediate point	100.00	50.00	0.1	0.1	0	0	Enabled

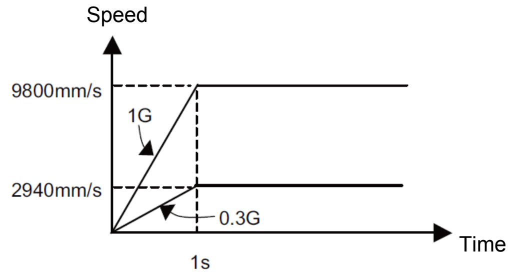
1) Position [mm] --- Set the position to move the actuator to.
The positions must satisfy the following relationships: Start point < Intermediate point < End point

Operation pattern	Move	Positions to be set		
		End point	Start point	Intermediate point
Stopping at 2 points	Move between 2 points	○	○	
Stopping at 3 points	Move between 3 points	○	○	○

2) Speed [mm/s] --- Set the speed of the actuator.
3) Acceleration [G] --- Set the acceleration of the actuator.
The input range permits entry of values greater than what is specified in the catalog.
Refer to the catalog or operation manual of your actuator.

4) Deceleration [G] --- Set the deceleration (G) at which the actuator stops.

(Reference) Acceleration is explained. The same concept applies to deceleration.
1 G = 9800 mm/s^2: Acceleration at which the actuator can accelerate to up to 9800 mm/s per second
0.3 G: Acceleration at which the actuator can accelerate to up to 9800 mm/s × 0.3 = 2940 mm/s



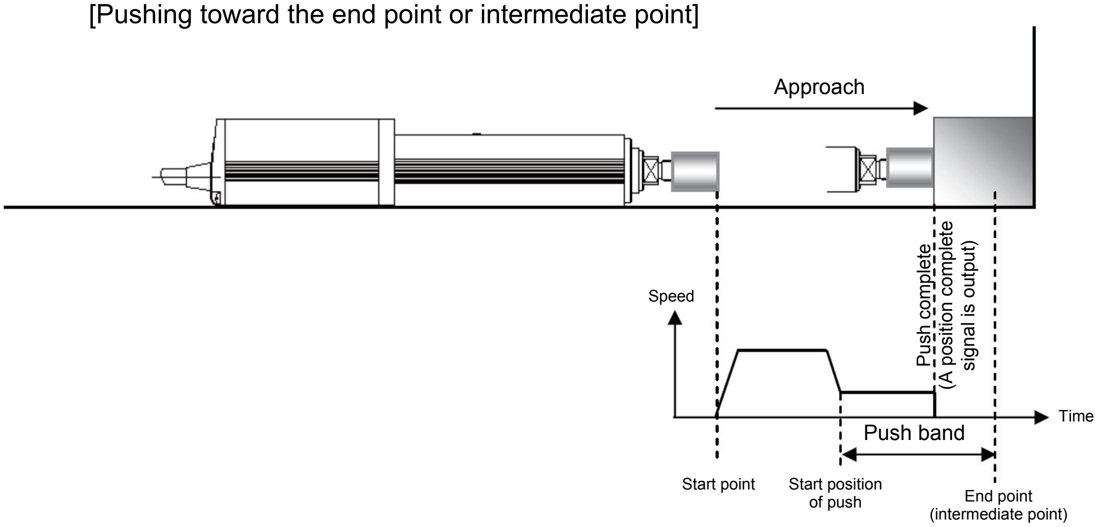
⚠ Caution: Setting the acceleration/deceleration

(1) Make sure the acceleration/deceleration you set does not exceed the rated acceleration/deceleration stated in the catalog or this operation manual. If the rated acceleration/deceleration is exceeded, the life of the actuator may drop significantly.
(2) If the actuator or work part receives impact or vibrates, lower the acceleration/deceleration. If the actuator is used continuously in such condition, the life of the actuator will drop significantly.
(3) If the transferable weight is significantly smaller than the rated payload capacity, accelerations/decelerations greater than the rating may be set. You can shorten the tact time this way, so contact IAI if you are interested. When contacting IAI, let us know the weight, shape and installation method of the work part as well as installation condition of the actuator (horizontal/vertical).

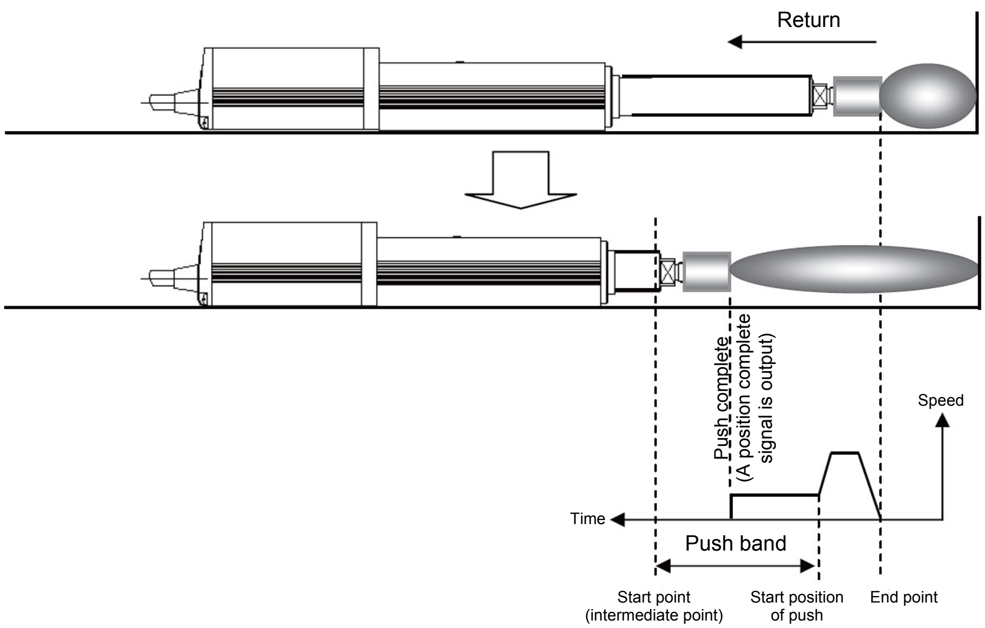
5) Push force [%] --- Set the push torque (current-limiting value) to be used in push-motion operation as a percent (%) value.
Increasing the current-limiting value increases the push force.
If "0" is set, positioning operation is performed.
For the relationship of push force and current-limiting value, refer to the catalog or the operation manual."

6) Push band [mm] --- Set the travel during push-motion operation.
When push-motion operation is performed, the actuator moves at the speed and rated torque set as part of positioning information, just like normal positioning, until the remaining travel enters the range set here. Once the remaining travel enters this range, the actuator moves to the position set in [1] while pushing the load.
The speed of push-motion operation is set in parameter No. 7. Do not use any setting that causes this speed to be exceeded.
If the setting in [2] is less than the push speed, the actuator pushes the work part at the set speed.
How the actuator operates as it pushes the work part toward the end point, start point and intermediate point is illustrated below.

[Pushing toward the end point or intermediate point]



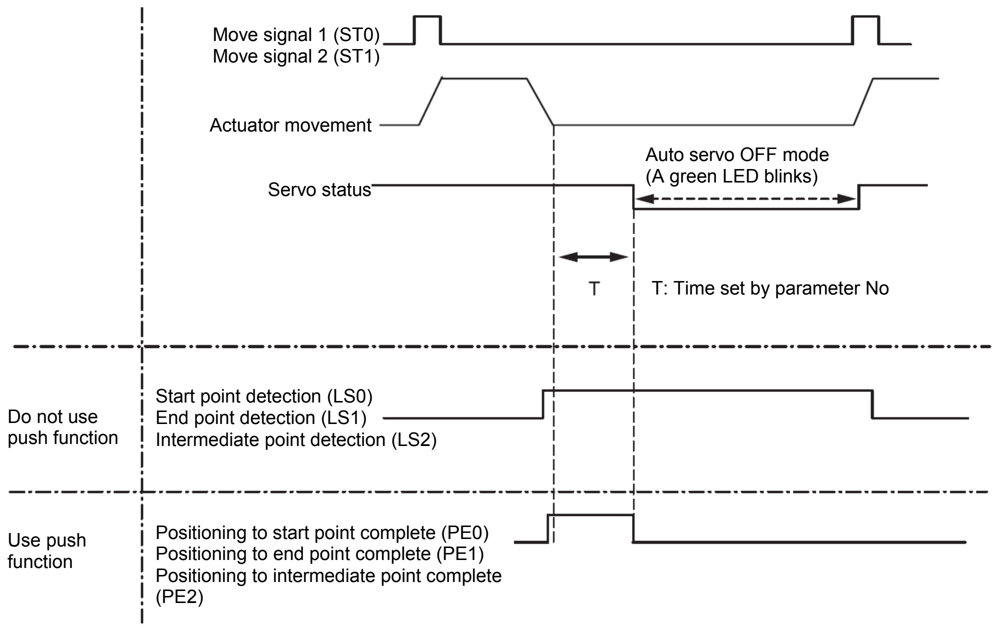
[Pushing toward the start point or intermediate point = Pulling]



7) Ecology --- When Ecology is enabled, you can have the motor power (servo) turned off automatically upon elapse of a specified period to save power after completion of positioning. Set the applicable period beforehand using a parameter.

Parameter No.	Parameter name	Initial value	Setting range
10	Auto servo OFF delay time [sec]	1	0 to 9999

[Auto motor power (Auto servo) OFF]
The motor power (servo) will turn off automatically upon elapse of a specified period after completion of positioning. When the next positioning command is issued, the motor power (servo) turns on automatically and positioning is performed. Since no holding current flows while the motor is at standstill, power consumption can be reduced.

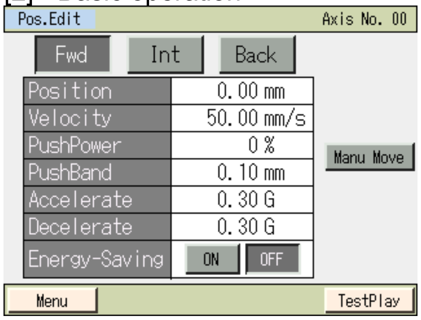


[Statuses of position detection output signals when the push function is not used]
Even when the motor power (servo) is turned off, as long as the actuator is positioned within the positioning band (parameter No. 1) the start point detection signal (LS0), end point detection signal (LS1) or intermediate point detection signal (LS2) will turn ON according to the applicable position, just like when a sensor is used. Accordingly, the position detection signal that has turned ON will remain ON after completion of positioning unless the actuator moves.

[Status of position complete signals when the push function is used]
In push-motion operation, the motor power (servo) does not turn off automatically while the actuator is pushing the work part.
If the actuator has missed the work part, the motor power (servo) turns off automatically.
Once the motor power (servo) turns off, a position complete status is lost. Accordingly, the push complete signal 0 (PE0), push complete signal 1 (PE1) and push complete signal 2 (PE2) will all turn OFF regardless of the stop position.

⚠ Caution: No holding torque is applied in the auto servo OFF mode. Since the actuator will move in this condition if an external force is applied, pay due attention to contact and safety when setting any operation involving auto motor power (servo) OFF.

[2] Basic operation



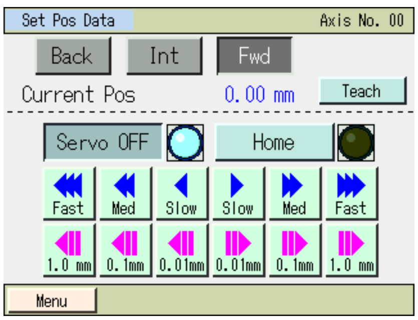
Touch the value field of each setting item such as position. When the numeric keypad is displayed, enter a desired value and then touch [ENT].

Touch either of Start, End or Int and the screen changes to the corresponding setting window for [Fwd], [Back] or [Int].

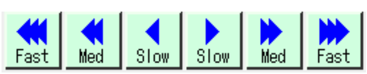
(Note) The positions must satisfy the following relationships: Home ≤ Start position ≤ Midway position ≤ End position

Touching [Jog] switches to jog operation.

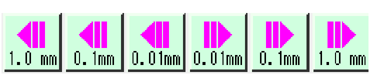
[Manual axis operation (jogging/inching)]
You can load position data via manual axis operation (jogging/inching).



