Touch Panel Teaching

TB-02

Applicable for Program Controller

Instruction Manual　Twelfth edition



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ME0355

In this instruction manual, states the contents for the program (SEL system) controllers.

For how to use the position (CON/SEP/MEC system) controllers, refer to the following instruction manual.

"Touch Panel Teaching TB-02 Position Controller Instruction Manual"

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

IAI Corporation

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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ME0356-12A

Support Models

This instruction manual states the details for those for program controller.

For how to handle the position controllers (ERC3, ERC2, ACON, PCON, SCON, SCON2, DCON, RACON, RPCON, MSCON, MCON, RCON, ASEP, PSEP, DSEP, MSEP, AMEC, PMEC, RCP6S, RCM-P6PC, RCM-P6AC and RCM-P6DC), refer to [Instruction Manual for Touch Panel Teaching to Apply for TB-02 Position Controllers] provided separately.

Program Controller Supported Model List

Controller Model Name	Support Started Version
XSEL-J/JX (Note 1)	V1.00
XSEL-K/KX/KT/KET	V1.00
XSEL-P/Q/PX/QX/PCT/QCT	V1.00
XSEL-R/S/RX/SX/RXD/SXD	V1.00
XSEL-RA/SA/RAX/SAX/RAXD/SAXD	V1.30
TT/TTA	V1.00
ASEL/PSEL/SSEL	V1.00
MSEL-PC/PG/PCX/PGX	V1.00
MSEL-PCF/PGF	V1.60
RSEL	V2.70
XSEL2	V4.80

Note 1 It is necessary that you prepare a dedicated cable for XSEL-J/JX.
[Refer to 3.15.2 XSEL-J/JX Dedicated Cable]

ROBO PUMP Supported Model List

ROBO PUMP Model Name	Support Started Version
RP-VPM	V4.70

How to version upgrade, refer to [24.2 Teaching Update].

ELECYLINDER Supported Model List

ELECYLINDER Type	Supported from version (Note 2)
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, EC-GRTR14M	V4.20
EC-WER1, EC-WEGR2	V5.00
EC-GRTR14□	V5.10

Make sure to use a version started to support or later.

(There should be some features not available to use in versions before supporting.)

Note 2 The digital speed controller equipped type will be the same version.

How to version upgrade, refer to [24.2 Teaching Update].

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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

Caution in Handling

- For this touch panel teaching pendant, the language to display can be switched among Japanese, English and Chinese.
  • Refer to [Section 21 Environment Setting [Language]] for how to change it.

- Do not attempt to give mechanical shock on this touch panel teaching pendant TB-02 as it may cause malfunction.

- 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.

- The LCD screen drops brightness if it is used for long time. In order to extend the life of LCD, set the time setting to turn off in the environment setting to turn it off automatically, and disconnect from the controller when it is not in use.

- Do not touch two points on the screen at the same time as the touch panel adopts the analog resistive film system. Touching two points at the same time can make the system detect the middle point on a line between the two points that you touched and react.

- Make operation on the touch panel with force of 0.5N or less.
  Applying higher force can damage the panel.

- The life of the touch panel is 1,000,000 times of pressing on the same spot (in environment of 25°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.

⚠ *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. Introduction

Thank you very much for purchasing our XSEL, TT/TTA, SSEL, ASEL, PSEL, MSEL, RSEL and XSEL2 Controller Teaching Pendant. Improper usage or mishandling may result in a product not only being unable to deliver full functions but also produce unexpected troubles or shorten the product's life. Please read this Manual carefully, and operate the product properly by paying attention to its handling. When operating the Teaching Pendant, always keep this Manual at hand and read the relevant items as required.
For the actuator and controller to be used, be sure to refer to the Instruction Manuals attached to the products.

- While the teaching pendant is left connected, "Effect" is valid for the safety velocity. Therefore, in the case of the orthogonal axis, the maximum velocity is 250 mm/s or lower when the program is started from the teaching pendant. In the case of the SCARA axis, the maximum velocity is 250 mm/s or lower for CP motion and 3% or less for PTP motion. To operate the controller according to the program velocity command, it is required to change the condition to "No Effect."
  For selection of the safety velocity between Effect and No Effect, refer to [15.8. Safety Velocity].

2. Specifications Check

2.1 Product Check

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

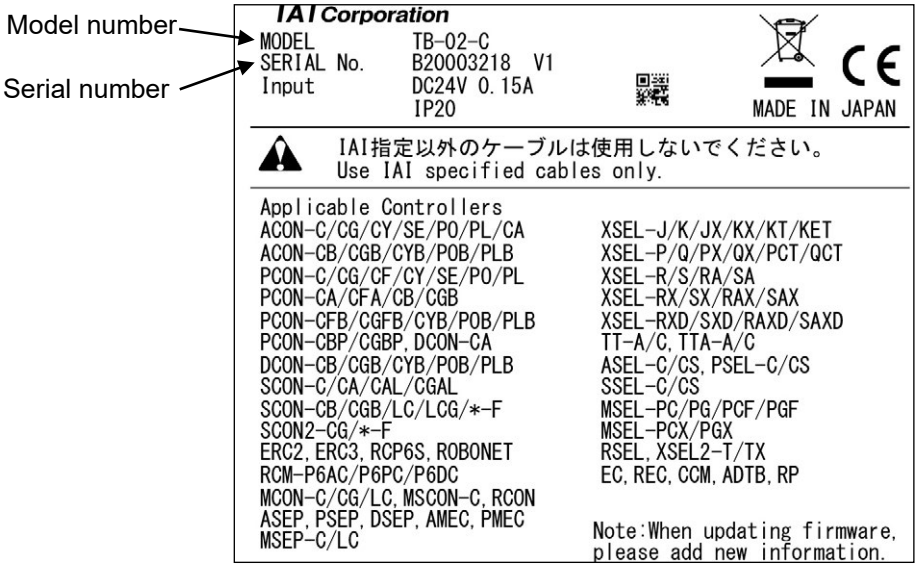
2.1.1 Component (excluding options)

No.	Product name	Model number	Number	Remarks
1	Teaching pendant (with 5m standard cable)	Refer to [How to Read Model Nameplate] and [How to Read Model Number].	1	Standard cable is fixed on main body.
Accessories				
2	Cable for Position Controllers / ELECYLINDER	CB-TB1-C002	1	when model C or SC selected
3	Cable for program Controllers	CB-TB1-X002	1	when model S or SC selected
4	Conversion Cable	CB-SEL-SJS002	1	when model S or SC selected
5	Touch pen	TCH-TB02	1	Provided with the main body ϕ4.5×102mm
6	Safety guide	M0194 	1	The picture shows an image.

2.1.2 Instruction manual related to this product

No.	Name	Control number
1	Instruction manual for touch-panel teaching pendant TB-02	ME0356
2	Instruction manual for XSEL-J/K/KE controller	ME0116
3	Instruction manual for XSEL-JX/KX controller	ME0119
4	Instruction manual for XSEL-KT/KET controller	ME0134
5	Instruction manual for XSEL-P/Q/PCT/QCT controller	ME0148
6	Instruction manual for XSEL-PX/QX controller	ME0152
7	Instruction manual for XSEL-R/S/RX/SX/RXD/SXD controller	ME0313
8	Instruction manual for tabletop robot TT	ME0149
9	Instruction manual for tabletop robot TTA	ME0320
10	Instruction manual for SSEL controller	ME0157
11	Instruction manual for ASEL controller	ME0165
12	Instruction manual for PSEL controller	ME0172
13	Instruction manual for MSEL- PC/PG/PCF/PGF/PCX/PGX controller	ME0336
14	Instruction manual for XSEL-RA/SA/RAX/SAX/RAXD/SAXD controller	ME0359
15	Instruction manual for RSEL controller	ME0392
16	Instruction manual for XSEL2 controller	ME0478
17	ELECYLINDER Rod Type / Table Type Instruction Manual	ME3778
18	ELECYLINDER Rod Type Dust and Drip Proof Instruction Manual	ME3779
19	ELECYLINDER Slider Type Instruction Manual	ME3793
20	ELECYLINDER Rod Type / Radial Cylinder Type Instruction Manual	ME3794
21	ELECYLINDER Belt Driven Type Instruction Manual	ME3798
22	ELECYLINDER Stopper Cylinder Instruction Manual	ME3799
23	ELECYLINDER Rotary Instruction Manual	ME3800
24	ELECYLINDER Large Slider Type Instruction Manual	ME3801
25	ELECYLINDER Cleanroom Specification Instruction Manual	ME3804
26	ELECYLINDER Gripper Instruction Manual	ME3806
27	ELECYLINDER Slider Type Dust and Drip Proof Instruction Manual	ME3814
28	Ultra Mini ELECYLINDER Instruction Manual	ME3815
29	ELECYLINDER Electricity Section Instruction Manual	ME3816
30	ELECYLINDER Long Stroke Gripper Type Instruction Manual	ME3824
31	ELECYLINDER Slider Type / Radial Cylinder Type Instruction Manual	ME3825
32	ELECYLINDER Compact Type Instruction Manual	ME3826
33	ELECYLINDER ROBO PUMP Instruction Manual	ME3827
34	ELECYLINDER 3-finger gripper Instruction Manual	ME3829
35	ELECYLINDER Vertical Compact / Dust Proof/Splash Proof Gripper Type Instruction Manual	ME3830
36	ELECYLINDER High Rigidity Slider Type / Clean Specification Instruction Manual	ME3833
37	ELECYLINDER Wide Slider / Clean Specification Instruction Manual	ME3834
38	ELECYLINDER Rod Type Double Guide Specification Instruction Manual	ME3835

2.1.3 How to Read Model Nameplate



2.1.4 How to Read Model Number

TB-02-SC-SWR-ENG

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

<Switch specification>
Not specified : Stop switch unit is gray.
SWR : Stop switch unit is red.

<Model number>
TB-02 : Standard type
TB-02D : With deadman switch type (left side)

<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
Note : It is necessary to provide a special cable (CB-TB1-XJ005) for X-SEL-J/JX controller.

Set model code for main unit + cables			Model code for enclosed cable	Remark
CON Cable/ SEL 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 Program Controller connection (XSEL-J/JX Type excluded)
	CB-SEL-SJS002		For ASEL, PSEL, SSEL, MSEL, RSEL and XSEL2 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		

2.2 Specifications

2.2.1 Basic Specifications

Item	Specifications
Rated Voltage	DC24V±10% (Supplied from controller)
Operational 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
Ground	Functional grounding (by shield in connection cable to controller)
Display Colors	65536 colors (16-bit colors)
Backlight Type	White LED backlight
Backlight Life	15,000 hours
Touch Panel Display	7 inch TFT color WVGA(800x480)
Touch Detection Type	4-wire resistive type
Touch Panel Life	1 million times
External Memory	SD/SDHC memory card (Note 1) 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
Languages	Japanese/English/Chinese
Touch Sound	ON/OFF Volume Settable in 3 steps, S, M, and L
Data Storage	Applicable to have data saved to and read from external Secure Digital memory card (Position data, program, parameter, symbol, global data)
Display Adjustment	Brightness adjustable for contrast and backlight
Clock Setting	Clock setting available with real time clock (Backup held with CR2032 button battery)
Communication Standard	Based on RS232C
Communication Speed	9,600bps/19,200bps/38,400bps/57,600bps/115,200bps/230,400bps
Protocol	Dedicated format
Connector	D sub 25 pin
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 [ ]

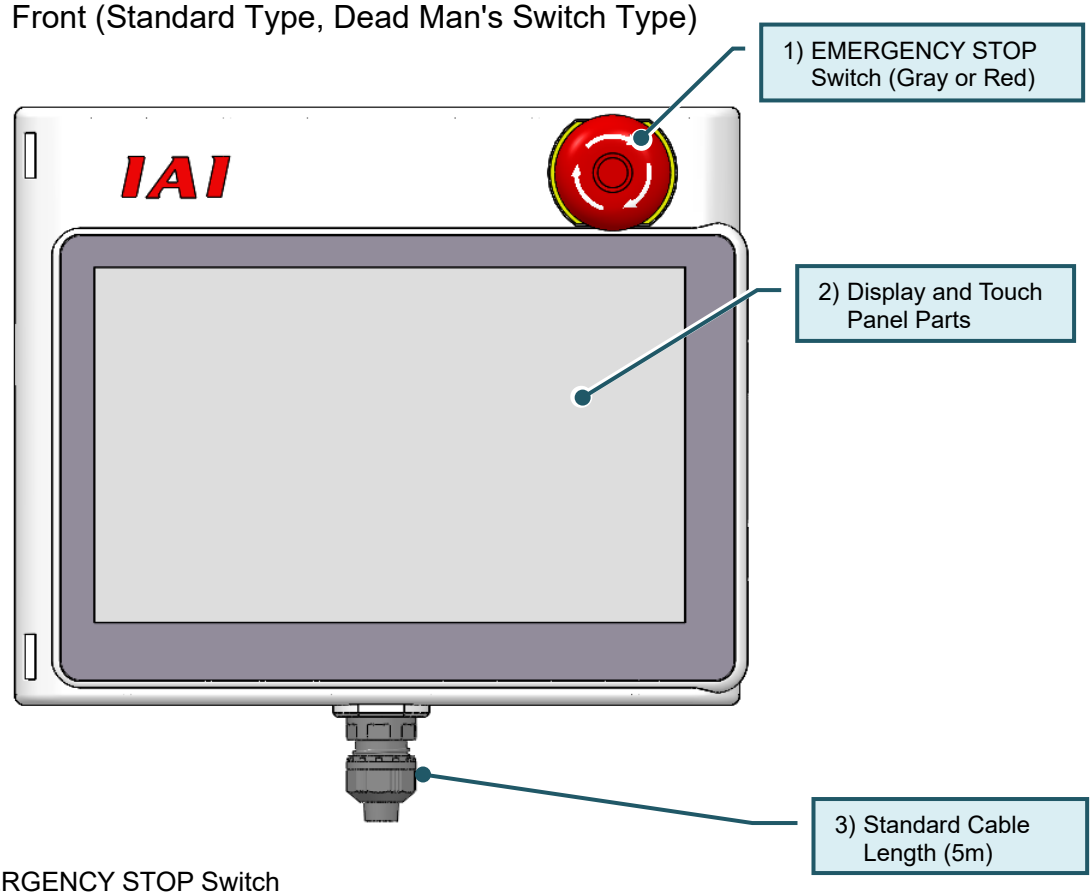
Item		Specifications
Mass		TB-02 : 470g approx. (Main Body) + 330g approx. (Cable 5m) TB-02D : 600g approx. (Main body) + 330g approx. (Cable 5m)
Note 1	SD HC™	Secure Digital memory card is a registered trademark for SD-3C, LLC and SDA.

2.2.2 Environmental Specifications

Item	Specifications
Ambient Operating Temperature	0 to 40°C
Ambient Operating Humidity	85%RH or less (non-condensing)
Ambient Storage Temperature	-20 to 70°C
Ambient Storage Humidity	85%RH or less (non-condensing)
Altitude	1000m or below above 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.
Shock Resistance	Frequency 10 to 57Hz / Swing width: 0.035mm (Continued), 0.075mm (Continued) 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

2.3 Explanation of Each Part

2.3.1 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
It consists of TFT color LCD and touch panel.
It is used to edit setting of each value and to display contents of teaching.
Touch the touch panel with a finger or a stylus pen to make operation.

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

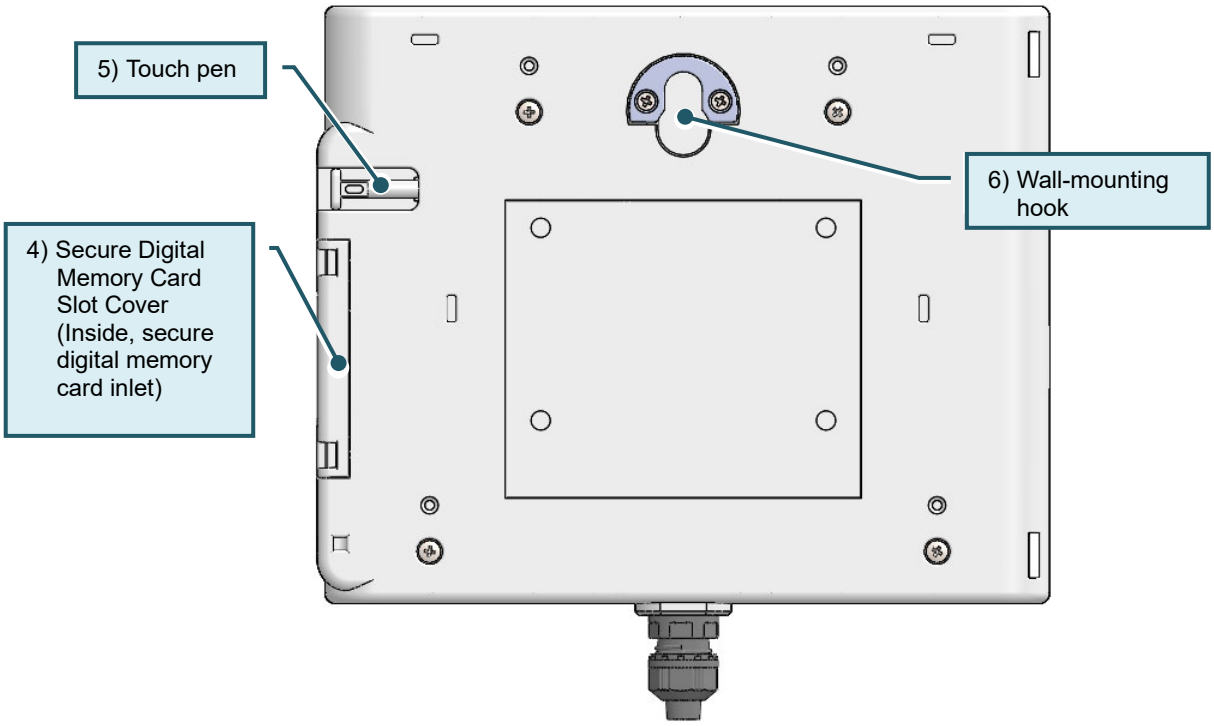
*2 This touch panel is of analog resistance membrane type, so do not touch two or more locations on the screen at the same time.
If two or more locations are touched at the same time, the centers of all touched locations may respond and trigger multiple operations.

*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.

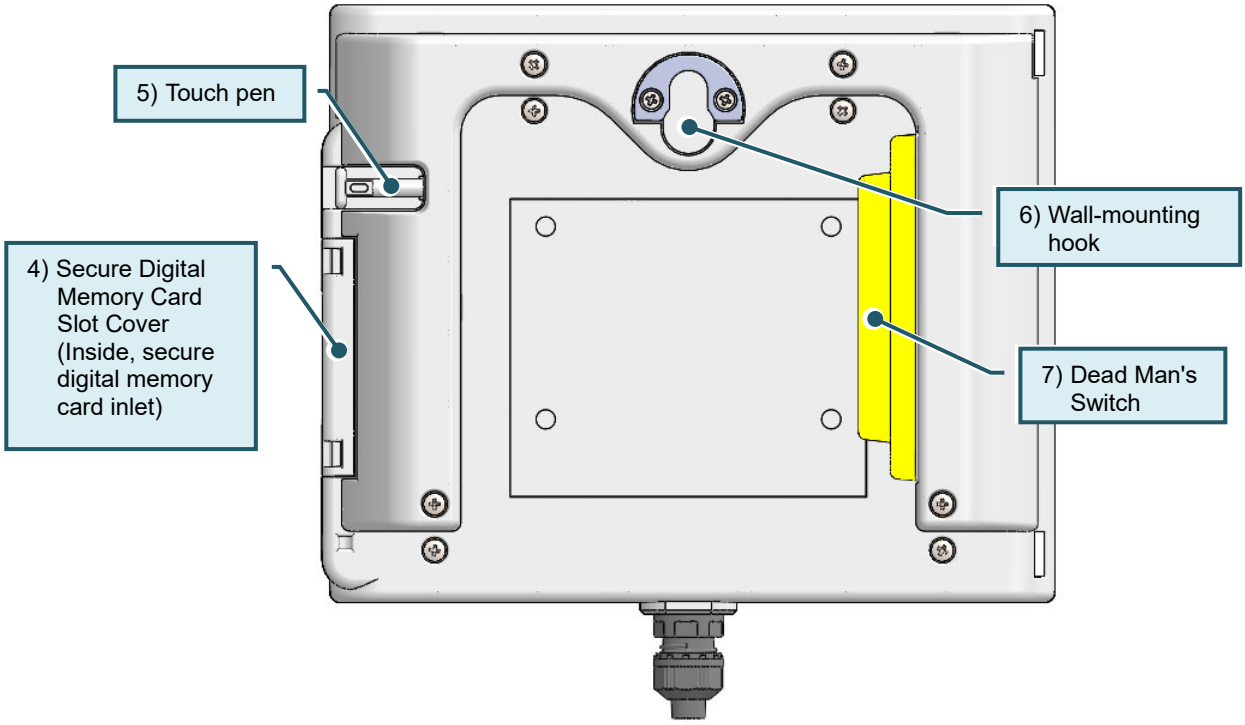
*4 The life of touch panel is approx. 1 million touches at the same location. (Assuming a use environment of 25°C)

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

2.3.2 Back (Standard Type)



2.3.3 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 [2.4 How to Set in/out Secure Digital Memory Card] to set in or out a Secure Digital memory card.

5) Touch pen
This touch pen is used to touch the touch-panel operation display screen.

6) Wall-mounting hook
This hook is used to mount the touch panel on a wall. The hook is available to hang with an M8 hex socket head cap screw.

7) Dead man's Switch (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.

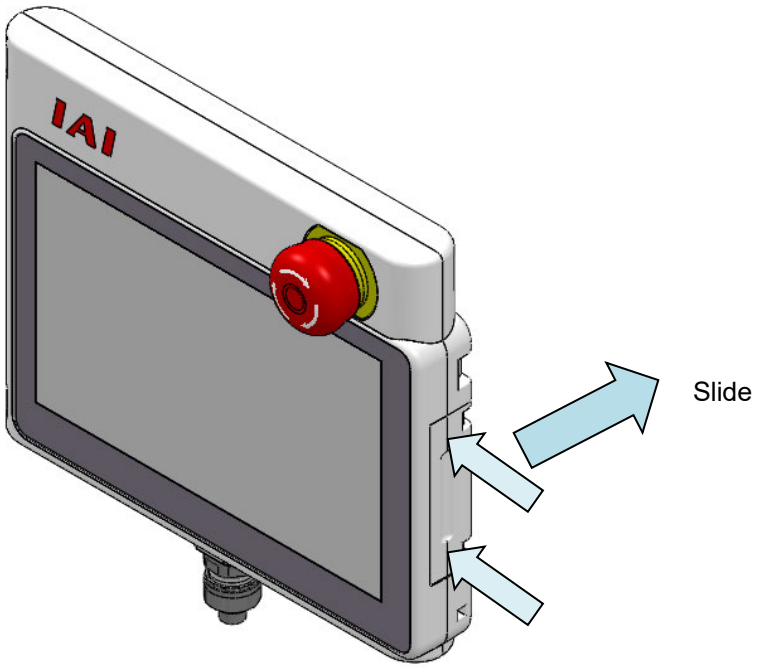
Level 1	Switch OFF	The hand is off the switch, or the switch is pressed with a very small force.
Level 2	Switch ON	The switch is pressed with an appropriate force.
Level 3	Switch OFF	The switch is pressed with a strong force.

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).

2.4 How to Set in/out Secure Digital Memory Card

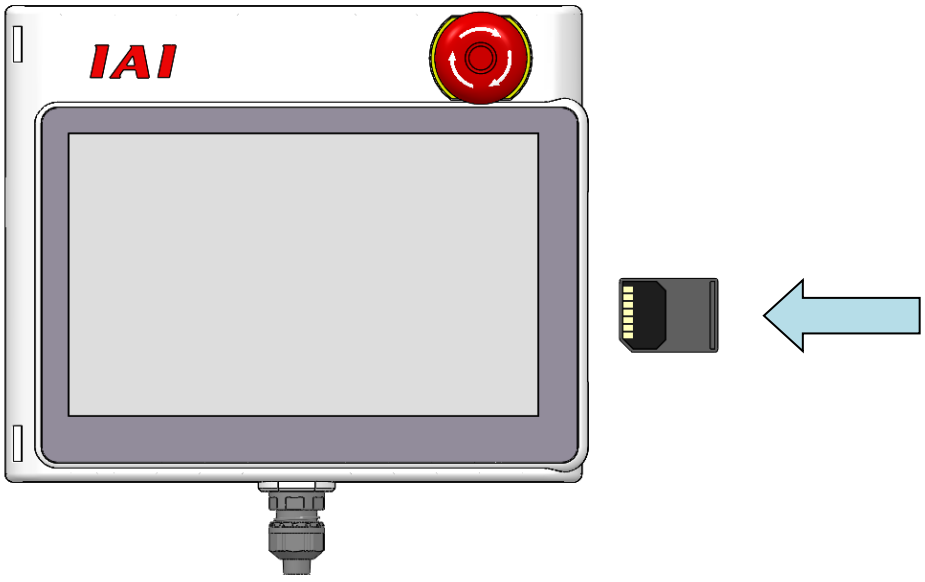
2.4.1 How to Take off Secure Digital Memory Card Cover

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



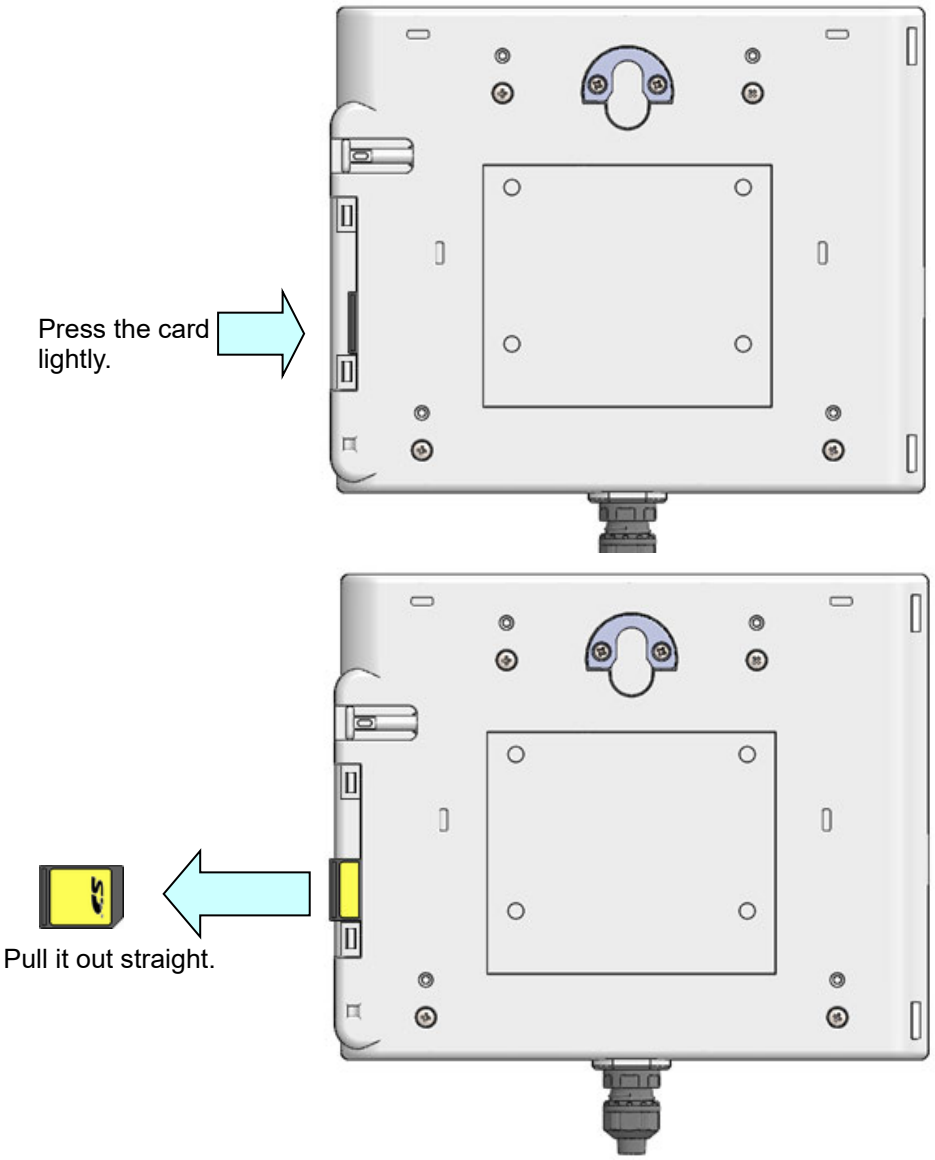
2.4.2 How to Insert Secure Digital Memory Card

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



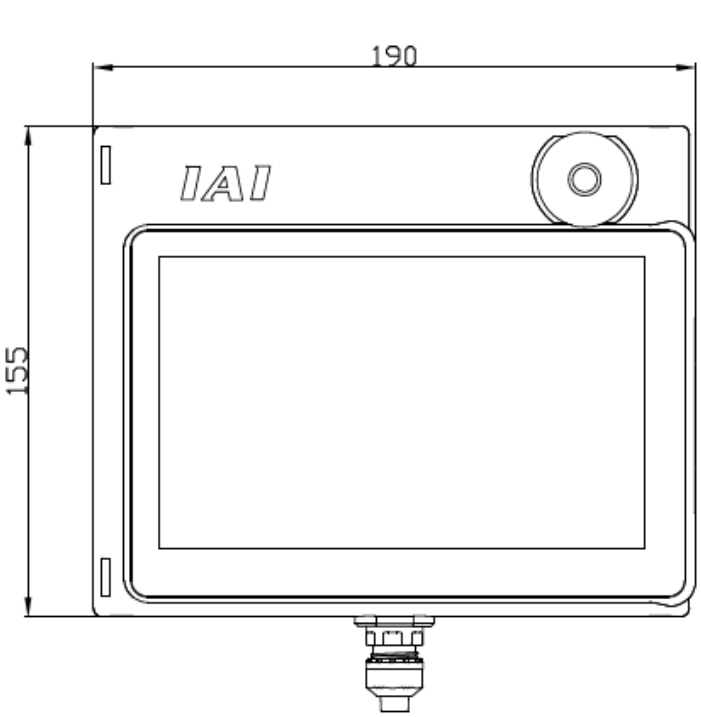
2.4.3 How to Take out Secure Digital Memory Card

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

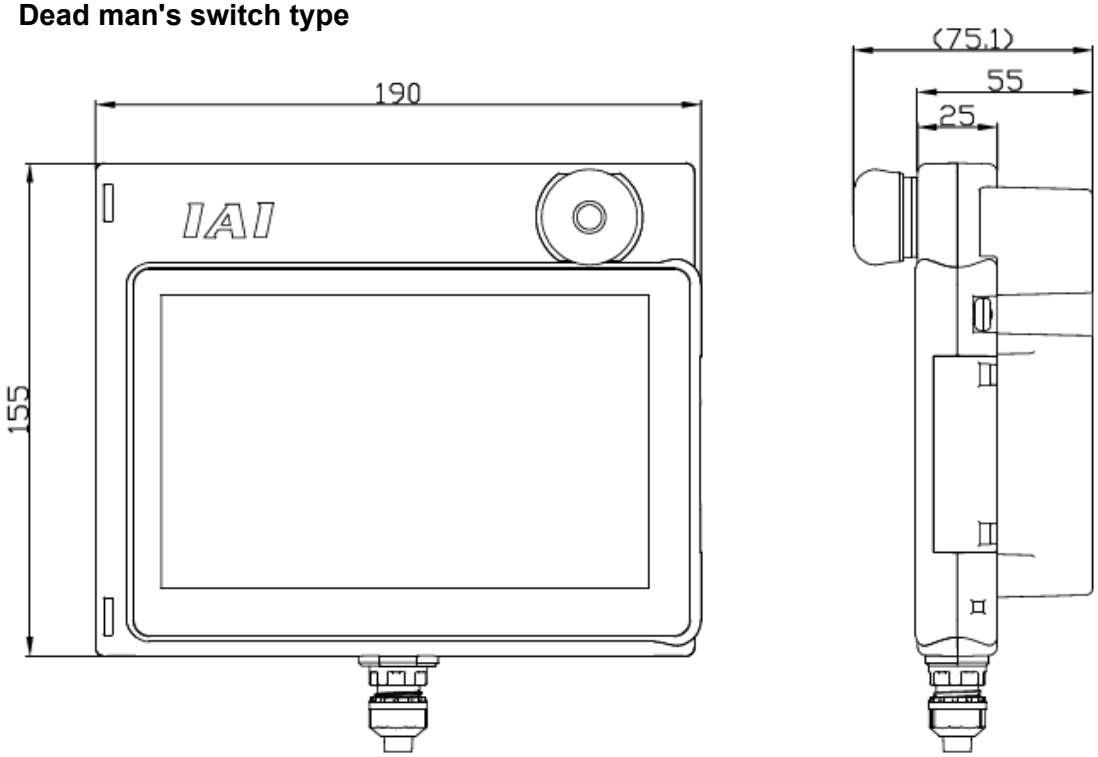


2.5 External Dimensions

Standard type (with no dead man's switch)



Dead man's switch type



2.6 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)

2.7 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 “AD7 RTC Backup Battery Voltage Drop” (“327 Calendar Feature Error” when RSEL or XSEL2 connected) once the voltage of the battery gets low. As the battery cannot be replaced at a customer's site, make a request to IAI.

2.8 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)



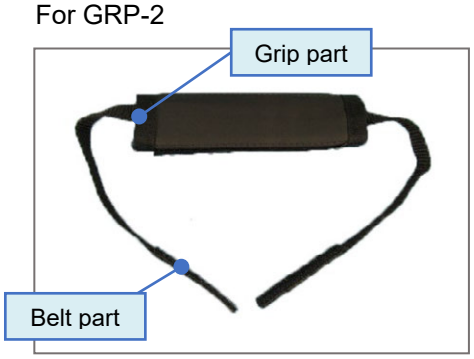
Grip Belt



Strap

2.8.1 How to Attach Grip Belt

2.8.1.1 For GRP-2





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

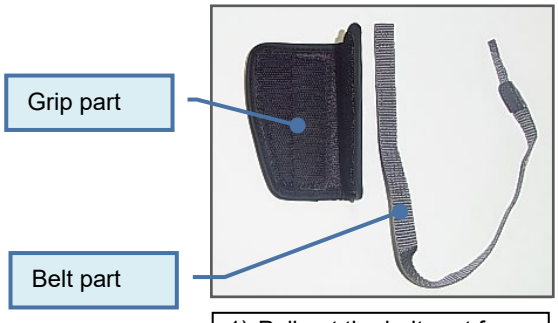


2) Fix the belt to the fabric hook-and-loop fastener in the opened grip area.



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

2.8.1.2 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.



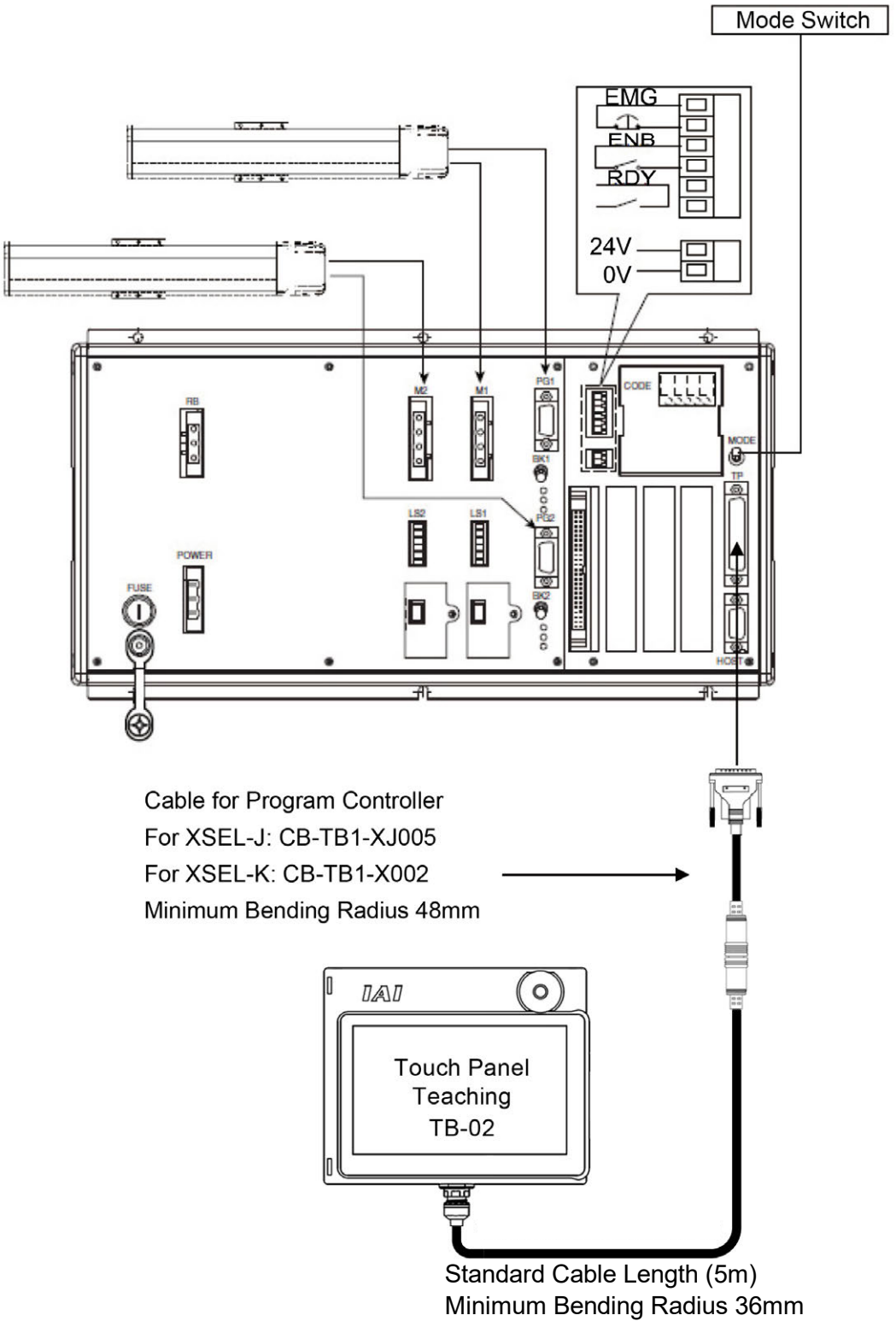
3) Put the belt part through the grip part.



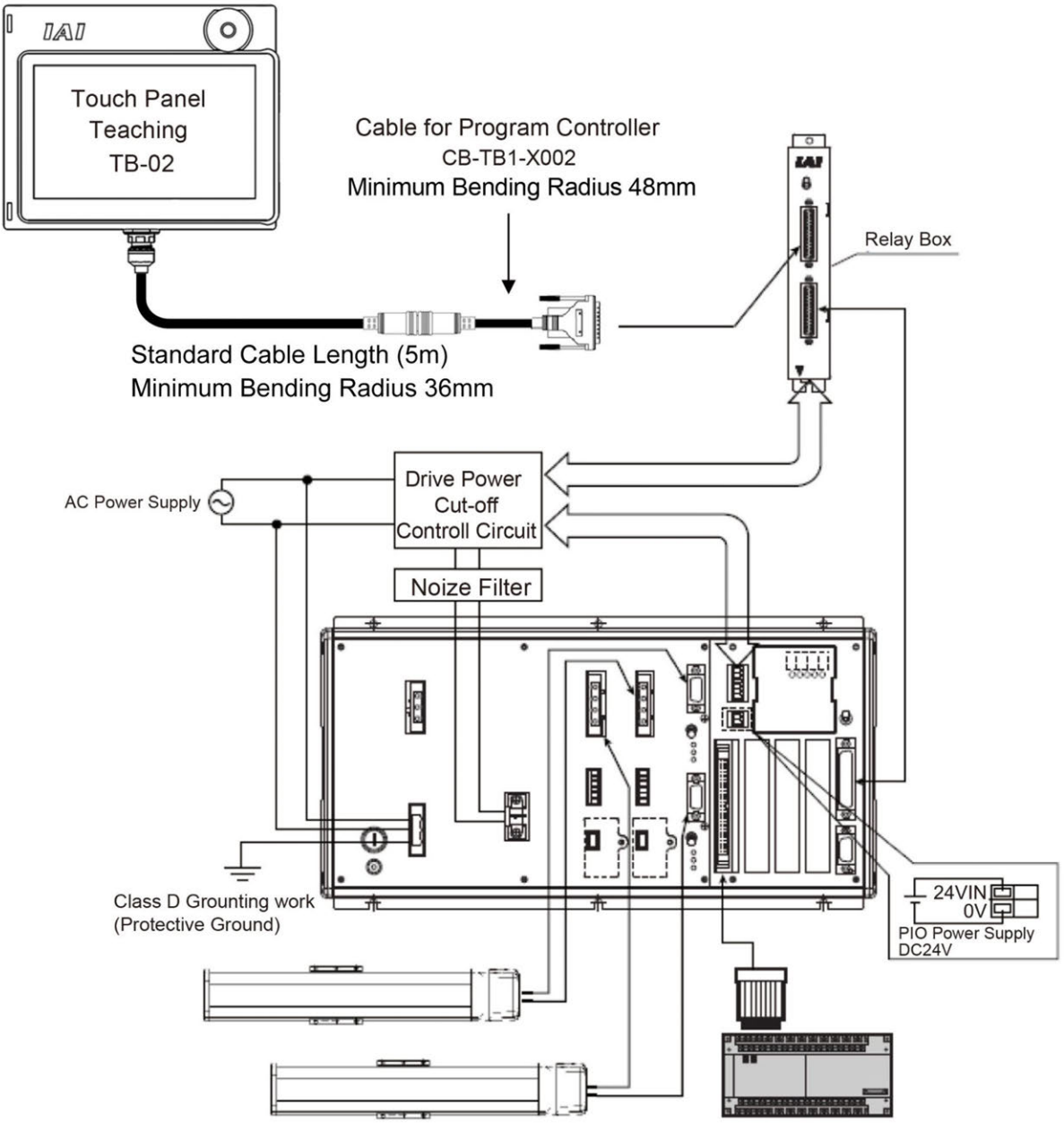
4) Attach the belt at the slit on the left top of the main unit and attach the belt to the grip part with the fabric hook-and-loop fastener.

3. Connection with the Controller

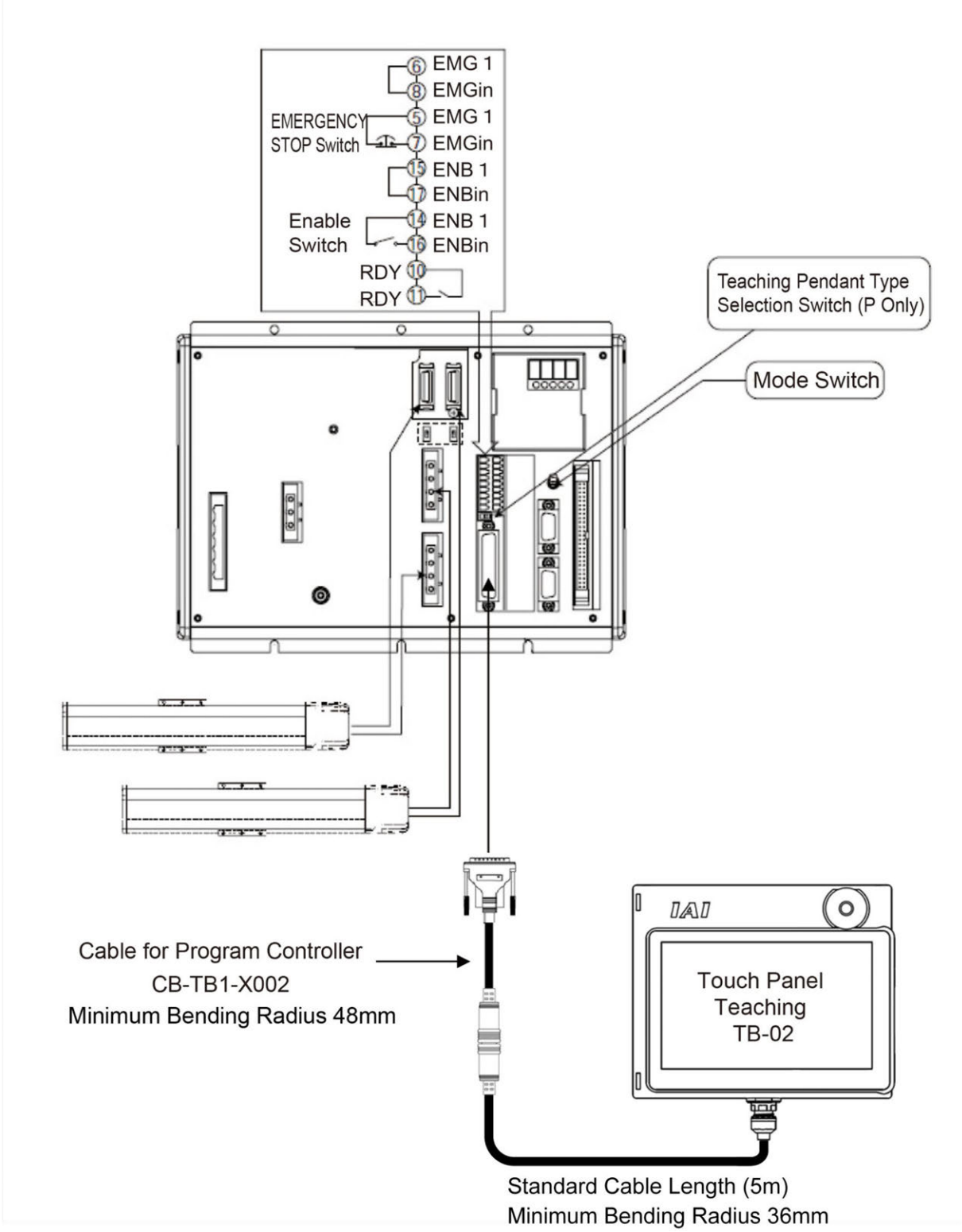
3.1 XSEL-J/K Type Controller



3.2 XSEL-KT/KET Type Controller

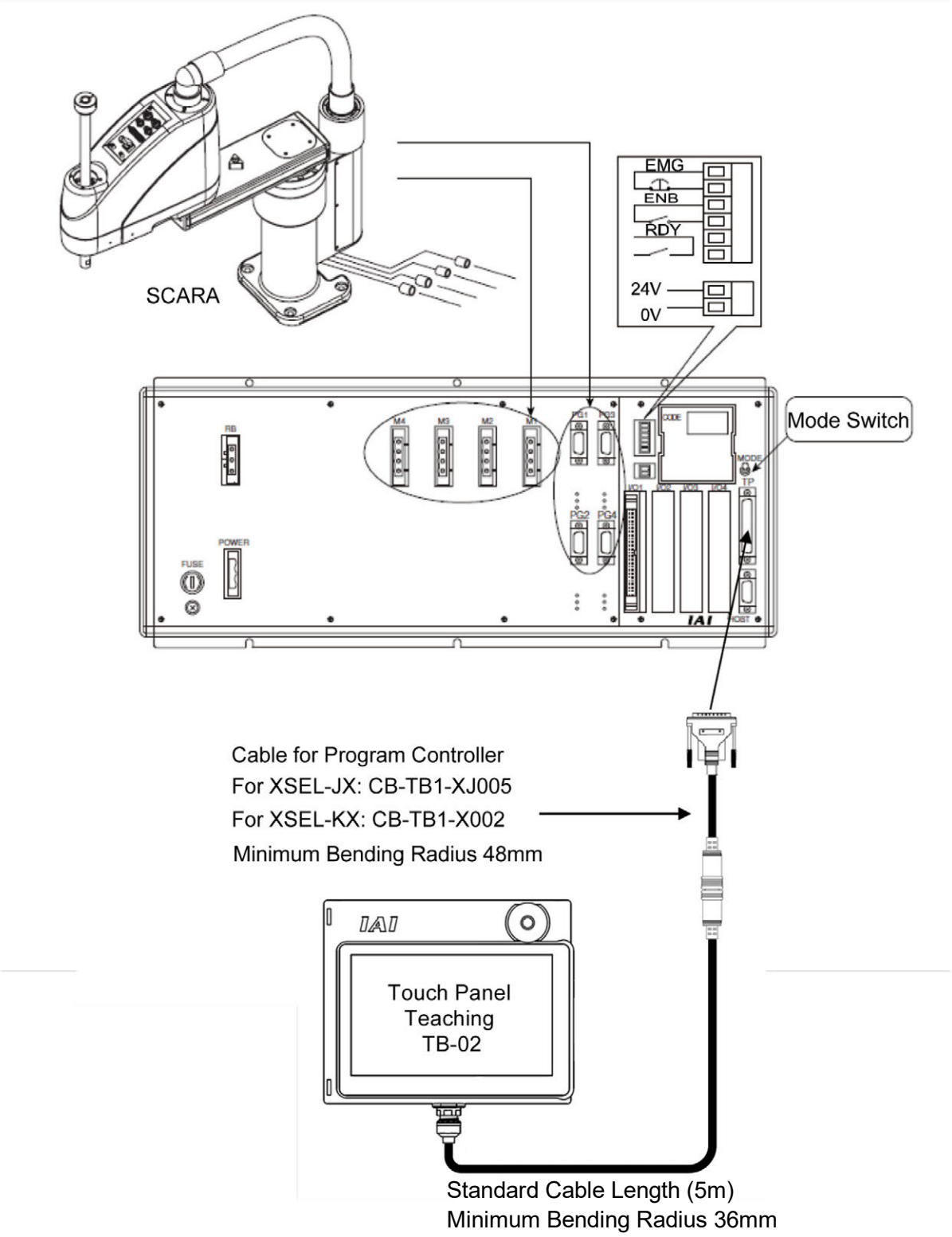


3.3 XSEL-P/Q/R/S/RA/SA Type Controller

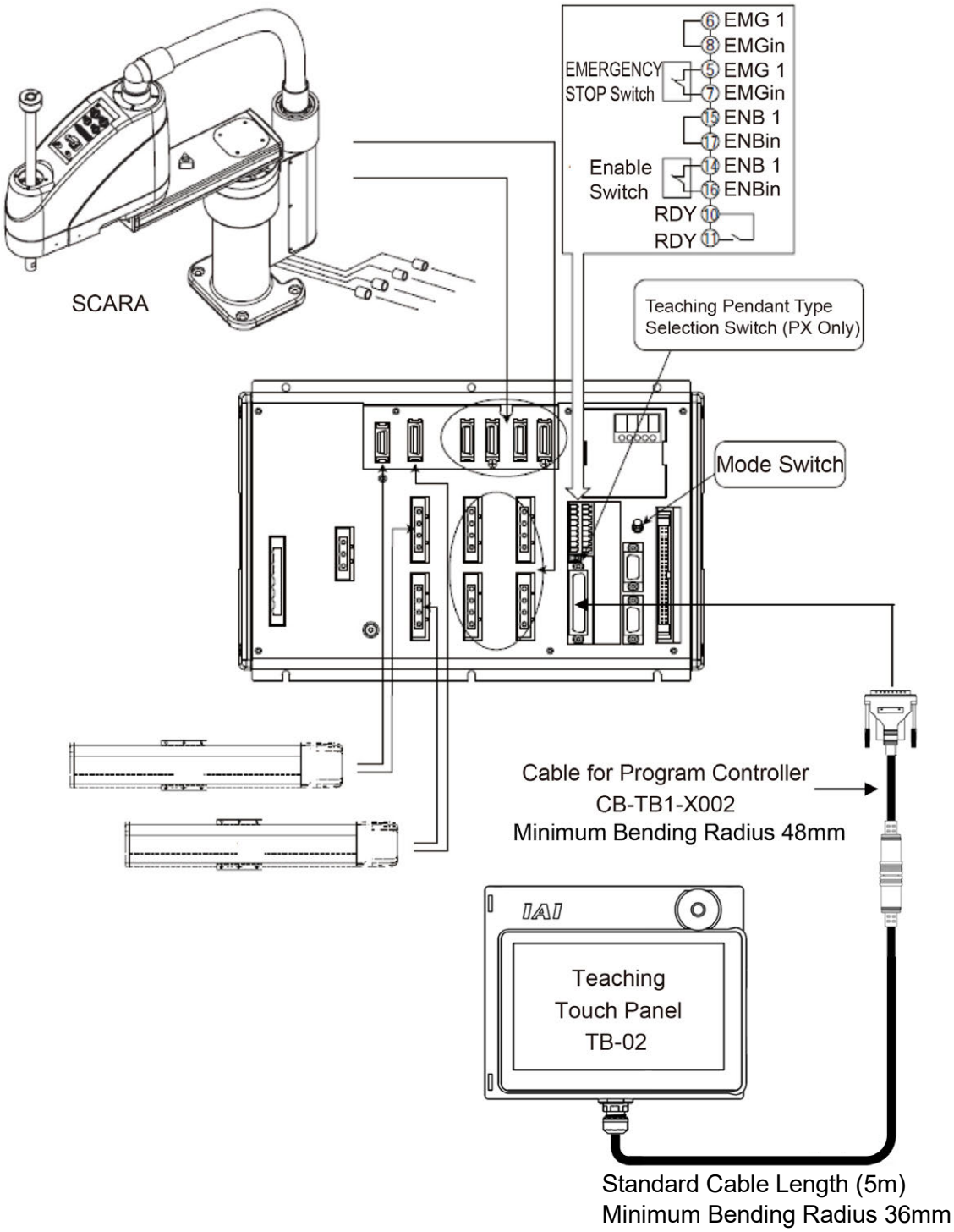


⚠ *Caution: Set the teaching pendant type selection switch of the XSEL-P type to the left.*

3.4 XSEL-JX/KX Type Controller

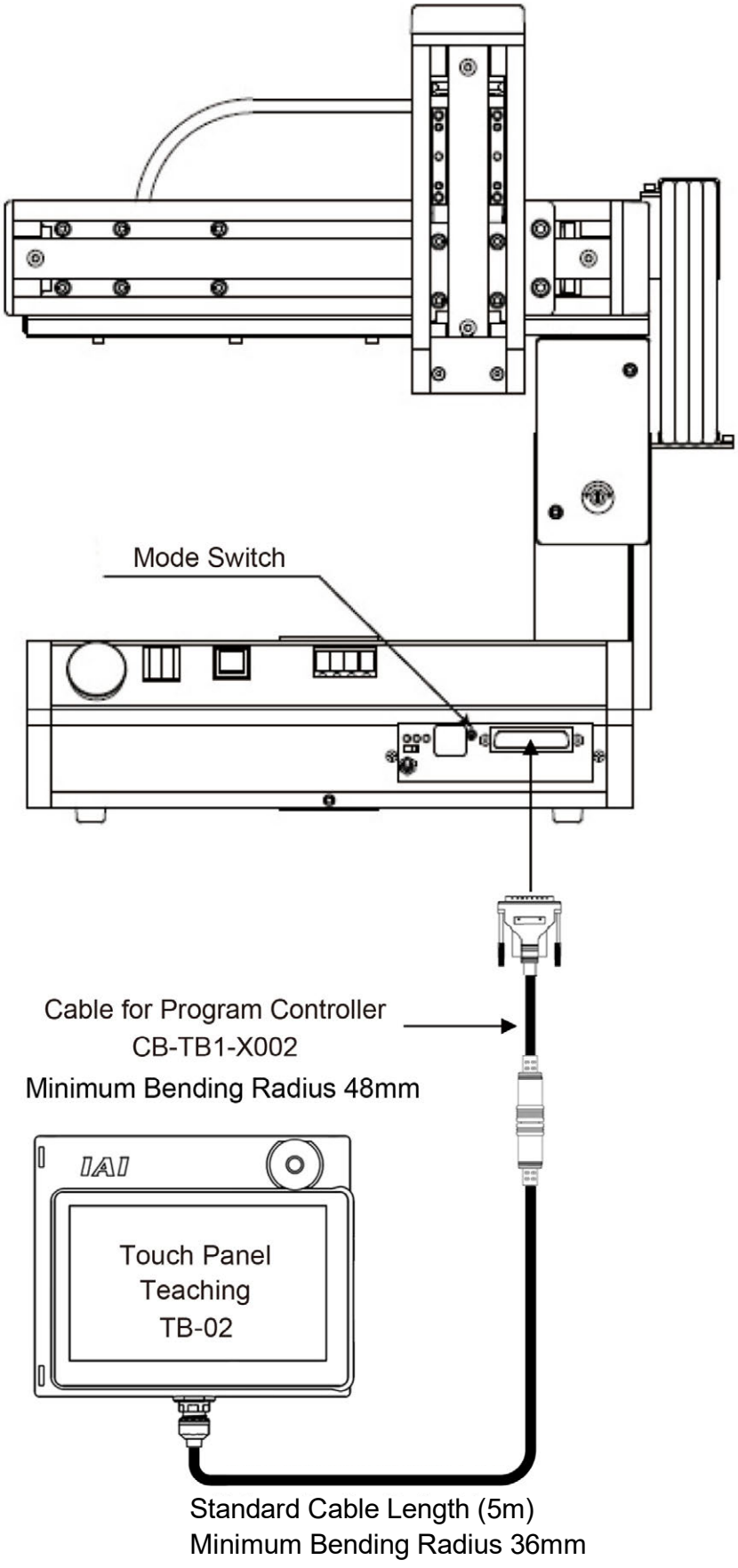


3.5 XSEL-PX/QX/RX/SX/RXD/SXD/RAX/SAX/RAXD/SAXD Type Controller

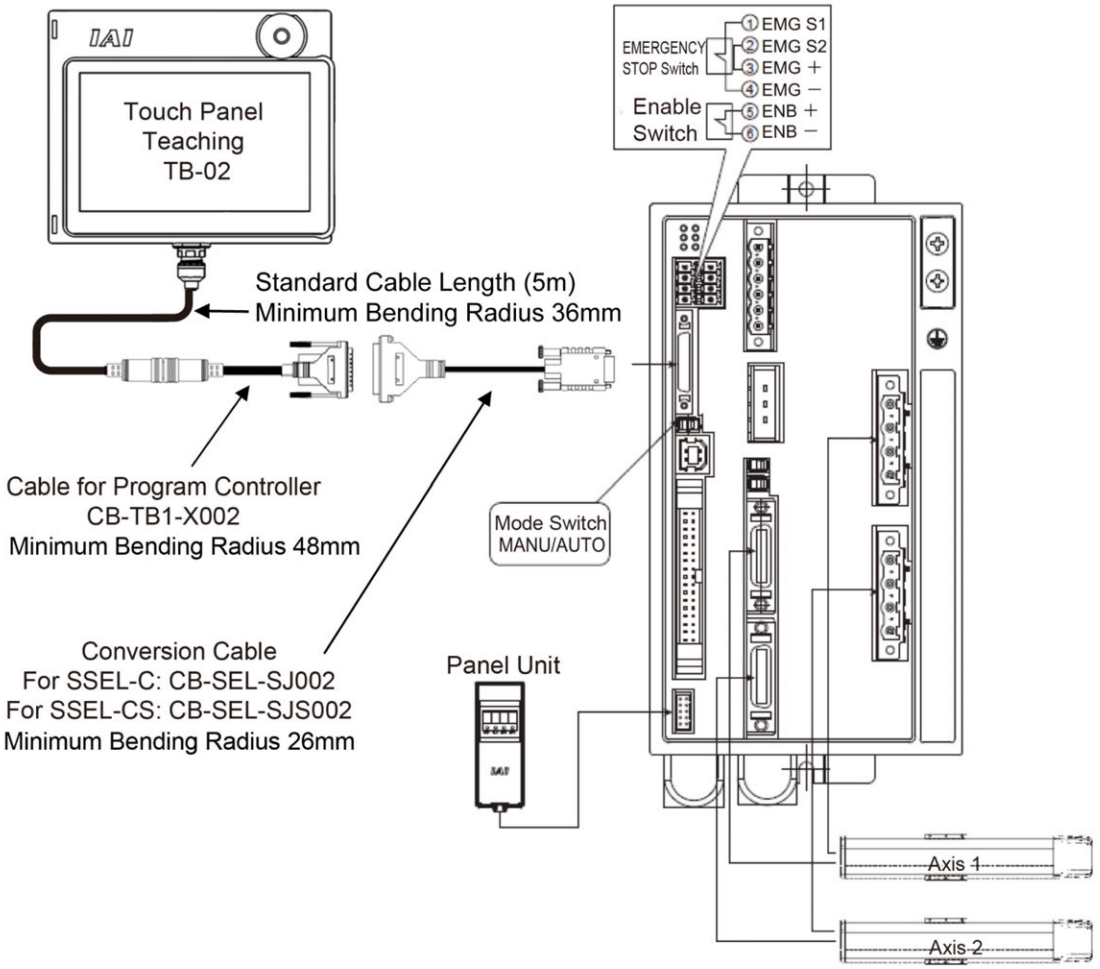


⚠ *Caution: Set the teaching pendant type selection switch of the XSEL-PX type to the left.*

