Touch Panel Teaching Pendant

TB-02

Applicable for Position Controller, ELECYLINDER

Instruction Manual Fifteenth Edition



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ME0356

This instruction manual describes the contents for position (CON/SEP/MEC system) controllers and ELECYLINDER / ROBO PUMP.

For how to use the position (SEL system) controllers, refer to the following instruction manual.

"Touch Panel Teaching Pendant TB-02 Program Controller Instruction Manual"

For details of applicable controllers, refer in the section for the supported models.

IAI Corporation

ROBO CYLINDER

Please Read Before Use

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, providing the information you need in order 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.

Please downloaded the user's manual from our website.
You can download it free of charge. User registration is required for the first time downloading.
URL : www.iai-robot.co.jp/data_dl/CAD_MANUAL/

When using the product, print out of the necessary portions of the relevant manual, or please display it on your computer, tablet terminal, etc. so that you can check it immediately.

After reading the instruction manual, keep it in a convenient place so that whoever is handling the product can refer to it quickly when necessary.

[Important]

- This instruction manual is an original document dedicated for this product.
- This product cannot be used in ways not shown in this instruction manual. IAI shall not be liable for any result whatsoever arising from the use of the product in any other way than what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of product improvement.
- If any issues arise regarding the information contained in this instruction manual, contact our customer center or the nearest sales office.
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ME0355-15A

Supported Models

This Instruction Manual is for the position controller and ELECYLINDER / ROBO PUMP.

For details on handling the program controller (ASEL, PSEL, SSEL, XSEL, MSEL, TT/TTA and RSEL), refer to the separate [Touch Panel Teaching Pendant TB-02 Applicable for Program Controller Instruction Manual].

1. Supported Model List

Refer to [2. List of Gateway Parameter Setting Tool Supported Models] for the supported models to the gateway parameter setting tool.

Controller model	Supported from version
ERC2 (Note 1)	V1.00
ERC3	V1.00
ACON	V1.00
DCON	V1.00
PCON (Note 5)	V1.00
SCON (Note 3)	V1.00
SCON2	V4.10
MCON (Note 2)	V1.00
MSCON	V1.00
RCP6S	V1.00
RCM-P6□C	V1.50
ELECYLINDER	Refer to Next Page

Controller model	Supported from version
ASEP	V1.00
DSEP	V1.00
PSEP	V1.00
MSEP	V1.00
AMEC	V1.00
PMEC	V1.00
RACON	V1.00
RPCON	V1.00
RCON (Note 4)	V2.10
REC	V2.70
ADTB-PEC	V4.40
ROBO PUMP	V4.70

Note1: Only ERC2 models with 4904 or higher stamped on the Serial No. sticker can be connected.

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 SE type via a SIO converter regardless of their version.

Note2: SSCNET III/H and MECHATROLINK-III of MCON-C/CG are applicable in V1.20 and later and EtherCAT Motion in V3.00 and later.
Note3: SCON-CB-F/CGB-F/LC-F/LCB-F (Servo Press dedicated controller) applicable for S in V1.40 and later.
EtherCAT Motion of SCON-CB/CGB is applicable in V3.00 and later.
Note4: SSCNET III/H, MECHATROLINK-III and EtherCAT Motion of RCON are applicable in V3.10 and later.
Note5: PCON-CBP/CGBP is applicable in V3.50 and later.

In the table below shows the models that support ELECYLINDER.

ELECYLINDER Type	Supported from version
EC-S6□, EC-S7□, EC-R6□, EC-R7□, EC-S6□CR, EC-S7□CR, EC-S6□H, EC-S7□H, EC-RR6□, EC-RR7□, EC-R6□W, EC-R7□W, EC-RP4□, EC-GS4□, EC-GD4□, EC-TC4□, EC-TW4□, EC-RR6□H, EC-RR7□H, EC-S6□AH, EC-S7□AH, EC-RR6□AH, EC-RR7□AH, EC-S3□, EC-S4□, EC-S6□R, EC-S7□R, EC-S6□AHR, EC-S7□AHR, EC-RR3□, EC-RR4□, EC-RR6□R, EC-RR7□R, EC-RR6□AHR, EC-RR7□AHR, EC-S3□CR, EC-S4□CR, EC-RR6□W, EC-RR7□W, EC-B6S, EC-B7S, EC-S3□R, EC-S4□R, EC-RR3□R, EC-RR4□R, EC-RTC9M, EC-RTC12M, EC-ST15L, EC-ST15ME, EC-S13□, EC-S13X□, EC-S15□, EC-S15X□	V3.40
EC-RR6X□AH, EC-RR7X□AH, EC-WS10□, EC-WS12□, EC-S6□AHCR, EC-S7□AHCR, EC-GD5□, EC-RP5□, EC-TC5□, EC-TW5□, EC-GRB8M, EC-GRB10M, EC-GRB13M, EC-GRB13L, EC-S10□, EC-S10X□	V3.50
EC-S3□A, EC-S4□A, EC-S6□A, EC-S7□A, EC-S6X□AH, EC-S7X□AH, EC-WS10□R, EC-WS12□R, EC-WS10□CR, EC-WS12□CR, EC-ST11□, EC-SRG11□, EC-SRG15□, EC-SL3□, EC-GDS3□, EC-GDB3□, EC-T3□	V3.70
EC-S6□D, EC-S7□D, EC-S6□W, EC-S7□W, EC-RTC18M	V3.80
EC-S18□, EC-S18X□	V3.90
EC-S3□AR, EC-S4□AR, EC-S6□AR, EC-S7□AR, EC-S3□ACR, EC-S4□ACR, EC-S6□ACR, EC-S7□ACR, EC-S6X□AHR, EC-S7X□AHR, EC-S6X□AHCR, EC-S7X□AHCR	V4.00
EC-B8S, EC-B8SS	V4.10
EC-RR8□, EC-RR10□, EC-RR8□R, EC-RR10□R, EC-S8□, EC-S8□A, EC-S8X□A, EC-S8□R, EC-S8□AR, EC-S8X□AR, EC-S8□CR, EC-S8□ACR, EC-S8X□ACR	V4.11
EC-GRC6M, EC-GRC7□, EC-GRST3□, EC-GRST6□, EC-GRST7□ EC-GRBP8M, EC-GRBP10M, EC-GRBP13□ EC-GRBP8MW, EC-GRBP10MW, EC-GRBP13□W	V4.20
EC-GRTR14□, EC-WER1, EC-WEGR2	V5.00

The table above shows the versions available for operation in any way of connection.
Make sure to use a version started to support or later. (There should be some features not available to use in versions before supporting)

* The versions of the digital speed controller equipped type (EC-D ~) should be the same as those for the non equipped type.

2. List of Gateway Parameter Setting Tool Supported Models

Controller model	Supported from version
MSEP-C	V1.00
MCON-C/CG (Note 6)	V1.00
RCP6S Gateway	V1.00
RCON (Note 7)	V2.10
REC	V2.70

Note6: SSCNETIII/H, MECHATROLINK-III and EtherCAT Motion of MCON-C/CG are not applicable.
Note7: SSCNET III/H, MECHATROLINK-III and EtherCAT Motion of RCON-GW/GWG are applicable in V3.10 and later.
Note: PLC features equipped types (MSEP-LC, MCON-LC/LCG and RCON-LC/LCG) are not applicable.

3. Version Upgrade

How to version upgrade, refer to [10.2 Teaching Update].

ROBO CYLINDER

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Change History Post-1

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 instruction 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 (PE) on the AC power cable of the controller and the grounding plate in the control panel, make sure 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 standards and criteria). For detail, follow the description in [an instruction manual of each controller or controller built-in actuator]. ● Conduct functional grounding on the FG terminal for a controller supplying 24V DC or a controller built-in type actuator. In order to minimize influence to mechanical operation given by electromagnetic interference (noise) to an electrical device or insulation failure, conduct grounding on a terminal or a conductor that is electrically stable. The reference impedance should be Type D (Former Class 3, ground resistance 100Ω or less).

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 instruction 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 removed cover or 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 instruction manual of each unit to ensure the safety. ● Using the devise in a way not indicated by IAI may lose the protection performance equipped to the device.

Alert Indication

The safety precautions are divided into “Danger”, “Warning”, “Caution” and “Notice” according to the warning level, as follows, and described in the instruction 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 pendant, the language to be displayed can be changed.
  Refer to the following for how to change it.
  - CON related controllers 3.1 Displayed Language Change
  - SEP related controllers 4.1 Displayed Language Change
  - MEC related controllers 5.1 Displayed Language Change
  - ELECYLINDER / ROBO PUMP 6.1 Displayed Language Change

- Do not apply mechanical shocks on this touch panel teaching pendant TB-02, because they may cause failure.

- When operating this touch panel teaching pendant TB-02, be sure to hold the teaching pendant to prevent the cables from receiving unnecessary tensile loads.

- If using the liquid crystal display screen for a long time, the brightness decreases. In order to extend the life of LCD, take measures such as to set the time setting to turn off in the environment setting to turn it off automatically or to disconnect from the controller when it is not in use.

- Do not touch more than one point at the same time, because the touch panel is an analog resistive film system. If you touch more than one point, the center position of more than one point may react and operate.

- Operate the touch panel by 0.5 N force or less.
  There is a risk that the panel will be broken if it is operated by stronger force than that.

- The life of the touch panel is around one million times under the condition of depression at the same point. (Based on the usage environment of 25 degrees C)

- Turn off the power to the controller before putting it in or out. Putting it in and out while the power is on may cause malfunction.

- When putting it in, check the connector matching position and insert it carefully with no excess force applied to any unexpected direction. Do not attempt to insert it forcefully when it does not go in smoothly.

- For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, use FAT32 Format for the file system.

- About JOG Switch in RCON Driver Unit Front Panel
  In case the communication with a teaching tool gets disconnected during a window to operate an actuator is open, operation of JOG switch leaves invalid.
  In order to get the function of JOG switch back to valid, it is necessary to reboot the RCON system power supplier or conduct the software reset.

⚠ *Caution : This touch panel teaching pendant TB-02 is exclusively designed for use with IAI controllers. Never connect it to other equipment.*
Failure may occur.

International Standards Compliances

This product comply with the following international standards:
Refer to [Overseas Standard Compliance Manual (ME0287)] for more detailed information.

RoHS3 Directive	CE Marking	UL
○	○	-

1. Confirming the Specifications

1.1 Product Check

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

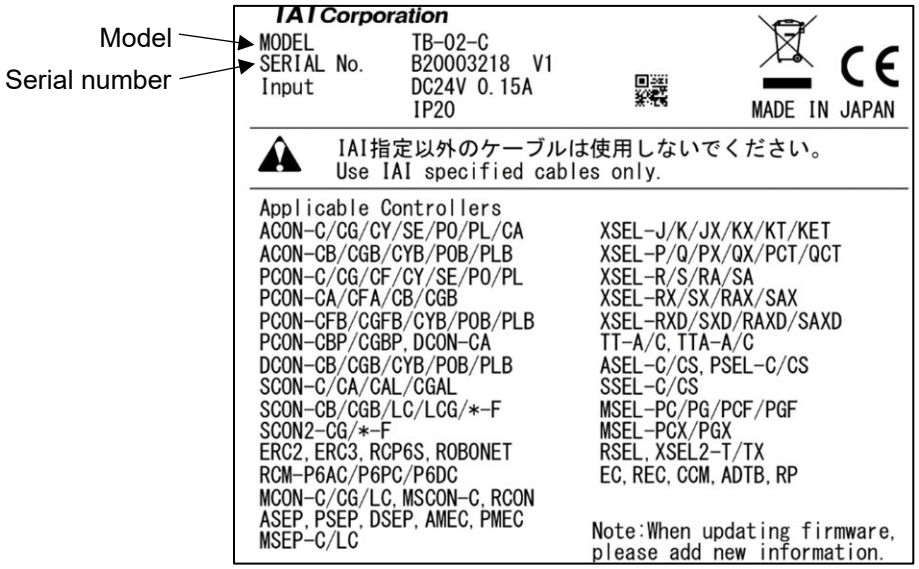
1.1.1 Component (excluding options)

No.	Product name	Model number	Number	Remarks
1	Teaching pendant (equipped with 5m standard cable)	Refer to “How to Read Model Nameplate” and “How to Read Model Number.”	1	Standard cable is affixed on body
Accessories				
2	Position controller / ELECYLINDER cable	CB-TB1-C002	1	When model C or SC is selected
3	Program controller cable	CB-TB1-X002	1	When model S or SC is selected
4	Replacement Cable	CB-SEL-SJS002	1	When model S or SC is selected
5	Touch pen	TCH-TB02	1	Provided with the teaching pendant ϕ4.5×102mm
6	Safety guide	M0194 	1	The picture shows an image.

1.1.2 Instruction Manual Related to This Product

No.	Name	Control number
1	Touch panel teaching pendant TB-02 Applicable for Position Controller, ELECYLINDER Instruction Manual	ME0355
2	Instruction manual for actuator integrated with ERC2 controller (PIO type)	ME0158
3	Instruction manual for actuator integrated with ERC2 controller (SIO type)	ME0159
4	Instruction manual for actuator integrated with ERC3 controller	ME0297
5	PCP6S Fieldbus Communication Instruction Manual	ME0349
6	Instruction manual for ACON-CA/DCON-CA controller	ME0326
7	Instruction manual for ACON-CB/CGB, DCON-CB/CGB controller	ME0343
8	Instruction manual for ACON-CYB/PLB/POB, DCON-CYB/PLB/POB controller	ME0354
9	Instruction manual for PCON-CA/CFA controller	ME0289
10	Instruction manual for PCON-CB/CGB/CFB/CGFB/CBP/CGBP controller	ME0342
11	Instruction manual for PCON-CYB/PLB/POB controller	ME0353
12	Instruction manual for SCON-CA/CAL/CGAL controller	ME0243
13	Instruction manual for SCON-CB/CGB/LC/LCG controller	ME0340
14	Instruction manual for SCON-CB-F/CGB-F/LC-F/LCG-F controller servo press function	ME0345
15	Instruction manual for SCON2-CG controller	ME0458
16	Instruction manual for SCON2-CG controller servo press function	ME0470
17	Instruction manual for RCON System	ME0384
18	Instruction manual for REC System	ME0394
19	Instruction manual for ROBONET	ME0208
20	Instruction manual for ASEP/PSEP/DSEP controller	ME0267
21	Instruction manual for PMEC/AMEC controller	ME0245
22	Instruction manual for MSEP-C/LC controller	ME0299
23	Instruction manual for MCON-C/CG controller	ME0341
24	Instruction manual for MSCON controller	ME0306
25	ELECYLINDER Rod Type / Table Type Instruction Manual	ME3778
26	ELECYLINDER Rod Type Dust and Drip Proof Instruction Manual	ME3779
27	ELECYLINDER Slider Type Instruction Manual	ME3793
28	ELECYLINDER Rod Type / Radial Cylinder Type Instruction Manual	ME3794
29	ELECYLINDER Belt Driven Type Instruction Manual	ME3798
30	ELECYLINDER Stopper Cylinder Instruction Manual	ME3799
31	ELECYLINDER Rotary Instruction Manual	ME3800
32	ELECYLINDER Large Slider Type Instruction Manual	ME3801
33	ELECYLINDER Cleanroom Specification Instruction Manual	ME3804
34	ELECYLINDER Gripper Instruction Manual	ME3806
35	ELECYLINDER Slider Type Dust and Drip Proof Instruction Manual	ME3814
36	Ultra Mini ELECYLINDER Instruction Manual	ME3815
37	ELECYLINDER Electricity Section Instruction Manual	ME3816
38	ELECYLINDER Long Stroke Gripper Instruction Manual	ME3824
39	ELECYLINDER Slider Type / Radial Cylinder Type Instruction Manual	ME3825
40	ELECYLINDER Compact Type Instruction Manual	ME3826
41	ELECYLINDER 3-finger gripper Instruction Manual	ME3829
42	ELECYLINDER Vertical Compact / Dust Proof/Splash Proof Gripper Type Instruction Manual	ME3830
43	ROBO POMP Instruction Manual	ME3827

1.1.3 How to Read Model Nameplate



1.1.4 How to Read Model Number

TB-02-SC-SWR-ENG

<Language option>
Not specified : Screens are displayed in Japanese.
ENG : Screens are displayed in English.
CHI : Screens are displayed in Chinese.
(Display can be changed to other languages)

<Switch Specifications>
No Indication : Stop switch in gray
SWR : Stop switch in red

<Cable Type>
SCN : With No Cable (Main body only)
C : With Position Controller/ELECYLINDER Cable
S : With Program Controller Cable and Conversion Cable
SC : With Program Controller Cable, Conversion Cable and Position Controller/ELECYLINDER Cable

<Model number>
TB-02 : Standard type
TB-02D : With deadman switch type (left side)
TB-02E : Teaching Pendant Equipped with Power Supply Unit (For ELECYLINDER) *
TB-02P : Teaching Pendant Equipped with Power Supply Unit (In common for ELECYLINDER / ROBOCYLINDER) *

* Refer to [1.9.2 Actuator Drive Power Supply Unit for Teaching Pendant How to Read Model Number] for the model code of the teaching pendant equipped with power supply unit TB-02E/TB-02P.

Set model code for main unit + cables		Model code for enclosed cable	Remark
CON/SEL Common Cable Equipped Type	TB-02-SC	For Con : CB-TB1-C002 For SEL : CB-TB1-X002 + CB-SEL-SJS002	Standard type (with no dead man's switch) stop switch portion in gray
	TB-02-SC-SWR		Standard type (with no dead man's switch) stop switch portion in red
	TB-02D-SC		Dead man's switch type (left) stop switch portion in gray
	TB-02D-SC-SWR		Dead man's switch type (left) stop switch portion in red
CON-Dedicated Type Cable for SEL (CB-TB1-X002) is also available to connect	TB-02-C	For CON : CB-TB1-C002	Standard type (with no dead man's switch) stop switch portion in gray
	TB-02-C-SWR		Standard type (with no dead man's switch) stop switch portion in red
	TB-02D-C		Dead man's switch type (left) stop switch portion in gray
	TB-02D-C-SWR		Dead man's switch type (left) stop switch portion in red
SEL-Dedicated Type Cable for CON (CB-TB1-C002) is also available to connect	TB-02-S	For SEL : CB-TB1-X002 + CB-SEL-SJS002 (Note 1) XSEL-J/JX Type not available to connect	Standard type (with no dead man's switch) stop switch portion in gray
	TB-02-S-SWR		Standard type (with no dead man's switch) stop switch portion in red
	TB-02D-S		Dead man's switch type (left) stop switch portion in gray
	TB-02D-S-SWR		Dead man's switch type (left) stop switch portion in red

(Note) Language option can be indicated in the last digit of the unit model code. (Displayed in Japanese when no indication)
1) Screens are displayed in English : -ENG 2) Screens are displayed in Chinese : -CHI

Model code for main unit itself		Model code for enclosed cable	Remark
CON/SEL Common (Single) Type	TB-02-SCN	With no enclosed cable	Standard type (with no dead man's switch) stop switch portion in gray
	TB-02-SCN-SWR		Standard type (with no dead man's switch) stop switch portion in red
	TB-02D-SCN		Dead man's switch type (left) stop switch portion in gray
	TB-02D-SCN-SWR		Dead man's switch type (left) stop switch portion in red

Model code for cable itself		Remark
Separately sold cable	CB-TB1-C002	For position controller/ELECYLINDER connection
	CB-TB1-X002	For SEL system connection (XSEL-J/JX Type excluded)
	CB-SEL-SJS002	For ASEL, PSEL, SSEL and MSEL Connection (used together with CB-TB1-X002)
	CB-TB1-XJ005	For XSEL-J/JX connection
	CB-TB1-GC002	For positioner controller TP adapter connection (to comply with Safety Categories)

Option model code		Remark
Strap	STR-1	
Grip Belt	GRP-2	Delivered individually without being assembled to main unit
	GRP-1 (Production Ended)	
Spiral Cord	SIC-1	Connect the stylus pen on the main unit in order to avoid loosing or dropping it

Maintenance part code		Remark
Touch Pen	TCH-TB02	

1.2 Specification

1.2.1 Basic Specification

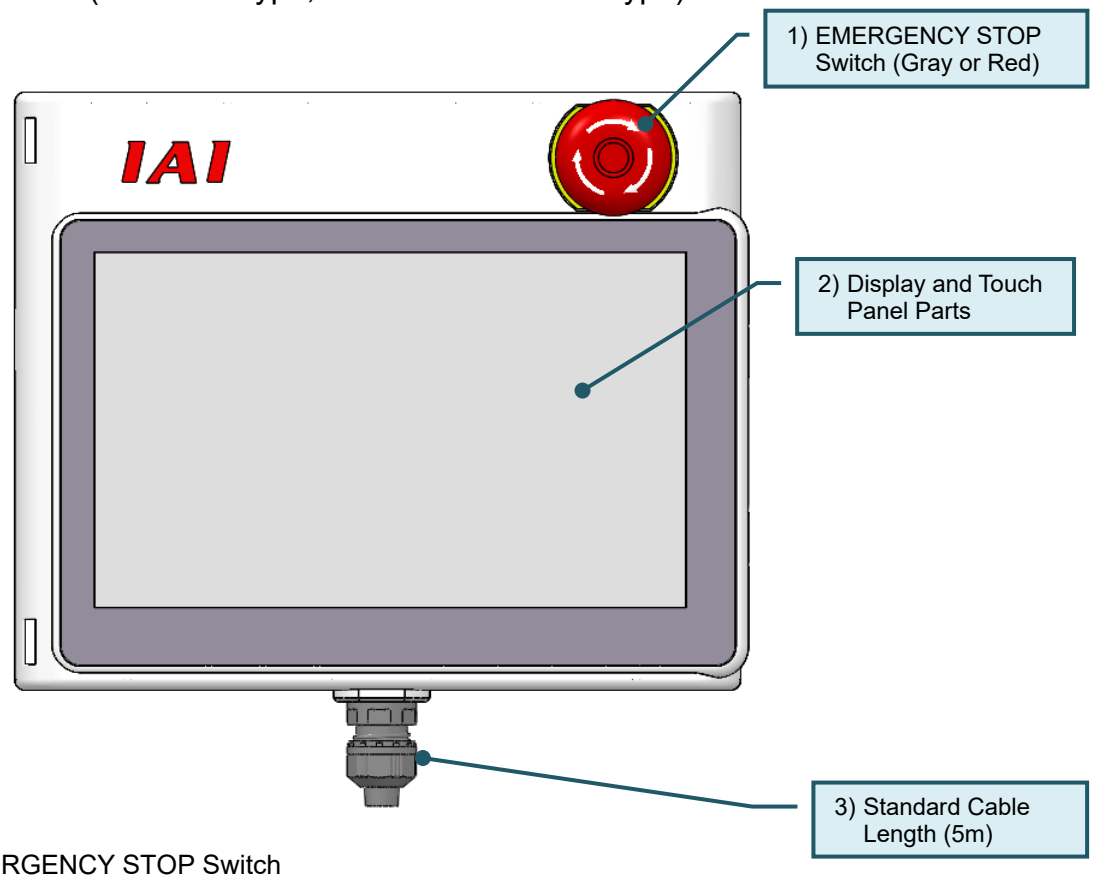
Item	Specifications
Rated voltage	24V DC ±10% (Supplied from controller)
Operating voltage range	21.6 to 26.4V DC
Power consumption	3.6W or less (150mA or less)
Insulation resistance	Between GND and FG 500V DC 10MΩ
Display colors	65536 colors (16-bit colors)
Backlight method	White LED backlight
Backlight life	15,000 hours
Touch panel screen	7 inch TFT color WVGA(800x480)
Touch detection method	4-wire resistive type
Touch panel life	1 million times
External memory	SD/SDHC memory card interface installed (1G to 32G) (Toshiba-made recommended)
Cable length	5m (Standard), 10m (Maximum)
Wall mounting hook	Hook available to use with M8 hex socket head cap screw
Touch pen (Accessory)	ϕ4.5×102mm
Language selection	Japanese/English/Chinese
Touch sound	ON/OFF Volume Settable in 3 steps, S, M, and L
Data save	Applicable to have data saved to and read from external Secure Digital memory card (FAT32 Format) (Position data, parameter, alarm list)
Display adjustment	Brightness adjustable for contrast and backlight
Time setting	Clock setting available with real time clock (Backup held with CR2032 button battery)
Communication standard	Based on RS485
Communication speed	115,200bps
Duration from the power being off to turned on	More than 2 seconds
Cooling method	Natural air-cooling
Size	TB-02 : 155 mm (H) × 190 mm (W) × 25 [45.1] mm (D) TB-02D : 155 mm (H) × 190 mm (W) × 55 [75.1] mm (D) Stop switch included in [ ]
Mass	TB-02 : 470g approx. (Main Body) + 330g approx. (Cable 5m) TB-02D : 600g approx. (Main body) + 330g approx. (Cable 5m)
SDHC™	SD memory card is a trademark of SD-3C, LLC and SDA.

1.2.2 Environmental Specifications

Item	Specifications
Working ambient temperature	0 to 40°C
Working ambient humidity	5%RH to 85%RH (There should be no water condensation or freeze)
Storage ambient temperature	-20 to 70°C
Storage ambient humidity	5%RH to 85%RH (There should be no water condensation or freeze)
Altitude	1000 meters or less above the sea level
Environment	Environment with no corrosive or flammable gas Avoid use in places with dust or in places where oil mist or cutting fluid splashes.
Vibration resistance	Frequency 10 to 57Hz / Swing width: 0.035mm (Continued), 0.075mm (Continual) Frequency 57 to 150Hz / Acceleration: 4.9m/s^2 (Continued), 9.8m/s^2 (Continued) XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
Pollution degree	II
Protection class	IP20
Protection function against electric shock	III

1.3 Explanation of Each Part

1.3.1 Front (Standard Type, Dead Man's Switch Type)



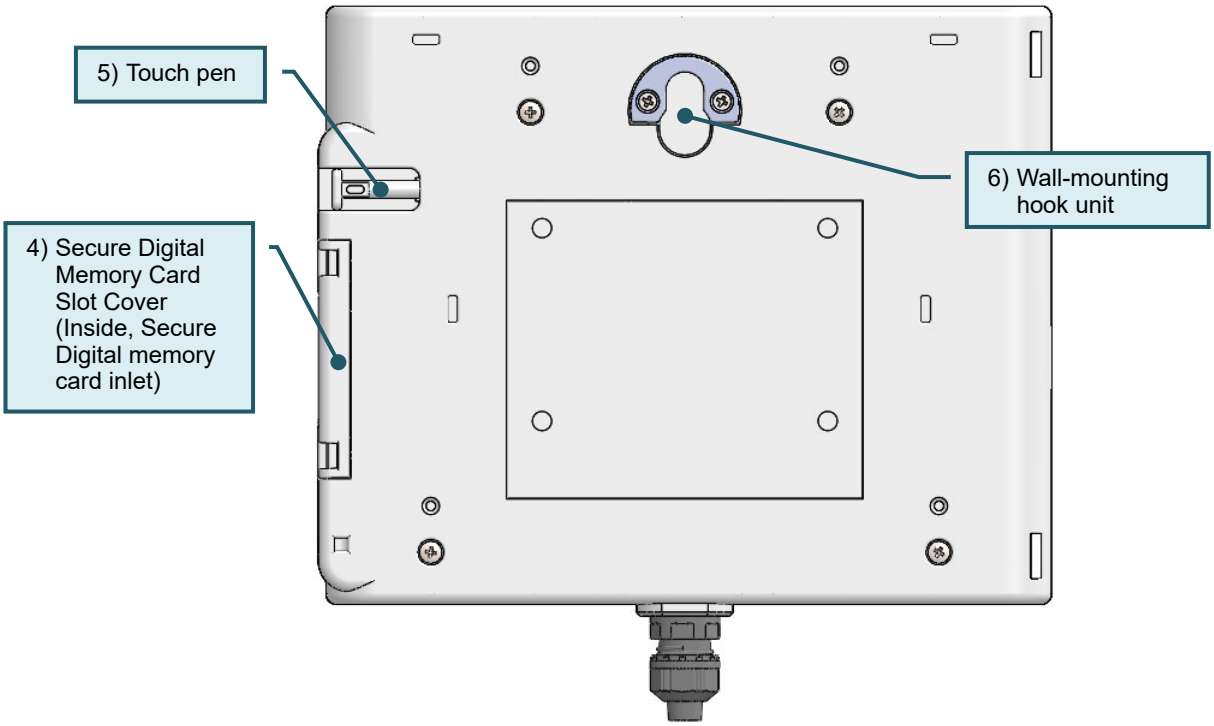
1) EMERGENCY STOP Switch
Press it to stop the operation.
To cancel, turn it in the direction of arrow.

2) Display and Touch Panel Parts
This screen is configured of a TFT color LCD and touch panel.
Use this screen to edit the various setting values and to display the teaching details, etc.
Touch the touch panel with a finger or touch pen to perform operations.

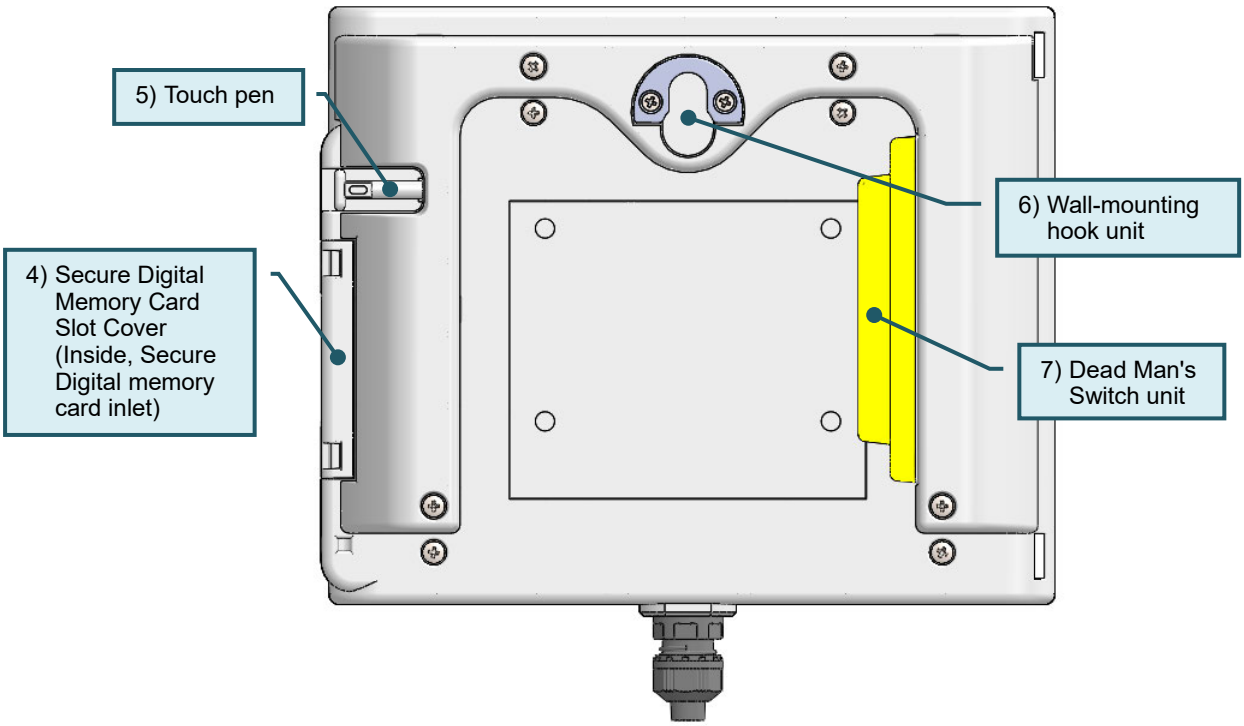
*1 In a use of the LCD display for a long term, the brightness may drop.
In order to extend the life of LCD, take measures such as to set the time setting to turn off in the environment setting to turn it off automatically or to disconnect from the controller when it is not in use.
*2 This touch panel 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.
*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.
*4 The life of touch panel is approx. 1 million touches at the same location. (Assuming a use environment of 25°C)

3) Standard Cable
5m cable is connected to the main unit.

1.3.2 Back (Standard Type)



1.3.3 Back (Dead Man's Switch Type)



4) Secure Digital Memory Card Slot Cover
There is an inlet for Secure Digital memory card inside the cover.
Refer to [1.4 How to Set in/out Secure Digital Memory Card] to set in or out a Secure Digital memory card.

5) Touch pen
Use this pen to touch the touch panel's operation and display screen.

6) Wall-mounting hook unit
Use this hook to hang the unit on a wall. The hook is available to hang with an M8 hex socket head cap screw.

7) Dead man's Switch unit (It is not equipped on the standard type.)
The dead man's switch has three conditions corresponding to three levels. The meaning of ON/OFF in each condition is explained below.

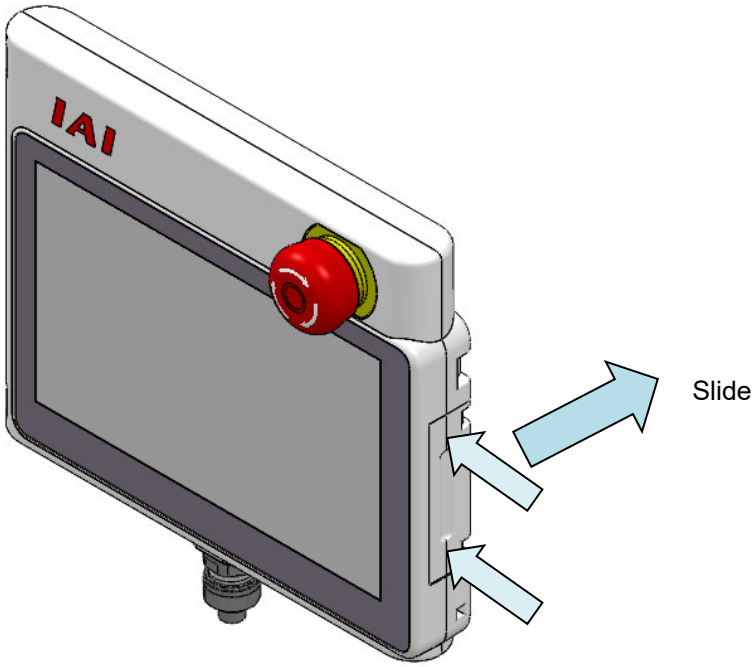
Level 1	Switch OFF	The hand is off the switch, or the switch is pressed with a very small force.
Level 2	Switch ON	The switch is pressed with an appropriate force.
Level 3	Switch OFF	The switch is pressed with a strong force.

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).

1.4 How to Set in/out Secure Digital Memory Card

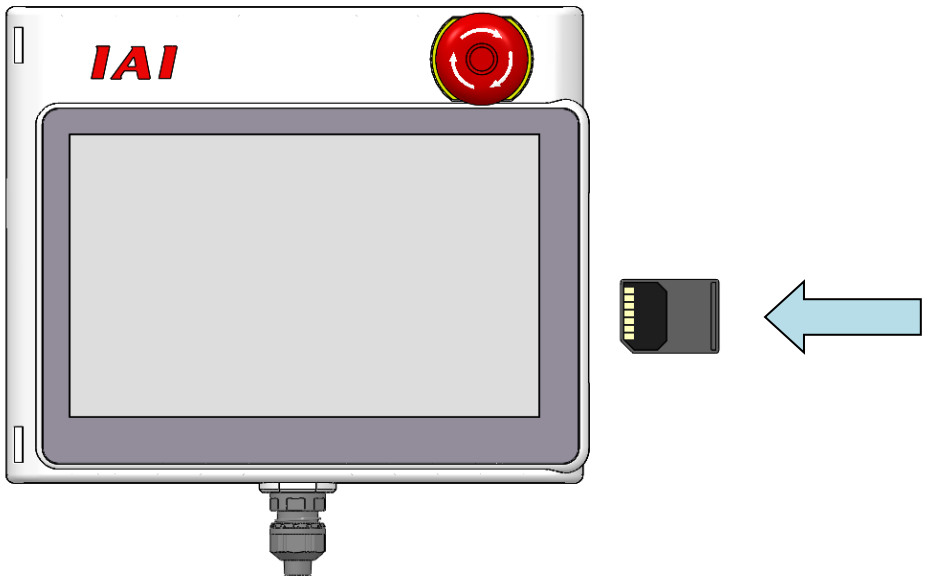
1.4.1 How to Take off Secure Digital Memory Card Slot Cover

Slide it towards the back while pushing it against the unit.



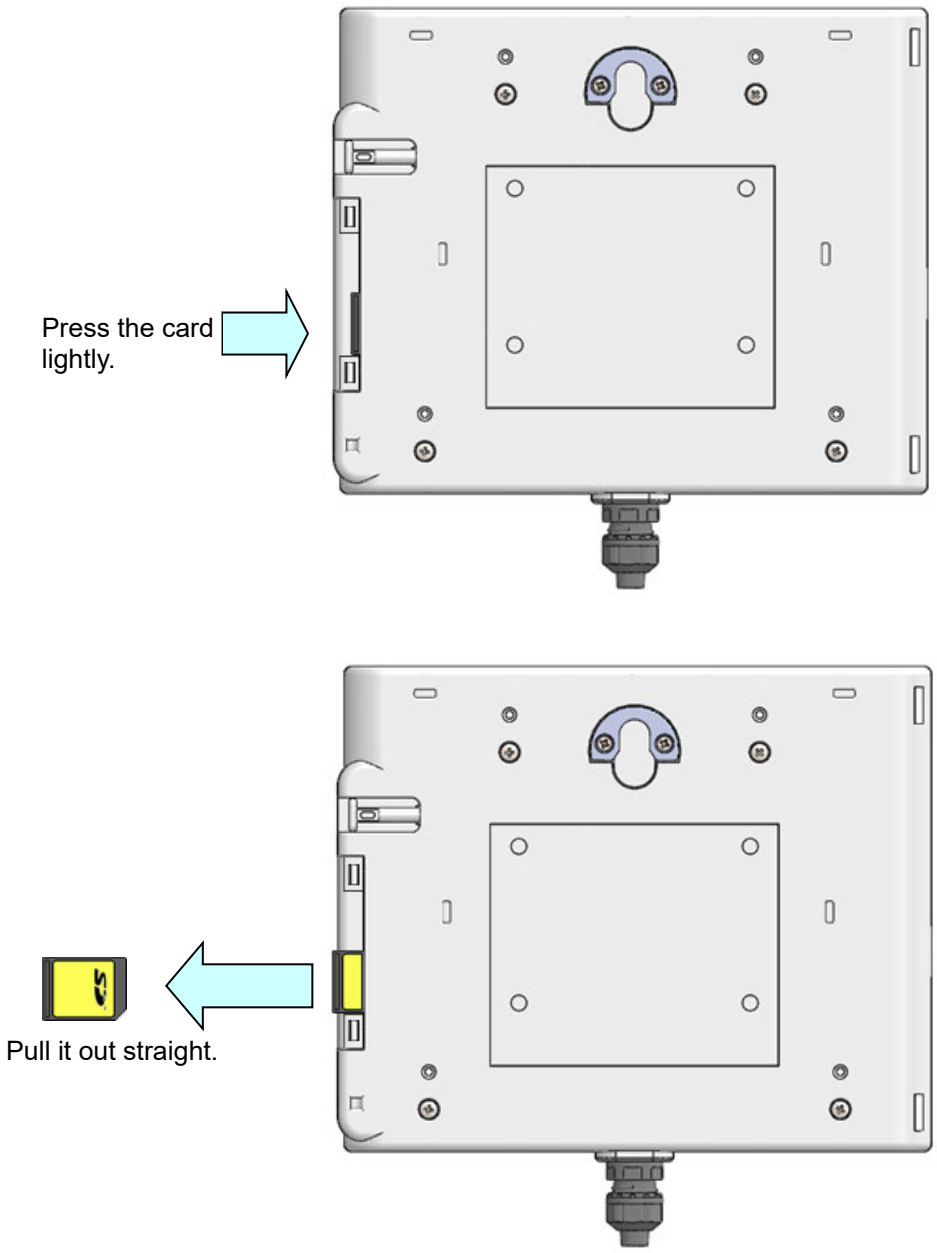
1.4.2 How to Insert Secure Digital Memory Card

Face the electrode side of a Secure Digital memory card to the front and push it in until it makes a click sound.



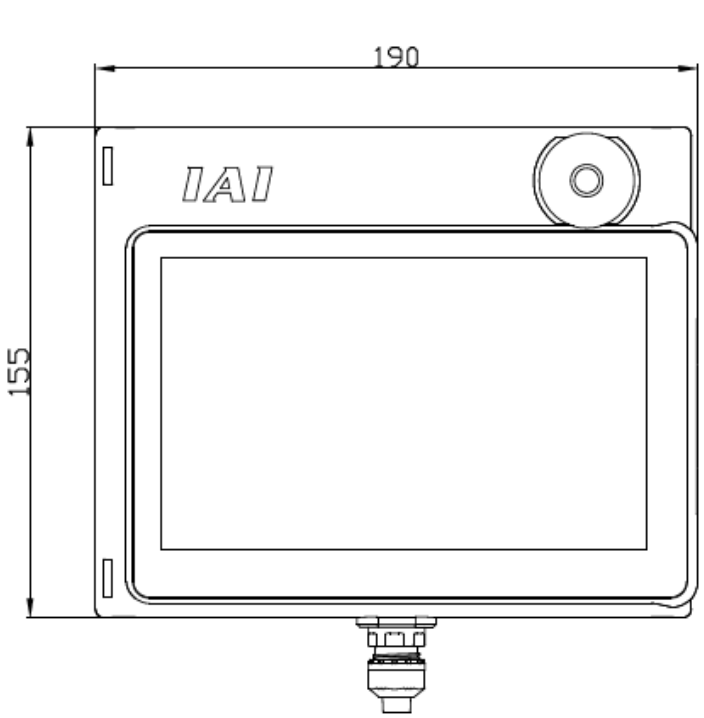
1.4.3 How to Take out Secure Digital Memory Card

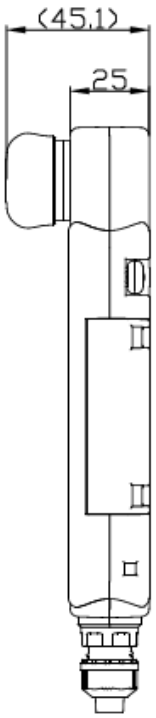
Press the Secure Digital memory card lightly and release and the card pops out a little. Pull it out straight.



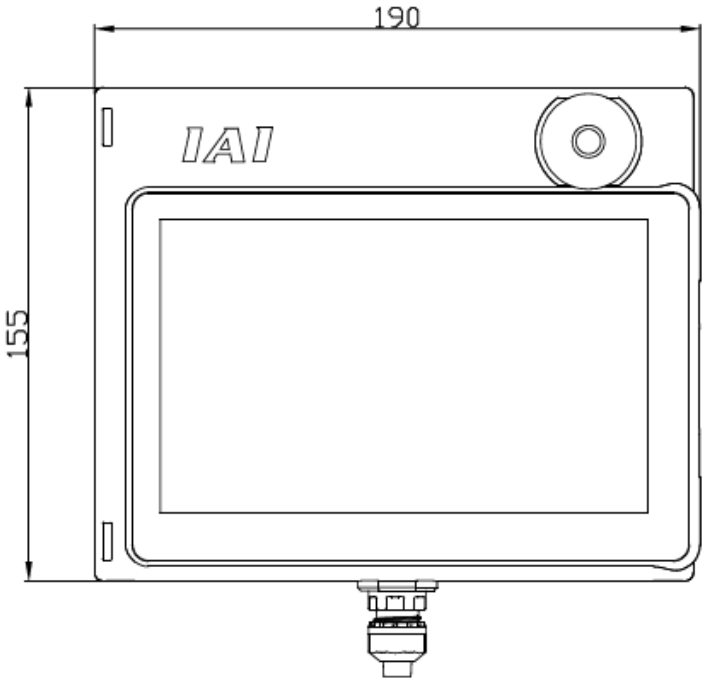
1.5 External Dimensions

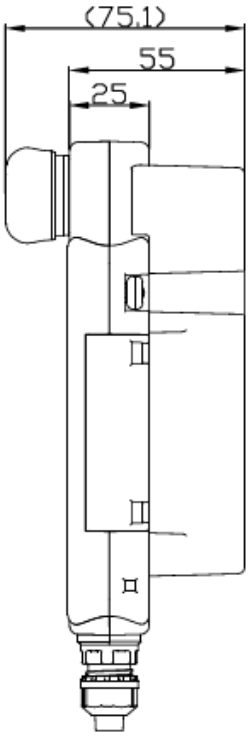
Standard type (with no dead man's switch)





Dead man's switch type





1.6 Life of Touch Panel LCD

The product life of the touch panel is 1,000,000 times of touches and that of the LCD backlight is 15,000 hours. (Ambient temperature at 25°C)

1.7 Built-in Battery (Life of Battery and Replacement of Battery)

With a button battery built-in the main body, the data set in the environment setting window, such as time and language settings and touch sound setting, is retained. The data should get reset to the default setting once the battery gets flat.

The nominal life of the button battery CR2032 that the manufacturer states is approximately five years (Ambient temperature at 25°C).
You will get notified with a message "187 RTC Backup Battery Voltage Drop" once the voltage of the battery gets low. As the battery cannot be replaced at a customer's site, make a request to IAI.

1.8 Optional Items

■ IAI Products

- Grip Belt (GRP-2) for support to hold on left hand
  (GRP-1) * Production Ended
- Spiral Cord (SIC-1) for stylus pen connection
- Touch Pen (* enclosed to main unit, for cases of loss and malfunction)
- Strap (STR-1)



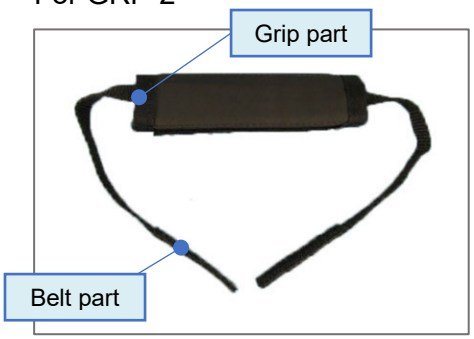
Grip Belt



Strap

1.8.1 How to Attach Grip Belt

1.8.1.1 For GRP-2





1) Put the belt through the slits at the grip belt attaching area.

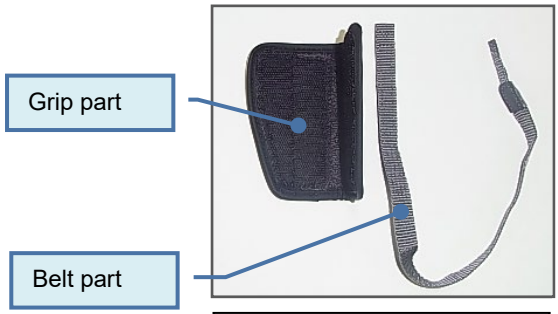


2) Fix the belt to the fabric hook-and-loop fastener in the opened grip area.



3) Close the grip area and fix it to the fabric hook-and-loop fastener in the grip area.

1.8.1.2 For GRP-1



1) Pull out the belt part from the grip part.



2) Attach the belt at the slit on the left bottom of the main unit.



3) Put the belt part through the grip part.



4) Attach the belt at the slit on the left top of the main unit and attach the belt to the grip part with the fabric hook-and-loop fastener.

1.9 Actuator Driving Power Supply Unit for Teaching Pendant

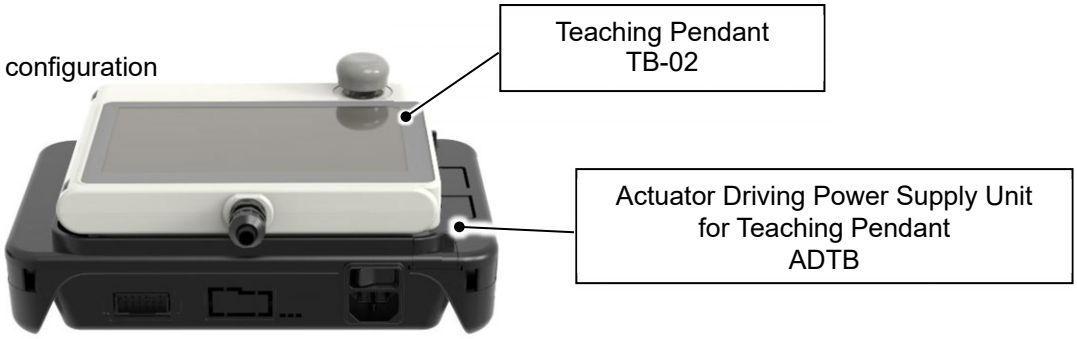
* ELECYLINDER described in this section (1.9) includes ROBO PUMP.

1.9.1 Feature

The actuator drive power supply unit is an option component of a teaching pendant that supplies power to an actuator in equipment with electric wiring not completed and enables brake release and simple operations at startup of the equipment.
It saves time to currently build up the power supply line and enables to have a quick trial run.

It is detachable to a teaching pendant, and enables to have a trial run in such cases as actuator position tuning and data setting.

1) Unit configuration



2) Compatible actuator

The applicable actuator should differ between EC Type (ADTB-EC) and PEC Type (ADTB-PEC).

EC type····· ELECYLINDER (24V pulse motor type) is available.

PEC type····· Operation of ROBOCYLINDER (pulse motor type: RCP2 Series and later) and ELECYLINDER (24V pulse motor type) is available.

3) Connection

For how to make connection, refer to [2.4 Connection of Actuator Drive Power Supply Unit].

4) Operation

For how to operate ELECYLINDER, it is the same as that of normal ELECYLINDER.
Refer to [Chapter 6 Operation of ELECYLINDER and ROBO PUMP].

For how to operate ROBOCYLINDER, refer to [Chapter 8 Operation of Actuator Drive Power Supply Unit]

1.9.2 How to Read Model Number

1) Model Code for Actuator Driving Power Supply Unit (ADTB) Individually

ADTB-EC-EC-5-1-BKT

<Attachment Bracket>
Blank : Not included
BKT : Bracket included

<Power Supply Cable for Driving Power Supply Unit>
0 : Without cable
1 : 100V AC Power Supply Cable (2m)
Equipped with Plug on Tip
2 : 200V AC Power Supply Cable (2m)
Equipped with Ring Tongue Terminal on Tip

<Cable length>
0 : Without cable
5 : 5m (Standard)

<Enclosed Cable Type>
N : Without cable
EC : EC Power Supply Connectivity Cable (CB-ADTB-PW050-RB Enclosed)

<Type>
EC : ELECYLINDER
PEC : ROBOCYLINDER (RCP series) and ELECYLINDER

2) Teaching Pendant Equipped with Power Supply Unit
(TB-02 + Drive Power Supply Unit ADTB Set Model Code)

TB-02E-C-SWR-1

<Power Supply Cable for Driving Power Supply Unit>
0 : Without cable
1 : 100V AC Power Supply Cable (2m)
Equipped with Plug on Tip
2 : 200V AC Power Supply Cable (2m)
Equipped with Ring Tongue Terminal on Tip

<Color of Stop Switch>
Blank : Gray
SWR : Red

<Controller connection cable>
C : For ELECYLINDER and position controllers

<Type>
02E : For ELECYLINDER (CB-ADTB-PW050-RB, CB-TB1-C002 Enclosed)
02P : In common for ELECYLINDER / ROBOCYLINDER (CB-ADTB-PW050-RB, CB-TB1-C002 Enclosed)

* Some types of RCP actuators to be connected may require another cable.
Prepare an applicable motor/encoder cable separately.
Refer to [2.5.5 List of Cables for RCP Connection of Actuator Drive Power Supply Unit] for details.

3) Model Code for Enclosed Power Supply Cables Individually
- 100V AC Power Supply Cable : KWD-UJ-2MBS (Cable length should be 2mm)
- 200V AC Power Supply Cable : CB-APMEC-PW020-TM (Cable length should be 2mm)

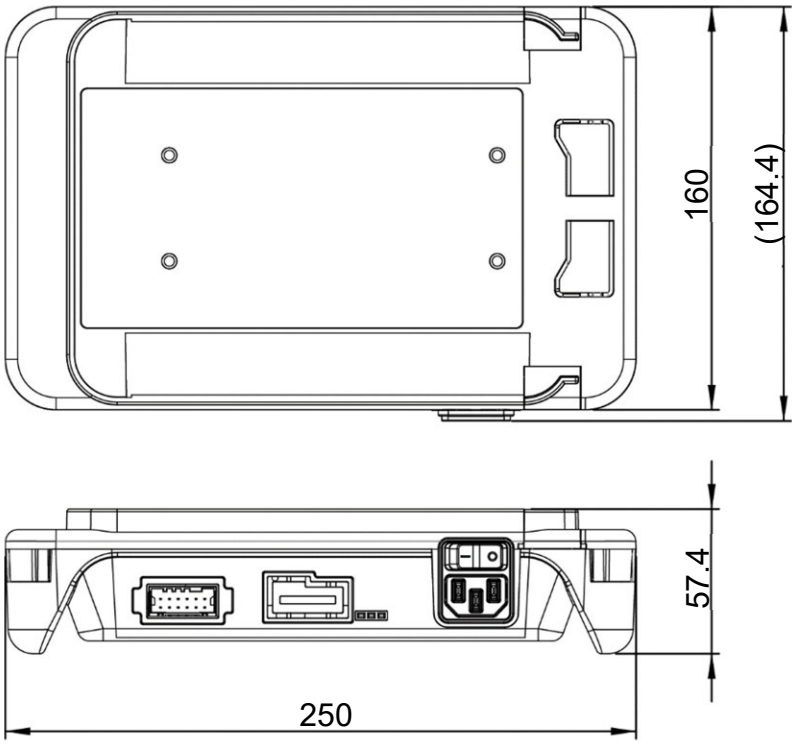
1.9.3 Basic Specification

Item			Specifications
Rated Input Voltage			Single-Phase 100 to 230V AC ±10%
Input Current			1.4Atyp.(AC100V), 0.6Atyp.(AC230V)
Frequency Range			50/60Hz±5%
Current Amperage			141VA (AC100V), 145VA (AC230V)
Output Current			DC24V ±10%
Load Current	ELE CYLINDER	Standard Dustproof and splashproof High-Stiffness	When Power Saving Setting Invalid: Rating 3.5A, Max. 4.2A When Power Saving Setting Valid: Rating 2.2A, Max. 4.2A
		Slim and Small	Max. 2.0A
		S8, B8S, RR8, RR10, RTC18	Max. 6.0A
	ROBO CYLINDER	20P, 20SP, 28P, 35P, 42P, 42SP, 56P	When High Output Setting Invalid: Max. 2.2A When High Output Setting Valid: Rating 3.5A, Max. 4.2A
		56SP, 60P, 86P	Max. 6.0A
Heat Radiation (ROBOCYLINDER)		20P, 20SP, 28P, 35P, 42P, 42SP, 56P	RCP2, RCP3 : 5W RCP4, RCP5, RCP6 : 8W
		56SP, 60P, 86P	19.2W
Ambient operating temperature			0 to 40°C (There should be no water condensation or freeze)
Ambient operating humidity			5%RH to 85%RH (There should be no water condensation or freeze)
Ambient storage temperature			-20 to 70°C
Ambient storage humidity			5%RH to 85%RH (There should be no water condensation or freeze)
Environment			Avoid corrosive gas and in particular avoid excessive dust
Altitude			1000 meters or less above the sea level
Vibration resistance			Frequency 10 to 57Hz / Swing width: 0.075mm Frequency 57 to 150Hz / Acceleration: 9.8m/s^2 XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
Dropped in package			From height 800mm, dropped on 1 corner + 3 edges + 6 surfaces
Overvoltage category			II
Pollution degree			2
Protection function against electric shock			II
Degree of protection			IP30
Mass			ADTB-EC : Approx. 740g / ADTB-PEC : Approx. 825g
Cooling method			TB-02E : Natural cooling / TB-02P : Forced air cooling with internal fan

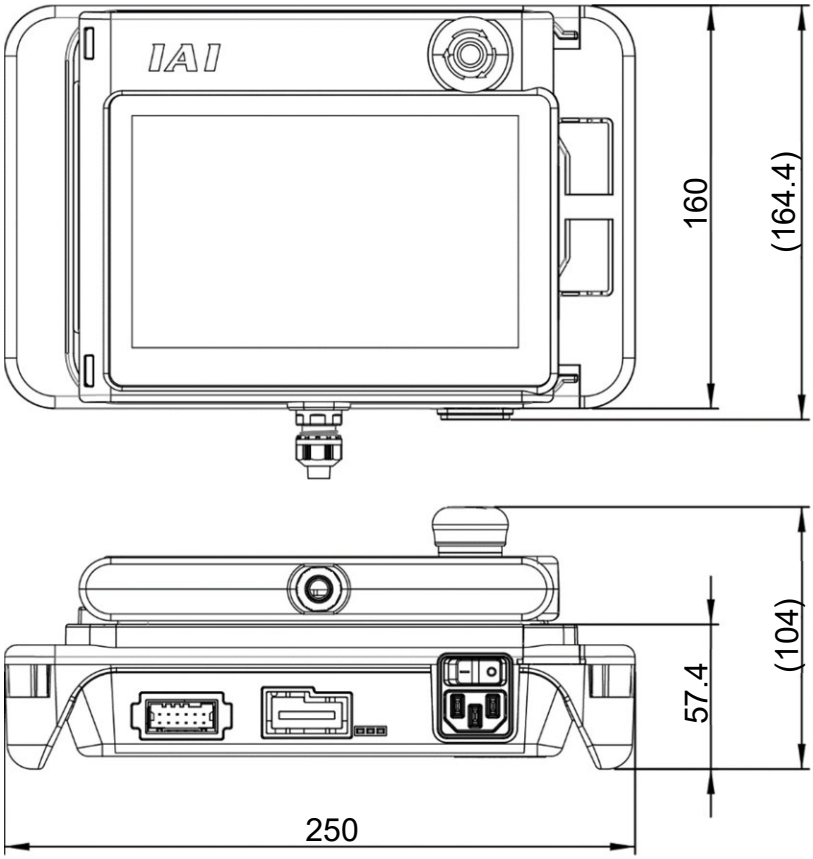
Note 20P, 20SP, 28P, 35P, 42P, 42SP, 56P, 56SP, 60P and 86P in ROBOCYLINDER show the motor type.

1.9.4 External Dimensions

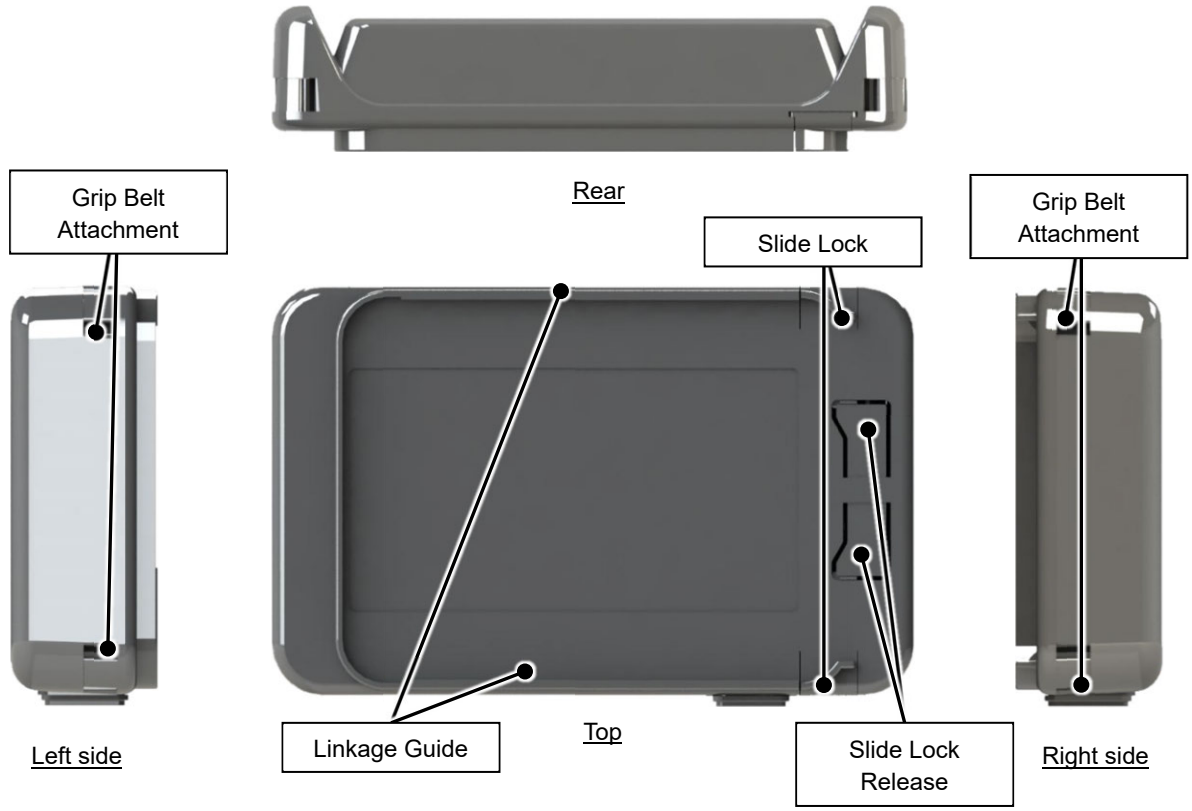
Driving Power Supply Unit Individually

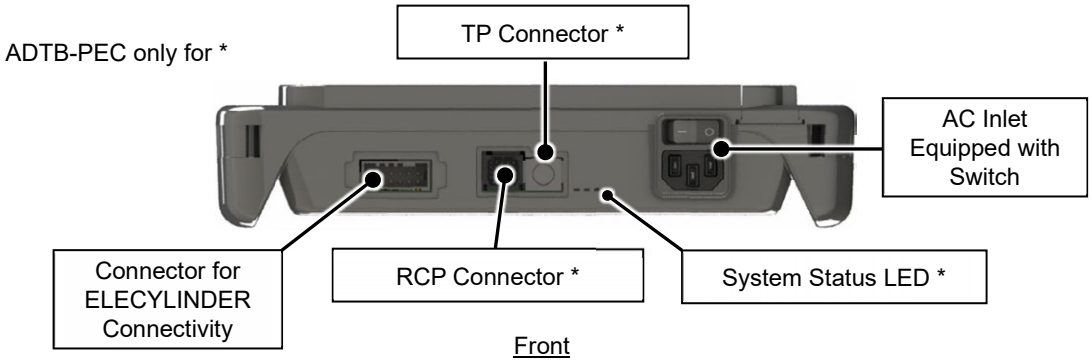


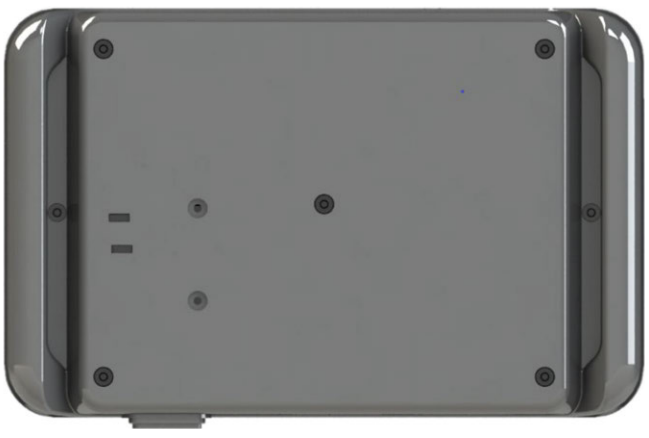
Teaching Pendant Equipped with Power Supply Unit (Linked with Drive Power Supply Unit)



1.9.5 Explanation of Each Part







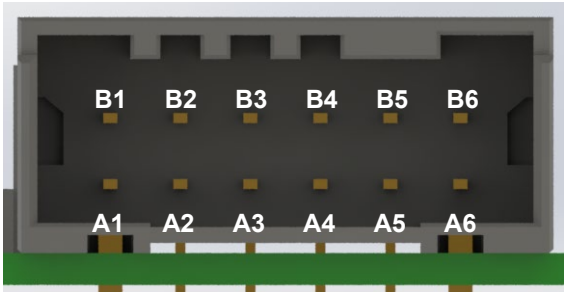
1.9.6 Feature of Each Part and Pin Assignment on Connector

1) AC Inlet Equipped with Switch



Model	DC11.0001.403	
Manufacturer	SCHURTER	
Pin No.	Signal name	Explanation
1	L	AC Input Live Terminal (Non-Grounding Side)
2	N	AC Input Neutral Terminal (Grounding Side)
3	PE	Protective Grounding Terminal (Class D Grounding)
Rated Voltage	Single-Phase 100 to 230V AC ±10%	
Input Current	1.4Atyp.(AC100V), 0.6Atyp.(AC230V)	
Connectivity Cable Specifications		
Item	Model	
100V AC Power Supply Cable	KWD-UJ-2MBS	
200V AC Power Supply Cable	CB-APMEC-PW020-TM	

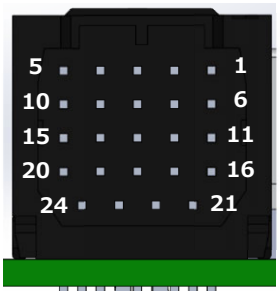
2) Connector for ELECYLINDER Connectivity



Model	1-1871935-6	
Manufacturer	TE	
Pin No.	Signal name	Explanation
A1	0V	GND
A2	24V (CP)	24V output (CP)
A3	NC	Not connected
A4	NC	Not connected
A5	NC	Not connected
A6	NC	Not connected
B1	/EC_CONE	EC Connector Fitting Detection Signal
B2	NC	Not connected
B3	NC	Not connected
B4	NC	Not connected
B5	GND	GND
B6	NC	Not connected
Output Voltage	24V DC±10%	
Load Current	Refer to [1.9.3 Basic Specification]	

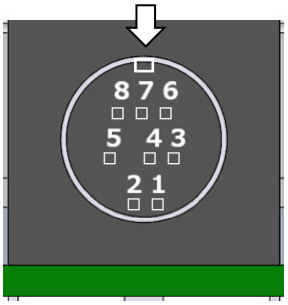
Connectivity Cable Specifications	
Item	Model
Connectivity Cable	EC Power Supply Connectivity Cable CB-ADTB-PW□□□-RB
	EC Power Supply + TB-03 Integrated Connectivity Cable CB-ADTB-PWTB□□□

3) RCP Connector (ADTB-PEC only)



Model	DF62-24P-2.2DS(01)				
Manu-facturer	Hirose Electric Co., Ltd.				
Pin No.	Signal name	Explanation	Pin No.	Signal name	Explanation
1	A+	Encoder A-Phase + Input	13	LS_GND	Grounding for Limit Switch
2	BK-	Brake Release Negative Side	14	LS-	Limit Switch Negative Side
3	ΦA+	Motor Drive Line A-Phase +	15	ΦB-	Motor Drive Line B-Phase -
4	ΦA-	Motor Drive Line A-Phase -	16	B-	Encoder B-Phase - Input
5	VMM	Motor Power Supply Line	17	ENC_SD-	Battery-less Absolute Communication Line -
6	A-	Encoder A-Phase - Input	18	VPS	Encoder Line Driver Enable Output
7	GND	0V	19	NC	Not connected
8	LS+	Limit Switch Positive Side	20	BK+	Brake Release Positive Side
9	VMM	Motor Power Supply Line	21	VCC	Encoder Power Supply 5V for Motor
10	ΦB+	Motor Drive Line B-Phase +	22	CF_VCC	Encoder Power Supply 5V for High-Thrust Motor
11	B+	Encoder B-Phase + Input	23	NC	Not connected
12	ENC_SD+	Battery-less Absolute Communication Line +	24	FG	Frame Ground
Connectivity Cable Specifications					
Item	Model				
Connec-tivity Cable	Motor Encoder Integrated Cable	CB-ADPC-MPA□□□ / CB-ADPC-MPA□□□-RB			
	High-Thrust Conversion Cable	CB-ADTBF-AJ002			

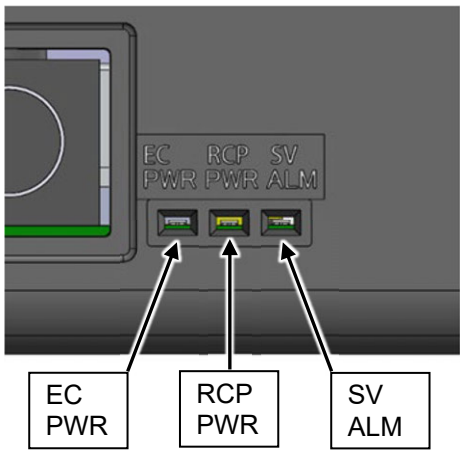
4) TP Connector (ADTB-PEC only)



Model	TCS7587-0121077	
Manufacturer	Hosiden Corporation	
Pin No.	Signal name	Explanation
1	SD+	RS485 Communication
2	SD-	RS485 Communication
3	T5V	TP Connection Detection
4	ENB	Teaching Enable
5	EMGA	Teaching Stop Signal
6	T24V	Teaching Power Supply
7	GND	GND
8	EMGB	Teaching Stop Signal
F1	GND	GND
F2	GND	GND
F3	GND	GND

Connectivity Cable Specifications	
Item	Model
Connectivity Cable	TB-01 Controller Connection Cable (For A/P/SCON, A/PSEP and A/PMEC) CB-TB1-C□□□
	TB-03 Controller Connection Cable CON Connection Type

5) System Status LED (ADTB-PEC only)

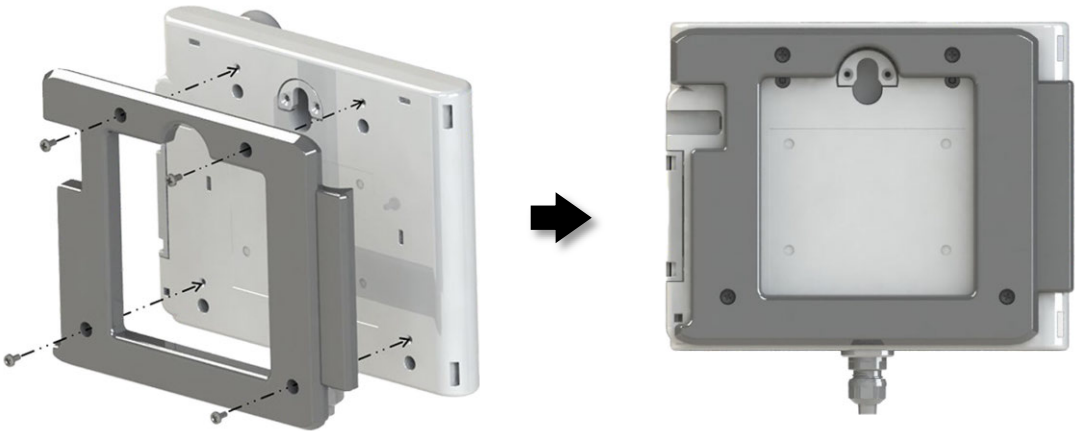


LED Display Type			
Panel Display	Display Color	Status	Explanation
EC PWR	Green	Light ON	In process to supply power to connector for ELECYLINDER (in normal condition)
	Red	Light ON	Alarm generated while supplying power to connector for ELECYLINDER
	Light OFF		Power supply to connector for ELECYLINDER stopped
RCP PWR	Green	Light ON	In process to supply power to internal controller (in normal condition)
	Red	Light ON	Alarm generated while supplying power to internal controller
	Light OFF		Power supply to internal controller stopped
SV ALM	Green	Light ON	Servo-on
		Blinking	Update mode (repeating flashing 2 times in 2 Hz and turned off for 1 sec)
	Green	Light ON	Alarm above operation release levels in generation Motor power supply voltage dropped STOP in process to input (in drive power cutoff)
		Blinking	In-rush detected (flashing in 1 Hz)
	Light OFF		Servo-off

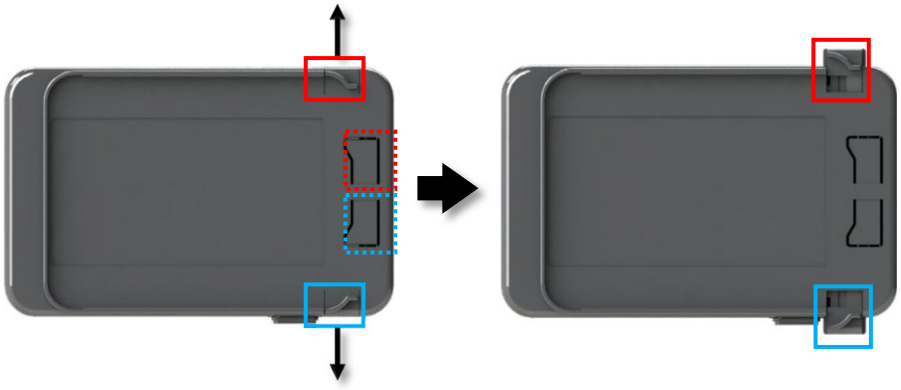
1.9.7 Joining Unit

Here explains how to join an actuator driving power supply unit to a teaching pendant.

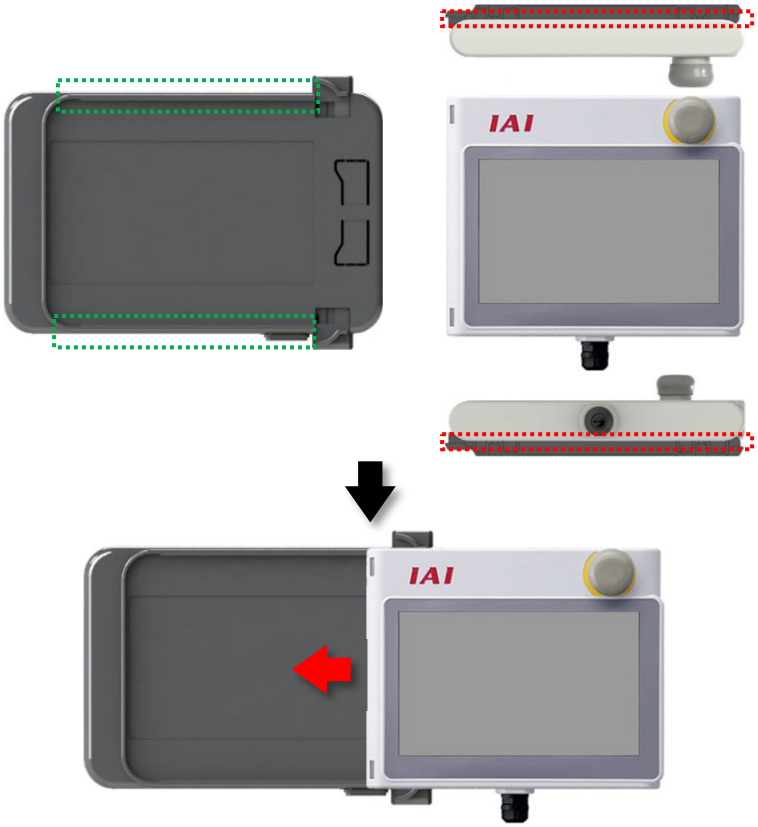
1 Put the attachment bracket on the back of the teaching pendant.



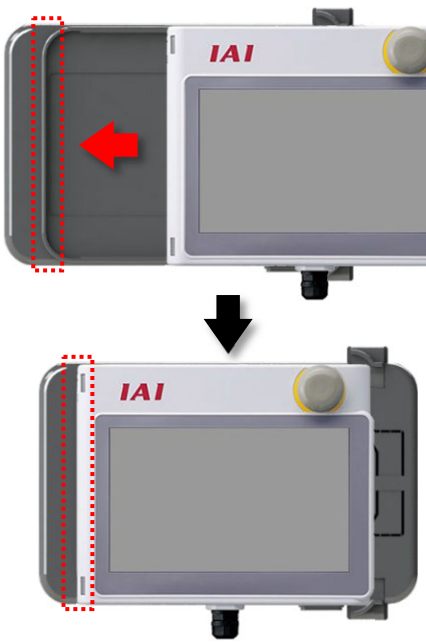
2 While pressing the slide lock release (broken line areas) on the driving power supply unit, slide the slide locks to make them open.



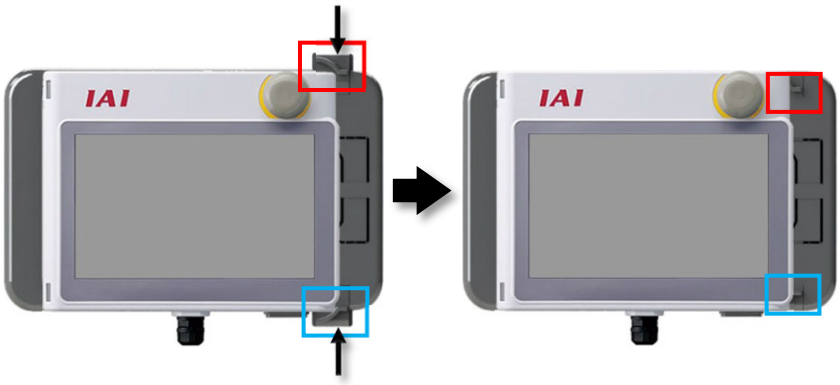
3 Insert the slots (red broken line areas in the figure) formed between the teaching pendant and the attachment bracket to the linkage guides on the actuator driving power supply unit from the right side.



4 Insert the teaching pendant along the linkage guides on the actuator driving power supply unit till the teaching pendant reaches the area marked with the broken line.



5 Slide it till the slide locks get locked to lock the teaching pendant.



1.9.8 Accessaries for ADTB-PEC

(1) Cable Attachment Fabric Fastener (2 pcs)
(2) Magic Band Strap Type (2 pcs)
(3) 3.5mm WtoB/W Connector Housing: Female (1 pc)
(4) DF62DL-24S-2.2C Connector Housing: Female (1 pc)
(5) Protection Cap (1 pc)

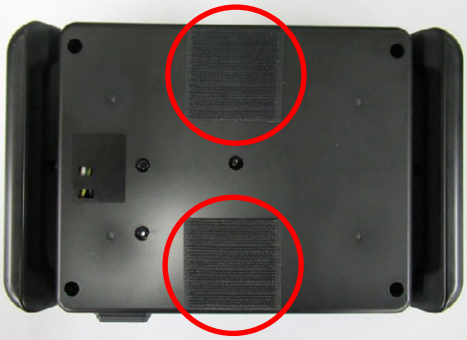
1.9.8.1 Accessaries for Cable Tie Fixation

(1) Cable Attachment Fabric Fastener (To be attached by user)
Attach the fabric fasteners on the bottom of ADTB as shown in [Attached Condition].

[Appearance]

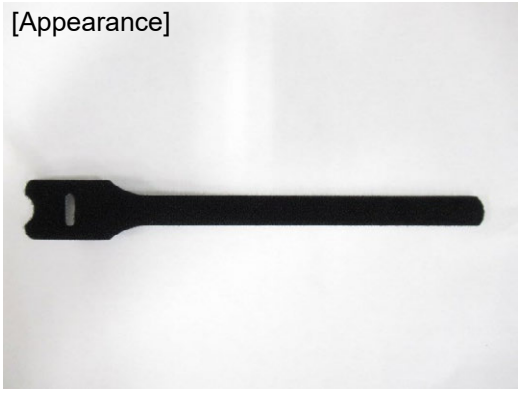


[Attached Condition]



(2) Magic Band Strap Type (To be attached by user)
Attach the magic bands on the teaching cable as shown in [Attached Condition].
Color: Black, Size: 25mm x 200mm, Manufacturer: Kuraray Fastening Co.,Ltd.

[Appearance]



[Attached Condition]



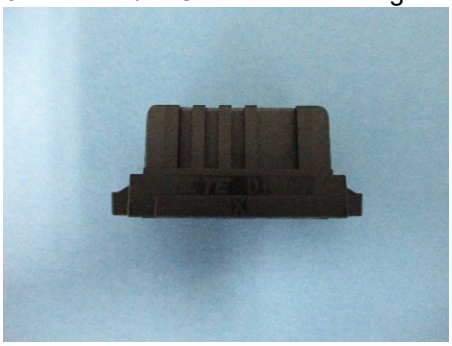
Attached Condition of Accessaries for Cable Tie Fixation



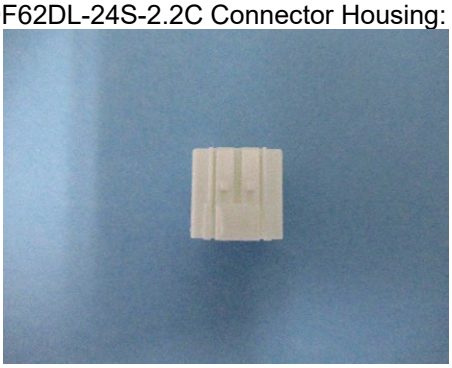
To the fabric fasteners attached on the bottom of the housing, put the magic bands tying the cable to fix the cable.

1.9.8.2 Accessaries for Electrostatic Discharge

(3) 3.5mm WtoB/W Connector Housing: Female (To be attached by user)



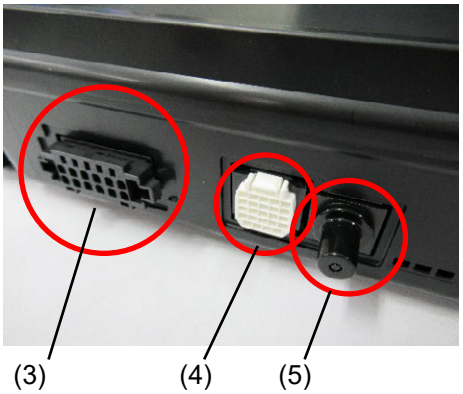
(4) DF62DL-24S-2.2C Connector Housing: Female (To be attached by user)



(5) Protection Cap: Female (To be attached by user)



Attached Condition of Accessaries for Electrostatic Discharge



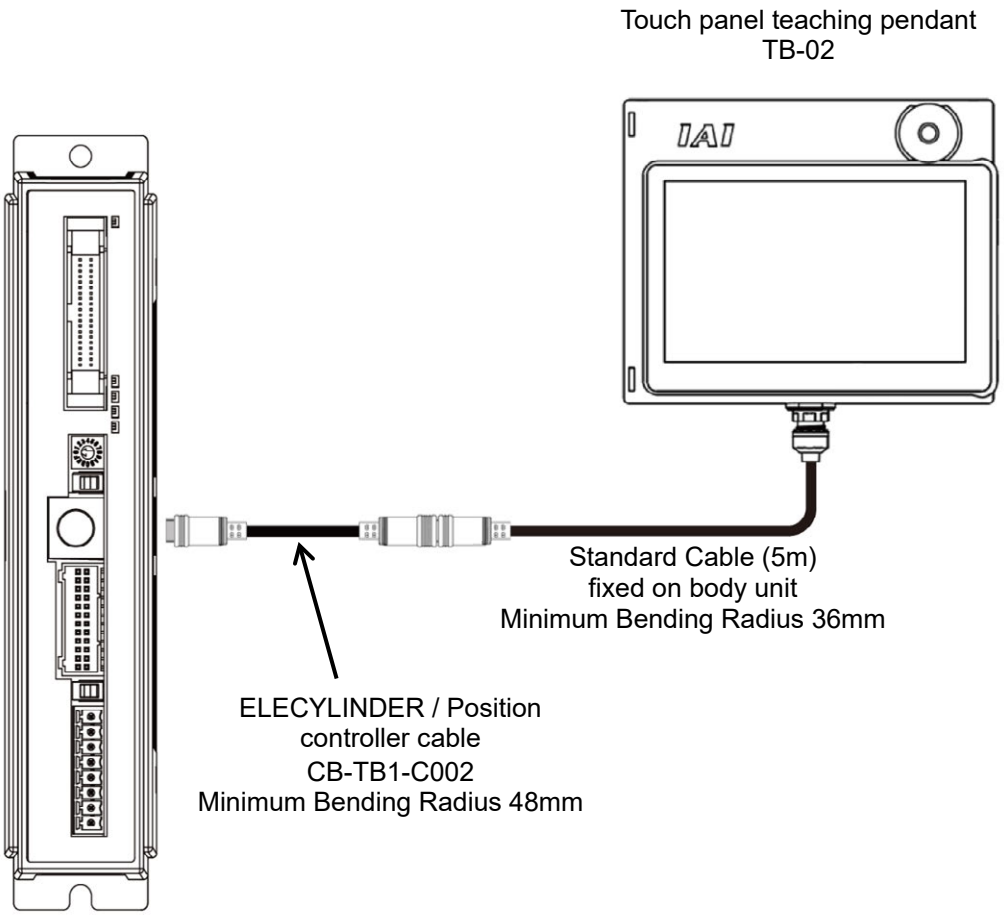
When a cable is not connected, apply the accessaries for electrostatic discharge to each connector.

2. Connection

2.1 Connecting with the Controller

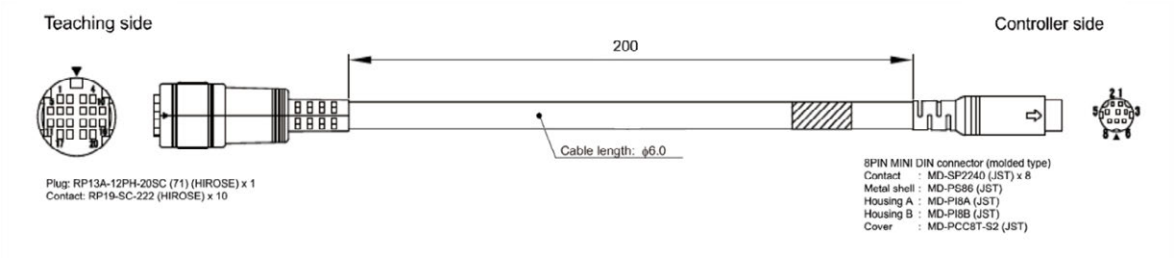
Turn the controller power OFF before connecting or disconnecting the touch panel teaching pendant TB-02.

> ⚠ *Caution*:
> - *Connecting or disconnecting the unit while the controller power is ON could result in faults.*
> - *Confirm the connector engagement section and connect/disconnect while taking care not to apply excessive force. If the connector does not fit in smoothly, do not push it in with force. Failure to observe this could result in faults.*



2.2 ELECYLINDER / Position Controller Connection Cable

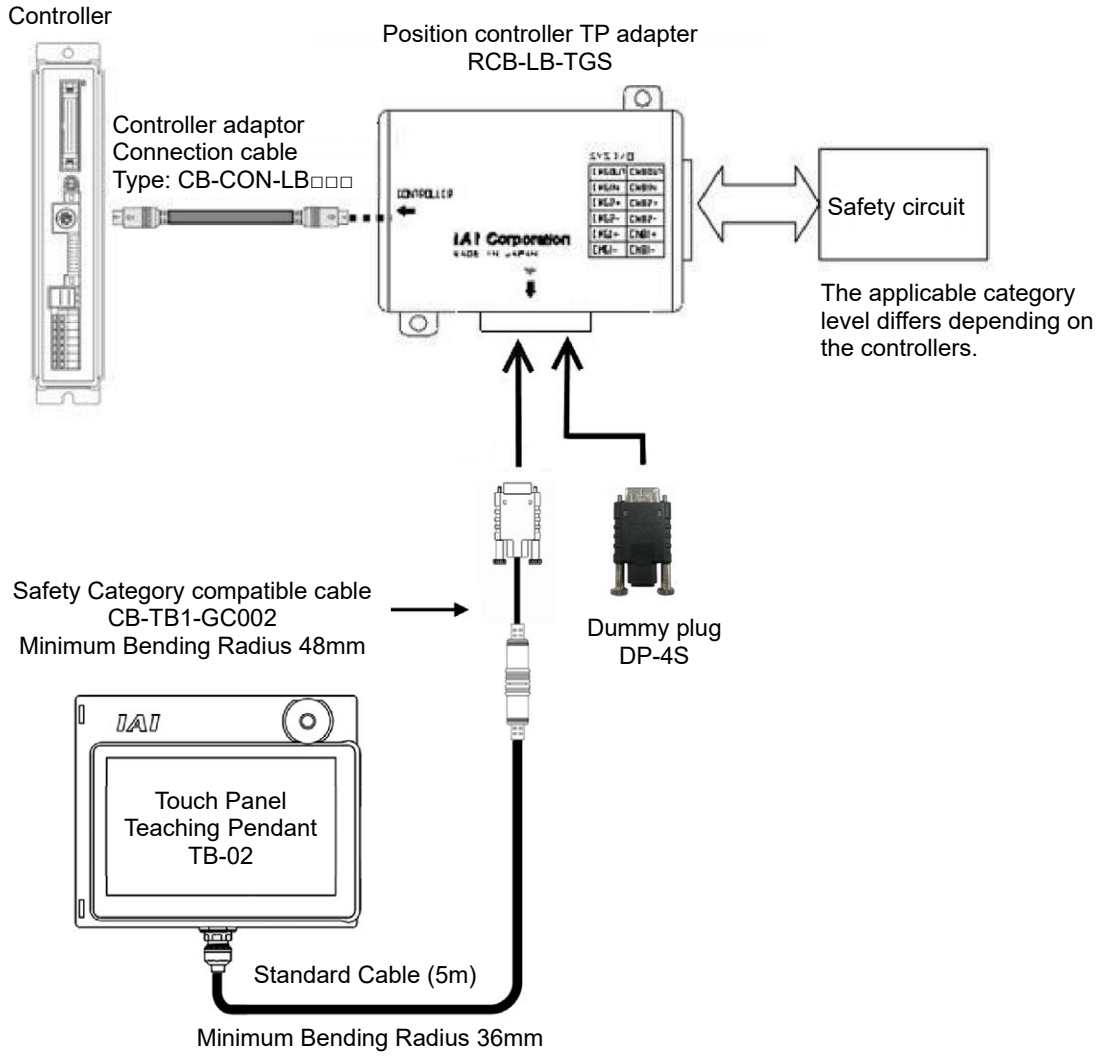
Model	CB-TB1-C002
Name	TB-02 ELECYLINDER / Position controller connection cable
Controller side connector type	MD connector (JST Mfg. Co., Ltd.)
TB-02 unit side connector type	RP13A-12PH-20SC (71) (HIROSE)
Minimum Cable Bending Radius	48mm



2.3 Safety Category Compliance

It is capable to comply with Safety Categories by connecting TB-02 and TP adapter (RCB-LB-TGS) for position controller and establishing wiring for safety circuit.

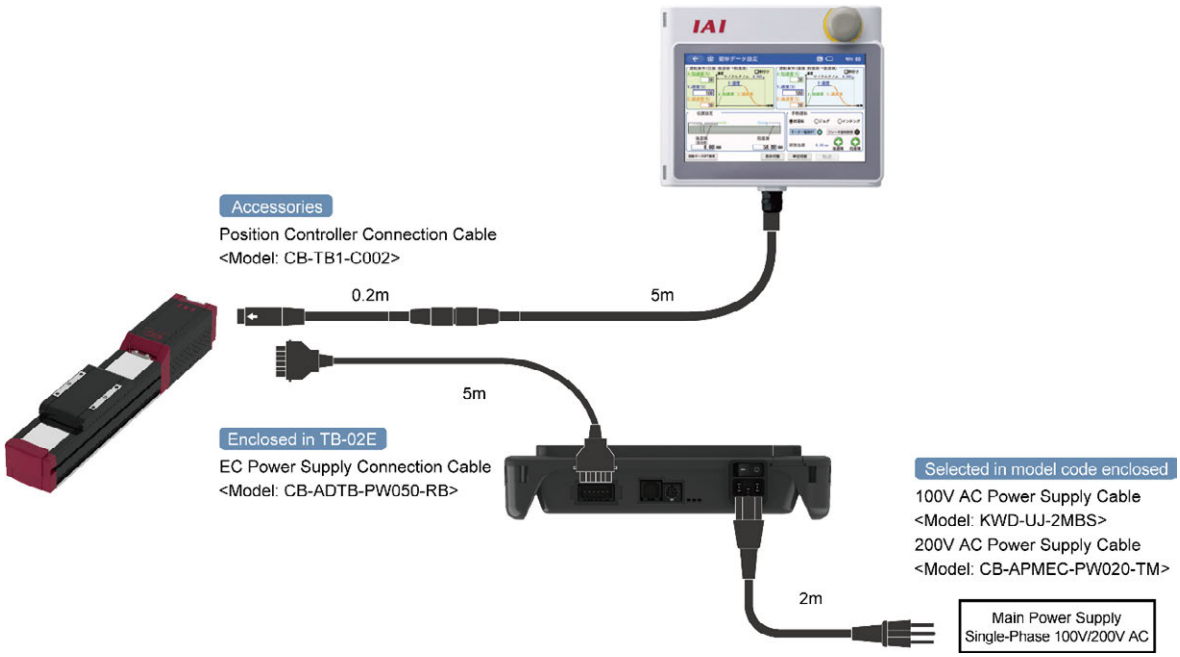
Join the Safety Category applicable cable CB-TB1-GC002 to the TB-02 standard cable.



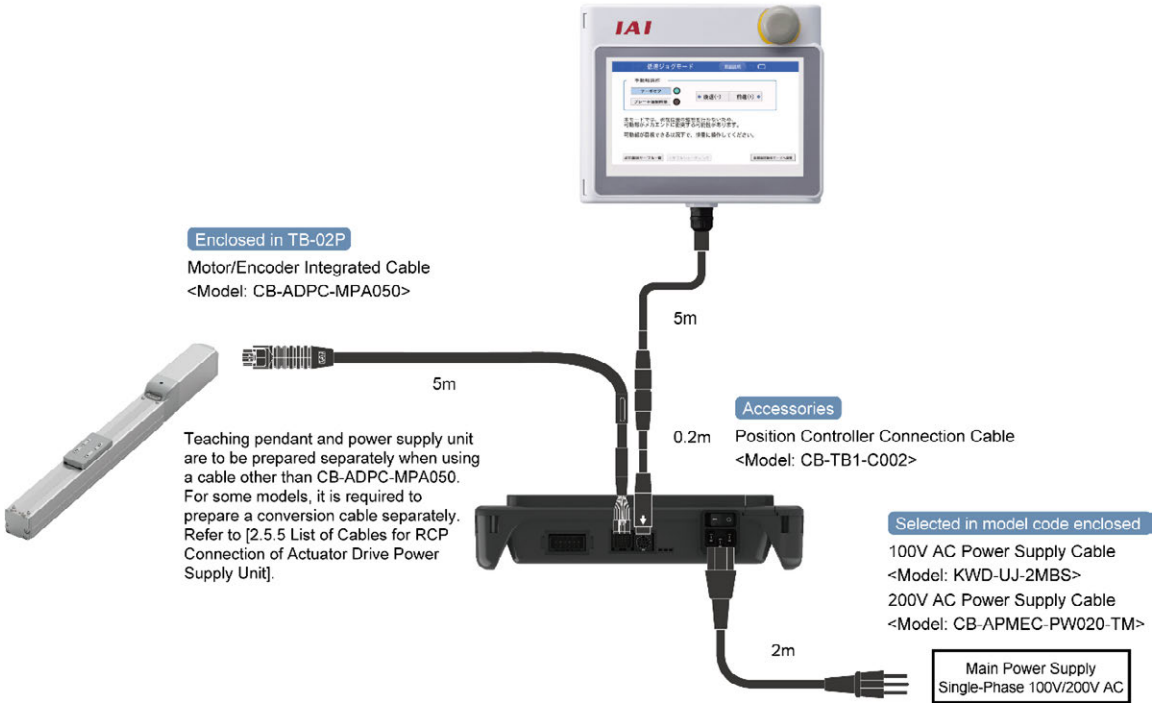
Note: When not connecting the TB-02, always insert a dummy plug DP-4S into the position controller's TP adapter.

2.4 Connection of Actuator Drive Power Supply Unit

2.4.1 Connecting with ELECYLINDER



2.4.2 Connecting with ROBOCYLINDER



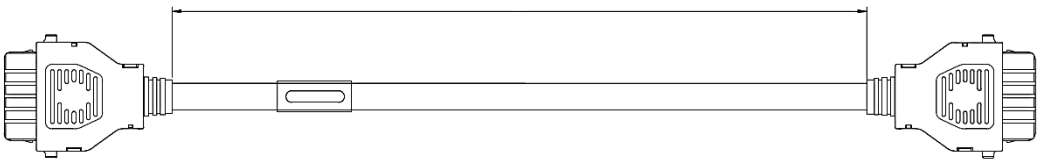
⚠ *Caution*:

- *Turn the controller power OFF before connecting or disconnecting the teaching pendan. Putting it on and off while the power supply to the controller is on may cause malfunction.*
- *Confirm the connector engagement section and connect/disconnect while taking care not to apply excessive force. If the connector does not fit in smoothly, do not push it in with force. Failure to observe this could result in faults.*
- *Do not attempt to connect (1) and (2) at the same time. It may cause malfunction.*



2.5 Actuator Drive Power Supply Unit Connection Cable

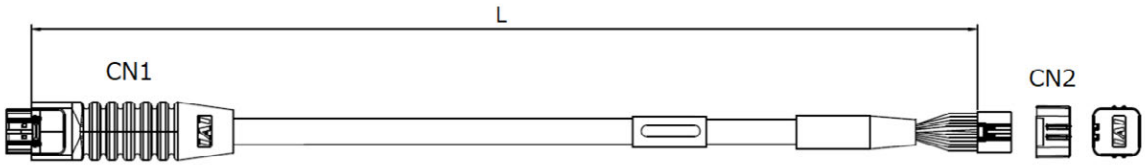
2.5.1 EC Power Supply Connection Cable : CB-ADTB-PW□□□-RB



Driving Power Supply Unit Side

ELECYLINDER Side

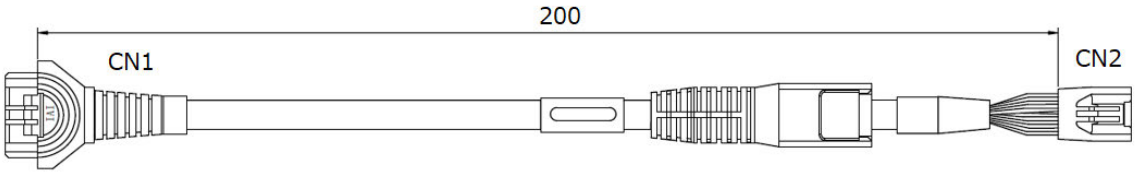
2.5.2 RCP Connection Cable: CB-ADPC-MPA□□□



Actuator Side

ADTB Side

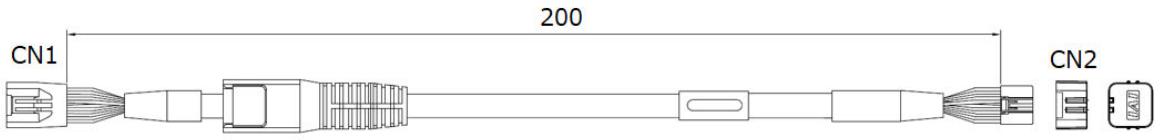
2.5.3 RCP Connection Conversion Cable : CB-CAN-AJ002



Actuator Side

ADTB Side

2.5.4 RCP Connection High-Thrust Conversion Cable : CB-ADTBF-AJ002

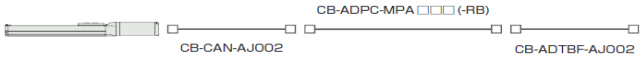
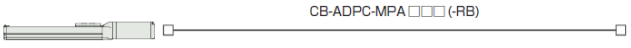
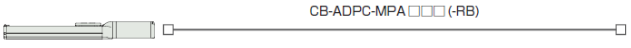
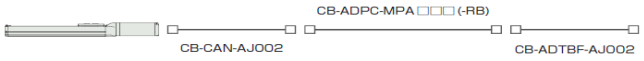
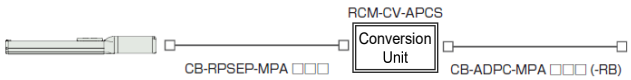
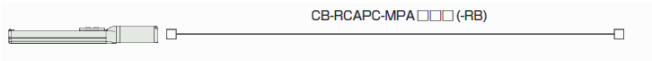
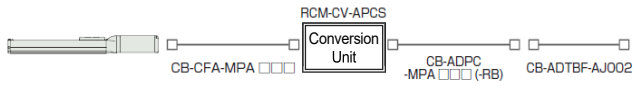
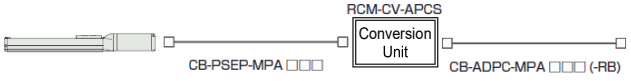
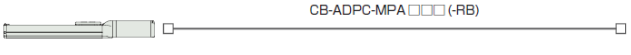


Actuator Side

ADTB Side

2.5.5 List of Cables for RCP Connection of Actuator Drive Power Supply Unit

It is necessary to prepare the following cables / conversion units when connecting to RCP Series. When using a cable or conversion cable / conversion unit other than CB-ADPC-MPA050, it is necessary to prepare a teaching pendant and power supply unit separately.

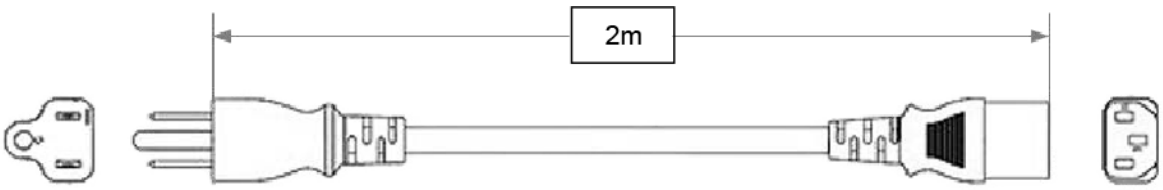
Actuator		Connection Cable (-RB: Robot Cable)
Series	Type	
RCP6 RCP6CR RCP6W RCP5 RCP5CR RCP5W	High-Thrust Type (56SP,60P,80P) SA8/WSA16 RA8/RA10/RRA8/WRA16	
	Other than High-Thrust Type	
RCP4 RCP4CR RCP4W	SA3/RA3/ST4525E Gripper Type (All Models) GRSML/GRSLL/GRSWL GRLM/GRLL/GRLW	
	High-Thrust Type (56SP,60P,80P) RA6(56SP)	
	Models Other than Above SA5/SA6/SA7 RA5/RA6(56P) ST615E/ST68E	
RCP3	All Models	
RCP2	RTBS(L)、RTCS(L)	
RCP2 RCP2CR RCP2W	GRSS/GRLS/GRST/GRHM/GRHB SRA4R/SRGS4R/SRGD4R	
	High-Thrust Type (56SP,60P,80P) HS8/RA8/RA10	
	Models Other than Above BA□/SA5/SA6/SA7/SS7/SS8 RA2/RA3/RA4/RA6 RGS□C/RGD□C/GR3LS/GR3LM Rotary Type in Standard Environment Specifications RTB(L)/RTBB(L)/RTC(L)/RTCB(L) Grippers in Standard Specifications GRS/GRM	
RCP2CR RCP2W	GRS/GRM/GR3SS/GR3SM Rotary Type (All Models) RTB(L)/RTBB(L)/RTBS(L) RTC(L)/RTCB(L)/RTCS(L)	

* The cable length from ADTB to an actuator should be 20m at maximum regardless of a conversion unit.

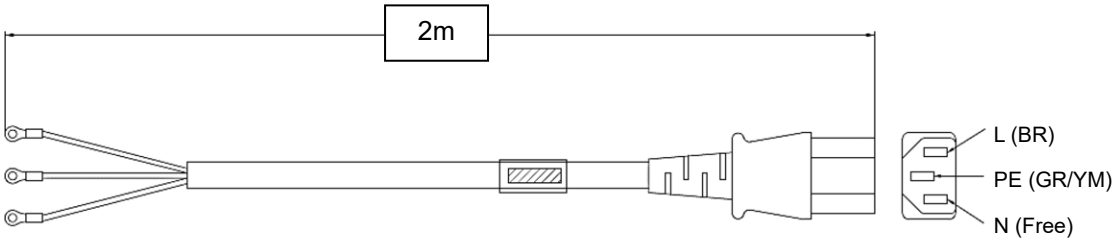
⚠ *Note : Make sure to use a high-thrust conversion cable (CB-ADTBF-AJ002) for the high-thrust type.*
As the connector profile is the same, connection can be made without a conversion cable, but control cannot be established without a conversion cable being connected.

2.6 Actuator Drive Power Supply Unit Power Supply Cable

2.6.1 100V AC Power Supply Cable (Model: KWD-UJ-2MBS)



2.6.2 200V AC Power Supply Cable (Model: CB-APMEC-PW020-TM)



3. Operation of CON Related Controllers

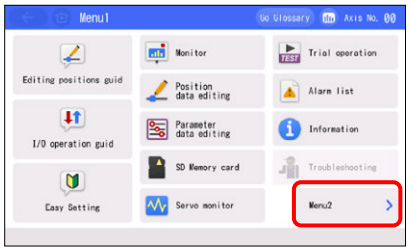
CON related controllers: ACON, DCON, PCON, SCON, SCON2, MCON, MSCON, RCP6S, RCM-P6□C, ERC2, ERC3, RACON, RPCON, RCON-PC/PCF/AC/DC/SC

3.1 Displayed Language Change

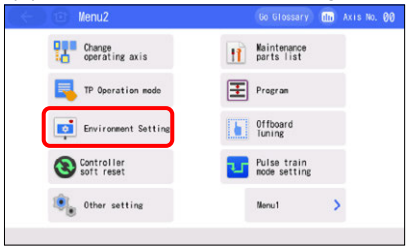
The language can be changed by following the steps below.

● Display change from English to Japanese

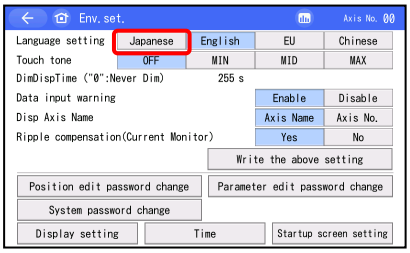
(1) Touch [Menu2] in Menu1.



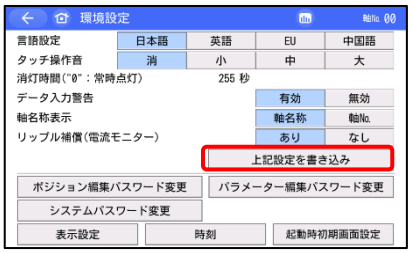
(2) Touch [Environment Setting] in Menu2.



(3) Touch [Japanese].



(4) Touch [上記設定を書き込み].



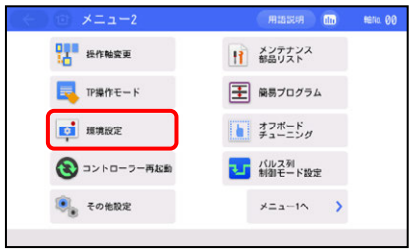
(Note) Skipping to another window without touching 上記設定を書き込み will allow language to go back to that before changed.

● Display change from Japanese to English

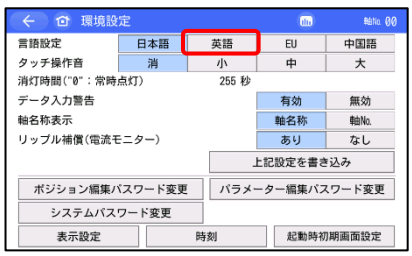
(1) Touch [メニュー2] in メニュー1.



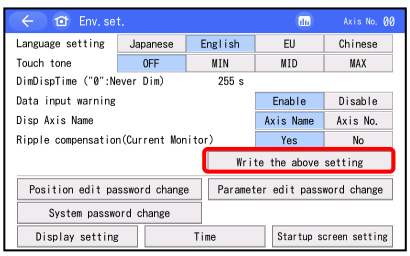
(2) Touch [環境設定] in メニュー2.



(3) Touch [英語].



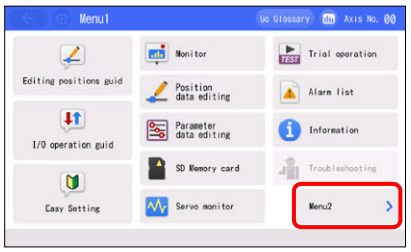
(4) Touch [Write the above setting].



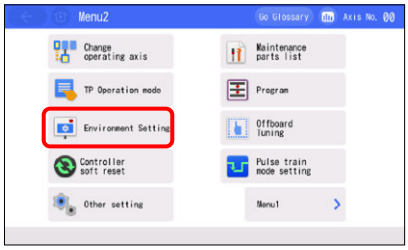
(Note) Skipping to another window without touching Write the above setting will allow language to go back to that before changed.

● Display change from English to Chinese

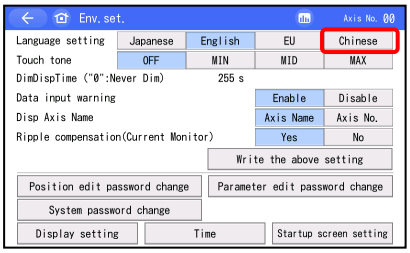
(1) Touch [Menu2] in Menu1.



(2) Touch [Environment Setting] in Menu2.



(3) Touch [Chinese].



(4) Touch [写入上述设定].



(Note) Skipping to another window without touching 写入上述设定 *will allow language to go back to that before changed.*

● Display change from Chinese to English

(1) Touch [菜单 2] in 菜单 1.



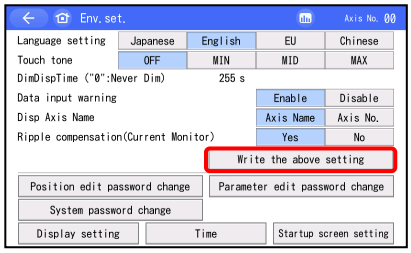
(2) Touch [环境设定] in 菜单 2.



(3) Touch [英语].



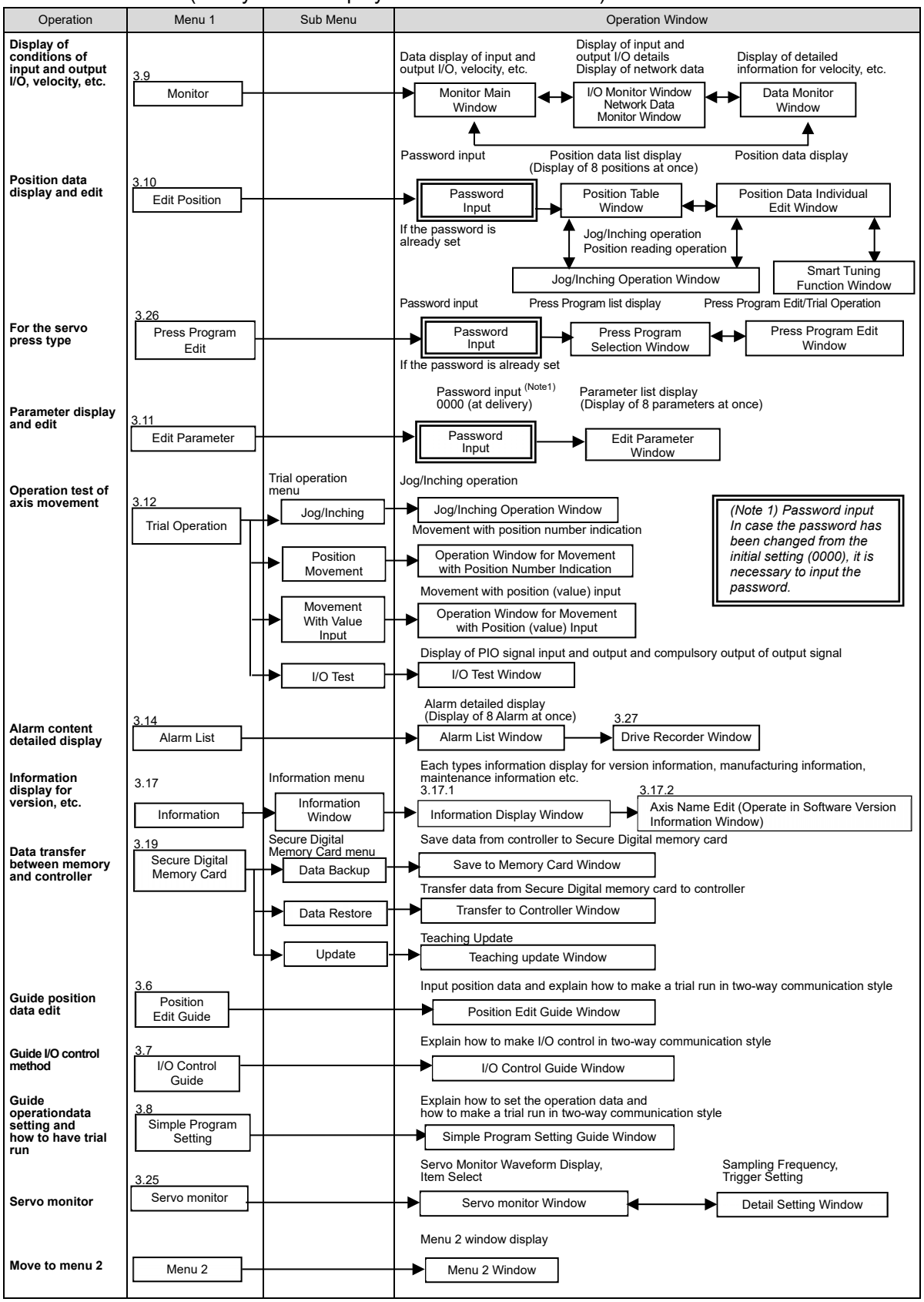
(4) Touch [Write the above setting].

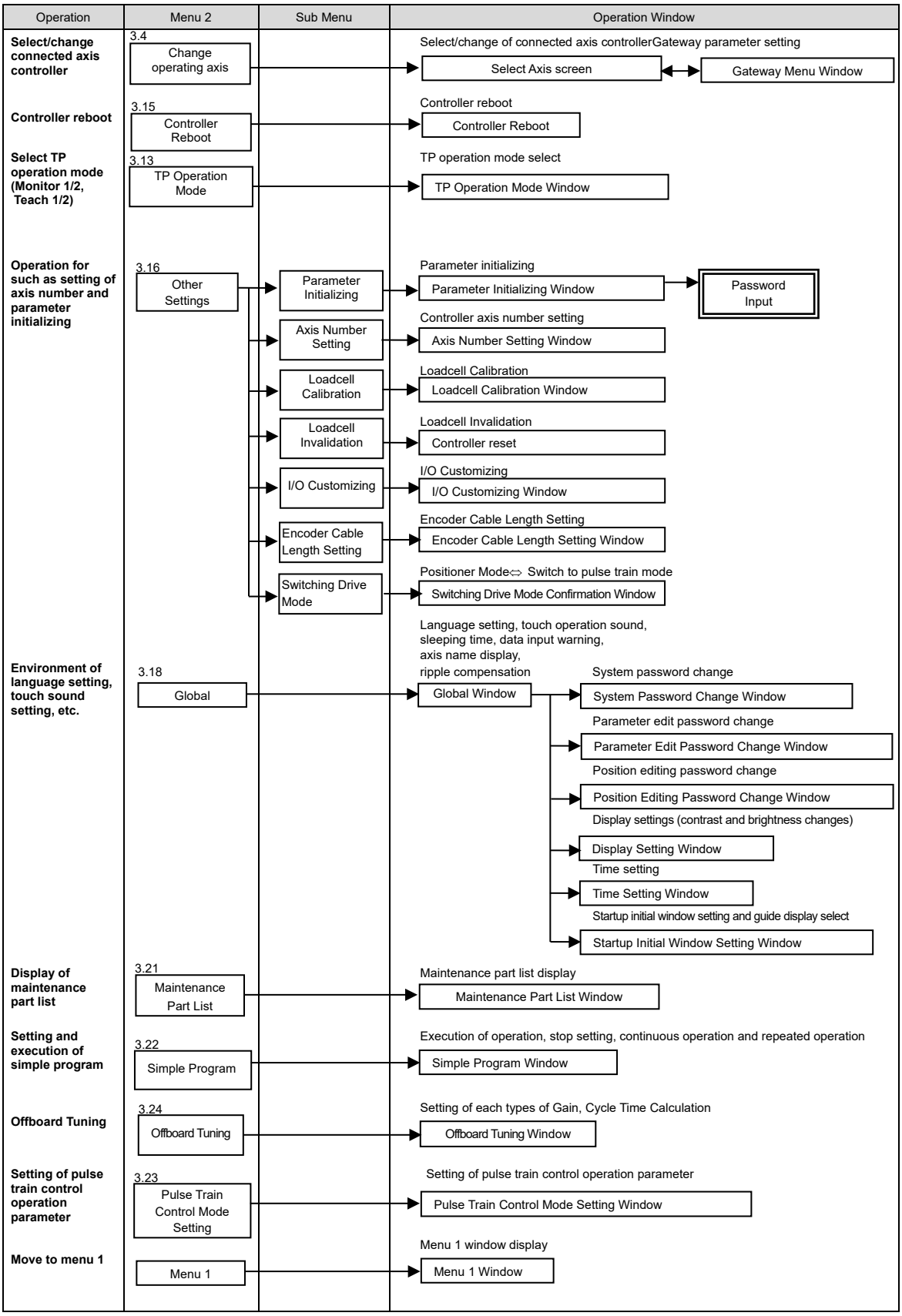


(Note) Skipping to another window without touching Write the above setting will allow language to go back to that before changed.

3.2 Operating Menu

Operating menu when the touch panel teaching pendant TB-02 is connected to a CON related controller is shown. (It may not be displayed for some controllers.)

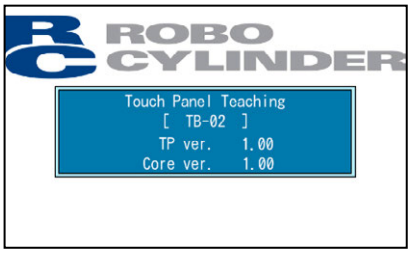



Operation
Menu 2
Sub Menu
Operation Window
Select/change connected axis controller
3.4
Change operating axis
Select/change of connected axis controllerGateway parameter setting
Select Axis screen
Gateway Menu Window
Controller reboot
3.15
Controller Reboot
Controller reboot
Controller Reboot
Select TP operation mode (Monitor 1/2, Teach 1/2)
3.13
TP Operation Mode
TP operation mode select
TP Operation Mode Window
Operation for such as setting of axis number and parameter initializing
3.16
Other Settings
Parameter Initializing
Parameter initializing
Parameter Initializing Window
Password Input
Axis Number Setting
Controller axis number setting
Axis Number Setting Window
Loadcell Calibration
Loadcell Calibration
Loadcell Calibration Window
Loadcell Invalidation
Loadcell Invalidation
Controller reset
I/O Customizing
I/O Customizing
I/O Customizing Window
Encoder Cable Length Setting
Encoder Cable Length Setting
Encoder Cable Length Setting Window
Switching Drive Mode
Positioner Mode⇔ Switch to pulse train mode
Switching Drive Mode Confirmation Window
Environment of language setting, touch sound setting, etc.
3.18
Global
Language setting, touch operation sound, sleeping time, data input warning, axis name display, ripple compensation
Global Window
System password change
System Password Change Window
Parameter edit password change
Parameter Edit Password Change Window
Position editing password change
Position Editing Password Change Window
Display settings (contrast and brightness changes)
Display Setting Window
Time setting
Time Setting Window
Startup initial window setting and guide display select
Startup Initial Window Setting Window
Display of maintenance part list
3.21
Maintenance Part List
Maintenance part list display
Maintenance Part List Window
Setting and execution of simple program
3.22
Simple Program
Execution of operation, stop setting, continuous operation and repeated operation
Simple Program Window
Offboard Tuning
3.24
Offboard Tuning
Setting of each types of Gain, Cycle Time Calculation
Offboard Tuning Window
Setting of pulse train control operation parameter
3.23
Pulse Train Control Mode Setting
Setting of pulse train control operation parameter
Pulse Train Control Mode Setting Window
Move to menu 1
Menu 1
Menu 1 window display
Menu 1 Window

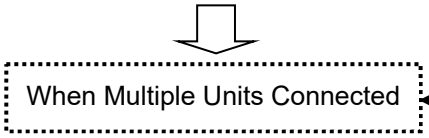
3.3 Initial Screen

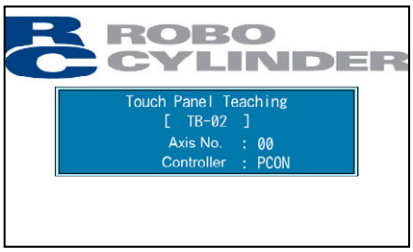
When the power is turned on, the IAI logo is displayed for approx. 1 second on the operation display screen of the touch panel teaching pendant and then the version information is displayed.

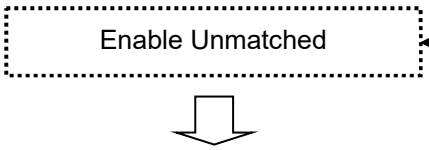




When Multiple Units Connected





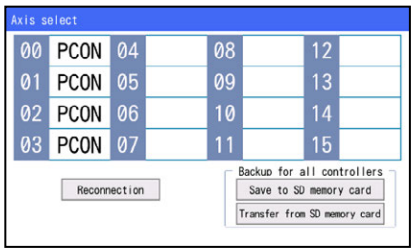




The Menu 1 screen appears.

When Multiple Units Connected

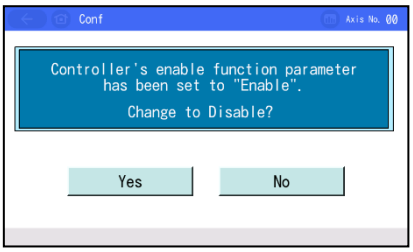
If multiple units are connected, the axis selection screen appears.



Select an axis to be operated with TB-02.
Refer to [3.4, "Changing Operating Axis."]

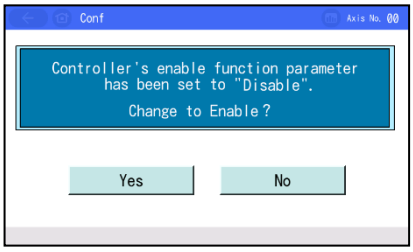
Enable Unmatched

1. On TB-02 pendants, this screen is displayed when the enable function parameter of the controller is set to “Enable.”



Select either [Yes] (Inactivate Enable Feature) or [No] (Activate Enable Feature).

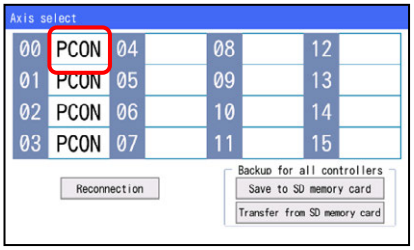
2.On TB-02D pendants, this screen is displayed when the enable function parameter of the controller is set to “Disable.”



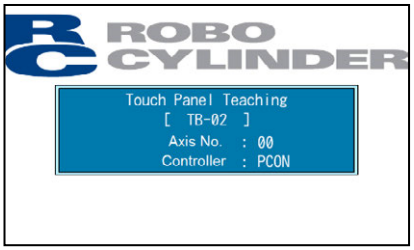
Select either [Yes] (Activate Enable Feature) or [No] (Inactivate Enable Feature).

3.4 Changing Operating Axis

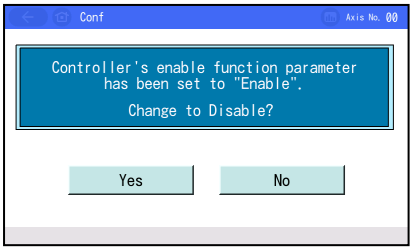
If multiple controllers are connected to the communication line, the axis selection screen appears.
Also, it opens by touching [Change operation axis] in the Menu 2 screen or [Axis Select] in the Gateway Menu screen.
If only one controller is connected, you need not select an axis.



Select the axis to be operated in the touch panel teaching pendant and touch it.

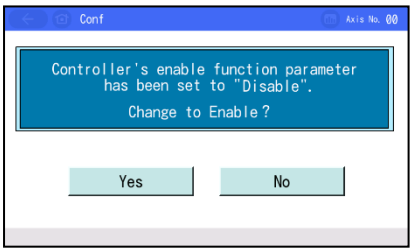


Connection with the selected controller axis starts.



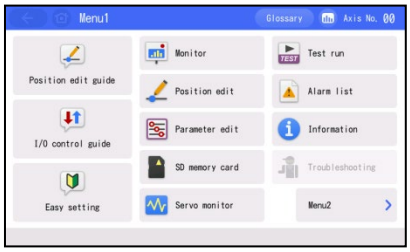
The following screen is shown when the enable feature parameter of the controller is valid in TB-02.

Select either [Yes] (Inactivate Enable Feature) or [No] (Activate Enable Feature).



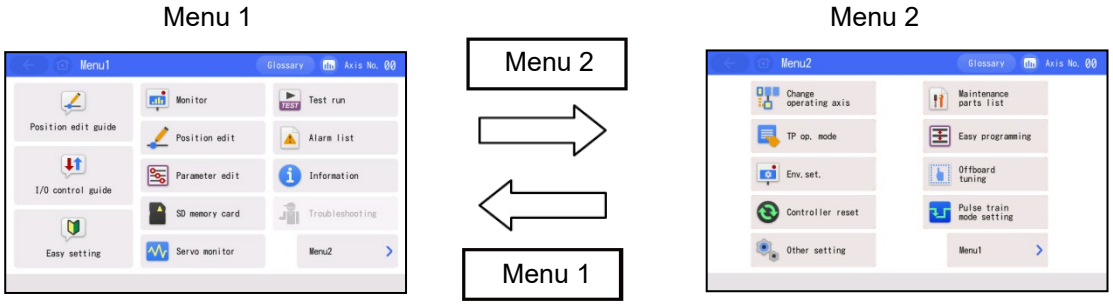
The following screen is shown when the enable feature parameter of the controller is invalid in TB-02D.

Select either [Yes] (Activate Enable Feature) or [No] (Inactivate Enable Feature).



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

3.5 Menu Selection



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.



1) Menu 1 (Virtual Axis) Screen Name : Shows the name of a screen.
A virtual axis should be displayed as (Virtual Axis).

2) Monitor Button : Opens the Monitor Screen

3) Axis No. 00 Change operating axis Button : Shows Select Axis screem.
(It should not function in a screen available to operate axes)

4) Return Button : Returns to Previous Screen

5) Home Button : Returns to Menu 1 Screen

6) Glossary Glossary Button : Shows the Explanation Screen for Terms

7) Stop Status Icons An icon should blink in the following status.

STOP The “STOP” icon should be displayed in a stop status.
Press and hold the icon and the "202: Stop" message should be displayed.

EMG The “ENG” icon should be displayed in an emergency stop status.
Press and hold the icon and the "202: Emergency stop" message should be displayed.

MP The “MP” icon should be displayed in a motor voltage drop status.
Press and hold the icon and the "203: Motor Voltage Drop" message should be displayed.

ENB The "ENB" icon should be displayed in a disable status.
Press and hold the icon and the "226: Enable Circuit Open" message should be displayed.

Safe The “Safe” icon should be displayed in the stop status in STO/SS1-t/SS2-t in the safety function or driver stop status.
Press and hold the icon and the "225: STO/SS1-t"/DRV_STOP or "207 : SS2-t" message should be displayed.

Described below are the functions of each button on the menu selection screen.

[Menu 1]
There are the following menus in Menu 1. Touch either of them to select it.
The screen should shift to the touched menu.

• Position edit guide	Explains how to input position data and how to make a trial run in two-way communication style using the actual position data edit screen. Refer to [3.6 Position Edit Guide]
• I/O control guide	Explains with actual operation how to perform positioning operation by I/O control when PIO Pattern is set to 0 in two-way communication style. Refer to [3.7 I/O Control Guide]
• Easy setting	Conducts data setting necessary for the requested operation from the sample program and then makes a trial operation in order in two-way communication style. Refer to [3.8 Simple Program Setting]
• Monitor	Displays the actuator status, I/O signal status, maintenance information and manufacturing information. Refer to [3.9 Monitor]
• Position edit	Conduct setting for position, velocity and acceleration / deceleration in order to operate an actuator. Refer to [3.10 Position Edit]
• Pressing program edit	It should be displayed when a servo pressing type controller (SCON-CB-F/SCON2-CG-F) is connected. Refer to [3.26 Pressing Program Edit]
• Parameter edit	Conduct parameter tunings to adjust system, to use additional features and so on. Refer to [3.11 Parameter Edit]
• SD memory card	Conduct readout of each type of data such as position data, parameters and alarm list, and save them and teaching update.
• Servo monitor	The actual operation status of the actuator is displayed in a waveform. It is available to record the displayed data. Refer to [3.25 Servo Monitor]
• Test run	Conduct manual operation with JOG, Inching and number indication and also make a trial run of I/O. Refer to [3.12 Trial Run]
• Alarm list	Shows a list of alarms and the time when they occurred. Refer to [3.14 Alarm List]
• Information	Shows the software version, network information, manufacturing information, maintenance information and models available for connection. Refer to [3.17 Information Display]
• Troubleshooting	Shows the contents of an alarm and the countermeasure when an alarm has been generated.

[Menu 2]
There are the following menus in Menu 2. Touch either of them to select it.
The screen should shift to the touched menu.

- Change operating axis — Select an axis to operate when multiple units of controllers are connected to the communication line. Refer to [3.4 Operation Axis Change]
- TP op. mode — Switch over between forbidden and permitted for PIO operation and between invalid and valid for the safety velocity. Refer to [3.13 TP Operation Mode]
- Env. set. — Conduct settings for display language, touch sound, turn-off time, data input warning, axis name display, ripple compensation, password, display, clock and initial window setting at startup. Refer to [3.18 Environment Setting]
- Controller reset — Restart the controller. Refer to [3.15, Restarting Controller.]
- Other setting — Conduct parameter initializing and axis number, loadcell calibration, loadcell invalidation, I/O customizing change, switching drive mode. Refer to [3.16 Other Settings]
- Maintenance parts list — Displays information of maintenance parts. Refer to [3.21 Maintenance Part List]
- Easy programming — It is a window that enables setting of movement between positions, timer and repeated operation by indicating number, and to have continuous operation manually. Refer to [3.22 Simple Program]
- Offboard tuning — Setting of optimum controlling parameters, each types of gain and calculation of cycle time are performed. Refer to [3.24 Offboard tuning]
- Pulse train mode setting — Conduct the settings to have the pulse train control. Refer to [3.23 Pulse Train Control Mode Setting]

[When Alarm Occurred]

When an alarm generates, the corresponding alarm code and message will appear at the bottom of the screen and the background color will change to orange (Red for some alarms).

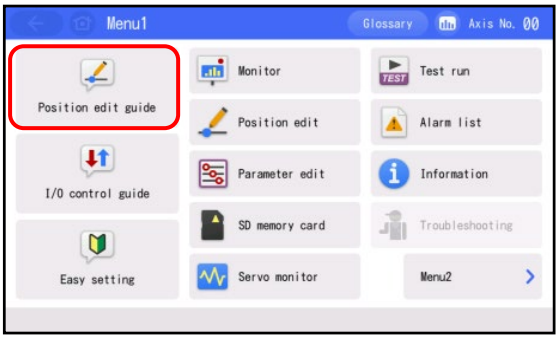
Touch the gray part at the bottom of the window that the alarm information is displayed, and the screen switches to the display window of alarm details.



3.6 Position Edit Guide

In the guide, explains how to input position data and how to make a trial run in two-way communication style using the actual position data edit screen.

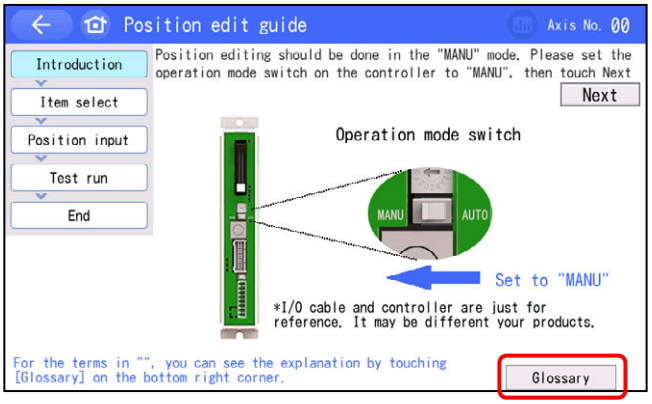
Operate in the order of [Introduction] → [Item select] → [Position input] → [Test run] → [End].



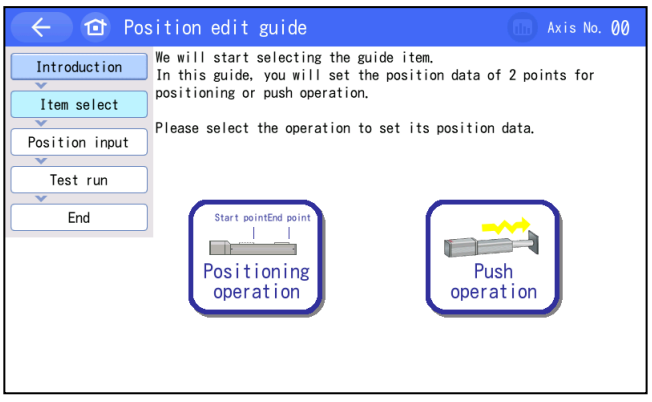
Touch [Position edit guide] icon.

After that, follow the instruction on the screen to operate.
Touch [←] button and the screen goes back to the previous window.
Some processes may be skipped depending on the actuator condition.
For the terms bracketed with " ", touch [Glossary] at the bottom right of the screen and the explanation can be confirmed.

Introduction

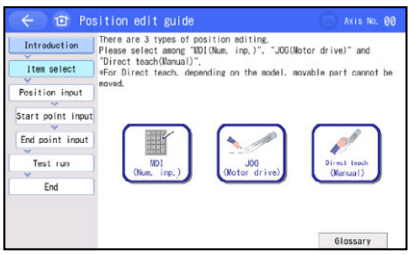


Item select

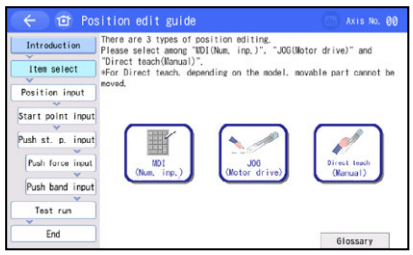


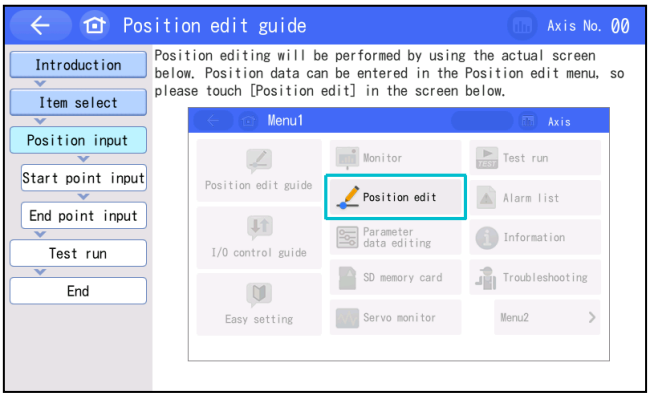
Position input

Positioning operation

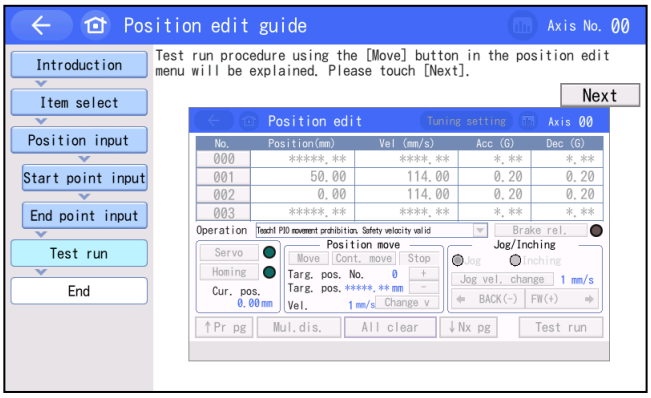


Push operation

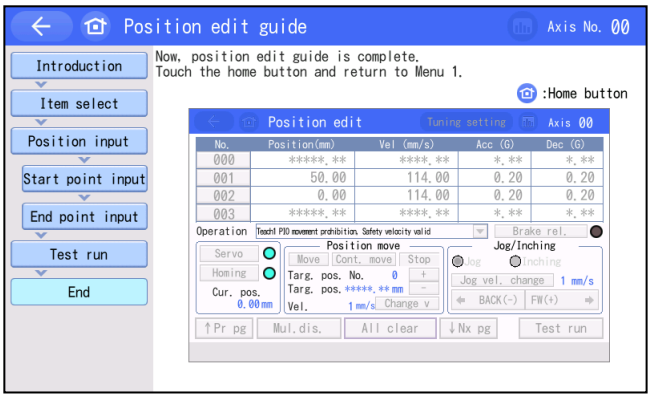




Test run



End

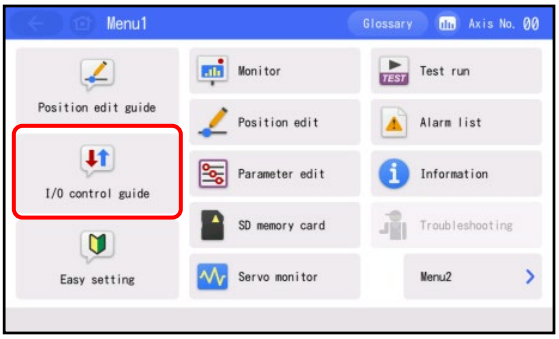


Touch the home button to return to Menu 1 screen.

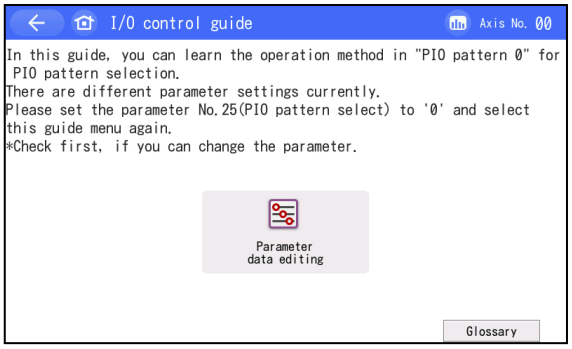
3.7 I/O Control Guide

Here, explains with actual operation how to perform positioning operation by I/O control when PIO Pattern is set to 0 in two-way communication style.

Perform operation in order of [Introduction] → [Servo ON] → [Release of pause] → [Homing] → [Expl. for pos.] → [Positioning] → [End].



Touch [I/O control guide] icon.

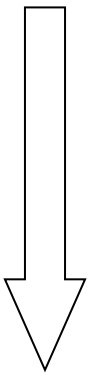


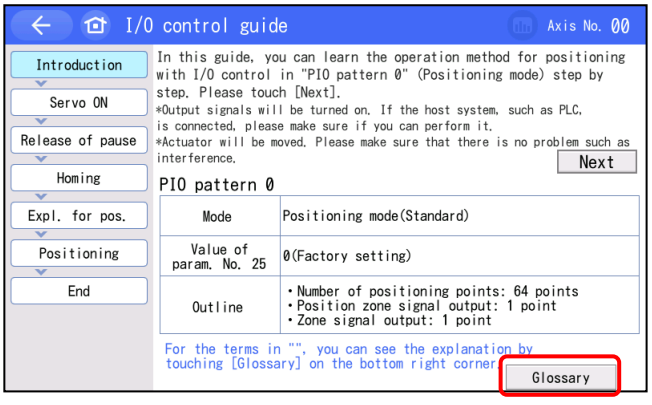
This window appears when PIO Pattern Select is set to a number except for “0”.

Confirm that there would be no problem if a change is made to the parameter, set PIO Pattern Select to “0”, and then select this guide menu.

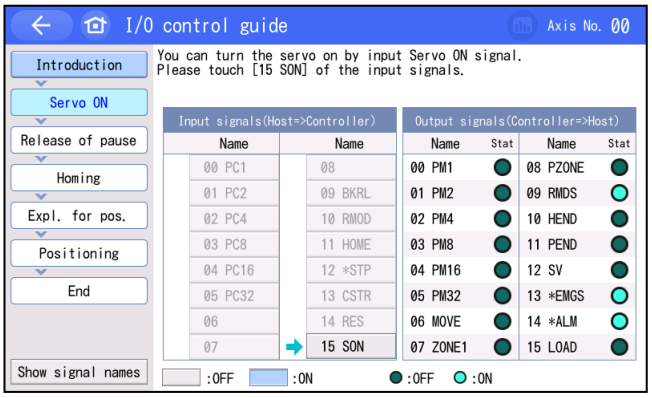
Follow the following descriptions to perform operation.
Touch [←] button to return to the previous screen.
There may be some procedures to skip depending on the condition of the actuator.
Also, for those terms marked with “ ”, explanation can be checked by touching [Glossary] on the right bottom of the screen.

Introduction

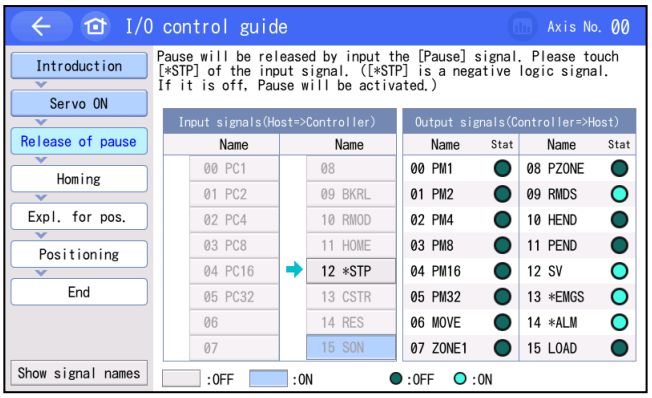




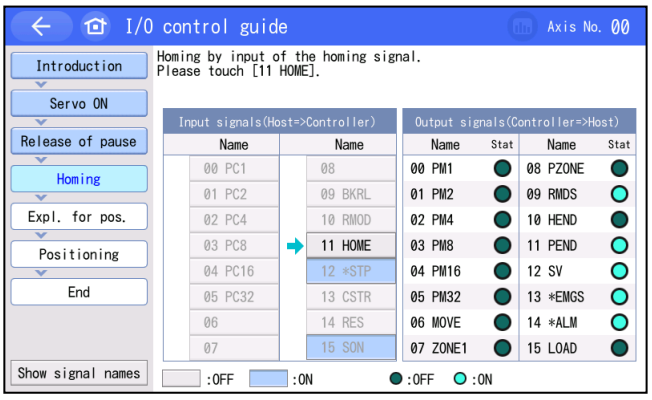
Servo ON



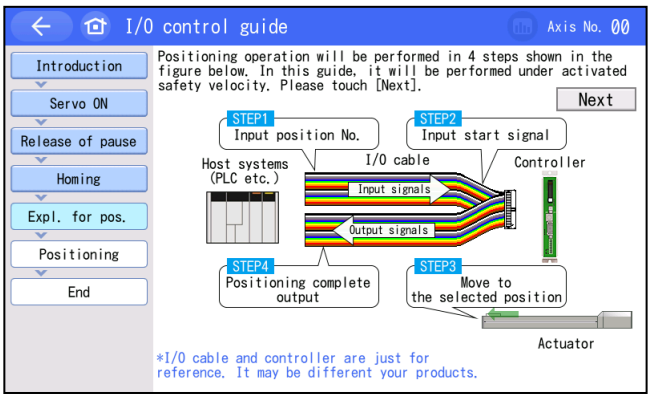
Release of pause



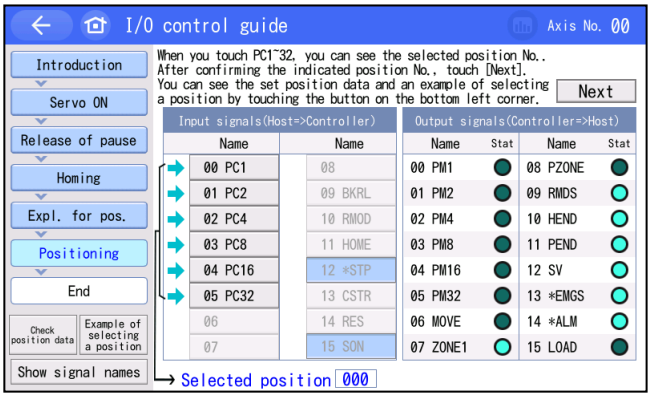
Homing



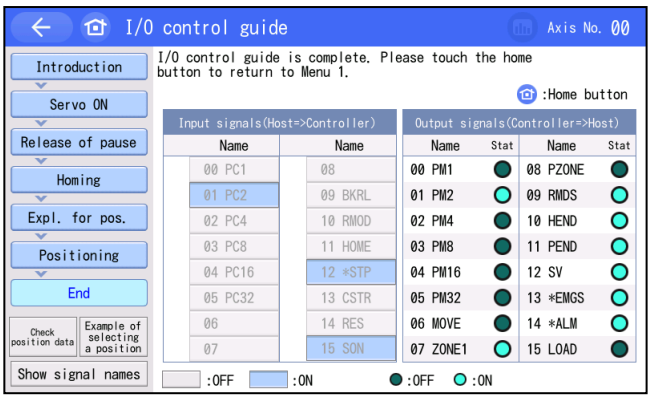
Expl. for pos.



Positioning



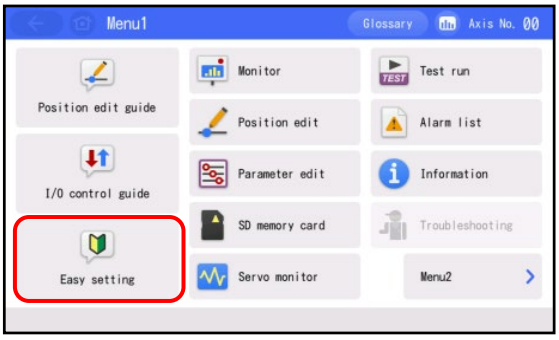
End



Touch the home button to return to Menu 1 screen.

3.8 Easy Program Setting

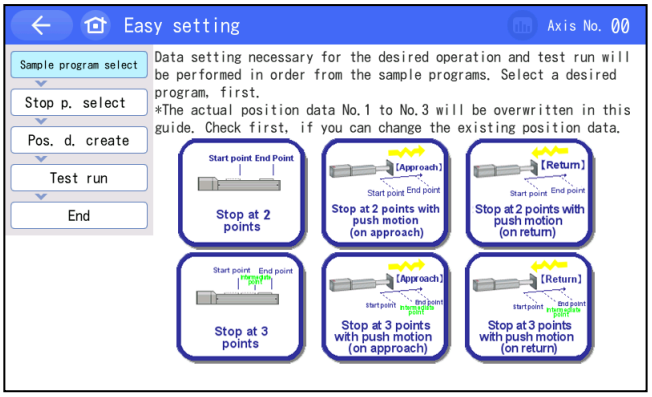
Conducts data setting necessary for the requested operation from the sample program and then makes a trial operation in order in two-way communication style.
Perform operation in order of [Sample program select] → [Stop p.select] → [Position d. create] → [Test run] → [End].



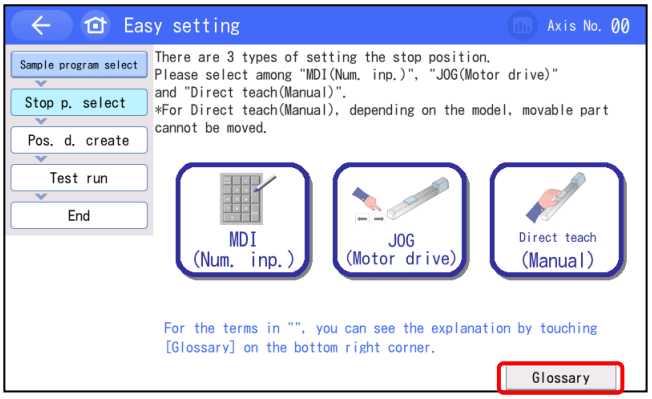
Touch [Easy setting] icon.

Follow the following descriptions to perform operation.
Touch [←] button to return to the previous screen.
There may be some procedures to skip depending on the condition of the actuator.
Also, for those terms marked with " ", explanation can be checked by touching [Glossary] on the right bottom of the screen.

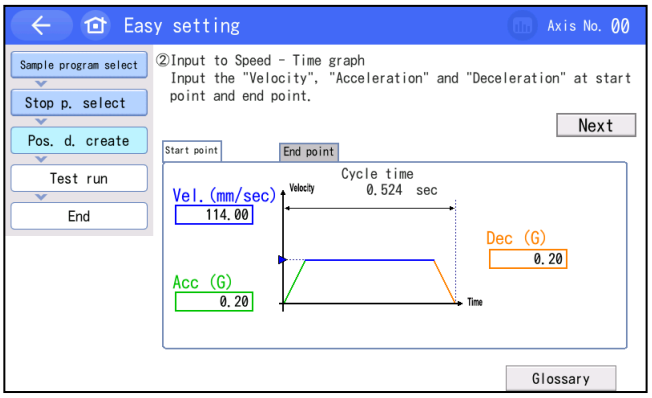
Sample program select



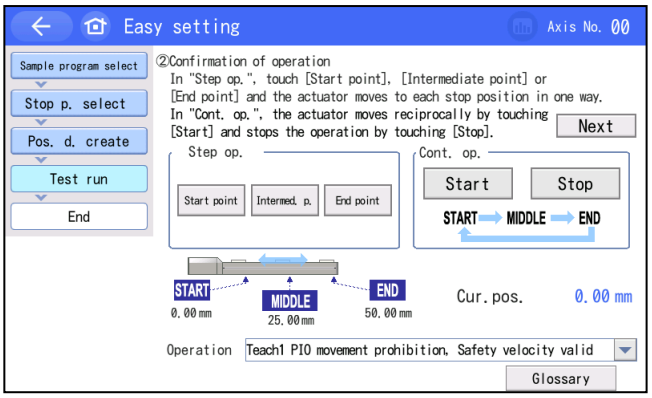
Stop p. select



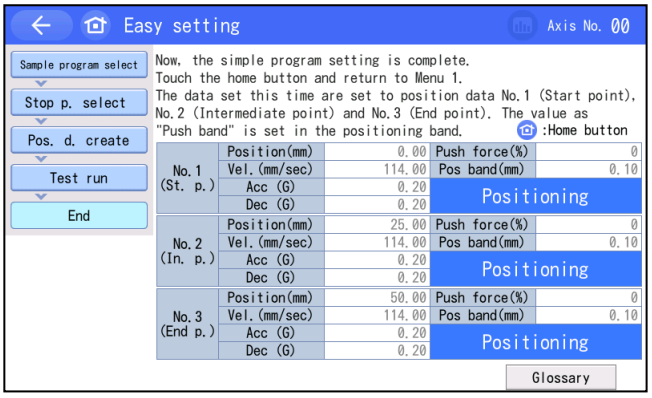
Pos. d. create



Test run



End

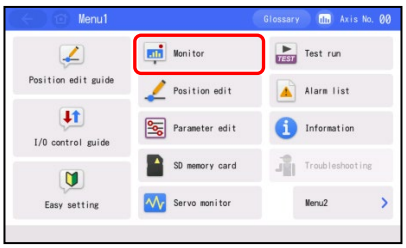


Touch the home button to return to Menu 1 screen.

3.9 Monitor

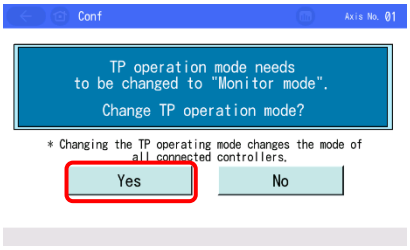
The displayed items and buttons vary depending on the controller model.
The signal names displayed also differ depending on the controller model and the operation pattern.

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



Touch [Monitor] on the Menu 1 screen.

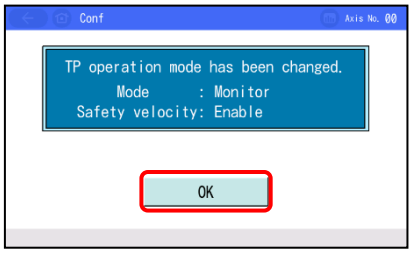
If the TP operation mode is not Monitor Mode 1 or 2, the following message screen appears.



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

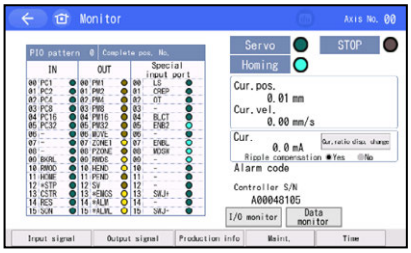
(Note) The safety speed does not change.
If the current mode is Teaching Mode 1, it changes to Monitor Mode 1.
If the current mode is Teaching Mode 2, it changes to Monitor Mode 2.

Note: For the multiple-axis controllers, TP Operation Mode of all the controllers should change.



Touch [OK].

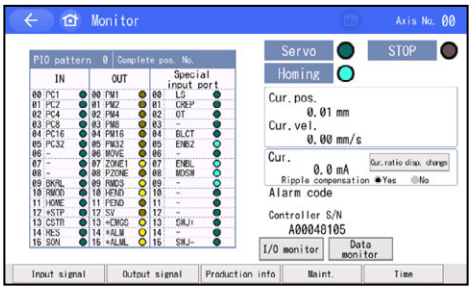
The main monitor screen appears.



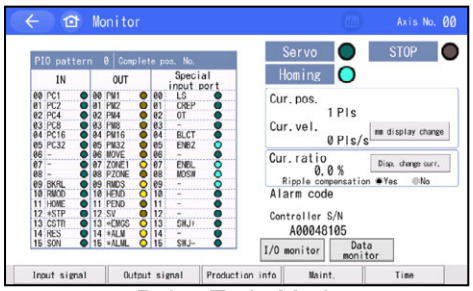
The items and buttons to be shown will differ depending on the controller models.
The signal names to be shown will also differ depending on the controller models and operation patterns.