Operation on the manual axis operation (jogging/inching) screen

- 

While any of these buttons is touched, the axis jogs in the direction of the arrow. The axis moves at 1 mm/s in the low-speed mode, 10 mm/s in the medium-speed mode, or 50 mm/s in the high-speed mode.
Select one of the speed.

- 

While any of these buttons is touched, the axis inches in the direction of the arrow. Select 0.01 mm, 0.1 mm or 1.0 mm as the inching distance.

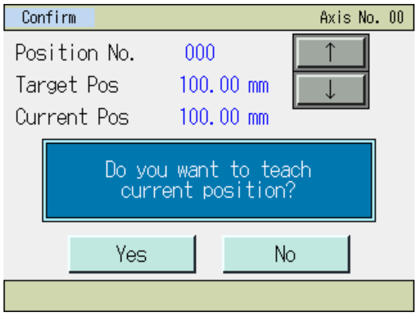
- [Servo ON]

Touching [Servo ON] when the motor power (servo) is turned off turns on the motor power (servo) and the ○ lamp will become lit. Touching [Servo OFF] when the motor power (servo) is turned on turns off the motor power (servo) and the ○ lamp will become unlit.

- [HOME]

Touching [HOME] before the home return is completed causes the axis to return home and the ○ lamp will become lit.

Position loading operation
Touch [Teach]. The confirmation screen appears.
You can change the position number by touching [↑]/[↓].
Touching [Yes] loads the current position.



[3] Example of position setting operation

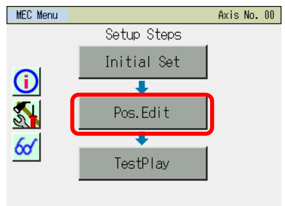
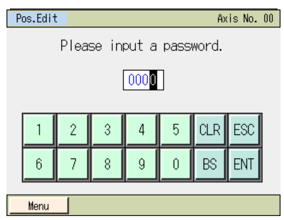
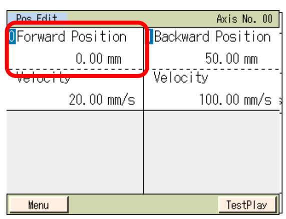
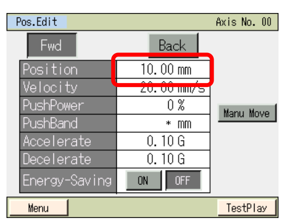
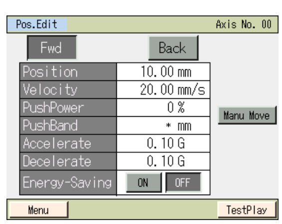
The operation is explained using specific examples.

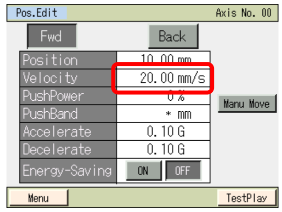
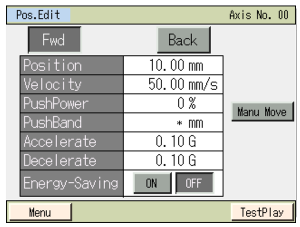
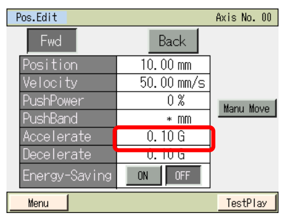
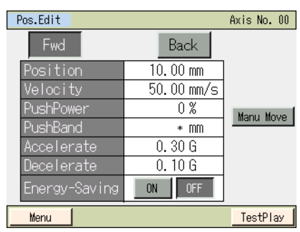
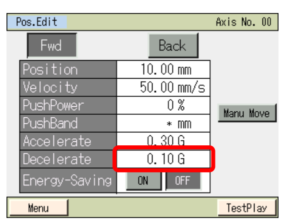
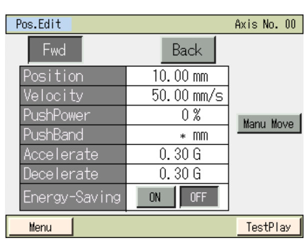
1) Setting the position, speed, acceleration and deceleration

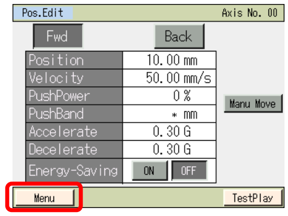
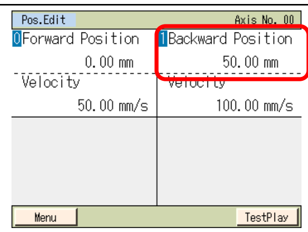
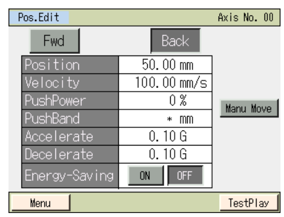
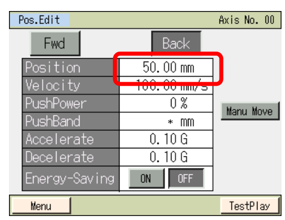
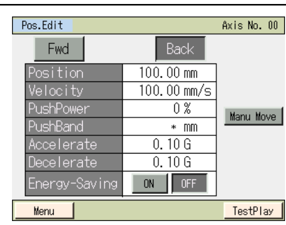
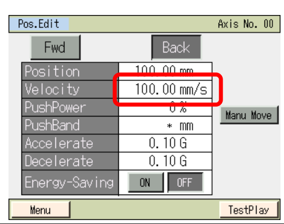
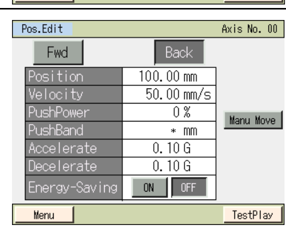
An example of stopping at 2 points is explained.

Positions are set to operate the actuator back and forth between 10.0 mm and 100.0 mm.

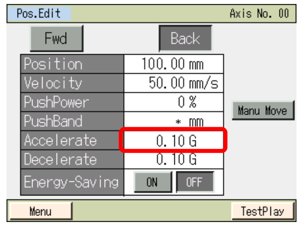
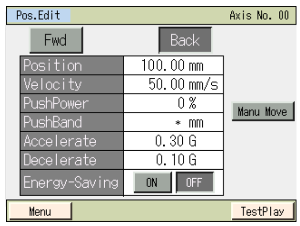
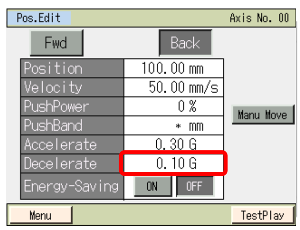
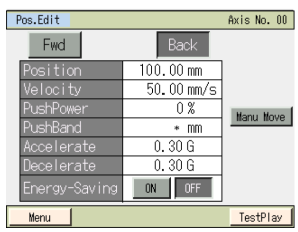
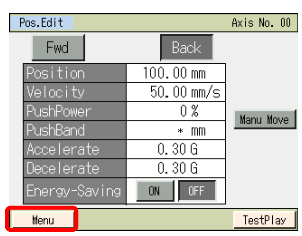
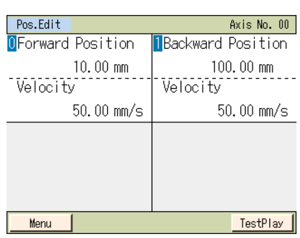
End position: 100.0 mm, Start position: 10.0 mm

No.	Operation	Screen	Remarks
1	Touch [Pos.Edit] on the MEC menu screen.		
2	If the password is not "0000," the password entry screen appears. Enter the password.		A desired position setting password can be set in the "position data edit" field of the parameter edit screen.
3	Set the position relating to the start point, acceleration, and deceleration. Touch [Forward Position].		Touch [Menu] to return to the MEC menu screen.
4	Touch the value field of position. When the numeric keypad is displayed, touch [1], [0], and then [ENT].		Touch [Menu] to return to the position setting screen.
5	"10.00" appears next to "Position."		Touch [Menu] to return to the position setting screen.

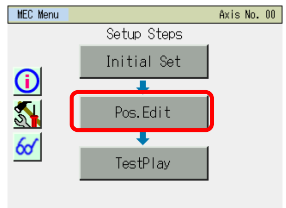
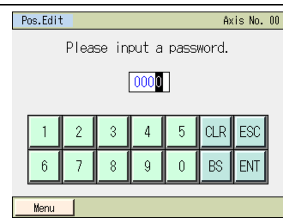
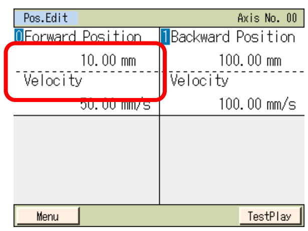
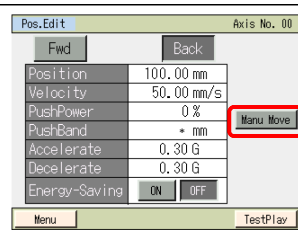
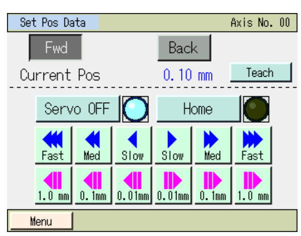
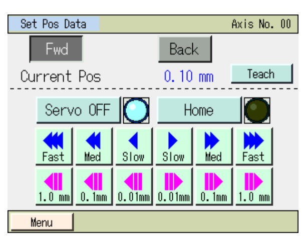
No.	Operation	Screen	Remarks
6	Touch the value field of position. When the numeric keypad is displayed, touch [5], [0], and then [ENT] .		Touch [Menu] to return to the position setting screen.
7	“50.00” is shown in the speed field.		Touch [Menu] to return to the position setting screen.
8	Touch the value field of acceleration. When the numeric keypad is displayed, touch [0], [.], [3], and then [ENT].		Touch [Menu] to return to the position setting screen.
9	“0.30” is shown in the acceleration field.		Touch [Menu] to return to the position setting screen.
10	Touch the value field of deceleration. When the numeric keypad is displayed, touch [0], [.], [3], and then [ENT].		Touch [Menu] to return to the position setting screen.
11	“0.30” is shown in the deceleration field.		Touch [Menu] to return to the position setting screen.

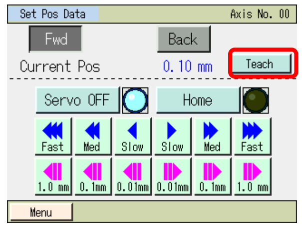
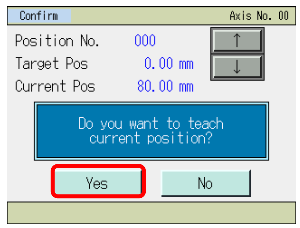
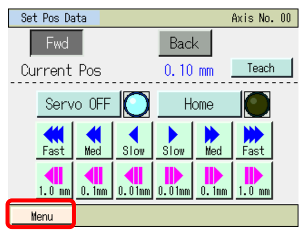
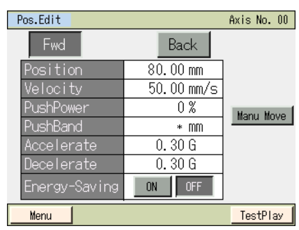
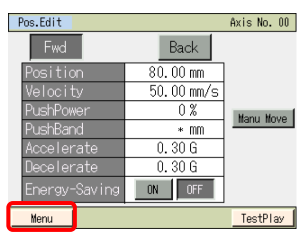
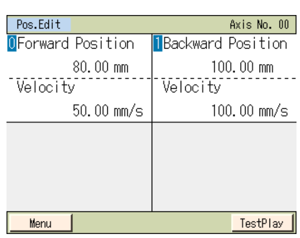
No.	Operation	Screen	Remarks
12	Touch [Menu].		
13	Set the position relating to the end point, acceleration, and deceleration. Touch [Backward Position].		Touch [Menu] to return to the MEC menu screen.
14	The display switches to the end point screen. Set the position relating to the end point, acceleration, and deceleration.		Touch [Menu] to return to the position setting screen.
15	Touch the value field of position. When the numeric keypad is displayed, touch [1], [0], [0], and then [ENT].		Touch [Menu] to return to the position setting screen.
16	“100.00” is shown in the position field.		Touch [Menu] to return to the position setting screen.
17	Touch the value field of position. When the numeric keypad is displayed, touch [5], [0], and then [ENT].		Touch [Menu] to return to the position setting screen.
18	“50.00” is shown in the speed field.		Touch [Menu] to return to the position setting screen.