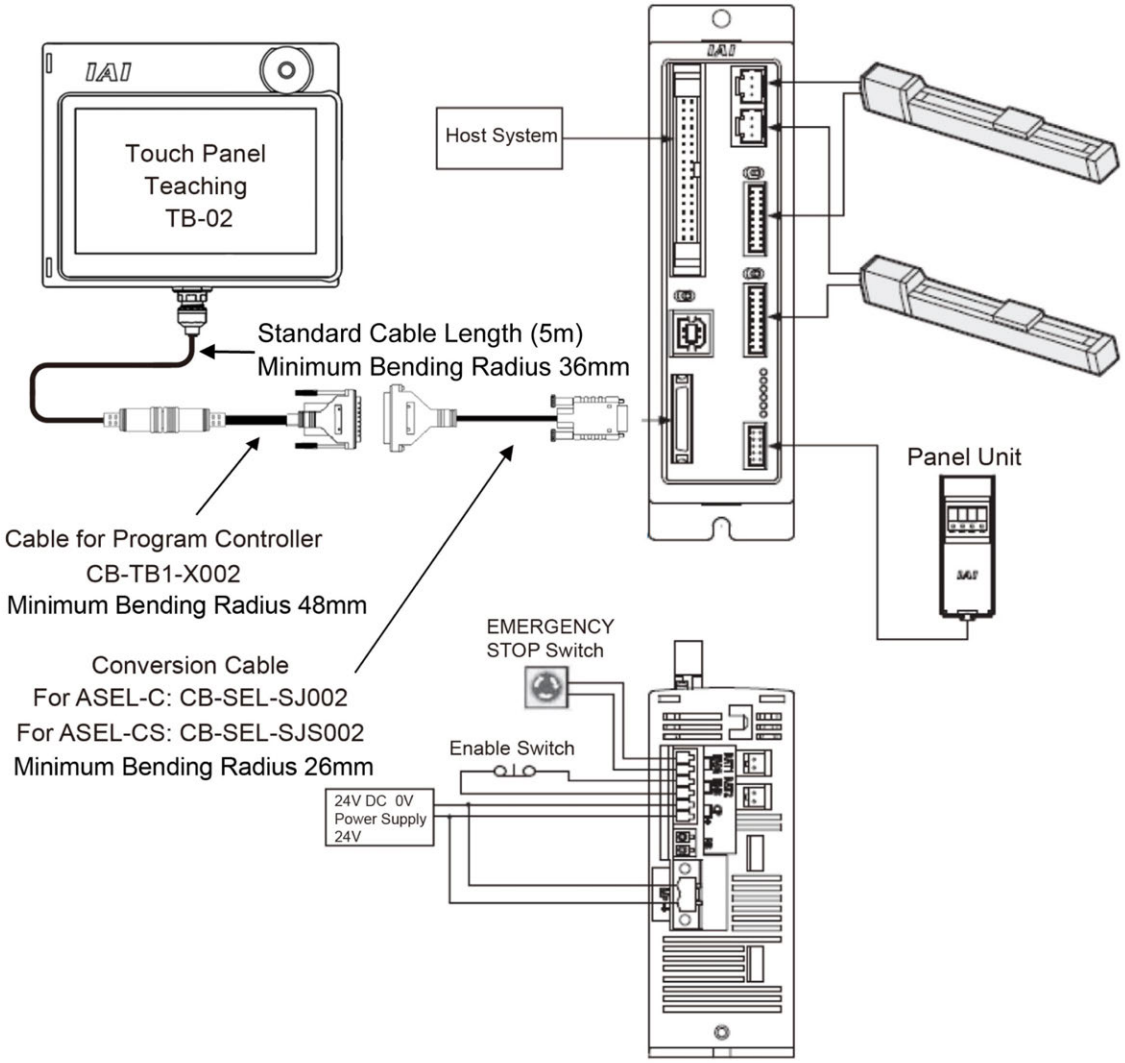
3.6 TT/TTA Type Controller



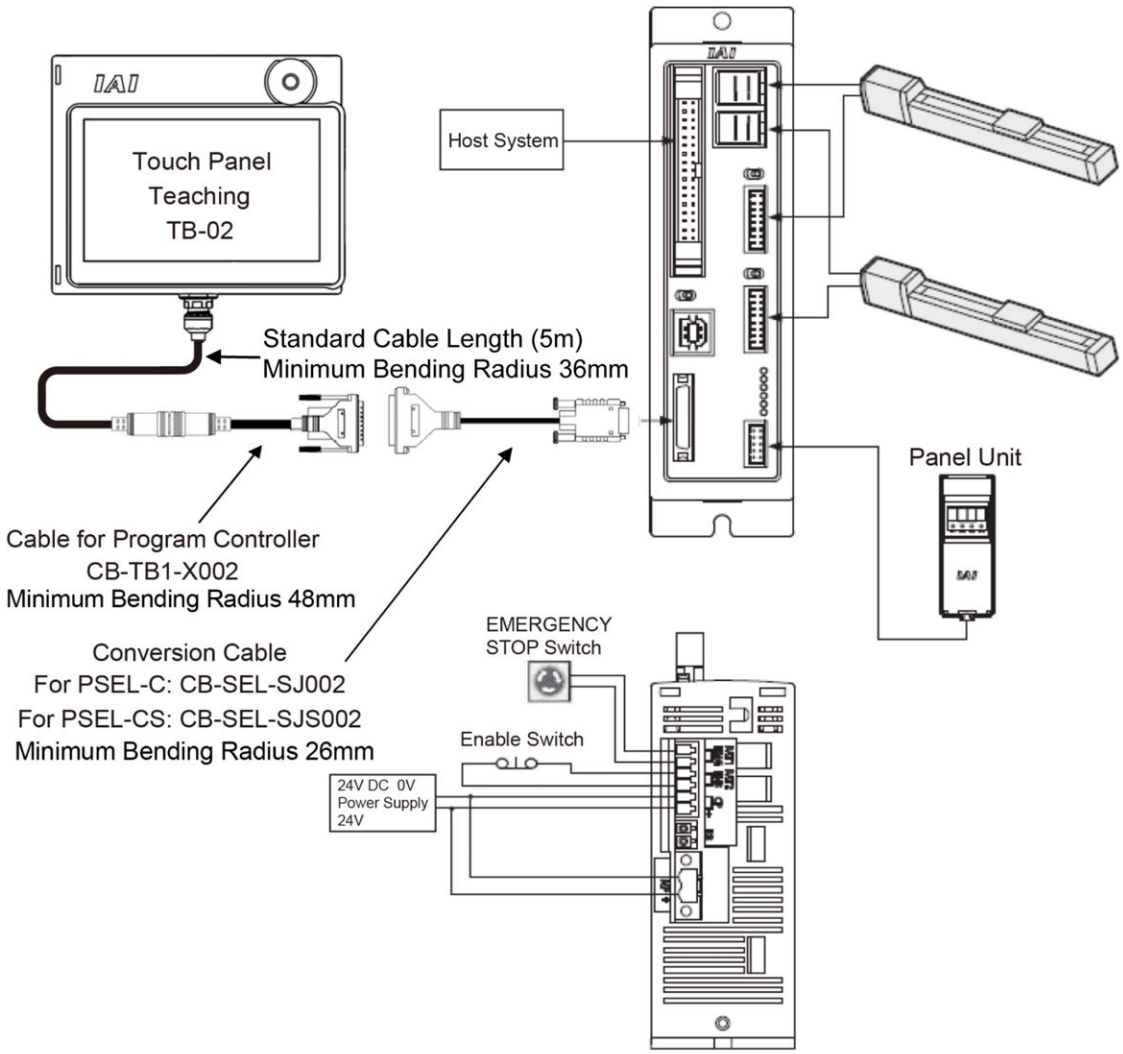
3.7 SSEL Type Controller



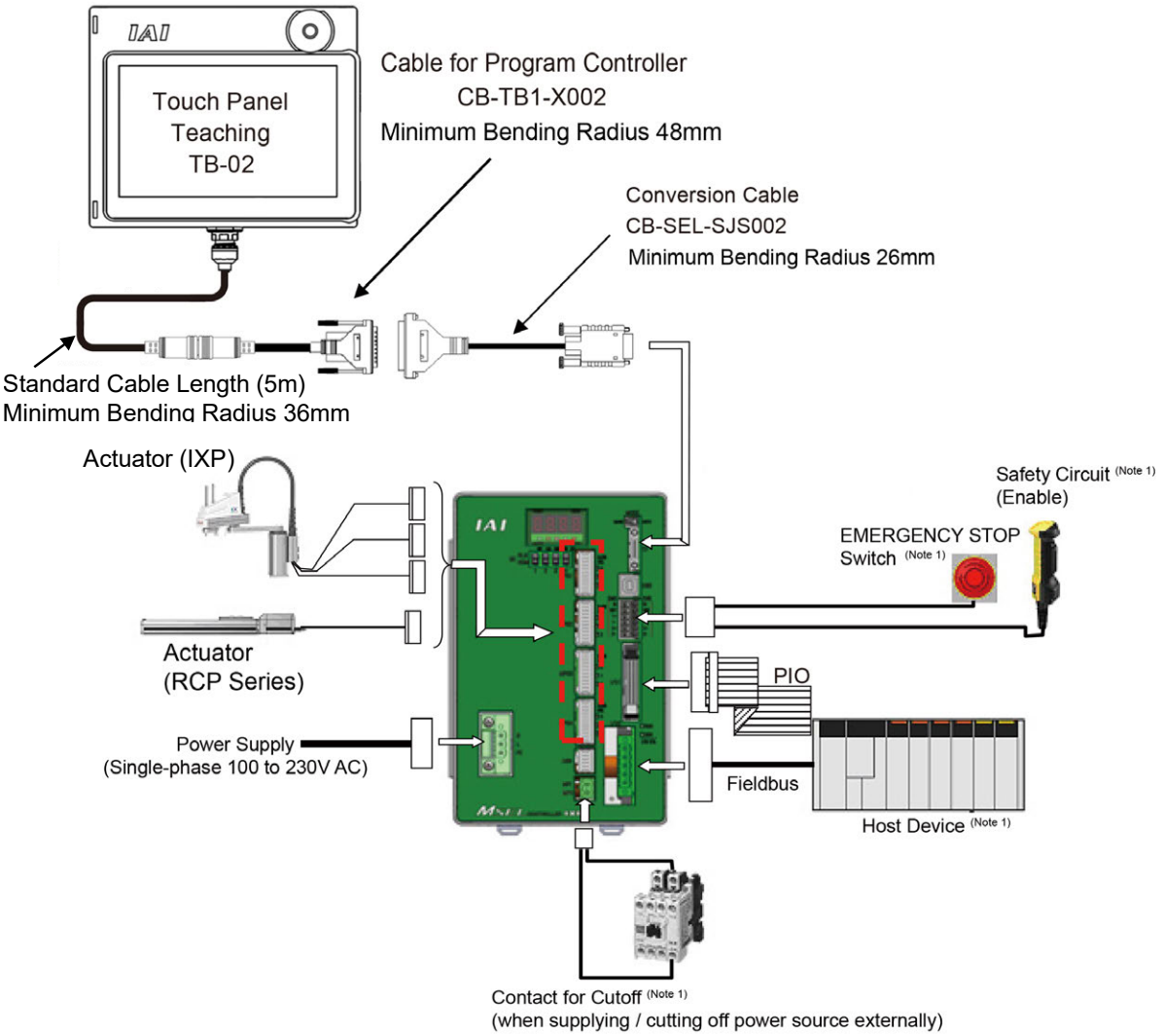
3.8 ASEL Type Controller



3.9 PSEL Type Controller

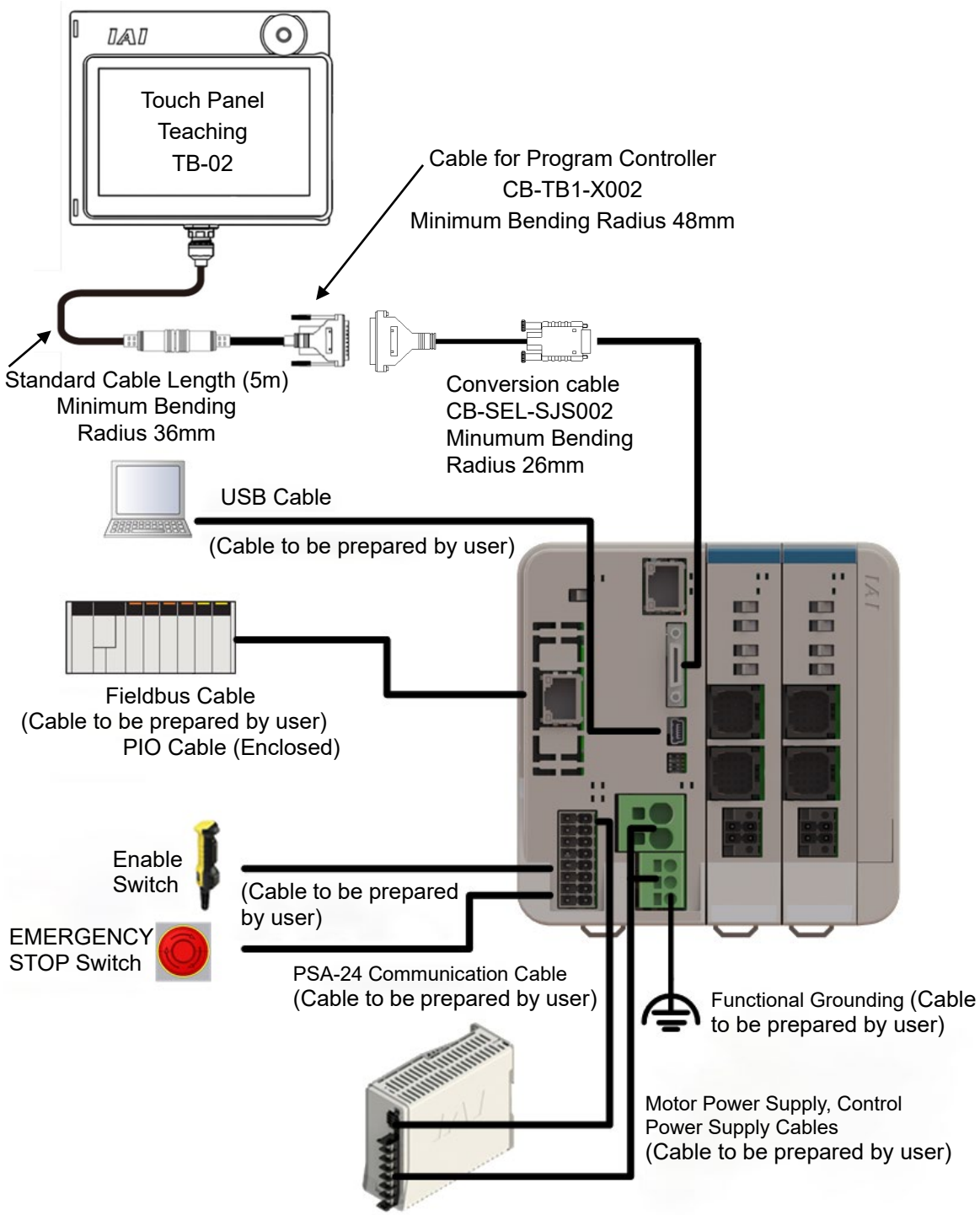


3.10 MSEL Type Controller

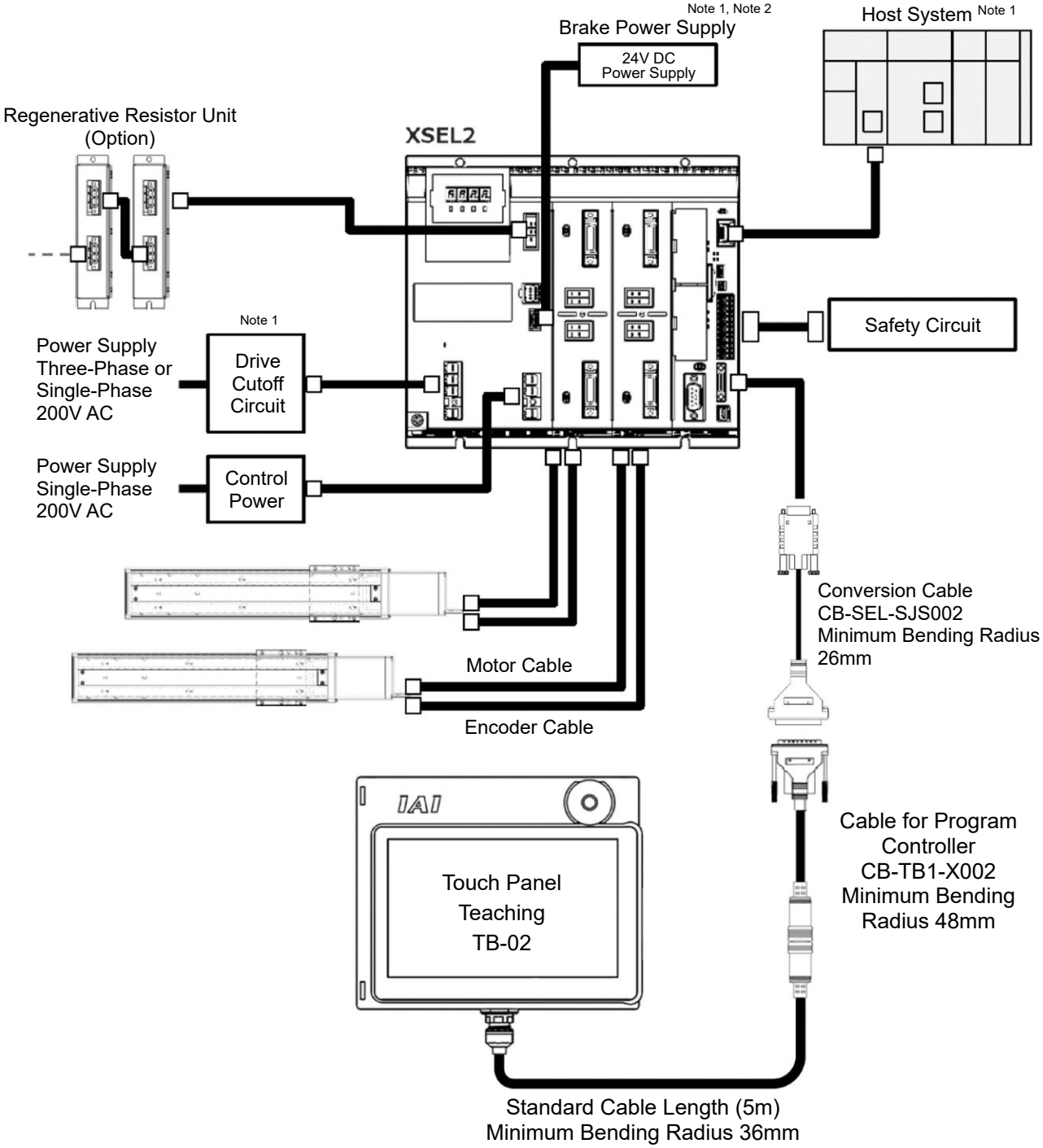


Note 1 Please prepare separately

3.11 RSEL Type Controller

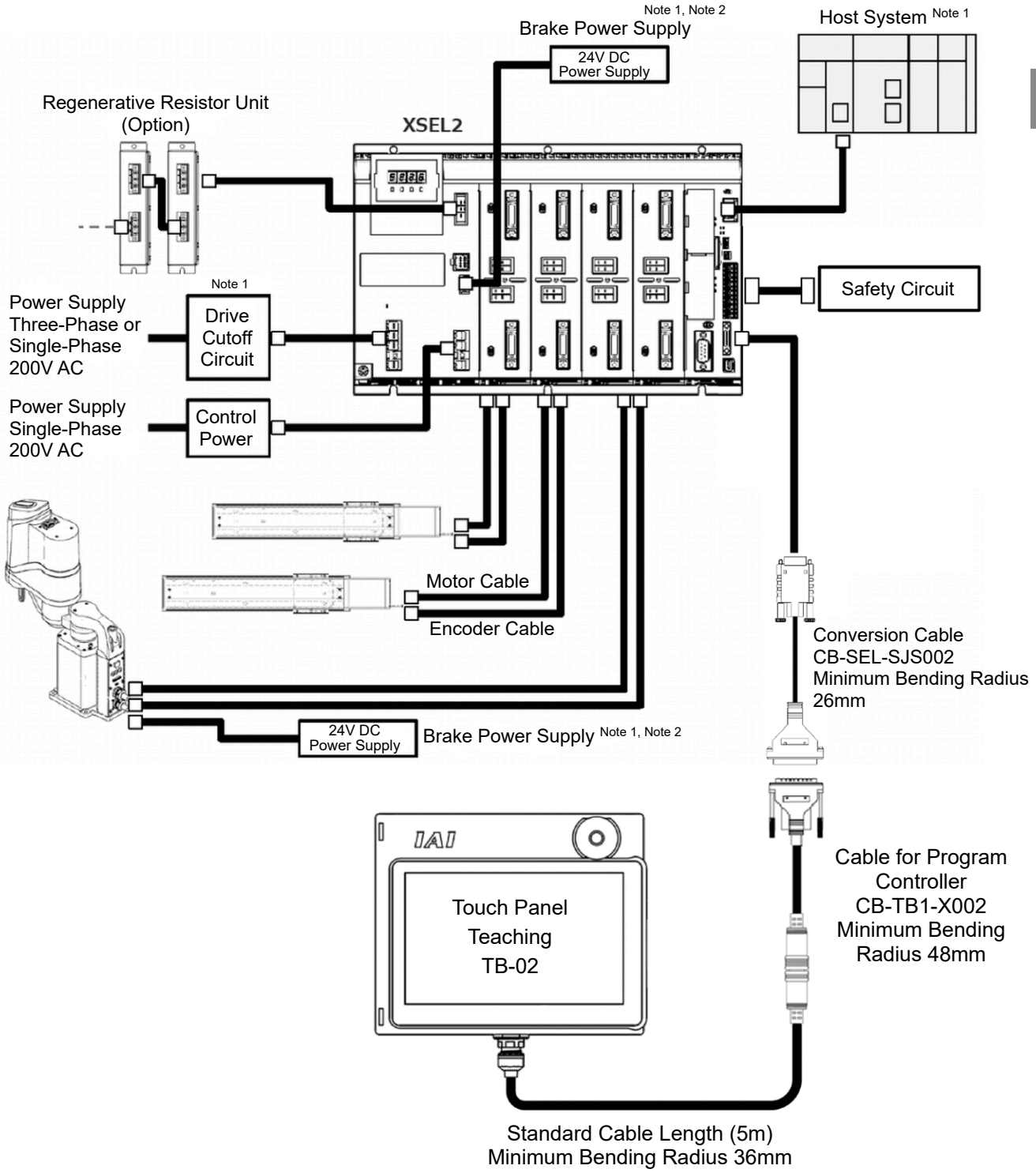


3.12 XSEL2-T Type Controller



Note 1 Please prepare separately.
Note 2 For an actuator equipped with a brake, it is necessary to supply +24V power for brake to the controller.

3.13 XSEL2-TX Type Controller

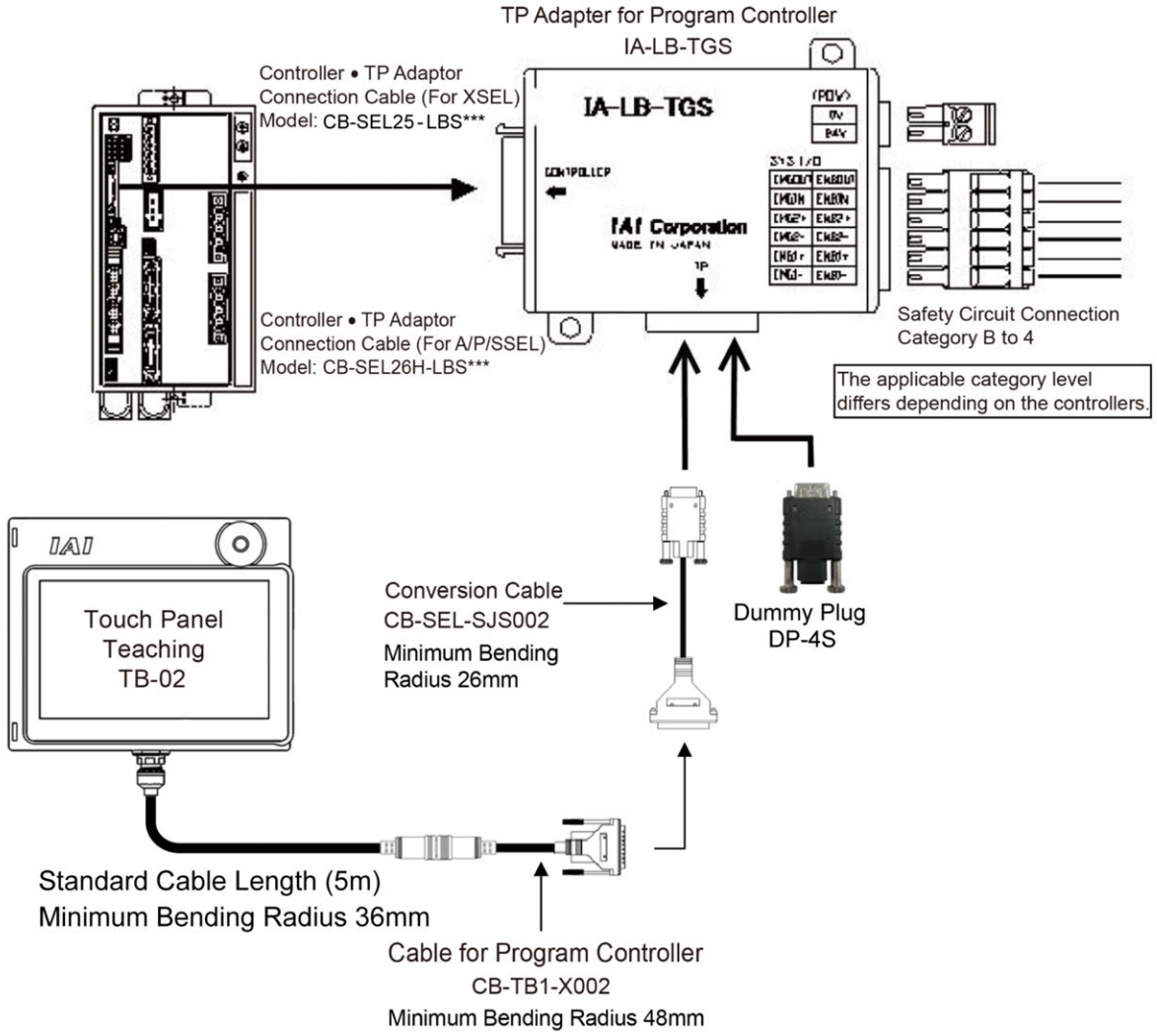


Note 1 Please prepare separately.
Note 2 For an actuator equipped with a brake, it is necessary to supply +24V power for brake to the controller.

3.14 Safety Category Compliant (Connection to the TP adapter)

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

* Safety category applicable type controllers can comply with Safety Categories also by using the system IO terminals, not using TP adapter. (The applicable safety category performance level differs depending on the controllers.)



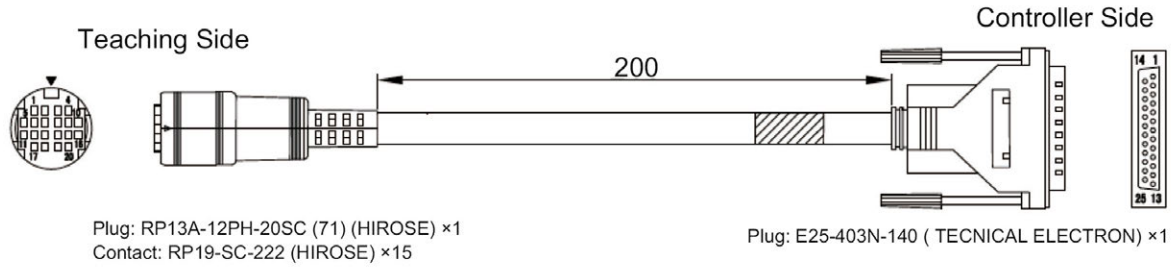
⚠ *Caution:*	*When TB-02 is not to be connected, make sure to put the dummy plug DP-4S on the TP adapter for program controller.*

3.15 Connection Cable

The cables stated below are required for connection to the program controllers.

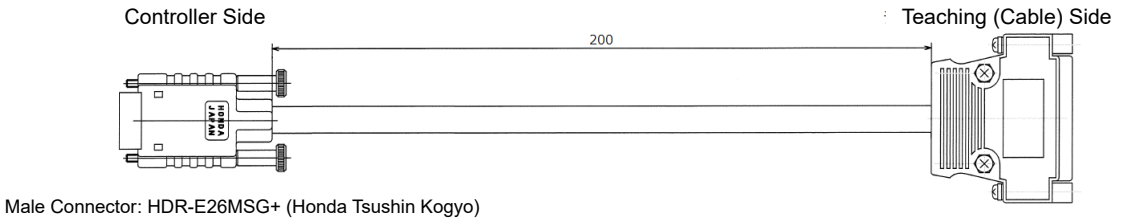
3.15.1 Program Controller Connection Cable (XSEL-J/JX Excluded)

Model Code	CB-TB1-X002
Name	Program Controller Connection Cable (Other than XSEL-J/JX types)
Connector Model on Controller Side	E25-403N-140 (Manufactured by TECNICAL ELECTRON)
Connector Model on TB-02 Unit Side	RP13A-12PH-20SC (71) (Manufactured by HIROSE)
Minimum Cable Bending Radius	48mm



For ASEL, PSEL, SSEL, MSEL, RSEL and XSEL2, the following conversion cable is also necessary.

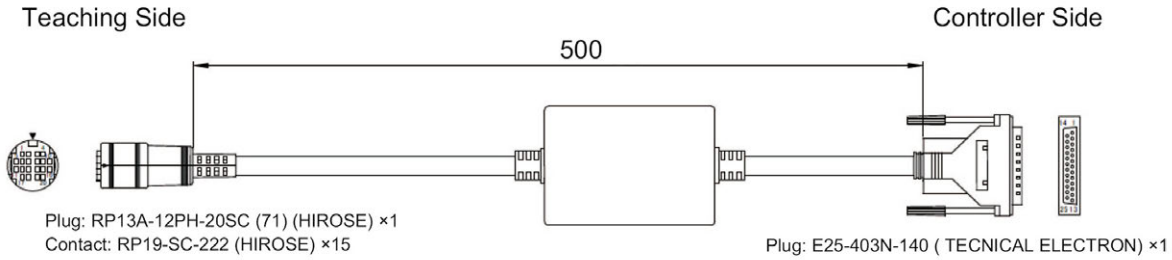
Model Code	CB-SEL-SJS002
Name	Connector Conversion Cable (ASEL, PSEL, SSEL, MSEL, RSEL and XSEL2)
Connector Model on Controller Side	HDR-E26MSG+ (Honda Tsushin Kogyo)
Connector Model on TB-02 Unit Side	XM3D-2521 (Omron)
Minimum Cable Bending Radius	26mm



3.15.2 XSEL-J/JX Dedicated Cable

The cables stated below are required for connection to XSEL-J/JX.

Model Code	CB-TB1-XJ005
Name	Program Controller Connection Cable (for XSEL-J/JX types)
Connector Model on Controller Side	E25-403N-140 (Manufactured by TECNICAL ELECTRON)
Connector Model on TB-02 Unit Side	RP13A-12PH-20SC (71) (Manufactured by HIROSE)
Minimum Cable Bending Radius	48mm

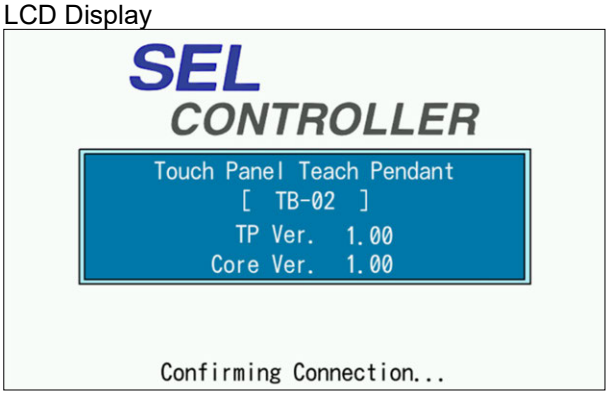


3.16 Teaching Pendant Connection Procedure

1) Connect actuators, I/O 24VDC power source, and system I/O to the controller first. Then connect the cable connector of the teaching pendant to the controller's teaching connector when the main power supply of the controller is OFF.

2) After you flip the mode switch to MANU side, supply power to the controller.

Teaching Pendant
LCD Display



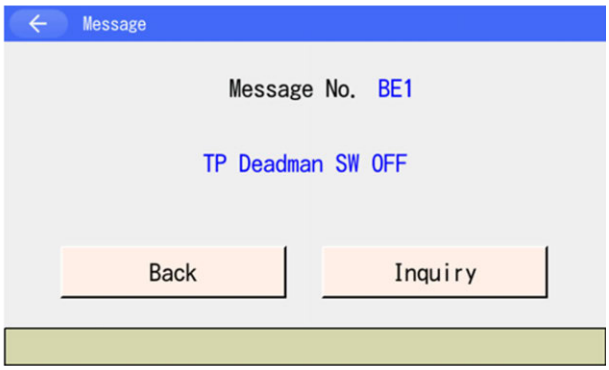
Displays the version of the teaching pendant and moves to the following main menu screen.

Main Menu Screen



This will be the basic window for all operations.

◎ The following message may appear on some controllers such as XSEL-K Controller when the power is turned on.
Either touch Return button to show the main menu window, and operations that do not require servo-on in the condition of switched off can be performed.

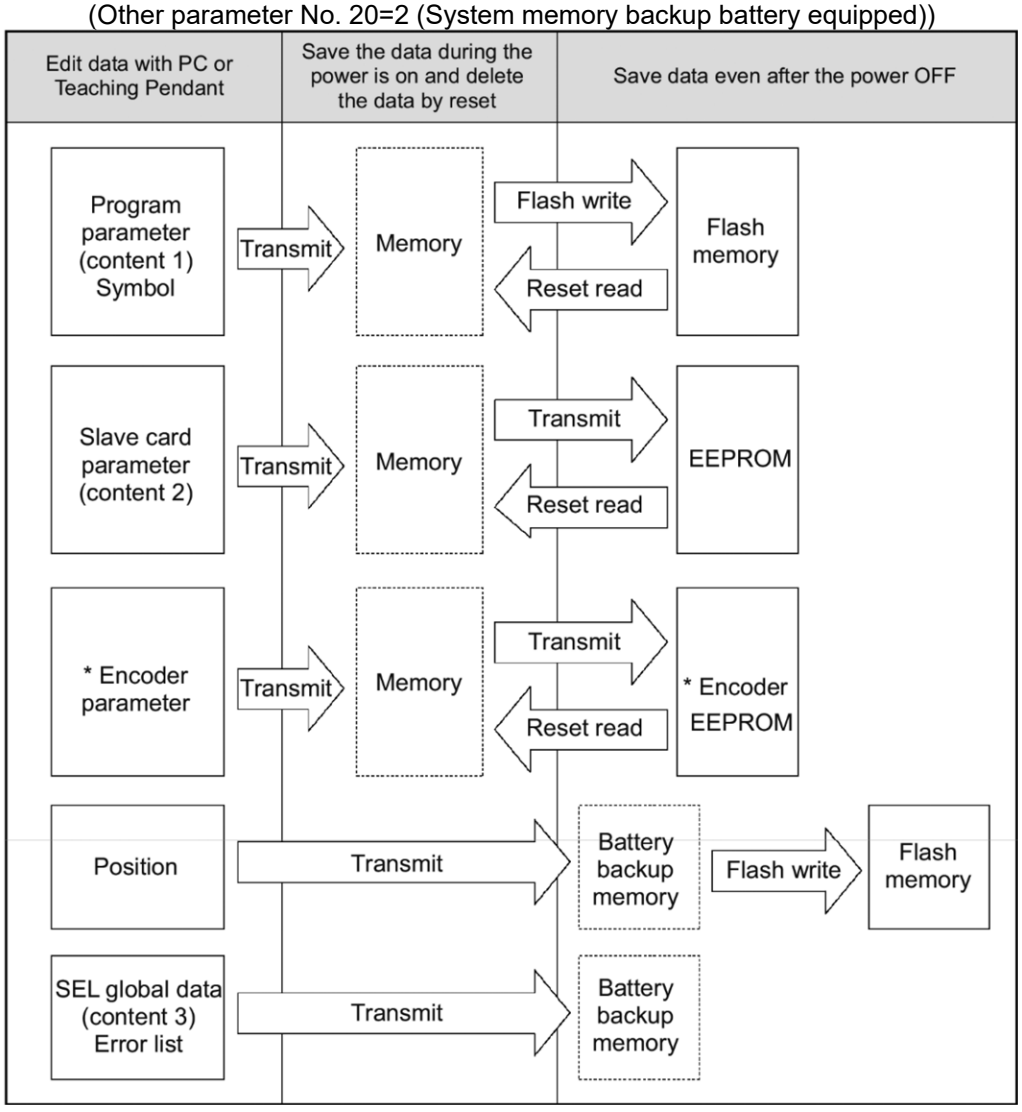


4. How to Save Data

Since the Controller adopts flash memory, there is a storage area by battery backup and a storage area by flash memory according to the data to be stored.
In addition, even if data is transferred from the PC software or Teaching Pendant, the data is only to be written in memory as shown in the chart below and the data is erased by power-off or controller reset.
To ensure data storage, write the data you want to store in flash memory.

4.1 Set-up at Shipment with System Memory Backup Battery

(Other parameter No. 20=2 (System memory backup battery equipped))



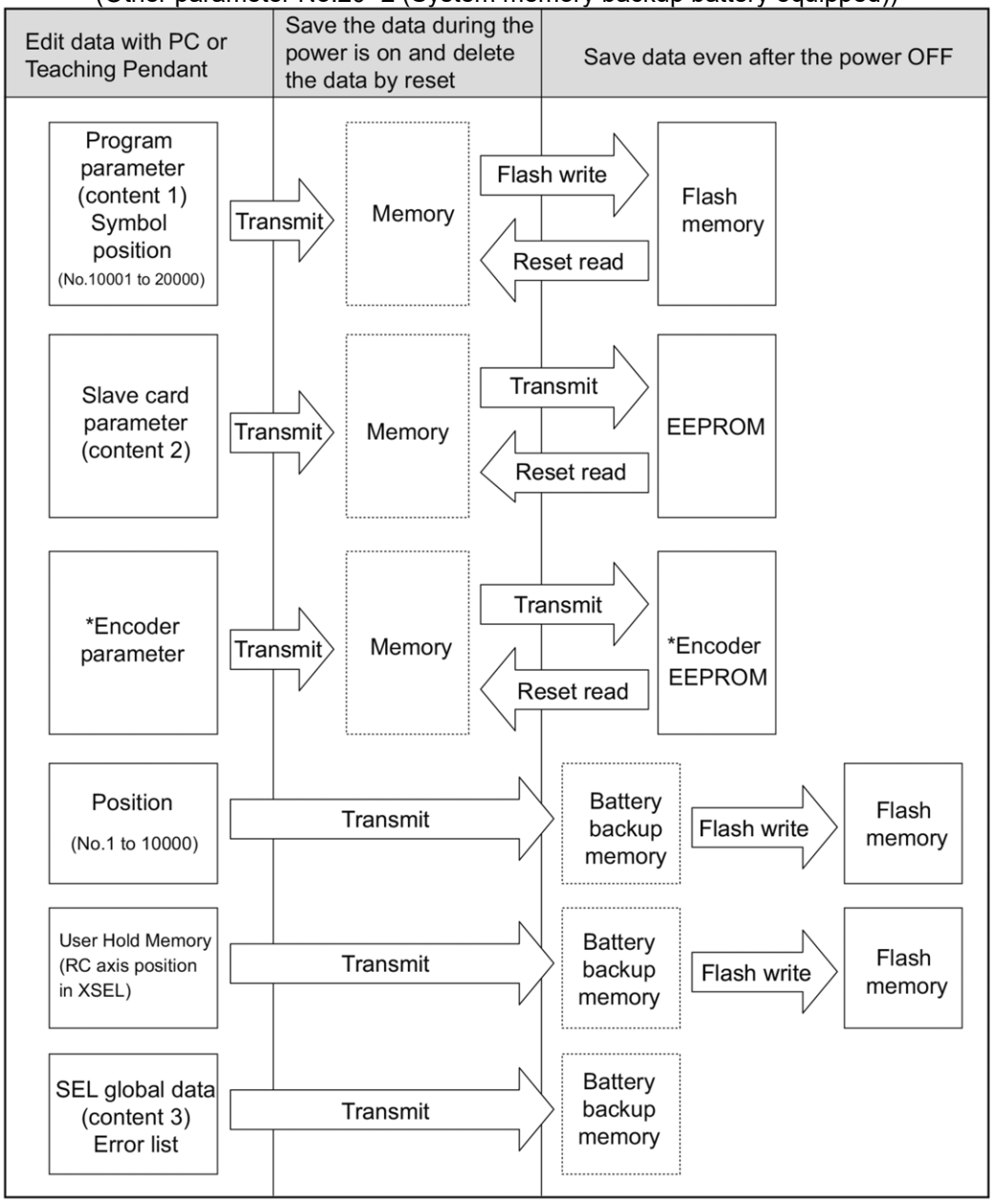
* Encoder parameters are not stored within the controller but in the EEPROM of the actuator's encoder itself. They are read into the controller at power-on or software-reset time.

Since the program, parameter, and symbol will be read from flash memory at restart time, the data in memory becomes the original data before editing unless the data is written in flash memory.
The controller always operates according to the data in memory (within the dotted box) excluding parameters.

Content 1: Parameters excluding content 2 below and encoder parameter
Content 2: Driver card, IO slot card (electric power type card) parameter (XSEL-J/K, JX/KX, TT/TTA) :
IO slot card (electric power type card) parameter (XSEL-P/Q, PX/QX, SSEL, ASEL, PSEL)
Content 3: Flag, Variable, and String

For the XSEL-P/Q and PX/QX controllers with the gateway function, the position Nos. 10001 to 20000 data memory and user hold memory (RC axis position in XSEL) have been added.

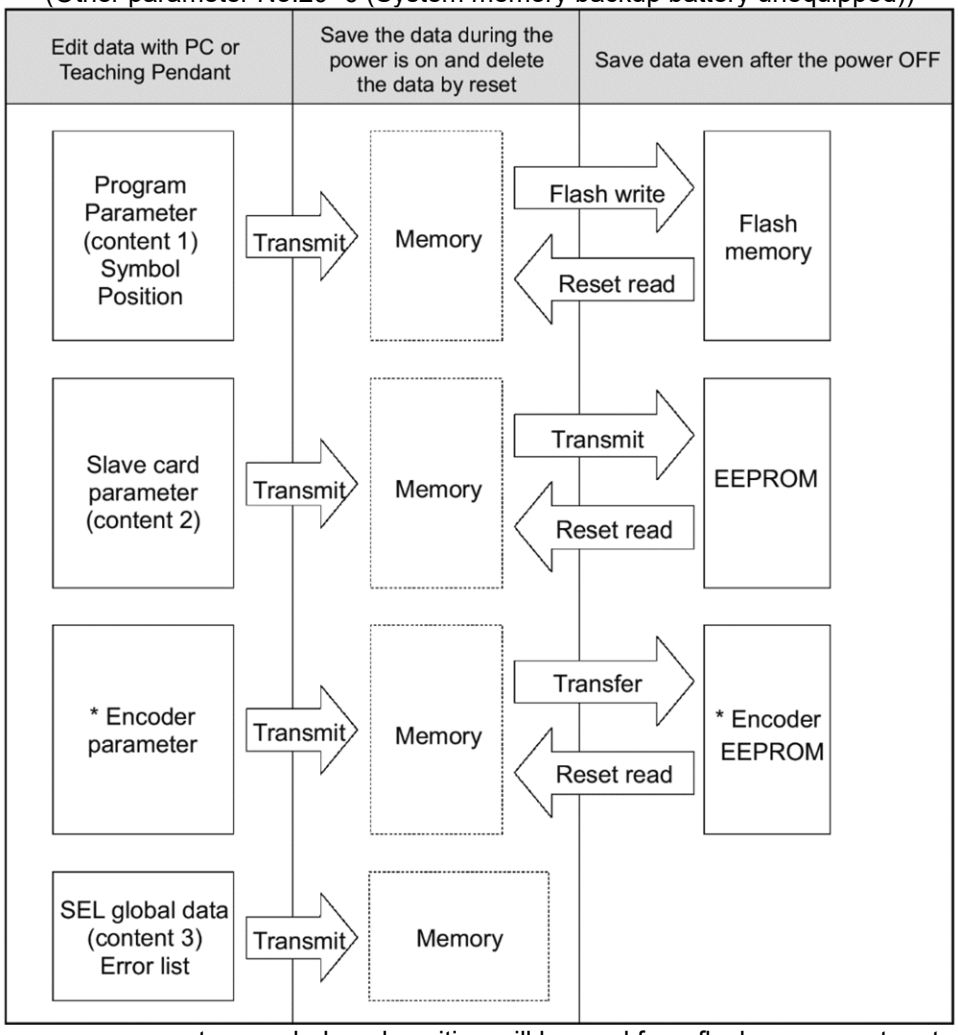
(Other parameter No.20=2 (System memory backup battery equipped))



* Encoder parameters are not stored within the controller but in the EEPROM of the actuator's encoder itself. They are read into the controller at power-on or software-reset time.

4.2 Set-up at Shipment without System Memory Backup Battery (Table Top Actuator TT, SSEL, ASEL, PSEL)

(Other parameter No.20=0 (System memory backup battery unequipped))

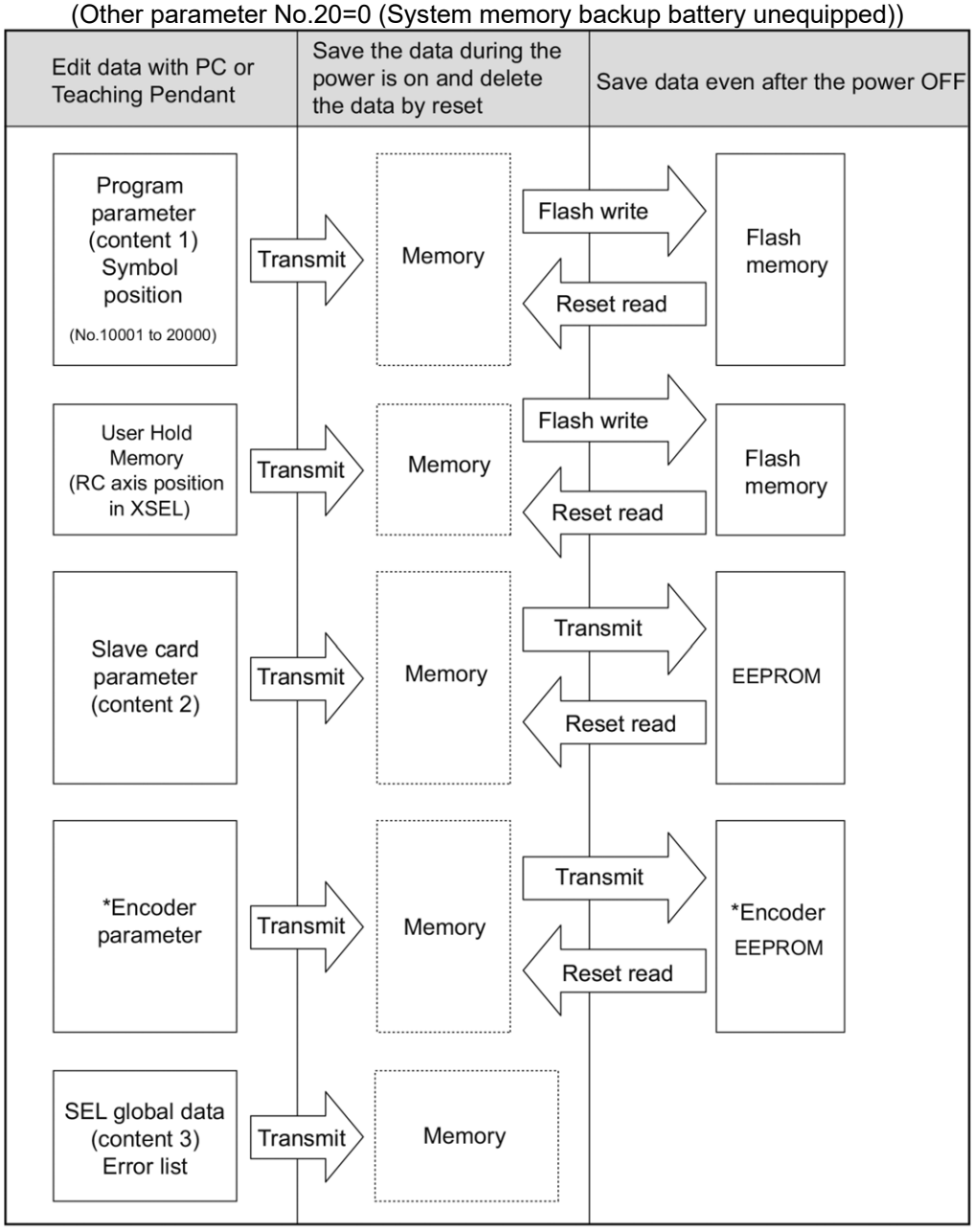


Since the program, parameter, symbol, and position will be read from flash memory at restart time, the data in memory becomes the original data before editing unless the data is written in flash memory. The controller always operates according to the data in memory (within the dotted box) excluding parameters.

> ⚠ *Caution: SEL global data can't be saved without the backup battery.*

For the XSEL-P/Q and PX/QX controllers with the gateway function, the position Nos. 10001 to 20000 data memory and user hold memory (RC axis position in XSEL) have been added.

(Other parameter No.20=0 (System memory backup battery unequipped))

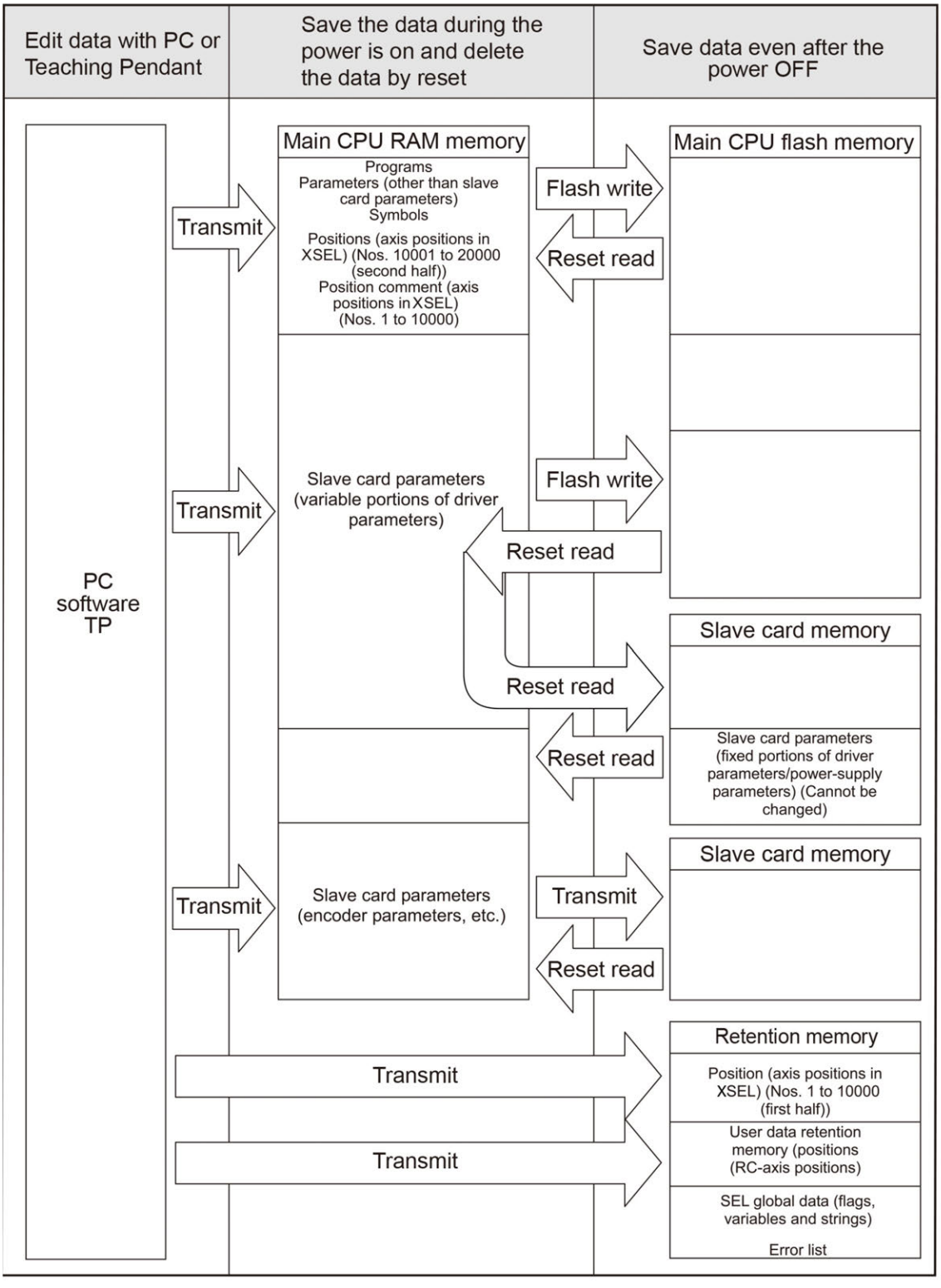


Since the program, parameter, symbol, and position will be read from flash memory at restart time, the data in memory becomes the original data before editing unless the data is written in flash memory. The controller always operates according to the data in memory (within the dotted box) excluding parameters.

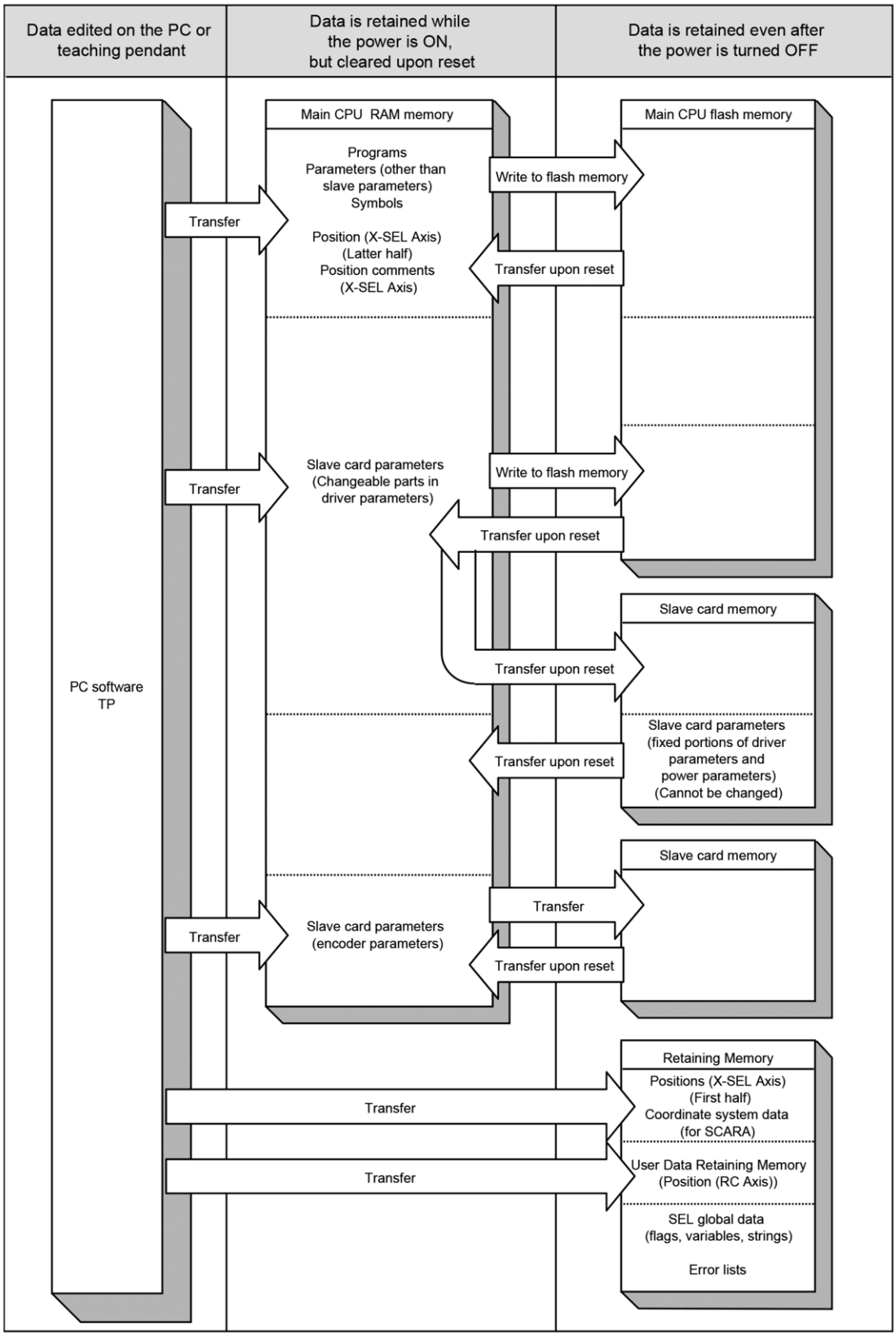
⚠ *Caution: SEL global data can't be saved without the backup battery.*

4.3 XSEL-R/S/RX/SX/RXD/SXD

An example of 20,000 positions is given below.

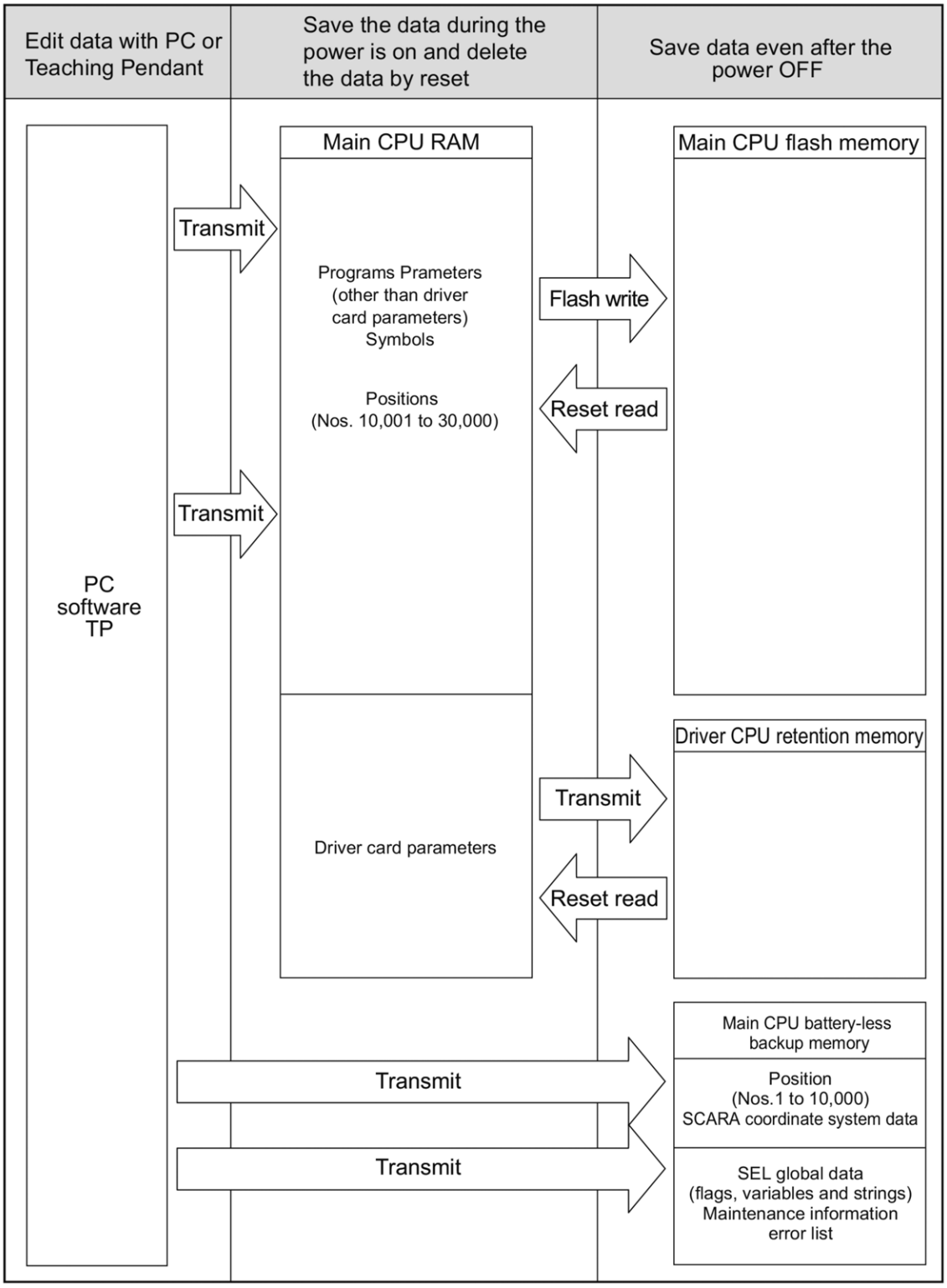


4.4 XSEL-RA/SA/RAX/SAX/RAXD/SAXD



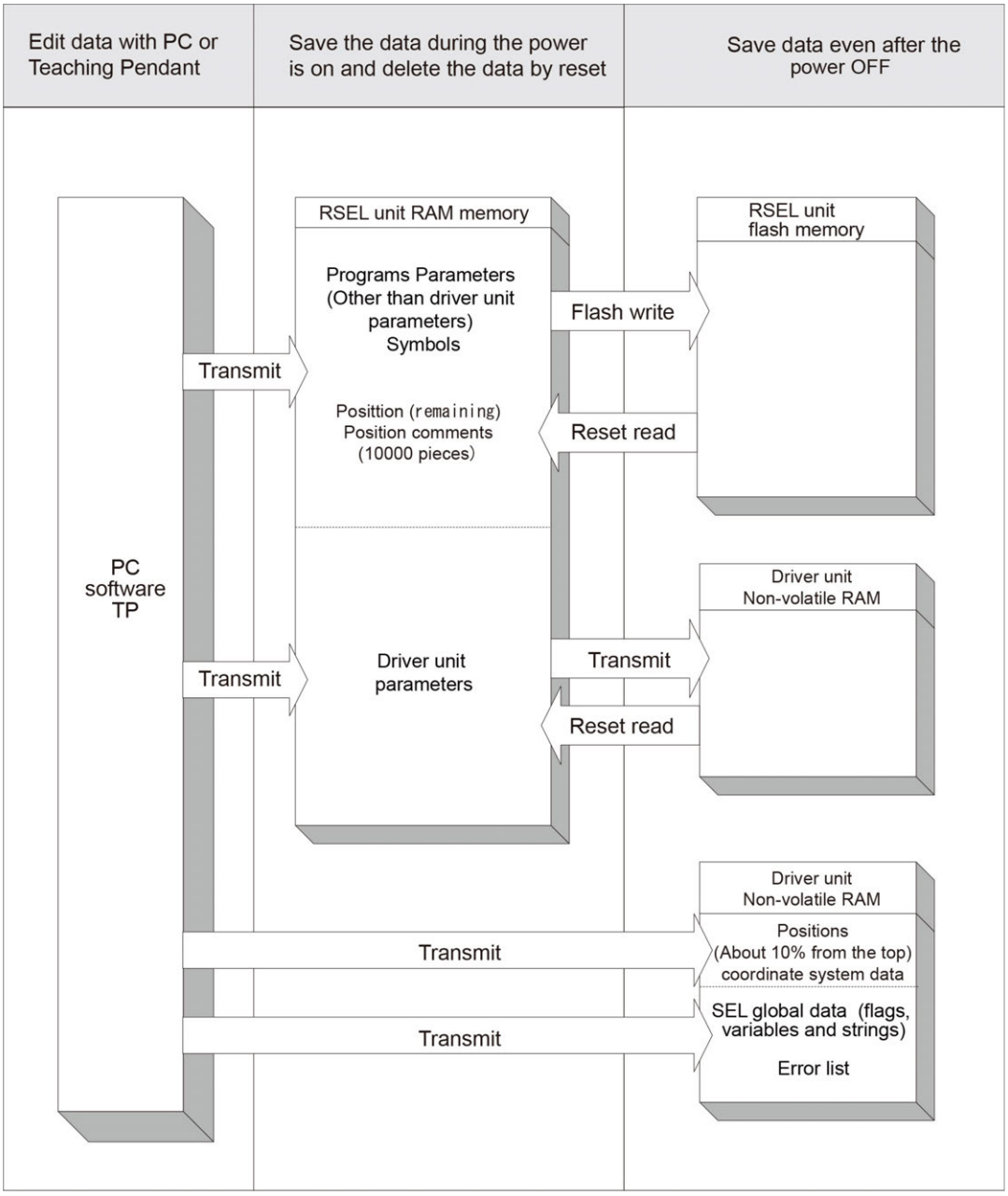
4.5 TTA, MSEL-PCX/PGX/PC/PG/PCF/PGF

Positions (No. 1 to 10000), SEL global data, error list, maintenance information and SCARA coordinate system data are stored in the battery-less backup memory (FRAM).It is not necessary to have a flash ROM writing.



4.6 RSEL

The RSEL has a storage area by holding memory and a storage area by flash memory.
In addition, even if data is transferred from the PC teaching software or Teaching Pendant, the data is only to be written in memory as shown in the chart below and the data is erased by power-off or controller reset. For important data, always write to the flash memory so that they will not be lost.

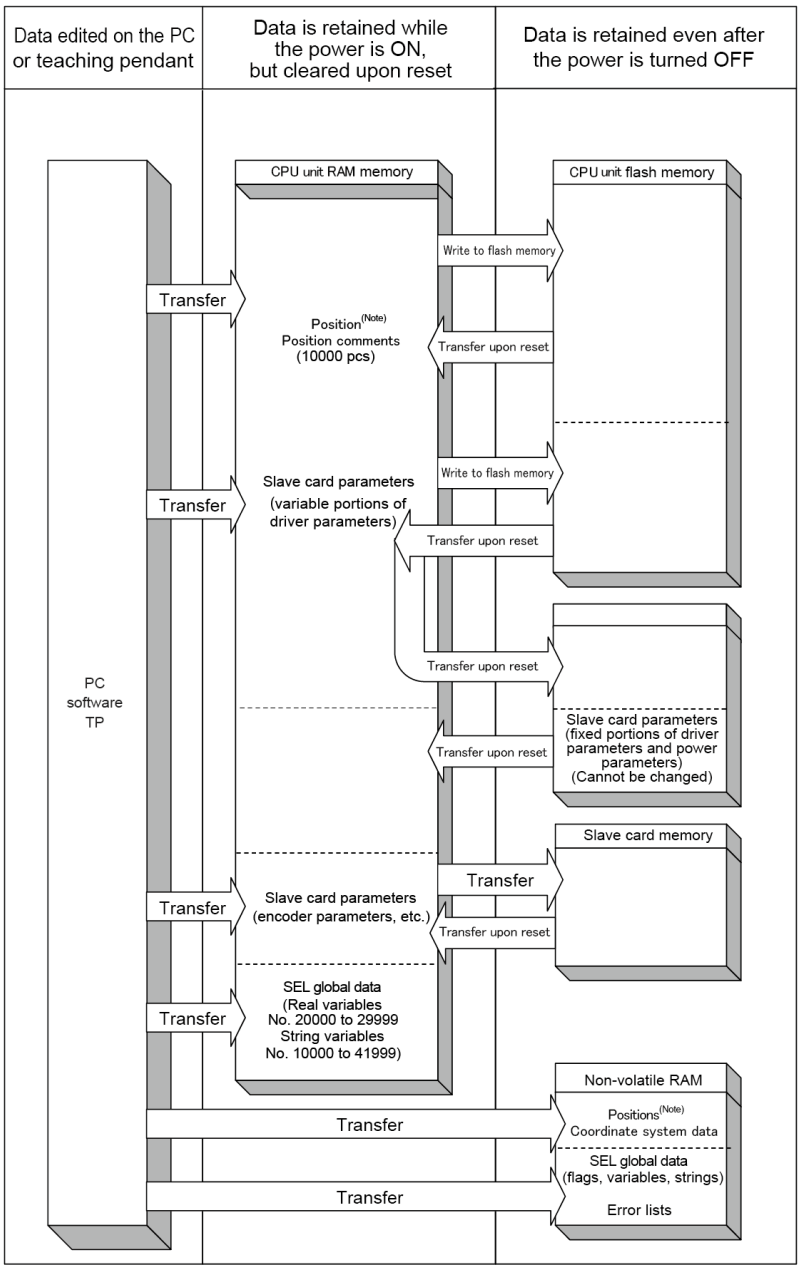


Since the programs, parameters and symbols are read from the flash memory at restart, the data in the temporary memory will remain the same as the original data before edit unless the edited data are written to the flash memory.
The controller always operates in accordance with the data in the main CPU memory (excluding the parameters).