3.9.1 Monitor Screen

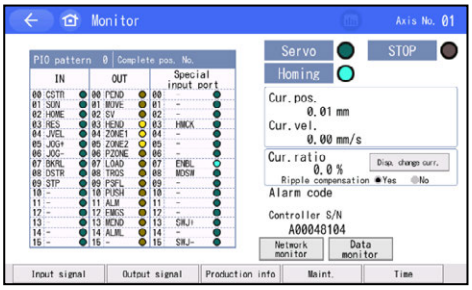
3.9.1.1 Monitor Main Screen



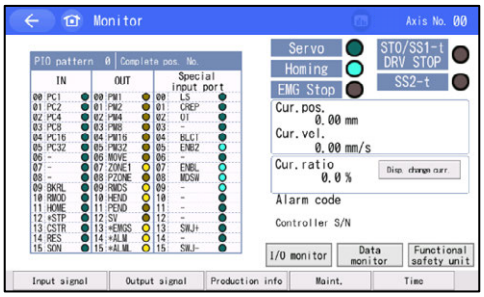
Positioner Mode



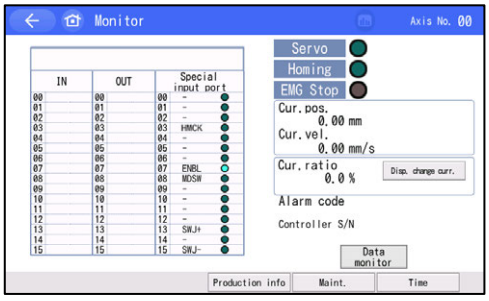
Pulse Train Mode



Network Type



Equipped with Functional Safety Unit



RCON Connection

[Note]
For RCON connections, there is no IN/OUT displayed.
Check it in [7.4.1 Data Monitor].

Touch [I/O monitor] and the I/O monitor screen will be displayed. Refer to [3.9.1.2 I/O Monitor Screen]
Touch [Data monitor] and the data monitor screen will be displayed.
Refer to [3.9.1.3 Data Monitor Screen] (For Network Type Single Axis Controllers)
Touch [Network monitor] and the network data monitor window opens.
(For the network type single axis controllers) Refer to [3.9.1.5 Network Data Monitor Screen]
Touch [Functional safety unit] and the functional safety unit screen will be displayed.
(For equipped with functional safety unit) Refer to [3.9.1.6 Functional Safety Unit Monitoring Screen]

Touch [Input signal] and the term explanation screen for input signals will be displayed.
Touch [Output Signal] and the term explanation screen for output signals will be displayed.
} Refer to [3.9.1.4 Glossary Screen for Input and Output Signals]

Touch [Production info] and the manufacturing information screen will be displayed.
Refer to [3.17 Information Display]
Touch [Maint.] and the maintenance information screen will be displayed.
Refer to [3.9.2 Maintenance Information Screen]
Touch [Time] and the controller clock setting screen will be displayed.
Refer to [3.9.3 Time Setting Screen for Controller]

Touch [Disp. change cur.] and the value of current will be displayed.

Touch [Cur. ratio disp. change] and the current ratio will be displayed.

For Pulse Train Control Mode
Touch [Disp. change pulse] and the current position is shown in Pls and the current velocity in Pls/s.
Touch [mm display change] and the current position is shown in mm and the current velocity in mm/s.

[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.
- Special input port — The statuses of the enable switch, etc., are shown. ON is lit. OFF is unlit.
- Servo — The servo ON status is shown. ON is lit. OFF is unlit.
- Homing — The home return status is shown. It on when the home-return operation is complete, and off when incomplete.
- Stop — It shows the status of stop. It is on when it is stopped. It turns off when the stop condition is released.
- STO/SS1-t t/DRV_STOP — It shows the status of STO/SS1-t/DRV_STOP for STO/SS1-t/DRV_STOP type of SCON-CB/SCON2. It is ON when in STO/SS1-t/DRV_STOP condition. It turns OFF when the condition is released.
- SS2-t — It shows the status of SS2-t for SS2-t type of SCON-CB/SCON2. It is ON when in SS2-t condition. It turns OFF when the condition is released.
- Cur. pos. — The current position is shown.
- Cur. vel. — The current speed is shown.
- Cur. — Shows the current.
- Cur. ratio — The value of electrical current is shown as a percentage of the rated current.
- Ripple compensation (Note 1) — It can be chosen with the radio button whether to display the current/current ratio with ripple compensation or without ripple compensation.
  • Yes : Shown in command current (Note 2)
  • No : Shown in output current (Note 3)
- Alarm code — The applicable alarm code is shown.
- Controller S/N — Shows the manufacturing number of the controller.

The items and buttons to be shown will differ depending on the controller models.
The signal names to be shown will also differ depending on the controller models and operation patterns.

Note 1 Ripple compensation is a feature for the pulse motor type controllers.
Shown below is the list of applicable models and applicable versions.
(Same for Safety Category Complied Type)

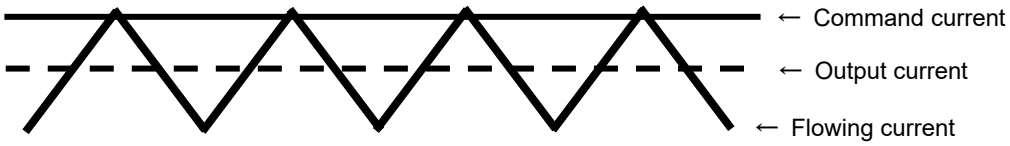
Tool/Controller	Applicable Versions
Teaching Pendant TB-02	V2.40 and later
RCON-PC	V0004 and later
PCON-CB/CFB/CBP	V0006 and later
PCON-CB/CFB (MECHATROLINK-III Connected Type)	V0005 and later
PCON-CYB/POB/PLB	V0003 and later
MPCON/MPCON-A	V0007 and later
MPCON/MPCON-A (EtherCAT Motion Connected Type)	V0004 and later
MPCON/MPCON-A (MECHATROLINK- III Connected Type)	
MPCON/MPCON-A (SSCNET III /H Connected Type)	
RCP6S, RCM-P6PC	V0003 and later

- In versions other than those listed above, the selections of ripple compensation should not be displayed.
- For those models with no selections of ripple compensation, the display should be shown in command current (Note 2).

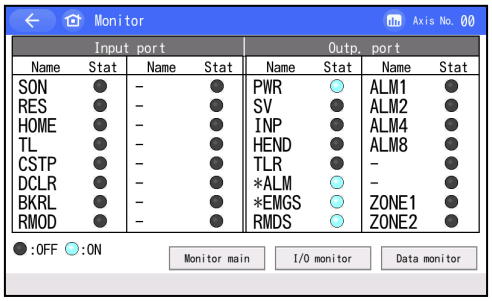
Note 2 In the pulse motor type controllers, the command current should compensate for the amount of current ripple considering transistor switching.

Note 3 In the pulse motor type controllers, output current close to the effective value should be figured out by calculation as it will not acquire the output current.

Pulse motor type controllers



3.9.1.2 I/O Monitor Screen (Only for models in which I/O monitoring function is enabled)



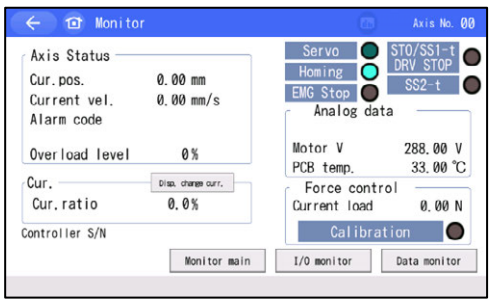
Touch [Monitor main] and the monitor main screen will be displayed.
Refer to [3.9.1.1 Monitor Main Screen]
Touch [Data monitor] and the data monitor screen will be displayed.
Refer to [3.9.1.3 Data Monitor Screen]

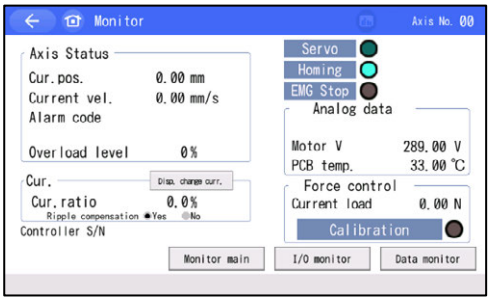
[Displayed Items]

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

The items and buttons to be shown will differ depending on the controller models.
The signal names to be shown will also differ depending on the controller models and operation patterns.

3.9.1.3 Data Monitor Screen





Touch [Monitor main] and the monitor main screen will be displayed. Refer to [3.9.1.1 Monitor Main Screen]
Touch [I/O monitor] and the I/O monitor screen will be displayed. Refer to [3.9.1.2 I/O Monitor Screen]

Touch [Disp. change cur.] and the value of current will be displayed.
Touch [Cur. ratio disp. change] and the current ratio will be displayed.

For Pulse Train Mode
Touch [Disp. change pulse] and the current position is shown in Pls and the current velocity in Pls/s.
Touch [mm display change] and the current position is shown in mm and the current velocity in mm/s.

[Displayed Items]

- Cur. pos. — The current position is shown.
- Current vel. — The current speed is shown.
- Alarm code — The applicable alarm code is shown.
- Overload level — Shows the overload level.
- Cur. — Shows the current.
- Cur. ratio — The value of electrical current is shown as a percentage of the rated current.

  Ripple compensation — It can be chosen with the radio button whether to display the current/current ratio with ripple compensation or without ripple compensation.
  • Yes : Shown in command current
  • No : Shown in output current
  (Refer to [3.9.1.1 Monitor Main Screen for details of ripple compensation])
- Controller S/N — Shows the manufacturing number of the controller.
- Servo — The servo ON status is shown. ON is lit. OFF is unlit.
- Homing — The home return status is shown. It is on when it is stopped. It turns off when the stop condition is released.
- Stop — It shows the status of stop. It is on when it is stopped. It turns off when the stop condition is released.
- STO/SS1-t t/DRV_STOP — It shows the status of STO/SS1-t/DRV_STOP for STO/SS1-t/DRV_STOP type of SCON-CB/SCON2. It is ON when in STO/SS1-t/DRV_STOP condition. It turns OFF when the condition is released.
- SS2-t — It shows the status of SS2-t for SS2-t type of SCON-CB/SCON2. It is ON when in SS2-t condition. It turns OFF when the condition is released.
- Control Voltage — The voltage of the control power supply is shown.
- Motor V — The voltage of the motor power supply is shown.
- PCB temp. — The PCB temperature is shown.

When PCON-CBP/CGBP and SCON-CB-F/SCON2-CG-F controllers are connected, the following items should be displayed.

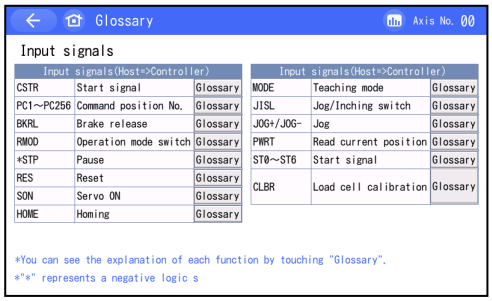
- Current load — When a loadcell is connected, it should display the current load.
- Calibration — It should display the condition of loadcell calibration. It is on when calibration is completed.

The items and buttons to be shown will differ depending on the controller models.
The signal names to be shown will also differ depending on the controller models and operation patterns.

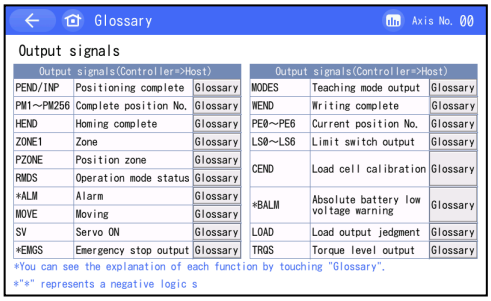
3.9.1.4 Glossary Screen for Input and Output Signals

In this screen, you can check the explanations for terms related to input and output signals.
Touch the [glossary] botton and the contents for each feature can be checked.

Glossary Screen for Input Signals

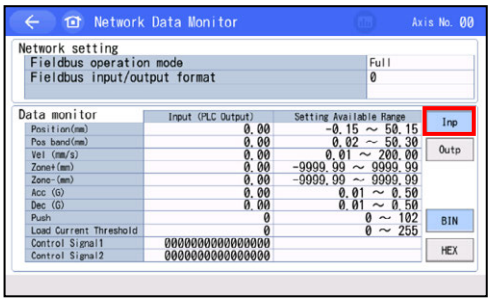


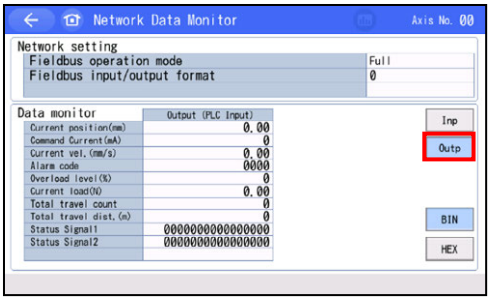
Glossary Screen for Output Signals



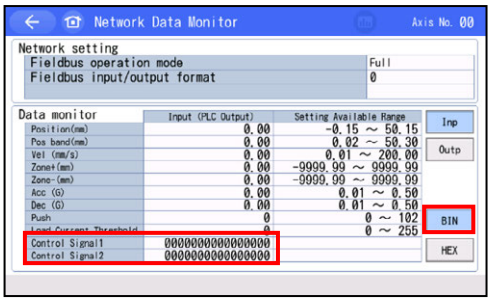
3.9.1.5 Network Data Monitor Screen

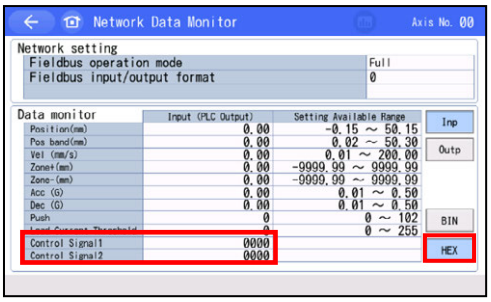
You can view the Network Data Monitor.
This function is not available for models or driver units that are not field network specifications.
For driver units, check [7.4.1 Data Monitor].





Touch [Input] and the input value should be displayed on the data monitor.
Touch [Output] and the output value should be displayed on the data monitor.





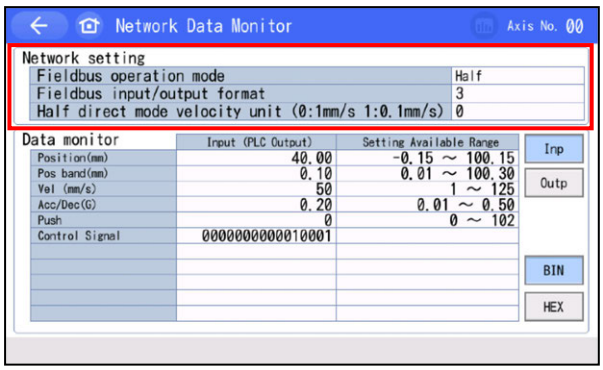
Values in “Control Signal 1” and “Control Signal 2” of input and “Status Signal 1” and “Status Signal 2” of output should be displayed in the binary numbers or hexadecimal numbers.

Touch [Binary] and the values are displayed in binary numbers.
Touch [Hexadecimal] and the values are displayed in hexadecimal numbers.

[Displays]

- Network setting - - - - - - - - - - - - - - - Refer to [3.9.1.5 (1) Network Setting]
- Data monitor (Positioner Type) - - - - - Refer to [3.9.1.5 (2) Data Monitor (Positioner Type)]
- Data monitor (Servo Press Type) - - - - Refer to [3.9.1.5 (3) Data Monitor (Servo Press Type)]

3.9.1.5 (1) Network Setting



- Fieldbus operation mode
  An operation mode name should be displayed in accordance with the setting in Parameter No. 84 “Fieldbus Operation Mode”.

Fieldbus operation mode setting

Parameter No. 84 Setting	Positioner Type	Servo Press Type
0	Remote I/O (Not Displayed)	Remote I/O (Not Displayed)
1	Simple Direct	Full Function
2	Half Direct	Pressing Direct
3	Full Direct	
4	Remote I/O 2	
5	Simple Direct 2	
6	Half Direct 2	
7	Remote I/O 3	
8	Half Direct 3	

- Fieldbus input/output format
  The value set in Parameter No. 90 [Fieldbus Input and Output Format] should be displayed.
  The setting will be reflected to the input and output values in the data monitor.

Fieldbus input/output format setting

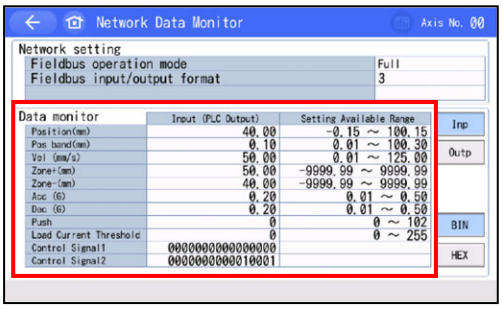
Parameter No. 90 Setting	Name
0	No swapping should be conducted. Data is to be sent as it is to PLC.
1	Upper bytes and lower bytes in each resistor should be swapped.
2	Upper words and lower words in two-word resistors should be swapped.
3	Upper bytes and lower bytes in each resistor should be swapped. For two-word resistors, upper words and lower words are to be swapped in addition.

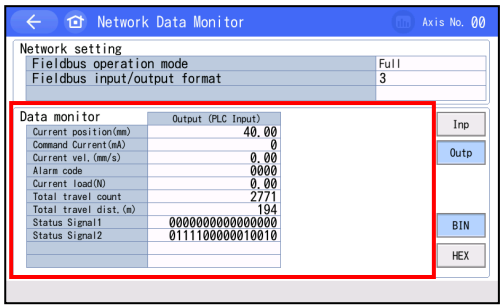
- Half direct mode velocity unit
  The value set in Parameter No.159 [Half Direct Mode Velocity Unit] should be displayed.

  It should be displayed when the fieldbus operation mode setting is either “2. Half Direct”, “6. Half Direct 2” or “8. Half Direct 3”.

3.9.1.5 (2) Data Monitor (Positioner Type)

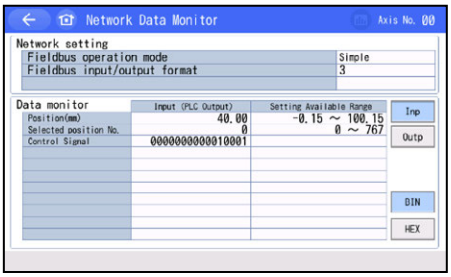
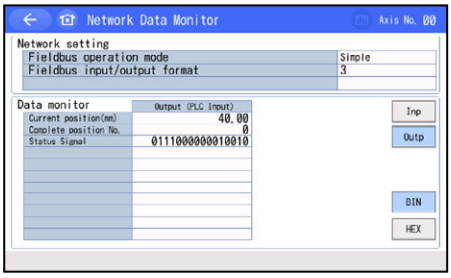
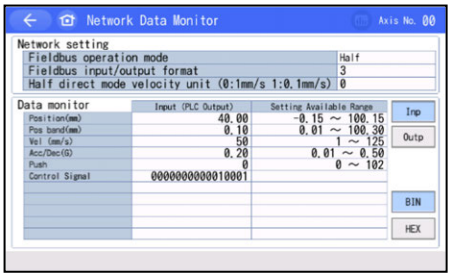
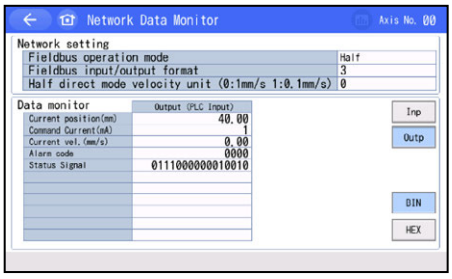
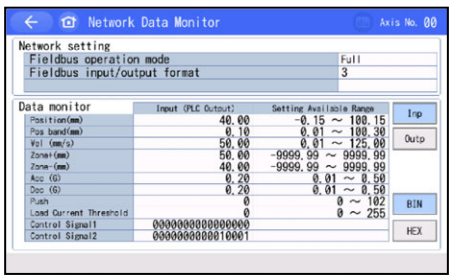
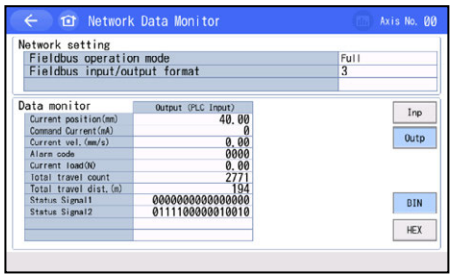
Input values to a controller, settable range and output values from a controller should be displayed.

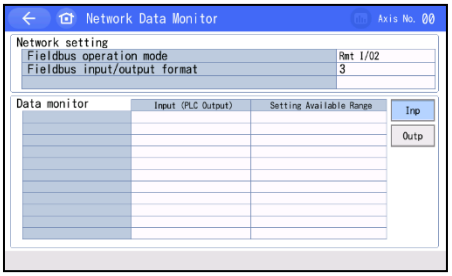
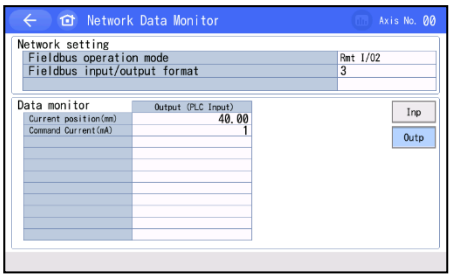
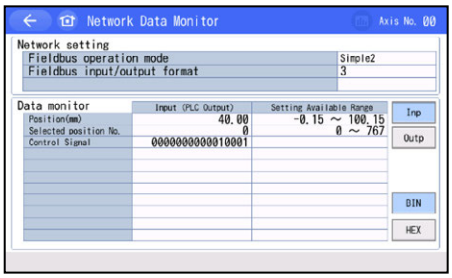
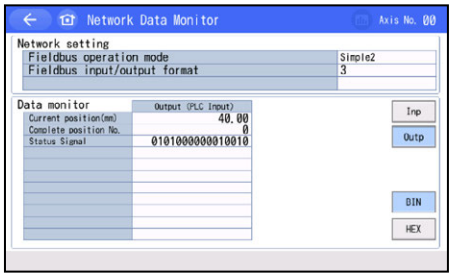
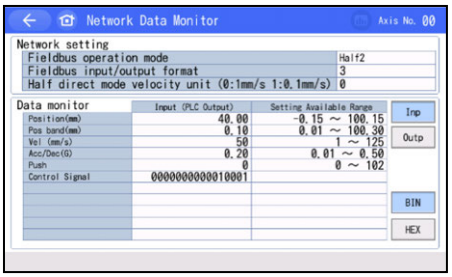
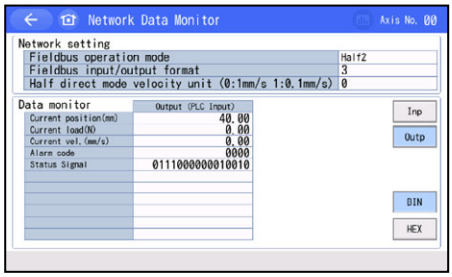
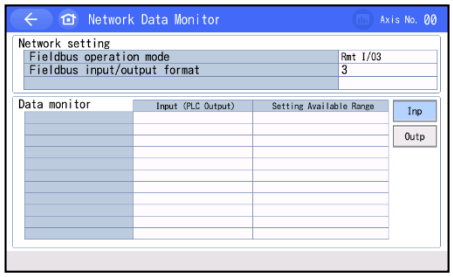
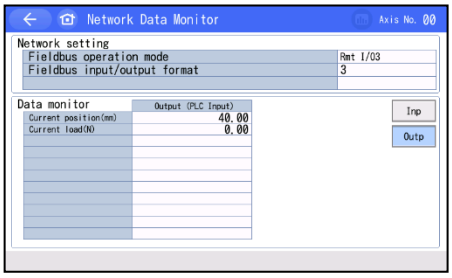
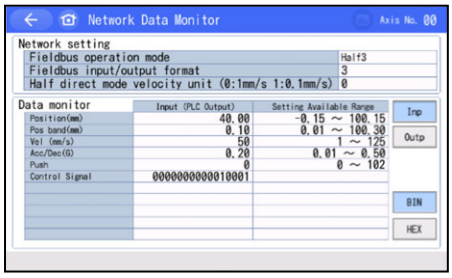
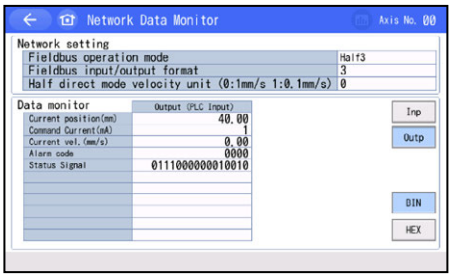




The window shown above is the display in Fieldbus Operation Mode “3: Full Direct”.
Shown in “Input and Output Display List for Each Positioner Type Fieldbus Operation Mode” is the screen displayed in each setting of Fieldbus Operation Mode.

Positioner Type Input and Output Display List for Each Fieldbus Operation Mode

Fieldbus Operation Mode	Input Value	Output Value
0 : Remote I/O	Network data monitor should not be displayed.	
1 : Simple Direct		
2 : Half Direct		
3 : Full Direct		

Fieldbus Operation Mode	Input Value	Output Value
4 : Remote I/O2		
5 : Simple Direct 2		
6 : Half Direct 2		
7 : Remote I/O 3		
8 : Half Direct 3		

Shown in “Positioner Type Data List” is the input and output contents in each setting of Fieldbus Operation Mode.

Positioner Type Data List

	Fieldbus Operation Mode								
	0	1	2	3	4	5	6	7	8
Input	Transition to network monitor information window cannot be conducted.	Target position	Target position	Target position	Occupied area (not displayed)	Target position	Target position	Occupied area (not displayed)	Target position
		Specified position No.	Positioning band	Positioning band		Specified position No.	Positioning band		Positioning band
		Control signal	Instruction speed	Pressing current limit		Control signal	Instruction speed		Instruction speed
			Command speed	Zone boundary on positive			Command speed		Command speed
			Push	Zone boundary on negative			Push		Push
			Control signal	Accelerate			Control signal		Control signal
				Decelerate					
				Load Current Threshold					
				Control signal 1					
				Control signal 2					
Output	Transition to network monitor information window cannot be conducted.	Current position	Current position	Current position	Current position	Current position	Current position	Current position	Current position
		Completed position No.	Command current value	Command current value	Command Current value	Completed position No.	Current load	Current load	Command current value
		Status signal	Current speed	Current speed		Status signal	Current speed		Current speed
			Alarm code	Alarm code			Alarm code		Alarm code
			Status signal	Current load			Status signal		Status signal
				Total number of movements					
				Total travelled distance					
				Status signal 1					
				Status signal 2					

Shown in “Positioner Type Input List” is the list of detailed explanations for the input items.

Positioner Type　Input List

	Item	Explanations
1	Target position	It shows the target position at direct position movement command. Unit : 0.01mm or 0.001mm
2	Positioning band	It shows the positioning band at direct position movement command. Unit : 0.01mm or 0.001mm
3	Command speed	It shows the velocity at direct position movement command. Unit : 0.01mm/s
4	Acceleration and deceleration speed	It shows the acceleration and deceleration at direct position movement command. Unit : 0.01G
5	Zone boundary on positive	It shows a value in the forward side when the zone output signal turns on. Unit : 0.01mm or 0.001mm Range available to indicate : -999999 to 999999
6	Zone boundary on negative	It shows a value in the backward side when the zone output signal turns on. Unit : 0.01mm or 0.001mm Range available to indicate : -999999 to 999999
7	Accelerate	It shows the acceleration at direct position movement command. Unit : 0.01G
8	Decelerate	It shows the deceleration at direct position movement command. Unit : 0.01G
9	Push	It shows the value in the pressing operation.
10	Load current threshold	It shows the threshold of the pressing motion.
11	Specified position No.	It shows the position number to be executed.
12	Control signal	It shows the control signals. Input should be displayed in the binary numbers or hexadecimal numbers. Refer to “Positioner Type Control Signals and Status Signals List” for show to set it up.
13	Control signal 1	It shows the control signal 1. Input should be displayed in the binary numbers or hexadecimal numbers. Refer to “Positioner Type Control Signals and Status Signals List” for show to set it up.
14	Control signal 2	It shows the control signal 2. Input should be displayed in the binary numbers or hexadecimal numbers. Refer to “Positioner Type Control Signals and Status Signals List” for show to set it up.

Shown in “Positioner Type Output List” is the list of detailed explanations for the input items.

Positioner Type Output List

	Item	Explanations
1	Current position	It shows the current position.
2	Command current	It shows the command current.
3	Current velocity	It shows the current velocity.
4	Alarm code	It shows the alarm code which is currently being occurred. It shows “0000” when an alarm is not occurred.
5	Overload level	Shows the overload level. (SCON2 only)
6	Current load	It shows the feedback values of the load data from the loadcell attached on the tip of an axis.
7	Total number of movements	It shows the total number of movement.
8	Total travelled distance	It shows the total travelled distance.
9	Completed position No.	Is shows the completed position number.
10	Status signal	It shows the status signal. Output should be displayed in the binary numbers or hexadecimal numbers. Refer to “Positioner Type Control Signals and Status Signals List” for show to set it up.
11	Status signal 1	It shows the status signal 1. Output should be displayed in the binary numbers or hexadecimal numbers. Refer to “Positioner Type Control Signals and Status Signals List” for show to set it up.
12	Status signal 2	It shows the status signal 2. Output should be displayed in the binary numbers or hexadecimal numbers. Refer to “Positioner Type Control Signals and Status Signals List” for show to set it up.

Positioner Type Control Signals and Status Signals List

	Bits	Fieldbus Operation Mode								
		0	1	2	3		4	5	6	7	8
					Control signal 1	Control signal 2					
Input	00	Not Applicable	CSTR	DSTR	-	DSTR	Not Applicable	CSTR	DSTR	Not Applicable	DSTR
	01		HOME	HOME	PUSH	HOME		HOME	HOME		HOME
	02		STP	STP	DIR	STP		STP	STP		STP
	03		RES	RES	INC	RES		RES	RES		RES
	04		SON	SON	GSL0	SON		SON	SON		SON
	05		JISL	JISL	GSL1	JISL		JISL	JISL		-
	06		JVEL	JVEL	MOD0	JVEL		JVEL	JVEL		MOD0
	07		JOG-	JOG-	MOD1	JOG-		JOG-	JOG-		MOD1
	08		JOG+	JOG+	ASO0	JOG+		JOG+	JOG+		NTC0
	09		PWRT	-	ASO1	CLBR		CLBR	CLBR		NTC1
	10		MODE	GSL0	-	-		-	GSL0		GSL0
	11		PMOD	GSL1	-	-		PMOD	GSL1		GSL1
	12		-	PUSH	NTC0	-		-	PUSH		PUSH
	13		-	DIR	NTC1	-		-	DIR		DIR
	14		RMOD	PMOD	-	PMOD		RMOD	PMOD		PMOD
	15		BKRL	BKRL	-	BKRL		BKRL	BKRL		BKRL

	Bits	0	1	2	3		4	5	6	7	8
					Control signal 1	Control signal 2					
Output	00		PEND	PEND	BALM	PEND		PEND	PEND		PEND
	01		HEND	HEND	CEND	HEND		HEND	HEND		HEND
	02		MOVE	MOVE	-	MOVE		MOVE	MOVE		MOVE
	03		ALM	ALM	-	ALM		ALM	ALM		ALM
	04		SV	SV	-	SV		SV	SV		SV
	05		PSFL	PSFL	-	PSFL		PSFL	PSFL		PSFL
	06		-	-	-	PUSH		PUSH	PUSH		-
	07		BALM	BALM	-	GHMS		BALM	BALM		BALM
	08		RMDS	RMDS	-	RMDS		RMDS	RMDS		RMDS
	09		WEND	-	-	TRQS		TRQS	CEND		-
	10		MODES	-	-	LOAD		LOAD	-		-
	11		PZONE	-	-	PZONE		PZONE	-		-
	12		ZONE1	ZONE1	-	ZONE1		ZONE1	ZONE1		ZONE1
	13		ZONE2	ZONE2	-	ZONE2		CEND	ZONE2		ZONE2
	14		PWR	PWR	-	PWR		PWR	PWR		PWR
	15		EMGS	EMGS	-	EMGS		EMGS	EMGS		EMGS

Refer to the instruction manual of each controller for the details of the signals.

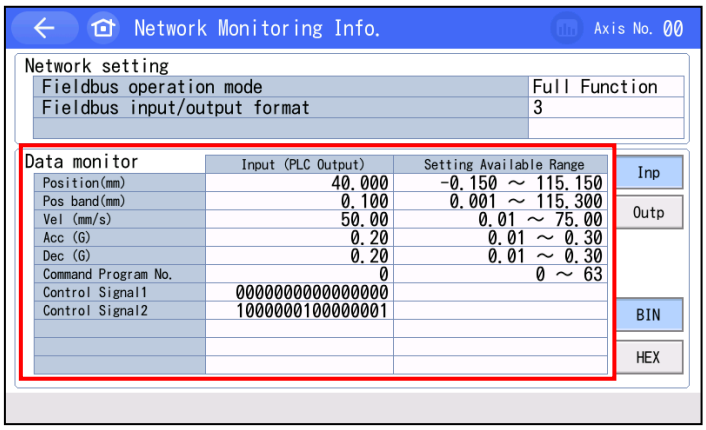
3.9.1.5 (3) Data Monitor (Servo Press Type)

Full Feature Mode

It is the mode applicable for the program operations and direct position movement commands.
It is not capable for a direct position movement command while a program is executed or program startup during direct position movement.

• Display of Input Values

It shows the input (PLC output) values to a controller and the settable range.
* Output a value within the settable range from the PLC.



Shown in “Servo Press Type Input List” is the list of detailed explanations for input items.

Servo Press Type Input List

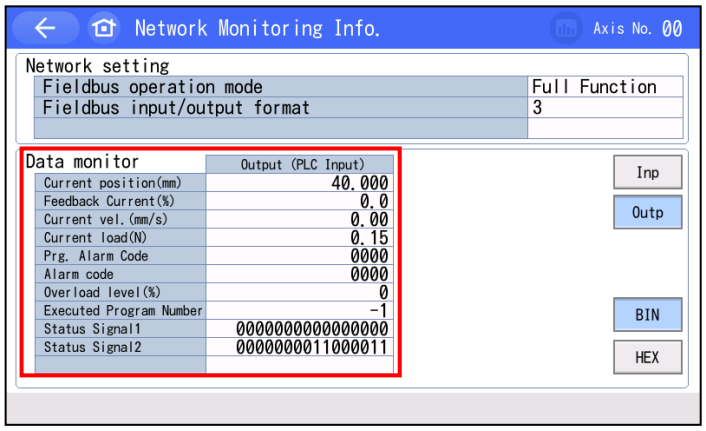
	Item	Explanations
1	Position	It shows the target position at direct position movement command. Unit : 0.01mm or 0.001mm
2	Pos band	It shows the positioning band at direct position movement command. Unit : 0.01mm or 0.001mm
3	Vel	It shows the velocity at direct position movement command. Unit : 0.01mm/s
4	Acc	It shows the acceleration at direct position movement command. Unit : 0.01G
5	Dec	It shows the deceleration at direct position movement command. Unit : 0.01G
6	Command Program No.	It shows the pressing program number to be executed.
7	Control Signal 1	Reserved Domain
8	Control Signal 2	It shows the status signal 2. Input should be displayed in the binary numbers or hexadecimal numbers. Refer to [Servo Press Type Status Signal 2 Detail] for the displayed contents.

Servo Press Type Control Signal 2 Details

Bits	Symbol	Name
00	SON	Servo ON command
01	HOME	Home return
02	RES	Alarm reset
03	CLBR	Loadcell calibration command
04	RMOD	Operation mode switchover
05	BKRL	Brake compulsory release
06	PSTR	Program startup
07	PHOM	Program home-position movement
08	ENMV	Axis operation permission
09	FPST	Program compulsory stop
10	SSTP	Searching stop
11	JISL	JOG/Inching switchover
12	JVEL	JOG velocity / Inching distance switchover
13	JOG+	JOG + Command
14	JOG-	JOG – Command
15	DSTR	Direct Positioning Startup Command

• Display of Output Values

It shows the output (PLC input) values from a controller.



Shown in “Servo Press Type Output List” is the list of detailed explanations for output items.

Servo Press Type Output List

	Item	Explanations
1	Ourrent position	It shows the current position.
2	Feedback Current	It shows the rate of the feedback current to the rated value.
3	Current vel.	It shows the current velocity.
4	Current load	It shows the feedback values of the load data from the loadcell attached on the tip of an axis.
5	Prg. Alarm Code	It shows the program alarm code which is currently being occurred. It shows “0000” when an program alarm is not occurred.
6	Alarm Code	It shows the alarm code which is currently being occurred. It shows “0000” when an alarm is not occurred.
7	Overload level	It shows the overload level.
8	Executed Program Number	It shows the program number being executed by the program startup command. It should be “-1” before the pressing program is executed.
9	Control Signal 1	It shows the status signal. Output should be displayed in the binary numbers or hexadecimal numbers. Refer to “Servo Press Type Status Signal 1 Detail” for the displayed contents.
10	Control Signal 2	It shows the status signal. Output should be displayed in the binary numbers or hexadecimal numbers. Refer to [Servo Press Type Status Signal 2 Detail] for the displayed contents.

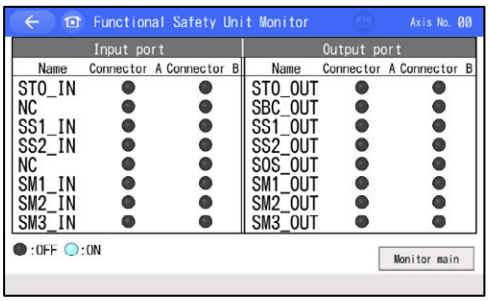
Servo Press Type　Control Signal 1 Details

Bits	Symbol	Name
00	APRC	In Approaching Operation
01	SERC	In Searching Operation
02	PRSS	In Pressurizing Operation
03	PSTP	Pressurizing in Stop
04	DCMP	In Depressurizing Operation
05	RTRN	In Return Operation
06	WAIT	Program in Standby
07	-	(Reserved)
08	-	(Reserved)
09	-	(Reserved)
10	PJOK	Position (Distance) Judgment Passed
11	PJNG	Position (Distance) Judgment Failure
12	LJOK	Load Judgment Passed
13	LJNG	Load Judgment Failure
14	JDOK	Total Judgment Passed
15	JDNG	Total Judgment Failure

Servo Press Type　Control Signal 2 Details

Bits	Symbol	Name
00	SV	Servo-on Status
01	HEND	Home-Return Complete
02	CEMD	Loadcell Calibration Complete
03	RMDS	Operation Mode Status
04	PEND	Positioning Completion
05	-	(Reserved)
06	ZONE1	ZONE 1
07	ZONE2	ZONE 2
08	PCMP	Program Completed in Normal Condition
09	PRUN	Program Executed
10	PORG	Program Home Position
11	MPHM	In Move to Program Home Position
12	PALM	Program Alarm
13	ALML	Light Malfunction Alarm
14	ALM	Alarm
15	EMSG	Emergency Stop

3.9.1.6 Functional Safety Unit Monitoring Screen

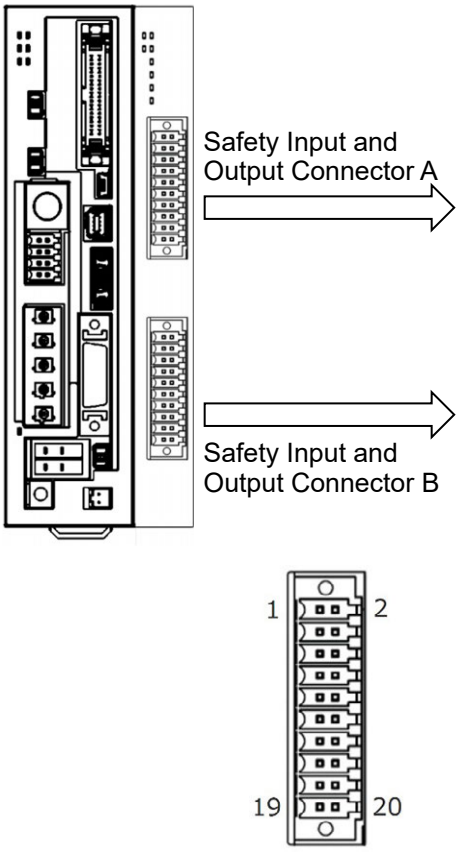


Touch [Monitor main] and it returns to the monitor main window. Refer to [3.9.1.1]

[Display Detail]

- Input Port — The status of the input port on the functional safety unit should be displayed. On when illuminated. Off when light out.
- Output Port — The status of the output port on the functional safety unit should be displayed. On when illuminated. Off when light out.

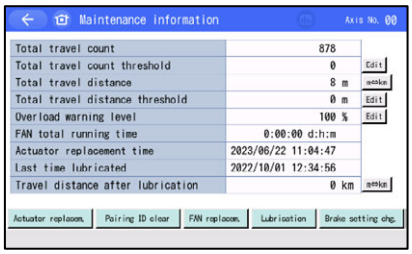
The safety input and output connector pin assignment of the functional safety unit should be as shown below.



Safety Input and Output Connector A			
No.	**Signal Name**	**Signal Name**	**No.**
1	STO_IN_A	STO_OUT_A	2
3	NC	SBC_OUT_A	4
5	SS1_IN_A	SS1_OUT_A	6
7	SS2_IN_A	SS2_OUT_A	8
9	NC	SOS_OUT_A	10
11	SM1_IN_A	SM1_OUT_A	12
13	SM2_IN_A	SM2_OUT_A	14
15	SM3_IN_A	SM3_OUT_A	16
17	IN_COM_A	OUT_COM_A	18
19	FG	FG	20

Safety Input and Output Connector B			
No.	**Signal Name**	**Signal Name**	**No.**
1	STO_IN_B	STO_OUT_B	2
3	NC	SBC_OUT_B	4
5	SS1_IN_B	SS1_OUT_B	6
7	SS2_IN_B	SS2_OUT_B	8
9	NC	SOS_OUT_B	10
11	SM1_IN_B	SM1_OUT_B	12
13	SM2_IN_B	SM2_OUT_B	14
15	SM3_IN_B	SM3_OUT_B	16
17	IN_COM_B	OUT_COM_B	18
19	FG	FG	20

3.9.2 Maintenance Information Screen



Touch either [Maintenance] in Monitor Window [3.9.1] or [Maintenance Information] in Information Window [3.17], and the maintenance information window should open.

[Actuator replacem.]---------- It should be conducted when an actuator is to be replaced.
Refer to [3.9.2.1, “Operating Method When Replacing the Actuator.”]

[Pairing ID clear] ---------- It should be conducted when only the motor unit is to be replaced.
Refer to [3.9.2.2, “Operating Method to Clear Pairing ID (When Replacing Motor Unit)”]

[FAN replacem.] (Note 1) -------- It should be conducted when the fan is to be replaced.
Refer to [3.9.2.3, “Operating Method When Replacing the FAN.”]

[Lubrication] (Note 2) ---------- It should be conducted when lubrication is to be supplied to an actuator.
Refer to [3.9.2.4, “Operating Method of Updating Maintenance Information Related to Lubrication”]

[Brake setting chg.] (Note 3) ---- It is to be conducted when a change is to be made whether there is a brake equipment or not.
Refer to [3.9.2.5, “Operation When Changing Setting of Brake Equipment”]

[Contents of Display]

- Total travel count — The cumulative total number of actuator movements is shown.
- Total travel count threshold — A notice should be made with an alarm when the total number of movement times has exceeded this setting value.
- Total travel distance — The cumulative total distance travelled by the actuator is shown.
- Total travel distance threshold — A notice should be made with an alarm when the total distance of drive has exceeded this setting value.
- Overload warning level — It shows the threshold to output an overload alarm.
- FAN total running time (Note 1) — Shows the total driving time of the fan on the controller.
- Actuator replacement time — It shows the day and time of when an actuator was replaced.
- Last time lubricated (Note 2) — It shows the day of when lubrication was supplied.
- Travel distance after lubrication (Note 2) — It shows the travel distance after lubrication.

The items and buttons to be shown will differ depending on the controller models.

Note 1 It should be shown in a controller that is equipped with a fan.

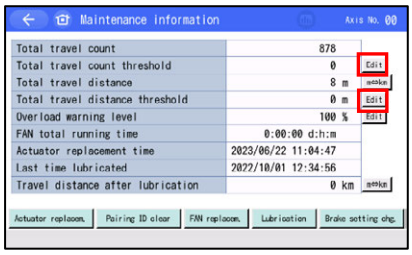
Note 2 It should be shown when the controller and actuators are applicable for the information management system.

Note 3 It should be displayed when the controller is either SCON or SCON2.

[Setting Values for Total Travel Count and Total Travel Distance]
It is available to issue a message level alarm when the total travel count has exceeded the setting threshold for the total travel count or when the total travel distance has exceeded the threshold for the total travel distance.

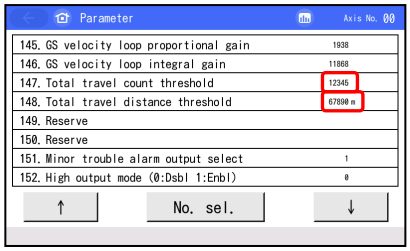
The settings for the total travel count threshold and the total travel distance threshold can be established by the process below.

(1) Establish Setting in Maintenance Information Window



Touch Edit on the right hand of the total travel count threshold or on the right hand of the total travel distance threshold, and the setting can be adjusted for each value.

(2) Establish Setting by Parameters



Show the following items in Parameter Edit screen refer to [3.11] and touch each value to adjust the setting for each value.

Item	Parameter No.
Total travel count threshold	147
Total travel distance threshold	148

Adjustment of values in either way of (1) and (2) should be reflected to each other.
* It is necessary to reboot it in order to activate the settings.

Message Level Alarm to be Output

Alarm code	Name	Description
04E	Exceeded Movement Count Threshold	It should be issued when the movement count has exceeded the movement count threshold (Parameter No. 147).
04F	Exceeded Operated Distance Threshold	It should be issued when the operated distance has exceeded the operated distance threshold (Parameter No. 148).

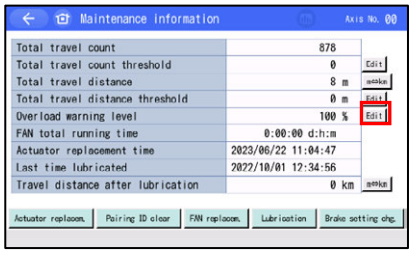
[Example of use of Total travel distance]

For example when using the RCPW rod type actuator, if the travel distance within three months exceeds 300km, the scraper section should be greased during the periodic inspection after every 300km of travel. (If distance does not exceed 300km, grease every 3 months.)
In this case, if the total travel distance threshold (Parameter No. 148) is set to ‘300’ before starting operation, alarm will notify you the timing for grease supply at the timing of exceeding 300km of the drive distance.
After that, set the total travel distance threshold (Parameter No. 148) to ‘600’, ‘900’ …, which are values that 300km of drive distance is added on top, and you can be continuously notified the timings for grease supply.

[About Overload Warning Level Setting]
With the motor temperature in operation in rated values as 100%, an alarm in the message level should be generated when the motor temperature has exceeded the ratio set in this section.
Set it to 100% and a judgement should not be made.

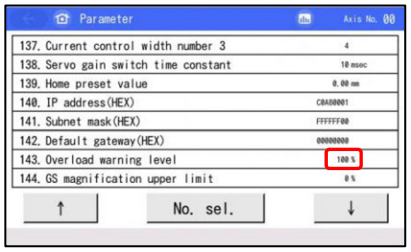
The overload warning level setting should be established in the way shown below.

(1) Establish Setting in Maintenance Information Window



Touch [Edit] on the right side of Overload Warning Level to set the value.

(2) Establish Setting by Parameters



Show the following items in Parameter Edit screen refer to [3.11] and touch each value to adjust the setting for each value.

Item	Parameter No.
Over Load Warning Load Level Ratio	143

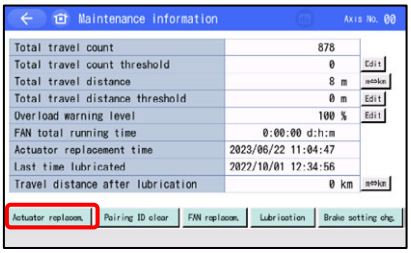
Adjustment of values in either way of (1) and (2) should be reflected to each other.
* It is necessary to reboot it in order to activate the settings.

Message Level Alarm to be Output

Alarm code	Name	Description
048	Driver overload warning	With motor temperature in operation in rated values as 100%, message level alarm to be generated when motor temperature exceeded ratio set in this section

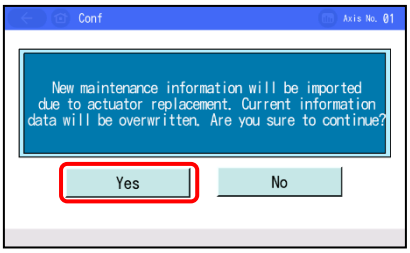
3.9.2.1 Operating Method When Replacing the Actuator (When Replacing the Actuator)

The following shows the method that resets the Total travel count and Total travel distance at the time of replacing the actuator that connects to the controller with the maintenance information function.
(Note) Do not implement this procedure when replacing only the motor unit.



Touch [Actuator replacem.] to display the password entry screen.

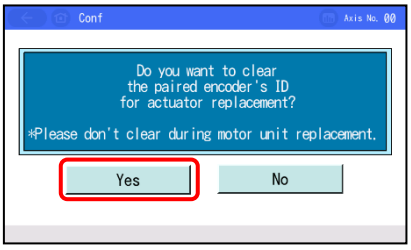
Enter “5119”, and then touch [ENT].



The actuator replacement confirmation screen appears.

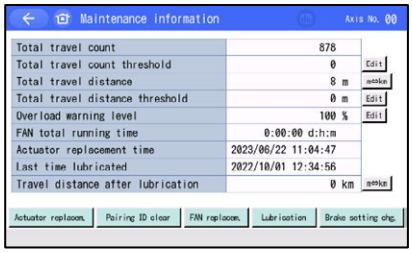
Touch [Yes].

The pairing ID clear confirmation screen appears, if the actuator is equipped with a battery-less absolute encoder.



The controller has the mechanism that if the encoder ID is different after checking the ID, then the absolute encoder error is output.
When replacing with the actuator which is absolutely reset, the last ID (pairing ID) of the actuator must be cleared.

Touch [Yes].



The Total travel count and Total travel distance are reset to 0.
The Actuator replacement time should be updated to the current day and time.

In the actuator which is equipped with the battery-less absolute encoder, the pairing ID is cleared.

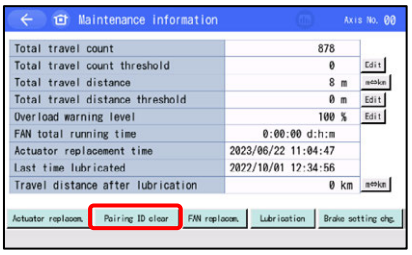
With that, the preparatory work of actuator replacement is finished.
Turn off the power of the controller, and then replace the actuator.

* It is not possible to change the serial number and manufacturing information of the actuator which can be changed in the PC supported software.

3.9.2.2 Operating Method to Clear Pairing ID (When Replacing Motor Unit)

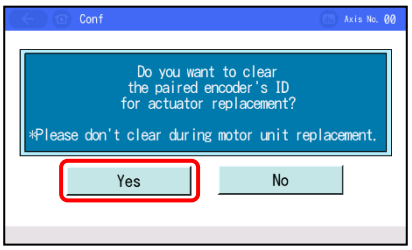
Stated below is how to clear only the pairing ID.
[Pairing ID Clear] button appears only when the actuator is equipped with the battery-less absolute encoder.

(Note) This process is to be conducted when only motor unit is to be replaced. Follow the process in "3.9.2.1 Operating Method When Replacing the Actuator" when replacing an actuator.



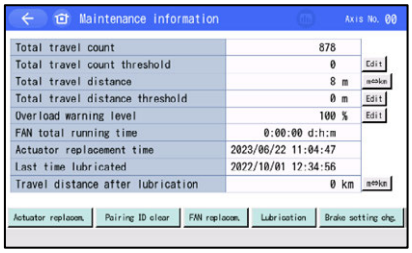
Touch [Pairing ID clear] to display the password entry screen.

Enter "5119", and then touch [ENT].



The controller has the mechanism that if the encoder ID is different after checking the ID, then the absolute encoder error is output.
When replacing with the actuator which is absolutely reset, the last ID (pairing ID) of the actuator must be cleared.

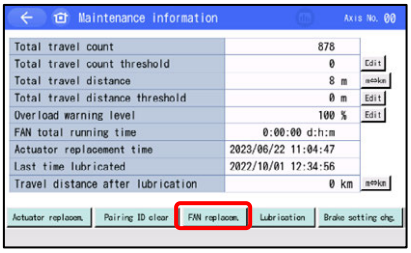
Touch [Yes].



The pairing ID is cleared.

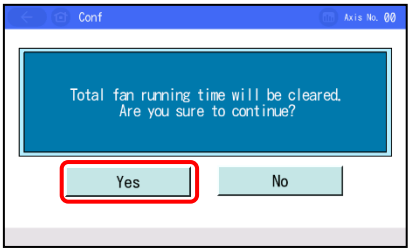
3.9.2.3 Operating Method When Replacing the FAN

Shown below is how to reset the total fan operation time at the time of the fan replaced.
The total fan operation time and [FAN replacem.] button should be shown only when the controller is equipped with a fan.



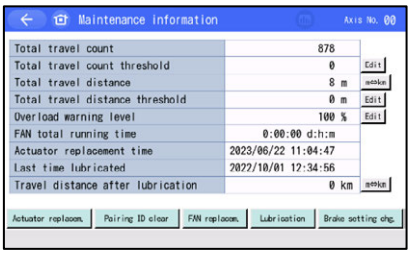
Touch [FAN replacem.] to display the password entry screen.

Enter “5119”, and then touch [ENT].



The FAN total runninng time clear confirmation screen appears.

Touch [Yes].

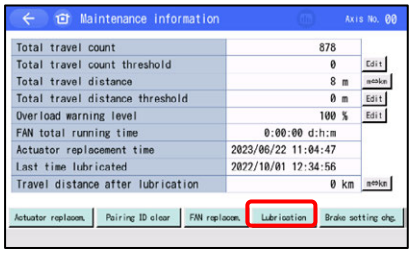


The FAN total running time is reset to 0.

3.9.2.4 Operating Method of Updating Maintenance Information Related to Lubrication

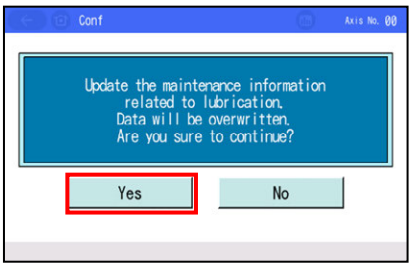
Shown below is how to record the time of lubrication and how to reset the drive distance after lubrication when lubrication to an actuator.

Last time lubrication, travel distance after lubrication and [Lubrication] button should be shown when both the controller and actuators are applicable for the information management system and Parameter No. 192 Actuator Identification System Use Flag is set to 1: Valid.



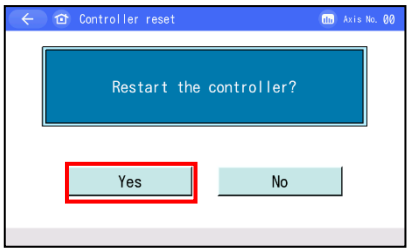
Touch [Lubrication] to display the password entry screen.

Enter '5119', and then touch [ENT].



Lubrication information clear confirmation window should be displayed.

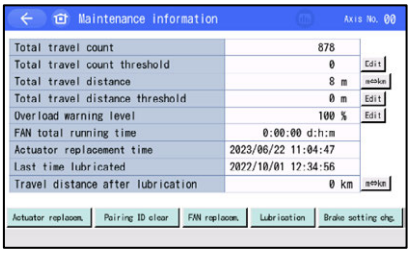
Touch [Yes].



Confirmation window for controller reboot should appear.

Touch [Yes].

If touch [No], controller would not reboot.

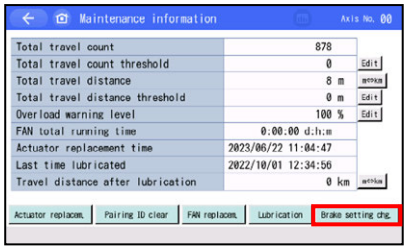


The lubrication time to the current day and time should be updated and the value in the drive distance after lubrication should be reset.

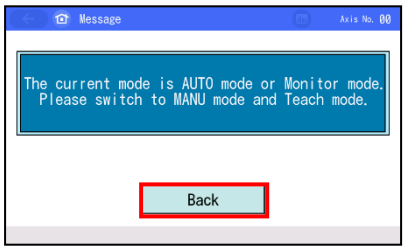
* Some models may require the power to be rebooted instead of controller being restarted. Follow the message in the shown window to make operation.

3.9.2.5 Operation When Changing Setting of Brake Equipment

How to change the brake equipment setting is as shown below.
[Brake setting chg.] button should be displayed when SCON/SCON2 controller gets connected.



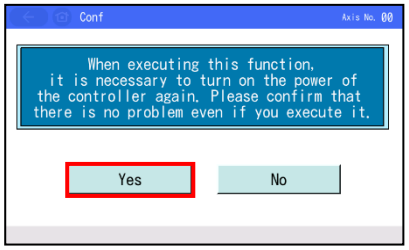
Touch [Brake setting chg.].



For Auto Mode and Monitoring Mode, there will be a message window shown up to encourage a switchover to MANU or Teaching Mode.

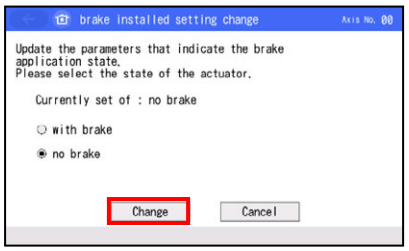
Touch [Back] and the screen goes back to the maintenance window.

Refer to [3.13 TP Operation Mode] for mode switchover.

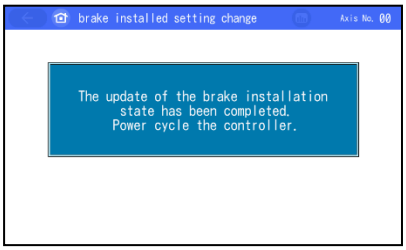


For MANU and Teaching Mode, a window for confirmation of execution should appear.

Confirm that there is no problem in executing it, and touch [Yes].



Select wither there is a brake or not in the brake equipment setting window, and touch [Change].



A window to show that the setting has changed should show up.

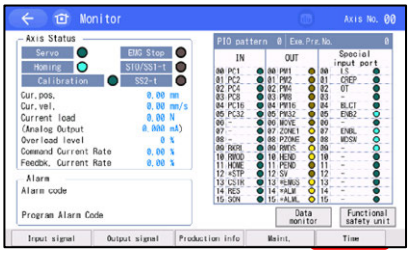
As the changed setting should become valid after the power supplied to the controller is rebooted, the power supplied to the controller should be rebooted.

> ⚠ *Note: If the information of a brake being equipped or not does not match in an actuator and a controller, not only that operation cannot be performed, but also it may cause malfunction. Make sure there is no mismatch in the setting.*

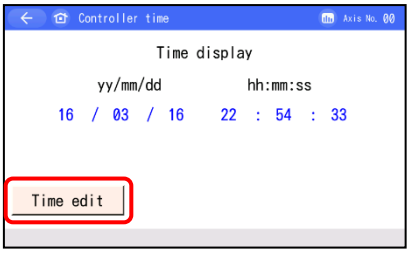
3.9.3 Time Setting Screen for Controller

In the controller with a calendar function, the time setting for the controller can be set.

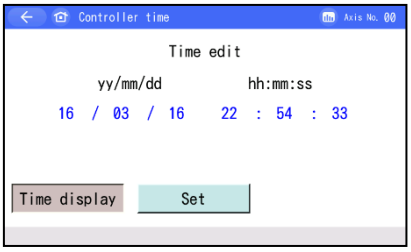
[How to Set Time]



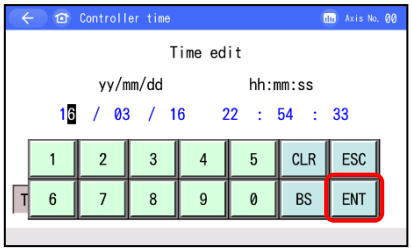
Touching [Time] displays the time setting screen.



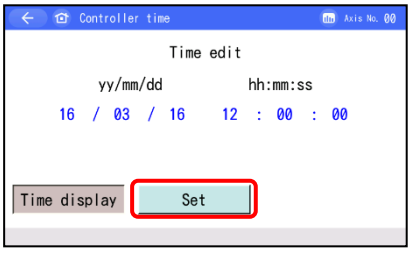
Controller's time is displayed.
Touch [Time edit].



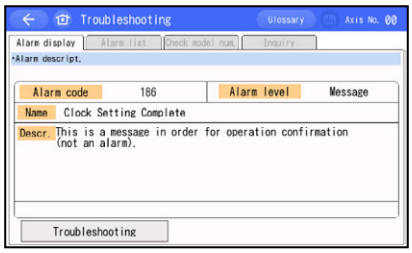
Touch the value of year, month, day, hours, minutes or seconds you want to change.



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



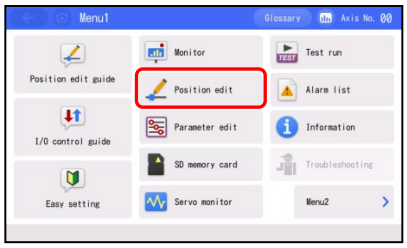
Touch [Set].



A screen telling the clock setting is complete appears, and then the controller clock will be displayed.

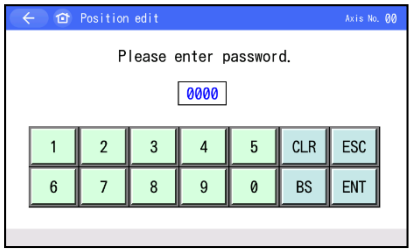
3.10 Position Editing

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



Touch [Position edit] on the Menu 1 screen.

If a position edit password is other than “0000,” the password entry screen appears.

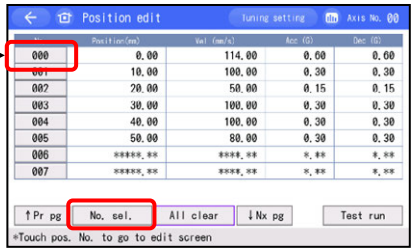


Enter the position edit password.
Touch [ENT].

> The default position edit password is “0000.”
> For how to change the position edit password, refer to 3.18, "Environment setting [Change Pos Edit Password]."

A position data table appears.

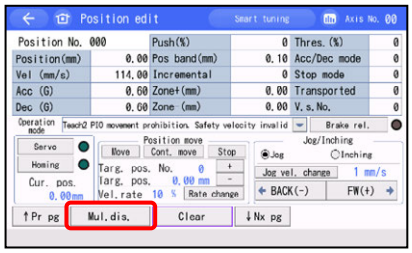
Position No. →



Touch [No. sel.] 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.”

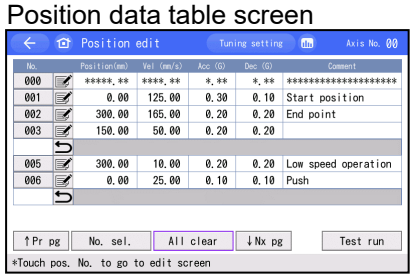
Data of the selected position number appears. (Position Data Individual Edit Screen)



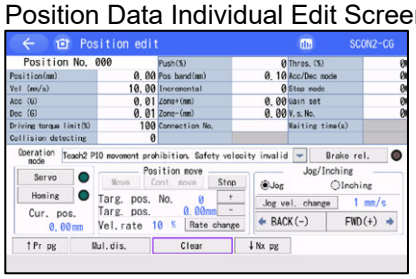
Touching [Mul. dis.] returns the screen to the position data table display.

The contents of display and setting items should differ depending on the controller.
For a controller applicable for comment input to position data (Refer to 3.10.2)

Position data table screen



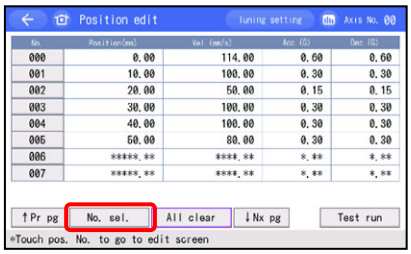
Position Data Individual Edit Screen



3.10.1 Position Data

For the controllers applicable for comment input of the position data (RCON-PC/PCF/AC/DC/SC, SCON-CB RCON connection type and SCON2), refer to [3.10.2] together.

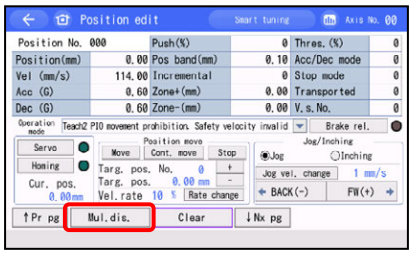
Position data table screen



No. sel.

Mul. dis.

Position Data Individual Edit Screen



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, transportation load / gain set and Vibration No. The setting of Zone +, Zone -, threshold, Acceleration / Deceleration Modes, Stop Mode, gain set and anti-vibration number are enabled or disabled depending on the controller types as shown in the table below, and the items to be displayed may differ accordingly.

> ⚠ *Caution: Operation with JOG Switch on Front Panel of RCON*
> *If TB-02 gets disconnected from the controller in the condition that this window is open, JOG switch operation will get disabled.*

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

> ⚠ *Warning: Be sure to specify absolute coordinates on PCON-C/CF/CA/CFA/CB/CFB/CBP, ACON-C/CA/CB, DCON-CA/CB, SCON-C/CA/CAL/CB, SCON2, ROBONET, ERC3 PIO Converter, RCP6S, MCON, MSCON (Remote I/O mode) controllers of solenoid valve mode 2, or PCON-CY/CYB, ACON-CY/CYB and DCON-CYB controllers of solenoid valve mode 1. (same for Safety Category Complied Type) 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.*

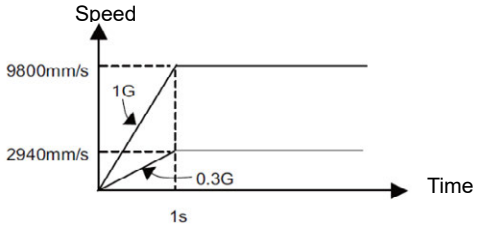
(2) Target position [mm]
Enter the target position to move the actuator to.

- 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/CAL/CB, SCON2, PCON-CA/CFA/CB/CFB/CBP/CYB, ACON-CA/CB/CYB, DCON-CA/CB/CYB, ERC3, RCP6S, MCON and MSCON, an alarm will be displayed if the set value is lower than the minimum velocity. (Same for Safety Category Complied Type)

(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.

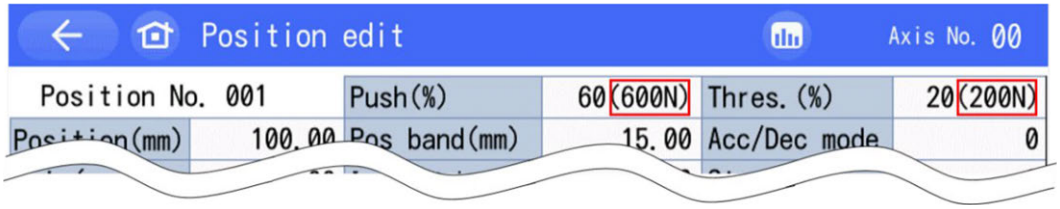


(Note) For SCON-CA/CAL/CB, SCON2, PCON-CA/CFA/CB/CFB/CBP/CYB, ACON-CA/CB/CYB, DCON-CA/CB/CYB, ERC3, RCP6S, MCON and MSCON, an alarm will be displayed if the set value exceeds the rated acceleration/deceleration.
(Same for Safety Category Complied Type)

⚠ *Caution: Acceleration/deceleration setting*
(1) Set accelerations/decelerations not exceeding the rated acceleration/deceleration specified in the catalog or in the instruction manual of the actuator. 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.

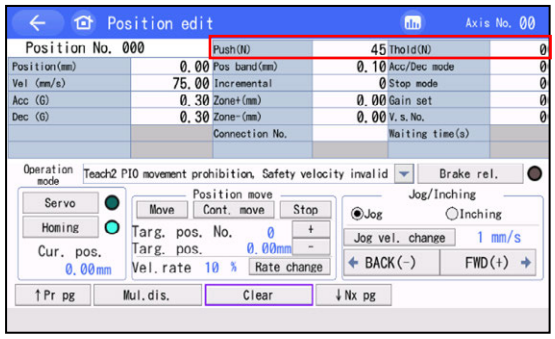
(5) Push [% / N]
Select “Positioning operation” or “Push-motion operation.”
The factory setting is 0.
0 : Positioning operation is performed.
Other than 0: Push-motion operation with the entered value as the current-limiting value is performed.

In PCON-CBP/CGBP Controllers, values in N (newton) are also shown as a reference except for when the input value is 0.

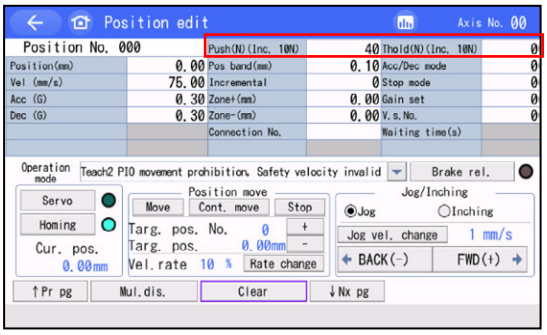


By setting Parameter No. 205 (Select Pressing Unit System) to 1: N Unit System in pressing using the force sensor in SCON2 Controller, the pressing force gets available to be input in N (Newton) unit.

Parameter No. 206 (Pressing Force Min. Unit) = 2: 1N



Parameter No. 206 (Pressing Force Min. Unit) = 3: 10N

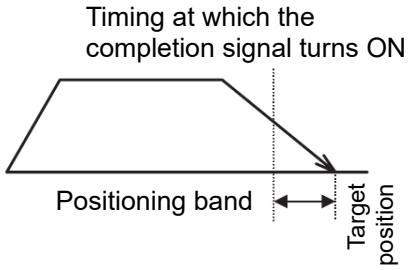


* In case of input in 10N unit system, the last digit of an input value should get rounded down. (e.g.) In "45" is input, it should be "40".

(6) Positioning band [mm]
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.

For “Positioning operation” (except for the solenoid valve mode below):

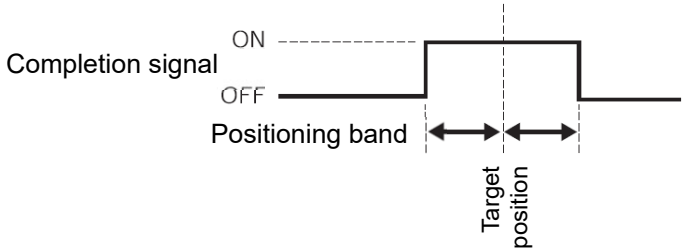
Increasing the value of positioning band quickens the start of the next sequence operation, so the tact time can be reduced. Set an optimal value by considering the balance of the entire system.



For “Positioning operation” (of the solenoid valve mode below):

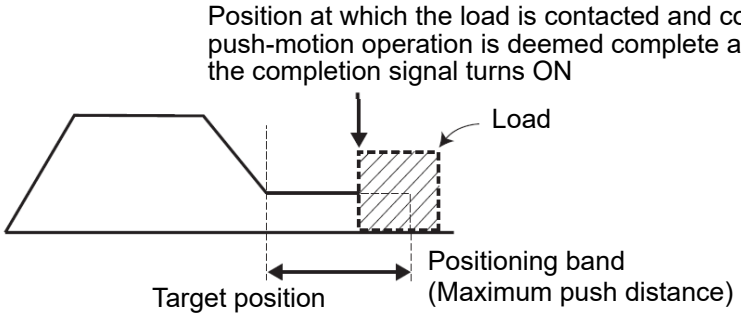
Note that on PCON-C/CF/CA/CFA/CB/CFB/CBP, ACON-C/CA/CB, DCON-CA/CB, SCON-C/CA/CAL/CB, SCON2, ROBONET, ERC3 PIO Converter, RCP6S, MCON and MSCON (Remote I/O mode) controllers of solenoid valve mode 2 or PCON-CY/CYB, ACON-CY/CYB, DCON-CYB controllers of solenoid valve mode 1, set the band after which the completion signal turns ON. (same for Safety Category Complied Type)

PCON-C/CF/CA/CFA/CB/CFB/CBP, ACON-C/CA/CB, DCON-CA/CB, SCON-C/CA/CAL/CB, SCON2, ROBONET, ERC3 PIO Converter, RCP6S, MCON and MSCON (Remote I/O mode) in solenoid valve mode 2, PCON-CY/CYB, ACON-CY/CYB and DCON-CYB in solenoid valve mode 1 (same for Safety Category Complied Type)



For "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) Depending on the combination with the actuator, PCON-CA/CFA/CB/CFB/CBP, SCON-CA/CAL/CB, SCON2 and ERC3 may not be able to set a value smaller than the minimum positioning width. (same for Safety Category Complied Type)

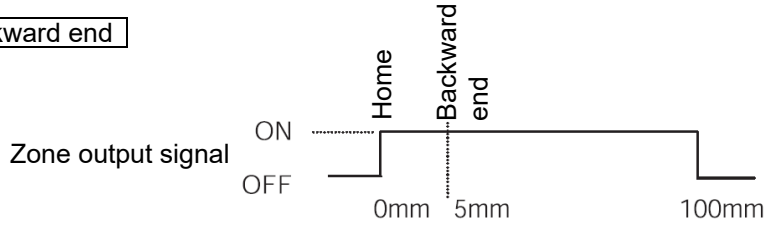
(7) Incremental
Specify absolute coordinates or incremental coordinates.
The factory setting is 0.
0: Absolute coordinate specification
1: Incremental coordinate specification

> ⚠ *Warning: Be sure to specify absolute coordinates on PCON-C/CF/CA/CFA/CB/CBP, ACON-C/CA/CB, DCON-CA/CB, SCON-C/CA/CAL/CB, SCON2, ROBONET, ERC3 PIO Converter, RCP6S, MCON and MSCON (Remote I/O mode) controllers of solenoid valve mode 2, or PCON-CY/CYB, ACON-CY/CYB and DCON-CYB controllers of solenoid valve mode 1. (same for Safety Category Complied Type)*
> *(Note) If incremental coordinates are specified on these controllers, a position data error occurs.*

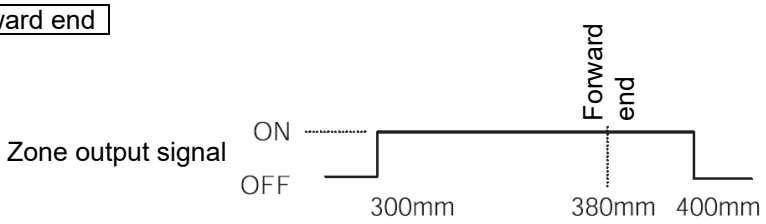
(8) Zone +/- [mm]
Define, for the standard type, the zone in which the zone output signal turns ON.
These parameters can be set differently for each target position.
[Setting example]

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

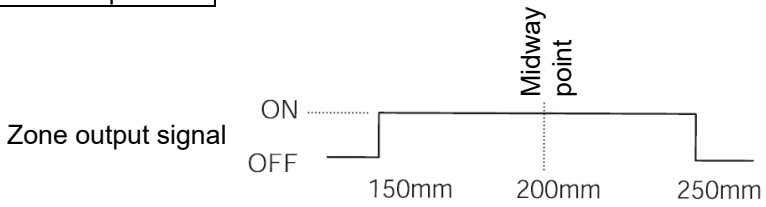
Movement command to backward end



Movement command to forward end



Movement command to intermediate position



(9) Threshold [% / N]
The setting of the threshold for the pressing torque should be established. The detection signal should be output when the torque (load current) reaches this set value or above in the range of the position zone during the pressing operation. It should be used for judgment of acceptance and failure of operation by monitoring the load current in such operation as press-fitting with the pressing operation.

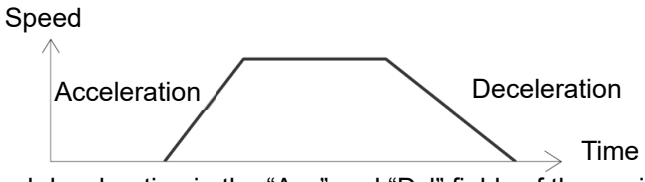
* In PCON-CBP/CGBP, values are also displayed in N (newton) as a reference. (Except for case of 0)
Also, by setting Parameter No. 205 (Select Pressing Unit System) to 1: N Unit System in pressing using the force sensor in SCON2 Controller, the threshold gets available to be input in N unit or 10N unit. Refer to [(5) Pressing] screen.

Also, it can be used as the threshold for judgment in collision detection.
Refer to the [instruction manual of the controller] for detail.

* Refer to [3.10.2 (6) Collision Detection (for SCON2-CG only)] for the collision detection of SCON2-CG.

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

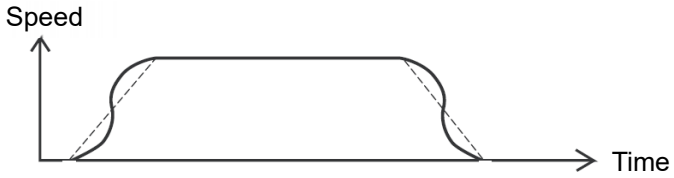
Trapezoid pattern



* 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.

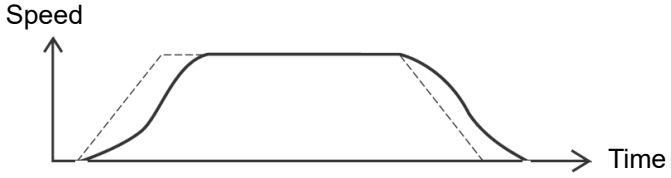


* The S-motion level is set by parameter No. 56 [S-motion ratio setting]. The setting unit is %, while the setting range is 0 to 100.
(The graph above assumes that the parameter is set to 100%.)
If 0 is set, the S-motion control is disabled.
Note that the setting made here is not reflected in jogging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

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

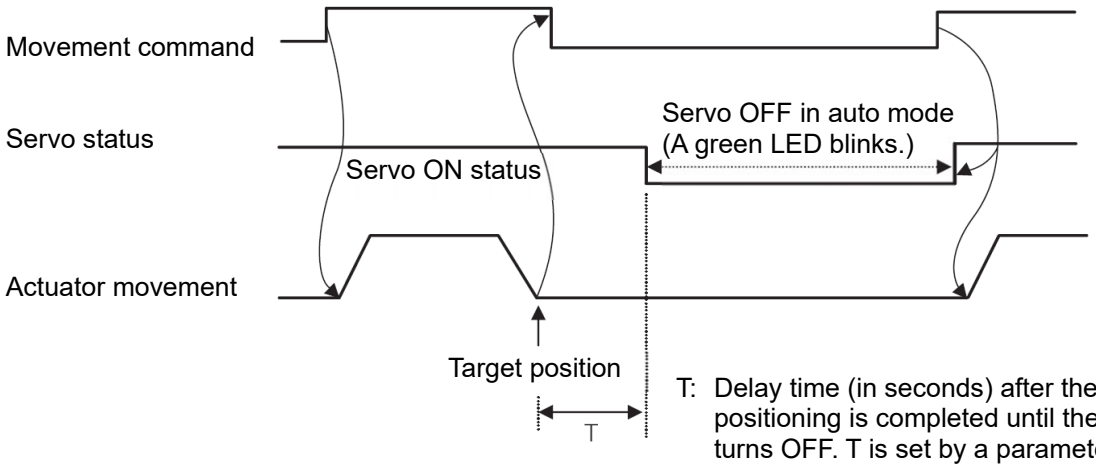
(11) Stop mode

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.



T: Delay time (in seconds) after the positioning is completed until the servo turns OFF. T is set by a parameter.

(Note) For RACON and RPCON, this mode cannot be set.

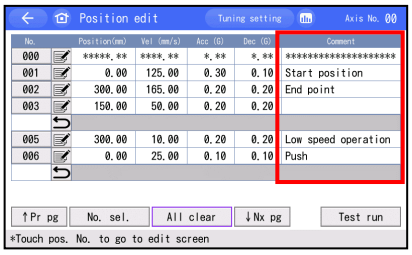
Full servo control mode selectable for the PCON (for the pulse motor) controller

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.

3.10.2 Additional Setting Items for Controllers Applicable for Position Data Comment Input

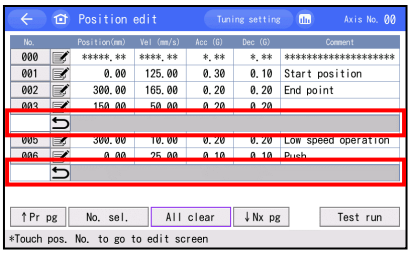
In addition to items in 3.10.1, following items should be added for controllers applicable for comment input in position data (RCON-PC/PCF/AC/DC/SC and SCON-CB RCON connection type and SCON2).

(1) Comment



Comment can be set with up to 20 characters of half size font.
The set comment data should be saved in the controller.

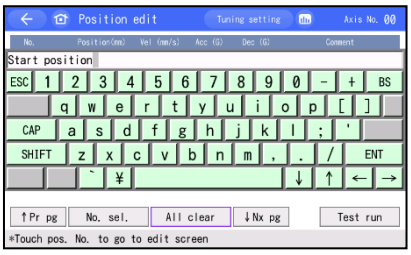
(2) One-Row Comment



Comment can be set with up to 56 characters of half size font.

The line set to one-row comment should not show a position number.

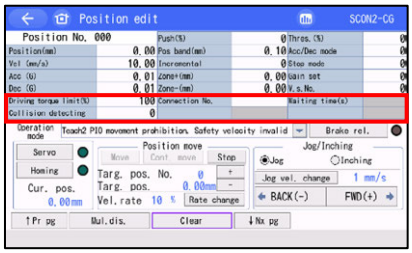
Touch  on the right hand of a position number, and a confirmation window asking “Do you change the position data on one-row comment?” should appear. Touch [Yes] to set as a one-row comment.
Touch  on the line set as a one-row comment, and a confirmation window asking “Do you change the one-row comment to the position data?” should appear. Touch [Yes] to set it back to position data.



Touch the comment box in a comment or a one-row comment, and the full keyboard should open and input in half size alphabetical and numerical symbols will get available. (If you use the PC software, full size characters will also get available for input.)

Input Operation on Full Keyboard
If you touch a text box in a comment or a one-row comment, the text set in the box should be displayed and a cursor should be shown at the end of the text. If a text is entered in this condition, the text already there should all be erased and a new text will be entered. If it is required to keep the existing text and add another, use an arrow key to move the cursor once, and then enter a text. When you want to finish text edit without confirming the entered text, touch ESC.

Position Data Individual Edit Screen



(3) Parameter Select Area
The setting items should differ depending on the value set in Parameter No. 191 Position Data Extension Feature.

Parameter No.191	Setting Item
0	No Setting Item
1	Drive Torque Limitation
2	Push speed

Drive Torque Limitation : Setting for movement current limitation at position movement can be established.
Push speed : Setting for pressing velocity limitation at position movement can be established.

(4) Linked Number
A position number to move to in a row after a movement has finished can be set.
Make it blank and linked operation will get invalid. (If you want it blank, touch [CLR] and [ENT].)

(5) Wait Time
When the setting is established for the linked number, standby time after a movement has finished can be set.
Setting should be available in a range between 0.01 and 600.00 [s].

(6) Collision detection (SCON2-CG only)
There are three types of parameter sets prepared for collision detection.
Establish the parameter set to use for the collision detection for each position.

Collision detection	Parameter Set to be Used
0	Not to be Used
1	Parameter set 1
2	Parameter set 2
3	Parameter set 3

Each parameter set operates with the parameters below.

Collision Detection Feature Parameter Names	Parameter No.			
	0: Not to be Used	1 : : Set No.1	2: Set No.2	3: Set No.3
Collision Judgment Current	——	213	217	221
Collision Judgment Distance	——	214	218	222
Collision Judgment Time	——	215	219	223
Reversing Operation Position Number at Collision Detection	——	216	220	224
Collision Detection Feature Output Selection	——	225		

* Refer to [SCON2 Instruction Manual (ME0458)] for details such as the input range of parameters.

3.10.3 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.

(2) Direct teaching · · · Turn off the servo control, move the rod or slider by hand to the target position, and then acquire the achieved position (current position) into the position table and specify that position.

(3) Jogging · · · Use [Forward+] or [Backward-] 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 [Forward+] or [Backward-] 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.
Touching [Forward+] or [Backward-] 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 1mm/s. 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. (Incremental specification)*
Before home return is completed, jogging/inching is possible only to the mechanical end. Operate the actuator by visually checking for potential interference.

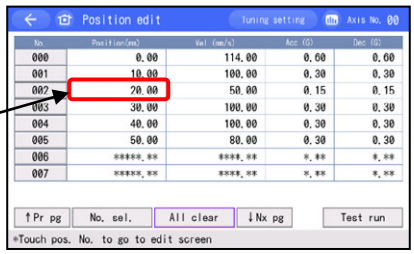
(1) Basic operation

[Data entry on the position data table screen]

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

Touch [↑ Pr pg] and [↓ Nx pg] to display the table showing the desired position data number.
Or, touch [No. sel.] 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 [All clear] clears all position data.

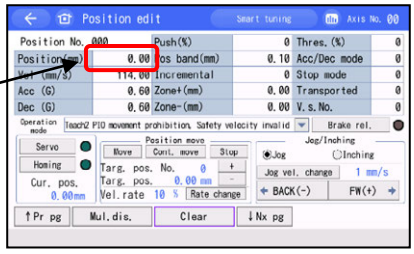
[Important]

Do not touch [↑ Pr pg] key or [↓ Nx pg] 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 [↑ Pr pg] key and [↓ Nx pg] key to switch the window and come back, and you will find the data showing the right values.

[Data Input in Position Data Individual Edit Screen]

In Position Data Individual Edit screen, all the items are available for setting.

Touch.

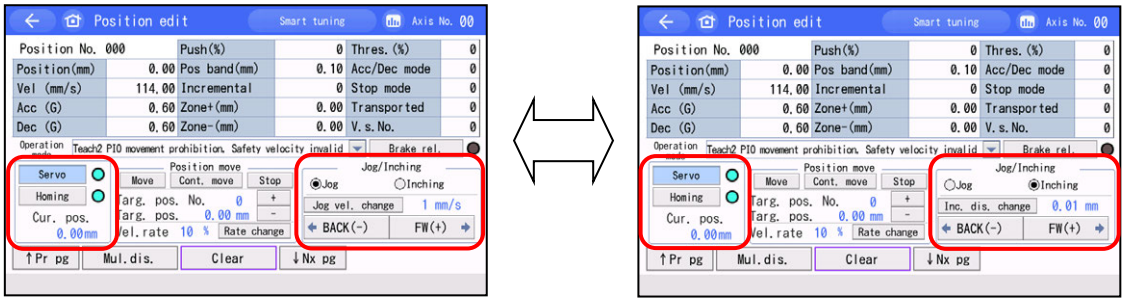


Touch a value in the target position or other desired field.
When the numeric keypad appears, key in the desired value and touch [ENT], and the value will be entered.

Touch [↑ Pr pg] or [↓ Nx pg] to change to the screen of the previous or next position number.
Touching [Mul. dis.] returns the screen to the position data table display.

[JOG / Inching Operation]

Movement and position data reading can be performed by JOG / Inching operation.



Operation in Position edit Window

- [Servo] : Touching [Servo] while the servo is OFF turns on the axis servo and ○ becomes lit. Touching [Servo] while the servo is ON turns off the axis servo and ○ becomes unlit.
- [Homing] : Touching [Homing] while home return is not yet completed causes the axis to return home and ○ becomes lit.
- ○ Jog ○ Inching : Select either JOG or Inching operation. Touch the letter, and the circle (radio button) on the touched side will be marked with a black dot.

radio button

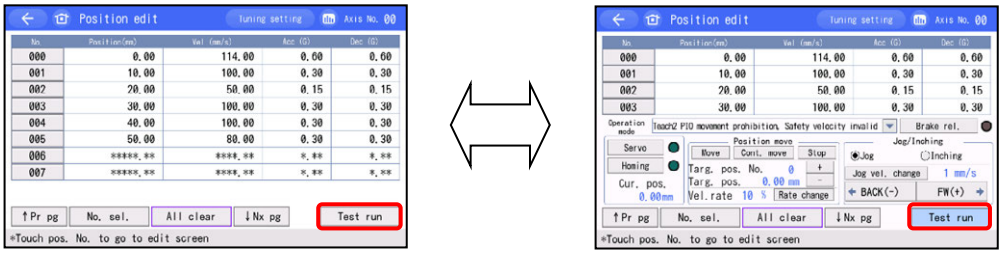
While JOG Selected;

- [Jog vel. change] : The jog speed changes in the order of 1, 10, 30, 50 and 100 mm/s every time [Jog vel. change] is touched.
- [BACK(-)], [FW(+)] : While touching, the axis moves in JOG. [BACK(-)] performs JOG operation in negative direction, and [FW(+)] in positive direction.

While Inching Selected;

- [Inc. dis. change] : Inching distance changes in order of 0.01, 0.10, 0.50, 1.00 and 5.00mm/s for every touch on [Inc. dis. change]
- [BACK(-)], [FW(+)] : A touch performs inching operation of an axis. [BACK(-)] performs inching operation in negative direction, and [FW(+)] in positive direction.
  Touch and hold it for two seconds, and JOG operation will be performed in 1mm/s. The speed increases in every 1 second afterwards.

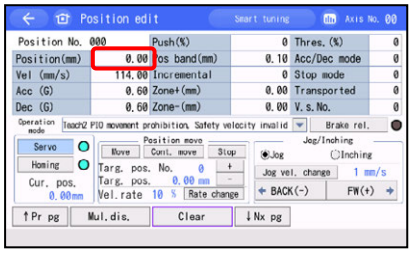
It is also available to perform JOG / Inching operation by touching [Test run] in the window of the multi-display.



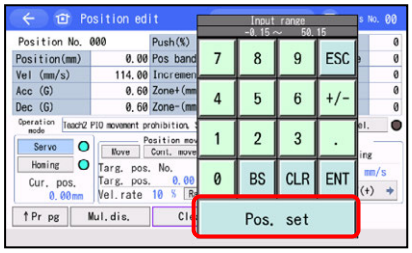
Touch [Test run] again and the window goes back to the multi-display.

Position acquisition operation

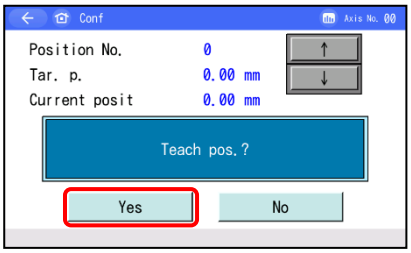
Move to the position that you would like to read by JOG / Inching operation.



Touch the target position of the position number that you would like to read.



Touch [Pos. set] button.



The confirmation window appears.
You can touch [↑] or [↓] to change the position number.
Touching [Yes] acquires the current position.

Return to the position edit window.

3.10.4 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 rod or 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 [FW(+)] or [BACK(-)] 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.

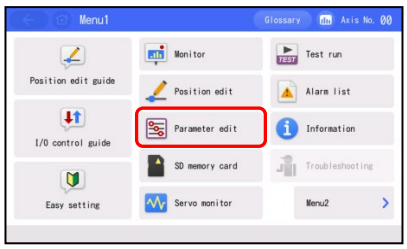
(4) Inching . . . Use [FW(+)] or [BACK(-)] to inch the actuator to the target position, and then acquire the achieved position (current position) into the position data table and specify that position.
The axis moves by the specified pitch (0.01, 0.10, 0.50, 1.00 or 5.00 (mm)) every time [FW(+)] or [BACK(-)] is touched. Touch and hold it for two seconds, and JOG operation will be performed in 1mm/s. The speed increases in every 1 second afterwards. Severer movement than JOG operation is available.

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.

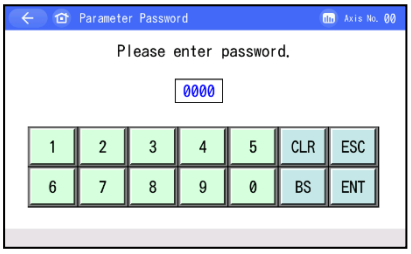
3.11 Parameter Editing

Parameters are displayed and edited.



Touch [Parameter edit] on the Menu 1 screen.

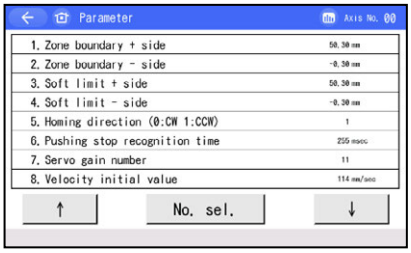
If a system password is not “0000,” the password entry screen appears.



Input the parameter edit password.
Touch [ENT].

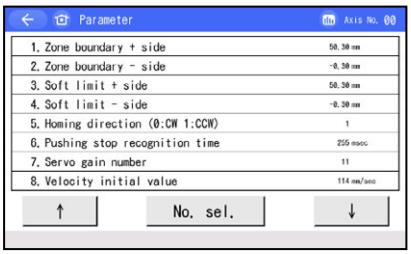
> The parameter edit password at delivery is set to “0000”.
> For how to change the parameter edit password, refer to 3.18 Environmental Setting [Parameter Edit Password Change].

A parameter table is displayed.



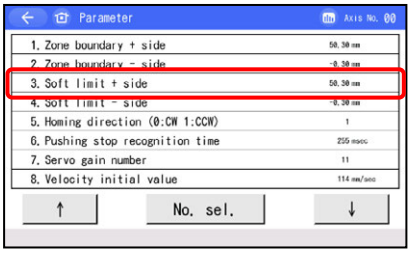
* The types of parameters vary from one controller to another. Refer to the instruction manual for each controller.

(1) Basic operation



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

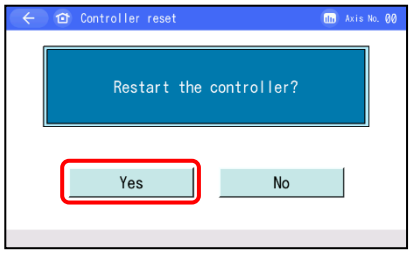
In this example, soft limit+ side is set.



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

To cancel the change after the numeric keys are displayed, touch [ESC].

Touching the Home button opens a confirmation screen with a message asking if you want to restart the controller.

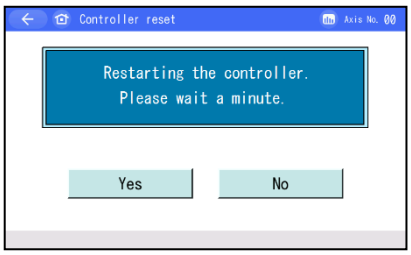


Touch [Yes].

Touch [No] to return to the 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.

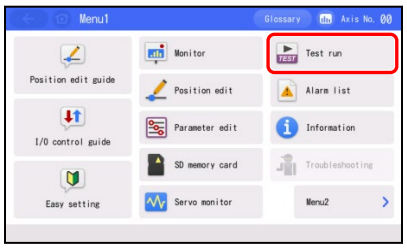
> ⚠ *Caution: If the controller is not restarted, the parameter that has been rewritten does not translate to the intended action.*
> *The parameter will become effective once the controller is restarted or power is reconnected.*

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



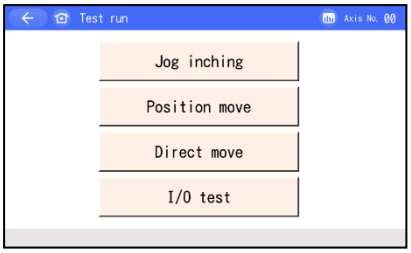
3.12 Test Run

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 [Test run] on the Menu 1 screen.

The movement menu screen appears.



Touch either one of [Jog inching], [Position move], [Direct move] or [I/O test].

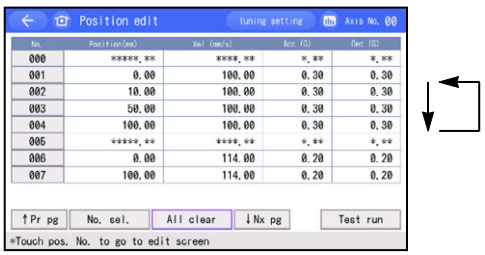
(1) Jog inching
Perform jog/inching operation.
Refer to [3.12.1 JOG / Inching Operation] for details about how to operate.

(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.



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
	⋮	



Refer to [3.12.2 Position Movement Operation] for details about how to operate.

(3) Direct move
Input the target position and the speed on the numeric keys to perform movement.
Refer to [3.12.3 Direct Movement Operation] for details about how to operate.

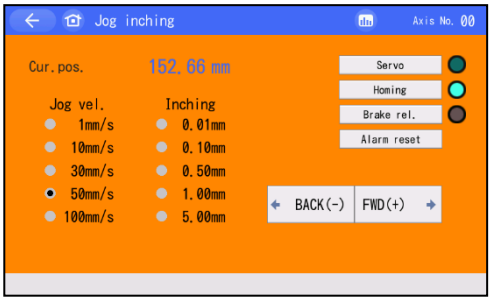
(4) I/O test
Monitoring of the PIO input signals and compulsory output of the output signals can be conducted.
Refer to [3.12.4 I/O test] for details about how to operate.

3.12.1 Jog/Inching Operation

You can perform jog operation and inching operation.



Jog/Inching Screen



When Alarm Generated

[Operation on the jog/inching screen]

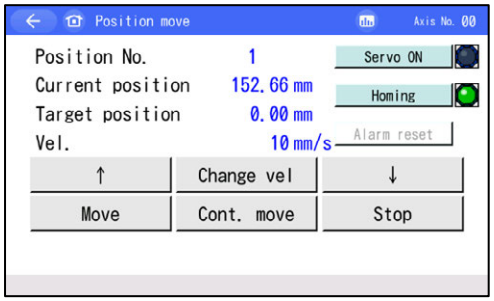
- Jog vel. / Inching :Select either of 1, 10, 30, 50 or 100mm/s of JOG speed or 0.01, 0.10, 0.50, 1.00, 5.00mm of inching distance, and JOG operation with the selected speed or inching operation with the selected distance can be conducted. The circle (radio button) on the selected one will be marked with a black dot.
- [Servo] :Touching [Servo] while the servo is OFF turns on the axis servo and ○ becomes lit.
  Touching [Servo] while the servo is ON turns off the axis servo and ○ becomes unlit.
- [Homing] :Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.
- [Brake rel.] :For an actuator equipped with a brake, touch [Brake rel.] and the brake gets compulsorily released and the circle turns on.
  Touch [Brake rel.] again and the brake works and the circle turns off.
- [Alarm reset] :After removing a cause of an error, touch [Alarm reset] to cancel the alarm.
- [BACK(-)], [FWD(+)] :When JOG operation is selected, while touching them, the axis moves in the set speed. When inching operation is selected, every time touching them, the axis moves for the set distance.
  [BACK(-)] performs JOG operation in negative direction.
  [FWD(+)] performs JOG operation in positive direction.
  In inching operation, touch and hold them for two seconds, and JOG operation will be performed in 1mm/s. The speed increases in every 1 second afterwards.

⚠ *Caution: An axis could drop if the brake compulsory release is performed while the servo is off when the axis is installed in the vertical orientation.*

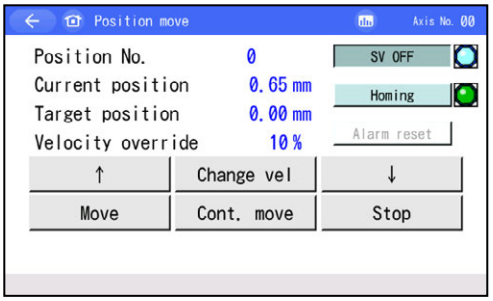
⚠ *Caution: Operation with JOG Switch on Front Panel of RCON*
If TB-02 gets disconnected from the controller in the condition that this window is open, JOG switch operation will get disabled.

3.12.2 Position Movement Operation

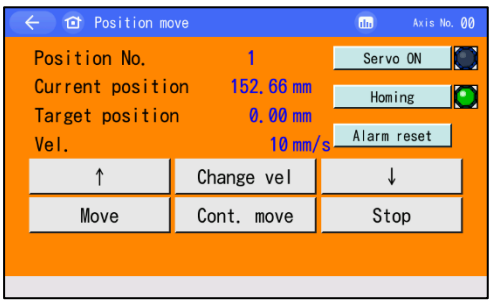
Move to a position or continuously to multiple positions registered in the position table.
The items to be displayed should differ depending on valid/invalid of the safety velocity. Refer to [3.13 TP Operation Mode]



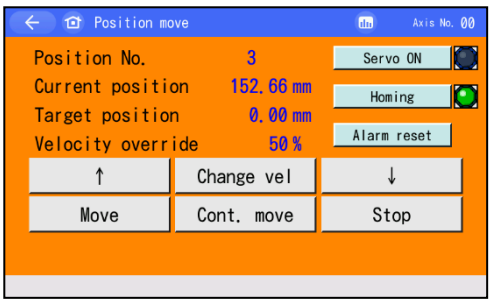
When Safety Velocity is Valid



When Safety Velocity is Invalid



When Alarm Generated
with Safety Velocity Activated



When Alarm Generated
with Safety Velocity Inactivated

[Operation on the position movement screen]

- Position No. : Displays the selected position number.
- Current position : Displays the current position.
- Target position : Displays the target position set in the selected position number.

When Safety Velocity is Valid;
- Vel. : The set velocity (mm/s) should be displayed.

When Safety Velocity is Invalid;
- Velocity override : Displays the selected speed override (%).
- [Servo ON] : Touching [Servo ON] while the servo is OFF turns on the axis servo and ○ becomes lit.
  Touching [Servo OFF] while the servo is ON turns off the axis servo and ○ becomes unlit.
- [Homing] : Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.
- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.

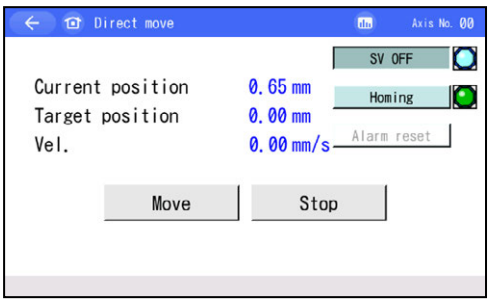
- [↑], [↓] : Touch [↑] and [↓] to select a desired position number.
- [Change vel] : When Safety Velocity is Valid
  Speed can be changed in order of 1mm/s, 10 mm/s,
  30 mm/s, 50 mm/s and 100 mm/s every time touching [Change vel]

  : When Safety Velocity is Invalid
  Speed override can be changed in order of 10%, 50% and 100%
  every time touching [Change vel].
- [Move] : Touch [Move] after the home-return operation is completed, and an axis moves to a target position.
- [Cont. move] : Touch [Cont. Move] after the home-return operation is completed, and an axis performs continuous drive until pressing [Stop].
- [Stop] : Touching [Stop] stops the axis.

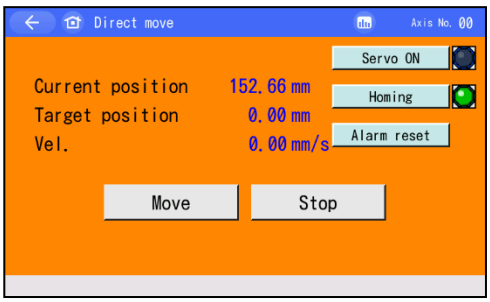
⚠ *Caution: Operation with JOG Switch on Front Panel of RCON*
If TB-02 gets disconnected from the controller in the condition that this window is open, JOG switch operation will get disabled.

3.12.3 Direct Movement Operation

A position is specified directly to move the axis.



Direct Movement Screen



When Alarm Generated

[Operation on the direct movement screen]

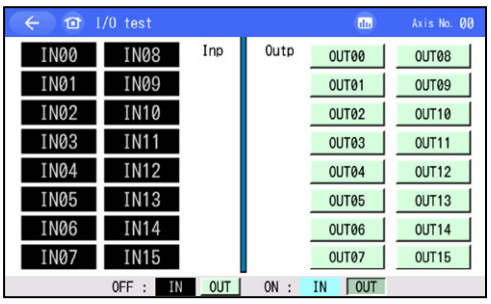
- Current position : Displays the current position.
- Target position : Touching “Target position” displays the numeric keypad. Enter a desired target position and then touch [ENT].
- Vel. : Touching “Vel.” displays the numeric keypad. Enter a desired speed and then touch [ENT].
- [Servo ON] : Touching [Servo ON] while the servo is OFF turns on the axis servo and ○ becomes lit.
  Touching [Servo OFF] while the servo is ON turns off the axis servo and ○ becomes unlit.
- [Homing] : Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.
- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.
- [Move] : Touching [Move] moves the axis to the target position you have set.
- [Stop] : Touching [Stop] stops the axis movement.

⚠ *Caution: Operation with JOG Switch on Front Panel of RCON*
If TB-02 gets disconnected from the controller in the condition that this window is open, JOG switch operation will get disabled.

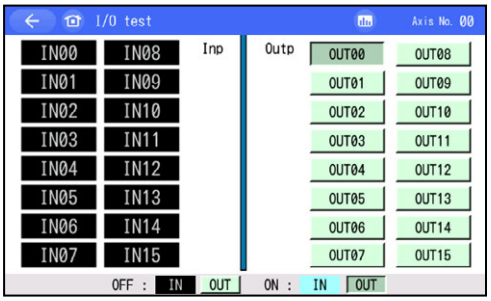
3.12.4 I/O test

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

[Operation on the I/O test screen]



If it is required to have OUT00 in status of off to turn on, touch [OUT00].

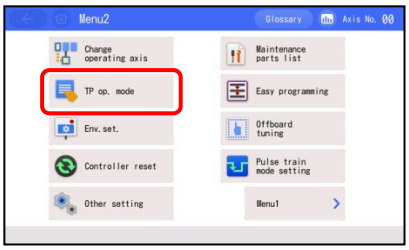


OUT00 should turn on.

Touch [OUT00] again and it should turn off.

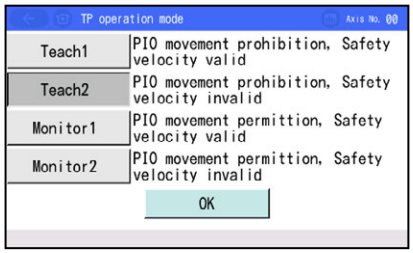
3.13 TP Operation Mode

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 (Safety velocity valid / PIO movement prohibition)
  PIO movement prohibition : You can write position data, parameters, etc., to the controller and issue actuator operation commands.
  Safety velocity valid : The maximum speed corresponds to the safety speed set by a parameter, regardless of the speed specified in the position data table.

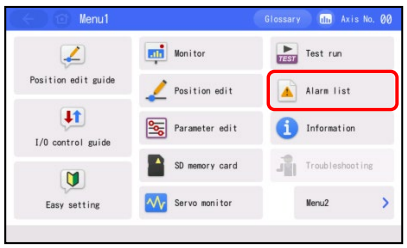
- Teach2 (Safety velocity invalid / PIO movement prohibition)
  PIO movement prohibition : You can write position data, parameters, etc., to the controller and issue actuator operation commands.
  Safety velocity invalid : You can move the actuator at the speed (greater than the safety speed) set in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

- Monitor1 (Safety velocity valid / PIO movement permittion)
  PIO movement permittion : 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.
  Safety velocity valid : The maximum speed corresponds to the safety speed set by a parameter, regardless of the speed command from the PLC.

- Monitor2 (Safety velocity invalid / PIO movement permittion)
  PIO movement permittion : 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.
  Safety velocity invalid : You can move the actuator at the speed (greater than the safety speed) according to the command from the PLC.

3.14 Alarm List

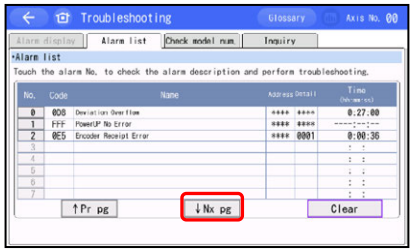
A list of alarms that may generate after the controller power is turned on is shown. [For alarm details, refer to 9, “Error Display.”]



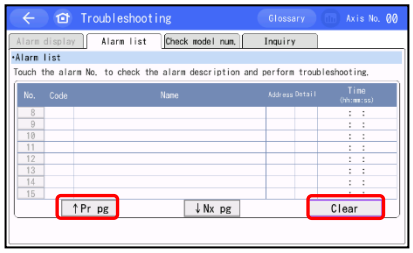
Touch [Alarm list] on the Menu 1 screen.

The controller’s alarm list appears.

Controller without the calendar function



Touching [↓ Nx pg] displays the list of the next screen.

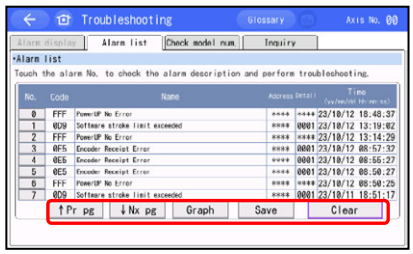


Touching [↑ Pr pg] displays the list of the previous screen.

Touching [Clear] 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.

Controller with the calendar function



Touching [↑ Pr pg] displays the list of the previous screen.
Touching [↓ Nx pg] displays the list of the next screen.
Touch [Save] and the screen goes to the window to save to a Secure Digital memory card to save the alarm information.
Refer to [3.19.1 Data Backup of the Controller]

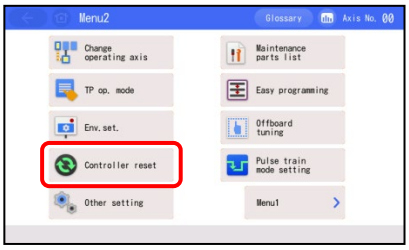
Touching [Clear] clears all alarms.

The screen can be moved to the drive recorder window from [Graph] from SCON2 controller.
Refer to [3.27 Drive Recorder Feature]

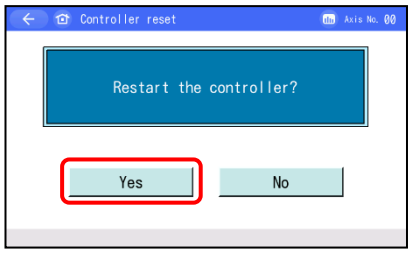
(Note) “PowerUP No Error” indicates that the controller power was turned on. It does not indicate an error.
The occurrence time corresponds to the time each alarm occurred.

3.15 Controller Reset

The controller is restarted.

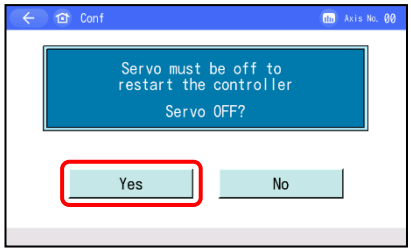


Touch [Controller reset] on the Menu 2 screen.

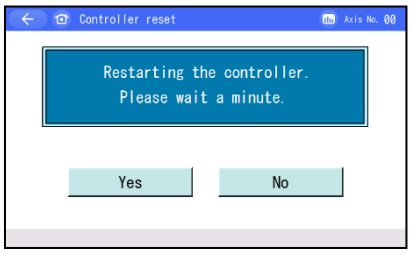


Touch [Yes].

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



This window appears if the servo is on.
Touch [Yes].
Touch [No] to return to the Menu 2 screen without restarting the controller.

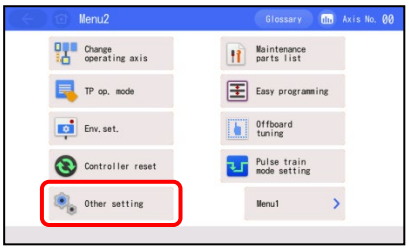


The controller is restarted.

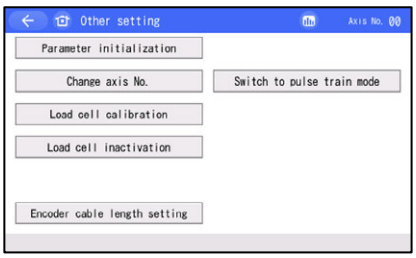
Returns to Menu 1 Screen.

3.16 Other Settings

Parameter initializing, axis number change, loadcell calibration, loadcel invalidation, I/O customizing, switching drive mode can be conducted.



Touch [Other setting] in Menu 2 screen.



Other setting screen opens.
(Buttons to be displayed should differ depending on the controller models.)

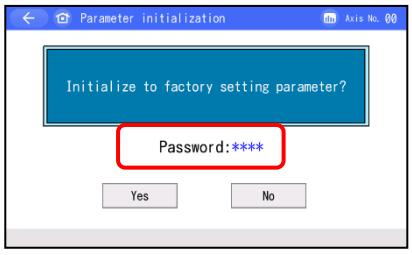
Touch a button of the feature that you would like to conduct such as [Parameter initialization].

3.16.1 Parameter Initialization

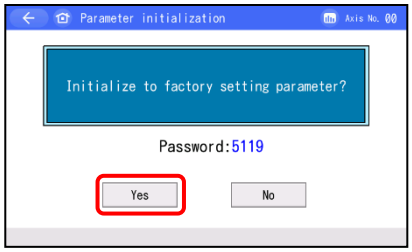
The parameters are reset to their factory default settings (initialized).

> ⚠ *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.*

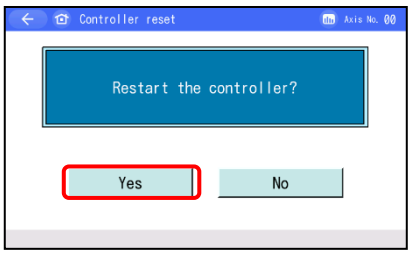
Touch [Parameter initialization] in Other setting screen to display Parameter initialization screen.



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



Touch [Yes], and the confirmation screen for controller reboot appears.



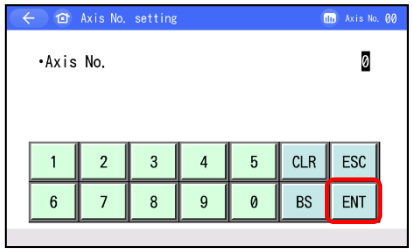
Touch [Yes].

Touch [No], and the controller will not be rebooted and the screen returns to the previous.

> ⚠ *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.*

3.16.2 Axis Number Change

Touch [Change axis No.] in Other setting window to display Axis No. setting screen.



You can set a value between 0 and 15.
Set a desired axis number and then touch [ENT].

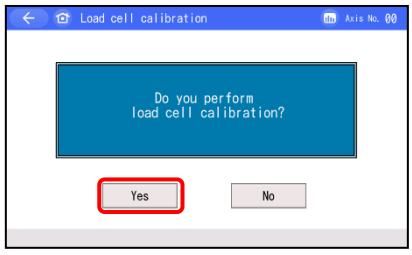


Touch [Execute].

3.16.3 Load Cell Calibration

Loadcell calibration can be conducted on an actuator equipped with a loadcell. (SCON-CB-F, SCON2-CG-F, PCON-CBP/CGBP)

Touch [Load cell calibration] in Other setting window to display Load cell calibration screen.



Touch [Yes].

3.16.4 Load Cell Inactivation

Function of the loadcell can be invalidated temporarily on an actuator equipped with a loadcell. (SCON-CB-F, SCON2-CG-F, PCON-CBP/CGBP)

Touch [Load cell inactivation] in Other setting screen, and the controller gets rebooted and the loadcell becomes invalid.

> ⚠ *Caution: There will be no confirmation window appearance after touching [Load cell inactivation] button.*

Loadcell becomes valid at reboot of the next controller or when the power is back on.

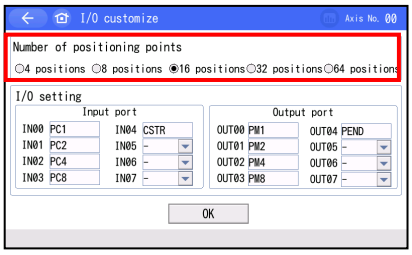
3.16.5 I/O Customizing

Feature Dedicated for PCON-CYB/ACON-CYB/DCON-CYB

I/O customizing becomes available if PIO pattern is set to “5: User Select Mode] in PCON-CYB, ACON-CYB and DCON-CYB.

Select a desired number of the positions (4, 8, 16, 32 or 64), and necessary number of command position number signals (PC*) and the start signal CSTR should be assigned to the input ports, and necessary number of complete position number signals (PM*) and the positioning complete signal PEND to the output ports. Desired signals from the indicated signals (refer to Signals Available for Assignment) can be assigned to the other ports.

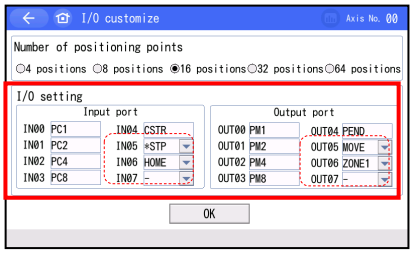
Touch [I/O Customizing] in Other Setting window to show the I/O customizing window.



(It is set to the initial assignment condition as shown in the table below at delivery.)

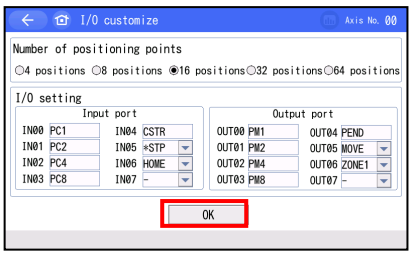
Select a number of positions.

In accordance with the selected number of positions, necessary signals should be assigned to the input and output ports.



A pulldown button ▼ button should be displayed to a port available for signal assignment.

Touch the pulldown ▼ button and select a signal to be assigned.



Once all the necessary items are selected, touch [OK] to confirm the assignment.

The number of positioning points will be changed and the input and output signals will become valid after a reboot.

Number of positioning points	IN/ OUT	IN/OUT 0	IN/OUT 1	IN/OUT 2	IN/OUT 3	IN/OUT4	IN/OUT5	IN/OUT 6	IN/OUT 7
4 points	IN	PC1	PC2	CSTR	Available for Assignment	Available for Assignment	Available for Assignment	Available for Assignment	Available for Assignment
	OUT	PM1	PM2	PEND	Available for Assignment	Available for Assignment	Available for Assignment	Available for Assignment	Available for Assignment
8 points	IN	PC1	PC2	PC4	CSTR	Available for Assignment	Available for Assignment	Available for Assignment	Available for Assignment
	OUT	PM1	PM2	PM4	PEND	Available for Assignment	Available for Assignment	Available for Assignment	Available for Assignment
16 points	IN	PC1	PC2	PC4	PC8	CSTR	Available for Assignment	Available for Assignment	Available for Assignment
	OUT	PM1	PM2	PM4	PM8	PEND	Available for Assignment	Available for Assignment	Available for Assignment
32 points	IN	PC1	PC2	PC4	PC8	PC16	CSTR	Available for Assignment	Available for Assignment
	OUT	PM1	PM2	PM4	PM8	PM16	PEND	Available for Assignment	Available for Assignment
64 points	IN	PC1	PC2	PC4	PC8	PC16	PC32	CSTR	Available for Assignment
	OUT	PM1	PM2	PM4	PM8	PM16	PM32	PEND	Available for Assignment

Initial Assignment at Delivery									
64 点	IN	PC1	PC2	PC4	PC8	PC16	PC32	CSTR	RES
	OUT	PM1	PM2	PM4	PM8	PM16	PM32	PEND	*ALM

■Signals Available for Assignment

Any signal in the list of signals below can be selected.
For the detail of each signal, please refer to the instruction manual of each controller.

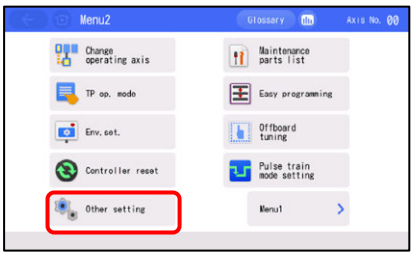
Input	
Signal name	Content
NC (-)	Feature not assigned
* STP	Release of pause : Pause command when OFF
SON	Servo ON command : Servo turned on when ON
HOME	Home returnc : Home-return command when ON
RES	Reset : Reset executed when ON
JISL	Jog/inching switching : JOG operation when OFF, Inching operation when ON
JVEL	Jog-speed/inch-distance switching : Parameter No. 26 “JOG Velocity” and Parameter No. 48 “Inching Distance” are used when it is off and Parameter No. 47 “JOG Velocity 2” and Parameter No. 49 “Inching Distance 2” when it is on.
JOG+/JOG-	Jog : JOG+ : Movement to direction opposite home when ON JOG- : Movement to direction of home when ON * The direction of movement should be the other way around of the reversed type.
RMOD	Operation mode : AUTO Mode when OFF, MANU Mode when ON
BKRL	Brake release : Brake Released when ON

Output	
Signal name	Content
NC(-)	Feature not assigned
MOVE	Moving signal : It turns ON during actuator movement process
SV	Operation preparation end : Servo turned on when ON
HEND	Home return completion : Home-return command when ON
* ALM	Alarm : It turns OFF when an alarm is generated
ZONE1	ZONE : It turns ON when the current position is in the zone setting
ZONE2	ZONE 2 : It turns ON when the current position is in the zone setting
PZONE	Position zone : It turns ON when the current position is in the position zone setting
* EMGS	Emergency stop : It turns OFF when in emergency stop status.
RMDS	Operation Mode Condition : It turns off when the current condition is in AUTO Mode and on when in MANU Mode
LOAD	Load Output Judgment : It turns ON when reached and OFF when not reached
TRQS	Torque level : It turns ON when reached and OFF when not reached
PSFL	Pressing and a miss : It turns ON when miss-pressing occurred
PWR	Controller ready : It turns ON when it is ready
CM1, CM2, CM4, CM8	With the combination of the output of these signals, the current command current rate (ratio to the rated value) should be output. * In order to output the command current rate, it is necessary that all of the four signals, CM1, CM2, CM4 and CM are assigned. With this as a reason, it is available only when the number of positioning points is either four points or eight points. • PCON-CYB outputs the current load current in every 6.25% period. • ACON-CYB and DCON-CYB output the current load current in every 18.75% period.
PUSH	In Pressing Process : It turns ON during pressing process
GHMS	In Home-Return Process : It turns on during home-return process
* ALMC	Critical Malfunction Status : It turns off when an alarm occurred which disables operation to be continued (It is necessary to reboot the power)
MEND	It turns on when positioning is complete, pressing is complete or miss-pressing is occurred and turns off when operation started
* OVLW	Overload Warning Signal : It turns on when the estimated motor temperature exceeds the setting and turns off when it falls below the setting
* ALML	Light Malfunction Status : It turns off when an alarm occurred for light malfunction which operation is still possible to continue

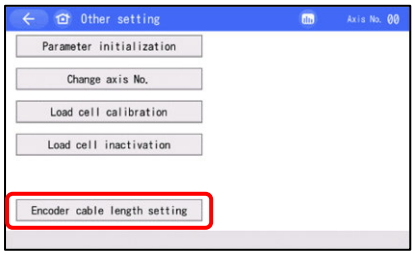
(Note) "" in the symbol names above shows signals in active low.*

3.16.6 Encoder Cable Length Setting

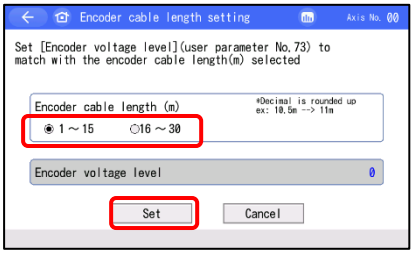
Set the "Encoder Voltage Level" suitable for the selected encoder cable length (m)



Touch [Other setting] on the Menu 2 screen.

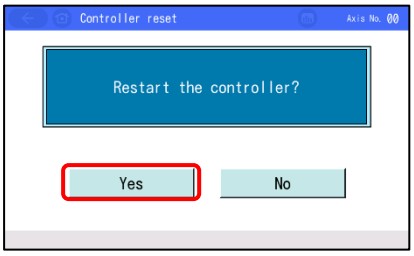


Touch [Encorder cable length setting]



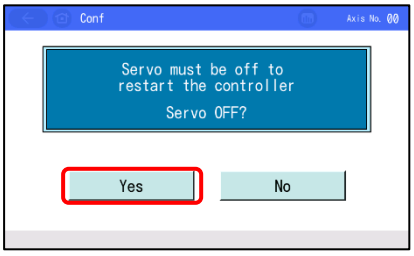
Select the encoder cable length.

Touch [Set]



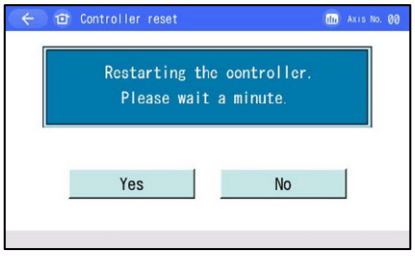
Touch [Yes]

Touch No and the controller will not perform reboot and the screen will go back to the previous.



Touch [Yes]

Touch No and the controller will not perform reboot and the screen will go back to the previous.



The controller should be rebooted.

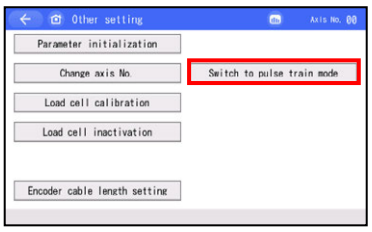
The screen goes back to Menu 1.

3.16.7 Switching Drive Mode

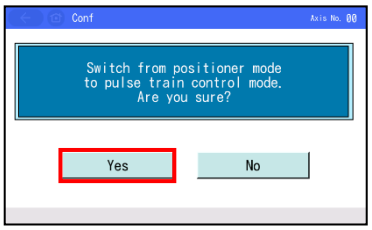
It is a feature dedicated for SCON2 controllers.

The mode can be switched over between Positoner Mode and Pulse Train Control Mode.

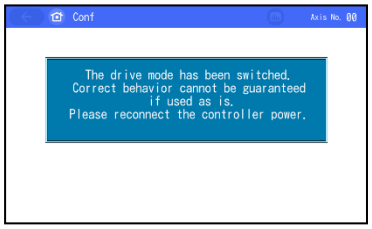
[1] Switching over from Positioner Mode to Pulse Train Control Mode



Touch [Switch to pulse train mode].

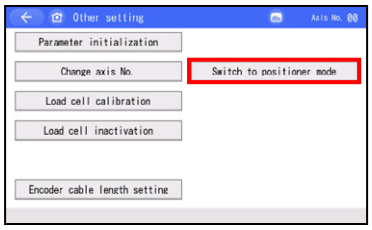


Touch [Yes].

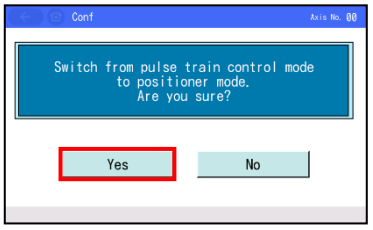


Reboot the power supplied to the controller.

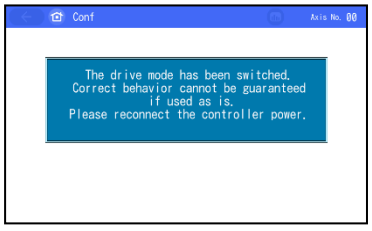
[2] Switching over from Pulse Train Control Mode to Positioner Mode



Touch [Switch to positioner mode].



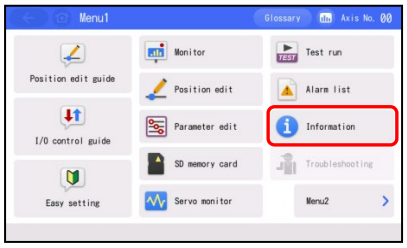
Touch [Yes].



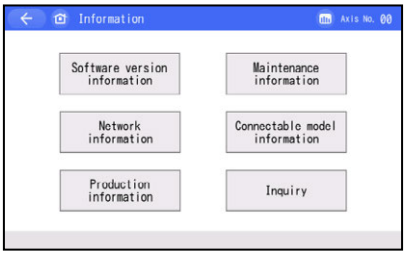
Reboot the power supplied to the controller.

3.17 Information Display

Information such as the controller version, manufacturing information and maintenance information is displayed.



Touch [Information] on the Menu 1 screen.



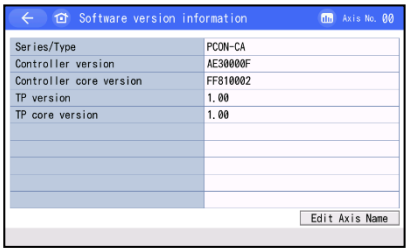
The information screen appears.

Touch a button of the feature that you would like to display such as [Software version information].

3.17.1 Display Screen for Each Type of Data

3.17.1.1 Software version information

Touch [Software version information] in Information screen.

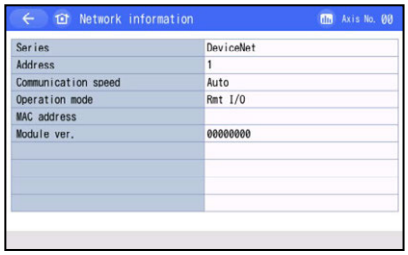


Software version information screen opens.
In this, shows the series/type of the controller and versions of the controller and this teaching pendant.

Touch [Edit Axis Name] and the name of axes can be edited.
Refer to [3.17.2 Axis Name Edit] for how to edit an axis name.

3.17.1.2 Network information

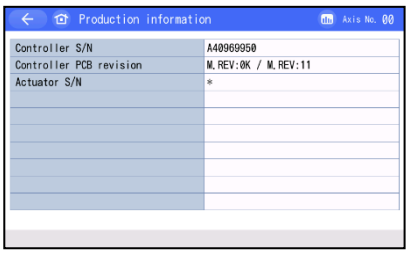
Touch [Network information] in Information screen.



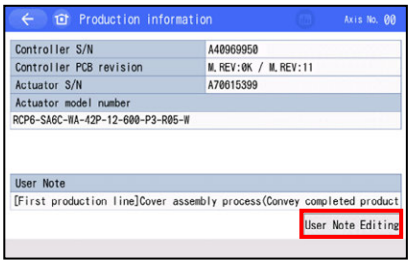
Network information screen opens.
In this, shows various of information regarding the network.

3.17.1.3 Production information

Touch [Production information] in Information screen.

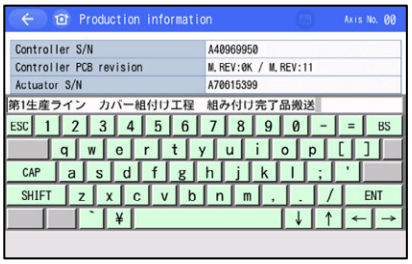


Production information screen opens.
In this, shows manufacturing information such as the serial number of the controller and actuators.



Actuator S/N, actuator model number and user note should be displayed when both the controller and actuators are applicable for the information management system and Parameter No. 192 Actuator Identification System Use Flag is set to 1: Valid.

For the Actuator S/N, actuator model number and user note, the information saved in the encoder should be displayed.



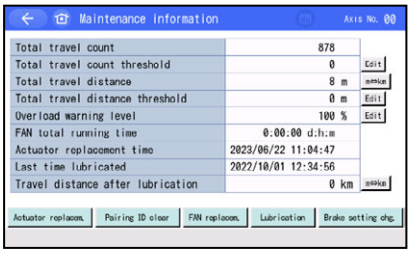
Touch [User Note Editing], show the full keyboard, and it is available to edit the memo.

The user note is available for editing up to 124 characters in half size at the maximum. (Only half size alphabetical and numerical characters and half size symbols are available for input in TB-02.)

Refer to “Input Operation on Full Keyboard” in 3.10.2 for entering a text.

3.17.1.4 Maintenance information

Touch [Maintenance information] in Information screen.

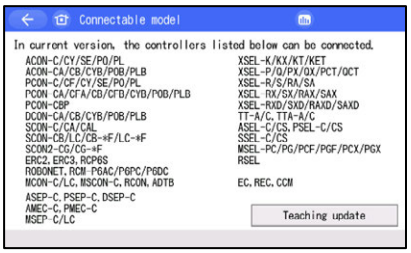


Maintenance information screen opens.

Refer to [3.9.2 Maintenance Information Screen] for the items to be shown and how to operate the buttons.

3.17.1.5 Connectable model

Touch [Connectable model] in Information screen.



Connectable model screen opens.

(Note) The images in this instruction manual may differ from the latest display.

Refer to [10.2 Teaching Update] for how to update teaching.

3.17.1.6 Inquiry

Touch [Inquiry] in Information screen.

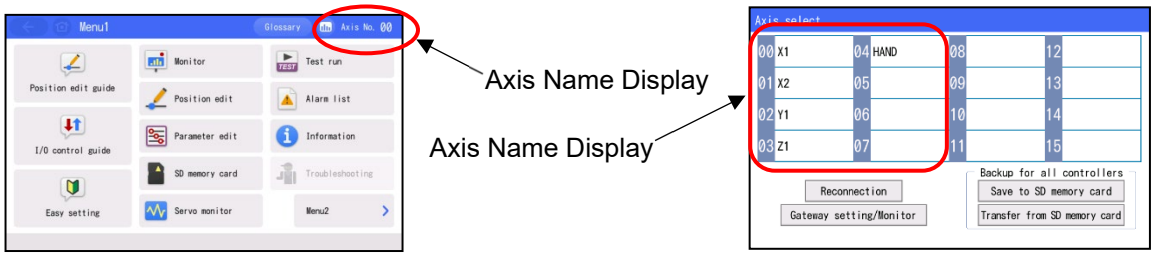


Inquiry screen opens.

3.17.2 Axis Name Edit

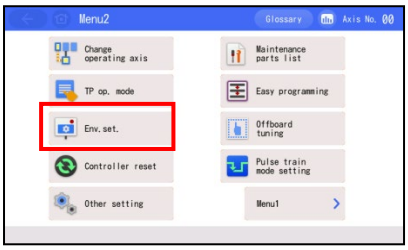
A name can be set on an axis. To show the axis name, select Axis Name at the axis name display section in the environment setting screen. Refer to [3.18 Environment Setting [Axis Name Display]]

Axis name is shown in the right top of each screen or select axis screen.
Even if the axis name is set to be shown, axis number will be shown if there is no axis name setting conducted.

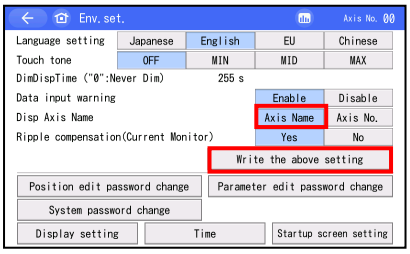


(Note) The available characters for setting in TB-02 are capitalized font English characters (from A to Z) and numbers (from 0 to 9).

[Axis Name Edit Operation]

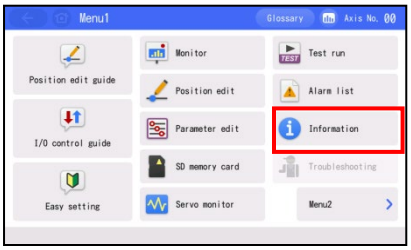


Touch [Env. set.] on the Menu 2 screen.

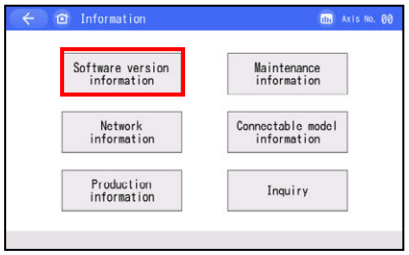


Set to “Axis Name” for the axis name display.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

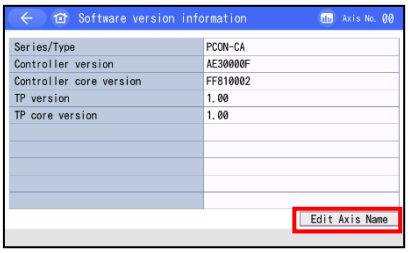


Touch [Information] on the Menu 1 screen.

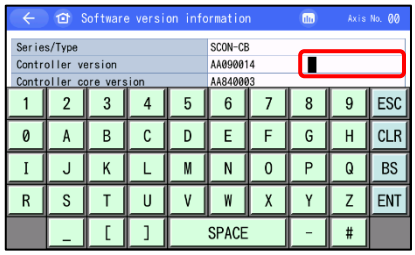


Information screen opens.

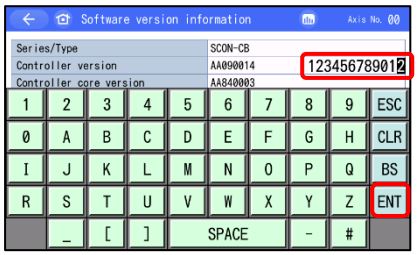
Touch [Software version information].



Touch [Edit Axis Name] in Software version information screen.

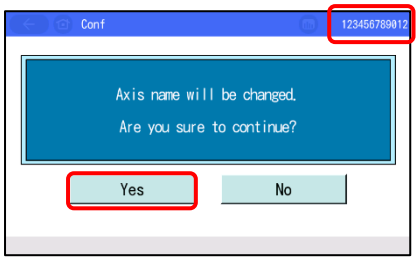


The right of the controller core version display is the input area.
Character select buttons are shown in the half bottom of the screen.



Input a name and touch [ENT].
The number of characters available for input is 12 in half-size font characters.

Touch [ENT] with nothing input, and it is defined as no setting. With no setting, an axis number will be shown.



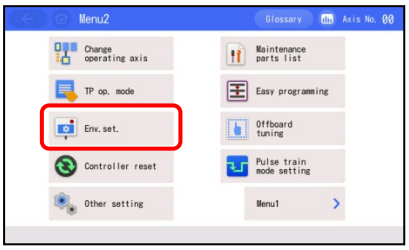
The axis name should be shown on the top right. (Temporary setting)

Touch [Yes].

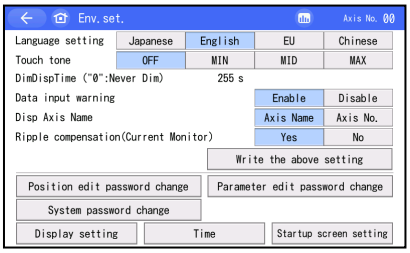
Touch [No] and the condition goes back to before setting.

3.18 Environment Setting

You can change the language setting, touch operation sound setting, dim display time setting, data input warning setting, axis name display setting, position editing password change / PrsProgram edit password change, parameter edit password change, system password change, display setting, time setting and Startup screen setting.

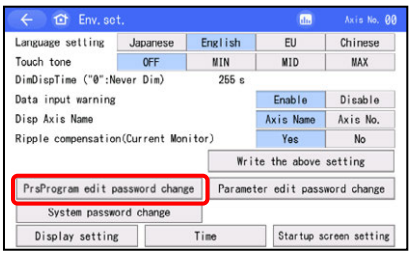


Touch [Env. set.] on the Menu 2 screen.



The environment setting screen appears.

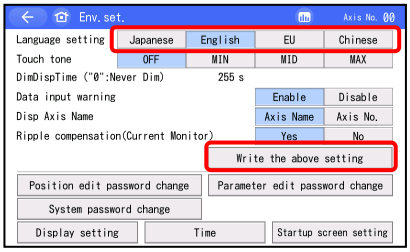
Servo Press Type Controller



For the servo press type controllers;
[Change Prs Program Edit Password] button should be shown instead of [Change Position Edit Password] button.

[language setting]

Select a language to show from Japanese / English / EU / Chinese.

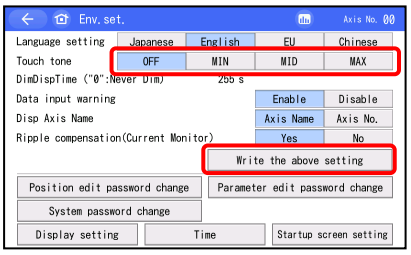


Touch a language (such as [Japanese]) to show.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

For the operation procedures in detail to change the language, refer to 3.1 Switching Display Language.

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

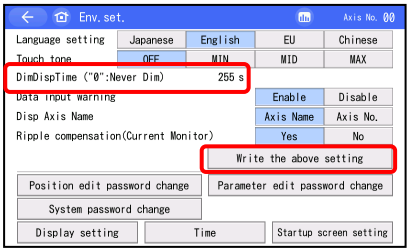


Touch [OFF]. A touch tone is not output.

Touch [MAX], [MID] or [MIN]. A touch tone is output.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

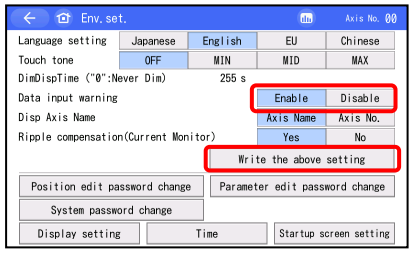
[DimDispTime]
Set the dim display time when not being operated.
Zero seconds mean the display is on all the time.



Touching [DimDispTime (“0”: Never Dim) 0 sec] displays the numerical keypad.
Enter a desired time and touch [ENT].
You can set a value between 0 to 255 seconds.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

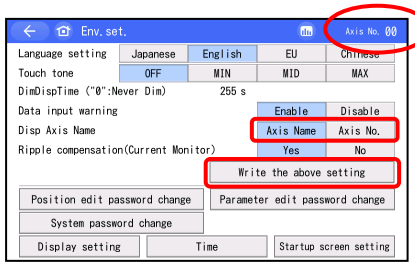
[Data input warning]
The warning can be output when a value less than the minimum speed and a value exceeding the rated acceleration/deceleration speed are entered in the position data. Note that the value is entered even if the warning occurs. Always use within the specification of the actuator.



Touch [Enable] to give the warning.
Touch [Disable] not to give the warning.

Select either Enable or Disable,
and then touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

[Axis Name Display]
Make a selection whether to show the name or number for axis display.



Axis Name Display

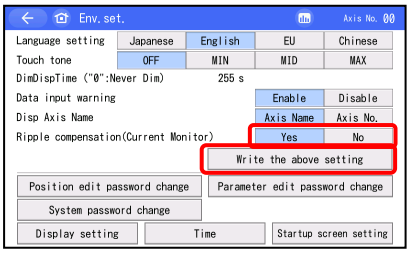
Touch [Axis Name] and the name will be shown.
Touch [Axis No.] and the number will be shown.

Select either Axis Name or Axis No, and touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

The axis name can be set in Software version information screen.
Refer to [3.17.2 Axis Name Edit]

[Ripple Compensation]

Setting should be conducted whether to have the ripple compensation or not in the monitor window and data monitor window.

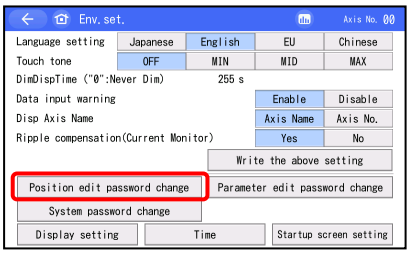


Touch [Yes] and the setting should be established with ripple compensation.
Touch [No] and the setting should be established without ripple compensation.

Select either yes or no and touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

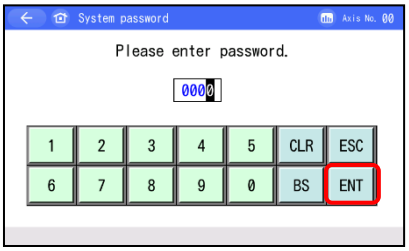
[Change Pos Edit Password/Prs Program edit password change]
Change the position edit password or Prs Program edit password.

In Change Prs Program Edit Password, the display “Position Edit Password” is replaced with “Prs Program Edit Password”, but the way to operate the window should be the same.



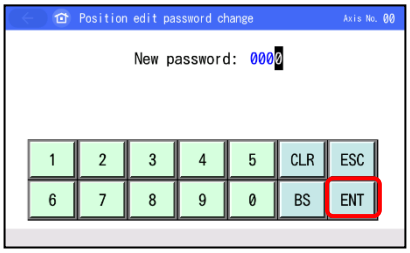
Touch [Position edit password change] or [Prs Program edit password change].

If the system password is not “0000,” the password entry screen appears.



Input a system password.
Touch [ENT].

> The default system password is “5119.”
> For how to change the system password, refer to [Change System Password] as described later.

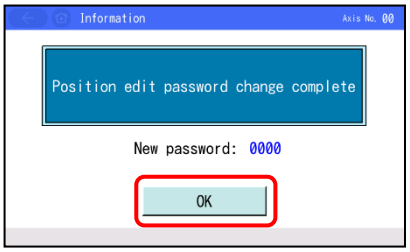


Enter the new position edit password/Prs Program edit password change to change to.
If the position edit password/Prs Program edit password is not set, enter “0000.”

Touch [ENT].



Touch [Change].

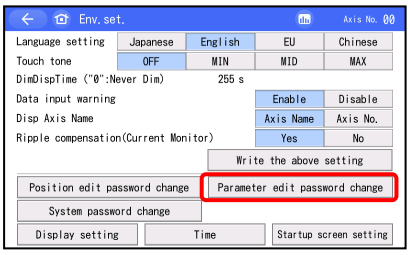


The new password after change will be displayed. Make sure it shows the same as the password you have set.

Touch [OK].

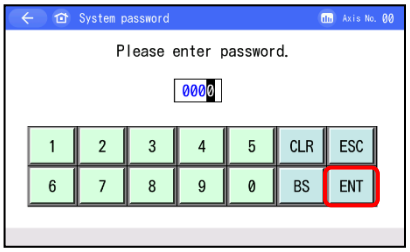
[Change Parameter Edit Password]

Change the parameter edit password.



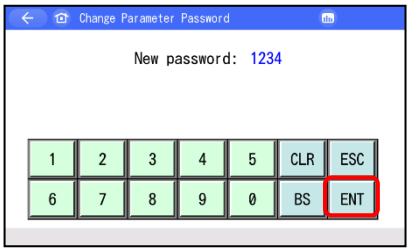
Touch [Parameter edit password change].

If the system password is not “0000,” the password entry screen appears.



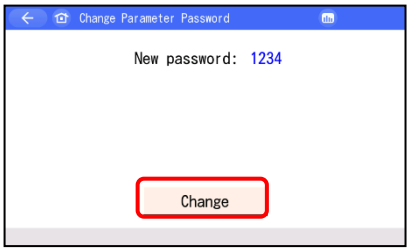
Input a system password.
Touch [ENT].

> The default system password is “5119.”
> For how to change the system password, refer to [Change System Password] in the next page.

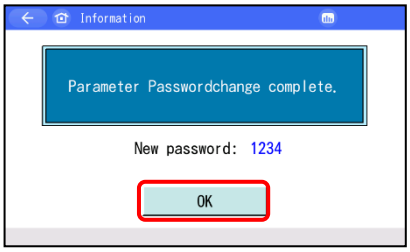


Enter the new parameter edit password to change to.
If the parameter edit password is not set, enter “0000.”

Touch [ENT].



Touch [Change].

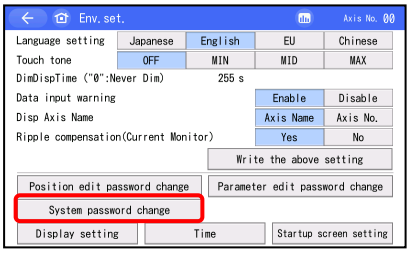


The new password after change will be displayed. Make sure it shows the same as the password you have set.

Touch [OK].

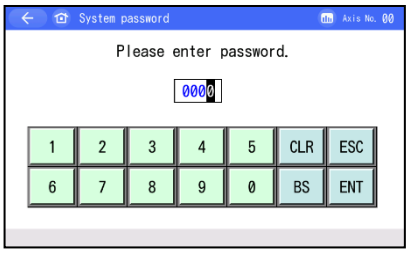
[Change System Password]

Change the system password.



Touch [System password change].

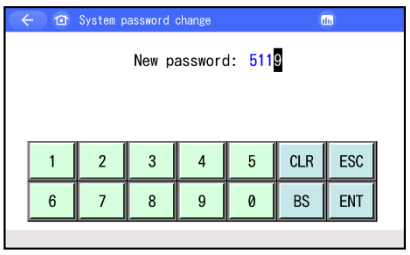
If the system password is not “0000,” the password entry screen appears.



Input the system password that is currently set.

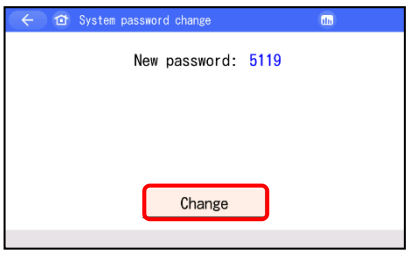
Touch [ENT].

The default system password is “5119.”

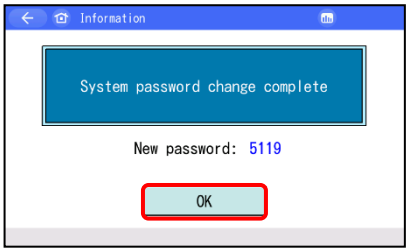


Enter the new system password to change to.
If you do not set the system password, enter 0000.

Touch [ENT].



Touch [Change].

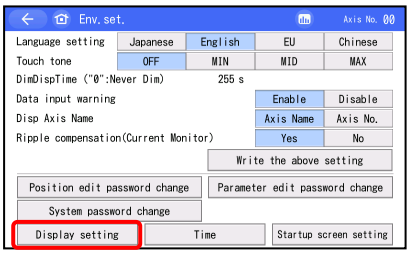


The new password after change will be displayed. Make sure it shows the same as the password you have set.

Touch [OK].

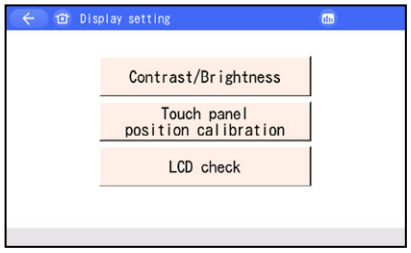
[Display setting]

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



Touch [Display setting].

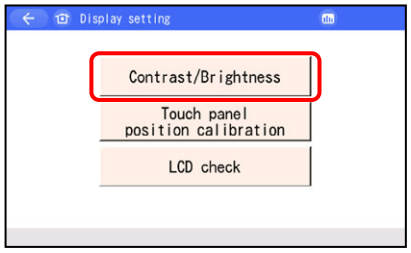
Display setting menu window is displayed.



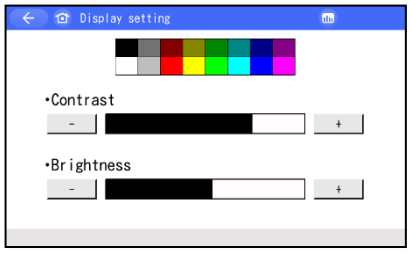
Select Display setting menu.

● Change the Contrast/Brightness

You can adjust contrast (shading of liquid crystal) and brightness (of liquid crystal).



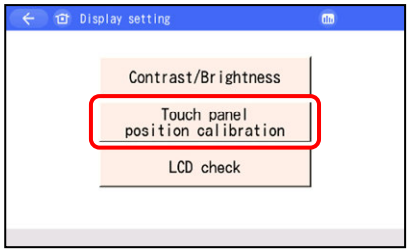
Touch [Contrast/Brightness]



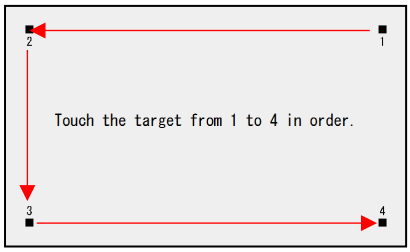
Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

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

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



Touch [Touch panel position calibration].

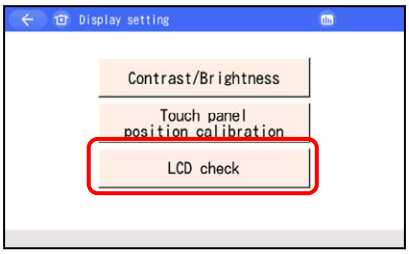


Touch [■] in the order of 1, 2, 3 and 4.

The display returns to Display setting menu screen.

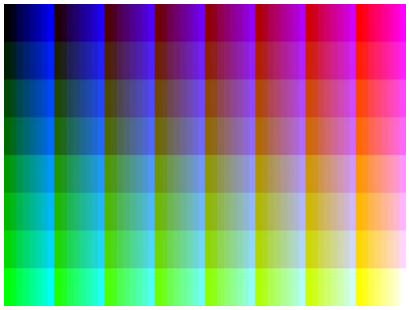
●LCD Check

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



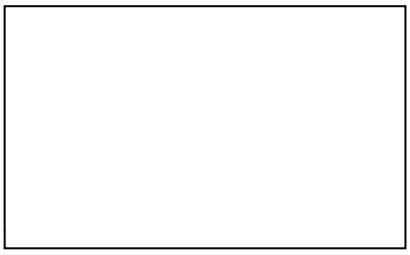
Touch [LCD check].

Color Pattern is displayed



Touch any point on the screen.

White Only is displayed



Touch any point on the screen.

Black Only is displayed



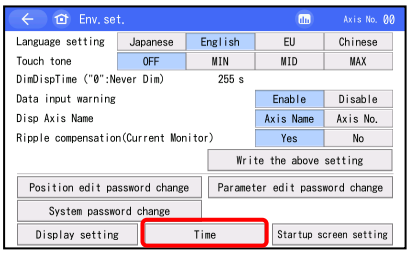
Touch any point on the screen.

The display returns to Display setting menu screen.