7. Operation of MEC Related Controllers

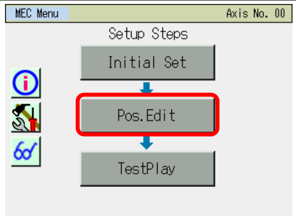
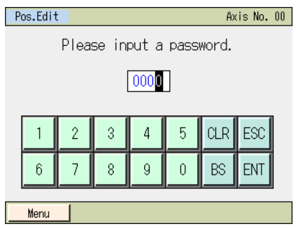
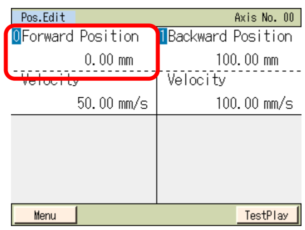
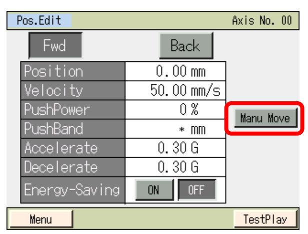
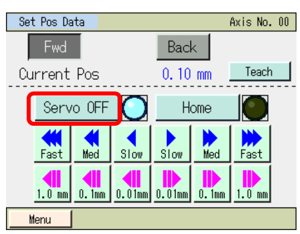
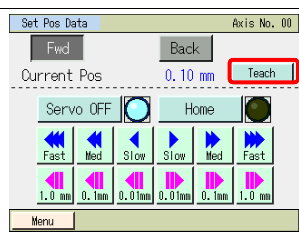
No.	Operation	Screen	Remarks
19	Touch the value field of acceleration. When the numeric keypad is displayed, touch [0], [.], [3], and then [ENT].		Touch [Menu] to return to the position setting screen.
20	"0.30" is shown in the acceleration field.		Touch [Menu] to return to the position setting screen.
21	Touch the value field of deceleration. When the numeric keypad is displayed, touch [0], [.], [3], and then [ENT].		Touch [Menu] to return to the position setting screen.
22	"0.30" is shown in the deceleration field.		Touch [Menu] to return to the position setting screen.
23	Touch [Menu].		Touch [Menu] to return to the position setting screen.
24			Touch [Menu] to return to the MEC menu screen.

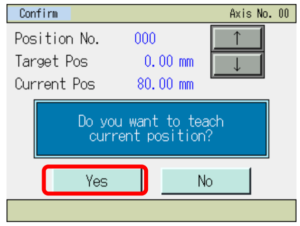
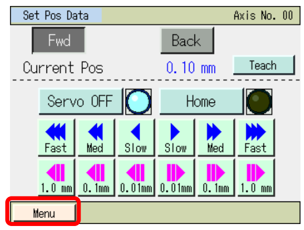
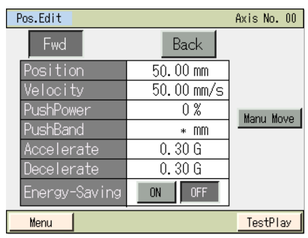
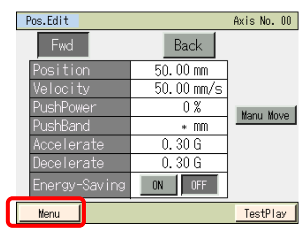
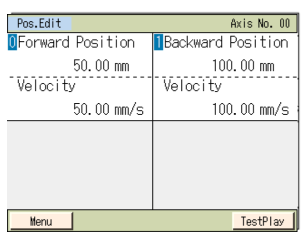
2) Manual axis operation (jogging/inching) (Using [Fast] [Med] [Slow] [Slow] [Med] [Fast] [1.0 mm] [0.1mm] [0.01mm] [0.01mm] [0.1mm] [1.0 mm] jog/inch the actuator to the target position, and then loading the achieved position (current position) as the end point or start point)
An example of stopping at 2 points is explained.
How to load the current position of 80.0 m as the start point is explained.

No.	Operation	Screen	Remarks
1	Touch [Pos.Edit] on the MEC menu screen.		
2	If the password is not "0000," the password entry screen appears. Enter the password.		A desired position setting password can be set in the "position data edit password" field of the parameter edit screen.
3	Set the position relating to the start point, acceleration, and deceleration. Touch [Forward Position].		Touch [Menu] to return to the MEC menu screen.
4	Touch [Manu Move].		Touch [Menu] to return to the position setting screen. * If home return is not yet complete, perform home return first.
5	If the motor power (servo) is currently OFF, touch [Servo ON] to turn ON the motor power (servo).		
6	Use [Fast] [Med] [Slow] [Slow] [Med] [Fast] to move the slider or rod to the target position of 80.0 mm.		• Jogging Touch any of [Fast] [Med] [Slow] [Slow] [Med] [Fast], and the axis will move and continue moving. • Inching Touch any of, [1.0 mm] [0.1mm] [0.01mm] [0.01mm] [0.1mm] [1.0 mm] and the axis will move by the distance corresponding to the button you have touched.

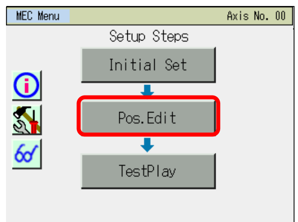
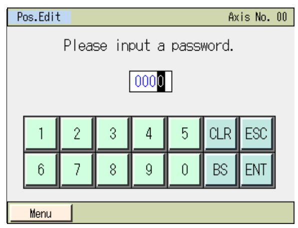
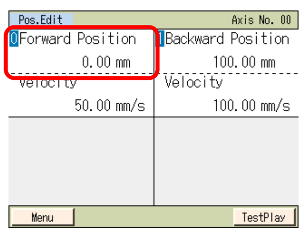
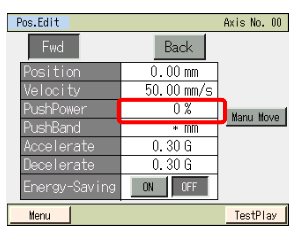
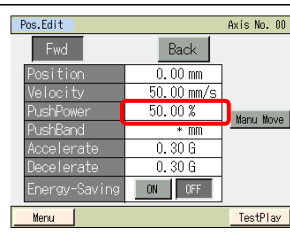
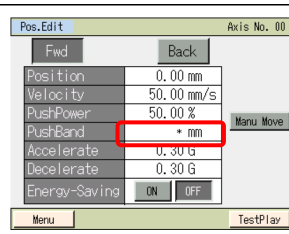
No.	Operation	Screen	Remarks
7	Touch [Teach].		
8	Touch [Yes].		
9	Touch [Menu].		
10	“80.00” is shown in the position field. This confirms that the position data has been loaded.		Touch [Menu] to return to the position setting screen.
11	Touch [Menu].		Touch [Menu] to return to the position setting screen.
12			Touch [Menu] to return to the MEC menu screen.

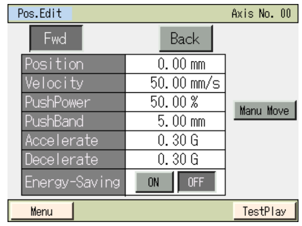
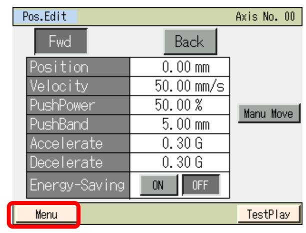
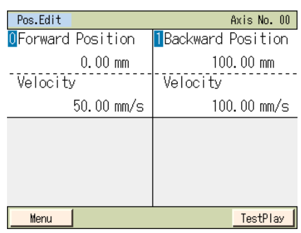
3) Direct teaching (Moving the slider by hand to the target position, and then loading the achieved position (current position) as the end point or start point)
An example of stopping at 2 points is explained.
How to load the current position of 50.00 mm as the start point is explained.

No.	Operation	Screen	Remarks
1	Touch [Pos.Edit] on the MEC menu screen.		
2	If the password is not “0000,” the password entry screen appears. Enter the password.		A desired position setting password can be set in the “position data edit” field of the parameter edit screen.
3	Set the position relating to the start point, acceleration, and deceleration. Touch [Forward Position].		Touch [Menu] to return to the MEC menu screen.
4	Touch [Manu Move].		Touch [Menu] to return to the position setting screen. * If home return is not yet complete, perform home return first.
5	If the motor power (servo) is currently ON, touch [Servo ON] to turn OFF the motor power (servo).		
6	Move the slider or rod by hand to the target position of 50.00 mm. Touch [Teach].		

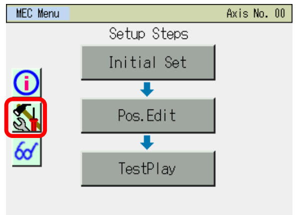
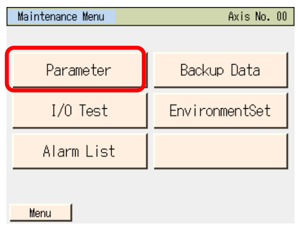
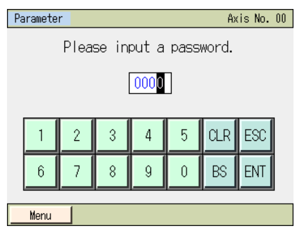
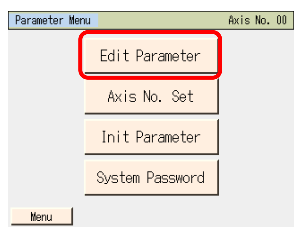
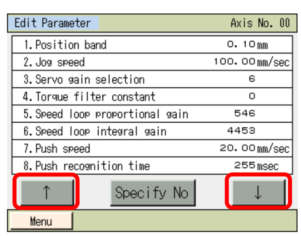
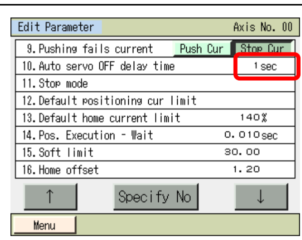
No.	Operation	Screen	Remarks
7	Touch [Yes].		
8	Touch [Menu].		
9	"50.00" is shown in the position field. This confirms that the position data has been loaded.		Touch [Menu] to return to the position setting screen.
10	Touch [Menu].		Touch [Menu] to return to the position setting screen.
11			Touch [Menu] to return to the MEC menu screen.

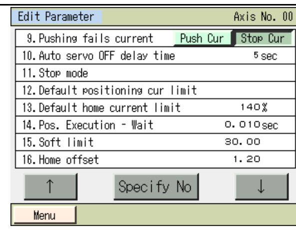
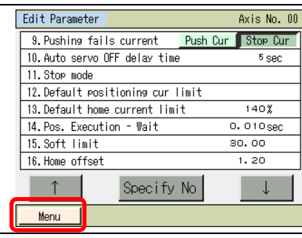
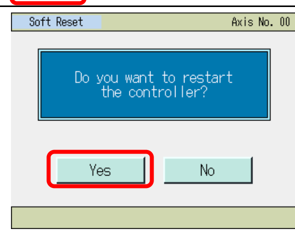
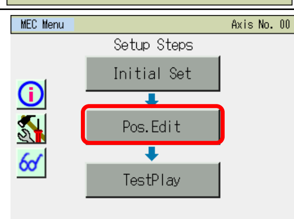
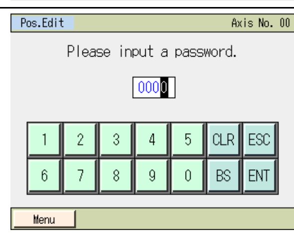
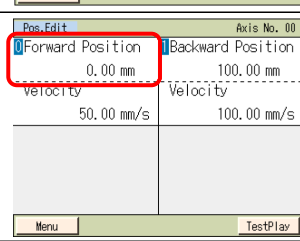
4) Setting for push-motion operation (push force, push band)
An example of stopping at 2 points is explained.
In this example, push-motion operation is performed at the start point.
Push force: 50%, Push band: 5.0 mm