> ⚠ *Caution: The first 10% of the position data is stored in non-volatile RAM and the rest in flash memory. Comments for each position data can be used for up to 10,000 positions regardless of the position number, and are saved in flash memory.*

4.7 XSEL2-T/TX

In XSEL controller, there is a storage domain with saving memory and a storage domain with flash memory.
Also note that even if you transfer data to your controller via the PC software or teaching pendant, the data is only written to the temporary memories and will be cleared once the power is turned OFF or controller is reset, as shown below.
So that your important data is saved without fail, write the data to the flash memory.



Since programs, parameters and symbols are loaded from the flash memory upon restart, these data in the temporary memories will return to the conditions before editing unless written to the flash memory. The controller always operates according to the data in each temporary memory (excluding parameters).

> ⚠ *Caution: No.1 to 5000 of the position data should be saved in the non-volatile RAM and the remaining in the flash memory. (No. 1 to 2500 in non-volatile RAM and remaining in the flash memory when there are two axis groups) Comment in each position data can be used in 10000 positions at maximum regardless of the position number and should be saved in the flash memory.*

4.8 Caution

Cautions in data transfer and flash writing
Never shut OFF the main power while the data is transmitting and writing into flash.
Data may be lost and controller may be rendered inoperable.

Cautions concerning the increase in the number of positions (XSEL-P/Q, PX/QX controller)
The number of position data items has been raised to 20,000 in the XSEL-P/Q and PX/QX controllers for the increased memory capacity (with gateway function).
Take care with the following items.
** When the battery backup memory is used (Other Parameter No. 20 is set to "2"), the position data save domain is in the battery backup memory for the Position No. 1 to 10000, and in the main CPU flash ROM for the position No. 10001 to 20000. Accordingly, when the data is not written in the flash ROM and the power is turned OFF or the software reset is performed, the data items for the position No. 10001 to 20000 are deleted. After that, the next time the machine is turned ON, the data written in the flash ROM from before is read. When the data is to be held, write the data into the flash ROM. Also, when the battery backup memory is not used (Other Parameter No. 20 is set to "2"), the data save domain for all data items for the Position No. 1 to 20000 is in the main CPU flash ROM. In this case, when the data is to be held, write the data also in the flash ROM.*

Point to note when saving parameters to a file (RSEL system)
The driver unit parameters are stored in the driver unit itself
(unlike other parameters, they are not stored in the RSEL unit).
The driver unit parameters will be read from the driver unit when the power is turned on or upon software reset. Therefore, if no driver unit is connected, the driver unit parameters will not be saved.

Point to note when transferring a parameter file to the controller (RSEL system)
When a parameter file is transferred to the controller, the driver unit parameters will be transferred to the driver unit. Therefore, when transferring the driver unit parameters, use the same driver unit configuration as when the parameter file was saved.

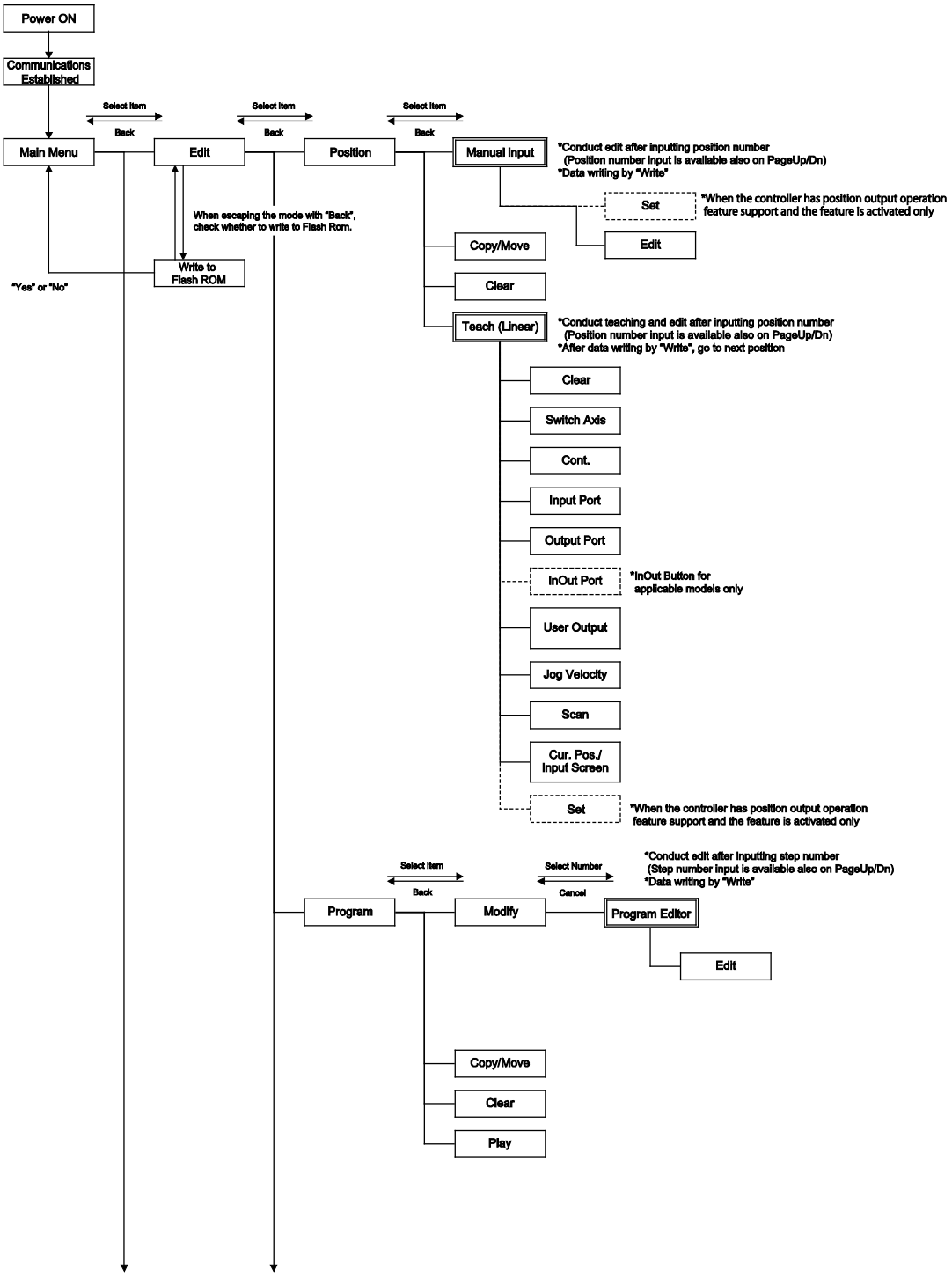
About saving position data (RSEL system and XSEL2-T/TX controller)
The storage area for position data is 10% non-volatile RAM from the beginning and flash memory for the rest.
Position data comments are stored in flash memory. Therefore, if the power is turned off or software reset is performed without writing to the flash ROM, 90% of the position data and the position data comment are erased, and the data from the previous flash ROM writing is read. If you want to keep the data, write to flash ROM.

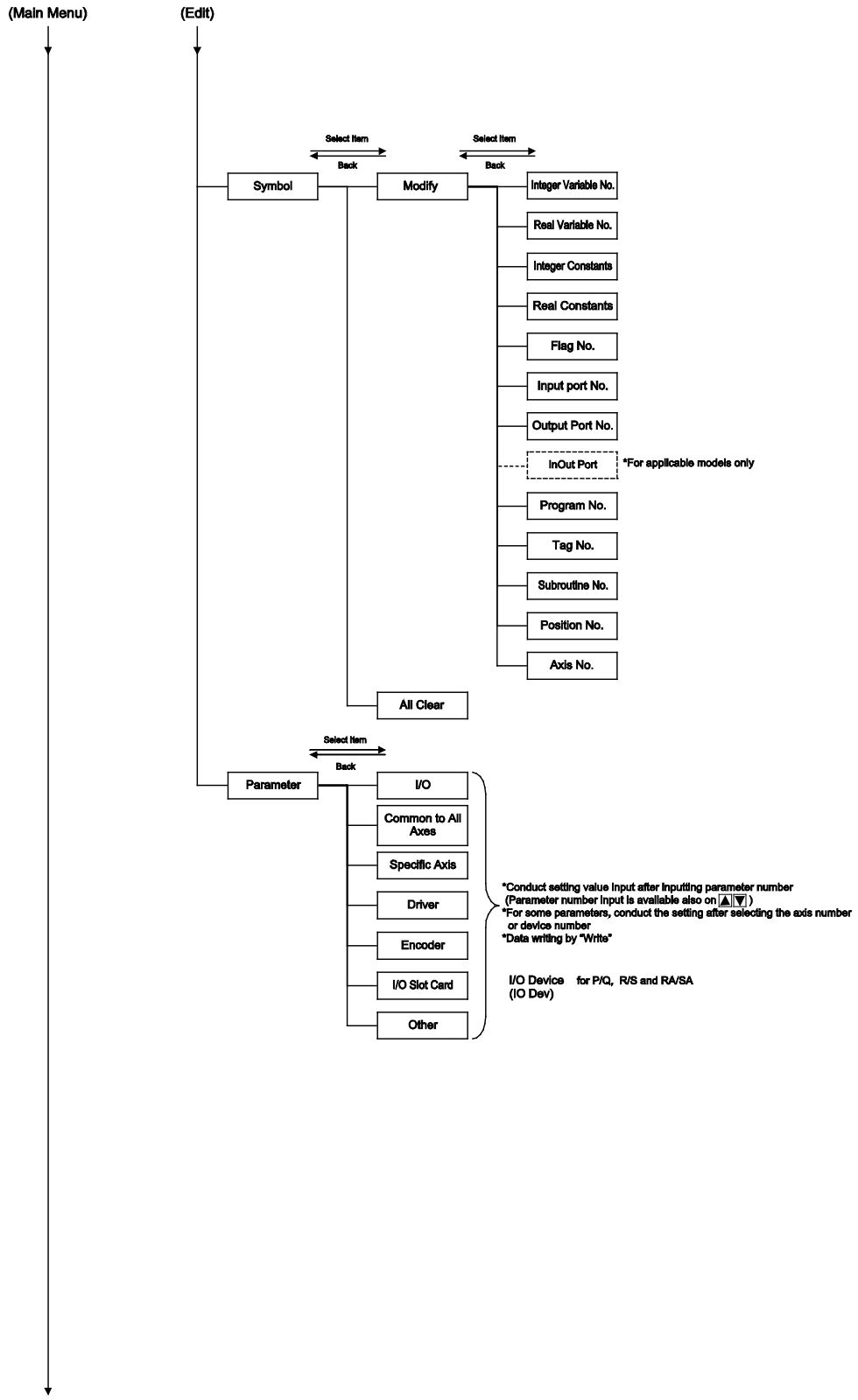
About memory initialization (RSEL system and XSEL2-T/TX controller)
As Position Data / Maintenance Information Data and SEL Global Data should not be initialized even if there is an error detected (error data should remain as it is), do not attempt to use the data as it is. In order to cancel the error, it is necessary to initialize the memory in the data that the error was detected.
For position data, write in the flash ROM together after initializing.

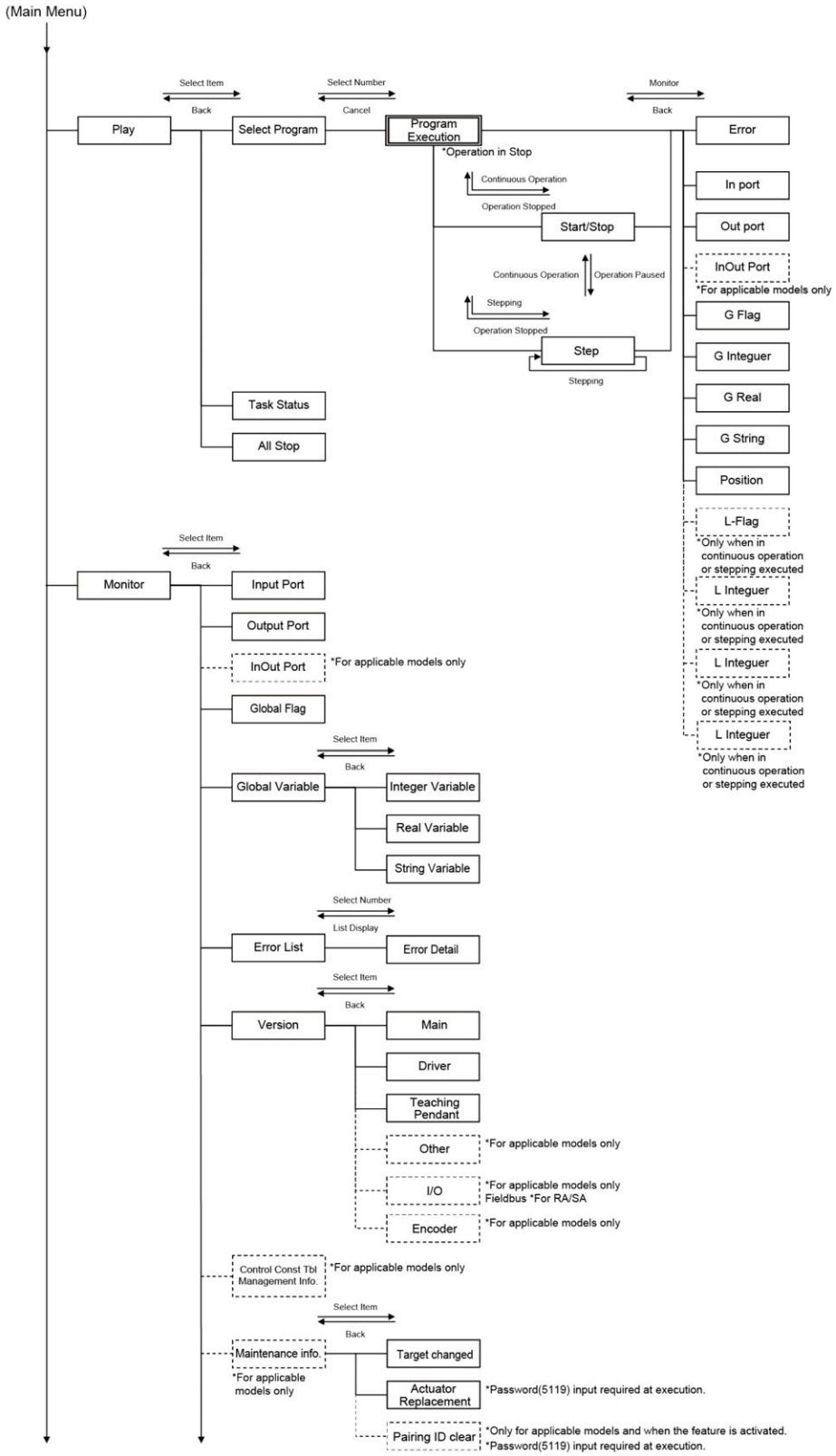
Memory initialization method
- *Position data*
  : Main menu → [Controller] → [Memory initialization] → [Position data]
- *Coordinate System data*
  : Main menu → [Controller] → [Memory initialization] → [Coordinate System data]
- *SEL global data*
  : Main menu → [Controller] → [Memory initialization] → [Global variables]
- *Maintenance information data*
  : Main menu → [Monitor] → (Next) → [Maintenance information] → [Information initialization]
  ** Can be initialized when error No.405 occurs*

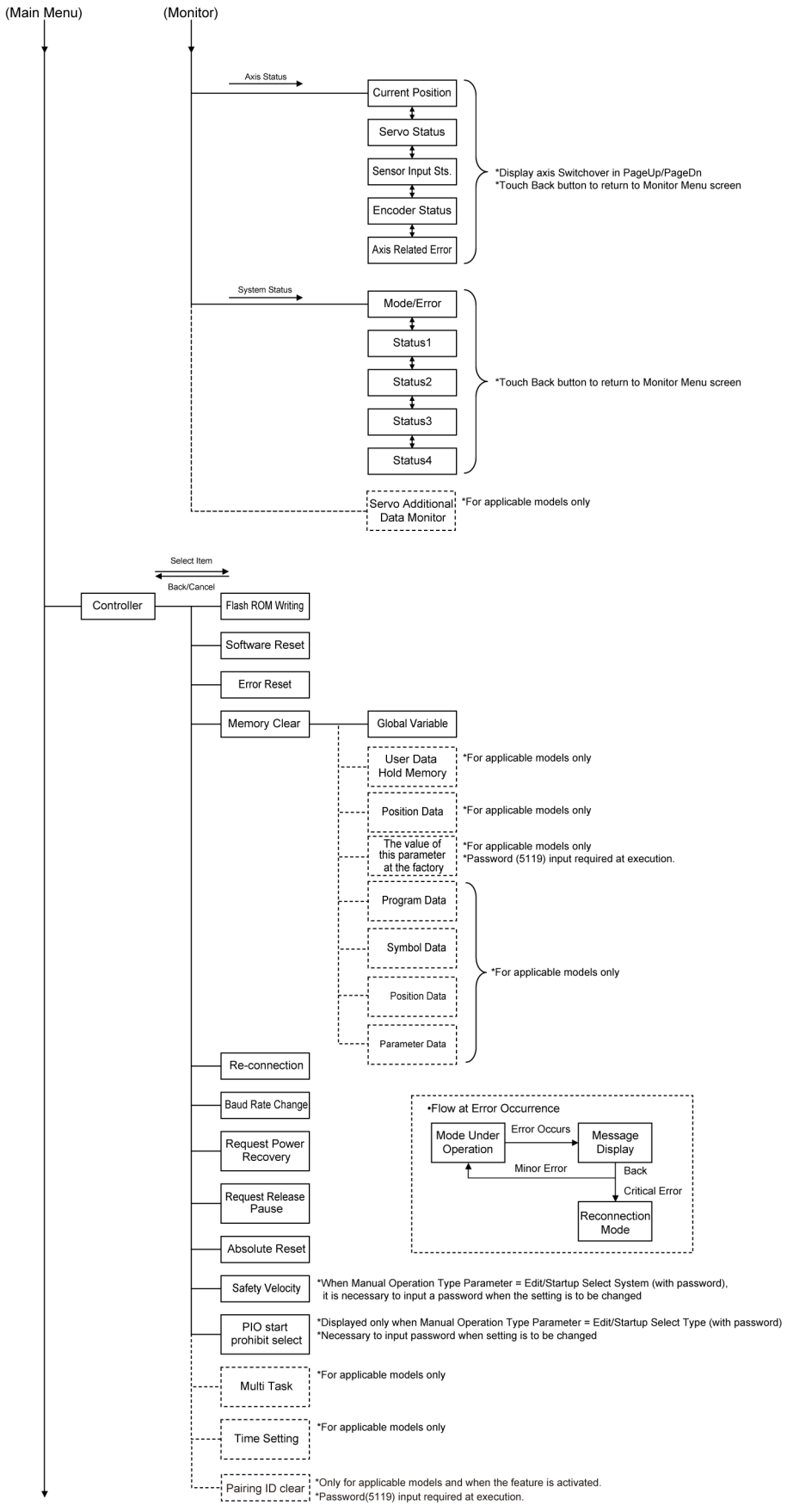
5. Mode Transition Diagram

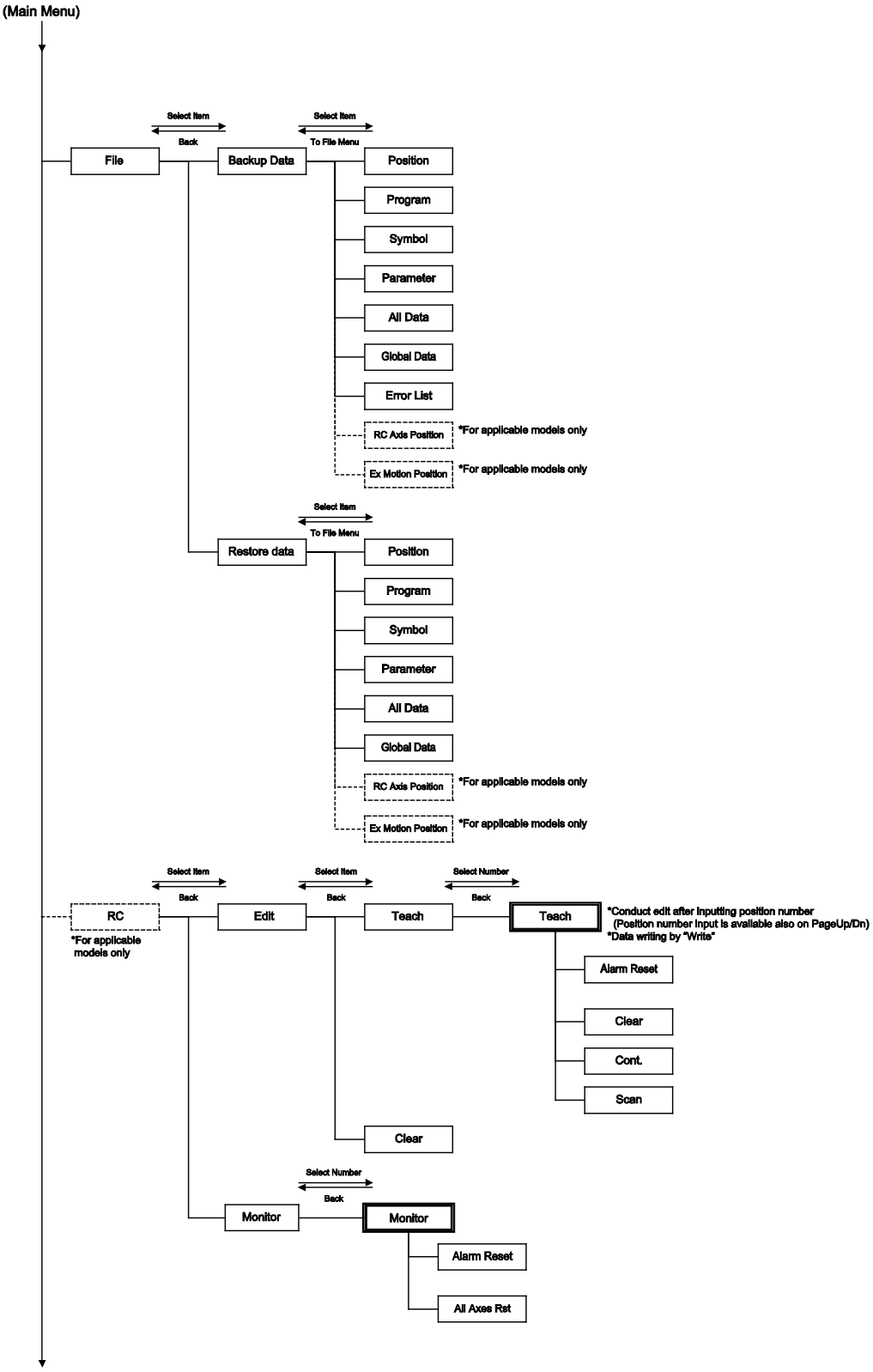
5.1 XSEL-J/K/P/Q/R/S/RA/SA, TT, TTA Controller

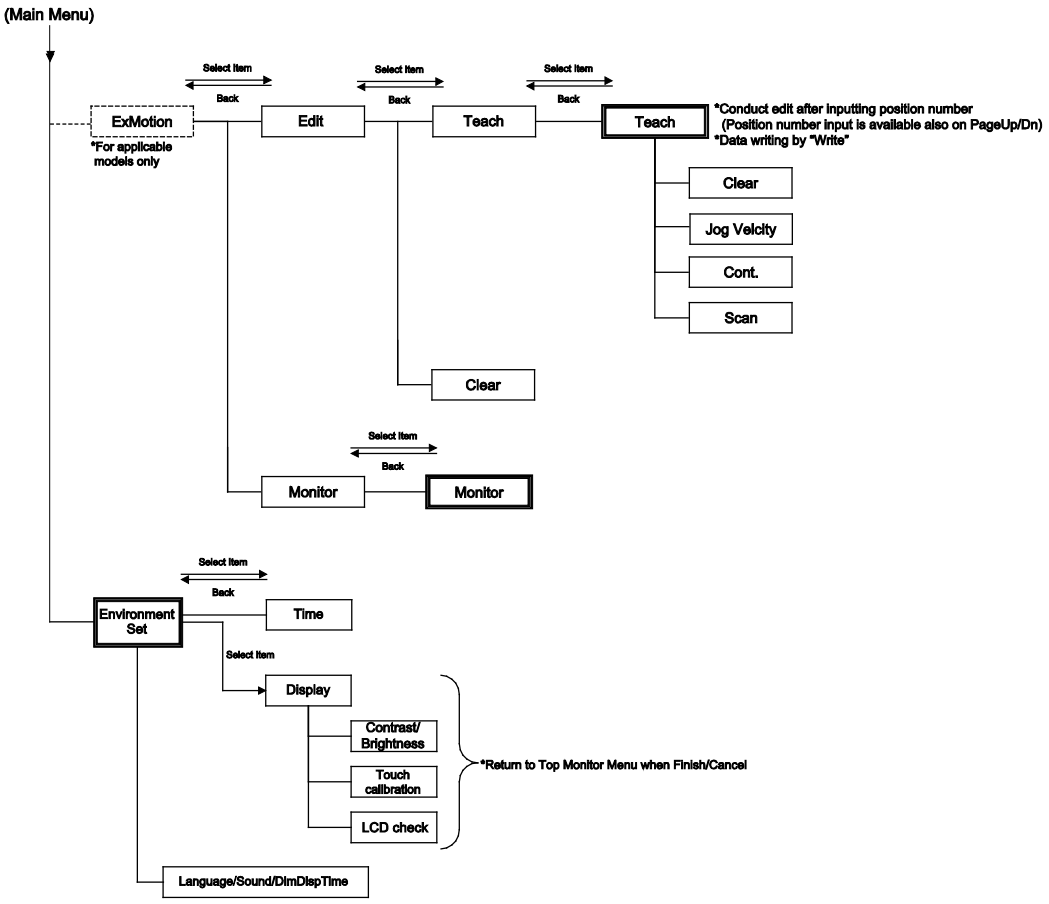



(Main Menu)
(Edit)
Select Item
Back
Select Item
Back
Symbol
Modify
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input port No.
Output Port No.
InOut Port
*For applicable models only
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Select Item
Back
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
I/O Slot Card
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*For some parameters, conduct the setting after selecting the axis number
or device number
*Data writing by "Write"
I/O Device for P/Q, R/S and RA/SA
(IO Dev)

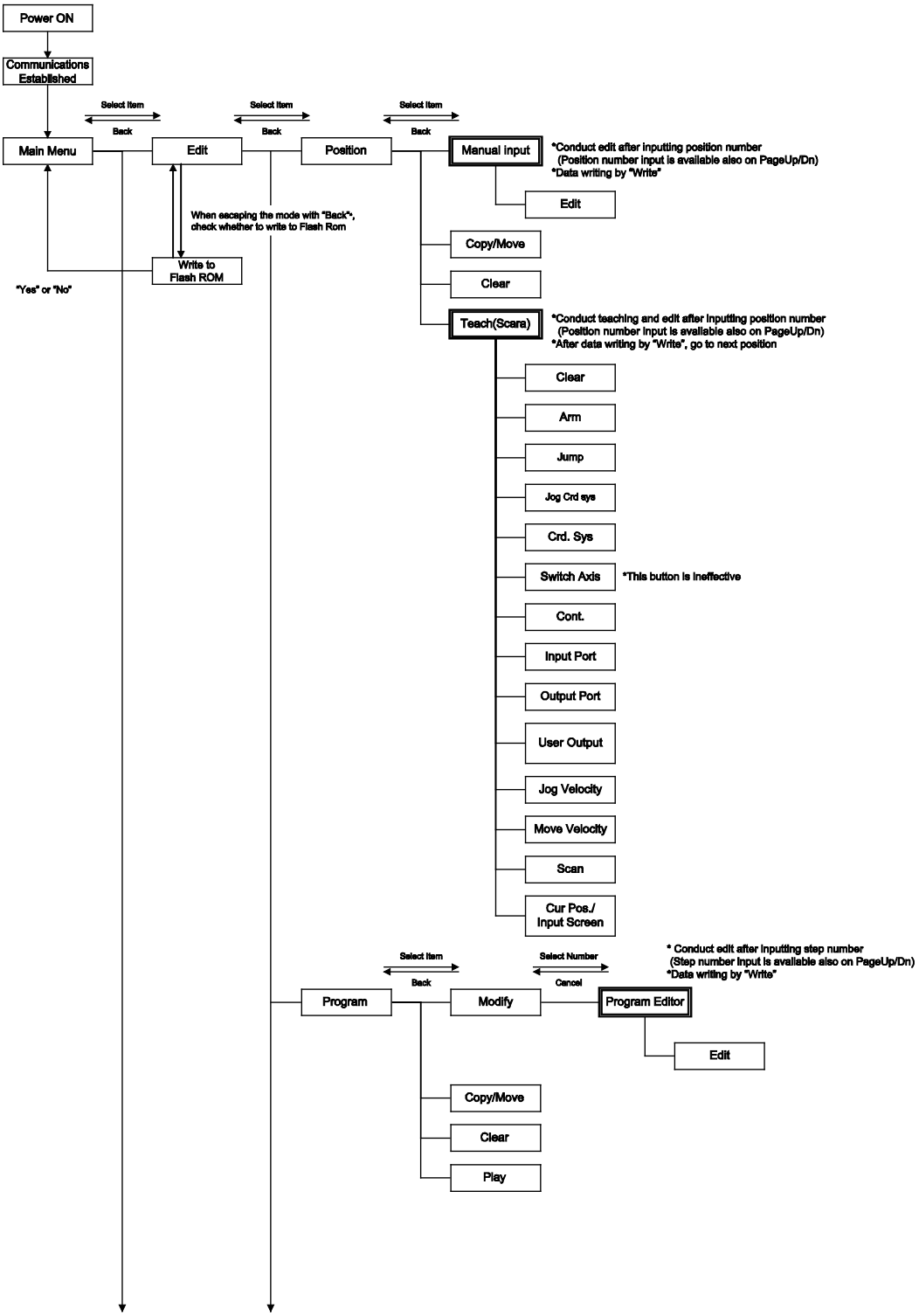

(Main Menu)
Play
Select Item
Back
Select Program
Select Number
Cancel
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Monitor
Back
Error
In port
Out port
InOut Port
*For applicable models only
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Monitor
Select Item
Back
Input Port
Output Port
InOut Port
*For applicable models only
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List
Select Number
List Display
Error Detail
Version
Select Item
Back
Main
Driver
Teaching Pendant
Other
*For applicable models only
I/O
*For applicable models only
Fieldbus *For RA/SA
Encoder
*For applicable models only
Control Const Tbl Management Info.
*For applicable models only
Maintenance info.
Select Item
Back
Target changed
Actuator Replacement
*Password(5119) input required at execution.
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.
*For applicable models only

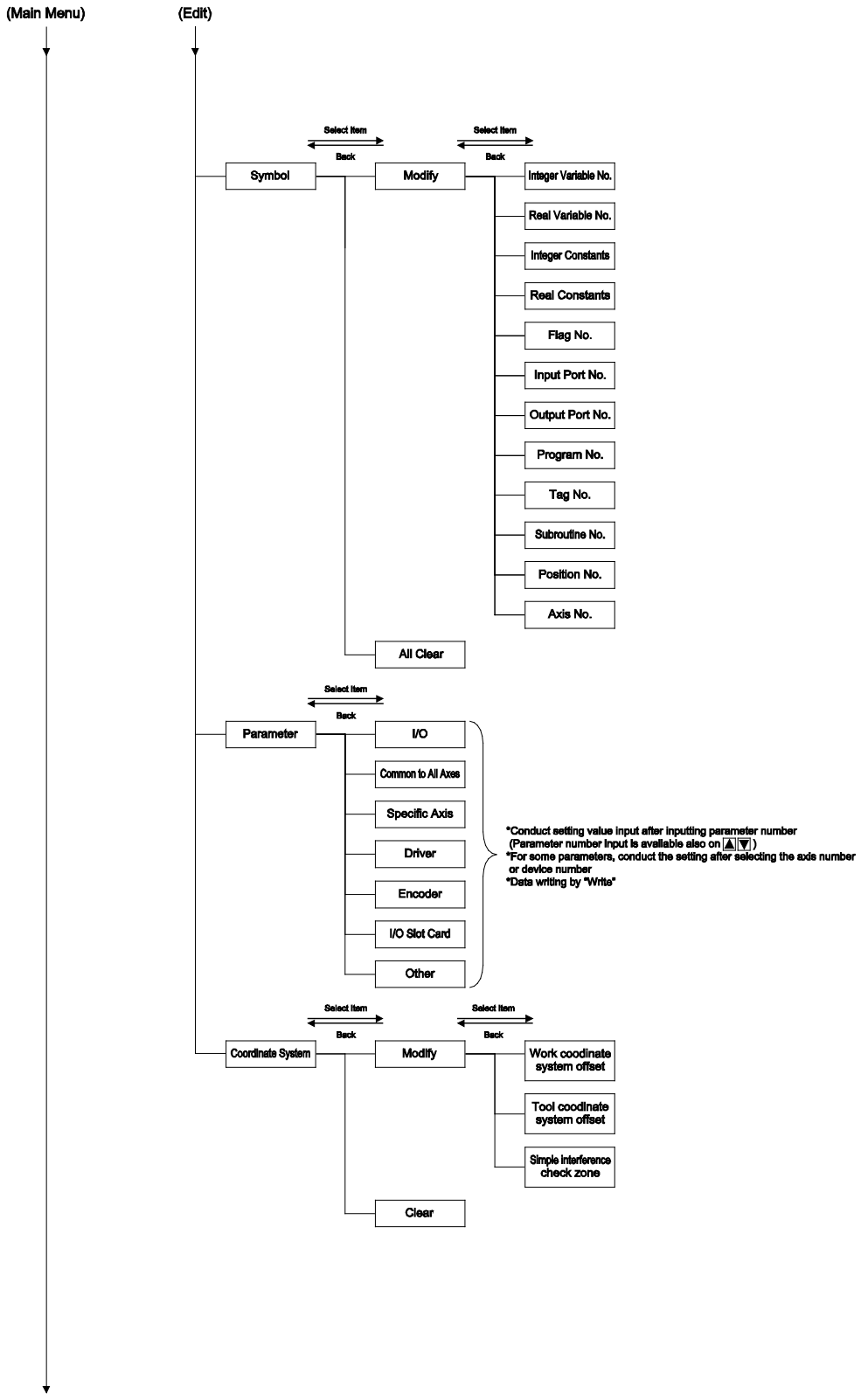

(Main Menu)
(Monitor)
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
*For applicable models only
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
User Data Hold Memory
*For applicable models only
Position Data
*For applicable models only
The value of this parameter at the factory
*For applicable models only
*Password (5119) input required at execution.
Program Data
Symbol Data
Position Data
Parameter Data
*For applicable models only
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
*For applicable models only
Time Setting
*For applicable models only
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.

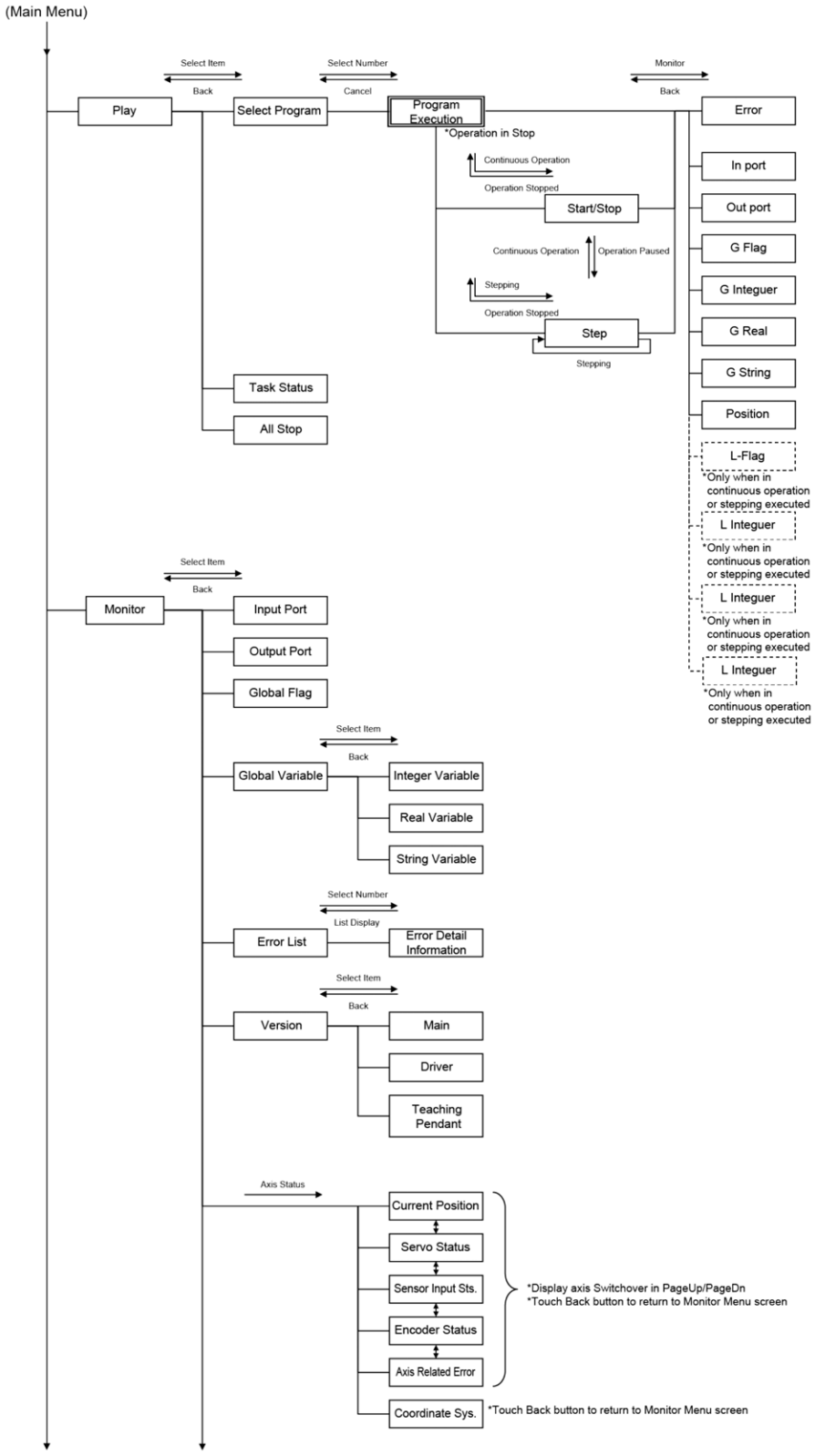

(Main Menu)
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
RC Axis Position
*For applicable models only
Ex Motion Position
*For applicable models only
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
RC Axis Position
*For applicable models only
Ex Motion Position
*For applicable models only
Select Item
Back
Select Item
Back
Select Number
Back
RC
*For applicable models only
Edit
Teach
Teach
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"
Alarm Reset
Clear
Cont.
Scan
Clear
Select Number
Back
Monitor
Monitor
Alarm Reset
All Axes Rst

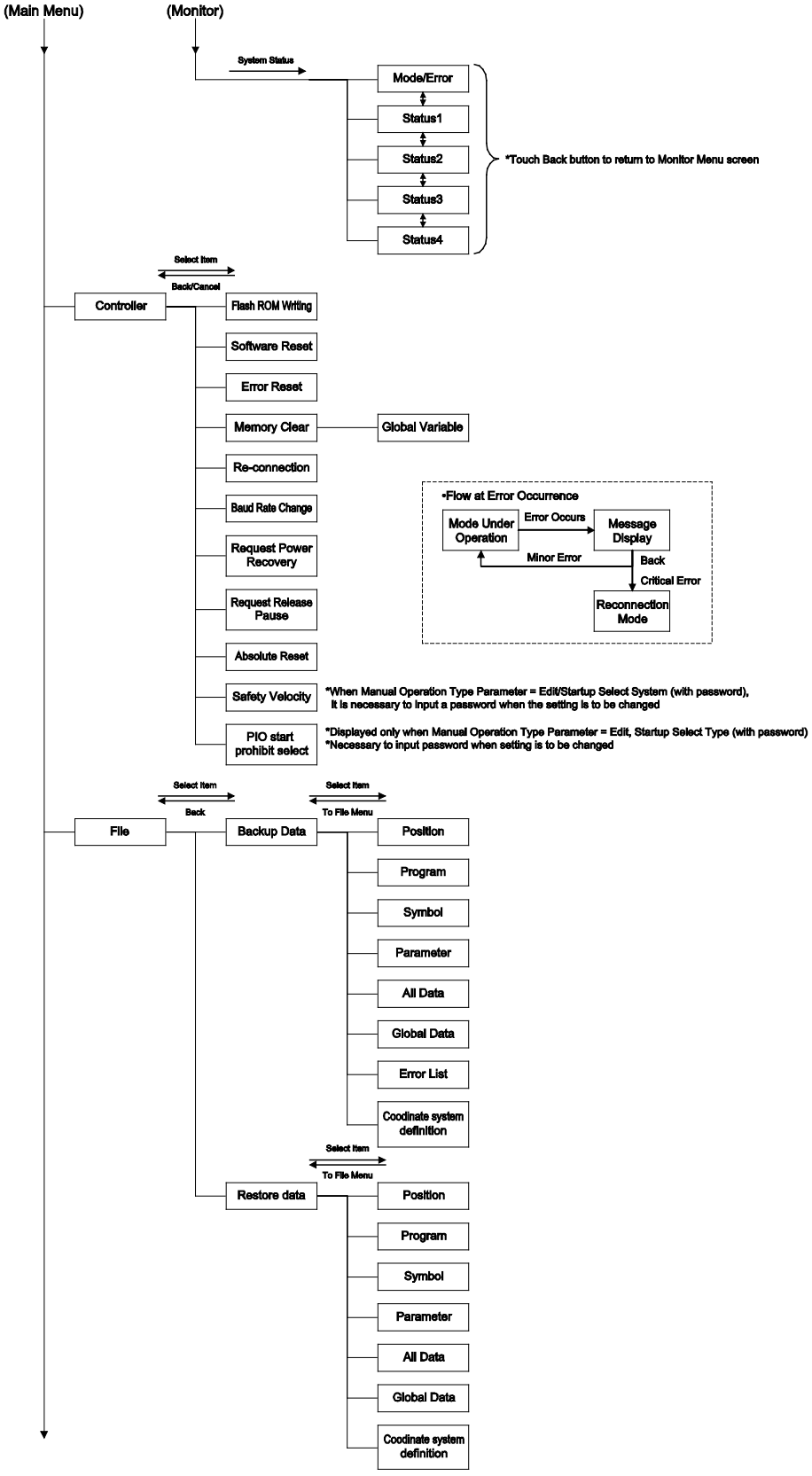

(Main Menu)
Select Item
Back
ExMotion
*For applicable models only
Edit
Teach
Teach
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"
Clear
Jog Velcity
Cont.
Scan
Clear
Monitor
Monitor
Environment Set
Time
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime

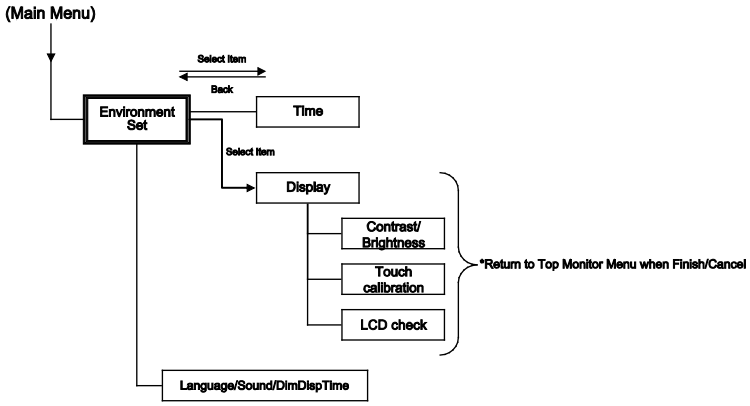
5.2 XSEL-JX/KX Controller



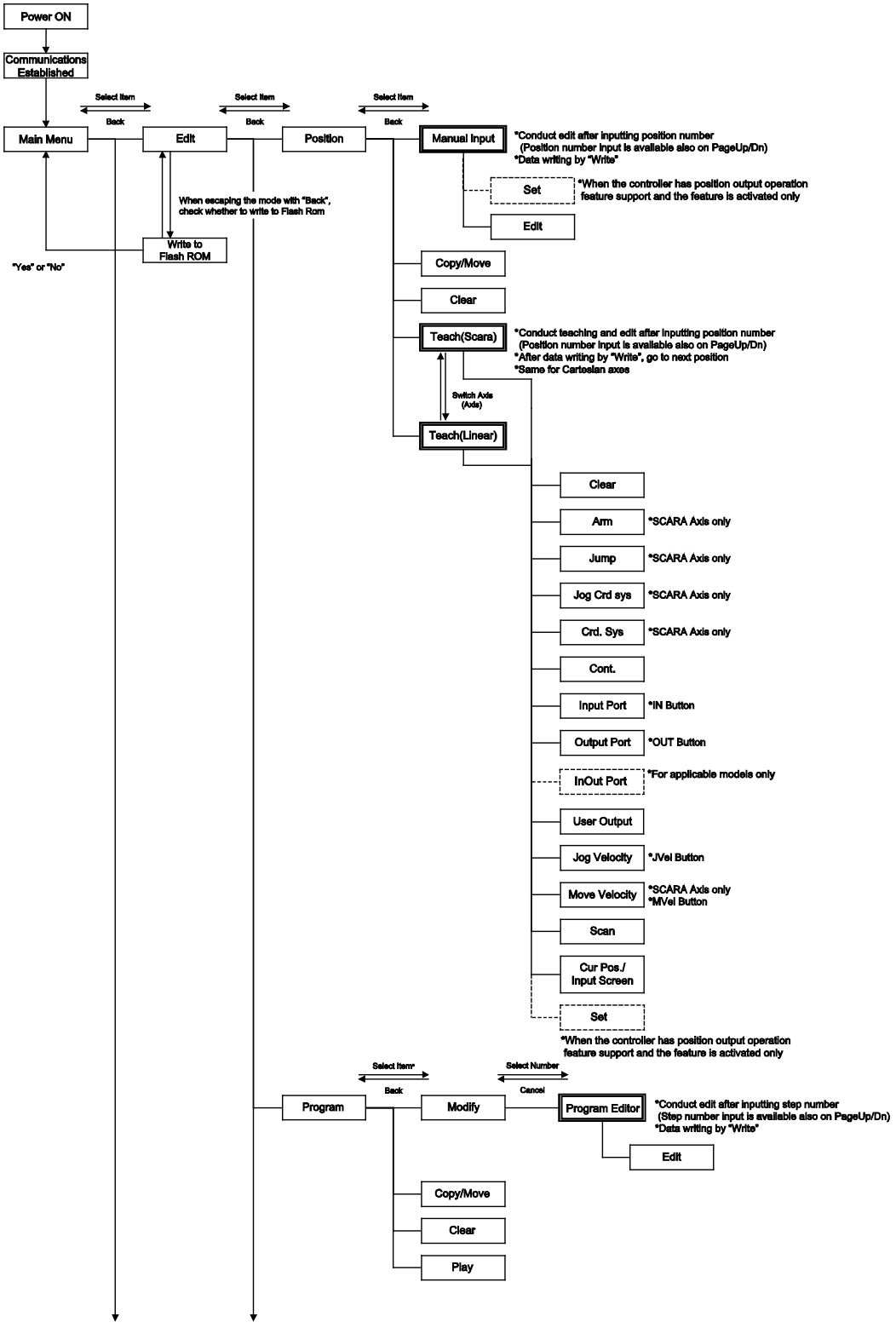

(Main Menu)
(Edit)
Select Item
Back
Symbol
Modify
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input Port No.
Output Port No.
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
I/O Slot Card
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*For some parameters, conduct the setting after selecting the axis number
or device number
*Data writing by "Write"
Coordinate System
Work coodinate system offset
Tool coodinate system offset
Simple interference check zone
Clear

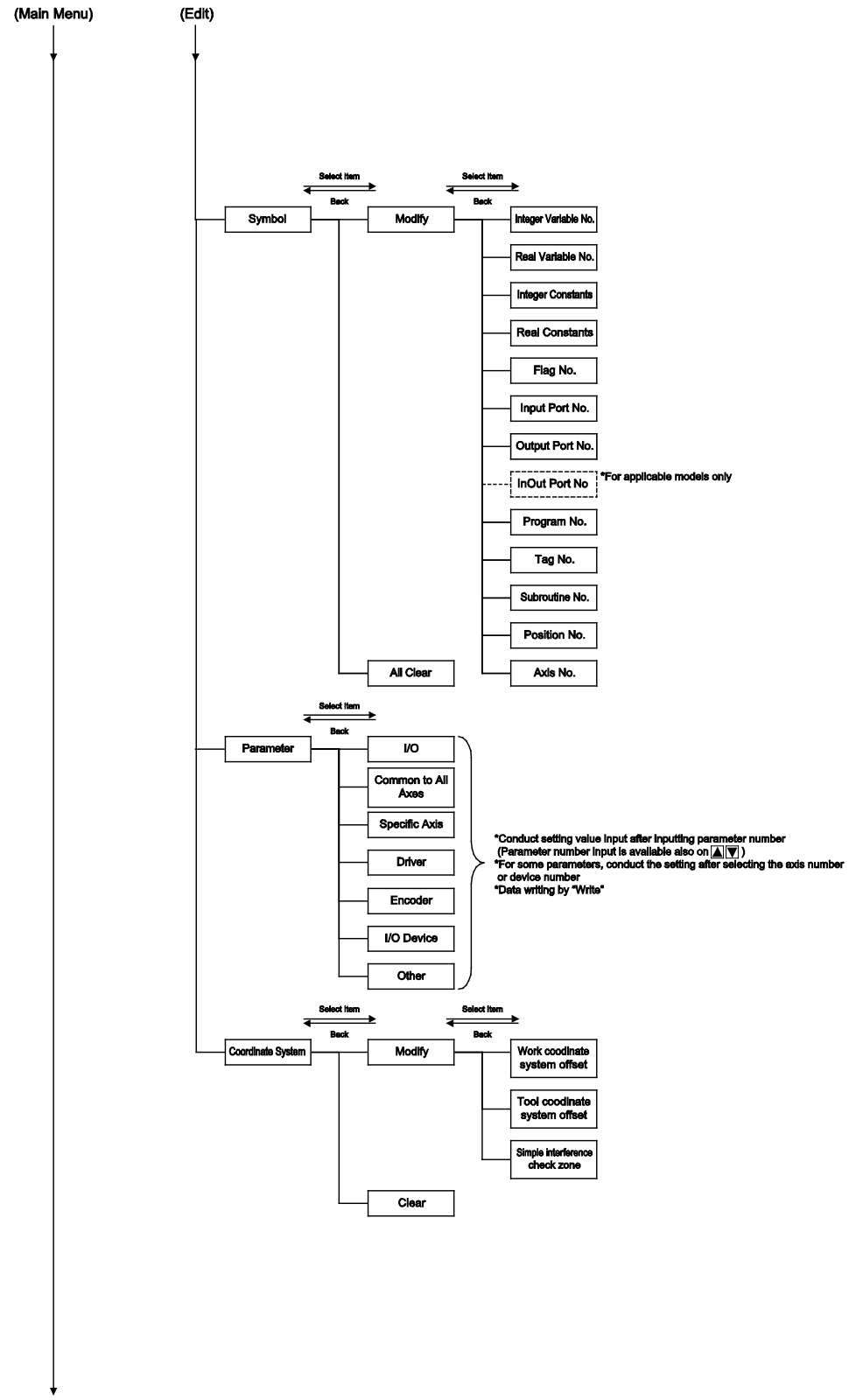

(Main Menu)
Play
Select Item
Back
Select Program
Select Number
Cancel
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Monitor
Back
Error
In port
Out port
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Monitor
Select Item
Back
Input Port
Output Port
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List
Select Number
List Display
Error Detail Information
Version
Select Item
Back
Main
Driver
Teaching Pendant
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
Coordinate Sys.
*Touch Back button to return to Monitor Menu screen

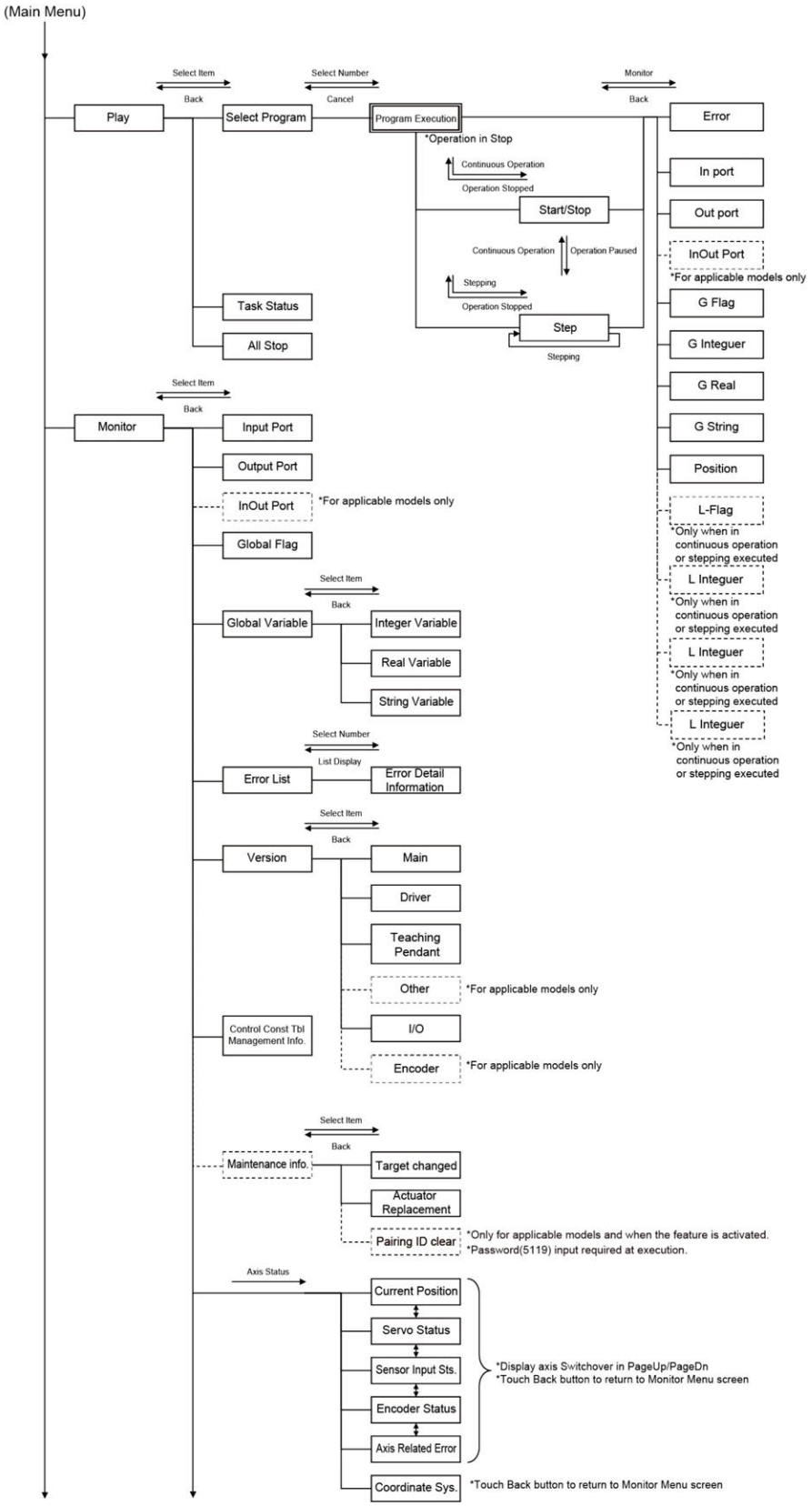

(Main Menu)
(Monitor)
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), It is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password) *Necessary to input password when setting is to be changed
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Select Item
Back
File
Select Item
To File Menu
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Coodinate system definition
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
Coodinate system definition

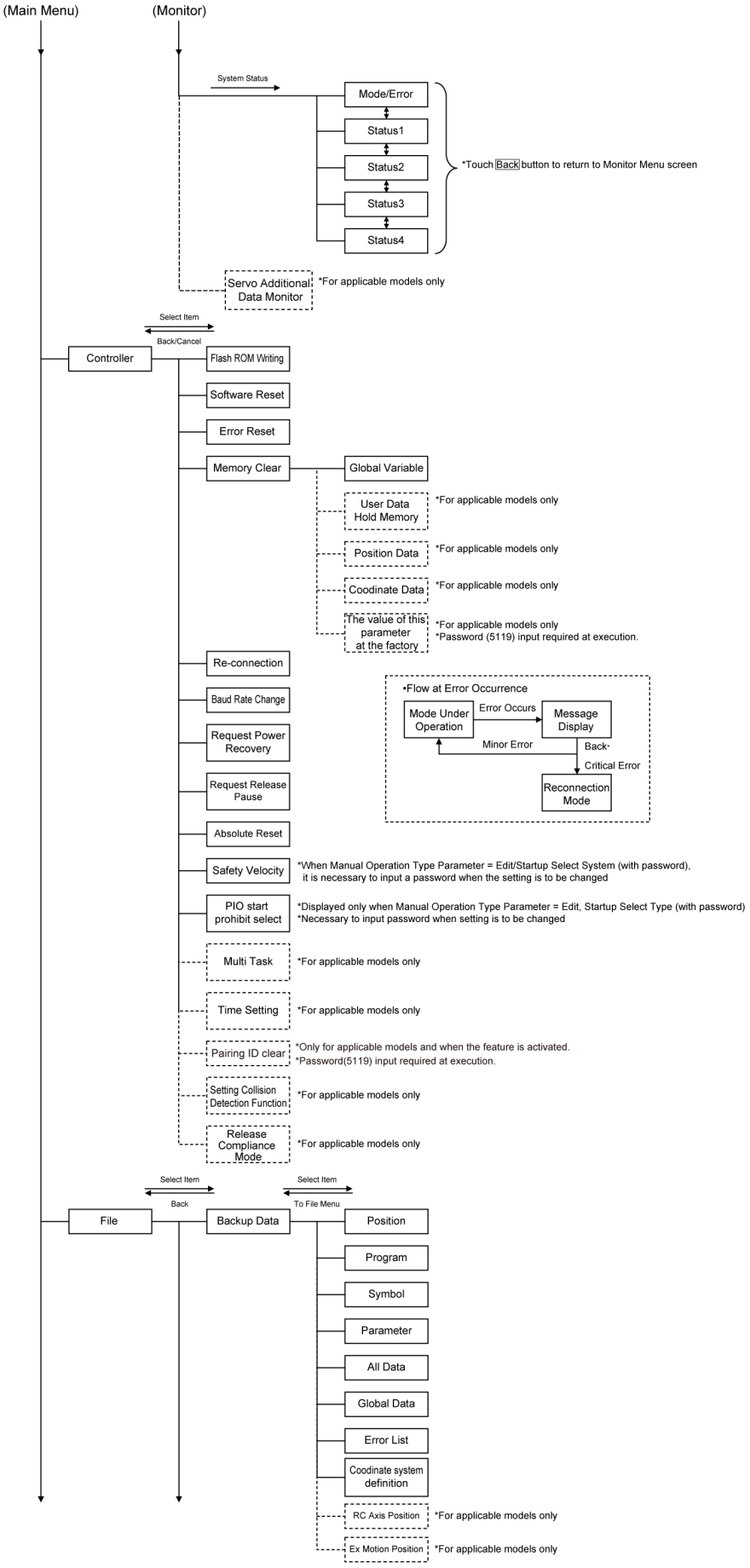

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime

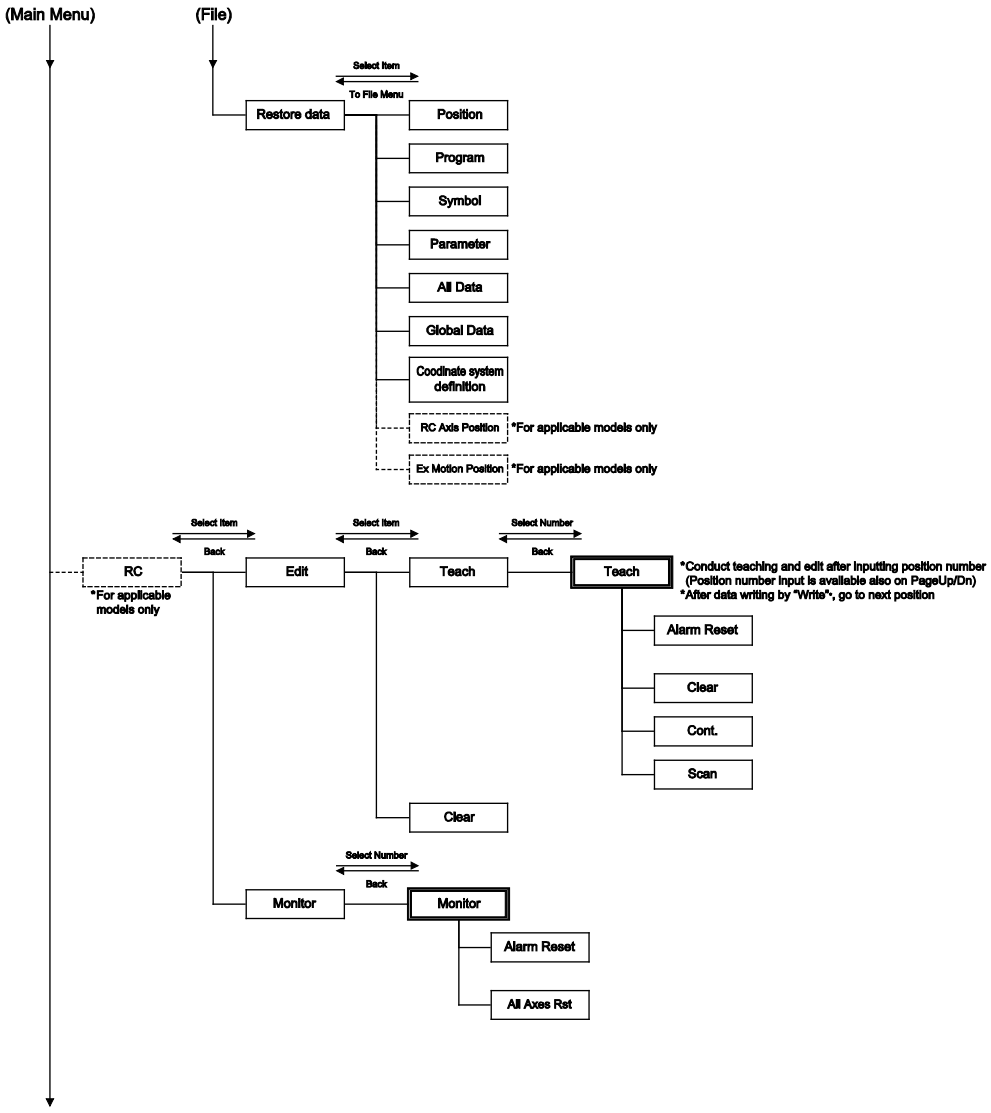
5.3 XSEL-PX/QX/RX/SX/RAX/SAX Controller

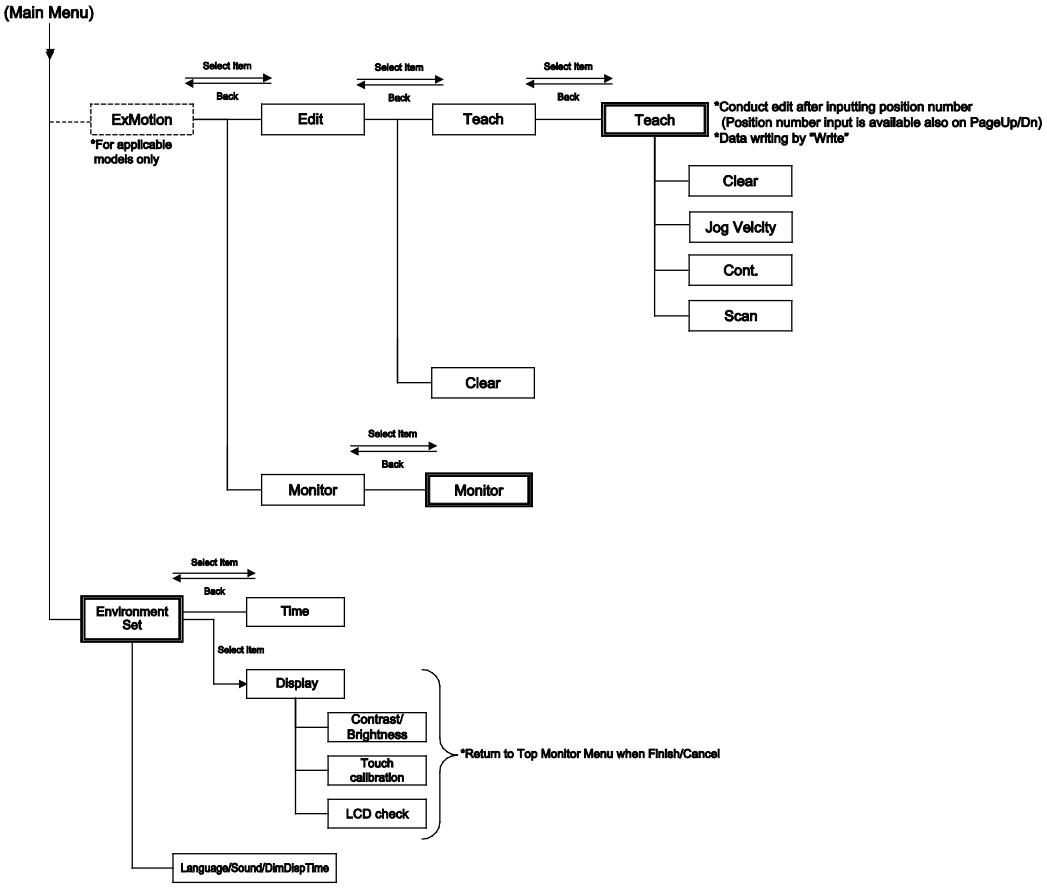



(Main Menu)
(Edit)
Select Item
Back
Symbol
Modify
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input Port No.
Output Port No.
InOut Port No
*For applicable models only
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
I/O Device
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*For some parameters, conduct the setting after selecting the axis number
or device number
*Data writing by "Write"
Coordinate System
Work coodinate system offset
Tool coodinate system offset
Simple interference check zone
Clear