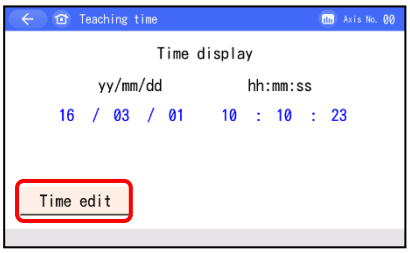
[Time Setting]

You can set the time for TB-02 or controller with the calendar function.

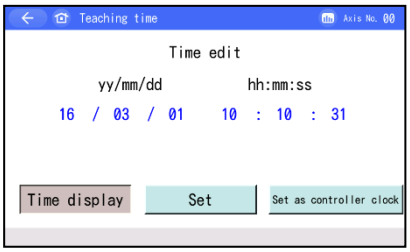
1) Time setting for TB-02.



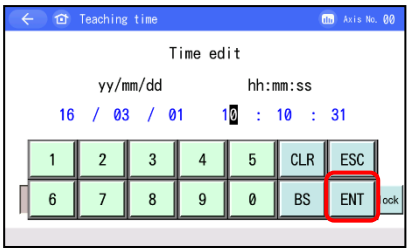
Touch [Time].



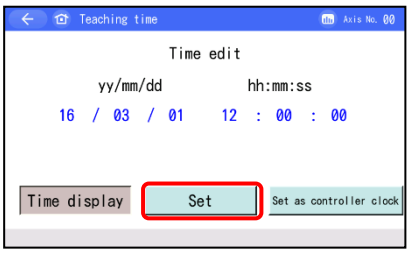
The time of TB-02 is displayed.
Touch [Time edit].



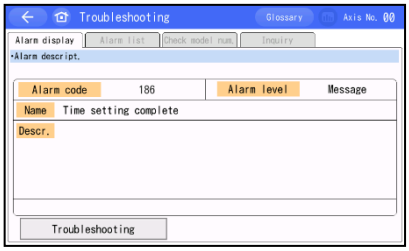
Touch the value of year, month, day, hour, minute or second that is required to be changed.



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

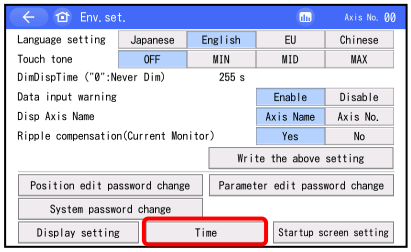


Touch [Set].

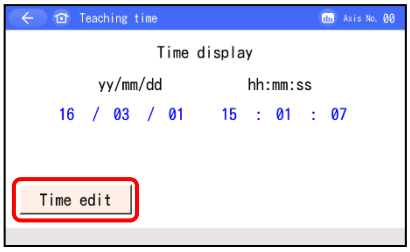


The clock setting complete window is shown and the clock in TB-02 gets changed.

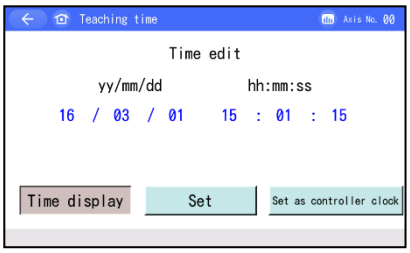
2) Time setting for controller with the calendar function.



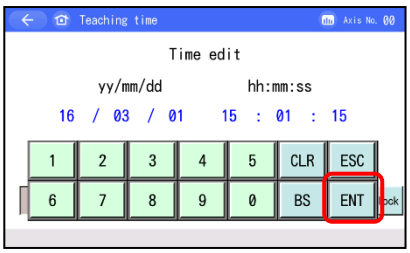
Touch [Time].



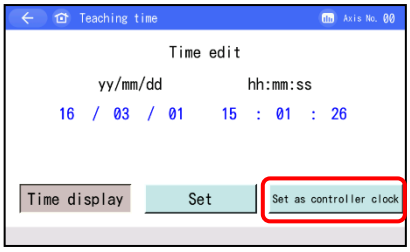
Teaching time is displayed.
Touch [Time edit].



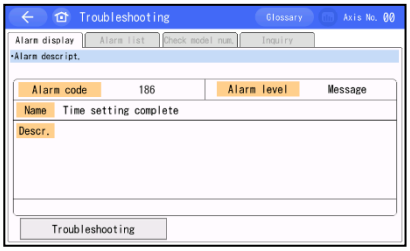
You don't need to change the time in the case of setting the time of the teaching to the controller.
Touch the value of year, month, day, hour, minute or second that is required to be changed.



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



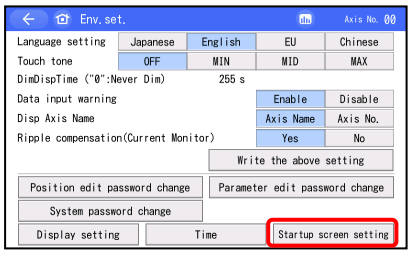
Touch [Set as controller clock].



The clock setting complete screen is shown and the clock in the controller gets changed.

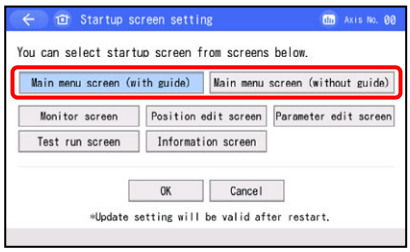
[Startup screen setting]

Setting can be established for the window shown in the screen first after the power is turned on. Also, show / hide can be selected for the icons of Position edit guide, I/O control guide and Easy setting in Menu 1 screen.



Touch [Startup screen setting].

1) Guide Icon Display Select



[Main menu screen (with guide)]
: Displays the guide icons (Note 1).

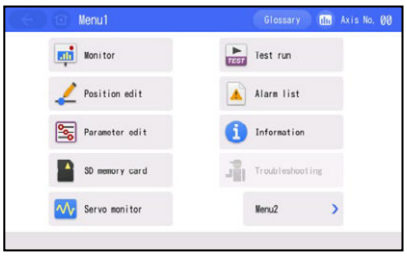
[Main menu screen (without guide)]
: Displays no guide icon (Note 1).

Touch [OK].

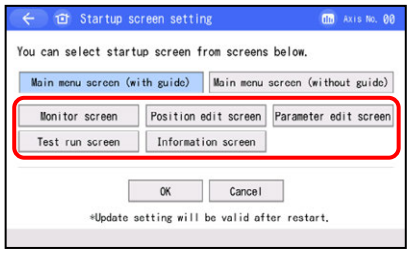
(Note1) Position edit guide Icon, I/O control guide Icon and Easy setting Icon

Menu 1 screen with guide icons (Note 1) hidden

* Depending on the connected model, the guide may not be available. Therefore, for some models, the guide icon may remain hidden even when With Guide is selected.



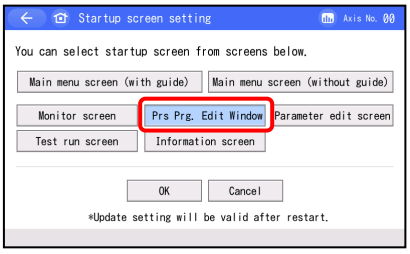
2) Initial Screen Select at Startup



Select a screen from those below for the screen shown first after the power is turned on.

[Monitor screen]
[Position edit screen]
[Parameter edit screen]
[Test run screen]
[Information screen]

Touch either one to select and touch [OK].



For the servo press type controllers;

[Prs Program Edit Window] should be shown instead of [Position Edit Window].

3.19 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.
** For how to operate the press program data, refer to 3.26.4 Secure Digital Memory Card*

(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 : \TB_CON\Position\File Name*
- *Parameter : \TB_CON \Parameter\File Name*
- *Alarm List : \TB_CON \Alarmlist\File Name*

(Note) Files with Chinese names are not supported.

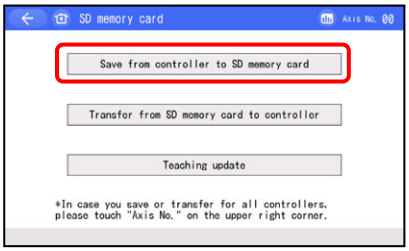
> ⚠ *Caution: For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, Have FAT32 Format for the file system.*

3.19.1 Data Backup of the Controller

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

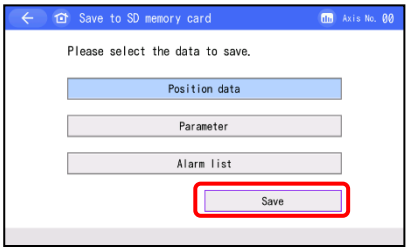


Touch [SD memory card] in Menu 1 screen.



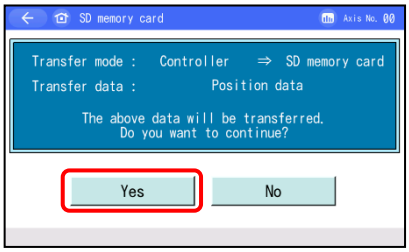
SD memory card screen opens.

Touch [Save from controller to SD memory card].



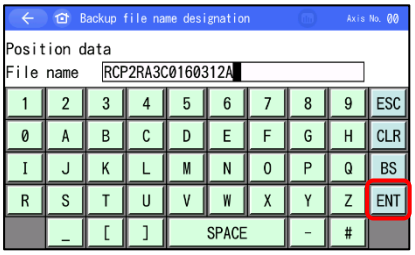
Select the data type for the backup such as [Position data] and touch it. (Multiple selection available)
The data type been selected will be shown in light blue.

Touch [Save].



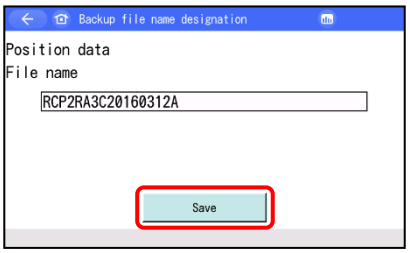
Touch [Yes].

Touch [No], and the screen returns to the previous screen.

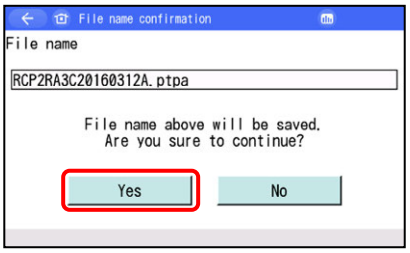


Numeric keys are displayed. Input a file name and touch [ENT].

The file name is to be typed with 32 characters at maximum in letters and numbers.



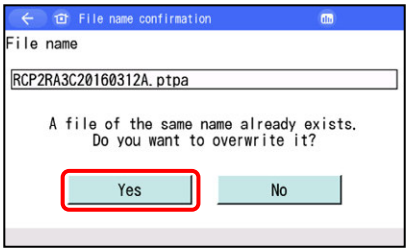
Touch [Save].



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

Touch [Yes].

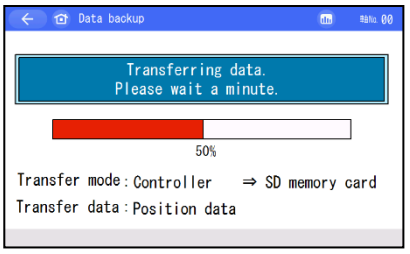
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



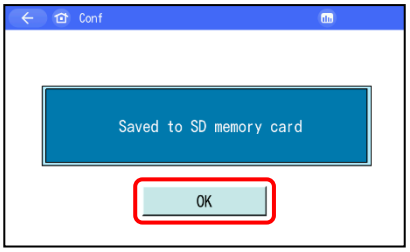
The screen below appears if the same name is found.

Touch [Yes] if overwriting data.

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.

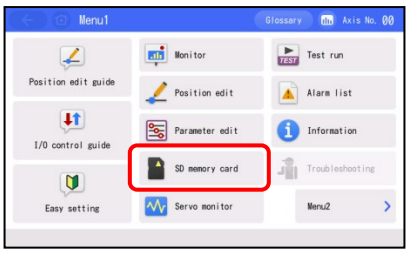


A message to tell the data transfer is complete pops up and the backup process is finished.

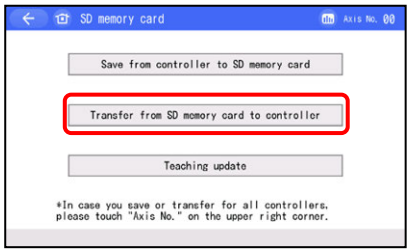
Touch [OK], and the screen returns to Secure Digital Memory Card screen.

3.19.2 Restore to Controller

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

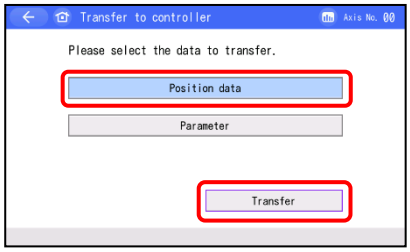


Touch [SD memory card] in Menu 1 screen.



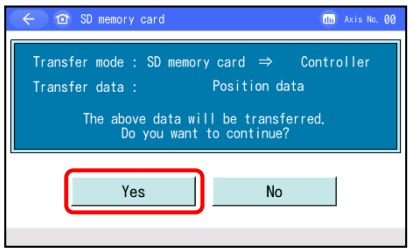
SD memory card screen opens.

Touch [Transfer from SD memory card to controller].



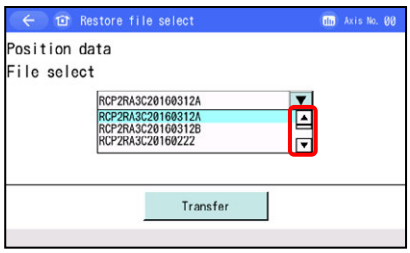
Select the data type to transfer to the controller, such as [Position data], and touch it. (Multiple selection available) The data type been selected will be shown in light blue.

Touch [Transfer].

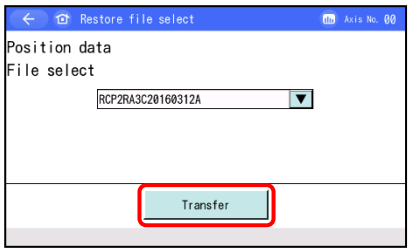


Touch [Yes].

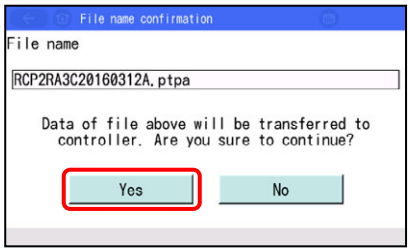
If [No] is touched, the screen goes back to the data backup screen.



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

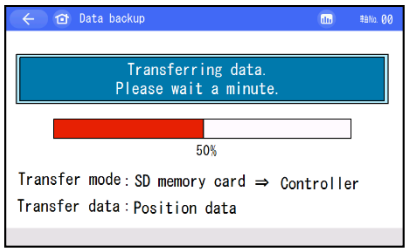


Touch [Transfer].



Touch [Yes].

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

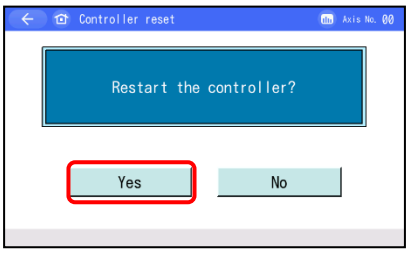


Data transfer screen will be shown.



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

Touch [OK].



If the position data is transferred, the reboot window should not be shown. The reboot window should be displayed only when the parameter data is transferred.

Touch [Yes] to reboot the system when it is displayed.

3.20 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/s], 0.70 [G]
2) When 40.00 [mm] is indicated
   ⇒ Velocity and acceleration for shortest operation time : 300.00 [mm/s], 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.

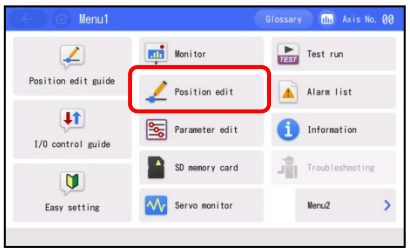
For a reference, the following table shows the list of the operation time for each moving distance.

List of Operation Time for Each Moving Distance

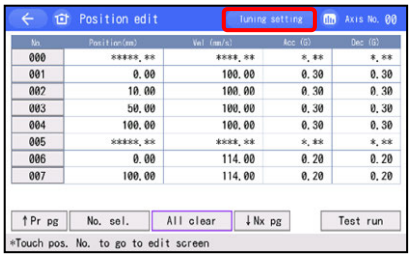
Carrier load [Kg]	Movement distance [mm]	Velocity [mm/s]	Acceleration/ Deceleration [G]	Operation time [msec]
12.0	30.00	**250.00**	**0.70**	**156**
		300.00	0.50	161
	40.00	250.00	0.70	196
		300.00	**0.50**	**195**

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

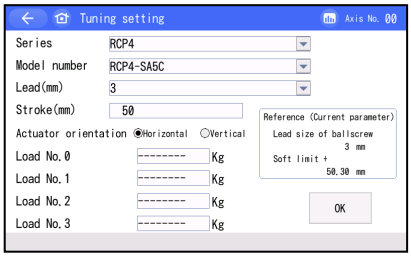
1) Basic Information Settings
Set the model code, lead, stroke, actuator posture and the payload of the applicable actuator.



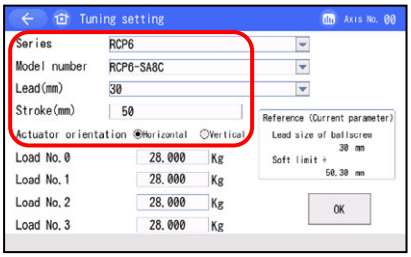
Touch [Position edit].



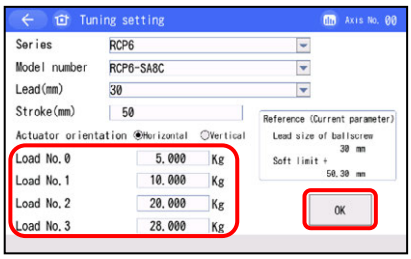
Touch [Tuning setting].



Tuning setting screen opens.



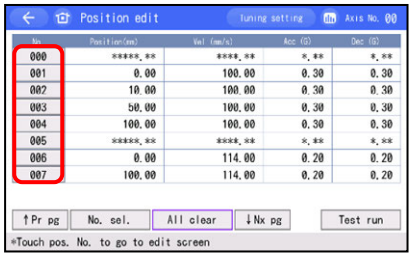
Touch ▼ and ▲ to select the applicable series, model type, lead (mm). For the stroke, numeric keys will appear if touching it. Input a value on the numeric keys.
Select the actuator posture from either horizontal or vertical.



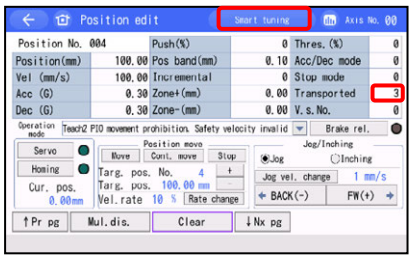
Touch the number input box from Load No. 0 to No. 3. Numeric keys appear. Set the payload.

Touch [OK] to return to Position edit screen.

2) 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.



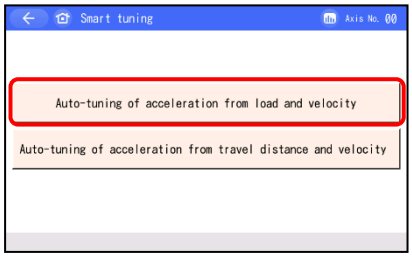
Select the position to have Smart Tuning Function and touch it.



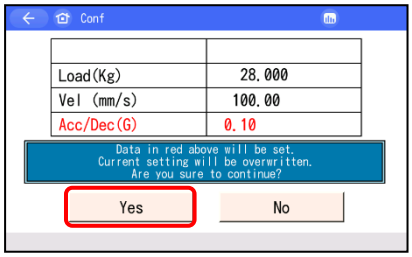
Select one from 0 (Transported Load No. 0) to 3 (Transported Load No. 3) and set to the transported load.

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

Touch [Smart tuning].



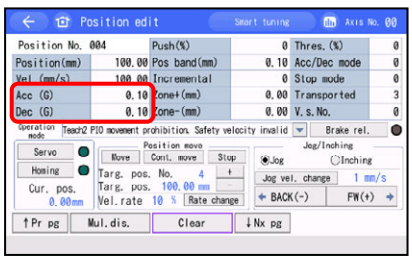
Touch [Auto-tuning of acceleration from load and velocity].



Acceleration and deceleration after automatic tuning are shown.

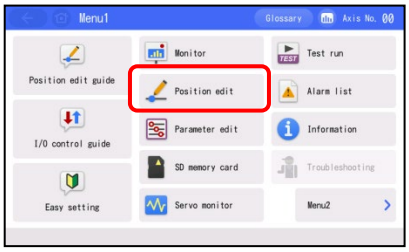
Touch [Yes].

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

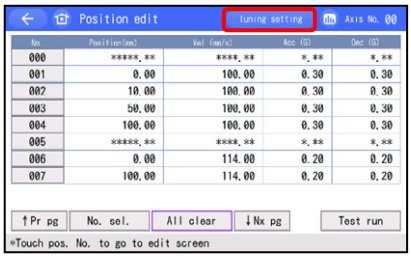


3.20.2 Operation to Automatically Set Velocity and Acceleration Speed from Moving Distance

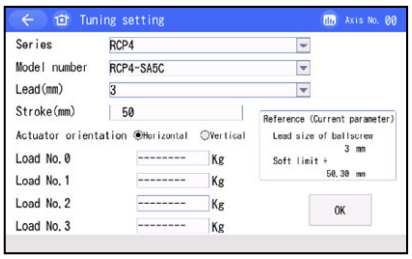
1) Basic Information Settings
Set the model code, lead, stroke, actuator posture and the payload of the applicable actuator.



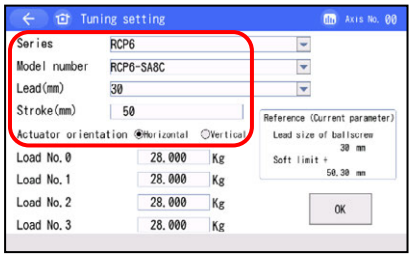
Touch [Position edit].



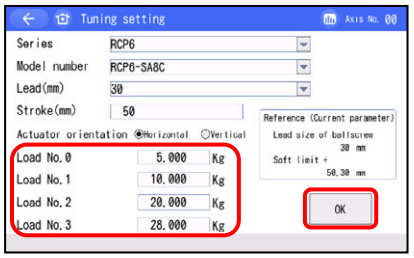
Touch [Tuning setting].



Tuning setting screen opens.



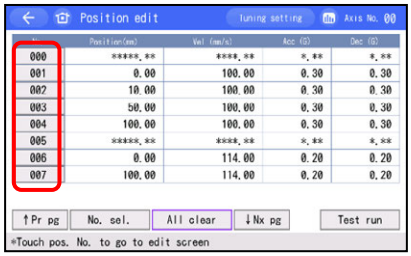
Touch ▼ and ▲ to select the applicable series, model type, lead (mm). For the stroke, numeric keys will appear if touching it. Input a value on the numeric keys.
Select the actuator posture from either horizontal or vertical.



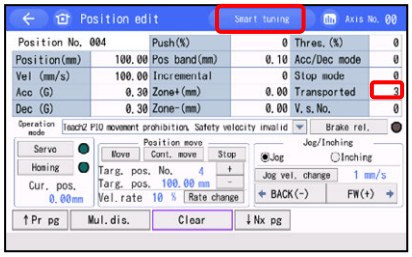
Touch the number input box from Load No. 0 to No. 3. Numeric keys appear. Set the payload.

Touch [OK] to return to Position edit window.

2) 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.



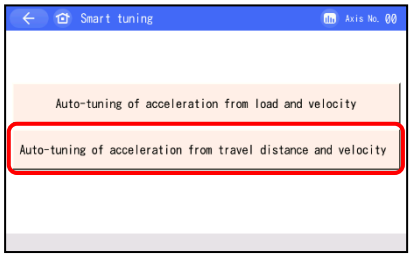
Select the position to have Smart Tuning Function and touch it.



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 [Smart tuning].

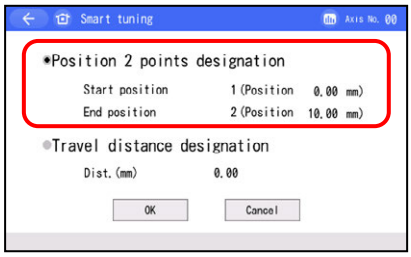


Touch [Auto-tuning of acceleration from travel distance and velocity].

There are two ways to set up the moving distance.

- Position 2 points designation
- Travel distance designation

(Position 2 points designation)

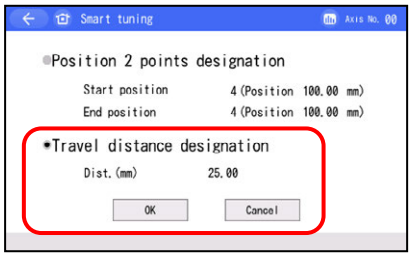


Select Position 2 points designation.
Touch the value on the start position and the numeric key will be shown.
Set the Start position.

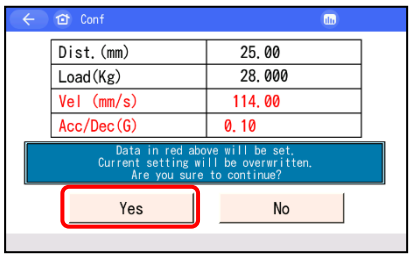
Touch the value on the end position and the numeric key will be shown.
Set the End position.

(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.

(Travel distance designation)



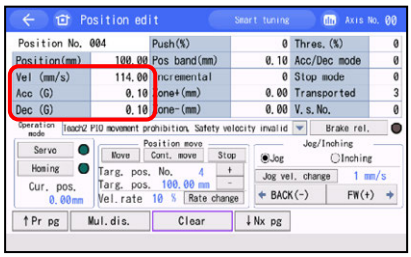
Select [Travel distance designation].
Touch the value on the moving distance [mm] and the numeric key will be shown.
Set the Distance.



Acceleration and deceleration after automatic tuning are shown.

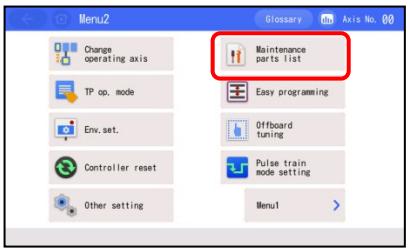
Touch [Yes].

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

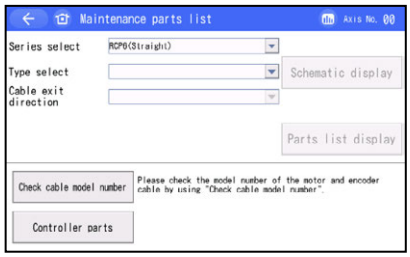


3.21 Maintenance Parts List

Information of maintenance components is displayed.



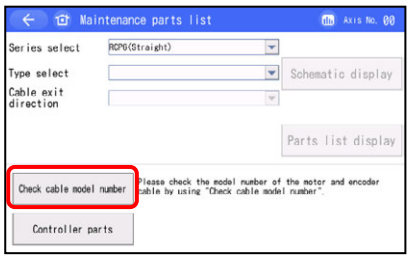
Touch [Maintenance parts list] in Menu 2 screen.



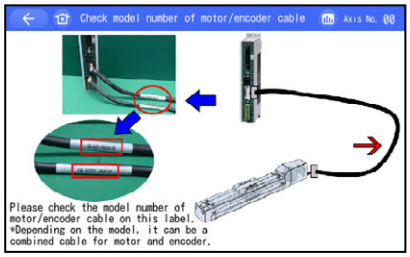
Maintenance parts list screen opens.

3.21.1 Check Cable Model Number, Controller Parts

[Check cable model number]



Touch [Check cable model number].

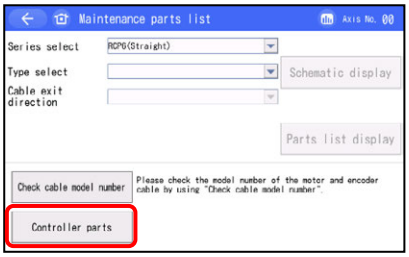


Check model number of motor / encoder cable opens.

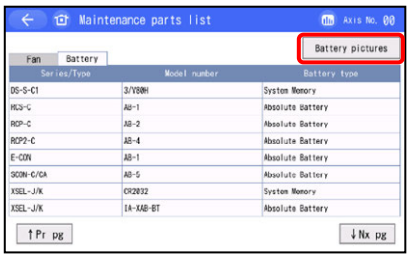
Touch [←] button and the screen goes back to the previous page.

> ⚠ *Caution: For the model number of the motor / encoder cable, check the cable model number that is actually used referring to "Check cable model number".*

[Controller parts]



Touch [Controller parts].



The battery list opens.

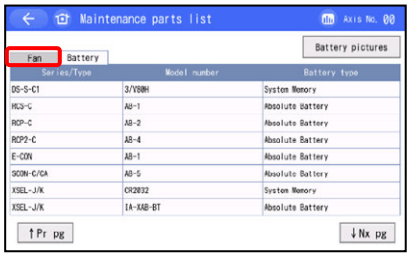
Touch [↑ Pr pg], and the screen shifts to the list in the previous window.
Touch [↓ Nx pg], and the screen shifts to the list in the next screen.

Touch [Battery pictures].

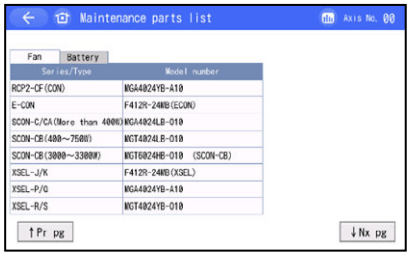


The screen shows the list of battery pictures.

Touch [←] button and the screen goes back to the previous page.



Touch [Fan].

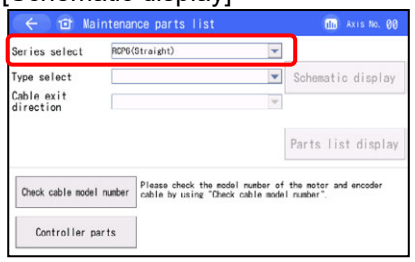


The fan list opens.

Touch [↑ Pr pg], and the screen shifts to the list in the previous screen.
Touch [↓ Nx pg], and the screen shifts to the list in the next screen.

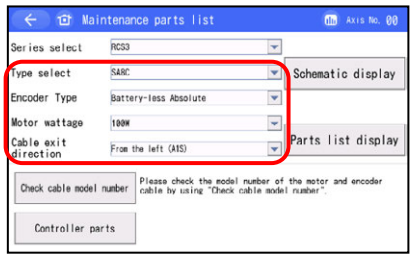
3.21.2 Schematic Display and Parts List Display

[Schematic display]



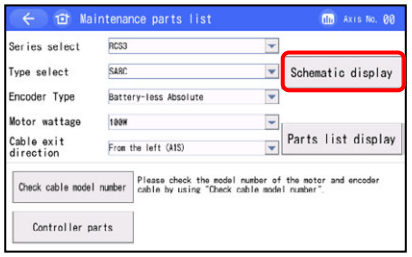
Open Maintenance parts list window.

Touch ▼ and ▲ in the series select column to choose the actuator model type.



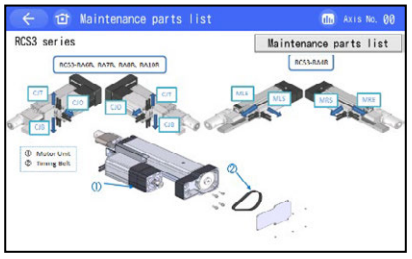
Items to be displayed will differ depending on the selected model type.

Touch ▼ and ▲ in each item to choose the appropriate contents.



Touch [Schematic display].

(Note) There are some models with no Schematic display.

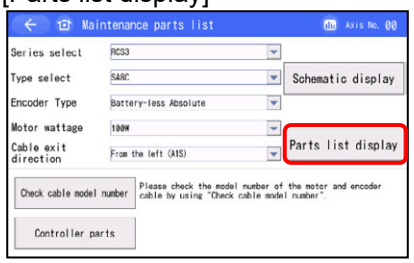


Schematic display is displayed.

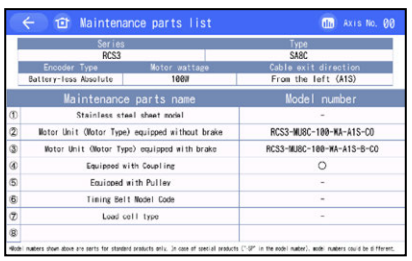
Touch [Maintenance parts list] to display the components list described below.

Touch [←] button to return to the previous screen.

[Parts list display]



Touch [Parts list display].



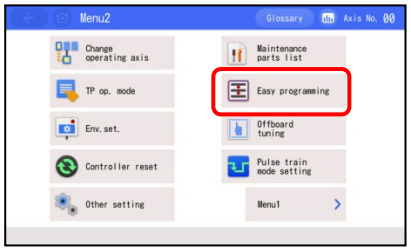
The parts list opens.

Touch [←] button to return to the previous screen.

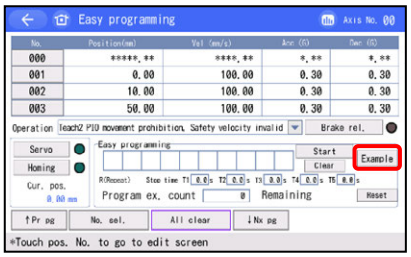
3.22 Easy Programming

The easy programming is a test mode same as the position movement. You can set any movement order or set time for pause between movements to perform continuous operation. You can also indicate the number of repeated times.

[How to Establish Setting]
Set the position number (0 to maximum position number) of the destination to the easy programming input part (step). In order to have a pause between operations, use prepared five timers T1 to T5. Timer can be set in 0.1 second unit from 0 to 99.9sec. When it is required to repeat operation, input R (repeat indication symbol) at the end.
The number of steps available to indicate is 10 at maximum including R.
If there is a space, the step after that is not valid. The easy programming stops. Steps after R are also invalid.

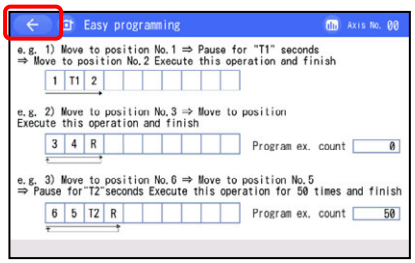


Touch [Easy programming] in Menu 2 screen.



Easy programming screen opens.

Touch [Example] and examples for how to construct a program are displayed.

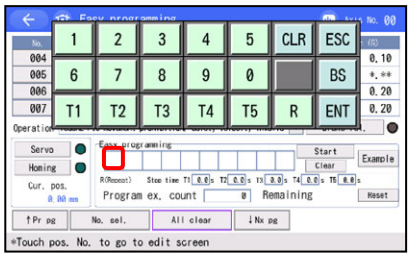


Touch [←] button to return to the previous screen.

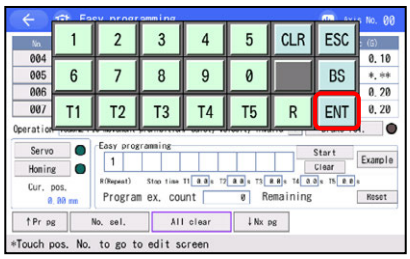
Take this as a reference when constructing a Easy programming.

> ⚠ *Caution: Operation with JOG Switch on Front Panel of RCON*
> *If TB-02 gets disconnected from the controller in the condition that this window is open, JOG switch operation will get disabled.*

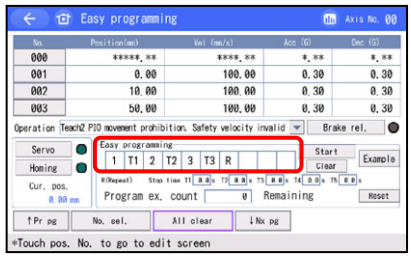
[Driving Easy Programming]



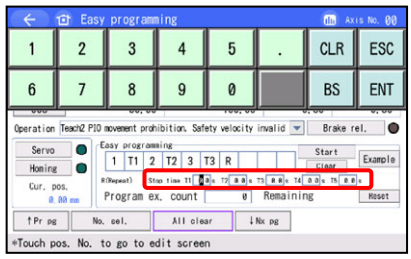
Touch the first (on the most left) step of the easy programmng.



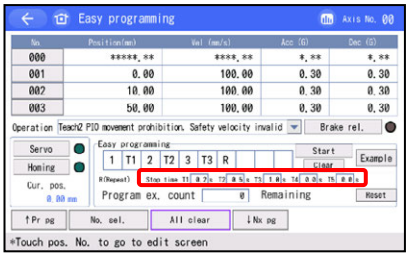
Input a position number or a timer (T1 to T5) and touch [ENT].



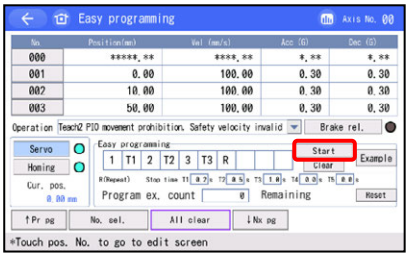
Set the next step and after in the same manner.
Set R at the end when it is required to repeat the operation.



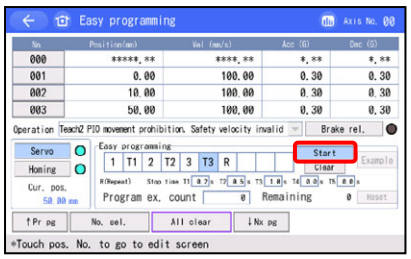
Touch a timer to use (T1 to T5) when it is required to have time for pause.



Set the time for pause.

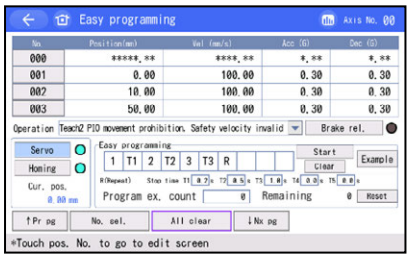


Have the servo on and the home-return conducted, and then touch [Start] to start the operation.

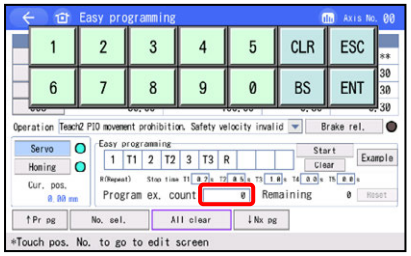


During the operation, the [Start] and the step number in execution turn to blue.

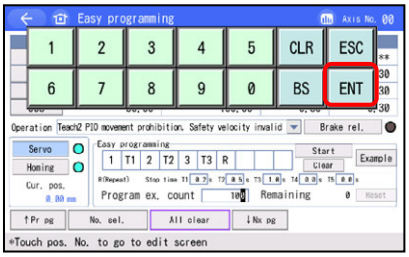
To stop operation, touch the [Start] again.



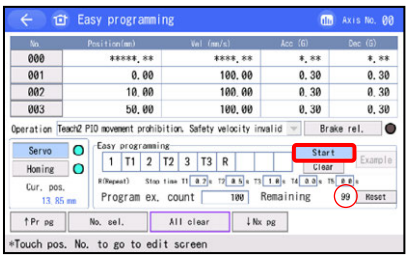
Operation stops.



Touch the number to execute the program when it is required to set number of repeating.

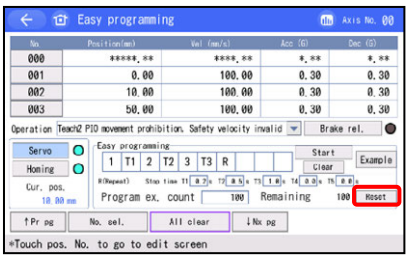


Set the number to repeat and touch [ENT].

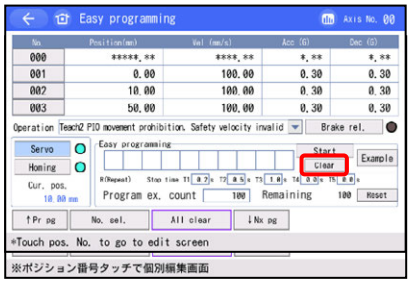


Touch [Start] to start operation.

The number of remaining for repeating is displayed, and counts down as 100 → 99 → 98 → …



Touch [Reset] and the remained times go back to the number of program execution times.



Touch [Clear], and the set easy program will be all deleted.

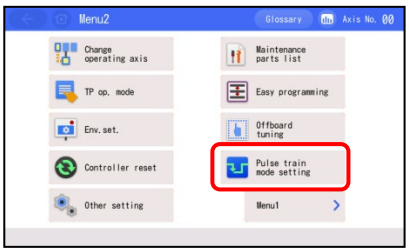


Caution: When there is an alarm issued due to such a reason as making a mistake in position number indication, go back to Easy programming screen with [↩] button.
In case of moving from Menu 2 screen to Easy programming screen, the set simple program will be deleted, if you are using a version earlier than V5.10.

(Note) When using versions earlier than V5.10, simplified programs cannot be saved.
When using version V5.20 or later, simplified programs can be saved through the position data backup operation. During transfer, the position data and simplified programs are transferred simultaneously.

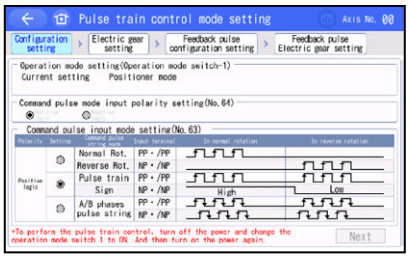
3.23 Pulse Train Mode Setting

Establish the settings to conduct the pulse-train control.



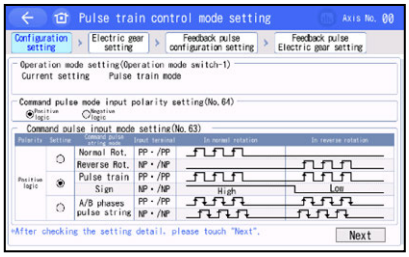
Touch [Pulse train mode setting] in Menu 2 screen.

The icon will not be shown for the controllers that are not applicable for the pulse-train control.



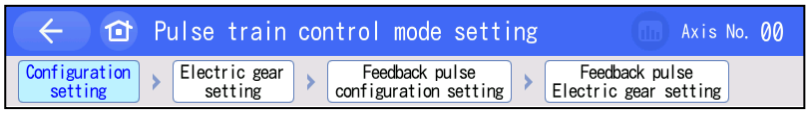
A message in red will appear if the setting is not done appropriately for the pulse-train control mode. Follow the massage for appropriate action.

(Shown in the figure on the left is the display for SCON)



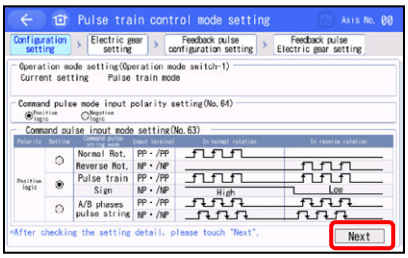
For the pulse-train control mode, pulse-train control mode setting screen is displayed.

In the pulse-train control mode setting, set the parameters necessary for control in four screens.



[Configuration setting] ---------- Refer to [3.23.1]
↓ ↓
[Electric gear setting]---------- Refer to [3.23.2]
↓ ↓
[Feedback pulse configuration setting] ------ Refer to [3.23.3]
↓ ↓
[Feedback pulse Electric gear setting] --------- Refer to [3.23.4]

3.23.1 [Configuration Setting]



First, display the [Configuration setting] screen.

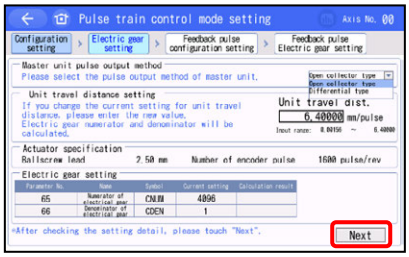
Once setting is finished, touch [Next].

[Contents of Display]

- Operation mode setting — Displays the current operation mode. Confirm that it shows Pulse-Train Control Mode.
- Command pulse mode input polarity setting — Set the input polarity whether active high or active low. (Parameter No. 64)
- Command pulse input mode setting — Set the format for the command pulse input. (Parameter No. 63)

Command Pulse Train Format		Input Terminal	In Clockwise	In Counterclockwise	Setting Value
Active Low	CW Pulse Train	PP・/PP			2
	CCW Pulse Train	NP・/NP			
	CW pulse train shows the motor rotation amount in clockwise and CCW pulse train in counterclockwise.				
	Pulse Train	PP・/PP			1
	Symbol	NP・/NP	Low	High	
	The command pulse shows the motor rotation amount, and the command symbol shows the rotation direction.				
	A/B-Phase Pulse Train	PP・/PP			0
		NP・/NP			
	It is the A/B phase quad edge evaluation pulse of the phase difference in 90deg, and is the command for rotation amount and the rotation direction.				
Active High	CW Pulse Train	PP・/PP			2
	CCW Pulse Train	NP・/NP			
	Pulse Train	PP・/PP			1
	Symbol	NP・/NP	High	Low	
	A/B-Phase Pulse Train	PP・/PP			0
		NP・/NP			

3.23.2 [Electric Gear Setting]



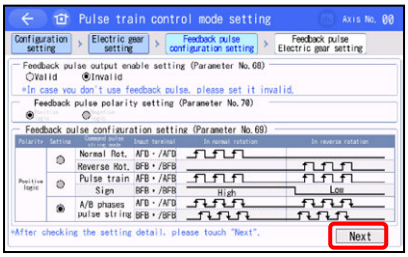
Second, display the [Electric gear setting] screen.

Once setting is finished, touch [Next].

[Contents of Display]

- Master unit pulse output method — Select the pulse output system of the host unit whether it is the open collector type or differential (line drive) type.
- Unit travel distance setting — Set the unit movement amount of the actuator for one pulse. With this input value, the numerator and the denominator of the electronic gear are automatically figured out. In case the value is out of the input range as a result of calculation, an error message will be displayed in red. Change the value.
- Actuator specification — The ball screw lead and the number of encoder pulses of the actuator are displayed.
- Electronic gear setting — It is a parameter to determine the unit movement amount of the actuator for one pulse of the command pulse train input. Input the unit movement amount and this parameter can be automatically figured out and the set numbers for the numerator and the denominator of the electronic gear get displayed.
  Electronic Gear Numerator (Parameter No. 65)
  Electronic Gear Denominator (Parameter No. 66)

3.23.3 [Feedback Pulse Configuration Setting]



Third, display the [Feedback pulse configuration setting] screen.

Once setting is finished, touch [Next].

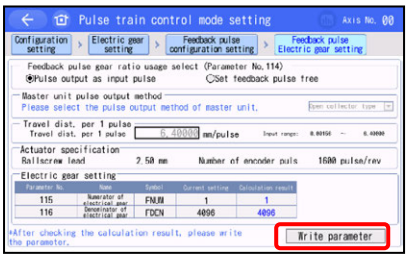
[Contents of Display]

- Feedback pulse output enable setting — Set the validation of the feedback pulse output. (Parameter No. 68)

When the feedback pulse output is “valid”, conduct the following settings.

- Feedback pulse polarity setting — Set the feedback pulse whether active high or active low. (Parameter No. 70)
- Feedback pulse configuration Setting — Set the format for the feedback pulse output. (Parameter No. 69)

3.23.4 [Feedback Pulse Electric Gear Setting]



Lastly, display the [Feedback pulse Electric gear setting] screen.

Once setting is finished, touch [Write parameter].

[Contents of Display]

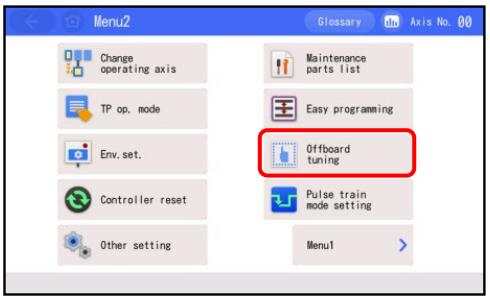
- Feedback pulse gear ratio usage select — Select whether to have the feedback pulse output and input pulse in equal ratio or to be set individually. (Parameter No. 114)

When Feedback pulse gear ratio usage select is set to “Set feedback pulse free”, conduct the following settings.

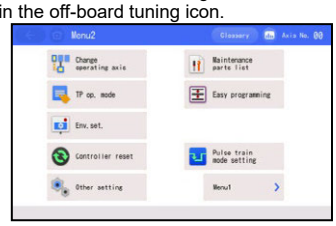
- Master unit pulse output method — Select the pulse output system of the host unit whether it is the open collector type or differential (line drive) type.
- Travel dist. per 1 pulse — Set the unit movement amount of the actuator for one pulse. With this input value, the numerator and the denominator of the electronic gear are automatically figured out. In case the value is out of the input range as a result of calculation, an error message will be displayed in red. Change the value.
- Actuator specification — The ball screw lead and the number of encoder pulses of the actuator are displayed.
- Electronic gear setting — It is a parameter to determine relation between the movement amount of the actuator and the number of output pulse.
  Input the unit movement amount and this parameter can be automatically figured out and the set numbers for the numerator and the denominator of the electronic gear get displayed.
  Electronic Gear Numerator (Parameter No. 115)
  Electronic Gear Denominator (Parameter No. 116)

3.24 Offboard Tuning

Offboard tuning function is a feature established in purpose of calculating the optimum gain considering the payload. By inputting the operational conditions, optimum controlling parameter (each types of gain) settings and cycle time will be figured out.



In no controller of offboard tuning function, it does not appear in the off-board tuning icon.



The gain to be calculated is the following six types (from 1) to 6)).
There are four gain set prepared to save the six types of the gain to the controller parameters, and it is available to write the calculated gain in the indicated gain set.

	ParameterName	Parameter No.			
		Set No.0	Set No.1	Set No.2	Set No.3
1)	Servo gain number	7	120	126	132
2)	Position Field Forward Gain	71	121	127	133
3)	Speed loop proportional gain	31	122	128	134
4)	Speed loop integral gain	32	123	129	135
5)	Torque filter constant	33	124	130	136
6)	Current Control Band Number	54	125	131	137

Restrictions

1. Actuators not Applicable for Offboard Tuning Function

Actuators not listed in the select menu for the model code in the offboard tuning setting screen are not applicable for the offboard tuning function.

2. Caution for Gain Set No. 0

As the home-return operation is performed by using the gain in Gain Set No. 0, it is necessary to establish setting in Gain Set No. 0 following the caution notes below.

(1) When the payload is lighter than the rating

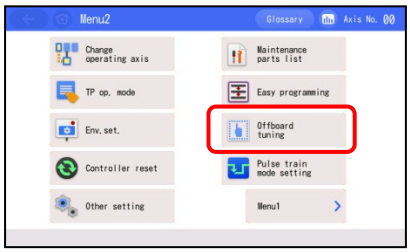
1) In Gain Set No. 0, set either type of the gain below.
   • Gain that is set at delivery
   • Adjusted gain suitable to the rated payload
2) Adjusted gain is to be set in Gain Set No. 1 to 3, not in Gain Set No. 0. If an adjusted gain is set in Gain Set No. 0, it may cause a problem at home-return operation such as vibration.

(2) When the payload is heavier than the rating

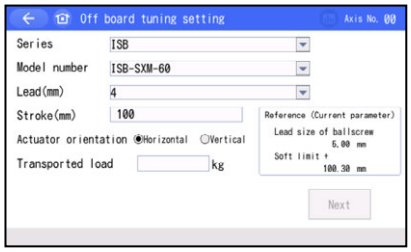
Adjusted gain is to be set in Gain Set No. 0.
As the load is heavier than the rated payload in the gain set at the delivery, home-return operation may not be able be conducted.

3.24.1 For Controllers Applicable for Gain Calculation (such as servomotor type controllers)

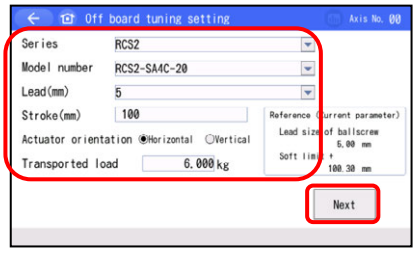
Setting of controlling parameters (each types of gain) and cycle time calculation are available.



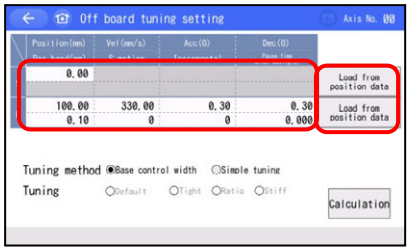
Touch [Offboard Tuning] in Menu 2 screen.



Offboard tuning window is displayed.

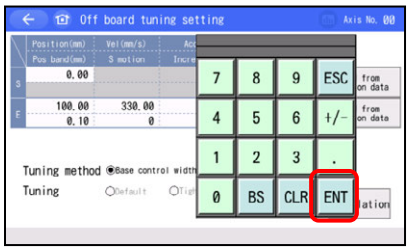


Select and input the following items and touch [Next].
- Series
- Model number
- Lead (mm)
- Stroke (mm)
- Actuator orientation
- Transported load



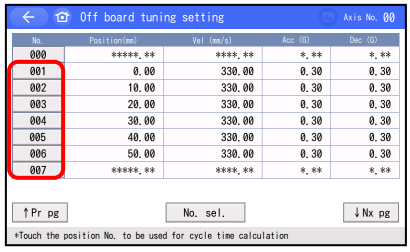
Set the start the positions of the start point and end point, velocity, acceleration / deceleration, positioning band, S-shaped motion, incremental and standby duration after movement.

Touch a value on an item to make setting.
To read in from the position data, touch [Read in from Position Data] on the start or end point.



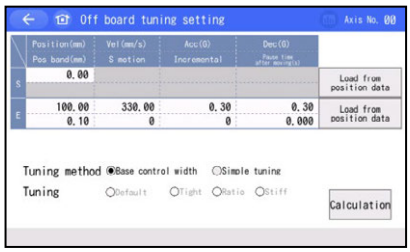
<To input setting value>

Input a setting value and touch [ENT].



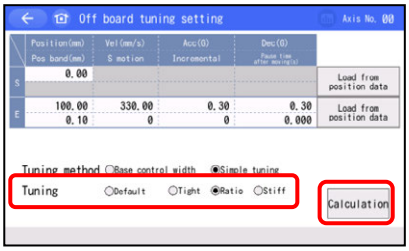
<To read in from position data>

Touch a position number to read in from.



Select either “Base Control width” or “Simple Tuning” in the tuning method.

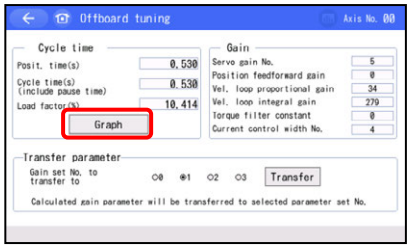
Base Control Width	It is suitable when it is required to calculate the gain automatically considering the payload, but not necessary to increase the responsiveness.
Simple Tuning	It is suitable when it is required to calculate the gain automatically considering the payload, and also to increase the responsiveness.



When “Simple Tuning” is selected in the tuning method, select a tuning rule from the following four types.

Touch [Calculation].

Tuning Rules	Explanations
Default	Select the optimum rule to the selected actuator and tuning is performed based on that rule. (*Note*) *Optimum Rule : Out of three rules, Tight, Ratio and Stiff, a rule capable to consider not to generate vibration and abnormal noise, and to increase responsiveness as much as possible at the same time*
Tight	It is a rule that increases the responsiveness the most in the three rules, but has the highest risk of generating vibration and abnormal noise at the same time.
Ratio	It is a rule of which the increase of the responsiveness is higher than Stiff and lower than Tight, and the risk of generating vibration and abnormal noise is lower than Tight and higher than Stiff.
Stiff	It is a rule that generates less vibration and abnormal noise in the three rules, but makes smallest increase to the responsiveness in the three.



Cycle time and gain value are calculated and displayed.

Touch [Graph], and the graph of the cycle time will be displayed.

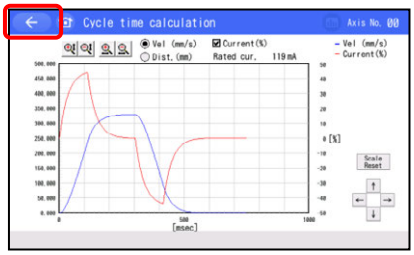
■ Calculated Items

Cycle time

Item name	Unit
Posit. time	(s)
Cycle time (include pause time)	(s)
Load factor	(%)

Gain

Item name
Servo gain No.
Position feedforward gain
Vel. loop proportional gain
Vel. loop integral gain
Torque filter constant
Current control width No.



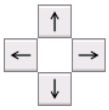
Select either velocity (mm/s) or drive distance (mm) to show its graph. (Values displayed on the left)
The graph for current (%) will be displayed at the same time. (Values displayed on the right)

Touch [←] button to return to the offboard tuning screen.

[Window Setting Buttons]



Scale Reset



: Touch it to enlarge the scale of the graph in vertical axis.

: Touch it to reduce the scale of the graph in vertical axis

: Touch it to enlarge the scale of the graph in horizontal axis

: Touch it to reduce the scale of the graph in horizontal axis

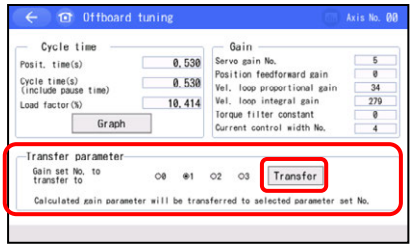
: Touch it to slide the displayed waveform frame upwards.

: Touch it to slide the displayed waveform frame downwards.

: Touch it to slide the displayed waveform frame to the left.

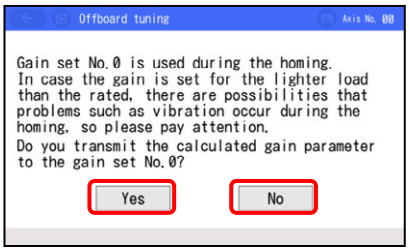
: Touch it to slide the displayed waveform frame to the right.

Scale Reset : Touch it to initialize the scale of the graph.



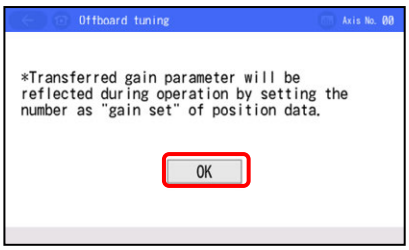
The calculated gain values can be transferred to a controller.

Select the gain set number (from 0 to 3) to be transferred and touch [Transfer] button.



As stated in the restrictions, a confirmation window will appear to show that a problem could occur if transferred to Gain Set No. 0.

Touch [Yes] or [No].



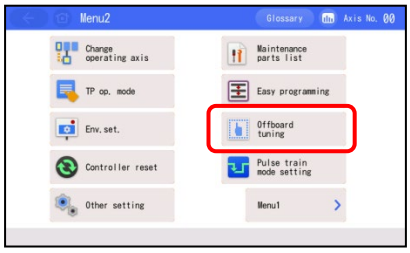
As the transfer is complete, a window for caution before reflection will show up.

Set a gain set number to the position data and use it.

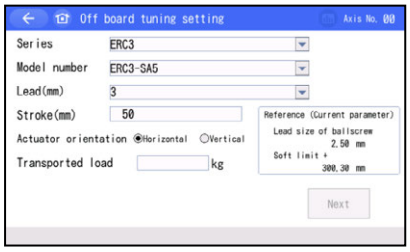
Touch [OK].

3.24.2 For Controllers Not Applicable for Gain Calculation (such as pulse motor type controllers)

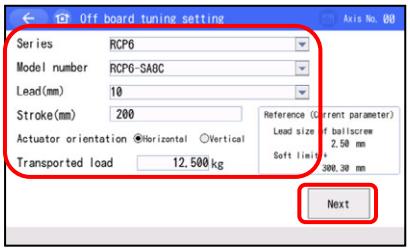
Setting of controlling parameters (each types of gain) cannot be performed, but cycle time calculation is available.



Touch [Offboard Tuning] in Menu 2 screen.

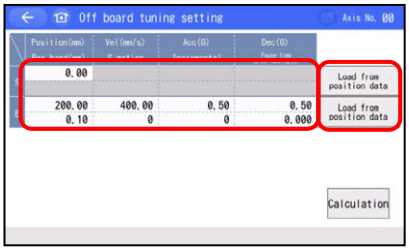


Offboard tuning window is displayed.



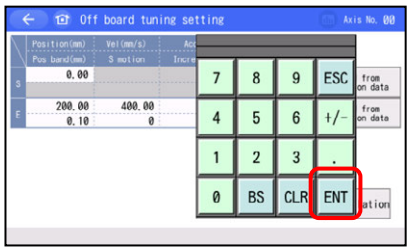
Select and input the following items and touch [Next].

- Series
- Model number
- Lead (mm)
- Stroke (mm)
- Actuator orientation
- Transported load



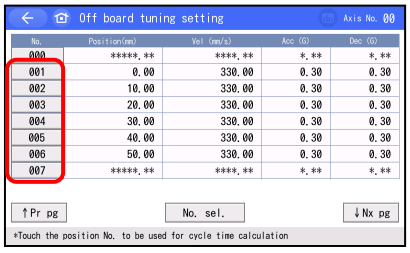
Set the start the positions of the start point and end point, velocity, acceleration / deceleration, positioning band, S-shaped motion, incremental and standby duration after movement.

Touch a value on an item to make setting.
To read in from the position data, touch [Read in from Position Data] on the start or end point.



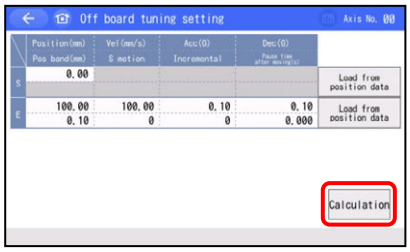
<To input setting value>

Input a setting value and touch [ENT].

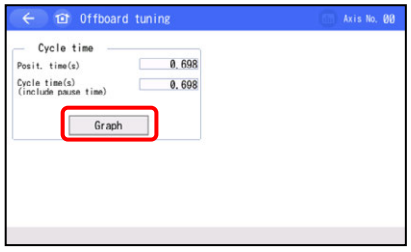


<To read in from position data>

Touch a position number to read in from.



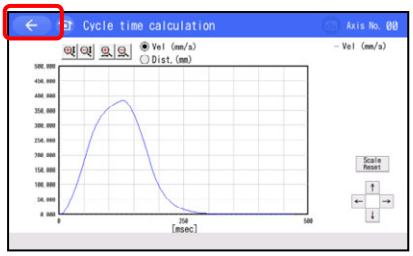
Touch [Calculation].



Cycle time is calculated and displayed.

Item name	Unit
Posit. time	(s)
Cycle time (include pause time)	(s)

Touch [Graph], and the graph of the cycle time will be displayed.



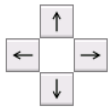
Select either velocity (mm/s) or drive distance (mm) to show its graph. (Values displayed on the left)

Touch [←] button to return to the offboard tuning window.

[Window Setting Buttons]



Scale Reset



: Touch it to enlarge the scale of the graph in vertical axis.

: Touch it to reduce the scale of the graph in vertical axis

: Touch it to enlarge the scale of the graph in horizontal axis

: Touch it to reduce the scale of the graph in horizontal axis

: Touch it to slide the displayed waveform frame upwards.

: Touch it to slide the displayed waveform frame downwards.

: Touch it to slide the displayed waveform frame to the left.

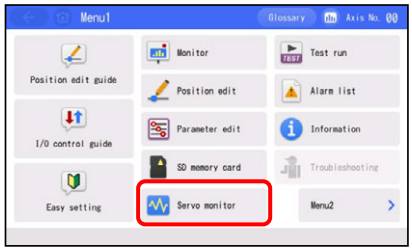
: Touch it to slide the displayed waveform frame to the right.

Scale Reset : Touch it to initialize the scale of the graph.

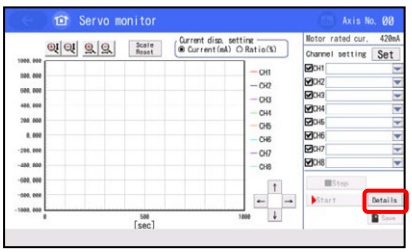
3.25 Servo Monitor

The actual operation status of the actuator is displayed in a waveform. It is available to record the displayed data.

> ⚠ *Caution: As ACON-C, PCON-C, SCON-C, SCON-CAL, ERC2, RACON and RPCON are not equipped with the servomotor features, there will be no servo monitor icons displayed. (Same for Safety Category Complied Type)*



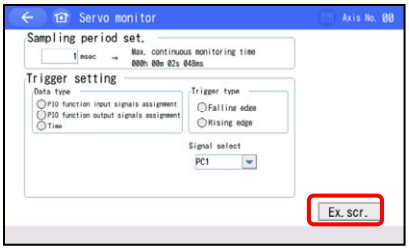
Touch [Servo monitor] in Menu 1 screen.



The servo monitor (waveform display) screen is displayed. Operations can be performed in this screen to select items, display settings, start/stop monitoring and display/save waveform.
Refer to [3.25.1 Servo Monitor (Waveform Display) Screen] for details of each button in this screen.

Touch [Details].

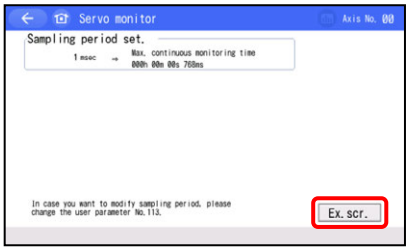
For ACON-CB/CYB, DCON-CB/CYB, PCON-CB/CYB/CBP, SCON-CB, SCON2, MCON and RCP6S



Display the window to conduct the sampling frequency setting and trigger setting. (Same for Safety Category Complied Type)
Refer to [3.25.2 Sampling Frequency Setting] and [3.25.3 Trigger Setting] for details of item settings.

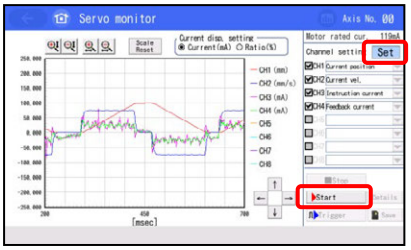
Touch Ex. Scr. and the screen returns to the servo monitor (waveform display) screen.

For ACON-CA, DCON-CA, PCON-CA, SCON-CA, MSCON, ERC3 and ERC3-GW



Current sampling frequency setting and continuous monitoring available time can be checked. Sampling frequency setting is to be conducted in Parameter No. 113 “Monitoring Frequency”. Trigger setting cannot be conducted.
(Same for Safety Category Complied Type)

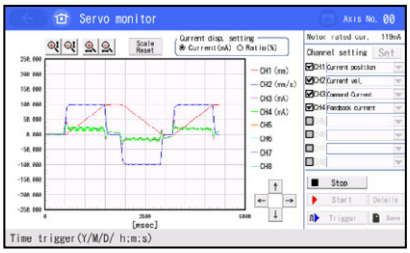
Touch [Ex. Scr.] and the screen returns to the servo monitor (waveform display) screen.



After confirming the channel setting, touch [Start Monitoring] to start monitoring. To have it in standby status for triggering, touch [Trigger Standby].

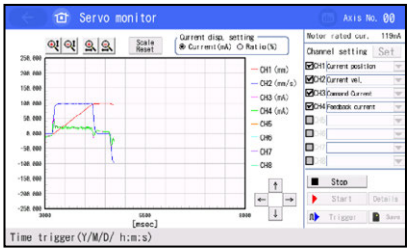
> ⚠ *Caution: Moving to another window during monitoring or trigger standby, the status of monitoring and trigger standby will be cancelled.*

■ Automatic Scroll Feature



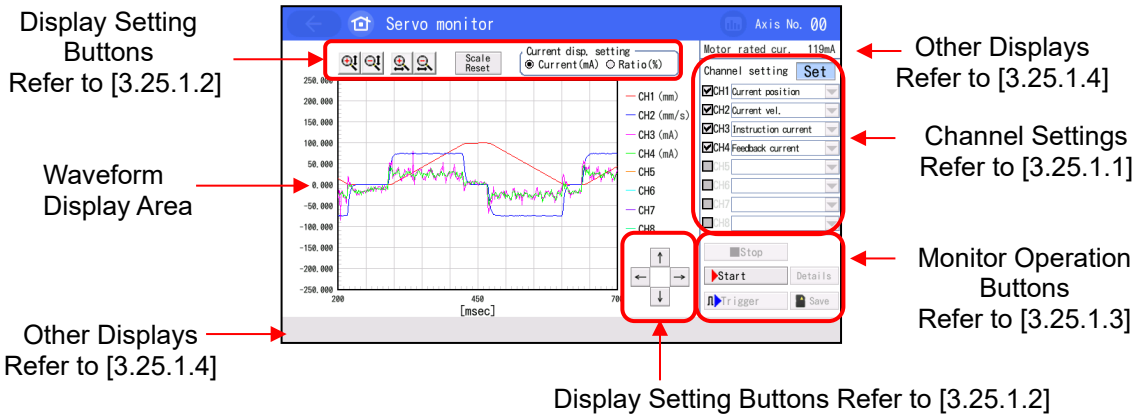
After monitoring has started, when the graph is drawn up to the end of the display area, the display area will be shifted.

Automatic Scroll



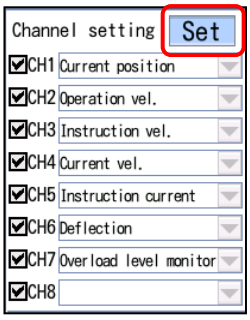
The automatic scroll stops if the monitoring is finished or any of Scroll Reset, ↑, →, ↓ or ← button (a button to scroll the display area) is pressed.

3.25.1 Servo Monitor (Waveform Display) Screen



3.25.1.1 Channel Settings

Select an item to be monitored in channel settings.



Select an item to be monitored from the select menu in each channel.
Once selection is made, touch [Confirm] to set it to monitoring standby status.

■ Checkmarks in the Left of Items
Items with a checkmark on can show the waveform in the screen.
For the items with no checkmark, the waveform will not be shown, but the data is acquired.

■ About Number of Channels
For the number of channels, selection can be made from 2, 4 and 8 (4 and 8 for SCON-CA).
Number of channels can be set in Parameter No. 112 “Monitoring Mode Select”.
[Reference] *(Note) It differs depending on models.*
• Number of channels when No. 112 is 1 = 4
• Number of channels when No. 112 is 2 = 8
• Number of channels when No. 112 is 3 = 2

The monitor items are shown in the table below.
(Note) Items subject to monitoring differ depending on models.

	Item name	Units	Unit (Note 1)
1)	Current Position	[mm]	←
2)	Velocity Operation Amount	[mm/s]	←
3)	Velocity Actual Command Value	[mm/s]	←
4)	Current Velocity	[mm/s]	←
5)	Command Current	[mA]	[%]
6)	Feedback Current	[mA]	[%]
7)	Current Load (for SCON-CA/CB/CGB, SCON2, PCON-CBP/CGBP only)	[N]	←
8)	Deviation	[Pls]	←
9)	Command Pulse Counter	[Pls]	←
10)	Overload Level Monitor	[%]	←
11)	Motion Driver Target Position (Motion type only)	[Pls]	←

Note 1 : Unit when rated ratio display selected

3.25.1.2 Display Setting Buttons



: Touch it to enlarge the scale of the graph in vertical axis.

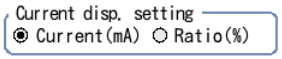
: Touch it to reduce the scale of the graph in vertical axis

: Touch it to enlarge the scale of the graph in horizontal axis

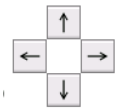
: Touch it to reduce the scale of the graph in horizontal axis



: Touch it to initialize the scale of the graph.



: Current Display Setting: System to display current can be selected



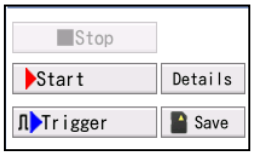
: Touch it to slide the displayed waveform frame upwards.

: Touch it to slide the displayed waveform frame downwards.

: Touch it to slide the displayed waveform frame to the left.

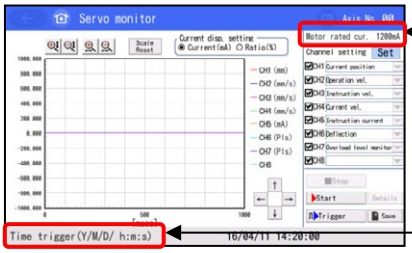
: Touch it to slide the displayed waveform frame to the right.

3.25.1.3 Monitor Operation Buttons



[Start] : Touch it to start monitoring.
[Stop] : Touch it to stop monitoring and trigger standby.
[Trigger] : Monitoring starts once the triggering conditions are satisfied.
Refer to [3.25.3 Trigger Setting]
[Details] : Touch it to display the window to conduct sampling frequency setting and trigger setting.
Refer to [3.25.2 Sampling Frequency Setting and 3.25.3 Trigger Setting]
It is available to touch when [Confirm] button is not on.
[Save] : Touch it to save the acquired data to a Secure Digital memory card in the CSV format.
Refer to [3.25.4.1 How to Save Waveform Data for the details of procedures]

3.25.1.4 Other Displays



Motor Rated Current

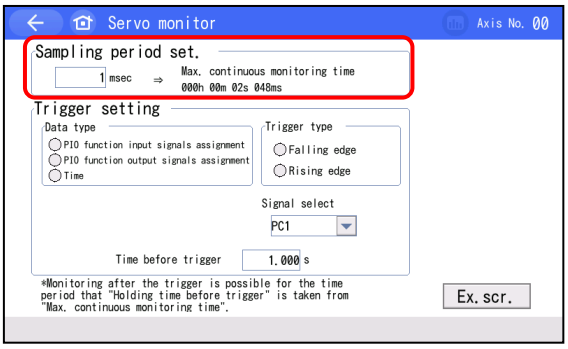
Setting Trigger Occurred Time (YY/MM/DD HH:MM:SS)

Motor Rated Current : It shows the motor rated current.
Setting Trigger Occurred Time (YY/MM/DD HH:MM:SS) : It shows the time when the triggering conditions are satisfied and monitoring is started.

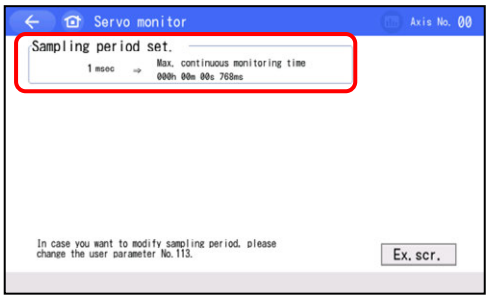
3.25.2 Sampling Frequency Setting

Press [Detail Setting] button in the servo monitor (waveform display) screen to show this screen.

Sampling period set. and continuous monitoring available time display can be conducted.
There are some models that setting of the Sampling period set. cannot be conducted, and only display of the current Sampling period set. is available.
(For the models only with display, the setting can be conducted in Parameter No. 113 “Monitoring Frequency”)



Screen for Models Only with Display



Sampling period Setting in This Screen
- After transition to this window, the value in Parameter No. 113 “Monitoring Frequency” gets initialized and the setting items for the sampling frequency will be displayed.
- Change to the setting is available in the range of the sampling frequency setting (refer to table below) for each controller.
- The value in Parameter No. 113 “Monitoring Frequency” will not be changed.

The sampling period and the number of records available to monitor for each controller are shown in the table below.

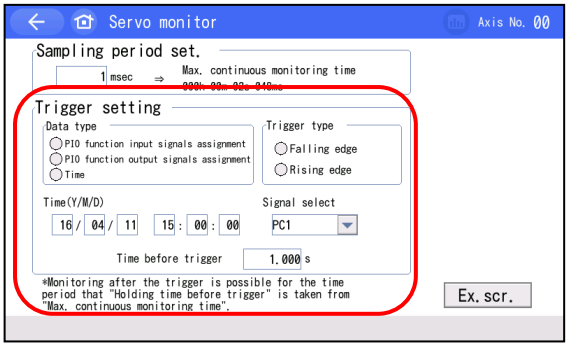
Controller (Same for Safety Category Complied Type)	Sampling period [ms]		Number of Records Available to Monitor		
	Availability of Setting	Setting Range	2-Channel Mode	4-Channel Mode	8-Channel Mode
ACON-CA, DCON-CA	Display Only	1 to 1000	8192	4096	2048
PCON-CA, ERC3	Display Only	1 to 1000	3072	1536	768
SCON-CA	Display Only	1 to 1000	-	15000	7500
MSCON	Display Only	1 to 1000	30000	15000	7500
SCON-CB, SCON2	Available for Setting	1 to 1000	30000	15000	7500
ACON-CB/CYB/PLB/POB, DCON-CB/CYB/PLB/POB, PCON-CB/CBP/CYB/PLB/POB, RCP6S	Available for Setting	1 to 60000	8192	4096	2048
MCON	Available for Setting	1 to 60000	4096	2048	1024

Continuous monitoring available time should be: Sampling period * Number of Records Available to Monitor

3.25.3 Trigger Setting

Trigger setting is available on ACON-CB/CYB/PLB/POB, DCON-CB/CYB/PLB/POB, PCON-CB/CBP/CYB/PLB/POB, SCON-CB, SCON2, MCON and RCP6S. (Same for Safety Category Complied Type)

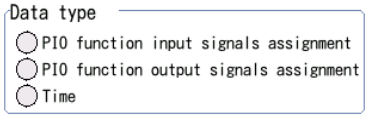
Press [Detail Setting] button in the servo monitor (waveform display) screen to show this screen.



Left of the screen, for purposes of explanation, it displays all of the configuration items.
Depending on the model and setting values that are connected, there are items that you do not want to display.

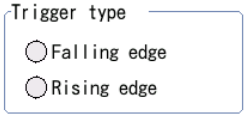
3.25.3.1 Setting Items in Trigger Setting

[Data type]
Select a condition to start monitoring from the three types below:



○PIO function input signals assignment
○PIO function input signals assignment
○Time

[Trigger type]
When “PIO Function Input Assignment (Bit)” or “PIO Function Output Assignment (Bit)” has been selected as the data type, select with which of the signal rising or falling the monitor should be started.

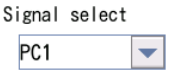


○Falling edge
○Rising edge

[Time (Y/M/D)]
When “Clock” has been selected at the data type, set the monitoring starting day.



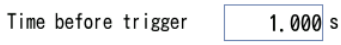
[Signal select]
When “PIO Function Input Assignment (Bit)” or “PIO Function Output Assignment (Bit)” has been selected as the data type, select the trigger signal.



It is available to select the signals assigned to the operation mode for each controller.

[Time before trigger]
It is available to acquire data for the indicated time from the triggering condition satisfaction.

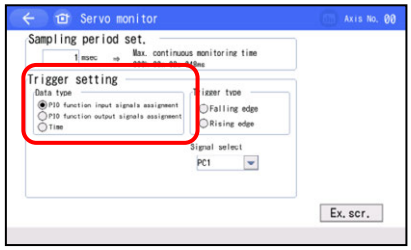
Feature for SCON-CB, SCON2 Only



(Note) The time to acquire data after the triggering condition satisfaction is time that “Retain Time before Triggering” is subtracted from “Continuous Monitoring Available Time”.

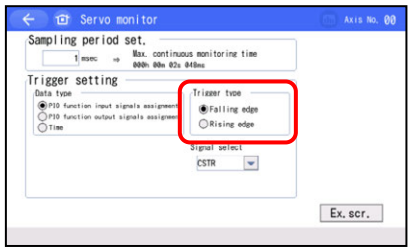
3.25.3.2 When Conducting Trigger Setting with Input and Output Signals

Indicate the condition to start monitoring with the input or output signal (1 bit) assigned to the operation mode for each controller.



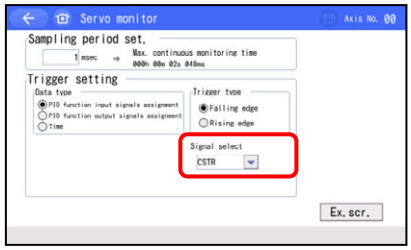
Select either of “PIO Function Input Assignment (Bit)” or “PIO Function Output Assignment (Bit)” in the data type.

When required to establish setting with input signal: select “PIO Function Input Assignment (Bit)”
When required to establish setting with output signal: select “PIO Function Output Assignment (Bit)”



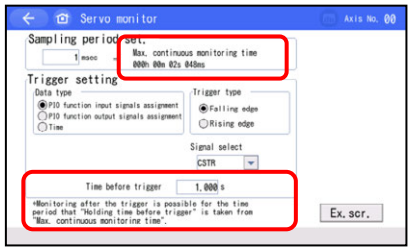
Select either of “Falling Edge” or “Rising Edge” in the trigger type.

When required to establish setting with falling: select “Falling Edge”
When required to establish setting with rising: select “Rising Edge”



Select a signal that can be a trigger in the signal select.

Signal can be selected from the input or output signals assigned to the operation mode for each controller.

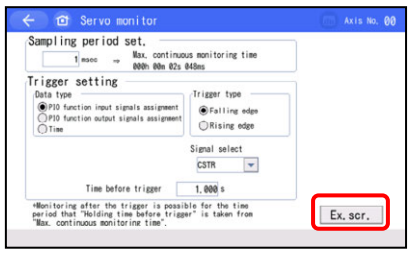


Feature for SCON-CB, SCON2 Only

Setting of the retain time before triggering is available.

By setting the time to this item, it is available to acquire data for the indicated time from the triggering condition satisfaction.
Set 0 when it is not required to use this feature.

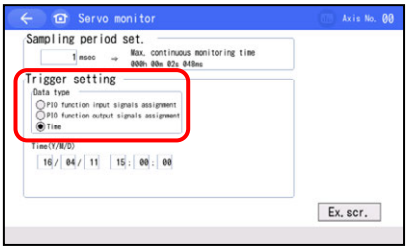
(Note) The time to acquire data after the triggering condition satisfaction is time that this setting is subtracted from the continuous monitoring available time.



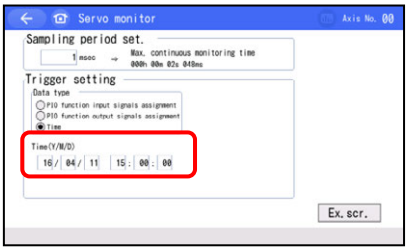
Touch [Ex. Scr.] button and the screen returns to the servo monitor (waveform display) window.

3.25.3.3 When Having Trigger Setting with Timer

The condition to start monitoring is indicated by day and time.

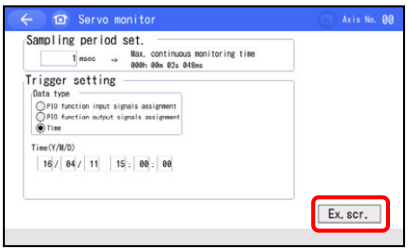


Select “Time” in Data Type.



The item setting for Year/Month/Day, Time gets displayed.
In the item setting, Year/Month/Day, Time when the screen was transited to the servo monitor window gets displayed.

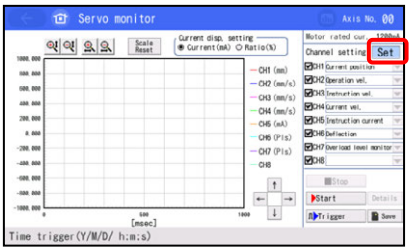
Set Year/Month/Day, Time that is later than now.



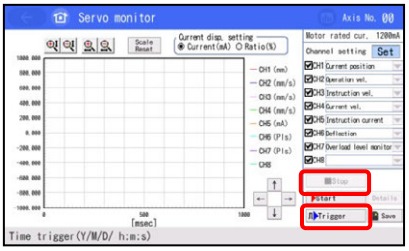
Touch [Ex. Scr.] button and the screen returns to the servo monitor (waveform display)

3.25.3.4 Start Trigger Standby Status

Trigger standby status can be started with procedures below for both situations when trigger setting was conducted with input and output signals and when conducted with time.



Touch [Set] in the servo monitor (waveform display) window to confirm the channel setting.



Touch [Trigger] to make it to the trigger standby status.
In order to cancel the trigger standby status, touch [Stop Monitoring].

Monitoring starts once the triggering conditions are satisfied.
Monitoring start time gets displayed on the right in “Setting Trigger Occurred Time” on the very bottom of the screen.

3.25.4 Operation to Save Data

3.25.4.1 How to Save Waveform Data



Insert a Secure Digital memory card.

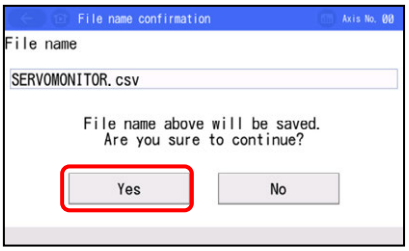
Touch [Save] while monitoring is stopped.



The file name indication screen opens. Input a file name and touch [ENT].

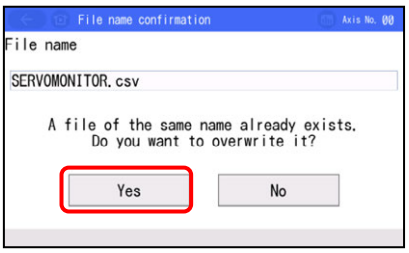


Touch [Save].



The file name confirmation screen pops up.
Touch [Yes].

Save the data, and return to the servo monitor screen.



In case there is a file with the same name exists, overwriting confirmation window appears.
Touch Yes if it is allowed to overwrite the old.

Save the data, and return to the servo monitor screen.

Domain to Save Data (cannot be changed)

The domain that the servo monitor data is saved is the folder stated below in a Secure Digital memory card.

\TB_CON\MonitorData\FileName.csv

3.25.4.2 To Obtain Screenshot

It is not available to obtain a screenshot while in monitoring.
Stop monitoring first, and then obtain a screenshot.
For detail of operation, refer to [10.1 Screenshot]

3.26 Press Program

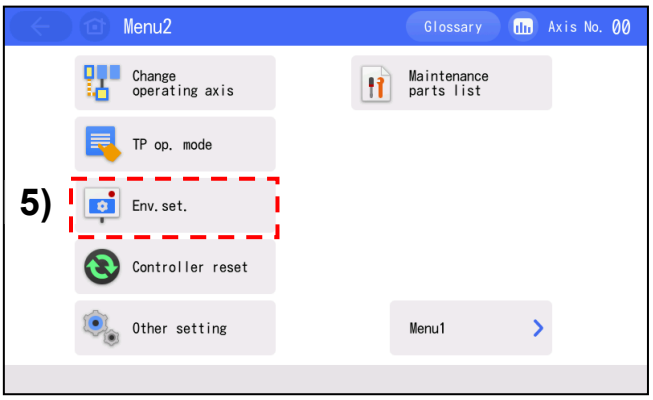
Operation of controller in the servo pressing type should be conducted in windows for pressing program.

- SCON-CB Controller Servo Pressing Type ····· Applicable in Ver. 1.40 and later
- SCON2 Controller Servo Pressing Type····· Applicable in Ver. 4.10 and later

The pressing program is to be used instead of the position data in the servo press type. Therefore, “Edit Position” icon will be replaced with “Edit Pressing Program” icon, and the display of the operation windows for test run and Secure Digital memory card will be changed to those applicable for the operations and edit / save for the pressing programs. Monitoring feature also be changed to that suitable for the servo press type.

Below shows the items that have windows dedicated for the pressing programs.





1) Windows in the monitor will differ. Refer to [3.26.1 Press Program Monitor]
2) “Edit Pressing Program” icon will be displayed in Menu 1 window.
   Refer to [3.26.2 Press Program Edit]
3) Windows in the test run will differ. Refer to [3.26.3 Press Program Test run]
4) Windows in the Secure Digital memory card will differ. Refer to [3.26.4 Secure Digital Memory Card]
5) Windows partially differ in the environment setting. Refer to [3.18 Environment Setting]
6) Guide related features (Note 1) cannot be used. (Guide icon in Menu 1 window will not be displayed)

Note 1 Features of “Position Edit Guide”, “I/O Control Guide” and “Simple Program Setting”

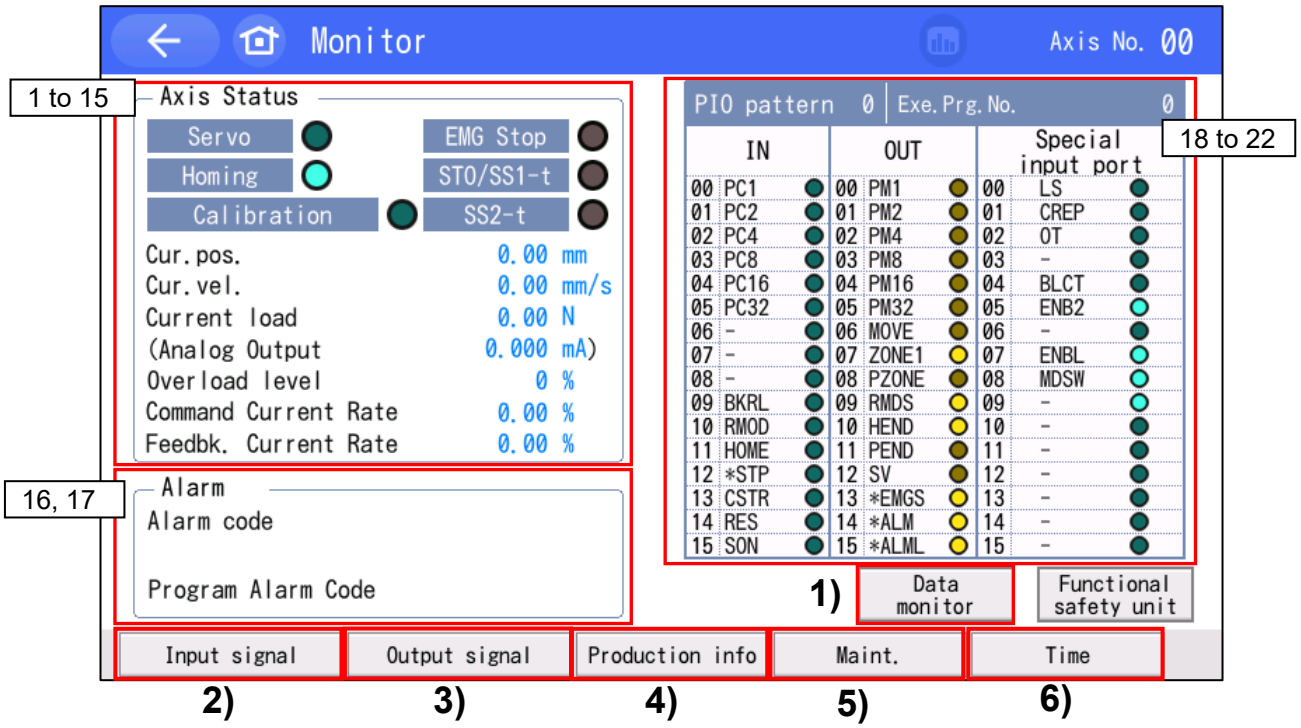
In 3.26, explains about 1) to 4).

3.26.1 Press Program Monitor

3.26.1.1 Press Program Monitor Screen

Touch [Monitor] button on the Menu 1 screen.

It shows the I/O status and current position of the connected controller.



Press program Monitor Screen Button List

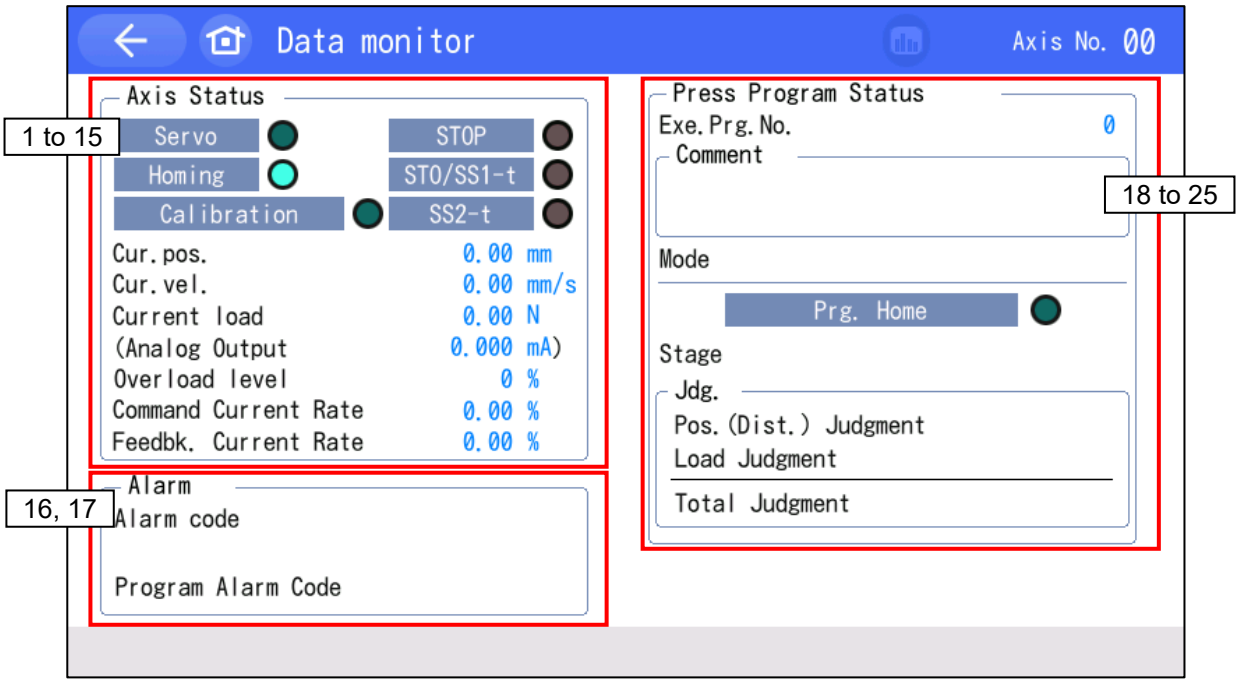
	Botton Name	Explanations
1)	Data monitor	Data monitor screen opens. Refer to [3.26.1.2]
2)	Input signal	It shows the term explanation window for input signals. Refer to [3.26.1.3]
3)	Output signal	It shows the term explanation window for output signals. Refer to [3.26.1.4]
4)	Production info	Productrion information screen opens. Refer to [3.17]
5)	Maint.	Maintenance screen opens. Refer to [3.9.2]
6)	Time	It shows the controller clock setting window. Refer to [3.9.3]

Press Program Monitor Screen Display List

	Name	Explanations
1	Servo	The servo status is shown. ON is lit. OFF is unlit.
2	Homing	The home return status is shown. Lit, if home return has completed.
3	Calibration	The status of loadcell calibration is shown. Lit, if loadcell calibration has completed.
4	Stop	It shows the status of stop. It is on when it is stopped. It turns off when the stop condition is released.
5	STO/SS1-t	It shows the status of STO/SS1-t for STO/SS1-t type of SCON-CB/SCON2. It is on when in STO/SS1-t condition. It turns off when the condition is released.
6	SS2-t	It shows the status SS2-t for SS2-t type of SCON-CB/SCON2. It is ON when in SS2-t condition. It turns OFF when the condition is released.
7	Cur. pos.	The current position is shown.
8	Cur. vel.	The current speed is shown.
9	Current load	The current load is shown.
10	Analog output	It shows the analog current output from the MF I/F connector on the controller in accordance with the current load.
11	Overload level	Tthe overload level is shown.
12	Command current rate	The command value of electrical current is shown as a percentage of the rated current. The current value will be shown if touching the command current rate.
13	Feedbk. current ratio	It shows the rate of the feedback current to the rated value. The current value will be shown if touching the feedback current rate.
14	Command current value	The command current value is shown. The current rate will be shown if touching the command current value.
15	Feedbk. Current Value	The feedback current is shown. The current rate will be shown if touching the feedback current value.
16	Alarm code	It shows the alarm codes of the controller. It shows a blank if there is no alar occurred.
17	Program Alarm Code	The program alarm code is shown.
18	PIO pattern	It shows the PIO pattern numbers set to the controller.
19	Exe. Prg. No.	It shows the pressing program number currently being executed.
20	IN	The press program home return status is shown. ON is lit. OFF is unlit.
21	OUT	The output status is shown. ON is lit. OFF is unlit.
22	Special Input port	It shows the status of such as the enable switch. ON is lit. OFF is unlit.

3.26.1.2 Data Monitor Screen

Touch [Data Monitor] button in the pressing program monitor window.



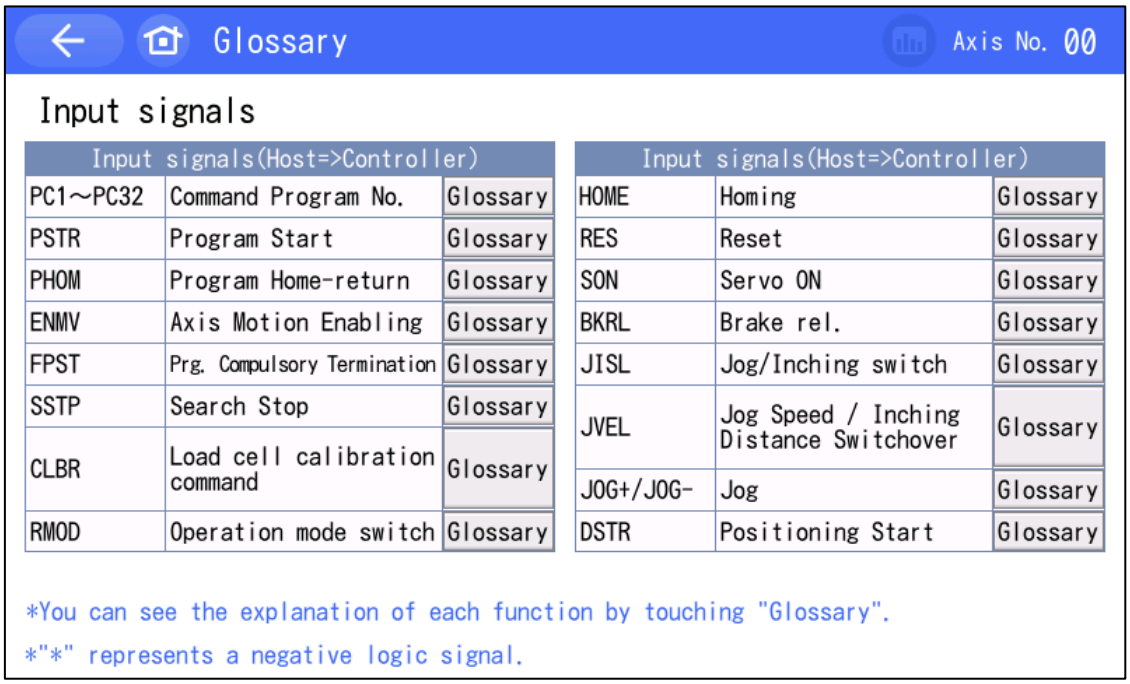
Press Program Data Monitor Screen Display List

	Name	Explanations
1	Servo	The servo status is shown. ON is lit. OFF is unlit.
2	Homing	The home return status is shown. Lit, if home return has completed.
3	Calibration	The status of loadcell calibration is shown. Lit, if loadcell calibration has completed.
4	Stop	It shows the status of stop. It is on when it is stopped. It turns off when the stop condition is released.
5	STO/SS1-t	It shows the status of STO/SS1-t for STO/SS1-t type of SCON-CB/SCON2. It is on when in STO/SS1-t condition. It turns off when the condition is released.
6	SS2-t	It shows the status SS2-t for SS2-t type of SCON-CB/SCON2. It is ON when in SS2-t condition. It turns OFF when the condition is released.
7	Cur. pos.	The current position is shown.
8	Cur. vel.	The current speed is shown.
9	Current load	The current load is shown.
10	Analog Output	It shows the analog current output from the MF I/F connector on the controller in accordance with the current load.
11	Overload level	Tthe overload level is shown.

	Name	Explanations
12	Command Current Rate	The command value of electrical current is shown as a percentage of the rated current. The current rate will be shown if touching the command current value.
13	Feedbk. Current Rate	It shows the rate of the feedback current to the rated value. The current value will be shown if touching the feedback current rate.
14	Command Current Value	The command current is shown. The current rate will be shown if touching the command current value.
15	Feedbk. Current Value	The feedback current is shown. The current rate will be shown if touching the feedback current value.
16	Alarm code	It shows the alarm codes of the controller. It shows a blank if there is no alar occurred.
17	Program Alarm Code	The program alarm code is shown.
18	Exe. Prg No.	It shows the pressing program number currently being executed.
19	Comment	It shows the comment set in the pressing program number currently being executed.
20	Mode	It shows the pressurizing operation mode set in the pressing program number currently being executed.
21	Prg Home	The program home return status is shown. It turns on when the movement operation to the program home position is complete.
22	Stage	It shows the control stage of the pressing program number currently being executed.
23	Pos. (Dist.) Judgment	It shows the result of the position (distance) judgment. If the result is passed, it shows OK and NG if it resulted failed. It shows blank before judgment is conducted.
24	Load Judgment	It shows the result of the load judgment. If the result is passed, it shows OK and NG if it resulted failed. It shows blank before judgment is conducted.
25	Total Judgment	It shows the result of the position (distance) judgment and the load judgment. It shows OK if both of the positon (distance) judgment and the load judgment resulted passed. It shows NG if both of the positon (distance) judgment and the load judgment resulted failed. It shows NG if the positon (distance) judgment resulted passed but the load judgment failed, or the positon (distance) judgment resulted failed while the load judgment passed. It shows OK if the positon (distance) judgment resulted passed but the load judgment unjudged, or the positon (distance) judgment is unjudged while the load judgment resulted passed. It shows blank before judgment is conducted.

3.26.1.3 Input Signals Glossary

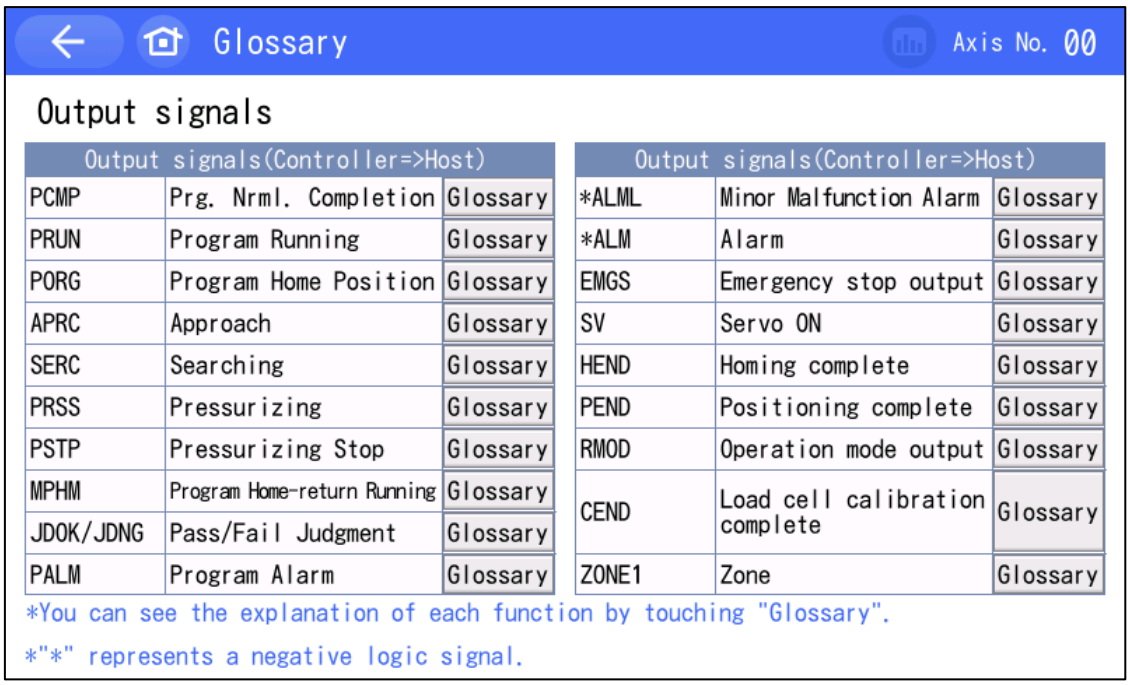
Touch [Input Signal Explanation] button in the pressing program monitor window.



Touch [Glossary] in each item and you can check the details of features.

3.26.1.4 Output Signals Glossary

Touch [Output Signal Explanation] button in the pressing program monitor window.



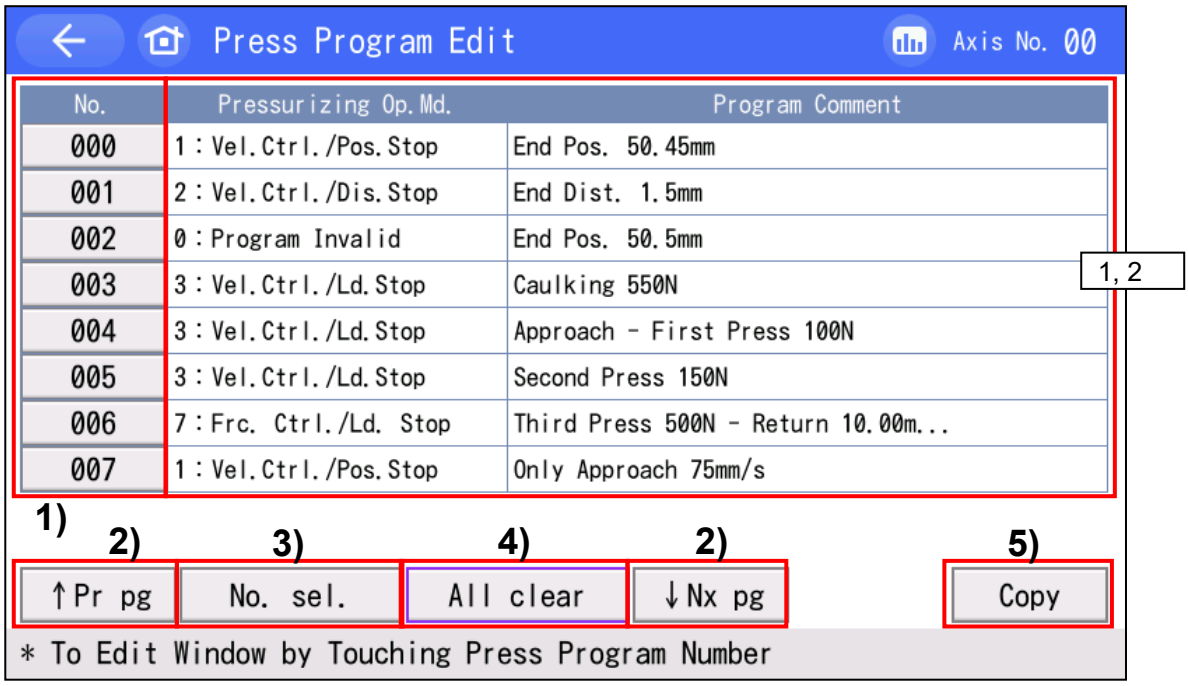
Touch [Glossary] in each item and you can check the details of features.

3.26.2 Press Program Edit

3.26.2.1 Press Program Select Screen

Touch [Press Program] button on the Menu 1 screen.

It is a window to select, copy and delete the saved pressing programs.



Press Program Select Screen Button List

	Botton Name	Explanations
1)	Press Program No.	It shows the individual edit window for the selected pressing program number.
2)	↑ Pr pg, ↓ Nx pg	It shows the previous and next pages of the pressing program list.
3)	No. sel.	Indicate a pressing program number, and it show the page including the indicated pressing program.
4)	All clear	Delete all the pressing programs in the controller. Refer to [3.26.2.4 (1)]
5)	Copy	The press program copy is shown.Refer to [3.26.2.3]

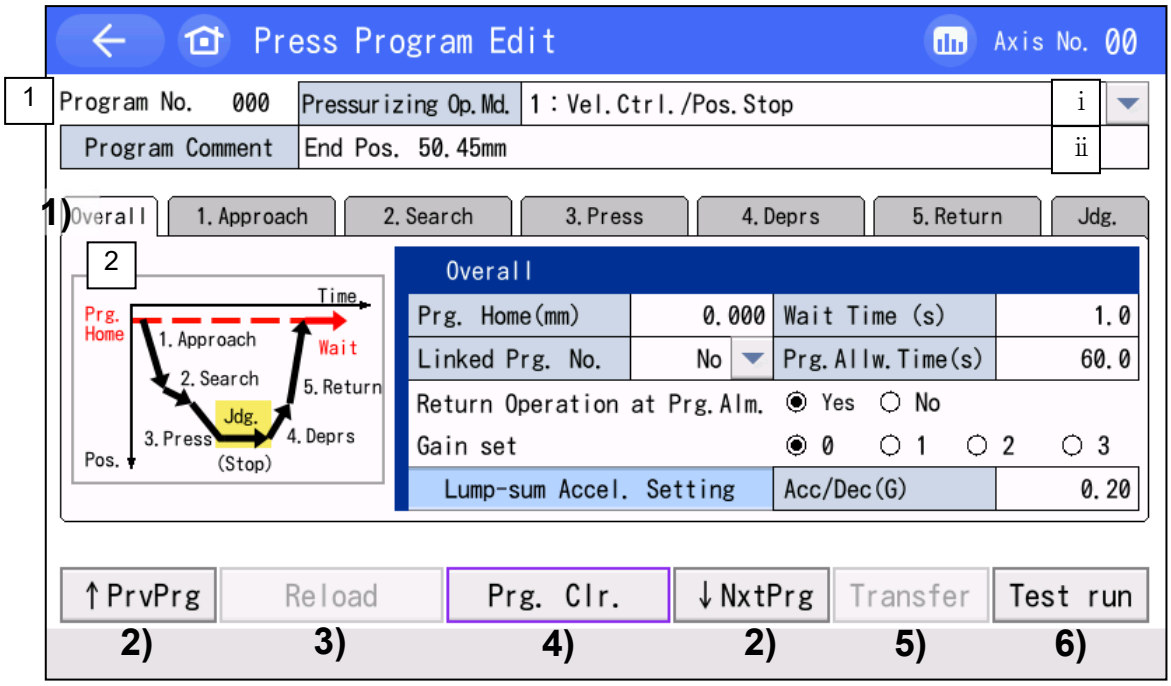
Press Program Select Screen Display List

	Botton Name	Explanations
1	Pressurizing Op.Md.	It shows the pressurizing operation mode set to the pressing program.
2	Program Comment	It shows the comment set in the pressing program. It can show 32 half-size font characters and 16 full-size font characters at the maximum, and show "…" after that.

3.26.2.2 Press Program Edit Screen

Touch a button for the pressing program number to be edited in the pressing program select window.

Pressing program setting can be performed.



Press Program Select Screen Button List

	Botton Name	Explanations
1)	Tab Select	Select each tab and the input display can be switched over. If any change is made in a tab, the name of the tab gets displayed in red. If the setting in the pressurizing operation mode has not been established, no tab but the overall tab can be selected.
2)	↑ PrvPrg, ↓ NxtPrg	The previous pressing program and the next pressing program can be displayed.
3)	Reload	It puts back the values in the pressing program to the ones before change. It cannot be made before making any change.
4)	Prg. Clr.	It deletes the pressing programs in display in the controller. Refer to [3.26.2.4 (2)]
5)	Transfer	It transfers the setting values which change is made in the pressing program to a controller. It cannot be made before making any change.
6)	Test run	It shows the test run window for the pressing program. Refer to [3.26.3]

Press Program Select Screen Display List

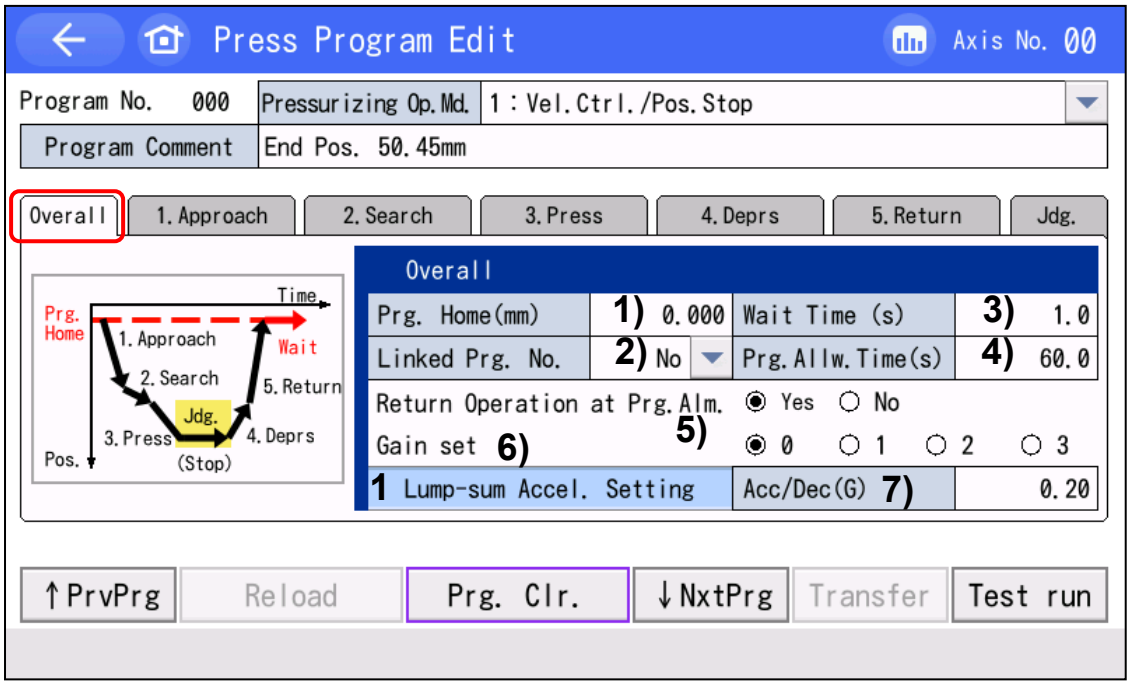
	Name	Explanations
1	Program No.	It shows the pressing program number which is currently in edit.
2	Figure of Control Stage	It shows the name and the arrow of the control stage which is currently in edit in red. It shows the name and the arrow of the control stage in gray when each control stage is inactivated. It shows all the names and arrows in gray when the pressurizing operation mode is set to “0: Program Invalid” and no registration is made.

Press Program Select Screen Input List

	Name	Explanations
i	Pressurizing Op.Md.	Following settings can be performed in the pressurizing operation mode. **Pressurizing Op.Md.** Blank (program setting not established) 0: Program Invalid 1: Velocity Control / Positon Stop 2: Velocity Control / Distance Stop 3: Velocity Control / Load Stop 4: Velocity Control / Incremental Load Stop 5: Force Control / Position Stop 6: Force Control / Distance Stop 7: Force Control / Load Stop 8: Force Control / Incremental Load Stop 9: Force Control / Position Stop 2 Setting in each item cannot be changed if [0: Program Invalid] or blank. Any pressurizing operation mode that the controller is not applicable will not be displayed. Refer to the instruction manual of the controller for detail.
ii	Program Comment	A comment can be input for the pressing program. A comment can be made with 64 half-size font characters at the maximum. The display is also capable for full-size font characters. A comment can be input even when the pressurizing operation mode is set to [0: Program Invalid]. A comment cannot be input when the pressurizing operation mode is blank.

Information for Each Tab

(1) Overall : Touch [Overall] tab.



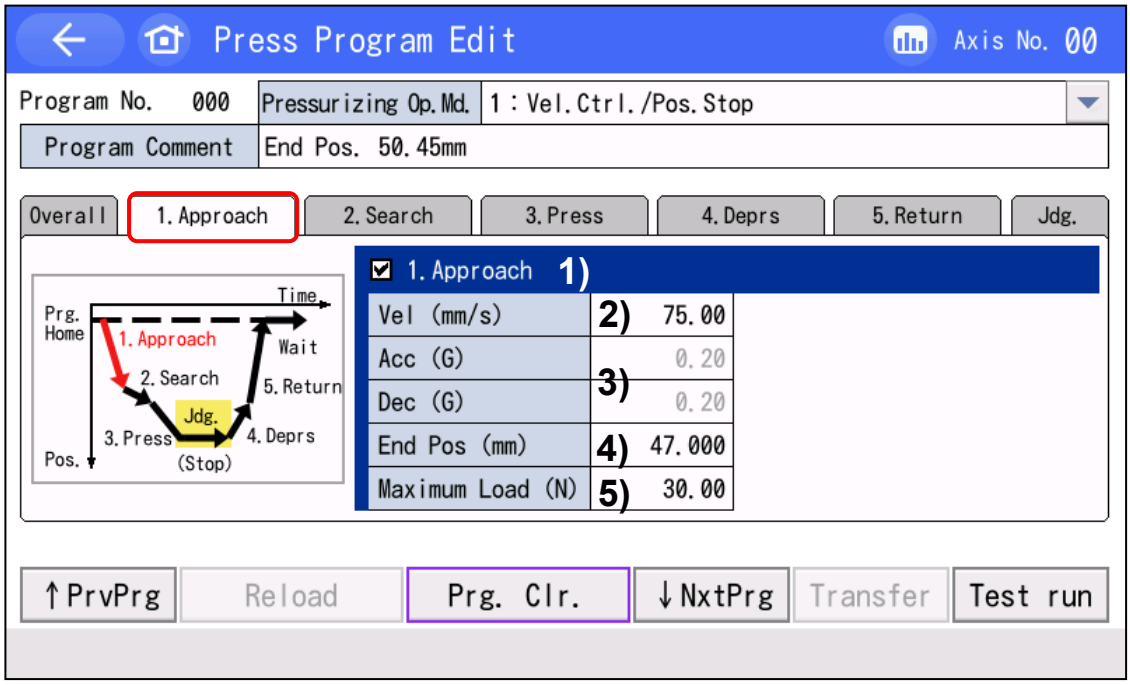
Press Program Select Screen [Overall] tab Setting List

	Name	Explanations
1)	Prg. Home (mm)	The program home position can be input.
2)	Linked Prg. No.	The pressing program number to be executed next can be input. The pressing program currently running can also be available for setting.
3)	Wait Time (s)	The standby time after finishing a pressing program can be input.
4)	Prg. Allw. Time (s)	Program execution allowable time can be input. It does not include the standby time. Input the program allowable time to make “Program Allowable Time > Pressurizing Stop Time”. Monitoring of the program allowable time will not be conducted if set to “0”.
5)	Return Operation at Prg. Alm.	Setting can be established for operation after a program alarm has been generated. With Setting: Returns to the program home position when a program alarm has been generated. With No Setting: Stays at the current position when a program alarm has been generated.
6)	Gain set	Gain set can be established.
7)	Acc/Dec (G)	Acceleration and deceleration of the whole pressing program can be input. If the acceleration and deceleration in the whole pressing program are the same at the time of change to acceleration and deceleration lump-sum setting, the value should be displayed. In case it is different, “*” will be displayed.

Press Program Select Screen [Overall] tab Button List

	Botton Name	Explanations
1	Lump-sum Accel. Setting	Select if acceleration and deceleration setting should be conducted at once. If “Acceleration and Deceleration Lump-Sum Setting” button is selected, acceleration and deceleration can be input. If “Acceleration and Deceleration Lump-Sum Setting” button is not selected, acceleration and deceleration input box will not be displayed.

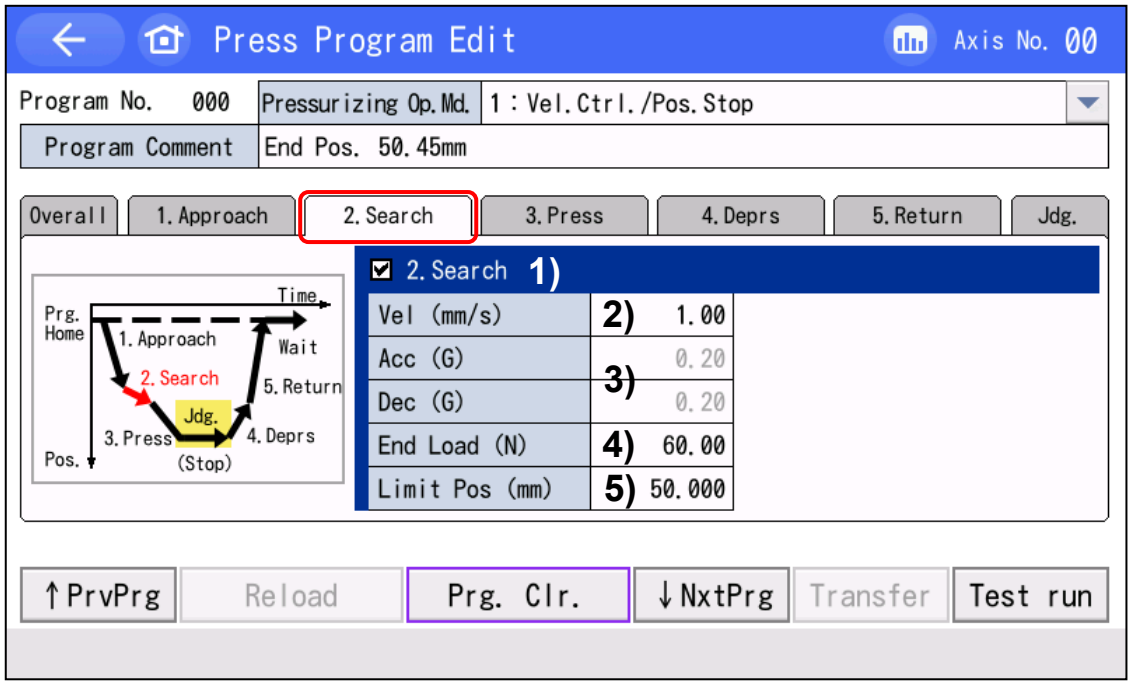
(2) Approach : Touch [1. Approach] tab.



Press Program Select Screen [1. Approach] tab Setting List

	Name	Explanations
1)	Approaching Valid / Invalid	Setting should be established whether to perform the approaching operation. Put a check mark to activate it. Remove a check mark to make it invalid, and input of velocity, acceleration, deceleration, complete position and maximum load will become unavailable.
2)	Vel (mm/s)	Velocity of the approaching operation can be input.
3)	Acc (G) Dec (G)	Acceleration and deceleration of the approaching operation can be input. The setting should basically be made within the range of the rated value stated in the catalog. A greater number than the rated value stated in the catalog may be able to be selected for the input range, however, it is for the case assuming “the purpose to shorten the takt time in the case that the transported weight is much lighter than the rated value”. Decrease the value if a problem could be caused by vibration on transported object during acceleration and deceleration. If the acceleration and deceleration lump-sum setting is valid, input cannot be made.
4)	End Pos (mm)	A positon to complete the approaching operation can be input. Input should be made for the complete position to make it “Approaching Complete Position < Searching Limit Position” and “Approaching Complete Position ≦ Pressurizing Complete Position”.
5)	Maximum Load (N)	The allowable value for the load in the approaching operation can be input.

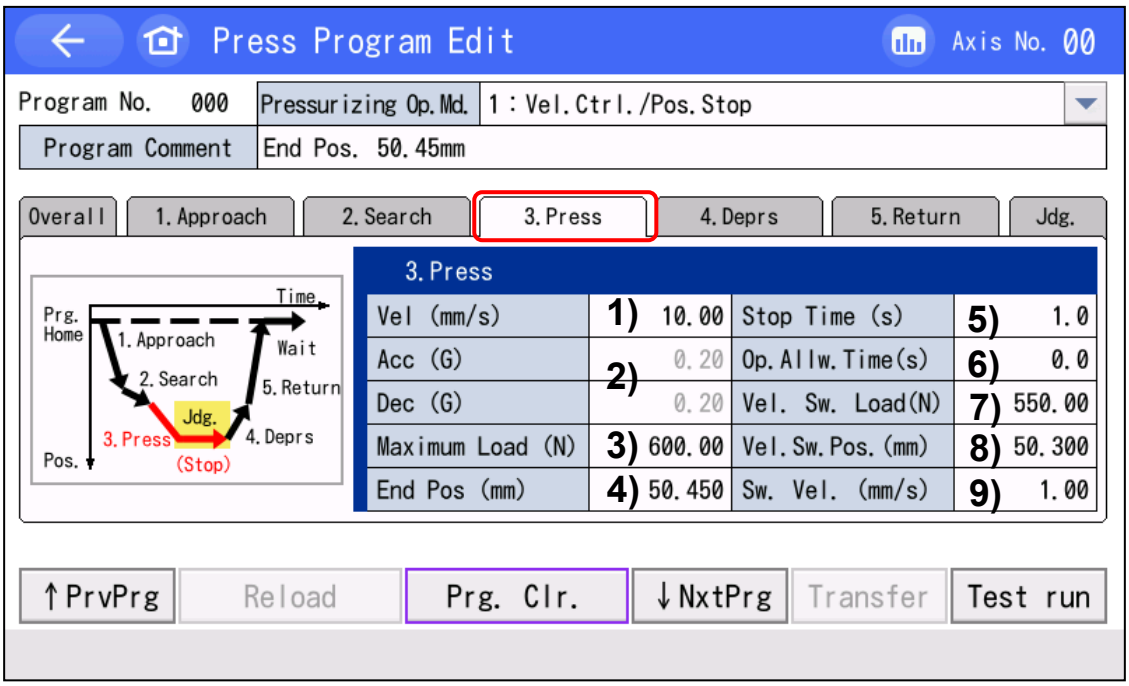
(3) Search : Touch [2. Search] tab.



Press Program Select Screen [2. Search] tab Setting List

	Name	Explanations
1)	Search Valid / Invalid	Setting should be established whether to perform the searching operation. Put a check mark to activate it. Remove a check mark to make it invalid, and input of velocity, acceleration, deceleration, complete position and maximum load will become unavailable.
2)	Vel (mm/s)	Velocity of the searching operation can be input.
3)	Acc (G) Dec (G)	Acceleration and deceleration of the searching operation can be input. The setting should basically be made within the range of the rated value stated in the catalog. A greater number than the rated value stated in the catalog may be able to be selected for the input range, however, it is for the case assuming “the purpose to shorten the takt time in the case that the transported weight is much lighter than the rated value”. Decrease the value if a problem could be caused by vibration on transported object during acceleration and deceleration. If the acceleration and deceleration lump-sum setting is valid, input cannot be made.
4)	End Pos (mm)	A load to complete the approaching operation can be input.
5)	Limit Pos (mm)	A limit positon for the searching operation can be input. Input should be made for the limit position to make it “Approaching Complete Position < Searching Limit Position” and “Searching Limit Position ≦ Pressurizing Complete Position”.

(4) Press : Touch [3. Press] tab.

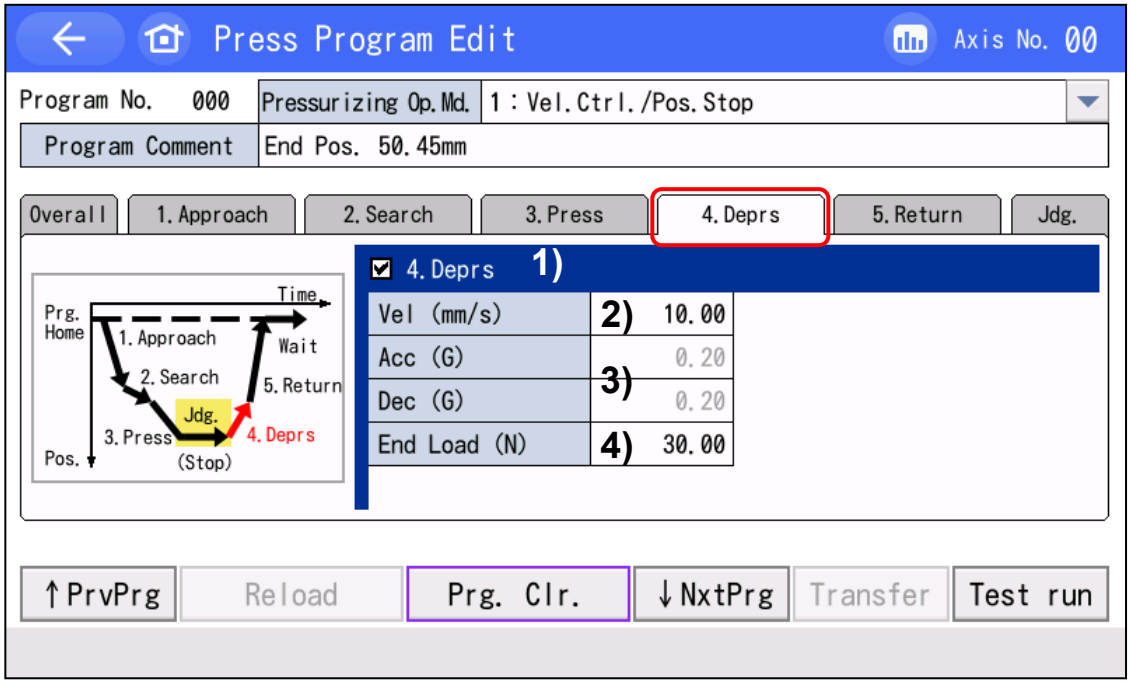


Press Program Select Screen [3. Press] tab Setting List

	Name	Explanations
1)	Vel (mm/s)	Velocity of the pressurizing operation can be input.
2)	Acc (G) Dec (G)	Acceleration and deceleration of the pressurizing operation can be input. The setting should basically be made within the range of the rated value stated in the catalog. A greater number than the rated value stated in the catalog may be able to be selected for the input range, however, it is for the case assuming “the purpose to shorten the takt time in the case that the transported weight is much lighter than the rated value”. Decrease the value if a problem could be caused by vibration on transported object during acceleration and deceleration. If the acceleration and deceleration lump-sum setting is valid, input cannot be made.
3)	Maximum Load (N)	Allowable value of the load in the pressurizing operation can be input. * It should be displayed when “1: Velocity Control / Position Stop”, “2: Velocity Control / Distance Stop”, “5: Force Control / Position Stop” or “6: Force Control / Distance Stop” in the pressurizing operation mode is selected.
	End Pos (N)	The load to finish the pressurizing operation can be input. * It should be displayed when “3: Velocity Control / Load Stop” in the pressurizing operation mode is selected.
	Target Load (N)	The load to target the pressurizing operation can be input. * It should be displayed when “3: Velocity Control / Load Stop” in the pressurizing operation mode is selected.
	Complete Incremental Load (N)	Incremental value from the start of pressurizing operation to the load can be input. * It should be displayed when “4: Velocity Control / Incremental Load Stop” in the pressurizing operation mode is selected.

	Name	Explanations
	Target Incremental Load (N)	The load to be targeted in pressurizing operation can be input in incremental value from the pressurizing operation start. * It should be displayed when “8: Force Control / Incremental Load Stop” in the pressurizing operation mode is selected.
4)	End Pos (mm)	The position to finish the pressurizing operation can be input. Input should be made for the complete position to make it “Approaching Complete Position ≦ Pressurizing Complete Position” and “Searching Limit Position ≦ Pressurizing Complete Position”.
	Complete Distance (mm)	The position to finish the pressurizing operation can be input in distance from the pressurizing operation start. * It should be displayed when “2: Velocity Control / Distance Stop” or “6: Force Control / Distance Stop” in the pressurizing operation mode is selected.
	Limit Pos (mm)	The limit position to finish the pressurizing operation can be input. “Approaching Complete Position ≦ Pressurizing Complete Position” and “Searching Limit Position ≦ Pressurizing Complete Position”. * It should be displayed when “3: Velocity Control / Load Stop” or “7: Force Control / Load Stop” in the pressurizing operation mode is selected.
5)	Stop Time (s)	The stop time after the pressurizing operation can be input.
6)	Op. Aiiw. Time (s)	The allowable time for the pressurizing operation can be input.
7)	Vel. Sw. Load (N)	Load to switch the speed during the pressurizing operation can be input. Load to switch over during the pressurizing operation can be input. * It should be displayed when “1: Velocity Control / Position Stop”, “2: Velocity Control / Distance Stop”, “3: Velocity Control / Load Stop”, “5: Force Control / Position Stop”, “6: Force Control / Distance Stop”, “7: Force Control / Load Stop” or “9: Force Control / Position Stop 2” in the pressurizing operation mode is selected.
	Velocity Switchover Incremental Load (N)	Incremental to switch the speed during the pressurizing operation can be input. * It should be displayed when “4: Velocity Control / Incremental Load Stop” or “8: Force Control / Incremental Load Stop” in the pressurizing operation mode is selected.
8)	Vel. Sw. Pos. (mm)	Position to switch the speed during the pressurizing operation can be input. * It should be displayed when “1: Velocity Control / Position Stop”, “3: Velocity Control / Load Stop”, “4: Velocity Control / Incremental Load Stop”, “5: Force Control / Position Stop”, “7: Force Control / Load Stop”, “8: Force Control / Incremental Load Stop” or “9: Force Control / Position Stop 2” in the pressurizing operation mode is selected.
	Velocity Switchover Distance (mm)	Distance to switch the speed during the pressurizing operation can be input. * It should be displayed when “2: Velocity Control / Distance Stop” or “6: Force Control / Distance Stop” in the pressurizing operation mode is selected.
9)	Sw.Vel. (mm/s)	Velocity to switch over during the pressurizing operation can be input.

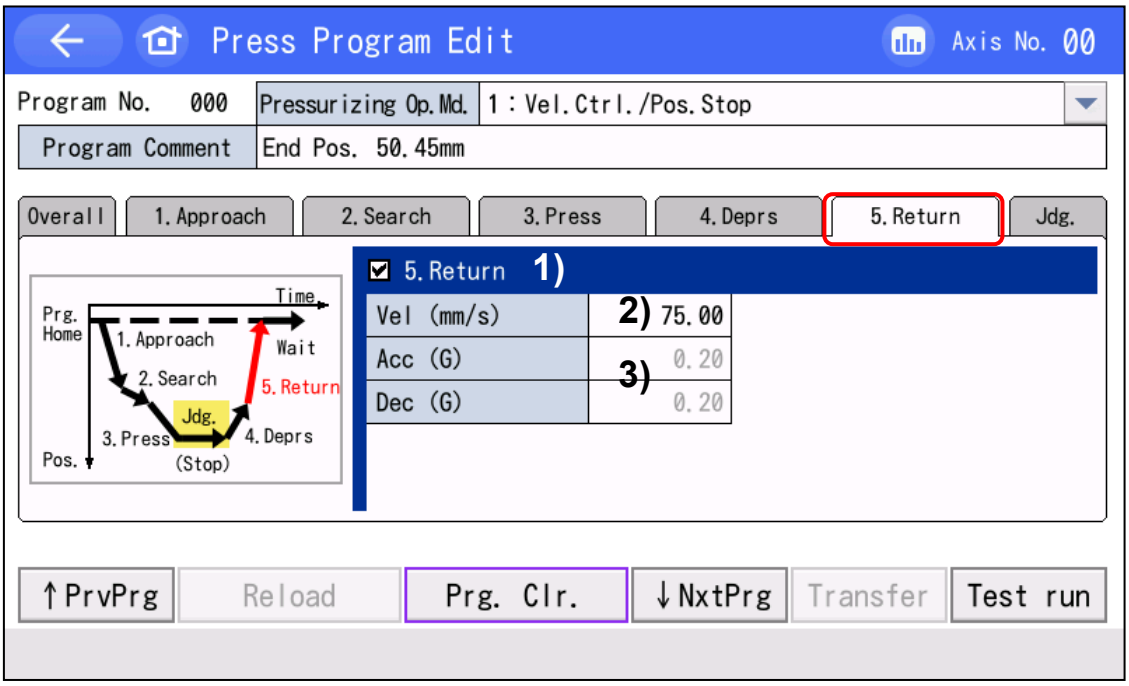
(5) Deprs : Touch [4. Deprs] tab.



Press Program Select Screen [4. Deprs] tab Setting List

	Name	Explanations
1)	Deceleration Valid / Invalid	Setting should be established whether to perform the deceleration operation. Put a check mark to activate it. Remove a check mark to make it invalid, and input of velocity, acceleration, deceleration, complete position and maximum load will become unavailable.
2)	Vel (mm/s)	Velocity of the deceleration operation can be input.
3)	Acc (G) Dec (G)	Acceleration and deceleration of the deceleration operation can be input. The setting should basically be made within the range of the rated value stated in the catalog. A greater number than the rated value stated in the catalog may be able to be selected for the input range, however, it is for the case assuming “the purpose to shorten the takt time in the case that the transported weight is much lighter than the rated value”. Decrease the value if a problem could be caused by vibration on transported object during acceleration and deceleration. If the acceleration and deceleration lump-sum setting is valid, input cannot be made.
4)	End Load [N]	A load to complete the deceleration operation can be input.

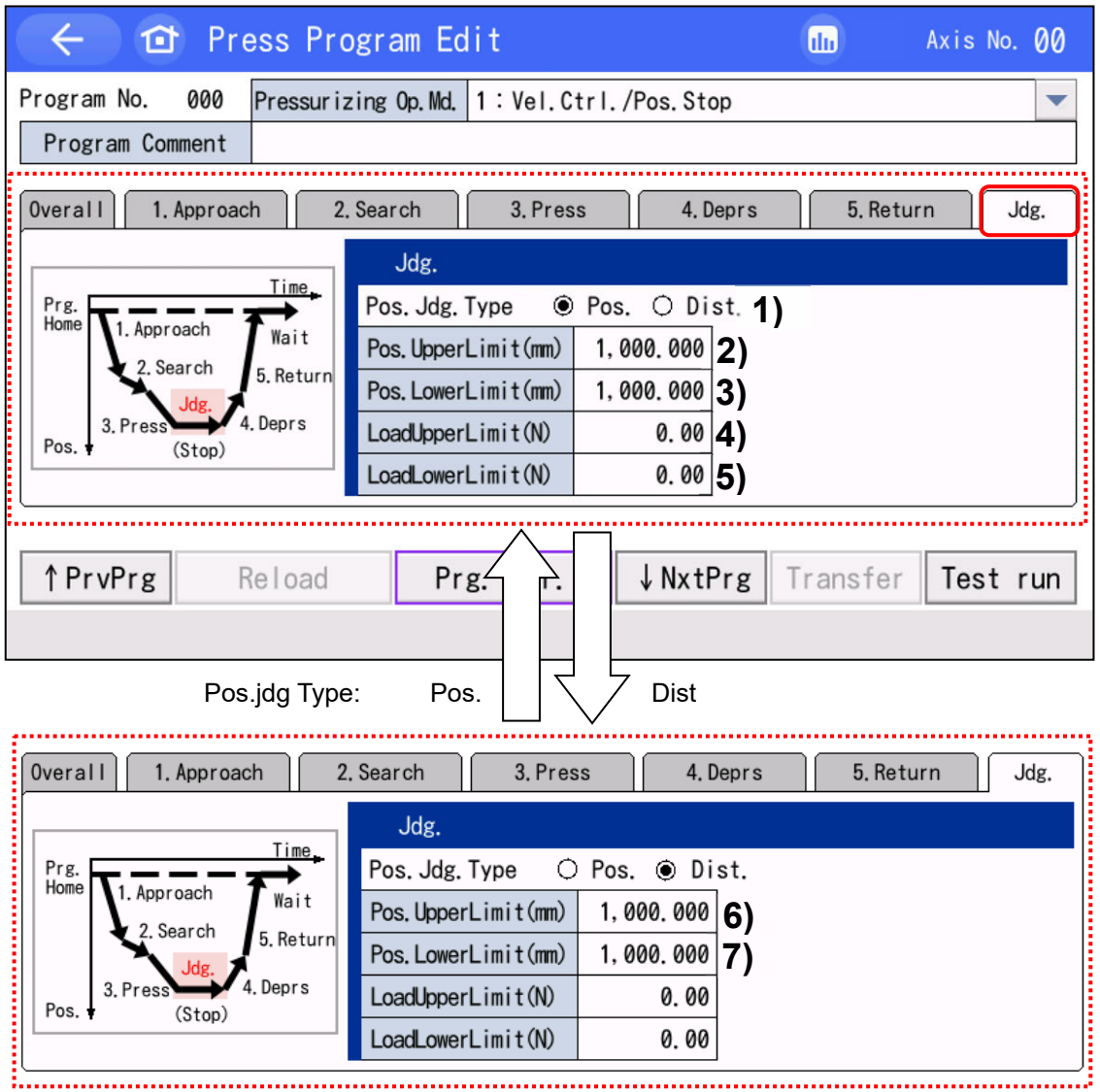
(6) Return : Touch [5. Return] tab.



Press Program Select Screen [5. Return] tab Setting List

	Name	Explanations
1)	Return Valid / Invalid	Setting should be established whether to perform the return operation. Put a check mark to activate it. Remove a check mark to make it invalid, and input of velocity, acceleration, deceleration, complete position and maximum load will become unavailable.
2)	Vel (mm/s)	Velocity of the return operation can be input.
3)	Acc (G) Dec (G)	Acceleration and deceleration of the return operation can be input. The setting should basically be made within the range of the rated value stated in the catalog. A greater number than the rated value stated in the catalog may be able to be selected for the input range, however, it is for the case assuming “the purpose to shorten the takt time in the case that the transported weight is much lighter than the rated value”. Decrease the value if a problem could be caused by vibration on transported object during acceleration and deceleration. If the acceleration and deceleration lump-sum setting is valid, input cannot be made.

(7) Jdg. : Touch [Jdg.] tab.

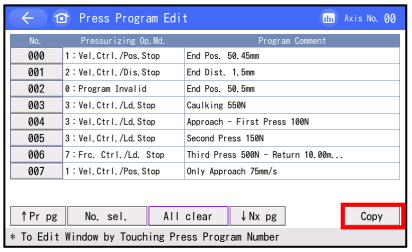


Press Program Select Screen [Jdg.] tab Setting List

	Name	Explanations
1)	Pos. Jdg. Type	Position judgment method can be set. Select “Position” to make the judgment made with position, and “Distance” with distance.
2)	Pos. UpperLimit (mm)	The upper limit for the position judgement can be input. Set the upper and lower positions to the same value and the position judgement becomes invalid.
3)	Pos. LowerLimit (mm)	The lower limit for the position judgement can be input. Set the upper and lower positions to the same value and the position judgement becomes invalid.
4)	LoadUpperLimit (N)	The upper limit for the load judgement can be input. Set the upper and lower loads to the same value and the load judgement becomes invalid.
5)	LoadLowerLimit (N)	The lower limit for the load judgement can be input. Set the upper and lower loads to the same value and the load judgement becomes invalid.
6)	Dis. UpperLimit (mm)	The upper limit for the distance judgement can be input. Set the upper and lower distance s to the same value and the distance judgement becomes invalid.
7)	Dis. LowerLimit (mm)	The lower limit for the distance judgement can be input. Set the upper and lower distance s to the same value and the distance judgement becomes invalid.

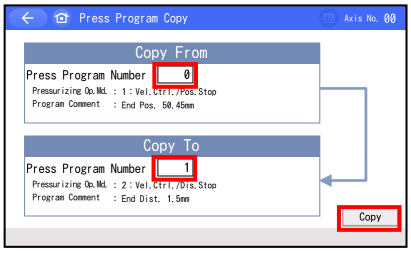
3.26.2.3 Press Program Copy

Copy of a saved pressing program can be made.



Check the program number to make a copy from and the domain number to make a copy to in the pressing program select window.

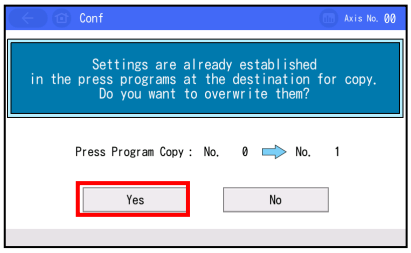
Touch [Copy].



The press program copy screen appears.
Input the number to copy from and the number to copy to.

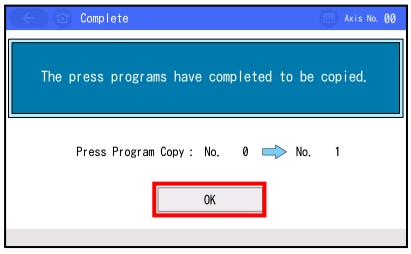
Touch [Copy].

(Note) [Copy] cannot be touched unless both of the number to copy from and the number to copy to are input.



A confirmation window for overwriting will show up if a pressing program is saved in the number to make a copy to.

Touch [Yes] when overwriting.
Touch [No] to cancel overwriting.
(The screen will go back to the pressing program copy window in this case.)



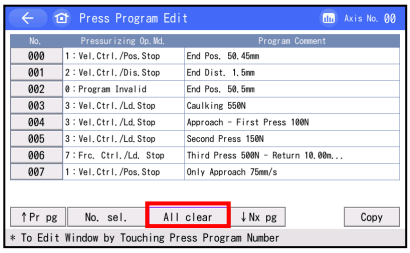
Copy Complete window will be displayed once the copy is complete.

Touch [OK].

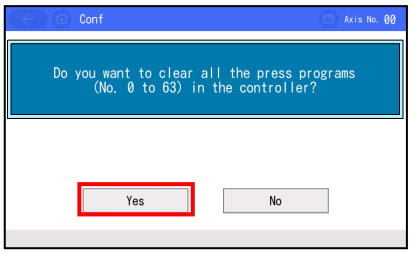
Return to the press program edit scrren.

3.26.2.4 Erasing Pressing Programs

(1) How to Delete All Pressing Programs at Once



Touch [All clear] on the press program edit screen.

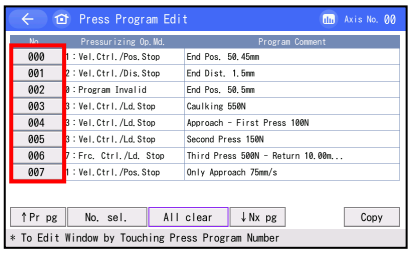


The press program all clear confirmation screen appears.
Touch [Yes].

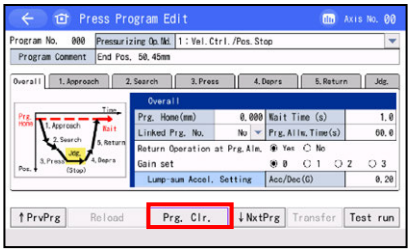
To cancel the clear all, touch [No].

Return to the press program edit scrren.

(2) How to Delete Pressing Program Individually

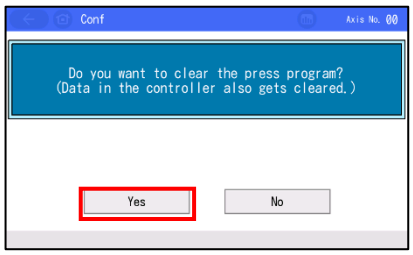


Touch the pressing program numbers that you would like to delete in the pressing program select window.



The press program clear confirmation screen appears.

Touch [Prg. Clr.].

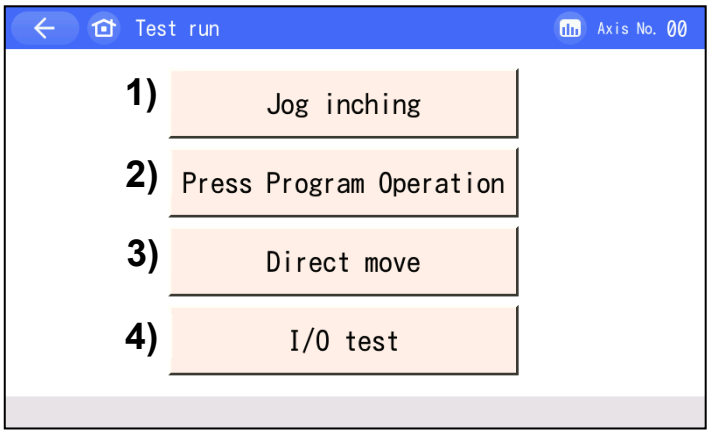


The press program clear conf screen appears.
Touch [Yes].

Return to the press program edit scrren.

3.26.3 Press Program Test Run

Touch [Test run] button in Menu 1 window.



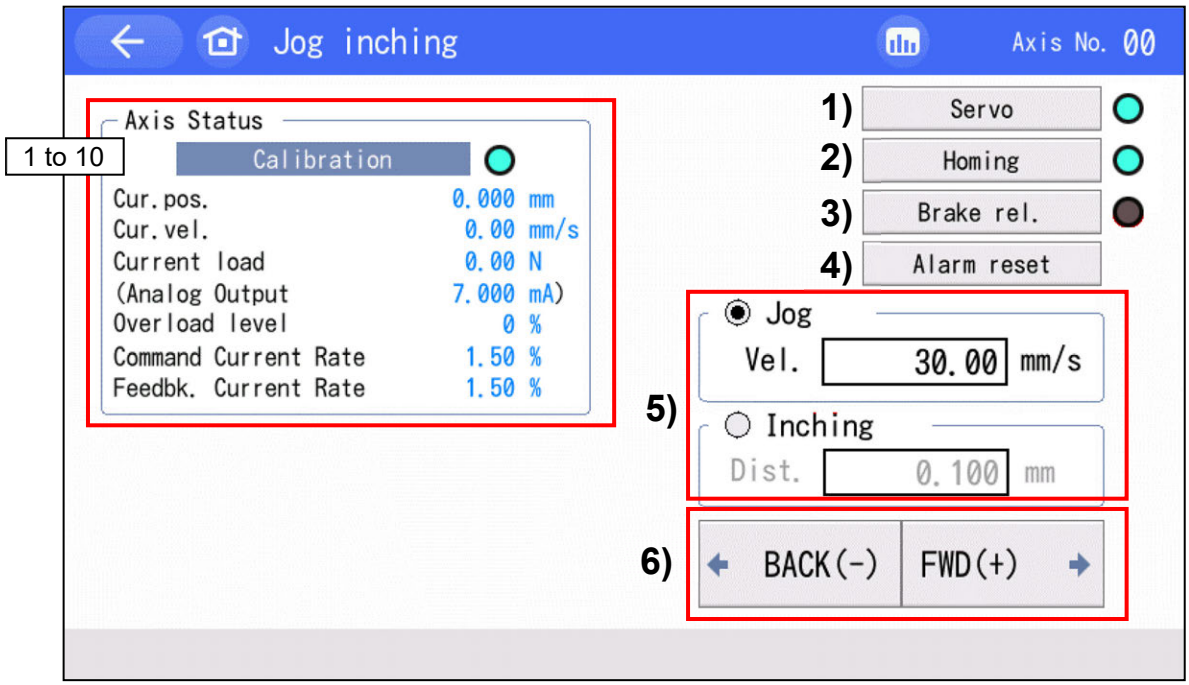
Press Program　Test run Menu Screen　Button List

	Botton Name	Explanations
1)	Jog inching	It shows the window for JOG / Inching. Refer to [3.26.3.1]
2)	Press Program Operation	It shows the pressing program operation window. Refer to [3.26.3.2]
3)	Direct move	It shows the direct numerical command movement window. Refer to [3.26.3.4]
4)	I/O test	It shows the I/O testing window. Refer to [3.12.4]

3.26.3.1 Jog Inching Screen

JOG / Inching operation can be conducted.

Touch the JOG / Inching operation button in the pressing program test run menu window.



Press Program Jog Inching Screen Button List

	Name	Explanations
1)	Servo	Touch [Servo] while the servo is off to turn the servo on for an axis and turn on the status display. If touching [Servo] while the servo is on, the servo for an axis will turn off and the status display turns off.
2)	Homing	Touch [Home-Return], and an axis performs the home-return operation and the status display turns on.
3)	Brake rel.	For an actuator equipped with a brake, touch [Brake Compulsory Release], and the screen shifts to the brake compulsory release confirmation window. Once the brake gets compulsorily released, the status display turns on. Touch [Brake Compulsory Release] again, and the brake gets locked and the status display turns off.
4)	Alarm Reset	Touch [Alarm reset] to cancel an alarm.
5)	Jog Inching	Select JOG, and the JOG velocity becomes valid and input gets available. Select Inching, and the inching velocity becomes valid and input gets available. While JOG setting is activated, input of inching distance becomes unavailable. While inching setting is activated, input of JOG velocity becomes unavailable.
6)	FWD (+), BACK (-)	When the JOG operation is selected, an axis moves in the set velocity while it is being touched. When the inching operation is selected, an axis moves in the set distance every time it is touched. [FWD (+)] moves an axis in the positive direction. [BACK (+)] moves an axis in the negative direction. Touching it and hold it for two seconds in the inching operation, and JOG operation can be made in 1mm/s. After that the speed increases as 1mm/s → 10mm/s → 30mm/s → 50mm/s → 100mm/s in every one second.

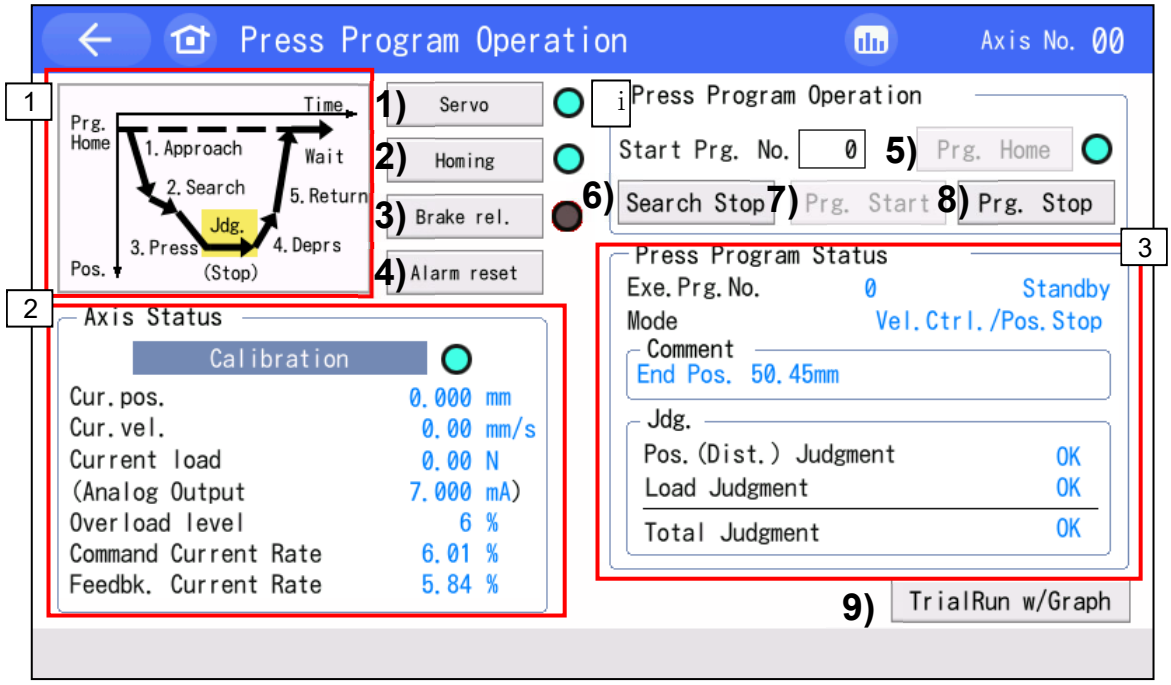
Press Program Jog Inching Screen Display List

	Botton Name	Explanations
1	Calibration	The loadcell calibration status is shown. It turns on if calibration has been completed.
2	Cur. pos.	The current position is shown.
3	Cru. vel.	The current speed is shown.
4	Current load	The current load is shown.
5	Analog Output	It shows the analog current output from the MF I/F connector on the controller in accordance with the current load.
6	Overload level	The overload level is shown.
7	Command Current Rate	The command value of electrical current is shown as a percentage of the rated current. The current value will be shown if touching the command current rate.
8	Feedbk. Current Rate	It shows the rate of the feedback current to the rated value. The current value will be shown if touching the feedback current rate.
9	Command Current Value	The command current is shown. The current rate will be shown if touching the command current value.
10	Feedbk. Current Value	The feedback current is shown. The current rate will be shown if touching the feedback current value.