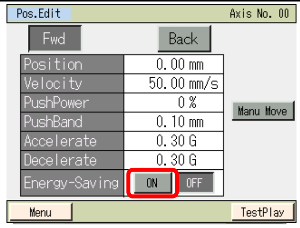
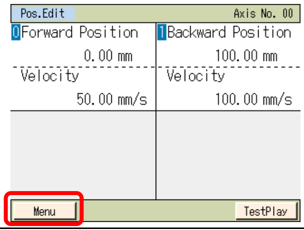
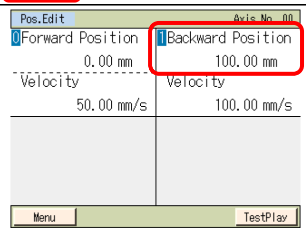
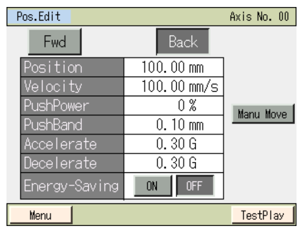
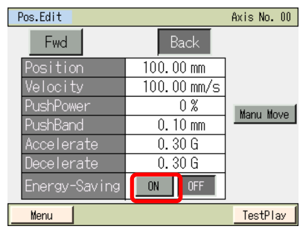
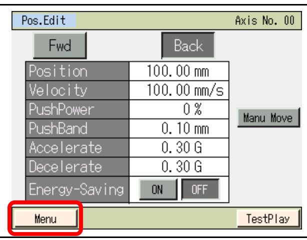
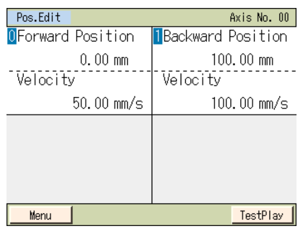
No.	Operation	Screen	Remarks
1	Touch [Pos.Edit] on the MEC menu screen.		
2	If the password is not “0000,” the password entry screen appears. Enter the password.		A desired position setting password can be set in the “position data edit password” field of the parameter edit screen.
3	Set the position relating to the start point, acceleration, and deceleration. Touch [Forward Position].		Touch [Menu] to return to the MEC menu screen.
4	Touch the value field of [PushPower]. When the numeric keypad is displayed, touch [5], [0], and then [ENT].		Touch [Menu] to return to the position setting screen.
5	“50.00” is shown in the push power field.		Touch [Menu] to return to the position setting screen.
6	Touch the value field of [PushBand]. When the numeric keypad is displayed, touch [5] and then [ENT].		Touch [Menu] to return to the position setting screen.

<table>
<tr><th>No.</th><th>Operation</th><th>Screen</th><th>Remarks</th></tr>
<tr><td>7</td><td>"5.00" is shown in the push band field.</td><td>
</td><td>Touch [Menu] to return to the position setting screen.</td></tr>
<tr><td>8</td><td>Touch [Menu].</td><td>
</td><td>Touch [Menu] to return to the position setting screen.</td></tr>
<tr><td>9</td><td></td><td>
</td><td>Touch [Menu] to return to the MEC menu screen.</td></tr>
</table>

5) Setting the energy-saving function (auto motor power (auto servo) OFF function)
An example of stopping at 2 points is explained.
How to automatically turn off the servo in 5.0 seconds after stopping is explained.

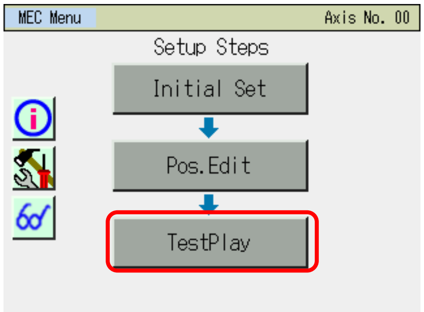
No.	Operation	Screen	Remarks
1	Touch [icon] on the MEC menu screen.		
2	Set the auto motor power (auto servo) OFF delay time. Touch [Parameter].		
3	Enter the password.		The password is “5119” (factory setting). A desired password can be set using the “system password” parameter accessible from the maintenance menu.
4	Touch [Edit Parameter].		
5	Touch [↑]/[↓] to navigate through the screens until the auto servo OFF delay time setting screen appears.		
6	Touch the value field of auto servo OFF delay time. When the numeric keypad is displayed, touch [5] and then [ENT].		

No.	Operation	Screen	Remarks
7	“5” is shown.		
8	Touch [Menu].		
9	Touch [Yes].		If you touch [No], the settings you have made will not be reflected until the controller is restarted.
10			
11	The controller is restarted and the MEC menu screen appears. Touch [Pos.Edit].		
12	If the password is not “0000,” the password entry screen appears. Enter the password.		A desired position setting password can be set in the “position data edit password” field of the parameter edit screen.
13	Set the energy-saving function at the start point. Touch [Forward Position].		Touch [Menu] to return to the MEC menu screen.

No.	Operation	Screen	Remarks
14	Touch [ON].		Touch [Menu] to return to the position setting screen.
15	Touch [Menu].		Touch [Menu] to return to the MEC menu screen.
16	Set the energy-saving function at the end point. Touch [Backward Position].		Touch [Menu] to return to the MEC menu screen.
17	The display switches to the end point screen. Set the energy-saving function relating to the end point.		Touch [Menu] to return to the position setting screen.
18	Touch [ON].		Touch [Menu] to return to the position setting screen.
19	Touch [Menu].		Touch [Menu] to return to the position setting screen.
20			Touch [Menu] to return to the MEC menu screen.

7.8 Trial operation

You can perform I/O tests and axis movement operation tests.

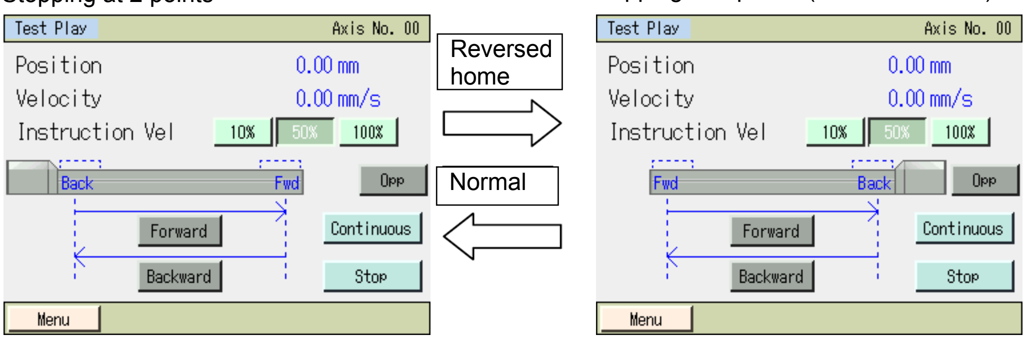


Touch [TestPlay] on the MEC menu screen.

- Operation test: You can perform operation tests of axis movement.
  A screen corresponding to the operation pattern you have selected appears.
  The display can be switched between the normal mode and reversed-home mode.
  If your actuator is of the reversed-home specification, you can switch to the reversed-home mode to align the display with the actual actuator.

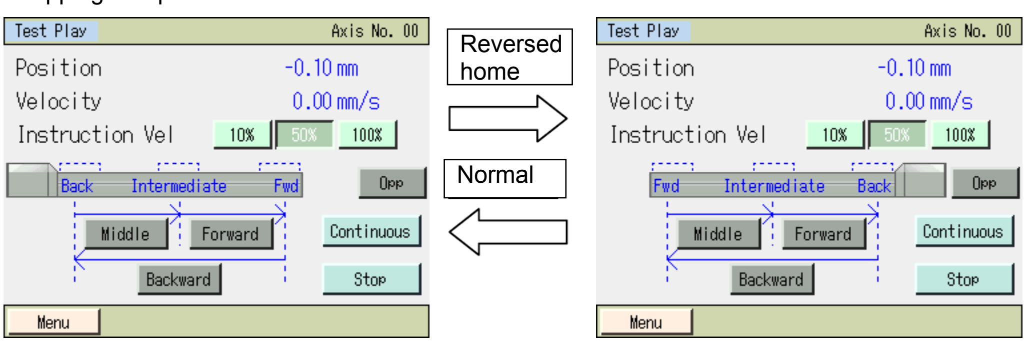
Stopping at 2 points

Stopping at 2 points (Reversed home)

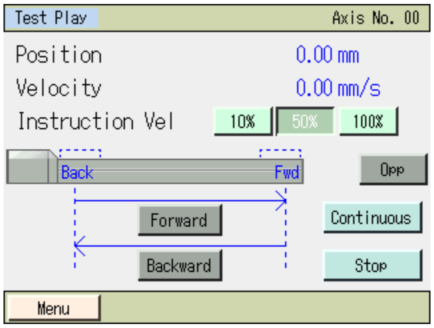


Stopping at 3 points

Stopping at 3 points (Reversed home)



The operating direction is shown by using an example of stopping at 2 points.

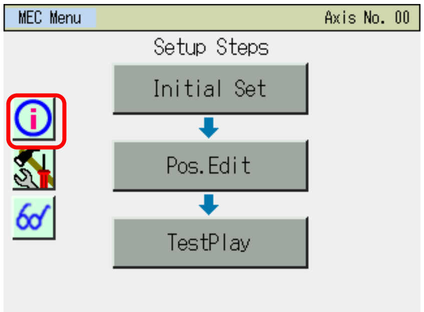


The current position of the axis is shown.
The speed of the axis is shown.

- Instruction Vel: Select [10%], [50%] or [100%] as the speed for trial operation. If the speed set on the position setting screen is 600 mm/s, for example, the trial Operation peed will become 600 mm/s if [100%] is selected, 300 mm/s if [50%] is selected, or 60 mm/s if [10%] is selected.
- Forward: Touching [Forward] causes the actuator to move toward the end point.
- Backward: Touching [Backward] causes the actuator to move toward the start point.
- Continuous: Touching [Continuous] causes the actuator to move continuously until [Stop] is touched.
  If the actuator is set to stop at 2 points, it will move between the start point and end point repeatedly.
  If the actuator is set to stop at 3 points, it will move in the sequence of intermediate point → end point → start point repeatedly.
- Stop: Touching [Stop] causes the actuator to stop.
- Opp, Normal: Touching [Opp] or [Normal] toggles the display mode between normal and reversed-home.

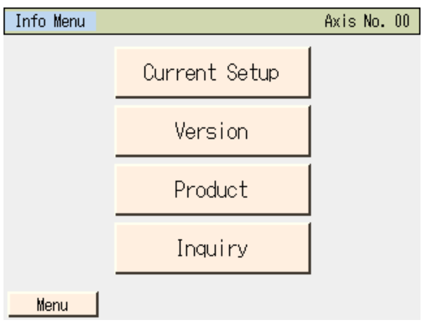
7.9 Information

The operation pattern, version and other information are shown.



Touch (i) on the MEC menu screen.

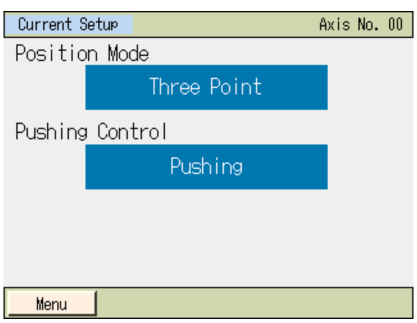
The information selection screen appears.



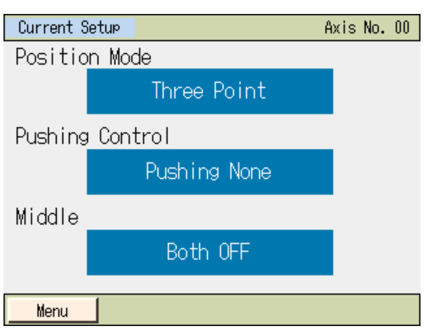
Touch the screen you want to display.
Touch [Menu] to return to the MEC menu screen.

[Setting check]
You can check the operation pattern, operation mode and other information currently set.

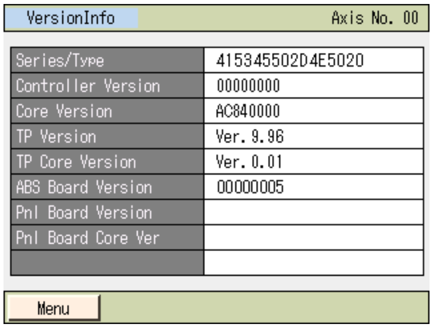
(Stopping at 2 points)



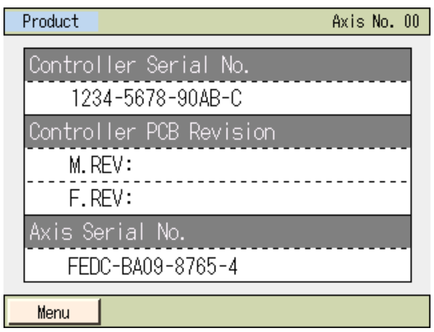
(Stopping at 3 points)



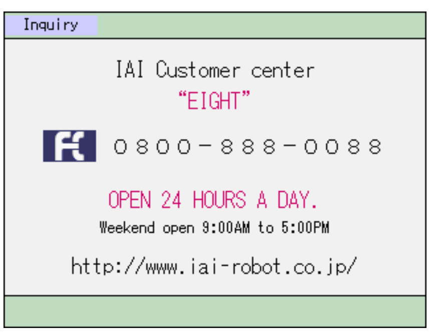
[Version/manufacturing information]
You can check the version information, etc.