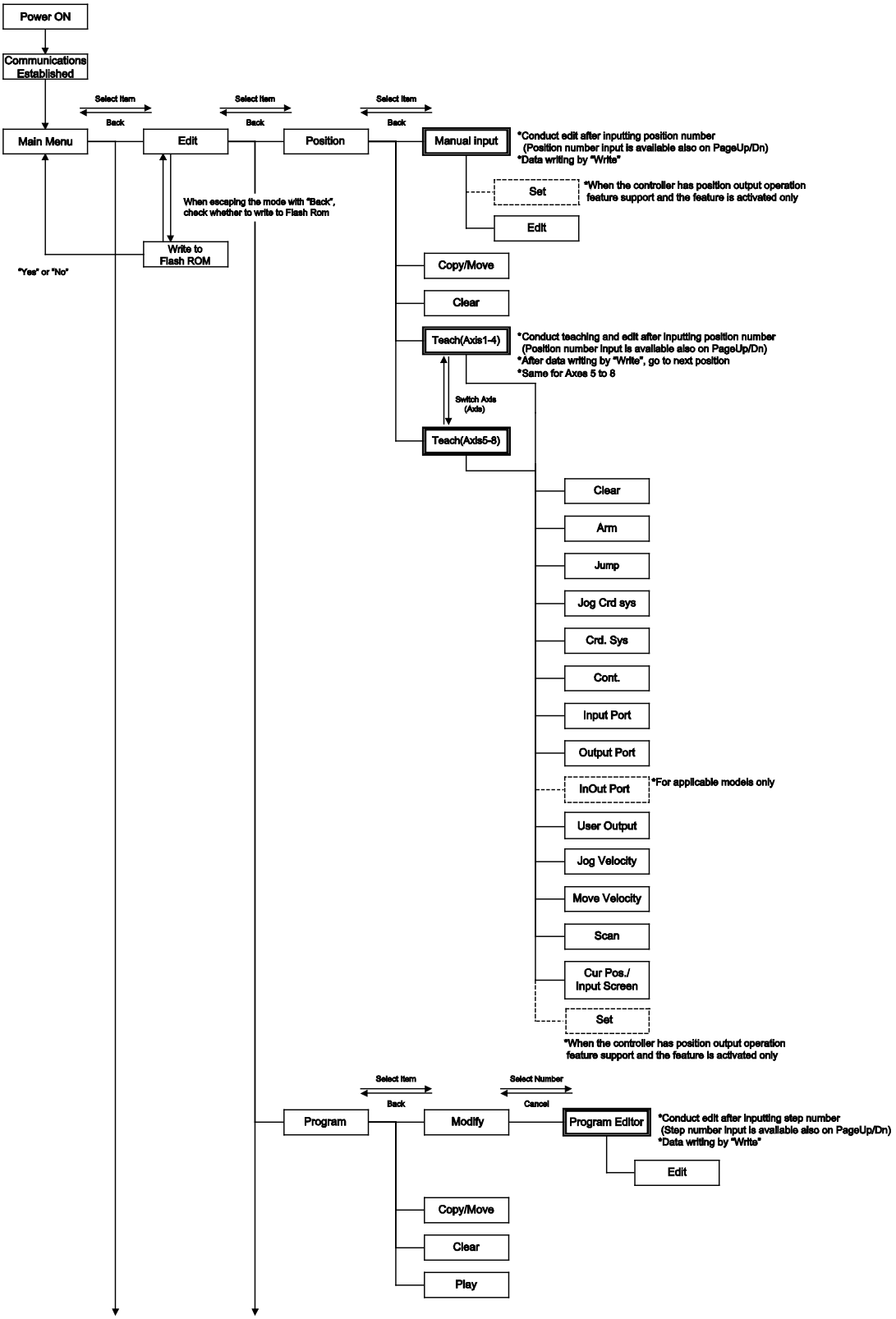

(Main Menu)
Play
Select Item
Back
Select Program
Select Number
Cancel
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Monitor
Back
Error
In port
Out port
InOut Port
*For applicable models only
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Monitor
Select Item
Back
Input Port
Output Port
InOut Port
*For applicable models only
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List
Select Number
List Display
Error Detail Information
Version
Select Item
Back
Main
Driver
Teaching Pendant
Other
*For applicable models only
I/O
Encoder
*For applicable models only
Control Const Tbl Management Info.
Maintenance info.
Select Item
Back
Target changed
Actuator Replacement
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
Coordinate Sys.
*Touch Back button to return to Monitor Menu screen

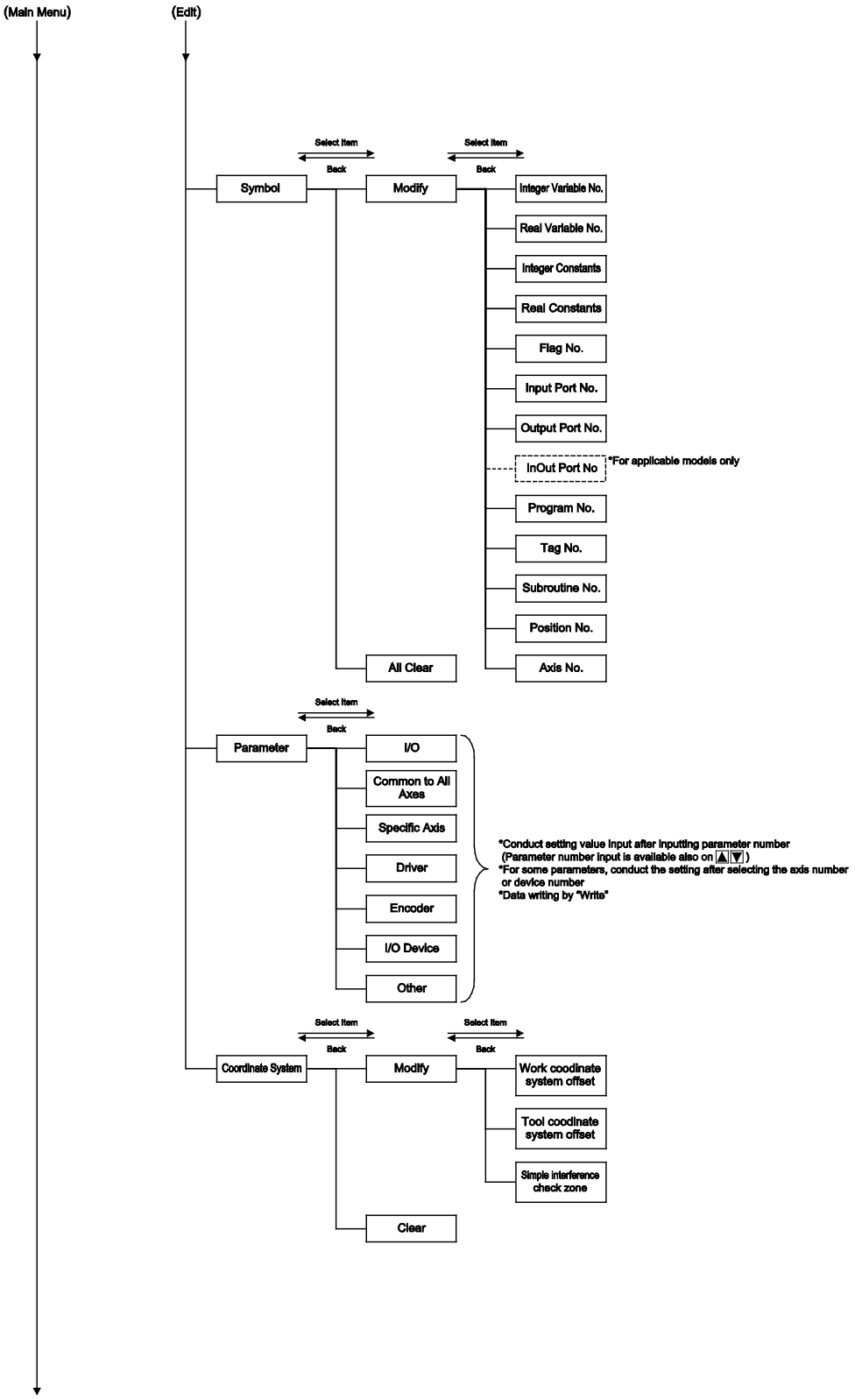

(Main Menu)
(Monitor)
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
*For applicable models only
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
User Data Hold Memory
*For applicable models only
Position Data
*For applicable models only
Coodinate Data
*For applicable models only
The value of this parameter at the factory
*For applicable models only
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
*For applicable models only
Time Setting
*For applicable models only
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.
Setting Collision Detection Function
*For applicable models only
Release Compliance Mode
*For applicable models only
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Coodinate system definition
RC Axis Position
*For applicable models only
Ex Motion Position
*For applicable models only

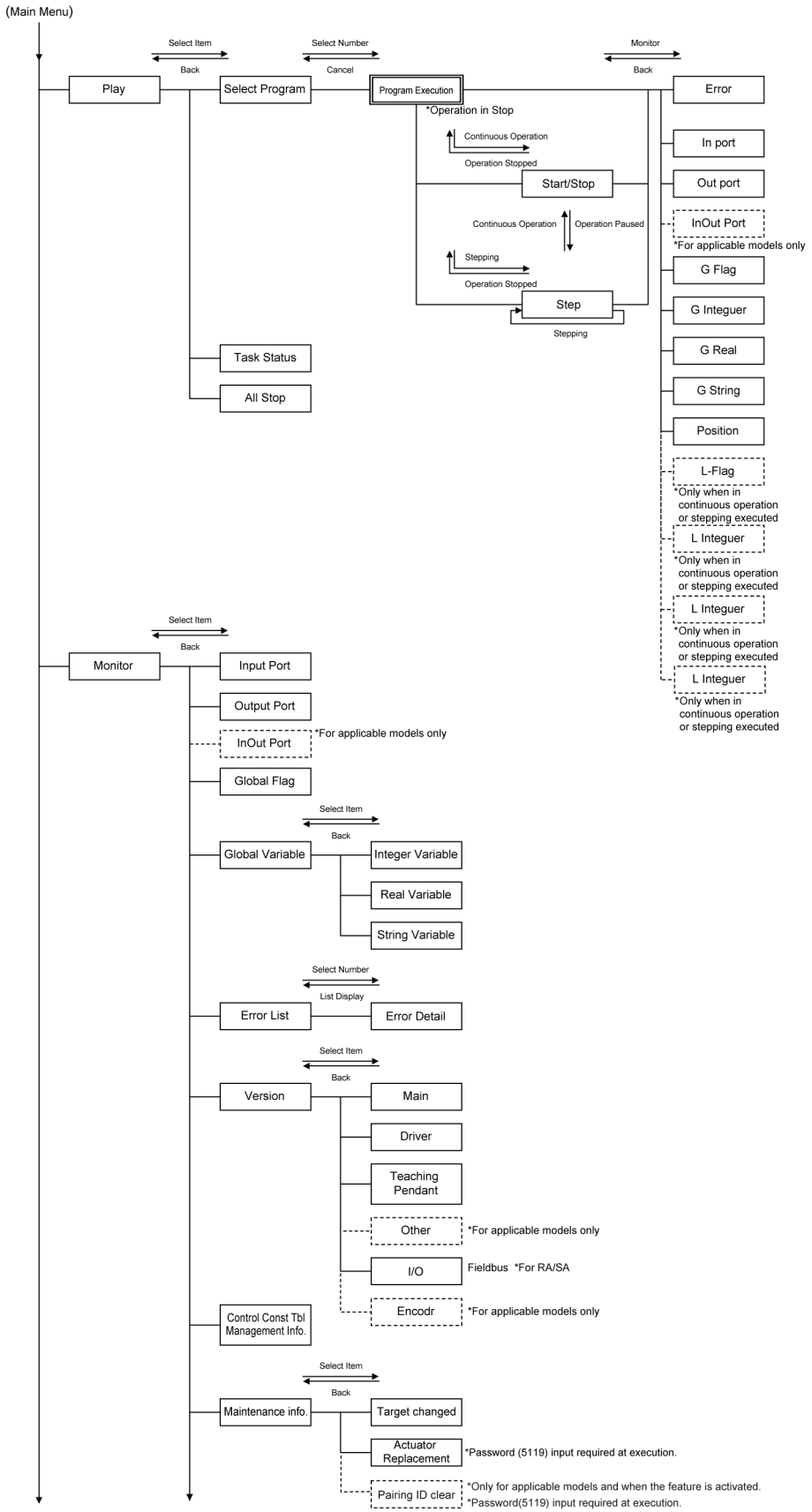

(Main Menu)
(File)
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
Coodinate system definition
RC Axis Position
*For applicable models only
Ex Motion Position
*For applicable models only
Select Item
Back
Select Item
Back
Select Number
Back
RC
*For applicable models only
Edit
Teach
Teach
*Conduct teaching and edit after inputting position number
(Position number input is available also on PageUp/Dn)
*After data writing by "Write", go to next position
Alarm Reset
Clear
Cont.
Scan
Clear
Select Number
Back
Monitor
Monitor
Alarm Reset
All Axes Rst

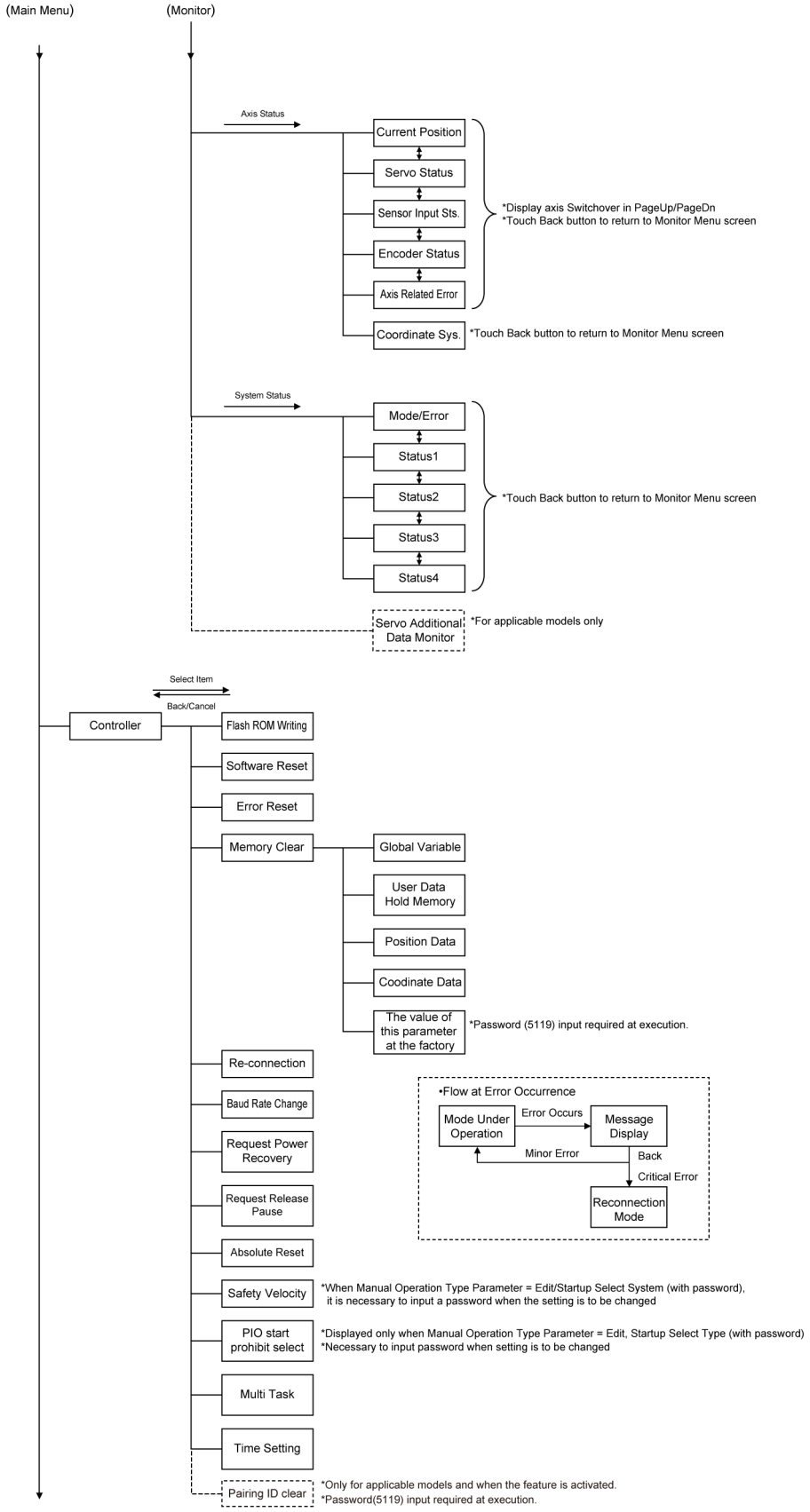

(Main Menu)
Select Item
Back
ExMotion
*For applicable models only
Edit
Teach
Teach
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"
Clear
Jog Velcity
Cont.
Scan
Clear
Monitor
Monitor
Environment Set
Time
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime

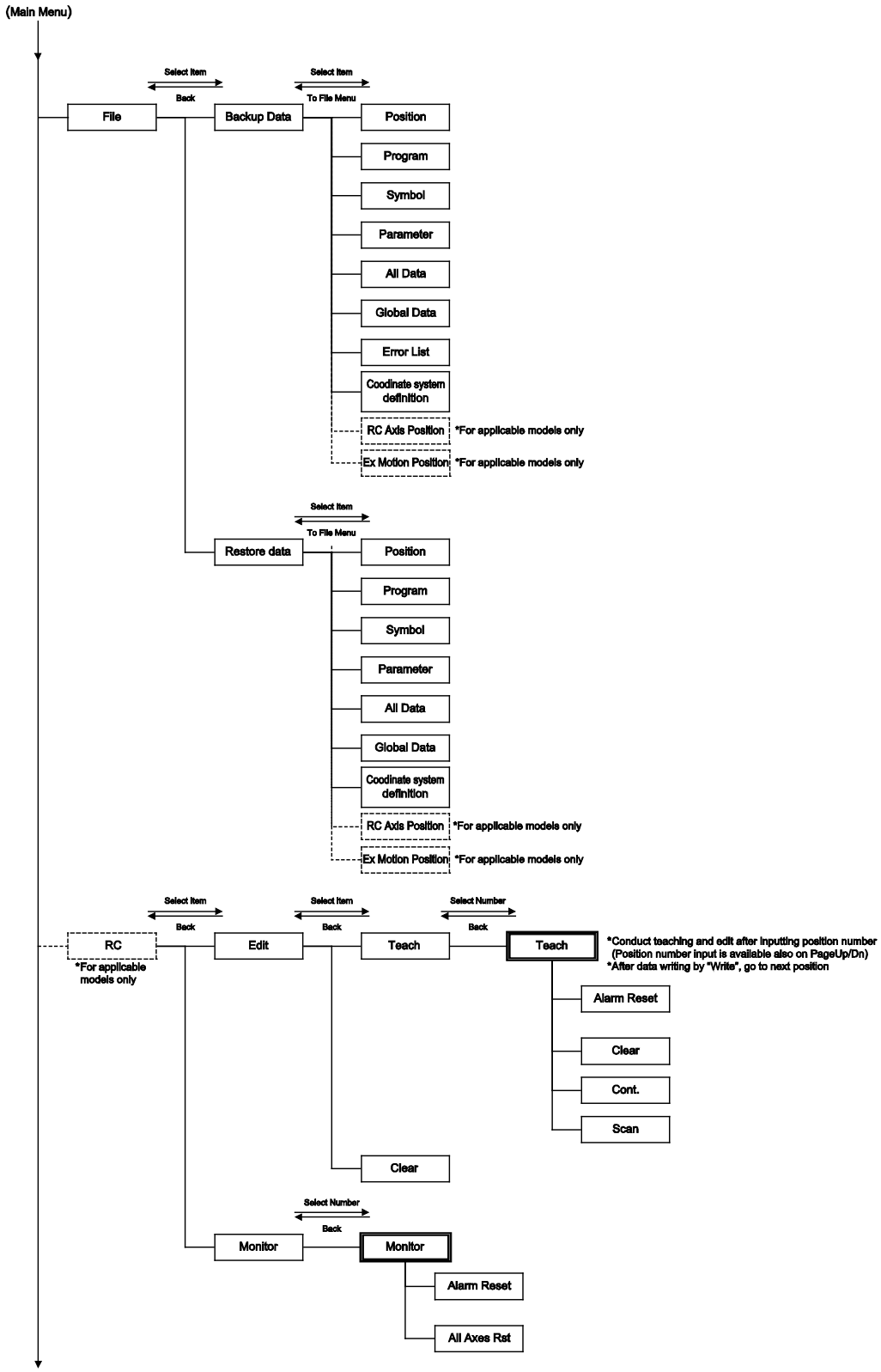
5.4 XSEL-RXD/SXD/RAXD/SAXD Controller

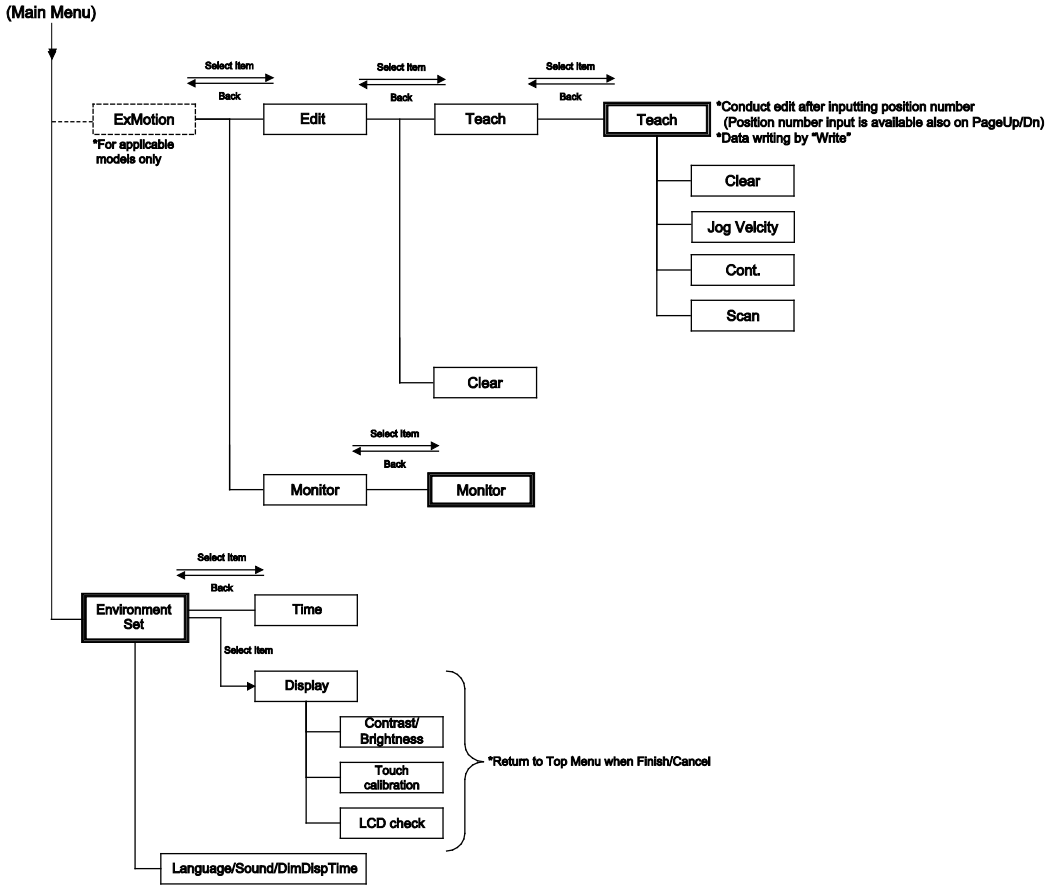



(Main Menu)
(Edit)
Select item
Back
Symbol
Modify
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input Port No.
Output Port No.
InOut Port No
*For applicable models only
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
I/O Device
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*For some parameters, conduct the setting after selecting the axis number or device number
*Data writing by "Write"
Coordinate System
Work coodinate system offset
Tool coodinate system offset
Simple interference check zone
Clear

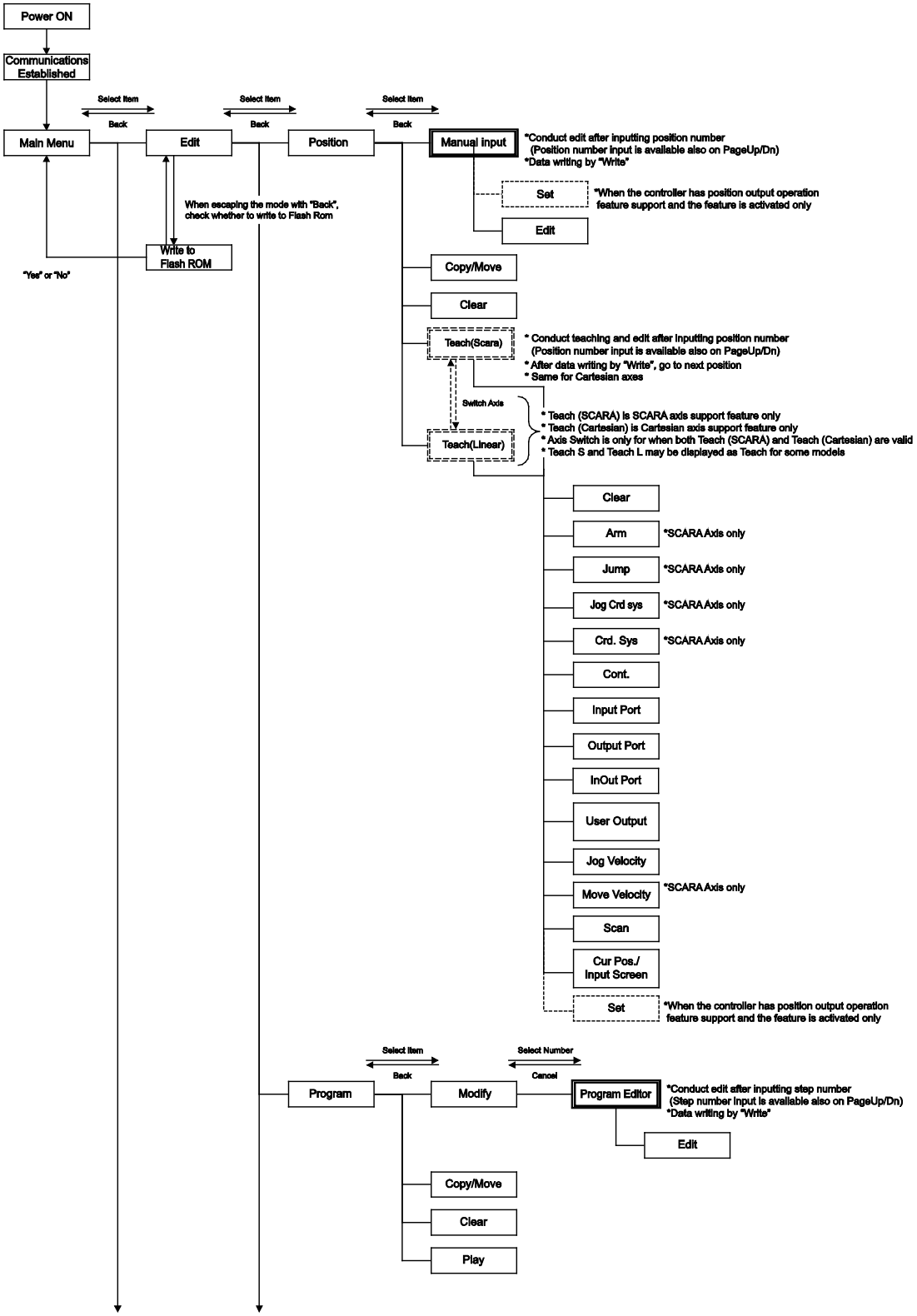

(Main Menu)
Play
Select Item
Back
Select Program
Select Number
Cancel
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Monitor
Back
Error
In port
Out port
InOut Port
*For applicable models only
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Monitor
Select Item
Back
Input Port
Output Port
InOut Port
*For applicable models only
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List
Select Number
List Display
Error Detail
Version
Select Item
Back
Main
Driver
Teaching Pendant
Other
*For applicable models only
I/O
Fieldbus *For RA/SA
Encodr
*For applicable models only
Control Const Tbl Management Info.
Maintenance info.
Select Item
Back
Target changed
Actuator Replacement
*Password (5119) input required at execution.
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.

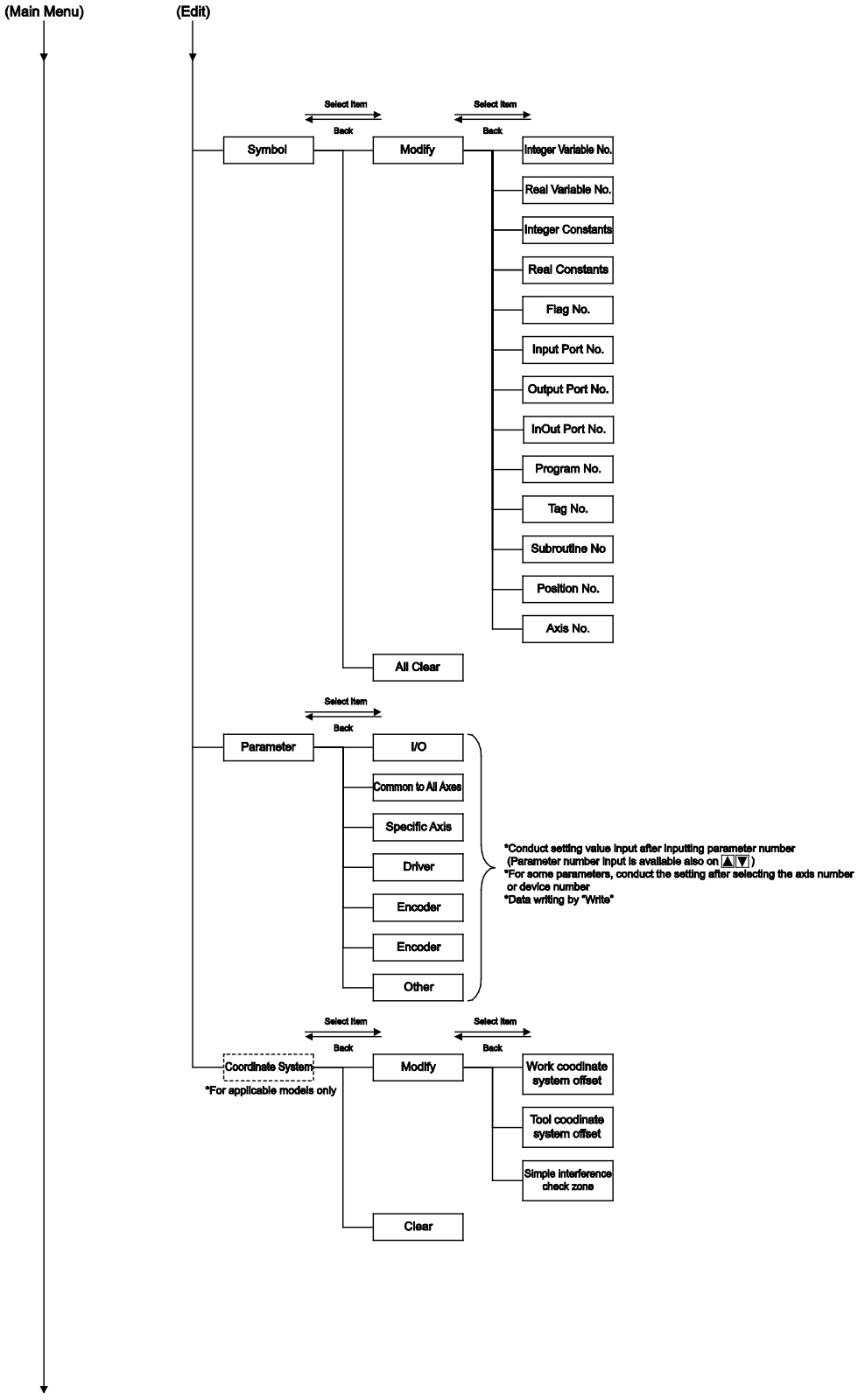

(Main Menu)
(Monitor)
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
Coordinate Sys.
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
*For applicable models only
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
User Data Hold Memory
Position Data
Coodinate Data
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
Time Setting
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode

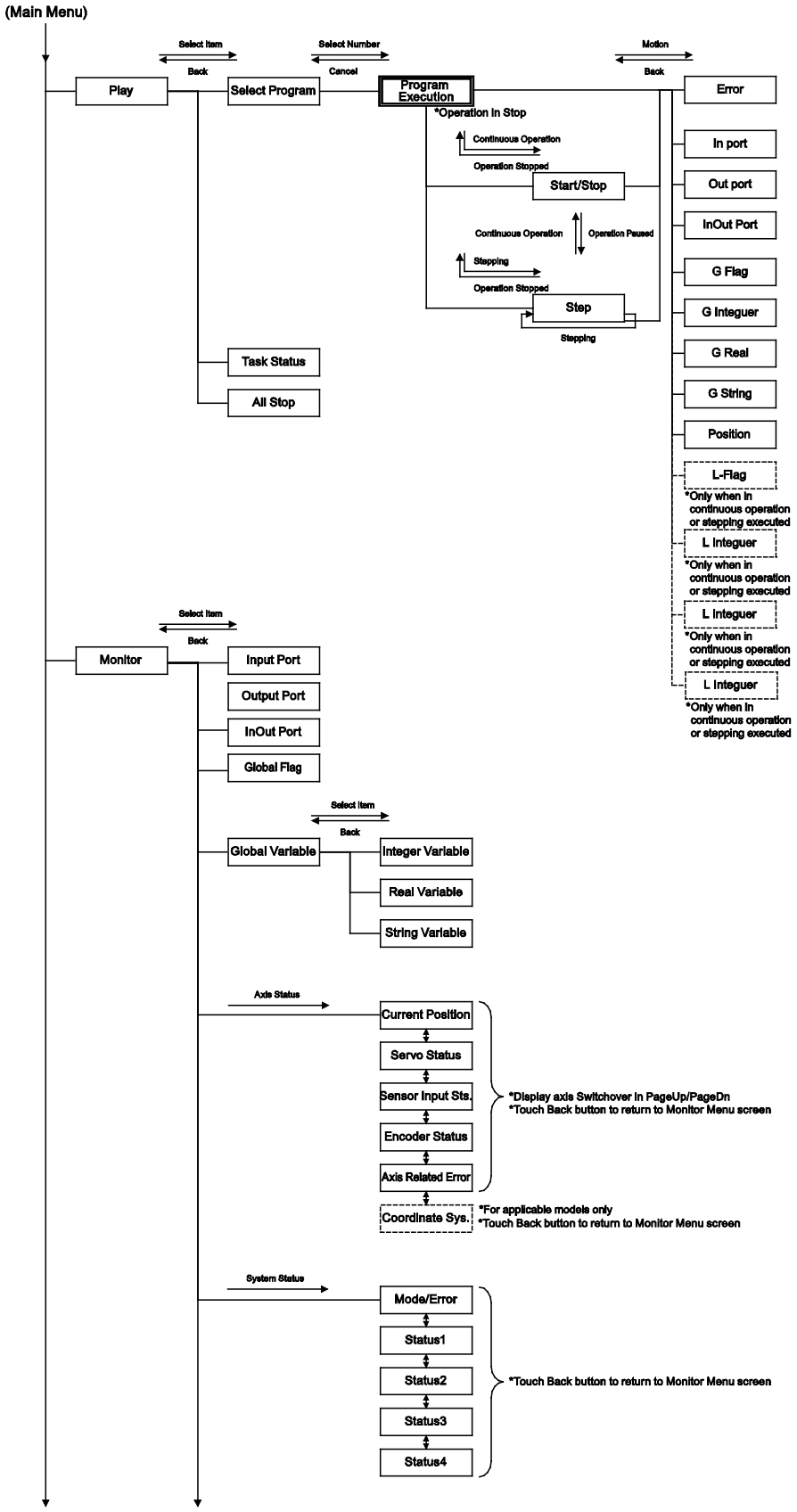

(Main Menu)
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Coodinate system definition
RC Axis Position
*For applicable models only
Ex Motion Position
*For applicable models only
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
Coodinate system definition
RC Axis Position
*For applicable models only
Ex Motion Position
*For applicable models only
Select Item
Back
Select Item
Back
Select Number
Back
RC
*For applicable models only
Edit
Teach
Teach
*Conduct teaching and edit after inputting position number (Position number input is available also on PageUp/Dn)
*After data writing by "Write", go to next position
Alarm Reset
Clear
Cont.
Scan
Clear
Select Number
Back
Monitor
Monitor
Alarm Reset
All Axes Rst

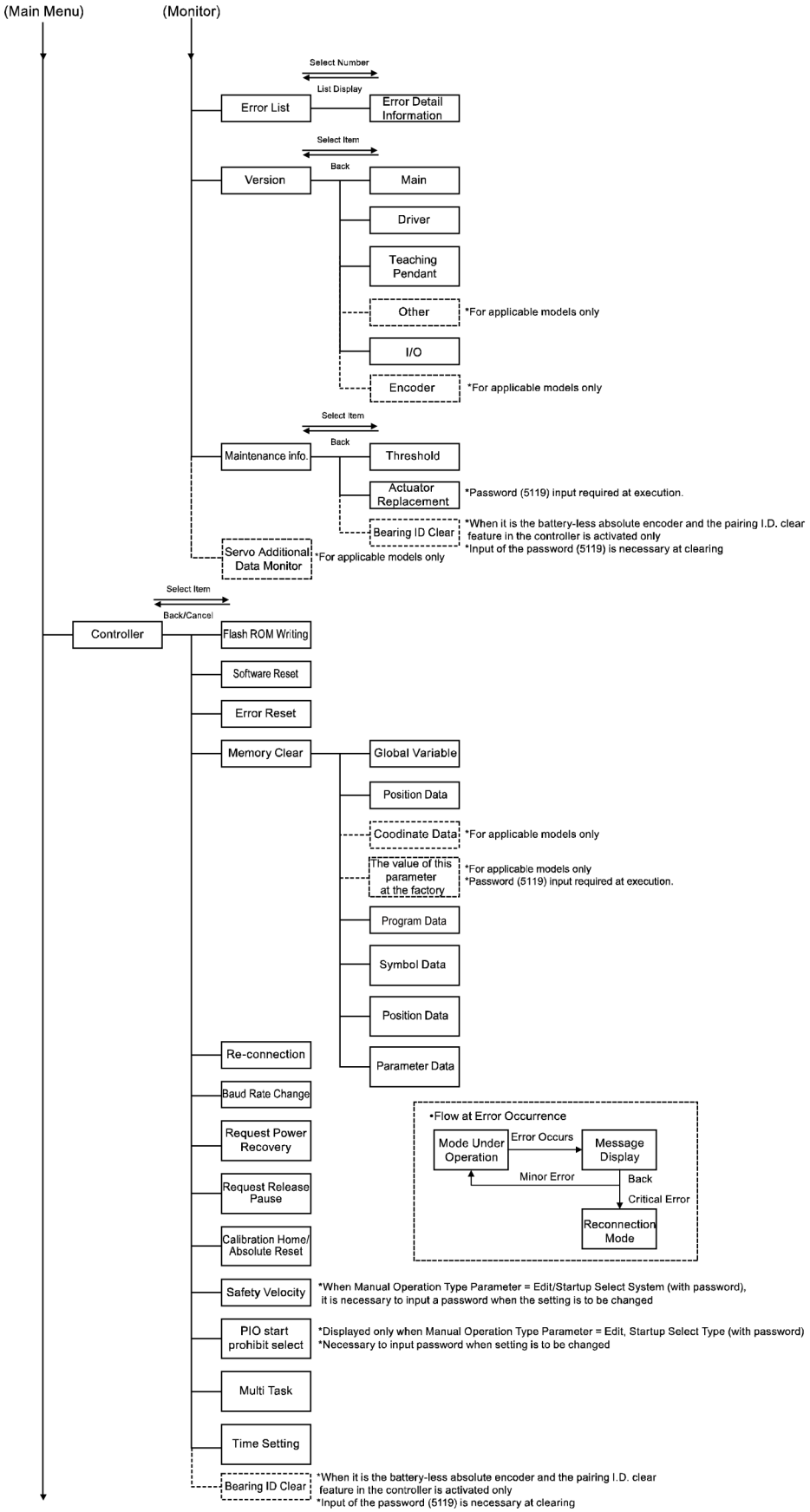

(Main Menu)
Select Item
Back
ExMotion
*For applicable models only
Edit
Teach
Teach
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"
Clear
Jog Velcity
Cont.
Scan
Clear
Monitor
Monitor
Environment Set
Time
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Menu when Finish/Cancel
Language/Sound/DimDispTime

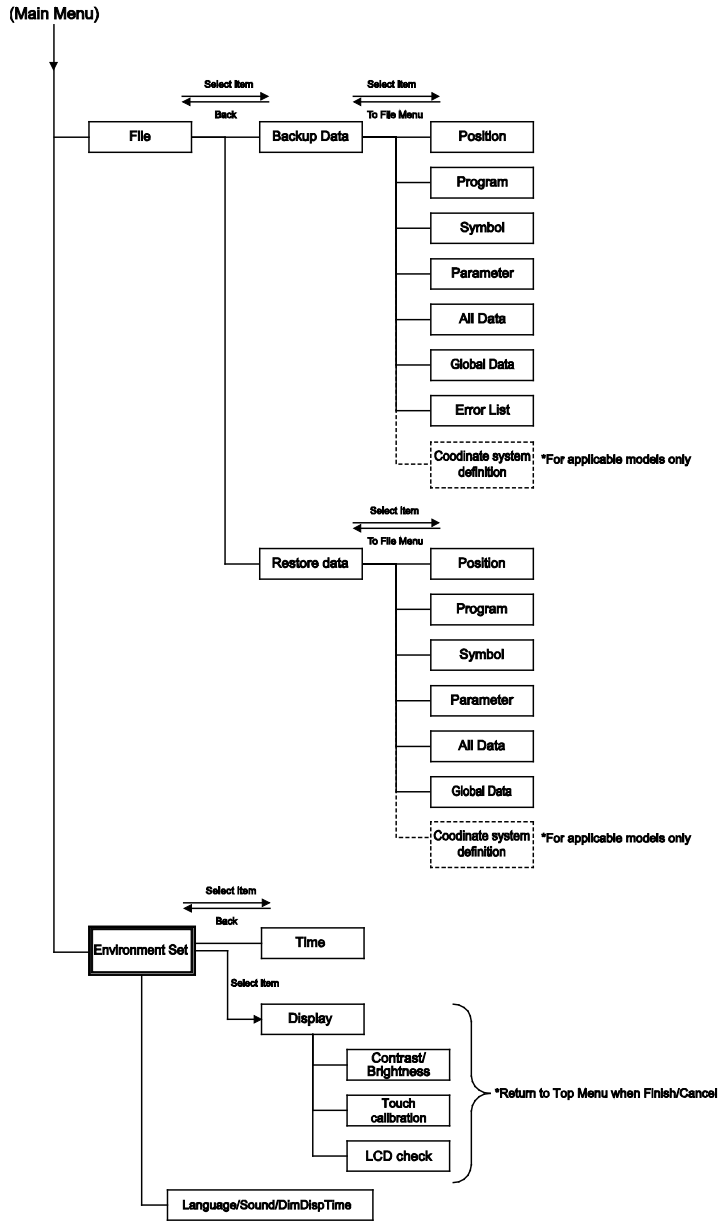
5.5 MSEL-PCX/PGX/PC/PG/PCF/PGF Controller




(Main Menu)
(Edit)
Select Item
Back
Symbol
Modify
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input Port No.
Output Port No.
InOut Port No.
Program No.
Tag No.
Subroutine No
Position No.
Axis No.
All Clear
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
Encoder
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*For some parameters, conduct the setting after selecting the axis number
or device number
*Data writing by "Write"
Coordinate System
*For applicable models only
Work coodinate system offset
Tool coodinate system offset
Simple interference check zone
Clear


(Main Menu)
Select Item
Back
Select Number
Cancel
Motion
Back
Play
Select Program
Program Execution
*Operation In Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Error
In port
Out port
InOut Port
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Select Item
Back
Monitor
Input Port
Output Port
InOut Port
Global Flag
Select Item
Back
Global Variable
Integer Variable
Real Variable
String Variable
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
Coordinate Sys.
*For applicable models only
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen

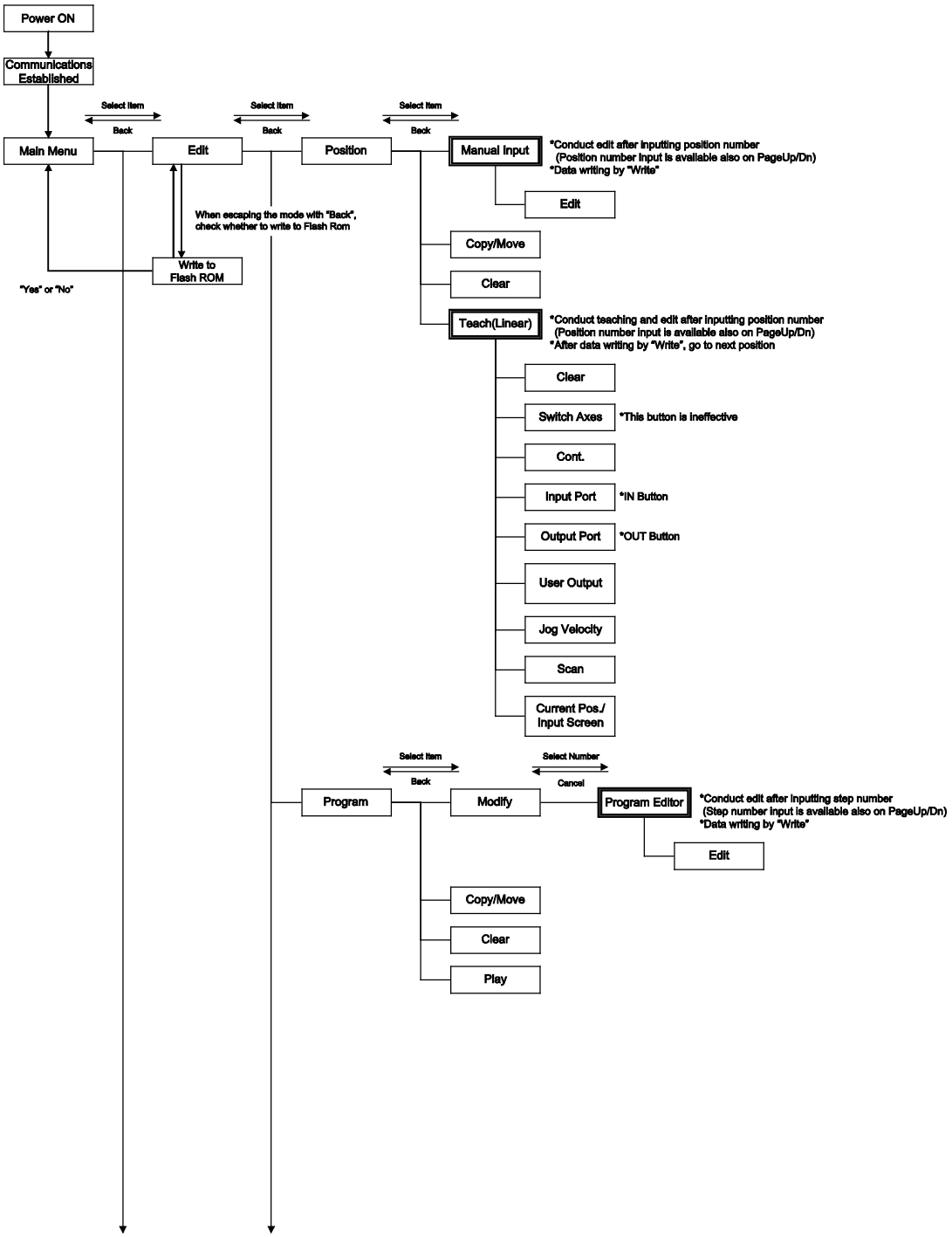

(Main Menu)
(Monitor)
Select Number
List Display
Error List
Error Detail Information
Select Item
Back
Version
Main
Driver
Teaching Pendant
Other
*For applicable models only
I/O
Encoder
*For applicable models only
Select Item
Back
Maintenance info.
Threshold
Actuator Replacement
*Password (5119) input required at execution.
Bearing ID Clear
*When it is the battery-less absolute encoder and the pairing I.D. clear feature in the controller is activated only
*Input of the password (5119) is necessary at clearing
Servo Additional Data Monitor
*For applicable models only
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
Position Data
Coodinate Data
*For applicable models only
The value of this parameter at the factory
*For applicable models only
*Password (5119) input required at execution.
Program Data
Symbol Data
Position Data
Parameter Data
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Calibration Home/ Absolute Reset
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
Time Setting
Bearing ID Clear
*When it is the battery-less absolute encoder and the pairing I.D. clear feature in the controller is activated only
*Input of the password (5119) is necessary at clearing

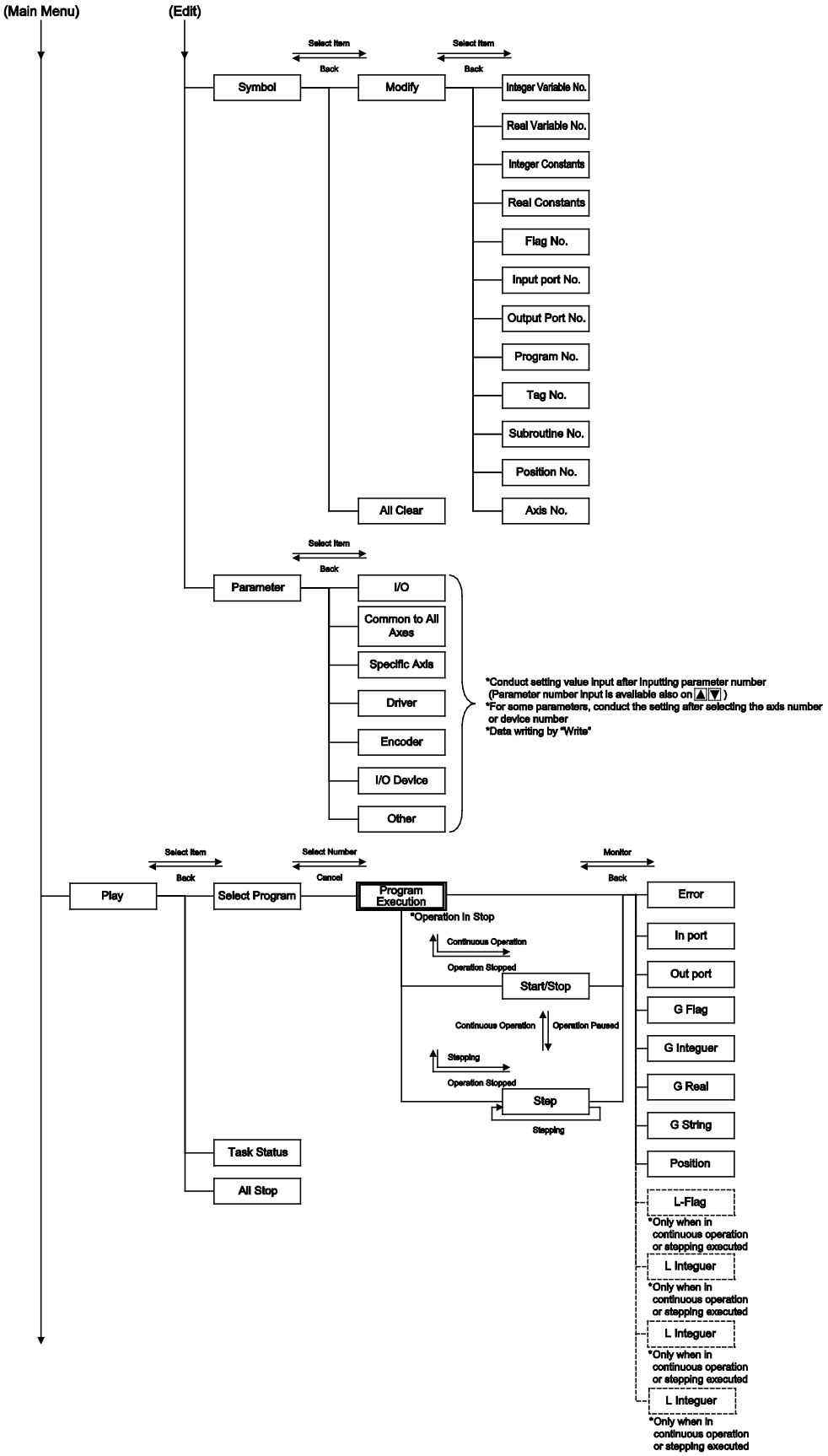

(Main Menu)
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Coodinate system definition
*For applicable models only
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
Coodinate system definition
*For applicable models only
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Menu when Finish/Cancel
Language/Sound/DimDispTime

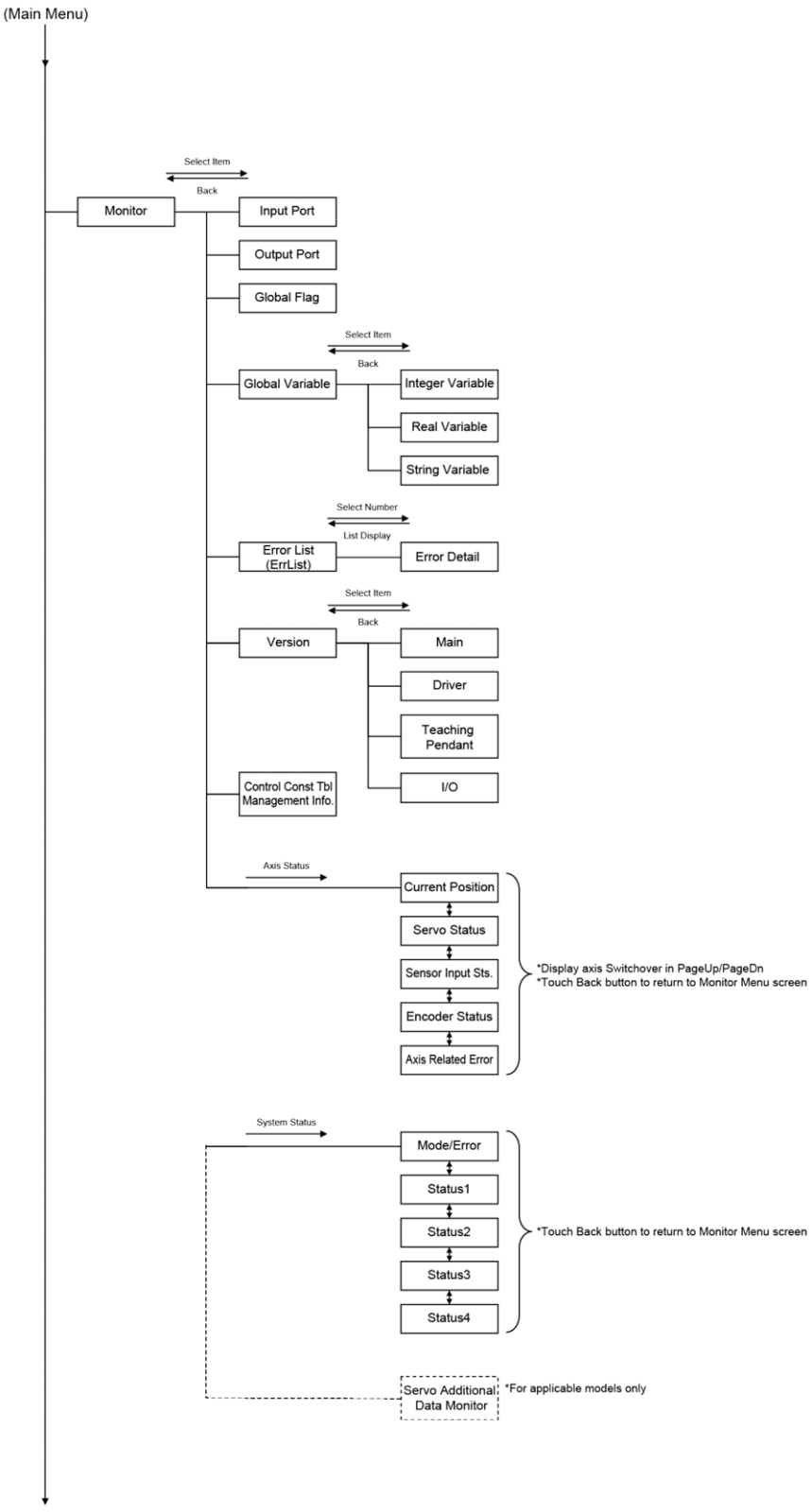
5.6 SSEL, ASEL, PSEL Controller

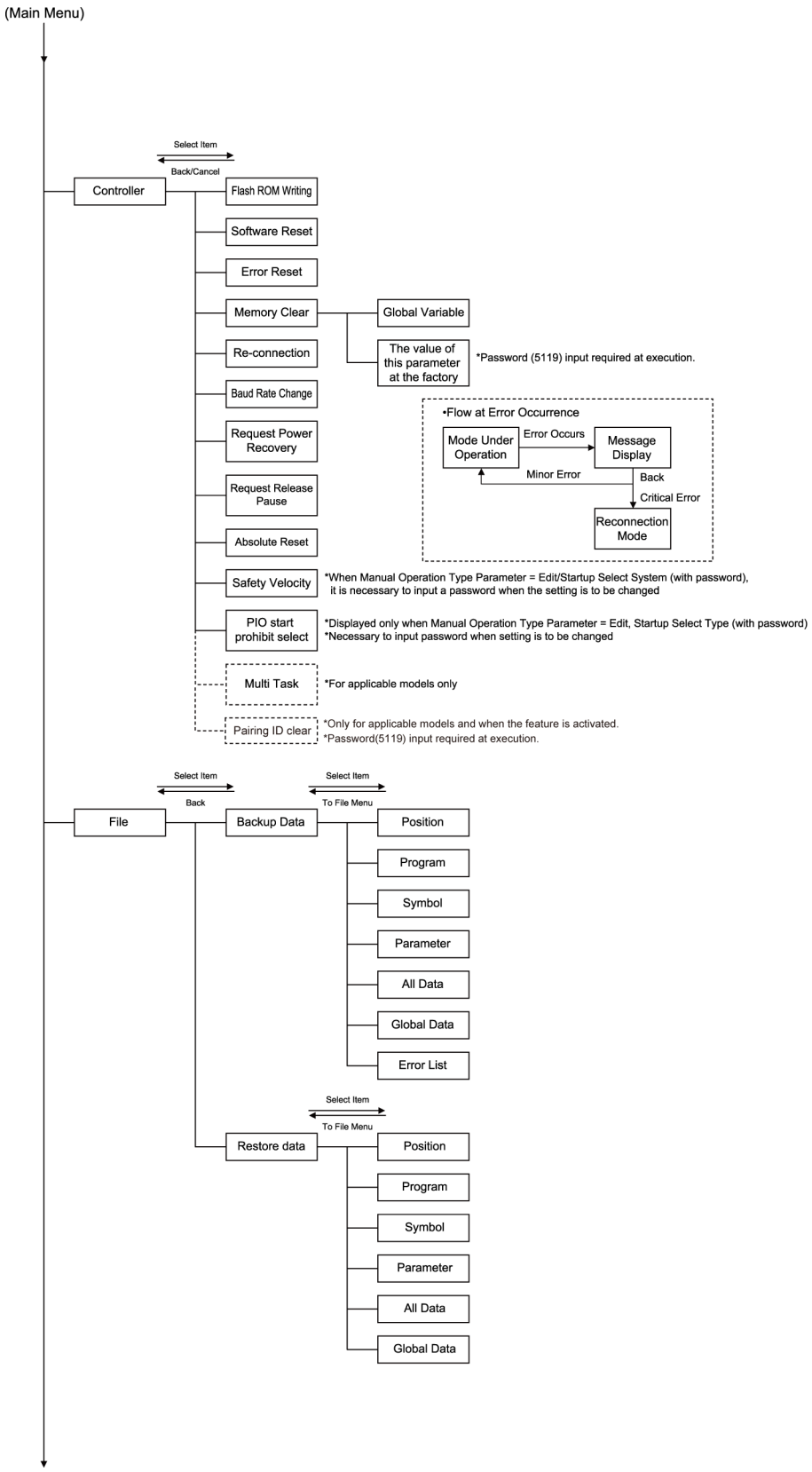
In the case of the SSEL, ASEL or PSEL controller, 2-type selection is possible between the program mode and positioner mode. Set the selection to the other parameter No. 25 “Operation mode type.” For details, refer to the [Operating Manual of the SSEL, ASEL or PSEL Controller].