3.26.3.2 Press Program Operation Screen

A pressing program can be indicated and made executed.

Touch [Run Pressing Program] button in the pressing program test run menu window.
Or, touch [Test Run] button in the pressing program edit window.



Press Program Operation Screen Button List

	Botton Name	Explanations
1)	Servo	Touch [Servo] while the servo is off to turn the servo on for an axis and turn on the status display. If touching [Servo] while the servo is on, the servo for an axis will turn off and the status display turns off.
2)	Homing	Touch [Home-Return], and an axis performs the home-return operation and the status display turns on.
3)	Brake rel.	For an actuator equipped with a brake, touch [Brake Compulsory Release], and the screen shifts to the brake compulsory release confirmation window. Touch [Brake Compulsory Release] again, and the brake gets locked and the status display turns off.
4)	Alarm Reset	Touch [Alarm reset] to cancel an alarm.
5)	Prg. Home	An axis moves to the program home position of the pressing program set in Start Prg No. The status display turns on once the axis movement has completed. The status display flashes during the depressurizing operation and return operation.

	Botton Name	Explanations
6)	Search Stop	It performs the operation in the control stage [1. Approaching] and [2. Searching] and stops an axis. Touch [Prg Start] while [Searching Stop] is selected, and an axis gets in the searching stop status, and gets in the normal execution when it is not selected. If it is executed with [1. Approaching] invalid, operation of only [2. Searching] will be conducted. If it is executed with [2. Searching] invalid, operation of only [1. Approaching] will be conducted. If it is executed with both [1. Approaching] and [2. Searching] invalid, the axis operation will not be conducted.
7)	Prg. Start	The pressing program set in Start Prg No. should be executed.
8)	Prg. Stop	Touch [Stop], and the axis stops.
9)	TrialRun w/Graph	It shows the pressing program run (graph) window. Refer to [3.26.3.3]

Press Program　Operation Screen　Display List

	Botton Name	Explanations
1	Figure of Control Stage	It shows the status of the control stage being executed. The arrow and letter for the control stage that is currently being executed should be shown in red. It shows the arrow and the letters in gray after the program has been executed when operation in each control stage is inactivated.
2	Axis Status	Monitor main in common
3	Press Program Status	Data monitor in common

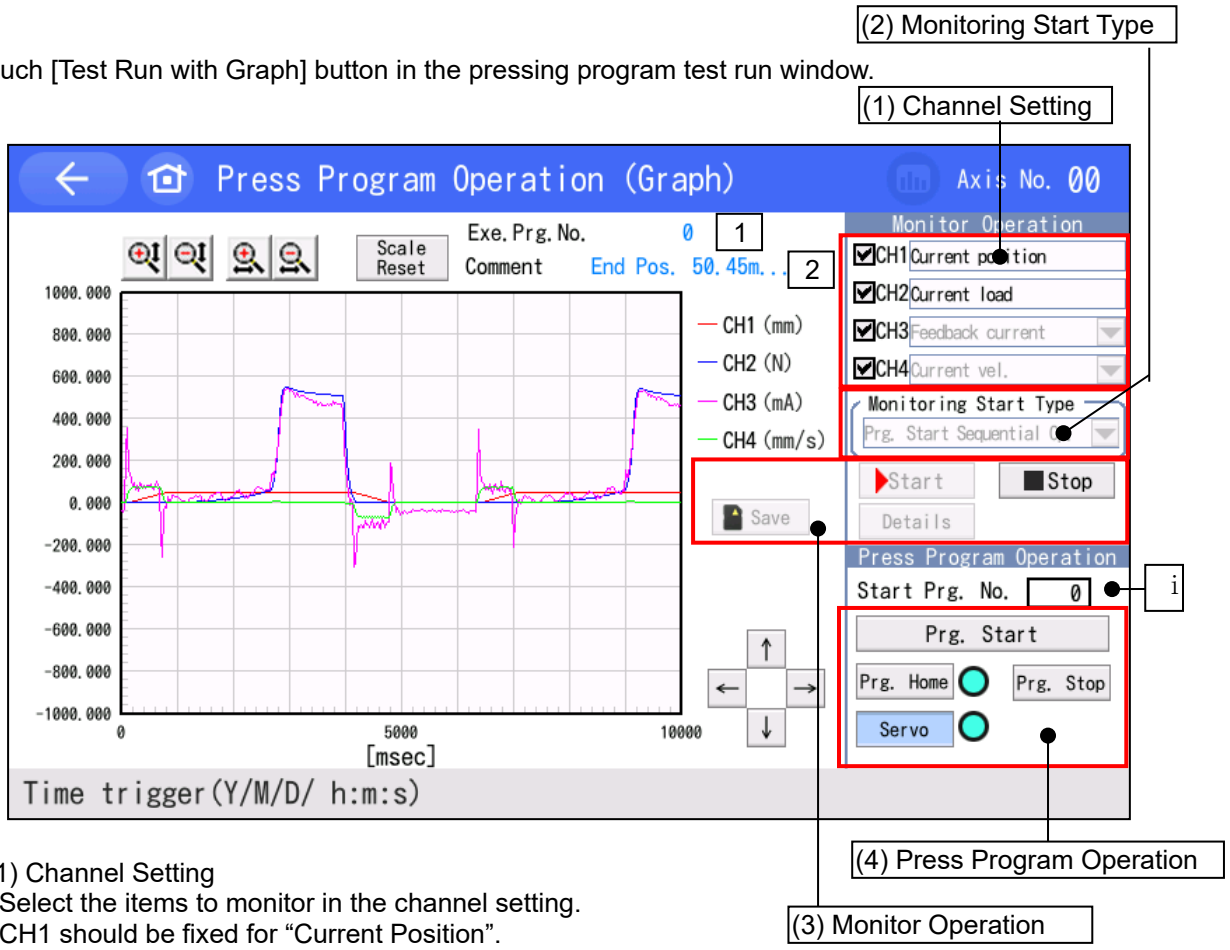
Press Program　Operation Screen　Setting List

	Botton Name	Explanations
i	Start Prg. No.	The pressing program number to be executed first can be indicated. When transited from the pressing program individual edit window, the pressing program number can be carried over.

3.26.3.3 Press Program Operation (Graph) Screen

Pressing program and servo monitoring can be conducted at the same time.

Touch [Test Run with Graph] button in the pressing program test run window.



(1) Channel Setting
Select the items to monitor in the channel setting.
CH1 should be fixed for “Current Position”.
CH2 should be fixed for “Current Load”.
Select items to monitor from the list for CH3 and CH4. “Feedback Current” is set in CH3 and “Current Velocity” in CH4 in the initial display.

- Check Marks on Left of Items
  A waveform can be displayed in the screen for those with a check mark.
  Even though a waveform is not displayed in the screen for those without a check mark, data is acquired.

Channel Setting Monitoring List

Item Name	Unit	Item Name	Unit
Current position	mm	Command Current Value	mA
Velocity Operation Amount	mm/s	Feedback Current Value	mA
Velocity Actual Command Value	mm/s	Current load	N
Current speed	mm/s	Deviation	Pls
		Overload Level Monitor	%

(2) Monitor Start Type　List of Monitoring Start Method

Item Name	Explanations
Linked with Prg Start	Monitoring starts at the same time as a program starts.
Normal Monitoring	Touch [Start], and monitoring starts.
Standby for Trigger	Monitoring starts with a method indicated in the trigger setting in the detail setting window.

(3) Monitor Operation　Button List

	Botton Name	Explanations
1)	Start	Touch [Start], and monitoring starts when the monitoring start type is set to “Normal Monitoring”. When the monitoring start type is “Standby for Trigger”, touch [Start], and the status gets to the standby for a trigger, and [Start] starts flashing. When the monitoring start type is “Linked with Prg Start”, [Start] becomes invalid.
2)	Stop	It stops monitoring and standby for a trigger.
3)	Details	It shows the window for sampling cycle settings and trigger settings.
4)	Save	Acquired data can be saved in CSV format to a Secure Digital memory card.

(4) Press Program Operation　Button List

	Botton Name	Explanations
5)	Prg. Start	The pressing program set in Start Prg No. should be executed. When the monitoring start type is “Linked with Prg Start”, touch [Prg Start], and monitoring starts at the same time.
6)	Prg. Home	It moves an axis to the program home position set in the pressing program edit. The status display turns on once the axis movement has completed.
7)	Prg. Stop	Touch [Stop], and an axis stops.
8)	Servo	Touch [Servo] while the servo is off to turn the servo on for an axis and turn on the status display. If touching [Servo] while the servo is on, the servo for an axis will turn off and the status display turns off.

Press Program Operation　Display List

	Name	Explanations
1	Exe. Prg. No.	It shows the pressing program number currently being executed.
2	Comment	It shows the comment set in the pressing program number currently being executed. It can show 15 half-size font characters and 7 full-size font characters at the maximum, and show “…” after that.

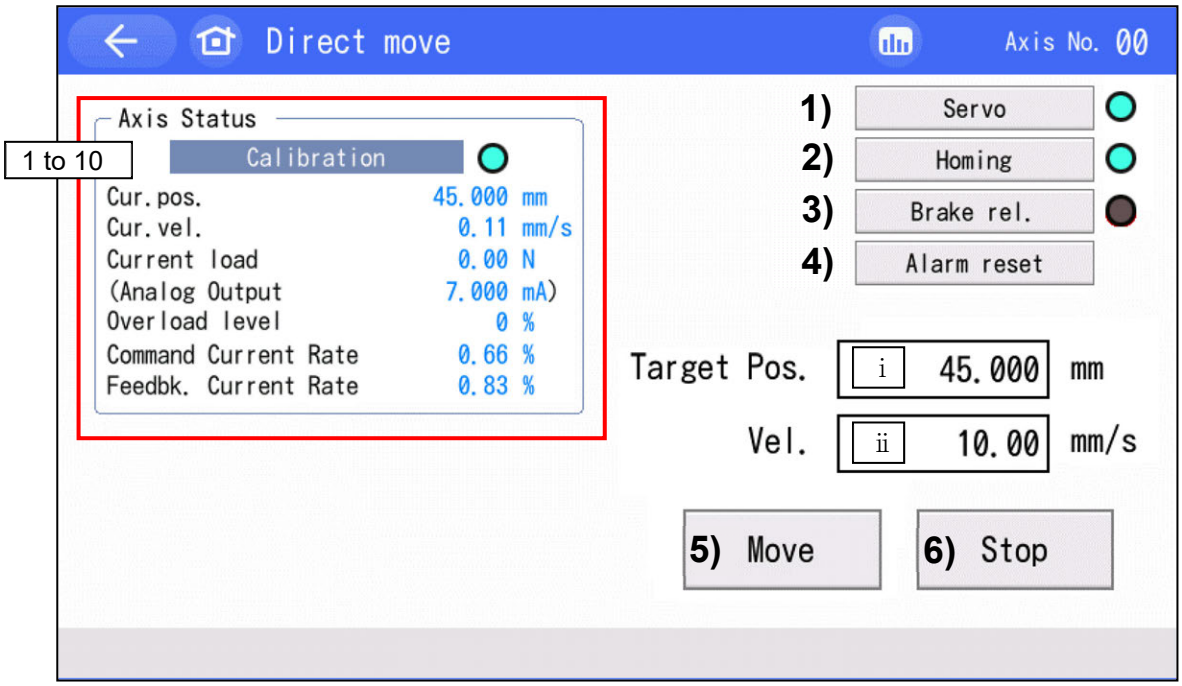
Press Program Operation　Setting List

	Name	Explanations
i	Start Prg. No.	A pressing program number to start with can be set.

3.26.3.4 Direct Move Screen

Indicate the target position and velocity directly to make an operation.

Touch [Numerical Command Movement] button in the pressing program test run menu window.



Press Program Direct Move Screen Button List

	Botton Name	Explanations
1)	Servo	Touch [Servo] while the servo is off to turn the servo on for an axis and turn on the status display. If touching [Servo] while the servo is on, the servo for an axis will turn off and the status display turns off.
2)	Homing	Touch [Home-Return] while home-return operation is incomplete, and an axis performs the home-return operation and the status display turns on.
3)	Brake rel.	For an actuator equipped with a brake, touch [Brake Compulsory Release], and the screen shifts to the brake compulsory release confirmation window. Touch [Brake Compulsory Release] again, and the brake gets locked and the status display turns off.
4)	Alarm Reset	Touch [Alarm reset] to cancel an alarm.
5)	Move	Touch [Move], and an axis moves to the target position in the set velocity.
6)	Stop	Touch [Stop], and the axis stops.

Press Program Direct Move Screen Status Display List

	Name	Explanations
1	Calibration	The loadcell calibration status is shown. It turns on if calibration has been completed.
2	Cur.pos.	The current position is shown.
3	Cur.vel.	The current speed is shown.
4	Current load	The current load is shown.
5	Analog Output	It shows the analog current output from the MF I/F connector on the controller in accordance with the current load.
6	Overload level	The overload level is shown.
7	Command Current Rate	The command value of electrical current is shown as a percentage of the rated current. The current value will be shown if touching the command current rate.
8	Feedbk. Current Rate	It shows the rate of the feedback current to the rated value. The current value will be shown if touching the feedback current rate.
9	Command Current Value	The command current is shown. The current rate will be shown if touching the command current value.
10	Feedbk. Current Value	The feedback current is shown. The current rate will be shown if touching the feedback current value.

Press Program Direct Move Screen Display List

	Name	Explanations
i	Target Pos. (mm)	The target position for an axis to be moved can be input.
ii	Vel. (mm/s)	The velocity to move an axis can be input.

3.26.4 Secure Digital Memory Card

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.

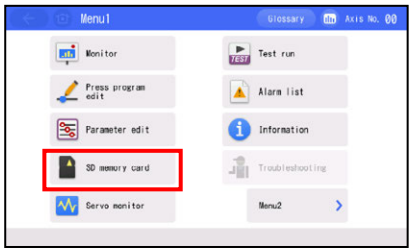
(Note) Extensions of the Stored Data
- *The file extensions of the data stored to the Secure Digital card are the same as those dealt in RC PC software, and are compatible. For instance, the position data for the PCON-C controllers is ptpc and the parameters are prpc.*
  Refer to [the details of the 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.
- *Press Program : \TB_CON \PressProgram \File Name*
- *Parameter : \TB_CON \Parameter\File Name*
- *Alarm List : \TB_CON \Alarmlist\File Name*

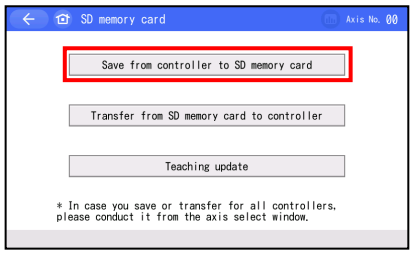
(Note) Files with Chinese names are not supported.

> ⚠ *Caution: For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, Have FAT32 Format for the file system.*

3.26.4.1 Press Program Save

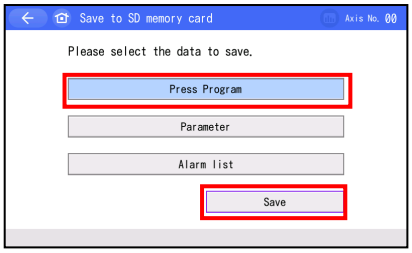


Touch [SD memory card] in Menu 1 screen.



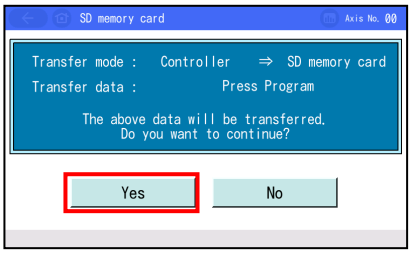
SD memory card screen opens.

Touch [Save from controller to SD memory card].



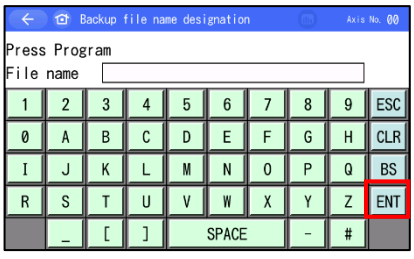
Select the data type for the backup such as [Press program] and touch it. (Multiple selection available)
The data type been selected will be shown in light blue.

Touch [Save].



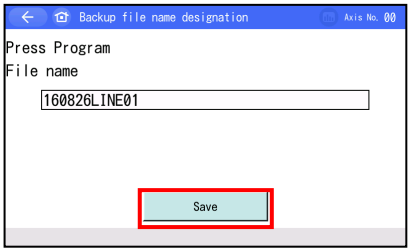
Touch [Yes].

Touch [No], and the screen returns to the previous screen.

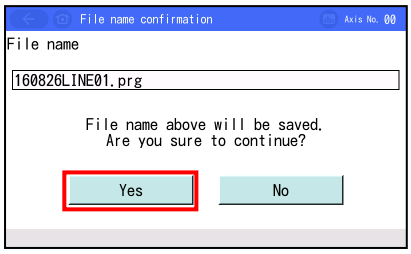


Numeric keys are displayed. Input a file name and touch [ENT].

The file name is to be typed with 32 characters at maximum in letters and numbers.



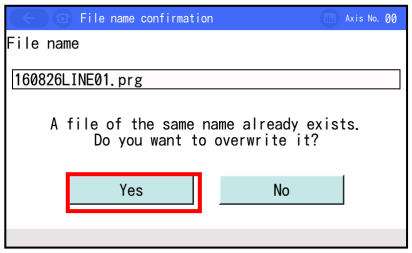
Touch [Save].



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

Touch [Yes].

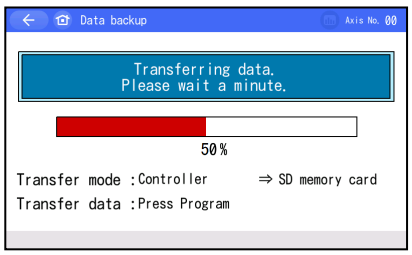
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



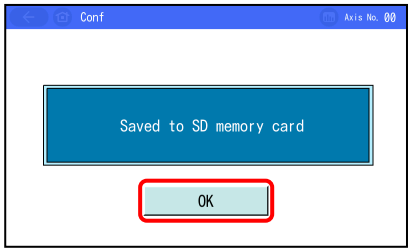
The screen below appears if the same name is found.

Touch [Yes] if overwriting data.

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.



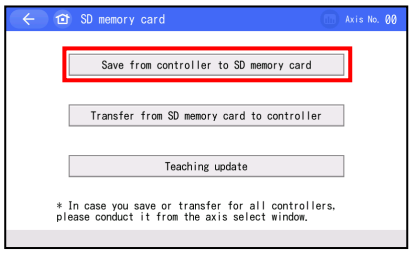
A message to tell the data transfer is complete pops up and the backup process is finished.

Touch [OK], and the screen returns to Secure Digital Memory Card screen.

3.26.4.2 Press Program Transfer

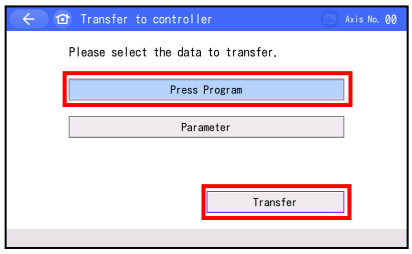


Touch [SD memory card] icon in Menu 1 screen.

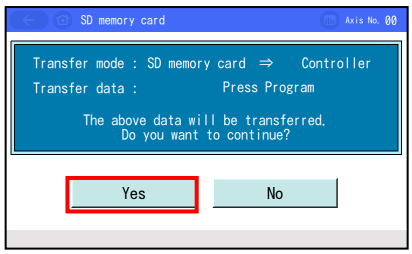


SD memory card screen opens.

Touch [Transfer from SD memory card to controller].

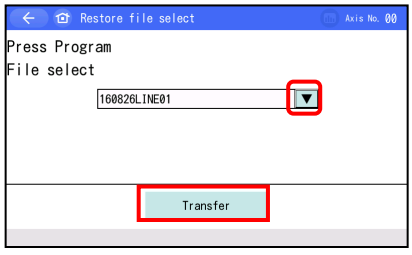


Select [Pressing Program] and touch [Transfer].
(Multiple selection available)



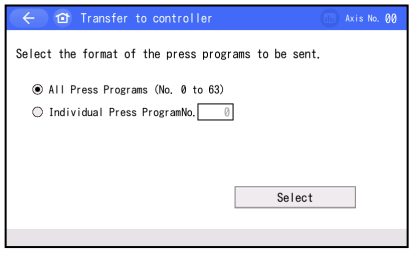
Touch [Yes].

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.

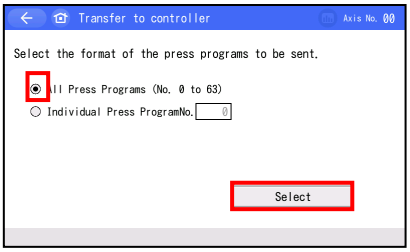
Touch [Transfer].



A window to select a pressing program to be transferred will show up.

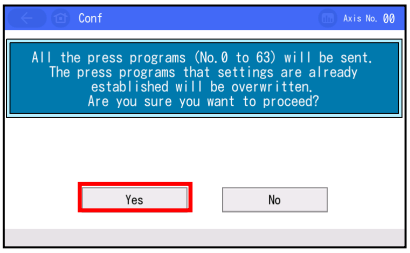
If transferring all the pressing programs, conduct the operation of 1), and conduct 2) if transferring individual pressing programs.

(1) Transfer of All Press Programs



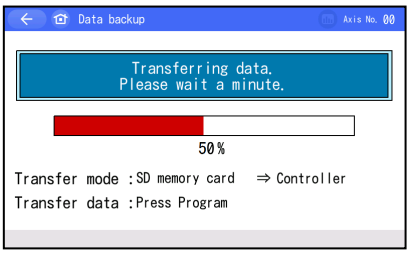
Select All Press programs.

Touch [Select].

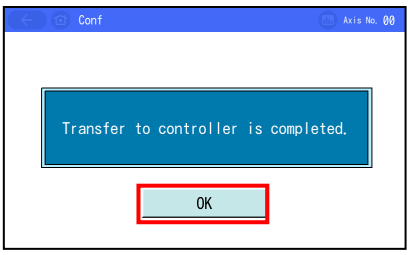


Touch [Yes].

Touch No, and the screen goes back to the pressing program transfer format select window.



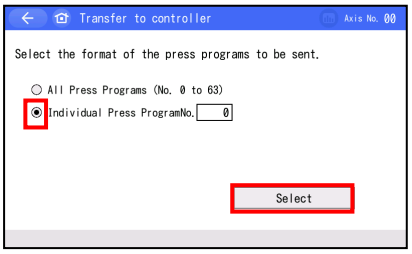
A window stating transferring data will be displayed.



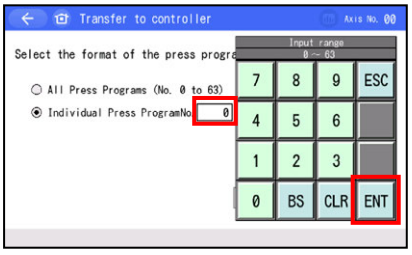
A message telling data transfer is completed will show up. The data transfer to a controller has now been completed.

Touch OK, and the screen goes back to the Secure Digital memory card window.

(2) Transfer of Individual Press Programs



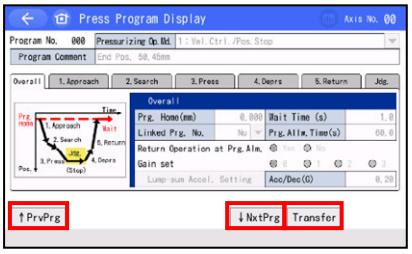
Select Individual Press ProgramNo..



Touch Individual Press ProgramNo..

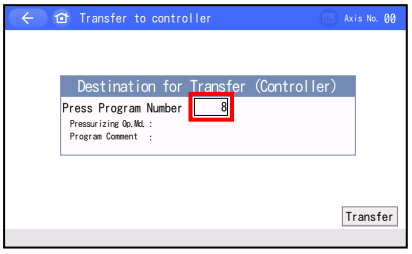
The numeric keys will appear. Input the input range and touch [ENT].

Touch [Select].

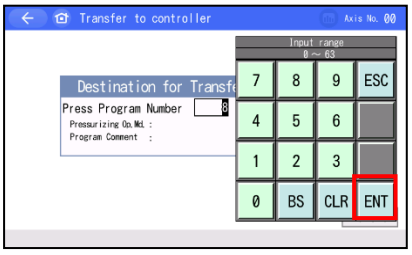


Touch [↑PrvPrg] and [↓NextPrg] to select a pressing program to be transferred.

Touch [Transfer].

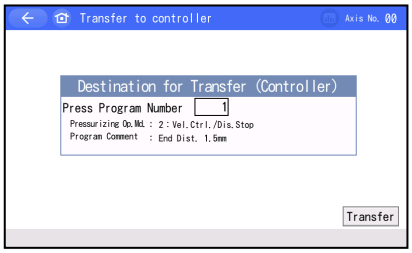


Input a pressing program number that the data is to be transferred to.

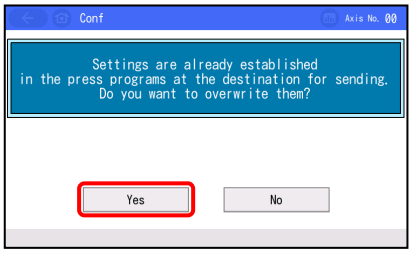


The numeric keys will appear. Input a pressing program number that the data is to be transferred to and touch [ENT].

Indicate a pressing program number that the data is to be transferred to and touch [Transfer].



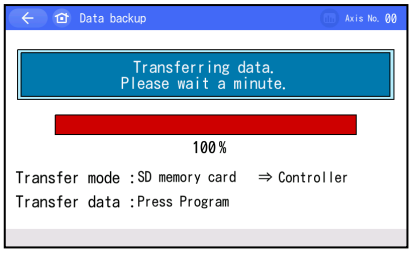
A pressurizing operation mode and a program comment will be displayed if a pressing program has already been registered.



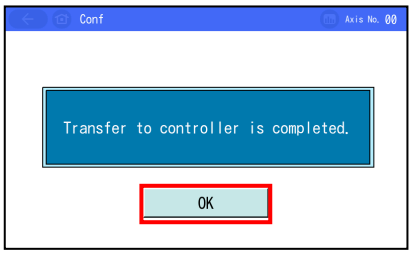
Select the pressing program number already registered, and this window will be shown.

Touch [Yes] if overwriting data.

Touch [No], and the screen goes back to the previous destination pressing program number select window.



A window stating transferring data will be displayed.



A message telling data transfer is completed will show up. The data transfer to a controller has now been completed.

Touch [OK], and the screen goes back to the Secure Digital memory card window.

3.27 Drive Recorder Feature

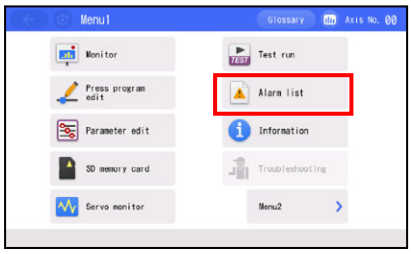
It is a feature dedicated for SCON2 controllers.

The drive recorder feature is a feature to support root cause analysis and quick recovery by recording behaviors of an actuator when an alarm is generated.
This feature should be categorized into two functions as stated below.

1) Graph Display Function
   Saving the operation data for several tens of seconds before and after generation of an alarm and shows it in a graph. Refer to [3.27.1]
2) Data Display at Alarm Generation Function
   Saving the data at the moment of an alarm being generated and shows it. Refer to [3.27.2]

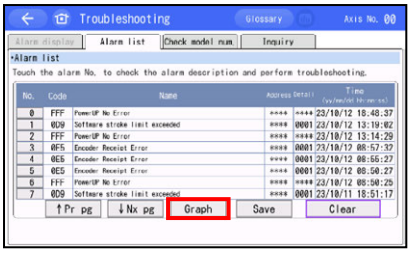
* Refer to SCON2 Controller Instruction Manual (ME0458) for detail of the drive recorder feature.

3.27.1 Graph Display (Drive Recorder Screen)



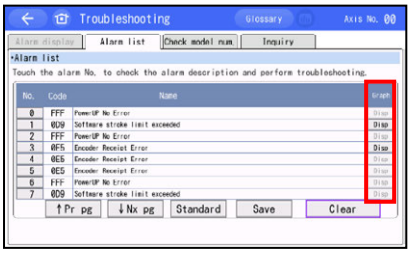
Display of Drive Recorder Screen

Touch [Alarm list] in the Menu 1 screen.



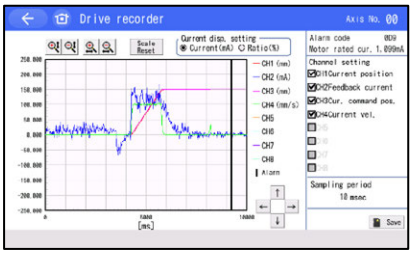
An alarm list of a controller should be displayed.

Touch [Graph].



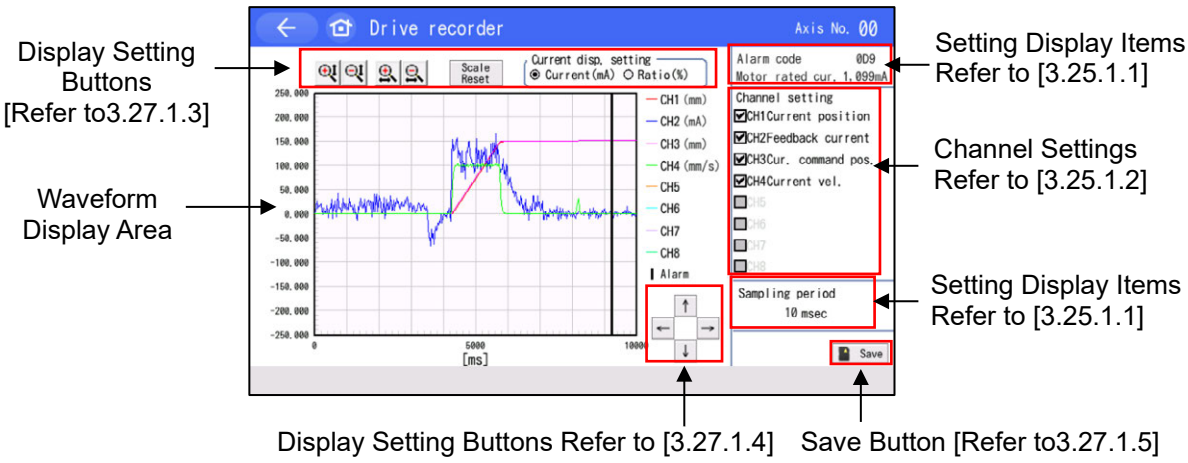
A button to show a graph should be shown on the right of each alarm.

Touch [Disp] on the right of an alarm that you would like to check.



After a window of data acquisition in process is shown, the drive recorder screen should appear.

Drive Recorder Screen



3.27.1.1 Setting Display Items

- Alarm Code : A code number of an alarm in displayed data should be displayed.
- Motor rated current : The motor rated current value should be displayed.
- Sampling Frequency : The sampling frequency of data should be displayed.

The sampling frequency can be changed in Parameter No. 212 in SCON2 controller. (1 to 1000ms)

3.27.1.2 Setting Display Items

The monitoring items selected in each channel should be displayed.
The monitoring items should be determined in Parameter No. 210 in SCON2 controller.

The monitor items are shown in the table below.

Parameter No.210				CH	Item name	Unit
0	1	2	3			
●	–	–	–	–	Drive recorder feature inactivated	–
×	●	●	●	1	Current position	[mm] or [pulse]
×	●	●	●	2	Feedback current	[%] or [mA]
×	●	●	×	3	Current command position	[mm] or [pulse]
×	●	●	×	4	Current velocity	[mm] or [pps]
×	×	●	×	5	Operation plan velocity	[mm] or [pps]
×	×	●	×	6	Current load	[N]
×	×	●	×	7	DC bus voltage	[V]
×	×	●	×	8	Estimated regenerative discharge electric energy	[W]

* About Check Marks ☑ on Left of Item Names in Screen
The items with a check mark on show a wave form on the screen.
Those with no check mark should not show a wave form on the screen, but the data is acquired.

Refer to SCON2 Controller Instruction Manual (ME0458) for details.

3.27.1.3 Display Setting Buttons



: Touch it to enlarge the scale of the graph in vertical axis.

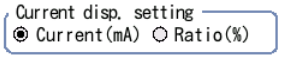
: Touch it to reduce the scale of the graph in vertical axis.

: Touch it to enlarge the scale of the graph in horizontal axis.

: Touch it to reduce the scale of the graph in horizontal axis.

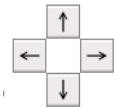


: Touch it to initialize the scale of the graph.



: Current Display Setting: System to display current can be selected.

3.27.1.4 Monitor Operation Buttons



: Touch it to slide the displayed waveform frame upwards.

: Touch it to slide the displayed waveform frame downwards.

: Touch it to slide the displayed waveform frame to the left.

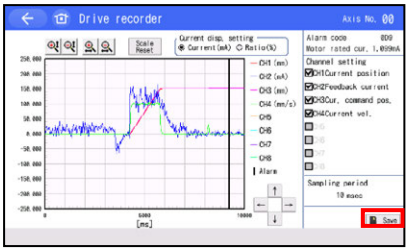
: Touch it to slide the displayed waveform frame to the right.

3.27.1.5 Data Save

[Save] : The acquired data should be saved in a Secure Digital memory card in the CSV format.

* Refer to the next page for the process to save data.

How to Save Drive Recorder Data



Insert a Secure Digital memory card.

Touch [Save] while monitoring is stopped.



The file name indication screen opens. Input a file name and touch [ENT].

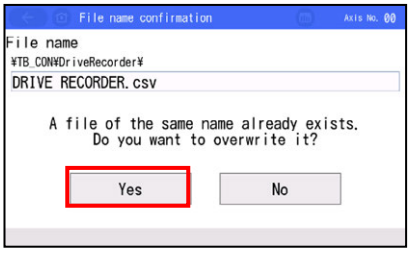


Touch [Save].



The file name confirmation screen pops up.
Touch [Yes].

Save the data, and return to the servo monitor screen.



In case there is a file with the same name exists, overwriting confirmation window appears.
Touch [Yes] if it is allowed to overwrite the old.

Save the data, and return to the servo monitor screen.

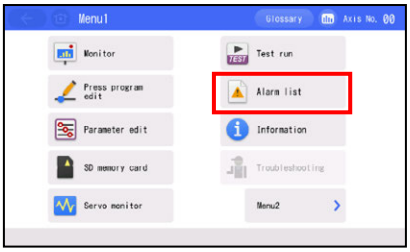
Domain to Save Data (cannot be changed)

The domain that the servo monitor data is saved is the folder stated below in a Secure Digital memory card.

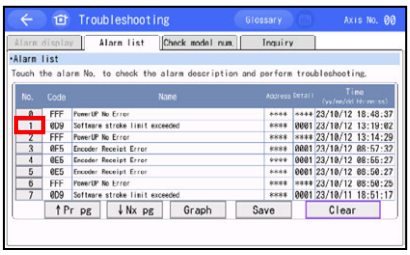
\TB_CON\DriveRecorder\FileName.csv

3.27.2 Data Display Feature at Alarm Generation (Data at Occurrence)

Display of Data at Occurrence



Touch [Alarm list] in the Menu 1 screen.



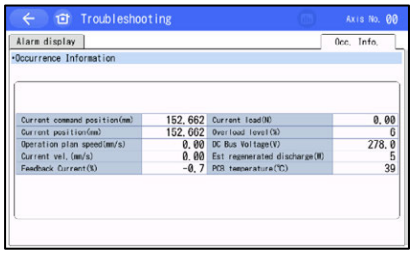
An alarm list of a controller should be displayed.

Touch [No.] on an alarm that you would like to check.



The alarm display screen should be displayed.

Touch the tab of the data at occurrence.



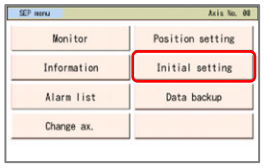
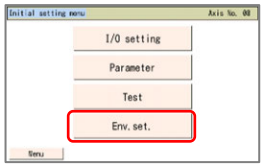
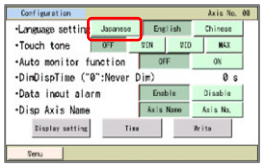
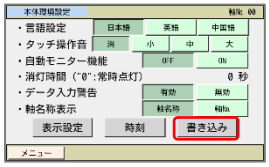
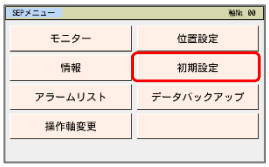
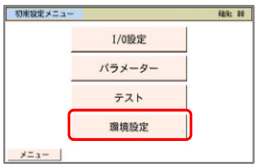
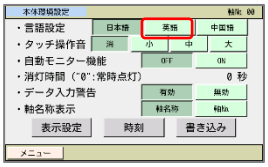
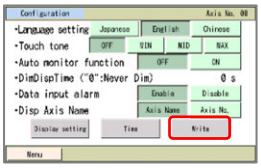
The window for data at occurrence should be displayed and the data when an alarm was generated can be checked.

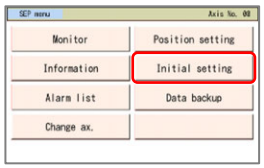
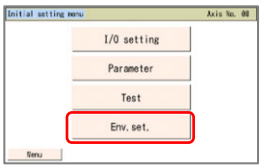
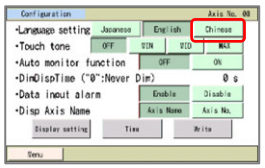
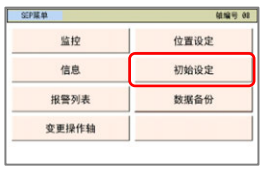
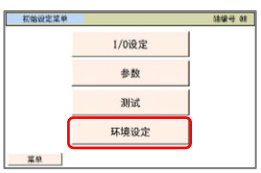
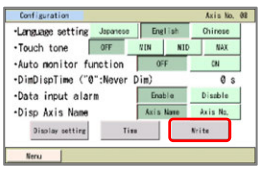
4. Operation of SEP Related Controllers

SEP related controllers: ASEP, PSEP, DSEP, MSEP

4.1 Transition of Operating States

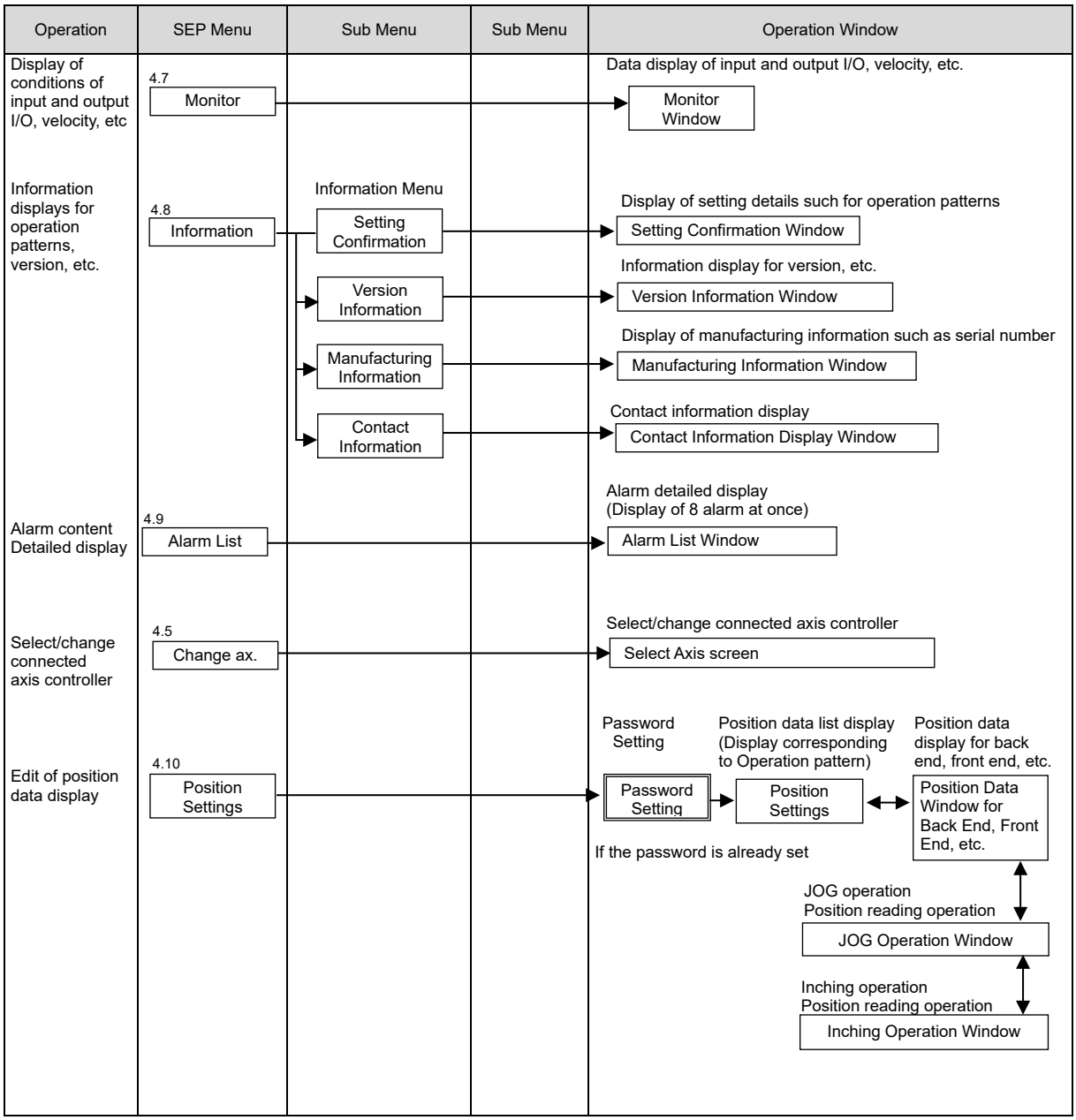
The language can be changed by following the steps below.
For the operations after the language change, please refer to the instruction manual written in each language.

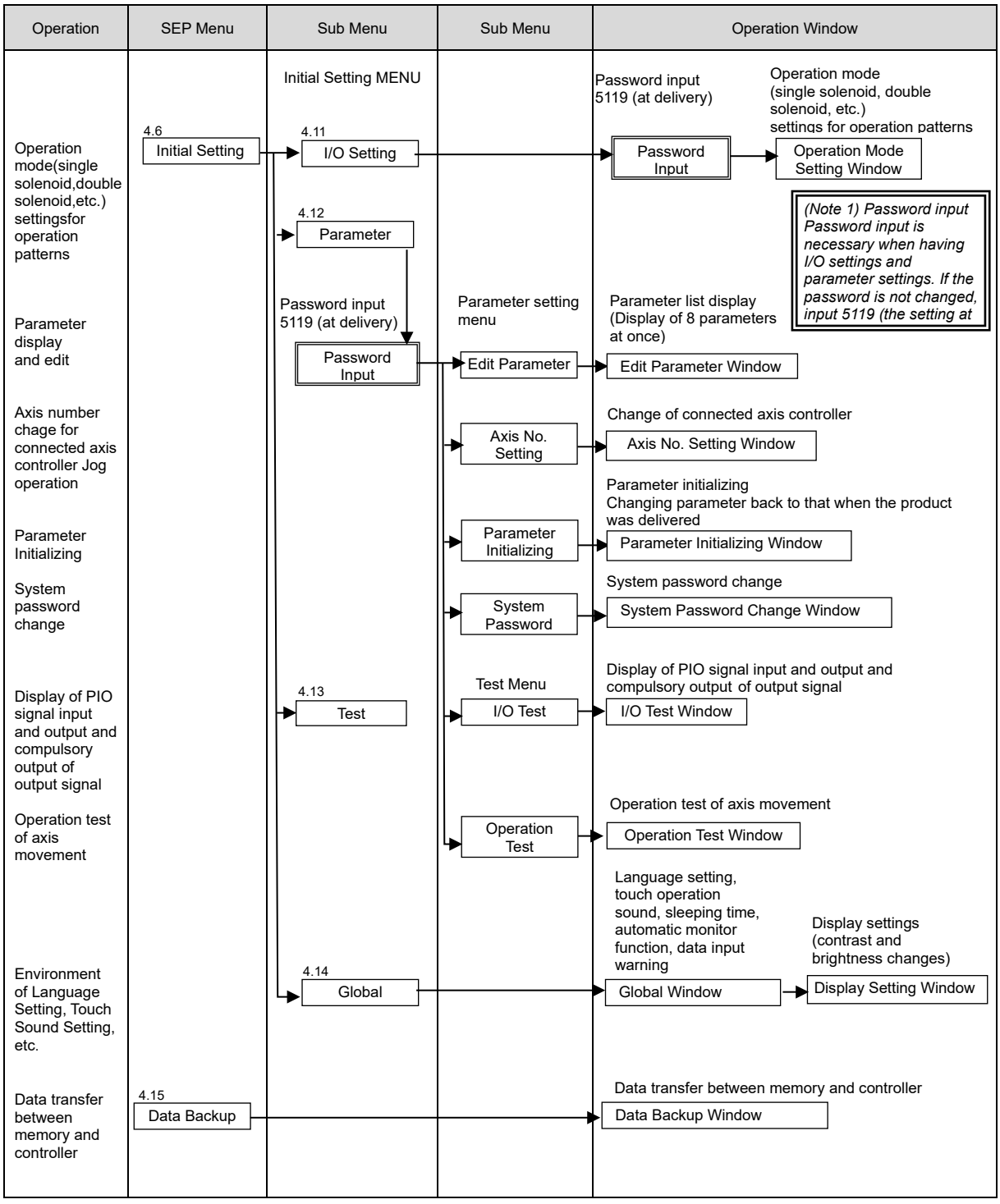
Display change from English to Japanese			
			
Touch [Initial Setting] in SEP Menu.	Touch [Env. Set.]	Touch [Japanese].	Touch [書き込み].
Display change from Japanese to English			
			
Touch [初期設定] in SEP メニュー	Touch [環境設定].	Touch [英語].	Touch [Write].

Display change from English to Chinese			
			
Touch [Initial Setting] in SEP Menu.	Touch [Env. Set.]	Touch [Chinese].	Touch [写入].
Display change from Chinese to English			
			
Touch [初始设定] in SEP 菜单.	Touch [环境设定].	Touch [英语].	Touch [Write].

4.2 Operating Menu

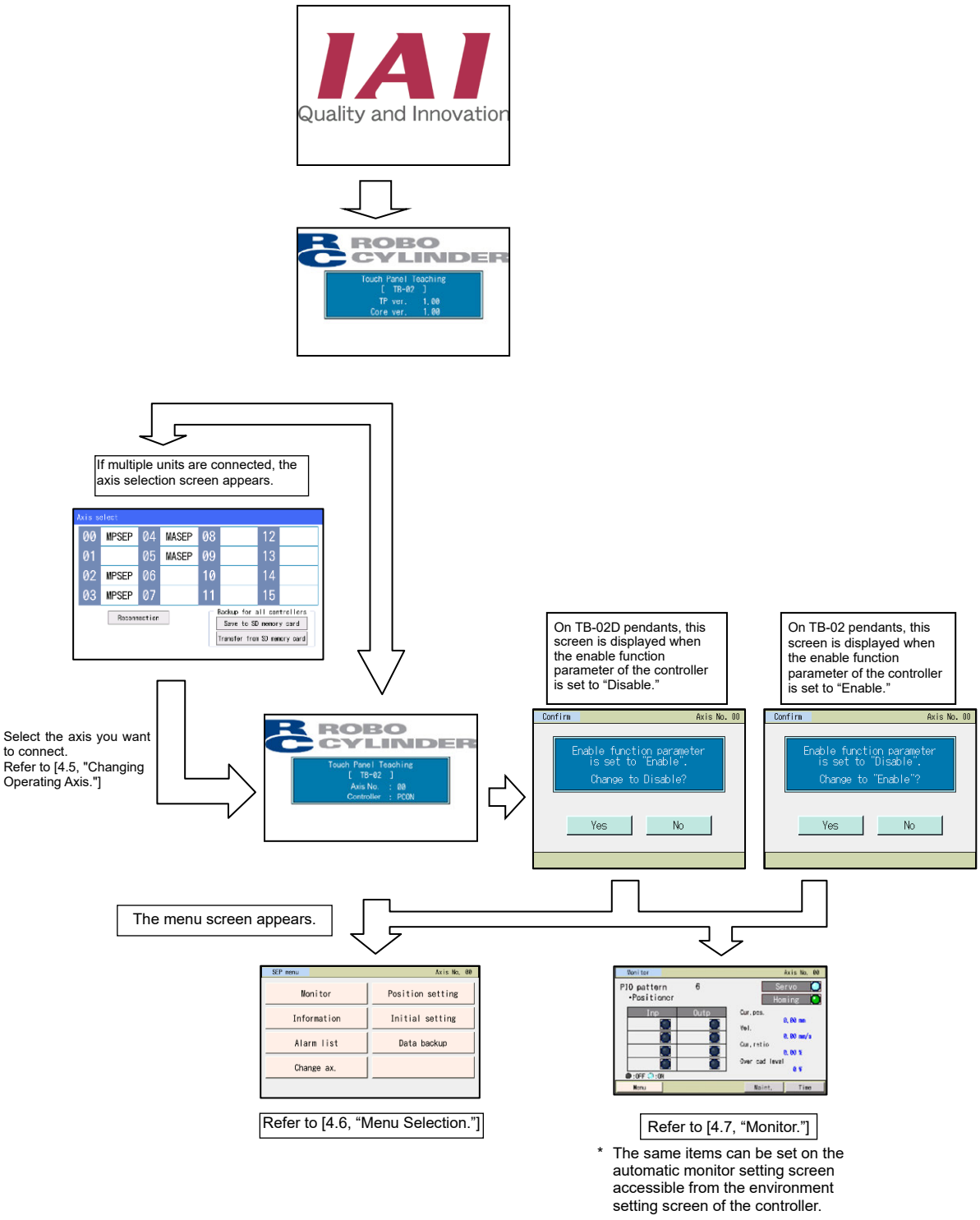
Transition of operating states when the touch panel teaching pendant TB-02 is connected to a SEP related controller is shown.




Operation
SEP Menu
Sub Menu
Sub Menu
Operation Window
Initial Setting MENU
Password input 5119 (at delivery)
Operation mode (single solenoid, double solenoid, etc.) settings for operation patterns
4.6
Initial Setting
4.11
I/O Setting
Password Input
Operation Mode Setting Window
Operation mode(single solenoid,double solenoid,etc.) settingsfor operation patterns
4.12
Parameter
(Note 1) Password input Password input is necessary when having I/O settings and parameter settings. If the password is not changed, input 5119 (the setting at
Password input 5119 (at delivery)
Parameter setting menu
Parameter list display (Display of 8 parameters at once)
Parameter display and edit
Password Input
Edit Parameter
Edit Parameter Window
Change of connected axis controller
Axis number chage for connected axis controller Jog operation
Axis No. Setting
Axis No. Setting Window
Parameter initializing
Changing parameter back to that when the product was delivered
Parameter Initializing
Parameter Initializing
Parameter Initializing Window
System password change
System Password
System Password Change Window
Display of PIO signal input and output and compulsory output of output signal
Test Menu
4.13
Test
I/O Test
I/O Test Window
Operation test of axis movement
Operation Test
Operation Test Window
Language setting, touch operation sound, sleeping time, automatic monitor function, data input warning
Display settings (contrast and brightness changes)
Environment of Language Setting, Touch Sound Setting, etc.
4.14
Global
Global Window
Display Setting Window
Data transfer between memory and controller
4.15
Data Backup
Data Backup Window

4.3 Initial Screen

When the power is turned on, the IAI logo is displayed for approx. 1 second on the operation display screen of the touch panel teaching pendant, after which version information is displayed.

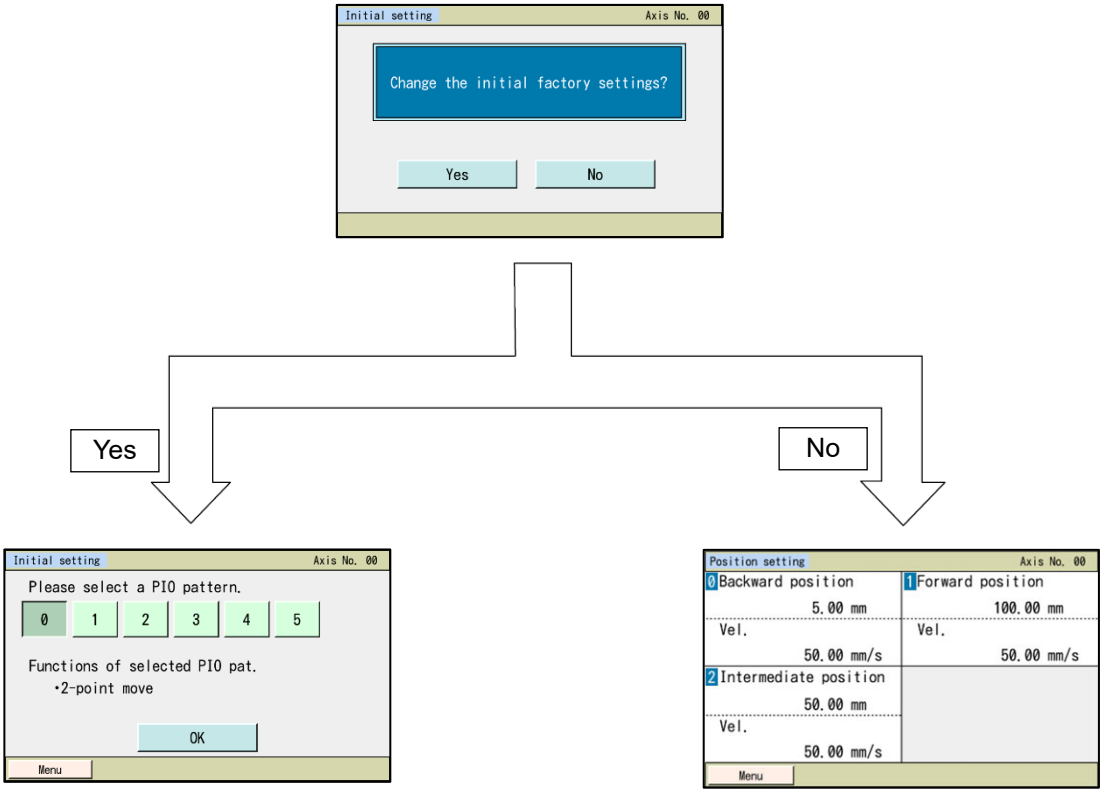


* The same items can be set on the automatic monitor setting screen accessible from the environment setting screen of the controller.

4.4 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.



Refer to [4.11, “I/O Setting.”]

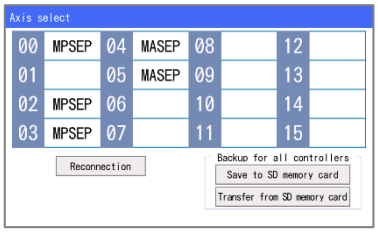
Refer to [4.10, “Position Setting.”]

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

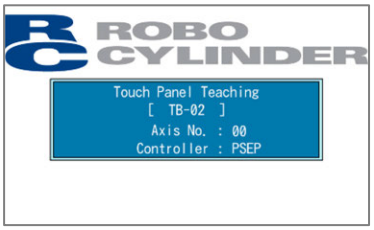
In MSEL, settings are also separately needed by the gateway parameter setting tool when starting up.
Refer to Chapter 7 Gateway Parameter Setting Tool or [Initial Setting] in MSEP Instruction Manual.

4.5 Changing Operating Axis

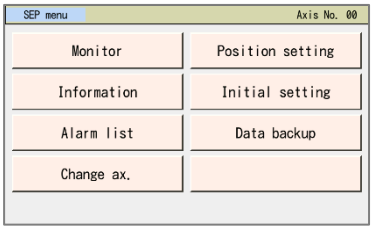
If multiple controllers are connected to the communication line, the axis selection screen appears.
This screen also appears when [Change ax.] is touched on the menu screen.
If only one controller is connected, you need not select an axis.



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



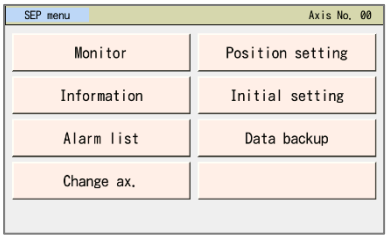
Connection with the selected controller axis starts.



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

4.6 Menu Selection

SEP menu

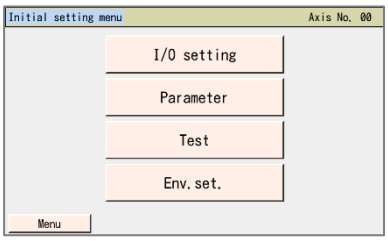


The SEP menu has seven items. Select and touch one of them.
The screen changes to the one corresponding to the menu item you have touched.

Menu list

- Monitor — Display the controller status. Refer to [4.7, “Monitor.”]
- Information — Display the operation pattern, version and other information. Refer to [4.8, “Information.”]
- Alarm List — Display alarm details. Refer to [4.9, “Alarm List.”]
- Change ax. — Select the controller axis to connect the touch panel teaching pendant to. Refer to [4.5, “Changing Operating Axis.”]
- Pos. Edit — Set the position, push power, push band, etc. Move by jogging. Refer to [4.10, “Position Setting.”]
- Backup Data — Transfer data between the touch panel teaching pendant and controller. Refer to [4.15, “Data Backup.”]
- Initial Set

Touch [Initial Setting], and the screen goes to the initial setting menu screen which is the next selection screen.



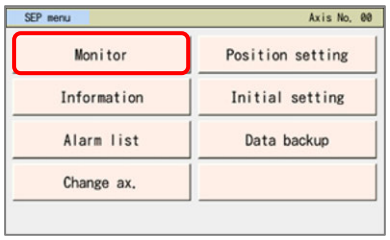
There are four types of menu in the initial setting menu screen. Select one of them and touch it. The screen goes to the touched menu.
Touch Menu to return to the previous SEP menu screen.

Initial setting menu list

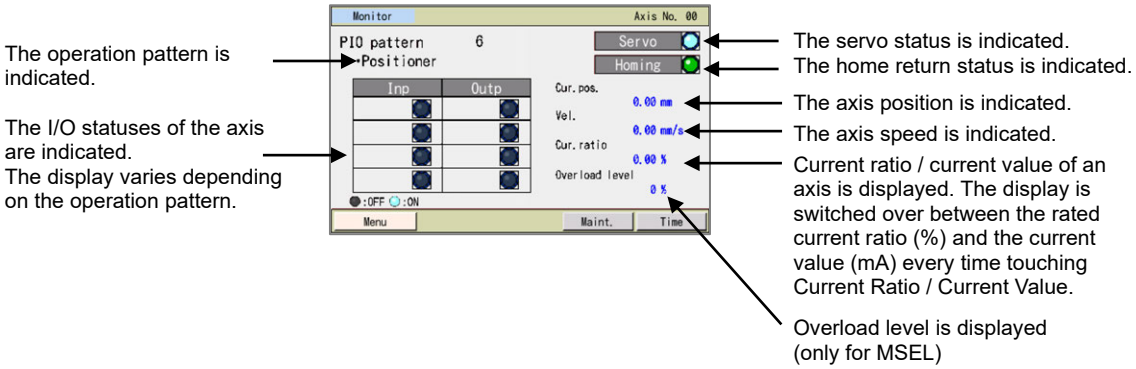
- I/O Set — Select an operation pattern (PIO pattern 0 to 5), set an operation mode (single solenoid, double solenoid), etc. Refer to [4.11, “I/O Setting.”]
- Parameter — Set parameters such as the default positioning band. Refer to [4.12, “Parameters.”
- Test — Perform I/O tests and operation tests for axis movement. Refer to [4.13, “Test.”]
- EnvironmentSet — Set the environment such as touch tone. Refer to [4.14, “Environment Setting.”]

4.7 Monitor

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



Touch [Monitor] on the SEP menu screen.



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

For the MSEP controller:

Touch [Maint.] to change to the maintenance information screen.
Displayed items are the same as CON-related controllers. (FAN Total Driving is not displayed.)
Set a target value for the total number of movements by the parameter No. 26 and a target value for the total driving time by the parameter No. 27.
Refer to [3.9.2, “Maintenance information screen.”]
When replacing the actuator, the operating method is the same as CON-related controllers.
Refer to [3.9.2.1, “Operating method when replacing the actuator.”]

Touch [Time] to change to the time editing screen.
The time setting method is the same as CON-related controllers.
Refer to [3.9.3, “Controller time setting screen.”]

I/O display on monitor screen

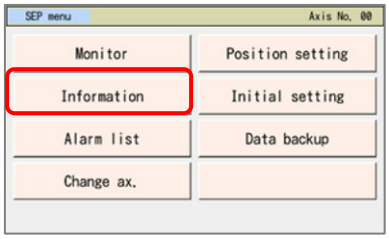
PIO pattern / Operation mode		Displayed item			
		IN3 (input)/OUT3 (output)	IN2 (input)/OUT2 (output)	IN1 (input)/OUT1 (output)	IN0 (input)/OUT0 (output)
Standard movement between 2 points: 0 Single solenoid	Input	-/ SON (servo ON signal) *1	-/ RES (reset signal)	-/ *STP (pause signal)	ST0 (move signal)
	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.

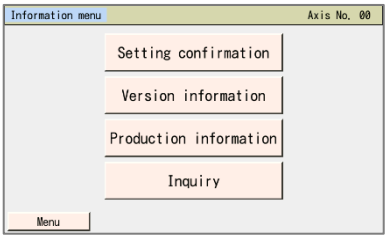
4.8 Information

The operation pattern, version and other information is displayed.



Touch [Information] on the SEP menu screen.

The information selection screen appears.

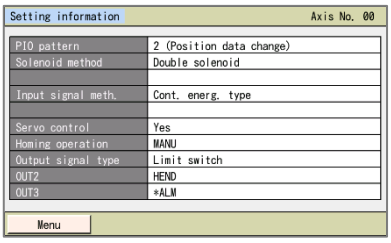


Touch the screen you want to display.

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

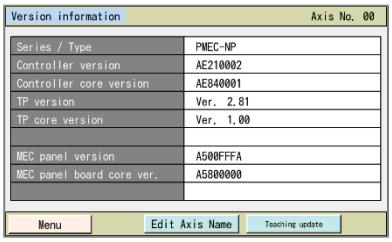
[Current Setup]

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

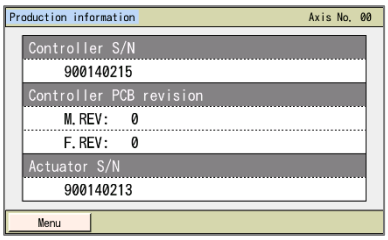


[Version]

You can check the version information, etc.



[Product]
You can check the serial number and other manufacturing information.

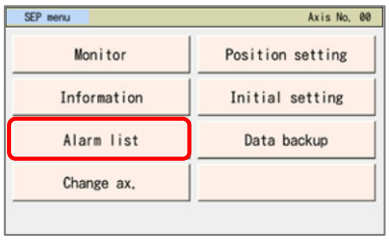


[Inquiry]
You can check how to contact IAI.



4.9 Alarm List

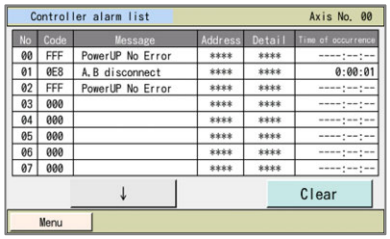
A list of alarms that may generate after the controller power is turned on is shown. [For alarm details, refer to 9. “Error Display.”]



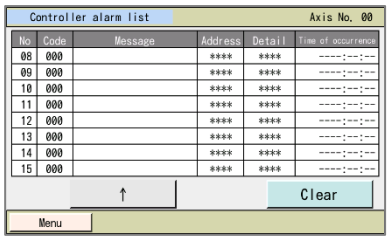
Touch [Alarm list] on the SEP menu screen.

The controller's alarm list appears.

Controller without the calendar function



Touching [↓] displays the list of the next screen.

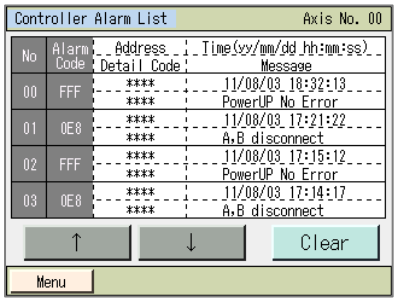


Touching [↑] displays the list of the previous screen.

Touching [Clear] 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.

Controller with the calendar function



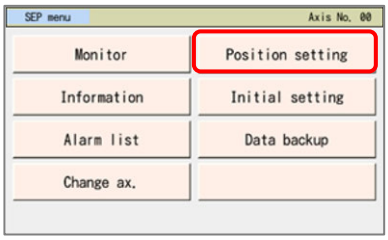
Touching [↑] displays the list of the previous screen.
Touching [↓] displays the list of the next screen.

Touching [Clear] clears all alarm details.

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

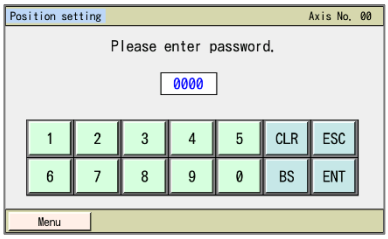
4.10 Position Setting (Setting of Position-related Data, Jog/Inching Operation)

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



Touch [Position setting] on the SEP menu screen.

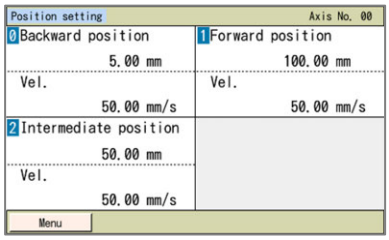
If the position data edit password is not “0000,” the password entry screen appears.



Enter a password and touch [ENT].

> You can set a position data edit 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.



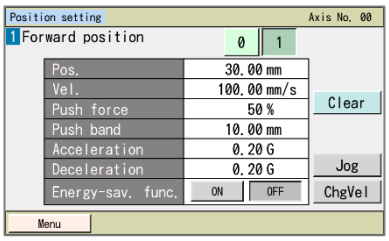
Touch the position you want to set.
Touch [Menu] to return to the SEP menu screen.
The screen shown to the left is an example of operation pattern 3.
The settings of various positions are shown.

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 three points	3
Movement by 3 inputs among 3 points: 4	Movement among three 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.

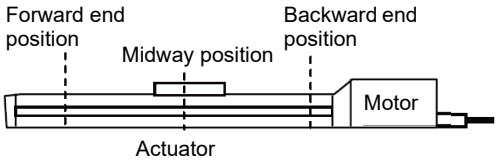
Touching a desired position displays the screen for setting the target position/speed for the position you have touched.
Set the position, speed, push power, push band, acceleration and deceleration.



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] Position [mm]	[2] Velocity [mm/s]	[3] Accelerate [G]	[4] Decelerate [G]	[5] PushPower [%]	[6] PushBand [mm]	[7] 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

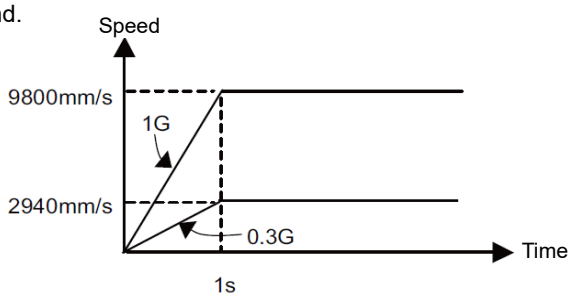
[1] Position (mm) ・・・Set the position to move the actuator to.
The positions must satisfy the following relationships: Backward position < Intermediate position < Forward position

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 instruction 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*

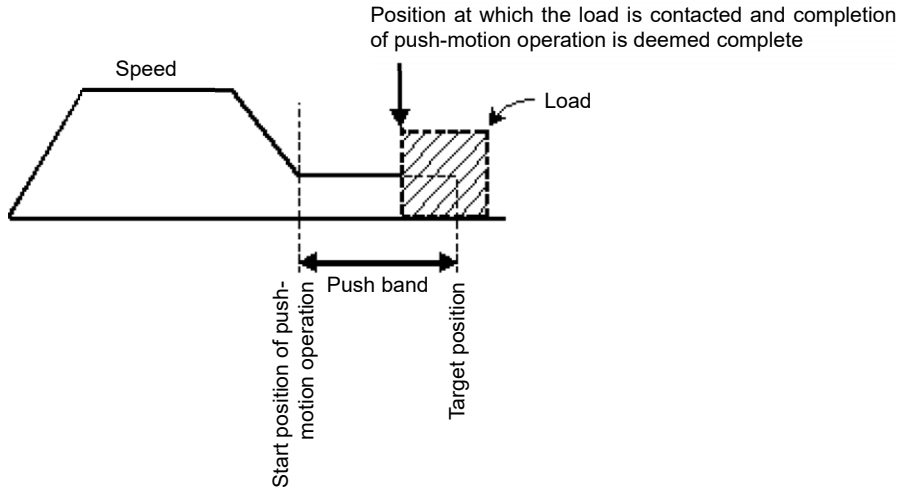
(1) Set accelerations/decelerations not exceeding the rated acceleration/deceleration specified in the catalog or the instruction manual of the actuator. If any acceleration/deceleration is set that exceeds the rated acceleration/deceleration, the life of the actuator may be significantly reduced.

(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.

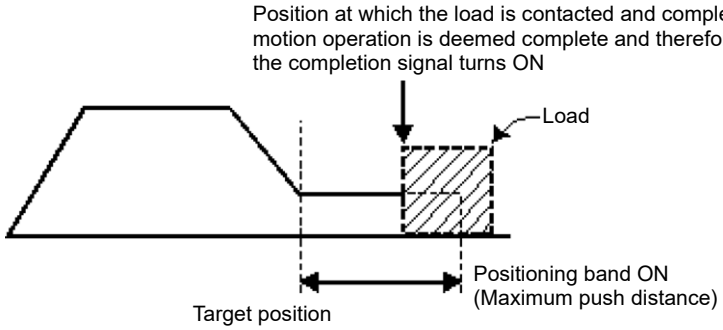
(3) If the load transferred by the actuator is significantly lighter than the rated payload capacity, you may be able to set accelerations/decelerations exceeding the rating. If this is the case, the tact time can be reduced, so contact IAI. When contacting IAI, tell us the weight, shape and installation method of your work part and installation condition (horizontal/vertical) of your actuator.

[5] Push power [%] · · · 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 instruction 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.



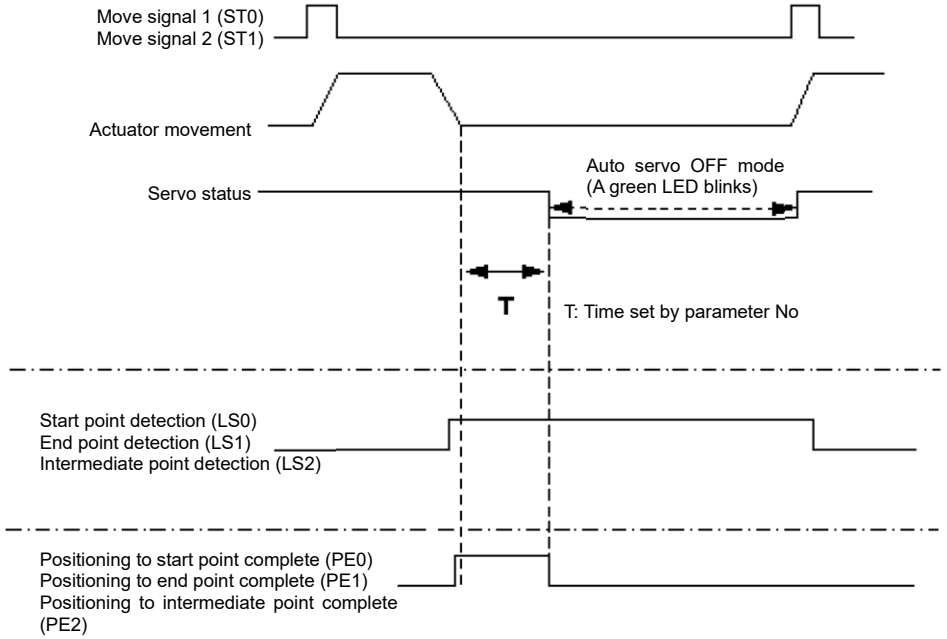
If CON method pressing in Fieldbus Type of MSEP Controllers is selected, the maximum pressing amount in the pressing operation from the target position is defined in Position Mode.
While considering the mechanical inconsistency of the work piece, set the positioning band so the positioning would not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

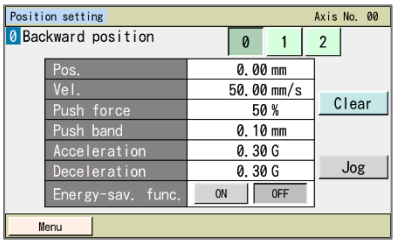
[8] Speed Chg Pos · · · Set the position at which to switch the speed while the actuator is moving to the forward end position or backward end position.
[9] Speed Chg Vel · · · Set the speed to change to.

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



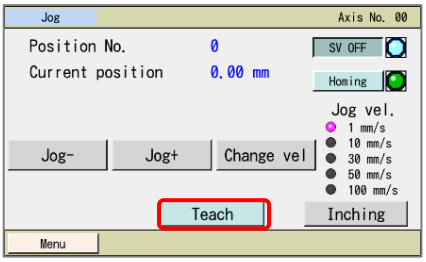
Touch the value of the position or other setting item. When the numeric keypad appears, enter a desired value and then touch [ENT].

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.

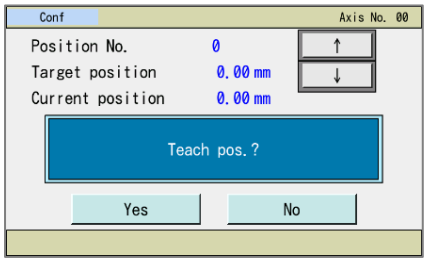
[Jog operation]
You can acquire position data via jogging operation.



Operation on the jog screen

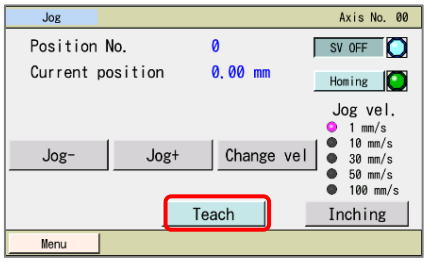
- [Jog-], [Jog+] : The axis jogs while each button is touched. [Jog-] moves the axis in the negative direction, while [Jog+] moves the axis in the positive direction.
- [SV ON] : Touching [SV ON] while the servo is OFF turns on the axis servo and ○ becomes lit.
  Touching [SV OFF] while the servo is 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

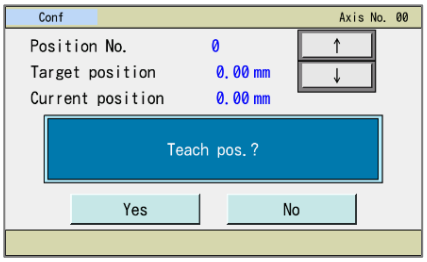
- [Inching-], [Inching+] : Touching each button once moves the axis by inching. [Inching-] moves the actuator in the negative direction. [Inching+] moves the actuator in the positive direction.
- [SV ON] : Touching [SV ON] while the servo is OFF turns on the axis servo and ○ becomes lit. Touching [SV 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.

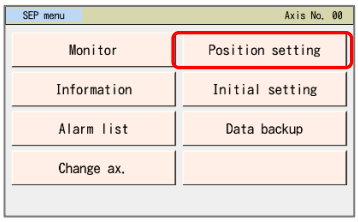
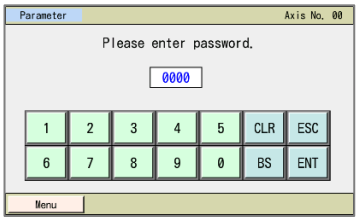
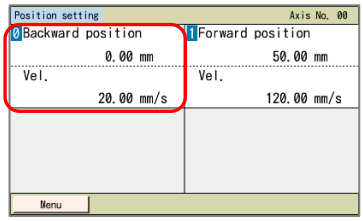
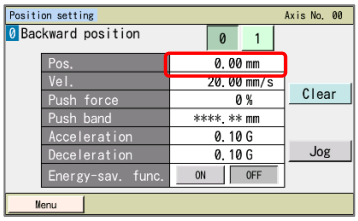
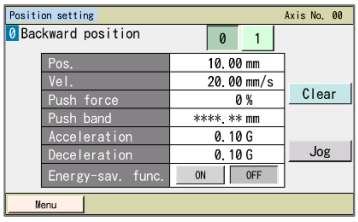
Touching [Yes] acquires the current position.

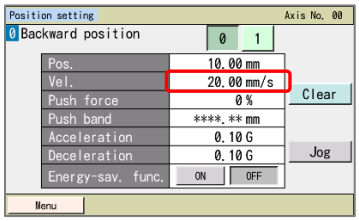
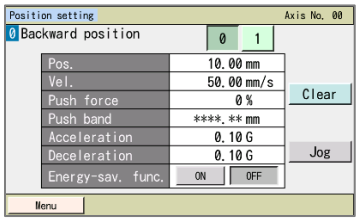
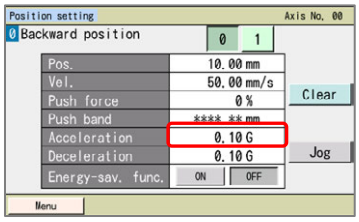
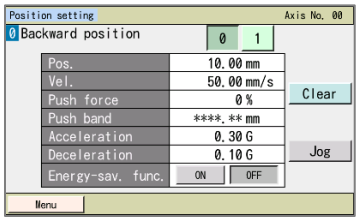
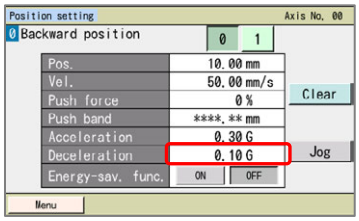
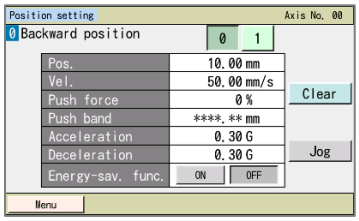


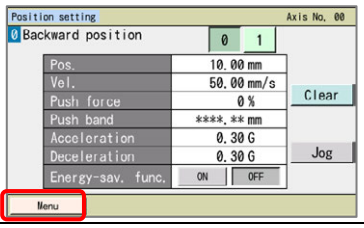
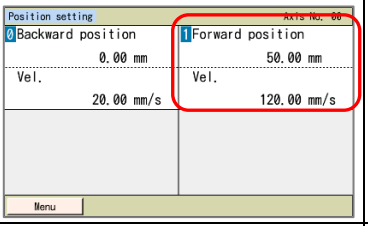
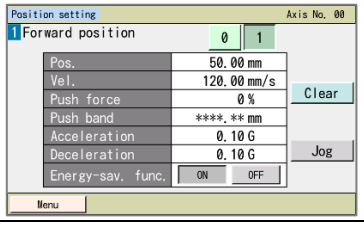
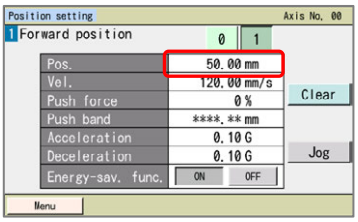
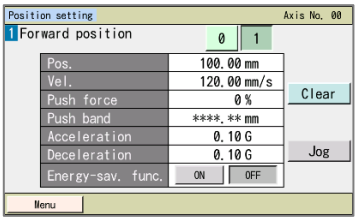
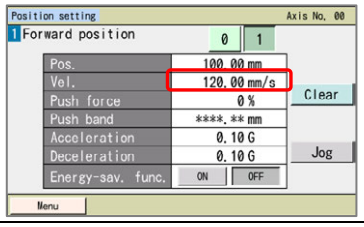
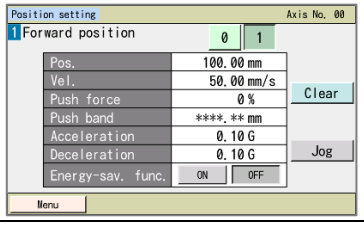
[3] Examples of position setting operations
Respective operations are explained by giving specific examples.

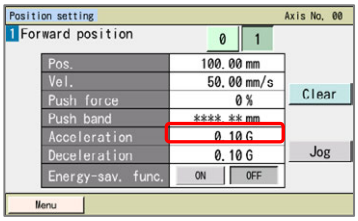
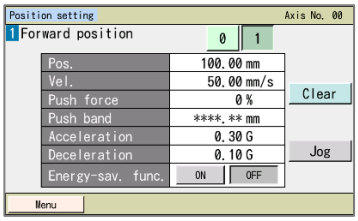
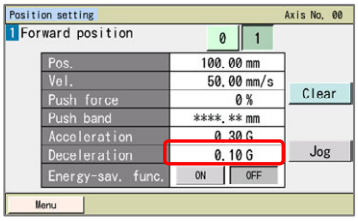
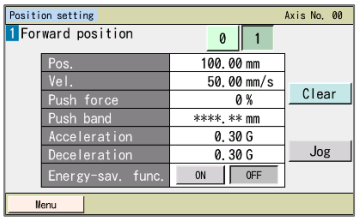
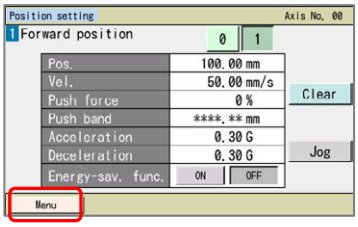
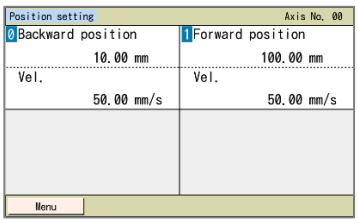
1) Setting of position, speed, acceleration and deceleration
An example of operation mode 0 (standard) is explained.
Set positions to move the actuator back and forth between 10.0mm and 100.0mm.

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

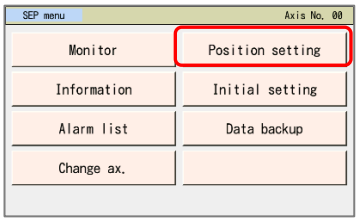
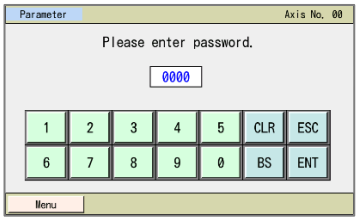
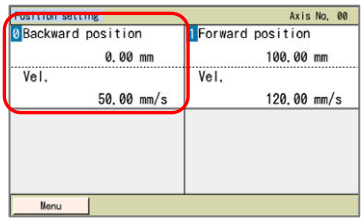
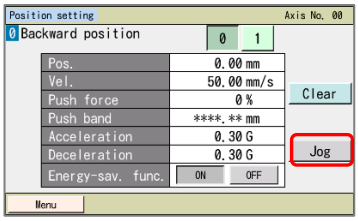
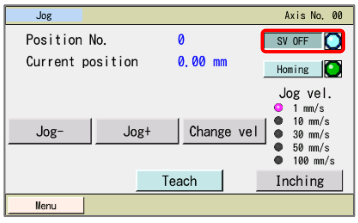
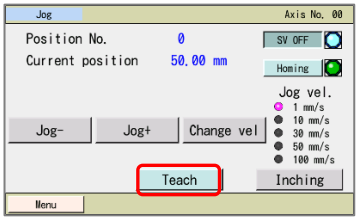
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Position setting].		
2	If the position data edit password is other than “0000,” the password input screen appears. Input a position data edit password and touch [ENT].		You can set a position data edit password from “Position data edit password” 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.

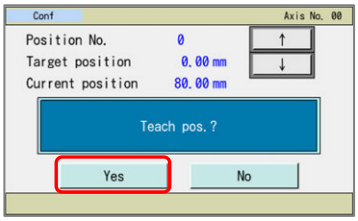
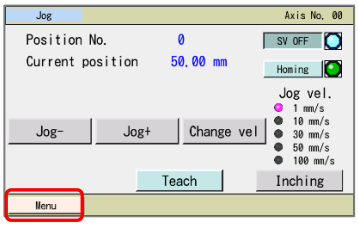
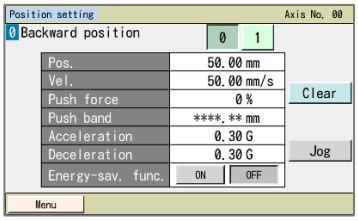
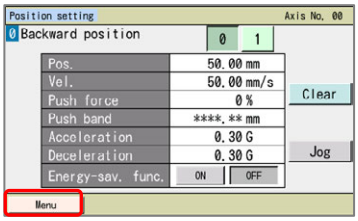
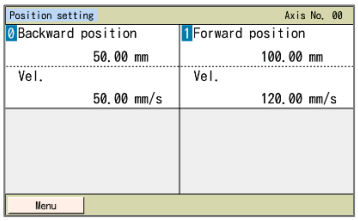
No.	Operation	Screen	Remarks
6	Touch the value in Velocity. The numeric keypad appears. Touch [5] and [0], and touch [ENT].		Touch [Menu] to return to the position setting screen.
7	50.00 is shown in Velocity.		Touch [Menu] to return to the position setting screen.
8	Touch the value in Accelerate. The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

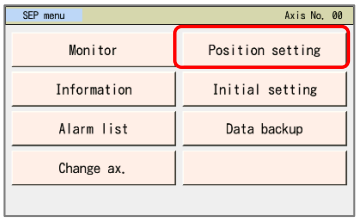
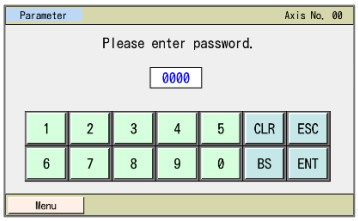
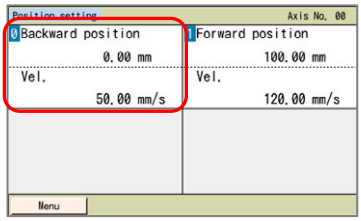
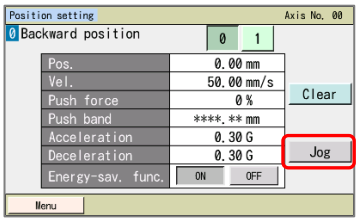
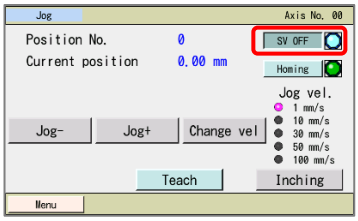
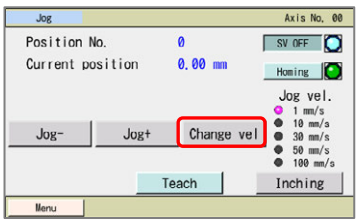
No.	Operation	Screen	Remarks
19	Touch the value in Accelerate. The numeric keypad appears. Touch [0], [.] and [3], and touch [ENT].		Touch [Menu] to return to the position setting screen.
20	0.30 is shown in Accelerate.		Touch [Menu] to return to the position setting screen.
21	Touch the value in Decelerate.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

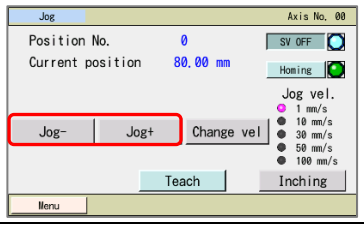
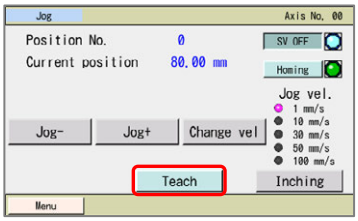
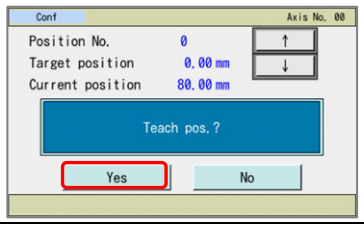
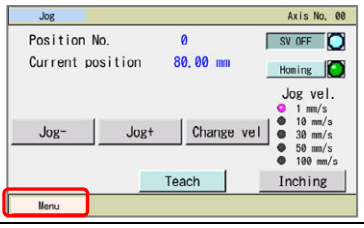
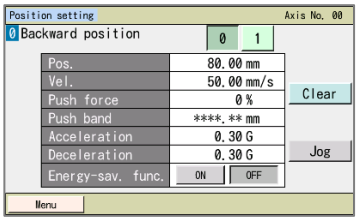
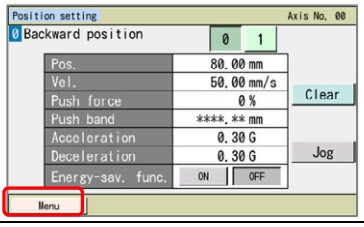
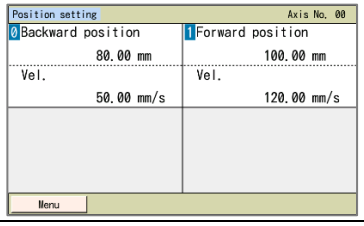
2) Direct teaching (Manually move the slider to the target position and then acquire the achieved position (current position) as the forward end position or backward end position)
An example of operation mode 0 (standard movement between 2 points) is explained.
How to acquire the current position, 50.0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

No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Position setting].		
2	If the position data edit password is other than “0000,” the password input screen appears. Input a position data edit password and touch [ENT].		You can set a position data edit password 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].		

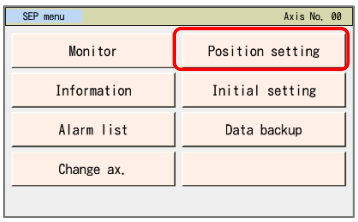
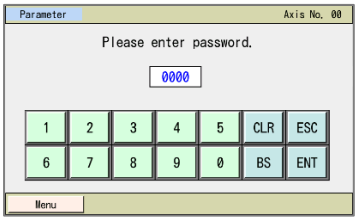
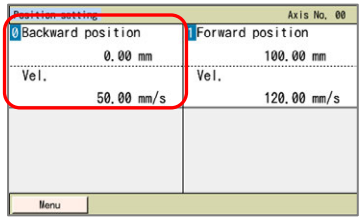
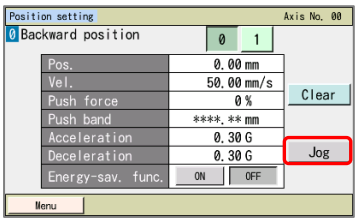
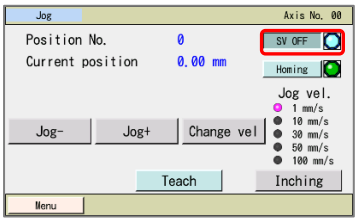
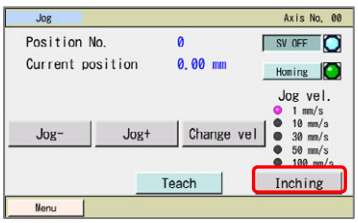
No.	Operation	Screen	Remarks
7	Touch [Yes].		
8	Touch [Menu].		
9	50.00 is shown in Position. It is now confirmed that the position data has been acquired.		Touch [Menu] to return to the position setting screen.
10	Touch [Menu].		Touch [Menu] to return to the position setting screen.
11			Touch [Menu]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

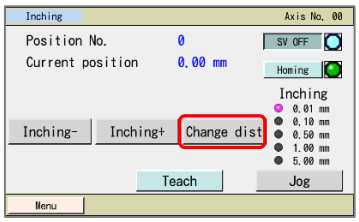
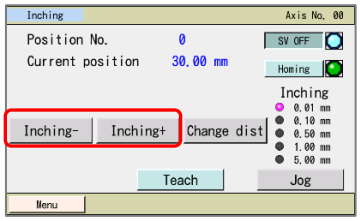
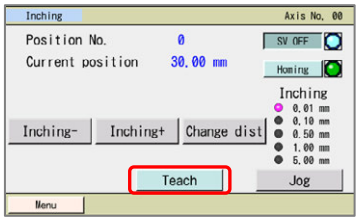
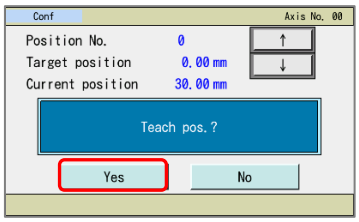
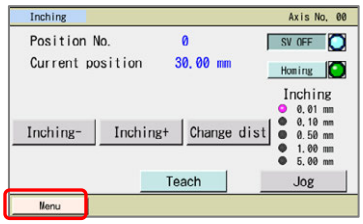
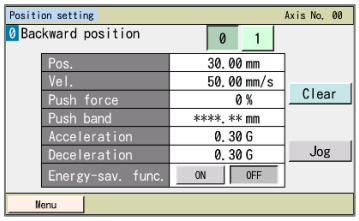
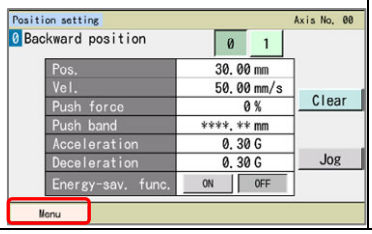
3) Jog (Use the arrow keys [Jog-] and [Jog+] to jog the actuator to the target position and then acquire the achieved position (current position) as the forward end position or backward end position).
An example of operation mode 0 (standard movement between 2 points) is explained.
How to acquire the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

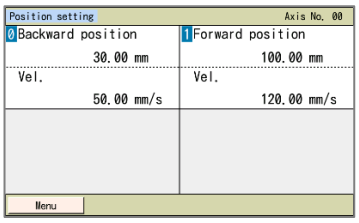
No.	Operation	Screen	Remarks
1	Touch [Position setting] on the SEP menu screen.		
2	If the position data edit password is other than “0000,” the password input screen appears. Input a position data edit password and touch [ENT].		You can set a position data edit password from “Position edit password” 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 [Change 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.

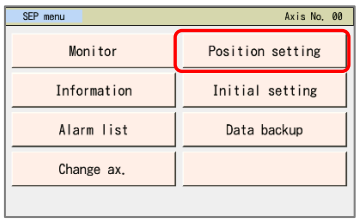
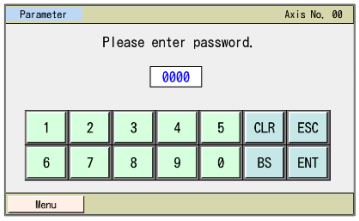
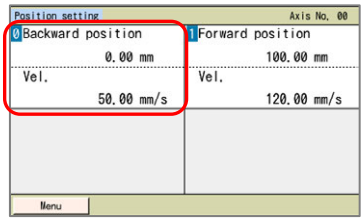
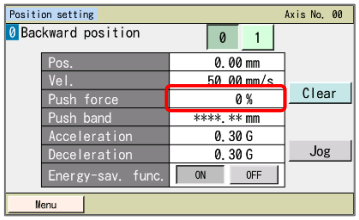
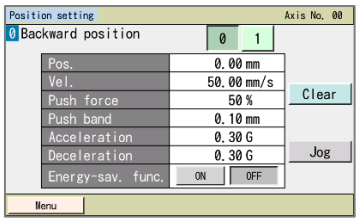
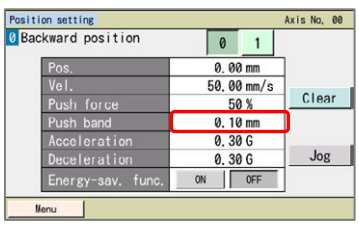
4) Inching (Use the arrow keys [Inching-] and [Inching+] to inch the actuator to the target position and then acquire the achieved position (current position) as the forward end position or backward end position).
An example of operation mode 0 (standard movement between 2 points) is explained.
How to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

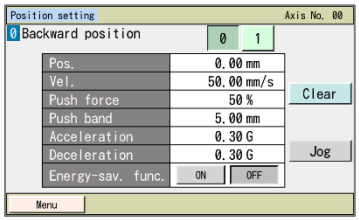
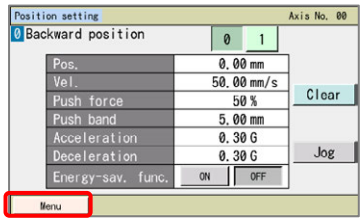
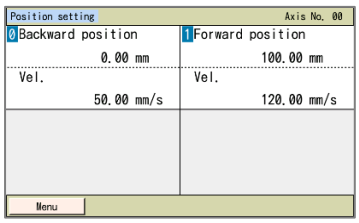
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Position setting].		
2	If the position data edit password is other than “0000,” the password input screen appears. Input a position data edit password and touch [ENT].		You can set a position data edit password from “Position edit password” 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 [Change dist] 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.

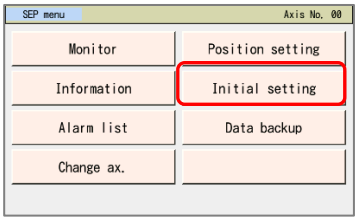
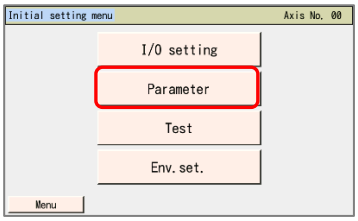
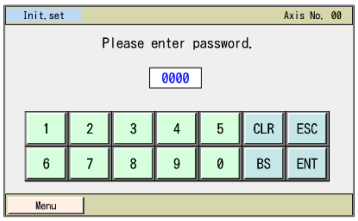
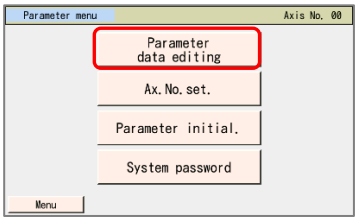
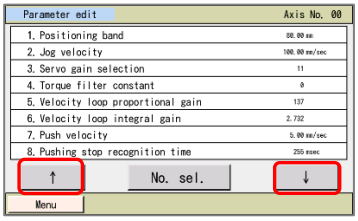
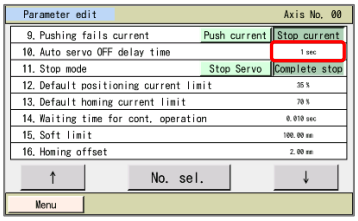
No.	Operation	Screen	Remarks
14			Touch [Menu] to return to the SEP menu screen.

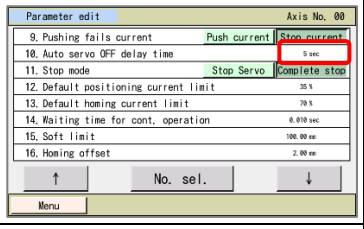
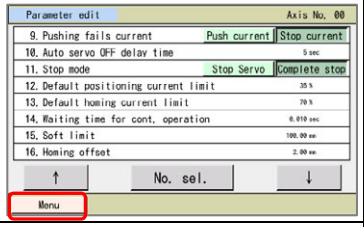
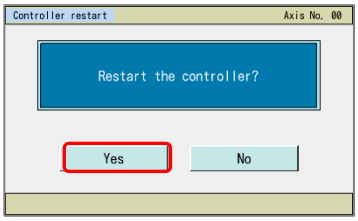
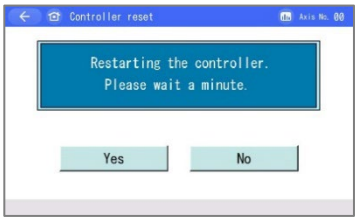
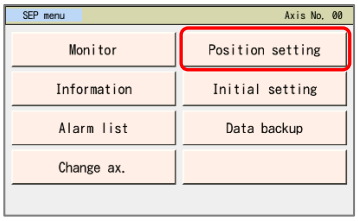
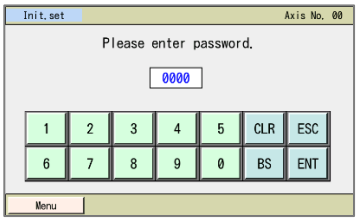
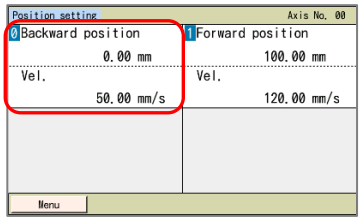
5) Setting of push-motion operation (push power, push band)
An example of operation mode 0 (standard movement between 2 points) is explained.
An example of push-motion operation at the backward end is explained.
Push power: 50%, push band: 5.0 mm

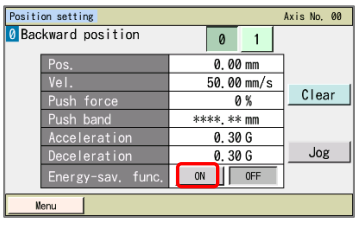
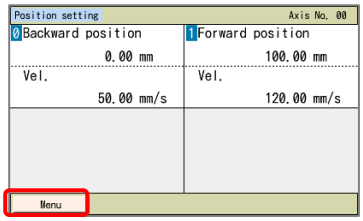
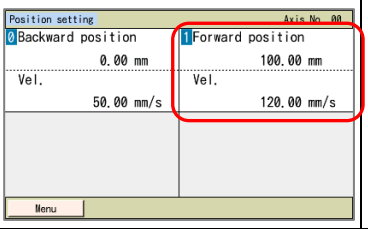
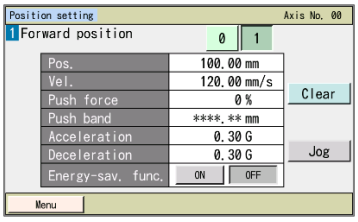
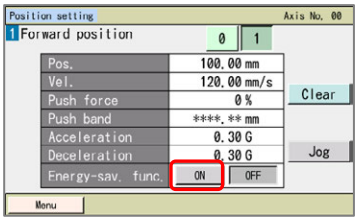
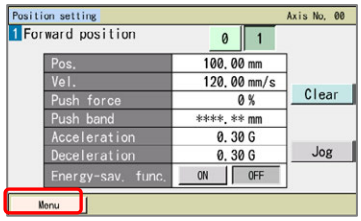
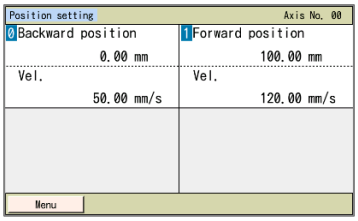
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Positon setting].		
2	If the position data edit password is other than “0000,” the password input screen appears. Input a position data edit password and touch [ENT].		You can set a position data edit password from “Position edit password” 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.

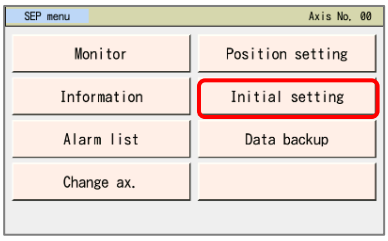
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Initial setting].		
2	Set a desired automatic servo OFF delay time. Touch [Parameter].		
3	If the system password is other than “0000,” the password input screen appears. Input a system password and touch [ENT].		The default system password is “5119”. For how to change the system password, refer to 4.12, “Parameters [Change System Password].”
4	Touch [Parameter data editing].		
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 [Position setting].		
12	If the position data edit password is other than “0000,” the password input screen appears. Input a position data edit password and touch [ENT].		You can set a position data edit password 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.

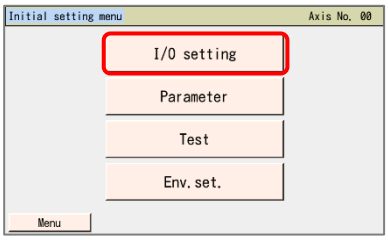
No.	Operation	Screen	Remarks
14	Touch [ON].		Touch [Menu] to return to the position setting screen.
15	Touch [Menu].		Touch [Menu] to return to the SEP menu screen.
16	Set the ecology function at the forward end position. Touch [Forward Position].		Touch [Menu] to return to the SEP menu screen.
17	The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

4.11 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.



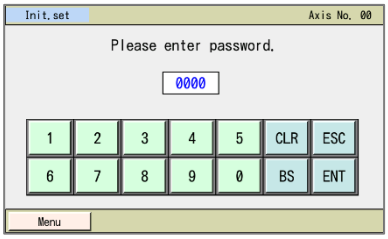
Touch [Initial setting] on the SEP menu screen.



Touch [I/O setting]

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

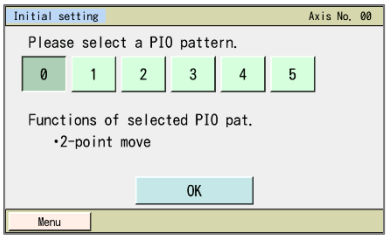
If the system password is other than “0000,” the password entry screen appears.



Enter a system password and then touch [ENT].

> The default system password is “5119”.
> For how to change the system password, refer to 4.12, “Parameters [Change System Password].”

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

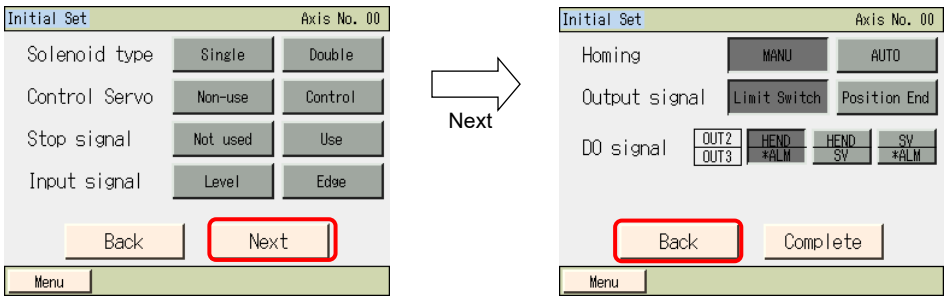


Select and touch one of operation patterns [0] to [5], and then touch [OK].

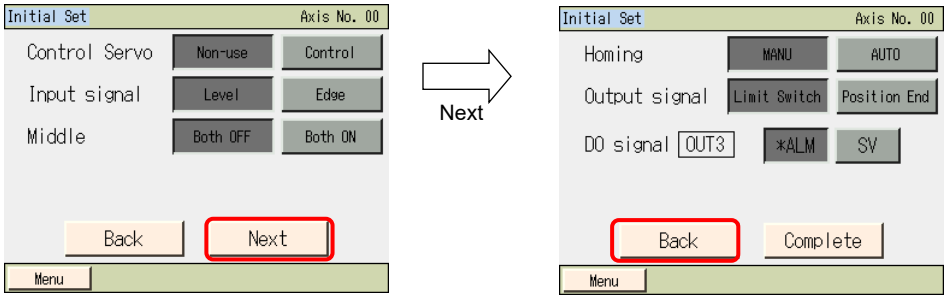
(Note) If connected to Fieldbus Type in MSEP Controllers, [6] (Positioner Mode) is shown.
If selecting [6], it is not necessary to have an operation for the initial setting.
The operation is complete.

The screen corresponding to the selected operation pattern appears.

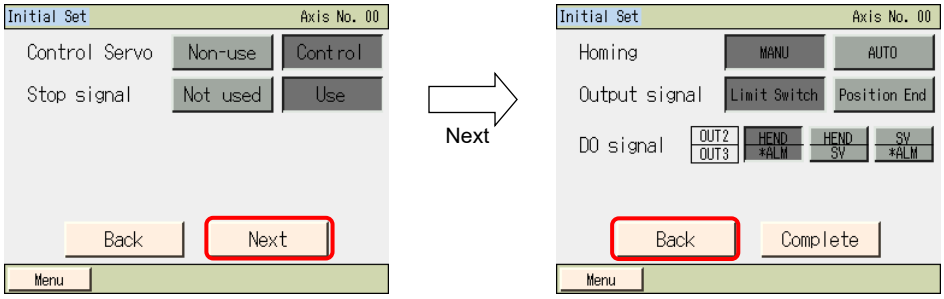
Operation pattern 0 (standard movement between 2 points), operation pattern 1 (change travel speed), operation pattern 2 (change position data)



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.

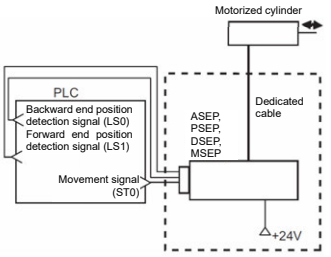
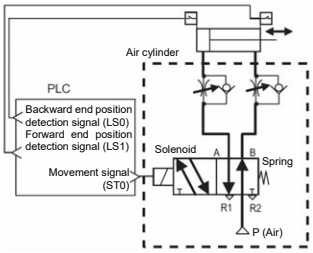
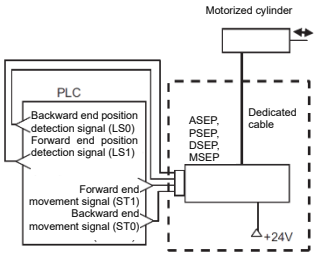
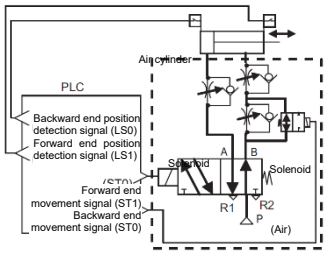
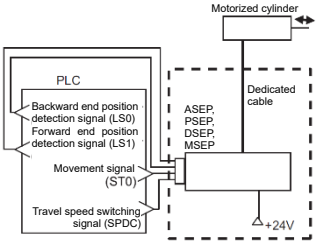
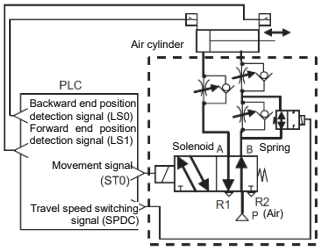
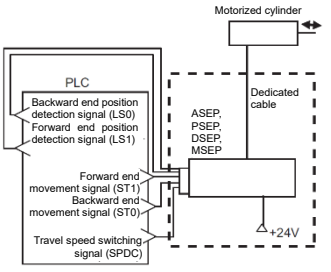
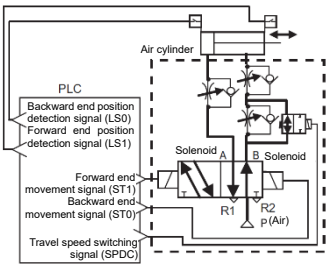
Touch [Back] to return to the operation pattern screen.

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				○	○	○		○	○

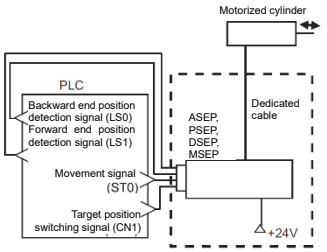
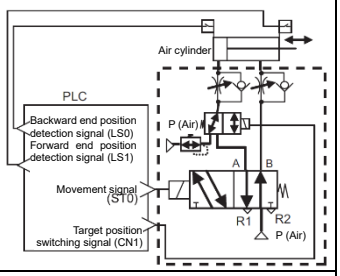
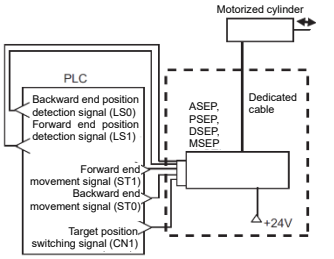
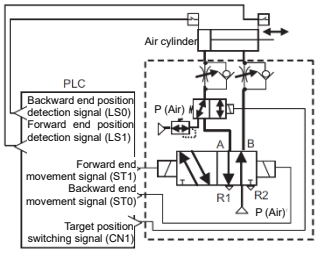
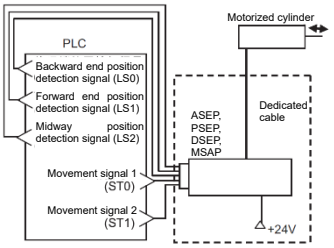
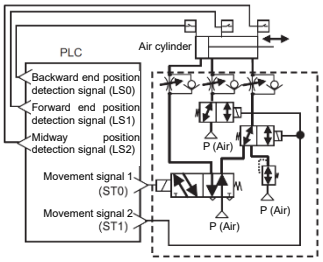
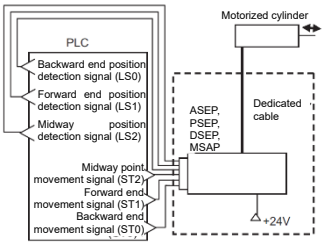
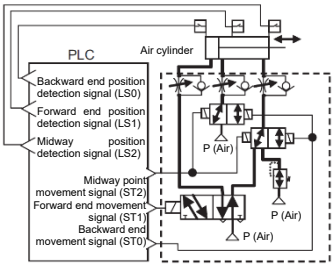
For details on each setting item, refer to the instruction manual for your “ASEP/PSEP/DSEP controller Instruction Manual”, “MSEP controller Instruction Manual”.

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 Instruction Manual", "MSEP controller Instruction 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 Instruction Manual", "MSEP controller Instruction 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)

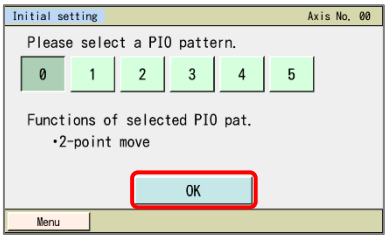
[Output signal selection operation pattern 3, 4]
When operation pattern 3 or 4 is set, set the OUT3 output signal if you have selected to use the servo control.
* Select either ALM (alarm status signal) or SV (servo ON status signal).

[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).

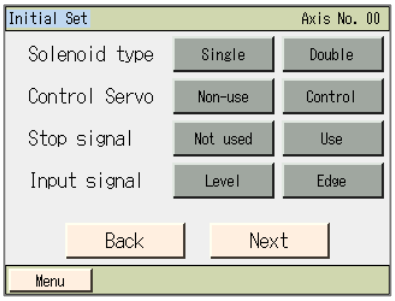
[2] Basic operation

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



Touch [0] and touch [OK].

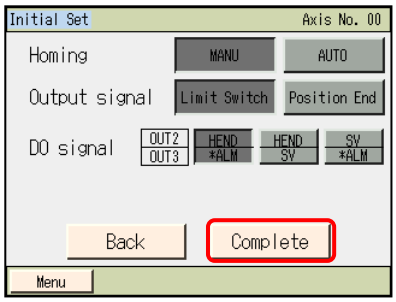
Touch [Menu] to return to the initial setting menu screen.



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

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

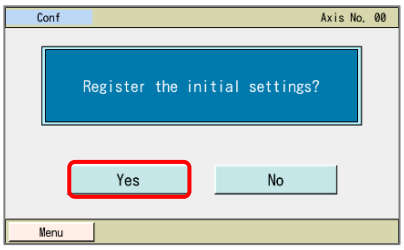
Hereafter, set one by one the items denoted by a O in the table of setting items in 4.11.
When all items on this screen have been set, touch [Next].



When the setting is complete, touch [Complete].

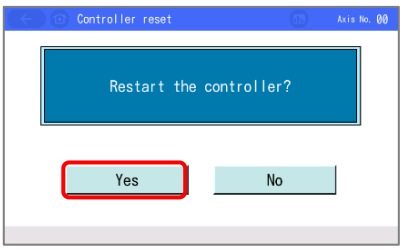
Touch [Back] to return to the previous screen.

Touch [Menu] to return to the initial setting menu screen. All settings you have made under the selected operation pattern become invalid.

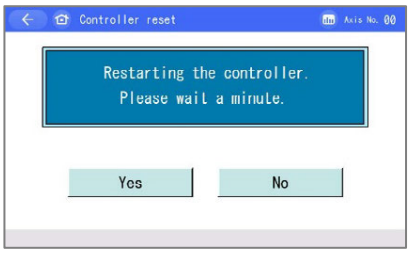


Touch [Yes].

Touch [No] to return to the operation pattern selection 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.

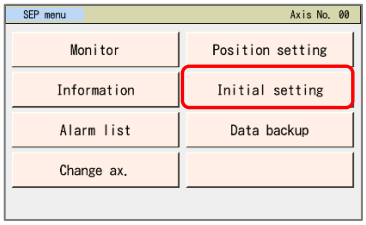
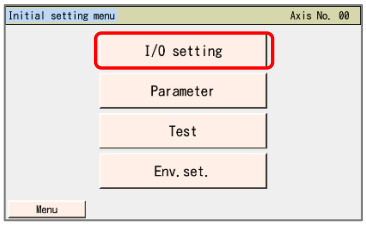
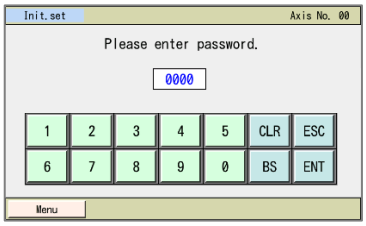
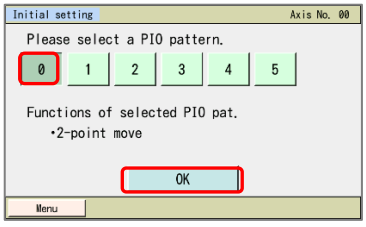
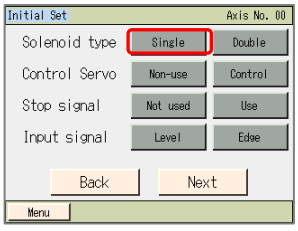


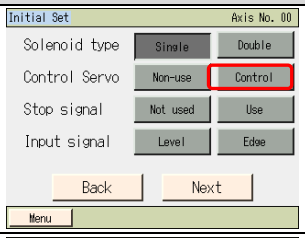
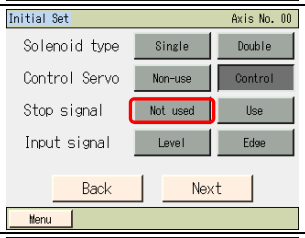
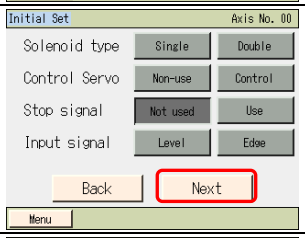
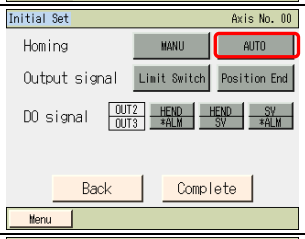
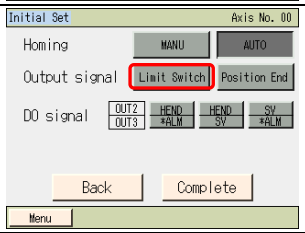
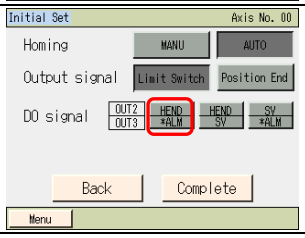
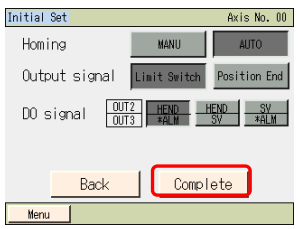
Touch [No], and the controller will not operate according to the operation pattern settings you have made until restarted.

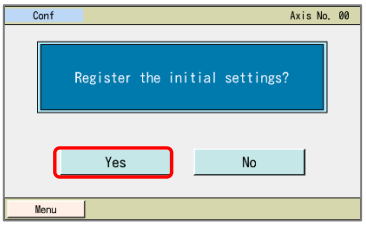
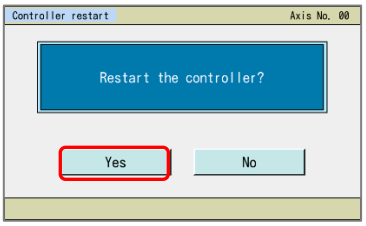
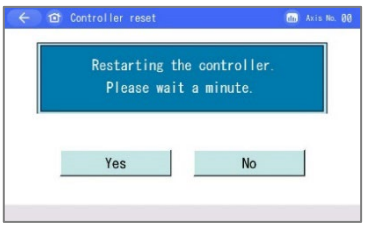
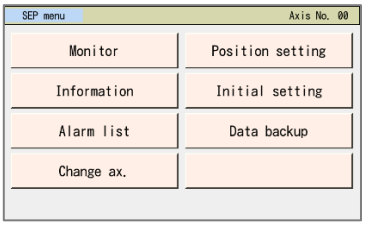
[3] Examples of I/O setting operations
Respective operations are explained by giving specific examples.

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)

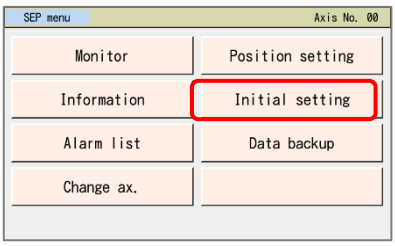
No.	Operation	Screen	Remarks
1	On the SEP menu screen: Touch [Initial setting].		
2	Touch [I/O setting].		Touch [Menu] to return to the SEP menu screen.
3	If the system password is other than “0000,” the password input screen appears. Input a system password and touch [ENT].		The default system password is “5119”. For how to change the system password, refer to 4.12, “Parameters [Change System Password].”
4	Touch [0] and touch [OK]. Operation pattern 0 is selected.		Touch [Menu] to return to the initial setting menu screen.
5	Touch [Single]. The single-solenoid operation mode is selected.		Touch [Menu] to return to the initial setting menu screen.

No.	Operation	Screen	Remarks
6	Touch [Control]. Servo control is selected.		Touch [Menu] to return to the initial setting menu screen.
7	Touch [Not used]. Non-use of pause command (*STP) is selected.		Touch [Menu] to return to the initial setting menu screen.
8	Touch [Next].		
9	Touch [AUTO]. AUTO home return is selected.		Touch [Menu] to return to the initial setting menu screen.
10	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.
11	Touch [HEND*ALM]. HEND and *ALM are selected as the OUT2 and OUT3 outputs.		Touch [Menu] to return to the initial setting menu screen.
12	Touch [Complete].		Touch [Back] to return to the previous screen. Touch [Menu] to return to the initial setting menu screen.

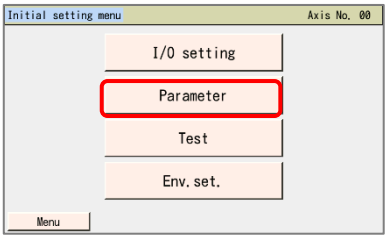
No.	Operation	Screen	Remarks
13	Touch [Yes].		Touch [NO] to return to the operation pattern selection screen. All settings you have made under the selected operation pattern become invalid.
14	Touch [Yes].		The controller does not operate according to the operation pattern settings you have made until restarted.
15			
16			After the controller has restarted, the display switches to the SEP menu screen.

4.12 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.

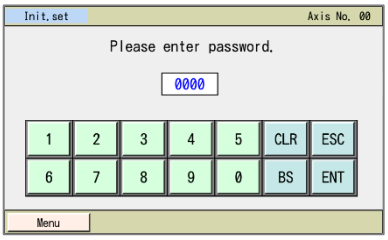


Touch [Initial setting] on the SEP menu screen.



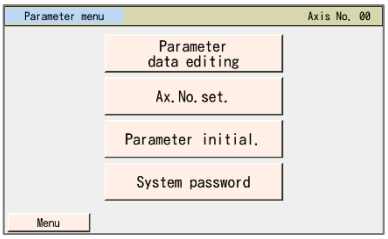
Touch [Parameter].

If the system password is other than “0000,” the password input screen appears.



Enter a system password and then touch [ENT].

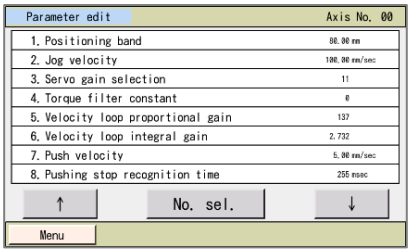
> The default system password is “5119”.
> For how to change the system password, refer to 4.12, "Parameters [Change System Password]."



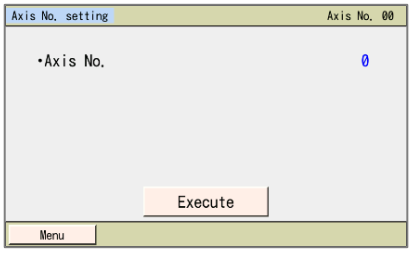
Select and touch [Parameter data editimg], [Ax. No. Set.], [Parameter initial.] or [System password].

The screen corresponding to the selected menu item appears.

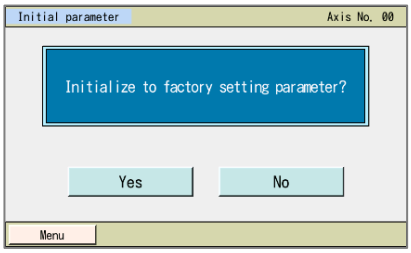
- Edit Parameter: You can set 36 types of parameters.



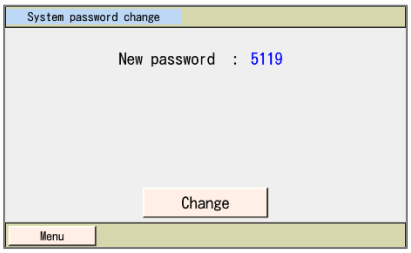
- Axis No. Set: Set the axis number.



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



- Change System Password: You can change the password for I/O setting and parameter editing.



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

No.1 (Default positioning band)
Set the positioning band.

No.2 (Jog speed)
Set the speed of jog operation.

No.3 (Servo gain number)
Set the servo gain number that determines the response of position control loops in servo control.

No.4 (Torque filter constant)
Set the torque filter time constant that determines the filter time constant for torque commands in servo control.

No.5 (Speed loop proportional gain)
Set the speed loop proportional gain that determines the response of speed control loops in servo control.

No.6 (Speed loop integral gain)
Set the speed loop integral gain that determines the response of speed control loops in servo control.

No.7 (Push speed)
Set the speed of push-motion operation.

No.8 (Push recognition time)
Set the push recognition time to recognize completion of operation after the work part was contacted in push-motion operation.

No.9 (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.

No.10 (Auto servo OFF delay time)
Set the time until the servo turns off automatically when the ecology function is enabled.

No.11 (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.

No.12 (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.

No.13 (Current limiting value during home return)
Set the current limiting value to be applied during home return operation.

No.14 (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.

No.15 (Soft limit)
Set the positive soft limit.

No.16 (Home return offset)
Set the offset for home return.

No.17 (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.

No.18 (Simple Absolute board) Displayed for absolute specification controllers
Set whether to enable or disable this function when the controller is of absolute specification.

No.19 (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.

No.20 (Position edit password)
Set the password for editing position data.

No.21 (Zone boundary 1 + side)
Set + side of the area in which the zone signal (ZONE 1) is turned ON.

No.22 (Zone boundary 1 - side)
Set - side of the area in which the zone signal (ZONE 1) is turned ON.

No.23 (Zone boundary 2 + side)
Set + side of the area in which the zone signal (ZONE 2) is turned ON.

No.24 (Zone boundary 2 - side)
Set - side of the area in which the zone signal (ZONE 2) is turned ON.

No.25 (PIO inching distance)
Set an inching distance for the inching entry command from PLC.

No.26 (Target value for total number of movements)
If the total number of movement exceeds the setting of this parameter, an alarm is generated to inform.

No.27 (Target value for total travelled distance)
If the total travelled distance exceeds the setting of this parameter, an alarm is generated to inform.

No.28 (High output setting)
Set whether to use the high output function. However, the actuator complying with high power(Note 1) has to be connected.
(Note 1) Actuator complying with high power: RCP 4 and RCP 5 series (except for high thrust types)

No.29 (BU Speed Loop Proportional Gain)
When setting the high output setting parameter valid, this parameter is effective for the speed loop proportional gain.

No.30 (BU Speed Loop Integral Gain)
When setting the high output setting parameter valid, this parameter is effective for the speed loop integral gain.

No.31 (Overload Level Ratio)
If it exceeds the rated current ratio set, the overload alarm (message level) is turned ON.

No.32 (Minor Failure Alarm Output Selection)
With setting 0, if the rated current ratio exceeds the value set in the overload level ratio parameter, ALM is output.
With setting 1, ALM is output by even message level alarms, such as the maintenance information error, in addition to the result of the overload level ratio.

No.33 (Enabled/disabled axis selection)

If you want to operate fewer axes than you bought, by setting this parameter disabled, the axis is considered as disabled and the alarm does not occur.
You can connect and operate only specific axes when starting up, or set them for expansion in future.

No.34 (Initial movement direction of excitation phase signal detection operation)

When the servo is first turned ON after power-on, the excitation detection is performed (Note 1). Define the detection direction at this time.
Usually, this parameter does not need to be changed. However, when it gets in touch with the mechanical end or any interfering object at the time of starting up, set the direction in which the motor is easy to move.
(Note 1) In the simple absolute specification, the excitation detection is performed at the time of completing home return.

No.35 (Excitation phase signal detection time)

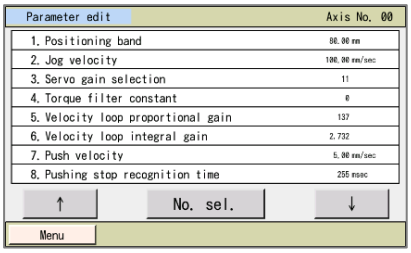
When the servo is first turned ON after power-on, the excitation detection is performed (Note 2). Define the detection time at this time.
Usually, this parameter does not need to be changed. However, when the excitation detection error or any malfunction occurs, it may be effective to change the setting of this parameter.
If you want to change this parameter, contact to us.
(Note 2) In the simple absolute specification, the excitation detection is performed at the time of completing home return.

No.36 (Excitation detection type)

When the servo is first turned ON after power-on, the excitation detection is performed (Note 3). The new method makes this operation smooth and makes it possible to reduce noise. (In this company's comparison)
(Note 3) In the simple absolute specification, the excitation detection is performed at the time of completing home return.

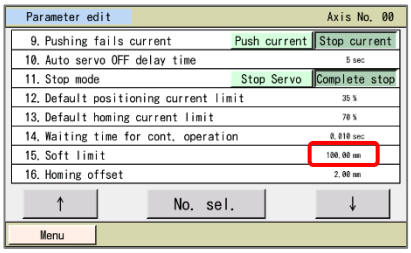
[2] Basic operation
Set parameters.

[Parameter]

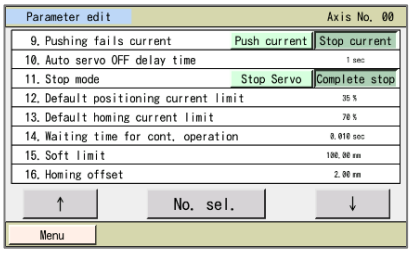


Touch [↑] to return to the previous screen.
Touch [↓] to move to the next screen.
Three screens are available, including one showing the default positioning band and others used to edit position data and password.
Touch [Menu] to return to the parameter menu screen.

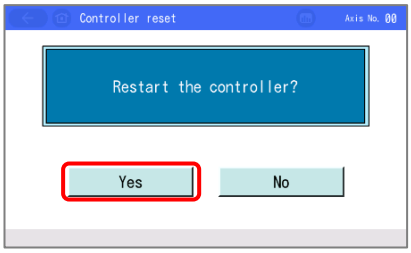
An example of setting a soft limit is explained.
Touch [↑] and [↓] on the displayed screen until the soft limit setting screen appears.



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



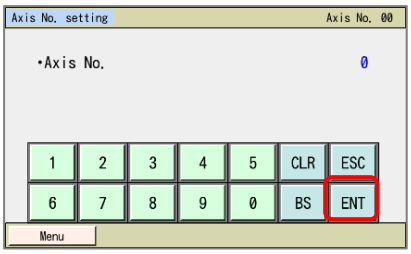
Change parameters and touch [Menu] to return to the controller restart screen.



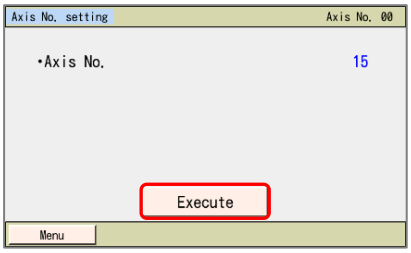
Touch [Yes].
The controller is restarted.
The controller operates according to the operation pattern settings you have made.
The display returns to the initial setting screen.

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



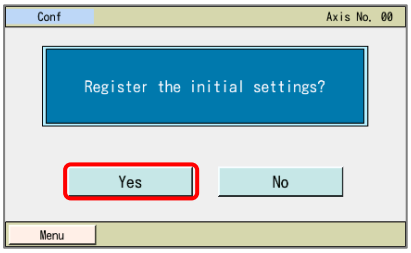


When the numeric keypad appears, enter a desired value and then touch [ENT].
You can set a value between 0 and 15.



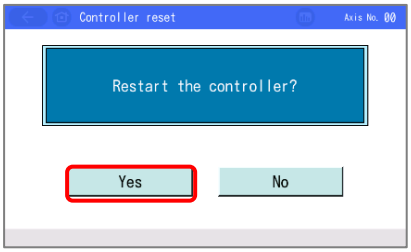
Touch [Execute].
In this example, 15 is set.

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



Touch [Yes].

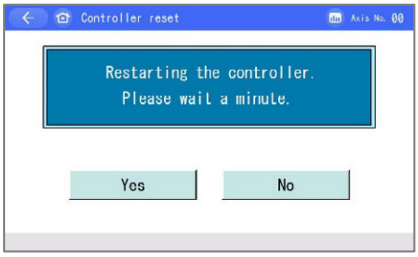
Touch [No] to return to the parameter menu screen without resetting the parameters to their factory default settings.



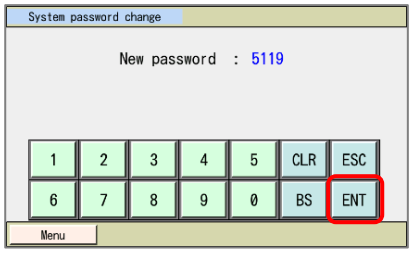
Touch [Yes].

The controller is restarted.
The controller operates 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.

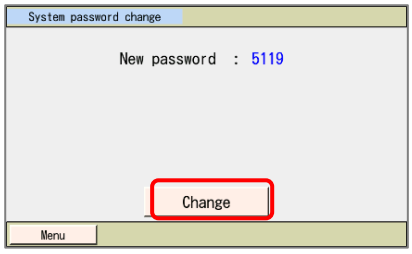


[Change System Password]
Change the system password.

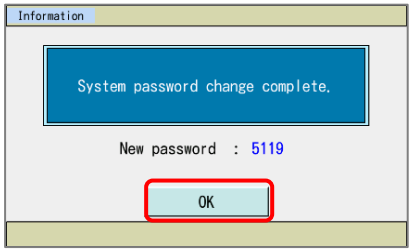


Enter the new system password to change to.
If you do not set the system password, enter 0000.

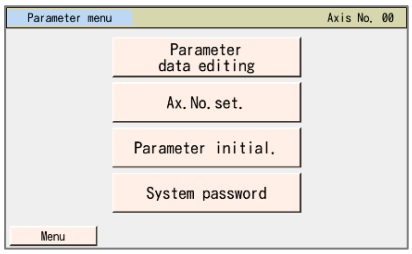
Touch [ENT].



Touch [Change].

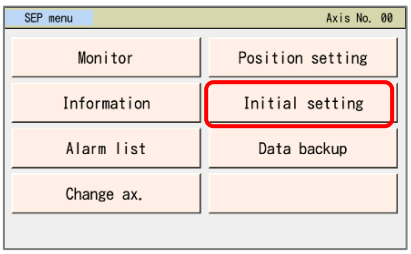


The system password changes.
Touch [OK] to return to the parameter menu screen.

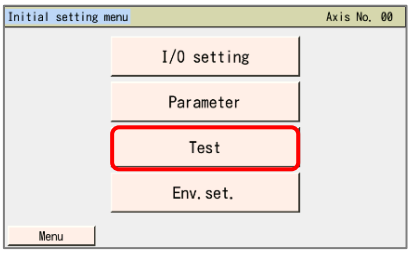


4.13 Test (I/O Tests, Operation Tests for Axis Movement)

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

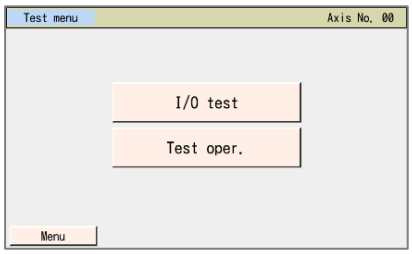


Touch [Initial setting] on the SEP menu screen.



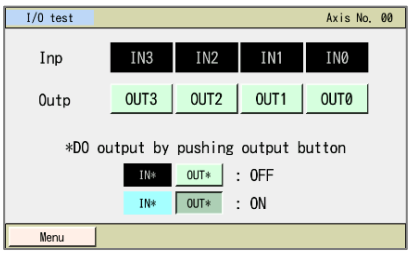
Touch [Test].

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



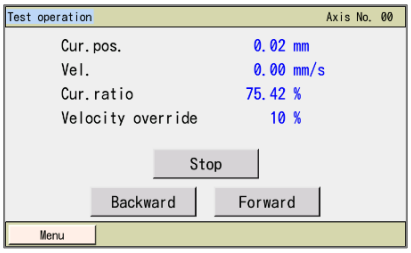
Select and touch either [I/O Test] or [TestPlay].

- 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.

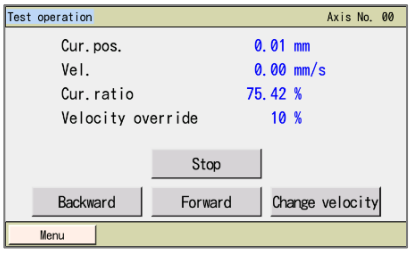


- Pos Test: Operation tests for axis movement can be performed.
  The screen corresponding to the selected operation pattern appears.

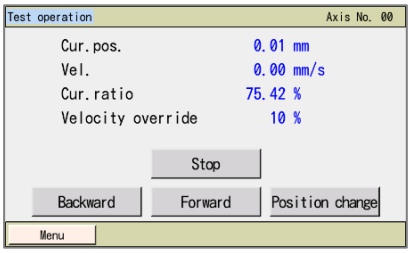
Operation pattern 0
(standard movement between 2 points)



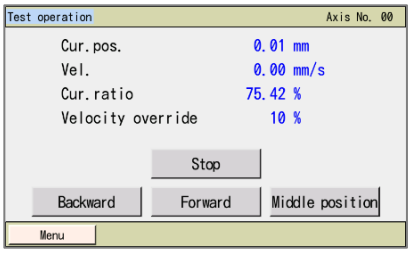
Operation pattern 1 (change travel speed)



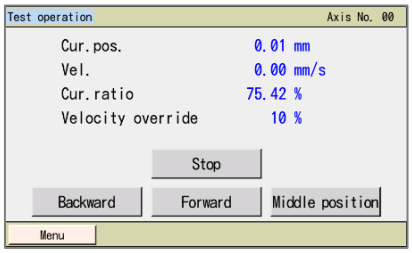
Operation pattern 2 (change position data)



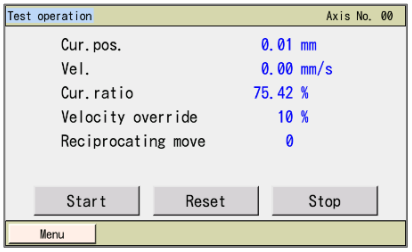
Operation pattern 3
(movement by 2 inputs among 3 points)



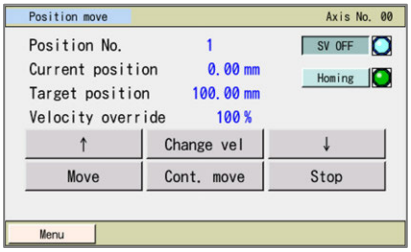
Operation pattern 4
(movement by 3 inputs among 3 points)



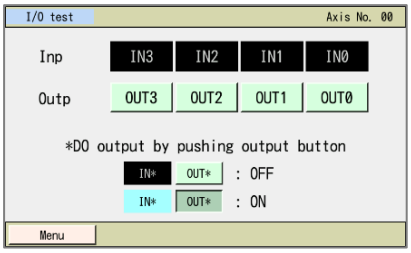
Operation pattern 5
(continuous back-and-forth operation)



Operation pattern 6
(positioner)



[1] Basic operation
[I/O test]

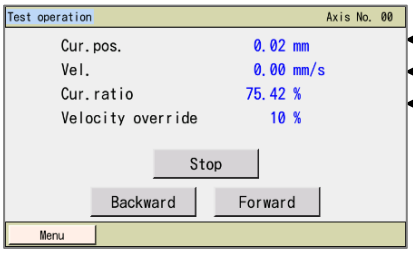


ON/OFF of input signals can be monitored.

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.



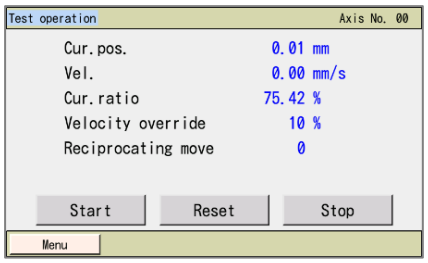
The current axis position is indicated.
The axis speed is indicated.
The electric rated current ratio/current value of the axis is indicated by a percentage of the rating.

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

- Current Rate/Current : You can switch the display between the rated current ratio (%) and current value (mA) every time you touch [Current Rate] or [Current].
- Vel Override : You can change the moving speed of the actuator to 10%, 50% or 100% of the speed set in the position data every time you touch [Vel Override].

- Backward : Touching [Backward] moves the actuator backward.
- Forward : Touching [Forward] moves the actuator forward.
- Stop : Touching [Stop] stops the actuator.

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 rated current ratio/current value of the axis is indicated by a percentage of the rating.
The back-and-forth operation times of the axis is indicated.

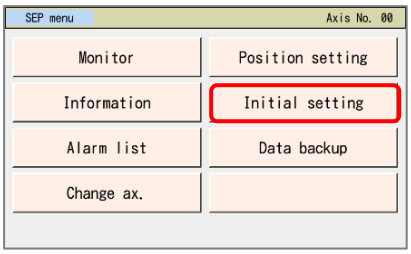
- Current Rate/Current : You can switch the display between the rated current ratio (%) and current value (mA) every time you touch [Current Rate] or [Current].
- Vel Override : You can change the moving speed of the actuator to 10%, 50% or 100% of the speed set in the position data every time you touch [Vel Override].

- 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.

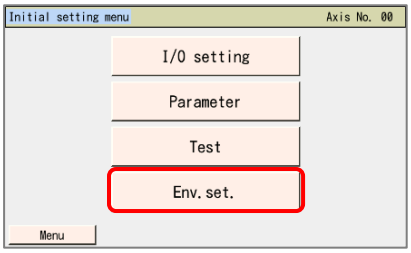
Continuous operation resumes once the operation test screen closes.

4.14 Environment Setting

You can set the language, touch operation sound, auto monitor function, sleeping time, data input warning, display and time.



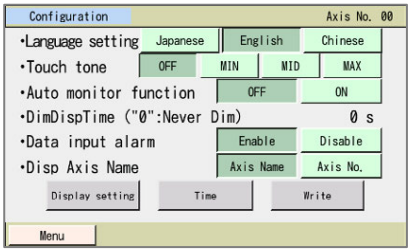
Touch [Initial setting] on the SEP menu screen.



Touch [Env.set.].

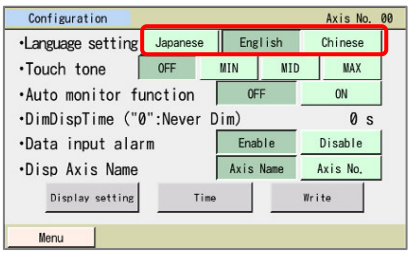
Touch [Menu] to return to the SEP menu screen.

The environment setting screen appears.



[1] Basic operation

- Language: Select a language to display.
  Display for Japanese/English/Chinese languages setting change

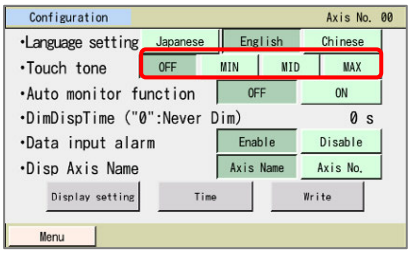


Touch a desired language ([English] etc.).

Touch [Write].

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

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

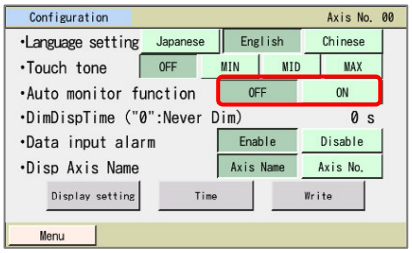


Touch [OFF]. A touch tone is not output.
Touch [MAX], [MID] or [MIN]. A touch tone is output.

Touch [Write].

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

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

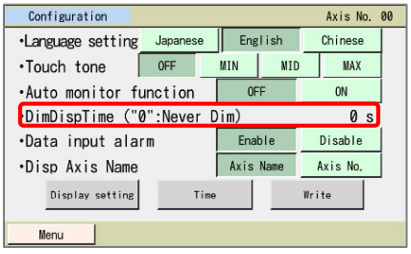


Touch [ON] to enable the auto monitor function.
Touch [OFF] to disable the auto monitor function.

Select either ON or OFF, and then touch [Write].

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

- Dim Display Time: Set the lights-out time when not being operated.
  If “0 sec” is set, the display will remain lit at all times.



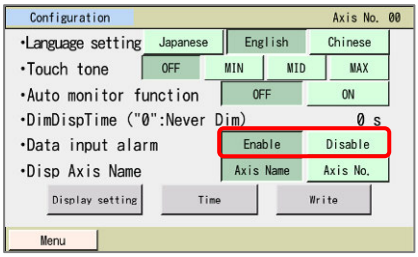
Touch [Dim Display Time (“0”: Never Dim) 0 sec].

Enter the light off time.
A desired value between 0 and 255 sec can be set.

Touch [Write].

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

- Data Input Warning: The warning can be output when a value less than the minimum speed and a value exceeding the rated acceleration/deceleration speed are entered in the position data. Note that the value is entered even if the warning occurs. Always use within the specification of the actuator.



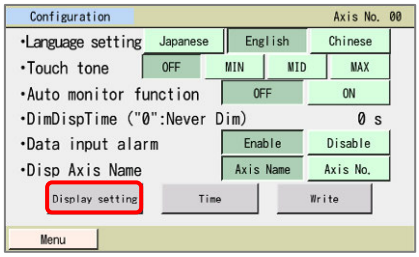
Touch [Effect] to give the warning.
Touch [Non Effect] not to give the warning.

Select either Effect or Non Effect, and then touch [Write].

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

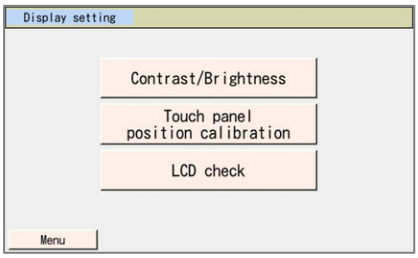
[Display]

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



Touch [Display setting].

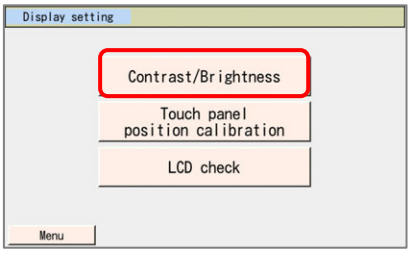
Display menu Window is displayed.



Select Display Setting menu.

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

●Change the Contrast/Brightness
You can adjust contrast (shading of liquid crystal) and brightness (of liquid crystal).



Touch [Contrast/Brightness].

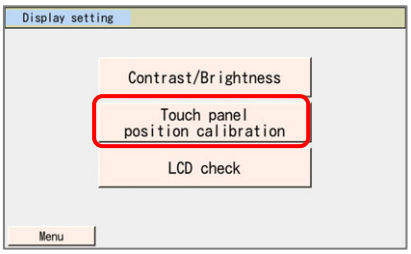


Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

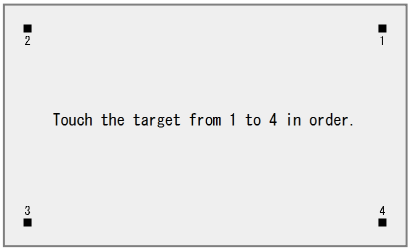
Brightness adjustment
Touch [–] and [+] under Brightness to adjust the brightness of the screen.

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

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



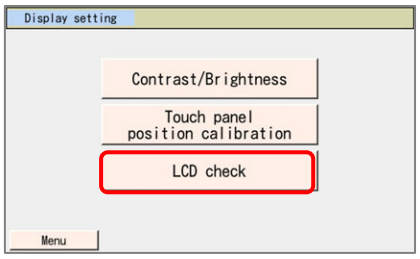
Touch [Touch panel position calibration].



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

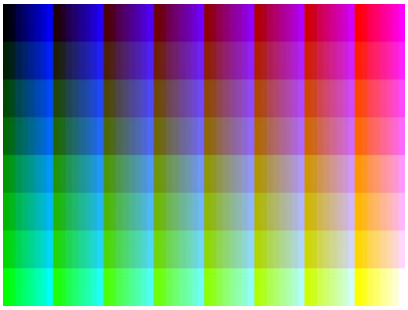
The display returns to Display menu screen.

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



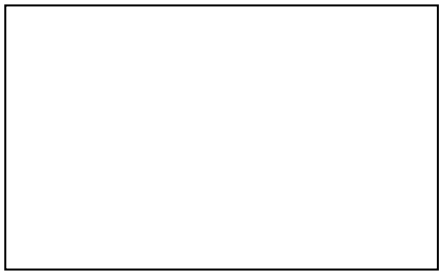
Touch [LCD check].

Color Pattern is displayed.



Touch any point on the screen.

White Only is displayed.



Touch any point on the screen.

Black Only is displayed.

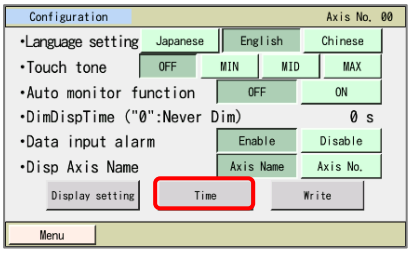


Touch any point on the screen.
The display returns to Display menu screen.

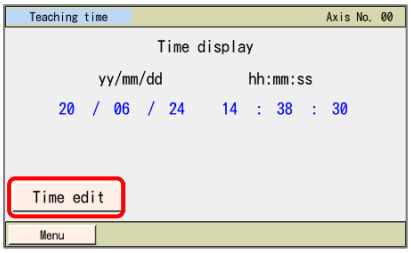
[Time setting]

Time setting can be performed for TB-02 or controller with a calendar function.

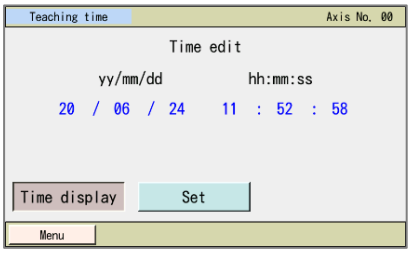
1) Time setting for TB-02



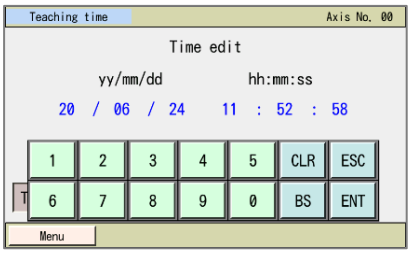
Touch [Time].



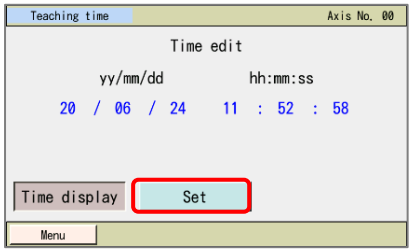
The time of teaching TB-02 is displayed.
Touch [Time Edit].



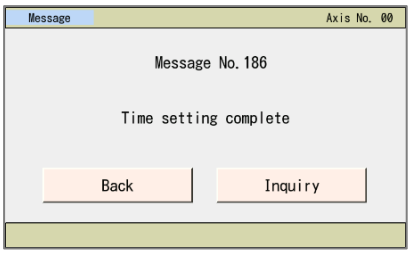
Touch the value of year, month, day, hour, minute or second that is required to be changed.