[Manufacturing information]
You can check the serial numbers and other manufacturing information.

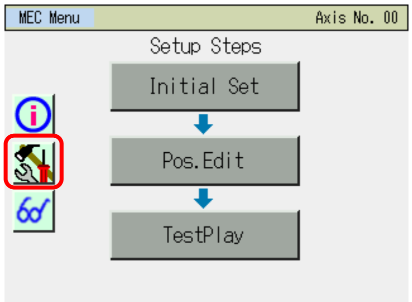


[Contact]
You can check the contact information of IAI.

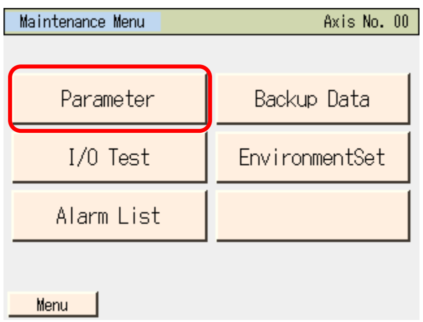


7.10 Maintenance – Parameters

Set the parameters and axis number. You can change the system password and reset all parameters to their factory defaults.

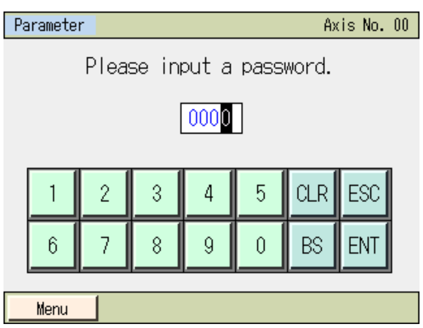


Touch  on the MEC menu screen.



Touch [Parameter].
Touch [Menu] to return to the MEC menu screen.

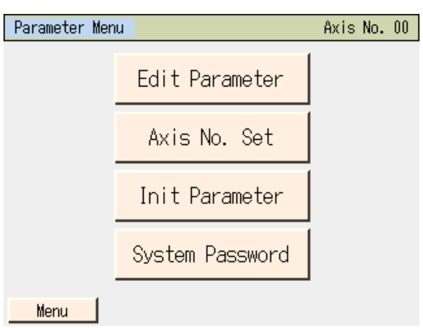
Before the display switches to the initial setting screen, the password entry screen appears if the password is other than "0000."



Enter the password using the numeric keypad, and then touch [ENT].

The password is "5119" (factory setting).

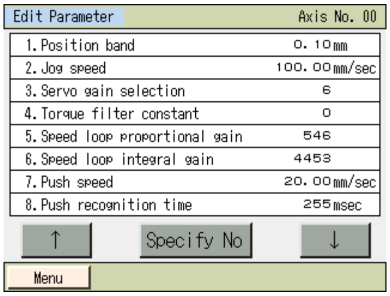
A desired password can be set using the "system password" parameter accessible from the maintenance menu.



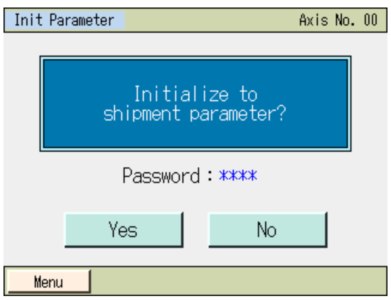
Select and touch [Edit Parameter], [Init Parameter] or [System Password].

A screen corresponding to the menu you have selected appears.

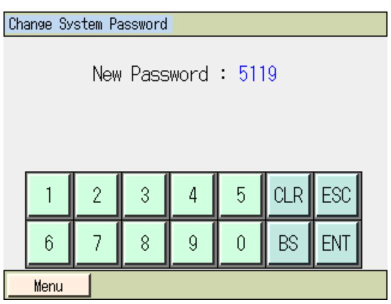
- Parameter edit : You can set 18 parameters.



- Parameter initialization : You can reset all parameters to their factory defaults (initialize the parameters).



- System password change : You can change the parameter edit password, etc.



[1] Types of parameter editing
For details on each parameter, refer to the operation manual for your PMEC/AMEC controller and ERC3 (MEC mode).

(Positioning band)
Set the positioning band.

(Jog speed)
Set the speed of jog operation.

(Servo gain number)
Set the servo gain number that determines the response of position control loops in servo control.

(Torque filter constant)
Set the torque filter time constant that determines the filter time constant for torque commands in servo control.

(Speed loop proportional gain)
Set the speed loop proportional gain that determines the response of speed control loops in servo control.

(Speed loop integral gain)
Set the speed loop integral gain that determines the response of speed control loops in servo control.

(Push speed)
Set the speed of push-motion operation.

(Push recognition time)
Set the push recognition time to recognize completion of operation after the work part was contacted in push-motion operation.

(Pushing fails current)
Set whether to use the push current or stop current as the current limiting value when the work part was missed in push-motion operation.
For AMEC, if the stop current is selected when the work part was missed in push-motion operation, the torque limit at the travel current limiting value is set.

(Auto servo OFF delay time)
Set the time until the auto motor power (auto servo) turns off automatically when the ecology function is enabled.

(Stop mode) Displayed for PMEC, ERC3 (MEC mode) controllers
Set whether to implement servo stop based on the full servo control method or complete stop without servo control when the actuator stops.

(Note) When this parameter is changed, the new setting will not be reflected until the position data is written to the controller again.

(Current limiting value while stopped after positioning) Displayed for PMEC, ERC3 (MEC mode) controller
Set the current limiting value to be applied while the actuator is stopped after positioning.

(Current limiting value during home return)
Set the current limiting value to be applied during home return operation.

(Position execution wait time during continuous operation)
This parameter is not used with PMEC, AMEC and ERC3 (MEC mode) controllers.

(Soft limit)
Set the positive soft limit.

(Home return offset)
Set the offset for home return.

(Home return direction)
Set whether to perform home return in the motor direction or front side direction.
The home return direction cannot be changed for some actuators, such as rod-type actuators.

(Position edit password)
Set the password for editing position data.

(PIO Inching distance) Displayed for ERC3
Set the inching distance for when conducting the inching operation in Quick Teach.

(Threshold for total number of movements) Displayed for ERC3
Set the threshold for total number of movements.
The total number of the actuator operation is counted in the maintenance function of ERC3.
An alarm is generated when the total operation distance exceeds the value set to threshold for total number of movements.

(Threshold for total travelled distance) Displayed for ERC3
Set the threshold for total travelled distance.
The total travelled distance of the actuator operation is counted in the maintenance function of ERC3.
An alarm is generated when the total operation distance exceeds the value set to threshold for total travelled distance.

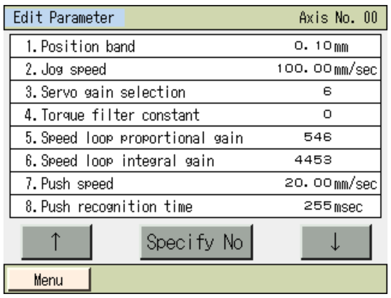
(High Output Setting) Displayed for ERC3
Set whether use the high output function. Enabling：Set to use the high output function.

(BU Speed Loop Proportional Gain) Displayed for ERC3
When the high output setting is activated, this parameter setting becomes effective for the speed loop proportional gain.

(BU Speed Loop Integral Gain) Displayed for ERC3
When the high output setting is activated, this parameter setting becomes effective for the speed loop integral gain.

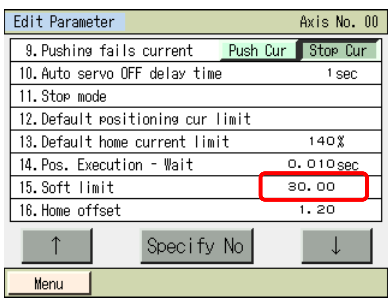
[2] Basic operation
Set parameters.

[Parameter]

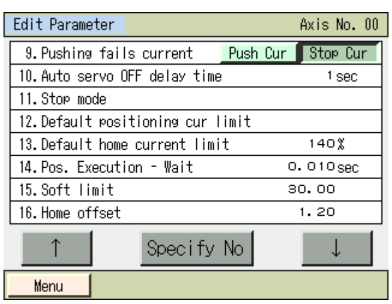


Touch [↑] to return to the previous screen.
Touch [↓] to move to the next screen.
Three screens are available, including one showing the default positioning band and others used to edit position data and password.
Touch [Menu] to return to the parameter menu screen.

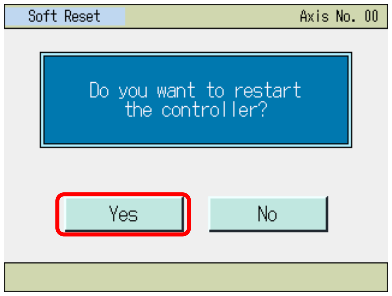
An example of setting a soft limit is explained.
Touch [↑] and [↓] on the displayed screen until the soft limit setting screen appears.



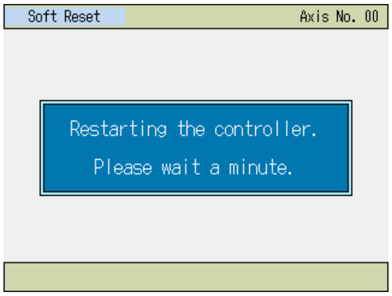
Touch the current value.
When the numeric keypad appears, enter a desired value and then touch [ENT].



Change parameters and touch [Menu] to return to the controller restart screen.



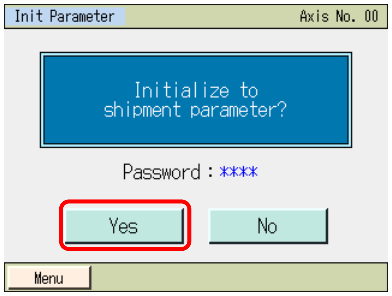
Touch [Yes].
The controller is restarted.
The controller operates according to the operation pattern settings you have made.
The display returns to the initial setting screen.



Touch [No], and the controller will not operate according to the operation pattern parameters you have set until restarted.

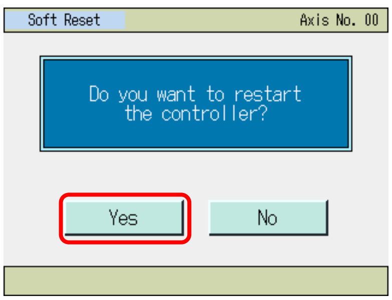
[Init Parameter]

The parameters are reset to their factory default settings.



Touch [Yes].

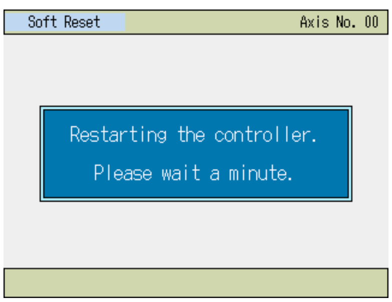
Touch [No] to return to the parameter menu screen without resetting the parameters to their factory default settings.



Touch [Yes].

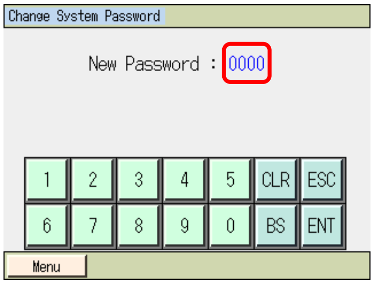
The controller is restarted.
The controller operate according to the factory-set parameters.
The display returns to the initial setting screen.

Touch [No], and the controller will not operate according to the factory-set parameters until restarted.

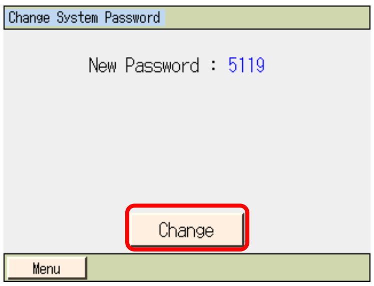


[Change System Password]

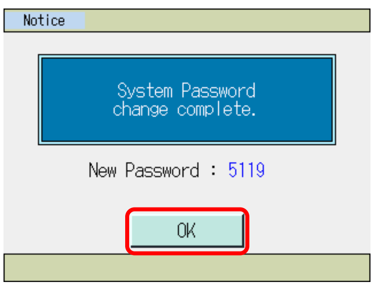
Change the password for parameter editing.