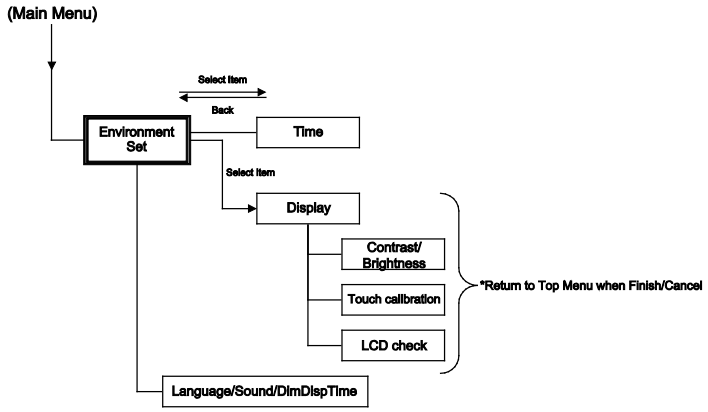
5.6.1 Program Mode




(Main Menu)
(Edit)
Select Item
Back
Symbol
Modify
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input port No.
Output Port No.
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
I/O Device
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*For some parameters, conduct the setting after selecting the axis number or device number
*Data writing by "Write"
Play
Select Program
Select Number
Cancel
Program Execution
Monitor
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Error
In port
Out port
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed

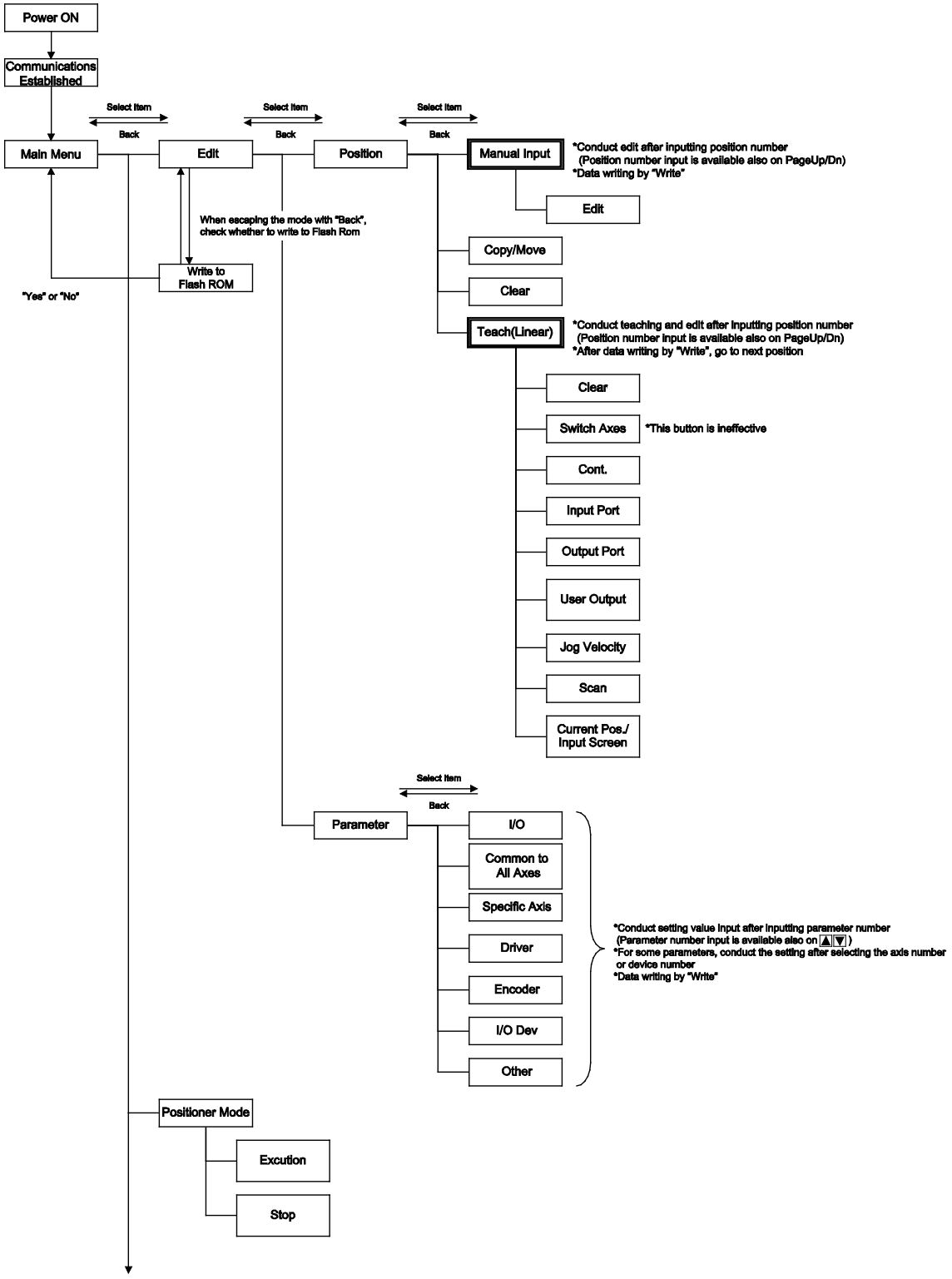

(Main Menu)
Select Item
Back
Monitor
Input Port
Output Port
Global Flag
Select Item
Back
Global Variable
Integer Variable
Real Variable
String Variable
Select Number
List Display
Error List (ErrList)
Error Detail
Select Item
Back
Version
Main
Driver
Teaching Pendant
I/O
Control Const Tbl Management Info.
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
*For applicable models only

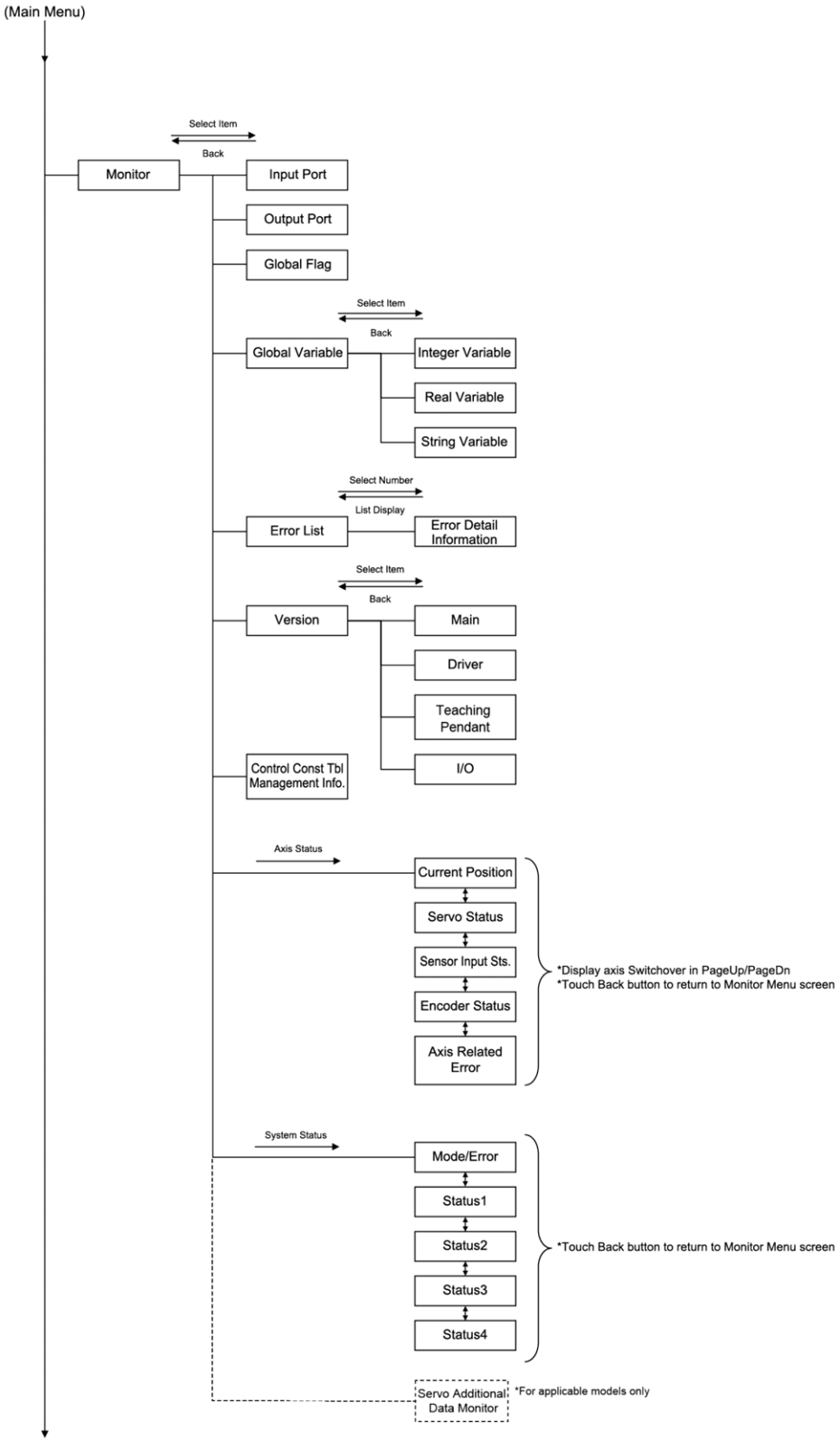

(Main Menu)
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
*For applicable models only
Pairing ID clear
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.
Select Item
Back
File
Backup Data
Select Item
To File Menu
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data

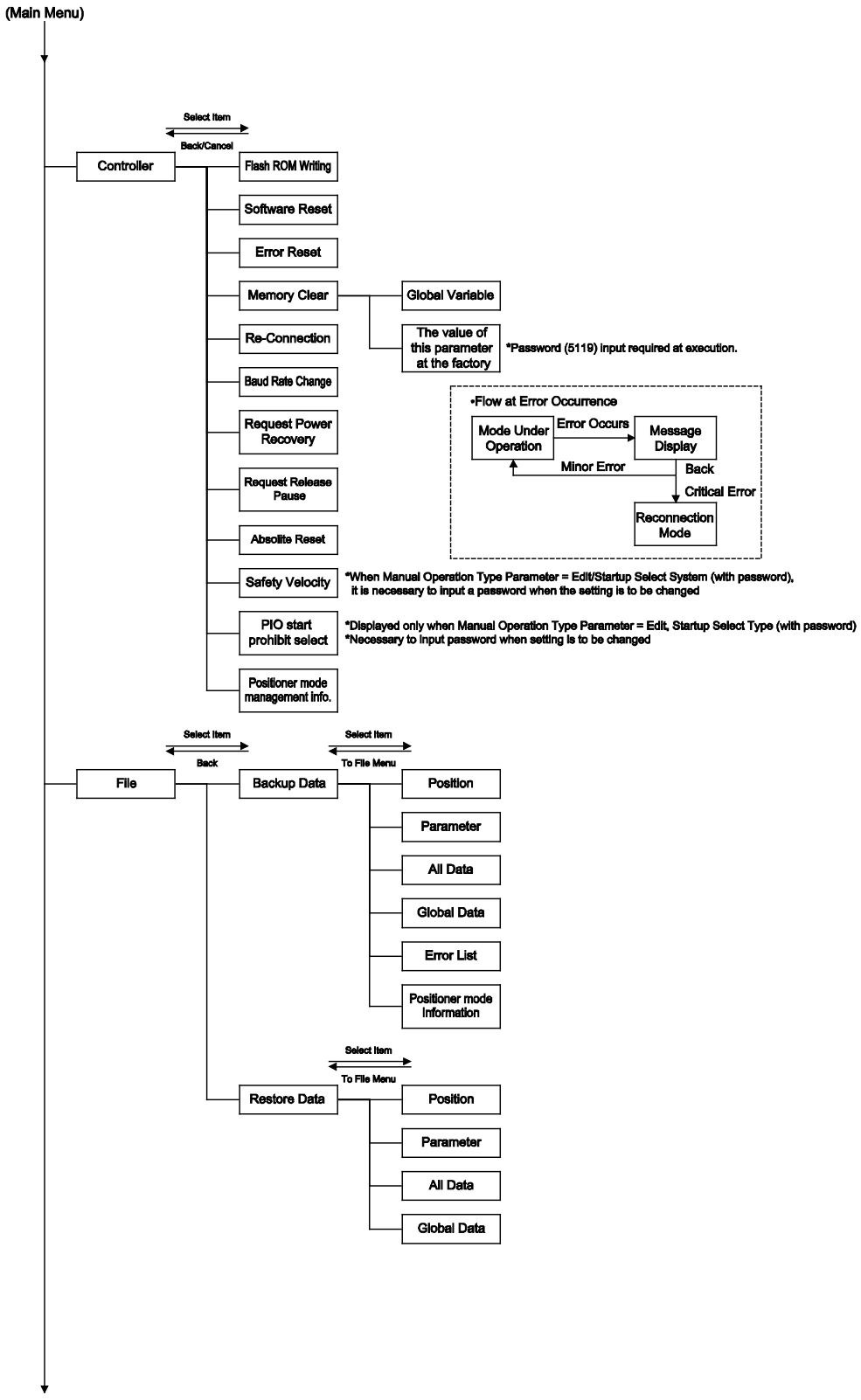

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Menu when Finish/Cancel
Language/Sound/DimDispTime

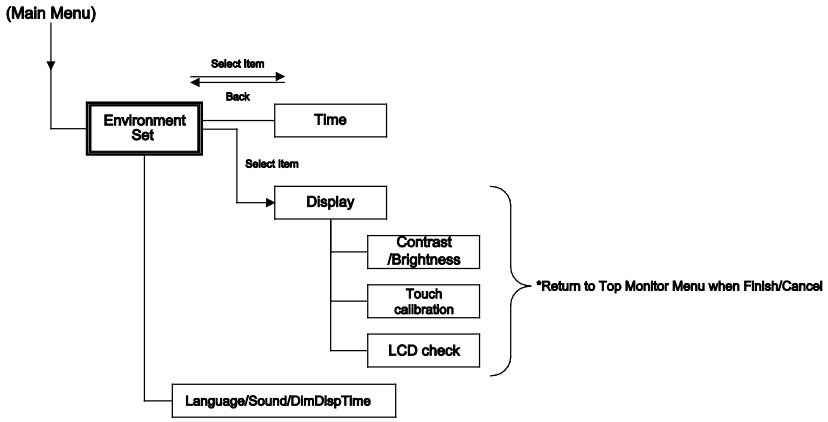
5.6.2 Positioner Mode

(Note) In the positioner mode, “Program edit” or “Symbol edit” is unavailable. “Two or more programs start prohibition” operation cannot be performed, either.




(Main Menu)
Select Item
Back
Monitor
Input Port
Output Port
Global Flag
Select Item
Back
Global Variable
Integer Variable
Real Variable
String Variable
Select Number
List Display
Error List
Error Detail Information
Select Item
Back
Version
Main
Driver
Teaching Pendant
I/O
Control Const Tbl Management Info.
Axis Status
Current Position
Servo Status
Sensor Input Sts.
Encoder Status
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
*For applicable models only

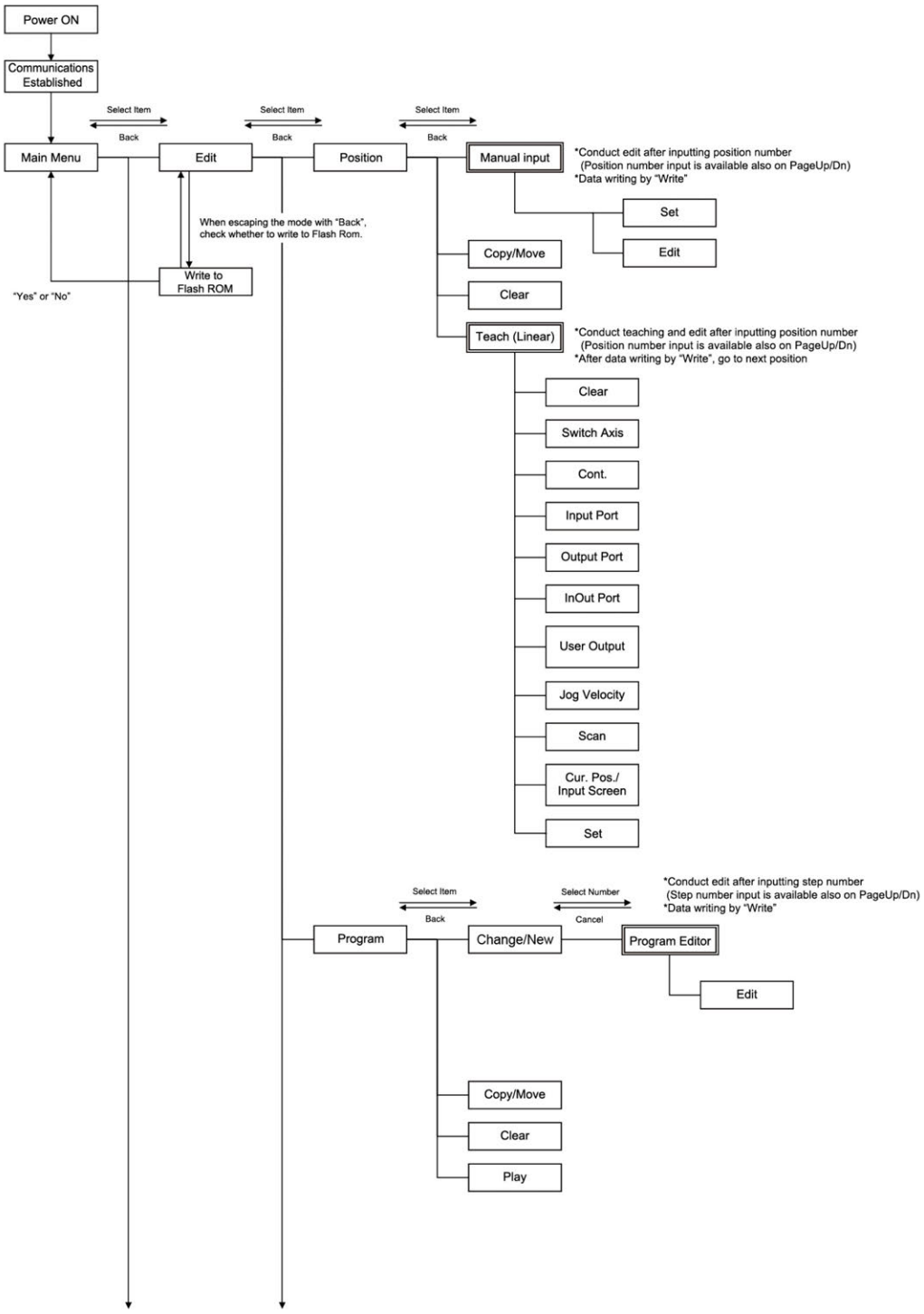

(Main Menu)
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-Connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolite Reset
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Positioner mode management info.
*Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Parameter
All Data
Global Data
Error List
Positioner mode information
Select Item
To File Menu
Restore Data
Position
Parameter
All Data
Global Data

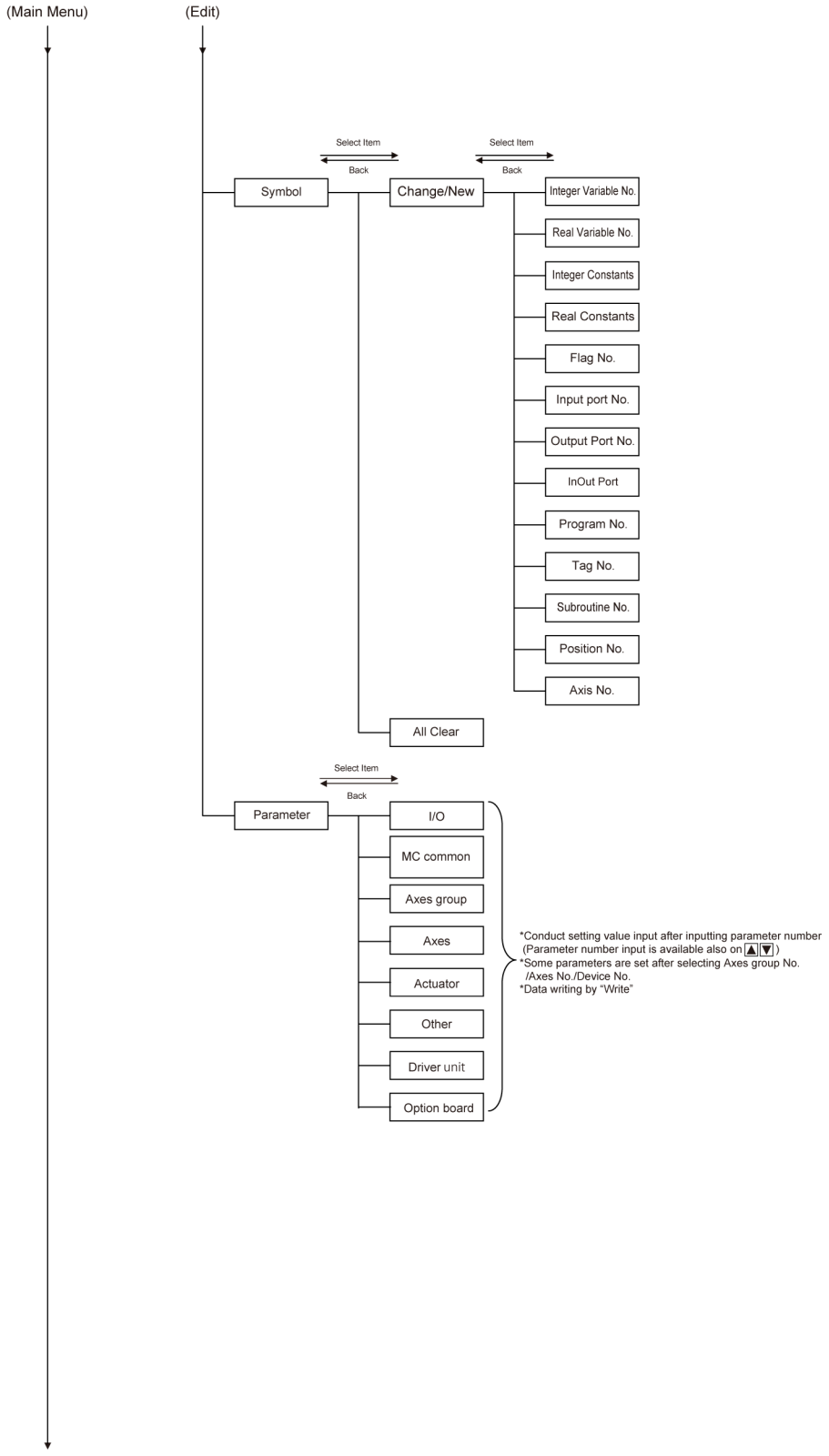

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast /Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime

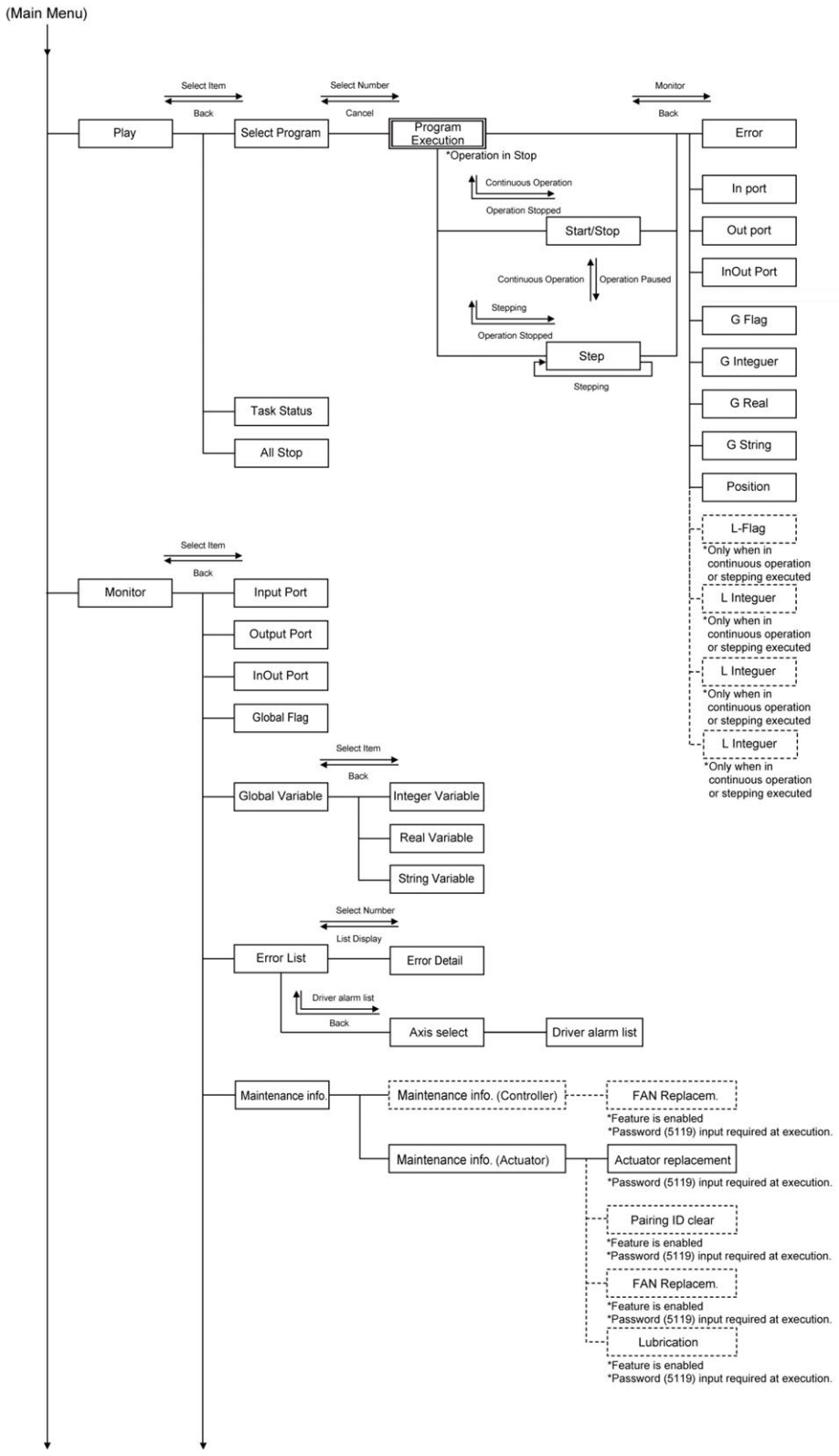
5.7 RSEL Controller

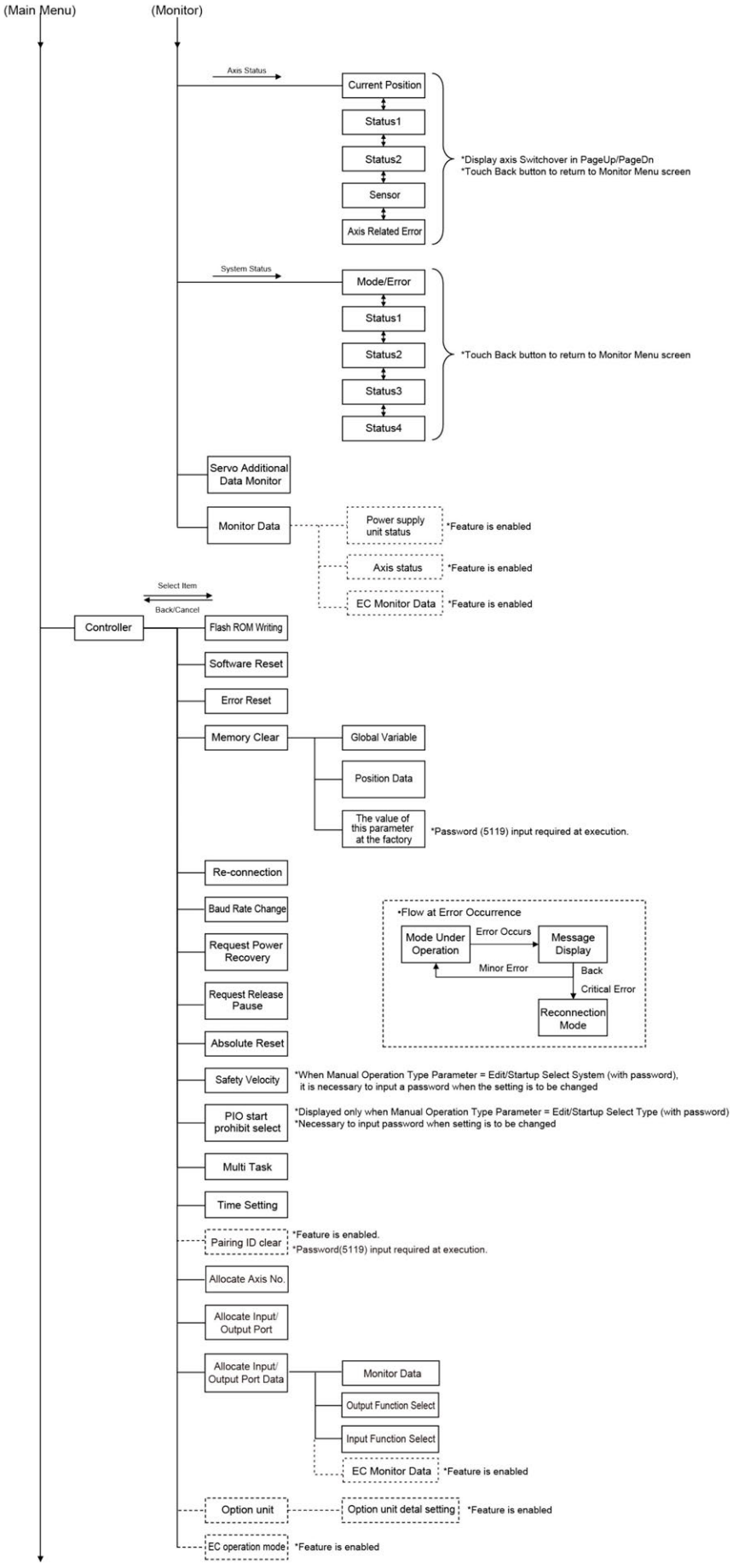
The menu construction should differ in the case of “When 6-axis Cartesian Robot is not connected” and “when 6-axis Cartesian Robot is connected” in RSEL Controller.

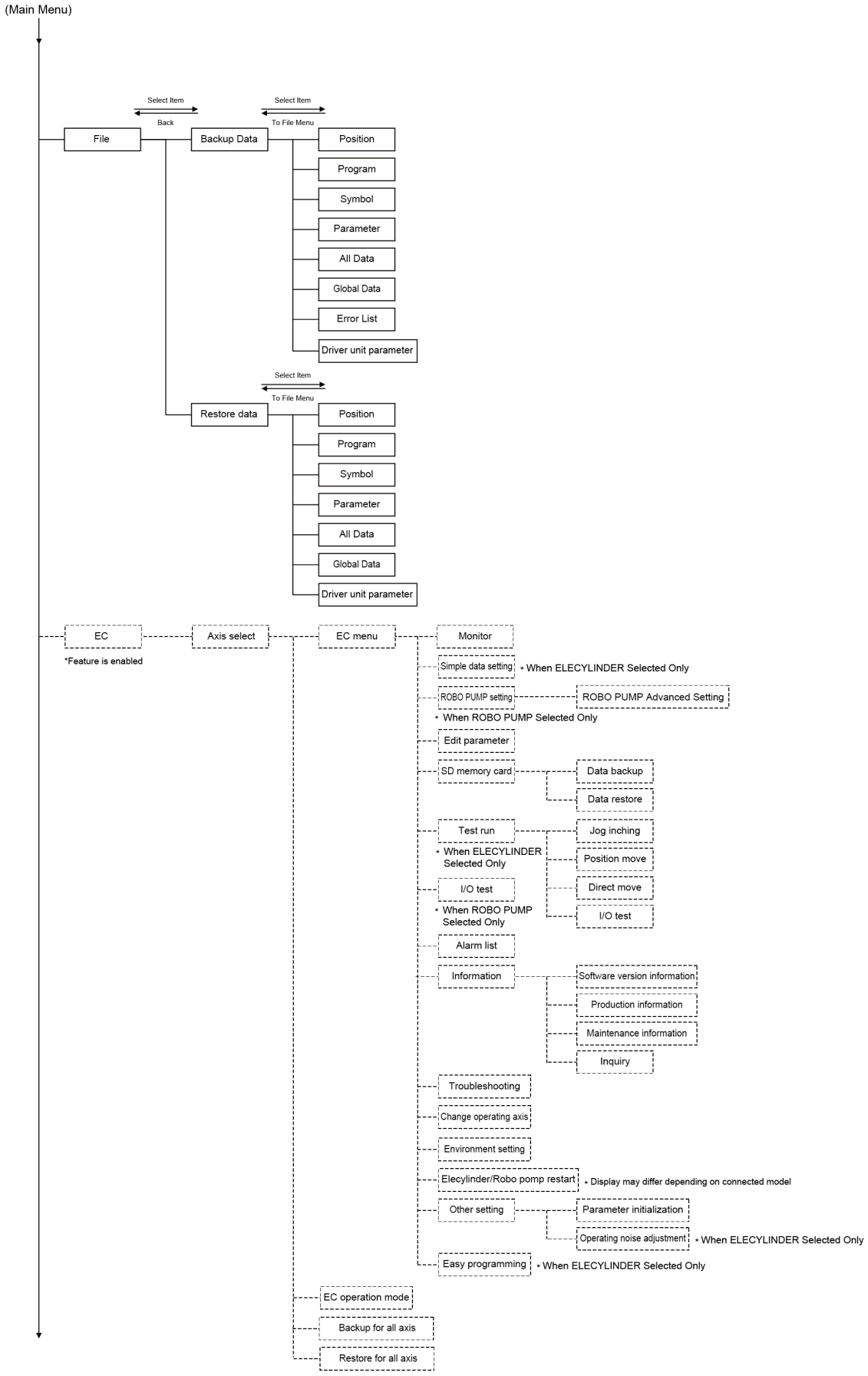
5.7.1 When 6-axis Cartesian Robot is not connected

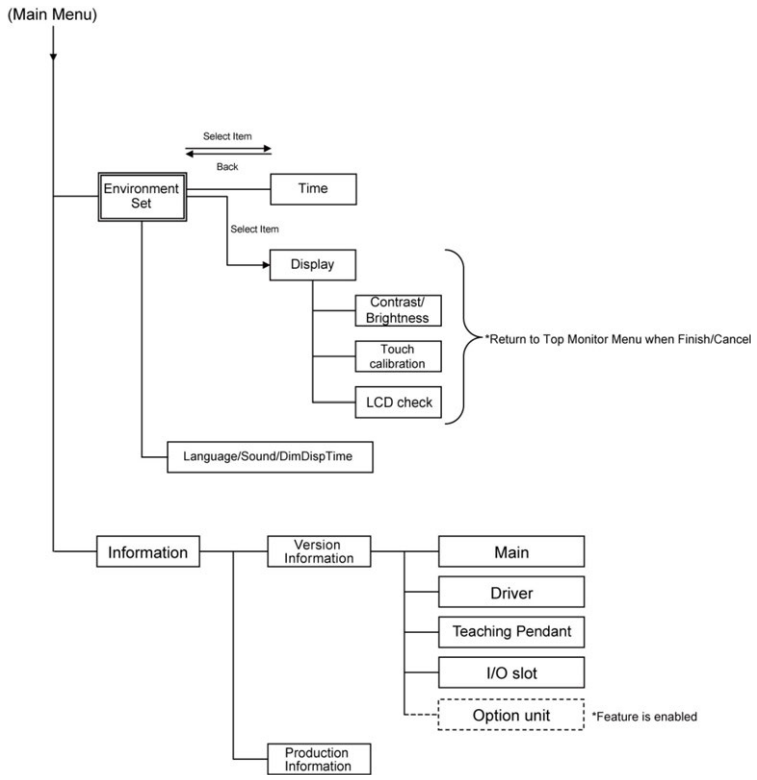



(Main Menu)
(Edit)
Select Item
Back
Select Item
Back
Symbol
Change/New
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input port No.
Output Port No.
InOut Port
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Select Item
Back
Parameter
I/O
MC common
Axes group
Axes
Actuator
Other
Driver unit
Option board
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*Some parameters are set after selecting Axes group No.
/Axes No./Device No.
*Data writing by "Write"

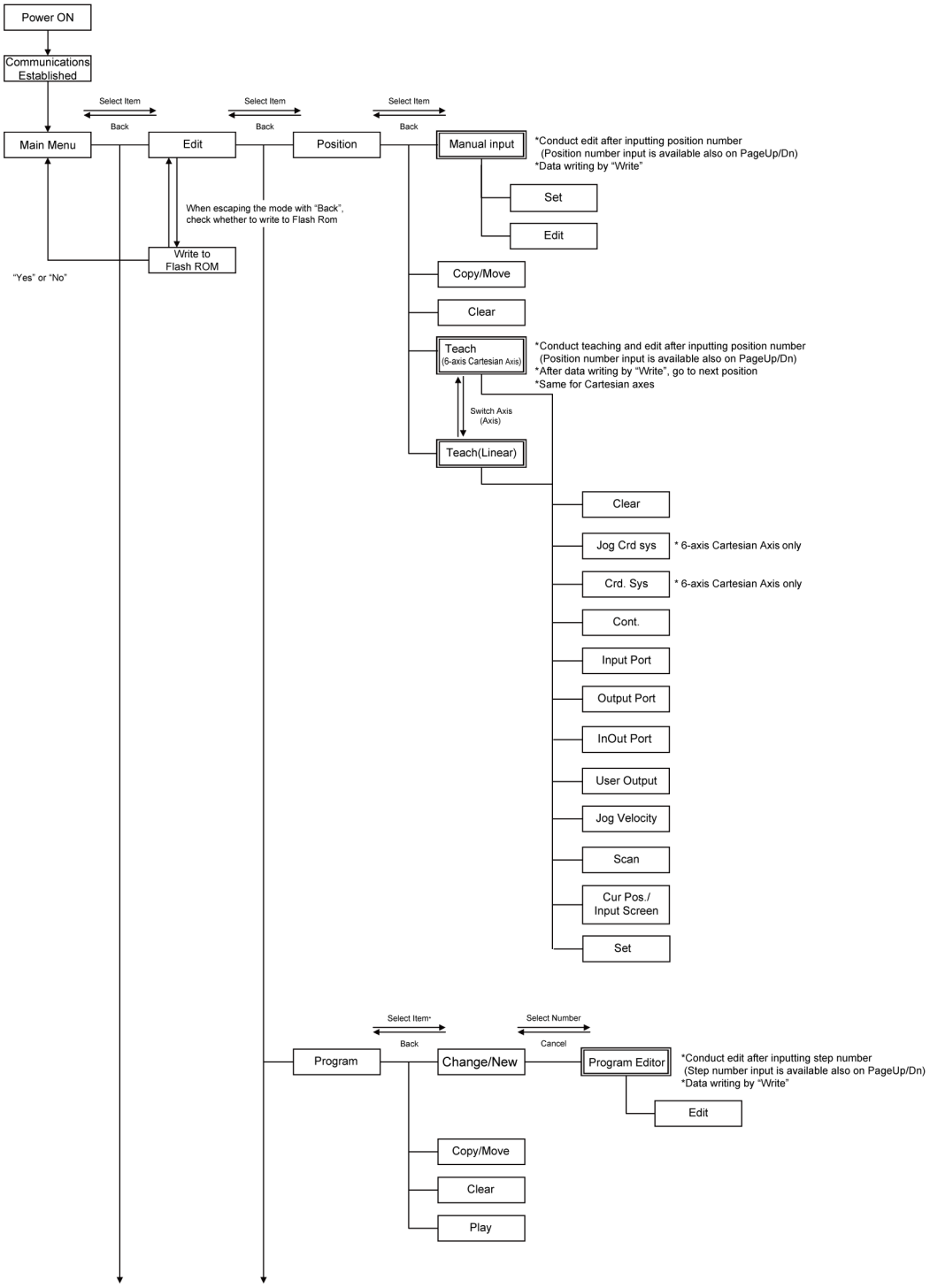

(Main Menu)
Select Item
Back
Select Number
Cancel
Monitor
Back
Play
Select Program
Program Execution
*Operation in Stop
Error
Continuous Operation
Operation Stopped
Start/Stop
In port
Out port
InOut Port
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Task Status
All Stop
Select Item
Back
Monitor
Input Port
Output Port
InOut Port
Global Flag
Select Item
Back
Global Variable
Integer Variable
Real Variable
String Variable
Select Number
List Display
Error List
Error Detail
Driver alarm list
Back
Axis select
Driver alarm list
Maintenance info.
Maintenance info. (Controller)
FAN Replacem.
*Feature is enabled
*Password (5119) input required at execution.
Maintenance info. (Actuator)
Actuator replacement
*Password (5119) input required at execution.
Pairing ID clear
*Feature is enabled
*Password (5119) input required at execution.
FAN Replacem.
*Feature is enabled
*Password (5119) input required at execution.
Lubrication
*Feature is enabled
*Password (5119) input required at execution.

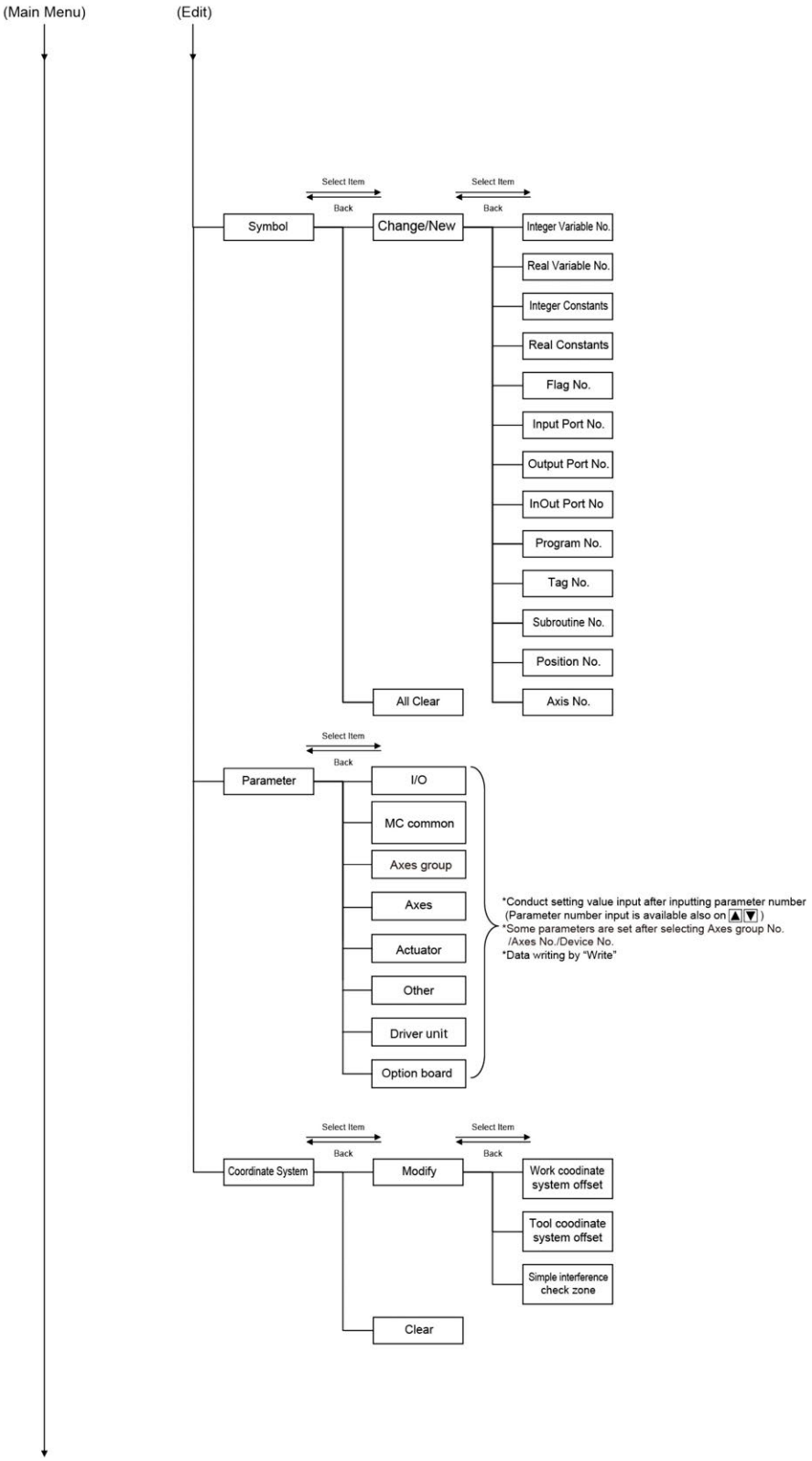

(Main Menu)
(Monitor)
Axis Status
Current Position
Status1
Status2
Sensor
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
Monitor Data
Power supply unit status
*Feature is enabled
Axis status
*Feature is enabled
EC Monitor Data
*Feature is enabled
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
Position Data
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
Time Setting
Pairing ID clear
*Feature is enabled.
*Password(5119) input required at execution.
Allocate Axis No.
Allocate Input/ Output Port
Allocate Input/ Output Port Data
Monitor Data
Output Function Select
Input Function Select
EC Monitor Data
*Feature is enabled
Option unit
Option unit detal setting
*Feature is enabled
EC operation mode
*Feature is enabled

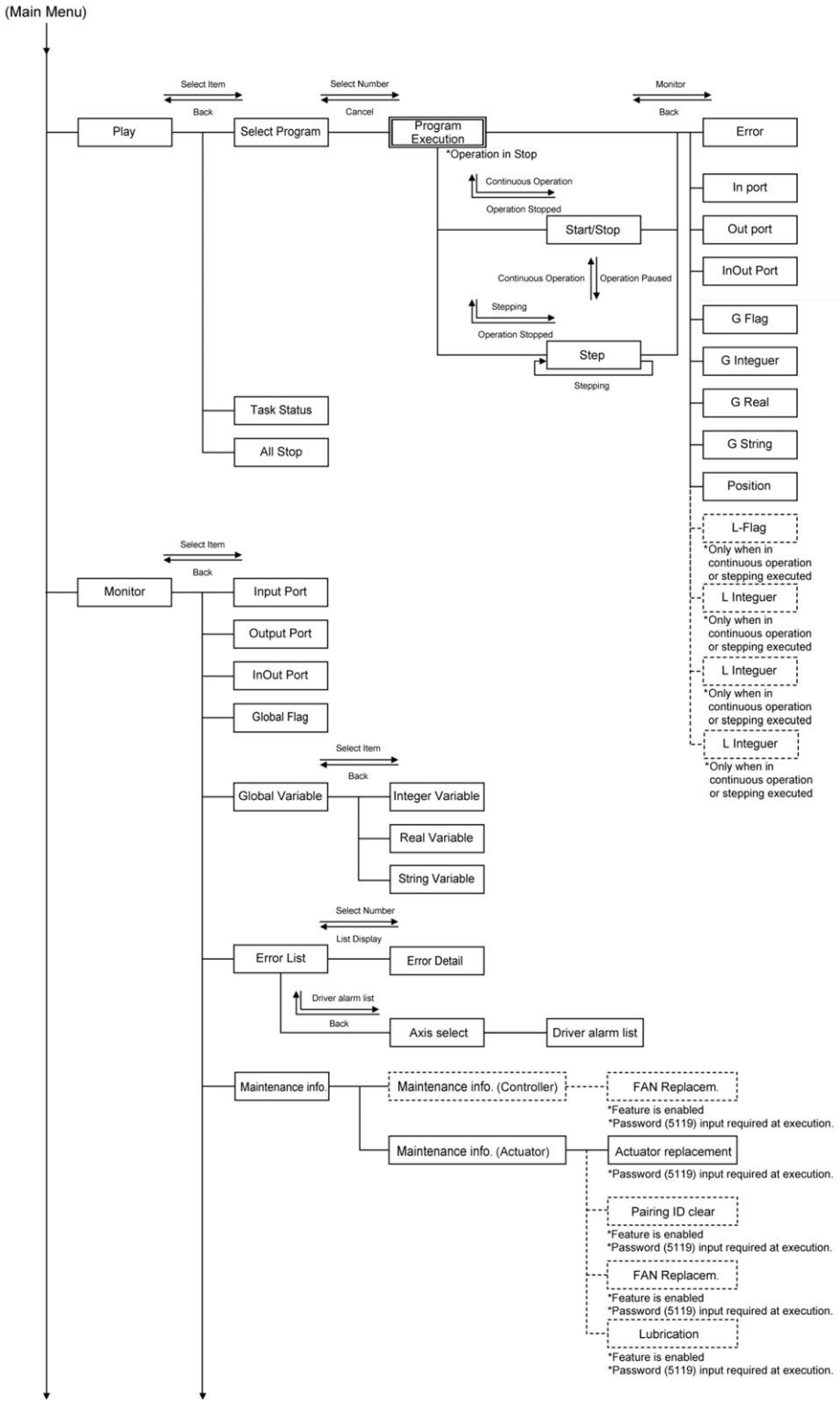

(Main Menu)
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Driver unit parameter
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
Driver unit parameter
EC
*Feature is enabled
Axis select
EC menu
Monitor
Simple data setting
* When ELECYLINDER Selected Only
ROBO PUMP setting
ROBO PUMP Advanced Setting
* When ROBO PUMP Selected Only
Edit parameter
SD memory card
Data backup
Data restore
Test run
* When ELECYLINDER Selected Only
Jog inching
Position move
Direct move
I/O test
I/O test
* When ROBO PUMP Selected Only
Alarm list
Information
Software version information
Production information
Maintenance information
Inquiry
Troubleshooting
Change operating axis
Environment setting
Elecylinder/Robo pomp restart
* Display may differ depending on connected model
Other setting
Parameter initialization
Operating noise adjustment
* When ELECYLINDER Selected Only
Easy programming
* When ELECYLINDER Selected Only
EC operation mode
Backup for all axis
Restore for all axis

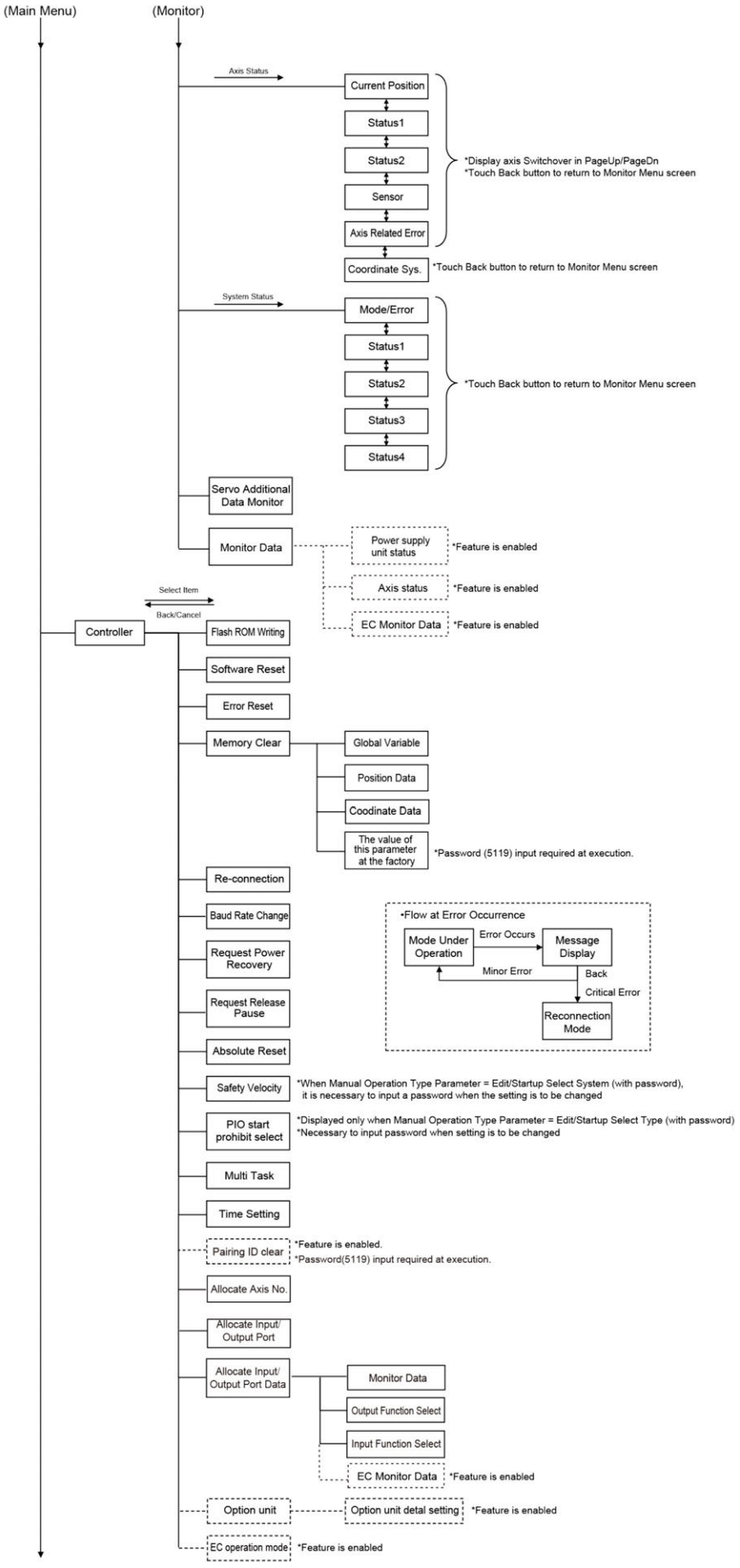

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime
Information
Version Information
Main
Driver
Teaching Pendant
I/O slot
Option unit
*Feature is enabled
Production Information

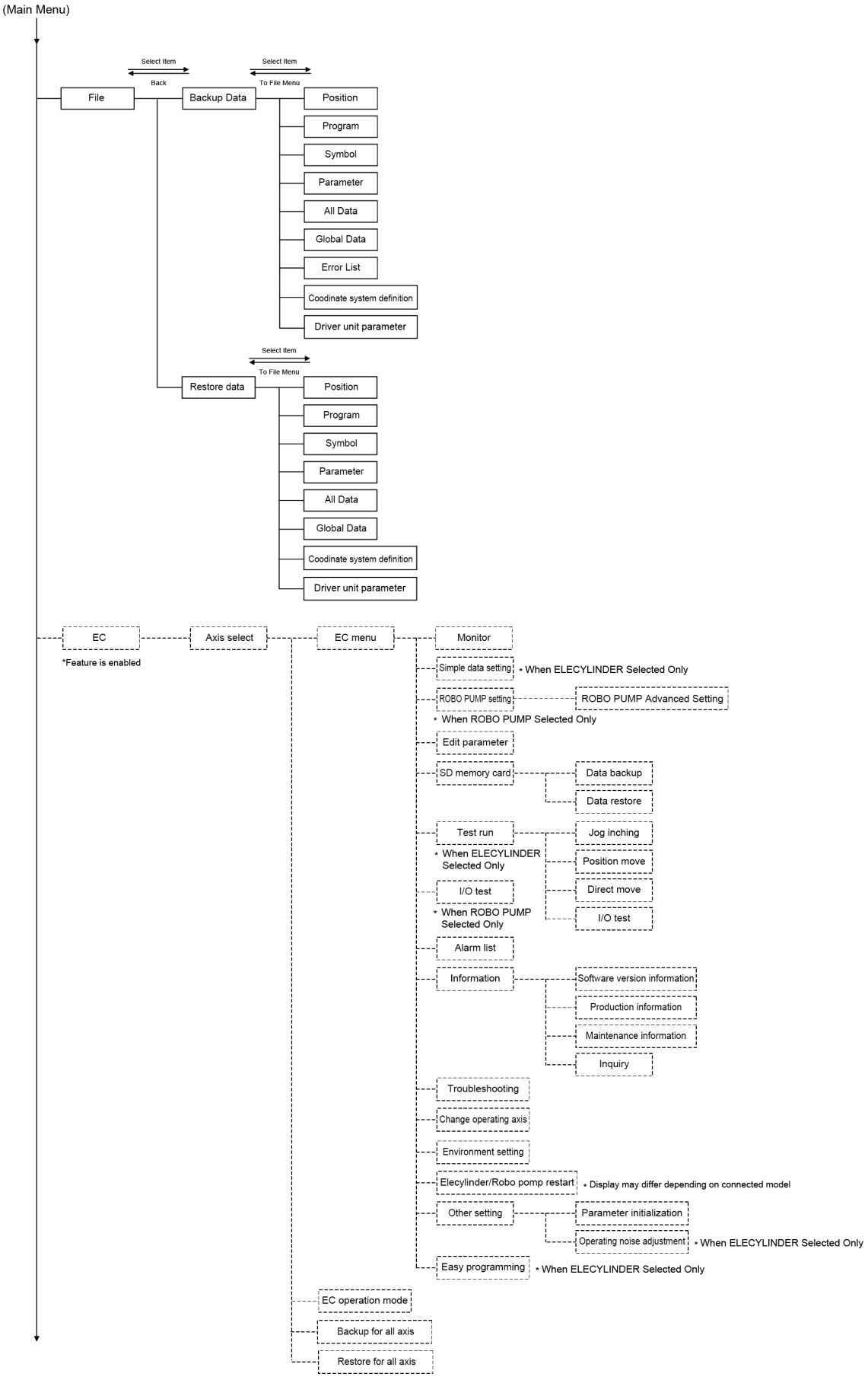
5.7.2 When 6-axis Cartesian Robot is connected

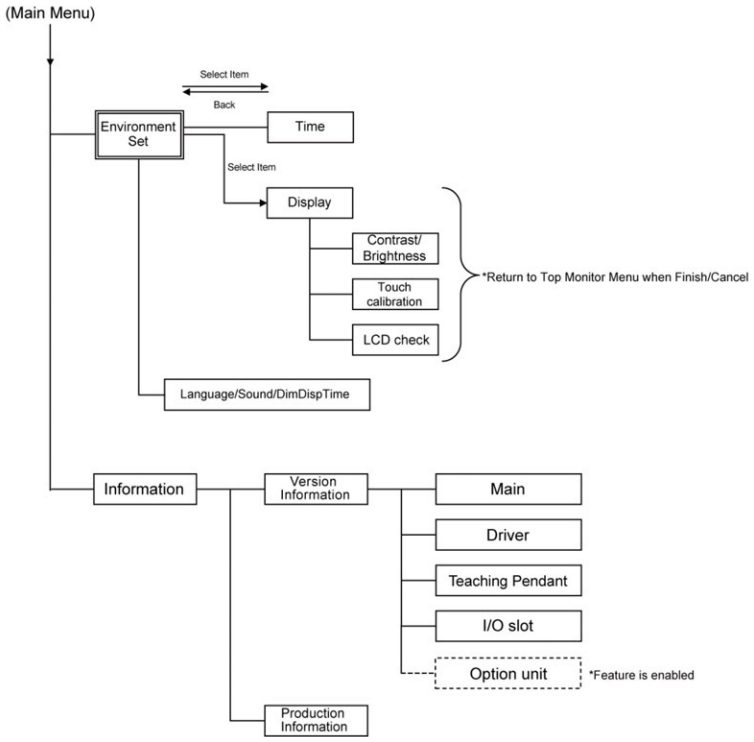



(Main Menu)
(Edit)
Select Item
Back
Symbol
Change/New
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input Port No.
Output Port No.
InOut Port No
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Parameter
I/O
MC common
Axes group
Axes
Actuator
Other
Driver unit
Option board
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*Some parameters are set after selecting Axes group No.
/Axes No./Device No.
*Data writing by "Write"
Coordinate System
Modify
Work coodinate system offset
Tool coodinate system offset
Simple interference check zone
Clear

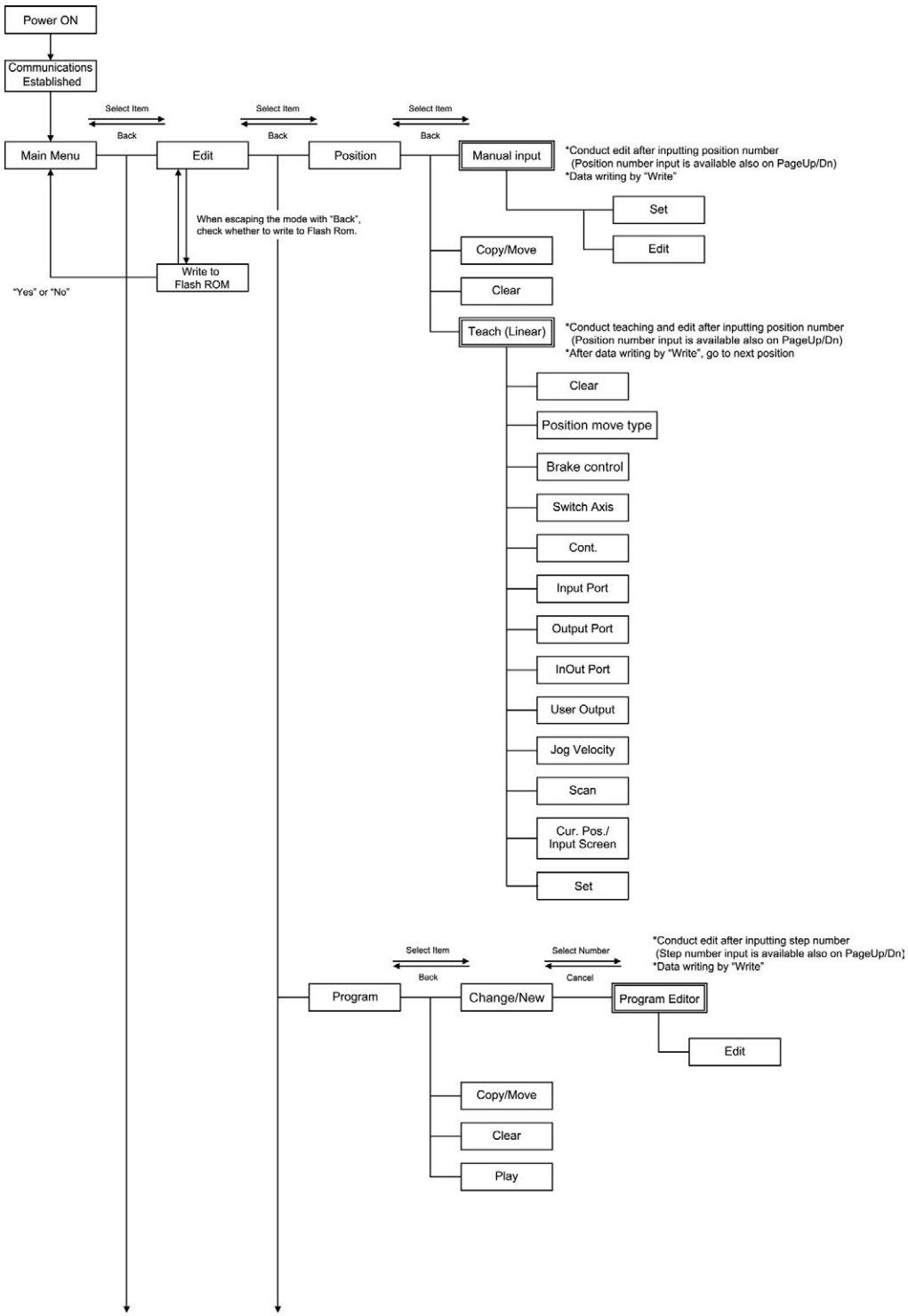

(Main Menu)
Play
Select Item
Back
Select Program
Select Number
Cancel
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Monitor
Back
Error
In port
Out port
InOut Port
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Monitor
Select Item
Back
Input Port
Output Port
InOut Port
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List
Select Number
List Display
Error Detail
Axis select
Driver alarm list
Driver alarm list
Back
Maintenance info.
Maintenance info. (Controller)
FAN Replacem.
*Feature is enabled
*Password (5119) input required at execution.
Maintenance info. (Actuator)
Actuator replacement
*Password (5119) input required at execution.
Pairing ID clear
*Feature is enabled
*Password (5119) input required at execution.
FAN Replacem.
*Feature is enabled
*Password (5119) input required at execution.
Lubrication
*Feature is enabled
*Password (5119) input required at execution.