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

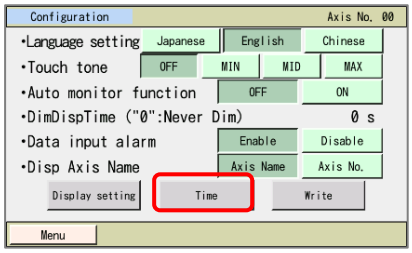


Touch [Set].

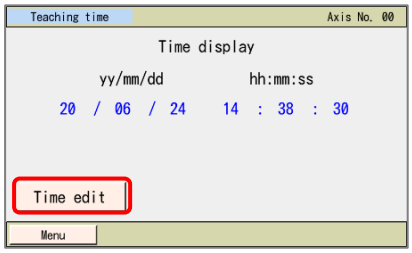


The time of the TB-02 is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

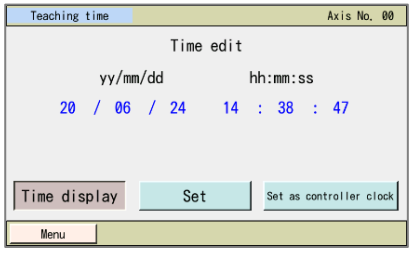
2) Time setting for controller with a calendar function



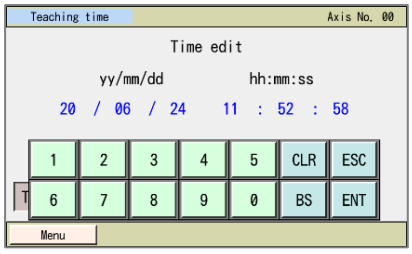
Touch [Time].



The time of teaching is displayed.
Touch [Time Edit].



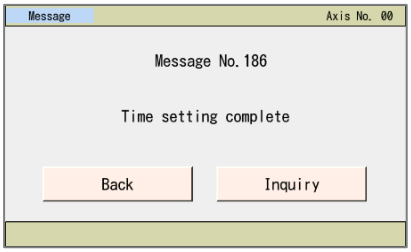
When setting the time of teaching to the controller, the time does not need to be changed.
Touch any one of year, month, day, hour, minute and second to change the time.



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



Touch [Set as controller clock].



The time of the controller is changed.
Touch [Back] to return to the teaching time setting screen.
Touch [Inquiry] to display the inquiry screen.

4.15 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.*

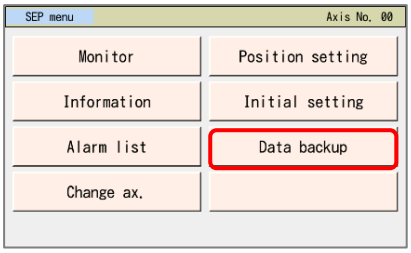
(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. The files existing in other directories other than the 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 : \TB_CON\Position\File Name*
- *Parameter : \TB_CON\Parameter\File Name*
- *Alarm List : \TB_CON\Alarmlist\File Name*

(Note) Files with Chinese names are not supported.

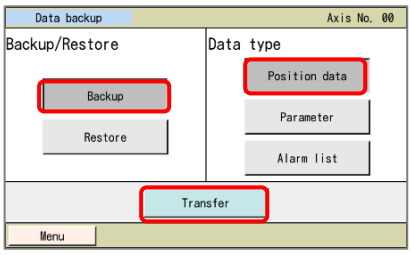
4.15.1 Data Backup of the Controller

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



Touch [Data backup] on the SEP Menu screen.

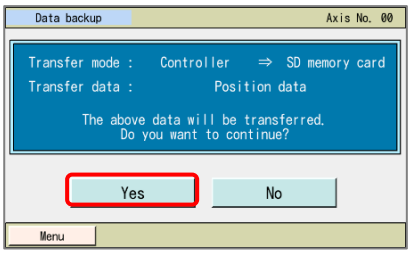
A screen for data transfer appears.



Touch [Backup].

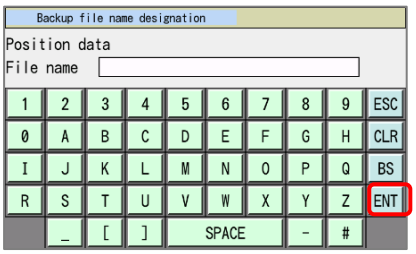
Select the data type for the backup such as [Position Data] and touch it.

Touch [Transfer].

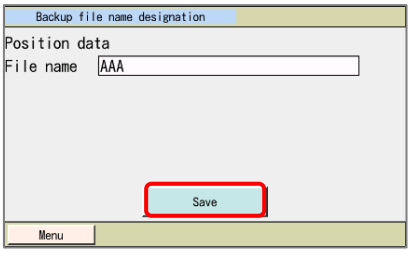


Touch [Yes].

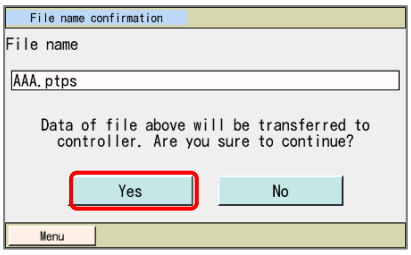
If [No] is touched, the screen goes back to the data backup screen.



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



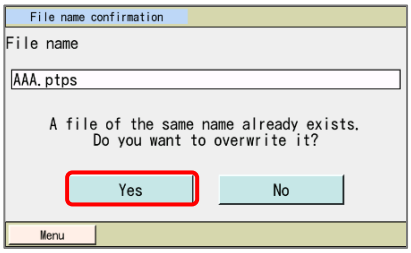
Touch [Save].



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

Touch [Yes].

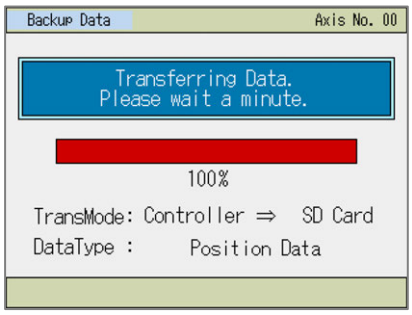
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



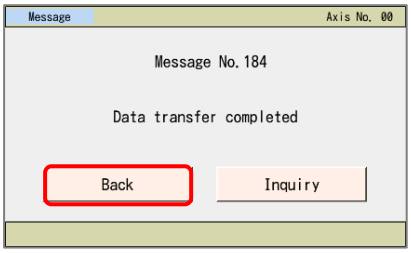
The screen below appears if the same name is found.

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.

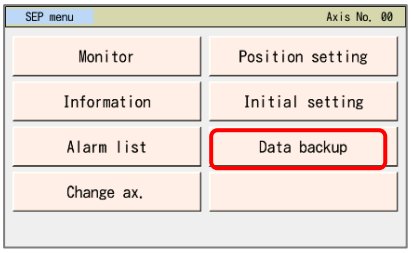


A message to tell the data transfer is complete pops up and the backup process is finished.

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

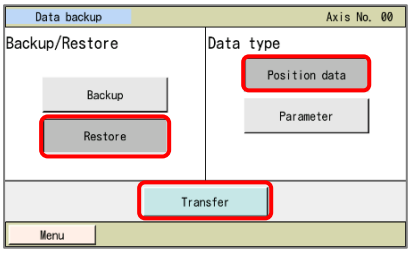
4.15.2 Restore to Controller

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



Touch [Data backup] on the SEP Menu screen.

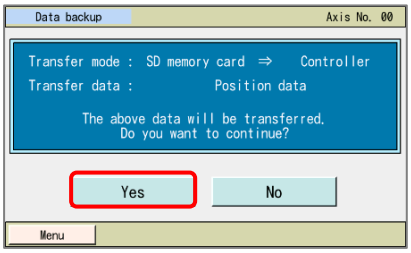
A window for data transfer appears.



Touch [Restore].

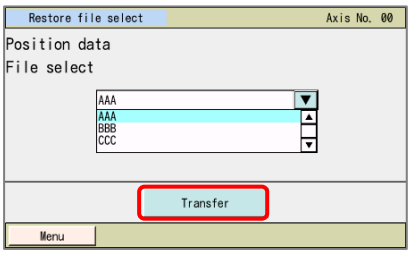
Select the data type to transfer to the controller, such as [Position Data], and touch it.

Touch [Transfer].



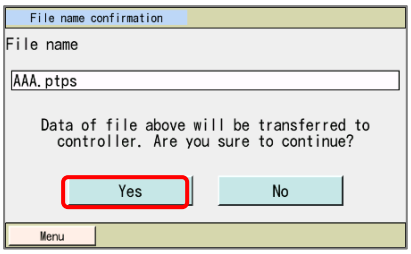
Touch [Yes].

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



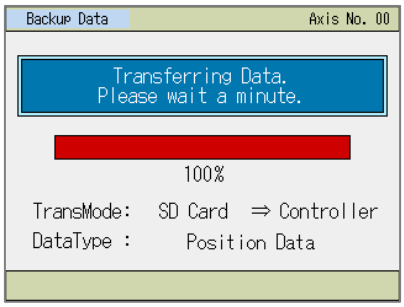
Touch ▲ and ▼ to select a file to transfer to the controller from the list of the backed up file names.

Touch [Transfer].

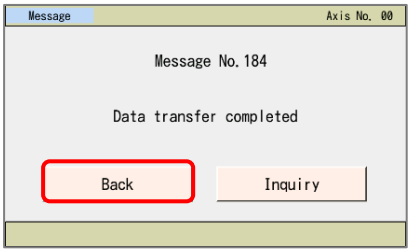


Touch [Yes].

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.

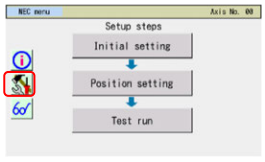
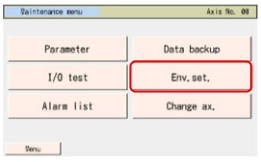
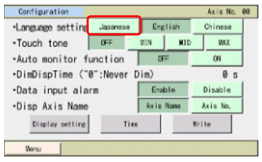
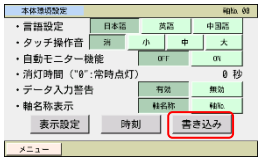
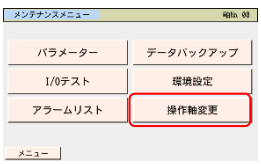
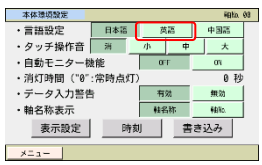
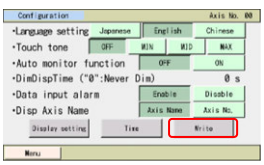
Touching [Back] can go back to the Backup Data screen.

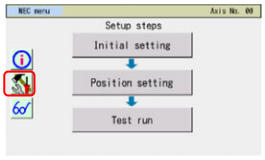
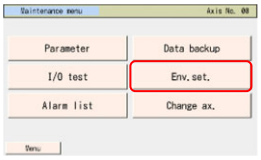
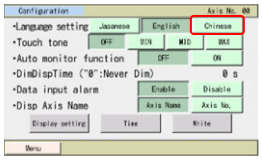
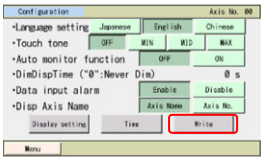
5. Operation of MEC Related Controllers

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

5.1 Transition of Operating States

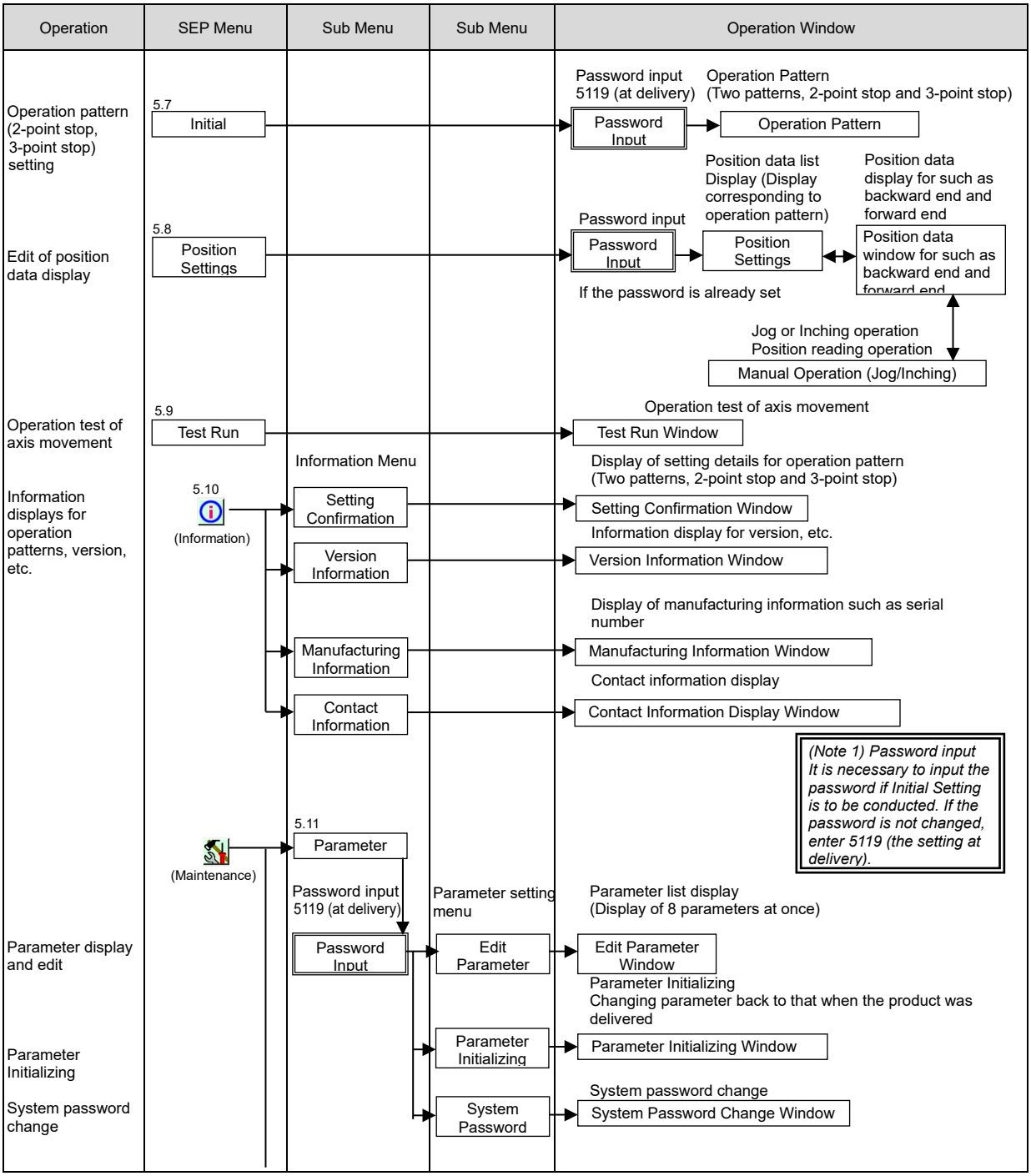
The language can be changed by following the steps below.
For the operation after the language change, please refer to the instruction manual written in each language

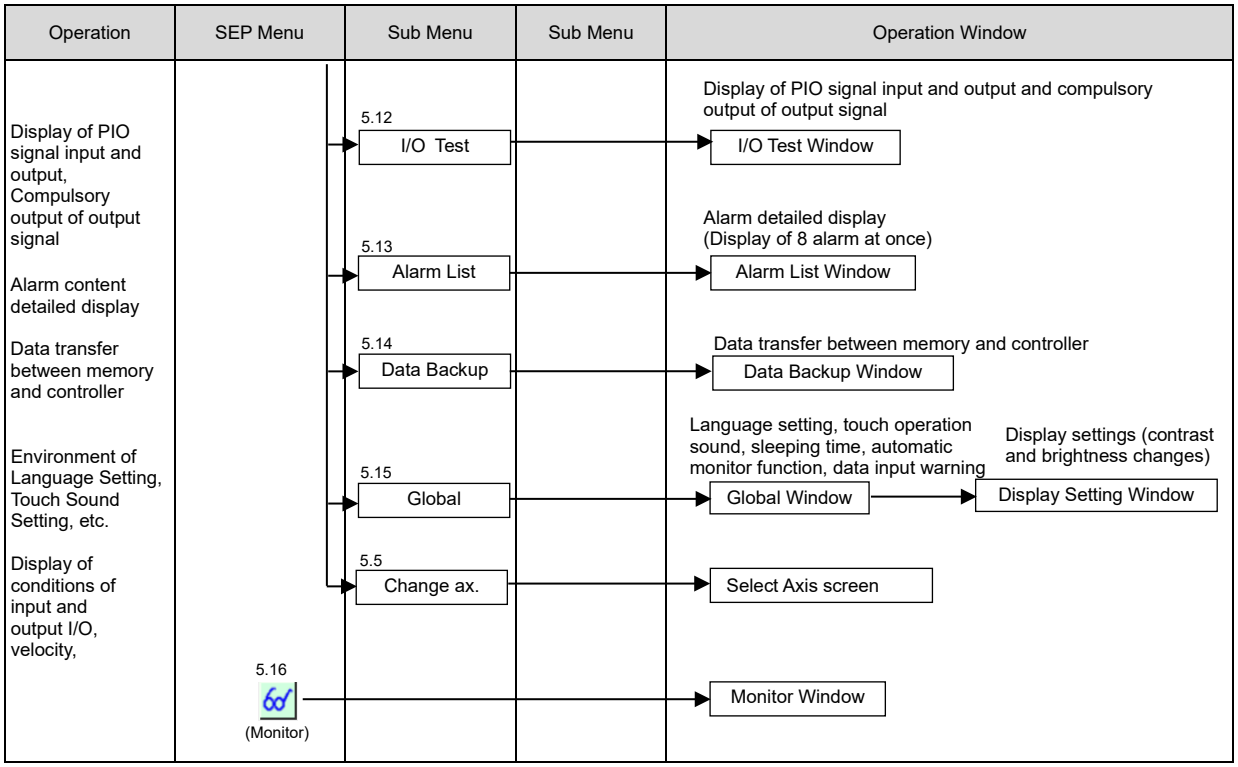
Display change from English to Japanese			
			
Touch in MEC Menu.	Touch [Env.Set.].	Touch [Japanese].	Touch [書き込み].
Display change from Japanese to English			
			
Touch in MEC メニュー.	Touch [環境設定].	Touch [英語].	Touch [Write].

Display change from English to Chinese			
			
Touch in MEC Menu.	Touch [Env.Set.].	Touch [Chinese].	Touch [写入].
Display change from Chinese to English			
			
Touch in MEC 菜单.	Touch [环境设定].	Touch [英语].	Touch [Write].

5.2 Operating Menu

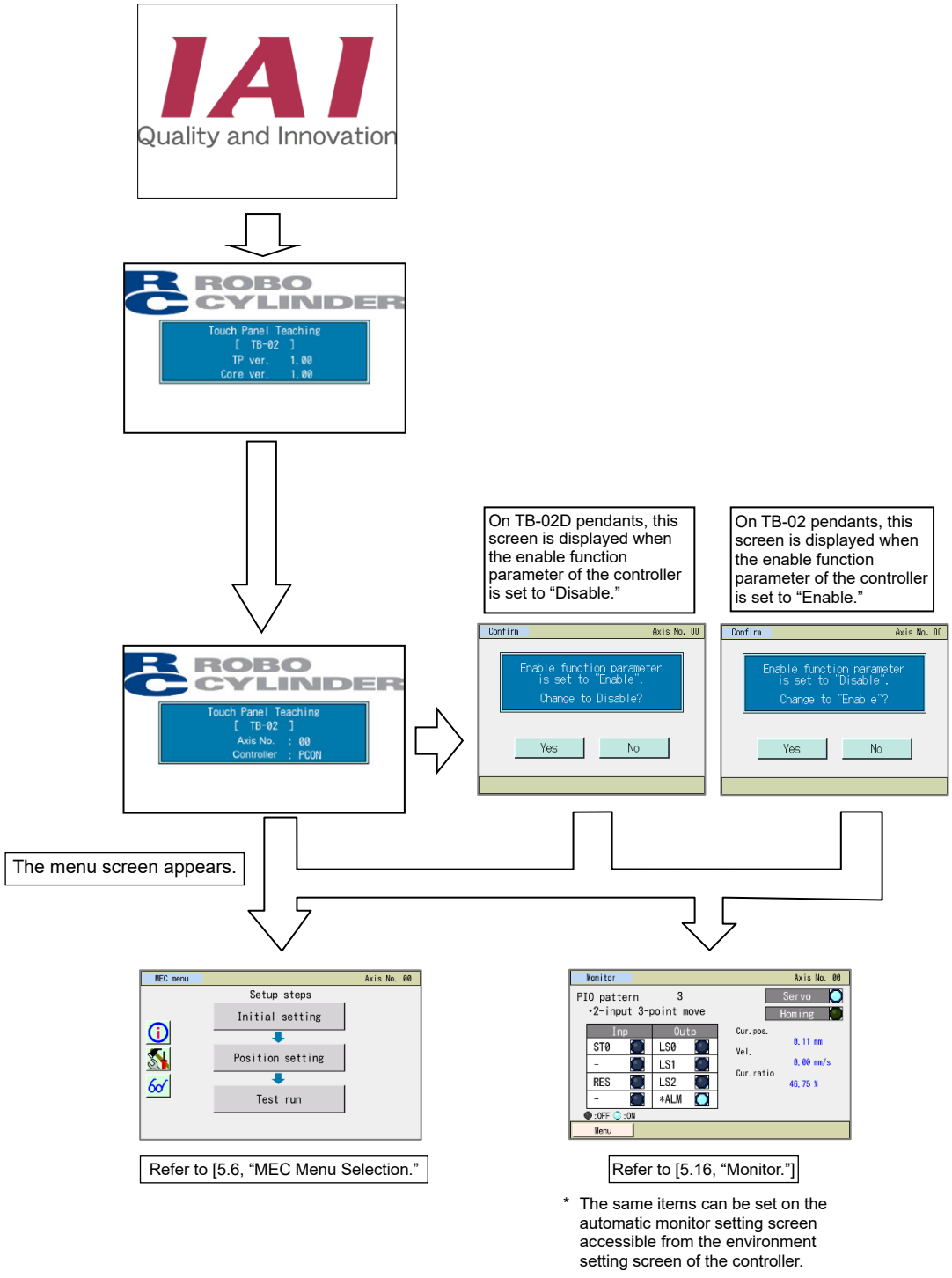
Transition of operating states when the touch panel teaching pendant TB-02 is connected to a MEC related controller is shown.




Operation
SEP Menu
Sub Menu
Sub Menu
Operation Window
Display of PIO signal input and output, Compulsory output of output signal
Alarm content detailed display
Data transfer between memory and controller
Environment of Language Setting, Touch Sound Setting, etc.
Display of conditions of input and output I/O, velocity,
5.12
I/O Test
Display of PIO signal input and output and compulsory output of output signal
I/O Test Window
5.13
Alarm List
Alarm detailed display
(Display of 8 alarm at once)
Alarm List Window
5.14
Data Backup
Data transfer between memory and controller
Data Backup Window
5.15
Global
Language setting, touch operation sound, sleeping time, automatic monitor function, data input warning
Global Window
Display settings (contrast and brightness changes)
Display Setting Window
5.5
Change ax.
Select Axis screen
5.16
(Monitor)
Monitor Window

5.3 Initial Screen

When the power is turned on, the IAI logo is displayed for approx. 1 second on the operation display screen of the touch panel teaching pendant, after which version information is displayed.



Refer to [5.6, “MEC Menu Selection.”

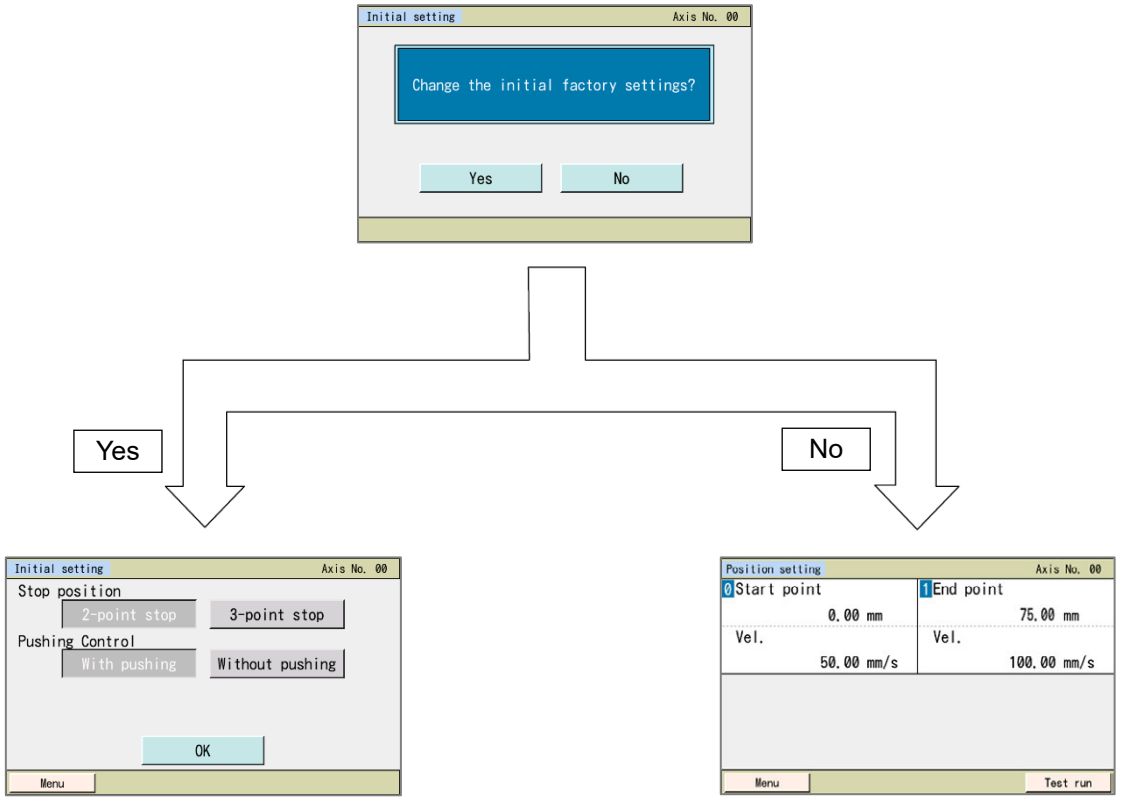
Refer to [5.16, “Monitor.”]

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

5.4 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, specifically the 2-point stopping operation mode, will remain effective.
  The display will switch to the position setting screen.



Refer to [5.7, “Initial Setting.”]

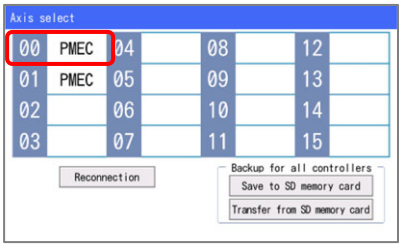
Refer to [5.8, “Position Setting.”]

Factory settings

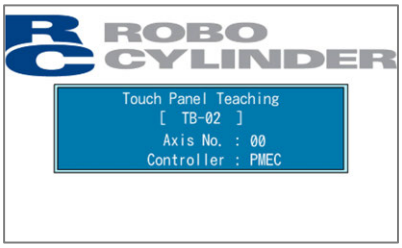
- Operation pattern:
  Stopping at 2 points

5.5 Operation Axis Change

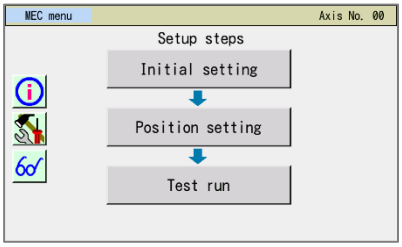
The axis select window is displayed when several units of controllers are connected to the communication line. Also, it can be displayed by touching (Maintenance) → [Change ax.] in the menu screen.
It is not necessary to select the axis when only one unit of controller is connected.



Select the axis to connect the touch panel teaching pendant and touch it.



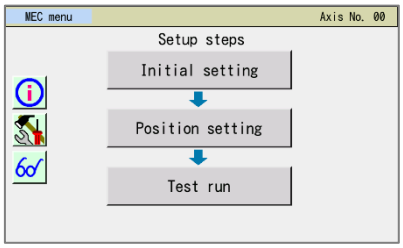
Connection to the selected axis controller gets started.



Once the connection to the controller is established, MEC menu screen opens.

5.6 MEC Menu Selection

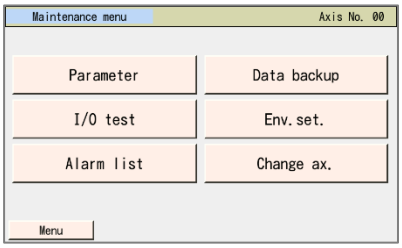
MEC menu



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 [5.7, “Initial Setting.”]
- Pos. Edit — Set the position, push force, push band, etc. The axis can be operated manually. Refer to [5.8, “Position Setting.”]
- TestPlay — Conduct axis movement operation tests. Refer to [5.9, “Trial operation.”]
- Information — The operation pattern, version and other information are displayed. Refer to [5.10, “Information.”]
- Maintenance — Touching switches the display to the maintenance menu screen, which is the next selection screen.



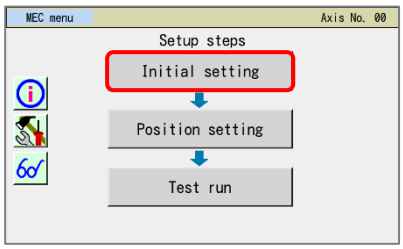
The maintenance screen shows six buttons, so select and touch a desired button.
The display will change to the menu screen corresponding to the button you have touched.
Touch [Menu] to return to the previous MEC menu screen.

Maintenance menu list

- Parameter — Set the default positioning band and other parameters. Refer to [5.11, “Maintenance – Parameters.”]
- I/O Test — Conduct I/O Tests. Refer to [5.12, “Maintenance – I/O Tests.”]
- Alarm List — Detail internal information of alarms are displayed. Refer to [5.13, “Maintenance – Alarm List.”]
- Backup Data — Transfer data between the touch panel teaching pendant and controller. Refer to [5.14, “Maintenance – Data Backup.”]
- EnvironmentSet — Set the touch sound and other environment specifications. Refer to [5.15, “Maintenance-Environment Setting.”]
- Change ax. — Select the controller of which the axis is operated with the touch panel teaching pendant [5.5 Operation Axis Change]

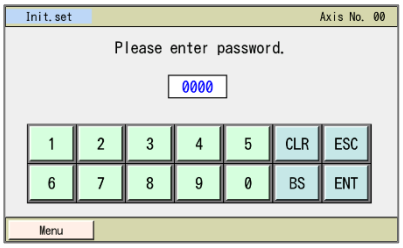
5.7 Initial Setting

Select whether to stop at 2 points or 3 points.



Touch [Initial Setting] on the MEC menu screen.

The password entry screen appears if the system password is other than “0000.”

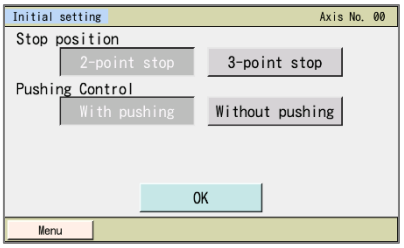


Enter the password and touch [ENT].

> The default system password is “5119”.
> For how to change the system password, refer to 5.11, “Maintenance – Parameters [Change System Password].”

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

Stopping at 2 points

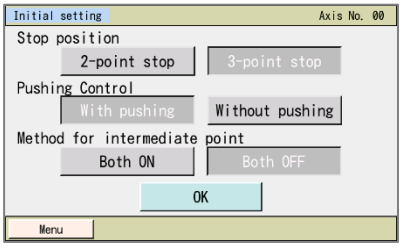


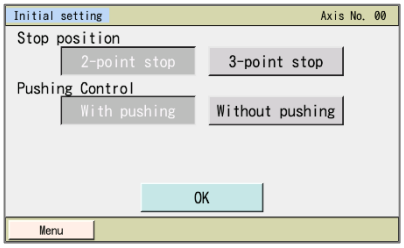
Select and touch either [Two Point] or [Three Point]. To perform positioning operation, select and touch [Pushing None]. To perform push-motion operation, select and touch [Pushing].
To stop at 3 points, select [Both OFF] or [Both ON] as the position specification method.

(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.*

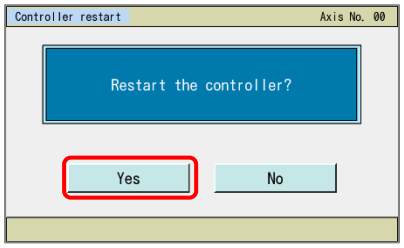
Stopping at 3 points





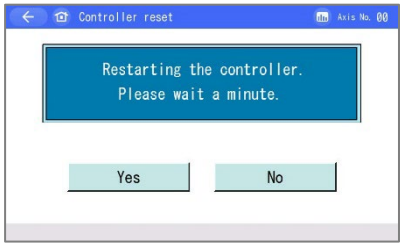
Touch [OK].

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



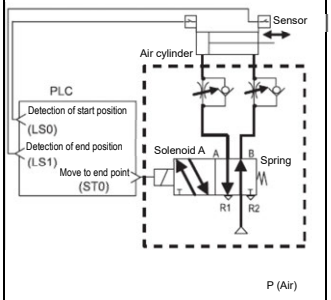
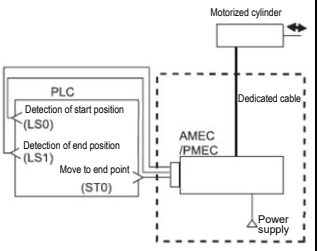
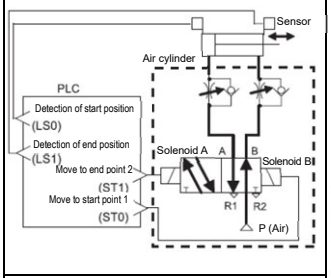
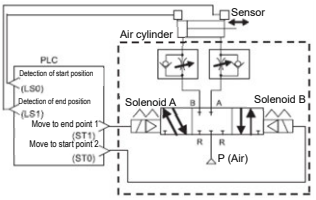
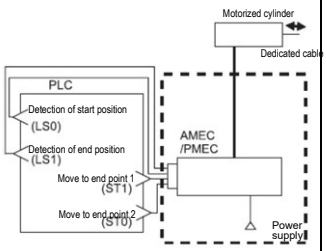
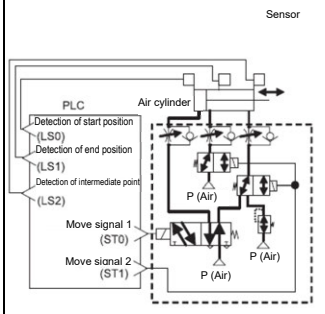
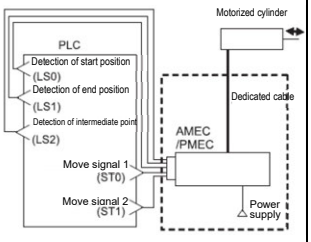
Touch [Yes].
The controller will restart.
After the restart, the controller will operate according to the initial settings you have made.
Return to the MEC menu screen.

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



Operation Pattern

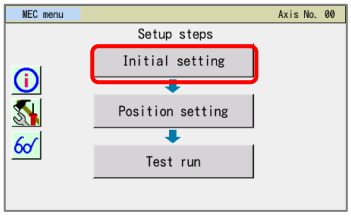
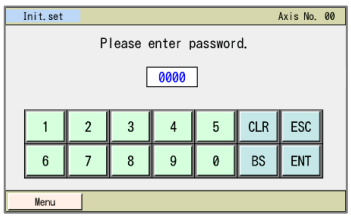
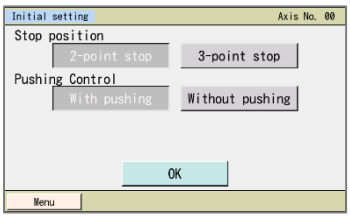
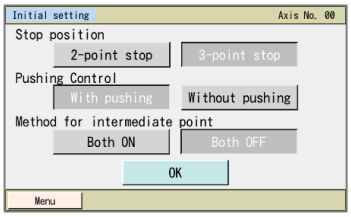
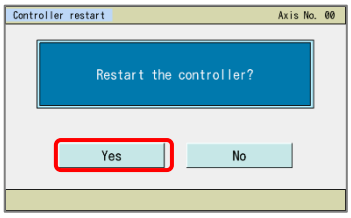
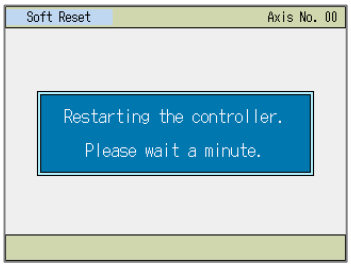
PMEC and AMEC and ERC3 (MEC mode) controllers offer two operation patterns.
The table below gives an overview of the Operation specification of each pattern. [For the setting methods, refer to the sections on initial setting and stop position setting.]

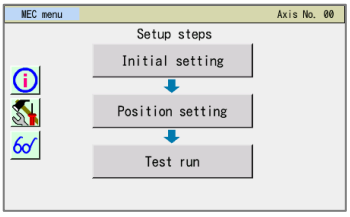
Operation pattern		Description	Air cylinder circuit (Reference)	How to connect motorized cylinder
Stopping at 2 points (2-point positioning)	Movement by 1 input between 2 points [Single-solenoid mode]	You can move the actuator between 2 points using the same control you would normally use with an air 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.		
Stopping at 3 points (3-point positioning)	Movement by 2 input between 2 points [Double-solenoid mode]	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.	 	
	Movement by 2 input between 3 points [3-point positioning]			

(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) instruction manual."

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

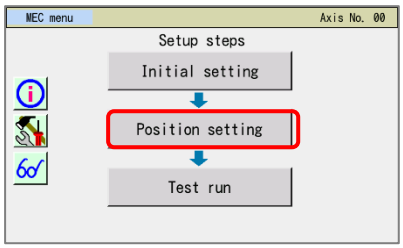
Example of stopping at 2 points Set as follows.

No.	Operation	Screen	Remarks
1	Touch [Initial setting] on the MEC menu screen.		
2	If the system password is not “0000,” the password entry screen appears. Enter the system password, and then touch [ENT].		The default system password is “5119”. For how to change the system password, refer to 5.11, “Maintenance – Parameters [Change System Password].”
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.

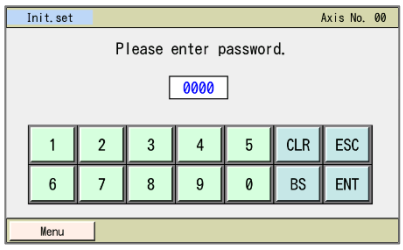
5.8 Position Setting (Position Data Setting and Manual Axis operation (Jogging, Inching))

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



Touch [Position setting] on the MEC menu screen.

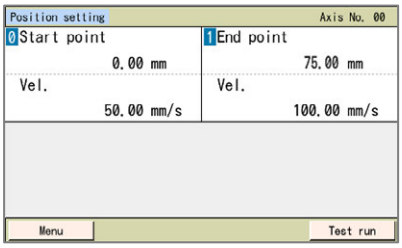
The password entry screen appears if the position data edit password is other than “0000.”



Enter the password and then touch [ENT].

A position data edit password can be set in the “position data edit password” field of the parameter edit screen.

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

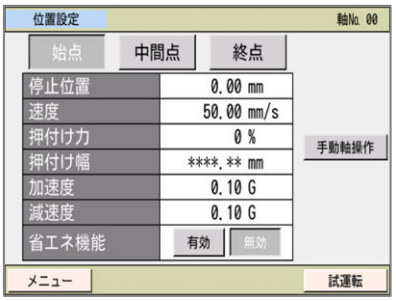


The screen shown to the left is an example of stopping at 2 points.
The set value of each position is shown.
Touch the position you want to set.
Touch [Menu] to return to the MEC menu screen.

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 among 3 points	3

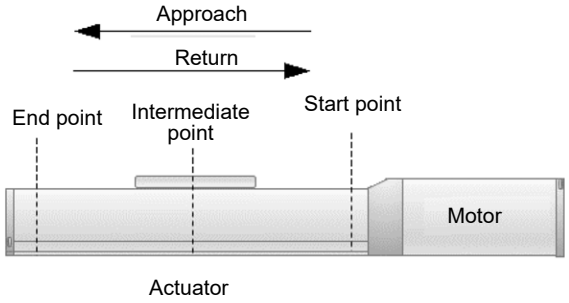
Touch the position you want to set, and the target position/speed setting screen of the touched position will appear.
Set the position, speed, push power, push band, accelerate and decelerate.



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] Accelerate [G]	[4] Decelerate [G]	[5] PushPowre [%]	[6] PushBand [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

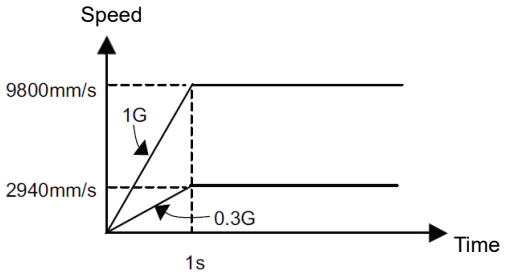
1) Position [mm] · · · Set the position to move the actuator to.
The positions must satisfy the following relationships: Start point < Intermediate point < End point

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 among 3 points	○	○	○

2) Speed [mm/s] · · · Set the speed of the actuator.
3) Accelerate [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 instruction manual of your actuator.

4) Decelerate [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 the instruction manual of the actuator. If the rated acceleration/deceleration is exceeded, the life of the actuator may drop significantly.

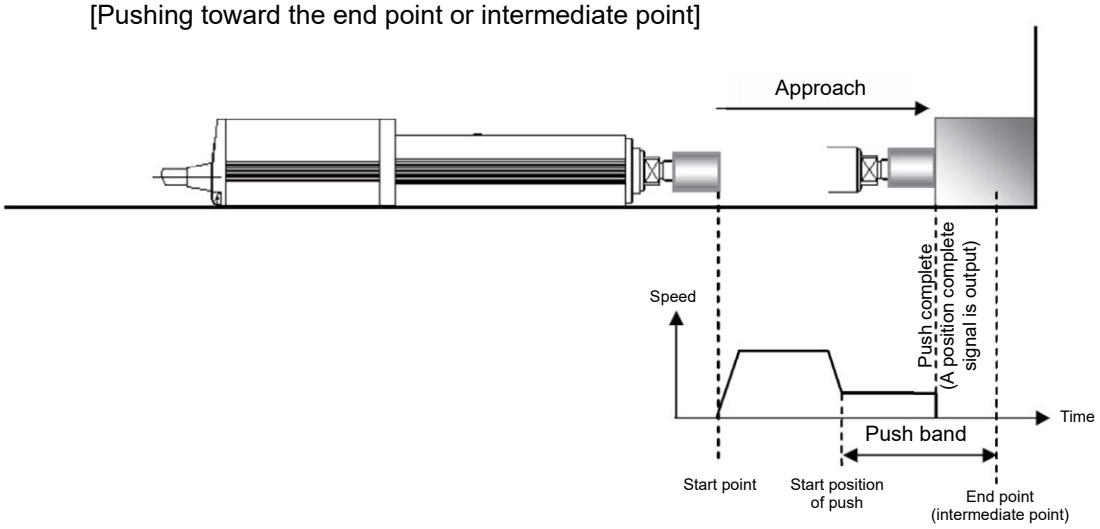
(2) If the actuator or work part receives impact or vibrates, lower the acceleration/deceleration. If the actuator is used continuously in such condition, the life of the actuator will drop significantly.

(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).

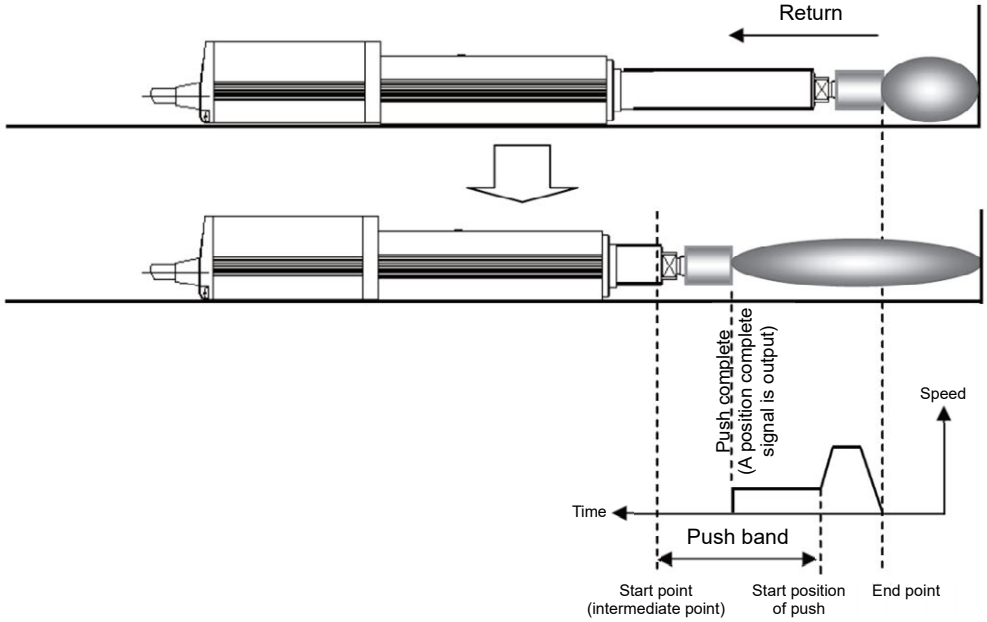
5) Push power [%] · · · Set the push torque (current-limiting value) to be used in push-motion operation as a percent (%) value.
Increasing the current-limiting value increases the push force.
If “0” is set, positioning operation is performed.
For the relationship of push force and current-limiting value,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



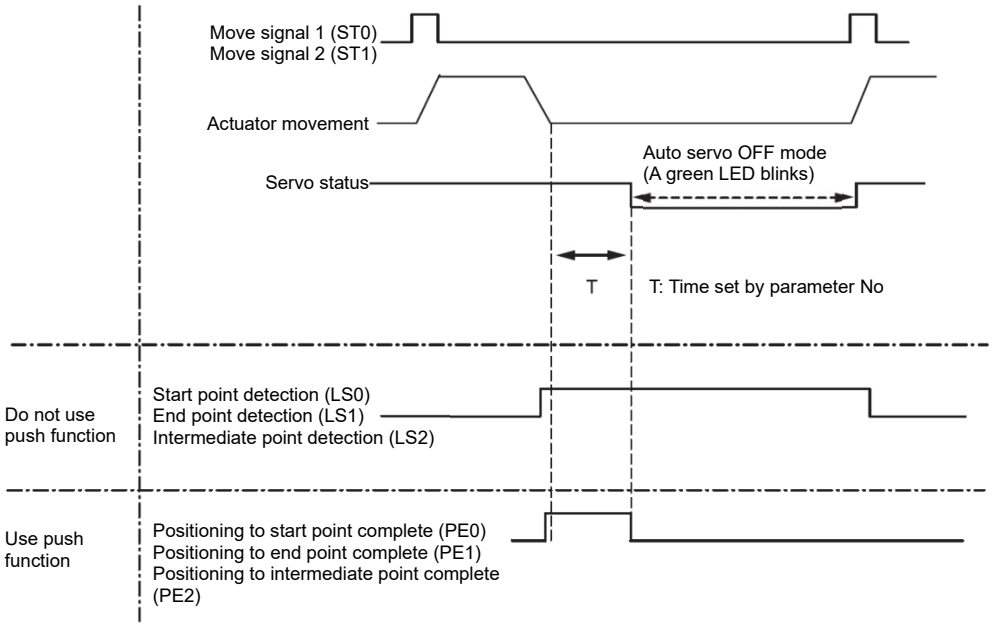
[Pushing toward the start point or intermediate point = Pulling]



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.

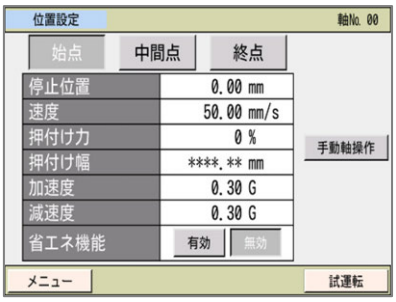


[Statuses of position detection output signals when the push function is not used]
Even when the motor power (servo) is turned off, as long as the actuator is positioned within the positioning band (parameter No. 1) the start point detection signal (LS0), end point detection signal (LS1) or intermediate 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



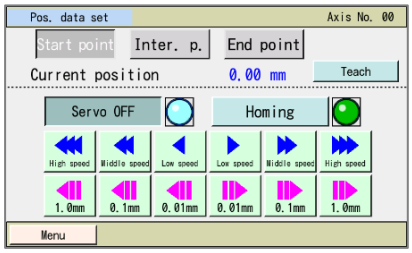
Touch the value field of each setting item such as position.
When the numeric keypad is displayed, enter a desired value and then touch [ENT].

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.

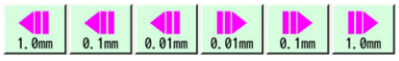
[Manual axis operation (jogging/inching)]
You can load position data via manual axis operation (jogging/inching).



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.

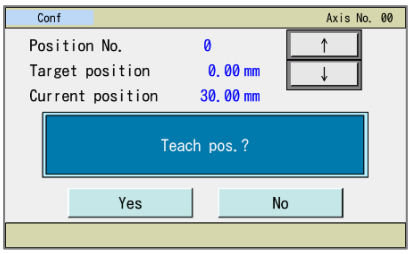
- [Servo ON]

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]

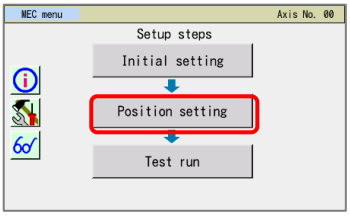
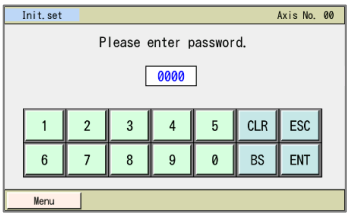
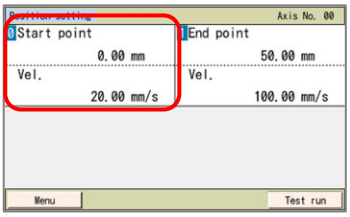
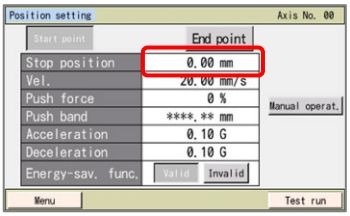
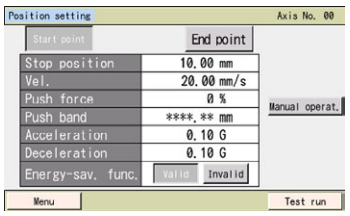
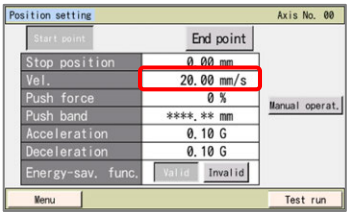
Touching [HOME] before the home return is completed causes the axis to return home and the ○ lamp will become lit.

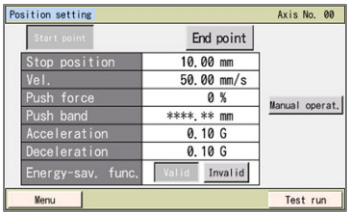
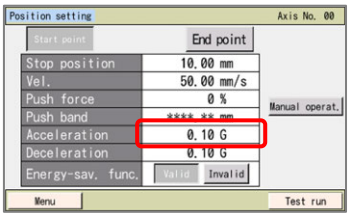
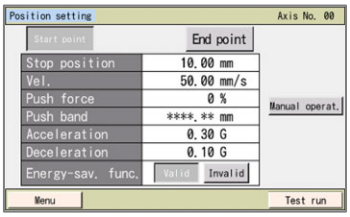
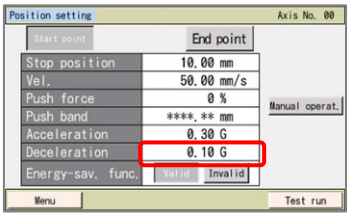
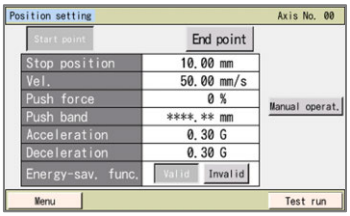
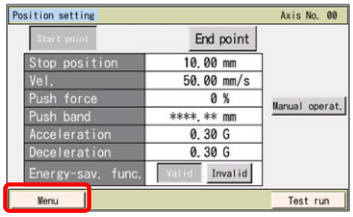
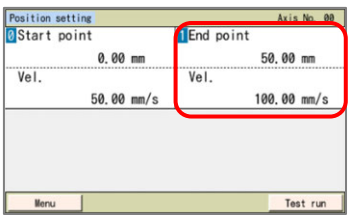
Position loading operation
Touch [Teach]. The confirmation screen appears.
You can change the position number by touching [↑]/[↓].
Touching [Yes] loads the current position.

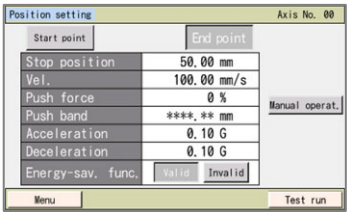
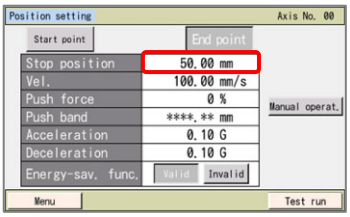
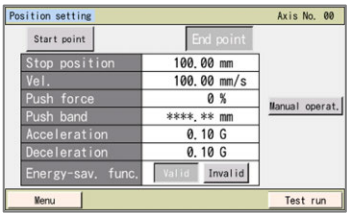
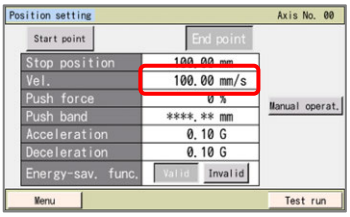
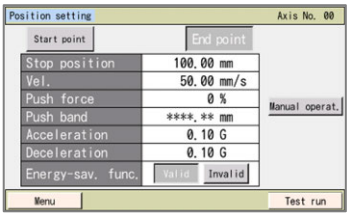
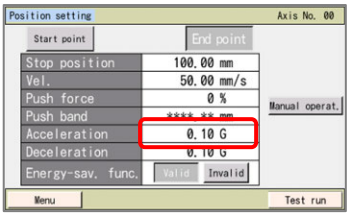
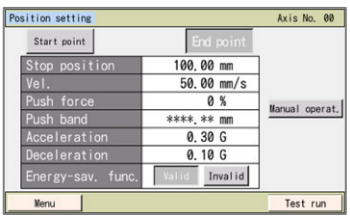


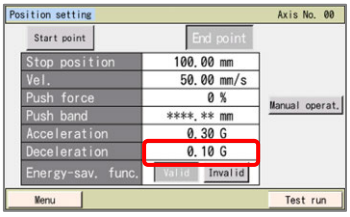
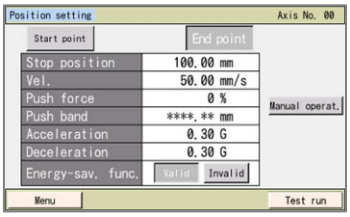
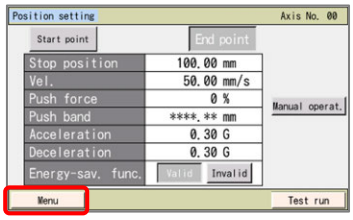
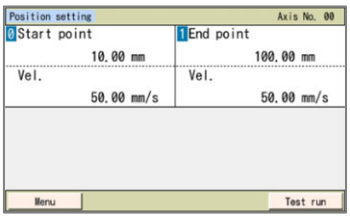
[3] Example of position setting operation
The operation is explained using specific examples.

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

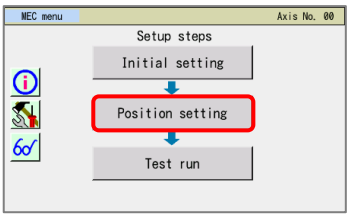
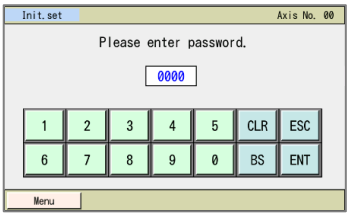
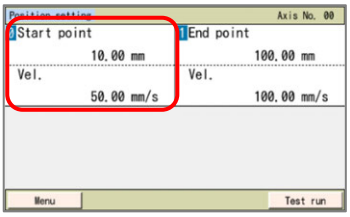
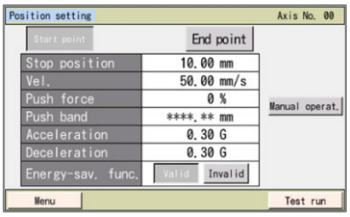
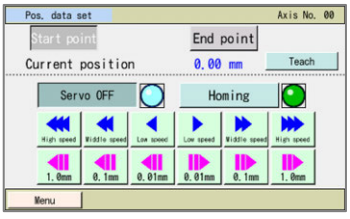
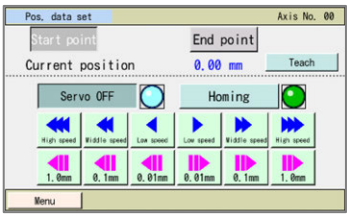
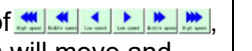
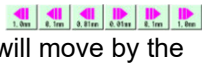
No.	Operation	Screen	Remarks
1	Touch [Position setting] on the MEC menu screen.		
2	If the position data edit password is not “0000,” the password entry screen appears. Enter the position data edit password and touch [ENT].		A position data edit password can be set in the “position data edit” field of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

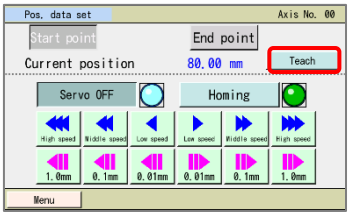
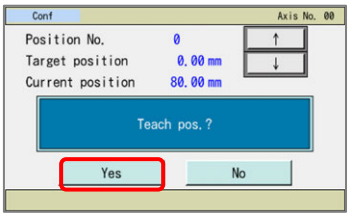
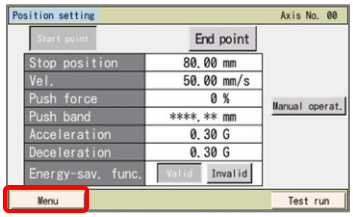
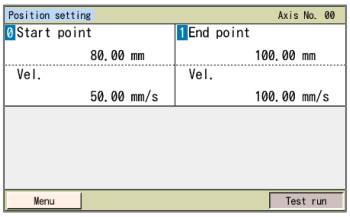
No.	Operation	Screen	Remarks
7	“50.00” is shown in the speed field.		Touch [Menu] to return to the position setting screen.
8	Touch the value field of acceleration. When the numeric keypad is displayed, touch [0], [.], [3], and then [ENT].		Touch [Menu] to return to the position setting screen.
9	“0.30” 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.
12	Touch [Menu].		
13	Set the position relating to the end point, acceleration, and deceleration. Touch [End point].		Touch [Menu] to return to the MEC menu screen.

No.	Operation	Screen	Remarks
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 velocity. 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.
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.

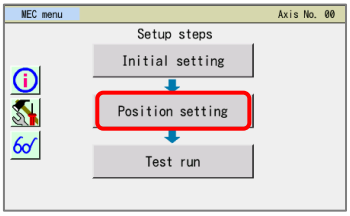
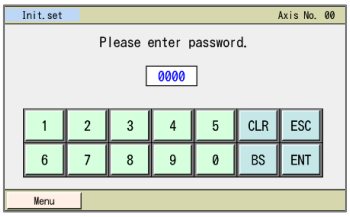
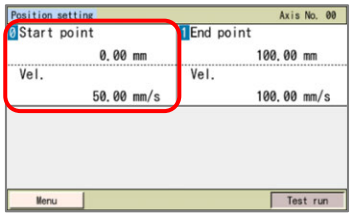
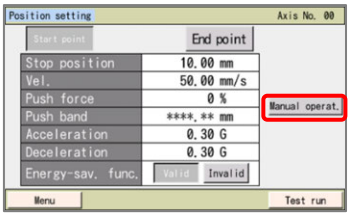
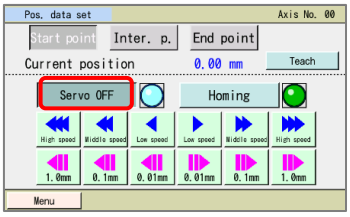
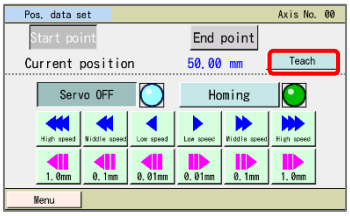
No.	Operation	Screen	Remarks
21	Touch the value field of deceleration. When the numeric keypad is displayed, touch [0], [.], [3], and then [ENT].		Touch [Menu] to return to the position setting screen.
22	“0.30” is shown in the deceleration field.		Touch [Menu] to return to the position setting screen.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

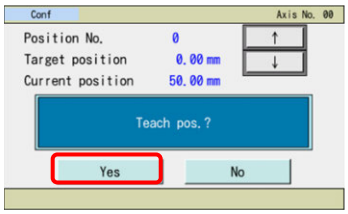
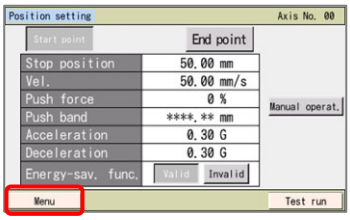
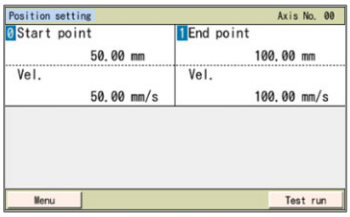
2) Manual axis operation (jogging/inching) (Using , jog/inch the actuator to the target position, and then loading the achieved position (current position) as the end point or start point)
An example of stopping at 2 points is explained.
How to load the current position of 80.0 m as the start point is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

No.	Operation	Screen	Remarks
1	Touch [Position setting] on the MEC menu screen.		
2	If the position data edit password is not “0000,” the password entry screen appears. Enter the position data edit password and touch [ENT].		A position data edit 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 [Start point].		Touch [Menu] to return to the MEC menu screen.
4	Touch [Manual operat.].		Touch [Menu] to return to the position setting screen.
5	If the motor power (servo) is currently OFF, touch [Servo ON] to turn ON the motor power (servo).		* If home return is not yet complete, perform home return first.
6	Use  to move the slider or rod to the target position of 80.0 mm.		• Jogging Touch any of , and the axis will move and continue moving. • Inching Touch any of,  and the axis will move by the distance corresponding to the button you have touched.

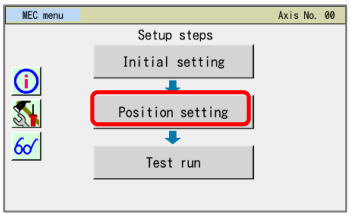
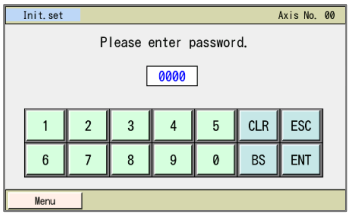
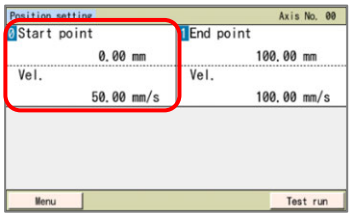
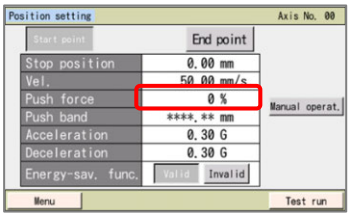
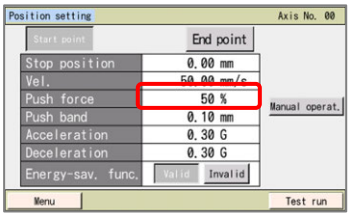
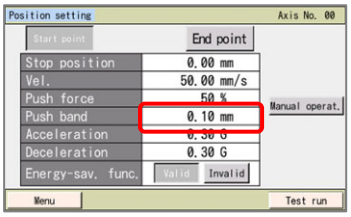
No.	Operation	Screen	Remarks
7	Touch [Teach].		
8	Touch [Yes].		
9	“80.00” is shown in the Stop position field. This confirms that the position data has been loaded. Touch [Menu].		Touch [Menu] to return to the position setting screen.
10	Return to the position setting screen.		Touch [Menu] to return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

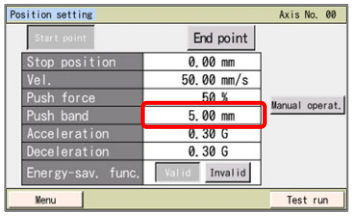
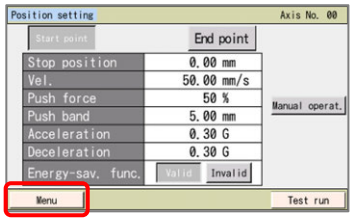
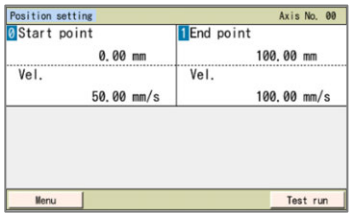
3) Direct teaching (Moving the slider by hand to the target position, and then loading the achieved position (current position) as the end point or start point)
An example of stopping at 2 points is explained.
How to load the current position of 50.00 mm as the start point is explained.

No.	Operation	Screen	Remarks
1	Touch [Position setting] on the MEC menu screen.		
2	If the position data edit password is not “0000,” the password entry screen appears. Enter the position data edit password and touch [ENT].		A position data edit 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 [Start point].		Touch [Menu] to return to the MEC menu screen.
4	Touch [Manual operat.].		Touch [Menu] to return to the position setting screen.
5	If the motor power (servo) is currently ON, touch [Servo ON] to turn OFF the motor power (servo).		* If home return is not yet complete, perform home return first.
6	Move the slider or rod by hand to the target position of 50.00 mm. Touch [Teach].		

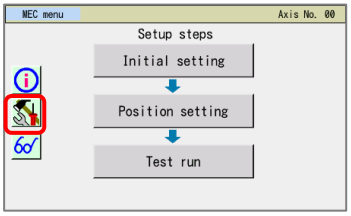
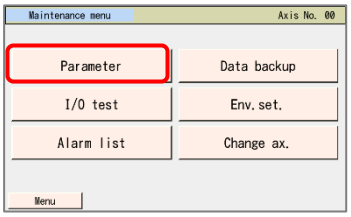
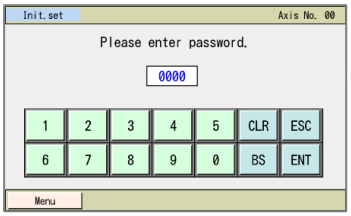
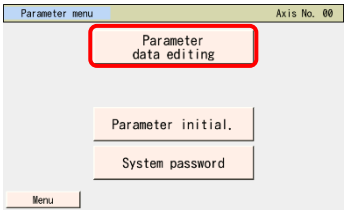
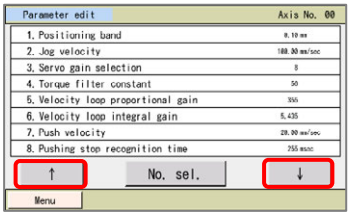
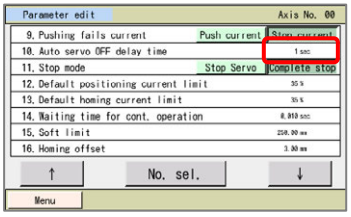
No.	Operation	Screen	Remarks
7	Touch [Yes].		
8	“50.00” is shown in the Stop position field. This confirms that the position data has been loaded. Touch [Menu].		
9	Return to the position setting screen.		Touch [Menu] to return to the position setting screen.

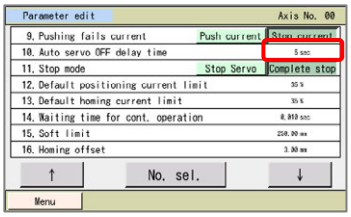
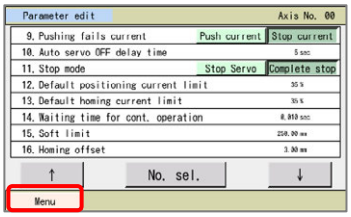
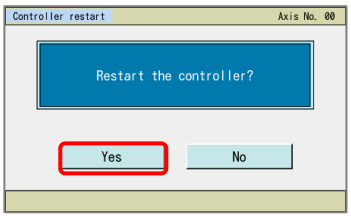
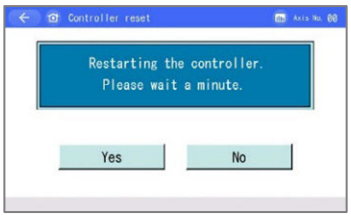
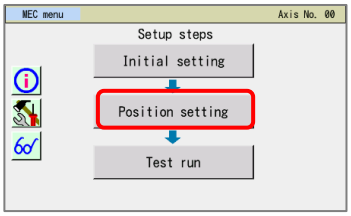
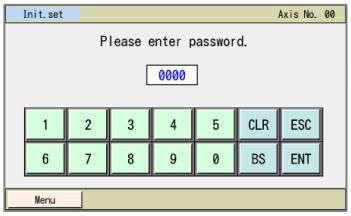
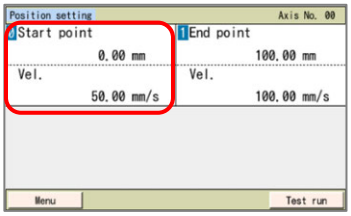
4) Setting for push-motion operation (push force, push band)
An example of stopping at 2 points is explained.
In this example, push-motion operation is performed at the start point.
Push force: 50%, Push band: 5.0 mm

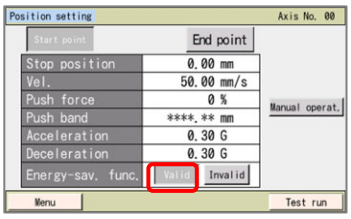
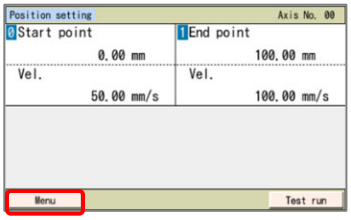
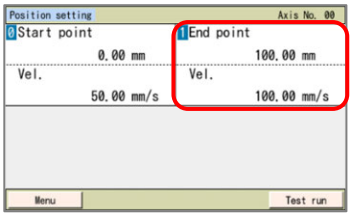
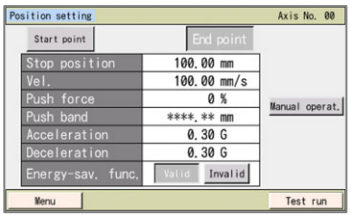
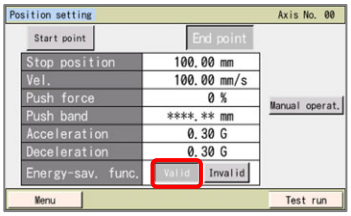
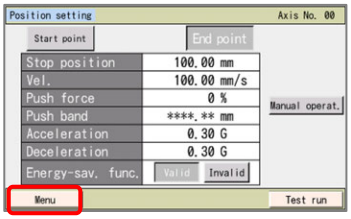
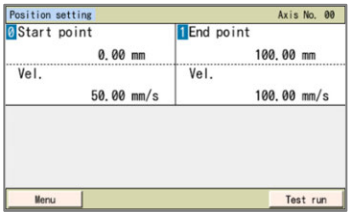
No.	Operation	Screen	Remarks
1	Touch [Position setting] on the MEC menu screen.		
2	If the position data edit password is not “0000,” the password entry screen appears. Enter the position data edit password and touch [ENT].		A position data edit password can be set in the “position data edit password” field of the parameter edit screen.
3	Set the position relating to the start point, acceleration, and deceleration. Touch [Start point].		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.

No.	Operation	Screen	Remarks
7	“5.00” is shown in the push band field.		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 MEC menu screen.

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.

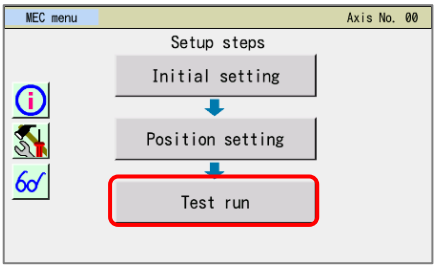
No.	Operation	Screen	Remarks
1	Touch  on the MEC menu screen.		
2	Set the auto motor power (auto servo) OFF delay time. Touch [Parameter].		
3	If the system password is other than “0000,” the password input screen appears. Input a system password and touch [ENT].		The default system password is “5119”. For how to change the system password, refer to 5.11, “Maintenance – Parameters [Change System Password].”
4	Touch [Parameter data editing].		
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 [Position setting].		
12	If the position data edit password is not “0000,” the password entry screen appears. Enter the position data edit password and touch [ENT].		A position data edit 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 [Start point].		Touch [Menu] to return to the MEC menu screen.

No.	Operation	Screen	Remarks
14	Touch [Valid].		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 [End point].		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 [Valid].		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.

5.9 Trial Operation

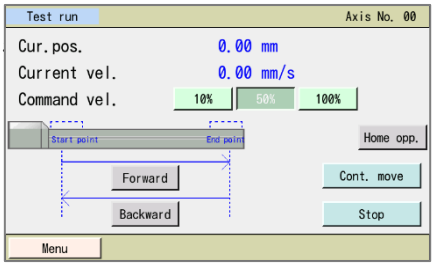
You can perform I/O tests and axis movement operation tests.



Touch [Test run] 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.

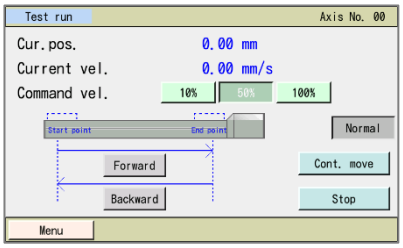
Stopping at 2 points



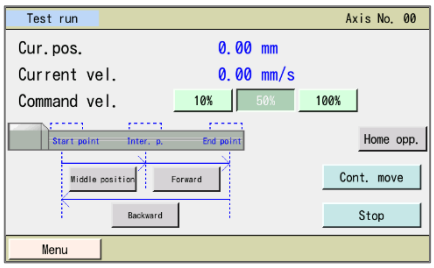
Reversed home

Normal

Stopping at 2 points (Reversed home)



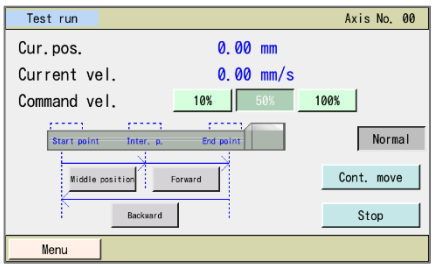
Stopping at 3 points



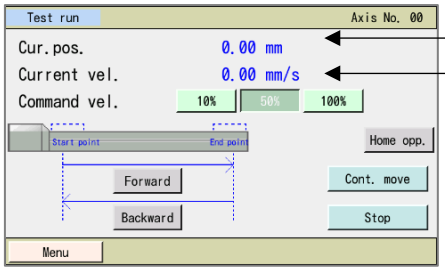
Reversed home

Normal

Stopping at 3 points (Reversed home)



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

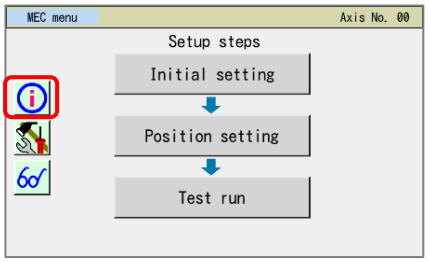


The current position of the axis is shown.
The speed of the axis is shown.

- 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 speed 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.

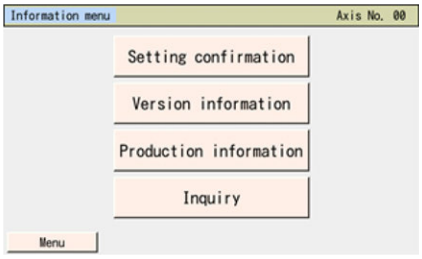
5.10 Information

The operation pattern, version and other information are shown.



Touch  on the MEC menu screen.

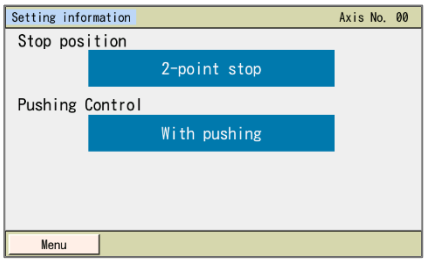
The information selection screen appears.



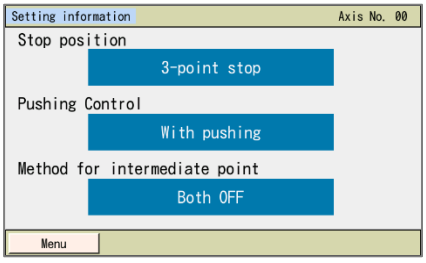
Touch the screen you want to display.
Touch [Menu] to return to the MEC menu screen.

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

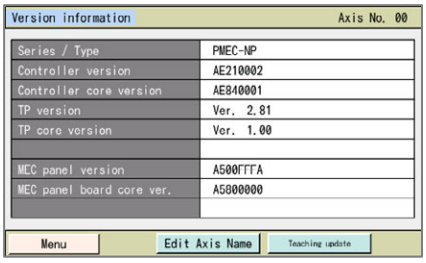
(Stopping at 2 points)



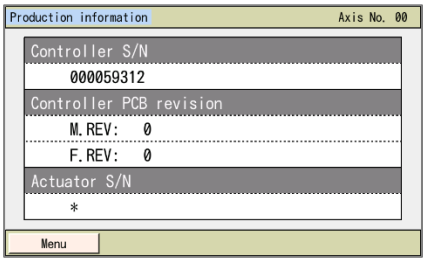
(Stopping at 3 points)



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



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

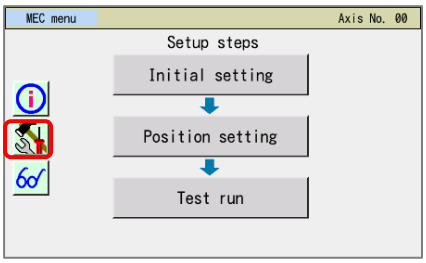


[Contact]
You can check the contact information of IAI.

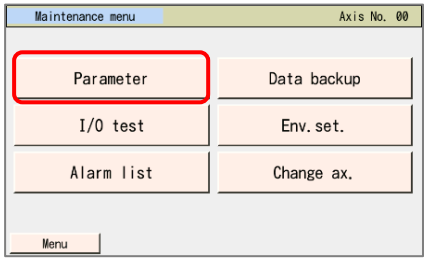


5.11 Maintenance – Parameters

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

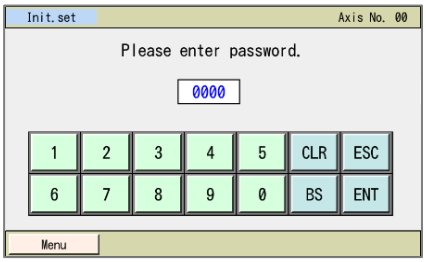


Touch  on the MEC menu screen.



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

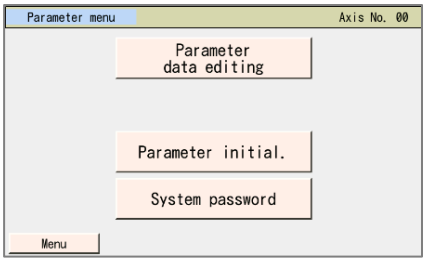
The password entry screen appears if the system password is other than “0000.”



Enter the password and then touch [ENT].

> The default system password is “5119”.
> For how to change the system password, refer to 5.11, “Maintenance – Parameters [Change System Password].”

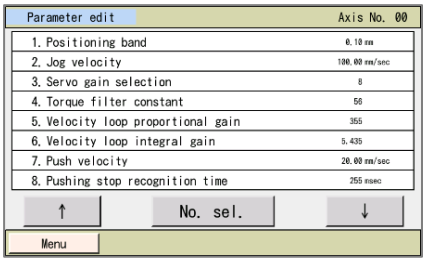
A desired password can be set using the “system password” parameter accessible from the maintenance menu.



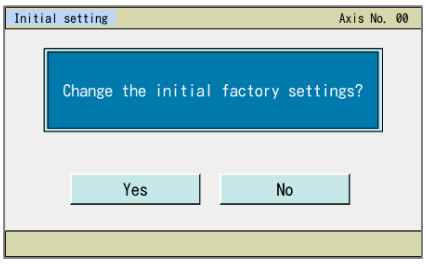
Select and touch [Parameter data editing], [Parameter initial] or [System password].

A screen corresponding to the menu you have selected appears.

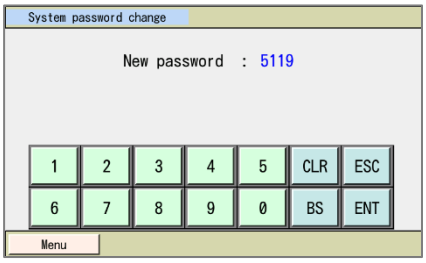
- Parameter edit : You can set 24 parameters.



- 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 instruction manual for your PMEC/AMEC controller and ERC3 (MEC mode).

No.1 (Positioning band)
Set the positioning band.

No.2 (Jog speed)
Set the speed of jog operation.

No.3 (Servo gain number)
Set the servo gain number that determines the response of position control loops in servo control.

No.4 (Torque filter constant)
Set the torque filter time constant that determines the filter time constant for torque commands in servo control.

No.5 (Speed loop proportional gain)
Set the speed loop proportional gain that determines the response of speed control loops in servo control.

No.6 (Speed loop integral gain)
Set the speed loop integral gain that determines the response of speed control loops in servo control.

No.7 (Push speed)
Set the speed of push-motion operation.

No.8 (Push recognition time)
Set the push recognition time to recognize completion of operation after the work part was contacted in push-motion operation.

No.9 (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.

No.10 (Auto servo OFF delay time)
Set the time until the auto motor power (auto servo) turns off automatically when the ecology function is enabled.

No.11 (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 full 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.

No.12 (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.

No.13 (Current limiting value during home return)
Set the current limiting value to be applied during home return operation.

No.14 (Position execution wait time during continuous operation)
This parameter is not used with PMEC, AMEC and ERC3 (MEC mode) controllers.

No.15 (Soft limit)
Set the positive soft limit.

No.16 (Home return offset)
Set the offset for home return.

No.17 (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.

No.18 (Position edit password)
Set the password for editing position data.

No.46 (PIO Inching distance) Displayed for ERC3
Set the inching distance for when conducting the inching operation in Quick Teach.

No.147 (Target value 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.

No.148 (Target value 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.

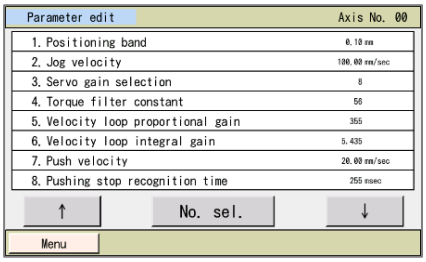
No.152 (High Output Setting) Displayed for ERC3
Set whether to use the high output function. Enabling：Set to use the high output function.

No.153 (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.

No.154 (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.

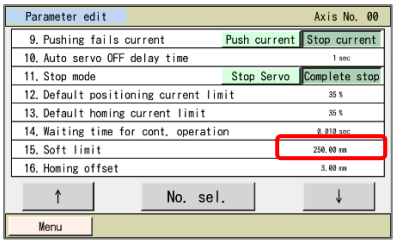
[2] Basic operation
Set parameters.

[Parameter]

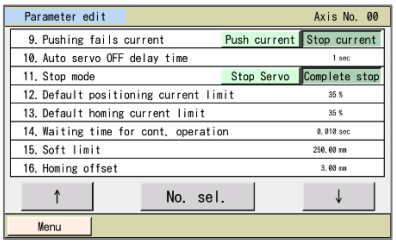


Touch [↑] to return to the previous screen.
Touch [↓] to move to the next screen.
Three screens are available, including one showing the default positioning band and others used to edit position data and password.
Touch [Menu] to return to the parameter menu screen.

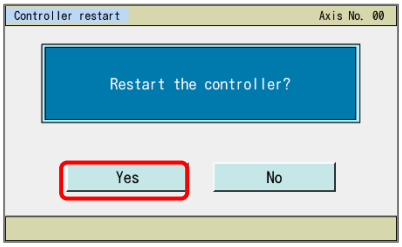
An example of setting a soft limit is explained.
Touch [↑] and [↓] on the displayed screen until the soft limit setting screen appears.



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

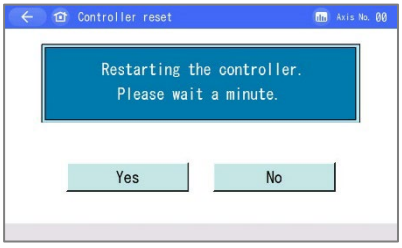


Change parameters and touch [Menu] to return to the controller restart screen.



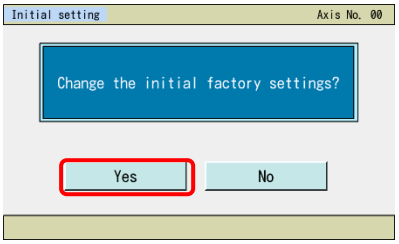
Touch [Yes].
The controller is restarted.
The controller operates according to the operation pattern settings you have made.
The display returns to the initial setting screen.

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



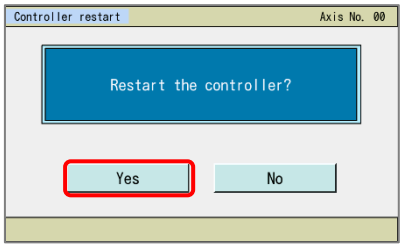
[Init Parameter]

The parameters are reset to their factory default settings.



Touch [Yes].

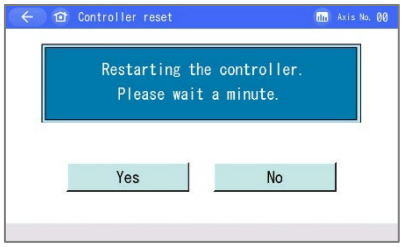
Touch [No] to return to the parameter menu screen without resetting the parameters to their factory default settings.



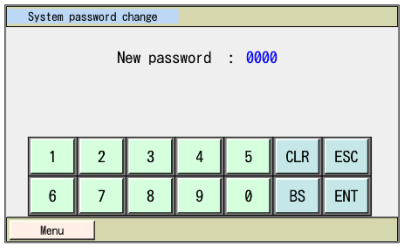
Touch [Yes].

The controller is restarted.
The controller operates 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.

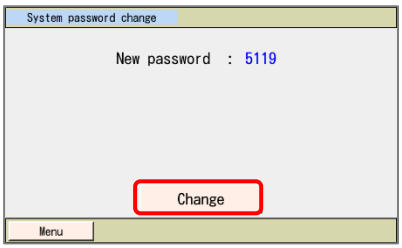


[Change System Password]
Change the system password.

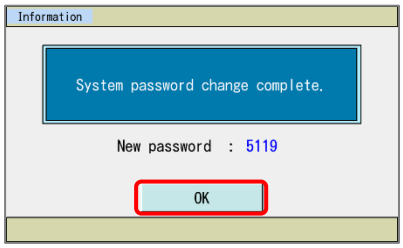


Enter the new system password to change to.
If you do not set the system password, enter 0000.

Touch [ENT].

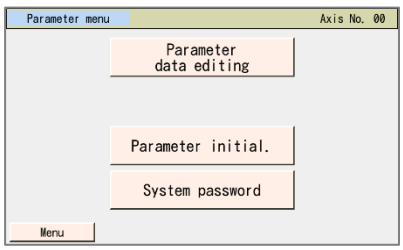


Touch [Change].



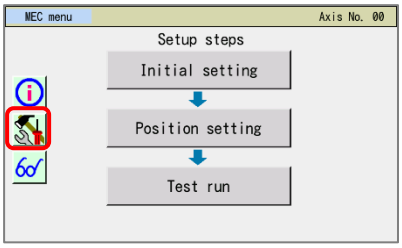
The system password changes.

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

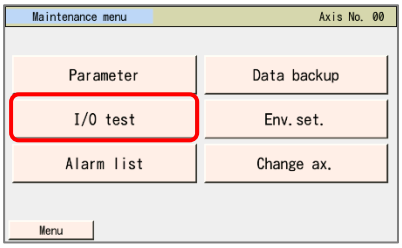


5.12 Maintenance – I/O Tests

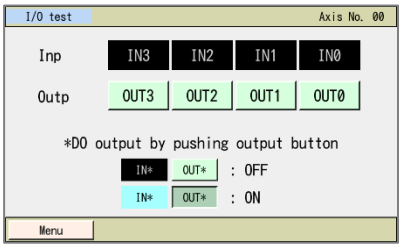
You can monitor PIO input signals.
Output signals can be forcibly turned ON or OFF.



Touch  on the MEC menu screen.



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



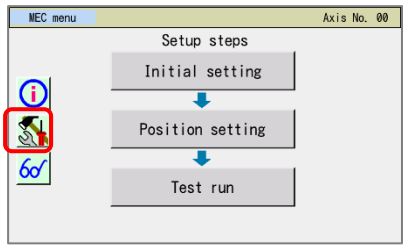
You can monitor the ON/OFF statuses of input signals.

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

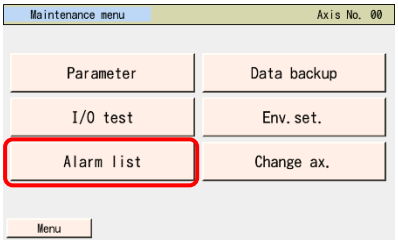
Touch [Menu] to return to the maintenance menu screen.

5.13 Maintenance – Alarm List

A list of alarms that have generated after the controller power was turned on is displayed.
Refer to [9, “Error Display” for the details of alarms.]



Touch  on the MEC menu screen.

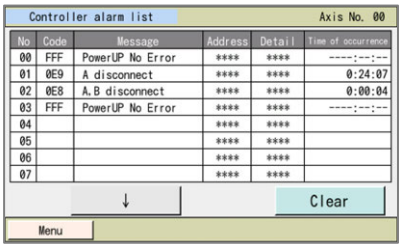


Touch [Alarm list].

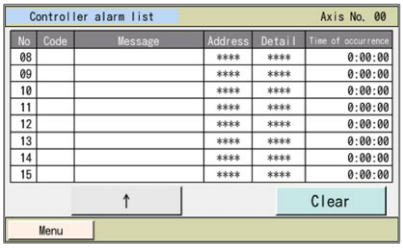
Touch [Menu] to return to the MEC menu screen.

The alarm list of the controller is displayed.

Controller without the calendar function



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

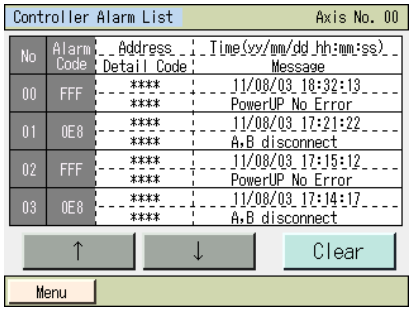


Touch [↑] to display the list of the previous screen.

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.

Controller with the calendar function



Touching [↑] displays the list of the previous screen.
Touching [↓] displays the list of the next screen.

Touching [Clear] clears all alarms.

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

5.14 Maintenance, 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 extension for PMEC controllers is ptpm and the parameters extension is prpm.*
- *The alarm list can only have the backup. It cannot be restored. Data is in a CSV file.*

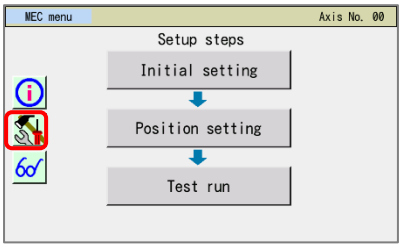
(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. The files existing in other directories other than the specified folders cannot be listed up in the file name list in the file selection at the initial setting or when restoring.
If the folder does not exist, it is automatically created.

- *Position Data : \TB_CON\Position\File Name*
- *Parameter : \TB_CON\Parameter\File Name*
- *Alarm List : \TB_CON\Alarmlist\File Name*

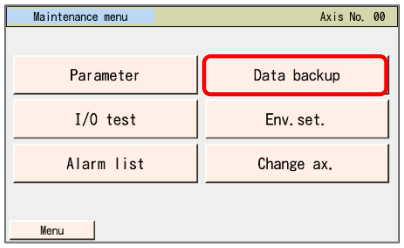
(Note) Files with Chinese names are not supported.

5.14.1 Data Backup of the Controller

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



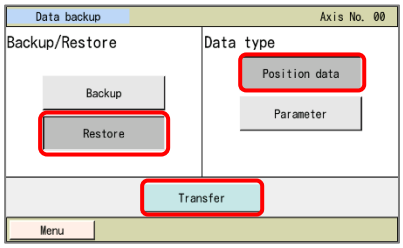
Touch  on the MEC Menu screen.



Touch [Data backup].

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

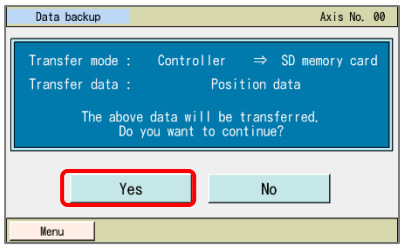
A screen for data transfer appears.



Touch [Restore].

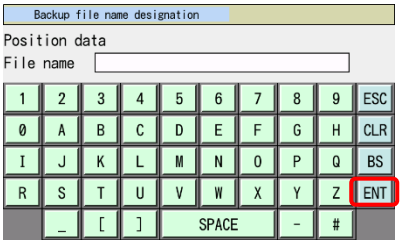
Select the data type for the backup such as [Position data] and touch it.

Touch [Transfer].



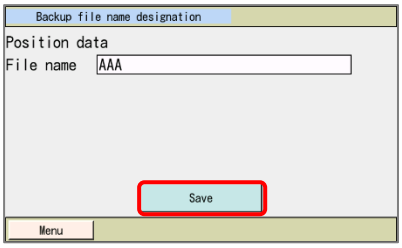
Touch [Yes].

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

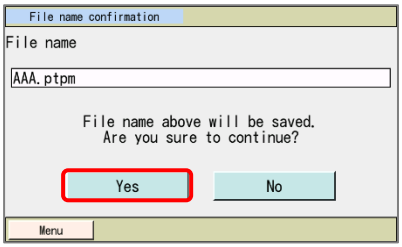


Numeric keys show up. Input a file name.
The file name is to be typed with 32 characters at maximum in letters and numbers.

Input a name and touch [ENT].



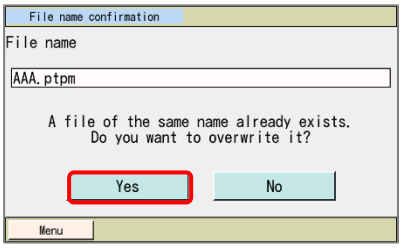
Touch [Save].



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

Touch [Yes].

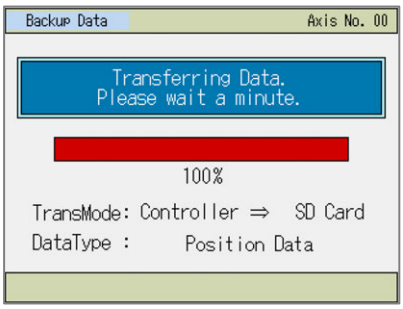
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



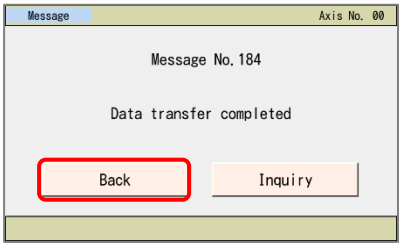
The screen below appears if the same name is found.

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.

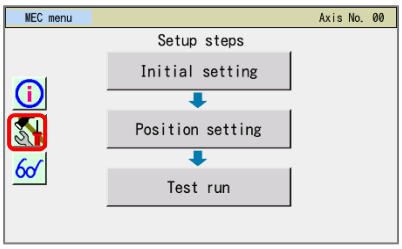


A message to tell the data transfer is complete pops up and the backup process is finished.

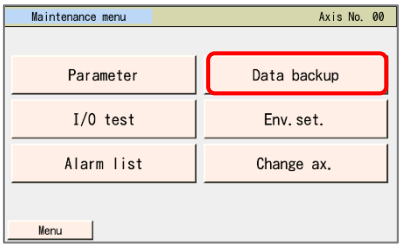
Touching [Back] can go back to the Backup Data screen.

5.14.2 Restore to Controller

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



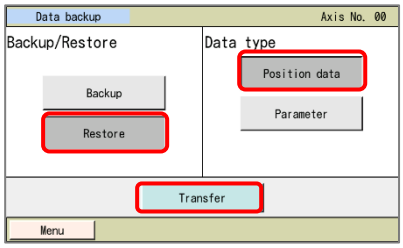
Touch  on the MEC menu screen.



Touch [Data backup]

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

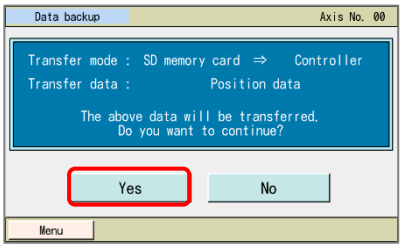
A screen for data transfer appears.



Touch [Restore].

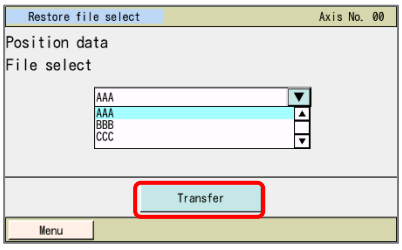
Select the data data type to transfer to the controller, such as [Position data], and touch it.

Touch [Transfer].



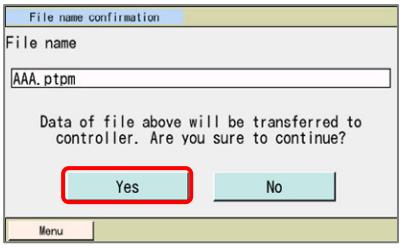
Touch [Yes].

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



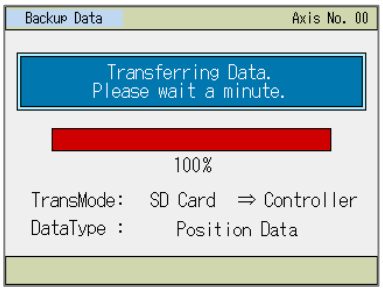
Touch ▲ and ▼ to select a file to transfer to the controller from the list of the backed up file names.

Touch [Transfer].

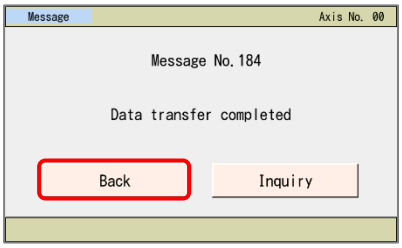


Touch [Yes].

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



Data transfer screen will be shown.

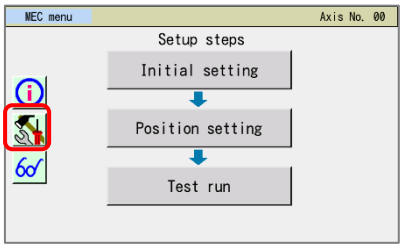


A message to tell the data transfer is complete pops up and the data transfer process to the controller is finished.

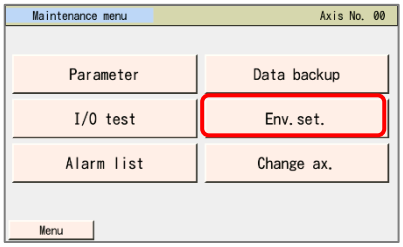
Touching [Back] can go back to the Backup Data screen.

5.15 Maintenance – Environment Setting

You can set the language, touch operation sound, auto monitor function, dim display time, data input warning, display and time.



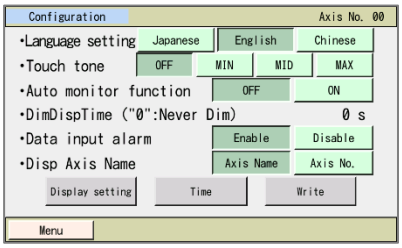
Touch  on the MEC menu screen.



Touch [Env.set.].

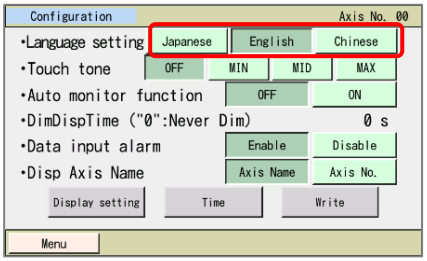
Touch [Menu] to return to the MEC menu screen.

The environment setting screen appears.



[1] Basic operation

- Language: Select a language to display.
  Display for Japanese/English/Chinese languages setting change

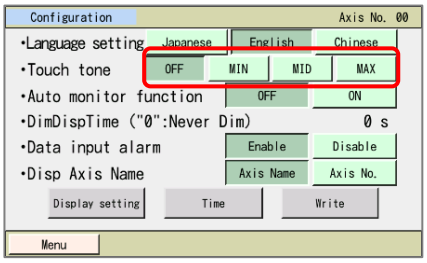


Touch a desired language ([English] etc.).

Touch [Write].

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

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

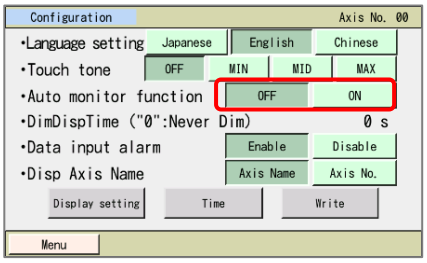


Touch [OFF]. A touch tone is not output.
Touch [MAX], [MID] or [MIN]. A touch tone is output.

Touch [Write].

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

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

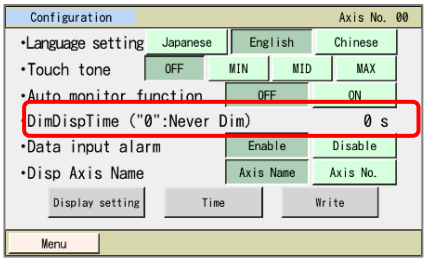


Touch [ON] to enable the auto monitor function.
Touch [OFF] to disable the auto monitor function.

Select either ON or OFF, and then touch [Write].

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

- Dim Display Time: You can set a desired dim display time when not being operated.
  If “0 sec” is set, the display will remain lit at all times.

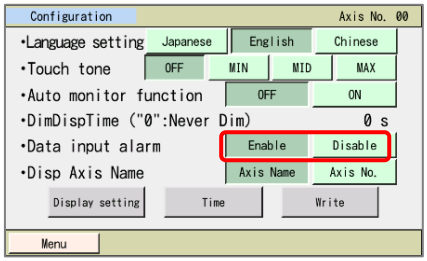


Touch [Dim Display Time ("0": Never Dim) 0 sec].
Enter the light off time.
A desired value between 0 and 255 sec can be set.

Touch [Write].

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

- Data Entry Alarm: The alarm can be output when a value less than the minimum speed and a value exceeding the rated acceleration/deceleration speed are entered in the position data. Note that the value is entered even if the alarm occurs. Always use within the specification of the actuator.



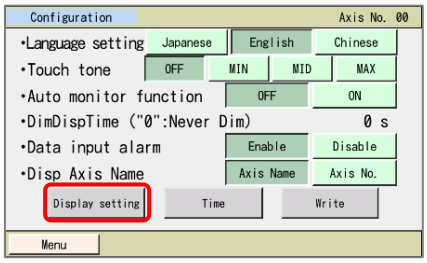
Touch [Effect] to give the warning.
Touch [Non Effect] not to give the warning.

Select either Effect or Non Effect, and then touch [Write].

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

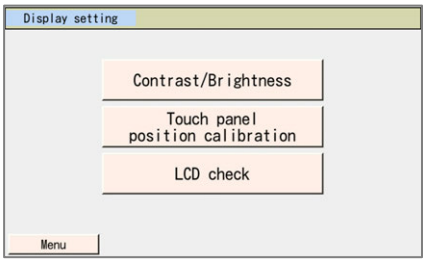
[Display]

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



Touch [Display setting].

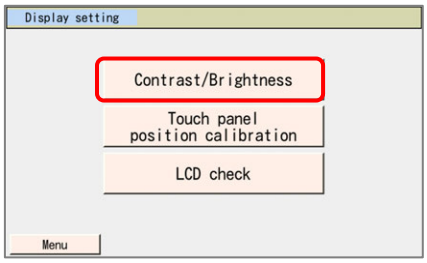
Display menu Window is displayed.



Select Display Setting menu.

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

●Change the Contrast/Brightness
You can adjust contrast (shading of liquid crystal) and brightness (of liquid crystal).



Touch [Contrast/Brightness].

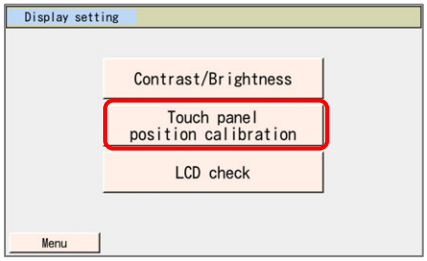


Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

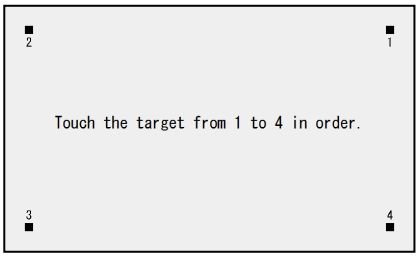
Brightness adjustment
Touch [–] and [+] under Brightness to adjust the brightness of the screen.

Touch [Menu] to save the setting status and return to Display menu screen.

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



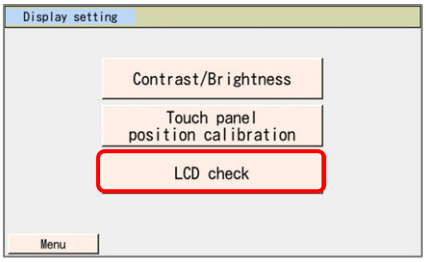
Touch [Touch panel position calibration].



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

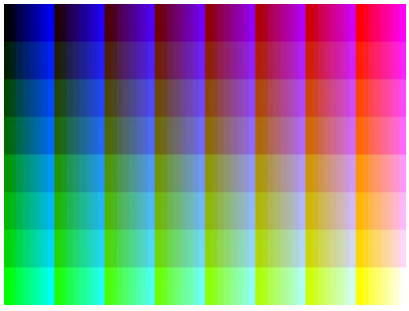
The display returns to Display menu screen.

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



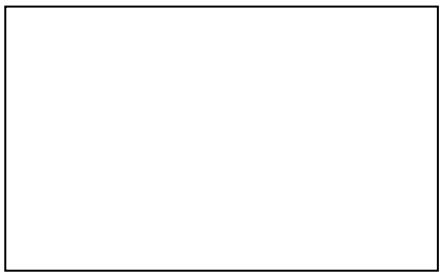
Touch [LCD check].

Color Pattern is displayed.



Touch any point on the screen.

White Only is displayed.



Touch any point on the screen.

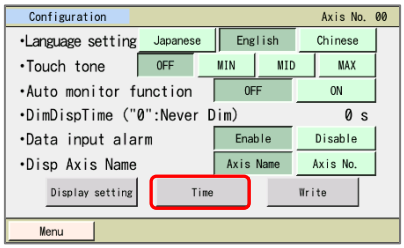
Black Only is displayed.



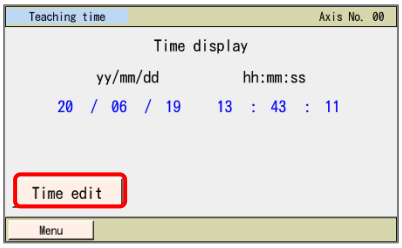
Touch any point on the screen.
The display returns to Display menu screen.

[Time Setting]

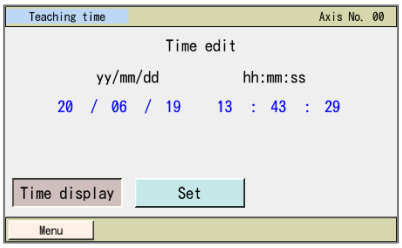
Time setting can be performed for TB-02.



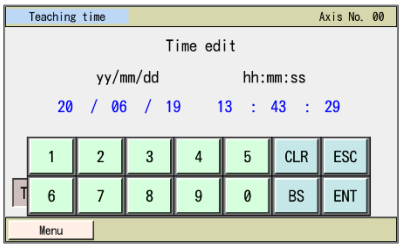
Touch [Time].



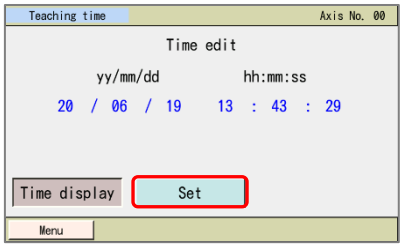
Touch [Time Edit].



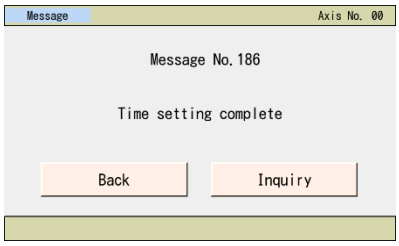
Touch the value of year, month, day, hour, minute or second that is required to be changed.



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



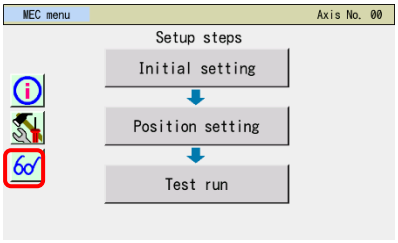
Touch [Set].



The time of the TB-02 is changed.
Touching [Back] can go back to the controller time setting screen.
Touching [Inquiry] displays the inquiry screen.

5.16 Monitor

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

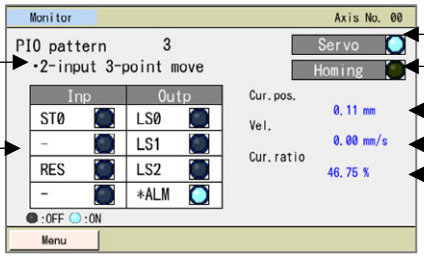


Touch  on the MEC menu screen.

The operation pattern is shown.

The I/O statuses of the axis are shown.

The displayed signals vary depending on the operation pattern.



The servo status is shown.

The home return status is shown.

The axis position is shown.

The axis speed is shown.

The electrical current of the axis is shown.
Display can be switched over between rated current ratio (%) and current (mA) each time touching Current Ratio/Current.

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

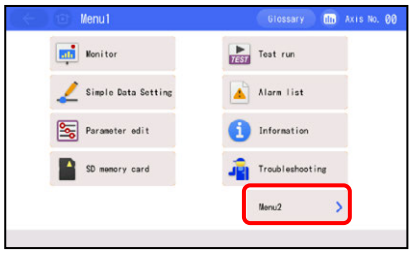
6. Operation of ELECYLINDER and ROBO PUMP

6.1 Displayed Language Change

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

● Display change from English to Japanese

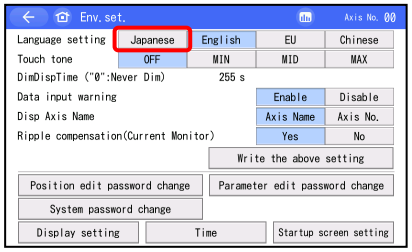
(1) Touch [Menu2] in Menu1.



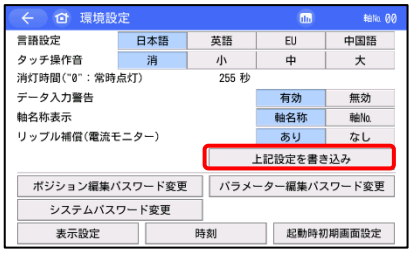
(2) Touch [Env. Set.] in Menu2.



(3) Touch [Japanese].



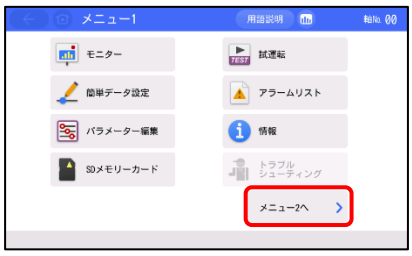
(4) Touch [上記設定を書き込み].



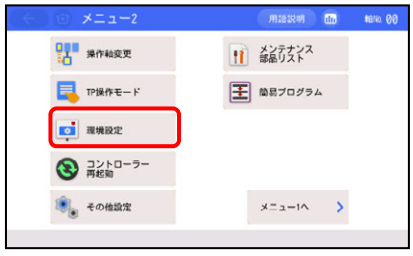
(Note) Skipping to another window without touching [上記設定を書き込み] will allow language to go back to that before changed.

● Display change from Japanese to English

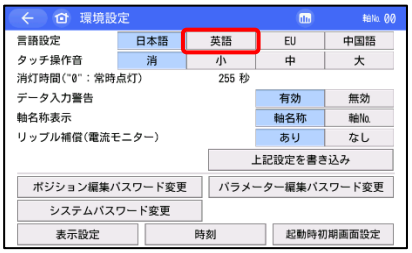
(1) Touch [メニュー2 へ] in メニュー1.



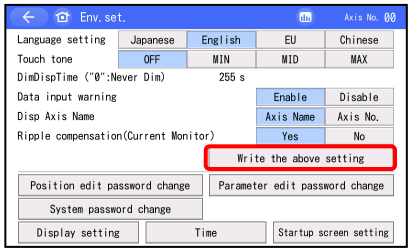
(2) Touch [環境設定] in メニュー2.



(3) Touch [英語].



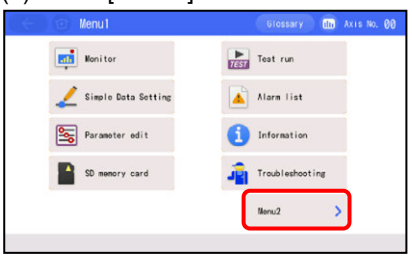
(4) Touch [Write the above setting].



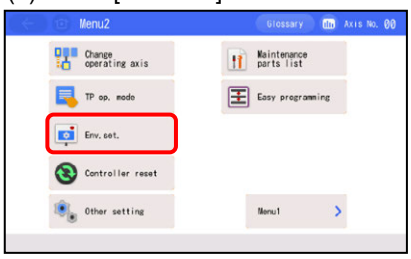
(Note) Skipping to another window without touching [Write the above setting] will allow language to go back to that before changed.

● Display change from English to Chinese

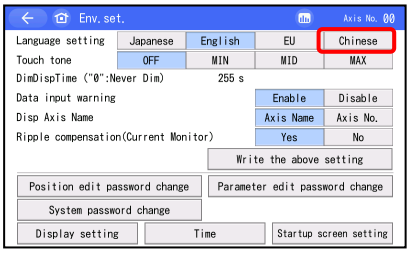
(1) Touch [Menu2] in Menu1.



(2) Touch [Env. Set.] in Menu2.



(3) Touch [Chinese].



(4) Touch [写入上述设定].



(Note) Skipping to another window without touching [写入上述设定] will allow language to go back to that before changed.

● Display change from Chinese to English

(1) Touch [菜单 2] in **菜单** 1.



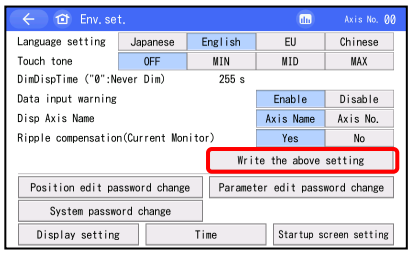
(2) Touch [环境设定] in **菜单** 2.



(3) Touch [英语].



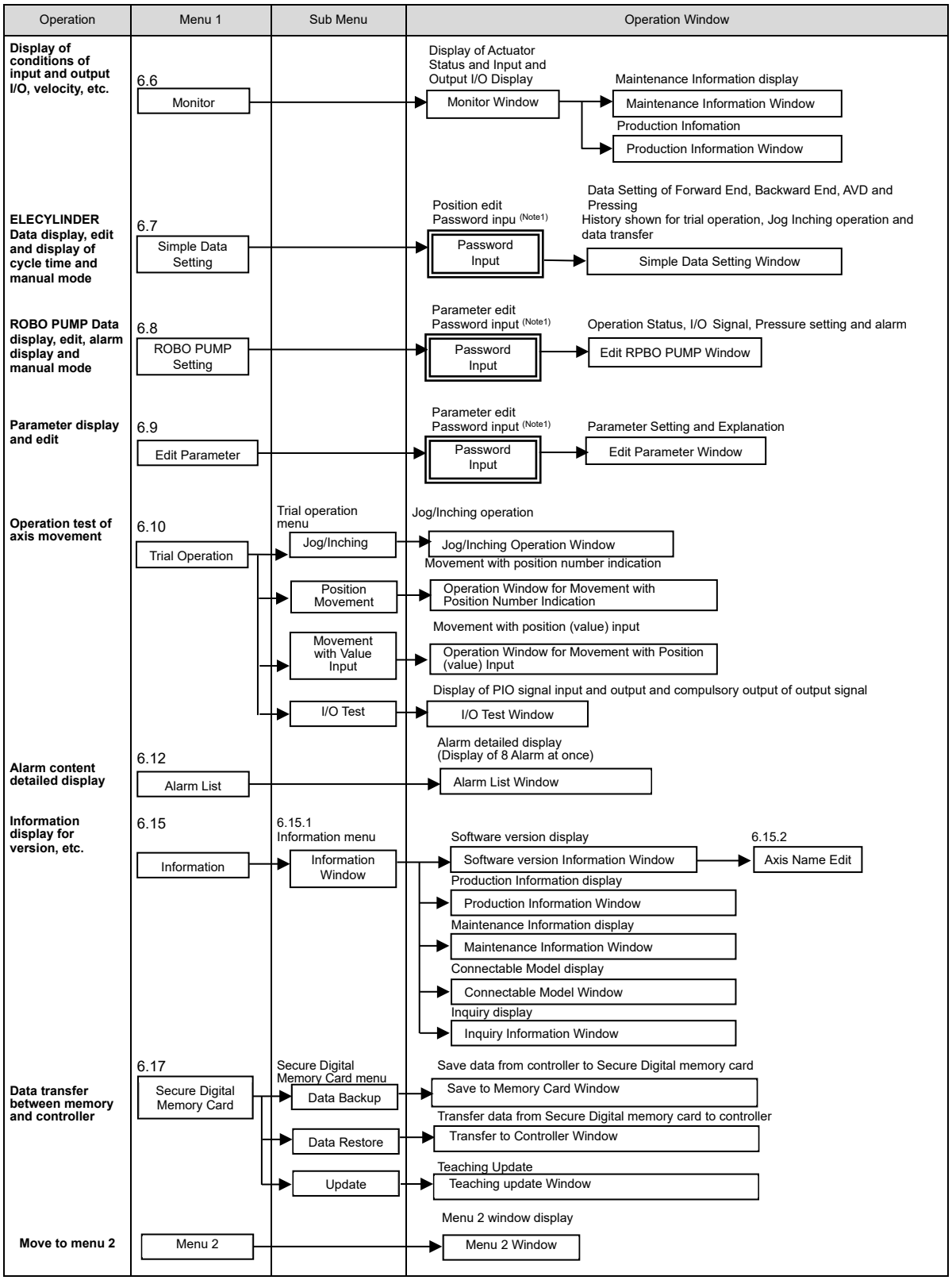
(4) Touch [Write the above setting].



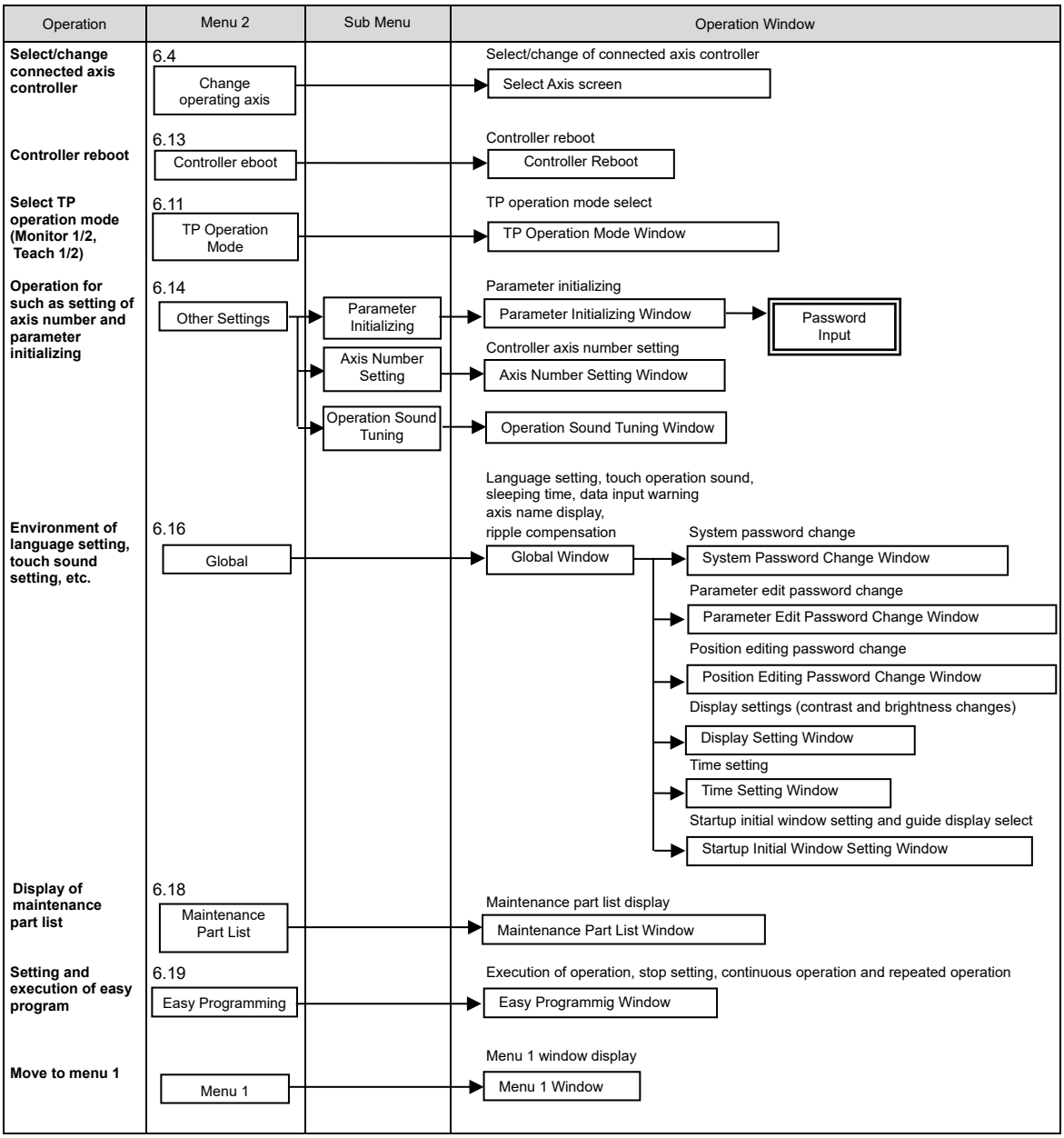
(Note) Skipping to another window without touching [Write the above setting] will allow language to go back to that before changed.

6.2 Operating Menu

Operating menu when the touch panel teaching pendant TB-02 is connected to ELECYLINDER or ROBO PUMP is shown.



(Note 1) Password input in case the password has been changed from the initial setting (0000), it is necessary to input the password.

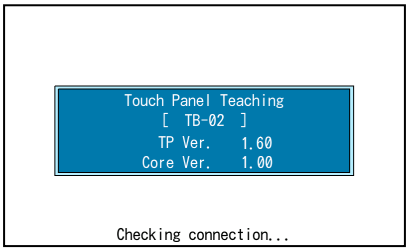

Operation
Menu 2
Sub Menu
Operation Window
Select/change connected axis controller
6.4
Change operating axis
Select Axis screen
Controller reboot
6.13
Controller eboot
Controller Reboot
Select TP operation mode (Monitor 1/2, Teach 1/2)
6.11
TP Operation Mode
TP operation mode select
TP Operation Mode Window
Operation for such as setting of axis number and parameter initializing
6.14
Other Settings
Parameter Initializing
Parameter initializing
Parameter Initializing Window
Password Input
Axis Number Setting
Controller axis number setting
Axis Number Setting Window
Operation Sound Tuning
Operation Sound Tuning Window
Environment of language setting, touch sound setting, etc.
6.16
Global
Language setting, touch operation sound, sleeping time, data input warning axis name display, ripple compensation
Global Window
System password change
System Password Change Window
Parameter edit password change
Parameter Edit Password Change Window
Position editing password change
Position Editing Password Change Window
Display settings (contrast and brightness changes)
Display Setting Window
Time setting
Time Setting Window
Startup initial window setting and guide display select
Startup Initial Window Setting Window
Display of maintenance part list
6.18
Maintenance Part List
Maintenance part list display
Maintenance Part List Window
Setting and execution of easy program
6.19
Easy Programming
Execution of operation, stop setting, continuous operation and repeated operation
Easy Programmig Window
Move to menu 1
Menu 1
Menu 1 window display
Menu 1 Window

6.3 Initial Screen

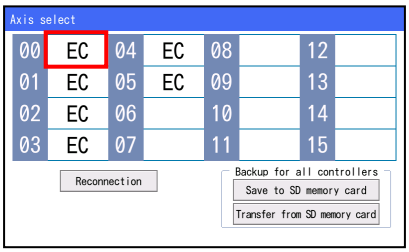
When the power is turned on, the IAI logo is displayed and then the version information is displayed.



IAI logo will be displayed in the screen for a few seconds.



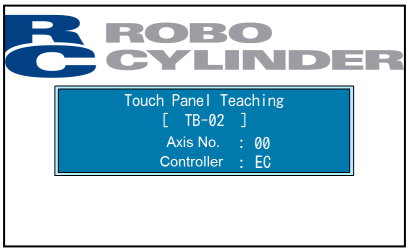
Versions of the teaching and core will be displayed.



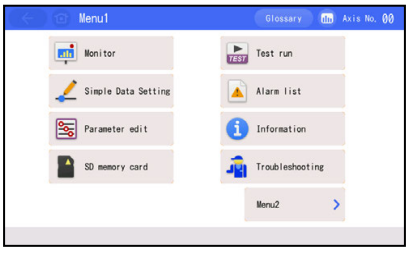
[Displayed only in multiple-unit connection]

If multiple units are connected, the axis selection screen appears.

Select an axis to be operated with the touch panel teaching pendant. Refer to [6.4 Change Operating Axis].



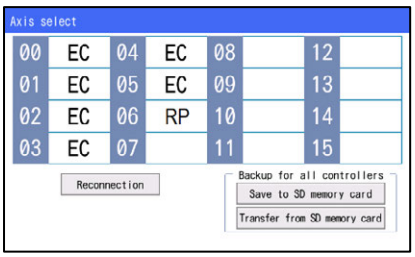
The number of axis to be operated and the type of controller will be displayed.
EC: ELECYLINDER
RP: ROBO PUMP



The Menu 1 screen appears.

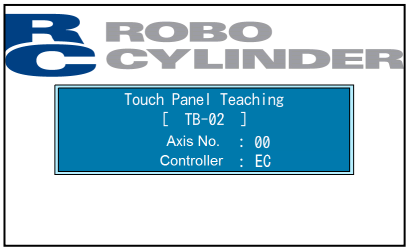
6.4 Change Operating Axis

If multiple controllers are connected to the communication line, the axis selection screen appears. It also can be shown by touching [Change operating axis] in the Menu 2 screen or Change axis operation Button on the top left of Menu 2 screen Refer to [6.5 Menu Selection].



Select the axis to be operated in the touch panel teaching pendant and touch it.

EC: ELECYLINDER
RP: ROBO PUMP

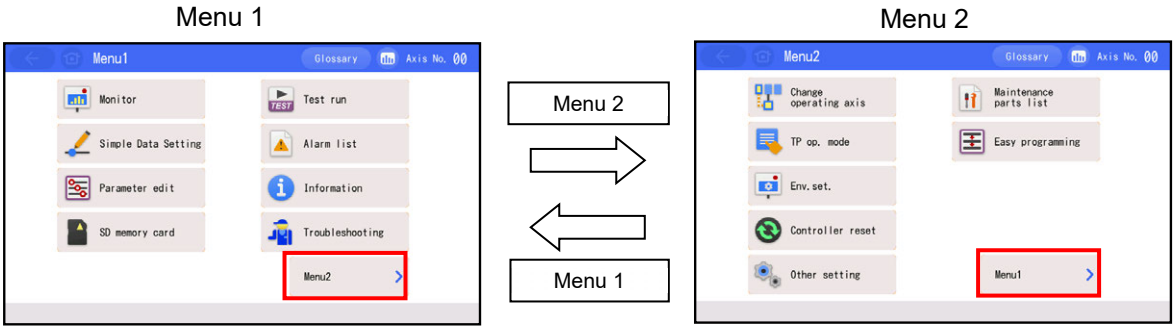


The connection with the controller of the selected ELECYLINDER and ROBO PUMP will be started.



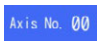
When connection with the controller is established, the Menu 1 screen appears.

6.5 Menu Selection



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.



1)		Return Button	: Returns to Previous Screen
2)		Home Button	: Returns to Menu 1 Screen
3)		Glossary Button	: Shows the Explanation Screen for Special Terms
4)		Monitor Button	: Opens the Monitor Screen
5)		Change operating axis Button	: Shows Select Axis Screen. (It should not function in a simple data setting screen)

6) Stop Status Icons An icon should blink in the following status.


The “STOP” icon should be displayed in a stop status.
Press and hold the icon and the "202: Stop" message should be displayed.


The “ENG” icon should be displayed in an emergency stop status.
Press and hold the icon and the "202: Emergency stop" message should be displayed.


The “MP” icon should be displayed in a motor voltage drop status.
Press and hold the icon and the "203: Motor Voltage Drop" message should be displayed.


The "ENB" icon should be displayed in a disable status.
Press and hold the icon and the "226: Enable Circuit Open" message should be displayed.

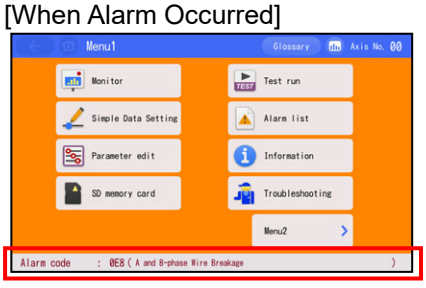
[Menu 1]

- Monitor — Displays the actuator status, I/O signal status, maintenance information and manufacturing information. Refer to [6.6 Monitor]
- Simple Data Setting — Conduct settings of position, velocity acceleration/deceleration to operate the actuator. Refer to [6.7 Simple Data Setting (Position Editing)]
- ROBO PUMP Setting — Setting of suction, release and monitoring display of ROBO PUMP should be established. Refer to [6.8 ROBO PUMP Setting]
- Parameter edit — Conduct settings such as to adjust operation range or home position, or to change the direction of home-return operation. Refer to [6.9 Parameter Edit]
- SD memory card — Perform readout of position data and parameters, file saving and storage of the alarm list. Teaching update also can be conducted in this menu. Refer to [6.17 Data Backup]
- Test run — Conduct manual operation with JOG, Inching and number indication and also make a trial run of I/O. Refer to [6.10 Test Run]
- Alarm list — Shows a list of alarms and the time when they occurred. Refer to [6.12 Alarm List]
- Information — Shows the software version, manufacturing information, maintenance information and models available for connection. Refer to [6.15 Information Display]
- Troubleshooting — Shows the contents of an alarm and the countermeasure when an alarm has been generated.

[Menu 2]

- Change operating axis — Select an axis to operate when multiple units of controllers are connected to the communication line. Refer to [6.4 Change Operating Axis]
- TP op. mode — Switch over between forbidden and permitted for PIO operation and between invalid and valid for the safety velocity. Refer to [6.11 TP Operation Mode]
- Env. set. — Conduct settings for display language, touch sound, turn-off time, data input warning, axis name display, ripple compensation, password, display, clock and initial window setting at startup. Refer to [6.16 Environment Setting]
- Controller reset — Restart the controller. Refer to [6.13 Controller Reset]
- Other setting — Conduct parameter initialization, axis number change and operation sound tuning. Refer to [6.14 Other Setting]
- Maintenance parts list — Displays information of maintenance parts. Refer to [6.18 Maintenance Parts List]
- Easy programming — It is a window that enables setting of movement between positions, timer and repeated operation by indicating number, and to have continuous operation manually at the ELECYLINDER. Refer to [6.19 Easy Programming]

[When Alarm Occurred]

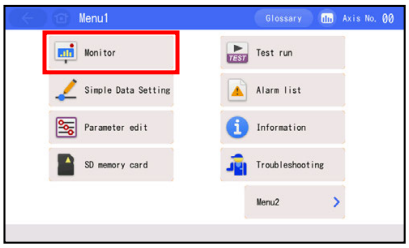


While an alarm is generated, the alarm group (Alarm code for ROBO PUMP) and the alarm name should be displayed at the bottom of the window, and the background should turn into orange (Red for some alarms).

Touch the gray part at the bottom of the window that the alarm information is displayed, and the screen switches to the display window of alarm details.

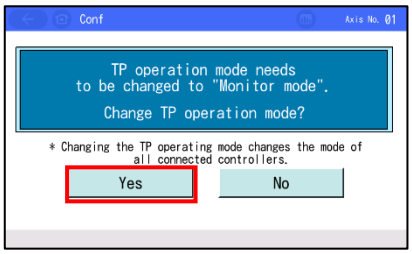
6.6 Monitor

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



Touch [Monitor] on the Menu 1 screen.

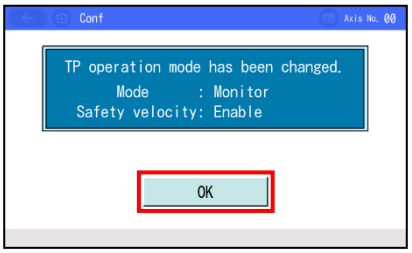
If the TP operation mode is not Monitor Mode 1 or 2, the following message screen appears.



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

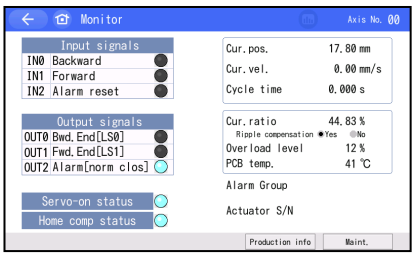
(Note) The safety speed does not change.
If the current mode is Teaching Mode 1, it changes to Monitor Mode 1.
If the current m ode is Teaching Mode 2, it changes to Monitor Mode 2.

Note: For the multiple-axis controllers, TP Operation Mode of all the controllers should change.

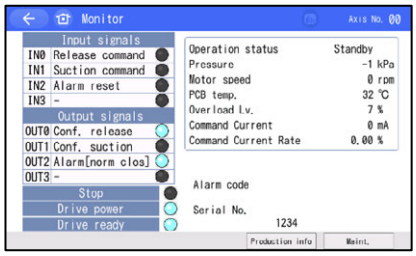


Touch [OK].

The monitor screen of ELECYLINDER or ROBO PUMP appears.



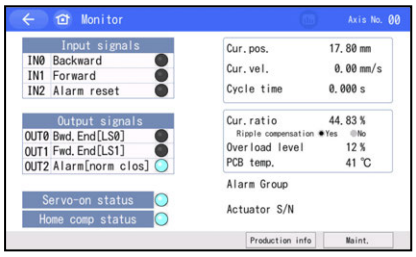
The monitor screen of ELECYLINDER
Refer to [6.6.1 Monitor Screen (ELECYLINDER)]



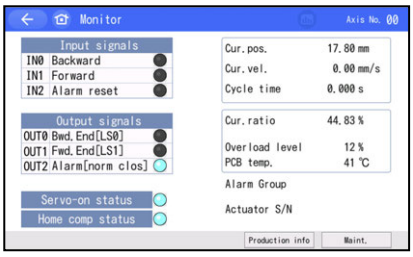
The monitor screen of ROBO PUMP
Refer to [6.6.1 Monitor Screen (ROBO PUMP)]

6.6.1 Monitor Screen (ELECYLINDER)

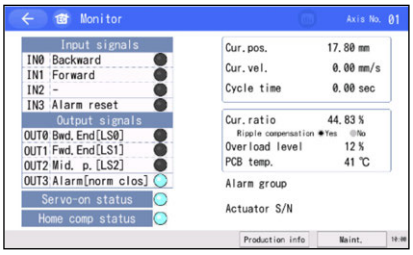
(Applicable for Ripple Compensation)



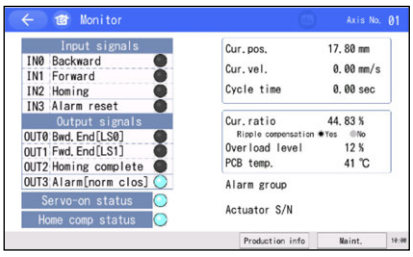
(Not Applicable for Ripple Compensation)



(3-position setting)



(Double (Multi-I/O enabled) when Solenoid Valve Type (operation mode) is selected)



Touch [Production info] and the production information screen will be displayed.
Refer to [6.15 Environment Setting]
Touch [Maint.] and the maintenance information screen will be displayed.
Refer to [6.6.3.1 Maintenance Information Screen]

[Displayed Items]

- Input signals — The status of each input signal is shown. ON is lit. OFF is unlit.
  *An input signal that a signal is not assigned (with a display of "-") should not illuminate even if it is turned on.
- Output signals — The status of each output signal is shown. ON is lit. OFF is unlit.
- Cur. pos. — The current position is shown.
- Cur. vel. — The current speed is shown.
- Cycle time — It shows the cycle time when performing operation in the velocity and acceleration/deceleration set in the forth and the way back.
- Cur. ratio — The value of electrical current is shown as a percentage of the rated current.

  Ripple compensation (Note 1) — It can be chosen with the radio button whether to display the current/current ratio with ripple compensation or without ripple compensation.
  • Yes : Shown in command current (Note 2)
  • No : Shown in output current (Note 3)
- Overload level — The overload level is shown in the rate that the motor raising temperature assumed to generate the overload alarm set as 100%.
- PCB temp. — Temperature of the control PC board in the actuator is shown.
- Alarm Group — The applicable alarm group is shown.
- Actuator S/N — Shows the manufacturing number of the actuator.

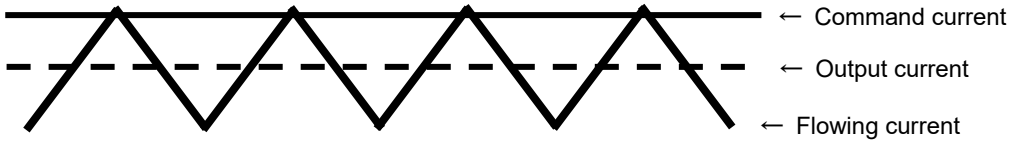
Note 1 Versions Applicable for Ripple Compensation

Tool/Actuator	Applicable Versions
Teaching Pendant TB-02	V2.40 and later
ELECYLINDER	V0006 and later

- In versions other than those listed above, the selections of ripple compensation should not be displayed.
- For those models with no selections, calculations should be performed in command current (Note 2).

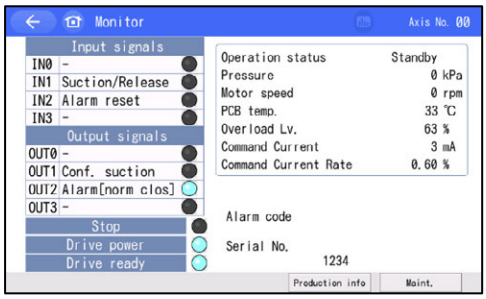
Note 2 The command current should compensate for the amount of current ripple considering transistor switching.

Note 3 In ELECYLINDER, output current close to the effective value should be figured out by calculation as it will not acquire the output current.

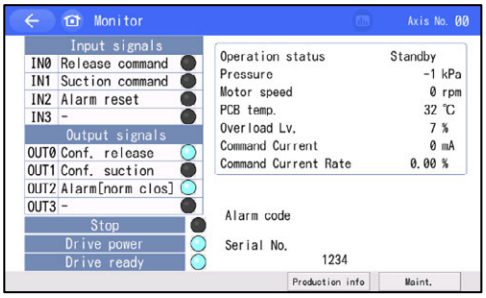


6.6.2 Monitor Screen (ROBO PUMP)

(PIO Pattern 0 or 1)



(PIO pattern 2)



Touch [Production info] and the production information screen will be displayed.
Refer to [6.15 Environment Setting]
Touch [Maint.] and the maintenance information screen will be displayed.
Refer to [6.6.3.2 Maintenance Information Screen]

[Displayed Items]

- Input signals — The status of each input signal is shown. ON is lit. OFF is unlit.
- Output signals — The status of each output signal is shown. ON is lit. OFF is unlit.
- Stop — The status of Emergency stop is shown. ON is lit. OFF is unlit.
- Drive power — The status of Drive power is shown. ON is lit. OFF is unlit.
- Drive ready — The status of Servo on is shown. ON is lit. OFF is unlit.

- Operation status — The operation status of the ROBO POMP is shown.
- Pressure — The pressure of the vacuum pump should be displayed.
- Motor speed — The revolution count of the motor should be displayed.
- PCB temp — Temperature of the control PC board in the ROBO PUMP is shown.
- Over load Lv. — The overload level is shown in the rate that the motor raising temperature assumed to generate the overload alarm set as 100%.
- Command Current — The Command Current is shown.
- Command Current Rate — The value of electrical current is shown as a percentage of the rated command current.
- Alarm code — The applicable alarm code is shown.
- Serial No. — Shows the manufacturing number of the ROBO PUMP.

6.6.3 Maintenance Information Screen

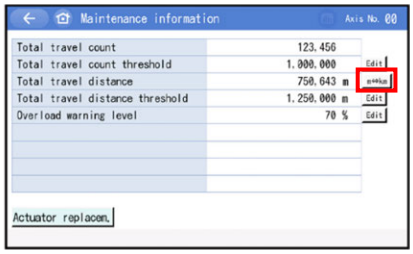
6.6.3.1 Maintenance Information Screen (ELECYLINDER)

(1) Total travel count and total travel distance

A warning should get output when the total travel count or total travel distance has exceeded each setting.

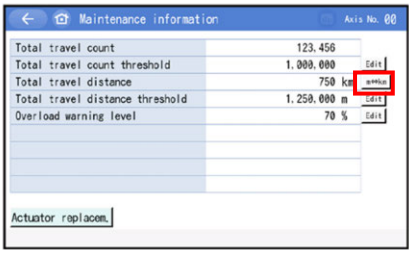
Touch [m ⇔ km] and the display of unit for the total travel distance (current value) can be switched between m and km.
(Rotary type excluded)

(Display in m for distance)



m ⇔ km

(Display in km for distance)

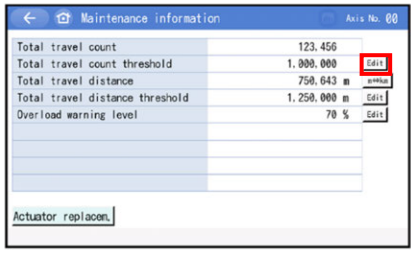


[Contents of Display]

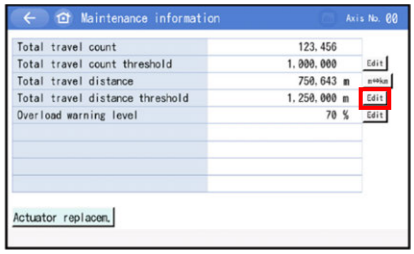
- Total travel count — The cumulative total number of actuator movements is shown.
- Total travel distance — The cumulative total distance travelled by the actuator is shown.
  (Rotary type: travel count for round trip between 0 and 180deg (To be figured out from total drive distance))

[Items of Setting]

- Total travel count threshold — Set the total travel count to output a warning.
- Total travel distance threshold — Set the total travel distance to output a warning.
  (Rotary type: setting of travel count for round trip between 0 and 180deg)



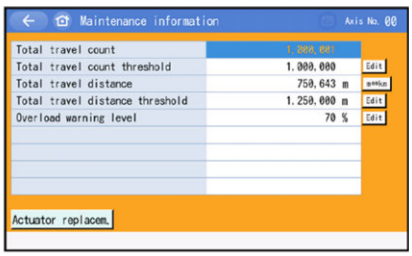
Touch [Edit] on the right of Total travel count threshold to change the setting for the total travel count threshold.



Touch [Edit] on the right of Total travel distance threshold to change the setting for the total travel distance threshold.

When Total Travel Count has Exceeded Total Travel Count Threshold





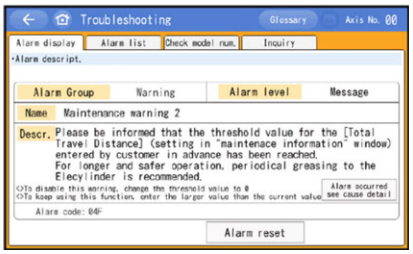
You will be notified in Maintenance warning 1 window.
The number in total travel count blinks in maintenance information window.

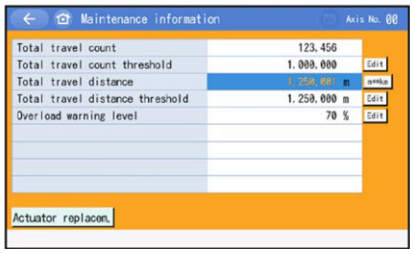
● / ● flash in turn



LED lamps on ELECYLINDER flash red and green in turn in all of Maintenance Warning 1, 2 and 3.

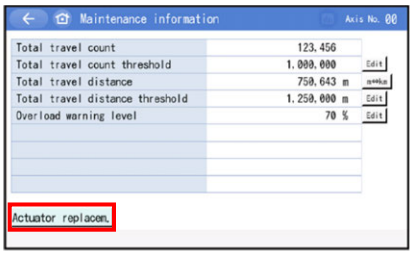
When Total Travel Distance has Exceeded Total Travel Distance Threshold





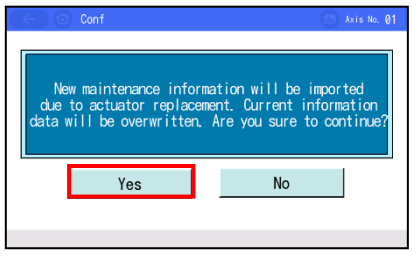
You will be notified in Maintenance warning 2 window.
The number in total travel distance blinks in maintenance information window.

[Resetting Total travel count and Total travel distance]



Touch [Actuator replacem.] to display the password entry screen.

Input “5119” and touch [ENT].



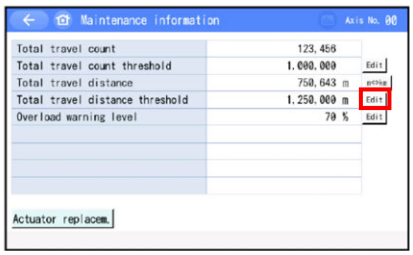
The actuator replacement confirmation screen appears.

Touch [Yes].

The Total travel count and Total travel distance are reset to 0.

(2) Over Load Warning

With the motor rising temperature estimated to generate an overload alarm set as 100%, an overload warning can get output when the temperature has exceeded the rate of the motor temperature set in this window.

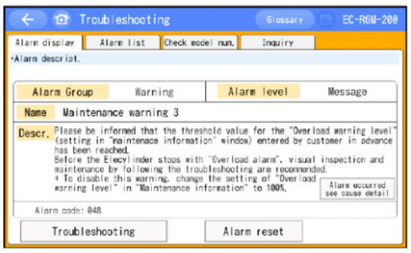


Touch [Edit] on the right of Over load warning level to change the setting for the over load warning level.

[Items of Setting]

- Over load warning level — Set the level to generate the over load warning alarm. Set to 100, and a warning should be generated.

When Over load Level has Exceeded Setting Rate



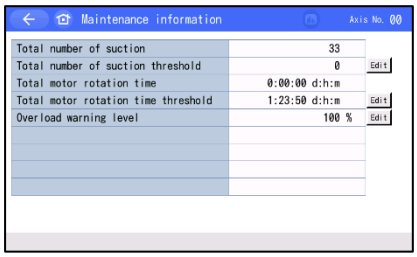
You will be notified as an overload warning in Maintenance warning 3 window.

LED lamps on ELECYLINDER flash red and green in turn.

6.6.3.2 Maintenance Information Screen (ROBO PUMP)

(1) Total number of suction and Total motor rotation time

A warning should get output when the total number of suction or total motor rotation time has exceeded each setting.

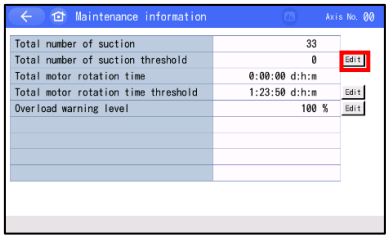


[Contents of Display]

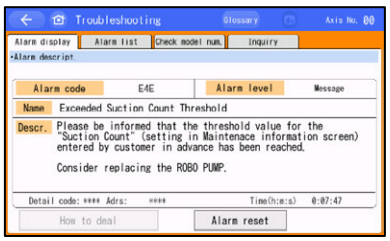
- Total number of suction — The cumulative of suction count for ROBO PUMP should be displayed.
- Total motor rotation time — The cumulative of motor revolution time for ROBO PUMP should be displayed.

[Items of Setting]

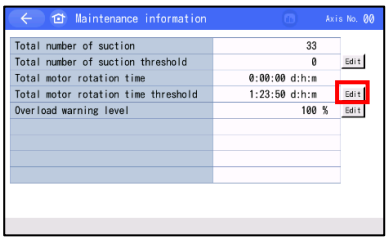
- Total number of suction threshold — Set the Total number of suction threshold to output a warning.
- Total motor rotarion time threshold — Set the Total motor rotarion time to output a warning.



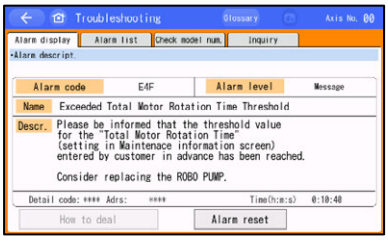
Touch [Edit] on the right of Total number of suction threshold to change the setting for the Total number of suction threshold.



When the total count of suction has exceeded the setting for the total count of suction, a notification should be made by displaying “E4E Exceeded Suction Count Threshold”.



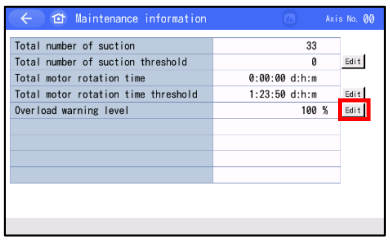
Touch [Edit] on the right of Total morot rotation time threchold to change the setting for the Total morot rotation time threchold.



When the total motor rotation time has exceeded the setting for the total motor rotation time, a notification should be made by displaying “E4F Exceeded Total Motor Rotation Time Threshold”.

(2) Over Load Warning

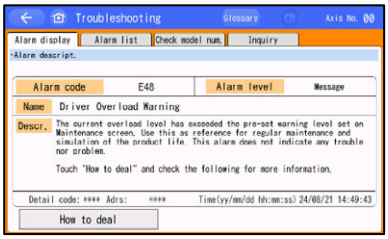
With the motor rising temperature estimated to generate an overload alarm set as 100%, an overload warning can get output when the temperature has exceeded the rate of the motor temperature set in this window.



Touch [Edit] on the right of Over load warning level to change the setting for the over load warning level.

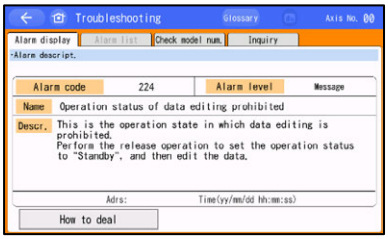
[Items of Setting]

- Over load warning level — Set the level to generate the over load warning alarm. Set to 100, and a warning should be generated.



When the Over load warning level has exceeded the setting for the Over load warning level threshold, a notification should be made by displaying "E48 Driver Over load Warning".

[When Touching [Edit] While in Suction of ROBO PUMP]



When [Edit] in any of the following is touched while in suction of ROBO PUMP, "224 Operation status of data editing prohibited" should be displayed.

- [Edit] at the Right of Total number of suction threshold
- [Edit] at the Right of Total morot rotation time threchold
- [Edit] at the Right of Over load warning leve

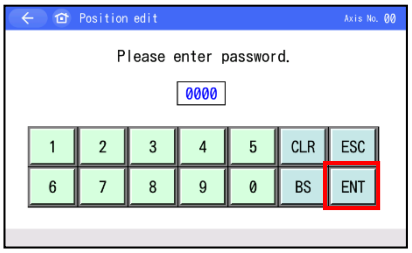
6.7 Simple Data Setting (ELECYLINDER)

Setting and editing of data related to operation such as forward end, backward end, velocity (V), acceleration (A), deceleration (D) and pressing setting can be performed. Also, JOG operation can be performed.



Touch [Simple Data Setting] on the Menu 1 screen.

If a position edit password is other than “0000,” the password entry screen appears.