Touch New Password.
When the numeric keypad appears, enter a desired value and then touch [ENT].

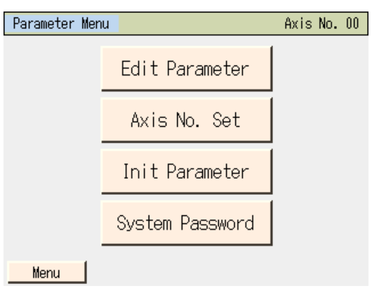


Touch [Change].



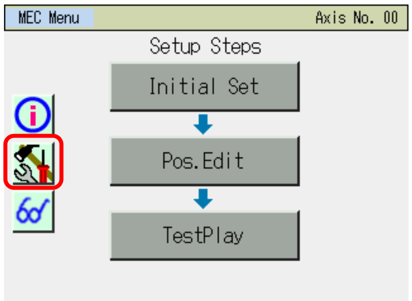
The system password changes.

Touch [OK] to return to the parameter menu screen.

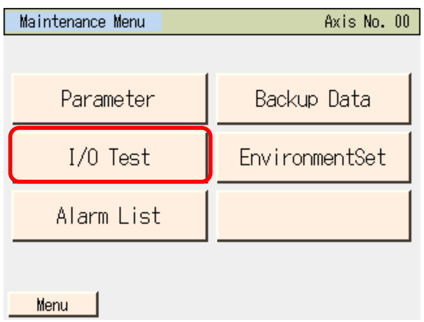


7.11 Maintenance – I/O Tests

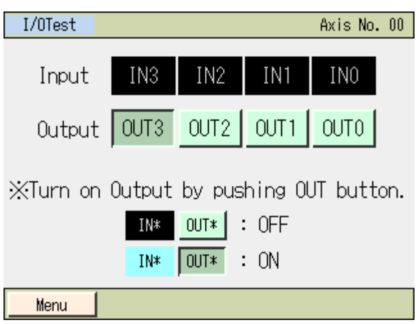
You can monitor PIO input signals.
Output signals can be forcibly turned ON or OFF.



Touch  on the MEC menu screen.



Touch [I/O Test].
Touch [Menu] to return to the MEC menu screen.



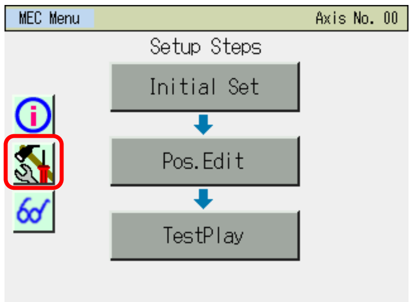
You can monitor the ON/OFF statuses of input signals.

Output signals OUT0 to OUT3 can be forcibly output by touching each signal button.

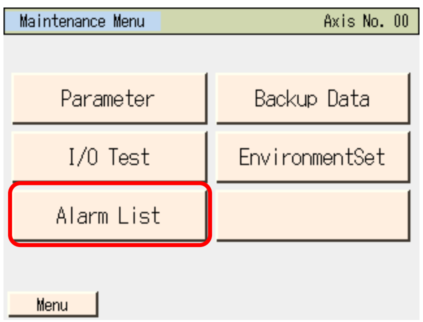
Touch [Menu] to return to the maintenance menu screen.

7.12 Maintenance – Alarm List

A list of alarms that have generated after the controller power was turned on is displayed. [Refer to 8, "Error Display" for the details of alarms.]



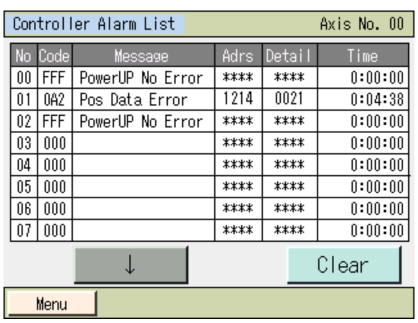
Touch  on the MEC menu screen.



Touch [Alarm List].

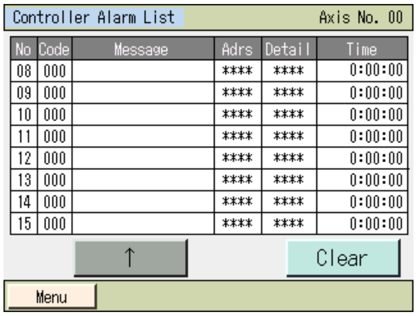
Touch [Menu] to return to the MEC menu screen.

The alarm list of the controller is displayed. The error list consists of errors 0 to 15.



No	Code	Message	Adrs	Detail	Time
00	FFF	PowerUP No Error	****	****	0:00:00
01	0A2	Pos Data Error	1214	0021	0:04:38
02	FFF	PowerUP No Error	****	****	0:00:00
03	000		****	****	0:00:00
04	000		****	****	0:00:00
05	000		****	****	0:00:00
06	000		****	****	0:00:00
07	000		****	****	0:00:00

Touch [↓] to display the next errors of the list.



Touch [↑] to display the previous list screen.

Touch [Clear], and the details of all alarms will be cleared.

(Note) PowerUP No Error indicates that the controller power was turned on.
It does not indicate an error.
The time of occurrence of each alarm is indicated by an elapsed time from this PowerUP No Error.

7.13 Data Backup

Data is transferred between the Secure Digital memory card in the touch panel teaching pendant and the controller.

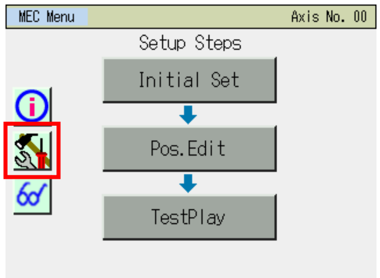
(Note) Type of Stored Data
This includes the position data, parameters and alarm list.
It is not applicable to the backup data storable in the MEC PC software.
Please note that MEC PC Software cannot deal with individual position data and parameters.

(Note) Extensions of the Stored Data
- The file extensions for AMEC Controllers to be stored in the Secure Digital card are ptam for the position data and pram for the parameters. The position data for PMEC controllers is ptpm and parameters are prpm.
- The alarm list can only have the backup. It cannot be restored. Data is in a CSV file.

(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. The files existing in other directories other than the specified folders cannot be listed up in the file name list in the file select at the initial setting or restore.
If the folder does not exist, it is automatically created.
- Position Data : \CONPTA\Position\File Name
- Parameter : \CONPTA\Parameter\File Name
- Alarm List : \CONPTA\Alarmlist\File Name

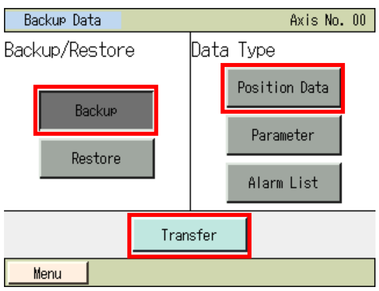
7.13.1 Data Backup of the Controller

The data in the controller is transferred to the Secure Digital memory card for backup.



Touch  on the MEC Menu screen.

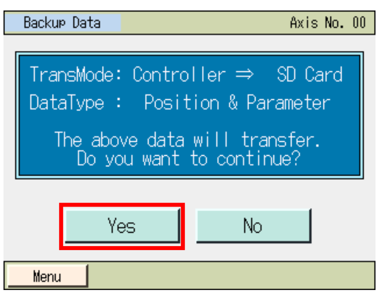
A screen for data transfer appears.



Touch [Backup].

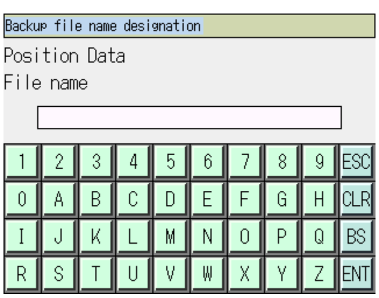
Select the data type for the backup such as [Position Data] and touch it.

Touch [Transfer].

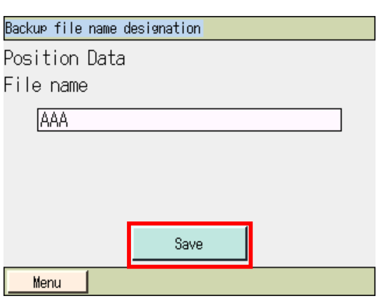


Touch [Yes].

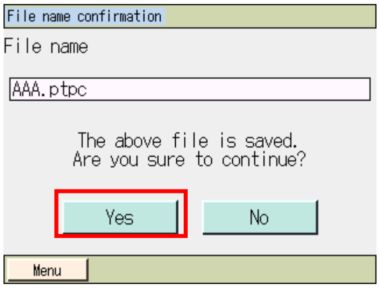
If [No] is touched, the screen goes back to the data backup screen.



Numeric keys show up. Input a file name.
The file name is to be typed with 32 characters at maximum in letters and numbers.



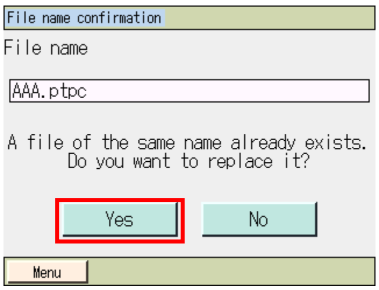
Touch [Save].



The screen below appears if the same name is not found.

Touch [Yes].

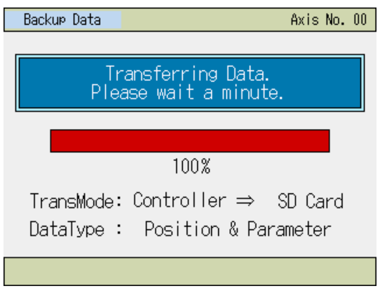
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



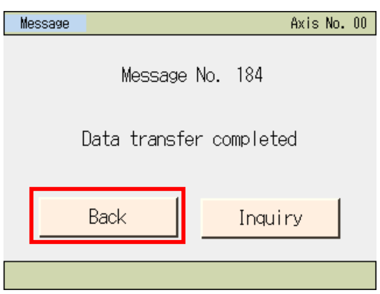
The screen below appears if the same name is not found.

Touch [Yes].

If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



Data transfer screen will be shown.

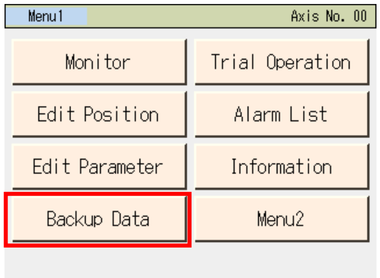


A message to tell the data transfer is complete pops up and the backup process is finished.

Touching [Back] can go back to the Backup Data screen.

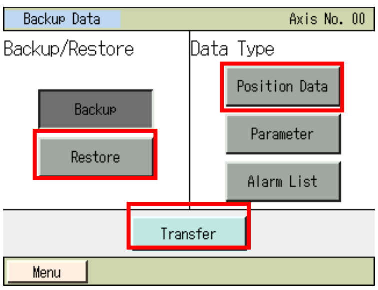
7.13.2 Restore to Controller

Data in the Secure Digital card is transferred to the controller.



Touch [Backup Data] on the Menu 1 screen.

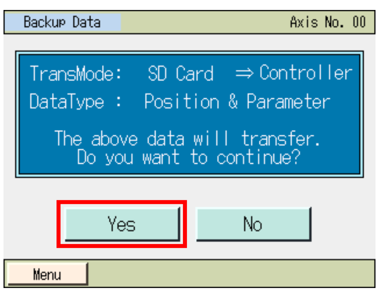
A screen for data transfer appears.



Touch [Restore].

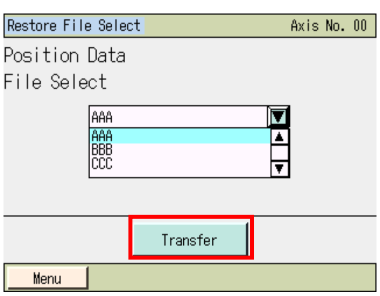
Select the data type to transfer to the controller, such as [Position Data], and touch it.