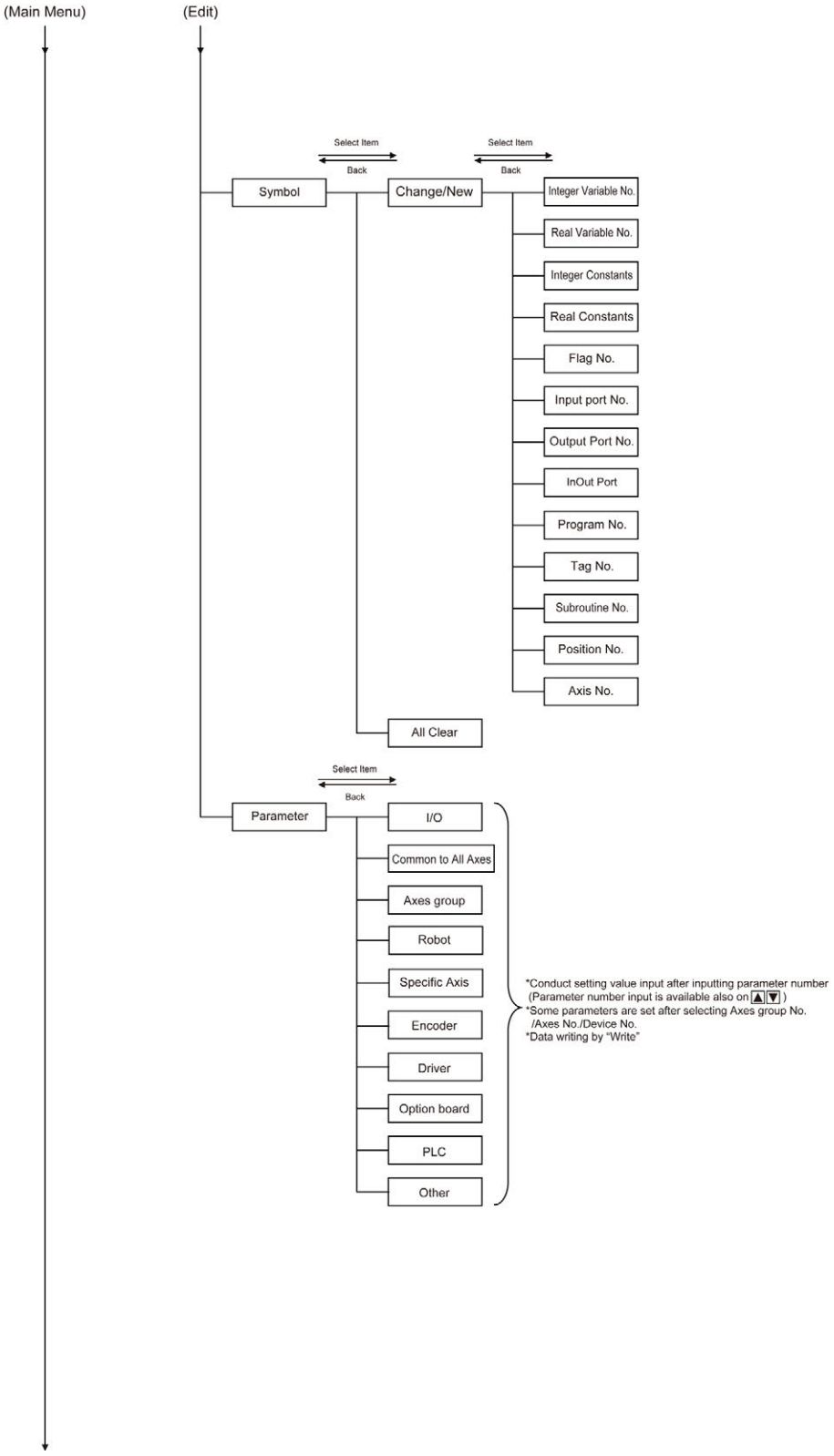

(Main Menu)
(Monitor)
Axis Status
Current Position
Status1
Status2
Sensor
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
Coordinate Sys.
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
Monitor Data
Power supply unit status
*Feature is enabled
Axis status
*Feature is enabled
EC Monitor Data
*Feature is enabled
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
Position Data
Coodinate Data
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
*Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
Time Setting
Pairing ID clear
*Feature is enabled.
*Password(5119) input required at execution.
Allocate Axis No.
Allocate Input/ Output Port
Allocate Input/ Output Port Data
Monitor Data
Output Function Select
Input Function Select
EC Monitor Data
*Feature is enabled
Option unit
Option unit detal setting
*Feature is enabled
EC operation mode
*Feature is enabled

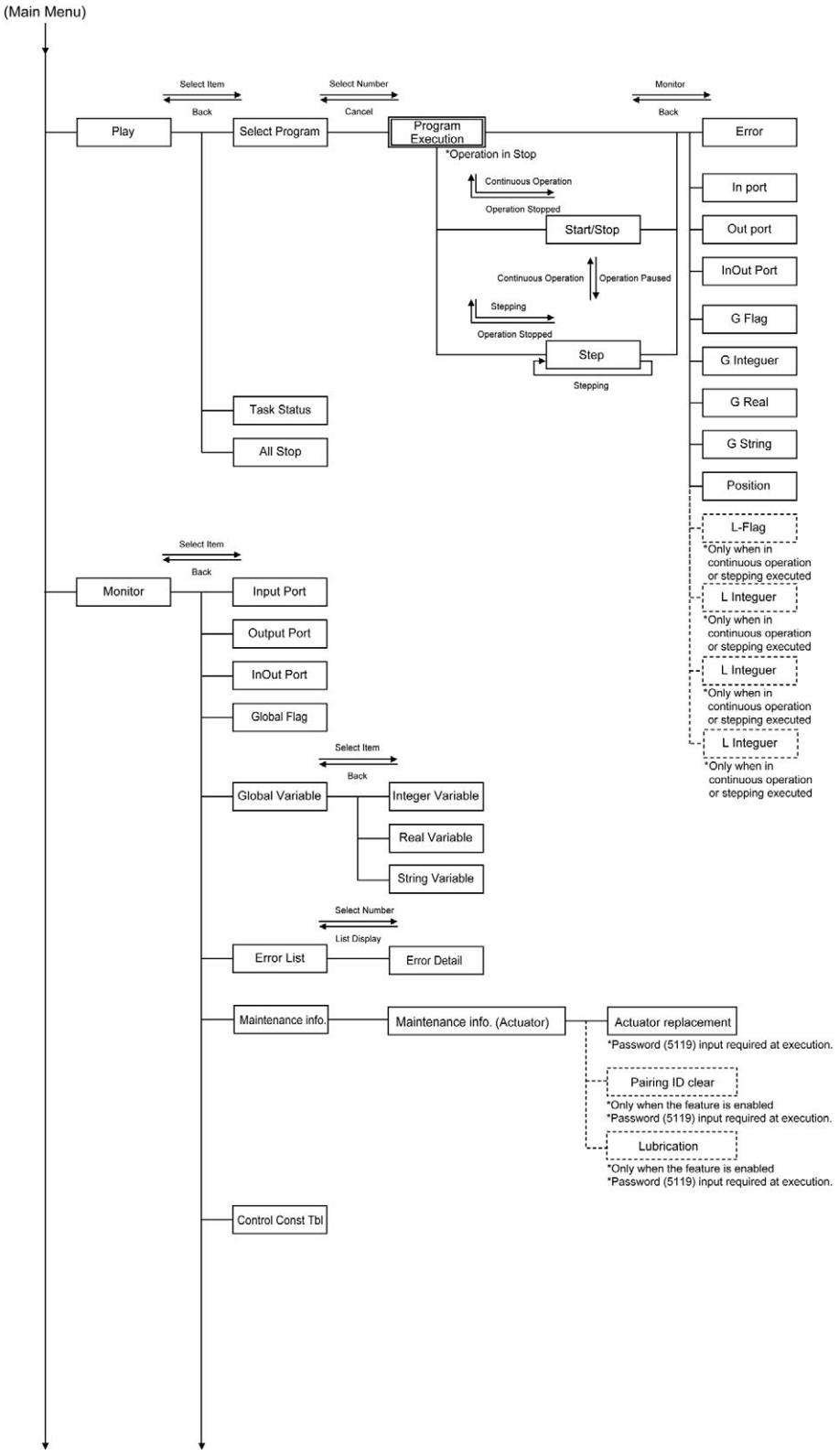

(Main Menu)
Select Item
Back
Select Item
To File Menu
File
Backup Data
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Coodinate system definition
Driver unit parameter
Select Item
To File Menu
Restore data
Position
Program
Symbol
Parameter
All Data
Global Data
Coodinate system definition
Driver unit parameter
EC
*Feature is enabled
Axis select
EC menu
Monitor
Simple data setting
* When ELECYLINDER Selected Only
ROBO PUMP setting
ROBO PUMP Advanced Setting
* When ROBO PUMP Selected Only
Edit parameter
SD memory card
Data backup
Data restore
Test run
* When ELECYLINDER Selected Only
I/O test
* When ROBO PUMP Selected Only
Jog inching
Position move
Direct move
I/O test
Alarm list
Information
Software version information
Production information
Maintenance information
Inquiry
Troubleshooting
Change operating axis
Environment setting
Elecylinder/Robo pomp restart
* Display may differ depending on connected model
Other setting
Parameter initialization
Operating noise adjustment
* When ELECYLINDER Selected Only
Easy programming
* When ELECYLINDER Selected Only
EC operation mode
Backup for all axis
Restore for all axis

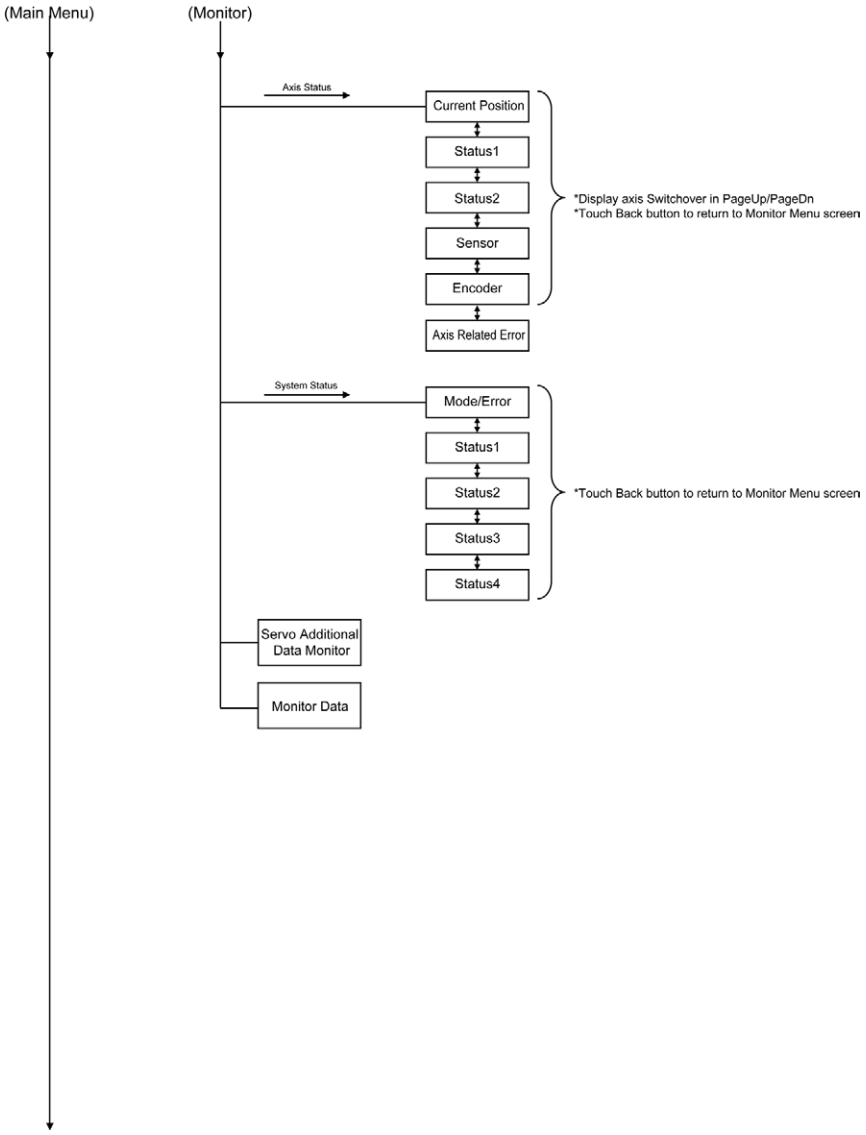

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime
Information
Version Information
Main
Driver
Teaching Pendant
I/O slot
Option unit
*Feature is enabled
Production Information

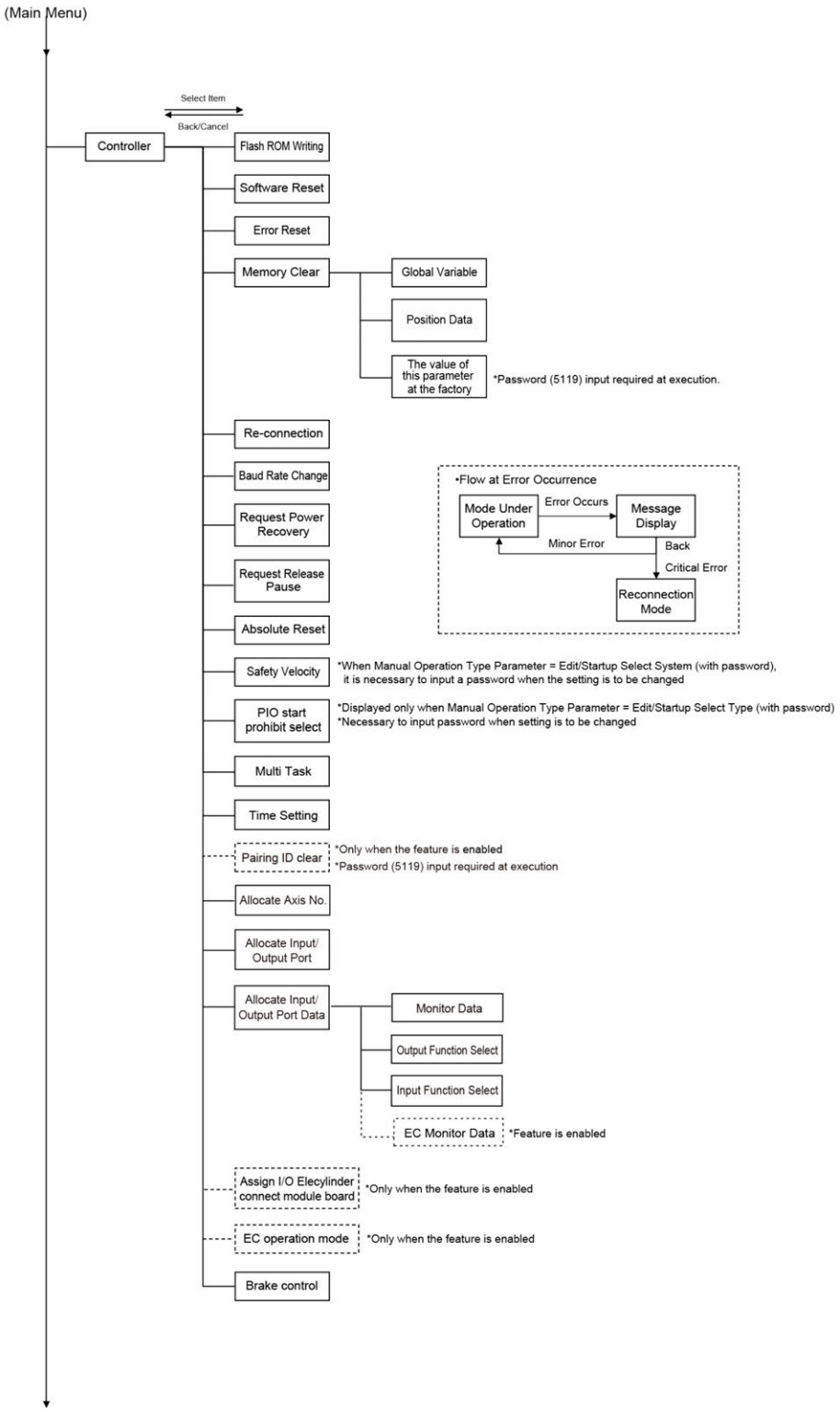
5.8 XSEL2-T Controller

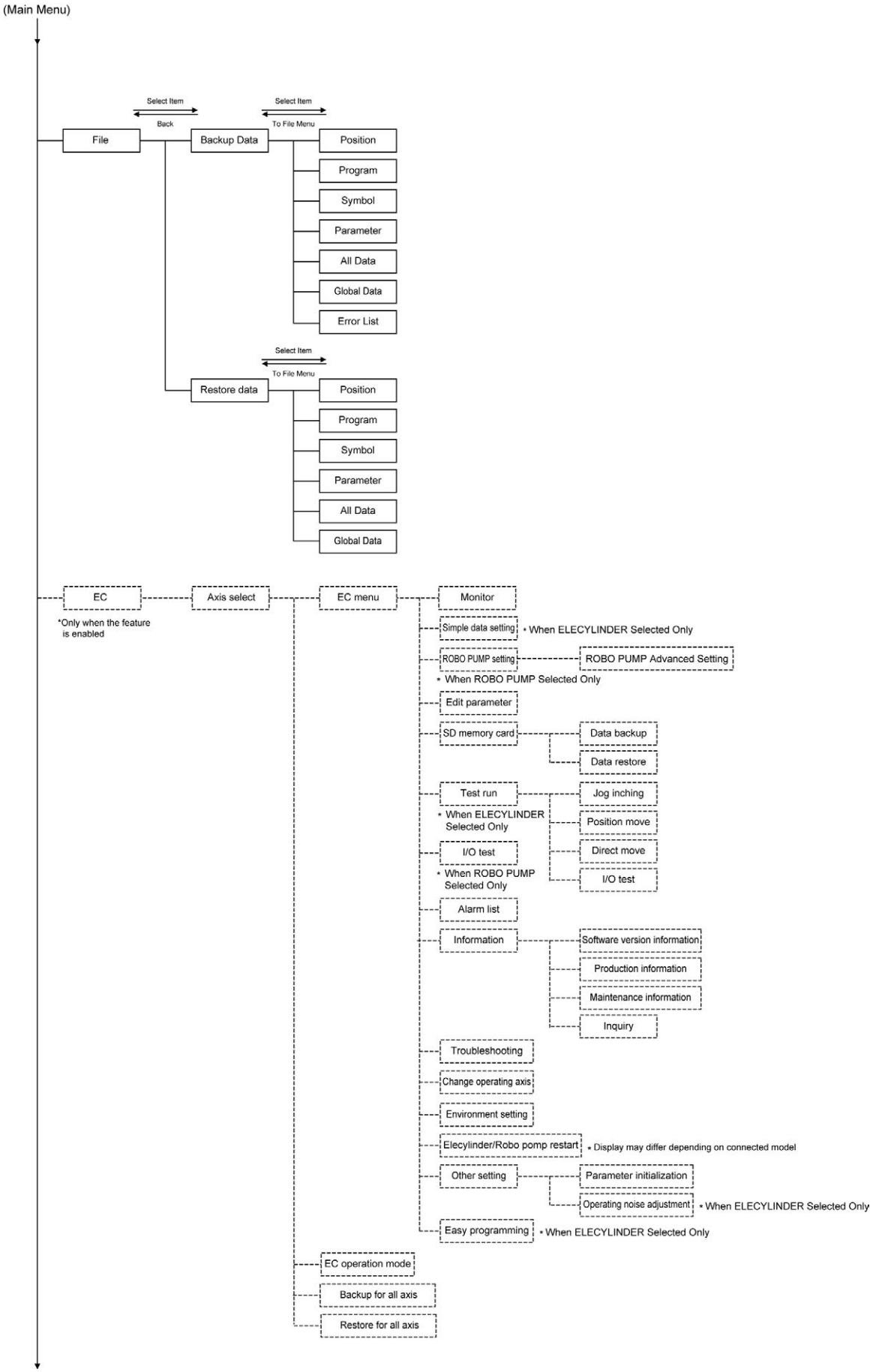


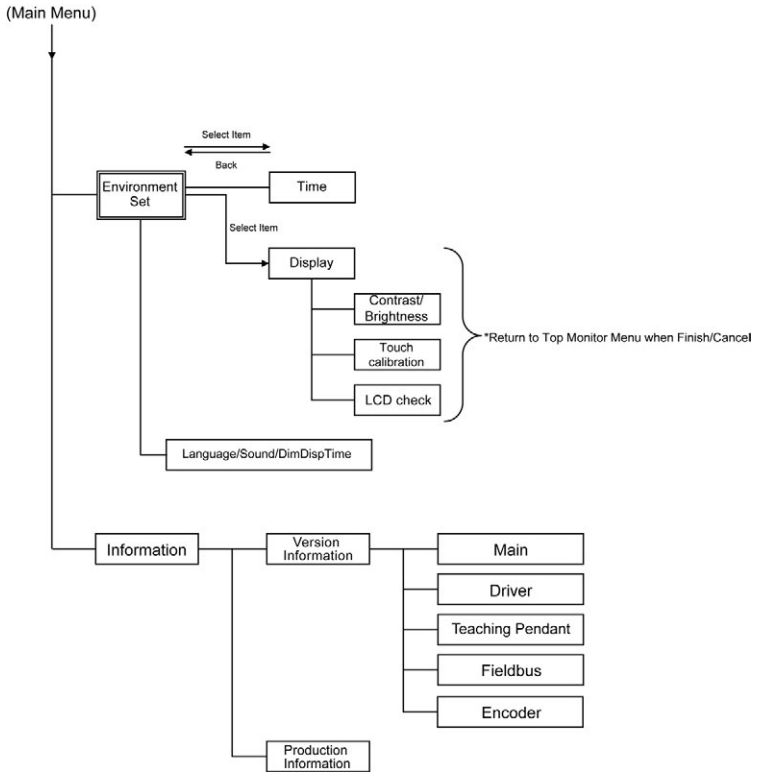

(Main Menu)
(Edit)
Select Item
Back
Select Item
Back
Symbol
Change/New
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input port No.
Output Port No.
InOut Port
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Select Item
Back
Parameter
I/O
Common to All Axes
Axes group
Robot
Specific Axis
Encoder
Driver
Option board
PLC
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*Some parameters are set after selecting Axes group No.
/Axes No./Device No.
*Data writing by "Write"


(Main Menu)
Select Item
Back
Select Number
Cancel
Monitor
Back
Play
Select Program
Program Execution
Error
*Operation in Stop
Continuous Operation
Operation Stopped
In port
Start/Stop
Out port
Continuous Operation
Operation Paused
InOut Port
Stepping
Operation Stopped
G Flag
Step
G Integuer
Stepping
G Real
G String
Task Status
All Stop
Position
L-Flag
*Only when in continuous operation or stepping executed
Select Item
Back
Monitor
Input Port
L Integuer
*Only when in continuous operation or stepping executed
Output Port
InOut Port
L Integuer
*Only when in continuous operation or stepping executed
Global Flag
L Integuer
*Only when in continuous operation or stepping executed
Select Item
Back
Global Variable
Integer Variable
Real Variable
String Variable
Select Number
List Display
Error List
Error Detail
Maintenance info.
Maintenance info. (Actuator)
Actuator replacement
*Password (5119) input required at execution.
Pairing ID clear
*Only when the feature is enabled
*Password (5119) input required at execution.
Lubrication
*Only when the feature is enabled
*Password (5119) input required at execution.
Control Const Tbl

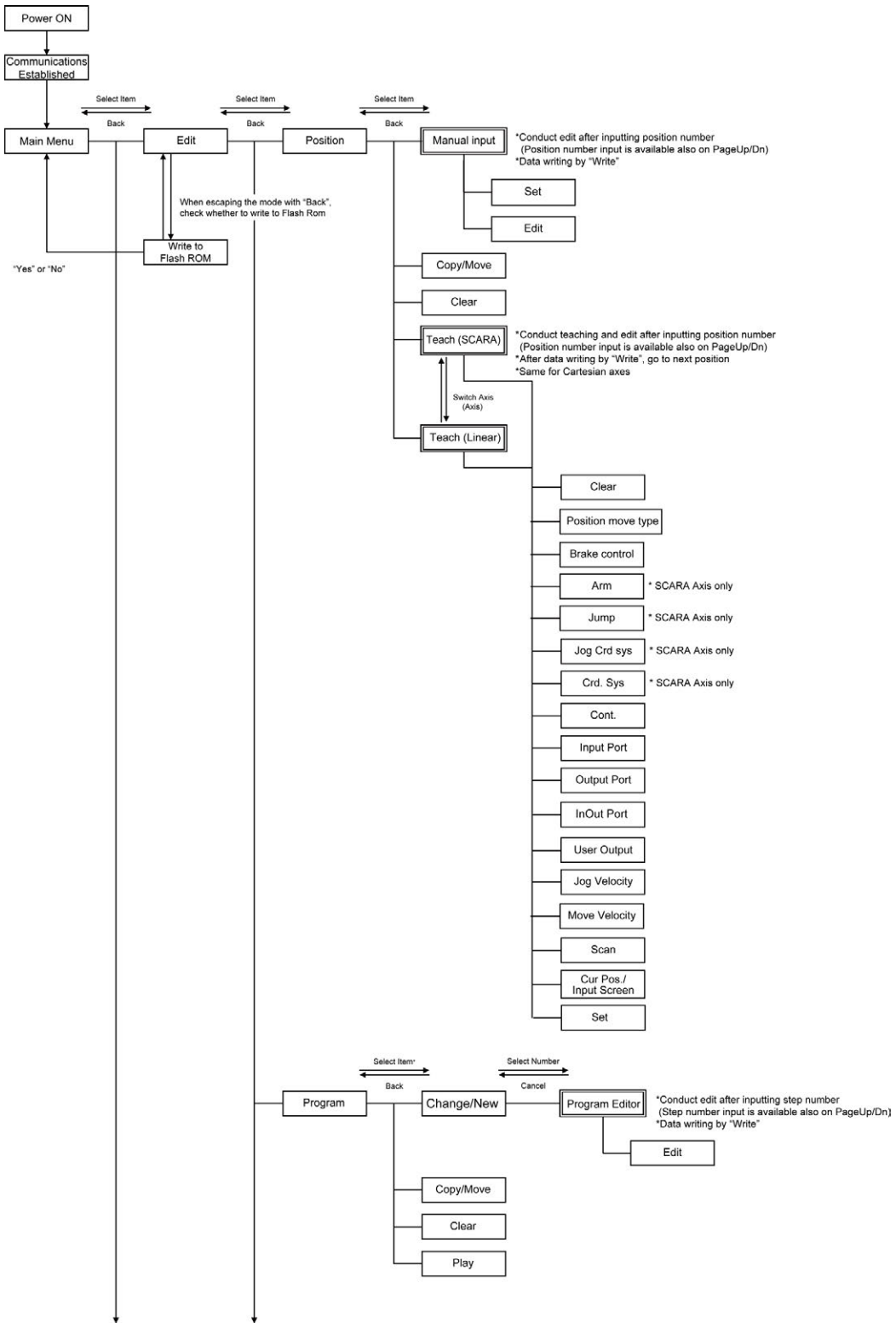

(Main Menu)
(Monitor)
Axis Status
Current Position
Status1
Status2
Sensor
Encoder
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
Monitor Data

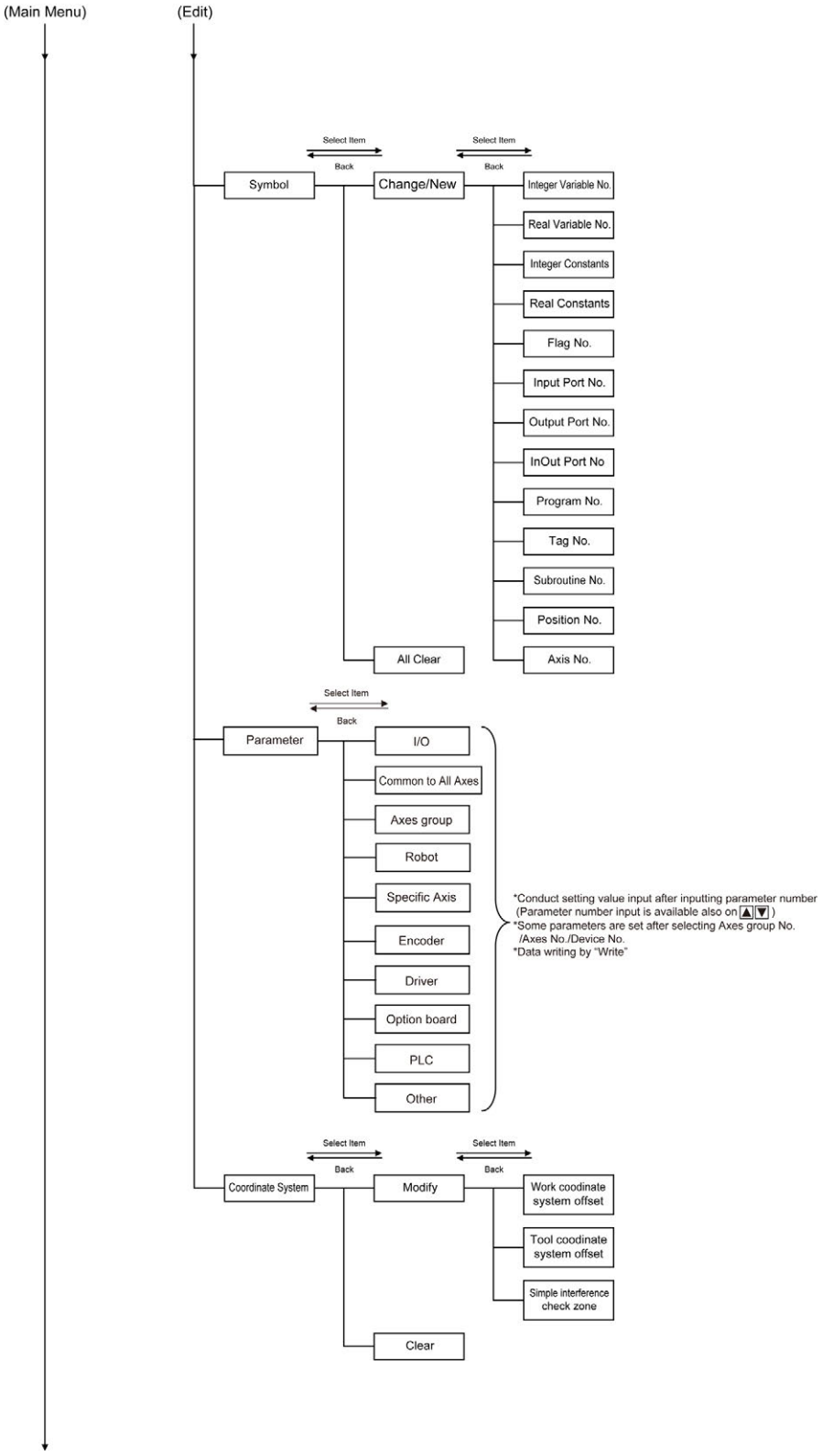

(Main Menu)
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
Position Data
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
Time Setting
Pairing ID clear
*Only when the feature is enabled
*Password (5119) input required at execution
Allocate Axis No.
Allocate Input/ Output Port
Allocate Input/ Output Port Data
Monitor Data
Output Function Select
Input Function Select
EC Monitor Data
*Feature is enabled
Assign I/O Elecylinder connect module board
*Only when the feature is enabled
EC operation mode
*Only when the feature is enabled
Brake control
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode

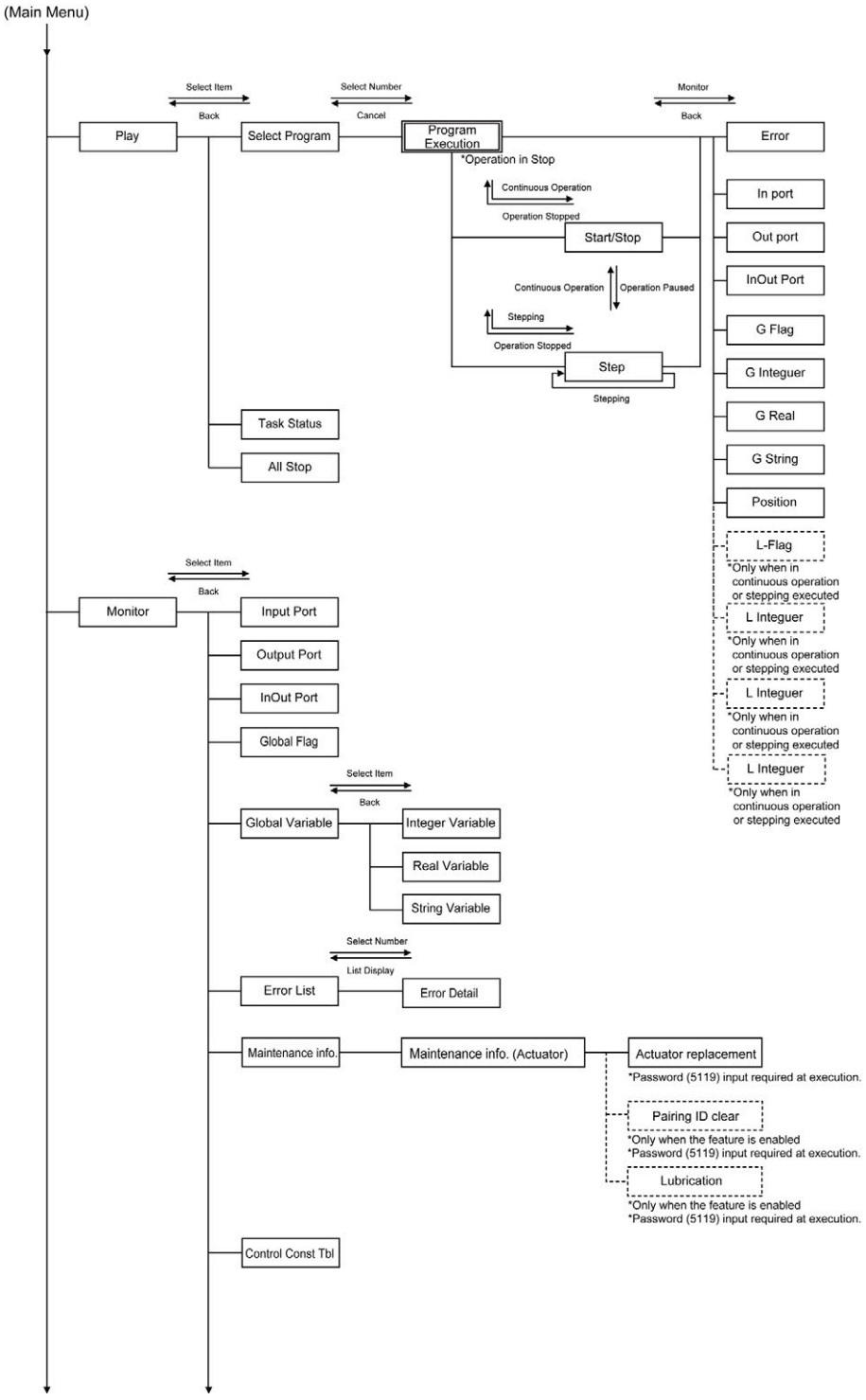

(Main Menu)
File
Select Item
Back
Backup Data
Select Item
To File Menu
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Restore data
Select Item
To File Menu
Position
Program
Symbol
Parameter
All Data
Global Data
EC
*Only when the feature is enabled
Axis select
EC menu
Monitor
Simple data setting
* When ELECYLINDER Selected Only
ROBO PUMP setting
ROBO PUMP Advanced Setting
* When ROBO PUMP Selected Only
Edit parameter
SD memory card
Data backup
Data restore
Test run
* When ELECYLINDER Selected Only
Jog inching
Position move
Direct move
I/O test
I/O test
* When ROBO PUMP Selected Only
Alarm list
Information
Software version information
Production information
Maintenance information
Inquiry
Troubleshooting
Change operating axis
Environment setting
Elecylinder/Robo pomp restart
* Display may differ depending on connected model
Other setting
Parameter initialization
Operating noise adjustment
* When ELECYLINDER Selected Only
Easy programming
* When ELECYLINDER Selected Only
EC operation mode
Backup for all axis
Restore for all axis

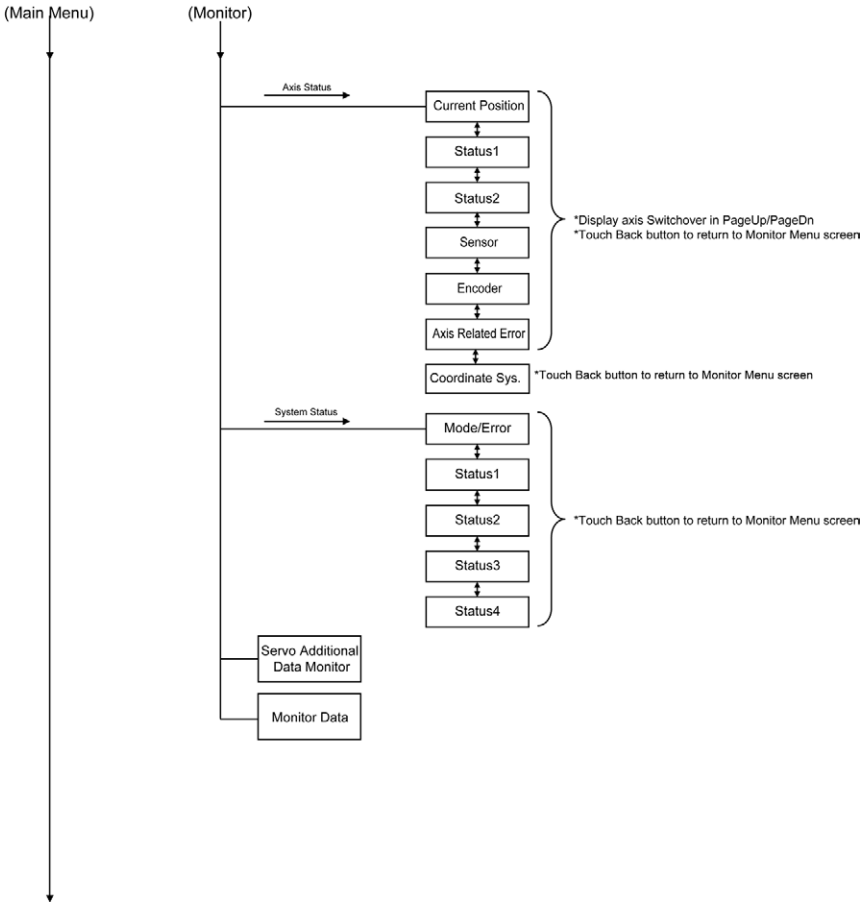

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime
Information
Version Information
Main
Driver
Teaching Pendant
Fieldbus
Encoder
Production Information

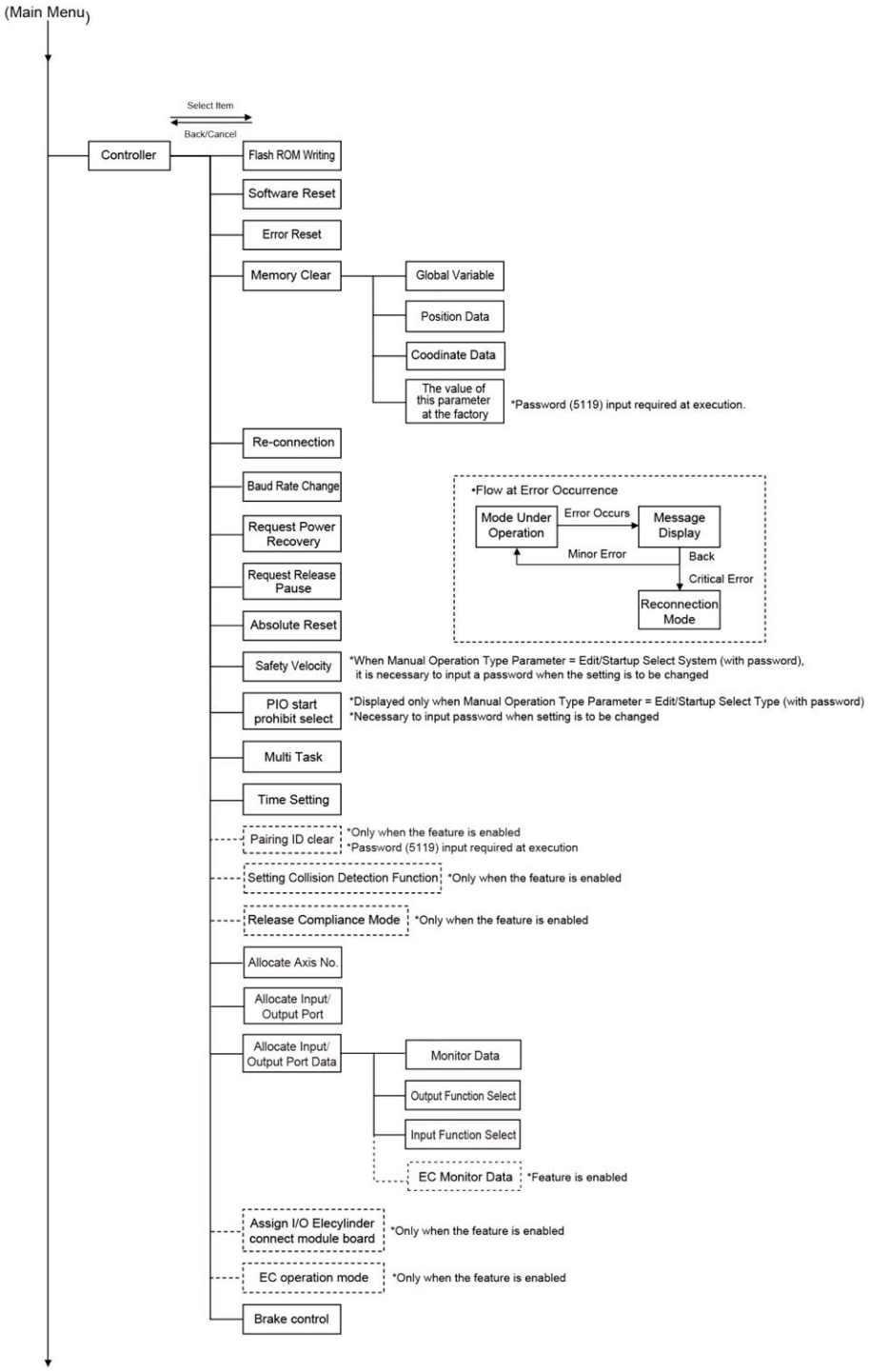
5.9 XSEL2-TX Controller

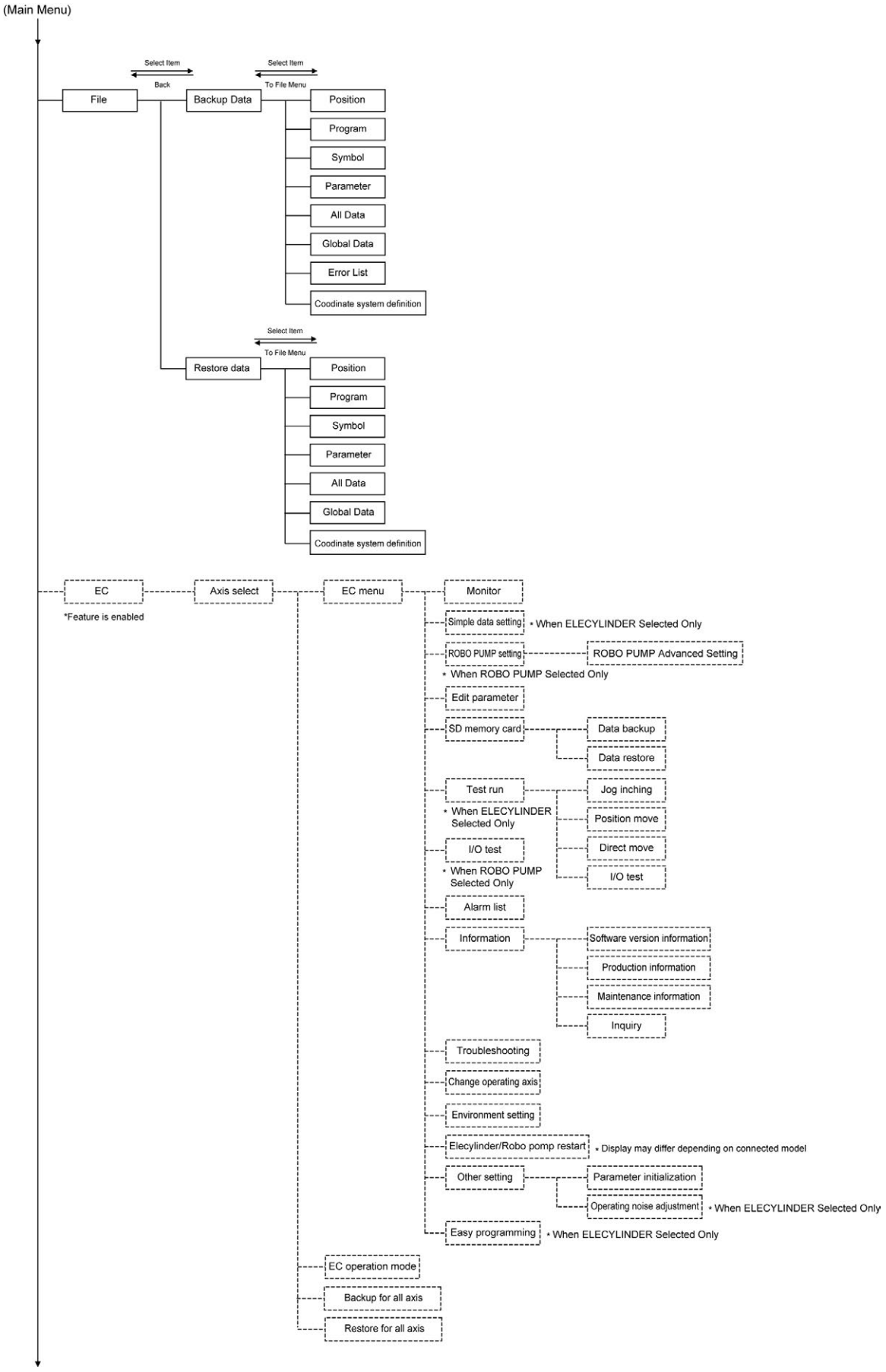


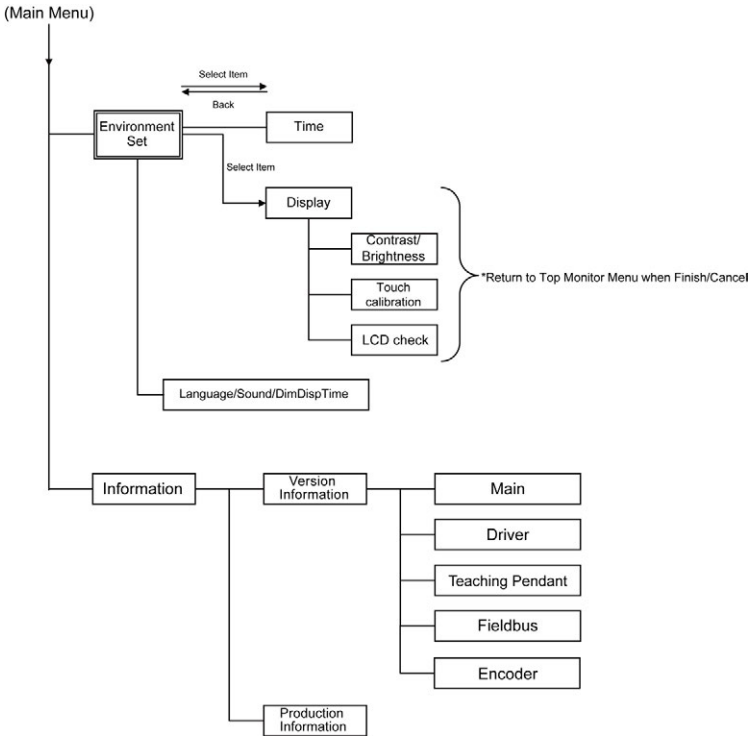

(Main Menu)
(Edit)
Select Item
Back
Symbol
Change/New
Integer Variable No.
Real Variable No.
Integer Constants
Real Constants
Flag No.
Input Port No.
Output Port No.
InOut Port No
Program No.
Tag No.
Subroutine No.
Position No.
Axis No.
All Clear
Parameter
I/O
Common to All Axes
Axes group
Robot
Specific Axis
Encoder
Driver
Option board
PLC
Other
*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*Some parameters are set after selecting Axes group No.
/Axes No./Device No.
*Data writing by "Write"
Coordinate System
Modify
Work coodinate system offset
Tool coodinate system offset
Simple interference check zone
Clear


(Main Menu)
Play
Select Item
Back
Select Program
Select Number
Cancel
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
Task Status
All Stop
Monitor
Back
Error
In port
Out port
InOut Port
G Flag
G Integuer
G Real
G String
Position
L-Flag
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
L Integuer
*Only when in continuous operation or stepping executed
Monitor
Select Item
Back
Input Port
Output Port
InOut Port
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List
Select Number
List Display
Error Detail
Maintenance info.
Maintenance info. (Actuator)
Actuator replacement
*Password (5119) input required at execution.
Pairing ID clear
*Only when the feature is enabled
*Password (5119) input required at execution.
Lubrication
*Only when the feature is enabled
*Password (5119) input required at execution.
Control Const Tbl

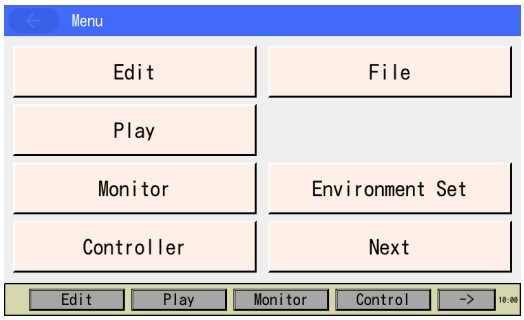

(Main Menu)
(Monitor)
Axis Status
Current Position
Status1
Status2
Sensor
Encoder
Axis Related Error
*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen
Coordinate Sys.
*Touch Back button to return to Monitor Menu screen
System Status
Mode/Error
Status1
Status2
Status3
Status4
*Touch Back button to return to Monitor Menu screen
Servo Additional Data Monitor
Monitor Data


(Main Menu)
Select Item
Back/Cancel
Controller
Flash ROM Writing
Software Reset
Error Reset
Memory Clear
Global Variable
Position Data
Coodinate Data
The value of this parameter at the factory
*Password (5119) input required at execution.
Re-connection
Baud Rate Change
Request Power Recovery
Request Release Pause
Absolute Reset
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode
Safety Velocity
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed
PIO start prohibit select
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed
Multi Task
Time Setting
Pairing ID clear
*Only when the feature is enabled
*Password (5119) input required at execution
Setting Collision Detection Function
*Only when the feature is enabled
Release Compliance Mode
*Only when the feature is enabled
Allocate Axis No.
Allocate Input/ Output Port
Allocate Input/ Output Port Data
Monitor Data
Output Function Select
Input Function Select
EC Monitor Data
*Feature is enabled
Assign I/O Elecylinder connect module board
*Only when the feature is enabled
EC operation mode
*Only when the feature is enabled
Brake control


(Main Menu)
File
Select Item
Back
Backup Data
Select Item
To File Menu
Position
Program
Symbol
Parameter
All Data
Global Data
Error List
Coodinate system definition
Restore data
Select Item
To File Menu
Position
Program
Symbol
Parameter
All Data
Global Data
Coodinate system definition
EC
*Feature is enabled
Axis select
EC menu
Monitor
Simple data setting
* When ELECYLINDER Selected Only
ROBO PUMP setting
ROBO PUMP Advanced Setting
* When ROBO PUMP Selected Only
Edit parameter
SD memory card
Data backup
Data restore
Test run
* When ELECYLINDER Selected Only
Jog inching
Position move
Direct move
I/O test
I/O test
* When ROBO PUMP Selected Only
Alarm list
Information
Software version information
Production information
Maintenance information
Inquiry
Troubleshooting
Change operating axis
Environment setting
Elecylinder/Robo pomp restart
* Display may differ depending on connected model
Other setting
Parameter initialization
Operating noise adjustment
* When ELECYLINDER Selected Only
Easy programming
* When ELECYLINDER Selected Only
EC operation mode
Backup for all axis
Restore for all axis


(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime
Information
Version Information
Main
Driver
Teaching Pendant
Fieldbus
Encoder
Production Information

6. Menu Selection



There are several items in the menu as shown below. Select one of them and touch it. (For switchover between Menu and Menu 2, touch Next/Prev. buttons.) Screen switches to an item you touched.

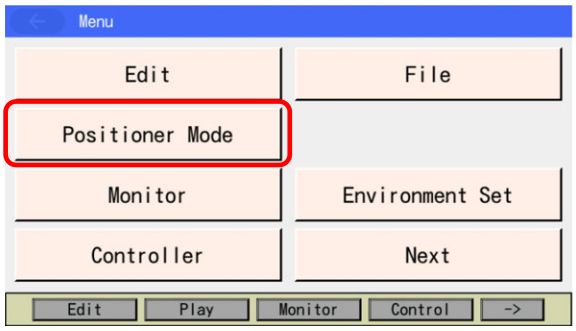
Menu list

- Edit : Editing of the positions, programs, symbols, parameters and coordinate systems, status display of the actuator and manual operation (teaching) can be performed.
  Refer to [8. Position Edit], [9. Program Edit], [11. Coordinate System Data Editing], [12. Symbol Edit] and [13. Parameter Edit].
- Play : Operation of the program drive and confirmation of task status can be conducted.
  Refer to [10. Program Execution].
- Monitor : Input ports, global flags, global variables, error list, version information*, maintenance information, axis status, system status and so on can be displayed.
  Refer to [14. Monitor].
- Controller : Setting or operation command of FROM writing, software reset, error reset, memory initializing, reconnection, baud rate change, drive source recovery request, pause cancel request, absolute reset, safety velocity, multiple program simultaneous startup are to be conducted.
  Refer to [15. Controller].
- File : Reading or saving of each data of positions, programs, parameters, symbols, error list and global can be conducted.
  Refer to [20. Data Backup].
- Environment Set : Language setting, touch operation sound, power-off time, display setting and clock setting can be performed.
  Refer to [21. Environment Setting].
- Teaching update : Software in this touch panel teaching pendant is to be updated using a Secure Digital memory card.
  Refer to [24. Appendix 24.2 Teaching update]
- Information : Version* and manufacturing information is displayed.
  Refer to [23. Information Display] (for applicable models only)

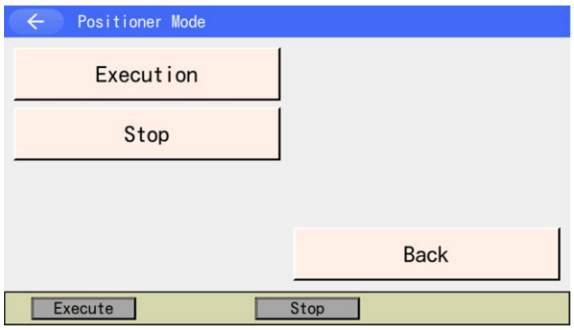
* The version information is to be displayed from either the monitor menu or the information menu. (It differs depending on the controller.)
* The figures on the lower right section of the panel, show the current time (This time display is shown also on the other screens).

7. Execute or Stop the Positioner Mode of the SSEL, ASEL and PSEL Controller

When the SSEL, ASEL or PSEL controller is in the positioner mode, execute or stop the positioner mode.



Touch Positioner Mode button in the Menu screen.



There are two items in the Positioner Mode screen.

Execution : Start up the positioner mode that is currently indicated.
Stop : Finish the positioner mode that is currently indicated.

> ⚠ *Caution: When the SSEL, ASEL or PSEL controller is executing in the positioner mode, parameter changes or Flash ROM writing cannot be performed.*
> *After stopping the positioner mode by the above operation, perform parameter changes or Flash ROM writing.*

8. Position Edit

There are two ways to input the position data.

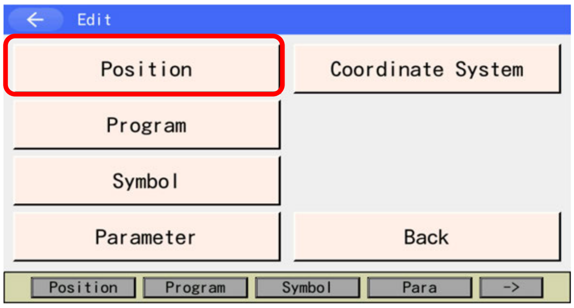
(1) Numerical input · It is the way to input numbers directly on the numeric keys in the touch panel in the position edit screen.

(2) Teaching ·········· The way to set on the target position by manual movement (direct teaching) of either JOG operation or inching operation with the servo being off, and to indicate to read that position (current position) in the position table.

8.1 Manual Input (Numerical Input)

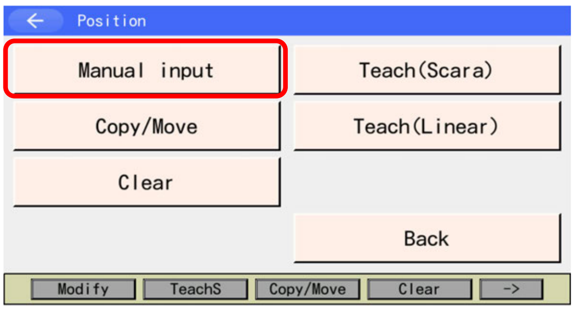


Touch Edit button in the Menu screen.



Touch Position button on the Edit screen.

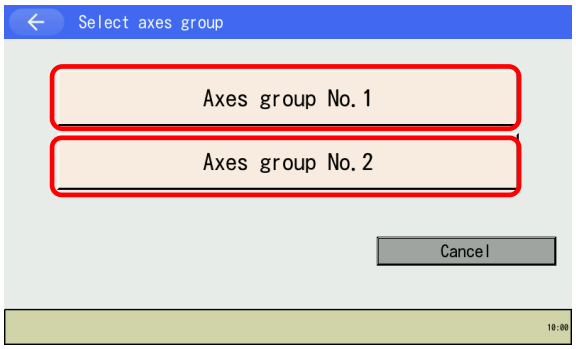
* Example shown on the left is for XSEL-JX/KX, PX/QX, RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD, MSEL-PCX/PGX and XSEL2-TX.



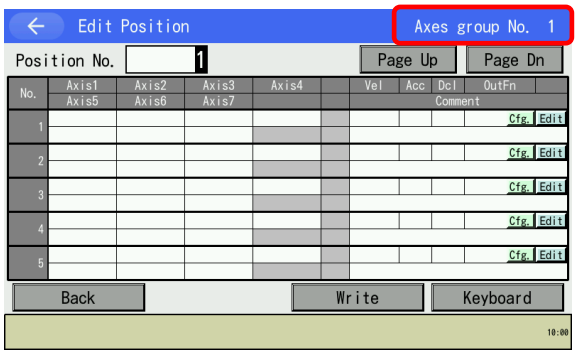
Touch Manual input button in Position menu screen.
Edit Position screen will appear.

* Example shown on the left is for XSEL-PX/QX, RX/SX, RAX/SAX, XSEL2-TX and MSEL-PCX/PGX (for 3-axis SCARA + additional axis type).

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Manual Input button. Touch an axes group number button to select the axes group number that is to be subject to.



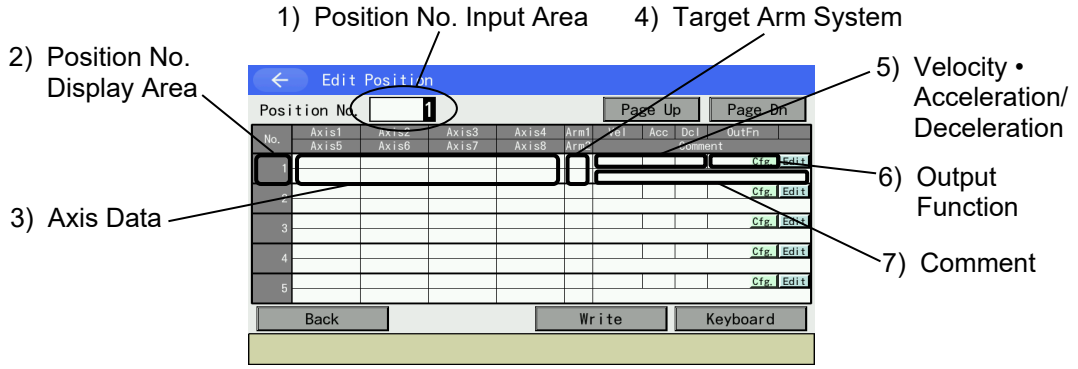
The select axes group screen should appear after you touch the Manual Input button.
Touch an Axes group No. button.

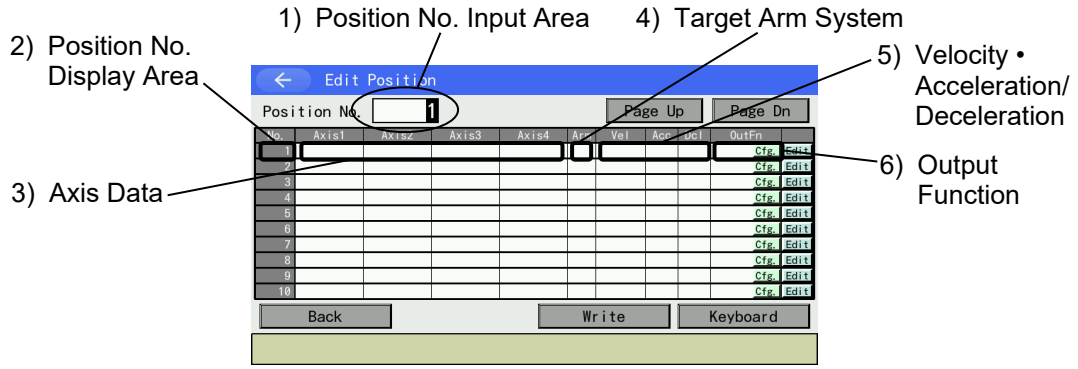


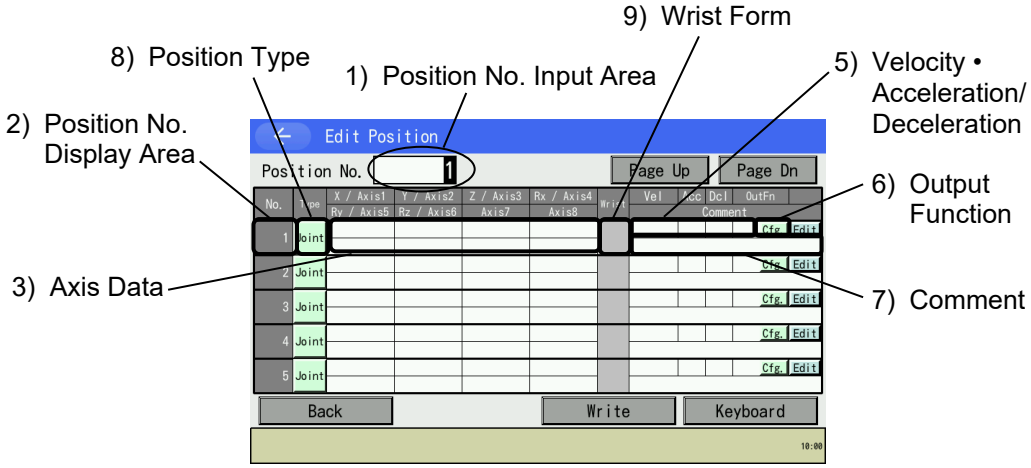
Edit Position screen will appear.

* The axes group number that was selected should be shown on the top right of the screen.

[Items Shown in Edit Position Screen]







* Figures on the top are for controllers with five axes or more. Figures on the middle are for controllers with four axes or more. The figure at the bottom shows a controller applicable for the 6-axis cartesian and 6-axis cartesian is set valid.
* Displayed items differ depending on the controller.

1) Position No. Input Area
Input position No. Displayed range will differ depending on the input value.

2) Position No. Display Area
It shows the Position No.

3) Axis Data
It is shown for the number of axes actually installed.
Axes 1 to 4
Indicate the positions of Axes 1 to 4.
Indicate the positions of SCARA axes for XSEL-JX/KX/PX/QX/RX/SX/RXD/SXD/RAX/SAX/RAXD/SAXD, MSEL-PCX/PGX and XSEL2-TX controllers. (Only when Group No. 1 for XSEL2-TX. For 3-axis SCARA type, Axes 1 to 3 are for the position indication of SCARA axis, and Axis 4 for additional axis.)
The range available to indicate is from -99999.999 to 99999.999.
Axes 5 to 8
Indicate the positions of Axes 5 to 8.
Indicate the positions of SCARA axes for XSEL-RXD/SXD/RAXD/SAXD controllers.
The range available to indicate is from -99999.999 to 99999.999.