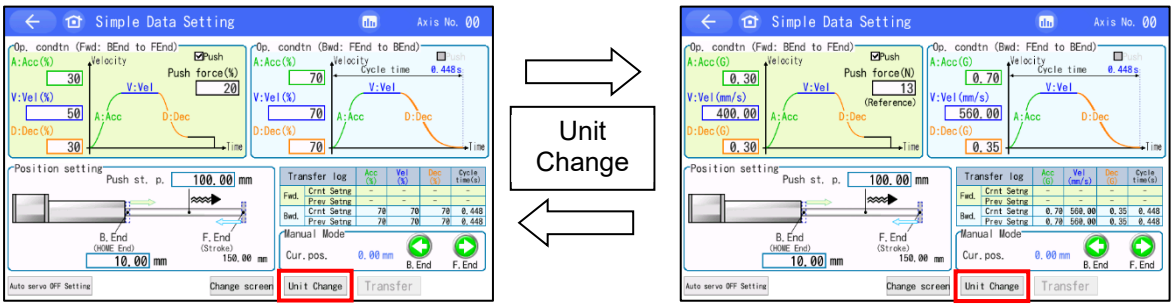
Enter the position edit password.
Touch [ENT].

> The default position edit password is “0000”.
> For how to change the position edit password, refer to 6.16, “Environment Setting [Change Pos Edit Password]”.

The simple data setting screen appears.

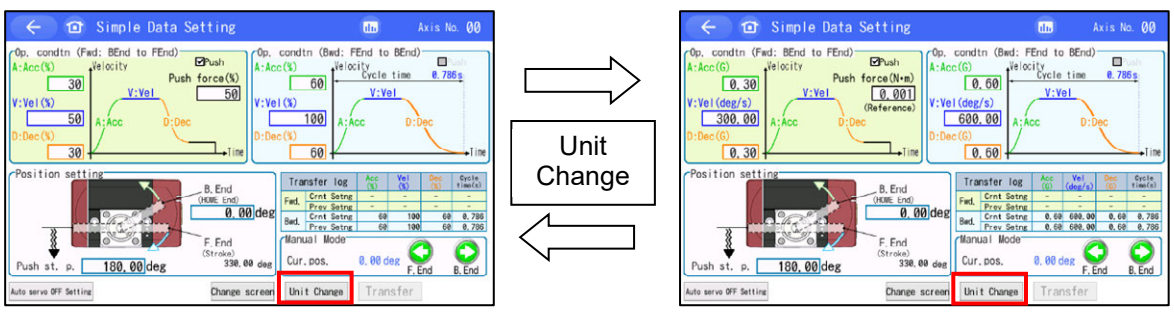
■ Unit Change
[Unit Change] switches the unit between % and mm/s for velocity, % and G for acceleration / deceleration and % and N for pressing force (Rotary type excluded).

Rod type: Simple data setting screen for pressing operation (2-position setting)

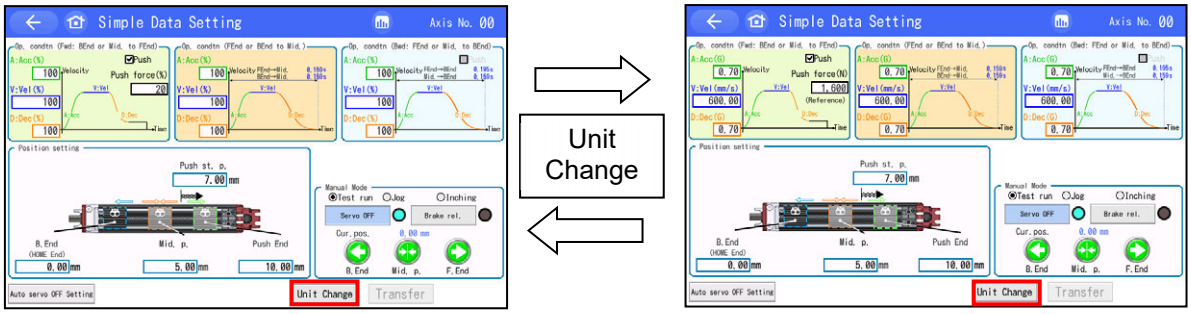


[Unit Change] switches the unit between % and deg/s for velocity, % and G for acceleration / deceleration and % and N•m for pressing force (Rotary type).

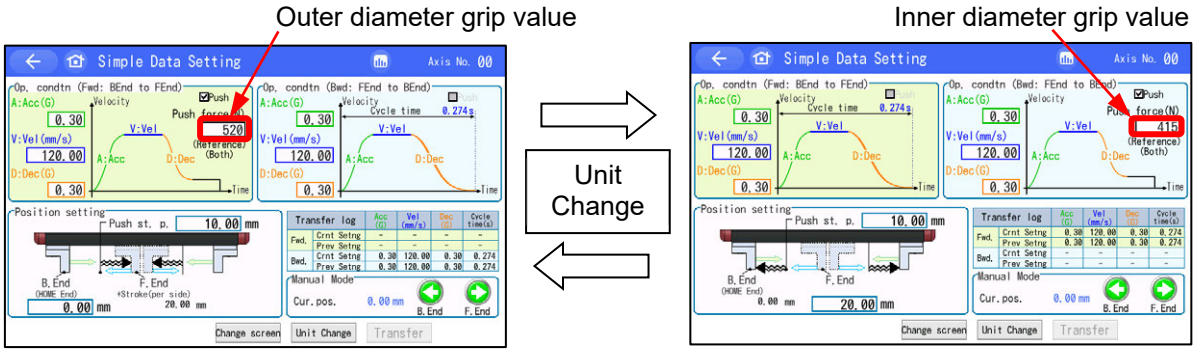
Rotary type: Simple data setting screen for pressing operation (2-position setting)



Wire Cylinder: Simple data setting screen for positioning operation (3-position setting)



3-finger gripper type: Simple data setting screen for pressing operation (2-position setting)



Caution: The 3-finger gripper is different in the grip force for outer diameter grip and inner diameter grip.
In a versions earlier than V5.00, when the display unit for the three-finger gripper (EC-GRTR14) is in [N], it should show the grip force for outer grip even if it is inner grip.

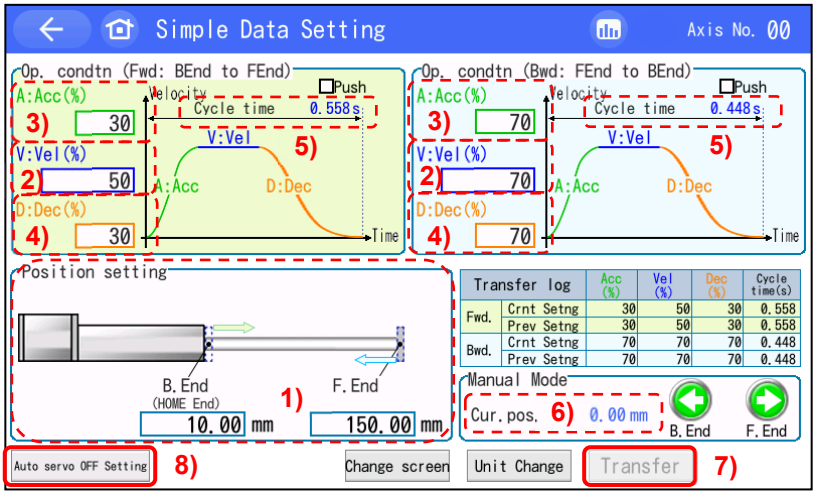


Therefore, when using the 3-finger gripper (EC-GRTR14) in versions earlier than V5.00 with gripping at the inner diameter, use the displayed unit in [%], not in [N], for grip force (pressing force).

- *To set up the grip force for the inner diameter grip, refer to the graph shown in [Relation Between Grip Force and Current Limit] in 3-finger gripper Instruction Manual (ME3829) to set it up in [%].*

6.7.1 Positioning Operation

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Rotary and Wire Cylinder excluded)



1) Position setting [mm] : Input the positions of the backward end and forward end. Positioning coordinate value. Enter is as the distance from the home position. The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation. Set a number from 0% to 100%. Also, the unit can be switched to mm/s by pressing [Unit Change]. Input can be made down to the two decimal places for mm/s.
Note 1 Min. Velocity [mm/s (deg/s)] = Lead Length [mm] / encoder pulse [pulse] / 0.001 [s]
(Number of 24V pulse motor type encoder pulse: 800)
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation. Set a number from 0% to 100%. Also, the unit can be switched to G by pressing [Unit Change]. Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop. Set a number from 0% to 100%. Also, the unit can be switched to G by pressing [Unit Change]. Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

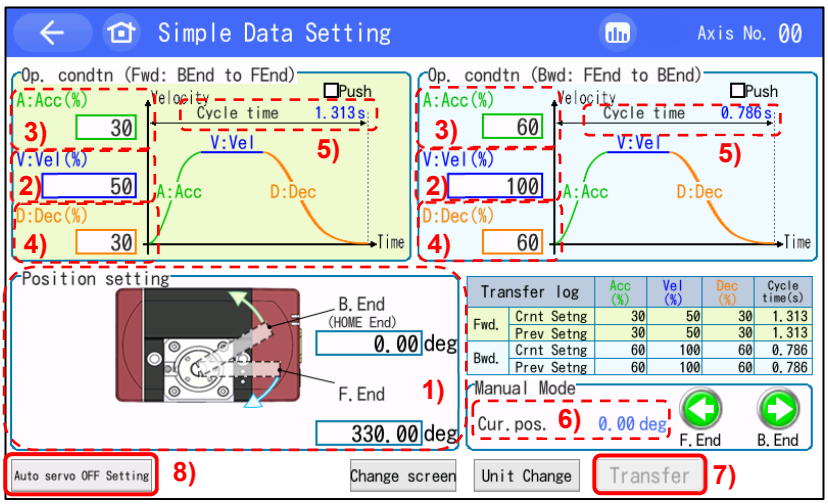
6) Cur. pos. [mm] : Displays the current position.

7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time. Refer to [6.7.5 Auto servo OFF]

> ⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
> *Also, without transferring, operation by the manual operation switch will not be available.*
> *For manual operation, refer to [6.7.3 Manual Mode].*

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Rotary)



1) Position setting [deg] : Input the positions of the backward end and forward end. Positioning coordinate value. Enter is as the distance from the home position. The unit is deg and input can be made down to two decimal places.

2) Vel [% or deg/s] : Set the velocity of operation. Set a number from 0% to 100%. Also, the unit can be switched to deg/s by pressing [Unit Change]. Input can be made down to the two decimal places for deg/s.

Note 1 The minimum velocity is as follows.
Min. Velocity [20 deg/s]

3) Acc [% or G] : Set the acceleration at the start of operation. Set a number from 0% to 100%. Also, the unit can be switched to G by pressing [Unit Change]. Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop. Set a number from 0% to 100%. Also, the unit can be switched to G by pressing [Unit Change]. Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

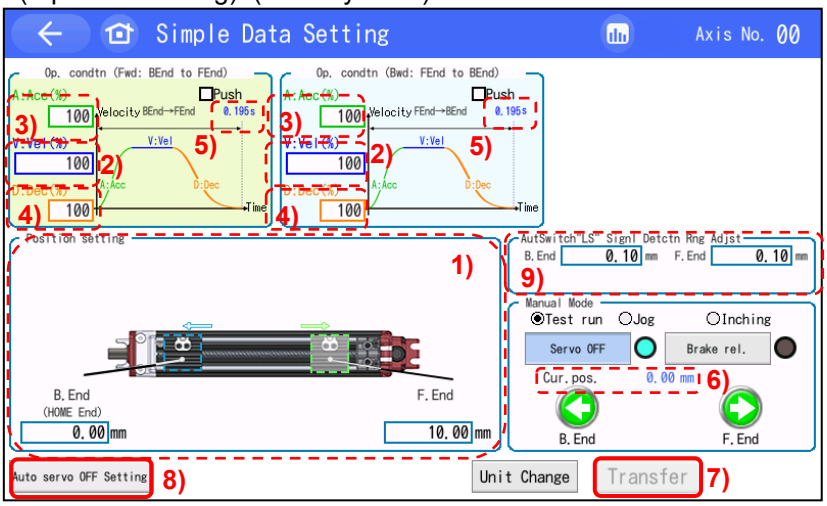
6) Cur. pos. [mm] : Displays the current position.

7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time. Refer to [6.7.5 Auto servo OFF]

> ⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
> *Also, without transferring, operation by the manual operation switch will not be available.*
> *For manual operation, refer to [6.7.3 Manual Mode].*

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Wire Cylinder)



1) Position setting [mm] : Input the positions of the backward end and forward end. Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to mm/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.
Note 1 Min. Velocity [mm/s (deg/s)] = Lead Length [mm] / encoder pulse [pulse] / 0.001 [s]
(Number of 24V pulse motor type encoder pulse: 800)
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

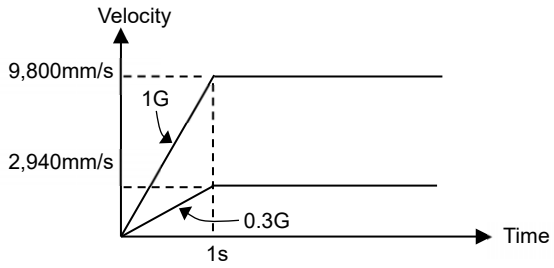
7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
[Refer to 6.7.5 Auto servo OFF]

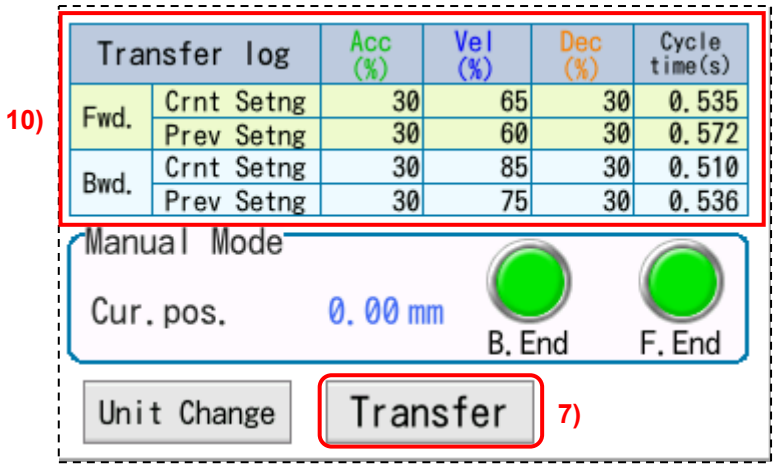
9) Auto Switch "LS" Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch "LS" signal.
Input the backward end and forward end.
The unit is mm and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
For manual operation, refer to [6.7.3 Manual Mode].

(Reference) Acceleration is explained. The same concept applies to deceleration.
1G = 9,800mm/s^2: Acceleration at which the actuator can increase its speed up to 9,800mm/s per second.
0.3G : Acceleration at which the actuator can increase its speed up to 2,940mm/s (9,800mm/s × 0.3) per second.

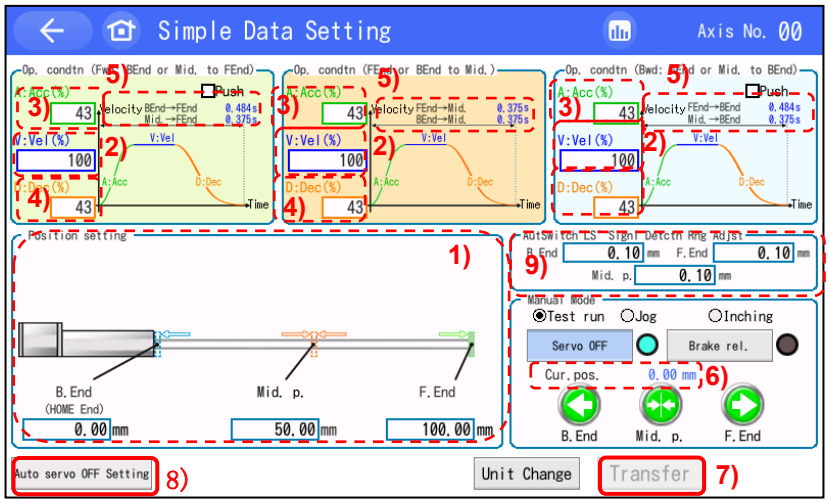


⚠ *Caution: If the actuator or work part receives impact or generates vibration, lower the acceleration/deceleration. If the system is used continuously with the actuator or work part receiving impact or generating vibration, the life of the actuator may be significantly reduced.*



10) Transfer log
Once the data of the velocity and acceleration/deceleration for the way forth and the way back is transferred by pressing [Transfer], the old setting parameters will be shown in the previous setting area and the new parameters in the current setting area, and the cycle time calculated from these parameters will be displayed.
However, it cannot be checked for the wire cylinder and the MF specification.

Shown below is the content of setting for the position data for the positioning operation (3-position setting). (Rotary and Wire Cylinder excluded)



1) Position setting [mm] : Input the positions of the backward end, forward end and middle point.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to mm/s by pressing [Unit Change].
Input can be made down to the two decimal places for mm/s.
Note 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [mm/s [deg/s]] = Lead Length [mm] / Number of encoder pulse [pulse] / 0.001 [s]
(Number of 24V servo motor type encoder pulse: 800)
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

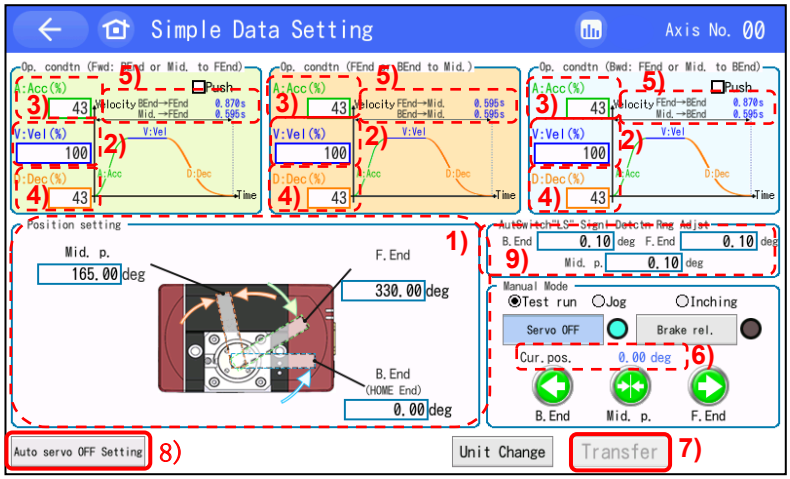
7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time.
Refer to [6.7.5 Auto servo OFF]

9) Auto Switch “LS” Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch “LS” signal.
Input the backward end, forward end and middle point.
The unit is mm and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
For manual operation, refer to [6.7.3 Manual Mode].

Shown below is the content of setting for the position data for the positioning operation (3-position setting). (Rotary)



1) Position setting [deg] : Input the positions of the backward end, forward end and middle point.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is deg and input can be made down to two decimal places.

2) Vel [% or deg/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to deg/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.

Note 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [20 deg/s]

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

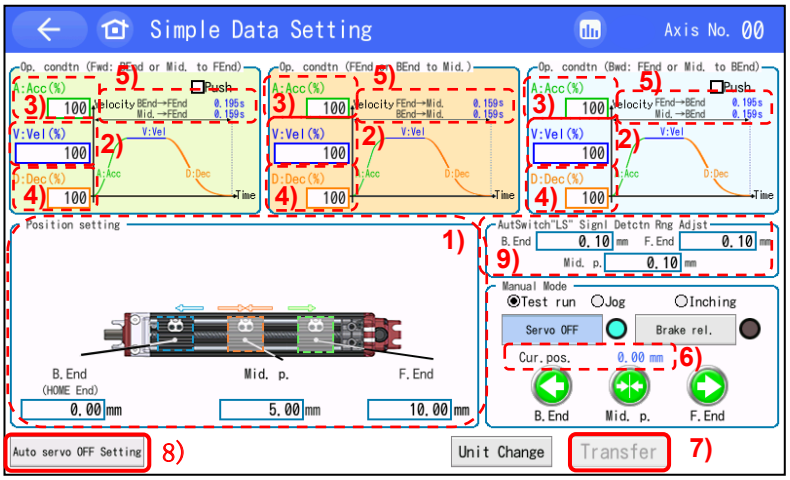
7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time.
Refer to [6.7.5 Auto servo OFF]

9) Auto Switch “LS” Signal Detection Range Adjustment [deg] : Sets the detection range of the auto switch “LS” signal.
Input the backward end, forward end and middle point.
The unit is deg and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
For manual operation, refer to [6.7.3 Manual Mode].

Shown below is the content of setting for the position data for the positioning operation (3-position setting). (Wire Cylinder)



1) Position setting [mm] : Input the positions of the backward end, forward end and middle point.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to mm/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.
Note 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [mm/s [deg/s]] = Lead Length [mm] / Number of encoder pulse [pulse] / 0.001 [s]
(Number of 24V servo motor type encoder pulse: 800)
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

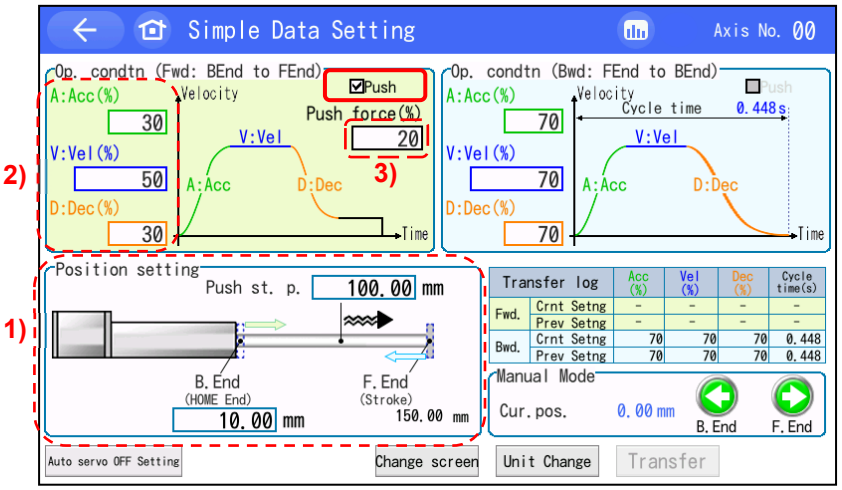
8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time.
Refer to [6.7.5 Auto servo OFF]

9) Auto Switch “LS” Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch “LS” signal.
Input the backward end, forward end and middle point.
The unit is mm and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

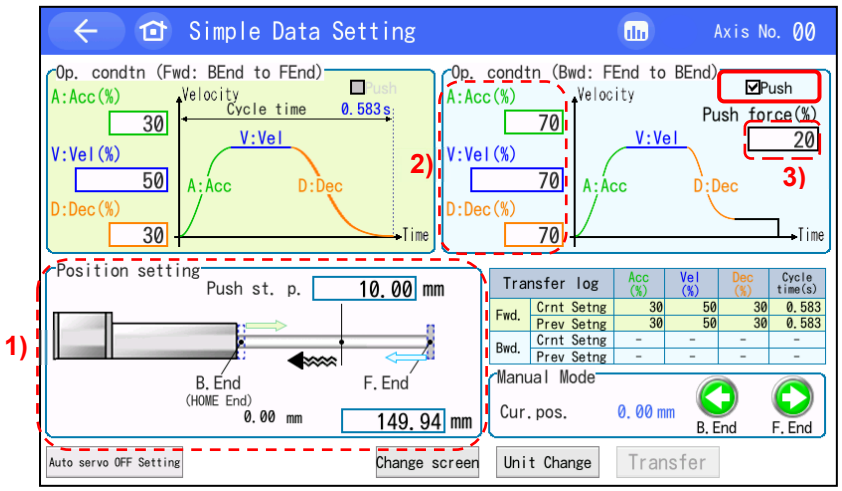
⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
For manual operation, refer to [6.7.3 Manual Mode].

6.7.2 Pressing Operation

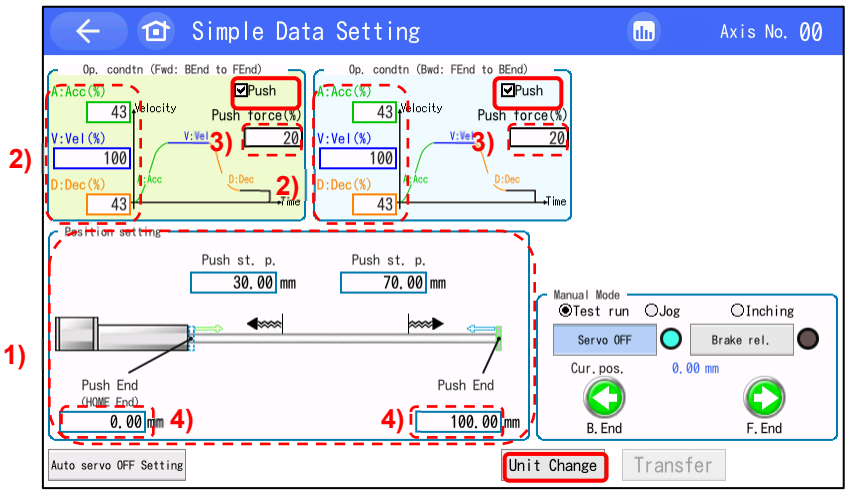
Shown below is the content of setting for the position data for the pressing operation.
(Rotary and Wire Cylinder excluded)
Touch the checkbox □ at Pressing to add a checkmark ✓, and the screen goes to the setting window for the pressing operation.
The number of points that can be configured for pressing operation differs depending on the EC specifications. For details, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)]
(Models for which the [□ Pressing] option is not displayed cannot perform pressing operation.)



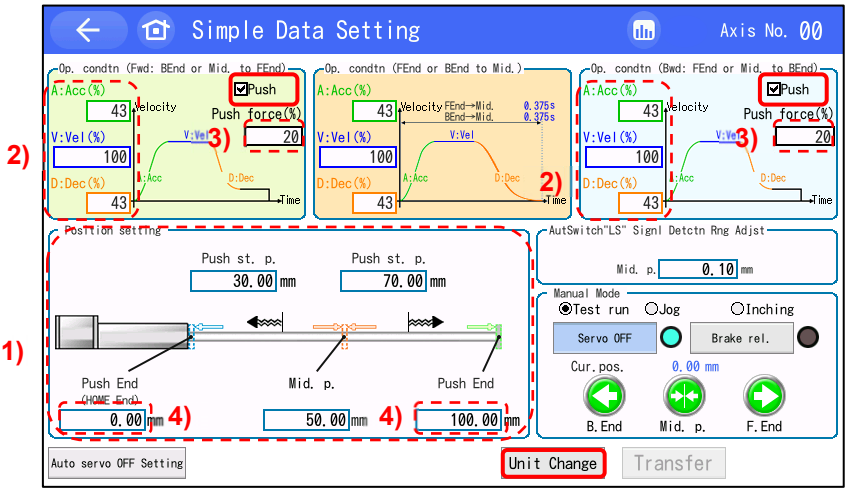
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing
(2-position setting)



2-end Pressing
(3-position setting)

1) Position setting [mm] : Setting can be made for the start position of movement (backward end, forward end or middle point) and the start position of pressing operation.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

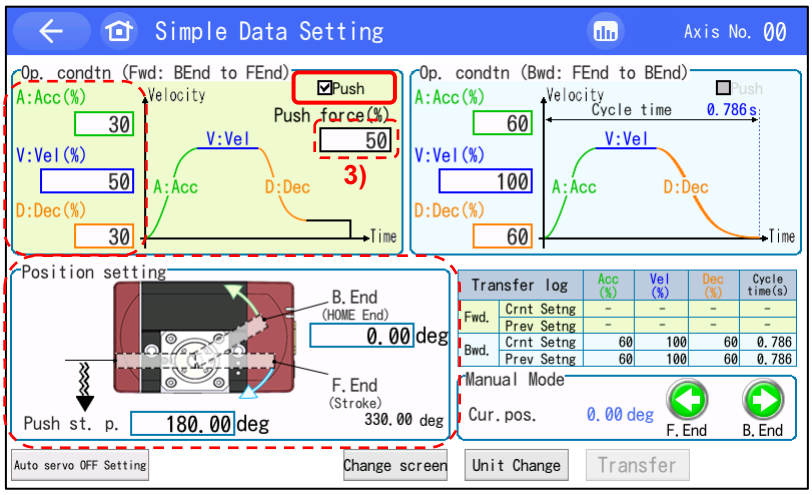
2) Vel, Acc, Dec : Setting can be made for the velocity, accelerationand deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation.
The way to conduct settings is the same as that for positioning operation.

3) Push force [% or N] : Set a push force (limit current value) in %.
The unit can be switched to N by pressing [Unit Change].
The pressing velocity should be 20mm/s.
If the velocity is set to 20mm/s or less, pressing operation will be performed in the setting velocity.

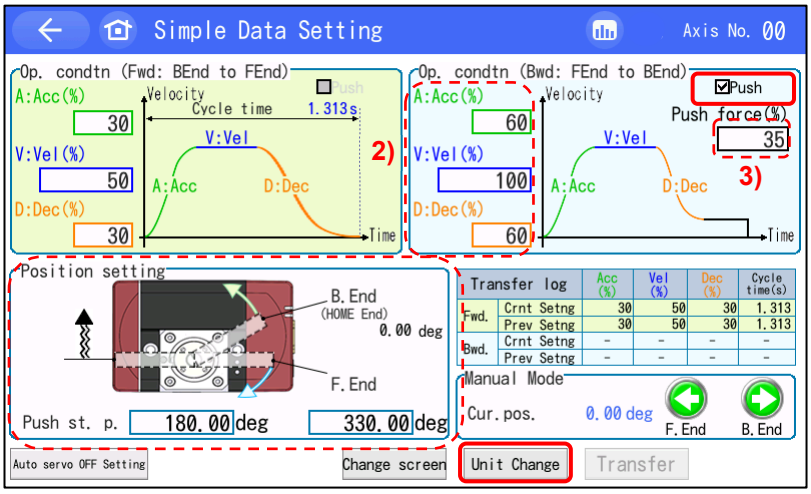
4) Push End [mm] : Set up the position to detect the pressing operation is missed.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

Transfer log : The transfer log will not be displayed in pressing operation.
The transfer operation and manual operation is the same as the positioning operation. Refer to [6.7.1 Positoning Operation]

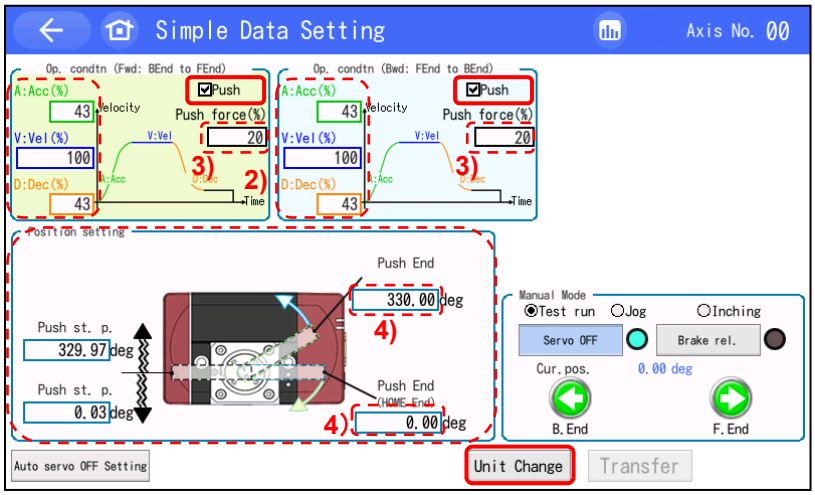
Shown below is the content of setting for the position data for the pressing operation. (Rotary)
Touch the checkbox □ at Pressing to add a checkmark ✓, and the screen goes to the setting window for the pressing operation.
The number of points that can be configured for pressing operation differs depending on the EC specifications. For details, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)]



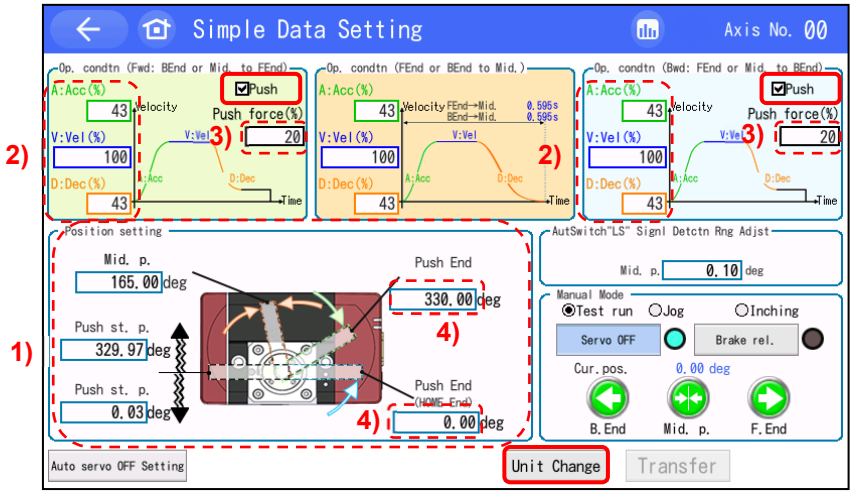
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (2-position setting)



2-end Pressing
(3-position setting)

1) Position setting [mm] : Setting can be made for the start position of movement (backward end, forward end or middle point) and the start position of pressing operation. Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

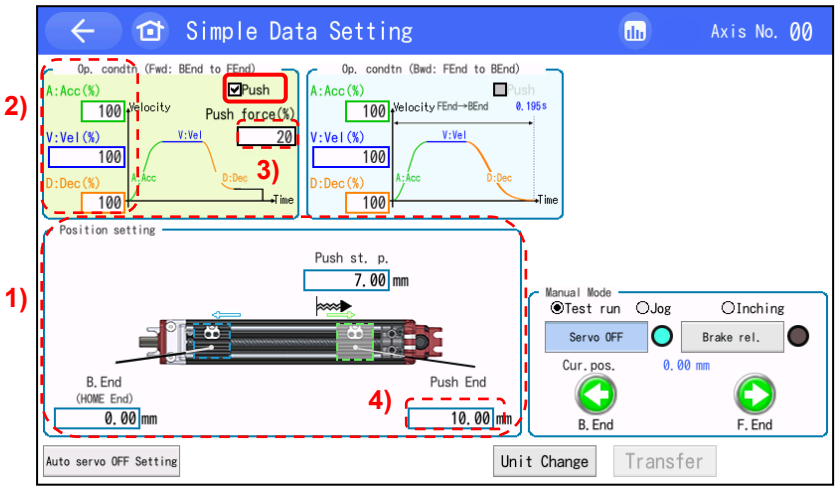
2) Vel, Acc, Dec : Setting can be made for the velocity, acceleration and deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation. The way to conduct settings is the same as that for positioning operation.

3) Push force [% or N•m] : Set a pressing torque (limit current value) in %.
The unit can be switched to N•m by pressing [Unit Change].
The pressing velocity should be 20deg/s.
If the velocity is set to 20deg/s or less, pressing operation will be performed in the setting velocity.

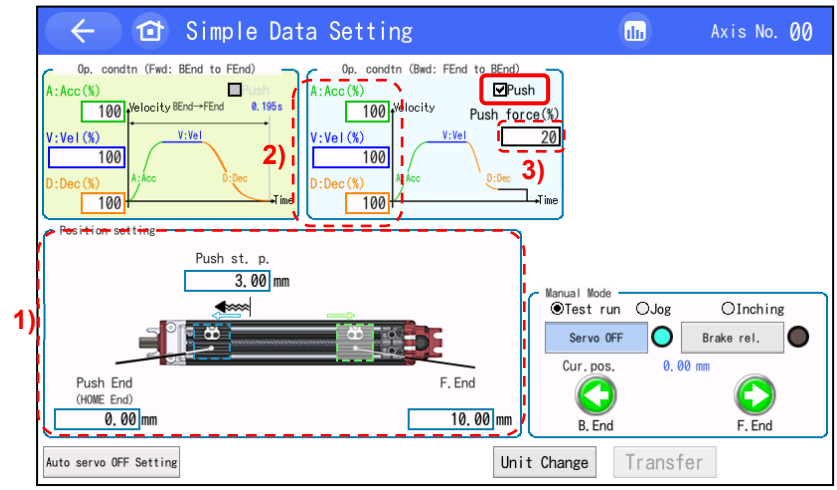
4) Push End [deg] : Set up the position to detect the pressing operation is missed. Positioning coordinate value. Enter is as the distance from the home position.
The unit is deg and input can be made down to two decimal places.

Transfer log : The transfer log will not be displayed in pressing operation.
The transfer operation and manual operation is the same as the positioning operation. Refer to [6.7.1 Positoning Operation]

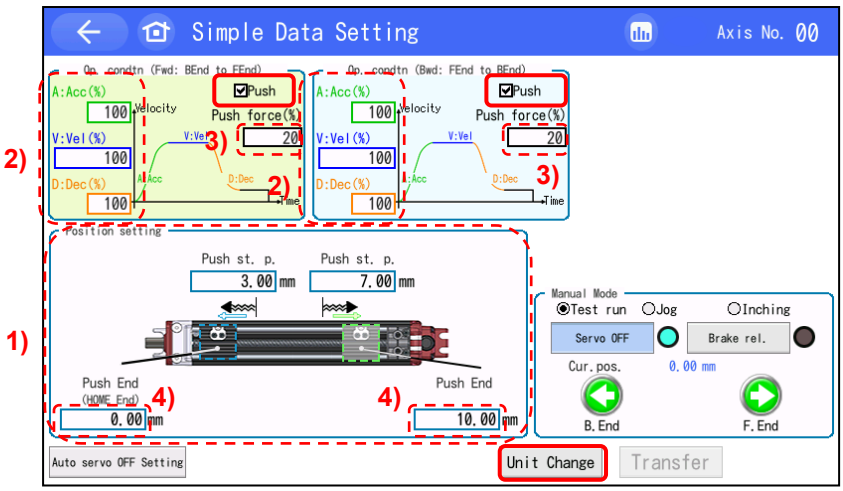
Shown below is the content of setting for the position data for the pressing operation.
(Wire Cylinder)
Touch the checkbox □ at Pressing to add a checkmark ✓, and the screen goes to the setting window for the pressing operation.
The number of points that can be configured for pressing operation differs depending on the EC specifications. For details, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)]



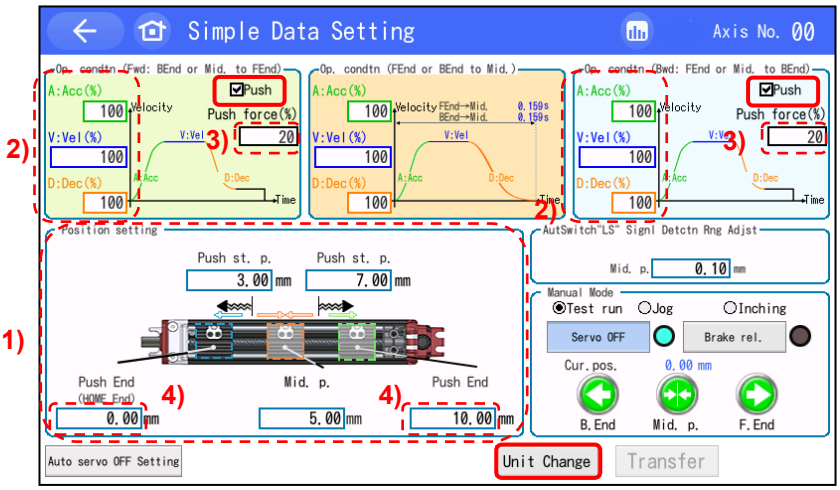
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (2-position setting)



2-end Pressing
(3-position setting)

1) Position setting [mm] : Setting can be made for the start position of movement (backward end, forward end or middle point) and the start position of pressing operation.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

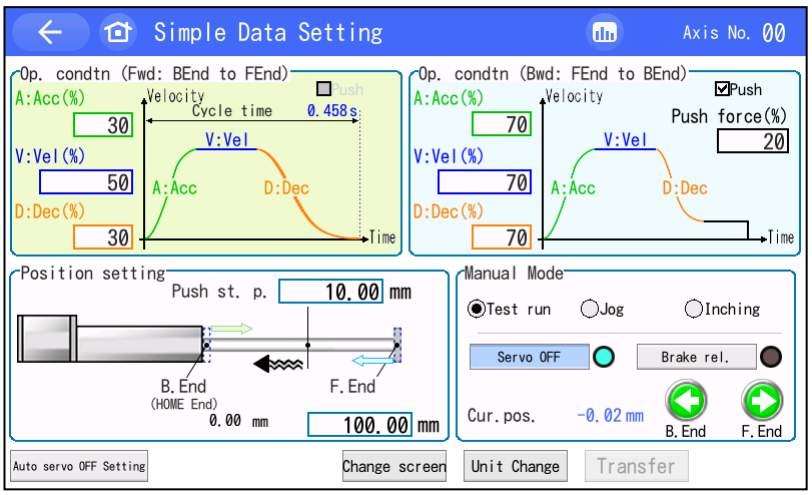
2) Vel, Acc, Dec : Setting can be made for the velocity, acceleration and deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation.
The way to conduct settings is the same as that for positioning operation.

3) Push force [% or N] : Set a push force (limit current value) in %.
The unit can be switched to N by pressing [Unit Change].
The pressing velocity should be 20mm/s.
If the velocity is set to 20mm/s or less, pressing operation will be performed in the setting velocity.

4) Push End [mm] : Set up the position to detect the pressing operation is missed.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

Transfer log : The transfer log will not be displayed in pressing operation.
The transfer operation and manual operation is the same as the positioning operation. Refer to [6.7.1 Positoning Operation]

6.7.3 Manual Mode

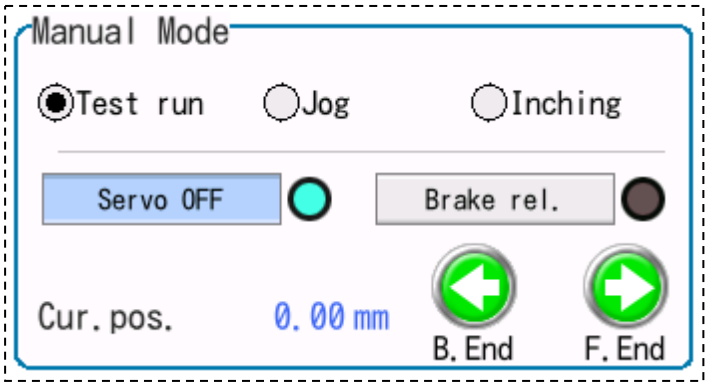


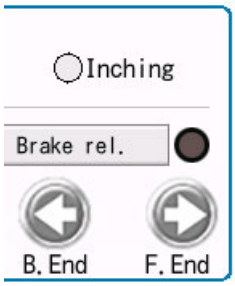
Once the simple data setup window is shown, the manual operation box should show up in the right bottom of the screen.
Selection can be made with ○ (radio buttons) from Trial Run, Jog and Inching.

(1) Test Run

Select Test run in radio buttons (○).

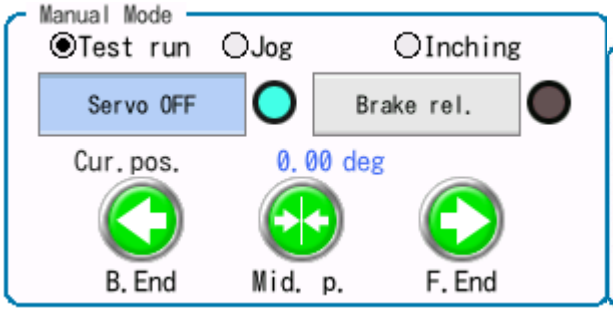
2-position setting

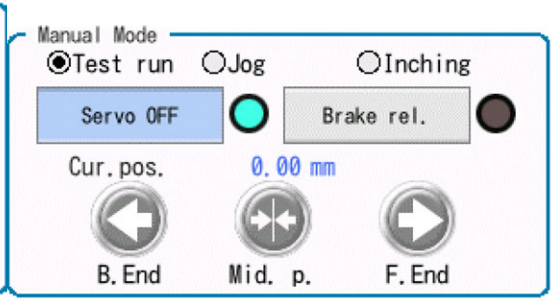




Set values not transferred

3-position setting





It should be switched over between power on and off by touching [Servo OFF] or [Servo ON].
It should be switched over between brake compulsory release on and off by touching [Brake rel.].

An actuator should move to the backward end if you touch [B. End].
Make operation using velocity and acceleration/deceleration in the operation conditions (Way back: from F. End to B. End).

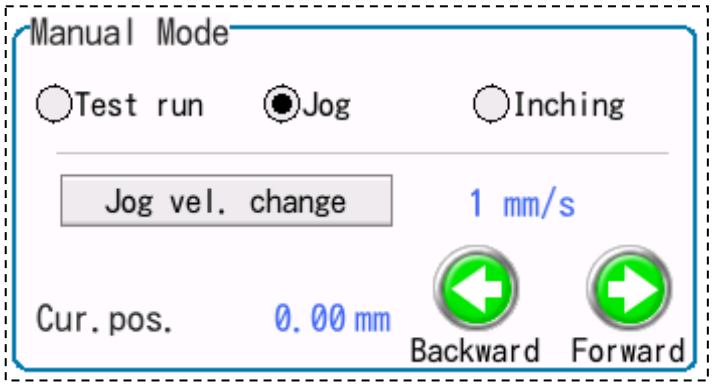
An actuator should move to the forward end if you touch [F. End].
Make operation using velocity and acceleration/deceleration in the operation conditions (Way forward: from B. End to F. End).

An actuator should move to the forward end if you touch [Mid. P.].
Make operation using velocity and acceleration/deceleration in the operation conditions (From F. End / B. End to Mid. P).

Both forward (including movement to middle point) and backward operations should activate while the button is touched and held. Release the button and the operation should stop.
[B. End] and [F. End], [Mid. P] are ready for operation when they are shown in green. If they are not green, the set values are not transferred. Transfer the set value data to a controller in advance by pressing [Transfer] button.

(2) JOG

Select JOG in radio buttons (○).



An actuator keeps moving backward while touching [Backward].
Regardless of the backward end setting, the actuator should move backwards till the home position.

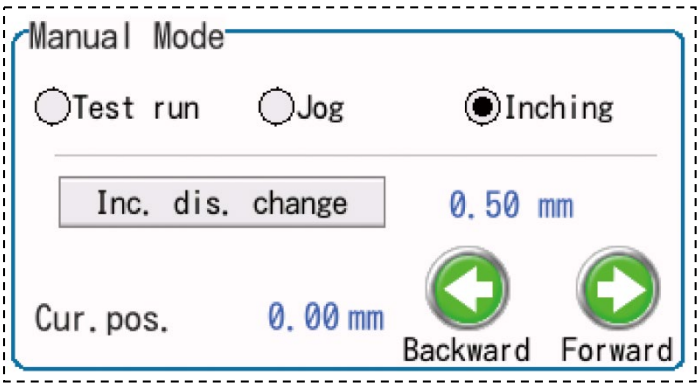
An actuator keeps moving forward while touching [Forward].
Regardless of the forward end setting, the actuator should move forwards till the stroke end.

Touch [Jog vel. change] and the velocity to move backward/forward should change in the order below.

1 mm/s (deg/s) → 10 mm/s (deg/s) → 30 mm/s (deg/s) → 50 mm/s (deg/s) → 100 mm/s (deg/s)

(3) Inching

Select Inching in radio buttons (○).



Touch [Backward] and an actuator should move backward in a certain distance.
Regardless of the backward end setting, the actuator should move backwards till the home position.

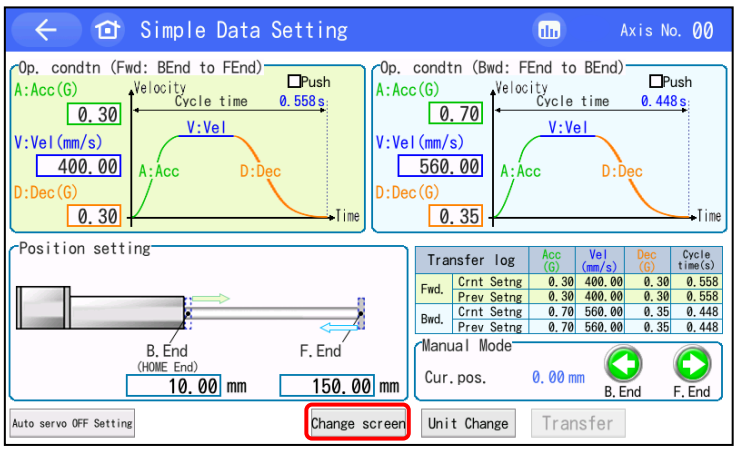
Touch [Forward] and an actuator should move forward in a certain distance.
Regardless of the forward end setting, the actuator should move forwards till the stroke end.

In the inching operation, keep touching it for two seconds and the operation switches to the jog operation in 1mm/s.
The velocity will increase in every second after that.

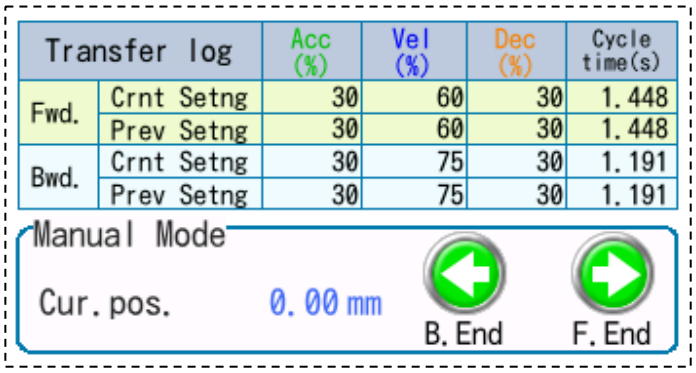
Touch [Inc. dis. change] and the distance to move in one touch should change in the order below.

0.01 mm (deg) → 0.10 mm (deg) → 0.50 mm (deg) → 1.00 mm (deg) → 5.00 mm (deg)

(4) Transfer log display (Not displayed in Wire Cylinder or 3-position setting)



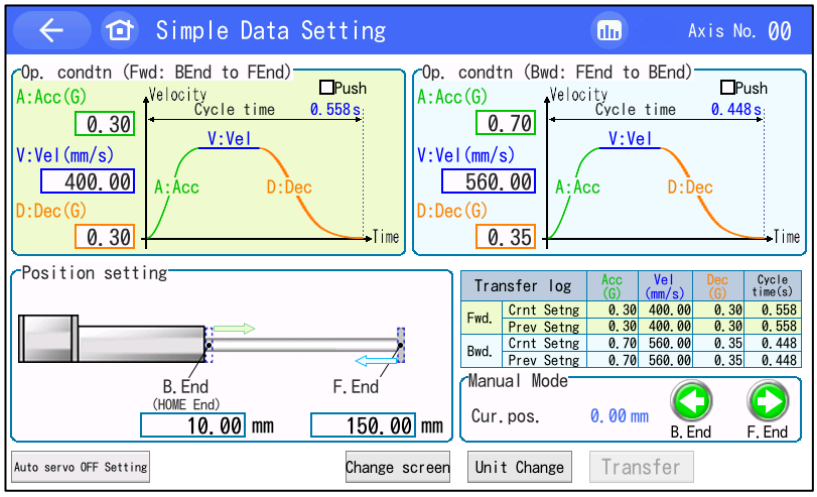
Touch [Change screen] and the screen should be switched over between the manual operation display and data transfer history display.
Switchover is available in any condition of Test run, Jog and Inching.



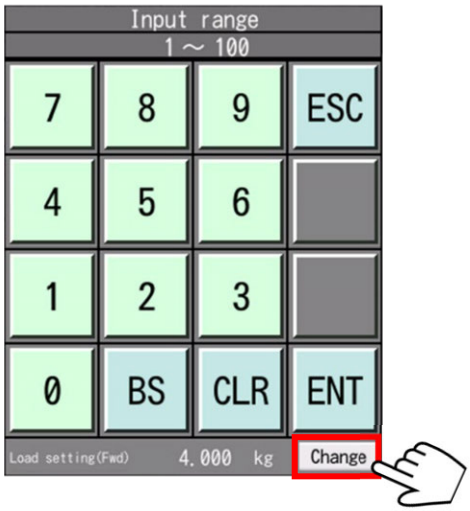
In the data transfer history display, the manual operation buttons work as [B. End] and [F. End] buttons for Test Run.
Once you switch the screen back to the manual operation display, the setting should go back to the test run.

6.7.4 Mounting Orientation Setting / Payload Setting

By setting “Payload (kg/kg-m^2)” and “Mounting Orientation” on the way back and forth in advance, the acceleration and deceleration you can choose can be determined.
* Setting is not available in 3 position setting.

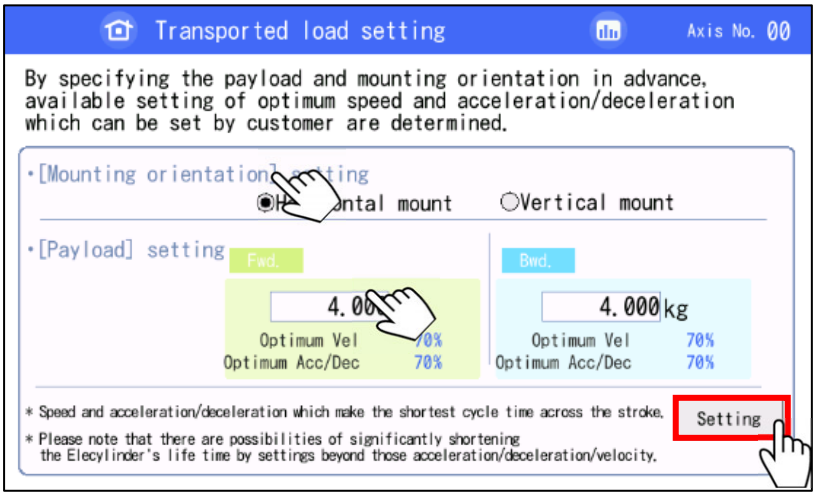


Touch either acceleration, velocity or deceleration.



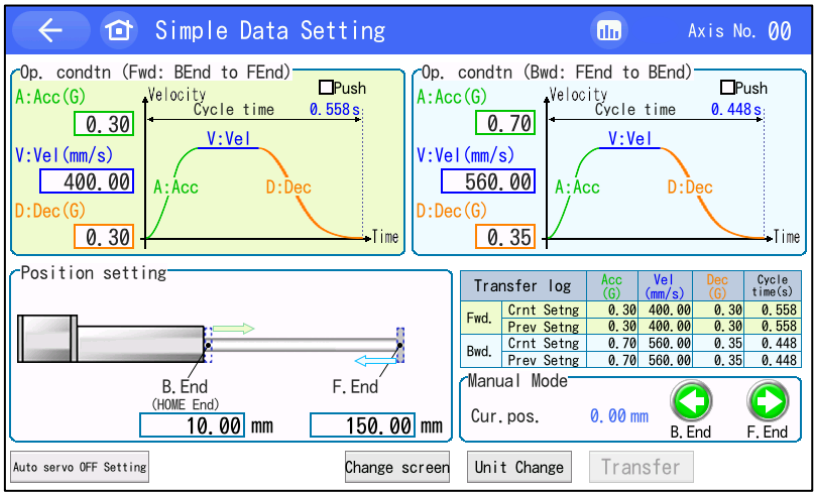
The numeric key pad should open.
Touch [Change] on the right bottom.

The models not applicable for the payload setting (refer to next page) should not have [Change] displayed.



Select "Mounting orientation", input "Payload" and then touch [Setting].

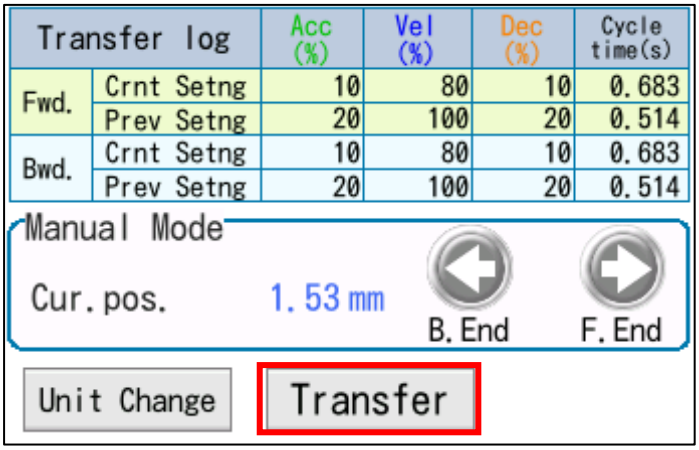
The unit is "kg-m^2" for rotary type



Touch an operational condition to be set or adjusted.



Input a value in the numeric keys and touch [ENT].



Touch [Transfer].

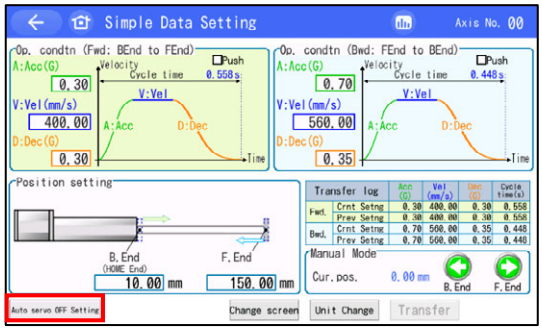
The values should get written to the controller, [Backward End] and [Forward End] should turn into green and "Transferred History" should be updated.

Payload Setting Not Applicable Model

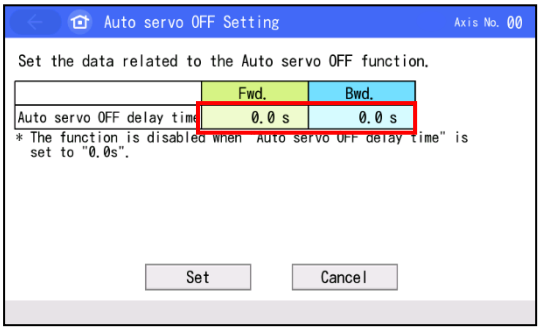
- Ultra Mini ELECYLINDER : EC-SL3□/GDS3L/GDB3□/T3□
- Gripper Type : EC-GRB□/GRBP□(W)/GRC□/GRST□/GRTR□
- Stopper Cylinder ECO Type : EC-ST15M
- Wire Cylinder : EC-WER1/WEGR2

6.7.5 Auto servo OFF

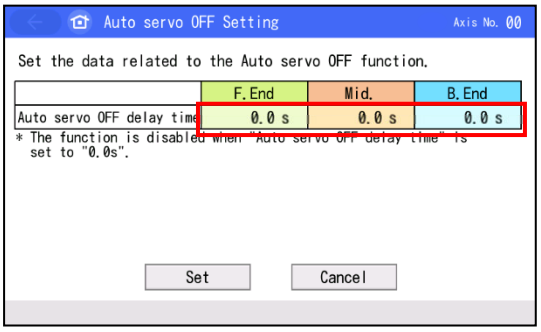
When the automatic servo-of is set, the servo should turn off when the automatic servo off latency has passed after the operation completed.
The automatic servo-off latency can be set to each of back and forth ways.



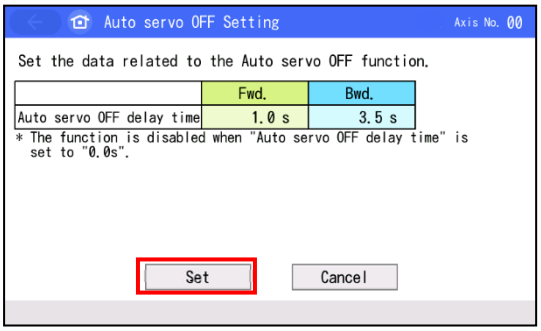
Touch [Auto servo OFF Setting] and the automatic servo-off setup window should appear.



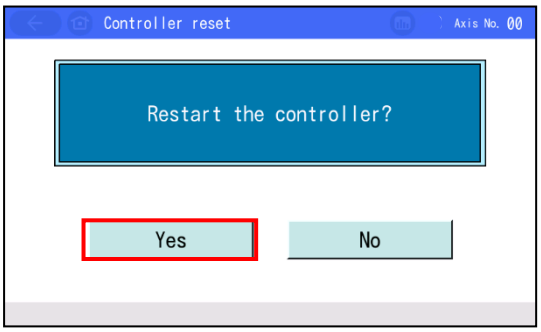
Set the automatic servo-off latency to back and forth ways.
* Set it to "0.0s", and the feature should be inactivated.



In the 3-position setting, setup for the middle position comes available.



Touch [Set up] after input.



Touch [Yes].

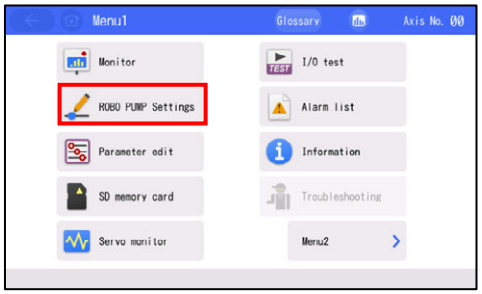
Reboot the controller and the automatic servo-off setup is complete.

The applicable version of ELECYLINDER

Models	Version
24V system ELECYLINDER	V000D or later
200V system ELECYLINDER	V0005 or later
Ultra Mini ELECYLINDER	V0002 or later
Compact type ELECYLINDER 20mm width ELECYLINDER	V0001 or later
Microcylinder	V0001 or later

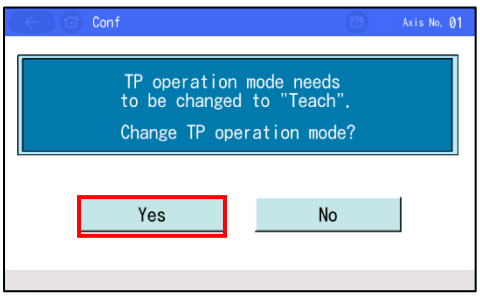
6.8 ROBO PUMP Setting

When ROBO PUMP is connected and ROBO PUMP is selected in the Select Axis screen, the [ROBO PUMP Settings] button should be shown in the Menu 1 screen. Touch it and the screen should shift to the ROBO PUMP Setting screen.
In the ROBO PUMP setting screen, settings for suction of ROBO PUMP, release, display of status monitor, pressure setting and detail settings are available.



Touch [ROBO PUMP settings] on the Menu 1 screen.

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

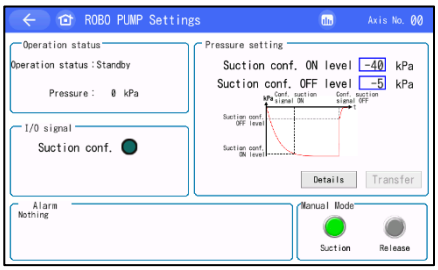
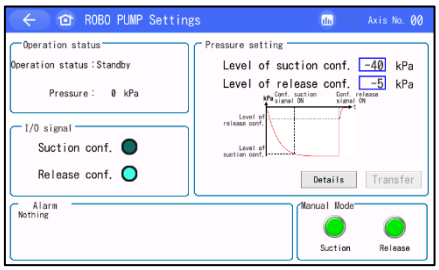
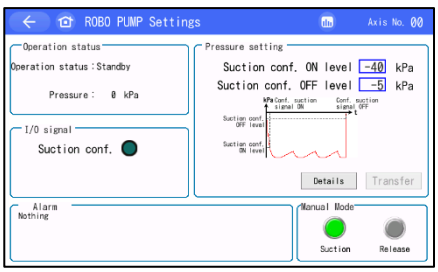
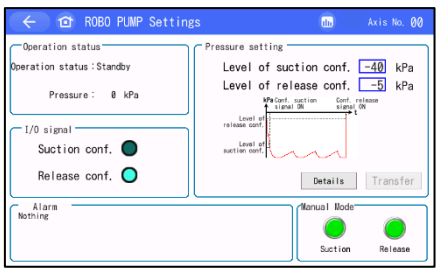


Touch [Yes] to change to Teach Mode 1 or 2.

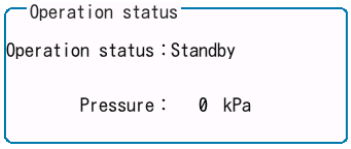
If not, touch [No].

(Note) The safety speed does not change.

ROBO PUMP Settings screen appears.
The contents of pressure setting may differ depending on the PIO patterns and enable or disable of the Energy-saving mode.

	If the PIO pattern is 0 or 1	If the PIO pattern is 2
Energy-saving mode Disabled		
Energy-saving mode Enabled		

6.8.1 Operation Status



Shown below is the displayed Items.

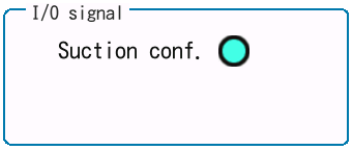
[Displayed Items]

- Operation status : The operation status of the ROBO POMP is shown.
- Pressure [kPa] : Pressure at the vacuum pump part should be displayed.

6.8.2 I/O Signal

Shown below is the displayed Items.

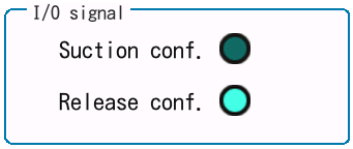
If the PIO pattern is 0 or 1.



[Displayed Items]

- Suction conf. : It should turn on when suction is complete.
  : It should be off when suction is not complete.

If the PIO pattern is 2.

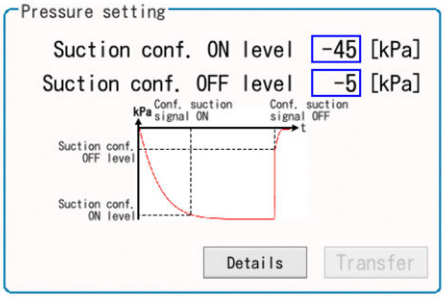


[Displayed Items]

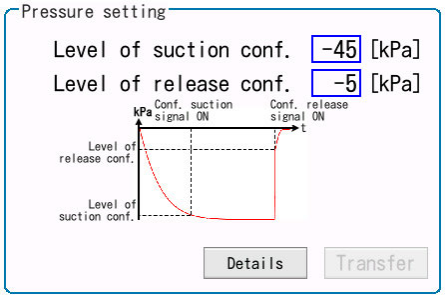
- Suction conf. : It should turn on when suction is complete.
- Release conf. : It should turn on when release is complete.

6.8.3 Pressure setting

If the PIO pattern is 0 or 1.



If the PIO pattern is 2.



The display details, process when each button is touched are as shown below.

[Display Details When PIO Pattern is 0 or 1]

- Suction conf. ON level [kPa] : The upper limit of pressure to terminate suction should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Suction conf. OFF level [kPa] : The upper limit of pressure to terminate release should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Pressure setting graph : The relation between the suction confirmation ON and OFF levels and the pressure should be shown.

[Display Details When PIO Pattern is 2]

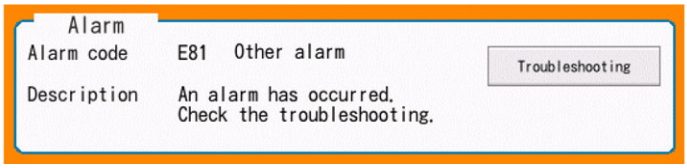
- Level of suction conf. [kPa] : The upper limit of pressure to terminate suction should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Level of release conf. [kPa] : The upper limit of pressure to terminate release should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Pressure setting graph : The relation between the suction confirmation and release confirmation levels and the pressure should be shown.

[Button]

- [Details] button : ROBO PUMP Details screen should be displayed Refer to [6.8.8.1 ROBO PUMP Advanced Settigs 1 screen (Energy-saving mode), 6.8.8.2 ROBO PUMP Advanced Settigs 2 screen (Level setting)].
- [Transfer] button : The changed setting should be sent to ROBO PUMP.

* The [Transfer] button should be inactivated when there is no change to the settings in the monitoring mode and teaching mode or during operation of suction or release.

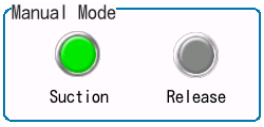
6.8.4 Alarm



The display details, process when each button is touched are as shown below.

- Alarm code : An occurred alarm code should be displayed.
  "None" should be shown when there is no alarm occurred.
- Content : An occurred alarm code should be displayed.
- [Troubleshooting] button : The screen moves to the troubleshooting window.

6.8.5 Manual Mode



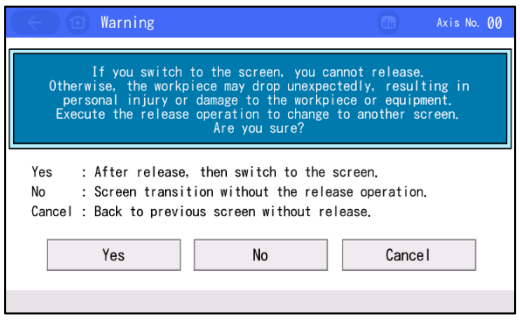
The process when each button is touched is as follows.

- [Suction] button : Touch it and the suction operation should start.
  When it is in standby and data is not yet sent, it should be valid.
- [Release] button : Touch it and the release operation should start.
  When PIO Pattern = 0 or 2, it should be valid during release or in standby.
  When PIO Pattern = 1, it should be valid only during suction.

* The [Suction] and [Release] buttons should be inactivated in the monitoring mode and when there is changed data before transferred.

6.8.6 Release Warning Confirmation Screen

When it is attempted to move to the Menu 1 window or Select Axis window during suction, the release warning confirmation window should open.

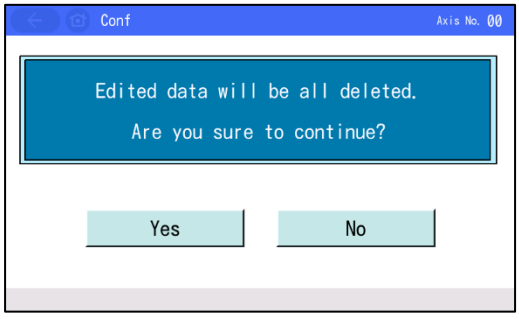


The process when each button is touched is as follows.

- [Yes] button : The screen should go to the Menu 1 window or Select Axis screen after the release process is completed.
- [No] button : The release process should not be performed before the screen goes to the Menu 1 screen or Select Axis screen.
- [Cnacel] button : The release process should not be performed, and the screen should go back to the ROBO PUMP Settings (ROBO PUMP Advanced Settings) screen.

6.8.7 Deleting Data in Edit Confirmation Screen

When data has been edited, but the [Transfer] was not touched and attempted to go to the Menu 1 screen or Select Axis screen, the Deleting Data in Edit Confirmation screen should come out.

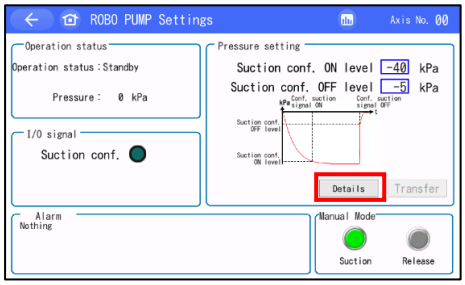


The process when each button is touched is as follows.

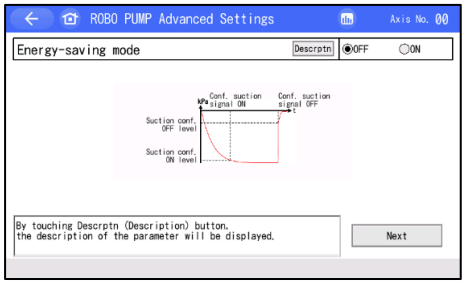
- [Yes] button : The data should be deleted and the screen goes to the Menu 1 screen or Select Axis screen.
- [No] button : The data should not be deleted, and the screen goes back to the ROBO PUMP Settings (ROBO PUMP Advanced Settings) screen.

6.8.8 ROBO PUMP Advanced Settigs screen

By touching the [Details] in the ROBO PUMP Settings screen, the screen goes to ROBO PUMP Advanced Settings Screen 1.
In ROBO PUMP Advanced Settings Screen 1, the Energy-saving mode enable/disable can be switched over.



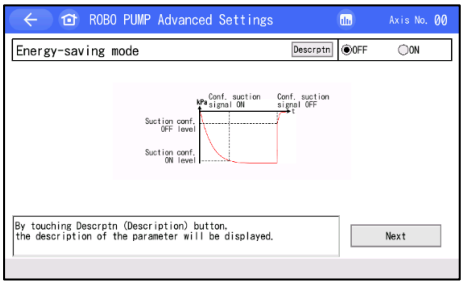
Touch [Detais] on the ROBO PUMP Settings screen.



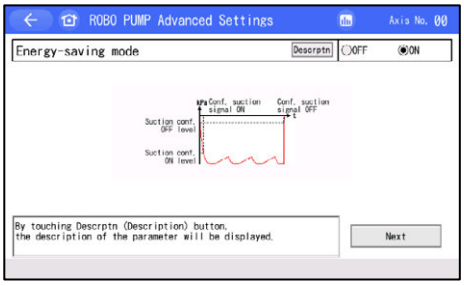
The ROBO PUMP Advanced Settigs screen will be displayed.

6.8.8.1 ROBO PUMP Advanced Settigs 1 screen (Energy-saving mode)

Energy-saving mode: Disabled



Energy-saving mode: Enabled

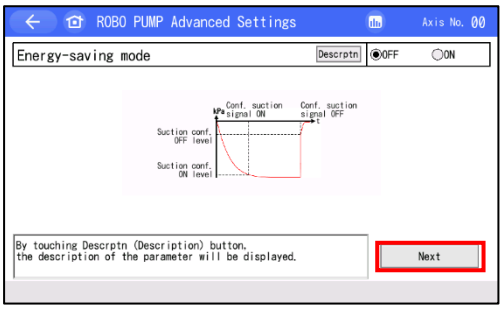


The display, setting details and process when each button is touched are as shown below.

- [Descrptn] button : Touch it and an explanation of the Energy-saving mode should be shown at the bottom of the window.
- [OFF], [ON] radio button : Setting for disable and enable of the Energy-saving mode can be conducted.
  Touch (radio button) at the item that you would like to set up or text string.
  (radio button) of the selected item should turn into black.
- Pressure setting graph : It should display the relation between the suction confirmation ON/OFF level and pressure when the PIO pattern is 0 or 1, and relation between suction confirmation and release confirmation levels and pressure when the PIO pattern is 2.
- Energy-saving mode : Touch the [Descrptn], and an explanation of the Energy-saving mode should be shown.
- [Next] button : ROBO PUMP Advanced Settigs screen 2 (Level setting) should be displayed.

6.8.8.2 ROBO PUMP Advanced Settigs 2 screen (Level setting)

By touching the [Next] in ROBO PUMP Advanced Settings Screen 1, the screen goes to ROBO PUMP Advanced Settings Screen 2.
In ROBO PUMP Advanced Settings Screen 2, setting of suction confirmation ON level, suction confirmation OFF, suction confirmation and release confirmation level can be conducted.
The suction confirmation ON level, suction confirmation OFF, suction confirmation and release confirmation level are to be determined by the setting of the PIO patterns.
Also, when the Energy-saving mode is enabled, the setting of the suction stop level can be established.

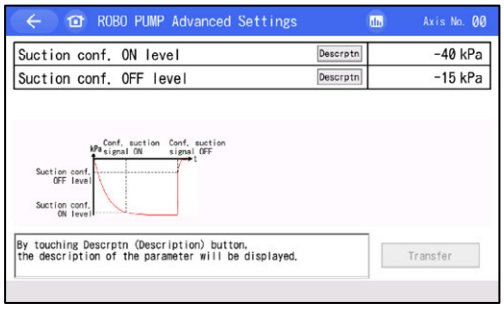


Touch [Next] on the ROBO PUMP Settings screen 1.

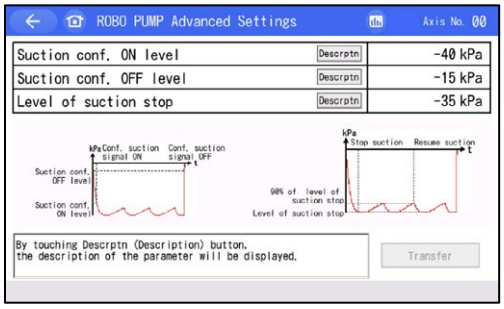
The ROBO PUMP Settings screen 2 will be displayed.
The display details, process when each button is touched are as shown below.

[Display Details When PIO Pattern is 0 or 1]

Energy-saving mode: Disabled



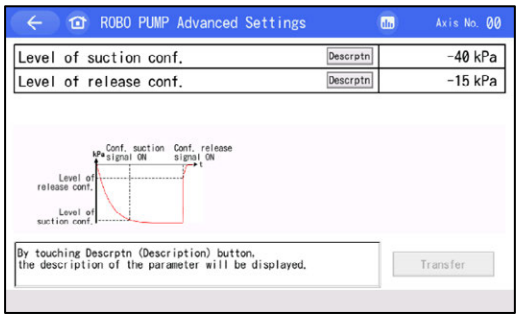
Energy-saving mode: Enabled



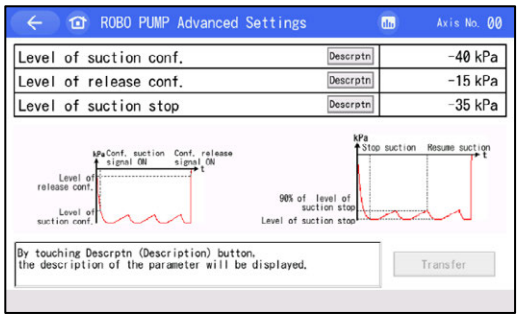
- Suction conf. ON level : The pressure to turn the suction confirmation signal ON is set up.
  A negative integer can be input.
  The suction confirmation signal should turn ON when the pressure gets below the set value.
- Suction conf.OFF level : The pressure to turn the suction confirmation signal OFF is set up.
  A negative integer can be input.
  The suction confirmation signal should turn OFF when the pressure gets above the set value.
- Level of suction stop : Pressure to stop suction operation when the Energy-saving mode is activated should be set.
  A negative integer can be input.
  Once the pressure reaches the value set in this parameter, the suction action stops, and the suction action resumes when the pressure goes above 90% of the set value.

[Display Details When PIO Pattern is 2]

Energy-saving mode: Disabled



Energy-saving mode: Enabled



- Level of suction conf. : The pressure to turn the suction confirmation signal ON is set up.
  A negative integer can be input.
  The suction confirmation signal should turn ON when the pressure gets below the set value.
- Level of release conf. : The pressure to turn the release confirmation signal ON is set up.
  A negative integer can be input.
  The release confirmation signal should turn ON when the pressure gets above the set value.
  The release confirmation signal should turn ON when the pressure gets above the set value.
  It should turn OFF when the suction signal turns on.
- Level of suction stop : Pressure to stop suction operation when the Energy-saving mode is activated should be set.
  A negative integer can be input.
  Once the pressure reaches the value set in this parameter, the suction action stops, and the suction action resumes when the pressure goes above 90% of the set value.

ROBO PUMP advanced setting screen 2 process when each button is touched are as shown below.

- [Descrptn] button : Touch the Descrptn button, and an explanation of the level setting should be shown at the bottom of the screen.
- Parameter : Touch the [Descrptn], and an explanation of the parameter should be shown.
- [Transfer] button : The changed setting should be sent to ROBO PUMP.

* The [Transfer] button should be inactivated when there is no change to the settings in the monitoring mode and teaching mode or during operation of suction or release.

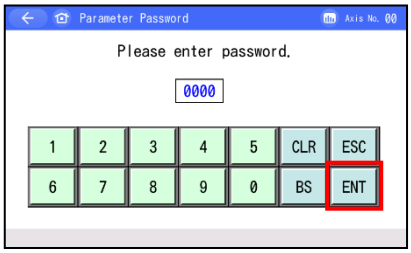
6.9 Parameter Edit

Parameters are displayed and edited.
Conduct it while an actuator or ROBO PUMP is not in operation.



Touch [Parameter edit] on the Menu 1 screen.

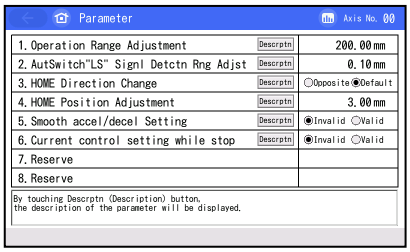
If a system password is not “0000,” the password entry screen appears.



Input the parameter edit password.
Touch [ENT].

> The parameter edit password at delivery is set to “0000”.
> For how to change the parameter edit password, refer to [6.16 Environment Setting [Parameter Edit Password Change]].

A parameter table is displayed.

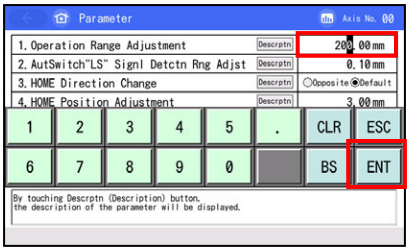


The displayed items may differ depending on models.

(1) Basic operation

There are three kinds, items to input setting values, items to select by touching (radio button) and items to select from the dropdown list.

Item to input a setting value



Touch the item that you would like to make a setting, and the setting parameter starts flashing and numeric keys will show up.
Touch numbers on the numeric keys to input and touch [ENT].

When the process needs to be cancelled after the numeric keys appear, touch [ESC].

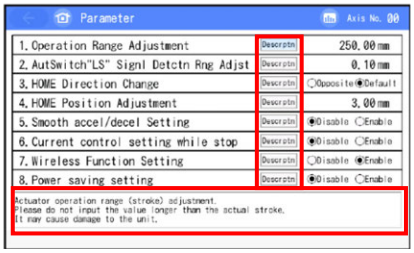
Item to tach ○ (radio button) to select



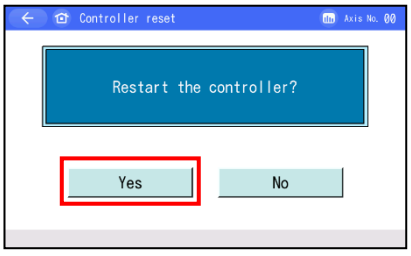
Touch ○ (radio button) of the item or the text itself that you would like to select.

A black dot will be marked in ○ (radio button) that you selected.

Descriptions



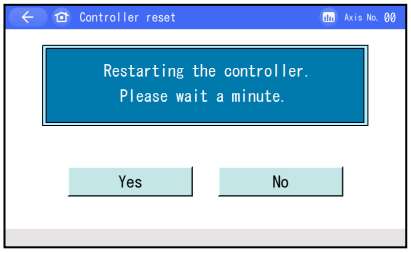
Touch [Descrptn] button and the descriptions of the setting items will be shown in the bottom of the screen.



Touch Home Button once all the settings are completed. A confirmation window asking “Restart the controller?” will come up. Touch [Yes] if you have made a change.

Touch [No] to return to the 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.

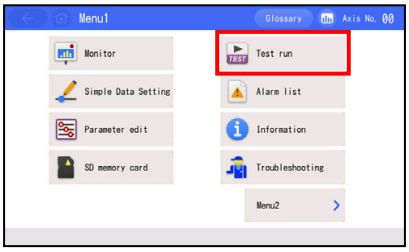
> ⚠ *Caution: If the controller is not restarted, the parameter that has been rewritten does not translate to the intended action.*
> *The parameter will become effective once the controller is restarted or power is reconnected.*



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

6.10 Test Run

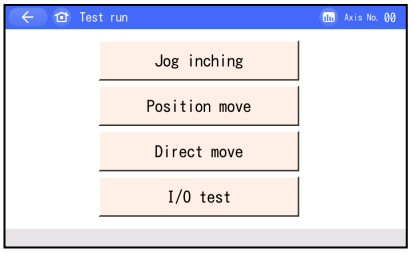
You can perform jog/inching operation, move to a position or continuously to multiple positions registered in the position table, or move to a position by specifying the position directly.
As it comes to the feature of only the I/O test for ROBO PUMP, the button should get to [I/O Test].



Touch [Test run] on the Menu 1 screen.

For ROBO PUMP, touch the [I/O test] and the screen shifts to the I/O test window. Refer to [6.10.4 I/O Test]

The test run menu screen appears.



Touch either one of [Jog inching], [Position move], [Direct move] or [I/O test].

(1) Jog inching
Perform jog/inching operation.

Refer to [6.10.1 Jog Inching Operation] for details about how to operate.

(2) Position move
Movement to the forward end or backward end or continuous movement should be performed.
- Move
  Movement should be made from the current position to either of the forward end or the backward end which has been indicated. (One time of movement only)
- Countinuous
  Movement should be made repeatedly between the forward end and the backward end.

Refer to [6.10.2 Position Movement Operation] for details about how to operate.

(3) Direct move
Input the target position and the speed on the numeric keys to perform movement.

Refer to [6.10.3 Direct Movement Operation] for details about how to operate.

(4) I/O test
Monitoring of the input and output signals and compulsory output of the output signal can be conducted.

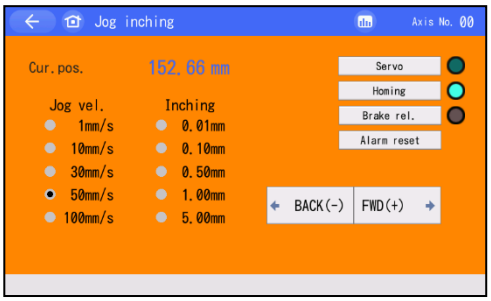
Refer to [6.10.4 I/O Test] for details about how to operate.

6.10.1 Jog Inching Operation

You can perform jog operation and inching operation..



Jog/Inching Screen



When Alarm Generated

[Operation on the Jog inching screen]

- Jog vel. / Inching : Select either of 1, 10, 30, 50 or 100mm/s of JOG speed or 0.01, 0.10, 0.50, 1.00, 5.00mm of inching distance, and JOG operation with the selected speed or inching operation with the selected distance can be conducted. The circle (radio button) on the selected one will be marked with a black dot.

- [Servo] : It shows the status of the servo whether it is ON or OFF for the axis. When the servo is ON, display of ○ is activated and it is inactivated when the servo is OFF.

- [Homing] : Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.

- [Brake rel.] : For an actuator equipped with a brake, touch [Brake rel.] and the brake gets compulsorily released and the circle turns on.
  Touch [Brake rel.] again and the brake works and the circle turns off.

- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.

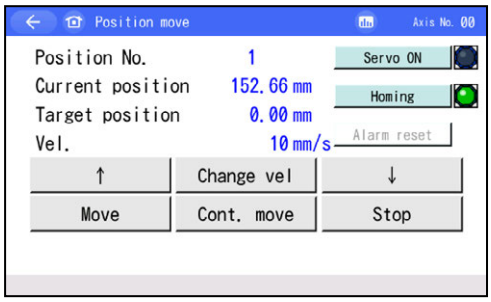
- [BACK (-)], [FWD (+)]: When JOG operation is selected, while touching them, the axis moves in the set speed. When inching operation is selected, every time touching them, the axis moves for the set distance.
  [BACK (-)] performs JOG operation in negative direction.
  [FWD (+)] performs JOG operation in positive direction.

  In inching operation, touch and hold them for two seconds, and JOG operation will be performed in 1mm/s. The speed increases in every 1 second afterwards.

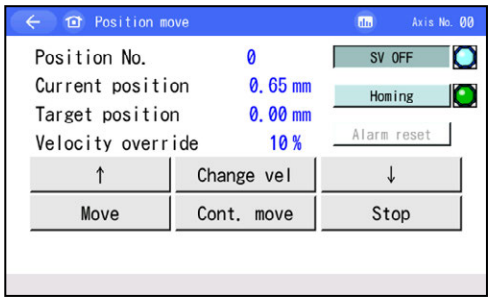
⚠ *Caution: An axis could drop if the brake compulsory release is performed while the servo is off when the axis is installed in the vertical orientation.*

6.10.2 Position Movement Operation

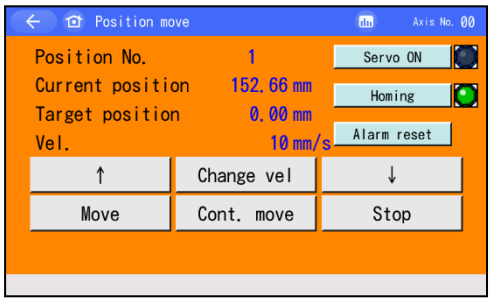
Move to a position or continuously to multiple positions registered in the position table.
The items to be displayed should differ depending on valid/invalid of the safety velocity.
Refere to [6.11 TP Operation Mode]



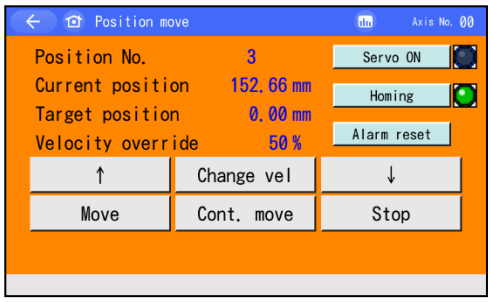
When Safety Velocity is Valid



When Safety Velocity is Invalid



When Alarm Generated
with Safety Velocity Activated



When Alarm Generated
with Safety Velocity Inactivated

[Operation on the position movement screen]

- Position No. : “1” should be shown when the forward end is selected and “0” when the backward end is selected.
- Current position : Displays the current position.
- Target position : Displays the target position set in the selected position number.

When Safety Velocity is Valid;
- Vel. : The set velocity (mm/s) should be displayed.

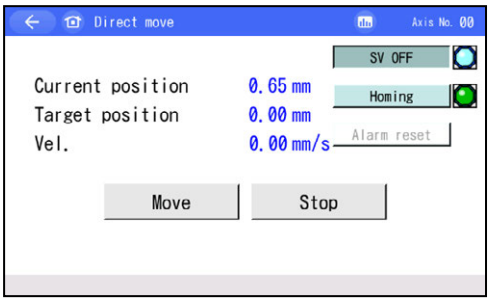
When Safety Velocity is Invalid;
- Velocity override : Displays the selected speed override (%).
- [Servo ON] : It shows the status of the servo whether it is ON or OFF for the axis. When the servo is ON, display of ○ is activated and it is inactivated when the servo is OFF.
- [Homing] : Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.
- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.

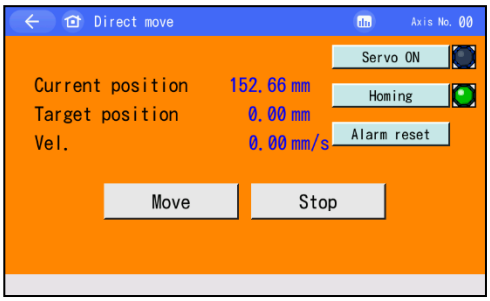
- [↑], [↓] : Touch [↑] or [↓]to select a position number (1: forward end, 0: backward end) for the movement target.
- [Change vel] : When Safety Velocity is Valid
  Speed can be changed in order of 1mm/s, 10mm/s, 30mm/s, 50mm/s and 100mm/s every time touching [Change vel].

  : When Safety Velocity is Invalid
  Speed override can be changed in order of 10%, 50% and 100% every time touching [Change vel].
- [Move] : Touching [Move] moves the axis to the target position.
- [Cont. move] : Touch [Cont. Move] and the axis performs continuous operation between the forward end and backward end till touching [Stop].
- [Stop] : Touching [Stop] stops the axis.

6.10.3 Direct Movement Operation

A position is specified directly to move the axis.





Direct Movement Screen When Alarm Generated

[Operation on the direct movement screen]

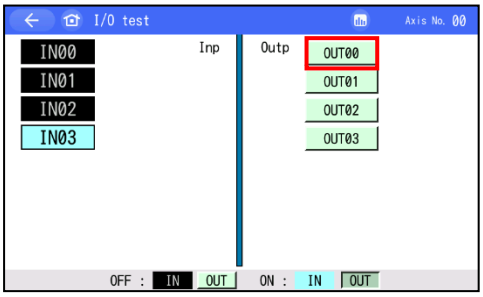
- Current position : Displays the current position.
- Target position : Touching “Target position” displays the numeric keypad. Enter a desired target position and then touch [ENT].
- Vel. : Touching “Vel.” displays the numeric keypad. Enter a desired speed and then touch [ENT].
- [Servo ON] : It shows the status of the servo whether it is ON or OFF for the axis. When the servo is ON, display of ○ is activated and it is inactivated when the servo is off.
- [Homing] : Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.
- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.
- [Move] : Touching [Move] moves the axis to the target position you have set.
- [Stop] : Touching [Stop] stops the axis.

6.10.4 I/O Test

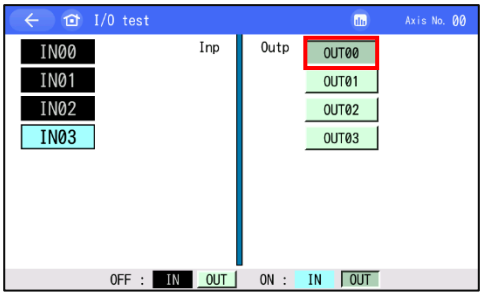
PIO input signal and the output signal can be monitored.
You can also touch OUT00 to OUT03 to forcibly turn ON/OFF the corresponding output signals.

Output signal ON/OFF should not be available in any status other than release of ROBO PUMP.

[Operation on the I/O test screen]



If it is necessary to turn on OUT00 which is currently off, touch [OUT00].

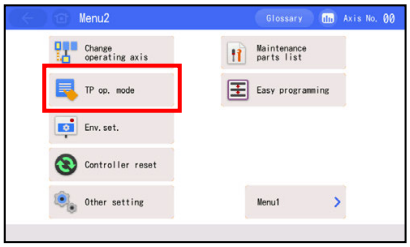


OUT00 turns on.

Touch [OUT00] again and it turns off.

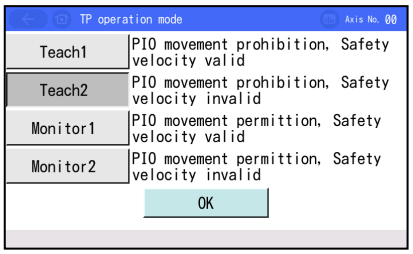
6.11 TP Operation Mode

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 (PIO movement prohibition / Safety velocity valid)
  PIO movement prohibition : Writing of contents and parameters in the simple data setting screen to the controller and command to the actuator operation system are available.
  Safety velocity valid : The maximum velocity should be the safety velocity (100m/s) regardless of the velocity indication in the simple data setting screen.

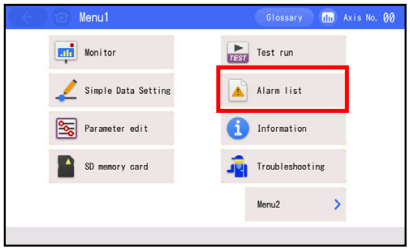
- Teach2 (PIO movement prohibition / Safety velocity invalid)
  PIO movement prohibition : Writing of contents and parameters in the simple data setting screen to the controller and command to the actuator operation system are available.
  Safety velocity invalid : Operation in the velocity set in the simple data setting screen (higher than the safety velocity) becomes available.

- Monitor1 (PIO movement permittion / Safety velocity valid)
  PIO movement permittion : Only monitoring is permitted. Writing of contents and parameters in the simple data setting screen to the controller or command to the actuator operation system are not available. Operation commands (jog, home return, etc.) cannot be issued from the touch panel teaching pendant.
  Safety velocity valid : The maximum velocity should be the safety velocity (100m/s) regardless of the velocity command from the PLC.

- Monitor2 (PIO movement permittion / Safety velocity invalid)
  PIO movement permittion : Only monitoring is permitted. Writing of contents and parameters in the simple data setting screen to the controller or command to the actuator operation system are not available. Operation commands (jog, home return, etc.) cannot be issued from the touch panel teaching pendant.
  Safety velocity invalid : You can move the actuator at the velocity (higher than the safety velocity) according to the command from the PLC.

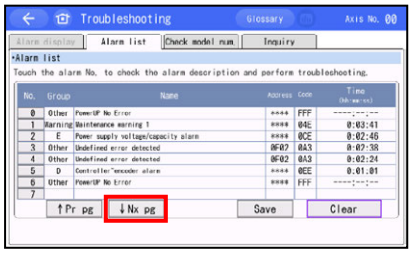
6.12 Alarm List

A list of alarms that may generate after the controller power is turned on is shown.



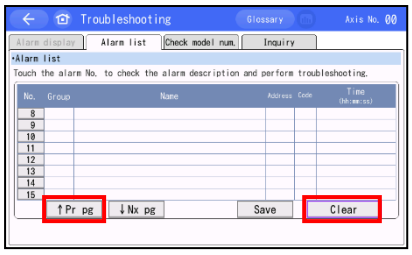
Touch [Alarm list] on the Menu 1 screen.

Alarm list will be displayed.
- ELECYLINDER display items :No., Group, Name, Address, Code, Time (hh:mm:ss)
- ROBOPUMP display items :No., Code, Name, Address, Detail, Time (hh:mm:ss)



A list of 8 items of the latest alarms and warnings should be displayed.

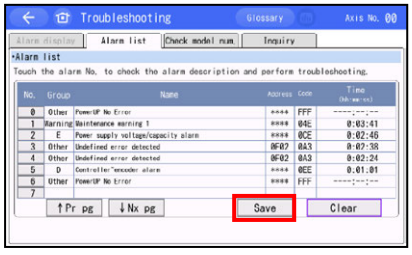
Touch [↓ Nx pg] and a list of the next 8 items should be shown.



Touch [↑ Pr pg] and a list of the previous 8 items should be shown.

Touching [Clear] clears all alarm details.

The time of occurrence of each alarm is indicated by an elapsed time from this “FFF PowerUP No Error”.



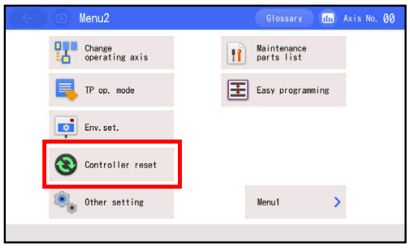
Touch [Save] and the screen goes to the screen to save to a Secure Digital memory card.

Refer to [6.17 Data Backup] for how to operate to save data to a Secure Digital memory card.

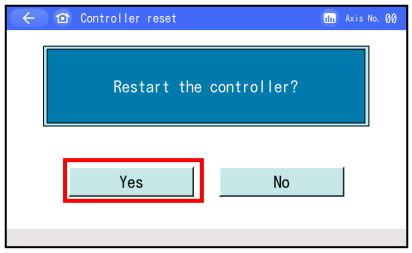
6.13 Controller Reset

The controller is restarted.

6.13.1 ELECYLINDER Reset

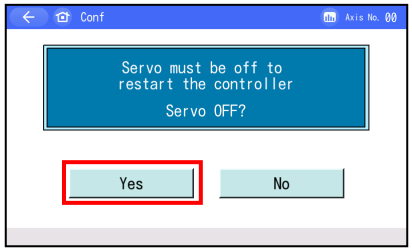


Touch [Controller reset] on the Menu 2 screen.



Touch [Yes].

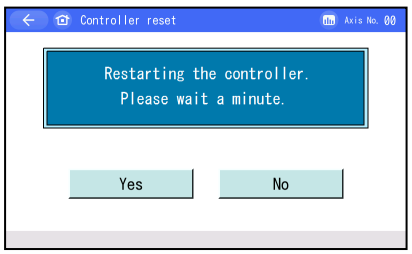
Touch [No] to return to the Menu 2 screen without restarting the controller.



This window appears if the servo is ON.

Touch [Yes].

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

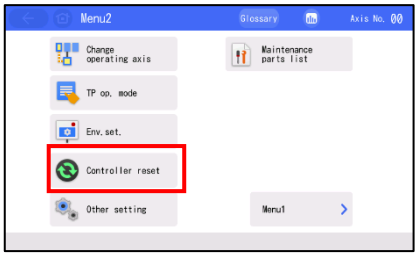


The controller is restarted.

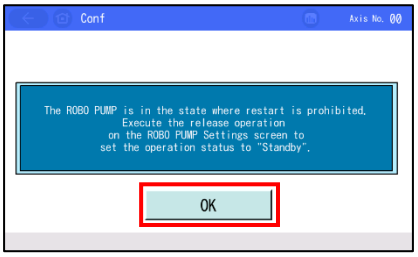


Returns to Menu 1 screen.

6.13.2 ROBO PUMP Reset

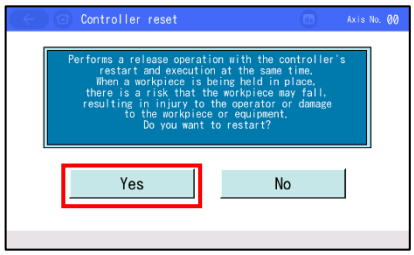


Touch [Controller reset] on the Menu 2 screen.



Touch it while in suction, and the window to show reboot prohibited should be displayed.

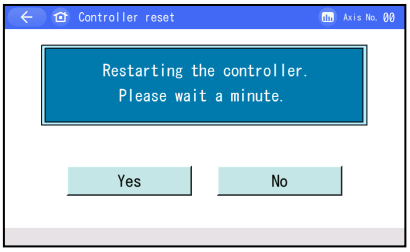
Touch [OK] to return to the Menu 2 screen to have it desorbed, and touch [Controller Reboot again].



In order to have a release operation at the same time as execution of reboot, a message to pull attention should be displayed.

Confirm that there is no problem in rebooting, and touch [Yes].

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



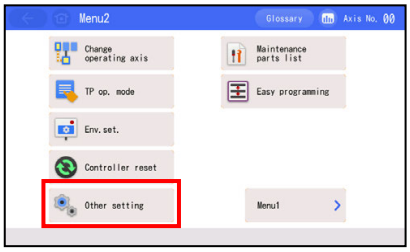
The controller is restarted.



Returns to Menu 1 screen.

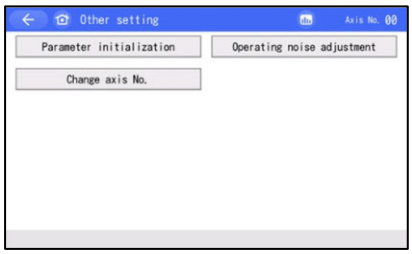
6.14 Other Setting

Parameter initialization, axis number change and operation sound tuning should be conducted.



Touch [Other setting] in Menu 2 screen.

For ROBO PUMP, have it conducted while it is desorbed.



Other setting screen opens.

Select one from [Parameter initialization], [Change axis No.] and [Operating noise adjustment] that you would like to carry on and touch the button.

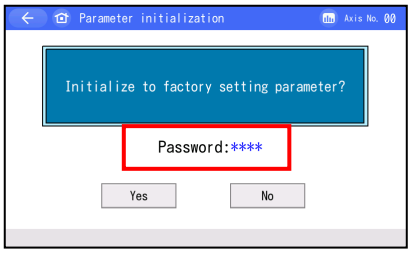
There is no feature to adjust the operational sounds for ROBO PUMP.

6.14.1 Parameter Initialization

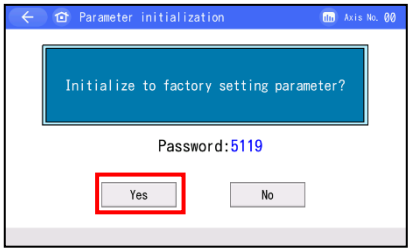
The parameters are reset to their factory default settings (initialized).

> ⚠ *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.*

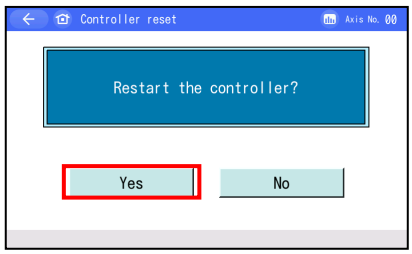
Touch [Parameter initialization] in Other setting screen to display Parameter initialization screen.



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



Touch [Yes], and the confirmation screen for controller reboot appears.



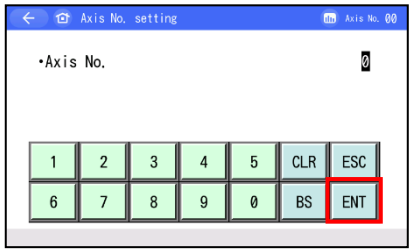
Touch [Yes].

Touch [No], and the controller will not be rebooted and the screen returns to the previous.

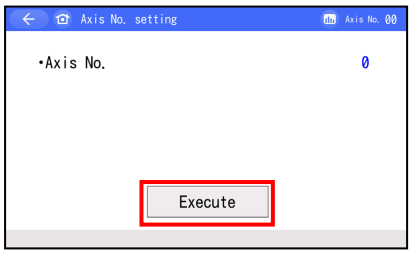
> ⚠ *Caution: If the controller is not restarted, the parameters that have been rewritten to their factory settings do not translate to the factory-set operations. The factory settings will become effective once the controller is restarted or power is reconnected.*

6.14.2 Axis Number Change

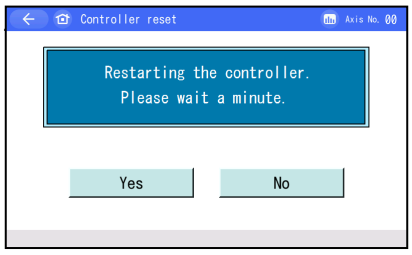
Touch [Change axis No.] in Other setting window to display Axis No. setting screen.



You can set a value between 0 and 15.
Set a desired axis number and then touch [ENT].



Touch [Execute].



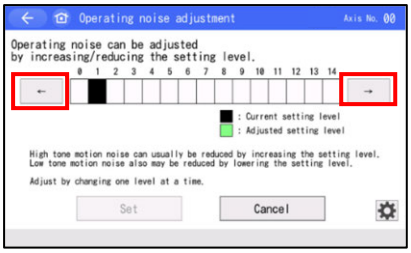
Returns to Menu 1 screen.

6.14.3 Operating Noise Adjustment (Applicable models only)

The operation noise can be tuned.
By having it tuned, possibility of an operation noise error could be reduced.

Touch the [Operating noise adjustment] in the Other Setting window to display the operating noise adjustment window.

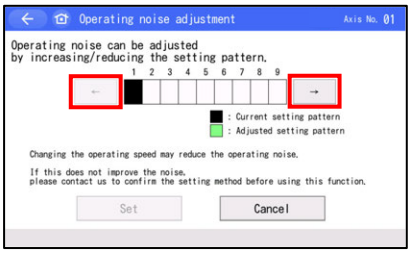
● For models that support level setting



Touch [←] and [→] on the right and left of the levels to adjust the level one by one to perform tuning.

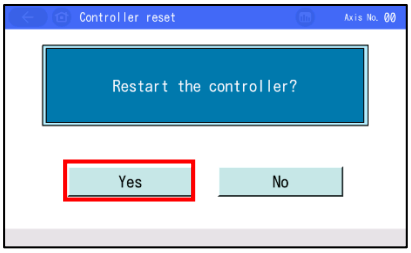
Once the tuning is finished, touch [Set].

● For models that support pattern setting



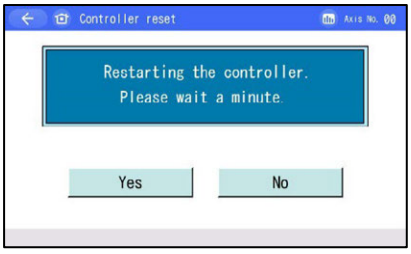
Touch [←] and [→] on the right and left of the pattern to adjust the pattern one by one to perform tuning.

Once the tuning is finished, touch [Set].



Touch [Yes].

Touch [No] and a restart of the controller would not be performed and the screen goes back to the previous window.

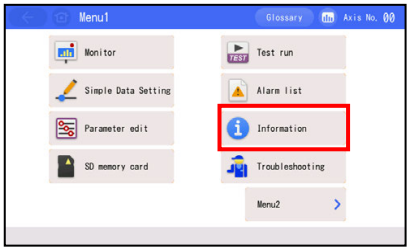


The controller should be restarted.

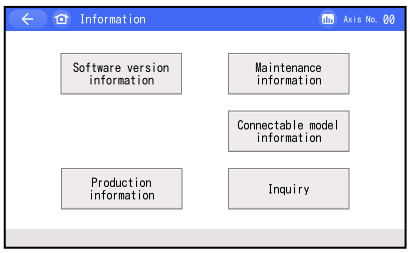
The screen goes back to Menu 1.

6.15 Information Display

Information such as the controller version, manufacturing information and maintenance information is displayed.



Touch [Information] on the Menu 1 screen.



The information screen appears.

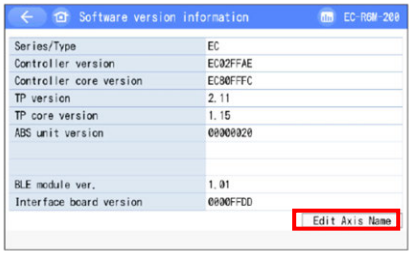
Touch a button of the feature that you would like to display such as [Software version information].

6.15.1 Display Screen for Each Type of Data

6.15.1.1 Software version information

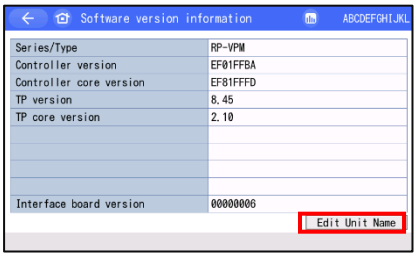
Touch [Software version information] in Information screen.

Software version information will be displayed.



ELECYLINDER software version information screen.

Touch [Edit Axis Name] and the name of axes can be edited. Refer to [6.15.2 Axis Name Edit] for how to edit an axis name.

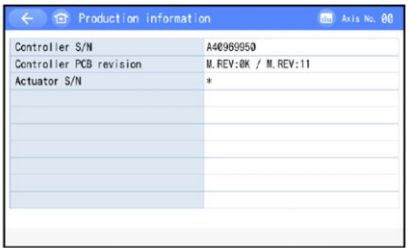


ROBOPUMP software version information screen.

Touch [Edit Unit Name] and the name of unit can be edited. Refer to [6.15.2 Axis Name Edit] for how to edit a unit name.

6.15.1.2 Production information

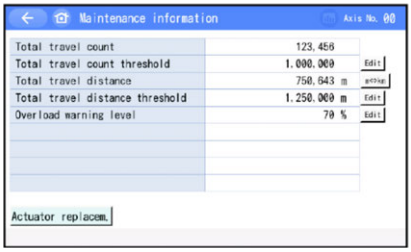
Touch [Production information] in Information screen.



Production information screen appears.

6.15.1.3 Maintenance information

Touch [Maintenance information] in Information screen.

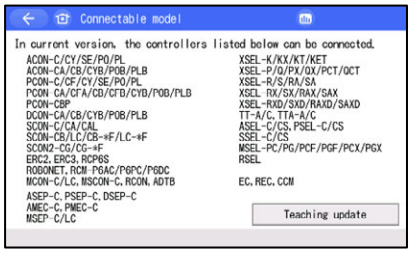


Maintenance information screen appears.

Refer to [6.6.3 Maintenance Information Screen] for how to operate displayed button.

6.15.1.4 Connectable model

Touch [Connectable model] in Information screen.



Connectable model screen appears.

(Note) The images in this instruction manual may differ from the latest display.

Refer to [10.2 Teaching Update] for how to update teaching.

6.15.1.5 Inquiry

Touch [Inquiry] in Information screen.

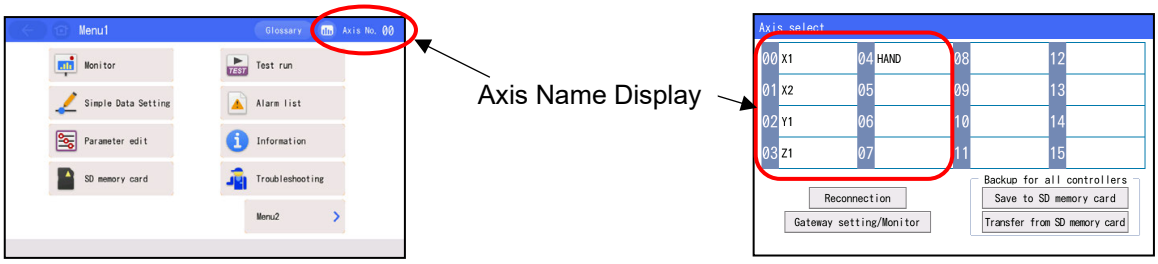


Inquiry screen appears.

6.15.2 Axis Name Edit

A name can be set on an axis of the ELECYLINDER and a unit of the ROBO PUMP. To show the name, select “Axis Name” at the axis name display section in the environment setting screen.

The set name should be displayed on the right top of each window and the Select Axis screen. Even if “Axis Name” is selected in the environment setting screen, axis numbers should be displayed if the axis name is not set.



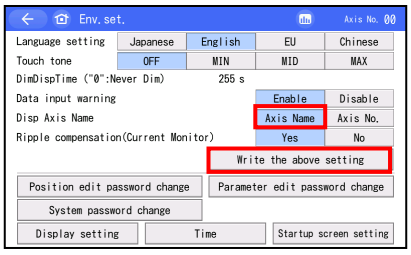
(Note) The available characters for setting in TB-02 are capitalized font English characters (from A to Z) and numbers (from 0 to 9).

[Axis Name Edit Operation]



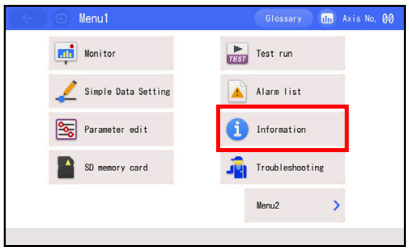
Touch [Env. set.] on the Menu 2 screen.

For ROBO PUMP, have it conducted while it is desorbed.

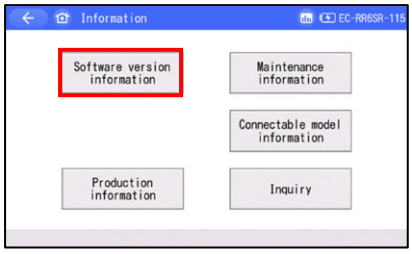


Set to “Axis Name” for the axis name display.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

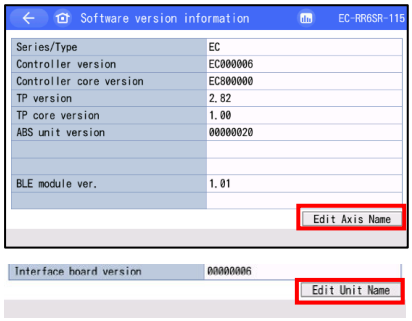


Touch [Information] on the Menu 1 screen.



Information screen opens.

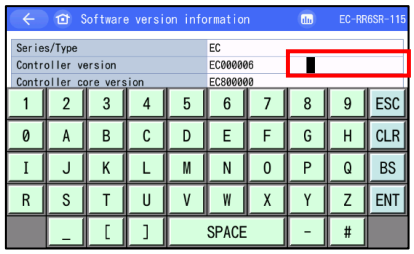
Touch [Software version information].



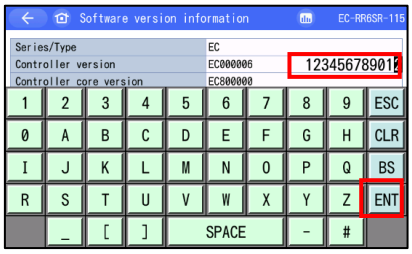
The Software version information screen will be displayed.

Touch [Edit Axis Name] in the case of ELECYLINDER.

Touch [Edit Unit Name] in the case of ROBO PUMP.

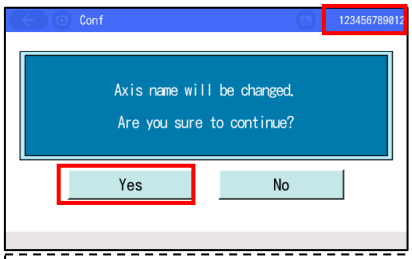


On the right of the Controller version display is the input area.
Character select buttons are shown in the half bottom of the screen.



Input a name and touch [ENT].
The number of characters available for input is 12 in half-size font characters.

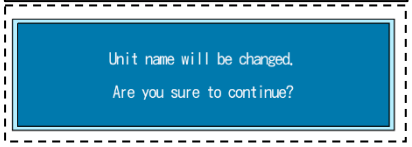
Touch [ENT] with nothing input, and it is defined as no setting. With no setting, an axis number will be shown.



The change confirmation screen will appear, with the axis name input shown in the right top.

This status is still a temporary setting.
Touch [Yes] to confirm the setting.

Touch [No] and the condition goes back to before setting.



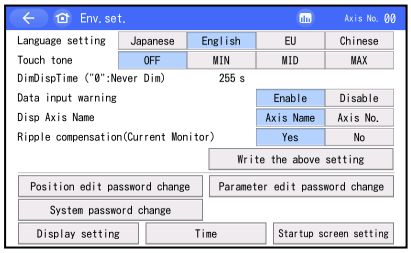
(Display of change confirmation window in ROBO PUMP)

6.16 Environment Setting

You can change the language setting, touch operation sound setting, dim display time setting, data input warning setting, axis name display setting, ripple compensation setting, position editing password change, parameter edit password change, system password change, display setting, time setting and Startup screen setting.

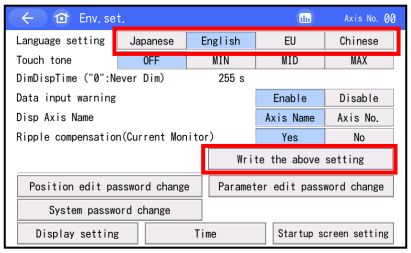


Touch [Env. set.] on the Menu 2 screen.



The environment setting screen appears.

[language setting]
Select a language to show from Japanese/English/EU/Chinese.

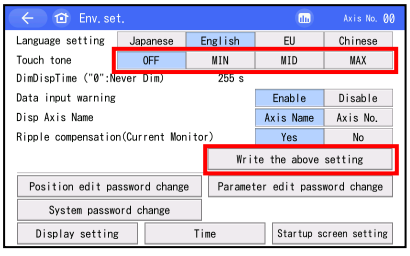


Touch a language (such as [Japanese]) to show.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

For the operation procedures in detail to change the language, refer to [6.1 Display Language Change].

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

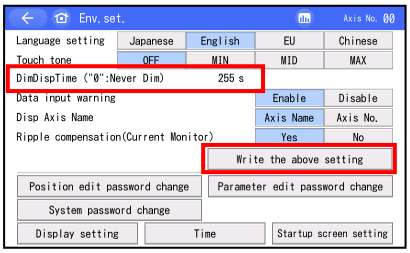


Touch [OFF]. A touch tone is not output.

Touch [MAX], [MID] or [MIN]. A touch tone is output.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

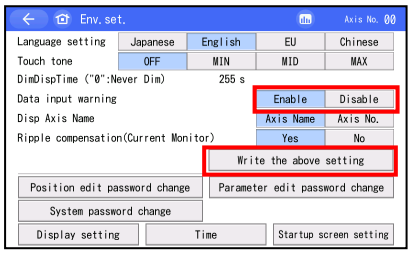
[DimDispTime]
Set the dim display time when not being operated.
Zero seconds mean the display is on all the time.



Touching [DimDispTime ("0": Never Dim) 0 sec] displays the numerical keypad.
Enter a desired time and touch [ENT].
You can set a value between 0 to 255 seconds.

Touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

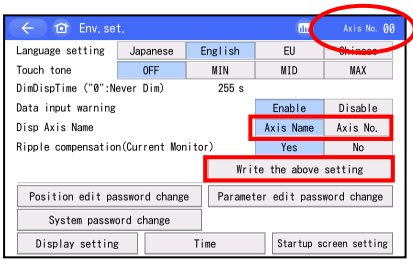
[Data input warning]
The warning can be output when a value less than the minimum speed and a value exceeding the rated acceleration/deceleration speed are entered in the position data. Note that the value is entered even if the warning occurs. Always use within the specification of the actuator.



Touch [Enable] to give the warning.
Touch [Disable] not to give the warning.

Select either Enable or Disable,
and then touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

[Axis Name Display]
Make a selection whether to show the name or number for axis display.



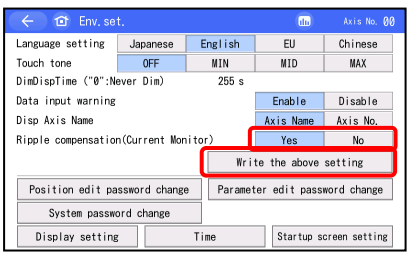
Axis Name Display

Touch [Axis Name] and the name will be shown.
Touch [Axis No.] and the number will be shown.

Select either Axis Name or Axis No, and touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

The axis name can be set in Software version information screen.
Refer to [6.15.2 Axis Name Edit]

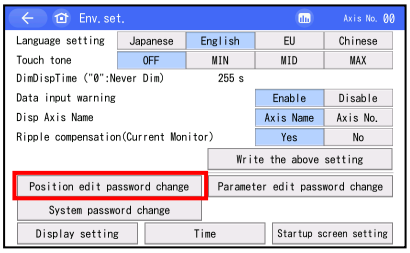
[Ripple Compensation]
Setting should be established to select whether to have ripple compensation or not to have it in the monitor window as the initial setting.



Touch [Yes] and the setting should be established with ripple compensation.
Touch [No] and the setting should be established without ripple compensation.

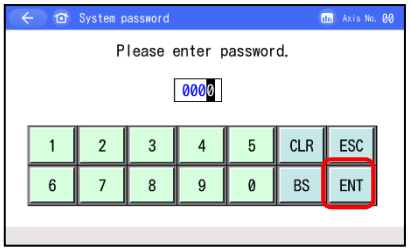
Select either yes or no and touch [Write the above setting]. The setting will not be changed when you move to another window without touching it.

[Change Pos Edit Password]
Change the position edit password.



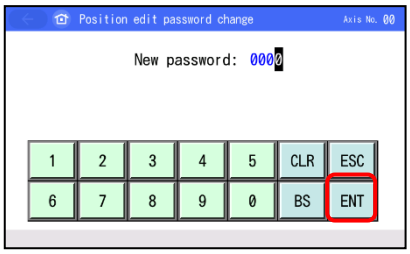
Touch [Position edit password change].

If the system password is not “0000”, the password entry screen appears.



Input a system password.
Touch [ENT].

> The default system password is “5119”.
> For how to change the system password, refer to [Change System Password] as described later.

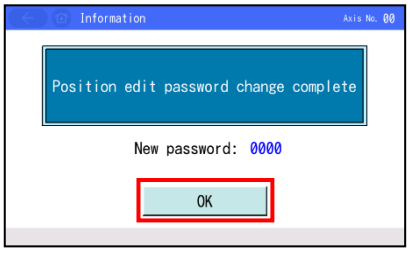


Enter the new position edit password to change to.
If the position edit password is not set, enter “0000”.

Touch [ENT].



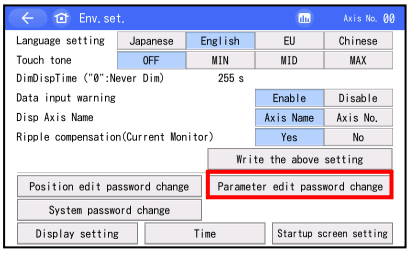
Touch [Change].



The new password after change will be displayed. Make sure it shows the same as the password you have set.

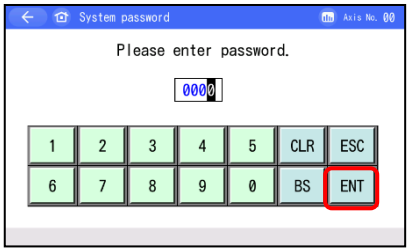
Touch [OK].

[Change Parameter Edit Password]
Change the parameter edit password.



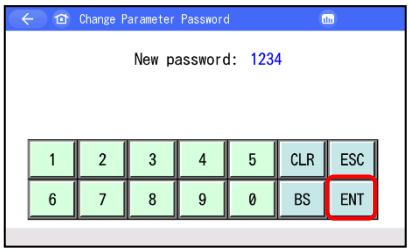
Touch [Parameter edit password change].

If the system password is not “0000”, the password entry screen appears.



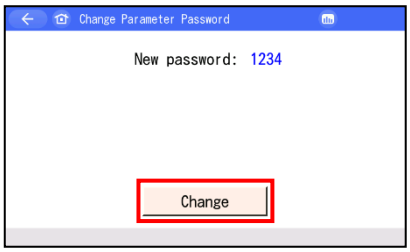
Input a system password.
Touch [ENT].

> The default system password is “5119”.
> For how to change the system password, refer to [Change System Password] in the next page.

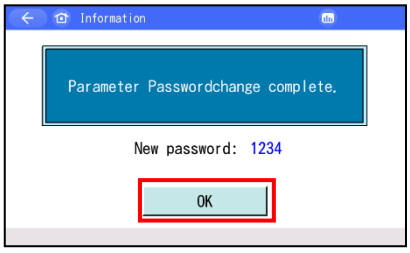


Enter the new parameter edit password to change to.
If the parameter edit password is not set, enter “0000”.

Touch [ENT].



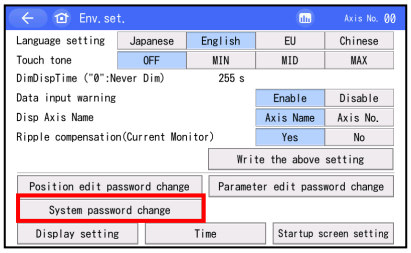
Touch [Change].



The new password after change will be displayed. Make sure it shows the same as the password you have set.

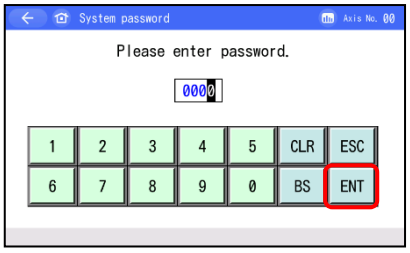
Touch [OK].

[Change System Password]
Change the system password.



Touch [System password change].

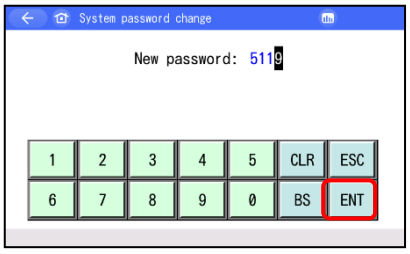
If the system password is not “0000”, the password entry screen appears.



Input the system password that is currently set.

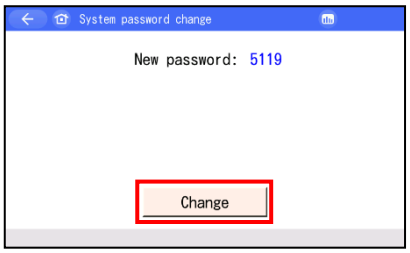
Touch [ENT].

The default system password is “5119”.

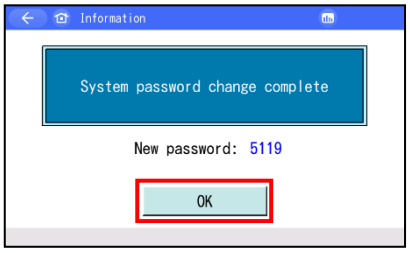


Enter the new system password to change to.
If you do not set the system password, enter 0000.

Touch [ENT].



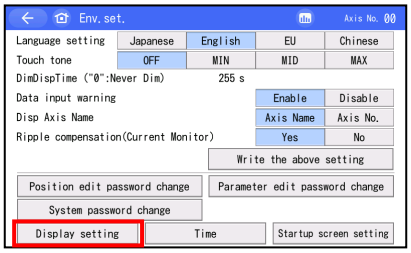
Touch [Change].



The new password after change will be displayed. Make sure it shows the same as the password you have set.

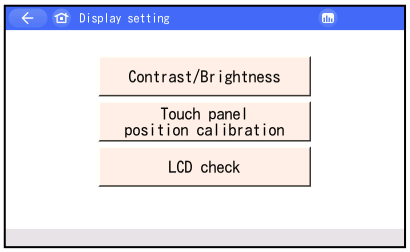
Touch [OK].

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



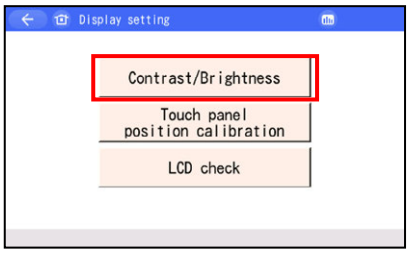
Touch [Display setting].

Display setting menu screen is displayed.

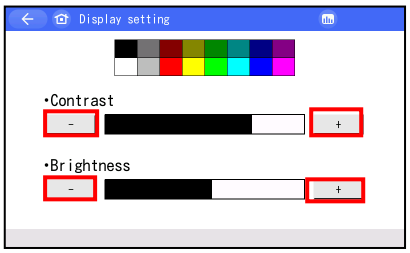


Select Display setting menu.

● Change the Contrast/Brightness
You can adjust contrast (shading of liquid crystal) and brightness (of liquid crystal).



Touch [Contrast/Brightness].

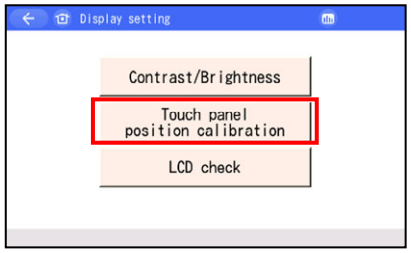


Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

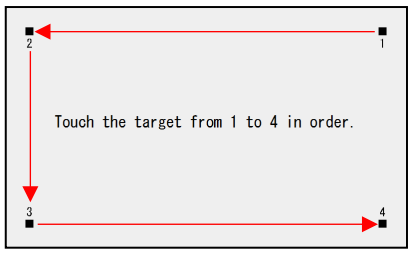
Brightness adjustment
Touch [–] and [+] under Brightness to adjust the brightness of the screen.

● Touch panel position calibration

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



Touch [Touch panel position calibration].

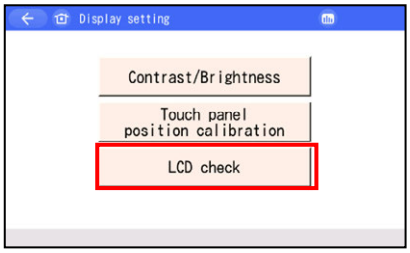


Touch [■] in the order of 1, 2, 3 and 4.

The display returns to Display setting menu screen.

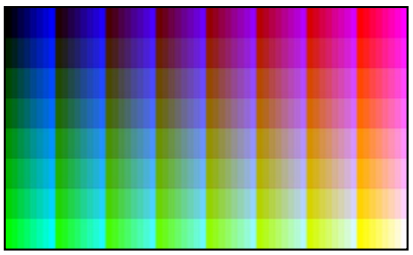
● LCD Check

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



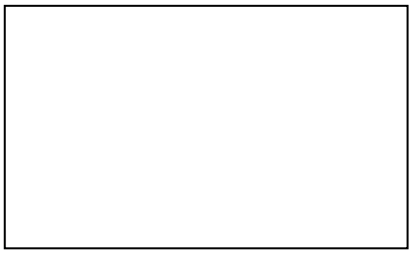
Touch [LCD check].

Color Pattern is displayed.



Touch any point on the screen.

White Only is displayed.



Touch any point on the screen.

Black Only is displayed.

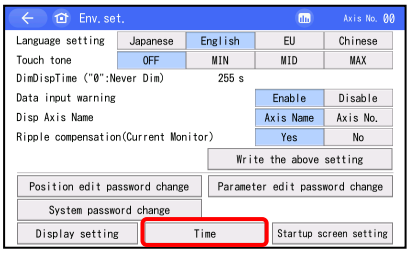


Touch any point on the screen.

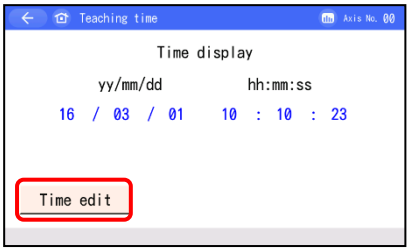
The display returns to Display setting menu screen.

[Time Setting]

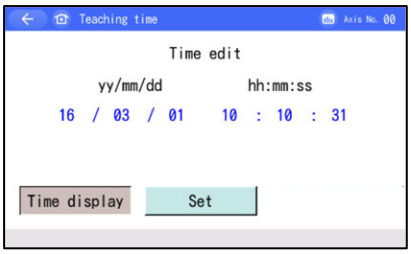
You can set the time for TB-02.



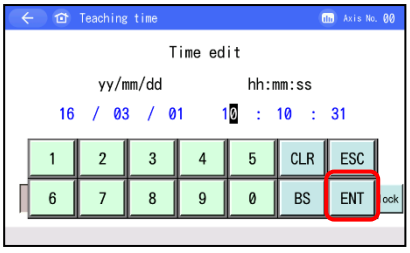
Touch [Time].



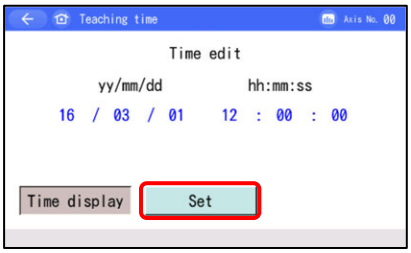
The time of TB-02 is displayed.
Touch［Time edit].



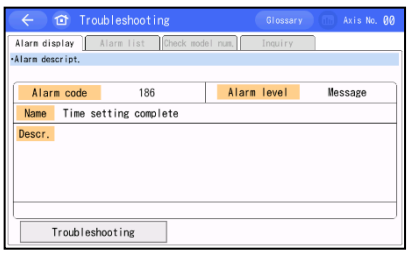
Touch the value of year, month, day, hour, minute or second that is required to be changed.



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

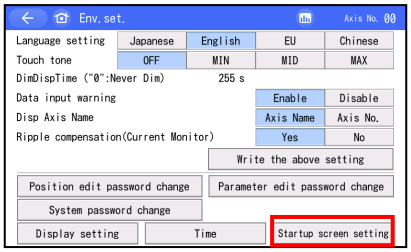


Touch [Set].

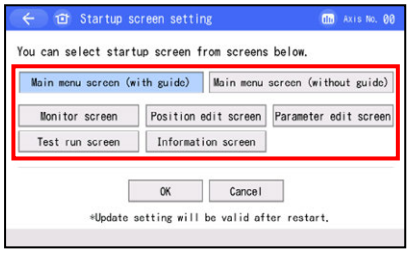


The clock setting complete window is shown and the clock in TB-02 gets changed.

[Startup screen setting]
Setting can be established for the window shown in the screen first after the power is turned on. Also, show/hide can be selected for the icons of Position edit guide, I/O control guide and Easy setting in Menu 1 screen.



Touch [Startup screen setting].



Select a screen from those below for the screen shown first after the power is turned on.
[Main menu screen] (Note 1)
[Monitor screen]
[Position edit screen] (Note 2) (Note 3)
[Parameter edit screen]
[Test run screen] (Note 3)
[Information screen]

Touch either one to select and touch [OK].

Note 1 In any case of selecting [Main menu screen (with guide)] or [Main menu screen (without guide)], the screen transits to the Main menu screen (without guide) screen.
Note 2 Select [Position edit screen], and Simple Data Setting Screen should be displayed at the startup.
Note 3 The Menu 1 screen should be displayed at startup for ROBO PUMP.

6.17 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.
There is no position data in ROBO PUMP.
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 ELECYLINDER is ptpc and the parameters are EC: prec,prec2,prec3,prec4,prec5 and ROBOPUMP: prrpv. 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.

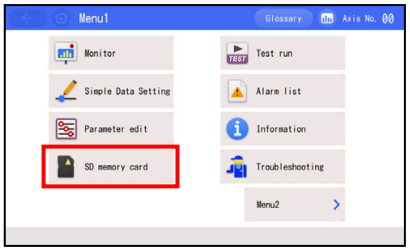
(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. The files existing in other directories other than the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

(Note) Files with Chinese names are not supported.

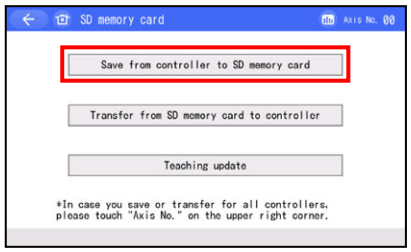
> ⚠ *Caution: For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, Have FAT32 Format for the file system.*

6.17.1 Data Backup of the Controller

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

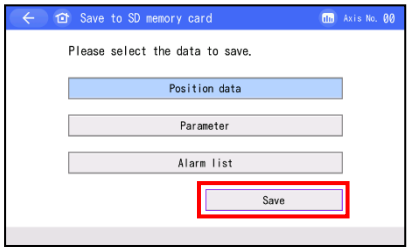


Touch [SD memory card] in Menu 1 screen.



SD memory card screen opens.

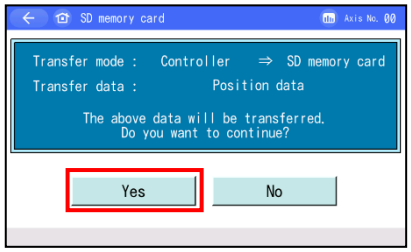
Touch [Save from controller to SD memory card].



Select the data type for the backup such as [Position data] and touch it. (Multiple selection available)
The data type been selected will be shown in light blue.

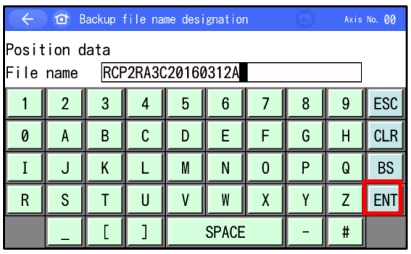
There is no position data in ROBO PUMP.

Touch [Save].



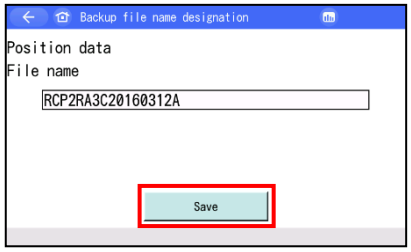
Touch [Yes].

Touch [No], and the screen returns to the previous screen.

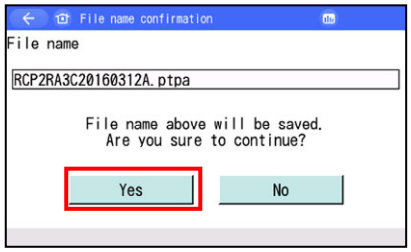


Numeric keys are displayed. Input a file name and touch [ENT].

The file name is to be typed with 32 characters at maximum in letters and numbers.



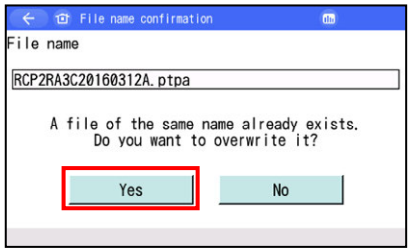
Touch [Save].



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

Touch [Yes].

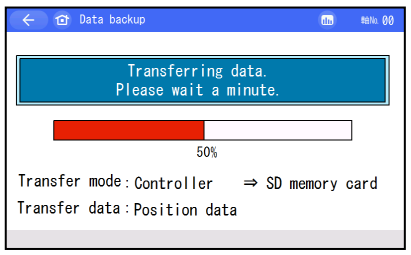
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



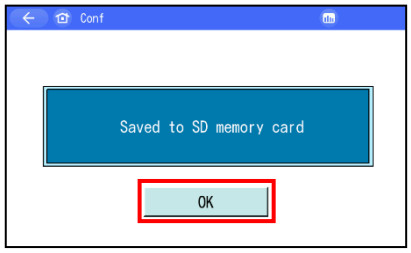
The screen below appears if the same name is found.

Touch [Yes] if overwriting data.

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.

Touch [OK], and the screen returns to SD memory card screen.

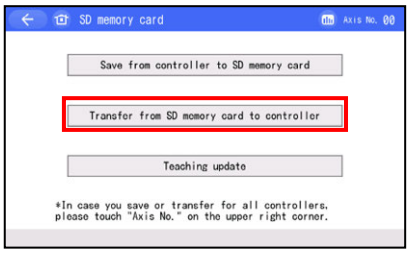
6.17.2 Restore to Controller

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



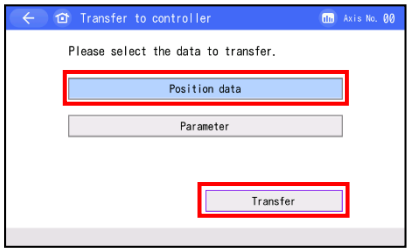
Touch [SD memory card] in Menu 1 screen.

For ROBO PUMP, have it conducted while it is desorbed.



SD memory card screen opens.

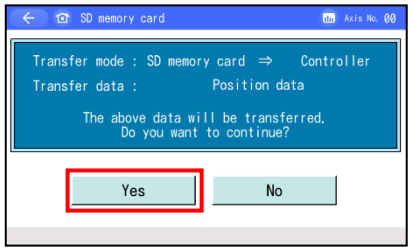
Touch [Transfer from SD memory card to controller].



Select the data type to transfer to the controller, such as [Position data], and touch it. (Multiple selection available)
The data type been selected will be shown in light blue.

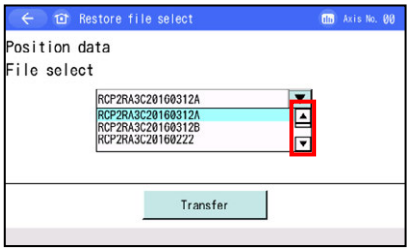
There is no position data in ROBO PUMP.

Touch [Transfer].

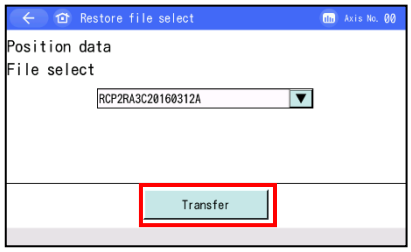


Touch [Yes].

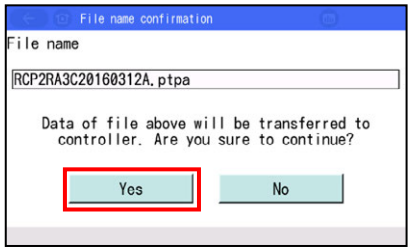
If [No] is touched, the screen goes back to the data backup screen.



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

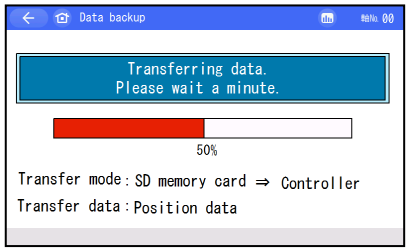


Touch [Transfer].

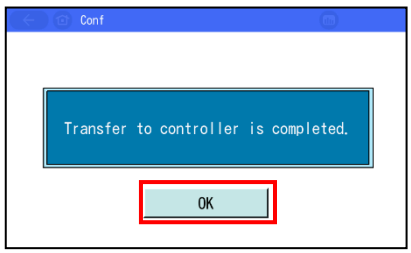


Touch [Yes].

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

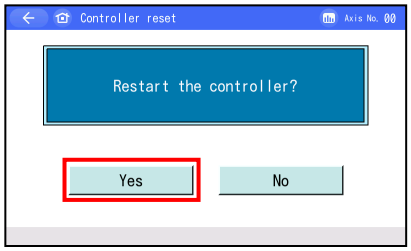


Data transfer screen will be shown.



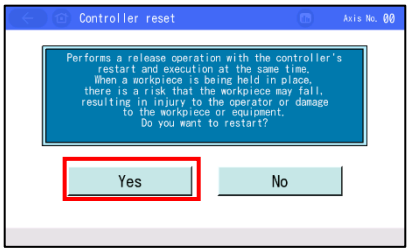
A message to tell the data transfer is complete pops up and the data transfer process to the controller is finished.

Touch [OK].



In the case of the ELECYLINDER.
If the position data is transferred, the reboot window should not be shown. The reboot window should be displayed only when the parameter data is transferred.

Touch [Yes] to reboot the system when it is displayed.



In the case of the ROBO PUMP
In order to have a release operation at the same time as execution of reboot, a message to pull attention should be displayed.

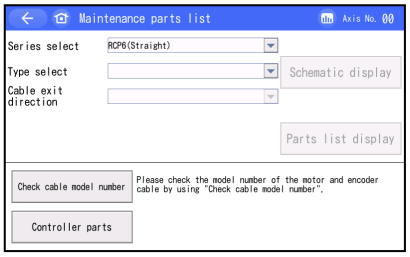
Confirm that there is no problem in rebooting, and touch [Yes].

6.18 Maintenance Parts List

Information of maintenance components is displayed.



Touch [Maintenance parts list] in Menu 2 screen.



Maintenance parts list screen opens.

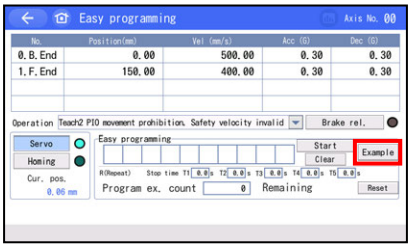
6.19 Easy Programming

It is a feature not applicable for ROBO PUMP.
In the easy programming, pause duration can be set between sets of operations and continuous operation can be performed by indicating the number of repeating times.

[How to Establish Setting]
Set the position number (0: backward end, 1: forward end) of the destination to the easy programming input part (step). In order to have a pause between operations, use prepared five timers T1 to T5. Timer can be set in 0.1 second unit from 0 to 99.9sec. When it is required to repeat operation, input R (repeat indication symbol) at the end.
The number of steps available to indicate is 10 at maximum including R.
If there is a space, the step after that is not valid. The easy programming stops. Steps after R are also invalid.

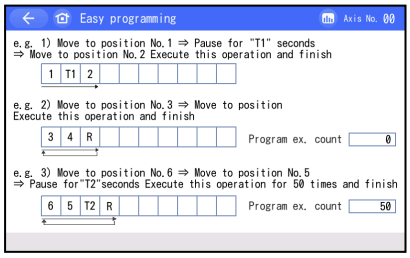


Touch [Easy programming] in Menu 2 screen.



Easy programming screen opens.

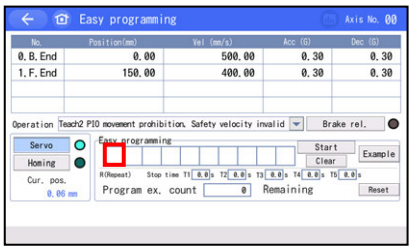
Touch [Example] and examples for how to construct a program are displayed.



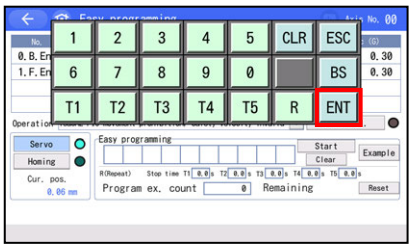
Touch [←] to return to the previous screen.

Take this as a reference when constructing an Easy programming.

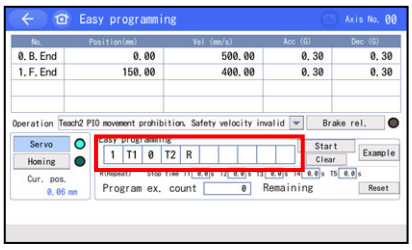
[Driving Easy Programming]



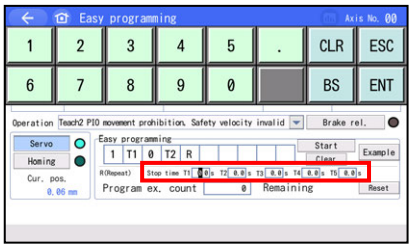
Touch the first (on the most left) step of the easy programmng.



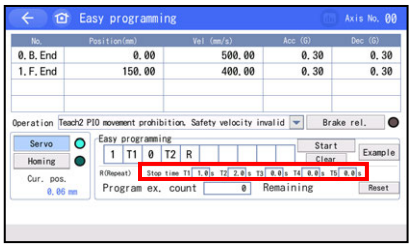
Input a position number or a timer (T1 to T5) and touch [ENT].



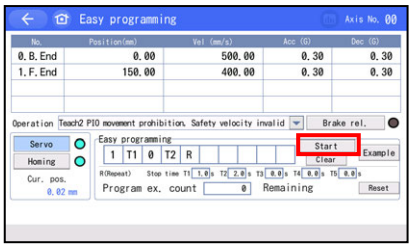
Set the next step and after in the same manner.
Set R at the end when it is required to repeat the operation.



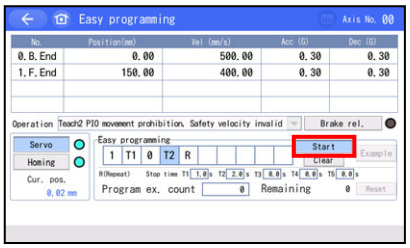
Touch a timer to use (T1 to T5) when it is required to have time for pause.



Set the time for pause.

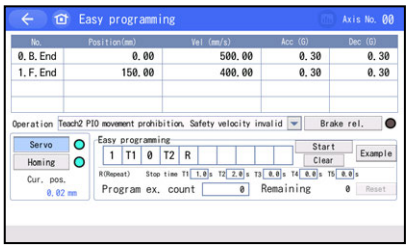


Have the servo ON and the home-return conducted, and then touch [Start] to start the operation.

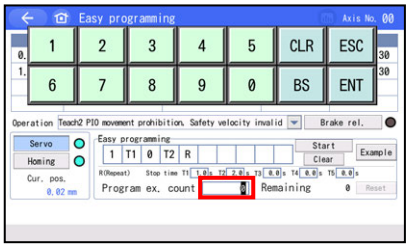


During the operation, the [Start] and the step number in execution turn to blue.

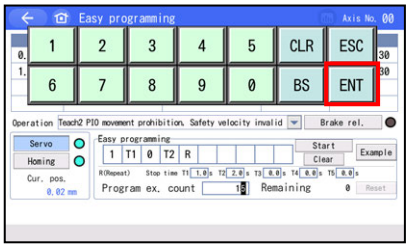
To stop operation, touch the [Start] again.



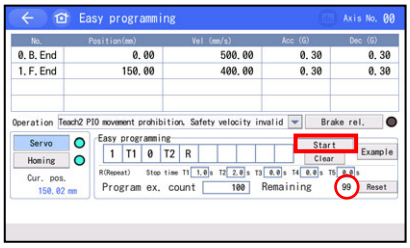
Operation stops.



Touch the number to execute the program when it is required to set number of repeating.

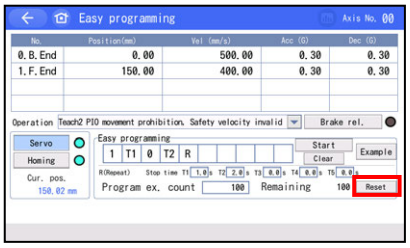


Set the number to repeat and touch [ENT].

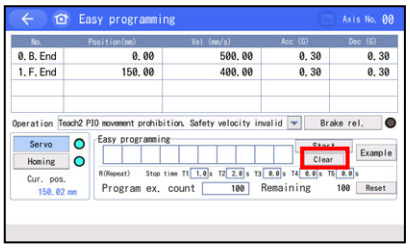


Touch [Start] to start operation.

The number of remaining for repeating is displayed, and counts down as 100 → 99 → 98 → ….



Touch [Reset] and the remained times go back to the number of program execution times.



Touch [Clear], and the set easy program will be all deleted.



Caution: When there is an alarm issued due to such a reason as making a mistake in position number indication, go back to Easy programming screen with [←] button. In case of moving from Menu 2 screen to Easy programming screen, the set simple program will be deleted, if you are using a version earlier than V5.10.

(Note) When using versions earlier than V5.10, simplified programs cannot be saved. When using version V5.20 or later, simplified programs can be saved through the position data backup operation. During transfer, the position data and simplified programs are transferred simultaneously.

7. Gateway Parameter Setting Tool

Gateway Parameter setting can be performed when this touch panel teaching pendant TB-02 is connected to a supported model.
Refer to “Applicable Models for Gateway Parameter Setting Tool” in this instruction manual for the models to support.

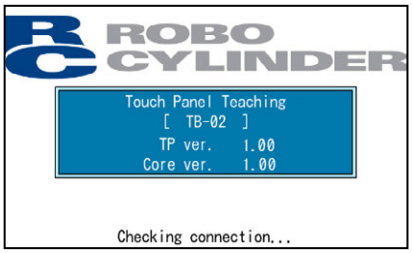
> Each window in the gateway parameter setting tool should differ depending on the type of controller to be used, field network, structure of axes, operation mode and settings in each parameter. Therefore, explanation in this section is prepared using some representative windows.

7.1 Starting up Gateway Parameter Setting Tool

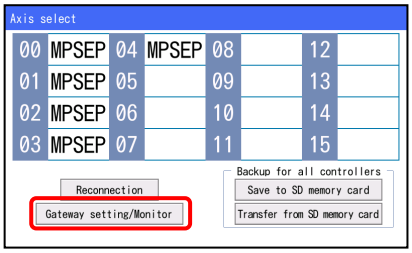
Gateway parameter setting tool should be started in the procedures described below.



IAI logo is displayed for approximately 1 second when the power is turned on.



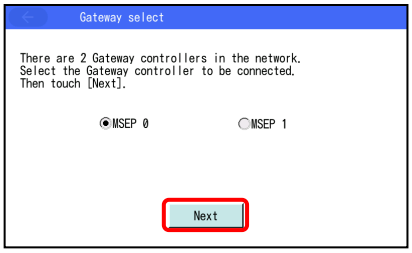
Version information is displayed.



Axis select window is displayed when several units are connected.

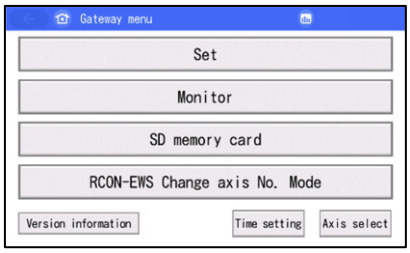
[Gateway setting / Monitor] button is shown in the right bottom of the screen for the supported models.

Touch [Gateway setting / Monitor].



When there are two or more gateway controllers in the same network, the gateway select window opens.

Select the controller to be connected and touch [Next].