Touch [Transfer].



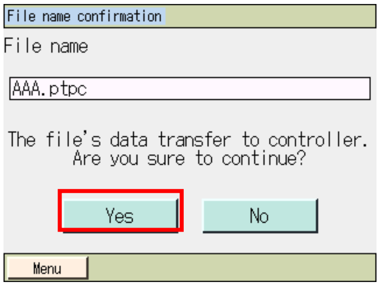
Touch [Yes].

If [No] is touched, the screen goes back to the data backup screen.



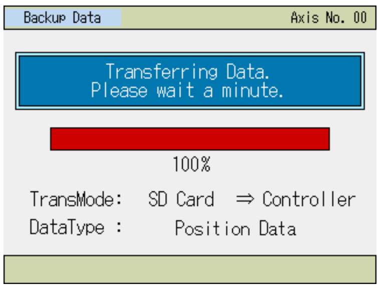
Touch ▲ and ▼ to select a file to transfer to the controller from the list of the backed up file names.

Touch [Transfer].

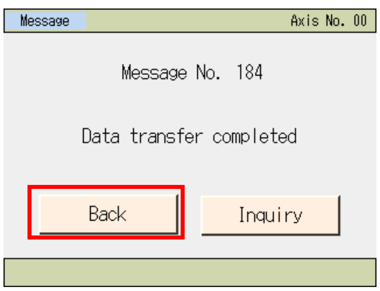


Touch [Yes].

If [No] is touched, the screen goes back to the previous one for the restore file select.



Data transfer screen will be shown.

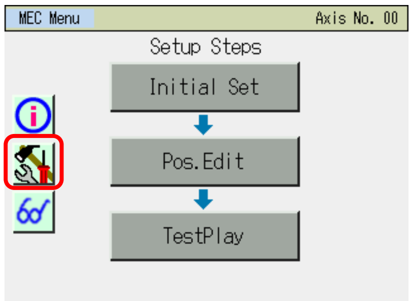


A message to tell the data transfer is complete pops up and the data transfer process to the controller is finished.

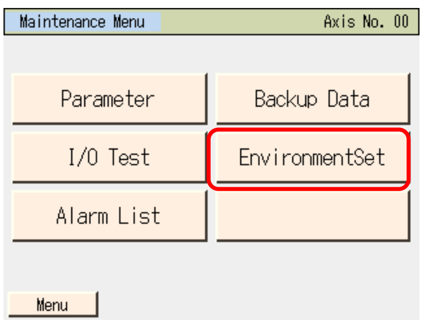
Touching [Back] can go back to the Backup Data screen.

7.14 Maintenance – Environment Setting (Touch sound Setting, Display Language Setting, Auto Monitor Setting, Display Setting (Screen Adjustment))

You can set the touch sound, display language and auto monitor, and also adjust the screen.

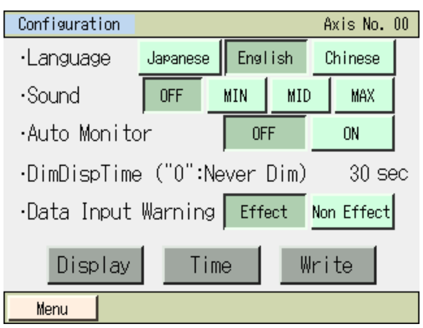


Touch  on the MEC menu screen.



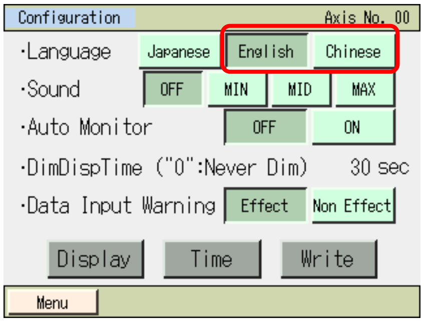
Touch [EnvironmentSet].
Touch [Menu] to return to the MEC menu screen.

The environment setting screen appears.



[1] Basic operation

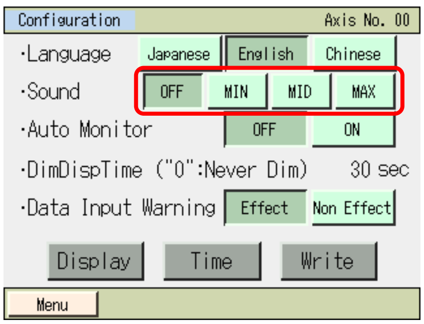
- Language: Select Japanese or English as the display language.
  Display for Japanese/English/Chinese languages setting change (Option model code: ENG)



Select and touch [Japanese], etc.

Touch [Write].
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

- Sound: Set whether to output or not output a touch tone.

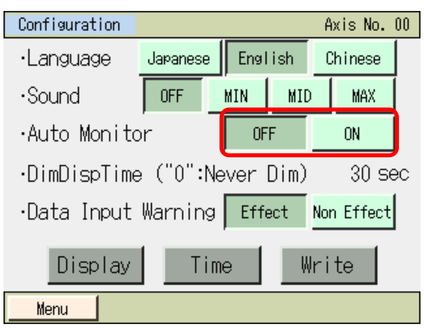


Touch [OFF]. A touch tone is not output.
Touch either of [MAX], [MID] or [MIN]. A touch tone is output.

Touch [Write].

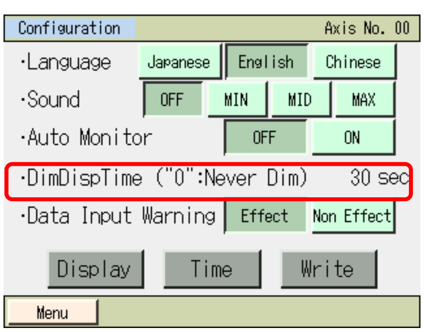
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another window.

- Auto Monitor: You can have the monitor screen appear first after the touch-panel teaching pendant is connected.



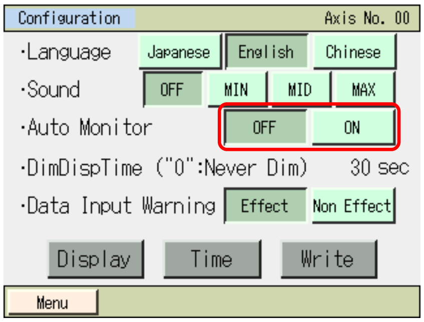
Touch [ON] to enable the auto monitor setting.

- Dim Display Time: You can set a desired time after which the display of the touch-panel teaching pendant will turn off. If "0 sec" is set, the display will remain lit at all times.

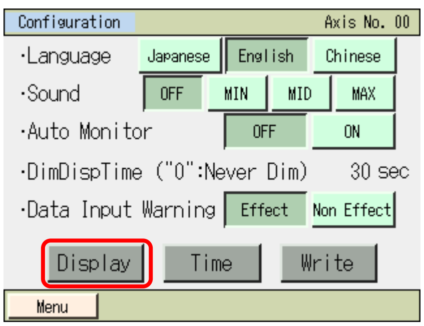


Touch •DimDispTime ("0":Never Dim) 30 sec.
When the numeric keypad is displayed, use the keypad to enter the light off time.
A desired value between 1 and 255 sec can be set.

- Data Input Warning: An alarm can be generated if a value below the minimum velocity or above the rated acceleration/deceleration is input in the position data. Even though, it is possible to input a value below the minimum velocity or above the rated acceleration /deceleration.

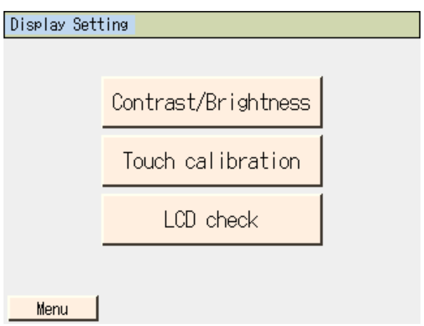


[Display]
Adjustment of contrast and brightness of the screen, position tuning for touch panel and LCD screen check can be performed.



Touch [Display].

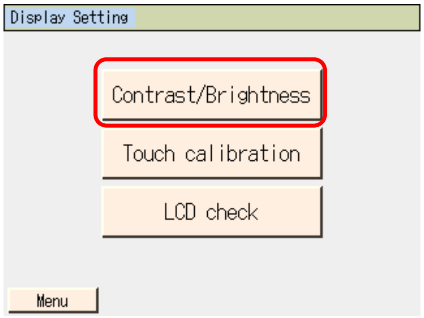
Display menu Window is displayed.



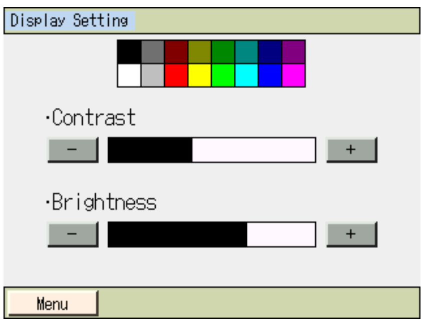
Select Display Setting menu.

Touch [Menu] and the display returns to EnvironmetSet screen.

●Change the Contrast/Brightness



Touch [Contrast/Brightness].

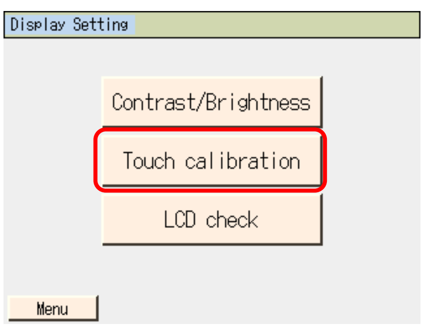


Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

Brightness adjustment
Touch [–] and [+] under Brightness to adjust the brightness of the screen.

Touch [Menu] and the display returns to Display menu screen.

●Touch calibration
A calibration for the position detection of the touch panel is performed.



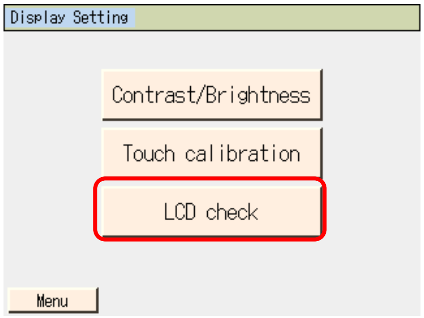
Touch [Touch Calibration].

Touch [・] in the order of 1, 2, 3 and 4.

Touch [Menu] and the display returns to Display menu screen.

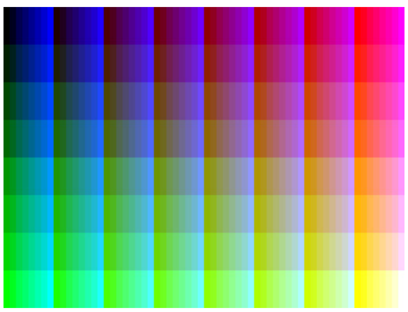
●LCD check

LCD display can be checked in the order of Color Pattern, White Only and Black Only.



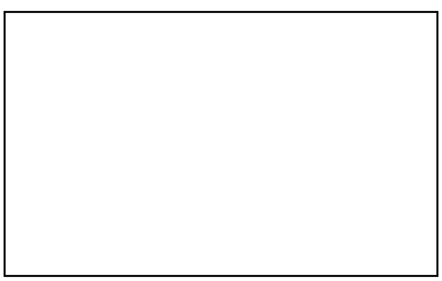
Touch [LCD Check].

Color Pattern is displayed.



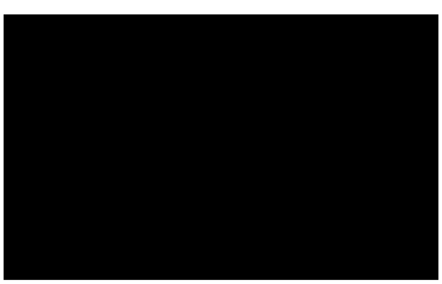
Touch any point on the screen.

White Only is displayed.



Touch any point on the screen.

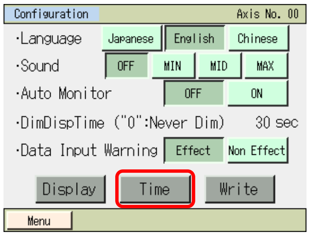
Black Only is displayed.



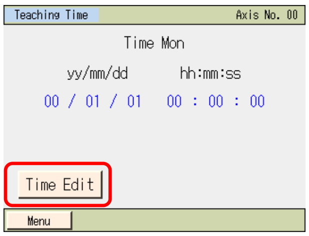
Touch any point on the screen.
The display returns to Display menu screen.