It should be as shown below when the 6-axis cartesian is activated.
X / Axes 1 to Rz / Axis 6
Indicate the position of the 6-axis cartesian.
The range available to indicate is from -99999.999 to 99999.999.
Axes 7 to Axis 8
Indicate the positions of the 6-axis cartesian added axes. Display should be only for the number of valid added axes.
The positions of the added axes should be available for indication only when the position type is the each axis coordinates.
The range available to indicate is from -99999.999 to 99999.999.

4) Target Arm System
Arm1 (Arm), Arm2
Indicate the target arm system of SCARA Axis (Axes 1 to 4 or Axes 1 to 3) and SCARA Axis (Axes 5 to 8) with Left and Right.
Arm1 (Arm) are displayed only when XSEL-RX/SX/RXD/SXD/RAX/SAX/RAXD/SAXD, MSEL-PCX/PGX or XSEL2-TX controller is connected. (Only when Group No. 1 for XSEL2-TX.)
Arm2 are displayed only when XSEL- RXD/SXD/RAXD/SAXD controller is connected.
The target arm system indication set in this section is effective in the following operations.
- Movement by MOVE button in Teaching screen (When there is no PTP target arm system setting in the position data, operation is made as “current arm system (movement of opposite arm system allowed when impossible)”)
- Servo operation SEL Command using position data

5) Velocity • Acceleration/Deceleration

Vel

Indicate the velocity.

The range available to indicate is from 1 to 9999. However, when the controller is XSEL-J/K/P/Q/R/S/RA/SA, SSEL, PSEL, ASEL, TT, TTA, MSEL-PC/PG/PCF/PGF or XSEL2-T and All Axes Common Parameter No. 20 “Max. Operation Velocity Check Timing” is set to 0, the range is from 1 to All Axis Common Parameter No. 21 “Max. Operation Velocity for Input Check”.

Acc

Indicate the Acceleration.

The range available to indicate is from 0.01 to 9.99. However, when the controller is XSEL-PX/QX, the range is from 0.01 to the higher value in either of All Axes Common Parameter No. 22 “SCARA Axis Max. CP Acceleration” or All Axes Common Parameter No. 203 “Linear Axis Max. Acceleration”.

"Max. Acceleration" and "Max. CP Acceleration" in All Axes Common Parameter No. 18 are in the maximum values When All Axes Common Parameter No. 18 "Max. Operation Acceleration / Deceleration Check Timing" is set to 0 in XSEL-P/Q/R/S/RA/SA, SSEL and XSEL2-T and for XSEL-J/K/JX/KX, ASEL, PSEL, TT, TTA or MSEL-PC/PG/PCF/PGF.

Dcl

Indicate the Deceleration.

The range available to indicate is from 0.01 to 9.99. However, when the controller is XSEL-PX/QX, the range is from 0.01 to the higher value in either of All Axes Common Parameter No. 23 “SCARA Axis Max. CP Deceleration” or All Axes Common Parameter No. 204 “Linear Axis Max. Deceleration”.

"Max. Deceleration" and "Max. CP Deceleration" in All Axes Common Parameter No. 19 are in the maximum values When All Axes Common Parameter No. 18 "Max. Operation Acceleration / Deceleration Check Timing" is set to 0 in XSEL-P/Q/R/S/RA/SA, SSEL and XSEL2-T and for XSEL-J/K/JX/KX, ASEL, PSEL, TT, TTA or MSEL-PC/PG/PCF/PGF.

6) Output Function

When the controller has position output operation feature support and the feature is activated only.

OutFn

Output functions of the position output operation feature are displayed. Setting can be conducted on the setting button.

7) Comment

Comment

It is displayed only when XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/RAXD/SAXD, RSEL and XSEL2-T/TX controller is connected.

Input a comment if necessary. (32 letters with half-size font at max.)

A comments can be input to the positions from No. 1 to 10000 for XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/RAXD/SAXD.

A comment can be input to any position number for RSEL and XSEL2-T/TX (up to 10000 comments).

8) Position Type

Type

It should be displayed only when the 6-axis cartesian is activated.

Position data type (orthogonal/each axis coordinates) is to be indicated. Touch the button and the type switches over between the orthogonal coordinates (orthogonal) and each axis coordinates (each axis).

9) Wrist Form

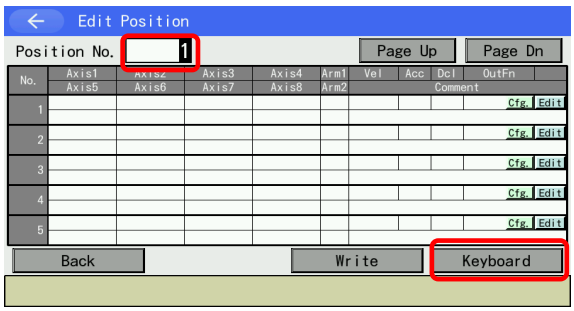
Wrist

It should be displayed only when the 6-axis cartesian is activated.

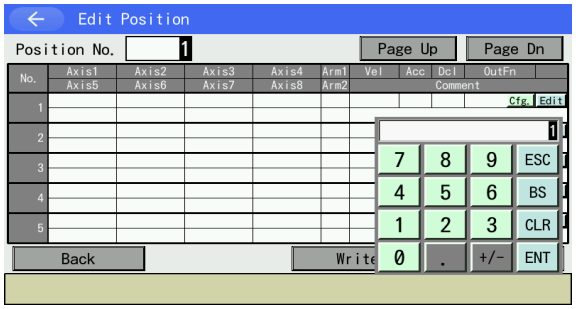
Indication can be made for the wrist form (Flip/Non Flip/Not Indicated). It can be indicated only when the position type is the orthogonal coordinates.

8.1.1 Basic Operation

[Addition and Change of Position Data]
First, indicate the position number that an addition or a change is required. When the screen is opened for the first time, a cursor is flashing in the position number input box. (When no flashing is confirmed, touch in the position number input box.)

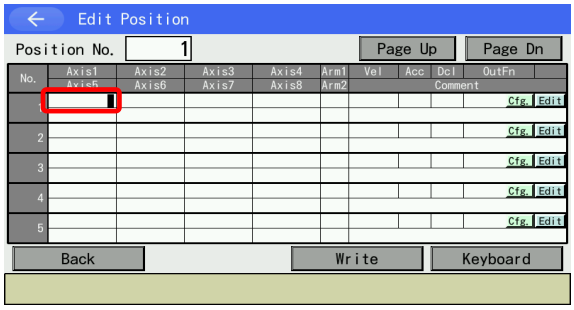


Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.

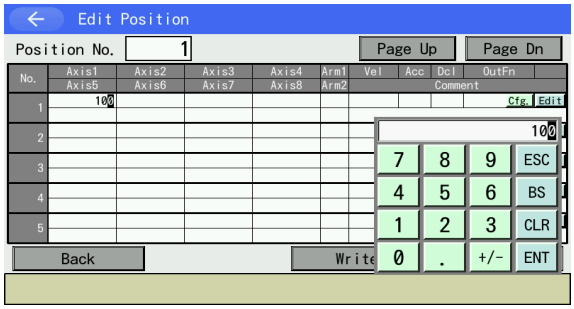


Touch the numeric part on the touch panel numeric keys to input numbers.
The contents of input will be shown in the box above the touch panel numeric keys.
When confirming the input number, touch ENT.
After touch panel numeric keys close and displayed range switches, the cursor moves to the input box for Axis1.
When redoing the input, touch ESC.
When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.

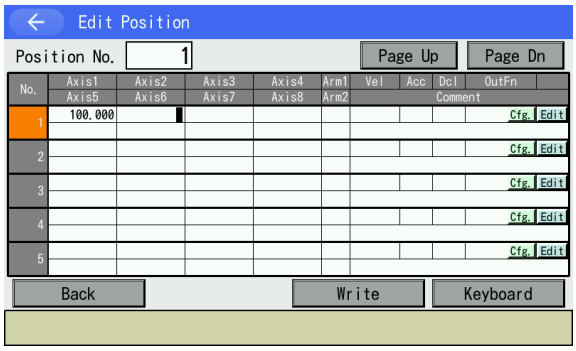
[Input of Axis Data (Axes 1 to 8 and X / Axis 1 to Rz / Axis 6), Vel (Velocity), Acc (Acceleration) and Dcl (Deceleration)]
Show the cursor to the input area for the item which is desired for inputting. To show the cursor in the input area for the item which is desired for inputting is to touch in that area (white area in the background, or an area framed in red for Axis1).



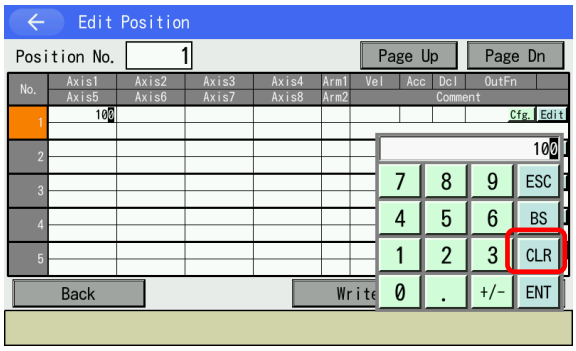
Touch the keyboard button with the cursor being displayed to show the touch panel numeric keys in order to input numbers.



If you want to input 100 to Axis1 (1st axis), touch Keyboard button to show the touch panel numeric keys, and touch 1 0 0 ENT on the touch panel numeric keys.



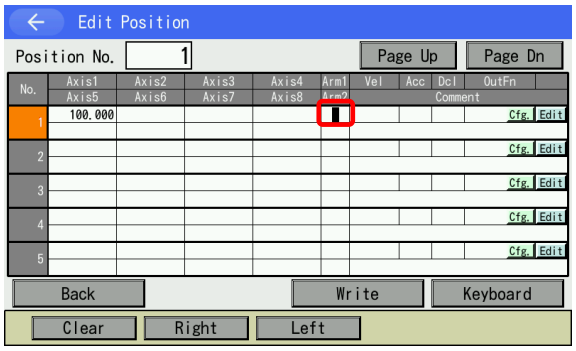
If it is accepted correctly, the focus moves onto Axis2. (If only one axis is installed, the cursor moves to Vel.)
Also, to show that it is being edited (controller writing not yet done), the background color in the position number display box turns to orange.
Axes 2 to 8 (for number of actually installed), Vel (velocity), Acc (acceleration) and Dcl (deceleration) are available to input.



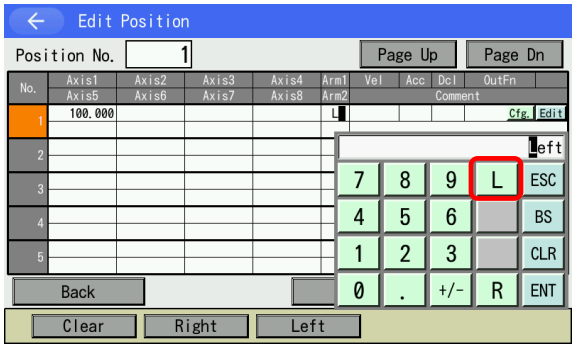
When you want to erase the data that is already input, touch CLR ENT on the touch panel numeric keys to delete what you want.

[Input of Target Arm System Data (Arm1 or Arm), (Arm2)]
* Arm1 (Arm) is a function dedicated only for XSEL-RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD, MSEL-PCX/PGX or XSEL2-TX.
  Arm2 is a function dedicated only for XSEL-RXD/SXD or RAXD/SAXD.

Show the cursor to the input area for the item which is desired for inputting. To show the cursor in the input area for the item which is desired for inputting is to touch in that area (white area in the background, or an area framed in red for Arm1).



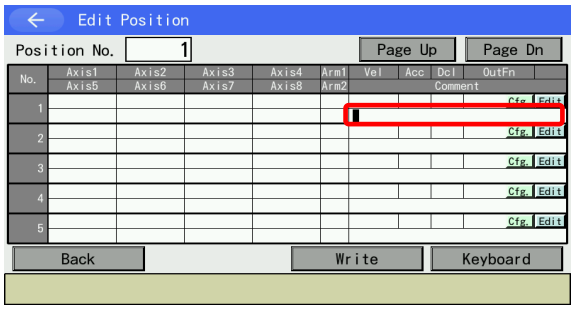
With the cursor being displayed, touch Keyboard button to show the touch panel numeric keys to input L/R.



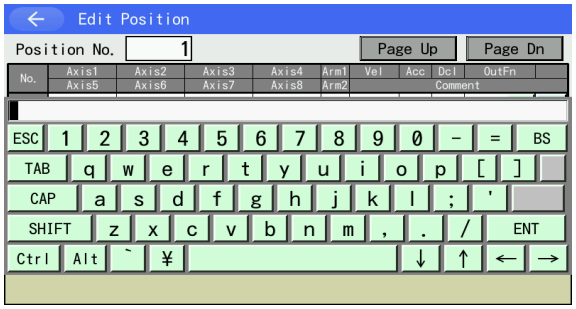
When you want to input Left (left arm), touch Keyboard button to show the touch panel numeric keys, and touch L ENT on the touch panel numeric keys.
When you want to input Right (right arm), touch R ENT, and when you delete what is input, touch CLR ENT.

[Input Comment]
* Feature for XSEL-R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX RAXD/SAXD, RSEL and XSEL2-T/TX

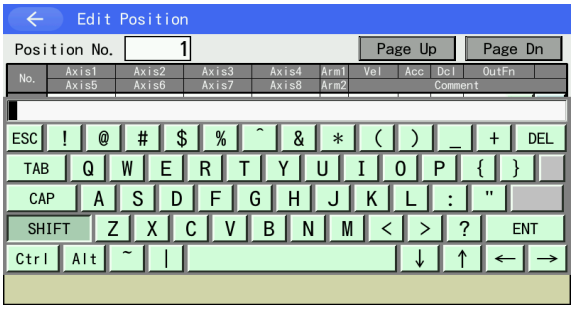
Have the cursor displayed in the comment input box. To show the cursor in the box, touch the comment input area (area that the background is white, marked with red highlight).



With the cursor being displayed, touch Keyboard button to show the touch panel numeric keys to input letters.



Initial Screen



SHIFT key being touched

Use the keyboard shown in the figure above to input a comment. When you want to input a capital letter, either touch SHIFT key or touch CAP key to show the capital letters. (Figure on top right) SHIFT key gets released every time after a letter is input while CAP key is remained on until it is touched again. Touch ENT or TAB key to confirm the letter you have input.

Operation of Special Function Keys out of Letters

ESC Cancels what was input and clears all the input conditions. When nothing is input, the keyboard closes by touching this key.

BS It deletes a letter in front of the cursor. When nothing is input, all letters are deleted.

DEL It deletes letters on the cursor.

TAB It confirms the input letters and closes the keyboard.

← It moves the cursor one step to the left.

→ It moves the cursor one step to the right.

↑ It moves the cursor one step to the left.

↓ It moves the cursor one step to the right.

SHIFT It converts the letters on the keyboard to capital letters. It is released by inputting one letter or touching SHIFT again.

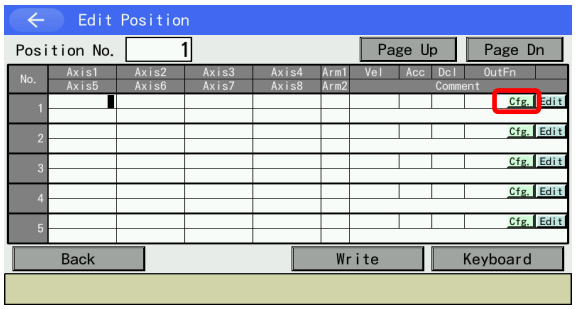
CAP It converts the letters on the keyboard to capital letters. Touch CAP again and it is released.

ENT It confirms the input letters and closes the keyboard.

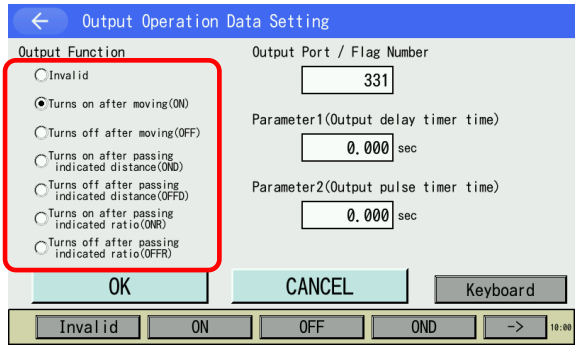
[Position Output Operation Data Input]

* Feature available only when position output operation feature is valid

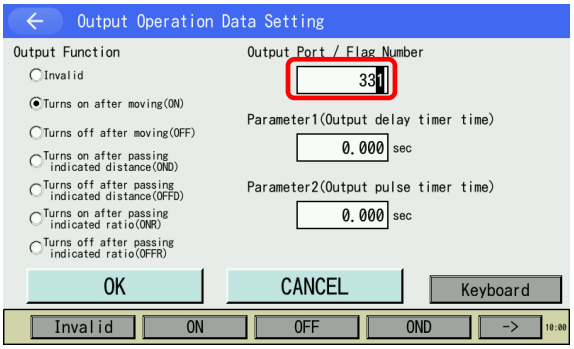
Touch the setting button of the position data required to input (area marked with red highlight). The cursor will not be displayed.



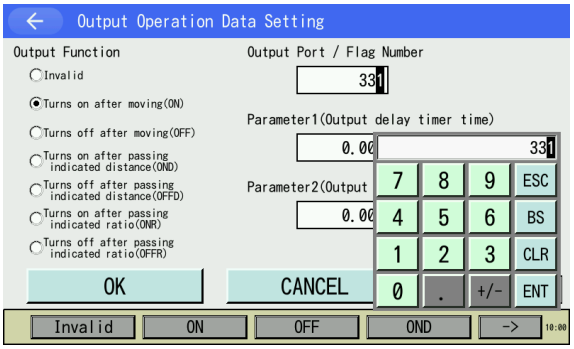
Touch the setting button of the position data required to input. The screen switches to the setting window.



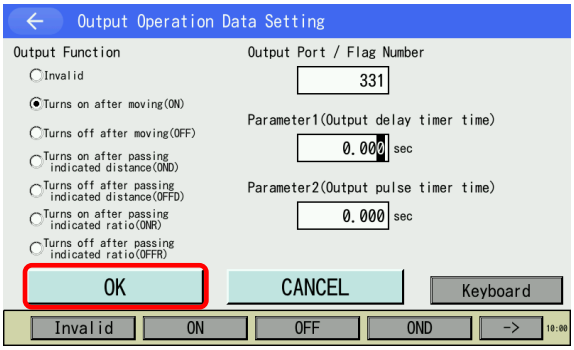
Select the output functions. Touch the radio buttons that you would like to select (figure in left, area marked with red highlight).



Input Output Ports / Flag Numbers, Parameter1 and Parameter2. Touch an input part where you would like to input contents (area marked with red highlight for Output Ports / Flag Numbers) to show the cursor. Touch the Keyboard button with the cursor being displayed to show the touch panel numeric keys in order to input numbers.

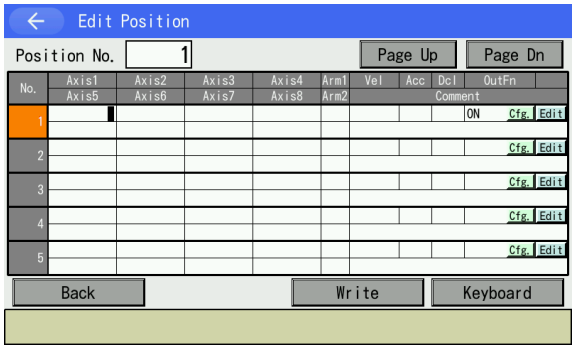


When you would like to input 331 in Output Ports / Flag Numbers, touch the Keyboard button to show the touch panel numeric keys and touch 3 3 1 ENT on the touch panel numeric keys.



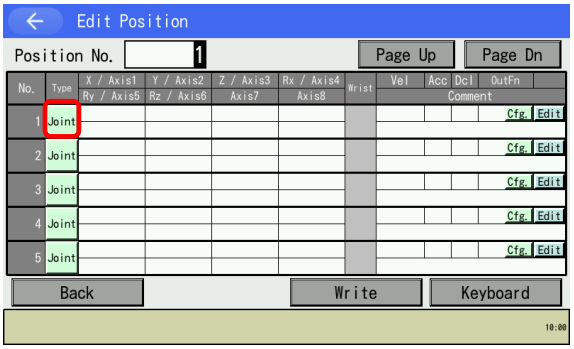
If the data is received properly, the screen goes back to the position output operation data setting window, and the cursor moves to the input area for the next item.

Touch the OK button after all the necessary items are input. The screen goes back to the previous window. Touch the CANCEL button when you wish to cancel the inputs.

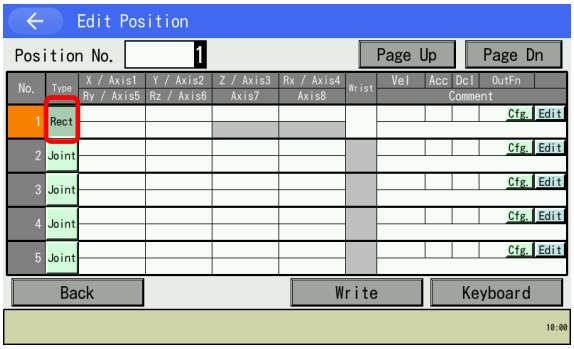


The selected output functions will be displayed in the output function column (OutFn).

[Position Type Input]
* Feature available when 6-axis cartesian activated only



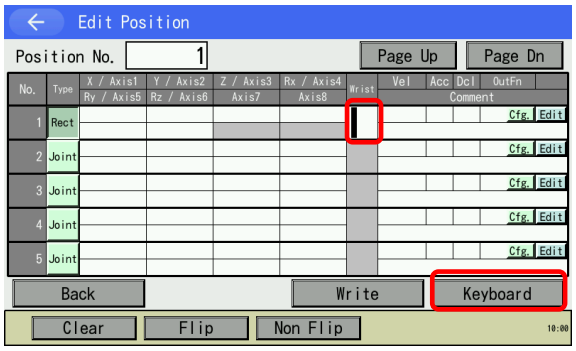
Touch a button in the position type column.



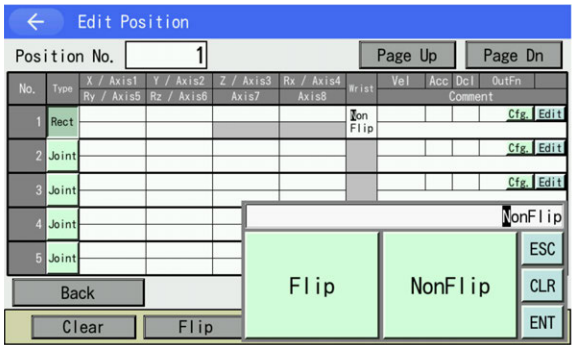
Button display in the position type column switches over.
Also, the display in the following item boxes switches along the selection of the position type.
(Available for input = Background in white / Unavailable for input = Background in grey)

* Added axis position data (from Axis 7 to 8) is available for input only when the position type is the each axis coordinates
* Wrist form is available for input only when the position type is the orthogonal coordinates

[Wrist Form Input]
* Feature available when orthogonal 6-axis cartesian activated only
Show the cursor in the wrist form box. In order to show the cursor, touch the input part (background in white, the position where circled in red) of the wrist form. The wrist form is available for input only when the position type is the orthogonal coordinates.



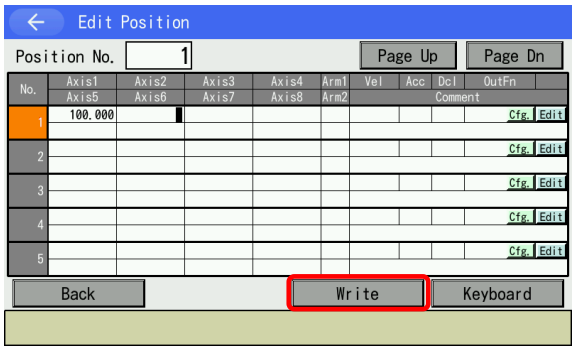
With the cursor kept showing, touch Keyboard button to show the touch panel keyboard and input Flip/Non Flip.



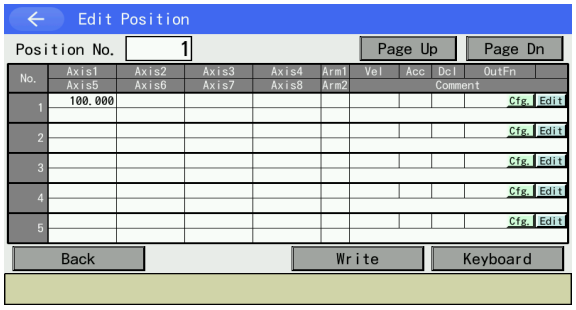
When it is required to input Flip, touch Flip and then ENT on the keyboard. When required Non Flip, touch [Non Flip] and then ENT.

When it is required to clear the inputs, touch CLR and then ENT.

[Data Transfer]



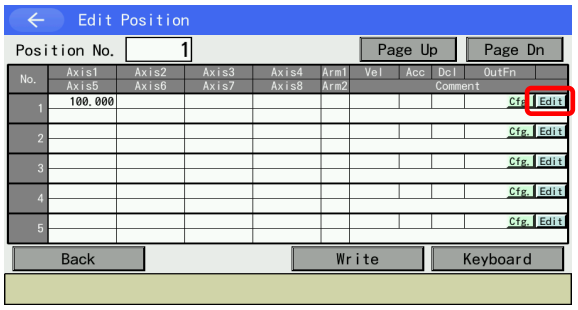
After inputting data, touch Write button on the touch panel to transfer the data to the controller.



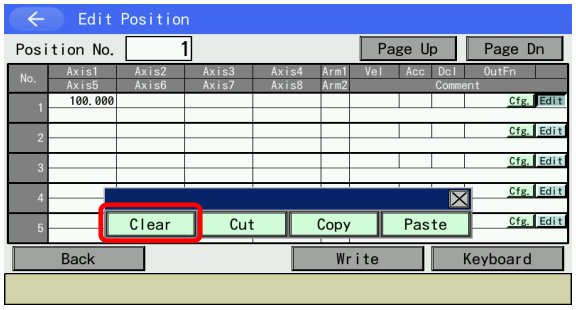
Once the transfer to the controller is complete, the background color in the position number display column will turn to the normal condition.

Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted*1. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have [8.1.2 Flash ROM Writing] conducted.
(*1 Except for controllers which possess feature to retain data)

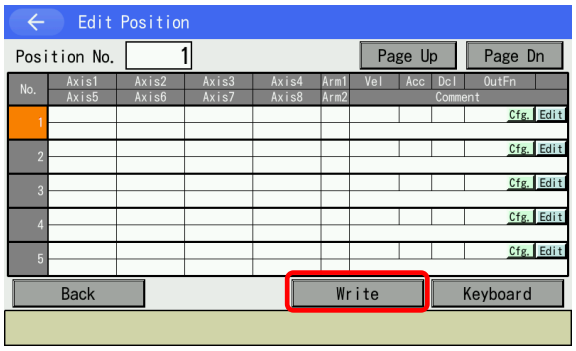
[Data Clear]



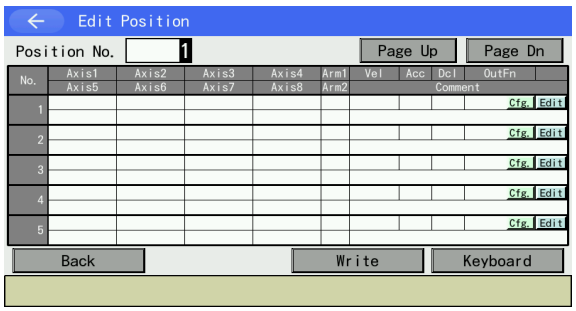
When you would like to delete the position data, touch Edit button on the position data that you would like to delete. The edit window opens.



Touch Clear button in the edit window. The edit window closes.



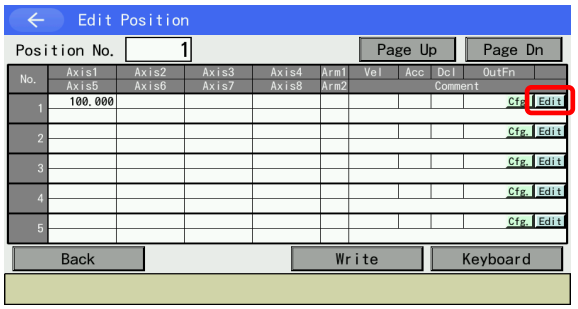
The position data was deleted, and the background color of the position number display column turns to orange, which shows that it is being edited (controller writing not yet done). Touch Write button on the touch panel to transfer the data to the controller.



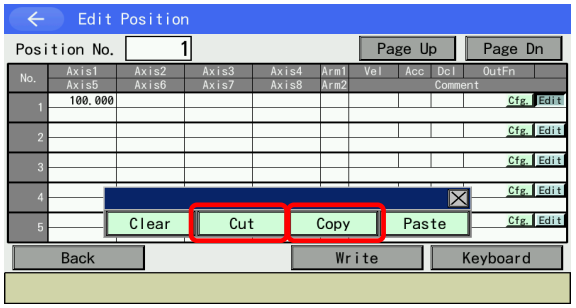
Once the transfer to the controller is complete, the background color in the position number display column will turn to the normal condition.

Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted*1. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have [8.1.2 Flash ROM Writing] conducted.
(*1 Except for controllers which possess feature to retain data)

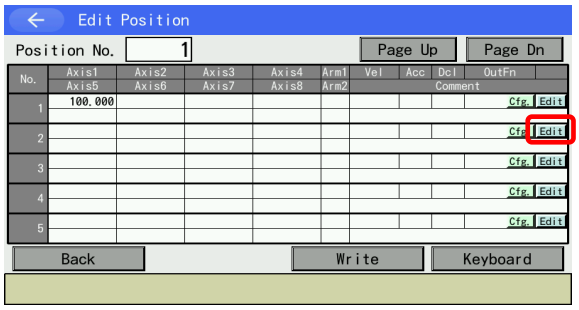
[Copy and move of data]



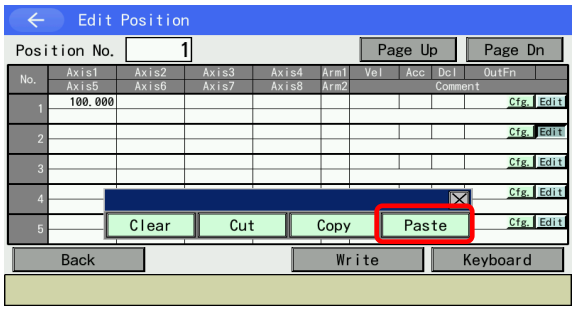
When you would like to copy (or move) the position data, touch the Edit button on the position data that you would like to copy (or move) from. The edit window opens.



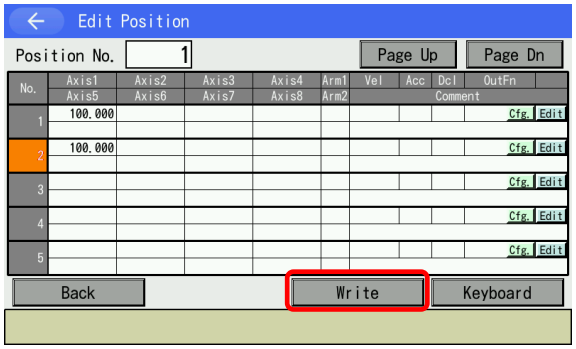
Touch the Copy button in the edit window when you would like to copy the data. Touch the Cut button in the edit window when you would like to move the data. The edit window closes.



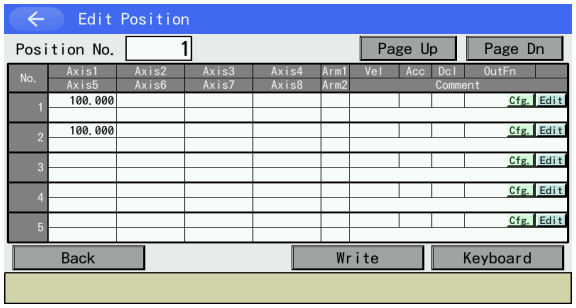
Touch the Edit button on the position data that you would like to copy (or move) the data to. The edit window opens.



Touch the Paste button in the edit window. The edit window closes.



The position data was copied (or moved), and the background color of the position number display column turns to orange, which shows that it is being edited (controller writing not yet done). (Shown in the figure one the left is an example of copying.)
Touch the Write button on the touch panel to transfer the data to the controller.

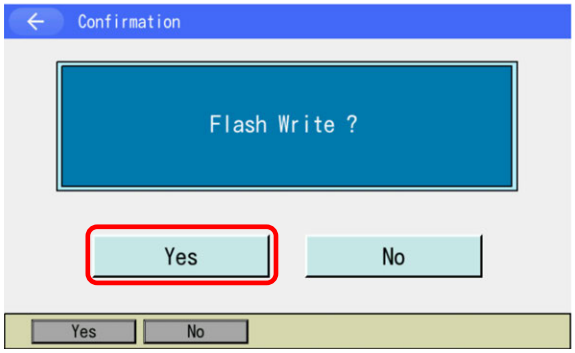


Once the transfer to the controller is complete, the background color in the position number display column will turn to the normal condition.

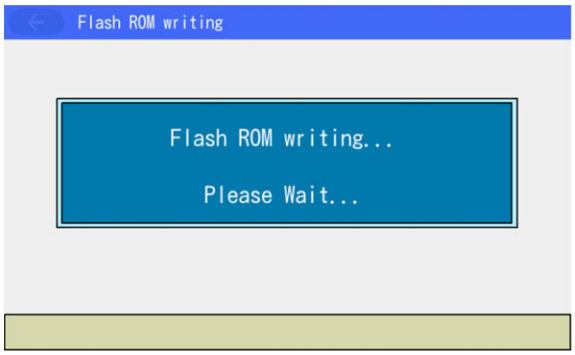
Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted*1. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have [8.1.2 Flash ROM Writing] conducted.
(*1 Except for controllers which possess feature to retain data)

8.1.2 Flash ROM Writing

The edit data will be cleared by restoring the power and executing software reset, only if the position edit data was transmitted to the controller.
To save the data after restoring the power and executing software reset, write the data to Flash ROM.
From the final editing screen, return to the Flash ROM writing screen with Back button.

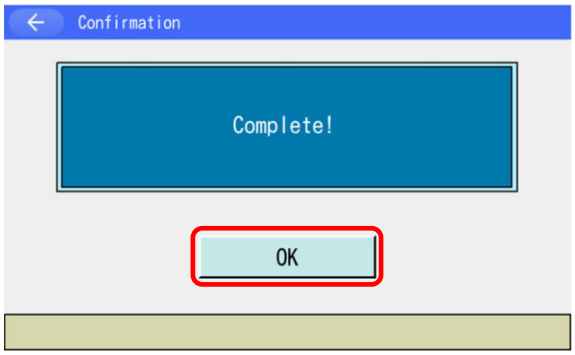


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

8.2 Teaching of the Orthogonal Axis

XSEL-J/K/P/Q/R/S/RA/SA, XSEL2-T, XSEL2-TX (Axis 5 to 8 in Axis Group No. 1 and all axes in Axis Group No. 2) 5th to 6th Axes of XSEL-PX/QX, 5th to 8th Axes of XSEL-RX/SX, 5th to 8th Axes of XSEL-RAX/SAX*1, Additional Axes on 3-axis SCARA Type MSEL-PCX/PGX, MSEL-PC/PG/PCF/PGF, TT, TTA, SSEL, ASEL or PSEL Controller and RSEL Orthogonal Axis
(*1 4th to 8th Axes for 3-axis SCARA Type)

8.2.1 Teaching

Teaching is one way to input position data (moving the actuator to an arbitrary position and getting that actuator's current position as data).
Methods for moving the actuators to an arbitrary position are the jog operation, inching operation, and manual movement (direct teaching) with a servo OFF status.
The fundamental flow of teaching is as follows:

1) Move the actuator (Jog operation • inching operation • manual movement (direct teaching) with a servo OFF status) select position No. and axis No. for data input.

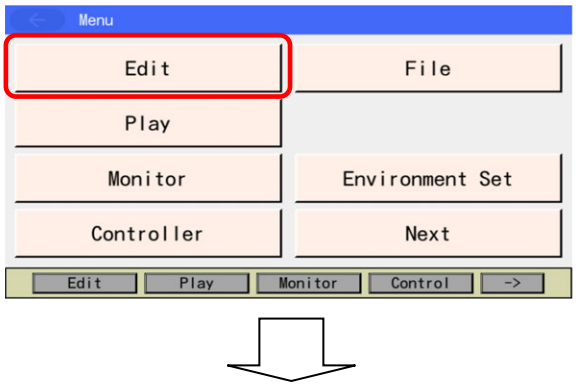
↓

2) Take the data of the current position of the actuator into the Teaching screen.

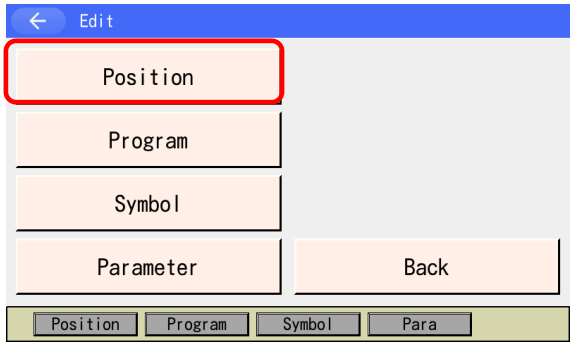
↓

3) Transmit the data to the controller.

Input the position data by teaching and repeating 1) to 3).
Teaching is transacted mainly at the Teaching screen.

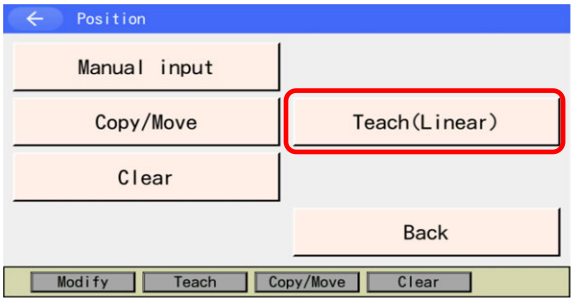


Touch Edit button in the Menu screen.

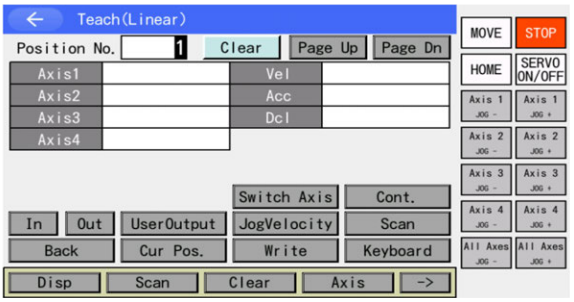


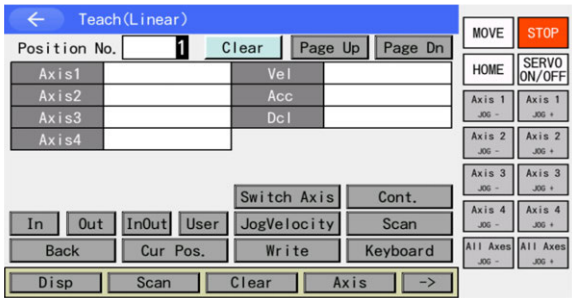
Touch Position button on the Edit screen.

* Example shown on the left is for XSEL-J/K, P/Q, R/S, RA/SA, TT, TTA, SSEL, ASEL, PSEL, MSEL-PC/PG/PCF/PGF, XSEL2-T and XSEL2-TX (axes group No. 2).



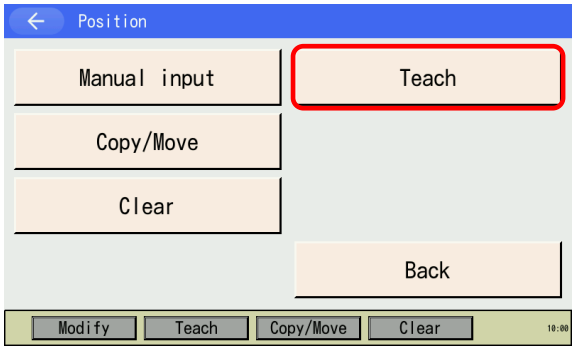
Touch Teach (Linear) button in Position menu screen.





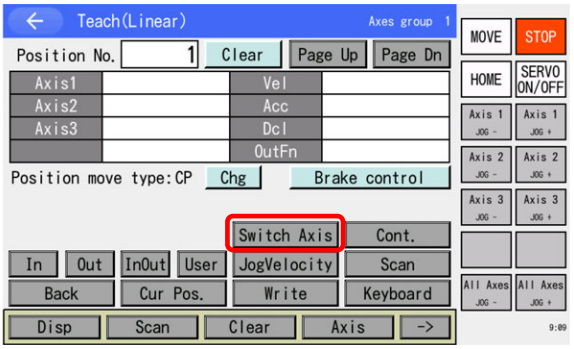
For Input and Output Ports

When you can find Teach button in the position menu screen, touch the Teach button to move to the teach screen, and touch the Switch Axis button in the teach window to switch the screen over to the teach screen that includes the axis you would require to operate.



Touch Teach button in Position menu screen.

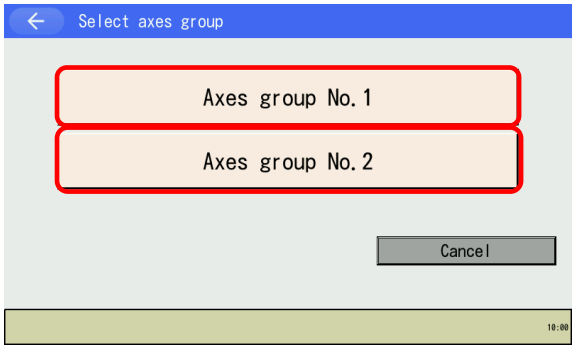
* Example in the figure on the left shows that of RSEL



Teach window appears.

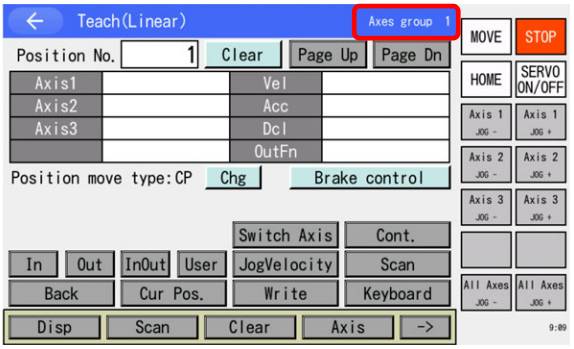
Touch the Switch Axis button to switch the screen over to the teach window that includes the axis you would require to operate.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group window should appear after you touch the Teach button. Touch an axes group number button to select the axes group number that is to be subject to.



Touch the Teach button.
The select axes group screen should appear after you.

Touch an Axes group No. button.



Teach window appears.

* The axes group number that was selected should be shown on the top right of the screen.

Explanation for each Display Area

Position No.	: Currently displayed position number
Axis1-4 (Axis5-8)	: Position data for the axes from Axis 1 to 4 or Axis 5 to 8. (Only the valid cartesian axes should be shown.)
Vel	: Velocity
Acc	: Acceleration
Dcl	: Deceleration
OutFn	: Output fanction

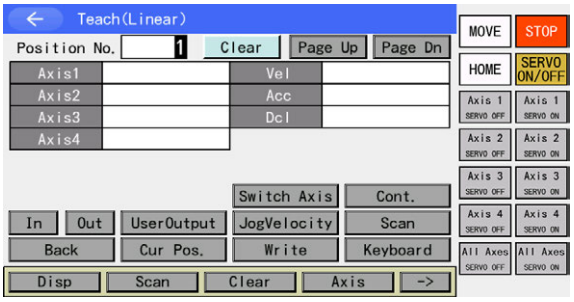
Explanation for each Touch Panel Button

Cur Pos.	: Switch the input data screen to the current position display.
Scan	: Current position is loaded to the screen. From Axis 1 to 4 (from Axis 5 to 8) should be loaded when the cursor is placed on them, and all the valid cartesian axes in those from Axis 1 to 8 should be loaded when the cursor is placed somewhere else or the cursor is not displayed.
Clear	: It clears all the axes data in the displayed position number.
Position move type Chg	: Position movement type should be switched.
Brake control	: The screen should shift to the window to operate brake compulsory release / lock.
Switch Axis	: Display axis should be switched when axes after the fifth axis is valid, or when there is an added axis in the three-axis SCARA type.
Cont.	: Execute continuance operation.
JogVelocity	: Set the jog velocity, etc.
In	: Monitor the input port.
Out	: Monitor the output port.
User	: Turn ON/OFF the output ports (sequential 8 points at the maximum set to parameters). (It is required to preset the I/O parameters No. 74 and No. 75.)

For models applicable for input and output ports

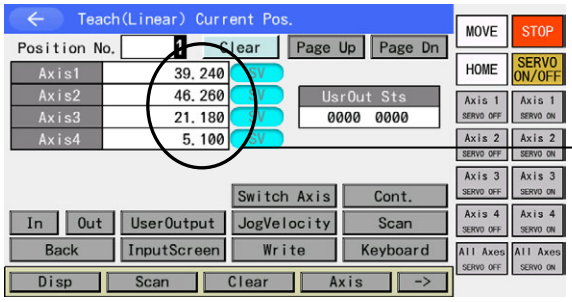
InOut	: Input and output ports are monitored.
User	: Turn ON/OFF the output ports (sequential 8 points at the maximum set to parameters). (It is required to preset the I/O parameters No. 74 and No. 75.)

For incremental encoder specification, it is required to execute homing after supplying power or software reset before you start teaching.

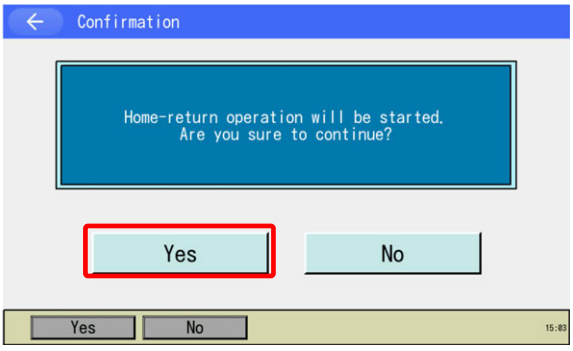


Turn the servo ON condition by touching the SERVO ON/OFF button and then the Servo all axes ON button in the Teach screen condition.
To check if servo is turned ON or OFF, touch Cur Pos. button.
After touching Home button, touch Move All Axes for all the axes, and the screen shifts to the home-return confirmation window. For each axis, touch Move 1 Axis to Move 4 Axes.

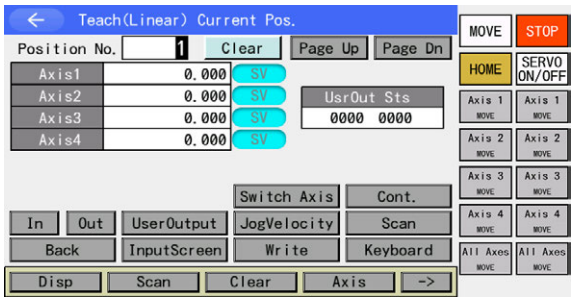
Current Position (Input Screen) Button



The data of the current position screen before homing doesn't have meaning.



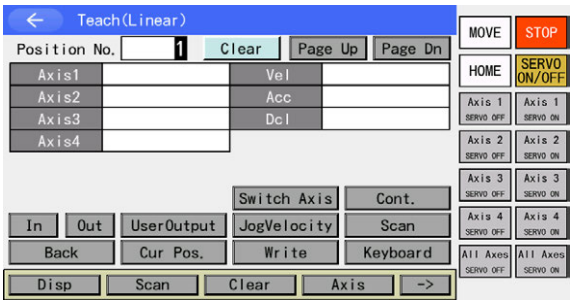
Touch the Yes button in the home-return operation confirmation window, and the home-return operation for all the axes or each axis should start and the screen goes back to the teach window.
In order to stop the operation on the way, touch the Stop button in the teach window.



After homing is complete, execute teaching.

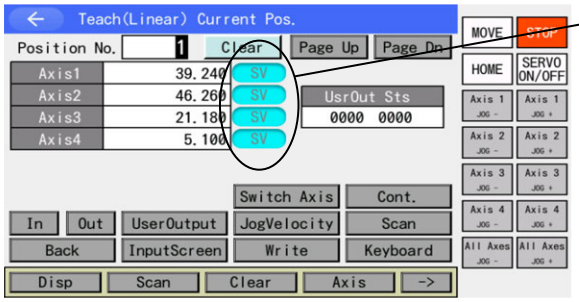
(1) Movement of an actuator

1) Jog Operation



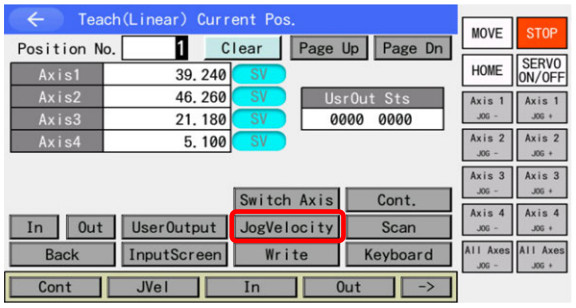
Turn the servo ON condition by touching the SERVO ON/OFF button and then the Servo all axes ON button in the Teaching screen condition.
Execute the all-axes servo OFF command when there is any axis in the servo ON status, and execute the all-axes servo ON command when all axes are in the servo OFF status.
To check if servo is turned ON or OFF, touch Cur Pos. button to show the current position screen.

Current Position (Input Screen) Button

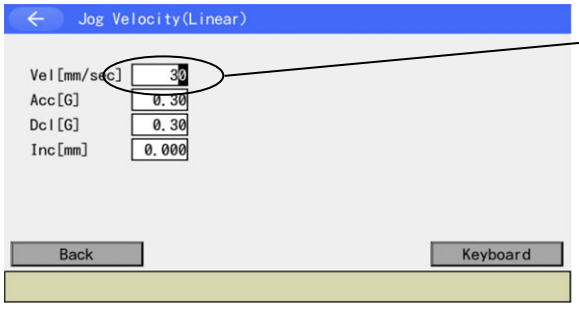


Servo Status
Light Blue: Servo ON, Black: Servo OFF

Touch the Axis 1 JOG-, Axis 1 JOG+, Axis 2 JOG-, Axis 2 JOG+, Axis 3 JOG-, Axis 3 JOG+, Axis 4 JOG- and Axis 4 JOG+ buttons to move the actuator to a designated position. (1 to 4 indicate axis No. and + represents plus direction [forward] while – represents minus direction [backward].)
To execute jog operation for the 5th and 8th axes, touch the Switch Axis button to switch the display to the 5th and 8th axes data display screen.



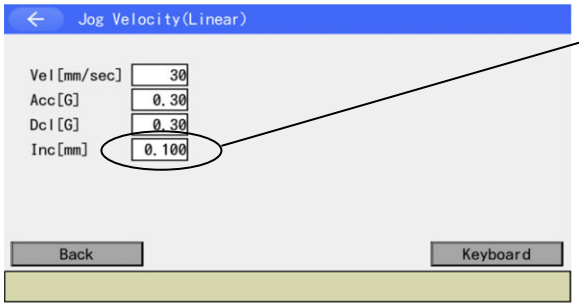
Changing the Jog Velocity
Change the actuator's moving velocity at the time of the jog operation.
Touch JogVelocity button in Teaching screen.



Jog velocity

Input Vel (velocity), Acc (acceleration), and Dcl (deceleration) at the time of the jog operation with the touch panel numeric keys. Set Inc (inching distance) 0.000. (To open the touch panel numeric keys, touch Keyboard button.)
You can also set the inching distance from this screen.
Touch Back button to return to Teaching screen to conduct the jog operation.

2) Inching Operation

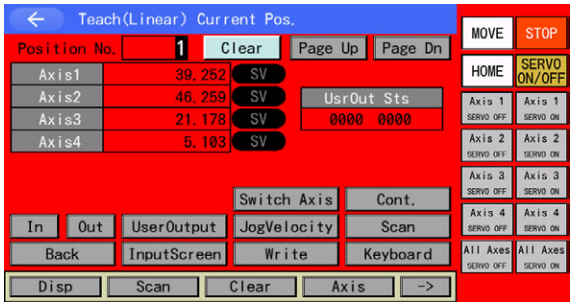


Inching distance

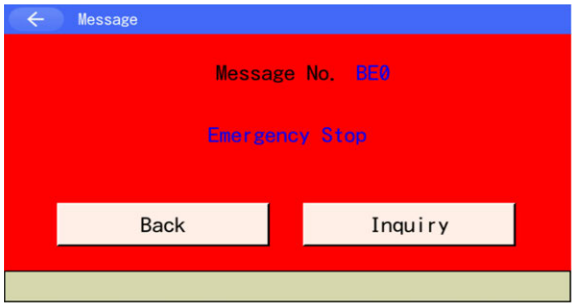
Set the inching distance. (the moving distance each time touching jog button.) In the jog velocity change screen, input a number in Inc (Inching Distance). (To open the touch panel numeric keys, touch Keyboard button.)
Value input range is 0.001 to 1.000 [unit: mm].
Touch Back button to return to Teaching screen to conduct the inching operation.

Touch the jog button once and the actuator moves for the distance of 1 inching. Touch Axis 1 JOG+ to Axis 4 JOG+ button and ALL Axes+ button to perform inching movement in the positive direction of the coordinate and Axis 1 JOG- to Axis 4JOG- button and ALL Axes- button to perform inching in the negative direction.
Touching and holding the jog button changes to jog operation. In approximately 1.6 seconds after the jog button is touched, inching operation changes to jog operation and further continuing to touch the button changes the jog velocity per second as follows: 1→10→50→100 [mm/s].

3) Manual Movement (Direct Teaching) with Servo OFF Status



Turn the servo OFF condition by touching the SERVO ON/OFF button and the Touch All Axes Servo-off button to turn the servo off.
To check if servo is turned ON or OFF, touch Current Pos. button.
Move the actuators to the designated position via manual mode.
(The background color in the screen turns to red during the emergency stop.)

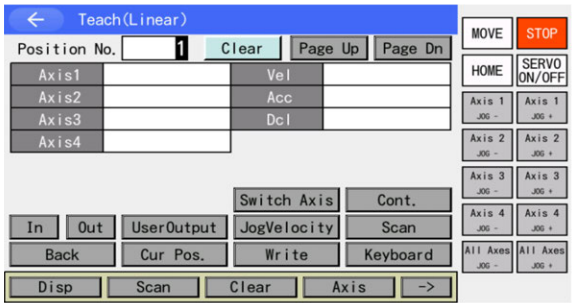


Pressing the EMERGENCY STOP button switches the display to the emergency stop screen.

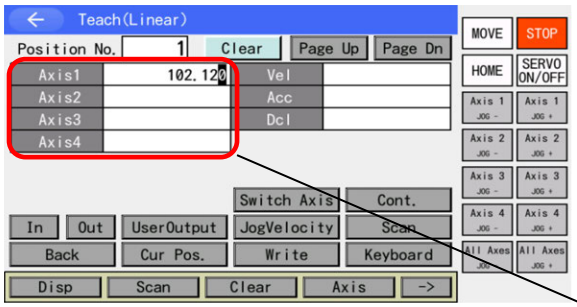
Touch Back button to return to Teaching screen.

> ⚠ *Warning:*
> *Be sure to execute manual movement when the EMERGENCY STOP button is pressed.*

(2) Take in the current position as a data
The determined actuator position is uploaded to the teaching screen as the position data.

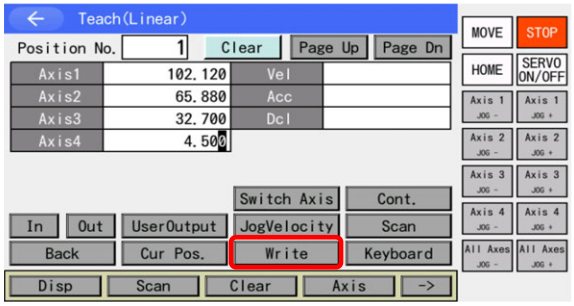


Touch in the position number input box to show the cursor and input a value on the touch panel numeric keys. (Touch panel numeric keys can be shown by touching Keyboard button.)
Or, select the position number to load the data from by touching Page Up and Page Dn buttons.

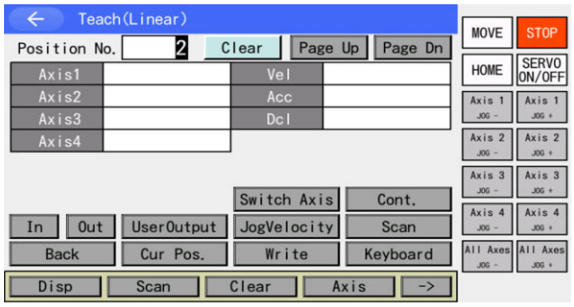


When the cursor is axis boxes, touch Scan button to load the current position data of the axis that the cursor is placed on. Touch Scan button when the cursor is not shown or placed in an area other than the axis boxes, the current position data of all the axes is loaded.

(3) Transmit to the Controller
Transmit the taken-in data to the controller.



In Teaching screen, touch Write button.
The loaded data is stored in the memory in the controller. Once the transfer to the controller is complete, the position number is incremented by one.
The data available to transfer to the controller is one position data that is being displayed. It is not possible to transfer the data of more than one position number at a time.



If the screen is switched with touching Page Up, Page Dn or Back button, before the data is transferred, the input data will become invalid.

Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted*1. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have 8.1.2 Flash ROM Writing conducted.
(*1 Except for controllers which possess feature to retain data)

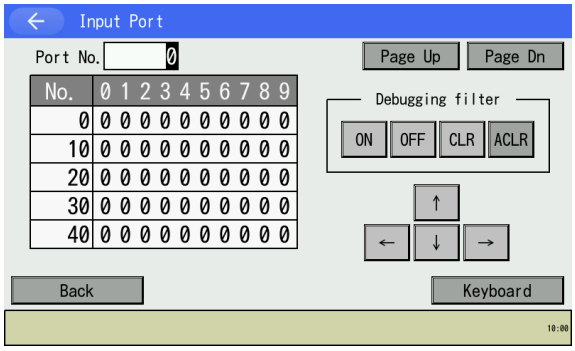
(4) I/O Monitor • Position Confirmation

During teaching operation, you can monitor various ports. You can also confirm the location by moving an actuator to a to the location of the position data with teaching.

1) Input/Output Monitor

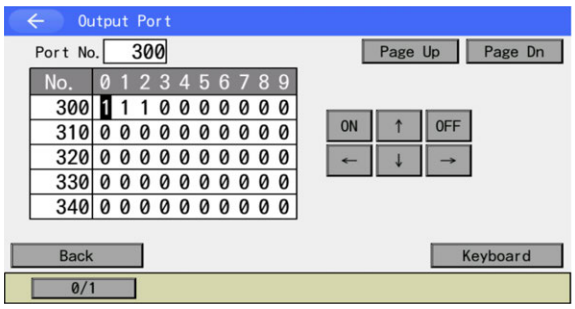
Either touch In or Out button in Teaching screen.
For models applicable for input and output ports, monitoring of the input and output ports is available by either touching InOut button.

Input Port



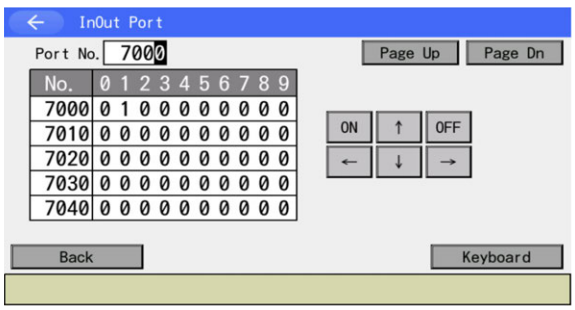
Refer to [14.2 Input Port] for debug filters.

Output Port



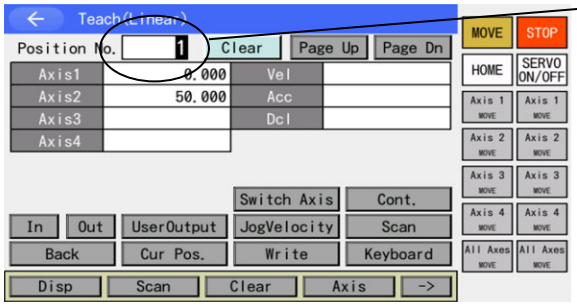
Either touch ON or OFF button to set ON/OFF (1/0) for the output port on the cursor position.

InOut Port (for applicable models)



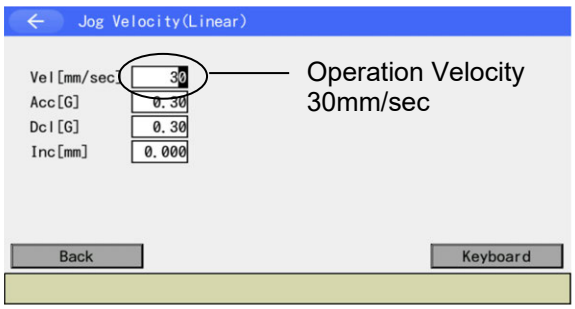
The way to operate is the same as the output port.

2) Moving
Move the actuator to the location of the position data transmitted to the controller.



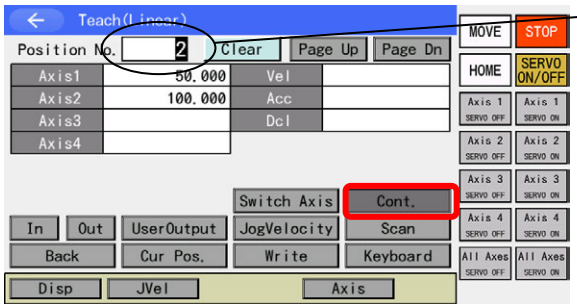
Select position No. to move in the Teaching screen condition.
Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.
To check if servo is turned ON or OFF touch Cur Pos. button.
The actuator starts moving by touching the MOVE button and then the all the axes moves button, in the case of all-axis movement. Touch the 1 axis move to 4 axis move in the case of each axis movement. To stop movement halfway, touch the STOP button.

To check or change the operation velocity, touch JogVelocity button.



Touch Keyboard button to show the touch panel numeric keys. (When cursor is not in Vel box, touch Vel box to make the cursor appear.) Input the change data on the numeric keys, and touch ENT.
After changing, touch Back button.
If the velocity, acceleration and deceleration are set in the position data, these settings are prioritized.
Priority: Parameter < JVel < Position Data

3) Continuous movement
Move the actuator continuously to the location of the position data transmitted to the controller.

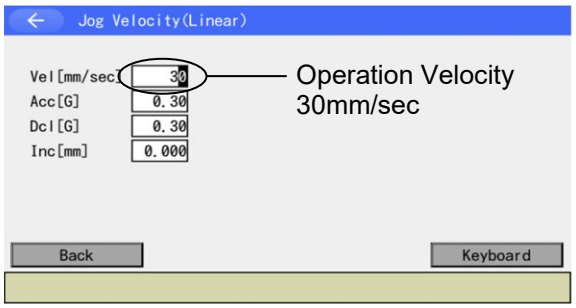


Position No. you'd like to move first

In Teaching screen, select the position number to operate first.
Touch SERVO ON/OFF button and then touch all ServoON button to turn the servo ON.
To check if servo is turned ON or OFF, touch Cur Pos. button.

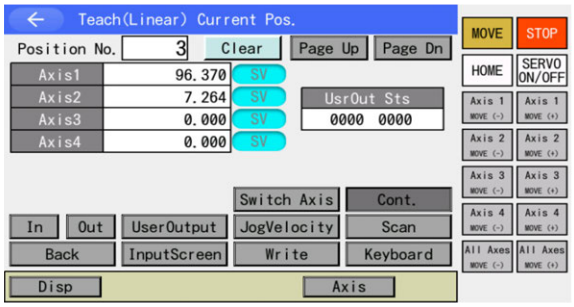
Touch Cont. button.

To check or change the operation velocity, touch JogVelocity button.