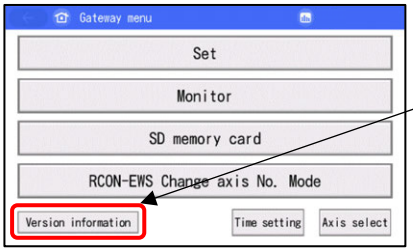


Gateway menu window is displayed.

(Note) The display language cannot be changed in the gateway parameter setting tool. Switch the display language in the environment setting of CON/SEP/MEC Controller, and then start up the gateway parameter setting tool.

7.2 Gateway Menu Select

Gateway Menu Window

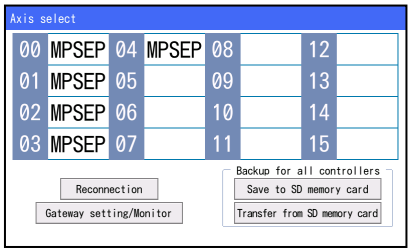


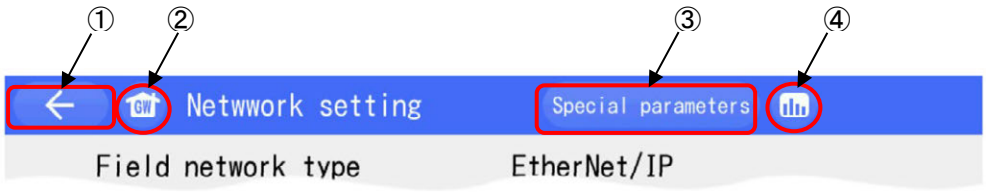
Version information for followings is displayed.
- Gateway firmware version
- Module version
- Teaching pendant version
- Optional unit version

There are six types of menu in the gateway menu. Select one of them and touch it. The screen goes to the touched menu.

- Set : Network setting is conducted. Refer to [7.3 Network Setting]
- Monitor : Data monitor, diagnosis information and alarm list are displayed. Refer to [7.4 Monitor Menu]
- SD memory card : Backup / restore of the gateway setting data is conducted. Refer to [7.5 Secure Digital Memory Card]
- RCON-EWS axis number change mode : The screen transits to the window to change the axis number of RCON-EWS. Refer to [7.6 RCON-EWS Axis Number Change Mode]
- Time setting : Clock setting on the controller is conducted. Refer to [7.7 Clock Setting]
- Axis select : Selection is made for axis to be operated with the touch panel teaching pendant Refer to [3.4 Operation Axis Change] (for CON system controllers) Refer to [4.5 Operation Axis Change] (for SEP system controllers)

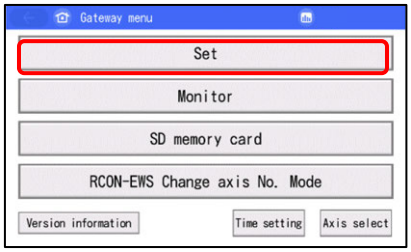
Axis Select Screen





①		Return Button	: Return to the previous screen.
②		Gateway Button	: Return to the gateway menu screen.
③		Special Parameter Button	: Setting is conducted for special parameters Refer to [7.3.2 Special Parameter Setting]
④		Monitor Button	: Displays the monitor screen. Refer to [7.4 Monitor Menu]

7.3 Network Setting



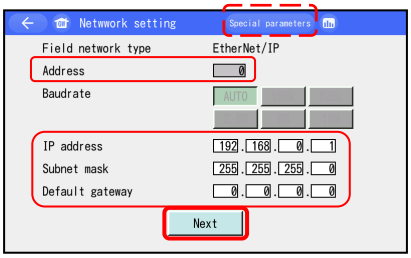
Touch [Set] button in the gateway menu screen to show the network setting screen.

7.3.1 Network Setting

Network setting is conducted. Refer to the instruction manual for each controller for the detail of settings.

■ For models except for MSEP-C, MCON-C/CG, RCP6S Gateway, REC and SSCNET III/H, MECHATROLINK-III and EtherCAT Motion of RCON

[Step 1] Network Setting Screen



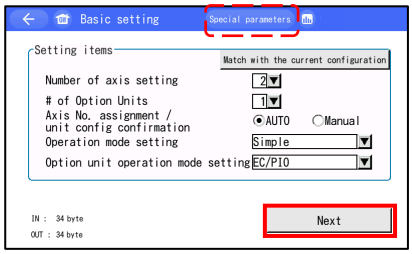
Establish the settings or display for the address (station number) (Note 1), IP address (Note 2), Subnet mask (Note 2), Default teway (Note 2) and MAC Address (Note 3).

Touch [Next] when setting is finished.

(Note 1) Set for those except for EtherNet/IP and PROFINET IO
(Note 2) Set for EtherNet/IP
(Note 3) Set for EtherNet/IP, PROFINET IO and CC-Link IE Field

Touch [Special parameters] when setting up the special parameters.
Refer to [7.3.2 Setup of Special Parameters]

[Step 2] Basic Setting Screen (only for RCON)



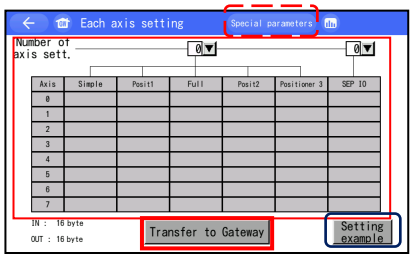
Settings for Number of axis sett., # of Option Units, Axis No. assignment / unit config confirmation and operation mode setting should be established.
Touch [Match with the current configuration], and the setting of such as number of axes should be adjusted to what can be operated following the current hardware construction.
The number of axes can be set to 0 in the versions listed below and later.
• RCON-GW (V0010 to)
• TB-02 (V5.10 to)
Touch [Next] when setting is finished.

If “Automatic” is selected in Axis Number Assignment / Unit Configuration Settings and a mode other than Individual Setting is selected in Operation Mode Settings, the screen will proceed to the [Step 4] Transfer Confirmation window when the RCON-EWS support bit is off, or when the RCON-EWS support bit is on and the number of optional units is set to 0.

Touch [Special parameters] when setting up the special parameters.
Refer to [7.3.2 Setup of Special Parameters]

[Step3] Setting of Number of Axes and Operation Mode

(1) Each Axis Setting Screeb for MSEP-C and MCON-C/CG

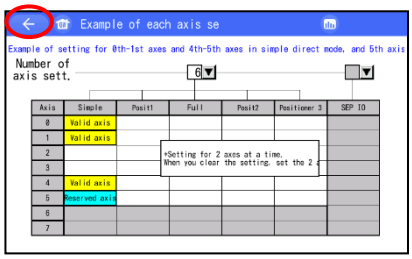


Set the operation mode and number of axes.

If required to set the special parameters, touch [Special parameters]. Refer to [7.3.2 Special Parameter Setting]

Touch [Transfer to Gateway] when setting is finished.

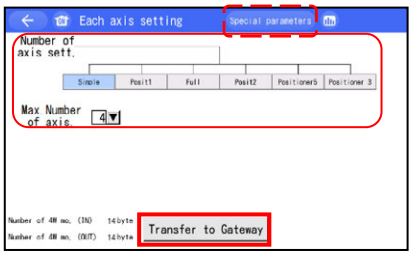
Example of each axis setting Screen



Touch [Example for Setting] in the each axis setting screen, and an example for each axis setting should appear. Refer to it for setting.

Touch [←] to return.

(2) Each Axis Setting Screen for RCP6S

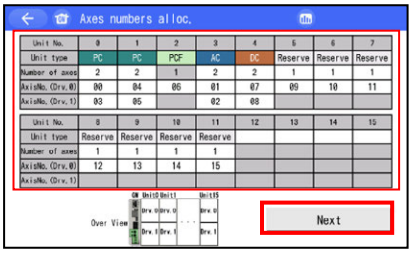


Set the operation mode and number of axes.

If required to set the special parameters, touch [Special parameters]. Refer to [7.3.2 Special Parameter Setting]

Touch [Transfer to Gateway] when setting is finished.

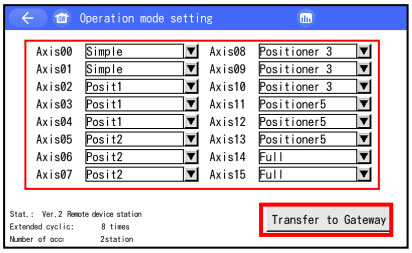
(3-1) Axis Number Assignment / Unit Construction Setting Screen in RCON



If you select “Manual” in the axis number assignment / unit construction setting, settings of the axis number assignments and unit construction can be adjusted.

Touch [Next] when setting is finished.

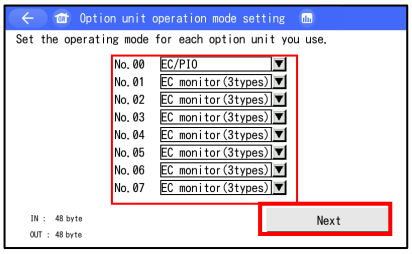
(3-2) Operation Mode Setting Screen in RCON



If you select “Individual Setting” in the operation mode setting, operation mode for each axis can be selected.

Touch [Transfer to Gateway] when setting is finished.

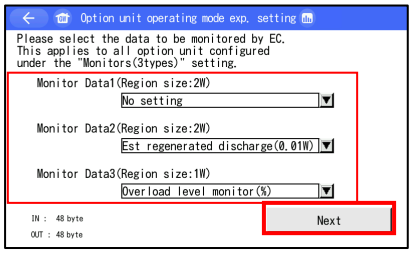
(3-3) RCON Option unit operation mode setting window



When “Individual Setting” is selected in the option unit operation mode setting, select the option unit operation mode for each axis.

Touch [Next] when setting is finished.

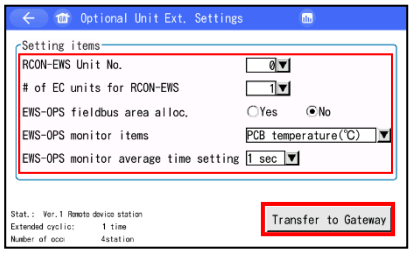
(3-4) RCON Option unit operating mode exp. setting window



When “EC Monitor (3 Types)” is selected in either the option unit operation mode setting on the basic setting screen or the option unit operation mode setting screen, select the data to be monitored by the EC.

When the settings are complete, touch [Transfer to Gateway].

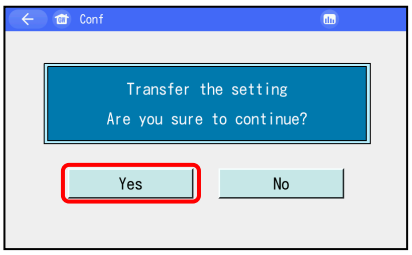
(3-5) RCON Optional Unit Ext. Settings Window



For RCON compatible with the e-Wiring System, when the number of option units is set to 1 or more, the option unit expansion settings should be configured.

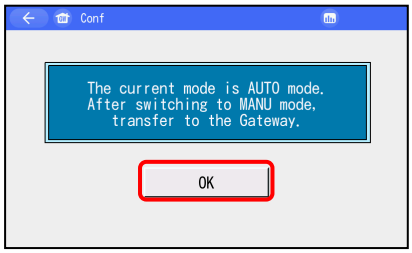
When the settings are complete, touch [Transfer to Gateway].

[Step 4] Transfer Confirmation Screen



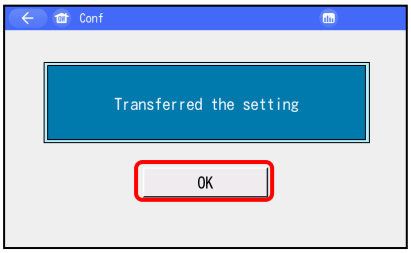
Touch [Yes].

Touch [No] and the screen goes back to [Step 3].



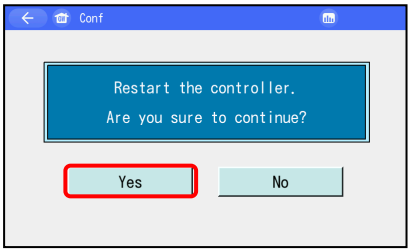
Confirmation window is shown when the operation mode switch on the controller is set to AUTO.

Touch [OK] and the screen goes back to [Step 3].



A message window to tell transfer is complete is shown when the transfer is completed in normal condition.

Touch [OK].

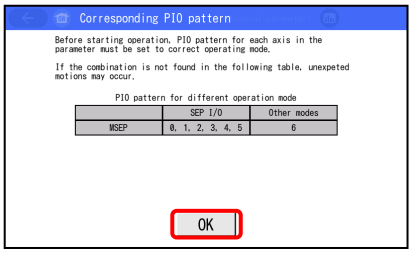


Reboot the controller after transfer is completed to activate the setting.

Touch [OK].

Reboot is cancelled if touching [No]. The transferred setting will not be activated in that case.

[Step 5] Corresponding PIO pattern Screen (only for MSEP-C and MCON-C/CG)

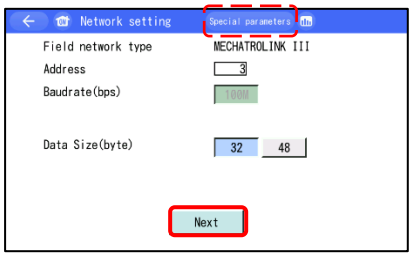


For MSEP-C and MCON-C/CG, the window for the applicable PIO patterns is displayed.
Set the PIO pattern of the controller following the displayed contents. It is not necessary to set the PIO pattern for RCP6S and RCON.

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

■ For SSCNET III/H, MECHATROLINK-III and EtherCAT Motion of RCON

[Step 1] Network setting Screen



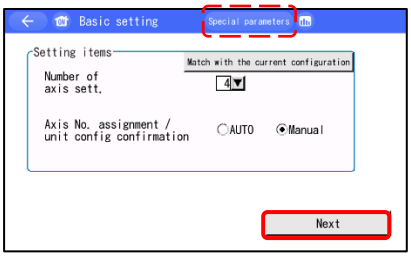
Setting of the address (Note 1) and data size (Note 2) should be established.

Touch [Next] when setting is finished.

(Note 1) To be set up for MECHATROLINK-III and SSCNET III/H
(Note 2) To be set up for MECHATROLINK-III

Touch [Special parameters] when setting up the special parameters.
Refer to [7.3.2 Setup of Special Parameters]

[Step 2] Basic setting Screen

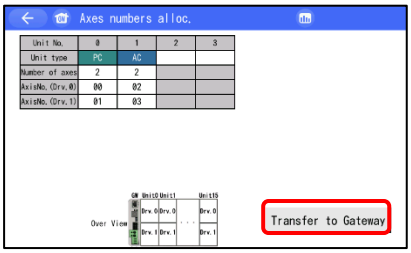


Axis quantity setting and Axis No. assignment / unit config confirmation should be established.
Touch [Match with the current configuration] and operation can be performed with the setting of the number of axes following the setting of the hardware configuration.

When “Manual” is selected in the Axis No. assignment / unit config confirmation, touch [Next].
When “Automatic” is selected in the Axis No. assignment / unit config confirmation, touch [Transfer to Gateway].

Touch [Special parameters] when setting up the special parameters.
Refer to [7.3.2 Setup of Special Parameters]

[Step3] Axes number alloc. Screen

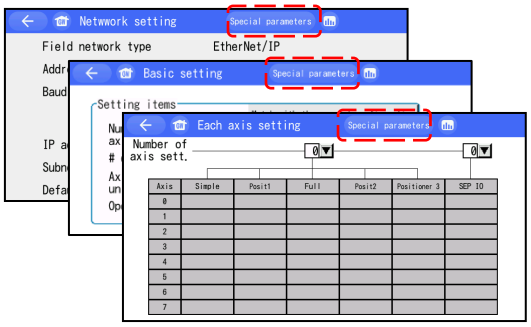


Set up the number of axes and axis numbers.

Touch [Transfer to Gateway] to complete the setup.

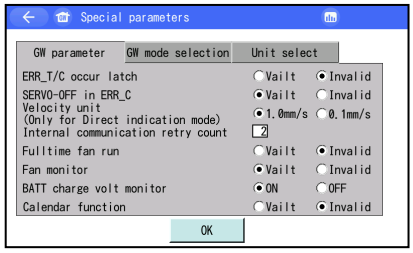
7.3.2 Special Parameter Setting

Establish the settings for the special parameters if necessary.
Touch [Special parameters] button on the top of either the network setting screen, basic setting screen or Each axis setting screen to show the special parameter screen.



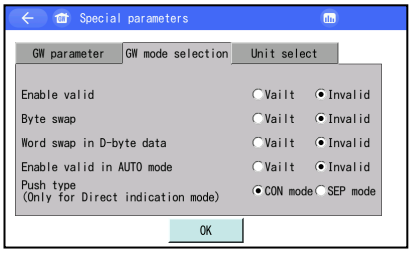
(1) Special Parameters for MSEP-C and MCON-C/CG

GW Parameter



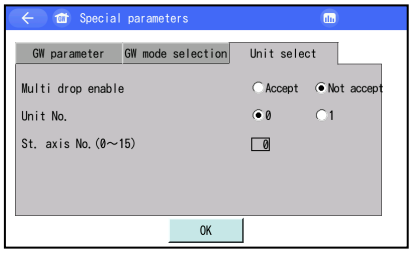
[Setting Items]
- Condition latch after the servo is turned off when ERR_T occurred (Vailt/Invalid)
- Servo-off when ERR_C occurred (Vailt/Invalid)
- Velocity unit (in Direct Numerical Mode only)
- Communication Retry Number Setting
- Fan always-on operation (Vailt/Invalid)
- Fan revolution monitoring (Vailt/Invalid)
- Absolute battery charge voltage monitoring (ON/OFF)
- Calendar feature (Vailt/Invalid)

GW Mode Select



[Setting Items]
- Enable valid (Vailt/Invalid)
- Byte swap (Vailt/Invalid)
- Double byte data word swap (Vailt/Invalid)
- Enable valid at AUTO (Vailt/Invalid)
- Pressing system in Direct Numerical Mode (CON mode/SEP mode)

Unit Select

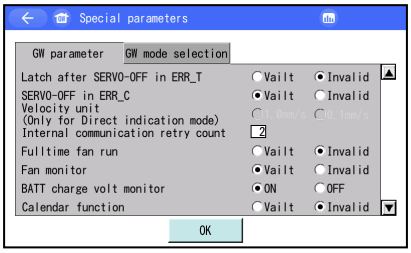


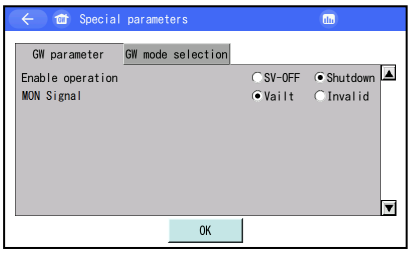
[Setting Items]
- Multidrop Permission (Accept/Not accept)
- Unit Number (0/1)
- Top Axis Number (0 to 15)

Refer to the [instruction manual for each control] for detail of each setting item.

(2) Special Parameters for RCP6S

GW Parameter



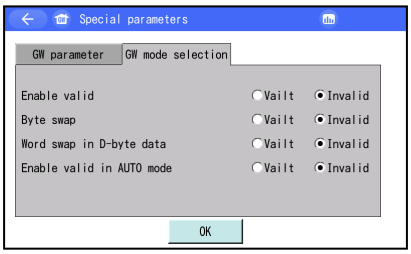


[Setting Items]
- Condition latch after the servo is turned off when ERR_T occurred (Vailt/Invalid)
- Servo-off when ERR_C occurred (Vailt/Invalid)
- Velocity unit (in Direct Numerical Mode only)
- Communication Retry Number Setting
- Fan always-on operation (Vailt/Invalid)
- Fan revolution monitoring (Vailt/Invalid)
- Absolute battery charge voltage monitoring (ON/OFF)
- Calendar feature (Vailt/Invalid)

- Enable valid (SV-OFF/Shutdown)
- MON Signal (Vailt/Invalid)

Pages are to be switched over with ▲ and ▼ buttons.

GW Mode Select

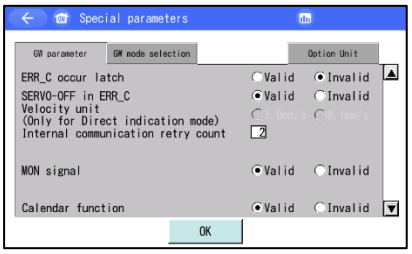


[Setting Items]
- Enable valid (Vailt/Invalid)
- Byte swap (Vailt/Invalid)
- Double byte data word swap (Vailt/Invalid)
- Enable valid at AUTO (Vailt/Invalid)

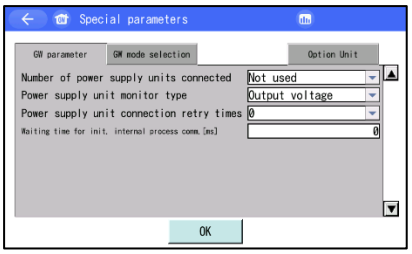
Refer to the [instruction manual for each control] for detail of each setting item.

(3) Special parameters for RCON (except for SSCNET III/H, MECHATROLINK-III and EtherCAT Motion)

Gateway parameter



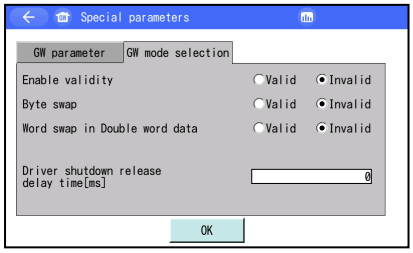
[Setting Items]
- ERC-C occur latch (Validl/Invalid)
- Servo-off in ERR_C (Valid/Invalid)
- Velocity unit (in Direct Numerical Mode only)
- Communication Retry Number Setting
- MON signal (Valid/Invalid)
- Calendar function (Valid/Invalid)



- Number of power supply units connected (Not used/1/2/3/4/5)
- Power supply unit monitor type (Output voltage / Auxiliary winding wire voltage / Output current / Peak hold current / Load factor / Fan rotating speed / PCB temperature)
- Power supply unit connection retry times
- Waiting time for init. internal process comm. [ms]

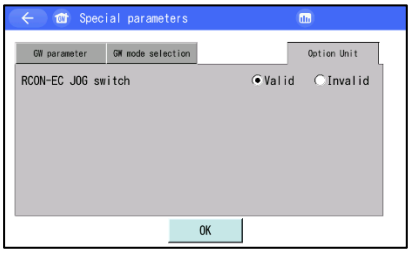
Pages are to be switched over with ▲ and ▼ buttons.

GW Mode Select



[Setting Items]
- Enable valid (Valid/Invalid)
- Byte swap (Valid/Invalid)
- Double byte data word swap (Valid/Invalid)
- Driver shutdown release dalay time [ms]

Option unit

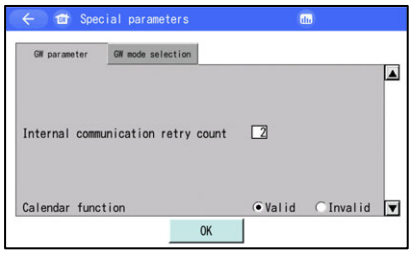


[Setting Items]
- RCON-EC JOG switch (Valid/Invalid)
- RCON-EWS Communication Retry Count Increment Value

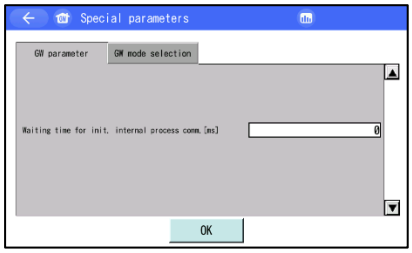
Refer to the [instruction manual for each control] for detail of each setting item.

(4) Special parameters for SSCNET III/H, MECHATROLINK-III and EtherCAT Motion of RCON

GW parameter



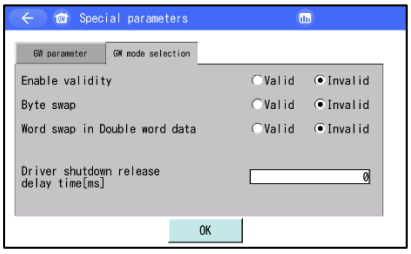
[Setting Items]
- Internal communication retry count
- Calendar function (Valid/Invalid)



- Waiting time for init. internal process comn. [ms]

Pages are to be switched over with ▲ and ▼ buttons.

GW Mode Select



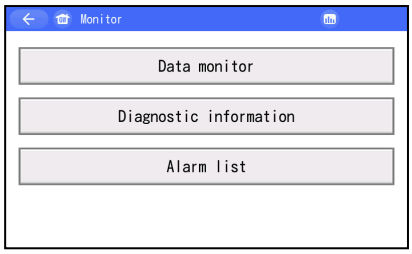
[Setting Items]
- Enable validity (valid/Invalid)
- Byte swap (Valid/Invalid)
- Word swap in Double word data (Valid/Invalid)
- Driver shutdown release dalay time [ms]

Refer to the [instruction manual for each control] for detail of each setting item.

7.4 Monitor Menu

Touch Monitor button in the gateway menu window to show the monitor screen.

Monitor Screen

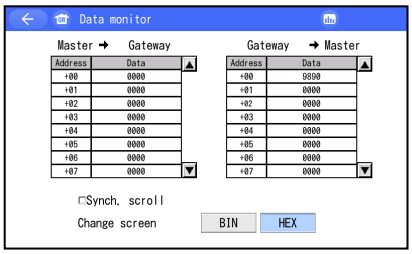


There are three types of menu in the monitor screen. Select one of them and touch it. The screen goes to the touched menu.

- Data monitor : Received data and sent data are displayed. Refer to [7.4.1 Data Monitor]
- Diagnosis information : Number of communication error occurrence and number of emergency stop detection are displayed. Refer to [7.4.2 Diagnosis Information]
- Alarm list : The alarm list is displayed. Refer to [7.4.3 Alarm List]

7.4.1 Data Monitor

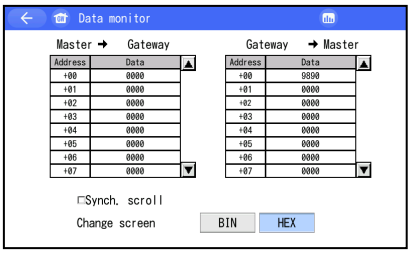
Touch [Monitor] in the gateway menu screen → [Data monitor] to show the data monitor screen.



Data Monitor screen
The data received by the gateway unit from the host (master) and the transmission data returned to the host (master) should be displayed.

The data allocation varies depending on the network type and operation mode.
When configuring the master or reading data, refer to the instruction manual of the gateway you use.
A list of instruction manual control numbers can be found in [1.1.2 Instruction Manual Related to This Product].

In the following section, an example for the direct numeric specification mode of RCON-GWG is explained.



On the screen, under “Master → Gateway” (left side), the network data shown in the instruction manual as “PLC → RCON System,” “PLC Output ⇒ RCON,” and “PLC Output ⇒ Each Axis Input” is displayed.

On the screen, under “Gateway → Master” (right side), the network data shown in the instruction manual as “RCON System → PLC,” “RCON ⇒PLC Input,” and “Each Axis Input ⇒PLC Input” is displayed.

Overall Configuration of Data Monitor

PLC → RCON system	RCON system → PLC
GW control (2W)	GW control (2W)
Reserve (6W)	Power supply unit status or Light malfunction maintenance signal (5W)
	Reserve (1W)
Axis number 1 control (RCON-PC-1)	Axis number 1 status (RCON-PC-1)
Axis number 2 control (RCON-SC-1)	Axis number 2 status (RCON-SC-1)
Axis number 3 control (SCON-CB-*-RC)	Axis number 3 status (SCON-CB-*-RC)
Option unit 0 control (RCON-EXT-NP)	Option unit 0 status (RCON-EXT-NP)
Option unit 1 control (RCON-NP)	Option unit 1 status (RCON-NP)
Option unit 2 control (RCON-EC-4_1)	Option unit 2 status (RCON-EC-4_1)
Option unit 3 control (RCON-EC-4_2)	Option unit 3 status (RCON-EC-4_2)

Fixed region configuration (Orange Section of Overall Data Monitor Configuration)

	PLC output ⇒ RCON			RCON ⇒ PLC input		
	High byte	Low byte	Word count	High byte	Low byte	Word count
Gateway control region	Gateway control signal 0		2	Gateway status signal 0		2
	Gateway control signal 1			Gateway status signal 1		
Power supply unit region *	Not available.		6	Power supply unit status signal 0		6
	Not available.			Power supply unit status signal 1		
	Not available.			Power supply unit status signal 2		
	Not available.			Power supply unit status signal 3		
	Not available.			Power supply unit status signal 4/ Light malfunction maintenance signal (Note1)		
	Not available.			Not available.		

* Occupied as a data region even if a power supply unit is not connected.
Note 1: This signal can change the feature by switchover in the gateway parameter.

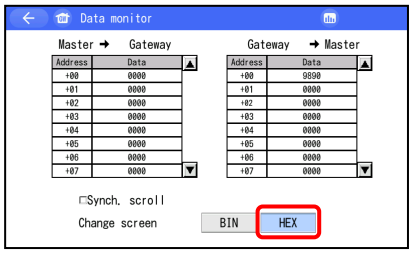
Data region configuration (Blue Section of Overall Data Monitor Configuration)
(1) Direct numerical control mode data region configuration

	PLC output ⇒ Each axis input			Each axis output ⇒ PLC input		
	High byte	Low byte	Word count	High byte	Low byte	Word count
Direct specified region	Specified position data (L) *		2	Present position data (L) *		2
	Specified position data (H) *			Present position data (H) *		
	Specified positioning width (L) *		2	Present current value (L) * (Note 1)		2
	Specified positioning width (H) *			Present current value (H) * (Note 1)		
	Specified speed		1	Present speed data		1
	Specified acceleration/deceleration		1	Not available.		1
	Pushing current limit value		1	Alarm code		1
Control signal region	Control signal		1	Status signal		1

* (L) is the low word of a 2-word datum while (H) is the high word of a 2-word datum.
Note 1: The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON series).

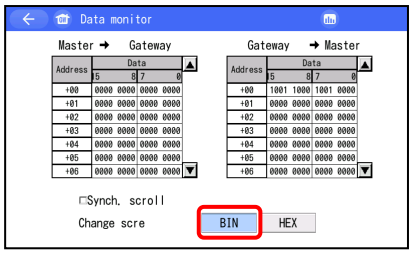
The RCON address configuration and I/O allocation are provided in Appendix 10.3 “RCON Address Configuration” and 10.4 “RCON I/O Assignment”.

Data monitor Screen

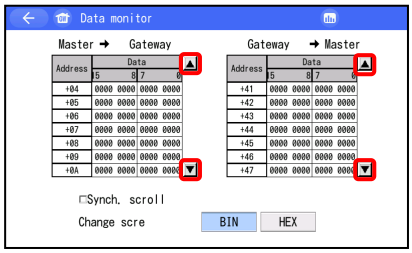


The data that the gateway unit has received from the host (master) and the data sent back to the host (master) are displayed.

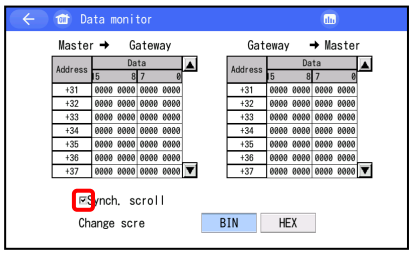
Data is shown in hexadecimal numbers when [HEX] is on.



The data switches to binary number display if touching [BIN].



Touch the scroll keys ▲ and ▼ to change the displayed address.

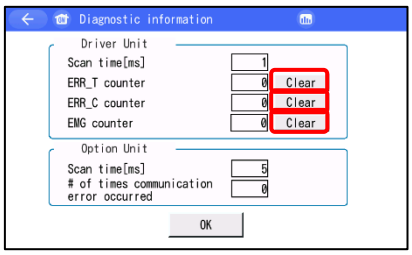


Check on Synch. scroll and the sent and received data can be scrolled together.

7.4.2 Diagnosis Information

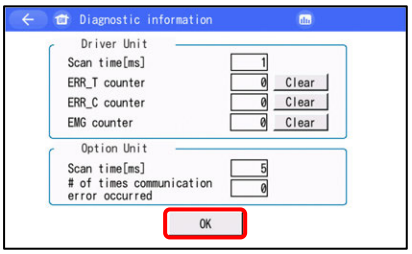
Touch [Monitor] in the gateway menu screen → [Diagnosis information] to show the diagnosis information screen.

Diagnosis Information Screen



Information of scan time, number of occurrence times of communication error (ERR_T and ERR_C) and number of detection times for emergency stop (EMG) is displayed.

Touch [Clear] on each counter, and the value goes back to 0.

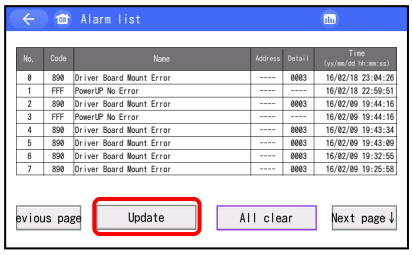


Touch [OK], and the screen returns to Monitor screen.

7.4.3 Alarm List

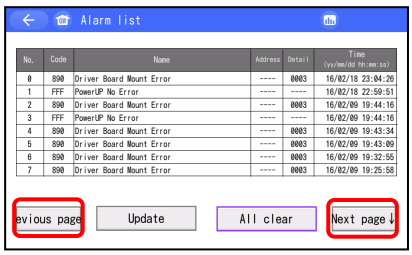
Touch [Monitor] in the gateway menu screen → [Alarm list] to show the alarm list screen.

Alarm list Screen



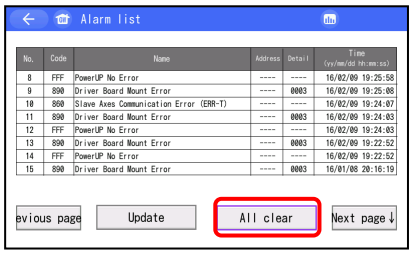
Show the alarm list of the gateway.

Touch [Update] and the alarm list can be read out again.

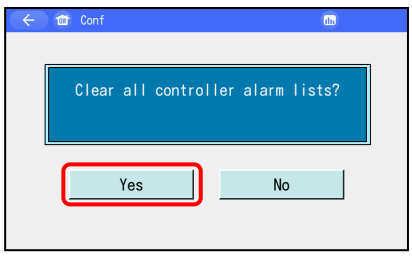


Touch [Next page], and the list in the next screen is shown.

Touch [Previous page], and the list in the previous screen is shown.

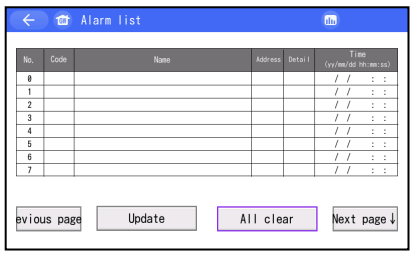


Touch [All clear], and the confirmation screen for alarm list all delete is shown.



Touch [Yes], and all in the alarm list will be deleted.

Touch [No], and the delete will be cancelled.

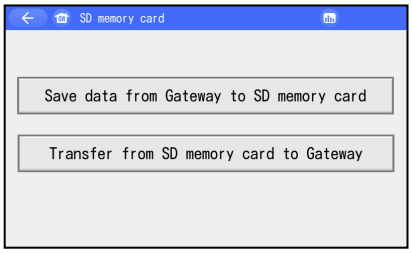


The alarm list is shown again.

7.5 Secure Digital Memory Card

Touch [SD memory card] button in the gateway menu screen to show the Secure Digital memory card window.

Secure Digital Memory Card Screen

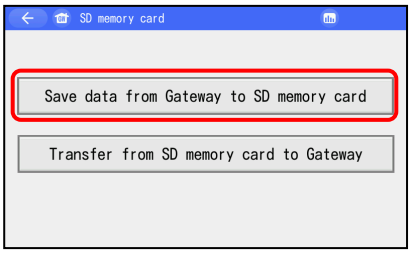


There are two types of menu in the Secure Digital memory card screen. Select one of them and touch it. The screen goes to the touched menu.

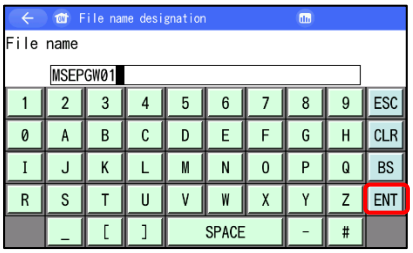
- Save from Gateway to Secure Digital Memory Card : Refer to [7.5.1]
- Transfer from Secure Digital Memory Card to Gateway : Refer to [7.5.2]

7.5.1 Save from Gateway to Secure Digital Memory Card

Secure Digital Memory Card Screen

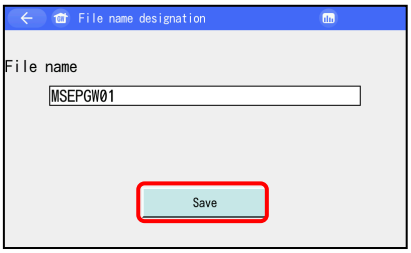


Touch [Save data from Gateway to SD memory card].

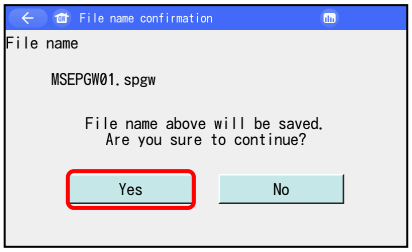


File name indication screen opens.

Input a file name and touch the [ENT].



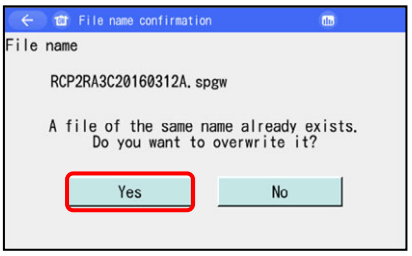
Touch [Save].



When the same file name does not exist in the Secure Digital memory card, confirmation screen for saving is shown.

Touch [Yes] and the data will be saved.

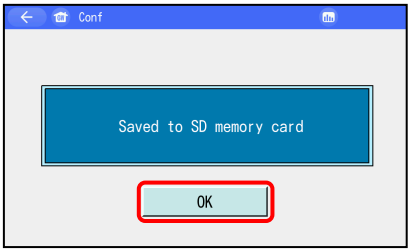
Touch [No] and the data will not be saved, and the screen goes back to the SD memory card screen.



When the same file name exists in the Secure Digital memory card, confirmation window for overwriting is shown.

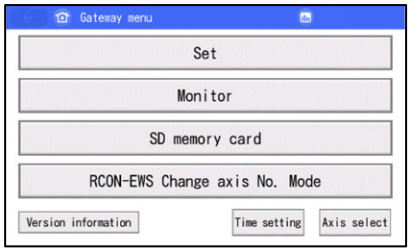
Touch [Yes] and the data will be overwritten.

Touch [No] and the data will not be overwritten, and the screen goes back to the SD memory card screen.



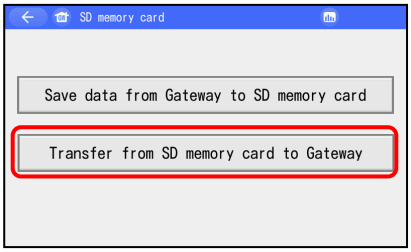
If touching [Yes], a message window to notify the data saving (overwriting) is completed is displayed.

Touch [OK].

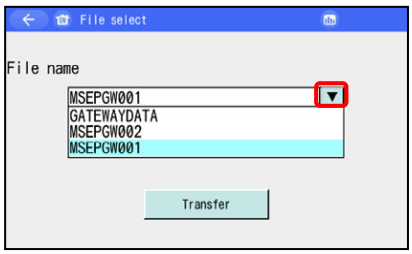


The screen goes back to the gateway menu screen.

7.5.2 Transfer from Secure Digital Memory Card to Gateway

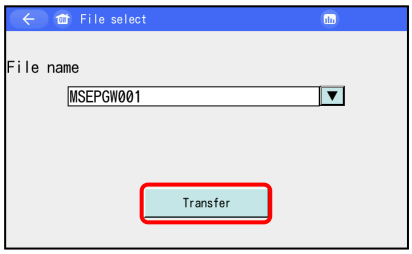


Touch [Transfer from SD memory card to Gateway].

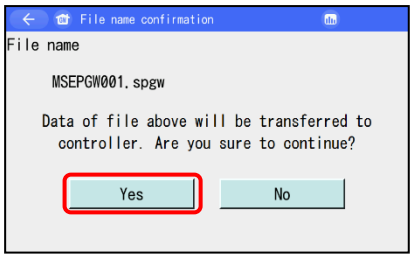


The File select screen opens.

Touch ▼ to select a file to transfer.

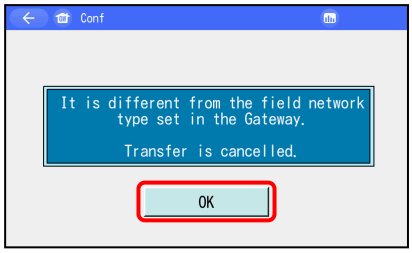


Touch [Transfer].



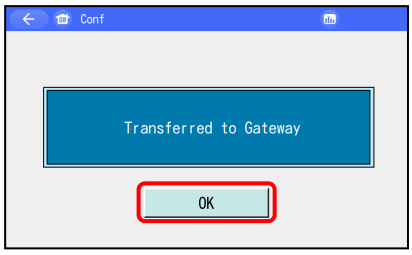
Confirm the file name and touch [Yes].

Touch [No] and the screen goes back to the SD memory card screen.



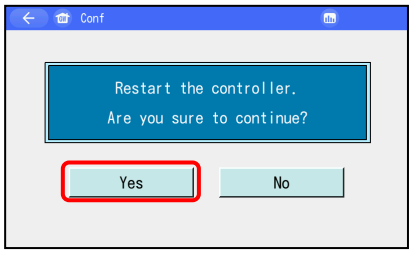
If the network type of the selected file is different, confirmation screen opens.

Touch [OK] to cancel the transfer.
The screen goes back to the gateway menu screen after cancellation.



If the transfer is completed in normal condition, a message screen to notify that the transfer is completed will be shown.

Touch [OK].



After transportation, reboot the controller to activate the settings.

Touch [Yes].

Touch [No] and the controller will not be rebooted. In this case the transferred change will not become activated.



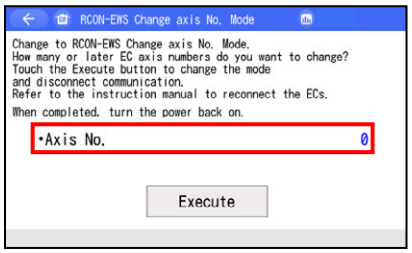
The screen goes back to the gateway menu screen.

7.6 RCON-EWS Axis Number Change Mode (RCON for e-Wiring System only)

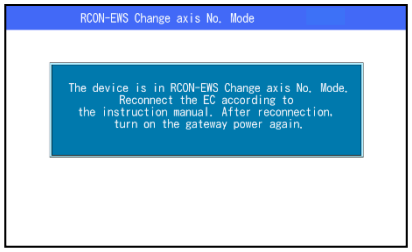
Change the axis numbers of EC units connected to the RCON-EWS.
The axis numbers can be changed starting from the entered axis number.

From the Gateway Menu window, touch the [RCON-EWS Change axis No. Mode] button to display the RCON-EWS Axis Number Change Mode window.

RCON-EWS Axis Number Change Mode Screen

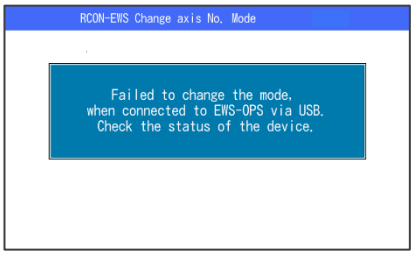


Input an axis number and touch [Execute].



In Process of Change Mode

Connect the EC unit and reboot the power to the gateway unit.



When Failured

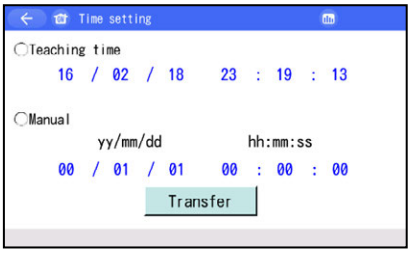
A USB may be connected to the EWS-OPS, and it may be in the debug mode.
Check the device status, then reboot the power to the gateway unit.

7.7 Clock Setting

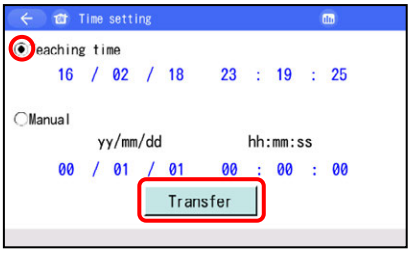
Establish the setting for the clock on the controller.
Selection can be made from an option to transfer the time data from this touch panel teaching pendant and another one to set the time manually.

Touch [Time setting] button in the gateway menu window to show the clock setting screen.

Time setting Screen



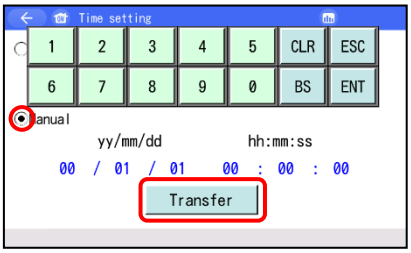
(1) Transfer the clock information in this touch panel teaching pendant



Select the radio button in the teaching clock.

Touch [Transfer] to transfer the clock data.

(2) Set the time manually and transfer



Select the radio button on Manual.

Input yy/mm/dd hh:mm:ss.
(Input numbers to each item. Touch [ENT] to confirm it.)

Touch [Transfer] to transfer the clock data.

8. Operation of Actuator Drive Power Supply Unit

8.1 Guideline

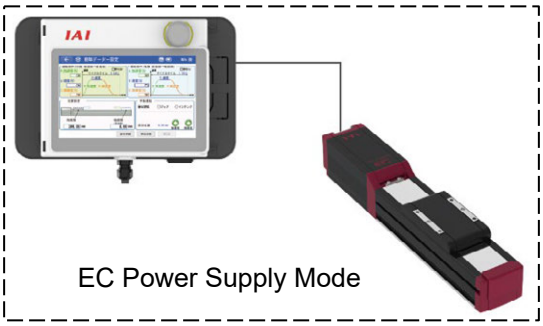
The actuator drive power supply unit (hereinafter called ADTB) is to be connected to TB-02 and not to use any controller installed separately, it enables a trial run of an actuator with a teaching pendant itself.

8.1.1 Applicable Actuators

There are EC Type (ADTB-EC) that capable of operation of ELECYLINDER only and PEC Type (ADTB-PEC) that is capable of operation of ELECYLINDER and pulse motor mounted ROBOCYLINDER.

EC Type····· Trial run of ELECYLINDER (24V pulse motor type) is capable.
PEC Type····· Trial run of ROBOCYLINDER (pulse motor type: RCP2 Series and later) and ELECYLINDER (24V pulse motor type).

When having a trial run of ELECYLINDER, as an actuator is operated by the controller built in ELECYLINDER, ADTB is to be used only for power supply to ELECYLINDER.

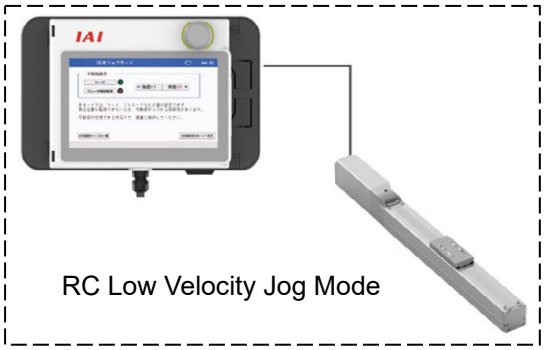


EC Power Supply Mode

Supply power to ELECYLINDER and ELECYLINDER can operate in normal condition.

When having a trial run on ROBOCYLINDER, ADTB can be a simple controller.
Operation such as jog operation in low velocity without using parameters and operation with parameters applicable for a position controller installed separately read from a Secure Digital card to ADTB is capable.

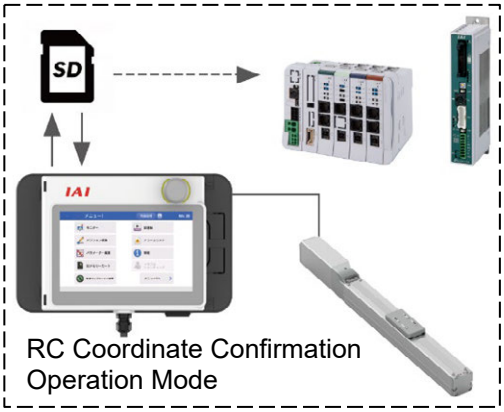
ADTB Power on



RC Low Velocity Jog Mode

Jog operation in low velocity should be made without using parameters.

Mode Switchover



RC Coordinate Confirmation Operation Mode

Operation should be made by reading ADTB parameters. Editing positions and position data operation are capable.

8.1.2 Operation

The way to operate ELECYLINDER is the same as that for normal ELECYLINDER.
Refer to [Chapter 6 Operation of ELECYLINDER and ROBO PUMP].

For how to operate ROBOCYLINDER, should be explained in this chapter and Chapter 3.

8.1.3 Initial Screen

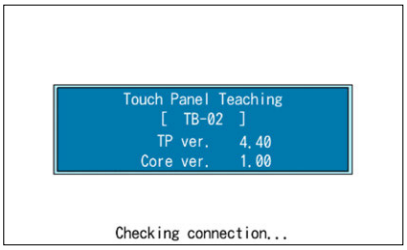
After the power gets turned on, the IAI logo and version information should be shown and then it gets to the low-speed jog mode screen.

Power on

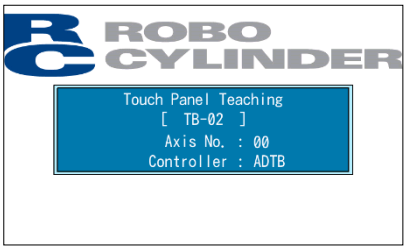
Confirm that the stop switch is not pressed and turn the power on to ADTB.



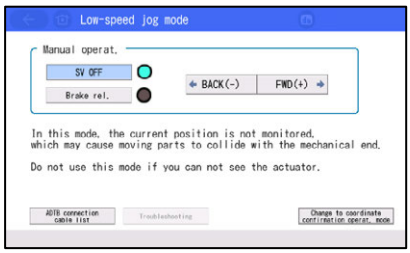
IAI logo should be displayed in a few seconds.



The version of the touch panel teaching pendant should be displayed.

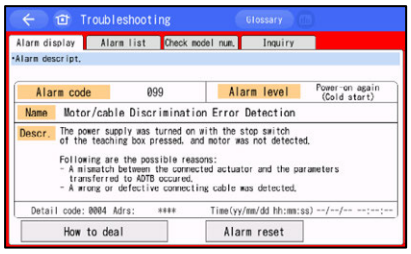


The axis number (00) and the controller type (ADTB) should be displayed.



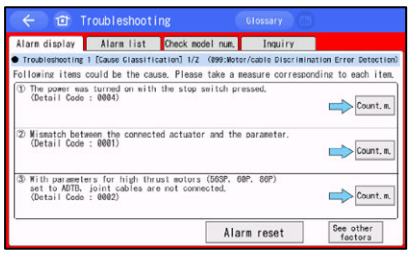
The low-speed jog mode screen should open.

■ When Power is Turned on While Stop Switch is Pressed



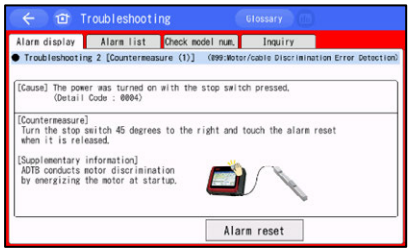
If the power is turned on while the stop switch is being pressed, as the motor cannot be defined, the low-speed jog mode screen would not be displayed and the window for Alarm Code 099 should be displayed.

Touch [How to deal].



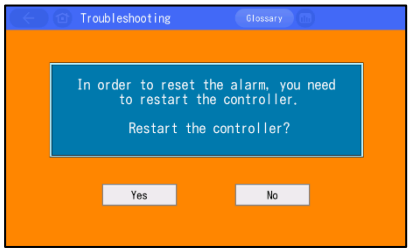
The Troubleshooting 1 screen should be displayed.

Touch [Countermeasure] on the right side of (1) The power was turned on with the stop switch pressed.



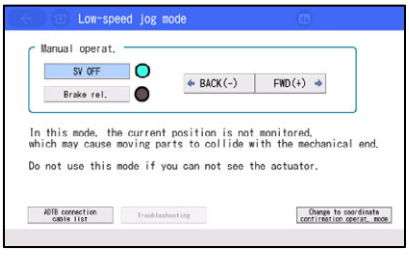
The Troubleshooting 2 screen should be displayed.

Following the instruction in the screen, turn the stop switch to the right for 45 degrees to release the locking feature on the stop switch and touch [Alarm reset].



A confirmation screen to reboot ADTB should show up.

Touch [Yes] to execute.



The Low-speed jog mode screen should be displayed.

8.1.4 Specifications, Dimensions, Name of Each Part, etc.

Refer to [1.9 Actuator Driving Power Supply Unit for Teaching Pendant].

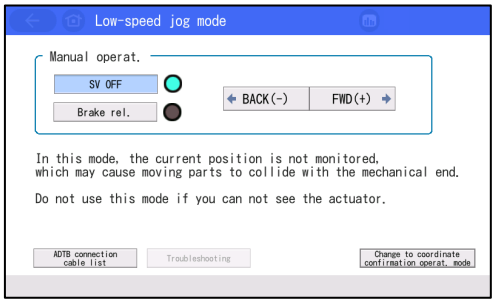
8.1.5 Connection

Refer to [2.4 Connection of Actuator Drive Power Supply Unit].

8.2 Low Velocity Jog Mode

Operation should be made in low velocity (300rpm) without using parameters. (The velocity cannot be changed.)
Only jog operation is available and home-return operation or position data movement is not available.

8.2.1 Low-speed jog mode screen



[Operation on the low-speed jog mode screen]

- [Servo ON] [Servo OFF] :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.
- [Brake rel.] :For an actuator equipped with a brake, touch [Brake rel.] and the brake gets compulsorily released and the circle turns on. Touch [Brake rel.] again and the brake works and the circle turns off.
- [BACK(-)], [FWD(+)] :The axis moves in 300rpm while touching it. [BACK(-)] performs JOG operation in negative direction. [FWD(+)] performs JOG operation in positive direction.

* The operation velocity of an actuator should be the lead of actuator × 5 [mm/s]. (300rpm: 300 rounds in 1 minute = 5 rounds in 1 seconds)

[ADTB connection cable list]
Touch it and the cable connected to RCP actuator should be displayed. [8.2.2 ADTB Connection Cable List Screen]

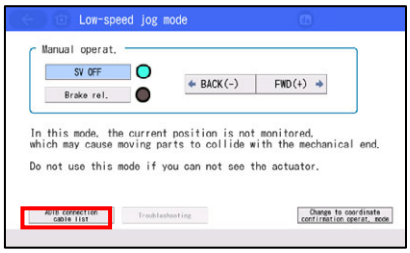
[Change to coordinate confirmation operat. mode]
Touch it and it is switched to the coordinate confirmation operation mode. [8.2.3 Transfer to Coordinate Confirmation Operation Mode]

[Troubleshooting] It should be displayed when an alarm is generated. Touch it and the troubleshooting screen should appear. Refer to [Chapter 9 Error Display]

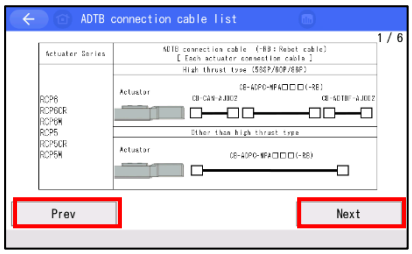
⚠ *Caution: In the low velocity jog mode, the coordinate of an actuator should not be monitored and back and forth operation should be made. Therefore, operation should be made in a constant velocity until the stroke end. Stop the actuator before it hits the stroke end. Operation till the stroke end may shorten the product life or cause malfunction.*

⚠ *Caution: An axis could drop if the brake compulsory release is performed while the servo is off when the axis is installed in the vertical orientation.*

8.2.2 ADTB Connection Cable List Screen

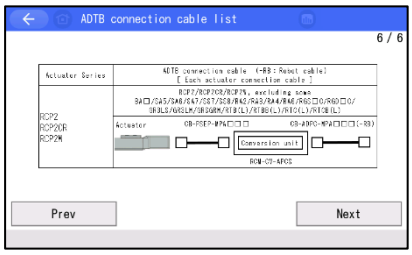


Touch [ADTB connection cable list] in the low-speed jog mode screen.

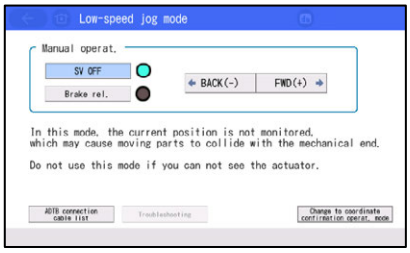


The ADTB connection cable list screen (1/6) should be displayed.

Touch [Next] and the next screens (→ 2/6 → ··· → 6/6 → 1/6 → ···) should be displayed in order.
Touch [Prev] and the previous screens (→ 6/6 → ··· → 1/6 → 6/6 →···) should be displayed in order.



Touch [←] and it returns to the low-speed jog mode screen.

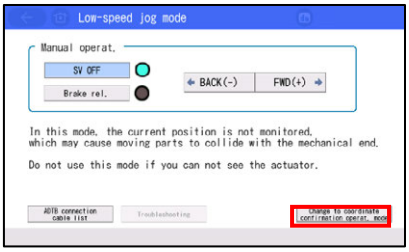


The low-speed jog mode screen should be displayed.

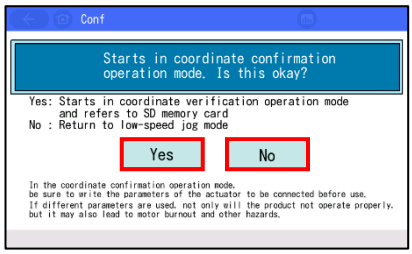
8.2.3 Transfer to Coordinate Confirmation Operation Mode

[About Parameter File for ADTB]

The parameter file for ADTB is necessary in order to switch over to the coordinate confirmation operation mode.
A parameter file for ADTB cannot be created by a user.
If a parameter file is required, confirm the model code of an actuator and the serial number described on the model code nameplate sticker attached on the side of the main unit, and request to a sales person in charge.

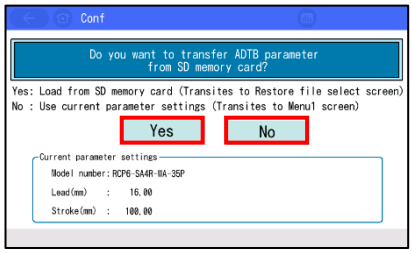


Touch [Change to coordinate confirmation operat. mode] in the low-speed jog mode screen.



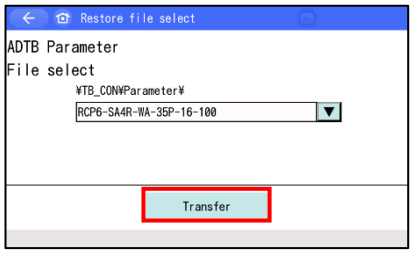
A confirmation screen for coordinate confirmation operation mode switchover should appear.

Touch [Yes] to switch over to the coordinate confirmation operation mode.
Touch [No] and it returns to the low-speed jog mode screen.



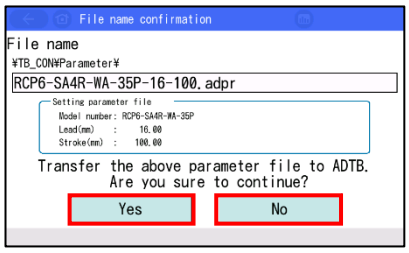
A confirmation screen for transferring a parameter for ADTB from a Secure Digital memory card should be displayed.

Touch [Yes] and it moves to a screen to select a file to transfer.
Touch [No] and the parameter would not be transferred and the current parameter settings should be used. It moves to the Menu 1 screen.



The restore file selection screen should be displayed. Select a file to be transferred in the pulldown menu.

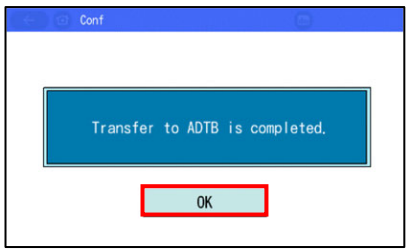
(A parameter file stored in \TB_CON\Parameter folder in a Secure Digital card will become available to select.)



The file name confirmation screen should be displayed.

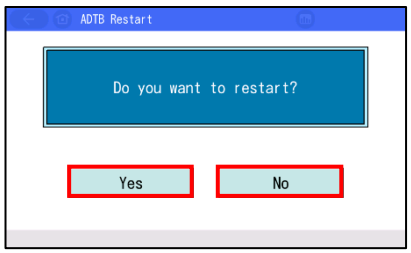
The information regarding model code, lead and stroke in the selected file should be displayed. Check if there is any problem.

Touch [Yes] and parameters should be transferred to ADTB.
Touch [No] and it should return to the restore file select screen.

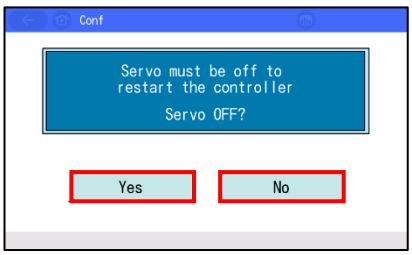


The transfer complete screen should appear.

Touch [OK].



A confirmation screen for rebooting should come up.



If the servo is on, a confirmation screen to turn the servo off should be displayed.

Touch [Yes] and the servo should be turned off and reboot.
Touch [No] and it returns to the restore file select screen.



After rebooting, Menu 1 should be displayed.

Operation according to the parameter should be available.
As the operation should basically be that of the CON system controller, refer to [Chapter 3 Operation for CON System Controller].

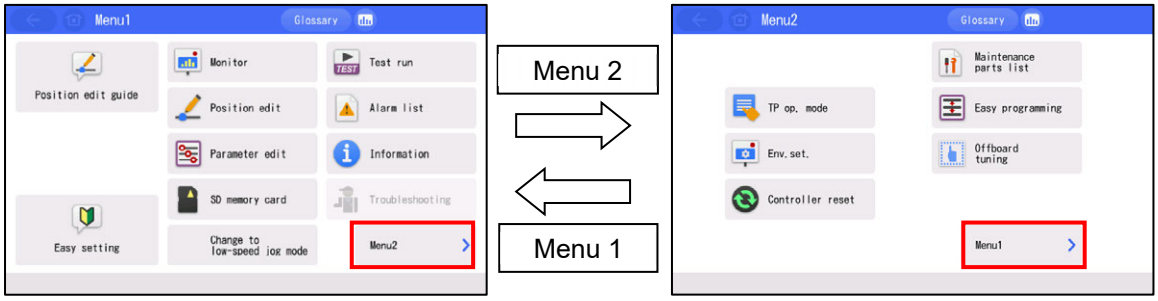
* There some features not available for operation.

8.3 Coordinate Confirmation Operation Mode

Operation should be made with parameters for ADTB read in.
Editing positions and position data operation are capable.

For how to switch over to the coordinate confirmation operation mode, refer to [8.2.2 Transfer to Coordinate Confirmation Operation Mode].

8.3.1 Coordinate Confirmation Operation Mode screen



As well as the position controller, the following features should be available to execute.
(Features not available for execution should not be displayed, such as dedicated functions for the pulse press actuator, are hidden.)

[Menu 1]

- Position edit guide — Refer to [3.6 Position Edit GuidePosition Edit Guide]
- Easy setting — Refer to [3.8 Easy Program Setting]
- Monitor — Refer to [3.9 Monitor] * There is no feature of I/O monitoring.
- Position edit — Refer to [3.10 Position Editing]
- Parameter edit — Refer to [3.11 Parameter Editing]
- SD memory card — Refer to [8.3.2 ADTB Data Backup]
- Test run — Refer to [3.12 Test Run]
- Alarm list — Refer to [3.14 Alarm List]
- Information — Refer to [3.17 Information Display] *There is no feature of axis name edit.
- Troubleshooting — Shows the contents of an alarm and the countermeasure when an alarm has been generated.

[Menu 2]

- TP op. mode — Refer to [3.13 TP Operation Mode]
- Env. set. — Refer to [3.18 Environment Setting]
- Controller reset — Refer to [3.15 Controller Reset]
- Maintenance parts list — Refer to [3.21 Maintenance Parts List]
- Easy programming — Refer to [3.22 Easy Programming]
- Offboard tuning — Refer to [3.24 Offboard Tuning]

8.3.2 ADTB Data Backup

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

(1) Type of Stored Data
It is available to save position data, parameters and alarm list.

(2) Compatibility of Saved Data
- The position data saves files in four types of extensions in one saving operation. The extensions of files and readable controllers are as shown below.

File Extension	Controller
.ptpb	PCON-CB/CFB/CGB/CGFB
.ptpbp	PCON-CBP/CGPB
.ptpcl	PCON-CYB
.ptc2	RCON-PC/PCF

- A parameter file can not be read in a controller.
- The alarm list can only have the backup. It cannot be restored. Data is in a CSV file.

(3) Directories of the Stored Data
The folders to store the backup data of ADTB and the folder to read the data from when restoring the data to ADTB 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 : \TB_CON\Position\File Name
- Parameter : \TB_CON\Parameter\File Name
- Alarm List : \TB_CON\Alarmlist\File Name

(4) Destination to save parameter data for coordinate confirmation operation mode
The parameter file for ADTB to read out when switching over to the coordinate confirmation operation mode should be stored in the following folder.

- Parameter for ADTB : \TB_CON\Parameter\File Name

(Note)
- *Data in a file name with 33 letters of half-size font characters or more should not be shown in the data list at restore.*
- *Files with Chinese names are not supported.*

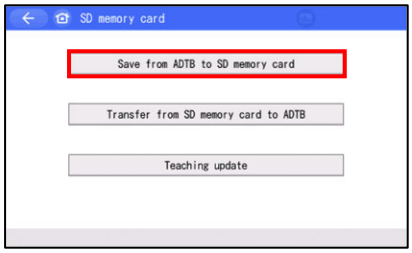
> ⚠ *Caution: For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, Have FAT32 Format for the file system.*

8.3.2.1 ADTB Data Backup

ADTB data is transferred to the Secure Digital memory card for backup.

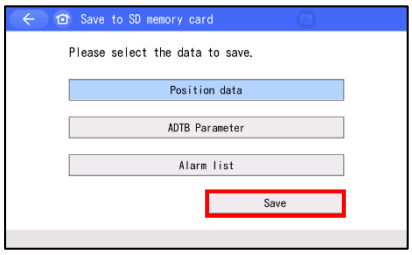


Touch [SD memory card] in Menu 1 screen.



SD memory card screen opens.

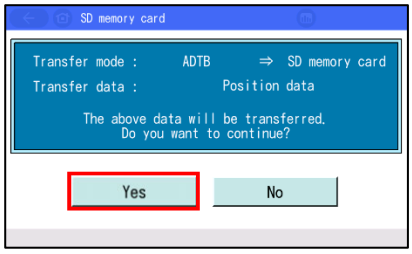
Touch [Save from ADTB to SD memory card].



Save to SD memory card screen opens.

Select the data type for the backup such as [Position data] and touch it. (Multiple selection available)

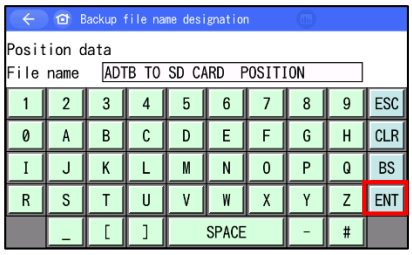
Touch [Save].



A confirmation screen for data to back up should be displayed.

If there is no problem in the selection, touch [Yes].

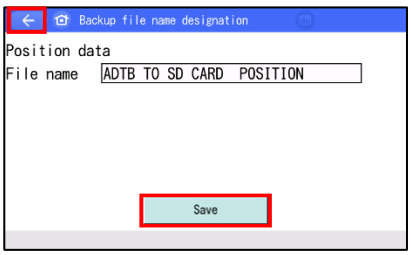
Touch [No], and the screen returns to the previous screen.



A screen to input a backup file name should be displayed.

Input a file name with a keyboard and touch [ENT].

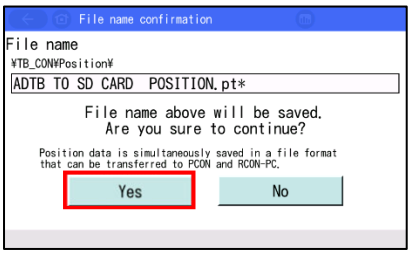
* The file name should be alphanumeric or symbols and the number of characters should be 32 or less.



Backup file name designation screen opens.

If there is no problem in the file name that was input, touch [Save].

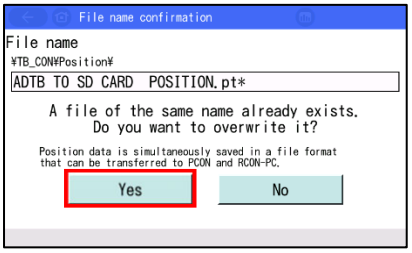
Touch [←] for redoing.



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

If there is no problem in the file name, touch [Yes].

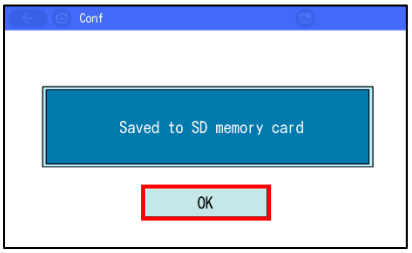
Touch [No] and it returns to a screen to indicate the backup file name with a keyboard.



The screen below appears if the same name is found.

Touch [Yes] if there is no problem to overwrite.

Touch [No] and it returns to a screen to indicate the backup file name with a keyboard.



After a screen for data transfer is shown, a message screen for the data transfer complete should be displayed.

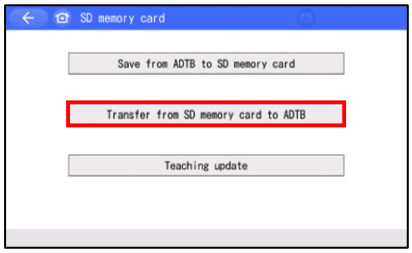
The backup process is finished.
Touch [OK], and the screen returns to Secure Digital Memory Card screen.

8.3.2.2 Restore to ADTB

Data in the Secure Digital Memory card is transferred to ADTB.

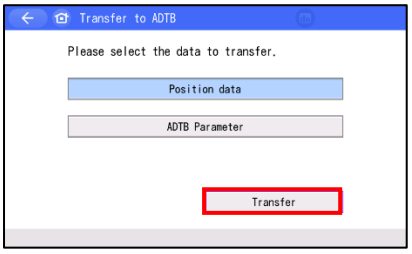


Touch [SD memory card] in Menu 1 screen.



SD memory card screen opens.

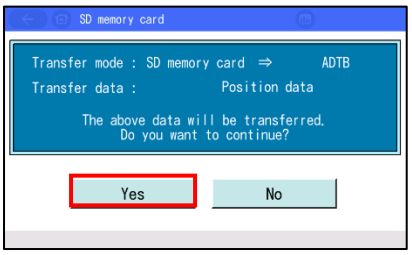
Touch [Transfer from SD memory card to ADTB].



Transfer to ADTB screen opens.

Select the data type to transfer to ADTB, such as [Position data], and touch it. (Multiple selection available)

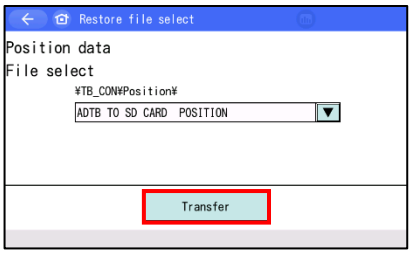
Touch [Transfer].



A confirmation screen for data to be transferred should be shown.

If there is no problem in the selection, touch [Yes].

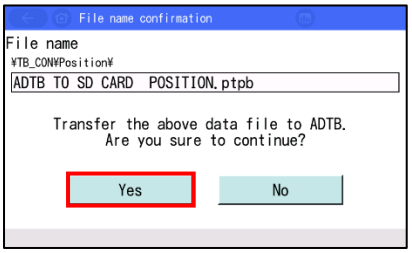
If [No] is touched, the screen goes back to the data backup screen.



Restore file select screen opens.

Touch ▼ to select a file to transfer to ADTB from the list of the backed up file names.

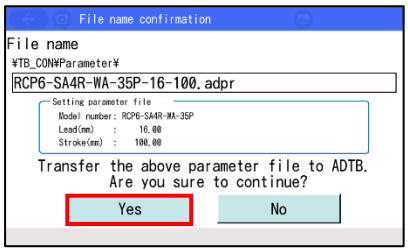
Touch [Transfer].



A confirmation screen for the file name to transfer should appear when the position data is to be transferred.

Touch [Yes] if there is no problem in the selected file.

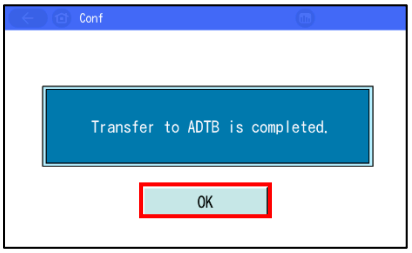
If [No] is touched, the screen goes back to the previous one for the restore file select.



A confirmation screen for the file name to transfer and the parameter setting should appear when the parameter data is to be transferred.

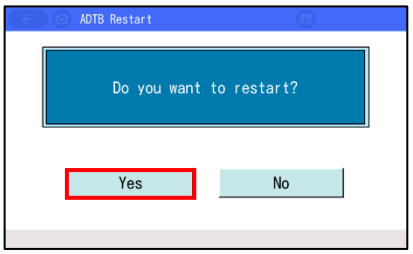
Touch [Yes] if there is no problem in the selected file.

Touch [No] and it should return to the select restore file screen.



After a screen for data transfer is shown, a message screen for the data transfer complete should be displayed.

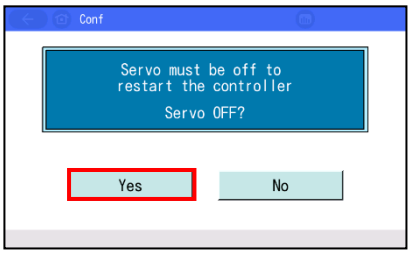
The data transfer to ADTB has completed. Touch [OK].



The screen should return to the one for ADTB transfer when the position data is to be transferred.
The screen for ADTB reboot should be displayed when the parameter data is to be transferred.

Touch [Yes] to execute reboot.

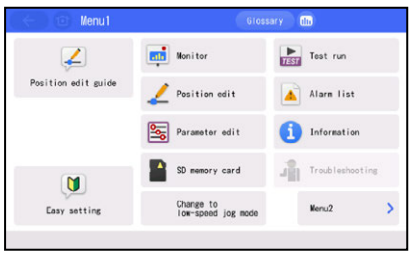
Touch [No] and the screen goes back to that for ADTB transfer.



If the servo is on, a confirmation screen to turn the servo off should be displayed.

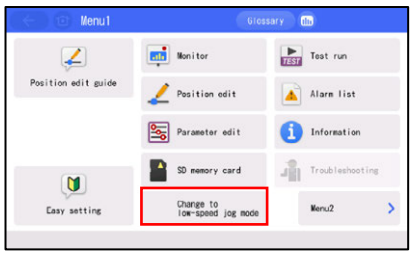
Touch [Yes] to turn the servo off.

Reboot the power.

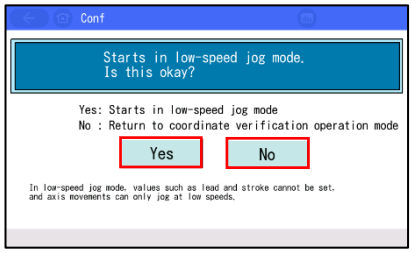


Return to Menu 1 after rebooting.

8.3.3 Transfer to Low Velocity Jog Mode

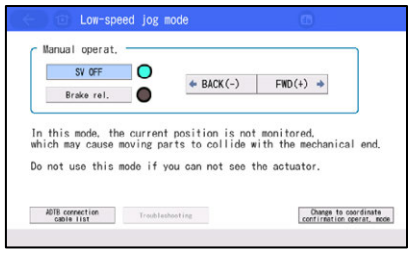


Touch [Change to low-speed jog mode] in Menu 1 screen.



A confirmation screen for low velocity jog mode switchover should be displayed.

[Yes] Should be switched over to the low velocity jog mode.
[No] Return to Menu 1.



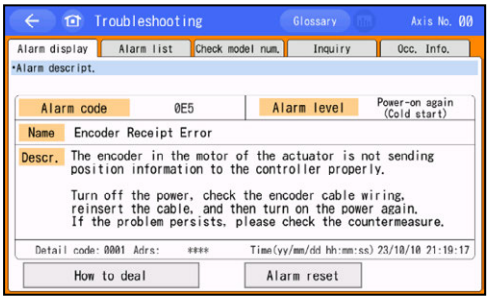
Low-speed jog mode screen opens.

9. Error Display

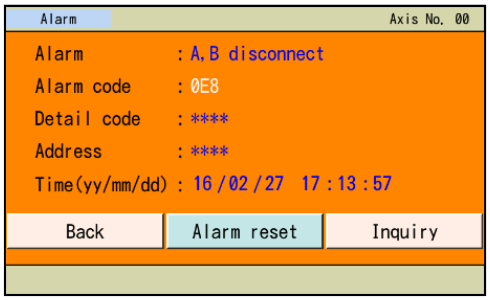
9.1 Occurrence of Alarm

If an alarm occurs, the alarm screen appears.

Controller of the CON System



Controller of the SEP System / MEC System System



9.1.1 Alarms Detected by Controller

Alarms of codes 000 to 0FF, 800 to 8FF and E00 to EFF are those detected by the controller and gateway.
These alarms include major alarms relating to the servo control system, power system, etc. For details on these alarms, refer to the instruction manual for your controller.

If an alarm occurs, remove the cause of each alarm and then perform the following operation.

- To reset operation -cancellation level alarms, touch [Alarm reset] on the alarm screen.
- To reset cold-start level alarms, reconnect the control power.

9.1.2 Messages which Occur when Operating the Touch Panel Teaching Pendant

Codes from 100 to 3FF are messages which occur when operating the touch panel teaching pendant.

- 100 to 1FF: Message level (entry errors, guide messages)
- 200 to 2FF: Operation cancellation level (errors having a disadvantage for operation)
- 300 to 3FF: Cold-start level (which requires re-power-on or reconnection)

The following table shows the list and countermeasures.

Code	Message	Contents, occurring cases, and countermeasures
112	Input data error	An inadequate value was entered in the parameter setting. Retype a proper value with reference to the actuator specification and the parameter list.
s113	Data too small	The input value is smaller than the setting range. Retype a proper value with reference to the actuator specification and the parameter list.
114	Data too large	The input value is bigger than the setting range. Retype a proper value with reference to the actuator specification and the parameter list.

Code	Message	Contents, occurring cases, and countermeasures
115	Not yet Homed	The operation of acquiring the current position was performed under the uncompleted home return in the teaching (display) mode. In first, execute the home return.
117	No position data	The target position is not set to the selected position number. In first, enter a target position.
11E	Unmatched pairdata	Inadequate values were entered in the magnitude relation of the data in a pair. Example: The case in which soft limit+ and limit- are the same on the parameter. Retype a proper value
11F	Value too small	The minimum settable travel to the target position depends on the lead length of the driving system and the resolution of the encoder. If the input target position is smaller than this minimum travel, this message is displayed. Example: If the lead length is 20 mm for the actuators of RCP2 series, since the resolution of the encoder is 800 pulses, the minimum travel is 0.025 mm/pulse (= 20 ÷ 800). In this case, if 0.02 mm is entered in the target position, this alarm occurs.
121	Search value error	The final arrival position exceeds the soft limit due to the push-motion operation. Set a value within the soft limits.
122	Duplicate link	An axis number was allocated despite that more than one axis were connected. Always allocate the axis number only when one axis is connected.
123	Password error	The input value of the system password, position editing password, or position data edit password does not match the setting value. Retype the correct password.
131	Unrecognizable Large Category Code Detected	The software of this teaching tool is not applicable for the connected controller. Updating this teaching tool is necessary. Refer to [10.2 Teaching Update]
132	Detect Undefined Controller	An unsupported controller was recognized. Example: When connected ACON-CA applied from Ver 2.10 in Ver 2.00 Follow the process in [10.2 Teaching Update] to update the software in an applicable version or later. Refer to [Support Models] for the applicable versions.

Code	Message	Contents, occurring cases, and countermeasures
133	Prohibit changing Axis No.	The axis number was changed by the teaching pendant connected to the controller by which the axis number is set with the rotary switch on the front panel. The teaching pendant cannot change the axis number. Change the number by the rotary switch on the front panel.
134	Controller Unsupport Function	The function number to which the controller does not correspond in the user adjustment mode was allocated. Example: If the adjustment number 6 "Load cell calibration execution" is performed to the model which does not support the load cell function.
150	Write-in Prohibited	Writing was attempted to a domain prohibited for write-in. Consult with IAI if the phenomenon would not be improved even with reconnection.
160	SDcard open error	A file in the SDcard could not open. Data backup was attempted without a SDcard inserted. Insert a SDcard.
161	SDcard write error	SDcard cannot be written. Check that the condition is not as follows. ・Free space of the SDcard is insufficient. ・SD card write-protect switch is engaged. ・File is set to the write prohibit property in overwriting. ・An unsupported SDcard is inserted.
162	SDcard read error	A SDcard was not inserted when data restore (transfer) was attempted. Have restore conducted with a SDcard inserted.
164	SDcard file format error	Restore (transfer) of the saved data could not be performed properly. The data saved in the SDcard may be damaged. Save data from the PC to the SDcard again, and try to transfer it. If an error occurs even with it, the original data in the PC should be damaged. Redo the work from backup of the data.
180	Axis No. Change Complete	Messages to confirm the operation (It is not to say any operation mistake or abnormal occurrence) Check the contents, and then press the "←" button on the top left of the screen to return to the original screen.
183	IO-function changed	
184	Data transfer completed	
185	LoadCell calibration completed	
186	Time setting completed	

Code	Message	Contents, occurring cases, and countermeasures
187	Brownout of RTC backup battery	Voltage of the battery inside the teaching pendant is reduced. *(Note)* *Settings for time, languages, and touch operation sound are initialized.* *The message is displayed only in Japanese (the default language).* *Consult us about replacing the battery.*
188	Input warning of below Min. Vel	The speed, which is less than the "minimum speed" that depends on the lead and encoder pulses, was entered in the "speed" of position data. The message is displayed, but entering data is possible. Retype a proper value after the confirmation of the specification, because the movement in less than the minimum speed may cause abnormal noise and vibration.
189	Input warning of over ratings ACC/DCL	An acceleration/deceleration speed, which exceeds the "rated acceleration/deceleration speed" of the actuator connected, was entered in the "acceleration/deceleration speed" of the position data. The message is displayed, but entering data is possible. Retype a proper value after the confirmation of the specification, because the movement in the excess high acceleration/deceleration speed may lead to actuator failures.
18A	Sending Loadcell Invalidation Command at Servo-off	It occurs when the loadcell is invalidated while the servo is on. Invalidate the loadcell after turning the servo off.
202	Stop	The system is stopped on the safety circuit at the equipment side or at the teaching pendant. 1) Turn the stop button on the teaching pendant clockwise and pull it towards you. 2) Set the circuit to have +24V that is output from STOP+ to input to STOP-.
203	MotorPower sag	For the controller of the "external cutout relay type," the motor driving power is not supplied from MPI terminals adequately. *(Note)* *Despite that the proper voltage is applied to MPI terminals, if this error occurs, the controller may be broken down.*
204	ABS-Battery Power sag	ABS battery brownout at power-on was detected. Replace the ABS battery.
205	STO/SS1-t/DRV_STOP	The safety requirement input signal/ The driver stop signal has been input. Insert the dummy plug to the controller when unexpectedly output.

Code	Message	Contents, occurring cases, and countermeasures
207	SS2-t	The safety requirement input signal has been input. Insert the dummy plug to the controller when unexpectedly output.
20A	Servo OFF while moving	1) Movement operation was performed with the servo OFF. 2) Since the servo ON signal (SON) from PLC was turned OFF during the movement operation, the servo was turned OFF and the movement operation became impossible. Turn the servo ON before the operation.
20C	Start ON while moving	The start signal (CSTR) from PLC was turned ON during the movement operation, so the movement command was duplicated. Check the output of the start signal (CSTR) from PLC.
20D	STP OFF while moving	The pause signal (*STP) from PLC was turned OFF during the movement operation, so the operation became impossible. Check the output of the pause signal (*STP) from PLC.
20E	Over soft-limit	It reached the soft limits. Check the settings of the soft limits, and use within the settings.
210	HOME ON while moving	The home return signal (HOME) from PLC was turned ON during the movement operation. Check the output of the home return signal (HOME) from PLC.
211	JOG ON while moving	The jogging movement signal (JOG) from PLC was turned ON during the movement operation. Check the output of the jogging movement signal (JOG) from PLC.

Code	Message	Contents, occurring cases, and countermeasures
212	Operational Command During Drive Cutoff	1) The motor power voltage is at 16.8V or below. Check the supplied motor power voltage. Confirm that the cables for drive source are those with complied cable diameter. [Compatible wire diameter] •Motor drive power supply: AWG20 to 8 (Copper Wire) • Control power: AWG22 or more (Copper Wire) 2) The stop switch at the right top of the front of this tool has been pressed. Turn the stop switch at the right top of the front of this tool to the right to release it. 3) As the equipment is in emergency stop status, +24V cannot be supplied to STOP- in the system I/O connector. Supply +24V to STOP- in the system I/O connector. 4) TB-02D (equipped with a dead man's switch) is connected. Make operation while gripping the dead man's switch. * Operation can be made by retaining middle position of the three positions. 5) An alarm has been generated in the gateway for RCON or REC. Check the alarm code in the gateway unit and remove the cause. 6) There is a communication error occurred in one of the actuators connected to RCON-EC. Unplug the cable connector while the controller power supply is off, confirm that there is no bent on the pins, and insert it again firmly till the end.
213	Suction / Release commands prohibited	Suction / Release command was issued while suction / Release commands are prohibited. • In Suction Command Set the operation status to "Standby" before conducting it. • In Release Command Set the operation status to “Suctioning” before conducting it.
220	Write prohibit (AUTO)	The position data or parameter was written during the AUTO mode. Write them after changing to the teaching mode.
221	Write prohibit (MON)	The position data or parameter was written during the monitor mode. Write them after changing to the teaching mode.

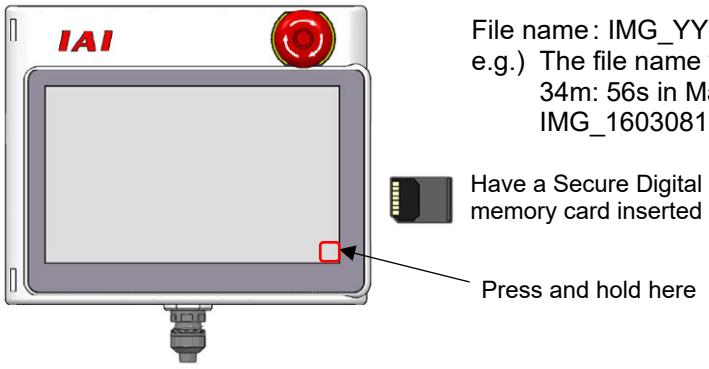
Code	Message	Contents, occurring cases, and countermeasures
222	Move prohibit (AUTO)	The actuator movement was operated during the AUTO mode. Operate the movement after changing to the teaching mode.
223	Move prohibit (MON)	The actuator movement was operated during the monitor mode. Operate the movement after changing to the teaching mode.
224	Data Edit Prohibited Operation Status	It is the operation status that editing data is prohibited. Conduct release to set the operation status to “Standby” before editing.
225	Transmitted message-related error	There was an error while generating a sending message. (e.g.) The version of a teaching pendant is old Program error of a teaching pendant
226	Enable Circuit Open	1) The contact connected to ENB Line is open. Revise the circuit and wirings. 2) The dead man's switch at the back of the main unit is not at the middle position. Grip the dead man's switch till it gets to the middle position. 3) There is an alarm generated in the gateway of R-Unit. Release the alarm of the gateway.
301	Overrun error	Abnormality occurred on the serial communication with the controller 1) The controller connection cable may be open. Check the connection cable for wrong wiring or wire breakage. 2) The controller connection cable connector may be inserted improperly. Securely insert the connection cable connector. 3) Garbled data could occur due to the influence of noise. Review the wiring run, installation, etc. so that the noise does not influence them. 4) In the control of multiple units with the serial communication, the slave station number could be duplicated. Change the number so that the slave station number is not duplicated. If still having trouble, consult us.
302	Framing error	
303	Parity error	
304	SCI Recieve-Que overflow	
305	SCI Send-Que overflow	
306	Recieve-Buffer overflow	
308	Response time out	
30A	Packet Recieve-Que overflow	
30B	Packet Send-Que overflow	

Code	Message	Contents, occurring cases, and countermeasures
30C	Not connected	The axis number of the controller cannot be recognized. 1) The version of the teaching pendant is old and not applicable for the connected controller. Check the latest version in the IAI homepage and have the version updated following the procedures in “9.2 Teaching Update” if the version is old. 2) The controller may not be functioning properly. Check that the RDY lamp of the controller is lighted. If the lamp is not lighted, the controller is broken down. 3) The communication lines (SGA/SGB) of the provided cable could break. Replace to a spare teaching pendant or replace with a PC to see if the problem solves. 4) If a SIO converter is used, the link cable could not be connected, though the power, 24 V, is supplied to the converter. Supply the power after connecting the link cable between the converter and the controller. 5) The same number could be mistakenly set by the ADRS switches under the condition that multiple controllers are connected. Do not duplicate the settings of the ADRS switches. If still having trouble, consult us.
30D	Recieve exept responce	The abnormal response was returned from the controller. (This may be a temporary abnormality caused by noise, etc.) If the condition occurs frequently, check the cables, noise elimination measures taken on the power supply, etc.
320	Both CON and SEP are detected	CON-related and SEP-related controllers are on the same communication line. (e.g.) Axis number 0: PCON-CA, Axis number 1: if PSEP is linked

10. Appendix

10.1 Screenshot

The capture of the displayed screen (screenshot) can be saved in the Secure Digital memory card.
When capturing a screenshot, press and hold on the right bottom of the screen for approximately two seconds while a Secure Digital memory card is inserted.
After making a “pip” sound, screenshot saving process starts. (The sound will not be made if the touch operation sound is set off.) The saved file name will be displayed on the screen for three seconds when the saving is complete.



File name: IMG_YYMMDDHHMMSS.bmp
e.g.) The file name when process has started at 12h: 34m: 56s in March 8, 2016
IMG_160308123456.bmp (751KB)

Domain to Save Data (cannot be changed)
The domain that the screenshot data is saved is the folder stated below in a Secure Digital memory card.
\TB_CON\ScreenShot\FileName

[Caution]
1. The saving process takes approximately 10 seconds at the maximum.
2. During the saving process, the monitor display (such as the current position) on the screen does not get updated.
3. There are some windows that you cannot get screenshots.

> ⚠ *Warning: As keys do not work on the screen during saving process, **emergency stop will not work by keys**. Do not attempt to use this feature when an actuator is operated (continuous movement, simple program, etc.) from the teaching.*

10.2 Teaching Update

The software in TB-02 can be updated using a SD memory card.
Also, in case the menu window of TB-02 would not be displayed due to a failure in updating for reasons such as the power got shut during updating process, it is available to make a recovery by having a compulsory update.

(Note) This update should update the software of TB-02.
It should not update the softwares of ELECYLINDER or each controller.
This update should update all the softwares of TB-02 for ELECYLINDER (for wireless link and wired link)/ROBO PUMP/CON/SEP/MEC/SEL regardless of connection status.
Update takes approximately 35 minutes.

Normal Update

- ELECYLINDER : Perform “10.2.1 How to Update when ELECYLINDER and ROBO PUMP Connected”
- ROBO PUMP : Perform “10.2.1 How to Update when ELECYLINDER and ROBO PUMP Connected”
- CON System : Perform “10.2.2 How to Update when CON System Controller Connected”
- SEP System : Perform “10.2.3 How to Update when SEP System Controller Connected”
- MEC System : Perform “10.2.4 How to Update when MEC System Controller Connected”
- When Alarm Generated : Perform “10.2.5 How to Update when Alarm Code 30C Displayed”

Compulsory Update : Perform “10.2.6 How to Compulsorily Update (in Common for All Models)”

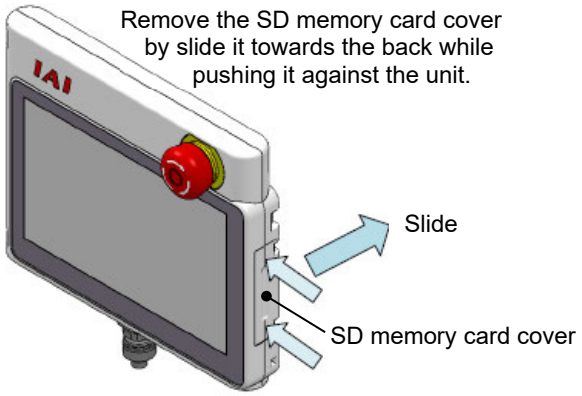
◆Preparation

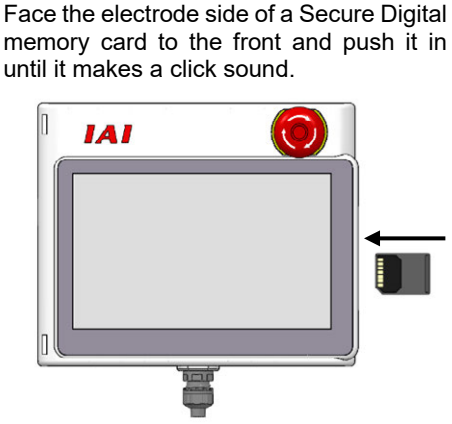
Preparation 1 Prepare a Secure Digital memory card or a Secure Digital High-Capacity memory card with 1GB to 32GB formatted in FAT32 (hereafter described as a Secure Digital memory card).

Preparation 2 Access homepage http://www.iai-robot.co.jp/download/tb-02/ and download the TB-02 update file TB02_$$$.zip and unzip it. ($$$ should be replaced by the version number in three digits)

Preparation 3 Copy the unzipped update file TB02_$$$.pct to the root folder of the Secure Digital memory card. ($$$ should be replaced by the version number in three digits)
(Note) Update cannot be conducted if there are two or more update files in the root folder.

Preparation 4 Take the SD memory card cover off, and insert a SD memory card while the power to TB-02 is off.



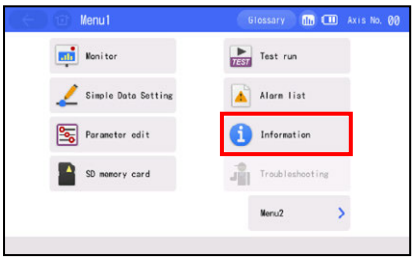


Preparation 5 Supply power to the controller to which TB-02 is connected and start up TB-02.

10.2.1 How to Update when ELECYLINDER and ROBO PUMP Connected

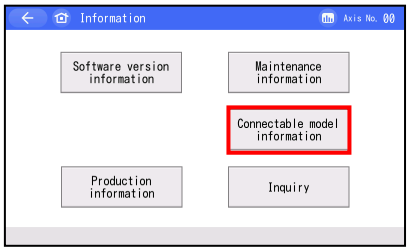
(Note) Refer to “10.2.5 No Connected Axis Error (Alarm Code 30C)” if Alarm Code 30 gets shown after the power is turned on.

[Step 1] Perform from Preparation 1 to Preparation 5 in “10.2 ◆Preparation”.



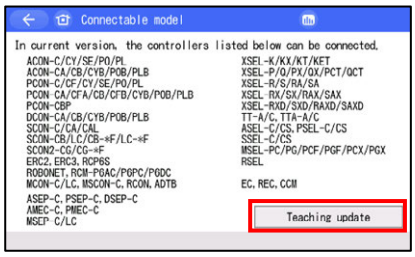
[Step 2]

Touch [Information] in Menu 1 window.



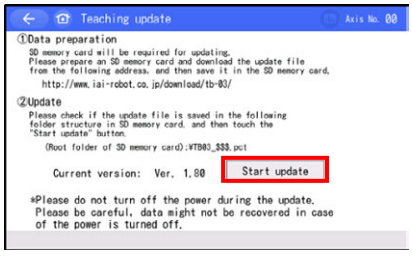
[Step 3]

Touch [Connectable model information].



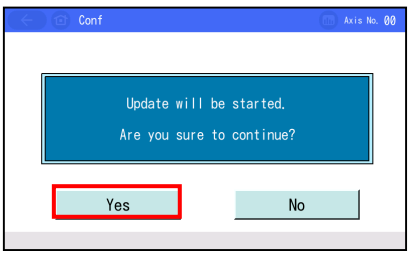
[Step 4]

Touch [Teaching update].
The image on the left may differ from the latest version.



[Step 5]

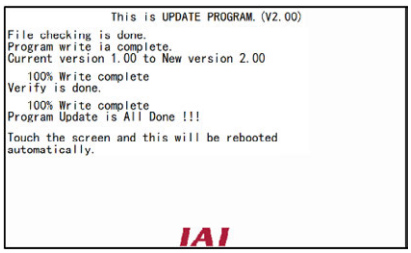
Touch [Start update].



[Step 6]

The updating confirmation window shows up.

Touch [Yes].



[Step 7]

Start updating.

Touch the screen after you confirm the following messages;
“Program Update is All Done!!!”
“Touch the screen and this will be rebooted automatically.”
* There may be a case that the black and white are in opposite depending on the version of the software.

TB-02 will start up in the new version.

> ⚠ *Caution: Do not attempt to turn off the power to TB-02 while in updating.*

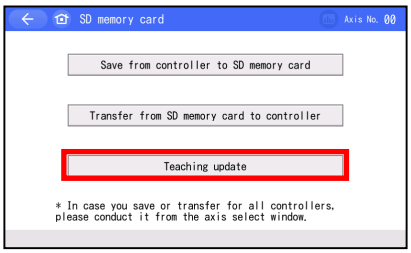
It is also available to perform by touching [SD Memory Card] → [Teaching update] in Menu 1 window.

[Step 1] Perform from Preparation 1 to Preparation 5 in “10.2 ◆Preparation”.



[Step 2]

Touch [SD memory card] in Menu 1 window.



[Step 3]

Touch [Teaching update].

[Step 4] Perform procedures from [Step 5] and after in the previous page.

10.2.2 How to Update when CON System Controller Connected

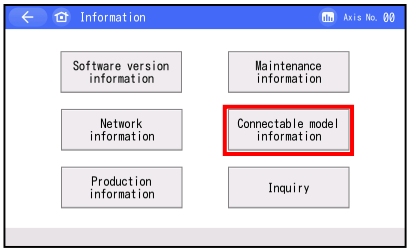
(Note) Refer to "10.2.5 No Connected Axis Error (Alarm Code 30C)" if Alarm Code 30 gets shown after the power is turned on.

[Step 1] Perform from Preparation 1 to Preparation 5 in "10.2 ◆Preparation".



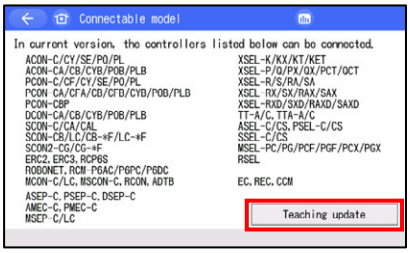
[Step 2]

Touch [Information] in Menu 1 window.



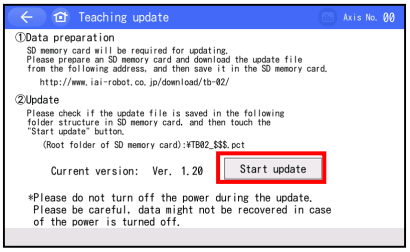
[Step 3]

Touch [Connectable model information].



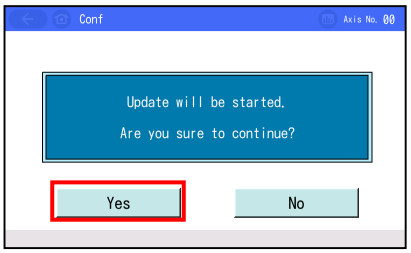
[Step 4]

Touch [Teaching update].
The image on the left may differ from the latest version.



[Step 5]

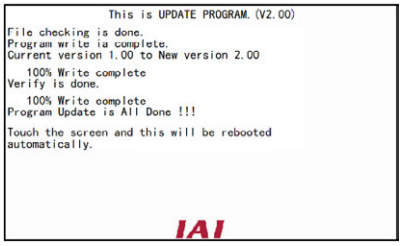
Touch [Start update].



[Step 6]

The updating confirmation window shows up.

Touch [Yes].



[Step 7]

Start updating.

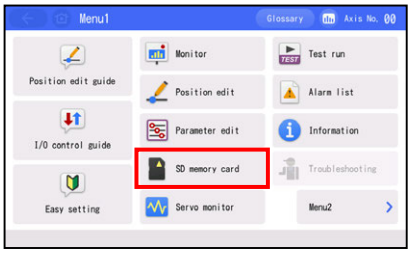
Touch the screen after you confirm the following messages;
"Program Update is All Done!!!"
"Touch the screen and this will be rebooted automatically."
* There may be a case that the black and white are in opposite depending on the version of the software.

TB-02 will start up in the new version.

Caution: Do not attempt to turn off the power to TB-02 while in updating.

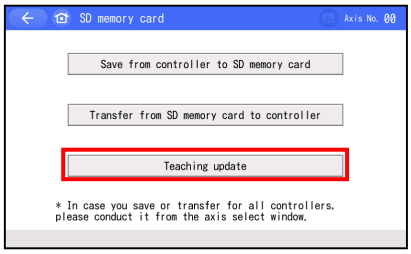
It is also available to perform by touching [SD Memory Card] → [Teaching update] in Menu 1 window.

[Step 1] Perform from Preparation 1 to Preparation 5 in "10.2 ◆Preparation".



[Step 2]

Touch [SD memory card] in Menu 1 window.

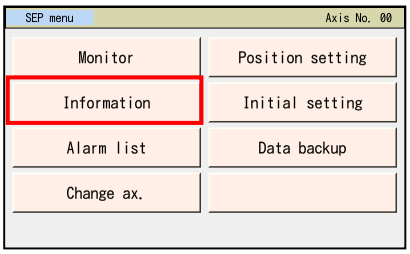


[Step 3] Touch [Teaching update]

[Step 4] Perform procedures from [Step 5] and after in the previous page.

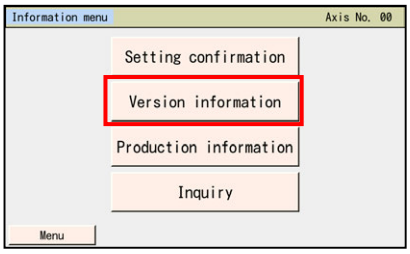
10.2.3 How to Update when SEP System Controller Connected

[Step 1] Perform from Preparation 1 to Preparation 5 in “10.2 ◆Preparation”.



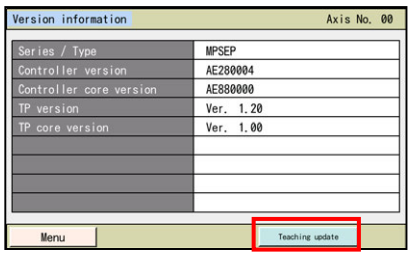
[Step 2]

Touch [Information] in SEP Menu window.



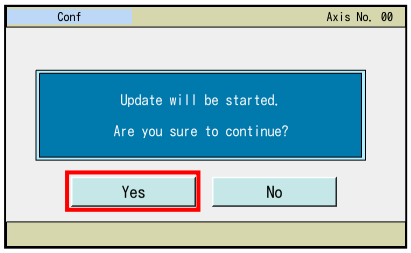
[Step 3]

Touch [Version information].



[Step 4]

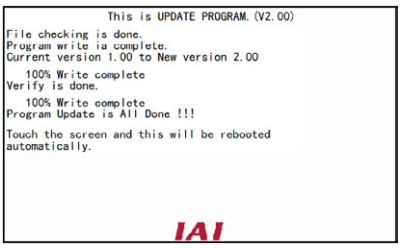
Touch [Teaching update].



[Step 5]

The updating confirmation window shows up.

Touch [Yes].



[Step 6]

Start updating.

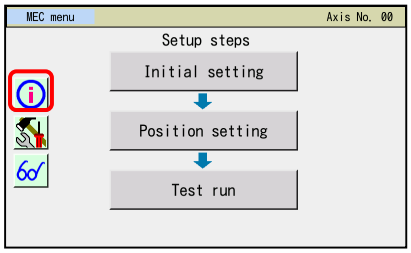
Touch the screen after you confirm the following messages;
“Program Update is All Done!!!”
“Touch the screen and this will be rebooted automatically.”
* There may be a case that the black and white are in opposite depending on the version of the software.

TB-02 will start up in the new version.

⚠ *Caution: Do not attempt to turn off the power to TB-02 while in updating.*

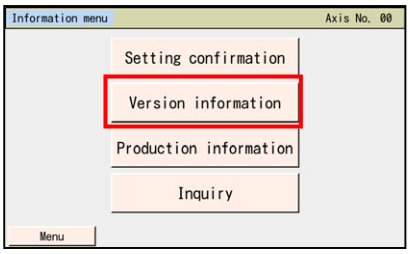
10.2.4 How to Update when MEC System Controller Connected

[Step 1] Perform from Preparation 1 to Preparation 5 in “10.2 ◆Preparation”.



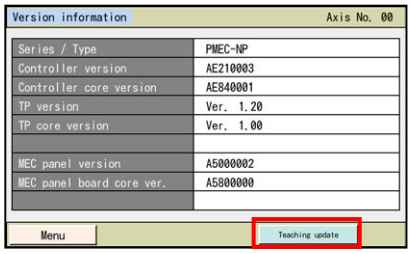
[Step 2]

Touch in MEC Menu window.



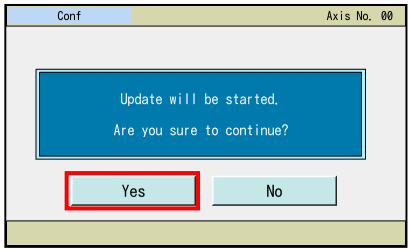
[Step 3]

Touch [Version information].



[Step 4]

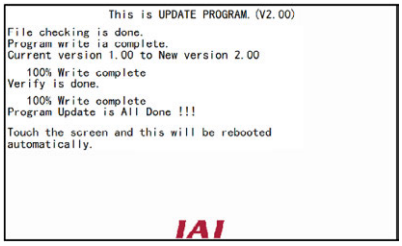
TouCCh [Teaching update].



[Step 5]

The updating confirmation window shows up.

Touch [Yes].



[Step 6]

Start updating.

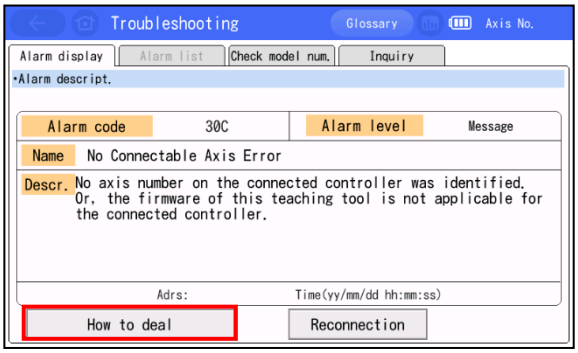
Touch the screen after you confirm the following messages;
“Program Update is All Done!!!”
“Touch the screen and this will be rebooted automatically.”
* There may be a case that the black and white are in opposite depending on the version of the software.

TB-02 will start up in the new version.

⚠ *Caution: Do not attempt to turn off the power to TB-02 while in updating.*

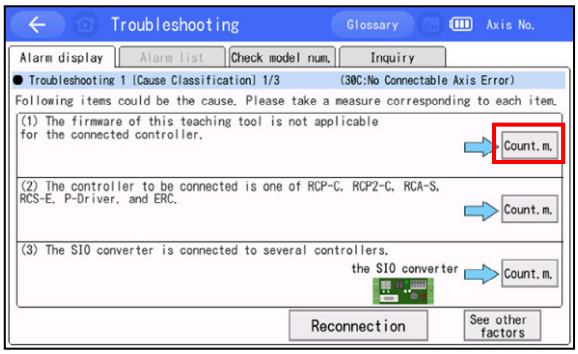
10.2.5 How to Update when Alarm Code 30C Displayed

[Step 1] Perform from Preparation 1 to Preparation 5 in “10.2 ◆Preparation”.



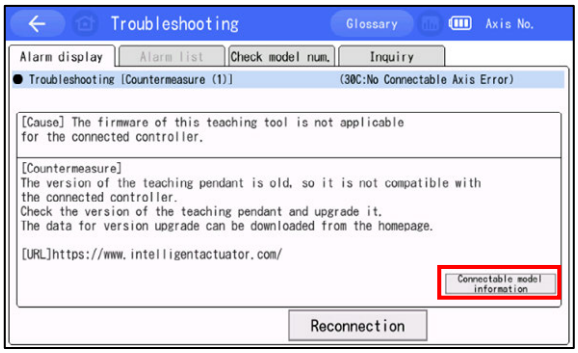
[Step 2]

While the alarm display window (Alarm: 30C) is being displayed, touch [How to deal].



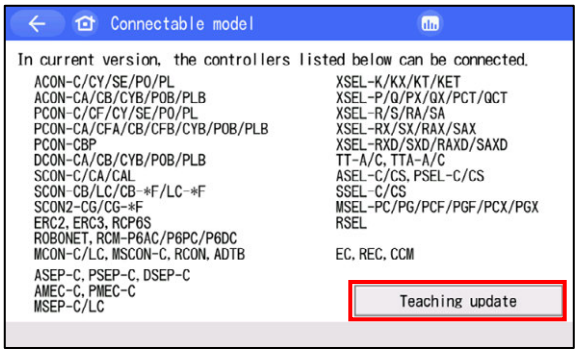
[Step 3]

Touch an applicable [Count.m].



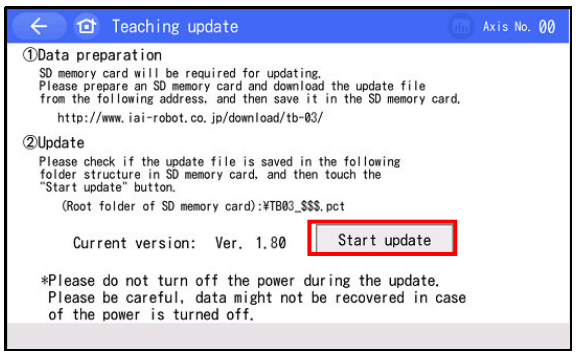
[Step 4]

Touch [Connectable model information].



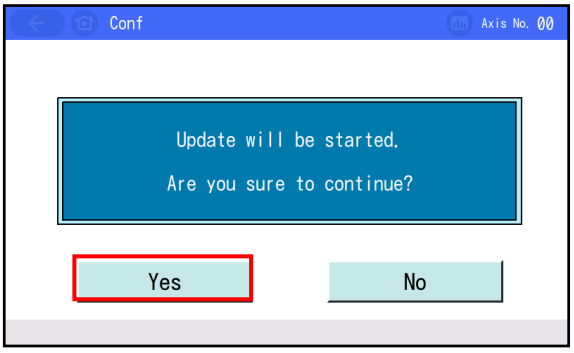
[Step 5]

Touch [Teaching update].
The image on the left may differ from the latest version.



[Step 6]

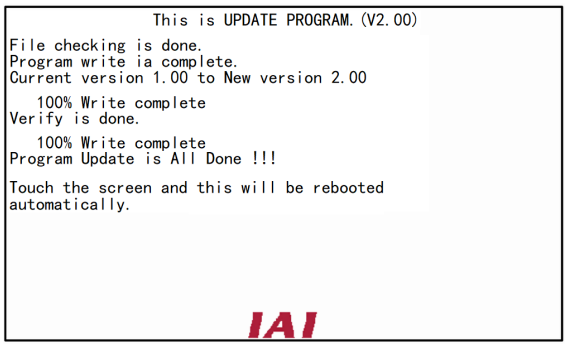
Touch [Start update].



[Step 7]

The updating confirmation window shows up.

Touch [Yes].



[Step 8]

Start updating.

Touch the screen after you confirm the following messages;
“Program Update is All Done !!!”
“Touch the screen and this will be rebooted automatically.”

* There may be a case that the black and white are in opposite depending on the version of the software.

TB-02 will start up in the new version.

⚠ *Caution: Do not attempt to turn off the power to TB-02 while in updating.*

10.2.6 How to and Compulsorily Update (in Common for All Models)

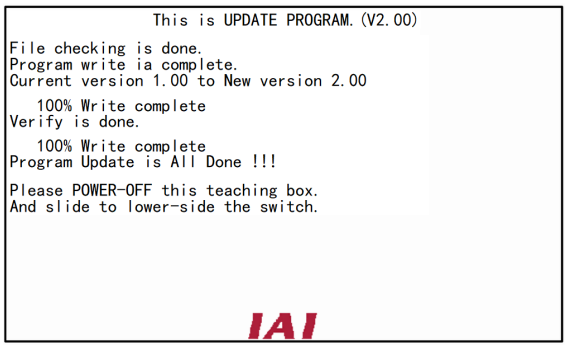
Follow the procedures below to update again in case the menu window of TB-02 would not be displayed due to a failure in updating for reasons such as the power got shut during updating process.

[Step 1] Perform from Preparation 1 to Preparation 4 in “10.2 ◆Preparation”.
(Turning the power on in Preparation 5 should be performed in [Step 3].)

[Step 2] Slide the update setting switch on the SD memory card slot (hereafter described as SW1) upward (to the side opposite the SD memory card slot).

[Step 3] Follow Preparation 5 in “10.2 ◆Preparation” to turn on the power to TB-02.
Once the power gets supplied, updating process starts without any confirmation window.

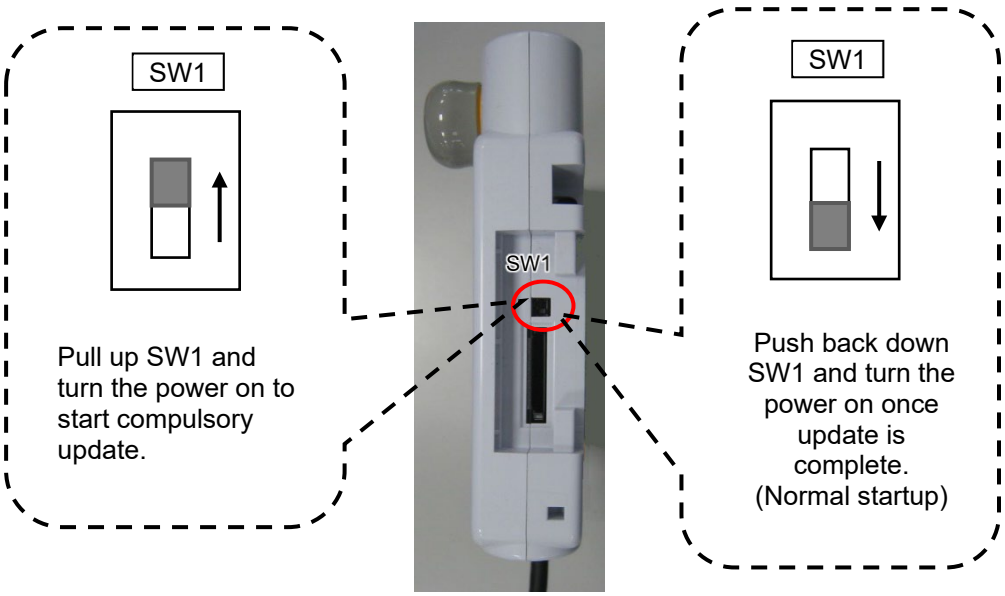
[Step 4] Once the update is complete, a window showing “Program Update is All Done !!!” appears.



* There may be a case that the black and white are in opposite depending on the version of the software.

[Step 5] Shut (turn off) the power slide SW1 downwards (towards the SD memory card), and then supply (turn on) the power again.

TB-02 will start up in the new version.

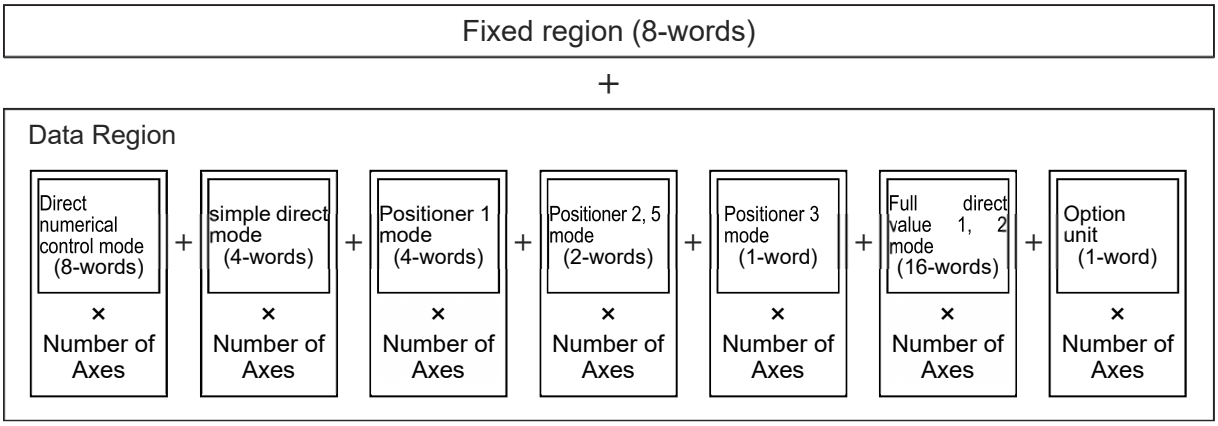


10.2.7 Troubleshooting

Condition	Considerable Cause	Check Items and Counteractions
[Teaching Update] or [Start Updating] is not active (grayed out) and cannot touch it.	1. No memory card is inserted (or can be identified). 2. There is no update file found in the route folder of the memory card. 3. There are several update files found in the route folder of the memory card.	1. Make sure that a SD memory card with 1GB to 32GB capacity formatted in FAT32 is firmly inserted. 2.3. Check that there is one file existed in the route folder of the memory card named “TB02_$$$.pct” (three digits of version number come in $$$).
Display appears stating “Software is not installed.” when the power gets turned on.	Software in normal condition is not written due to a reason such as failure in update.	Perform compulsory update. Refer to [10.2.6 How to and Compulsorily Update]
Display appears stating “File Format Error (Check sum Error)” at the start of update.	“TB02_$$$.pct” saved in the memory card is either not an update file or destroyed.	Save the update file again and try updating again.
Display appears stating “SD Card Access NG !!! ” at the start of update.	The memory card is inappropriate.	Try another memory card and update.
There is nothing shown on the screen after more than 1 minute passed after the update has started.	It is a phenomenon found in some memory cards.	[Process for Recovery] 1. Take out the memory card. 2. Turn the power off. 3. Conduct the compulsory update. Refer to [9.2.6 How to and Compulsorily Update]
Display appears stating “Update_Appl_WrteFROM NG !!!” during updating process.	The memory card was taken out during updating process.	Do not attempt to take out the memory card till updating is complete.
Display appears stating “SD Card Not Inserted !!!” at the start of compulsory update.	No memory card is inserted (or can be identified).	Make sure that a SD memory card with 1GB to 32GB capacity formatted in FAT32 is firmly inserted.
Display appears stating “File not found. !!! ” at the start of compulsory update.	1. There is no update file found in the route folder for the memory card. 2. There are several update files found in the route folder of the memory card.	Check that there is one file existed in the route folder of the memory card named “TB02_$$$.pct” (three digits of version number come in $$$).

10.3 RCON Address Configuration

The RCON address configuration is the same for all driver units regardless of field network type. The addresses occupied by the network consist of eight words of the fixed domains, data domains that vary depending on the operation mode and number of axes and the data domains for the EC connection unit. Each operation mode and occupied data region is as follows.
Direct numerical control mode, simple direct mode and positioner 1 to 3 and 5 modes can be mixed for use and the model for each axis can be selected arbitrarily.
It is not available to select an operation mode in the EC connection unit.



10.3.1 Fixed region configuration

	PLC output ⇒ RCON			RCON ⇒ PLC input		
	High byte	**Low byte**	**Word count**	**High byte**	**Low byte**	**Word count**
Gateway control region	Gateway control signal 0		2	Gateway status signal 0		2
	Gateway control signal 1			Gateway status signal 1		
Power supply unit region *	Not available.		6	Power supply unit status signal 0		6
	Not available.			Power supply unit status signal 1		
	Not available.			Power supply unit status signal 2		
	Not available.			Power supply unit status signal 3		
	Not available.			Power supply unit status signal 4/ Light malfunction maintenance signal (Note1)		
	Not available.			Not available.		

* Occupied as a data region even if a power supply unit is not connected.
Note 1: This signal can change the feature by switchover in the gateway parameter.

10.3.2 Data region configuration

(1) Direct numerical control mode data region configuration

	PLC output ⇒ each axis input			Each axis output ⇒ PLC input		
	High byte	**Low byte**	**Word count**	**High byte**	**Low byte**	**Word count**
Direct specified region	Specified position data (L) *		2	Present position data (L) *		2
	Specified position data (H) *			Present position data (H) *		
	Specified positioning width (L) *		2	Present current value (L) * (Note 1)		2
	Specified positioning width (H) *			Present current value (H) * (Note 1)		
	Specified speed		1	Present speed data		1
	Specified acceleration/deceleration		1	Not available.		1
	Pushing current limit value		1	Alarm code		1
Control signal region	Control signal		1	Status signal		1

* (L) is the low word of a 2-word datum while (H) is the high word of a 2-word datum.
Note 1: The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON series).

(2) Simple direct mode data region configuration

	Each axis output ⇒ PLC input					
	High byte	**Low byte**	**Word count**	**High byte**	**Low byte**	**Word count**
Position data specified region	Specified position data (L)		2	Present position data (L)		2
	Specified position data (H)			Present position data (H)		
Position specified region	Command position No.		1	Completed position No.		1
Control signal region	Control signal		1	Status signal		1

* (L) is the low word of a 2-word datum while (H) is the high word of a 2-word datum.

(3) Positioner 1 mode data region configuration

	PLC output ⇒ each axis input					
	High byte	**Low byte**	**Word count**	**High byte**	**Low byte**	**Word count**
Position data specified region	Reserve		2	Present position data (L)		2
	Reserve			Present position data (H)		
Position specified region	Command position No.		1	Completed position No.		1
Control signal region	Control signal		1	Status signal		1

* (L) is the low word of a 2-word datum while (H) is the high word of a 2-word datum.
* Positioner 1 mode does not use the position data specified region (PLC ⇒ each axis input), but it is occupied as a data region.

(4) Positioner 2 mode data region configuration

	High byte	Low byte	Word count	High byte	Low byte	Word count
Position specified region	Command position No.		1	Completed position No.		1
Control signal region	Control signal		1	Status signal		1

(5) Positioner 3 mode data region configuration

	High byte	Low byte	Word count	High byte	Low byte	Word count
Control signal region	Control signal	Command position No.	1	Status signal	Completed position No.	1

(6) Positioner 5 mode data region configuration

	High byte	Low byte	Word count	High byte	Low byte	Word count
Position specified region	Command position No.		1	Present position data (0.1 mm increments)		1
Control signal region	Control signal		1	Status signal		1

(7) Full direct value mode

PLC output ⇒ each axis input

High byte	Low byte	Word count
Target Position (L)*		2
Target Position (H)*		
Positioning Width (L)*		2
Positioning Width (H)*		
Speed (L)*		2
Speed (H)*		
Zone boundary +(L)*		2
Zone boundary +(H)*		
Zone boundary -(L)*		2
Zone boundary -(H)*		
Acceleration		1
Deceleration		1
Pressing Current Limit Value		1
Load Current Threshold		1
Control Signal 1		1
Control Signal 2		1

Each axis output ⇒ PLC input

High byte	Low byte	Word count
Current Position (L)		2
Current Position (H)		
Command Current (L)		2
Command Current (H)		
Current Speed (L)		2
Current Speed (H)		
Alarm Code		1
Overload Level Monitor		1
Reserved		1
Reserved		1
Total Moving Count (L)		2
Total Moving Count (H)		
Total Moving Distance (L)		2
Total Moving Distance (H)		
Status Signal 1		1
Status Signal 2		1

* (L) is the low word of a 2-word datum while (H) is the high word of 2-word datum.

(8) Full direct value 2 mode

PLC output ⇒ each axis input

High byte	Low byte	Word count
Target Position (L)*		2
Target Position (H)*		
Positioning Width (L)*		2
Positioning Width (H)*		
Speed (L)*		2
Speed (H)*		
Zone boundary +(L)*		2
Zone boundary +(H)*		
Zone boundary -(L)*		2
Zone boundary -(H)*		
Acceleration		1
Deceleration		
Pressing Current Limit Value		1
Load Current Threshold		1
Control Signal 1		1
Control Signal 2		1

Each axis output ⇒ PLC input

High byte	Low byte	Word count
Current Position (L)		2
Current Position (H)		
Command Current (L)		2
Command Current (H)		
Current Speed (L)		2
Current Speed (H)		
Alarm Code		1
Overload Level Monitor		1
Current Command Value (L)		2
Current Command Value (H)		
Estimated Regenerative Discharged Electric Energy (L)		2
Estimated Regenerative Discharged Electric Energy (H)		
Total Moving Distance (L)		2
Total Moving Distance (H)		
Status Signal 1		1
Status Signal 2		1

* (L) is the low word of a 2-word datum while (H) is the high word of a 2-word datum.

(9) EC connection unit/e-wiring system connection unit data region configuration

	High byte	Low byte	Word count	High byte	Low byte	Word count
Control signal region	Control signal (for four axes).		1	Status signal (for four axes)		1

(10) PIO/SIO/SCON expansion unit/PIO unit data region configuration

	High byte	Low byte	Word count	High byte	Low byte	Word count
Control signal region	Input signal (PLC → Controller)		1	Output signal (Controller → PLC)		1

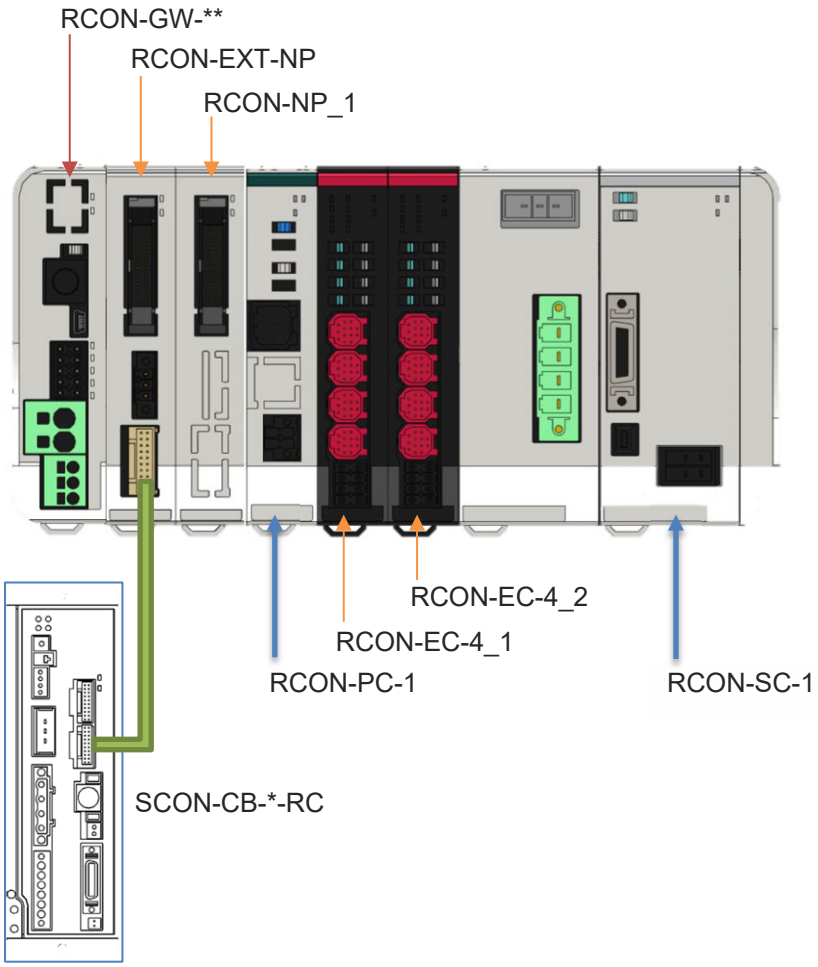
10.3.3 Address assignment order and occupied domains calculation

Here explains how to figure out the address assignment order and occupied domains.

The following shows the assignment order.

1. RCON Gateway Unit
2. 24V Driver Unit
3. 200V Driver Unit
4. Connected to SCON expansion connector SCON-CB-*-RC
5. Option Unit (*1)
6. EC Connection Unit

Configuration example:



In the example of the RCON system construction described in the previous page, the order of assignment should be as shown below.

PLC → RCON system	RCON system → PLC
GW control (2W)	GW control (2W)
Reserve (6W)	Power supply unit status or Light malfunction maintenance signal (5W)
	Reserve (1W)
Axis number 1 control (RCON-PC-1)	Axis number 1 status (RCON-PC-1)
Axis number 2 control (RCON-SC-1)	Axis number 2 status (RCON-SC-1)
Axis number 3 control (SCON-CB-*-RC)	Axis number 3 status (SCON-CB-*-RC)
Option unit 0 control (RCON-EXT-NP)	Option unit 0 status (RCON-EXT-NP)
Option unit 1 control (RCON-NP)	Option unit 1 status (RCON-NP)
Option unit 2 control (RCON-EC-4_1)	Option unit 2 status (RCON-EC-4_1)
Option unit 3 control (RCON-EC-4_2)	Option unit 3 status (RCON-EC-4_2)

*1 There are option units assignment should be made in order close to RCON gateway unit.

Complement: The order of the driver unit assignment should be able to be changed by setting up the gateway parameters.
The operation mode of the driver unit is capable of setting up for each axis.

⚠ *Caution: There are option units assignment should be made in order close to RCON gateway unit. Swapping in the software is not available.*

10.3.4 Overall address configuration example

Here shows an example for the overall address configuration when four-word mode axes (Simple Direct / Positioner 1) are connected for 12 axes, eight-word mode axes (Direct Indication) for two axes are connected, and also the overall address configuration when two-word mode axes (Positioner 2 / Positioner 5) for 12 axes and one unit of the EC connection unit are connected.
Note that CC-Link and DeviceNet are assigned with word addresses while PROFIBUS uses byte addresses.

[For CC-Link]
The following page shows a CC-Link configuration example.
Fixed 8-word region is assigned to the bit register (RX/RY), while the region for each axis is assigned to the word register (RWr/RWw).

■ CC-Link overall address configuration example (direct numerical control mode + simple direct mode/positioner 1 mode) shows direct numerical control mode connection for 2 axes and simple direct or positioner 1 mode connection for 12 axes.

PLC output ⇒ RCON

Output register	High byte	Low byte
RY0F to 00	Gateway control signal 0	
RY1F to 10	Gateway control signal 1	
RY2F to 20	(Not available)	
RY3F to 30	(Not available)	
RY4F to 40	(Not available)	
RY5F to 50	(Not available)	
RY6F to 60	(Not available)	
RY7F to 70	(Not available)	

RCON ⇒ PLC input

Input register	High byte	Low byte
RX0F to 00	Gateway status signal 0	
RX1F to 10	Gateway status signal 1	
RX2F to 20	Power supply unit status signal 0	
RX3F to 30	Power supply unit status signal 1	
RX4F to 40	Power supply unit status signal 2	
RX5F to 50	Power supply unit status signal 3	
RX6F to 60	Power supply unit status signal 4/ Light malfunction maintenance signal	
RX7F to 70	(Not available)	

8 words each
Fixed region

(*1)

PLC master extended cyclic settings	Output register		Input register	
16-word 1x multiplier (*2)	RWw 00H	(Axis 0) Specified position data (L)	RWr 00H	(Axis 0) Present position data (L)
	RWw 01H	(Axis 0) Specified position data (H)	RWr 01H	(Axis 0) Present position data (H)
	RWw 02H	(Axis 0) Command position No.	RWr 02H	(Axis 0) Completed position No.
	RWw 03H	(Axis 0) Control signal	RWr 03H	(Axis 0) Status signal
	RWw 04H	(Axis 1) Specified position data (L)	RWr 04H	(Axis 1) Present position data (L)
	RWw 05H	(Axis 1) Specified position data (H)	RWr 05H	(Axis 1) Present position data (H)
	RWw 06H	(Axis 1) Command position No.	RWr 06H	(Axis 1) Completed position No.
	RWw 07H	(Axis 1) Control signal	RWr 07H	(Axis 1) Status signal
	RWw 08H	(Axis 2) Specified position data (L)	RWr 08H	(Axis 2) Present position data (L)
	RWw 09H	(Axis 2) Specified position data (H)	RWr 09H	(Axis 2) Present position data (H)
	RWw 0AH	(Axis 2) Command position No.	RWr 0AH	(Axis 2) Completed position No.
	RWw 0BH	(Axis 2) Control signal	RWr 0BH	(Axis 2) Status signal
	RWw 0CH	(Axis 3) Specified position data (L)	RWr 0CH	(Axis 3) Present position data (L)
	RWw 0DH	(Axis 3) Specified position data (H)	RWr 0DH	(Axis 3) Present position data (H)
	RWw 0EH	(Axis 3) Command position No.	RWr 0EH	(Axis 3) Completed position No.
	RWw 0FH	(Axis 3) Control signal	RWr 0FH	(Axis 3) Status signal
32-word 4x multiplier setting 2 stations	⋮	⋮	⋮	⋮
	RWw 1FH	(Axis 7) Control signal	RWr 1FH	(Axis 7) Status signal
	⋮	⋮	⋮	⋮
	RWw 2FH	(Axis 11) Control signal	RWr 2FH	(Axis 11) Status signal
64-word 8x multiplier	RWw 30H	(Axis 12) Specified position data (L)	RWr 30H	(Axis 12) Present position data (L)
	RWw 31H	(Axis 12) Specified position data (H)	RWr 31H	(Axis 12) Present position data (H)
	RWw 32H	(Axis 12) Specified positioning width (L)	RWr 32H	(Axis 12) Present current value (L)
	RWw 33H	(Axis 12) Specified positioning width (H)	RWr 33H	(Axis 12) Present current value (H)
	RWw 34H	(Axis 12) Specified speed	RWr 34H	(Axis 12) Present speed data
	RWw 35H	(Axis 12) Specified acceleration/deceleration	RWr 35H	(Not available)
	RWw 36H	(Axis 12) Pushing current limit value	RWr 36H	(Axis 12) Alarm code
	RWw 37H	(Axis 12) Control signal	RWr 37H	(Axis 12) Status signal
	RWw 38H	(Axis 13) Specified position data (L)	RWr 38H	(Axis 13) Present position data (L)
	RWw 39H	(Axis 13) Specified position data (H)	RWr 39H	(Axis 13) Present position data (H)
	RWw 3AH	(Axis 13) Specified positioning width (L)	RWr 3AH	(Axis 13) Present current value (L)(*3)
	RWw 3BH	(Axis 13) Specified positioning width (H)	RWr 3BH	(Axis 13) Present current value (H)
	RWw 3CH	(Axis 13) Specified speed	RWr 3CH	(Axis 13) Present speed data
	RWw 3DH	(Axis 13) Specified acceleration/deceleration	RWr 3DH	(Not available)
	RWw 3EH	(Axis 13) Pushing current limit value	RWr 3EH	(Axis 13) Alarm code
	RWw 3FH	(Axis 13) Control signal	RWr 3FH	(Axis 13) Status signal

4 words each
Positioner 1
/simple direct
mode

8 words each
Direct numerical
control mode

*1 Extended cyclic settings are performed based on the occupancy information displayed with the gateway parameter configuration tool.

*2 Operation is also possible with CC-Link Ver.1.10 if extended cyclic 1x multiplier settings (4 stations occupied) are within the usable range.

*3 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

■ CC-Link overall address configuration example (positioner 2 mode + EC Connection Unit)
This is an example for connection of 12 axes of positioner 2 axes and one unit of the EC connection unit (for four axes).

PLC output ⇒ RCON

Output register	High byte	Low byte
RY0F to 00	Gateway control signal 0	
RY1F to 10	Gateway control signal 1	
RY2F to 20	(Not available)	
RY3F to 30	(Not available)	
RY4F to 40	(Not available)	
RY5F to 50	(Not available)	
RY6F to 60	(Not available)	
RY7F to 70	(Not available)	

RCON ⇒ PLC input

Input register	High byte	Low byte
RX0F to 00	Gateway status signal 0	
RX1F to 10	Gateway status signal 1	
RX2F to 20	Power supply unit status signal 0	
RX3F to 30	Power supply unit status signal 1	
RX4F to 40	Power supply unit status signal 2	
RX5F to 50	Power supply unit status signal 3	
RX6F to 60	Power supply unit status signal 4/ Light malfunction maintenance signal	
RX7F to 70	(Not available)	

8 words each
Fixed region

(*1)

PLC master extended cyclic settings	Output register		Input register	
	RWw 00H	(Axis 0) Command position No.	RWr 00H	(Axis 0) Completed position No.
	RWw 01H	(Axis 0) Control signal	RWr 01H	(Axis 0) Status signal
	RWw 02H	(Axis 1) Command position No.	RWr 02H	(Axis 1) Completed position No.
	RWw 03H	(Axis 1) Control signal	RWr 03H	(Axis 1) Status signal
	RWw 04H	(Axis 2) Command position No.	RWr 04H	(Axis 2) Completed position No.
	RWw 05H	(Axis 2) Control signal	RWr 05H	(Axis 2) Status signal
	RWw 06H	(Axis 3) Command position No.	RWr 06H	(Axis 3) Completed position No.
	RWw 07H	(Axis 3) Control signal	RWr 07H	(Axis 3) Status signal
	RWw 08H	(Axis 4) Command position No.	RWr 08H	(Axis 4) Completed position No.
	RWw 09H	(Axis 4) Control signal	RWr 09H	(Axis 4) Status signal
16-word	RWw 0AH	(Axis 5) Command position No.	RWr 0AH	(Axis 5) Completed position No.
	RWw 0BH	(Axis 5) Control signal	RWr 0BH	(Axis 5) Status signal
1x multiplier setting 4	RWw 0CH	(Axis 6) Command position No.	RWr 0CH	(Axis 6) Completed position No.
(*2)	RWw 0DH	(Axis 6) Control signal	RWr 0DH	(Axis 6) Status signal
	RWw 0EH	(Axis 7) Command position No.	RWr 0EH	(Axis 7) Completed position No.
	RWw 0FH	(Axis 7) Control signal	RWr 0FH	(Axis 7) Status signal
	RWw 10H	(Axis 8) Command position No.	RWr 10H	(Axis 8) Completed position No.
	RWw 11H	(Axis 8) Control signal	RWr 11H	(Axis 8) Status signal
	RWw 12H	(Axis 9) Command position No.	RWr 12H	(Axis 9) Completed position No.
32-word	RWw 13H	(Axis 9) Control signal	RWr 13H	(Axis 9) Status signal
	RWw 14H	(Axis 10) Command position No.	RWr 14H	(Axis 10) Completed position No.
4x multiplier setting 2	RWw 15H	(Axis 10) Control signal	RWr 15H	(Axis 10) Status signal
	RWw 16H	(Axis 11) Command position No.	RWr 16H	(Axis 11) Completed position No.
	RWw 17H	(Axis 11) Control signal	RWr 17H	(Axis 11) Status signal
	RWw 18H	(Axis 12 to Axis 15) Control signal	RWr 18H	(Axis 12 to Axis 15) Status signal

2 words each
Positioner 2 mode

1 words each
EC connection unit (*3)

*1 Extended cyclic settings are performed based on the occupancy information displayed with the gateway parameter configuration tool.
*2 Operation is also possible with CC-Link Ver.1.10 if extended cyclic 1x multiplier settings (4 stations occupied) are within the usable range.
*3 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
The axis numbers for the EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

■ CC-Link overall address configuration example (positioner 3 mode + PIO unit + EC Connection Unit)
This is an example for connection of 4 axes of positioner 3 axes, five units of the PIO unit and three units of the EC connection unit (for 12 axes).

PLC output ⇒ RCON

Output register	High byte	Low byte
RY0F to 00	Gateway control signal 0	
RY1F to 10	Gateway control signal 1	
RY2F to 20	(Not available)	
RY3F to 30	(Not available)	
RY4F to 40	(Not available)	
RY5F to 50	(Not available)	
RY6F to 60	(Not available)	
RY7F to 70	(Not available)	

RCON ⇒ PLC input

Input register	High byte	Low byte
RX0F to 00	Gateway status signal 0	
RX1F to 10	Gateway status signal 1	
RX2F to 20	Power supply unit status signal 0	
RX3F to 30	Power supply unit status signal 1	
RX4F to 40	Power supply unit status signal 2	
RX5F to 50	Power supply unit status signal 3	
RX6F to 60	Power supply unit status signal 4/ Light malfunction maintenance signal	
RX7F to 70	(Not available)	

8 words each Fixed region

(*1)

PLC master extended cyclic settings	Output register			Input register			
	RWw 00H	(Axis 0) Control signal	Command position No.	RWr 00H	(Axis 0) Status signal	Completed position No.	1 words each Positioner 3 mode
	RWw 01H	(Axis 1) Control signal	Command position No.	RWr 01H	(Axis 1) Status signal	Completed position No.	
	RWw 02H	(Axis 2) Control signal	Command position No.	RWr 02H	(Axis 2) Status signal	Completed position No.	
	RWw 03H	(Axis 3) Control signal	Command position No.	RWr 03H	(Axis 3) Status signal	Completed position No.	
	RWw 04H	(Unit_0) PIO input		RWr 04H	(Unit_0) PIO output		1 words each PIO unit (*3, *5)
	RWw 05H	(Unit_1) PIO input		RWr 05H	(Unit_1) PIO output		
	RWw 06H	(Unit_2) PIO input		RWr 06H	(Unit_2) PIO output		
	RWw 07H	(Unit_3) PIO input		RWr 07H	(Unit_3) PIO output		
	RWw 08H	(Unit_4) PIO input		RWr 08H	(Unit_4) PIO output		
	RWw 09H	(Axis 4 ~ Axis 7) Control signal		RWr 09H	(Axis 4 ~ Axis 7) Status signal		1 words each EC connection unit (*4, *5)
16-word	RWw 0AH	(Axis 8 ~ Axis 11) Control signal		RWr 0AH	(Axis 8 ~ Axis 11) Status signal		
	RWw 0BH	(Axis 12 ~ Axis 15) Control signal		RWr 0BH	(Axis 12 ~ Axis 15) Status signal		
1x multiplier setting 4	RWw 0CH	–		RWr 0CH	–		
(*2)	RWw 0DH	–		RWr 0DH	–		
	RWw 0EH	–		RWr 0EH	–		
	RWw 0FH	–		RWr 0FH	–		

*1 Extended cyclic settings are performed based on the occupancy information displayed with the gateway parameter configuration tool.
*2 Operation is also possible with CC-Link Ver.1.10 if extended cyclic 1x multiplier settings (4 stations occupied) are within the usable range.
*3 The PIO/SIO/SCON extension unit should occupy one word in the domain even if PIO features are not to be used.
*4 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
*5 The axis numbers for the PIO/SIO/SCON extension unit, PIO unit and EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

[For CC-Link IE Field and CC-Link IE TSN]
Fixed 8-word region is assigned to the bit register (RX/RY), while the region for each axis is assigned to the word register (RWr/RWw).

■ CC-Link IE Field and CC-Link IE TSN overall address configuration example (direct numerical control mode + simple direct mode/positioner 1 mode) shows direct numerical control mode connection for 2 axes and simple direct or positioner 1 mode connection for 12 axes.

PLC output ⇒ RCON

Output register	High byte	Low byte
RY0F to 00	Gateway control signal 0	
RY1F to 10	Gateway control signal 1	
RY2F to 20	(Not available)	
RY3F to 30	(Not available)	
RY4F to 40	(Not available)	
RY5F to 50	(Not available)	
RY6F to 60	(Not available)	
RY7F to 70	(Not available)	

RCON ⇒ PLC input

Input register	High byte	Low byte
RX0F to 00	Gateway status signal 0	
RX1F to 10	Gateway status signal 1	
RX2F to 20	Power supply unit status signal 0	
RX3F to 30	Power supply unit status signal 1	
RX4F to 40	Power supply unit status signal 2	
RX5F to 50	Power supply unit status signal 3	
RX6F to 60	Power supply unit status signal 4/ Light malfunction maintenance signal	
RX7F to 70	(Not available)	

8 words each
Fixed region

Output register	
RWw 00H	(Axis 0) Specified position data (L)
RWw 01H	(Axis 0) Specified position data (H)
RWw 02H	(Axis 0) Command position No.
RWw 03H	(Axis 0) Control signal
RWw 04H	(Axis 1) Specified position data (L)
RWw 05H	(Axis 1) Specified position data (H)
RWw 06H	(Axis 1) Command position No.
RWw 07H	(Axis 1) Control signal
RWw 08H	(Axis 2) Specified position data (L)
RWw 09H	(Axis 2) Specified position data (H)
RWw 0AH	(Axis 2) Command position No.
RWw 0BH	(Axis 2) Control signal
RWw 0CH	(Axis 3) Specified position data (L)
RWw 0DH	(Axis 3) Specified position data (H)
RWw 0EH	(Axis 3) Command position No.
RWw 0FH	(Axis 3) Control signal
⋮	⋮
RWw 1FH	(Axis 7) Control signal
⋮	⋮
RWw 2FH	(Axis 11) Control signal
RWw 30H	(Axis 12) Specified position data (L)
RWw 31H	(Axis 12) Specified position data (H)
RWw 32H	(Axis 12) Specified positioning width (L)
RWw 33H	(Axis 12) Specified positioning width
RWw 34H	(Axis 12) Specified speed
RWw 35H	(Axis 12) Specified acceleration/deceleration
RWw 36H	(Axis 12) Pushing current limit value
RWw 37H	(Axis 12) Control signal
RWw 38H	(Axis 13) Specified position data (L)
RWw 39H	(Axis 13) Specified position data (H)
RWw 3AH	(Axis 13) Specified positioning width (L)
RWw 3BH	(Axis 13) Specified positioning width
RWw 3CH	(Axis 13) Specified speed
RWw 3DH	(Axis 13) Specified acceleration/deceleration
RWw 3EH	(Axis 13) Pushing current limit value
RWw 3FH	(Axis 13) Control signal

Input register	
RWr 00H	(Axis 0) Present position data (L)
RWr 01H	(Axis 0) Present position data (H)
RWr 02H	(Axis 0) Completed position No.
RWr 03H	(Axis 0) Status signal
RWr 04H	(Axis 1) Present position data (L)
RWr 05H	(Axis 1) Present position data (H)
RWr 06H	(Axis 1) Completed position No.
RWr 07H	(Axis 1) Status signal
RWr 08H	(Axis 2) Present position data (L)
RWr 09H	(Axis 2) Present position data (H)
RWr 0AH	(Axis 2) Completed position No.
RWr 0BH	(Axis 2) Status signal
RWr 0CH	(Axis 3) Present position data (L)
RWr 0DH	(Axis 3) Present position data (H)
RWr 0EH	(Axis 3) Completed position No.
RWr 0FH	(Axis 3) Status signal
	⋮
RWr 1FH	(Axis 7) Status signal
	⋮
RWr 2FH	(Axis 11) Status signal
RWr 30H	(Axis 12) Present position data (L)
RWr 31H	(Axis 12) Present position data (H)
RWr 32H	(Axis 12) Present current value (L) (*1)
RWr 33H	(Axis 12) Present current value (H) (*1)
RWr 34H	(Axis 12) Present speed data
RWr 35H	(Not available)
RWr 36H	(Axis 12) Alarm code
RWr 37H	(Axis 12) Status signal
RWr 38H	(Axis 13) Present position data (L)
RWr 39H	(Axis 13) Present position data (H)
RWr 3AH	(Axis 13) Present current value (L) (*1)
RWr 3BH	(Axis 13) Present current value (H) (*1)
RWr 3CH	(Axis 13) Present speed data
RWr 3DH	(Not available)
RWr 3EH	(Axis 13) Alarm code
RWr 3FH	(Axis 13) Status signal

4 words each
Positioner 1 /simple direct mode

8 words each
Direct numerical control mode

*1 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

■ CC-Link IE Field and CC-Link IE TSN overall address configuration example (positioner 2 mode + EC Connection Unit)
This is an example for connection of 12 axes of positioner 2 axes and one unit of the EC connection unit (for four axes).

PLC output ⇒ RCON

Output register	High byte	Low byte
RY0F to 00	Gateway control signal 0	
RY1F to 10	Gateway control signal 1	
RY2F to 20	(Not available)	
RY3F to 30	(Not available)	
RY4F to 40	(Not available)	
RY5F to 50	(Not available)	
RY6F to 60	(Not available)	
RY7F to 70	(Not available)	

RCON ⇒ PLC input

Input register	High byte	Low byte
RX0F to 00	Gateway status signal 0	
RX1F to 10	Gateway status signal 1	
RX2F to 20	Power supply unit status signal 0	
RX3F to 30	Power supply unit status signal 1	
RX4F to 40	Power supply unit status signal 2	
RX5F to 50	Power supply unit status signal 3	
RX6F to 60	Power supply unit status signal 4/ Light malfunction maintenance signal	
RX7F to 70	(Not available)	

8 words each
Fixed region

Output register	
RWw 00H	(Axis 0) Command position No.
RWw 01H	(Axis 0) Control signal
RWw 02H	(Axis 1) Command position No.
RWw 03H	(Axis 1) Control signal
RWw 04H	(Axis 2) Command position No.
RWw 05H	(Axis 2) Control signal
RWw 06H	(Axis 3) Command position No.
RWw 07H	(Axis 3) Control signal
RWw 08H	(Axis 4) Command position No.
RWw 09H	(Axis 4) Control signal
RWw 0AH	(Axis 5) Command position No.
RWw 0BH	(Axis 5) Control signal
RWw 0CH	(Axis 6) Command position No.
RWw 0DH	(Axis 6) Control signal
RWw 0EH	(Axis 7) Command position No.
RWw 0FH	(Axis 7) Control signal
RWw 10H	(Axis 8) Command position No.
RWw 11H	(Axis 8) Control signal
RWw 12H	(Axis 9) Command position No.
RWw 13H	(Axis 9) Control signal
RWw 14H	(Axis 10) Command position No.
RWw 15H	(Axis 10) Control signal
RWw 16H	(Axis 11) Command position No.
RWw 17H	(Axis 11) Control signal
RWw 18H	(Axis 12 to Axis 15) Control signal

Input register	
RWr 00H	(Axis 0) Completed position No.
RWr 01H	(Axis 0) Status signal
RWr 02H	(Axis 1) Completed position No.
RWr 03H	(Axis 1) Status signal
RWr 04H	(Axis 2) Completed position No.
RWr 05H	(Axis 2) Status signal
RWr 06H	(Axis 3) Completed position No.
RWr 07H	(Axis 3) Status signal
RWr 08H	(Axis 4) Completed position No.
RWr 09H	(Axis 4) Status signal
RWr 0AH	(Axis 5) Completed position No.
RWr 0BH	(Axis 5) Status signal
RWr 0CH	(Axis 6) Completed position No.
RWr 0DH	(Axis 6) Status signal
RWr 0EH	(Axis 7) Completed position No.
RWr 0FH	(Axis 7) Status signal
RWr 10H	(Axis 8) Completed position No.
RWr 11H	(Axis 8) Status signal
RWr 12H	(Axis 9) Completed position No.
RWr 13H	(Axis 9) Status signal
RWr 14H	(Axis 10) Completed position No.
RWr 15H	(Axis 10) Status signal
RWr 16H	(Axis 11) Completed position No.
RWr 17H	(Axis 11) Status signal
RWr 18H	(Axis 12 to Axis 15) Status signal

2 words each
Positioner 2 mode

1 words each
EC connection unit (*1)

*1 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
The axis numbers for the EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

■ CC-Link IE Field and CC-Link IE TSN overall address configuration example (positioner 3 mode + PIO unit + EC Connection Unit)

This is an example for connection of 4 axes of positioner 3 axes, five units of the PIO unit and three units of the EC connection unit (for 12 axes).