[Time Setting]

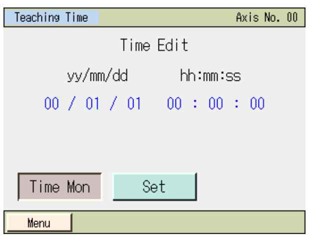
Time setting can be performed for CON-PTA/PDA/PGA/PGAS.



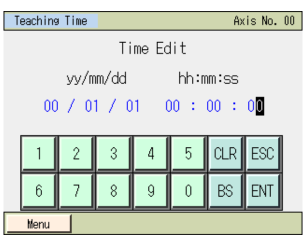
Touch [Time].



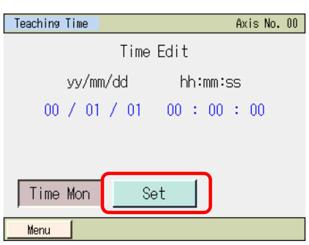
Touch [Time Edit].



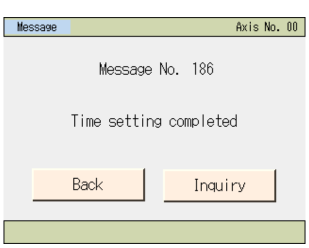
Touch the value of year, month, day, hour, minute or second that is required to be changed.



Numeric keys are displayed.
Input a value and touch [ENT].



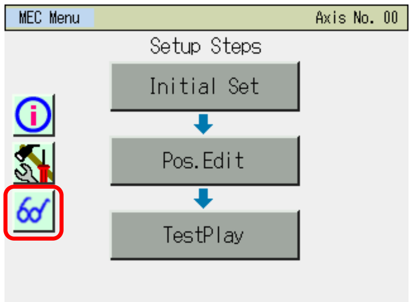
Touch [Set].



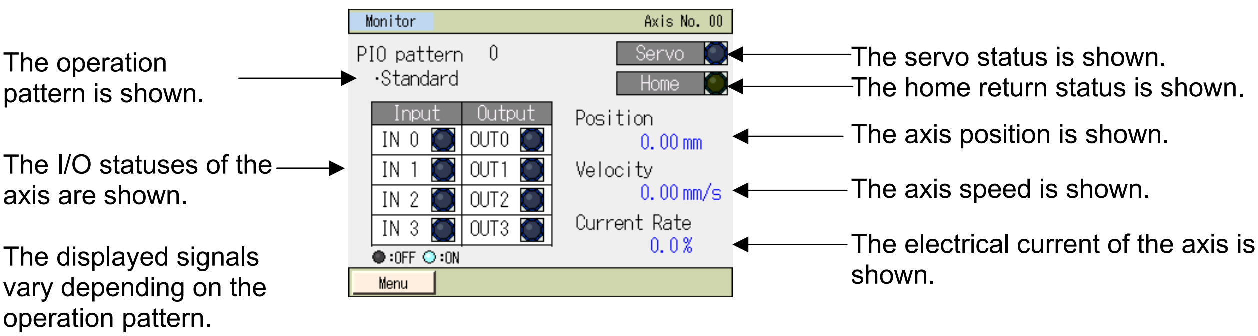
The time of the CON-PTA/PDA/PGA/PGAS is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

7.15 Monitor

The current position, speed, electrical current, system status and I/O statuses of the controller are displayed.



Touch  on the MEC menu screen.



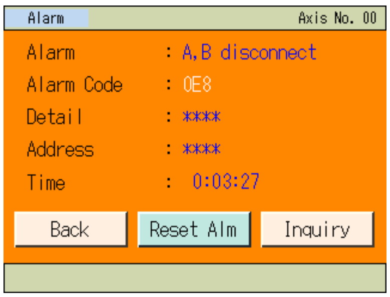
Touch [Menu] to return to the MEC menu screen.

8. Error Display

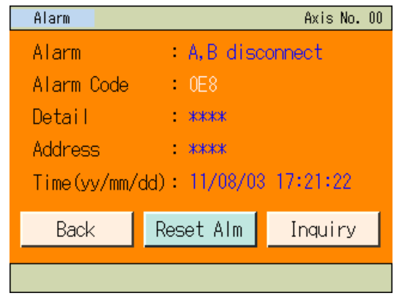
8.1 Occurrence of Alarm

If an error occurs, the alarm screen appears.

Model other than SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON



SCON-CA, SCON-CAL/CGAL, PCON-CA, ACON-CA, DCON-CA, ERC3 PIO Converter and MSCON



8.1.1 Alarms Detected by Controller

Alarms of codes 040 to 0FF are those detected by the controller.
These alarms include major alarms relating to the servo control system, power system, etc. For details on these alarms, refer to the operation manual for your controller.

Remove the cause of each alarm and then perform the operation specified below.

- To reset operation -cancellation level alarms, touch [Reset Alm] on the alarm screen.
- To reset cold-start level errors, reconnect the control power.

8.1.2 Alarms Detected by Touch-panel Teaching Pendant

Alarms detected by the touch-panel teaching pendant and remedial actions are explained.

[1] An alarm is displayed on the alarm screen.

Code	Error description	Cause and action
308	Response timeout error No response is returned from the controller.	[1] The controller connection cable is open. Check the connection cable for wrong wiring or wire breakage. [2] This is a temporary abnormality caused by noise, etc. Reconnect the controller power.
30D	Exceptional response receive error An abnormal response is returned from the controller.	This is a temporary abnormality caused by noise, etc. If the condition occurs frequently, check the cables, noise elimination measures taken on the power supply, etc.

8.2 Error Messages on Touch Panel

An error message is displayed on the touch panel display if, for example, an attempt is made to write to the controller an excessive value entered for the target position.
Check the entry to confirm that the value is correct, etc., and then try setting the value again.

Error message

Input data error
The entered value is too small
The entered value is too large
Password error

9. Appendix

9.1 Regarding RTC (Real Time Clock) Backup Voltage Drop

9.1.1 Action to Take after RTC (Real Time Clock) Backup Voltage Drop

A display of “No. 187 RTC Backup Voltage Drop” error indicates the battery has become depleted.

(Reference)
Battery Life
The nominal life time the supplier has announced is approximately 5 years (at ambient temperature 25 °C).

If the battery gets depleted, you will lose the following data:
- Time data (Note 1),
- TP parameters (Note 2) such for language setting and model specification setting,
- Calibration values of touch panel, and
- Values of LCD contrast and brightness (Note 3)

(Note 1) Set the current time every time turning the power on. The current time data is maintained until the power is turned off. The date when storing a file to an SD card is also based on the current time.
If the current time setting is not conducted, the current time will show the time passed since 00/01/01 00:00:00 when the power is turned on. The date of file storage to an SD card will show the time passed since the power is turned on.
- CON related controllers [Refer to 5.17 Environment Setting]
- SEP controller [Refer to 6.14 Environment Setting]
- MEC controller [Refer to 7.14 Maintenance Environment Setting]

(Note 2) For CON-PDA/PGA/PGAS, if the TP parameters are initialized, the model turns to CON-PTA, thus the setting is turned to that not to use the enable switch. When connected to a controller with the enable effective and turn the power on, you will be asked if you may invalid the setting. Select “No”. The dead man’s switch can be used.
If “Yes” is touched accidently, the setting becomes invalid, thus the dead man’s switch becomes no longer available. In this case, make the setting in Parameter No. 42 Enable Function of CON related controller to 0 = Effective.
[Refer to 5.8 Parameter Editing]

(Note 3) Readjust the contrast and brightness of the screen if an adjustment has already been made to those settings.
- CON related controllers [Refer to 5.17 Environment Settings]
- SEP controller [Refer to 6.14 Environment Settings]
- MEC controller [Refer to 7.14 Maintenance Environment Setting]

9.1.2 Battery Replacement

The battery cannot be replaced with the user’s responsibility.
Please contact us if a replacement work is needed.

10. Warranty

10.1 Warranty Period

One of the following periods, whichever is shorter:
- 18 months after shipment from our company
- 12 months after delivery to the specified location

10.2 Scope of Warranty

Our products are covered by warranty when all of the following conditions are met. Faulty products covered by warranty will be replaced or repaired free of charge:

(1) The breakdown or problem in question pertains to our product as delivered by us or our authorized dealer.

(2) The breakdown or problem in question occurred during the warranty period.

(3) The breakdown or problem in question occurred while the product was in use for an appropriate purpose under the conditions and environment of use specified in the Operation Manual and catalog.

(4) The breakdown or problem in question was caused by a specification defect or problem, or by a quality issue with our product.

Note that breakdowns due to any of the following reasons are excluded from the scope of warranty:
[1] Anything other than our product
[2] Modification or repair performed by a party other than us (unless we have approved such modification or repair)
[3] Anything that could not be easily predicted with the level of science and technology available at the time of shipment from our company
[4] A natural disaster, man-made disaster, incident or accident for which we are not liable
[5] Natural fading of paint or other symptoms of aging
[6] Wear, depletion or other expected result of use
[7] operation noise, vibration or other subjective sensation not affecting function or maintenance

Note that the warranty only covers our product as delivered and that any secondary loss arising from a breakdown of our product is excluded from the scope of warranty.

10.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.

10.4 Limited Liability

(1) We shall assume no liability for any special damage, consequential loss or passive loss such as a loss of expected profit arising from or in connection with our product.
(2) We shall not be liable for any program or control method created by the customer to operate our product or for the result of such program or control method.

10.5 Conditions of Conformance with Applicable Standards/Regulations, Etc., and Applications

(1) If our product is combined with another product or any system, device, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules. The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc. In such a case we will not be liable for the conformance of our product with the applicable standards, etc.

(2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact us if you must use our product for any of these applications:

- [1] Medical equipment pertaining to maintenance or management of human life or health
- [2] A mechanism or mechanical equipment intended to move or transport people (such as a vehicle, railway facility or aviation facility)
- [3] Important safety parts of mechanical equipment (such as safety devices)
- [4] Equipment used to handle cultural assets, art or other irreplaceable items

(3) Contact us at the earliest opportunity if our product is to be used in any condition or environment that differs from what is specified in the catalog or Operation Manual.

10.6 Other Items Excluded from Warranty

The price of the product delivered to you does not include expenses associated with programming, the dispatch of engineers, etc. Accordingly, a separate fee will be charged in the following cases even during the warranty period:

- [1] Guidance for installation/adjustment and witnessing of test operation
- [2] Maintenance and inspection
- [3] Technical guidance and education on operating/wiring methods, etc.
- [4] Technical guidance and education on programming and other items related to programs

11. Change History

Revision Date	Description of Revision
August 2011	First Edition
September 2011	Second Edition Pg. 8, 21 to 26, 28, 30 to 32, 71 to 72, 74, 85 and 216 The contents of ERC3 are added.
October 2011	Third Edition Pg. 200 ERC3 MEC Mode parameters added
October 2011	Fourth Edition DSEP added
November 2011	Fifth Edition Contents changed in Safety Guide Caution notes added for when working with two or more persons Pg. 7, 8, 21 to 24, 26 to 28, 30, 32 to 35, 73, 74, 76, 87, 88, 218 The contents of SCON-CA is added.
January 2012	Sixth Edition Statements added to show how to operate for data backup for position data and parameters in Pg. 91 to 95, 170 to 174, 221 to 225. MSEP added
May 2012	Seventh Edition Pg.1 to 7 Contents changed and added in Safety Guide Pg. 8, 41 Note added to explain that table may show '0' if touching [↑] key or [↓] key too fast to switch the windows in the table for position data.
August 2012	Eighth Edition MSCON added
August 2013	Ninth Edition CON-PGAS added
November 2013	Tenth Edition The contents of ACON-CA and DCON-CA are added.
February 2014	Eleventh Edition Pg.81 Load cell calibration operation added to 5. 13 User Adjustment
March 2014	Twelfth Edition Pg.15 Change made to note to state to turn power OFF before inserting/removing touch panel teaching

Revision Date	Description of Revision
May 2014	Thirteenth Edition Pg. 33 to 35 Correction made to contents of maintenance information
August 2014	Fourteenth Edition SCON-CAL/CGAL added
July 2016	14C Edition Pg. 10 Supported models added Pg. 11 The power supply voltage range to the basic specification added.

Manual No.: ME0295-14C (July 2016)

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