PLC output ⇒ RCON

Output register	High byte	Low byte
RY0F to 00	Gateway control signal 0	
RY1F to 10	Gateway control signal 1	
RY2F to 20	(Not available)	
RY3F to 30	(Not available)	
RY4F to 40	(Not available)	
RY5F to 50	(Not available)	
RY6F to 60	(Not available)	
RY7F to 70	(Not available)	

RCON ⇒ PLC input

Input register	High byte	Low byte
RX0F to 00	Gateway status signal 0	
RX1F to 10	Gateway status signal 1	
RX2F to 20	Power supply unit status signal 0	
RX3F to 30	Power supply unit status signal 1	
RX4F to 40	Power supply unit status signal 2	
RX5F to 50	Power supply unit status signal 3	
RX6F to 60	Power supply unit status signal 4/ Light malfunction maintenance signal	
RX7F to 70	(Not available)	

8 words each
Fixed region

Output register		
RWw 00H	(Axis 0) Control signal	Command position No.
RWw 01H	(Axis 1) Control signal	Command position No.
RWw 02H	(Axis 2) Control signal	Command position No.
RWw 03H	(Axis 3) Control signal	Command position No.
RWw 04H	(Unit_0) PIO input	
RWw 05H	(Unit_1) PIO input	
RWw 06H	(Unit_2) PIO input	
RWw 07H	(Unit_3) PIO input	
RWw 08H	(Unit_4) PIO input	
RWw 09H	(Axis 4 ~ Axis 7) Control signal	
RWw 0AH	(Axis 8 ~ Axis 11) Control signal	
RWw 0BH	(Axis 12 ~ Axis 15) Control signal	

Input register		
RWr 00H	(Axis 0) Status signal	Completed position No.
RWr 01H	(Axis 1) Status signal	Completed position No.
RWr 02H	(Axis 2) Status signal	Completed position No.
RWr 03H	(Axis 3) Status signal	Completed position No.
RWr 04H	(Unit_0) PIO output	
RWr 05H	(Unit_1) PIO output	
RWr 06H	(Unit_2) PIO output	
RWr 07H	(Unit_3) PIO output	
RWr 08H	(Unit_4) PIO output	
RWr 09H	(Axis 4 ~ Axis 7) Status signal	
RWr 0AH	(Axis 8 ~ Axis 11) Status signal	
RWr 0BH	(Axis 12 ~ Axis 15) Status signal	

1 words each
Positioner 3 mode

1 words each
PIO unit (*1, *3)

1 words each
EC connection unit (*2, *3)

*1 The PIO/SIO/SCON extension unit should occupy one word in the domain even if PIO features are not to be used.

*2 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.

*3 The axis numbers for the PIO/SIO/SCON extension unit, PIO unit and EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

[For DeviceNet]

■ DeviceNet overall address configuration example (direct numerical control mode + simple direct mode/positioner 1 mode)
Shows direct numerical control mode connection for 2 axes and simple direct or positioner 1 mode connection for 12 axes.

	PLC output ⇒ RCON		RCON ⇒ PLC input		
Relative CH *	**High byte**	**Low byte**	**High byte**	**Low byte**	
0	Gateway control signal 0		Gateway status signal 0		8 words each Fixed region
1	Gateway control signal 1		Gateway status signal 1		
2	(Not available)		Power supply unit status signal 0		
3	(Not available)		Power supply unit status signal 1		
4	(Not available)		Power supply unit status signal 2		
5	(Not available)		Power supply unit status signal 3		
6	(Not available)		Power supply unit status signal 4/ Light malfunction maintenance signal		
7	(Not available)		(Not available)		
8	(Axis 0) Specified position data (L)		(Axis 0) Present position data (L)		4 words each Positioner 1 /simple direct mode
9	(Axis 0) Specified position data (H)		(Axis 0) Present position data (H)		
10	(Axis 0) Command position No.		(Axis 0) Completed position No.		
11	(Axis 0) Control signal		(Axis 0) Status signal		
12	(Axis 1) Specified position data (L)		(Axis 1) Present position data (L)		
13	(Axis 1) Specified position data (H)		(Axis 1) Present position data (H)		
14	(Axis 1) Command position No.		(Axis 1) Completed position No.		
15	(Axis 1) Control signal		(Axis 1) Status signal		
16	(Axis 2) Specified position data (L)		(Axis 2) Present position data (L)		
17	(Axis 2) Specified position data (H)		(Axis 2) Present position data (H)		
18	(Axis 2) Command position No.		(Axis 2) Completed position No.		
19	(Axis 2) Control signal		(Axis 2) Status signal		
20	(Axis 3) Specified position data (L)		(Axis 3) Present position data (L)		
21	(Axis 3) Specified position data (H)		(Axis 3) Present position data (H)		
22	(Axis 3) Command position No.		(Axis 3) Completed position No.		
23	(Axis 3) Control signal		(Axis 3) Status signal		
. . .	. . .		. . .		
39	(Axis 7) Control signal		(Axis 7) Status signal		
. . .	. . .		. . .		
55	(Axis 11) Control signal		(Axis 11) Status signal		
56	(Axis 12) Specified position data (L)		(Axis 12) Present position data (L)		8 words each Direct numerical control mode
57	(Axis 12) Specified position data (H)		(Axis 12) Present position data (H)		
58	(Axis 12) Specified positioning width (L)		(Axis 12) Present current value (L) (*1)		
59	(Axis 12) Specified positioning width (H)		(Axis 12) Present current value (H) (*1)		
60	(Axis 12) Specified speed		(Axis 12) Present speed data		
61	(Axis 12) Specified acceleration/deceleration		(Not available)		
62	(Axis 12) Pushing current limit value		(Axis 12) Alarm code		
63	(Axis 12) Control signal		(Axis 12) Status signal		
64	(Axis 13) Specified position data (L)		(Axis 13) Present position data (L)		
65	(Axis 13) Specified position data (H)		(Axis 13) Present position data (H)		
66	(Axis 13) Specified positioning width (L)		(Axis 13) Present current value (L) (*1)		
67	(Axis 13) Specified positioning width (H)		(Axis 13) Present current value (H) (*1)		
68	(Axis 13) Specified speed		(Axis 13) Present speed data		
69	(Axis 13) Specified acceleration/deceleration		(Not available)		
70	(Axis 13) Pushing current limit value		(Axis 13) Alarm code		
71	(Axis 13) Control signal		(Axis 13) Status signal		

* Relative CH is the CH number relative to the gateway head CH

*1 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

■ DeviceNet overall address configuration example (positioner 2 mode + EC Connection Unit)
This is an example for connection of 12 axes of positioner 2 axes and one unit of the EC connection unit (for four axes).

	PLC output ⇒ RCON	RCON ⇒ PLC input	
Relative CH *	**High byte Low byte**	**High byte Low byte**	
0	Gateway control signal 0	Gateway status signal 0	8 words each Fixed region
1	Gateway control signal 1	Gateway status signal 1	
2	(Not available)	Power supply unit status signal 0	
3	(Not available)	Power supply unit status signal 1	
4	(Not available)	Power supply unit status signal 2	
5	(Not available)	Power supply unit status signal 3	
6	(Not available)	Power supply unit status signal 4/ Light malfunction maintenance signal	
7	(Not available)	(Not available)	
8	(Axis 0) Command position No.	(Axis 0) Completed position No.	2 words each Positioner 2 mode
9	(Axis 0) Control signal	(Axis 0) Status signal	
10	(Axis 1) Command position No.	(Axis 1) Completed position No.	
11	(Axis 1) Control signal	(Axis 1) Status signal	
12	(Axis 2) Command position No.	(Axis 2) Completed position No.	
13	(Axis 2) Control signal	(Axis 2) Status signal	
14	(Axis 3) Command position No.	(Axis 3) Completed position No.	
15	(Axis 3) Control signal	(Axis 3) Status signal	
16	(Axis 4) Command position No.	(Axis 4) Completed position No.	
17	(Axis 4) Control signal	(Axis 4) Status signal	
18	(Axis 5) Command position No.	(Axis 5) Completed position No.	
19	(Axis 5) Control signal	(Axis 5) Status signal	
20	(Axis 6) Command position No.	(Axis 6) Completed position No.	
21	(Axis 6) Control signal	(Axis 6) Status signal	
22	(Axis 7) Command position No.	(Axis 7) Completed position No.	
23	(Axis 7) Control signal	(Axis 7) Status signal	
24	(Axis 8) Command position No.	(Axis 8) Completed position No.	
25	(Axis 8) Control signal	(Axis 8) Status signal	
26	(Axis 9) Command position No.	(Axis 9) Completed position No.	
27	(Axis 9) Control signal	(Axis 9) Status signal	
28	(Axis 10) Command position No.	(Axis 10) Completed position No.	
29	(Axis 10) Control signal	(Axis 10) Status signal	
30	(Axis 11) Command position No.	(Axis 11) Completed position No.	
31	(Axis 11) Control signal	(Axis 11) Status signal	
32	(Axis 12 to Axis 15) Control signal	(Axis 12 to Axis 15) Status signal	1 words each EC connection unit (*1)

* Relative CH is the CH number relative to the gateway head CH

*1 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
The axis numbers for the EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

■ DeviceNet overall address configuration example (positioner 3 mode + PIO unit + EC Connection Unit)
This is an example for connection of 4 axes of positioner 3 axes, five units of the PIO unit and three units of the EC connection unit (for 12 axes).

	PLC output ⇒ RCON		RCON ⇒ PLC input		
Relative CH *	**High byte**	**Low byte**	**High byte**	**Low byte**	
0	Gateway control signal 0		Gateway status signal 0		8 words each Fixed region
1	Gateway control signal 1		Gateway status signal 1		
2	(Not available)		Power supply unit status signal 0		
3	(Not available)		Power supply unit status signal 1		
4	(Not available)		Power supply unit status signal 2		
5	(Not available)		Power supply unit status signal 3		
6	(Not available)		Power supply unit status signal 4/ Light malfunction maintenance signal		
7	(Not available)		(Not available)		
8	(Axis 0) Control signal	Command position No.	(Axis 0) Status signal	Completed position No.	1 words each Positioner 3 mode
9	(Axis 1) Control signal	Command position No.	(Axis 1) Status signal	Completed position No.	
10	(Axis 2) Control signal	Command position No.	(Axis 2) Status signal	Completed position No.	
11	(Axis 3) Control signal	Command position No.	(Axis 3) Status signal	Completed position No.	
12	(Unit_0) PIO input		(Unit_0) PIO output		1 words each PIO unit (*1, *3)
13	(Unit_1) PIO input		(Unit_1) PIO output		
14	(Unit_2) PIO input		(Unit_2) PIO output		
15	(Unit_3) PIO input		(Unit_3) PIO output		
16	(Unit_4) PIO input		(Unit_4) PIO output		
17	(Axis 4 ~ Axis 7) Control signal		(Axis 4 ~ Axis 7) Status signal		1 words each EC connection unit (*2, *3)
18	(Axis 8 ~ Axis 11) Control signal		(Axis 8 ~ Axis 11) Status signal		
19	(Axis 12 ~ Axis 15) Control signal		(Axis 12 ~ Axis 15) Status signal		

* Relative CH is the CH number relative to the gateway head CH
*1 The PIO/SIO/SCON extension unit should occupy one word in the domain even if PIO features are not to be used.
*2 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
*3 The axis numbers for the PIO/SIO/SCON extension unit, PIO unit and EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

[For PROFIBUS-DP, EtherNet/IP (Including front port specification), EtherCAT]

■ Overall address configuration example (direct numerical control mode + simple direct mode/positioner 1 mode)
Shows direct numerical control mode connection for 2 axes and simple direct or positioner 1 mode connection for 12 axes.

	PLC output ⇒ RCON	RCON ⇒ PLC input	
Relative byte *	High byte Low byte	High byte Low byte	
0	Gateway control signal 0	Gateway status signal 0	8 words each Fixed region
2	Gateway control signal 1	Gateway status signal 1	
4	(Not available)	Power supply unit status signal 0	
6	(Not available)	Power supply unit status signal 1	
8	(Not available)	Power supply unit status signal 2	
10	(Not available)	Power supply unit status signal 3	
12	(Not available)	Power supply unit status signal 4/ Light malfunction maintenance signal	
14	(Not available)	(Not available)	
16	(Axis 0) Specified position data (L)	(Axis 0) Present position data (L)	4 words each Positioner 1 /simple direct mode
18	(Axis 0) Specified position data (H)	(Axis 0) Present position data (H)	
20	(Axis 0) Command position No.	(Axis 0) Completed position No.	
22	(Axis 0) Control signal	(Axis 0) Status signal	
24	(Axis 1) Specified position data (L)	(Axis 1) Present position data (L)	
26	(Axis 1) Specified position data (H)	(Axis 1) Present position data (H)	
28	(Axis 1) Command position No.	(Axis 1) Completed position No.	
30	(Axis 1) Control signal	(Axis 1) Status signal	
32	(Axis 2) Specified position data (L)	(Axis 2) Present position data (L)	
34	(Axis 2) Specified position data (H)	(Axis 2) Present position data (H)	
36	(Axis 2) Command position No.	(Axis 2) Completed position No.	
38	(Axis 2) Control signal	(Axis 2) Status signal	
40	(Axis 3) Specified position data (L)	(Axis 3) Present position data (L)	
42	(Axis 3) Specified position data (H)	(Axis 3) Present position data (H)	
44	(Axis 3) Command position No.	(Axis 3) Completed position No.	
46	(Axis 3) Control signal	(Axis 3) Status signal	
. . .	. . .	. . .	
78	(Axis 7) Control signal	(Axis 7) Status signal	
. . .	. . .	. . .	
110	(Axis 11) Control signal	(Axis 11) Status signal	
112	(Axis 12) Specified position data (L)	(Axis 12) Present position data (L)	8 words each Direct numerical control mode
114	(Axis 12) Specified position data (H)	(Axis 12) Present position data (H)	
116	(Axis 12) Specified positioning width (L)	(Axis 12) Present current value (L) (*1)	
118	(Axis 12) Specified positioning width (H)	(Axis 12) Present current value (H) (*1)	
120	(Axis 12) Specified speed	(Axis 12) Present speed data	
122	(Axis 12) Specified acceleration/deceleration	(Not available)	
124	(Axis 12) Pushing current limit value	(Axis 12) Alarm code	
126	(Axis 12) Control signal	(Axis 12) Status signal	
128	(Axis 13) Specified position data (L)	(Axis 13) Present position data (L)	
130	(Axis 13) Specified position data (H)	(Axis 13) Present position data (H)	
132	(Axis 13) Specified positioning width (L)	(Axis 13) Present current value (L) (*1)	
134	(Axis 13) Specified positioning width (H)	(Axis 13) Present current value (H) (*1)	
136	(Axis 13) Specified speed	(Axis 13) Present speed data	
138	(Axis 13) Specified acceleration/deceleration	(Not available)	
140	(Axis 13) Pushing current limit value	(Axis 13) Alarm code	
142	(Axis 13) Control signal	(Axis 13) Status signal	

* Relative byte is the byte address relative to the gateway head

*1 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

■ Overall address configuration example (positioner 2 mode + EC Connection Unit)
This is an example for connection of 12 axes of positioner 2 axes and one unit of the EC connection unit (for four axes).

	PLC output ⇒ RCON	RCON ⇒ PLC input	
Relative byte *	**High byte Low byte**	**High byte Low byte**	
0	Gateway control signal 0	Gateway status signal 0	8 words each Fixed region
2	Gateway control signal 1	Gateway status signal 1	
4	(Not available)	Power supply unit status signal 0	
6	(Not available)	Power supply unit status signal 1	
8	(Not available)	Power supply unit status signal 2	
10	(Not available)	Power supply unit status signal 3	
12	(Not available)	Power supply unit status signal 4/ Light malfunction maintenance signal	
14	(Not available)	(Not available)	
16	(Axis 0) Command position No.	(Axis 0) Completed position No.	2 words each Positioner 2 mode
18	(Axis 0) Control signal	(Axis 0) Status signal	
20	(Axis 1) Command position No.	(Axis 1) Completed position No.	
22	(Axis 1) Control signal	(Axis 1) Status signal	
24	(Axis 2) Command position No.	(Axis 2) Completed position No.	
26	(Axis 2) Control signal	(Axis 2) Status signal	
28	(Axis 3) Command position No.	(Axis 3) Completed position No.	
30	(Axis 3) Control signal	(Axis 3) Status signal	
32	(Axis 4) Command position No.	(Axis 4) Completed position No.	
34	(Axis 4) Control signal	(Axis 4) Status signal	
36	(Axis 5) Command position No.	(Axis 5) Completed position No.	
38	(Axis 5) Control signal	(Axis 5) Status signal	
40	(Axis 6) Command position No.	(Axis 6) Completed position No.	
42	(Axis 6) Control signal	(Axis 6) Status signal	
44	(Axis 7) Command position No.	(Axis 7) Completed position No.	
46	(Axis 7) Control signal	(Axis 7) Status signal	
48	(Axis 8) Command position No.	(Axis 8) Completed position No.	
50	(Axis 8) Control signal	(Axis 8) Status signal	
52	(Axis 9) Command position No.	(Axis 9) Completed position No.	
54	(Axis 9) Control signal	(Axis 9) Status signal	
56	(Axis 10) Command position No.	(Axis 10) Completed position No.	
58	(Axis 10) Control signal	(Axis 10) Status signal	
60	(Axis 11) Command position No.	(Axis 11) Completed position No.	
62	(Axis 11) Control signal	(Axis 11) Status signal	
64	(Axis 12 to Axis 15) Control signal.	(Axis 12 to Axis 15) Status signal	1 words each EC connection unit (*1)

* Relative byte is the byte address relative to the gateway head

*1 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
The axis numbers for the EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

■ Overall address configuration example (positioner 3 mode + PIO unit + EC Connection Unit)
This is an example for connection of 4 axes of positioner 3 axes, five units of the PIO unit and three units of the EC connection unit (for 12 axes).

	PLC output ⇒ RCON		RCON ⇒ PLC input		
Relative byte *	**High byte**	**Low byte**	**High byte**	**Low byte**	
0	Gateway control signal 0		Gateway status signal 0		8 words each Fixed region
2	Gateway control signal 1		Gateway status signal 1		
4	(Not available)		Power supply unit status signal 0		
6	(Not available)		Power supply unit status signal 1		
8	(Not available)		Power supply unit status signal 2		
10	(Not available)		Power supply unit status signal 3		
12	(Not available)		Power supply unit status signal 4/ Light malfunction maintenance signal		
14	(Not available)		(Not available)		
16	(Axis 0) Control signal	Command position No.	(Axis 0) Status signal	Completed position No	1 words each Positioner 3 mode
18	(Axis 1) Control signal	Command position No.	(Axis 1) Status signal	Completed position No	
20	(Axis 2) Control signal	Command position No.	(Axis 2) Status signal	Completed position No	
22	(Axis 3) Control signal	Command position No.	(Axis 3) Status signal	Completed position No	
24	(Unit_0) PIO input		(Unit_0) PIO output		1 words each PIO unit (*1, *3)
26	(Unit_1) PIO input		(Unit_1) PIO output		
28	(Unit_2) PIO input		(Unit_2) PIO output		
30	(Unit_3) PIO input		(Unit_3) PIO output		
32	(Unit_4) PIO input		(Unit_4) PIO output		
34	(Axis 4 ~ Axis 7) Control signal		(Axis 4 ~ Axis 7) Status signal		1 words each EC connection unit (*2, *3)
36	(Axis 8 ~ Axis 11) Control signal		(Axis 8 ~ Axis 11) Status signal		
38	(Axis 12 ~ Axis 15) Control signal		(Axis 12 ~ Axis 15) Status signal		

* Relative byte is the byte address relative to the gateway head

*1 The PIO/SIO/SCON extension unit should occupy one word in the domain even if PIO features are not to be used.

*2 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.

*3 The axis numbers for the PIO/SIO/SCON extension unit, PIO unit and EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

[For PROFINET-IO]

■ PROFINET-IO overall address configuration example (direct numerical control mode + simple direct mode/positioner 1 mode)
Shows direct numerical control mode connection for 2 axes and simple direct or positioner 1 mode connection for 12 axes.

	PLC output ⇒ RCON	RCON ⇒ PLC input	
4-word Module count	**High byte Low byte**	**High byte Low byte**	
1	Gateway control signal 0	Gateway status signal 0	8 words each Fixed region
	Gateway control signal 1	Gateway status signal 1	
	(Not available)	Power supply unit status signal 0	
	(Not available)	Power supply unit status signal 1	
2	(Not available)	Power supply unit status signal 2	
	(Not available)	Power supply unit status signal 3	
	(Not available)	Power supply unit status signal 4/ Light malfunction maintenance signal	
	(Not available)	(Not available)	
3	(Axis 0) Specified position data (L)	(Axis 0) Present position data (L)	4 words each Positioner 1 /simple direct mode
	(Axis 0) Specified position data (H)	(Axis 0) Present position data (H)	
	(Axis 0) Command position No.	(Axis 0) Completed position No.	
	(Axis 0) Control signal	(Axis 0) Status signal	
4	(Axis 1) Specified position data (L)	(Axis 1) Present position data (L)	
	(Axis 1) Specified position data (H)	(Axis 1) Present position data (H)	
	(Axis 1) Command position No.	(Axis 1) Completed position No.	
	(Axis 1) Control signal	(Axis 1) Status signal	
5	(Axis 2) Specified position data (L)	(Axis 2) Present position data (L)	
	(Axis 2) Specified position data (H)	(Axis 2) Present position data (H)	
	(Axis 2) Command position No.	(Axis 2) Completed position No.	
	(Axis 2) Control signal	(Axis 2) Status signal	
6	(Axis 3) Specified position data (L)	(Axis 3) Present position data (L)	
	(Axis 3) Specified position data (H)	(Axis 3) Present position data (H)	
	(Axis 3) Command position No.	(Axis 3) Completed position No.	
	(Axis 3) Control signal	(Axis 3) Status signal	
. . .	. . .	. . .	
14	(Axis 11) Specified position data (L)	(Axis 11) Present position data (L)	
	(Axis 11) Specified position data (H)	(Axis 11) Present position data (H)	
	(Axis 11) Command position No.	(Axis 11) Completed position No.	
	(Axis 11) Control signal	(Axis 11) Status signal	
15	(Axis 12) Specified position data (L)	(Axis 12) Present position data (L)	8 words each Direct numerical control mode
	(Axis 12) Specified position data (H)	(Axis 12) Present position data (H)	
	(Axis 12) Specified positioning width (L)	(Axis 12) Present current value (L) (*1)	
	(Axis 12) Specified positioning width (H)	(Axis 12) Present current value (H) (*1)	
16	(Axis 12) Specified speed	(Axis 12) Present speed data	
	(Axis 12) Specified acceleration/deceleration	(Not available)	
	(Axis 12) Pushing current limit value	(Axis 12) Alarm code	
	(Axis 12) Control signal	(Axis 12) Status signal	
17	(Axis 13) Specified position data (L)	(Axis 13) Present position data (L)	
	(Axis 13) Specified position data (H)	(Axis 13) Present position data (H)	
	(Axis 13) Specified positioning width (L)	(Axis 13) Present current value (L) (*1)	
	(Axis 13) Specified positioning width (H)	(Axis 13) Present current value (H) (*1)	
18	(Axis 13) Specified speed	(Axis 13) Present speed data	
	(Axis 13) Specified acceleration/deceleration	(Not available)	
	(Axis 13) Pushing current limit value	(Axis 13) Alarm code	
	(Axis 13) Control signal	(Axis 13) Status signal	

*1 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

■ PROFINET-IO overall address configuration example (positioner 2 mode + EC Connection Unit)
This is an example for connection of 12 axes of positioner 2 axes and one unit of the EC connection unit (for four axes).

4-word Module count	PLC output ⇒ RCON High byte	PLC output ⇒ RCON Low byte	RCON ⇒ PLC input High byte	RCON ⇒ PLC input Low byte	
1	Gateway control signal 0		Gateway status signal 0		8 words each Fixed region
	Gateway control signal 1		Gateway status signal 1		
	(Not available)		Power supply unit status signal 0		
	(Not available)		Power supply unit status signal 1		
2	(Not available)		Power supply unit status signal 2		
	(Not available)		Power supply unit status signal 3		
	(Not available)		Power supply unit status signal 4/ Light malfunction maintenance signal		
	(Not available)		(Not available)		
3	(Axis 0) Command position No.		(Axis 0) Completed position No.		2 words each Positioner 2 mode
	(Axis 0) Control signal		(Axis 0) Status signal		
	(Axis 1) Command position No.		(Axis 1) Completed position No.		
	(Axis 1) Control signal		(Axis 1) Status signal		
4	(Axis 2) Command position No.		(Axis 2) Completed position No.		
	(Axis 2) Control signal		(Axis 2) Status signal		
	(Axis 3) Command position No.		(Axis 3) Completed position No.		
	(Axis 3) Control signal		(Axis 3) Status signal		
5	(Axis 4) Command position No.		(Axis 4) Completed position No.		
	(Axis 4) Control signal		(Axis 4) Status signal		
	(Axis 5) Command position No.		(Axis 5) Completed position No.		
	(Axis 5) Control signal		(Axis 5) Status signal		
6	(Axis 6) Command position No.		(Axis 6) Completed position No.		
	(Axis 6) Control signal		(Axis 6) Status signal		
	(Axis 7) Command position No.		(Axis 7) Completed position No.		
	(Axis 7) Control signal		(Axis 7) Status signal		
7	(Axis 8) Command position No.		(Axis 8) Completed position No.		
	(Axis 8) Control signal		(Axis 8) Status signal		
	(Axis 9) Command position No.		(Axis 9) Completed position No.		
	(Axis 9) Control signal		(Axis 9) Status signal		
8	(Axis 10) Command position No.		(Axis 10) Completed position No.		
	(Axis 10) Control signal		(Axis 10) Status signal		
	(Axis 11) Command position No.		(Axis 11) Completed position No.		
	(Axis 11) Control signal		(Axis 11) Status signal		
9	(Axis 12 to Axis 15) Control signal		(Axis 12 to Axis 15) Status signal		1 words each EC connection unit (*1)

*1 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
The axis numbers for the EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

■ PROFINET-IO overall address configuration example (positioner 3 mode + PIO unit + EC Connection Unit)
This is an example for connection of 4 axes of positioner 3 axes, five units of the PIO unit and three units of the EC connection unit (for 12 axes).

4-word Module count	PLC output ⇒ RCON High byte	PLC output ⇒ RCON Low byte	RCON ⇒ PLC input High byte	RCON ⇒ PLC input Low byte	
1	Gateway control signal 0		Gateway status signal 0		8 words each Fixed region
	Gateway control signal 1		Gateway status signal 1		
	(Not available)		Power supply unit status signal 0		
	(Not available)		Power supply unit status signal 1		
2	(Not available)		Power supply unit status signal 2		
	(Not available)		Power supply unit status signal 3		
	(Not available)		Power supply unit status signal 4/ Light malfunction maintenance signal		
	(Not available)		(Not available)		
3	(Axis 0) Control signal	Command position No.	(Axis 0) Status signal	Completed position No.	1 words each Positioner 3 mode
	(Axis 1) Control signal	Command position No.	(Axis 1) Status signal	Completed position No.	
	(Axis 2) Control signal	Command position No.	(Axis 2) Status signal	Completed position No.	
	(Axis 3) Control signal	Command position No.	(Axis 3) Status signal	Completed position No.	
4	(Unit_0) PIO input		(Unit_0) PIO output		1 words each PIO unit (*1, *3)
	(Unit_1) PIO input		(Unit_1) PIO output		
	(Unit_2) PIO input		(Unit_2) PIO output		
	(Unit_3) PIO input		(Unit_3) PIO output		
	(Unit_4) PIO input		(Unit_4) PIO output		
5	(Axis 4 ~ Axis 7) Control signal		(Axis 4 ~ Axis 7) Status signal		1 words each EC connection unit (*2, *3)
	(Axis 8 ~ Axis 11) Control signal		(Axis 8 ~ Axis 11) Status signal		
	(Axis 12 ~ Axis 15) Control signal		(Axis 12 ~ Axis 15) Status signal		

*1 The PIO/SIO/SCON extension unit should occupy one word in the domain even if PIO features are not to be used.
*2 The EC connection unit occupies domains and axis numbers for four axes (one word) even though not all of four axes are connected.
*3 The axis numbers for the PIO/SIO/SCON extension unit, PIO unit and EC connection unit should be assigned from after axes connected to driver units (RCON-PC/AC/DC/PC/SC) and SCON extension unit.

10.4 RCON I/O Assignment

10.4.1 Fixed area control/status signals

[1] Gateway control/status signals

The first 2 words in each of input and output in the address configuration in the gateway unit are the signals to control the gateway unit and to monitor the status.

PLC output

									Address *			
									CC-Link, CC-Link IE Field CC-Link IE TSN	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
									–	Relative CH	Relative byte	Relative module
Gateway Control signal 0	b15	b14	b13	b12	b11	b10	b9	b8	RY 0*	+0	+0	+0
	MON	–	RTE	–	–	–	–	–			+1	
	b7	b6	b5	b4	b3	b2	b1	b0				
	–	–	–	–	–	–	–	–				
Gateway Control signal 1	b15	b14	b13	b12	b11	b10	b9	b8	RY 1*	+1	+2	
	–	–	–	–	–	–	–	–				
	b7	b6	b5	b4	b3	b2	b1	b0			+3	
	–	–	–	–	–	–	–	–				

PLC input

									Address *			
									CC-Link, CC-Link IE Field CC-Link IE TSN	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
									–	Relative CH	Relative byte	Relative module
Gateway Status signal 0	b15	b14	b13	b12	b11	b10	b9	b8	RX 0*	+0	+0	+0
	RUN	LERC	ERRT	MOD	ALMH	ALML	–	SEMG			+1	
	b7	b6	b5	b4	b3	b2	b1	b0				
	ALMC128	ALMC64	ALMC32	ALMC16	ALMC8	ALMC4	ALMC2	ALMC1				
Gateway Status signal 1	b15	b14	b13	b12	b11	b10	b9	b8	RX 1*	+1	+2	
	LNK15	LNK14	LNK13	LNK12	LNK11	LNK10	LNK9	LNK8				
	b7	b6	b5	b4	b3	b2	b1	b0			+3	
	LNK7	LNK6	LNK5	LNK4	LNK3	LNK2	LNK1	LNK0				

*Address is the address relative to the gateway head.

CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses while PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses. PROFINET-IO uses 4-word module addresses.
The * in CC-Link, CC-Link IE Field and CC-Link IE TSN bit register addresses is 0 to F.
For CC-Link and CC-Link IE Field, b10 to b15 are bA to bF. (Hexadecimal notation)
For PROFIBUS-DP, EtherNet/IP, and EtherCAT, b8 to b15 are b0 to b7. (Byte addresses)

I/O signal list

Signal type		Bit	Symbol name	Content
PLC output	Control signal 0	15	MON	PLC control output is enabled when ON ("1") (PLC output is reflected on controller unit) and disabled when OFF ("0"). * It should be used only for control of driver units. It does not affect the control signal of the optional unit.
		14	–	Not available. Keep this OFF ("0") normally.
		13	RTE	Turn it on and the hold status of ERR-T or ERR-C during operation gets released: Release signal when ERR-T or ERR-C was set to latch in the gateway parameter setting seal
		12-0	–	Not available. Keep this OFF ("0") normally.
	Control signal 1	15-0	–	Not available.
PLC input	Status signal 0	b15	RUN	Turns ON when gateway is in normal operation.
		b14	LERC	Turns ON and stays ON when an ERR-C error is generated while operating. Enabled when ERR-C generation is configured with the gateway parameter configuration tool.
		b13	ERRT	Turns ON if a gateway or axis communication error is detected.
		b12	MOD	Turns ON if MANU is selected with the unit front operation mode setting switch, and turns OFF when AUTO is selected.
		b11	ALMH	Turns ON if an error occurs that requires the gateway to be restarted. (Likely due to a mistaken parameter setting. Confirm as needed.)
		b10	ALML	Turns ON if a minor error caused by the gateway occurs. (Likely that calendar data has been deleted. Confirm as needed.)
		b9	–	Not available
		b8	SEMG	Turns ON when the system I/O connector STOP signal input is OFF (stop). All connected axes will go to stop status if this bit turns ON.
		b7	ALMC 1 to 128	Outputs alarm codes caused by the gateway.
		b6		
		b5		
		b4		
		b3		
		b2		
		b1		
		b0		
	Status signal 1	b15	LNK15	When communication between the gateway unit and the driver unit is solidly established, the bit No. that the gateway recognizes as enabled turns ON. Axis No. 0 = LNK0 to Axis No. 15 = LNK15 * It is not available in EC connection unit
		b14	LNK14	
		b13	LNK13	
		b12	LNK12	
		b11	LNK11	
		b10	LNK10	
		b9	LNK9	
		b8	LNK8	
		b7	LNK7	
		b6	LNK6	
		b5	LNK5	
		b4	LNK4	
		b3	LNK3	
		b2	LNK2	
		b1	LNK1	
		b0	LNK0	

[2] Power supply unit (PSA-24) status signal

Eight words of input and output from the top address of the gateway unit are the fixed domains. Six words in these domains should be assigned as the power supply unit status signal domains and the condition of the IAI 24V DC power supply unit PSA-24 can be checked.

■ Address configuration

Request command region and response command region comprise 6 words for each I/O. Address is the address relative to the gateway head.

(1) For CC-Link and CC-Link IE Field

Bit Address	PLC output ⇒ gateway ⇒ each axis input		Each axis output ⇒ gateway ⇒ PLC input		Bit Address
	b15 High byte b8	**b7 Low byte b0**	**b15 High byte b8**	**b7 Low byte b0**	
RY 2F~20	Not available		Power supply unit status signal 0		RX 2F~20
RY 3F~30	Not available		Power supply unit status signal 1		RX 3F~30
RY 4F~40	Not available		Power supply unit status signal 2		RX 4F~40
RY 5F~50	Not available		Power supply unit status signal 3		RX 5F~50
RY 6F~60	Not available		Power supply unit status signal 4/ Light malfunction maintenance signal		RX 6F~60
RY 7F~70	Not available		Not available		RX 7F~70

(2) For DeviceNet

Word Address	PLC output ⇒ gateway ⇒ each axis input		Each axis output ⇒ gateway ⇒ PLC input	
	b15 High byte b8	**b7 Low byte b0**	**b15 High byte b8**	**b7 Low byte b0**
+2	Not available		Power supply unit status signal 0	
+3	Not available		Power supply unit status signal 1	
+4	Not available		Power supply unit status signal 2	
+5	Not available		Power supply unit status signal 3	
+6	Not available		Power supply unit status signal 4/ Light malfunction maintenance signal	
+7	Not available		Not available	

(3) For PROFIBUS-DP, EtherNet/IP (Including front port specification), and EtherCAT

*1 Byte Address	PLC output ⇒ gateway ⇒ each axis input		Each axis output ⇒ gateway ⇒ PLC input	
	b15 High byte b8	**b7 Low byte b0**	**b15 High byte b8**	**b7 Low byte b0**
+4/+5	Not available		Power supply unit status signal 0	
+6/+7	Not available		Power supply unit status signal 1	
+8/+9	Not available		Power supply unit status signal 2	
+10/+11	Not available		Power supply unit status signal 3	
+12/+13	Not available		Power supply unit status signal 4/ Light malfunction maintenance signal	
+13/+14	Not available		Not available	

*1 b8 to b15 of the high byte are b0 to b7.

(4) For PROFINET-IO

*2 Module Address	PLC output ⇒ gateway ⇒ each axis input		Each axis output ⇒ gateway ⇒ PLC input	
	b15 High byte b8	**b7 Low byte b0**	**b15 High byte b8**	**b7 Low byte b0**
+0	Not available		Power supply unit status signal 0	
	Not available		Power supply unit status signal 1	
	Not available		Power supply unit status signal 2	
	Not available		Power supply unit status signal 3	
+1	Not available		Power supply unit status signal 4/ Light malfunction maintenance signal	
	Not available		Not available	

*2 PROFINET-IO uses 4-word unit module addresses.

■ I/O signal

The details of the power supply unit status signal address configuration are as follows.

PLC input

Power supply unit Status signal 0 to 4	b15	b14	b13	b12	b11	b10	b9	b8
	LNK	–	–	–	–	OPMV	FANW	FANA
	b7	b6	b5	b4	b3	b2	b1	b0
	PSMV							

I/O signal list

Signal type		Bit	Symbol name	Content
PLC input	Power unit Status signal 0 to 4	b15	LNK	When communication between the gateway unit and the power supply unit is solidly established, it turns ON when the gateway unit recognizes it as enabled.
		b14 to 11	–	Not available
		b10	OPMV	ON when a reading error occurs in monitored data.
		b9	FANW	Generates a message level alarm (alarm 04C "Fan rotation speed drop") when the fan rotation speed decreases 30%. ON when an alarm occurs and OFF when the alarm is canceled.
		b8	FANA	If the fan rotation speed drops 50%, an operation cancel level alarm (alarm code 0D6 "Fan error detection") is generated, and the actuator stops. ON when an alarm occurs and OFF when the alarm is canceled.
		b7	PSMV	Monitors the item selected using the gateway parameter configuration tool. One of the following seven items can be monitored. (1) Output voltage: 0 to 255 V (2) Voltage of auxiliary winding: 0 to 255 V (3) Output current: 0 to 25.5 A (0.1 A increments) (4) Peak hold current: 0 to 25.5 A (0.1 A increments) (5) Load factor: 0 to 255% (6) FAN rotation speed: 0 to 25,500 r/min (100 r/min increments) (7) PCB temperature: 0 to 255°C
		b6		
		b5		
		b4		
		b3		
		b2		
		b1		
		b0		

Monitored items

Item	Content
(1) Output voltage	This power supply can vary the output voltage according to the load. The output voltage monitoring value changes, but this is not abnormal.
(2) Voltage of auxiliary winding	Control power supply voltage inside the power supply unit. As with the output voltage, it changes according to the load on the output voltage side.
(3) Output current	Instantaneous value of output current.
(4) Peak hold current	Peak value of output current.
(5) Load factor	Ratio of integral value of output current and rated output current. If this value exceeds 100%, the output voltage is cut off as an overload error.
(6) FAN rotation speed	It is the speed of the fan rotation.
(7) PCB temperature	Internal temperature: Temperature in the vicinity of the output capacitor on the secondary side.

[3] Light Malfunction Maintenance Output Feature (Light Malfunction Maintenance Signal)

The light malfunction maintenance output feature is a feature that outputs light malfunction alarms output from each driver unit and maintenance warnings output from ELECYLINDER connected to the EC connection unit and e-wiring system connection unit to the host PLC. (Note1)

Power Supply Unit Status Signal 4 in the power supply unit status signal domain should be assigned as the domain of the maintenance signals.

This feature gets enabled by having the number of the connected power supply units assigned to the gateway to four units or less.

This signal can be utilized as a predictive maintenance feature.

■I/O signal

The details of light malfunction maintenance signal address configuration are as follows.

PLC input

Light Malfunction Maintenance Signal	b15	b14	b13	b12	b11	b10	b9	b8
	MNT15	MNT14	MNT13	MNT12	MNT11	MNT10	MNT9	MNT8
	b7	b6	b5	b4	b3	b2	b1	b0
	MNT7	MNT6	MNT5	MNT4	MNT3	MNT2	MNT1	MNT0

I/O signal list

Signal type		Bit	Symbol name	Content
PLC input	Light Malfunction Maintenance Signal	b15	MNT15	ALML bit of ELECYLINDER connected via a driver and EC connection unit should be assigned in order of axis numbers. Axis No.0 = MNT0 to Axis No.15 = MNT15
		b14	MNT14	
		b13	MNT13	
		b12	MNT12	
		b11	MNT11	
		b10	MNT10	
		b9	MNT9	
		b8	MNT8	
		b7	MNT7	
		b6	MNT6	
		b5	MNT5	
		b4	MNT4	
		b3	MNT3	
		b2	MNT2	
		b1	MNT1	
		b0	MNT0	

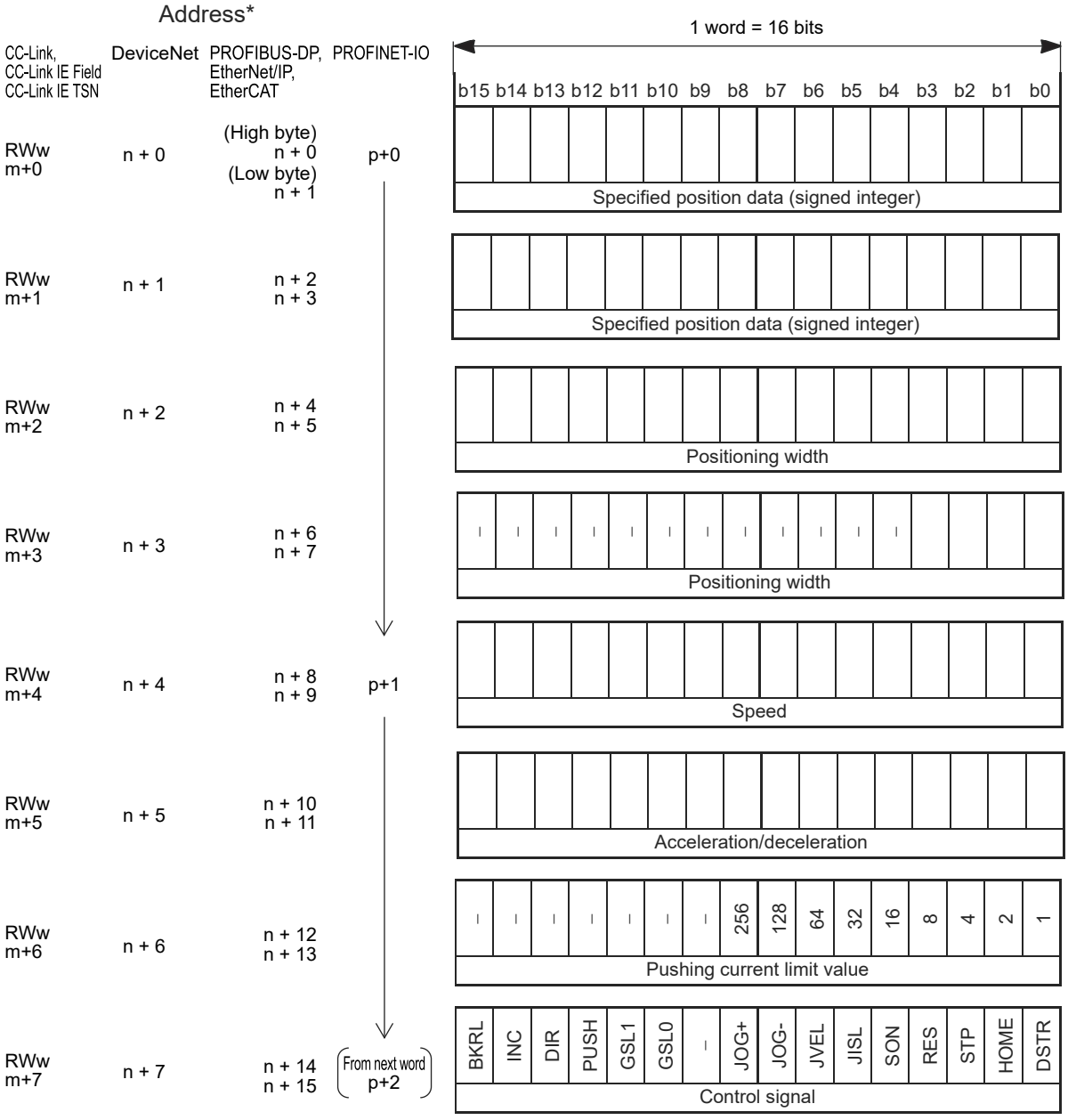
Note1 Gateway version should be V0009 or later

10.4.2 Direct numerical control mode assignment

Assigning the direct numerical control mode is as follows.
Set the current limit value in push-motion, acceleration/deceleration and speed within the range of the actuator specifications, and set the target position data within the software stroke range.

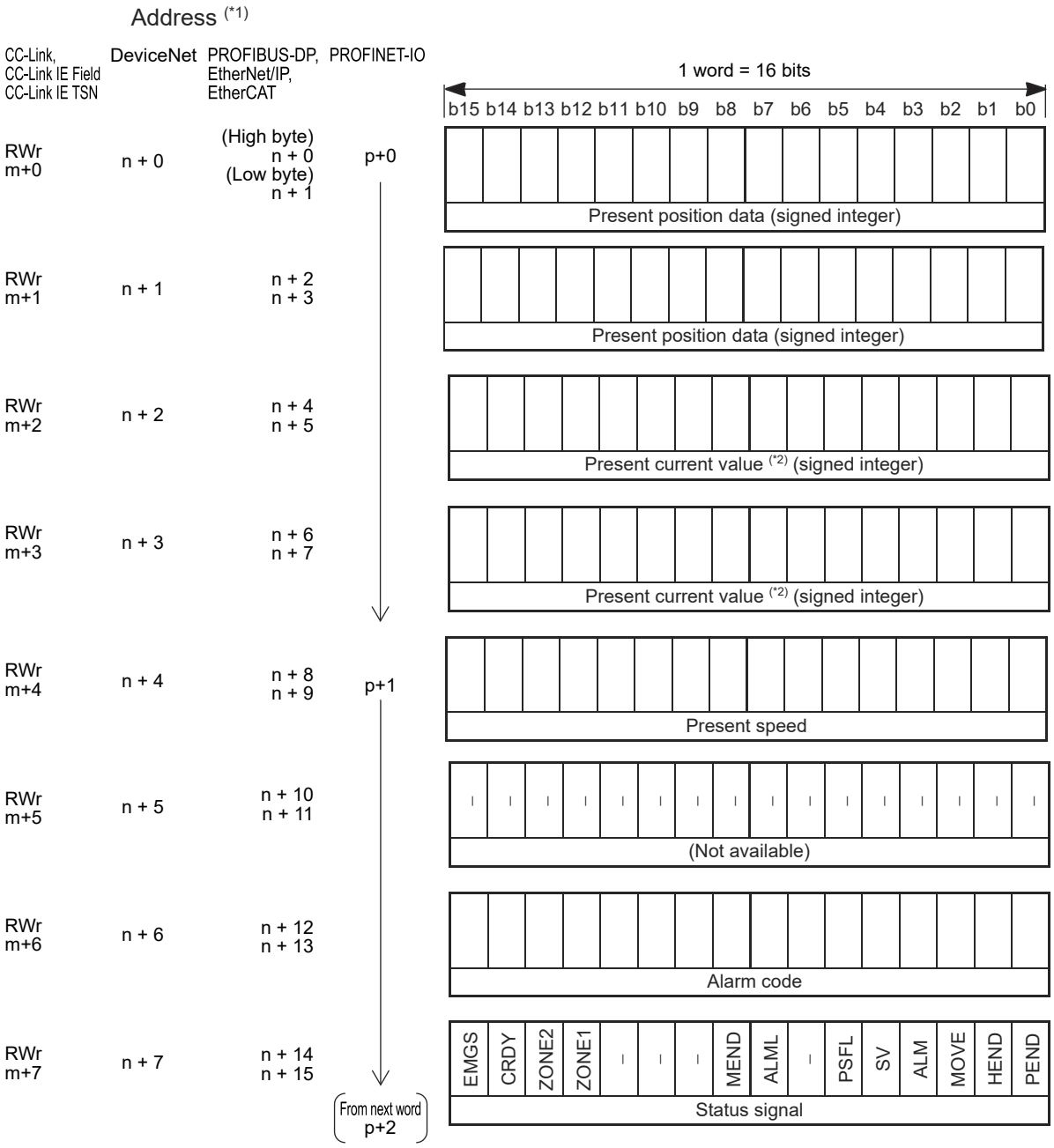
Setting units: Current limit value = 1%, Acceleration/deceleration = 0.01 G,
Speed = 1.0 mm/s or 0.1 mm/s, Position data/Positioning width = 1/100 mm

PLC output = Axis control signal



* m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

PLC input = Axis status signal



*1 m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

*2 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

Note: The maximum number of connectable axes in CC-Link, CC-Link IE Field, CC-Link IE TSN and EtherNet/IP (Front port) should be 16 axes. For others, the maximum number of connectable axes should be eight axes.

[I/O Signal List] Operation in direct numerical control mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC output	Position specified data	32-bit data	–	32-bit signed integer (unit: 0.01 mm; 0.001° for DD motor). Ex) For +25.40 mm, specify as 2540. ● The maximum set value is +9,999.99 mm = 999999. ● Set the position data within the software stroke range. ● For negative numbers, specify with 2's complement when input is made in a hexadecimal number.
	Positioning width	32-bit data	–	32-bit integer (unit: 0.01 mm; 0.001° for DD motor). Ex) For +25.40 mm, specify as 2540. ● Set the position data within the software stroke range. ● Specify the direction of push-motion operation with DIR. ● Note that when the specified positioning width data is not set, the parameter No.10 "Positioning width initial value" will not be applied.
	Speed	16-bit data	–	16-bit integer (unit: 1.0 mm/s or 0.1 mm/s). Ex) For 200mm/s, specify as 200 when unit = 1.0mm/s ● If the speed is not set or set as "0", it will remain stopped. Alarm will not be triggered. If the speed is changed by setting to "0" during travel, it will decelerate and stop. ● The unit can be switched with the gateway parameter configuration tool. (It is set to 1.0 mm/s by default.)
	Acceleration/ deceleration	16-bit data	–	16-bit integer (unit: 0.01G). Ex) When setting at 0.20 G, specify as 20. ● Note that when the acceleration/deceleration is not set, the parameter No.9 "Acceleration/deceleration initial value" will not be applied. ● The acceleration and deceleration cannot be individually set. They will be set together as acceleration/deceleration.
	Pushing current limit value	16-bit data	–	Set the current limit value in push-motion operation. The setting range is 0 to 200%, where 255 = 100% and 510 = 200% (Note 1). Ex) To set to 50%, specify 255 × 50% = 127.

[I/O Signal List] Direct numerical control mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

<table>
<tr><th colspan="2">Signal type</th><th>Bit</th><th>Signal name</th><th colspan="2">Content</th></tr>
<tr><td rowspan="17">PLC output</td><td rowspan="17">Control signal</td><td>b15</td><td>BKRL</td><td colspan="2">Forced brake release</td></tr>
<tr><td>b14</td><td>INC</td><td colspan="2">Incremental
[OFF: absolute position command,
ON: relative position command]</td></tr>
<tr><td>b13</td><td>DIR</td><td colspan="2">Push direction specification
[ON: travel in home reverse direction,
OFF: travel in home direction]
(Note) This signal is enabled when CON push-motion method is selected.</td></tr>
<tr><td>b12</td><td>PUSH</td><td colspan="2">Push-motion specification
[ON: push-motion operation, OFF: positioning operation]</td></tr>
<tr><td>b11</td><td>GSL1</td><td>Servo gain parameter set 1 selection</td><td rowspan="2">Servo gain parameter set selection to use.
<table><tr><th>GSL1</th><th>GSL0</th><th>Function</th></tr><tr><td>OFF</td><td>OFF</td><td>Parameter set 0 selection</td></tr><tr><td>OFF</td><td>ON</td><td>Parameter set 1 selection</td></tr><tr><td>ON</td><td>OFF</td><td>Parameter set 2 selection</td></tr><tr><td>ON</td><td>ON</td><td>Parameter set 3 selection</td></tr></table></td></tr>
<tr><td>b10</td><td>GSL0</td><td>Servo gain parameter set 0 selection</td></tr>
<tr><td>b9</td><td>–</td><td colspan="2">Not available</td></tr>
<tr><td>b8</td><td>JOG+</td><td colspan="2">+Jog [ON: travel in home reverse direction, OFF: Stop]</td></tr>
<tr><td>b7</td><td>JOG-</td><td colspan="2">-Jog [ON: travel in home direction, OFF: Stop]</td></tr>
<tr><td>b6</td><td>JVEL</td><td colspan="2">Jog speed / inching distance switching
[OFF: Uses RCON parameter No. 26 "Jog velocity" and No. 48 "Inching setting value"
ON: Uses RCON parameter No. 47 "Jog velocity 2 setting value or command vel. setting value" (Note 2) and No. 49 "Inching 2 setting value"]</td></tr>
<tr><td>b5</td><td>JISL</td><td colspan="2">Jog/Inching switching [ON: Inching, OFF: Jog]</td></tr>
<tr><td>b4</td><td>SON</td><td colspan="2">Servo ON command [ON: Servo ON, OFF: Servo OFF]</td></tr>
<tr><td>b3</td><td>RES</td><td colspan="2">Reset [ON to execute reset]</td></tr>
<tr><td>b2</td><td>STP</td><td colspan="2">Pause [ON: Pause, OFF: Pause cancel]</td></tr>
<tr><td>b1</td><td>HOME</td><td colspan="2">Home return
[ON to execute home return command. Even when turned OFF midway, it will run until completion]</td></tr>
<tr><td>b0</td><td>DSTR</td><td colspan="2">Positioning command
[ON to execute travel command. Even when turned OFF midway, it will run until completion]</td></tr>
</table>

Note 1: The range available for setting should differ depending on actuators. Refer to [Instruction manual for actuator to be used].

Note 2: When command speed setting = 0: operates at the value of RCON parameter No. 47 "PIO Jog velocity 2". When command speed setting ≠ 0: operates at the command speed set value.

[I/O Signal List] Direct numerical control mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Present position data	32-bit data	–	Present position data is output in 32-bit signed integer (unit: 0.01mm and 0.001deg for DD motor). Ex) For +25.4 mm, it will be 2540. ● For negative numbers, 2's complement will be displayed when reading is made in a hexadecimal number.
	Present current value (Note 1)	32-bit data	–	Motor command current value data is output in 32-bit integer (unit: mA). Ex) For +1A (+1000mA), it will be 1000.
	Present speed	16-bit data	–	Output in 16-bit integer (unit: 1.0 mm/s or 0.1 mm/s). Change the unit using the gateway parameter configuration tool. Ex) For 125mm/s, 1,250 will be displayed when unit = 1.0mm/s ● It should be 2's complement when operating in negative direction.
	Alarm code	16-bit data	–	Outputs the currently generated alarm code. (ALM is ON.) Note that this is not the same as the simple alarm code.
	Status signal	b15	EMGS	Emergency stop status [ON: Emergency stop status]
		b14	CRDY	Controller ready [ON: Ready]
		b13	ZONE2	Zone output monitor 2 [ON: Present position is within the setting range of zone 2, OFF: Limit position is not within the setting range]
		b12	ZONE1	Zone output monitor 1 [ON: Present position is within the setting range of zone 1, OFF: Limit position is not within the setting range]
		b11	–	Not available.
		b10		
		b9		
		b8	MEND	Command complete signal [ON: When in positioning complete, push-motion complete or idling status after travel, OFF: Travel start or servo OFF]
		b7	ALML	Minor malfunction alarm [ON: When overload warning or message level alarm occurs]
		b6	–	Not available

Note 1 The present current value should be the command current value for the stepper motor and be the feedback current value for the AC servomotor (including AC servomotor connected to SCON).

[I/O Signal List] Direct numerical control mode

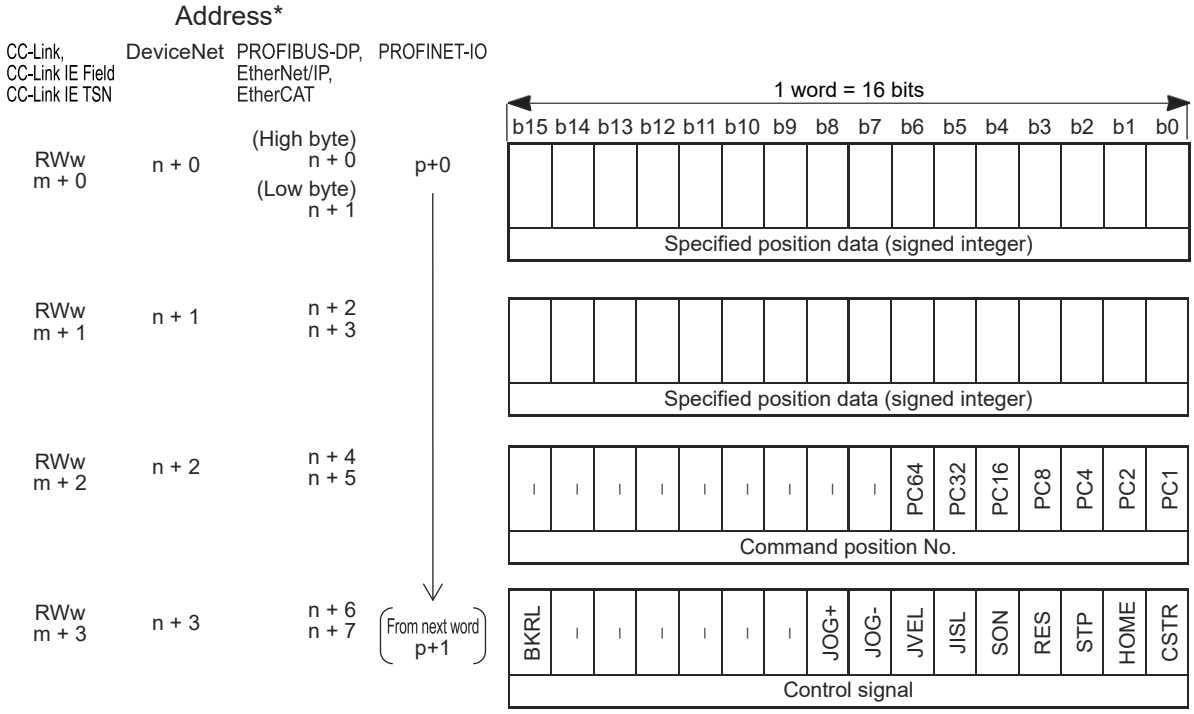
(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Status signal	b5	PSFL	Push-motion operation contactless [ON: push-motion operation completed contactless]
		b4	SV	Operation ready [ON: Operation ready (Servo ON)]
		b3	ALM	Alarm [ON: Alarm generated, OFF: No alarm]
		b2	MOVE	Traveling [ON: Traveling, OFF: Stopped]
		b1	HEND	Home return complete [ON: Maintaining home after home return complete]
		b0	PEND	Positioning complete [ON: After completion, stopped at servo ON, OFF: For contactless push-motion, stopped at servo OFF]

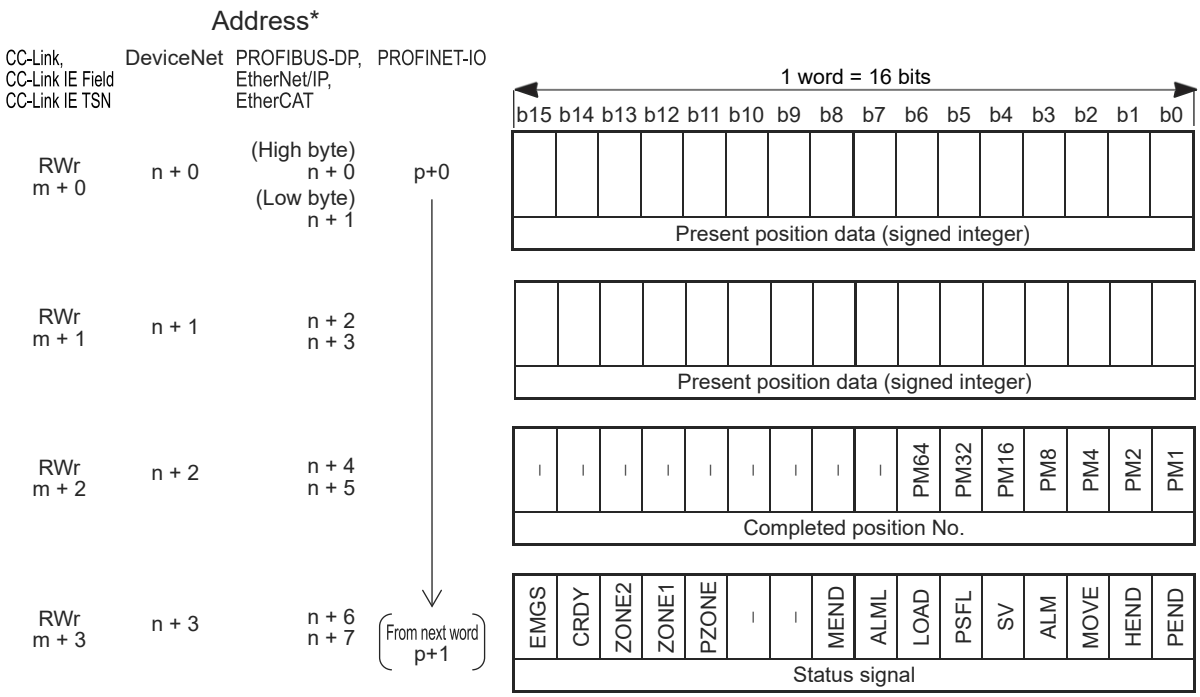
10.4.3 Simple direct mode assignment

Assigning the simple direct mode is as follows.

PLC output = Axis control signal



PLC input = Axis status signal



* m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

[I/O Signal List] Simple direct mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC output	Position specified data	32-bit data	–	32-bit signed integer (unit: 0.01 mm; 0.001° for DD motor). Ex) For +25.40 mm, set as 2540. ● The maximum set value is +9,999.99 mm = 999999. ● For negative numbers, specify with 2's complement when input is made in a hexadecimal number.
	Command position No.	b6-b0	PC**	The travel data not specified by the position data are set in the position table. This position No. will be specified in binary.
	Control signal	b15	BKRL	Forced brake release [ON: forced brake, OFF: brake enabled]
		b14	–	Not available
		b13		
		b12		
		b11		
		b10		
		b9		
		b8	JOG+	+Jog [ON: travel in home reverse direction, OFF: Stop]
		b7	JOG-	-Jog [ON: travel in home direction, OFF: Stop]
		b6	JVEL	Jog velocity/inching distance switchover [OFF: Use RCON parameter No. 26 "Jog velocity" and No. 48 "Inching set value" ON : Use RCON parameter No. 47 "Jog velocity 2" and No. 49 "Inching 2 set value"]
		b5	JISL	Jog/Inching switching [ON: Inching, OFF: Jog]
		b4	SON	Servo ON [ON: Servo ON, OFF: Servo OFF]
		b3	RES	Reset [ON to execute reset]
		b2	STP	Pausing [ON: Pause, OFF: Pause cancel]
		b1	HOME	Home return [ON to execute home return command. Even when turned OFF midway, it will run until completion]
		b0	CSTR	Positioning start [ON to execute travel command. Even when turned OFF midway, it will run until completion]

[I/O Signal List] Simple direct mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Present position data	32-bit data	–	32-bit signed integer (unit: 0.01 mm; 0.001° for DD motor). Ex) For +25.40 mm, outputs as 2540. ● The maximum output value is +9,999.99 mm = 999999. ● For negative numbers, 2's complement will be displayed when reading is made in a hexadecimal number.
	Complete position No.	b6-b0	PM**	Reads the completed position No. in binary. Outputs the simple alarm code while alarm is generated.
	Status signal	b15	EMGS	Emergency stop status [ON: Emergency stop status]
		b14	CRDY	Controller ready [ON: Ready]
		b13	ZONE2	Zone output monitor 2 [ON : Present position is within the setting range of zone 2, OFF: Limited position is not within the setting range]
		b12	ZONE1	Zone output monitor 1 [ON : Present position is within the setting range of zone 1, OFF: Limited position is not within the setting range]
		b11	PZONE	Position zone output monitor [ON when the present position is within the position zone setting]
		b10	–	Not available.
		b9		
		b8	MEND	Command complete [ON : When in positioning complete, push-motion complete or idling status after travel, OFF: Travel start or servo OFF]
		b7	ALML	Minor malfunction alarm output [ON: When overload warning or message level alarm occurs]
		b6	LOAD	Load output judgment status [ON: When collision is detected]
		b5	PSFL	Push-motion operation contactless [ON: push-motion operation completed contactless]
		b4	SV	Operation ready [ON: Operation ready (Servo ON)]
		b3	ALM	Alarm [ON: Alarm generated, OFF: No alarm]
		b2	MOVE	Traveling [ON: Traveling, OFF: Stopped]

[I/O Signal List] Simple direct mode

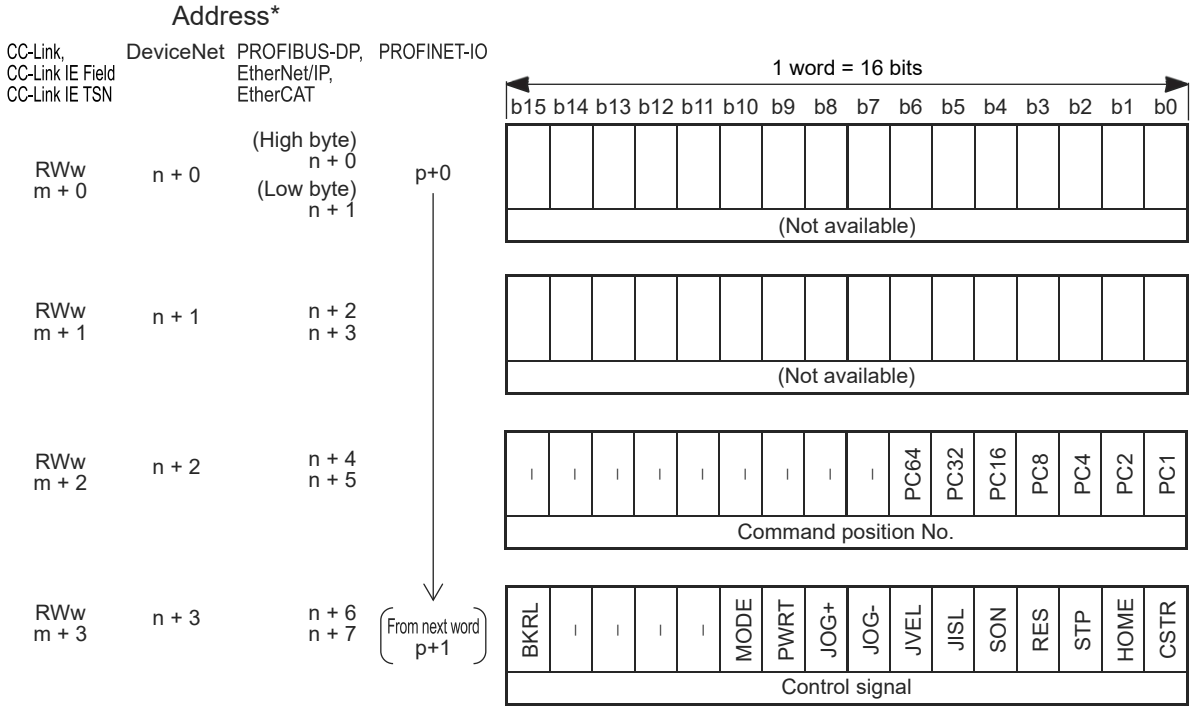
(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Status signal	b1	HEND	Home return complete [ON: Maintaining home after home return complete]
		b0	PEND	Positioning complete [ON : After completion, stopped at servo ON, OFF: For contactless push-motion, stopped at servo OFF]

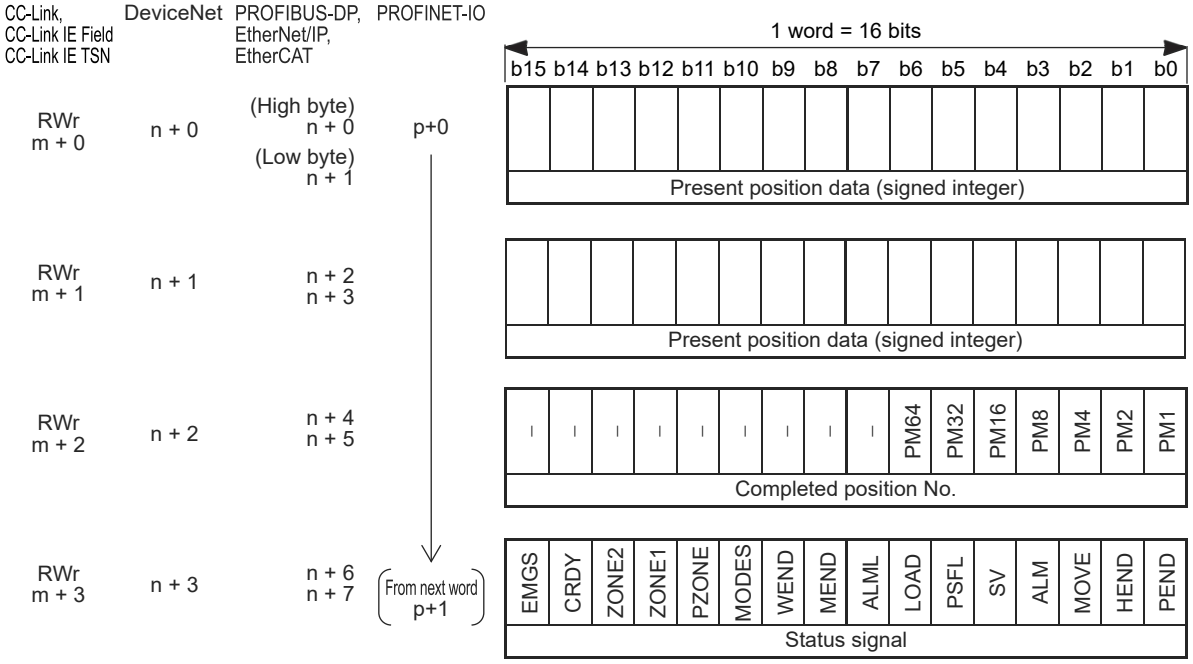
10.4.4 Positioner 1 mode assignment

Assigning the positioner 1 mode is as follows.

PLC output = Axis control signal



PLC input = Axis status signal



* m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

[I/O Signal List] Positioner 1/2 mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC output	Command position No.	b6-b0	PC**	Specifies the command position No. in binary.
	Control signal	b15	BKRL	Forced brake release [ON: forced brake, OFF: brake enabled]
		b14	–	Not available
		b13		
		b12		
		b11		
		b10	MODE	Teaching mode command [OFF: Normal operation mode, ON: Teaching mode]
		b9	PWRT	Position data import command [ON: Position data import]
		b8	JOG+	+Jog [ON: travel in home reverse direction, OFF: Stop]
		b7	JOG-	-Jog [ON: travel in home direction, OFF: Stop]
		b6	JVEL	Jog velocity/inching distance switchover [OFF: Use RCON parameter No. 26 Jog velocity and No. 48 Inching set value ON: Use RCON parameter No. 47 Jog velocity 2 and No. 49 Inching 2 set value]
		b5	JISL	Jog/Inching switching [ON: Inching, OFF: Jog]
		b4	SON	Servo ON [ON: Servo ON, OFF: Servo OFF]
		b3	RES	Reset [ON to execute reset]
		b2	STP	Pausing [ON: Pause, OFF: Pause cancel]
		b1	HOME	Home return [ON to execute home return command. Even when turned OFF midway, it will run until completion]
		b0	CSTR	Positioning start [ON to execute travel command. Even when turned OFF midway, it will run until completion]

[I/O Signal List] Positioner 1/2 mode

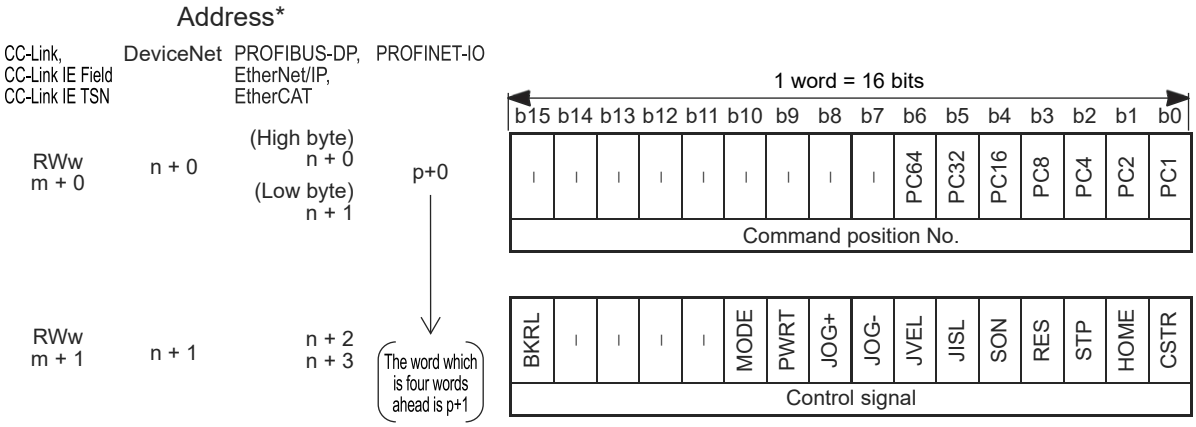
(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Present position data	32-bit data	–	32-bit signed integer (unit: 0.01 mm; 0.001° for DD motor). Ex) For +25.40 mm, outputs as 2540. ● The maximum output value is +9,999.99 mm = 999999. ● For negative numbers, 2's complement will be displayed when reading is made in a hexadecimal number.
	Complete position No.	b6-b0	PM**	Reads the completed position No. in binary. Outputs the simple alarm code while alarm is generated.
	Status signal	b15	EMGS	Emergency stop status [ON: Emergency stop status]
		b14	CRDY	Controller ready [ON: Ready]
		b13	ZONE2	Zone output monitor 2 [ON: Present position is within the setting range of zone 2, OFF: Limited position is not within the setting range]
		b12	ZONE1	Zone output monitor 1 [ON: Present position is within the setting range of zone 1, OFF: Limited position is not within the setting range]
		b11	PZONE	Position zone output monitor [ON when the present position is within the position zone setting]
		b10	MODES	Teaching mode status [ON for teaching mode]
		b9	WEND	Position data import complete [ON when position data import completes]
		b8	MEND	Command complete [ON: When in positioning complete, push-motion complete or idling status after travel, OFF: Travel start or servo OFF]
		b7	ALML	Minor malfunction alarm output [ON: When overload warning or message level alarm occurs]
		b6	LOAD	Load output judgment status [ON: When collision is detected]
		b5	PSFL	Push-motion operation contactless [ON: push-motion operation completed contactless]
		b4	SV	Operation ready [ON: Operation ready (Servo ON)]
		b3	ALM	Alarm [ON: Alarm generated, OFF: No alarm]
		b2	MOVE	Traveling [ON: Traveling, OFF: Stopped]
		b1	HEND	Home return complete [ON: Maintaining home after home return complete]
		b0	PEND	Positioning complete [ON: After completion, stopped at servo ON, OFF: For contactless push-motion, stopped at servo OFF]

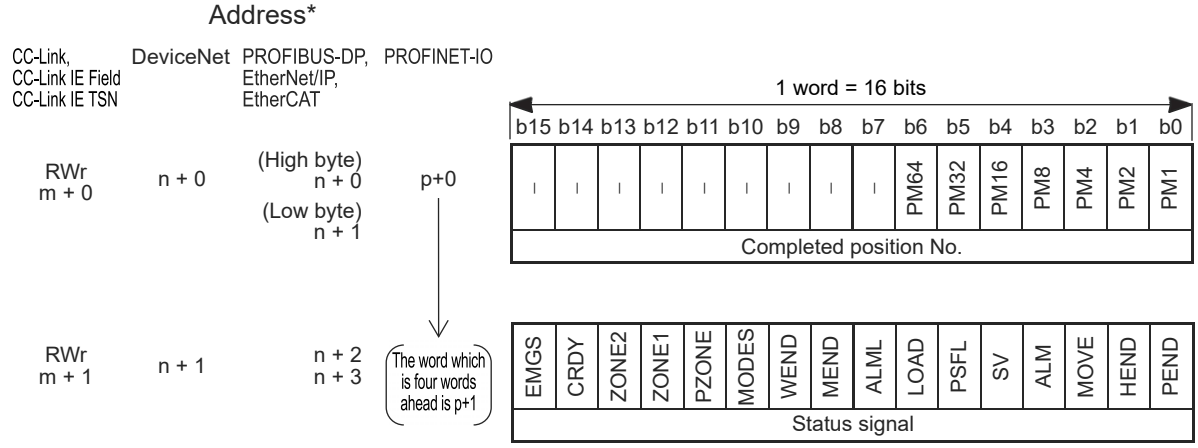
10.4.5 Positioner 2 mode assignment

Assigning the positioner 2 mode is as follows.

PLC output = Axis control signal



PLC input = Axis status signal



* m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

I/O signal list and alarm content list are all the same except for "Present position data" in positioner 1 mode. In positioner 1 mode, the "Present position data" is included in the PLC input signal. It is not included in positioner 2 mode. Refer to [6.2.4 Positioner 1 mode assignment].

10.4.6 Positioner 3 mode assignment

Assigning the positioner 3 mode is as follows.

PLC output = Axis control signal

Address*

CC-Link, CC-Link IE Field, CC-Link IE TSN	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
RWw m + 0	n + 0	(High byte) n + 0 (Low byte) n + 1	p+0

1 word = 16 bits

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
BKRL	–	–	SON	RES	STP	HOME	CSTR	–	PC64	PC32	PC16	PC8	PC4	PC2	PC1
Control signal								Command position No.							

PLC input = Axis status signal

Address*

CC-Link, CC-Link IE Field, CC-Link IE TSN	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
RWr m + 0	n + 0	(High byte) n + 0 (Low byte) n + 1	p+0

1 word = 16 bits

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
EMGS	ZONE1	PSFL	SV	ALM	MOVE	HEND	PEND	–	PM64	PM32	PM16	PM8	PM4	PM2	PM1
Status signal								Completed position No.							

* m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

[I/O Signal List] Positioner 3 mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC output	Control signal	b15	BKRL	Forced brake release [ON: forced brake, OFF: brake enabled]
		b14	–	Not available
		b13		
		b12	SON	Servo ON [ON: Servo ON, OFF: Servo OFF]
		b11	RES	Reset [ON to execute reset]
		b10	STP	Pausing [ON: Pause, OFF: Pause cancel]
		b9	HOME	Home return [ON to execute home return command. Even when turned OFF midway, it will run until completion]
		b8	CSTR	Positioning start [ON to execute travel command. Even when turned OFF midway, it will run until completion]
	Command position No.	b7	–	Not available
		b6-b0	PC**	Specifies the command position No. in binary.

[I/O Signal List] Positioner 3 mode

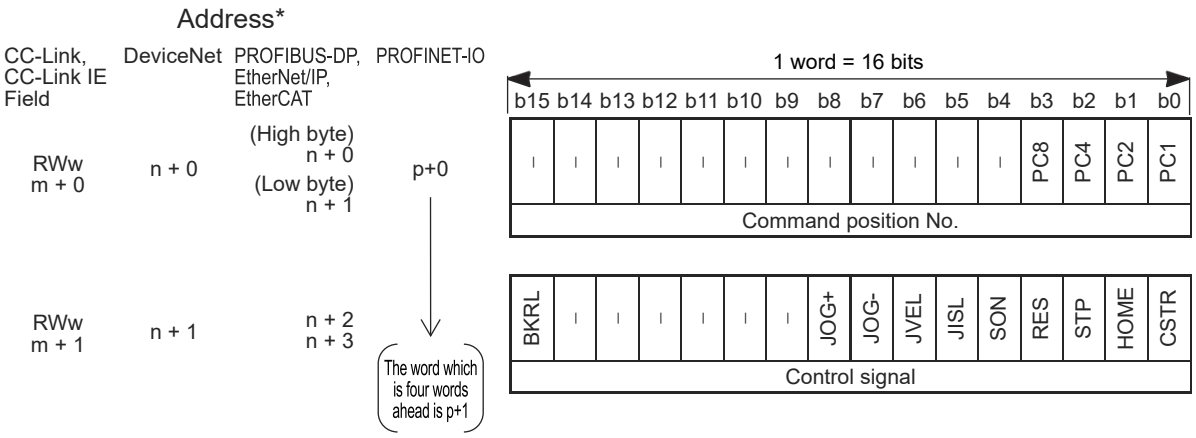
(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Status signal	b15	EMGS	Emergency stop status [ON: Emergency stop status]
		b14	ZONE1	Zone output monitor 1 [ON: Present position is within the setting range of zone 1, OFF: Limited position is not within the setting range]
		b13	PSFL	Push-motion operation contactless [ON: push-motion operation completed contactless]
		b12	SV	Operation ready [ON: Operation ready (Servo ON)]
		b11	ALM	Alarm [ON: Alarm generated, OFF: No alarm]
		b10	MOVE	Traveling [ON: Traveling, OFF: Stopped]
		b9	HEND	Home return complete [ON: Maintaining home after home return complete]
		b8	PEND	Positioning complete [ON: After completion, stopped at servo ON, OFF: For contactless push-motion, stopped at servo OFF]
	Complete position No.	b7	–	Not available
		b6-b0	PM**	Reads the completed position No. in binary. Outputs the simple alarm code while alarm is generated.

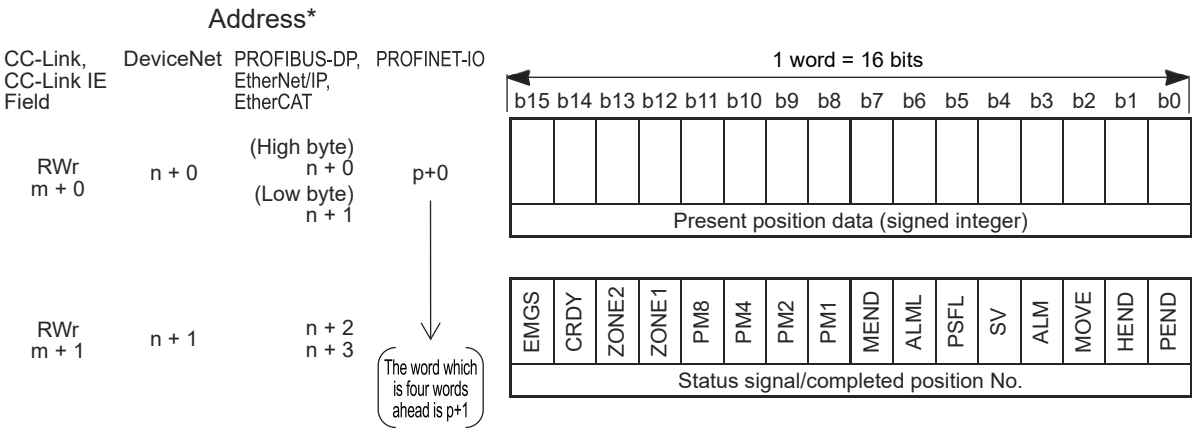
10.4.7 Positioner 5 mode assignment

Assigning the positioner 5 mode is as follows.

PLC output = Axis control signal



PLC input = Axis status signal



* m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

> ⚠ *Caution:*
> - *The maximum present position data that can be output in positioner 5 mode is 3,276.7 mm (327.67° for DD motor).*
> - *If the maximum value is exceeded, the present position data will not be correctly output.*
>
> *This may lead to display or operation malfunction, resulting in personal injury or device damage.*
> - *For use in an operation range exceeding the maximum value, select a different operation mode.*

[I/O Signal List] Positioner 5 mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC output	Command position No.	b3-b0	PC**	Specifies the command position No. in binary.
	Control signal	b15	BKRL	Forced brake release [ON: forced brake, OFF: brake enabled]
		b14	–	Not available
		b13		
		b12		
		b11		
		b10		
		b9		
		b8	JOG+	+Jog [ON: travel in home reverse direction, OFF: Stop]
		b7	JOG-	-Jog [ON: travel in home direction, OFF: Stop]
		b6	JVEL	Jog velocity/inching distance switchover [OFF: Use RCON parameter No. 26 Jog velocity and No. 48 Inching set value ON: Use RCON parameter No. 47 Jog velocity 2 and No. 49 Inching 2 set value]
		b5	JISL	Jog/Inching switching [ON: Inching, OFF: Jog]
		b4	SON	Servo ON [ON: Servo ON, OFF: Servo OFF]
		b3	RES	Reset [ON to execute reset]
		b2	STP	Pausing [ON: Pause, OFF: Pause cancel]
		b1	HOME	Home return [ON to execute home return command. Even when turned OFF midway, it will run until completion]
		b0	CSTR	Positioning start [ON to execute travel command. Even when turned OFF midway, it will run until completion]

[I/O Signal List] Positioner 5 mode

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC input	Present position	16 bits	–	16-bit signed integer (unit: 0.1 mm; 0.01° for DD motor). Ex) For +25.40 mm, outputs as 254. ● The maximum output value is +3,276.7 mm = 32767. ● For negative numbers, 2's complement will be displayed when reading is made in a hexadecimal number.
	Status signal, complete position No.	b15	EMGS	Emergency stop status [ON: Emergency stop status]
		b14	CRDY	Controller ready [ON: Ready]
		b13	ZONE2	Zone output monitor 2 [ON: Present position is within the setting range of zone 2, OFF: Limited position is not within the setting range]
		b12	ZONE1	Zone output monitor 1 [ON: Present position is within the setting range of zone 1, OFF: Limited position is not within the setting range]
		b11-b8	PM**	Reads the completed position No. in binary. Outputs the simple alarm code while alarm is generated.
		b7	MEND	Command complete [ON: When in positioning complete, push-motion complete or idling status after travel, OFF: Travel start or servo OFF]
		b6	ALML	Minor malfunction alarm output [ON: When overload warning or message level alarm occurs]
		b5	PSFL	Push-motion operation contactless [ON: push-motion operation completed contactless]
		b4	SV	Operation ready [ON: Operation ready (Servo ON)]
		b3	ALM	Alarm [ON: Alarm generated, OFF: No alarm]
		b2	MOVE	Traveling [ON: Traveling, OFF: Stopped]
		b1	HEND	Home return complete [ON: Maintaining home after home return complete]
		b0	PEND	Positioning complete [ON: After completion, stopped at servo ON, OFF: For contactless push-motion, stopped at servo OFF]

10.4.8 Full direct value mode assignment

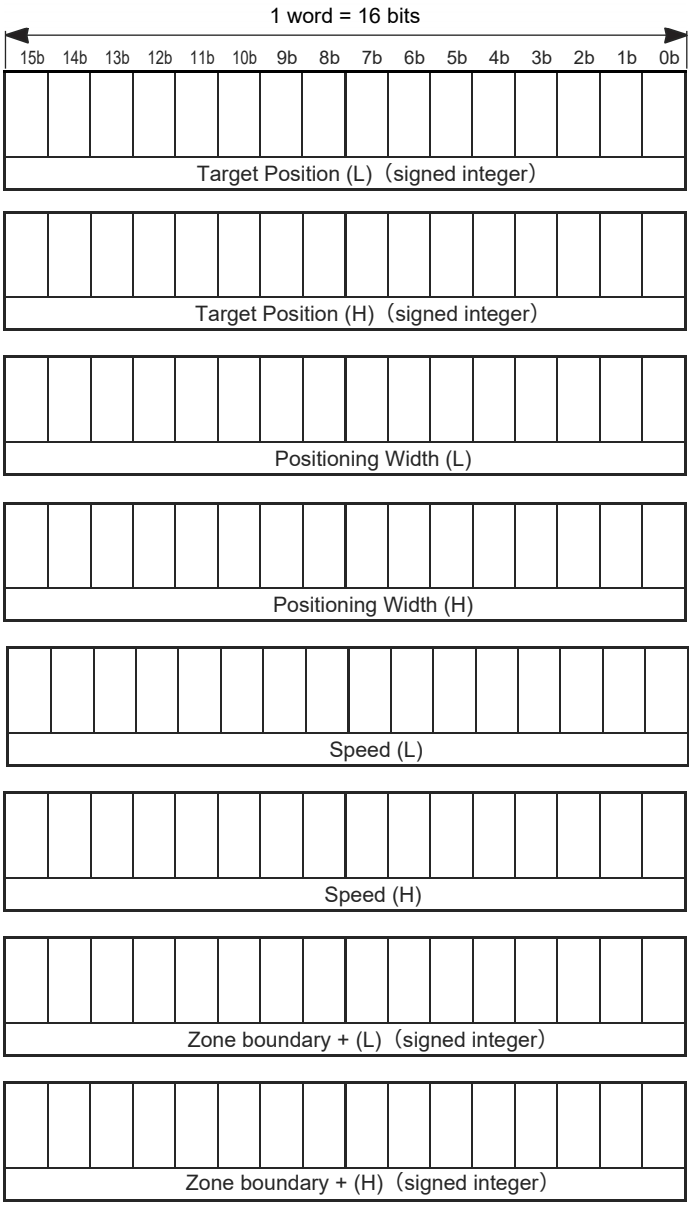
Assigning full direct value mode is as follows.
Set the current limit value in push-motion, acceleration/deceleration and speed within the range of the actuator specifications, and set the target position data within the software stroke range.

Setting units: Current limit value = 1%, Acceleration/deceleration = 0.01 G, Speed = 1.0 mm/s or 0.1 mm/s, Position data/Positioning width = 1/100 mm

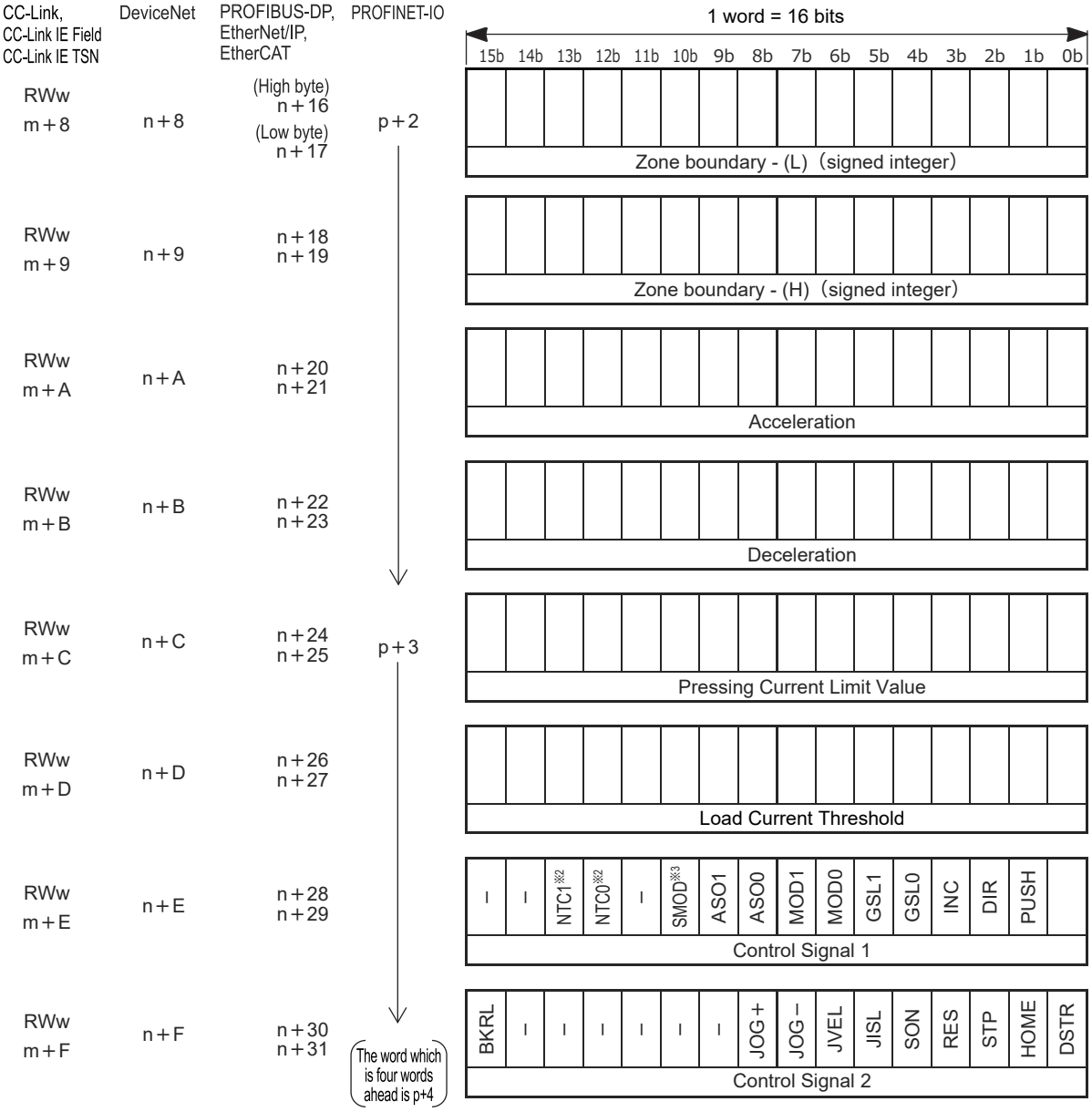
PLC output = Axis control signal

Address*1

CC-Link, CC-Link IE Field CC-Link IE TSN	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO	
RWw m+0	n+0	(High byte) n+0 (Low byte) n+1	p+0	Target Position (L) (signed integer)
RWw m+1	n+1	n+2 n+3		Target Position (H) (signed integer)
RWw m+2	n+2	n+4 n+5		Positioning Width (L)
RWw m+3	n+3	n+6 n+7		Positioning Width (H)
RWw m+4	n+4	n+8 n+9	p+1	Speed (L)
RWw m+5	n+5	n+10 n+11		Speed (H)
RWw m+6	n+6	n+12 n+13		Zone boundary + (L) (signed integer)
RWw m+7	n+7	n+14 n+15		Zone boundary + (H) (signed integer)



Address*1



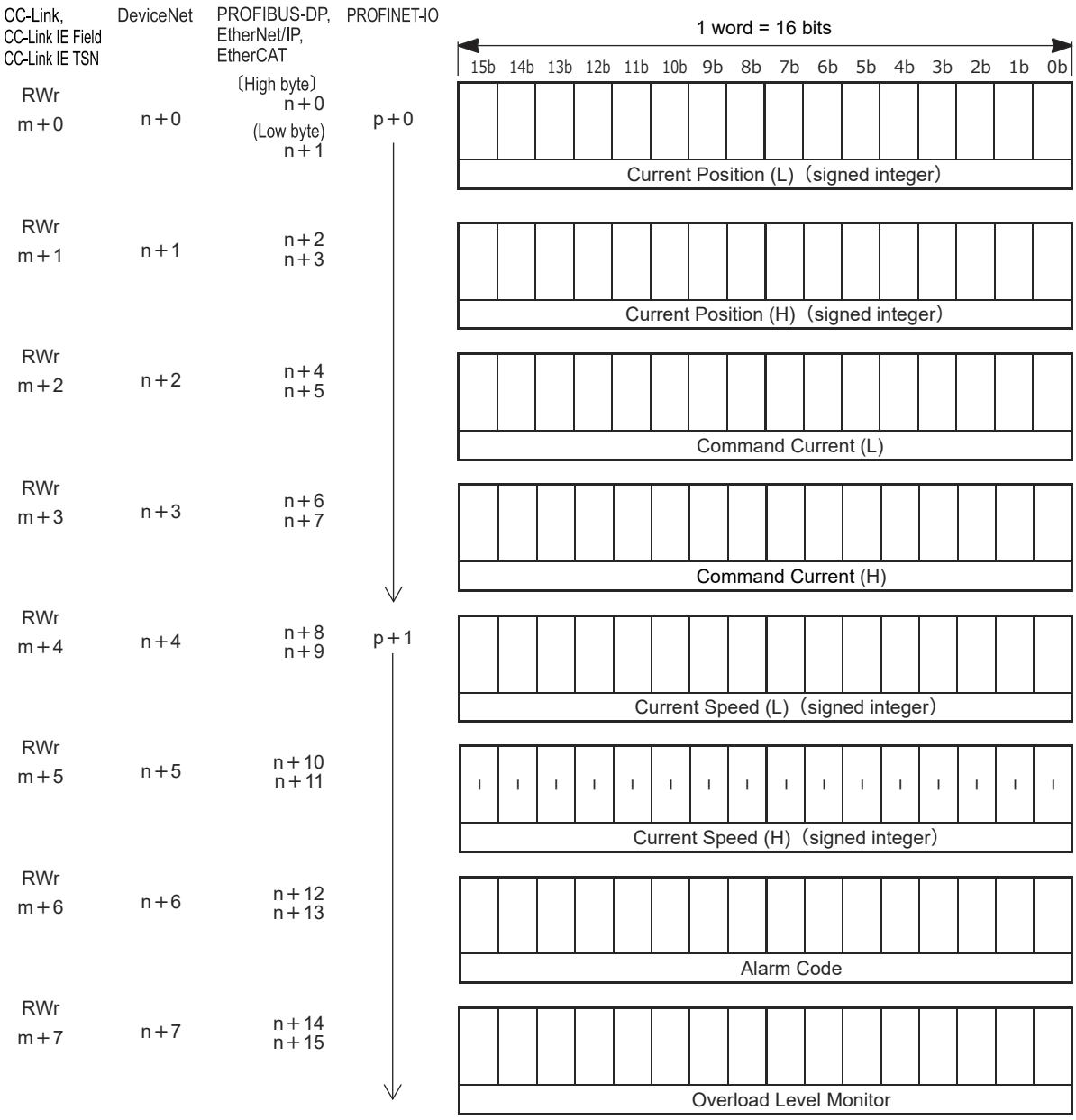
*1 m is the head register address of each axis. n is the head relative address of each axis. p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

*2 NTC0 and NTC1 are supported only for RCON-AC, RCON-SC, SCON-CB-RC, and SCON2-CG-RC.

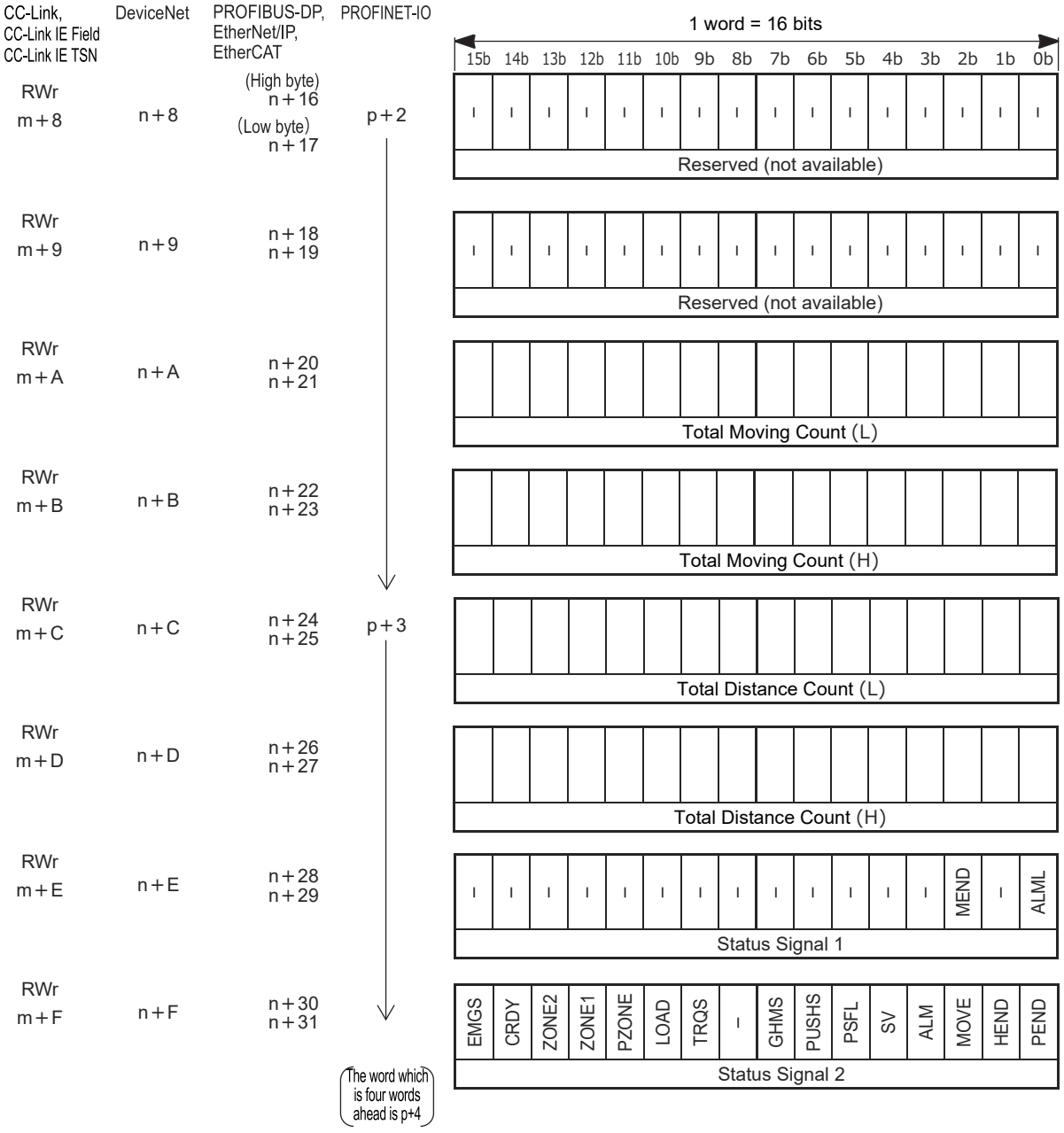
*3 SMOD is supported only for RCON-PC/PCF.

PLC input = Axis status signal

Address*1



Address*1



*1 m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

*2 Current value is command current value for pulse motors and the feedback current value for AC servo motors (including AC servo motors connected to SCON).

*3 LOAD and TRQS are supported only for RCON-PC/PCF、RCON-SC、SCON-CB-RC and SCON2-CG-RC.

I/O Signal Assignment

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC output	Target Position	32bits data	-	32-bit Signed Integer Set the target position on the absolute coordinates. Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Specifiable range: - 9,999,999 to 9,999,999 Input example: +25.40mm in the unit of 0.01mm should be indicated as 2,540. * If the value larger than the value (0.2mm) inside the soft limit for the parameter, the movement would be limited to the inside the soft limit (0.2mm). * When the input is performed in hexadecimal notation, input the negative value using a complement of 2.
	Positioning Width	32bits data	-	32-bit Integer Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Specifiable range: - 9,999,999 to 9,999,999 Input example: +25.40mm in the unit of 0.01mm should be indicated as 2,540. This register value has two meanings depending on the operation type. 1) In the case of positioning operation, it shows the allowable range from the target position, that is regarded as the positioning completion. 2) In the case of pressing operation, it shows the pressing width value. Specify the normal operation or pressing operation using the PUSH control signal setting.
	Speed	32bits data	-	32-bit Integer Specify the speed at which to move the actuator. Designate unit: 0.1mm/s Settable range: 0 to 999,999 * Deceleration stop if and to specify in motion 0. It under suspension, it will remain stopped on the spot. Input example: To set 25.41 mm, specify 2540. If a move command is issued by specifying a value exceeding the maximum speed, an alarm will occur.
	Zone boundary +	32bits data	-	32-bit Signed Integer Apart from the zone specified using the parameter setting, the zone signal effective after the homing operation is output. When the current position is inside of this “+” Value, the status signal PZONE is turned ON. Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Specifiable range : - 9,999,999 to 9,999,999 Input the value satisfying the relationship of “Zone boundary +” > “Zone boundary -”. When this function is not to be used, the same value is applied to both Zone boundarys. Example: If the unit is 0.01mm and it is 25.40mm, set it as 2,540. * When it is input in hexadecimal notation, input the negative value using a compliment of 2.
	Zone boundary -	32bits data	-	
	Acceleration	16bits data	-	16-bit Integer Set the acceleration/deceleration in movement (The same value is applied both to acceleration and deceleration). Unit: 0.01G Specifiable range: 1 to 999 Input example: When it is 0.30G, set it as 30. When the movement command is set with the value of 0 or bigger than the max. acceleration/deceleration value, an alarm is issued.
	Deceleration	16bits data	-	

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC output	Pressing Current Limit Value	16bits data	-	16-bit Integer Set the current limit in pressing operation. Specifiable range: 0 (0%) to 510 (200%). The actual specifiable range varies depending on each actuator. (Refer to [the catalog or instruction manual for the each actuator].) * When the movement command is set with the value bigger than the max. pressing current value, an alarm is issued.
	Load Current Threshold	16bits data	-	16-bit Integer Set the current threshold in this register when whether or not the load current exceeds the threshold is judged. Specifiable range: 0 (0%) to 510 (200%).

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

<table>
<tr><th colspan="2">Signal Type</th><th>Bit</th><th>Symbol</th><th colspan="2">Contents</th></tr>
<tr><td rowspan="15">PLC output</td><td rowspan="15">Control Signal 1</td><td>b15</td><td rowspan="2">-</td><td colspan="2" rowspan="2">Unavailable</td></tr>
<tr><td>b14</td></tr>
<tr><td>b13</td><td>NTC1</td><td>Anti-Vibration Control Mode Selection 1</td><td rowspan="2">Select the anti-vibration control parameter set to be used
<table><tr><th>NTC1</th><th>NTC0</th><th>Functions</th></tr><tr><td>OFF</td><td>OFF</td><td>Anti-vibration control not used</td></tr><tr><td>OFF</td><td>ON</td><td>Parameter set 1 selected</td></tr><tr><td>ON</td><td>OFF</td><td>Parameter set 2 selected</td></tr><tr><td>ON</td><td>ON</td><td>Parameter set 3 selected</td></tr></table></td></tr>
<tr><td>b12</td><td>NTC0</td><td>Anti-Vibration Control Mode Selection 0</td></tr>
<tr><td>b11</td><td>-</td><td colspan="2">Unavailable</td></tr>
<tr><td>b10</td><td>SMOD</td><td colspan="2">Stop Control Mode</td></tr>
<tr><td>b9</td><td>ASO1</td><td>Stop Mode 1</td><td rowspan="2">Select the stop mode for standby
<table><tr><th>ASO 1</th><th>ASO 0</th><th>Functions</th></tr><tr><td>OFF</td><td>OFF</td><td>Invalid (Servo is always ON)</td></tr><tr><td>OFF</td><td>ON</td><td>Servo is turned OFF after the time set in Parameter No.36 is passed.</td></tr><tr><td>ON</td><td>OFF</td><td>Servo is turned OFF after the time set in Parameter No.37 is passed.</td></tr><tr><td>ON</td><td>ON</td><td>Servo is turned OFF after the time set in Parameter No.38 is passed.</td></tr></table></td></tr>
<tr><td>b8</td><td>ASO0</td><td>Stop Mode 0</td></tr>
<tr><td>b7</td><td>MOD1</td><td colspan="2" rowspan="2">[Acceleration/Deceleration Mode]
OFF/OFF for Trapezoid Pattern
OFF/ON for S-shaped Motion
ON/OFF for Primary Lag Filter</td></tr>
<tr><td>b6</td><td>MOD0</td></tr>
<tr><td>b5</td><td>GSL1</td><td>Servo Gain Parameter Set Selection 1</td><td rowspan="2">Set the parameter for servo gain switchover
<table><tr><th>GSL1</th><th>GSL0</th><th>Functions</th></tr><tr><td>OFF</td><td>OFF</td><td>Parameter set 0 selected</td></tr><tr><td>OFF</td><td>ON</td><td>Parameter set 1 selected</td></tr><tr><td>ON</td><td>OFF</td><td>Parameter set 2 selected</td></tr><tr><td>ON</td><td>ON</td><td>Parameter set 3 selected</td></tr></table></td></tr>
<tr><td>b4</td><td>GSL0</td><td>Servo Gain Parameter Set Selection 0</td></tr>
<tr><td>b3</td><td>INC</td><td colspan="2">[Incremental Command]
“OFF” for Absolute Position Command, “ON” for Relative Position Command</td></tr>
<tr><td>b2</td><td>DIR</td><td colspan="2">[Pressing Direction Setup]
“OFF” for the direction reducing the positioning width from the target position,
“ON” for the direction adding the positioning width from the target position</td></tr>
<tr><td>b1</td><td>PUSH</td><td colspan="2">[Pressing Setup]
“OFF” for Positioning Operation, “ON” for Pressing Operation</td></tr>
<tr><td>b0</td><td>-</td><td colspan="2">Unavailable</td></tr>
</table>

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC output	Control Signal 2	b15	BKRL	[Forced Brake Release] “ON” for brake release
		b14	-	Unavailable
		b13		
		b12		
		b11		
		b10		
		b9		
		b8	JOG+	[+ Jog] “ON” for Movement in the Opposite Direction of Home
		b7	JOG-	[- Jog] “ON” for Movement to the Home Direction
		b6	JVEL	[Jog-Speed/Inch-Distance Change-Over] Setting value (parameter) to use can be switched over. OFF : Parameter No. 26, “Jog speed” Parameter No. 48, “Inch distance” ON : Operation should be made with the value set in Parameter No. 47 “Jog speed 2” when set to Command Speed = 0, and with the command speed setting value when set to Speed Command ≠ 0. Parameter No. 49, “Inch distance 2”
		b5	JISL	[Jog/Inching Change-Over] “OFF” for Jog Operation, “ON” for Inching Operation
		b4	SON	[Servo ON Command] “ON” for Servo ON
		b3	RES	[Reset] “ON” for Reset Execution
		b2	STP	[Pause] “ON” for Pause Command
		b1	HOME	[Homing] “ON” for Homing Command
		b0	DSTR	[Positioning Command] “ON” for Movement Command

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC input	Current Position	32 bits data	-	Current Position: 32-bit Signed Integer Stores the current position. Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Example reading: 000003FF$_H$ = 1023 (decimal) = 10.23mm (When unit is 0.01mm) * When it is read in hexadecimal notation, input the negative value using a compliment of 2.
	Command Current	32 bits data	-	32-bit Integer Stores the currently commanded current. The unit is mA. Example reading: 000003FF$_H$ =1023 (decimal) = 1023mA
	Current Speed	32 bits data	–	32-bit Signed Integer Stores the current speed. The unit is 0.01mm/s. Positive Figure: Under movement in the opposite direction of home Negative Figure: Under movement in the home direction Example reading: 000003FF$_H$ = 1023 (decimal) = 10.23mm/s * When it is read in hexadecimal notation, input the negative value using a compliment of 2.
	Alarm Code	16 bits data	–	16-bit Integer Stores an alarm code when an alarm (all alarms including message level ones) is generated. Stores “0$_H$” when no alarm is generated and during battery voltage drop warning.
	Overload Warning Monitor	16 bits data	-	16-bit Integer It shows the motor load (%).
	Total Moving Cunt	32 bits data	–	32-bit Integer Unit: times
	Total Moving Distance	32 bits data	–	32-bit Integer Unit: m

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC input	Status Signal 1	b15	-	Unavailable
		b14		
		b13		
		b12		
		b11		
		b10		
		b9		
		b8		
		b7		
		b6		
		b5		
		b4		
		b3		
		b2	MEND	[Command Complete Signal] Turns ON when the travel to the target position commanded from the host is completed.
		b1	-	Unavailable
		b0	ALML	[Light Error Alarm] On when battery voltage dropped and light malfunction alarm generated
	Status Signal 2	b15	EMGS	[Emergency Stop] “ON” for Emergency Stop Status
		b14	PWR	[Controller Ready] “ON” for Ready
		b13	ZONE2	[Zone 2] “ON” for the current position within the zone set range
		b12	ZONE1	[Zone 1] “ON” for the current position within the zone set range
		b11	PZONE	[Position Zone] This signal turns ON when the current position is inside the specified position zone.
		b10	LOAD	[Load Output Judgment] “ON” for Reached “OFF” for Not reached
		b9	TRQS	[Torque Level] “ON” for Reached “OFF” for Not reached
		b8	-	Unavailable
		b7	GHMS	[Under Homing Operation] “ON” for Homing Operation
		b6	PUSHS	[Under Pressing Operation] “ON” for Pressing Operation
		b5	PSFL	[Pressing and a Miss] This signal turns ON when the actuator missed the load in push-motion operation
		b4	SV	[Operation Ready] “ON” with Servo ON
		b3	ALM	[Alarm] “ON” with alarm issue
		b2	MOVE	[Movement Signal] “ON” with Actuator Movement
		b1	HEND	[Homing Completion] “ON” with Homing Completion
		b0	PEND	[Positioning Completion Signal] “ON” with Positioning Completion

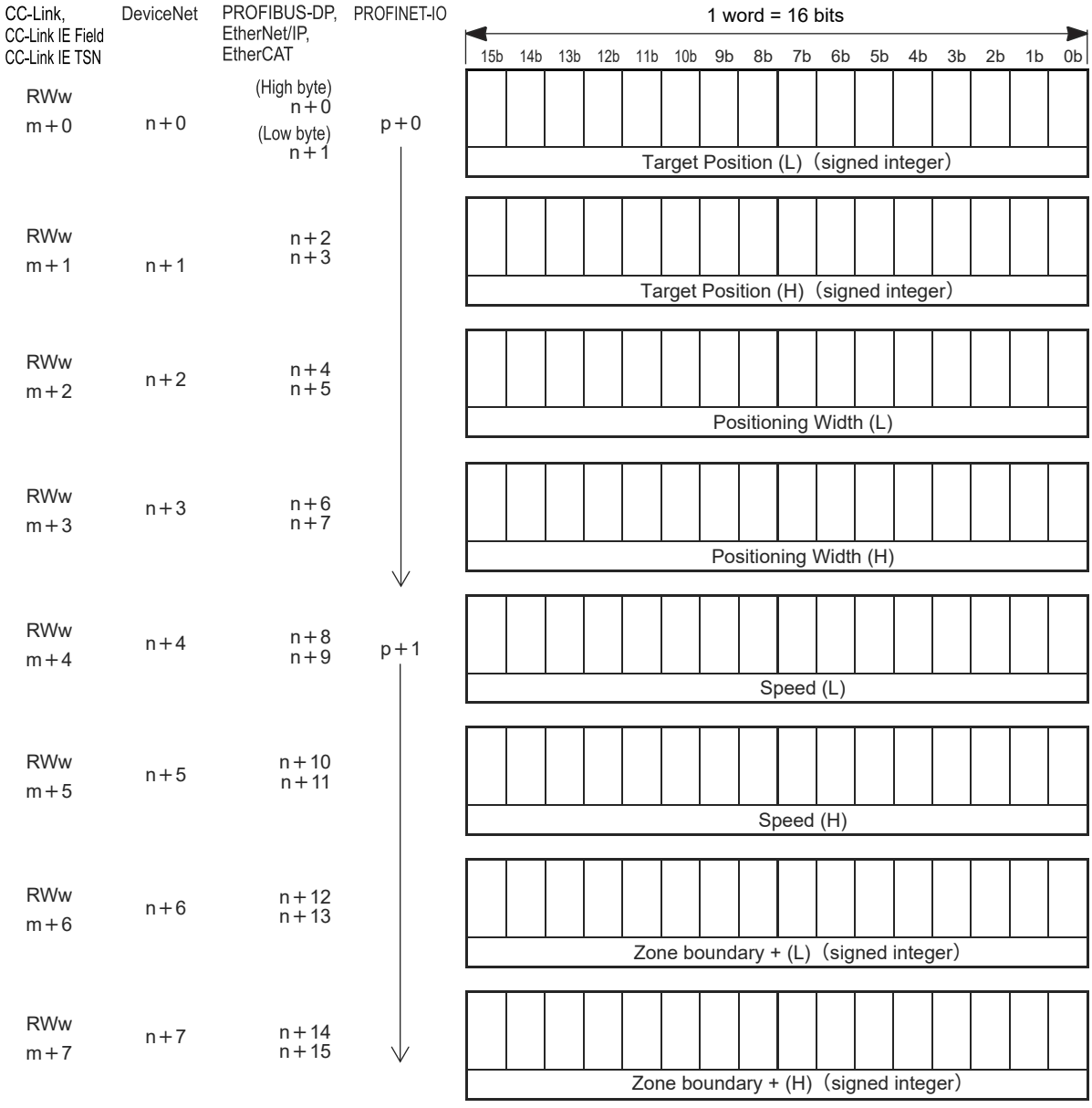
10.4.9 Full direct value 2 mode assignment

Assigning full direct value mode is as follows.
Set the current limit value in push-motion, acceleration/deceleration and speed within the range of the actuator specifications, and set the target position data within the software stroke range.

Setting units: Current limit value = 1%, Acceleration/deceleration = 0.01 G, Speed = 1.0 mm/s or 0.1 mm/s, Position data/Positioning width = 1/100 mm

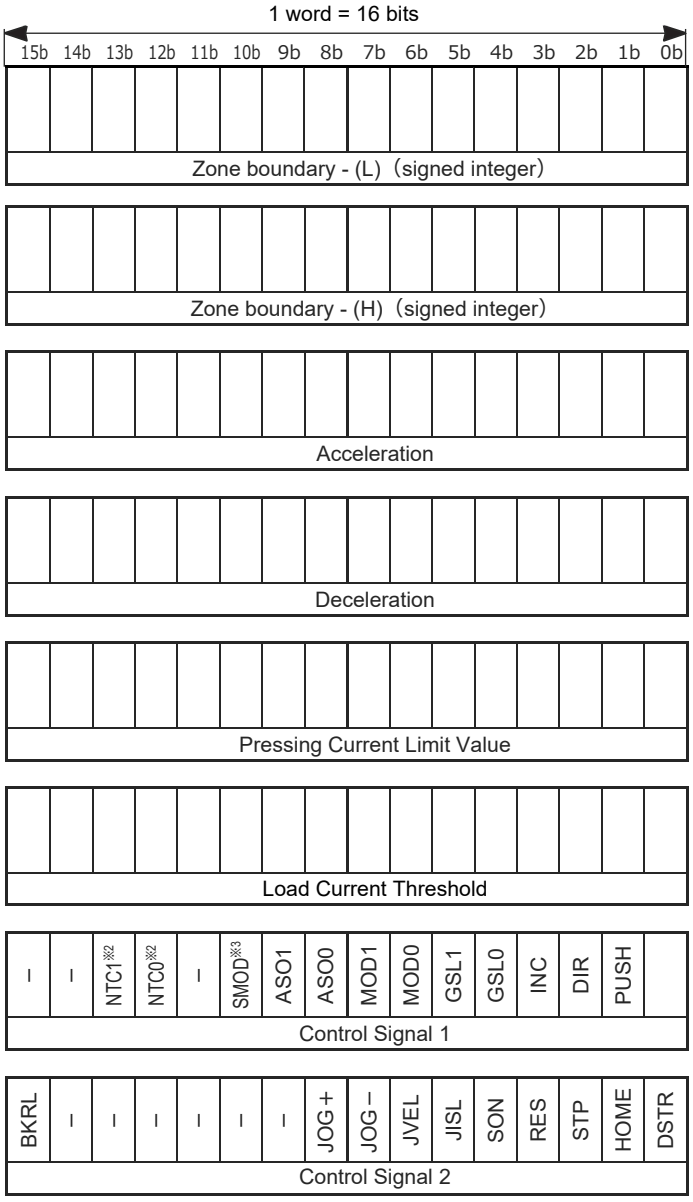
PLC output = Axis control signal

Address*1



Address*1

CC-Link, CC-Link IE Field CC-Link IE TSN	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO	Contents
RWw m+8	n+8	(High byte) n+16 (Low byte) n+17	p+2	Zone boundary - (L) (signed integer)
RWw m+9	n+9	n+18 n+19		Zone boundary - (H) (signed integer)
RWw m+A	n+A	n+20 n+21		Acceleration
RWw m+B	n+B	n+22 n+23		Deceleration
RWw m+C	n+C	n+24 n+25	p+3	Pressing Current Limit Value
RWw m+D	n+D	n+26 n+27		Load Current Threshold
RWw m+E	n+E	n+28 n+29		Control Signal 1
RWw m+F	n+F	n+30 n+31	The word which is four words ahead is p+4	Control Signal 2



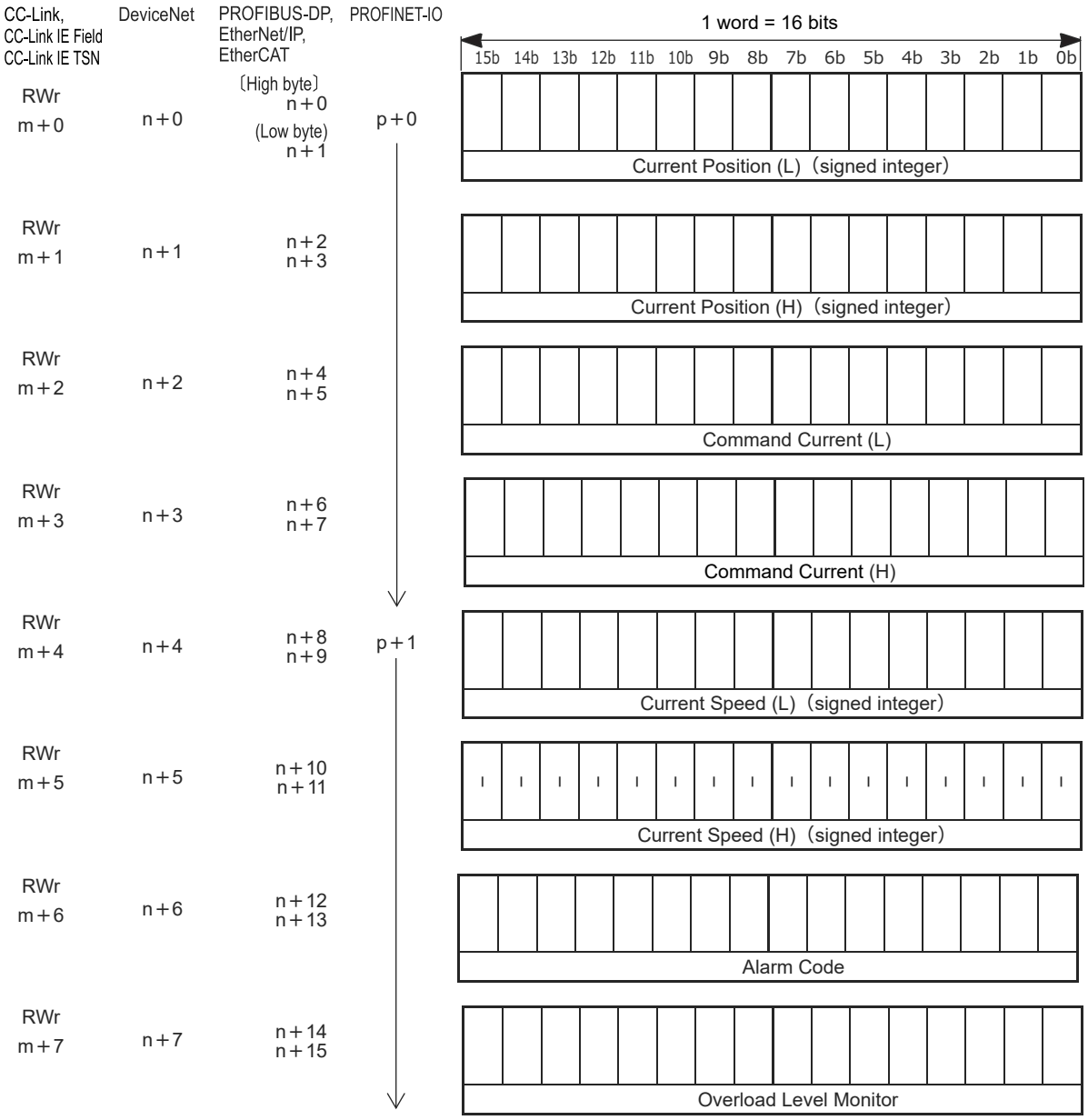
*1 m is the head register address of each axis. n is the head relative address of each axis. p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

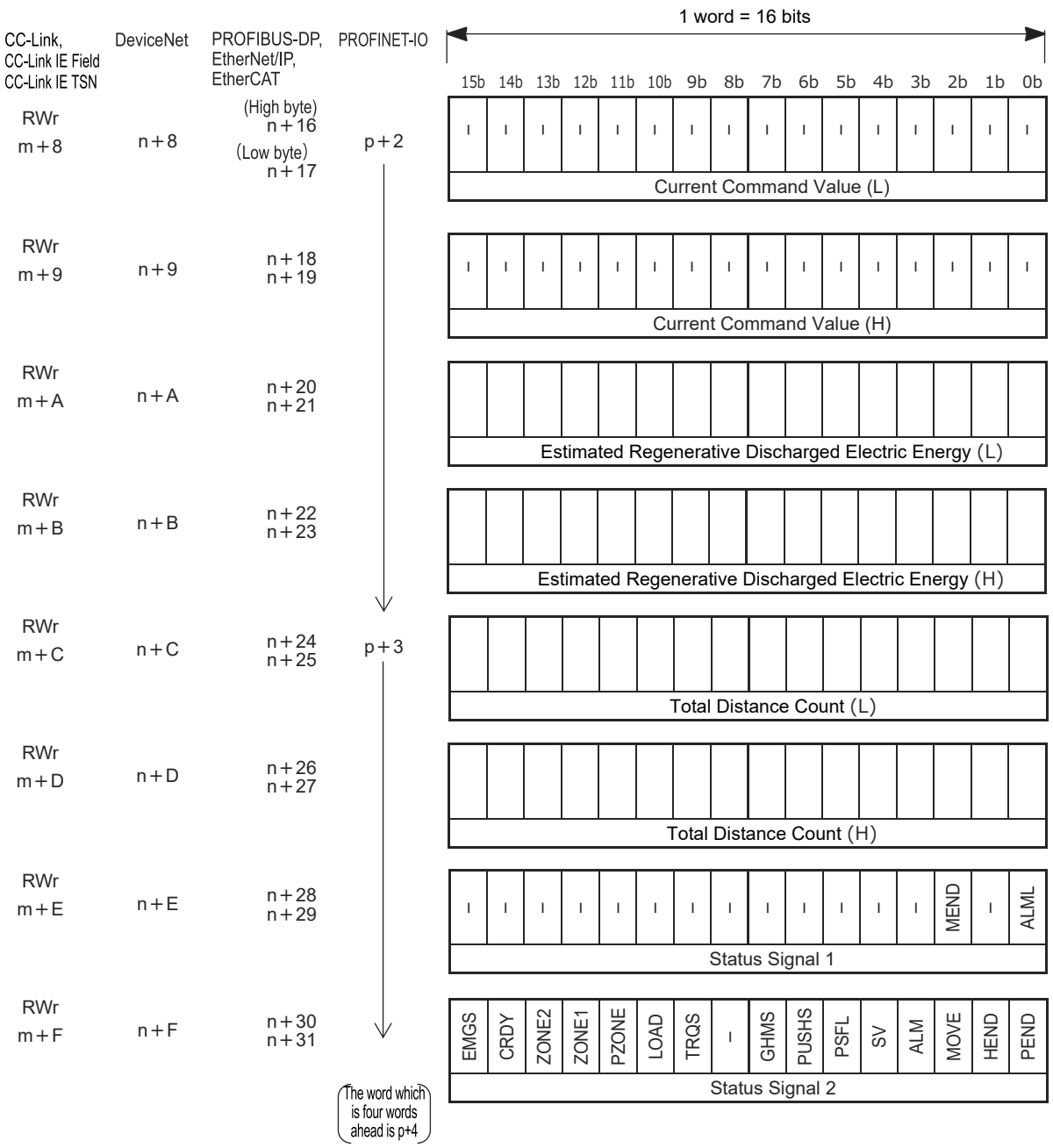
*2 NTC0 and NTC1 are supported only for RCON-AC, RCON-SC, SCON-CB-RC, and SCON2-CG-RC.

*3 SMOD is supported only for RCON-PC/PCF.

PLC input = Axis status signal

Address*1





*1 m is the head register address of each axis. n is the head relative address of each axis.
p is the head module address of each axis.
CC-Link, CC-Link IE Field, CC-Link IE TSN and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

*2 Current value is command current value for pulse motors and the feedback current value for AC servo motors (including AC servo motors connected to SCON).

*3 LOAD and TRQS are supported only for RCON-PC/PCF、RCON-SC、SCON-CB-RC and SCON2-CG-RC.

I/O Signal Assignment

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC output	Target Position	32bits data	-	32-bit Signed Integer Set the target position on the absolute coordinates. Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Specifiable range: - 9,999,999 to 9,999,999 Input example: +25.40mm in the unit of 0.01mm should be indicated as 2,540. * If the value larger than the value (0.2mm) inside the soft limit for the parameter, the movement would be limited to the inside the soft limit (0.2mm). * When the input is performed in hexadecimal notation, input the negative value using a complement of 2.
	Positioning Width	32bits data	-	32-bit Integer Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Specifiable range: - 9,999,999 to 9,999,999 Input example: +25.40mm in the unit of 0.01mm should be indicated as 2,540. This register value has two meanings depending on the operation type. 1) In the case of positioning operation, it shows the allowable range from the target position, that is regarded as the positioning completion. 2) In the case of pressing operation, it shows the pressing width value. Specify the normal operation or pressing operation using the PUSH control signal setting.
	Speed	32bits data	-	32-bit Integer Specify the speed at which to move the actuator. Designate unit: 0.1mm/s Settable range: 0 to 999,999 * Deceleration stop if and to specify in motion 0. It under suspension, it will remain stopped on the spot. Input example: To set 25.41 mm, specify 2540. If a move command is issued by specifying a value exceeding the maximum speed, an alarm will occur.
	Zone boundary +	32bits data	-	32-bit Signed Integer Apart from the zone specified using the parameter setting, the zone signal effective after the homing operation is output. When the current position is inside of this “+” Value, the status signal PZONE is turned ON. Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Specifiable range: - 9,999,999 to 9,999,999 Input the value satisfying the relationship of “Zone boundary +” > “Zone boundary -”. When this function is not to be used, the same value is applied to both Zone boundarys. Example: If the unit is 0.01mm and it is 25.40mm, set it as 2,540. * When it is input in hexadecimal notation, input the negative value using a compliment of 2.
	Zone boundary -	32bits data	-	
	Acceleration	16bits data	-	16-bit Integer Set the acceleration/deceleration in movement (The same value is applied both to acceleration and deceleration). Unit: 0.01G Specifiable range: 1 to 999 Input example: When it is 0.30G, set it as 30. When the movement command is set with the value of 0 or bigger than the max. acceleration/deceleration value, an alarm is issued.
	Deceleration	16bits data	-	

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC output	Pressing Current Limit Value	16bits data	-	16-bit Integer Set the current limit in pressing operation. Specifiable range: 0 (0%) to 510 (200%). The actual specifiable range varies depending on each actuator. (Refer to [the catalog or instruction manual for each actuator].) * When the movement command is set with the value bigger than the max. pressing current value, an alarm is issued.
	Load Current Threshold	16bits data	-	16-bit Integer Set the current threshold in this register when whether or not the load current exceeds the threshold is judged. Specifiable range: 0 (0%) to 510 (200%).

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

<table>
<tr><th colspan="2">Signal Type</th><th>Bit</th><th>Symbol</th><th colspan="2">Contents</th></tr>
<tr><td rowspan="15">PLC output</td><td rowspan="15">Control Signal 1</td><td>b15</td><td rowspan="2">-</td><td colspan="2" rowspan="2">Unavailable</td></tr>
<tr><td>b14</td></tr>
<tr><td>b13</td><td>NTC1</td><td>Anti-Vibration Control Mode Selection 1</td><td rowspan="2">Select the anti-vibration control parameter set to be used
<table><tr><th>NTC1</th><th>NTC0</th><th>Functions</th></tr><tr><td>OFF</td><td>OFF</td><td>Anti-vibration control not used</td></tr><tr><td>OFF</td><td>ON</td><td>Parameter set 1 selected</td></tr><tr><td>ON</td><td>OFF</td><td>Parameter set 2 selected</td></tr><tr><td>ON</td><td>ON</td><td>Parameter set 3 selected</td></tr></table></td></tr>
<tr><td>b12</td><td>NTC0</td><td>Anti-Vibration Control Mode Selection 0</td></tr>
<tr><td>b11</td><td>-</td><td colspan="2">Unavailable</td></tr>
<tr><td>b10</td><td>SMOD</td><td colspan="2">Stop Control Mode</td></tr>
<tr><td>b9</td><td>ASO1</td><td>Stop Mode 1</td><td rowspan="2">Select the stop mode for standby
<table><tr><th>ASO1</th><th>ASO0</th><th>Functions</th></tr><tr><td>OFF</td><td>OFF</td><td>Invalid (Servo is always ON)</td></tr><tr><td>OFF</td><td>ON</td><td>Servo is turned OFF after the time set in Parameter No.36 is passed.</td></tr><tr><td>ON</td><td>OFF</td><td>Servo is turned OFF after the time set in Parameter No.37 is passed.</td></tr><tr><td>ON</td><td>ON</td><td>Servo is turned OFF after the time set in Parameter No.38 is passed.</td></tr></table></td></tr>
<tr><td>b8</td><td>ASO0</td><td>Stop Mode 0</td></tr>
<tr><td>b7</td><td>MOD1</td><td colspan="2" rowspan="2">[Acceleration/Deceleration Mode]
OFF/OFF for Trapezoid Pattern
OFF/ON for S-shaped Motion
ON/OFF for Primary Lag Filter</td></tr>
<tr><td>b6</td><td>MOD0</td></tr>
<tr><td>b5</td><td>GSL1</td><td>Servo Gain Parameter Set Selection 1</td><td rowspan="2">Set the parameter for servo gain switchover
<table><tr><th>GSL1</th><th>GSL0</th><th>Functions</th></tr><tr><td>OFF</td><td>OFF</td><td>Parameter set 0 selected</td></tr><tr><td>OFF</td><td>ON</td><td>Parameter set 1 selected</td></tr><tr><td>ON</td><td>OFF</td><td>Parameter set 2 selected</td></tr><tr><td>ON</td><td>ON</td><td>Parameter set 3 selected</td></tr></table></td></tr>
<tr><td>b4</td><td>GSL0</td><td>Servo Gain Parameter Set Selection 0</td></tr>
<tr><td>b3</td><td>INC</td><td colspan="2">[Incremental Command]
“OFF” for Absolute Position Command, “ON” for Relative Position Command</td></tr>
<tr><td>b2</td><td>DIR</td><td colspan="2">[Pressing Direction Setup]
“OFF” for the direction reducing the positioning width from the target position,
“ON” for the direction adding the positioning width from the target position</td></tr>
<tr><td>b1</td><td>PUSH</td><td colspan="2">[Pressing Setup]
“OFF” for Positioning Operation, “ON” for Pressing Operation</td></tr>
<tr><td>b0</td><td>-</td><td colspan="2">Unavailable</td></tr>
</table>

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC output	Control Signal 2	b15	BKRL	[Forced Brake Release] “ON” for brake release
		b14	-	Unavailable
		b13		
		b12		
		b11		
		b10		
		b9		
		b8	JOG+	[+ Jog] “ON” for Movement in the Opposite Direction of Home
		b7	JOG-	[- Jog] “ON” for Movement to the Home Direction
		b6	JVEL	[Jog-Speed/Inch-Distance Change-Over] Setting value (parameter) to use can be switched over. OFF : Parameter No. 26, “Jog speed” Parameter No. 48, “Inch distance” ON : Operation should be made with the value set in Parameter No. 47 “Jog speed 2” when set to Command Speed = 0, and with the command speed setting value when set to Speed Command ≠ 0. Parameter No. 49, “Inch distance 2”
		b5	JISL	[Jog/Inching Change-Over] “OFF” for Jog Operation, “ON” for Inching Operation
		b4	SON	[Servo ON Command] “ON” for Servo ON
		b3	RES	[Reset] “ON” for Reset Execution
		b2	STP	[Pause] “ON” for Pause Command
		b1	HOME	[Homing] “ON” for Homing Command
		b0	DSTR	[Positioning Command] “ON” for Movement Command

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC input	Current Position	32 bits data	-	Current Position: 32-bit Signed Integer Stores the current position. Unit: 0.01mm (other than DD motor) 0.001° (DD motor) Example reading: 000003FF$_H$ = 1023 (decimal) = 10.23mm (When unit is 0.01mm) * When it is read in hexadecimal notation, input the negative value using a compliment of 2.
	Command Current	32 bits data	-	32-bit Integer Stores the currently commanded current. The unit is mA. Example reading: 000003FF$_H$ =1023 (decimal) = 1023mA
	Current Speed	32 bits data	–	32-bit Signed Integer Stores the current speed. The unit is 0.01mm/s. Positive Figure: Under movement in the opposite direction of home Negative Figure: Under movement in the home direction Example reading: 000003FF$_H$ = 1023 (decimal) = 10.23mm/s * When it is read in hexadecimal notation, input the negative value using a compliment of 2.
	Alarm Code	16 bits data	–	16-bit Integer Stores an alarm code when an alarm (all alarms including message level ones) is generated. Stores “0$_H$” when no alarm is generated and during battery voltage drop warning.
	Overload Warning Monitor	16 bits data	-	16-bit Integer It shows the motor load (%).
	Current Command Value	32 bits data	–	32-bit Signed Integer It is the position in the operation plan that the controller currently indicates. The unit is 0.01mm/s. (Example) Reading: 000003FF$_H$ = 1023 (decimal) = 10.23mm * When it is read in hexadecimal notation, input the negative value using a compliment of 2.
	Estimated Regenerative Discharged Electric Energy	32 bits data	–	32-bit Signed Integer Unit is 0.01W. Estimated average power applied to the regenerative resistor. The update cycle varies depending on the driver. RCON-SC, SCON models: 512ms RCON-AC, RCON-DC: 256ms If the estimated value exceeds the specified value of each controller, alarm 0CA “overheat” is output. In this case, review the operating conditions or consider adding an external regenerative resistor. This function is not supported by RCON-PC/PCF.
	Total Moving Distance	32 bits data	–	32-bit Integer Unit: m

(* “ON” in the table shows the corresponding bit of “1” and “OFF” shows “0”).

Signal Type		Bit	Symbol	Contents
PLC input	Status Signal 1	b15	-	Unavailable
		b14		
		b13		
		b12		
		b11		
		b10		
		b9		
		b8		
		b7		
		b6		
		b5		
		b4		
		b3		
		b2	MEND	[Command Complete Signal] Turns ON when the travel to the target position commanded from the host is completed.
		b1	-	Unavailable
		b0	ALML	[Light Error Alarm] On when battery voltage dropped and light malfunction alarm generated
	Status Signal 2	b15	EMGS	[Emergency Stop] “ON” for Emergency Stop Status
		b14	PWR	[Controller Ready] “ON” for Ready
		b13	ZONE2	[Zone 2] “ON” for the current position within the zone set range
		b12	ZONE1	[Zone 1] “ON” for the current position within the zone set range
		b11	PZONE	[Position Zone] This signal turns ON when the current position is inside the specified position zone.
		b10	LOAD	[Load Output Judgment] “ON” for Reached “OFF” for Not reached
		b9	TRQS	[Torque Level] “ON” for Reached “OFF” for Not reached
		b8	-	Unavailable
		b7	GHMS	[Under Homing Operation] “ON” for Homing Operation
		b6	PUSHS	[Under Pressing Operation] “ON” for Pressing Operation
		b5	PSFL	[Pressing and a Miss] This signal turns ON when the actuator missed the load in push-motion operation
		b4	SV	[Operation Ready] “ON” with Servo ON
		b3	ALM	[Alarm] “ON” with alarm issue
		b2	MOVE	[Movement Signal] “ON” with Actuator Movement
		b1	HEND	[Homing Completion] “ON” with Homing Completion
		b0	PEND	[Positioning Completion Signal] “ON” with Positioning Completion

10.4.10 Assignment of EC connection unit/e-wiring system connection unit

The assignment of the EC connection unit and e-wiring system connection unit should be as shown below.
The EC connection unit occupies domains for four axes (one word) even though not all of four axes are connected.

PLC output = Axis control signal

	Address*		
CC-Link, CC-Link IE Field	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
RWw m+0	n+0	(High byte) n+0 (Low byte) n+1	p+0

1 word = 16 bits

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
–	RES	ST1	ST0	–	RES	ST1	ST0	–	RES	ST1	ST0	–	RES	ST1	ST0
Control signal (4th Axis)				Control signal (3rd Axis)				Control signal (2nd Axis)				Control signal (1st Axis)			

PLC input = Axis status signal

	Address*		
CC-Link, CC-Link IE Field	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
RWr m+0	n+0	(High byte) n+0 (Low byte) n+1	p+0

1 word = 16 bits

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
E3RD	*ALM	LS1/PE1	LS0/PE0	E2RD	*ALM	LS1/PE1	LS0/PE0	E1RD	*ALM	LS1/PE1	LS0/PE0	E0RD	*ALM	LS1/PE1	LS0/PE0
Status signal (4th Axis)				Status signal (3rd Axis)				Status signal (2nd Axis)				Status signal (1st Axis)			

* m is the head register address of each unit. n is the head relative address of each unit.
p is the head module address of each unit.
CC-Link, CC-Link IE Field, and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

For the 3 Position Mode Specification (MF), refer to [3 Position Mode Specification Instruction Manual (ME3837) 2.2.1 I/O Signal Assignment].

[I/O Signal List] EC Connection Unit/e-Wiring System Connection Unit

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

Signal type		Bit	Signal name	Content
PLC output	Control signal (4th Axis)	b15	–	Not available
		b14	RES	Alarm Cancel [Alarm cancelled with on]
		b13	ST1	Drive Forward [Drives forward with on (drives forward after home-return operation when home return not complete), decelerate and stop on the way with off]
		b12	ST0	Drive Backward [Drives backward with on (drives backward after home-return operation when home return not complete), decelerate and stop on the way with off]
	Control signal (3rd Axis)	b11	–	Not available
		b10	RES	Alarm Cancel [Alarm cancelled with on]
		b9	ST1	Drive Forward [Drives forward with on (drives forward after home-return operation when home return not complete), decelerate and stop on the way with off]
		b8	ST0	Drive Backward [Drives backward with on (drives backward after home-return operation when home return not complete), decelerate and stop on the way with off]
	Control signal (2nd Axis)	b7	–	Not available
		b6	RES	Alarm Cancel [Alarm cancelled with on]
		b5	ST1	Drive Forward [Drives forward with on (drives forward after home-return operation when home return not complete), decelerate and stop on the way with off]
		b4	ST0	Drive Backward [Drives backward with on (drives backward after home-return operation when home return not complete), decelerate and stop on the way with off]
	Control signal (1st Axis)	b3	–	Not available
		b2	RES	Alarm Cancel [Alarm cancelled with on]
		b1	ST1	Drive Forward [Drives forward with on (drives forward after home-return operation when home return not complete), decelerate and stop on the way with off]
		b0	ST0	Drive Backward [Drives backward with on (drives backward after home-return operation when home return not complete), decelerate and stop on the way with off]

[I/O Signal List] EC Connection Unit/e-Wiring System Connection Unit

(ON = corresponding bit is "1", OFF = corresponding bit is "0")

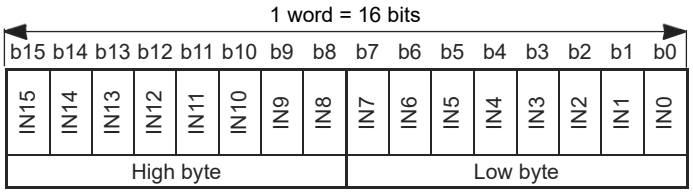
Signal type		Bit	Signal name	Content
PLC input	Status signal (4th Axis)	b15	E3RD	Operation Ready [On: Operation ready (servo on)]
		b14	*ALM	Alarm (break contact) [ON: No alarm, OFF: Alarm generated]
		b13	LS1/PE1	Driving Forward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the forward end. It turns on when pressing operation completes.]
		b12	LS0/PE0	Driving Backward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the backward end. It turns on when pressing operation completes.]
	Status signal (3rd Axis)	b11	E2RD	Operation Ready [On: Operation ready (servo on)]
		b10	*ALM	Alarm (break contact) [ON: No alarm, OFF: Alarm generated]
		b9	LS1/PE1	Driving Forward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the forward end. It turns on when pressing operation completes.]
		b8	LS0/PE0	Driving Backward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the backward end. It turns on when pressing operation completes.]
	Status signal (2nd Axis)	b7	E1RD	Operation Ready [On: Operation ready (servo on)]
		b6	*ALM	Alarm (break contact) [ON: No alarm, OFF: Alarm generated]
		b5	LS1/PE1	Driving Forward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the forward end. It turns on when pressing operation completes.]
		b4	LS0/PE0	Driving Backward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the backward end. It turns on when pressing operation completes.]
	Status signal (1st Axis)	b3	E0RD	Operation Ready [On: Operation ready (servo on)]
		b2	*ALM	Alarm (break contact) [ON: No alarm, OFF: Alarm generated]
		b1	LS1/PE1	Driving Forward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the forward end. It turns on when pressing operation completes.]
		b0	LS0/PE0	Driving Backward Complete / Pressing Complete [It turns on when an actuator gets in the detection range of the backward end. It turns on when pressing operation completes.]

10.4.11 Assignment of PIO (PIO/SIO/SCON Extension Unit, PIO Unit)

The assignment of the PIO (PIO/SIO/SCON extension unit) should be as shown below.

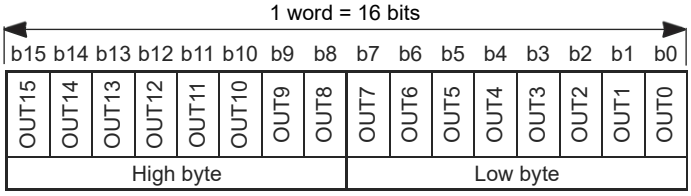
PLC output = Axis control signal

	Address*		
CC-Link, CC-Link IE Field	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
RWw m+0	n+0	(High byte) n+0 (Low byte) n+1	p+0



PLC input = Axis status signal

	Address*		
CC-Link, CC-Link IE Field	DeviceNet	PROFIBUS-DP, EtherNet/IP, EtherCAT	PROFINET-IO
RWr m+0	n+0	(High byte) n+0 (Low byte) n+1	p+0



* m is the head register address of each unit. n is the head relative address of each unit.
p is the head module address of each unit.
CC-Link, CC-Link IE Field, and DeviceNet have word addresses, PROFIBUS-DP, EtherNet/IP, and EtherCAT use byte addresses, and PROFINET-IO uses 4-word module addresses.

> ⚠ *Caution: PIO assignment is a feature to link the input and output signals to a host device. Function assignment to the RCON system cannot be conducted. Use it for general input and output.*

11. Warranty

11.1 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

11.2 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 Instruction 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:
- Anything other than our product
- Modification or repair performed by a party other than us (unless we have approved such modification or repair)
- Anything that could not be easily predicted with the level of science and technology available at the time of shipment from our company
- A natural disaster, man-made disaster, incident or accident for which we are not liable
- Natural fading of paint or other symptoms of aging
- Wear, depletion or other expected result of use
- 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.

11.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.

11.4 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.

11.5 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:

- Medical equipment pertaining to maintenance or management of human life or health
- A mechanism or mechanical equipment intended to move or transport people (such as a vehicle, railway facility or aviation facility)
- Important safety parts of mechanical equipment (such as safety devices)
- 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 Instruction Manual.

11.6 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:

- Guidance for installation/adjustment and witnessing of test operation
- Maintenance and inspection
- Technical guidance and education on operating/wiring methods, etc.
- Technical guidance and education on programming and other items related to programs

Change History

Revision Date	Description of Revision
March 2016	First Edition
May 2016	Second Edition Applicable for language switching feature 3.24 Offboard Tuning added 3.25 Servo Monitor added Terms to use integrated, correction made
June 2016	2B Edition • Supported models added • 1.8.1 How to Attach Grip Belt added • 6.5 Applied to Secure Digital memory card feature in Gateway Menu window • Detailed process to update teaching added
September 2016	Third Edition • Supported models added • 3.2 Operation Menu corrected • 3.9.1.5 Network Data Monitor Features added • 3.10.1 Position Data statements revised • 3.16.5 I/O Customizing Features added • 3.25 Automatic Scroll Features added • 3.26 Servo Press Dedicated Window added
April 2017	Fourth Edition • Applicable for ELECYLINDER • Applicable for EtherCAT Motion
April 2018	Fifth Edition • Applicable for RCON System • 2.1 to 2.3 Note added for cable minimum bending radius • 9.2 Time for teaching update revised
October 2018	Sixth Edition • Models added for ELECYLINDER supported • 2.2 Position controller / ELECYLINDER cable wiring diagram deleted • 6.6.2, 6.14 Figure for Maintenance Information Window swapped, description revised • 6.7.3 Manual Mode added • 6.8 Figure for Parameter Edit Window swapped • Correction made
February 2019	6B Edition • Models added for ELECYLINDER supported

Revision Date	Description of Revision
May 2019	Seventh Edition • Models added for ELECYLINDER supported • 3.9.1.1, 3.9.1.2, 3.18, 6.6.1, 6.15 Selection of with or without ripple compensation added to display of current/current ratio • 3.9.1.1, 3.9.1.2, 3.26.1.1, 3.26.1.2 STO/SS1-t condition displayed for STO/SS1-t type SCON • 6.7.3 Motor Power Off and Brake Compulsory Release buttons added in ELECYLINDER Simple Setting Window • 6.7.4 Description deleted for operation method (positioning operation)
July 2020	Eight Edition • Supported models added • 1.1.2 Instruction manuals related to this product stored in DVD added • 3.2 Operation Menu - "Other Settings" → "Encoder Cable Length Setting" added • 3.16.6 Encoder Cable Length Setting added • 3.17.1, 3.19.1, 3.25.4.1, 3.26.4.1 Change made to figure for teaching numeric key pad • Chapter 4 Update made to SEP system controllers operation teaching figures • Chapter 5 Update made to MEC system controllers operation teaching figures • 6.2 Operation Menu - "Other Settings" → "Operation Sound Tuning" added • 6.7 Rotary types added • 6.7.4 Loading Posture Setting / Payload Setting added • 6.13 Other Settings "Operation Sound Tuning" added • 6.13.3 Operation Sound Tuning added • 6.14.1 Change made to teaching figures • 6.16.1 Change made to teaching numeric key pad figures • 7 Change made to gateway menu window • 7.3.2 (3) Change made to figures for RCON special parameters Option units added • 7.4.2 Change made to diagnosis information teaching figures • 7.5.1 Change made to teaching figures • Correction made, terms integrated

Revision Date	Description of Revision
November 2020	Ninth Edition • Caution note added for supported models • 1.1.4 TB-02443355E added in how to read model code plate • 3.5 Change made to explanation of menu screen • 3.2, 4.2, 5.2, 6.2 Change made to [Change operating axis] in Menu 2 and names of operation screens • 3.10.3, 6.5 Change made to functional conditions of operation axis change button • 3.12.1, 3.12.2 Change made to button explanation sentences • 7.3 Applicable for Gateway Parameter Setting Tool RCON Motion • 30C of error display, Message of Contents, example of occurrence and countermeasure added • Correction made, change made to teaching window
April 2021	Edition 9B • Models added for ELECYLINDER supported • Change made to [Change vel] content in 6.9.2 Position Movement Operation • Terms integrated
May 2021	Tenth Edition • Supported models added • PCON-CBP/CGBP added • Correction made
April 2022	Edition 10B • Supported models added • 1.9.2 Correction made in how to read model code • 6.13.3 Comment added in Operation Noise Tuning
June 2022	Edition 10C • Image of window swapped • Supported models added, Correction made • 1.7 Description revised regarding built-in battery • 6.7.4 Descriptions added for Payload Setting Not Applicable Model • 6.13 Description revised regarding Other Setting
August 2022	Edition 10D • Supported models added

Revision Date	Description of Revision
July 2023	Edition 10E • Models change and added for ELECYLINDER supported • 1.1.2 [ELECYLINDER Electricity Section Instruction Manual] added • 1.5.2 [Caution] added • 6.7 Change made to Simple Data Setting content • 6.7.5 Auto servo OFF added • 7.3.1 [Step1] "MAC Address" to the network setting screen addde • 9.2 Description revised for Teaching Update 9.2.1, 9.2.5 to 9.2.7 added
November 2023	Eleventh Edition • SCON2 controller applied for functional safety unit • The table of supported models of ELECYLINDER is integrated with the description of SEL system • 1.9, 2.4 to 2.6, Chapter 8 PEC type to Actuator Drive Power Supply Unit added • 3.9.2 Brake equipment setting change feature added in maintenance data window • 3.12 Alarm rest feature added in trial run window • 3.16 Drive mode switchover feature added in other window • 3.27 Drive Recorder Feature added • 6.9 Alarm rest feature added in trial run window • From Chapter 8 onward, moved the chapter number forward • 10.1.2 Message Code 225 added • Correction made, terms integrated
March 2024	Edition 11B • 1.9.3 Revised the basic specifications of the actuator drive power supply unit. • 1.9.8 Accessaries for ADTB-PEC added • 3.10.2 Collision Detection Feature added • Chapter 3 Insufficient information added, description content revised • Chapter 6 Insufficient information added, description content revised • Chapter 9 Information added in No. 202, 205 and 206 • Correction made, terms integrated
June 2024	Edition 11C • 1.1.2 Instruction Manual Related to This Product added • 6.7 Note added related to grip force of ELECYLINDER 3-finger gripper

Revision Date	Description of Revision
August 2024	Twelveth Edition • Applicable for ROBO PUMP Standard type (RP-VPM) • Supported models of ELECYLINDER added. • 3.5, 6.5 Stop status icon display on screen added • 9.1.2 Message No. 131,150,212,213,224,226 added. Deleted for Message No. 181.182, Contents changed for 160 to 186 • 10.2 Time for teaching update revised. • Correction made, explanation revised.
March 2025	Edition 12B • Became applicable for 3 position mode specification (option model code MF) of ELECYLINDER • 6.7 Caution contents added for ELECYLINDER three-fingered gripper • 6.7.4 GRBP□(W) and GRTR□ added to subject models not applicable for payload setting
April 2025	Thirteenth Edition • Applicable for Wire Cylinder • Supported models of ELECYLINDER added • 6.7 Simple Data Setting Window description revised for unit switchover • 6.7 Caution contents chenged for ELECYLINDER 3-finger gripper • Correction made
August 2025	Edition 13B • 6.7.1 Note added, description content revised • 6.7.5 Added a compact type ELECYLINDER to the applicable version of ELECYLINDER • 6.16 Delete the 1) Guide Icon Display Select • Correction made
October 2025	Edition 13C • Changes due to discontinuation of including the First Step Guide
January 2026	Fourteenth Edition • 7.6 RCON-EWS Axis Number Change Mode (RCON for e-Wiring System only) added • Correction made, explanation revised.

Revision Date	Description of Revision
March 2026	Edition 14B • 3.9.1 Monitor screen changed, RCON connection added Added STO/SS1-t/DRV_STOP and SS2-t to display content • 3.9.1.5 Added a description of the Network Data Monitor Screen • 3.9.3 How to Set Time screen chenged • 3.10 Position Data Individual Edit Screen changed • 3.26.1 Monitor screen, Data Monitor screen changed • Chapter 7 Gateway Menu Window changed • Chapter 9 Code 205, 207 Corrections • Chapter 10 10.3 RCON RCON Address Configuration, 10.4 RCON I/O Assignment added • Correction made
June 2026	Fifteenth Edition • 6.7.1 Added automatic switch "LS" to positioning operation (3-position setting) • 6.7.2 Added 2-end Pressing (2-position setting, 3-position setting) to the pressing operation, and explanation revised. • 6.7.5 Added Microcylinder to the applicable version of ELECYLINDER • 7.3.1 Added (3-3), (3-4) and (3-5) to [Step 3] • Explanation revised.

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