Operation Velocity 30mm/sec

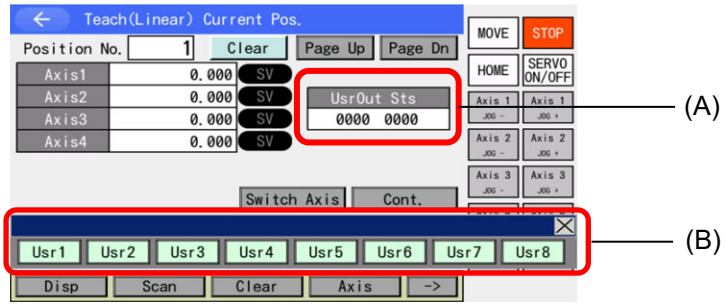
Touch Keyboard button to show the touch panel numeric keys. (When cursor is not in Vel box, touch Vel box to make the cursor appear.) Input the change data on the numeric keys, and touch ENT.
After changing, touch Back button.
If the velocity, acceleration and deceleration are set in the position data, these settings are prioritized.
Priority: Parameter < JVel < Position Data



The actuator (in all axes) starts continuous movement by touching the MOVE button and then the all axes moves+ or all axes moves- button, in the case of all-axis movement. Touch the 1 axis move- 1 axis move+ to 4 axis move- 4 axis move+ buttons in the case of each axis movement.
During continuous movement, the display changes to the current position screen. To stop, touch the STOP button.
To restart continuous movement, touch the MOVE button. After touching move button, touch either All Axes Move (+) or All Axes Move (-) to resume the continuous movement.

> ⚠ *Caution:*
> *Please note that it may take a few seconds before movement start after all axes moves+ or all axes moves- button are touched. (The time elapsed until movement start varies according to the number of registered position data.)*

(5) User-specified output port operation
The output ports set for the parameter can be easily turned ON/OFF.
Touch UserOutput button in the Teaching screen condition.



When UserOutput button is touched

(A) User-specified output port status
The conditions of user-specified output ports are displayed as '1' (=ON) and '0' (=OFF).
(The conditions are displayed from the first specified port for the number of specified ports from the left.)

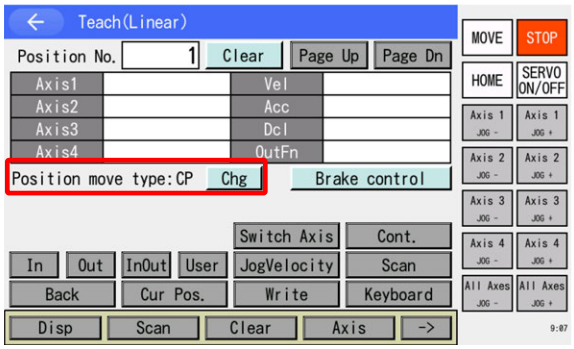
(B) User-Specified Output Port Operation Panel Window
It is a panel window to perform the operation to turn ON/OFF the user-specified output ports.
Assignment is made for the number of specified ports in the order of 'Usr1', 'Usr2', 'Usr3' … from the top of the user-specified output ports.
By touching a Usr1 to Usr8 buttons, an operation can be performed to turn each output port ON/OFF.
(Port ON Command is executed when the port status display is '0' (OFF) and Port OFF Command when the status display is '1' (ON)).
To close this panel window, touch × on the top right.

1) Setting of user-specified output port parameters
For the operation method for parameter setting, refer to [13. Parameter Edit].
The first port No. and the number of ports are set with the following parameters:
- Number of ports
  I/O parameter No. 74 "QntPrtUsrOut" (Number of output ports used by TP user (hand, etc.))
- First port No.
  I/O parameter No. 75 "TopNo.UseOut" (First output port No. by TP user (hand, etc.))

(Setting example) When the first port No. is set to 308 and the number of ports is set to 8:

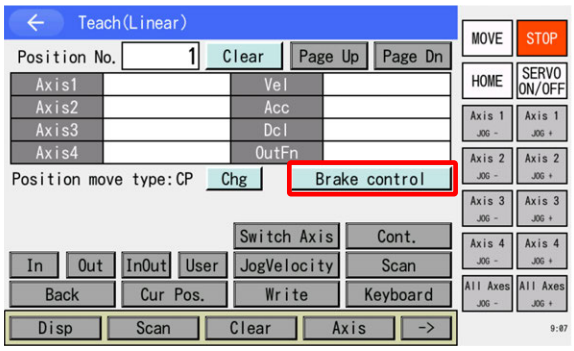
'Usr1' ····· Output port 308
'Usr2' ····· Output port 309
'Usr3' ····· Output port 310
'Usr4' ····· Output port 311
'Usr5' ····· Output port 312
'Usr6' ····· Output port 313
'Usr7' ····· Output port 314
'Usr8' ····· Output port 315

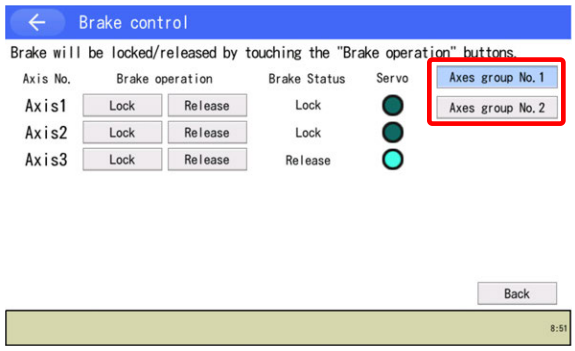
(6) Changing Position Movement Type (for applicable models only)
An operation type (CP/PTP) for position movement can be indicated.



Touch the Chg button in the "Position Movement Type" label before the movement starts to select the operation type for the next movement. Change cannot be made during movement or continuous movement.
The default of the cartesian axis should be CP operation.

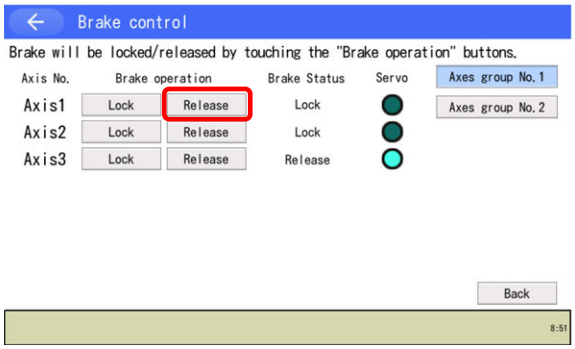
(7) Brake Control (for applicable models only)
When it is connected to the brake control applicable model, the Brake control button should be displayed. Touch it and the screen should shift to the brake control window.



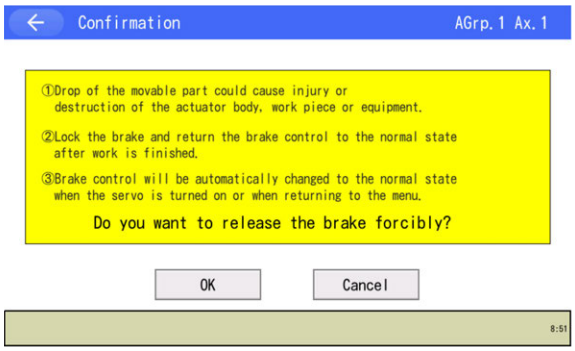


When several axis group are set, an axis group of an axis that you would like to have a brake control should be selected with the Axes group No. 1 and Axes group No. 2 buttons.

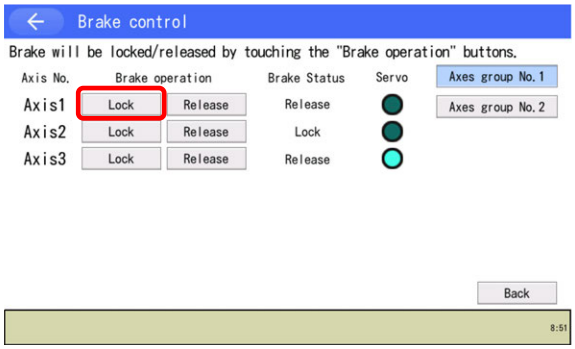
The brake operation button and the status of an effective axis should be displayed.



To release an axis in brake lock status compulsorily, touch the Release button in the brake operation column.



As the screen shifts to the confirmation window, confirm the contents and touch the OK button when having a compulsory release, and touch the Cancel button when cancel.



When the brake is to be locked, confirm the servo in the axis number to lock is off, and touch the Lock button in the brake operation column. When it is locked, the brake status should be shown “Lock”. When the servo is on, touch the Back button to return to the teach window, turn the servo off and turn it back on to lock it.

⚠ Warning: Caution for Brake Compulsory Release

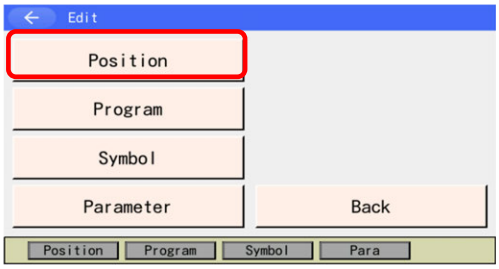
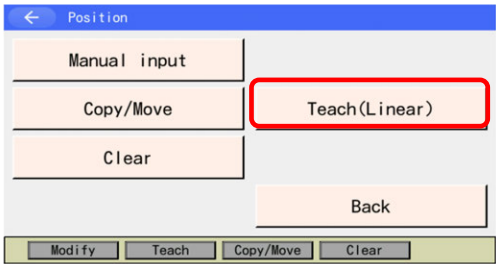
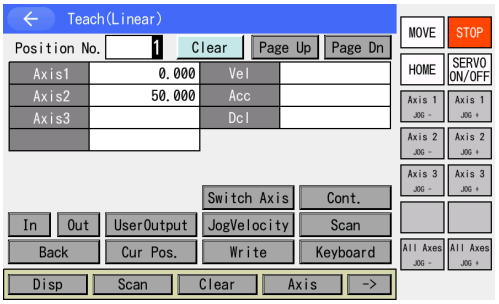
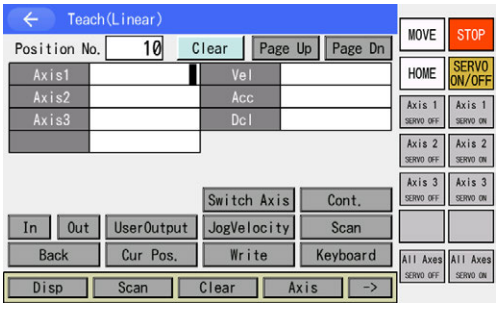
(1) The moving part may drop, which may cause injury or cause damage on the actuator main unit, workpiece or equipment. Pay special attention.

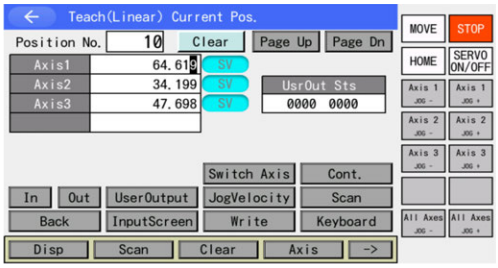
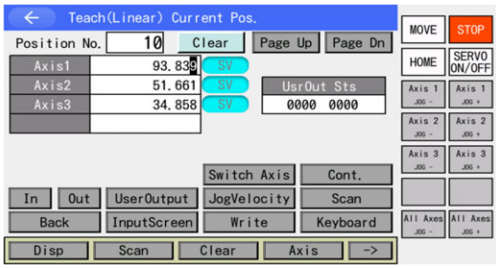
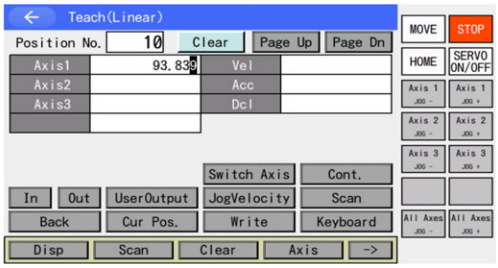
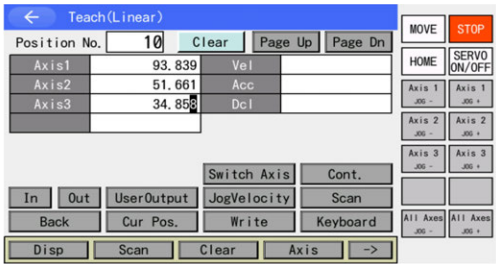
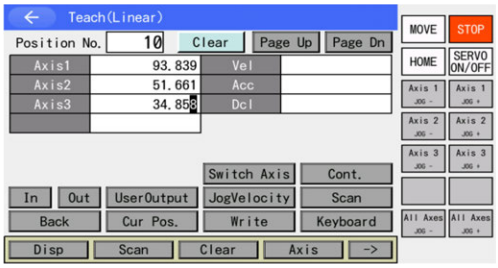
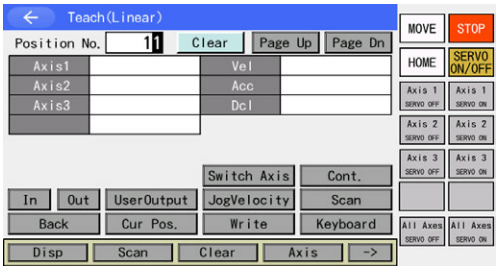
(2) Make sure to lock the brake after the work is finished to set the brake control back to the normal condition.

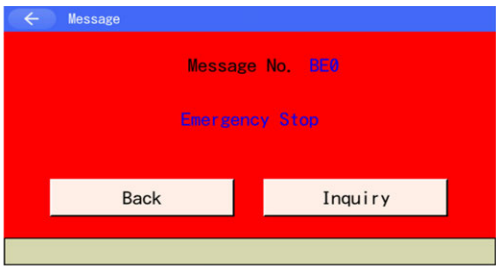
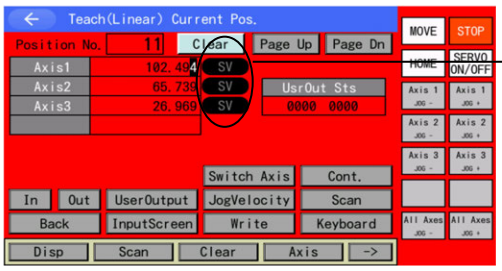
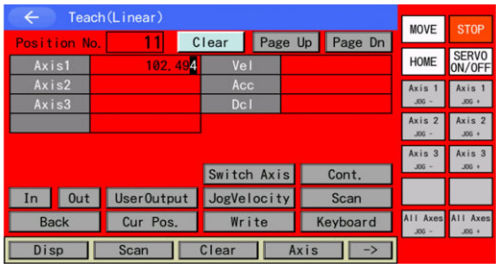
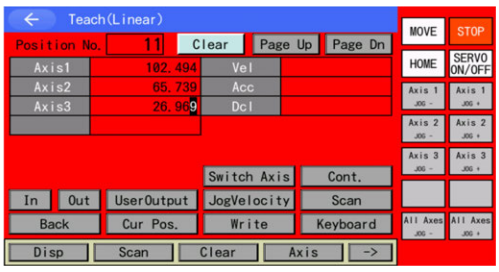
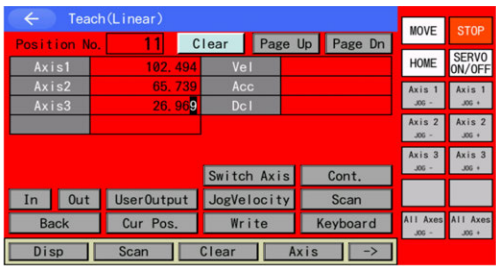
(3) When the servo is turned on and when it gets back to the menu window, the brake control should get back to the normal condition automatically.

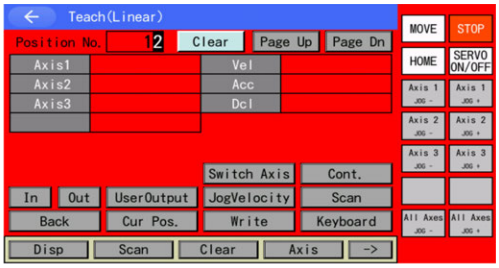
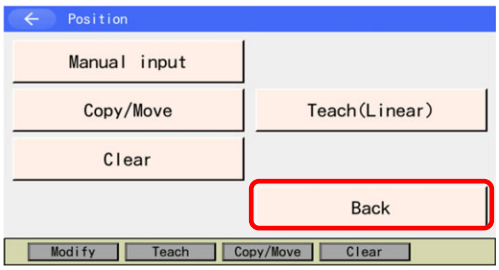
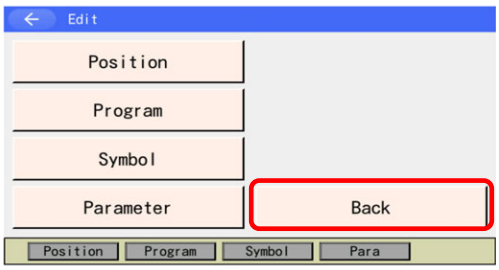
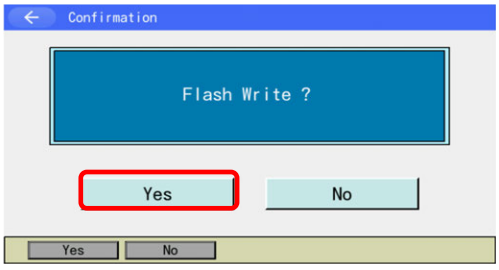
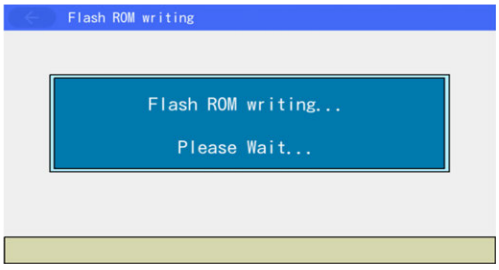
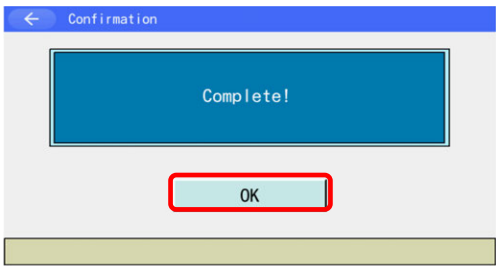
8.2.2 Example of Teaching Input

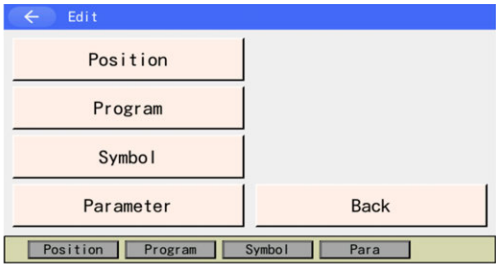
Entering the data into position No. 10 using the jog and into position No. 11 by manual movement (direct teaching) with Servo OFF status.

No.	Operation		
1	Touch Edit button.		
2	Touch Position button.		
3	Touch Teach(Linear) button.		
4	Either use Page Up button and Page Dn button in the touch panel or input “10” in the position number on the software numeric key, and then touch ENT for confirmation.		
5	Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.		

No.	Operation		
6	Touch the jog buttons Axis 1 JOG-, Axis 1 JOG+, Axis 2 JOG-, Axis 2 JOG+, Axis 3 JOG- and Axis 3 JOG+ to move the robot to a desired position.		
7	Touch the Scan button to load the current position of the axis No., where there is the cursor, to the input screen. Touch Cur Pos. button to confirm that the data has been loaded.		
8	Touch in the input area for Axis2 to move the cursor to the next axis and touch Scan button.		
9	Load the data also for the 3rd axis.		
10	Touch Write button to transfer the position data to the controller. The position moves to No. 11.		If the screen is switched with Page Up button or Page Dn button before the data is transferred, the input data will become invalid.
11	Touch SERVO ON/OFF button and then touch Servo all axes OFF button to turn the servo OFF.		

No.	Operation		
12	Press the EMERGENCY STOP button. Touch Back button.		⚠ *Warning:* *Be sure to execute manual movement when the EMERGENCY STOP button is pressed.* To have manual operation on Z-axis, it is necessary to release the brake. As a result, the Z-axis may drop by the weight of such as a hand installed on the end when the brake is released. Do not attempt to conduct teaching manually on the Z-axis.
13	Touch Cur Pos. button to confirm that the servo is OFF. Move each axis manually to a desired position.		Servo OFF It turns to light blue when the servo is turned ON.
14	Touch Scan button to load the axis number current position where the cursor is to the input screen.		
15	Touch in the input area for Axis2 to move the cursor to the next axis and touch Scan button. Load the data also for the 3rd axis in the same manner.		
16	Touch Write button to transfer the position data to the controller. The position moves to No. 12.		If the screen is switched with Page Up button or Page Dn button before the data is transferred, the input data will become invalid.

No.	Operation		
17	Finish the position data input with teaching. Touch Back button.		
18	Touch Back button.		The figures shown hereafter are in the condition of the emergency stop being cancelled.
19	Touch Back button.		
20	To write the data to the flash ROM, touch Yes button. If writing is not necessary, touch No button.		
21	While in writing process to flash ROM, the display 'Flash ROM writing...' flashes.		***Never shut off the power to the controller during Flash ROM writing.***
22	The flash ROM writing process is finished. Touch OK button. The screen returns to Edit menu.		

No.	Operation		
23			

8.3 Teaching for SCARA Axis

XSEL-JX/KX/PX/QX/RX/SX/RAX/SAX, 1st to 4th[*1] Axes of XSEL2-TX (Axes Group No. 1), 1st to 4th Axes or 5th to 8th Axes of XSEL-RXD/SXD/RAXD/SAXD, 1st to 4th[*1] Axes on MSEL-PCX/PGX
(*1 1st to 3rd Axes for 3-axis SCARA Type)

8.3.1 Teaching

Teaching is one way to input position data (moving the actuator to an arbitrary position and getting that actuator's current position as data).
Methods for moving the actuators to an arbitrary position are the jog operation, inching operation, and manual movement (direct teaching) with a servo OFF status.
The fundamental flow of teaching is as follows:

1) Move the actuator (Jog operation • inching operation • manual movement (direct teaching) with a servo OFF status).

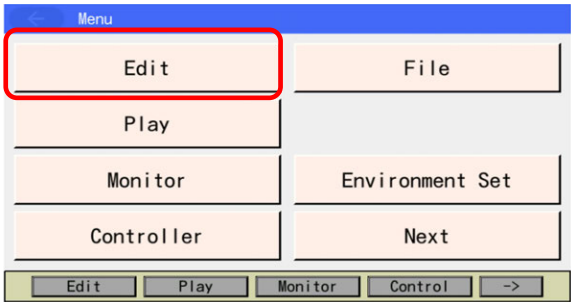
↓

2) Take the data of the current position of the actuator into the Teaching screen.

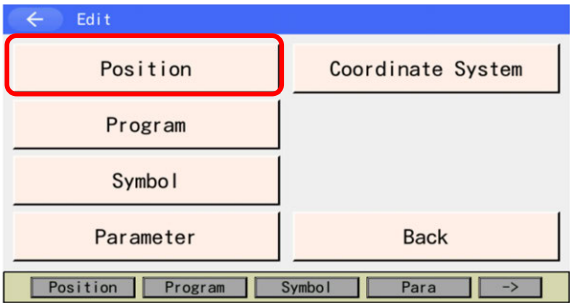
↓

3) Transmit the data to the controller.

Input the position data by teaching and repeating 1) to 3).
Teaching is transacted mainly at the Teaching screen.



Touch Edit button in the Menu screen.



Touch Position button on the Edit screen.

* Example shown on the left is for XSEL-JX/KX, PX/QX, RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD, MSEL-PCX/PGX and XSEL2-TX.
* There is no coordinate system buttons shown when a controller other than above is connected.

Touch Teach(Scara) button in Position menu screen.

* For XSEL-RXD/SXD and RAXD/SAXD, touch either Teach (Axis 1 - 4) or Teach (Axis 5 - 8).

Current arm system

Jump Setting Status

Coordinate system for jog operation
- Wn: Work coordinate system
  n: Work coordinate system No. (0: Base coordinate system)
- Tn : Tool coordinate system
  n: Tool coordinate system No.
- A : Each axis system

Explanation for each Display Area

Position No.	: Currently displayed position number
Axis1-4 (Axis5-8)	: Position data for the SCARA axes for the 1st unit or 2nd unit (Only the valid SCARA axes should be shown.)
Vel	: Velocity
Acc	: Acceleration
Dcl	: Deceleration
Arm	: Target Arm (for XSEL-RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD, MSEL-PCX/PGX and XSEL2-TX Controllers only)
OutFn	: Output function

Explanation for each Touch Panel Button

Current Position	: Switch the input data screen to the current position display.
Load	: Current position is loaded to the screen. From Axis 1 to 4 (from Axis 5 to 8) should be loaded when the cursor is placed on them, and all the valid SCARA axes in those from Axis 1 to 8 should be loaded when the cursor is placed somewhere else or the cursor is not displayed.
Clear	: It clears all the axes data in the displayed position number.
Position move type Chg	: Position movement type should be switched.
Brake control	: The screen should shift to the window to operate brake compulsory release / lock.
Jog Coordinate System Chg	: It switches over the coordinate system for jog operation.
JVel	: Set the jog velocity.
Mvel	: It determines the operation speed in Continuous Operation Mode or operation with MOVE key.
Arm System Chg	: It switches over the arm system. (It is necessary that the servo is turned ON in advance)
Coordinate System Setting	: Selection of the coordinate system number is conducted.
In	: Input port is monitored.
Out	: Output port is monitored.
User	: Turn ON/OFF the output ports (sequential 8 points at the maximum set to parameters). (It is required to preset the I/O parameters No. 74 and No. 75.)
Continuous Operation	: The mode is changed to Continuous Operation Mode.
Jump Coordinate System Chg	: Jump operation setting is conducted.
InOut	: Monitoring is conducted on input and output ports (for applicable models only)
Axis Switchover	: Display axis should be switched when axes after the fifth axis is valid, or when there is an added axis in the three-axis SCARA type.

8.3.2 Jog Movement Direction and Coordinate System

(1) Jog buttons and movement directions

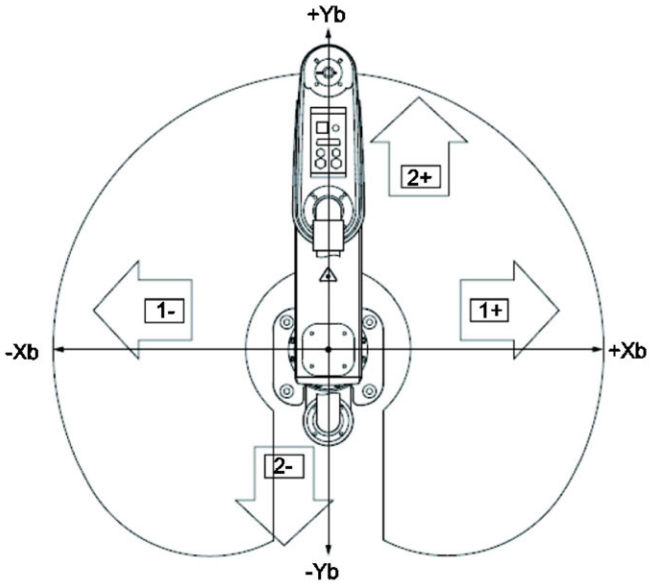
The movement direction during jog operation changes according to the coordinate system No. selected.

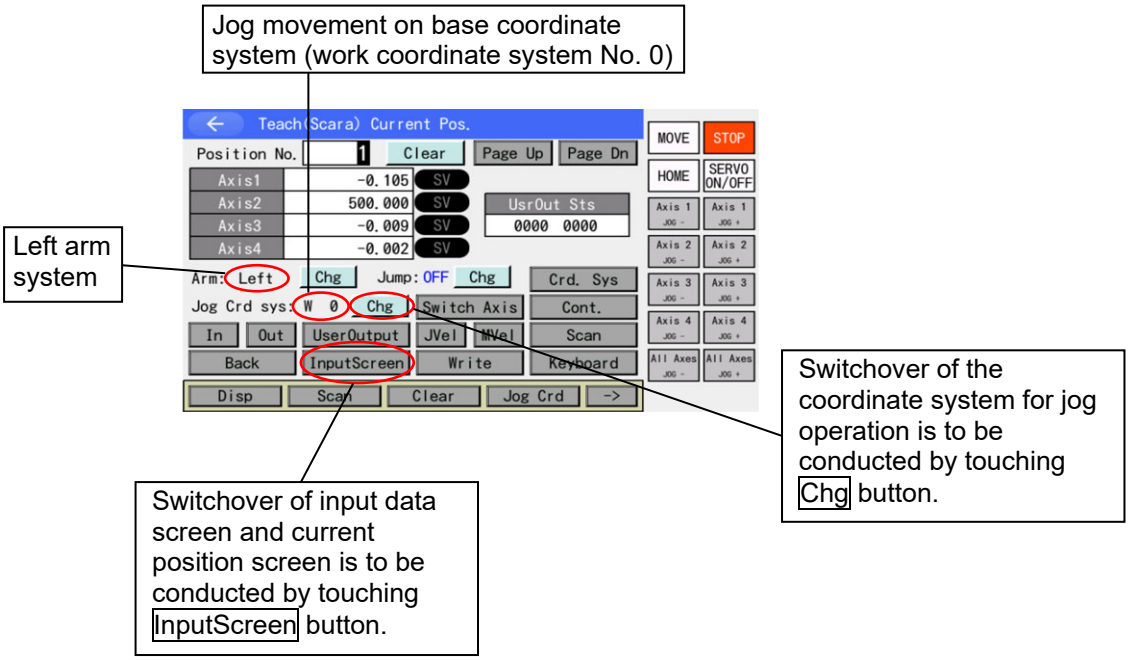
The status before shipment is the base coordinate system (work coordinate system No. 0) and tool coordinate system No. 0.

For the setting of coordinate system data, refer to [11. Coordinate System Data Edit].

1) Jog operation on base coordinate system

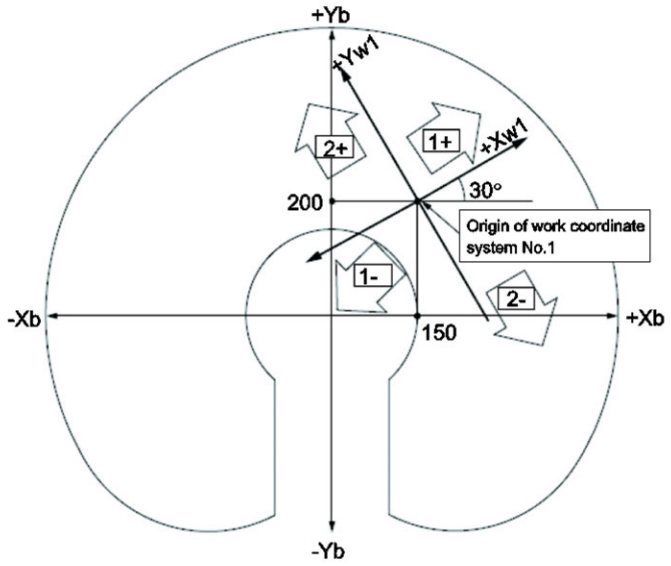
The jog buttons and movement directions on the base coordinate system are as shown below.

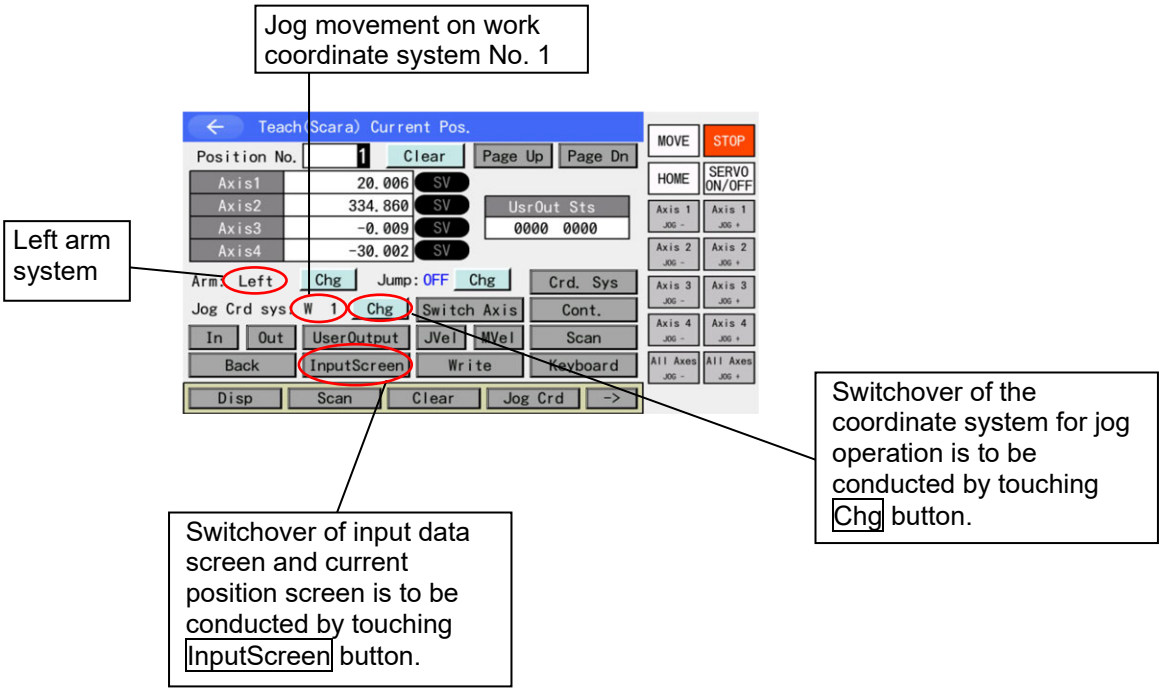




2) Jog operation on work coordinate system

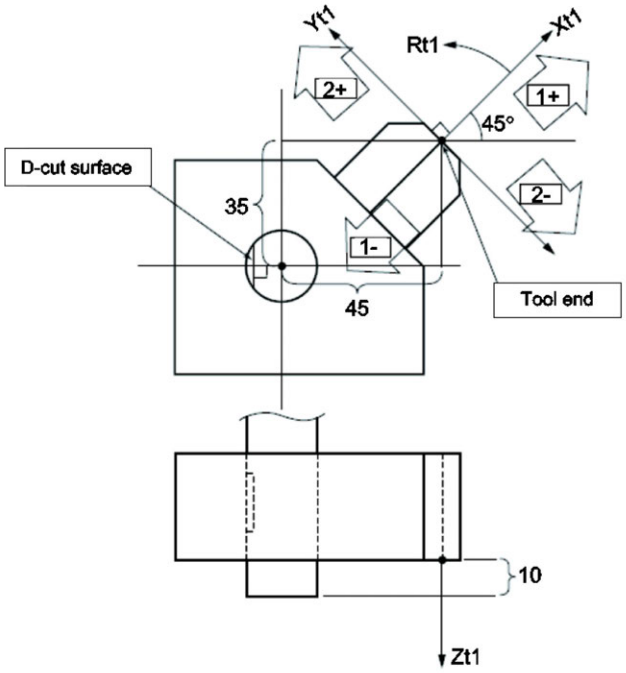
Example) The jog buttons and movement directions on the work coordinate system No. 1 are as shown below.
The offset values from the work coordinate system No. 1 become Xofw1 = 150, Yofw1 = 200, Zofw1 = 0, and Rofw1 = 30.

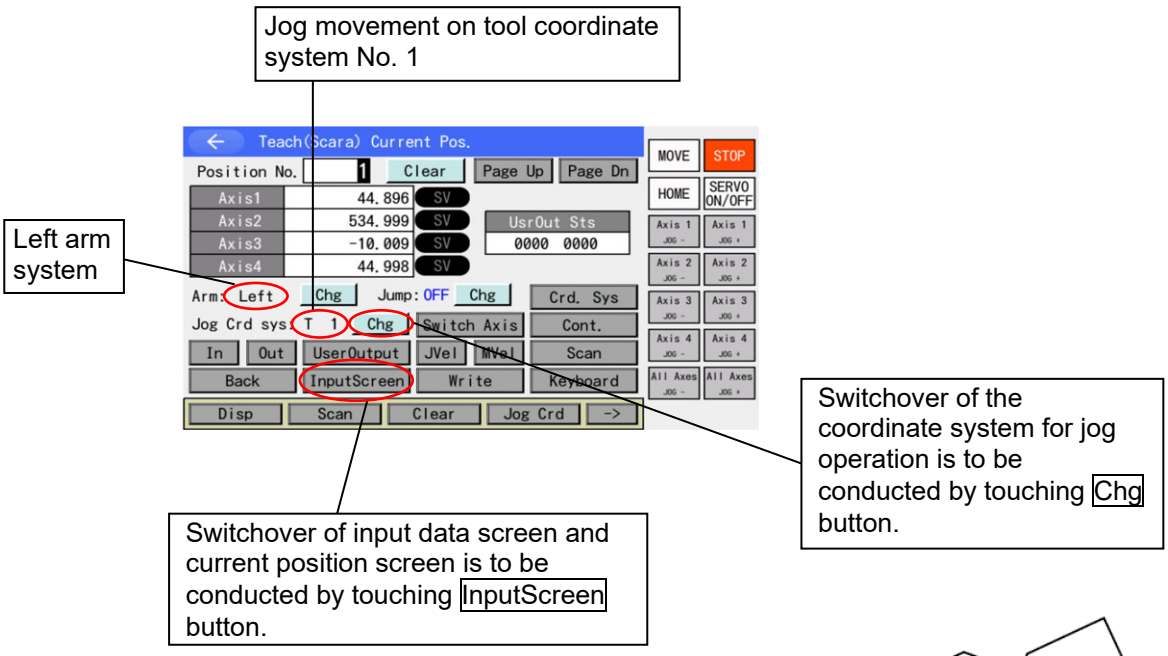




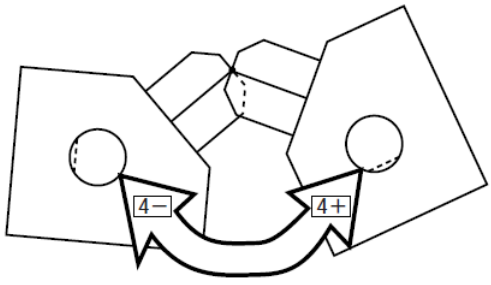
3) Jog operation on tool coordinate system

Example) The jog buttons and movement directions on the tool coordinate system No. 1 are as shown below.
The offset values from the tool coordinate system No. 1 become Xoft1 = 45, Yoft1 = 35, Zoft1 = -10, and Roft1 = 45.
(For 3-axis SCARA type, Roft will not be taken into account)

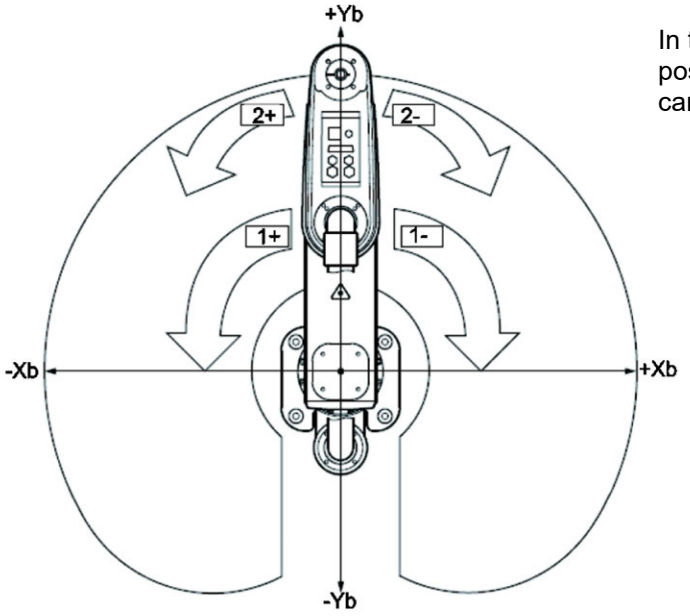




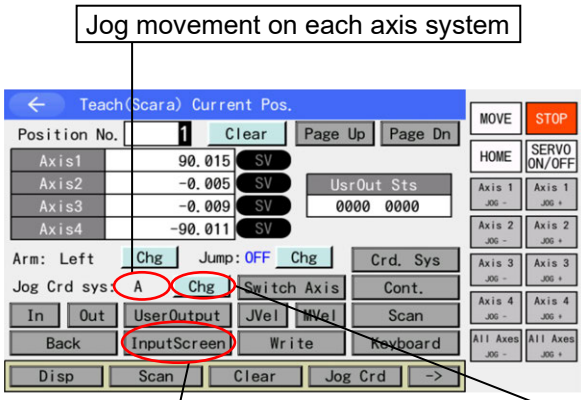
Touching the jog button for the 4th axis (R axis) performs rotary movement centering on the tool end as shown in the figure on the right.
(For 4-axis SCARA type only)



4) Jog operation on each axis system (jog operation on each arm)
Each arm, jog buttons and movement directions are as shown below.



In the case of each axis system, the position display on the teaching screen cannot be incorporated.

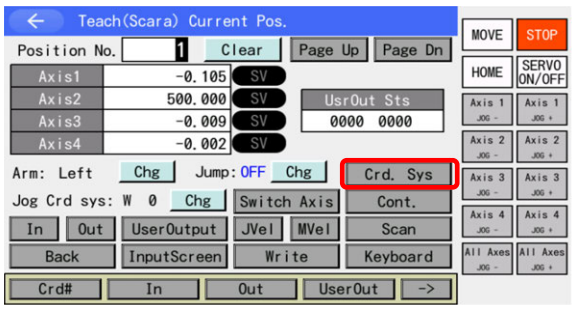


Jog movement on each axis system

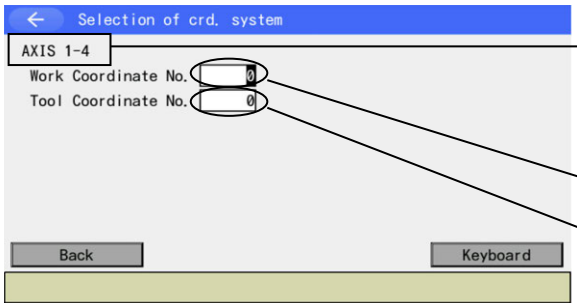
Switchover of the coordinate system for jog operation is to be conducted by touching Chg button.

Switchover of input data screen and current position screen is to be conducted by touching InputScreen button.

(2) Selection of coordinate system No.



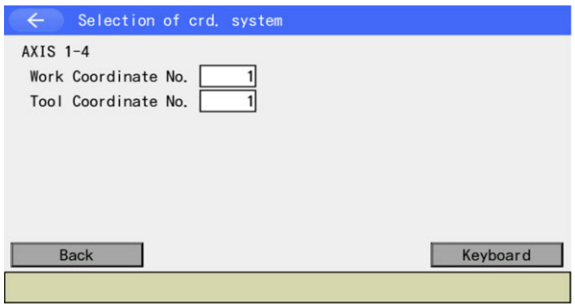
Touch Crd. Sys button.



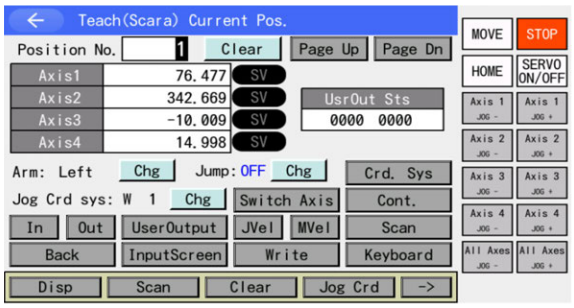
Displayed only for XSEL-RXD/SXD or RAXD/SAXD.
The axis number displayed in Teach screen is shown.

Enter the work coordinate system No.

Enter the tool coordinate system No.



This is a screen displayed when the work coordinate system No. 1 and the tool coordinate system No. 1 are selected.
Touch Back button to return to Teaching screen.



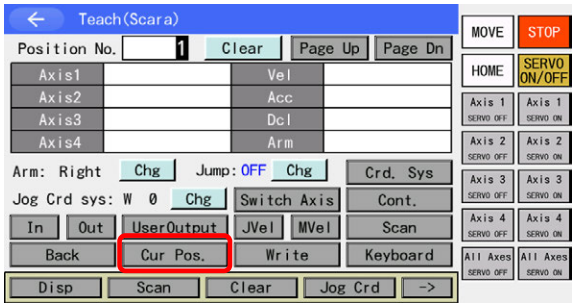
The coordinate values displayed indicate the tool tip position of the tool coordinate system No. 1 on the work coordinate system No. 1.

8.3.3 Actuator Operation

Jog the actuator or move it to the input (transferred) position data by using the Teaching Pendant. Operate the actuator on the Teaching screen.

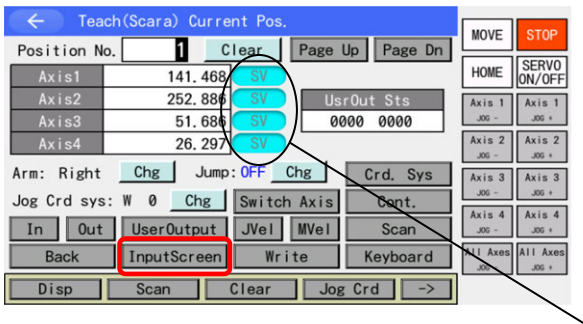
How to Open to Teaching Screen
Go to Edit → Position → Teach (SCARA) in touch panel operation
For XSEL-RXD/SXD/RAXD/SAXD, go to Edit → Position → Teach (Axis 1-4) or Teach (Axis 5-8)

(1) Jog operation

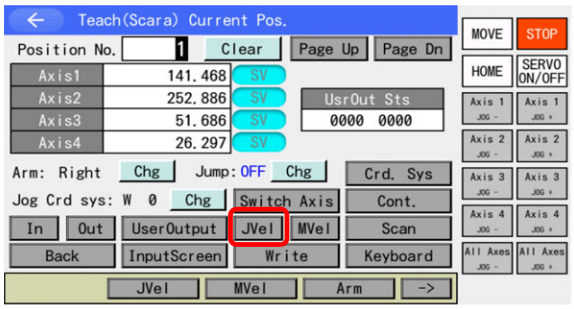


Turn the servo ON condition by touching the SERVO ON/OFF button and then the Servo all axes ON button in the Teaching screen condition.
To check if servo is turned ON or OFF, touch Cur Pos. button.

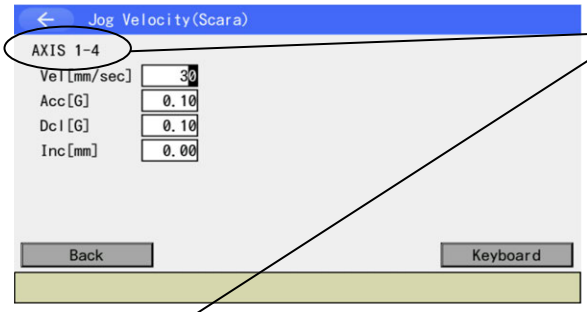
Cur Pos. (InputScreen) button



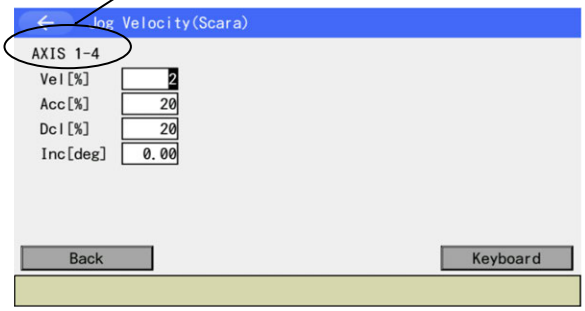
Before operation, check the jog operation coordinate system selected.
Touch the Axis 1 JOG-, Axis 1 JOG+, Axis 2 JOG-, Axis 2 JOG+, Axis 3 JOG-, Axis 3 JOG+, Axis 4 JOG- and Axis 4 JOG+ (Axis 1 JOG-, Axis 1 JOG+, Axis 2 JOG-, Axis 2 JOG+, Axis 3 JOG- and Axis 3 JOG+ buttons for 3-Axis SCARA type) to move the actuator to any given position.



Change of jog velocity
The actuator movement velocity under jog operation is changed.
Touch JVel button.



Work Coordinate System,
Tool Coordinate System



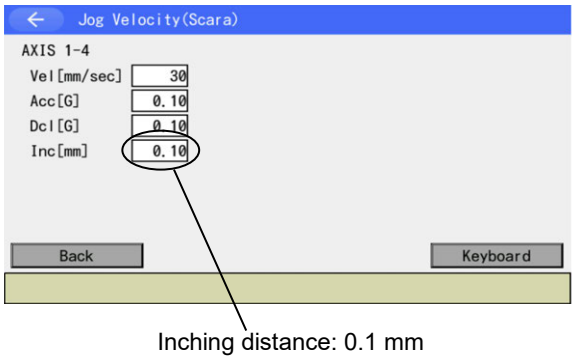
Each Axis System

It should be shown only for XSEL-RXD/SXD and RAXD/SAXD.
The axis number displayed in the teach window should be displayed.

Input the Vel (velocity), Acc (acceleration) and Dcl (deceleration) in the jog operation on the touch panel numeric keys.
Inc (inching distance) should be 0.00.
In addition, the inching distance can also be set from this screen.
However, in the each axis system, input percentage (%) values for Vel (velocity), Acc (acceleration) and Dcl (deceleration).
Touch Back button to return to Teaching screen to conduct the jog operation.

* Refer to [next page] for the maximum setting of the velocity (Vel), acceleration (Acc) and deceleration (Dcl) in the jog operation.

(2) Inching operation



Set the inching distance (travel made every time the JOG button is pressed once).
In the jog velocity screen, input a number in Inc (inching distance) on the touch panel numeric buttons. The numerical input range is between 0.01 and 1.00 [unit: mm].
Touch Back button to return to Teaching screen to conduct the inching operation.
Clicking the jog button once makes 1- inching distance movement.
Clicking any of Axis 1 JOG+ through Axis 4 JOG+ makes inching movement in the coordinate plus direction, while clicking any of Axis 1 JOG- through Axis 4 JOG- makes inching movement in the coordinate minus direction.

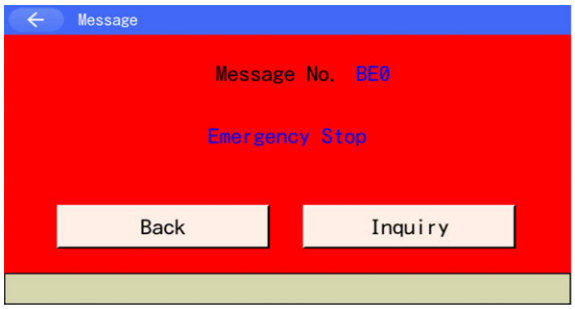
* The maximum setting of the velocity (Vel), acceleration (Acc) and deceleration (Dcl) in the jog operation are as shown below.

For Models Other than XSEL2-TX
- ⊙ 1st SCARA Axis in Controller for SCARA: Work Coordinate System, Tool Coordinate System
  - Velocity : 250mm/s
  - Acceleration : All Axes Common Parameter No. 22
  - Deceleration : All Axes Common Parameter No. 23
- ⊙ 2nd SCARA Axis in Controller for SCARA: Work Coordinate System, Tool Coordinate System
  - Velocity : 250mm/s
  - Acceleration : All Axes Common Parameter No. 208
  - Deceleration : All Axes Common Parameter No. 209
- ⊙ Cartesian Axes in Controller for SCARA
  - Velocity : 250mm/s
  - Acceleration : All Axes Common Parameter No. 203
  - Deceleration : All Axes Common Parameter No. 204
- ⊙ 1st or 2nd SCARA Axis in Controller for SCARA: Each Coordinate System
  - Velocity : All Axes Common Parameter No. 35 (Input Range from 1 to 10%)
  - Acceleration : 100%
  - Deceleration : 100%

For XSEL2-TX
- ⊙ 1st SCARA Axis in Controller for SCARA: Work Coordinate System, Tool Coordinate System
  - Velocity : 250mm/s
  - Acceleration : Robot Parameter No. 22
  - Deceleration : Robot Parameter No. No. 23
- ⊙ Cartesian Axes in Controller for SCARA
  - Velocity : 250mm/s
  - Acceleration : All Axes Common Parameter No. 22
  - Deceleration : All Axes Common Parameter No. 23

- ⊙ 1st SCARA Axis in Controller for SCARA: Each Coordinate System
  - Velocity : Robot Parameter No. No. 35 (Input Range from 1 to 10%)
  - Acceleration : 100%
  - Deceleration : 100%

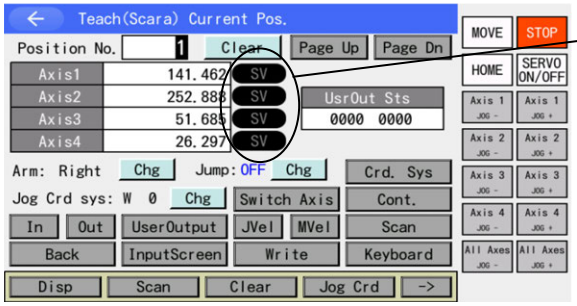
(3) Manual movement (direct teaching) under servo OFF



Touch SERVO ON/OFF button and then touch Servo all axes OFF button to turn the servo OFF.
Press the EMERGENCY STOP button.

Emergency stop input screen
Touch Back button to return to Teaching screen.

> ⚠ *Warning:*
> *Be sure to execute manual movement when the EMERGENCY STOP button is pressed.*



Servo OFF

Move the actuator to any given position manually.

> To move the Z-axis or R-axis manually, the brake must be released. Consequently, the Z-axis may drop under the weight of the hand attached to the tip when the brake is released.
> Do not perform teaching by manual movement of the Z-axis or R-axis.

(4) Arm system change

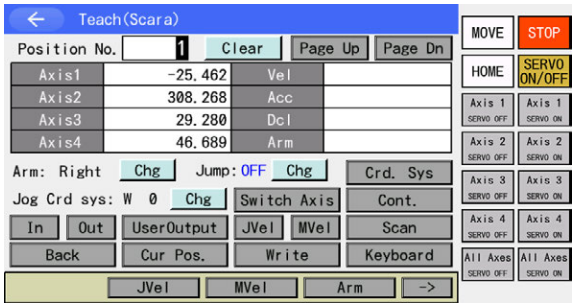
Change the current arm system over to the opposite arm system (Right arm → left arm, left arm → right arm). The 1st arm does not move and the 2nd arm moves in such a way that it becomes straightened with the 1st arm.

Switchover of the arm system can be conducted on the teaching screen.

How to Open to Teaching Screen

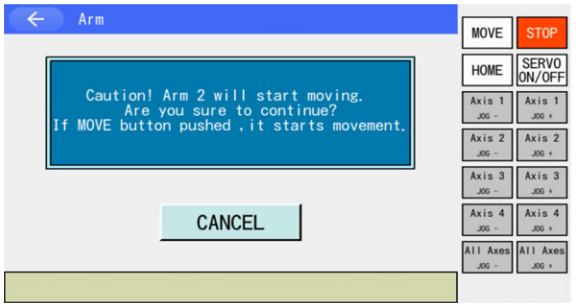
Go to Edit → Position → Teach (SCARA) in touch panel operation

For XSEL-RXD/SXD/RAXD/SAXD go to Edit → Position →Teach (Axis 1-4) or Teach (Axis 5-8)

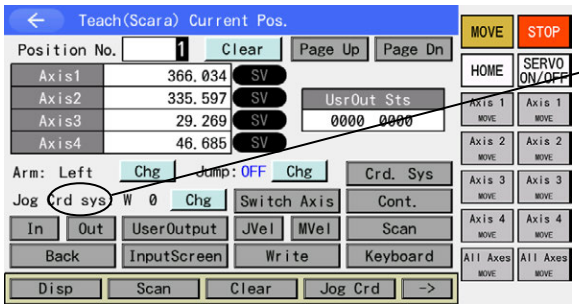


Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.

Touch Arm Chg button.



Select whether or not to change the arm system. Touch MOVE button when desired to execute. When execution is not desired, touch CANCEL button.



Current arm system display

When the MOVE button is touched, the display changes over to the current position screen and the 2nd arm moves until it becomes straightened with the 1st arm.

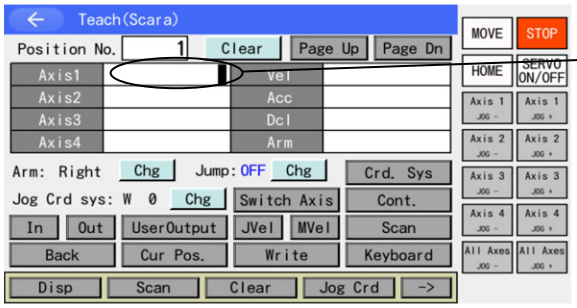
After completion of the operation, the current arm system display will change.

(5) Load Current Position as Data

Check the work coordinate system No., tool coordinate system No., and arm system currently selected in advance.

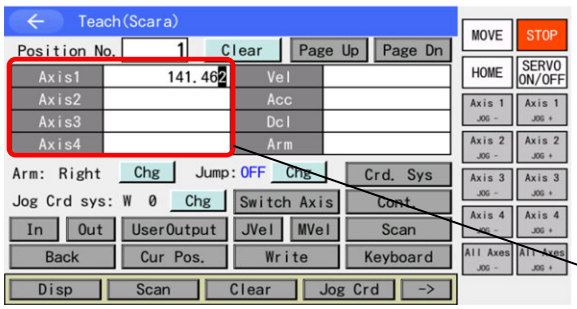
Display Change : Go to Edit → Position → Teach (SCARA) → Crd. Sys in touch panel operation

For XSEL-RXD/SXD/RAXD/SAXD, go to Edit → Position → Teach (Axis1-4) or Teach (Axis5-8) → Crd. Sys



The selected actuator's location is incorporated as position data into the teaching screen.

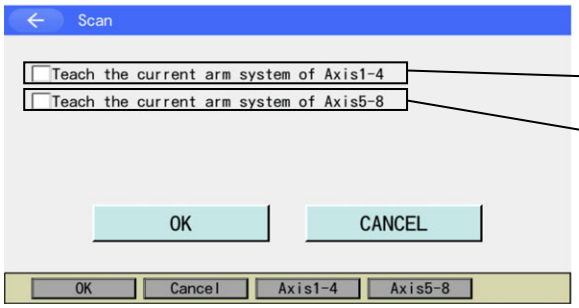
Touch in the position number input box to show the cursor and input a value with touch panel numeric keys. (Touch panel numeric keys can be shown by touching Keyboard button.)
Or, select the position number to load the data from by touching Page Up and Page Dn buttons.



The current position data of the axis where the cursor is placed is loaded by touching Scan button when the cursor is in the axis boxes. The current position data for all the axes is loaded if Scan button is touched when the cursor is not displayed or it is placed out of the axis boxes

Axis box

In the case of the XSEL-RX/SX, RXD/SXD, RAXD/SAXD, MSEL-PCX/PGX or XSEL2-TX controller, it can be selected as to whether or not the arm system is scanned and the data is set on the position data.



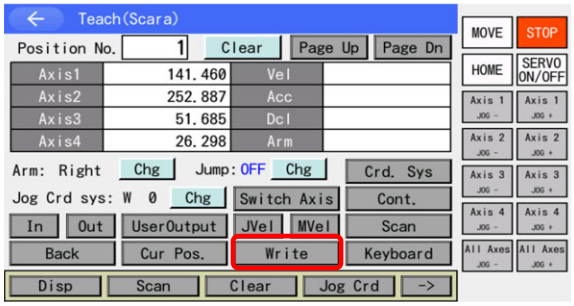
Arm System Data for Axes 1 to 4 Scanning Selection

Arm System Data for Axes 5 to 8 Scanning Selection

For 3-axis SCARA type, the display shows Axis 1-3 instead of Axis 1-4. Also, Axes 5 to 8 arm system load check boxes are displayed only in XSEL-RXD/SXD, RAXD/SAXD.
Touch in the check box for the applicable axis to put a check mark and establish the load setting. If you touch in the box in which there is already a check mark, the check mark will be removed and loading will not be conducted.

(6) Transfer to Controller

The incorporated data is transferred to the controller.



In Teaching screen, touch Write button.
The loaded data is stored in the memory in the controller. Once the transfer to the controller is complete, the position number is incremented by one.
The data available to transfer to the controller is one position data that is being displayed. It is not possible to transfer the data of more than one position number at a time.

If the screen is switched with touching Page Up, Page Dn or Back button, before the data is transferred, the input data will become invalid.

Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted[*1]. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have [8.1.2 Flash ROM Writing] conducted.
(*1 Except for controllers which possess feature to retain data)

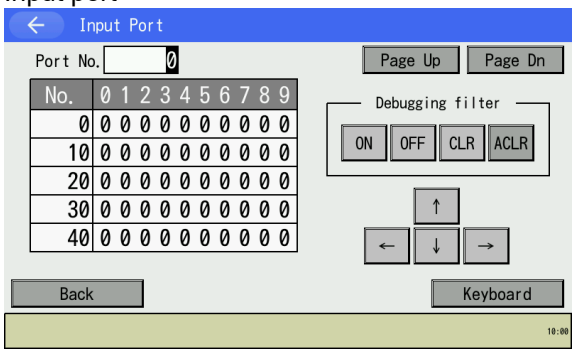
(7) I/O Monitor

1) Input/Output Monitor

Touch In or Out button in Teaching screen.

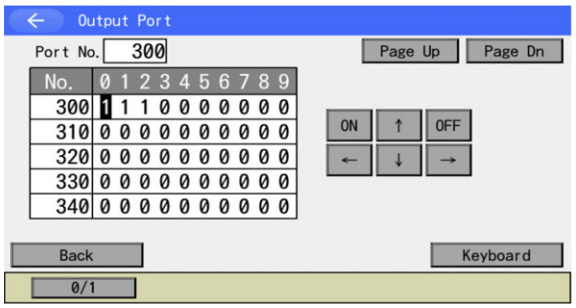
For models applicable for input and output ports, monitoring of the input and output ports is available by touching InOut button.

Input port



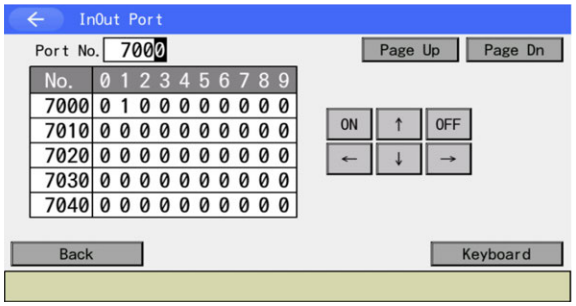
Refer to [14.2 Input Port] for debug filters.

Output ports



Touching ON and OFF buttons, the output port of the cursor position can be turned ON/OFF (1/0).

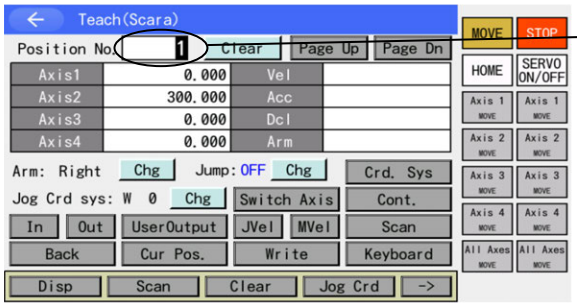
InOut Port (for applicable models)



The way to operate is the same as the output port.

(8) Movement

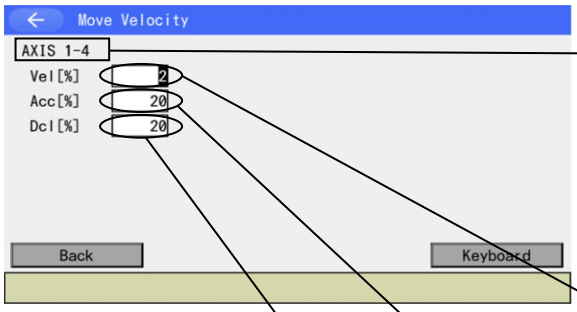
The actuator is moved to the location of the position data transferred to the controller. (Check the location of the teaching position data.)



Position number to move

Select position No. to move in the Teaching screen condition.
Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.
To check if servo is turned ON or OFF, it is necessary to switch to the current position screen. It shows the servo is ON when SV mark beside the position in the current position screen is in light blue.
The actuator starts moving by touching the MOVE button and then the all axes moves button. To stop movement halfway, touch the STOP button.

To check or change the operation velocity, touch MVel button to open the operation velocity setting screen.



Displayed only in X-SEL-RXD/SXD and RAXD/SAXD, axis number in teach window

Input the change data on the touch panel numeric keys (which are displayed by touching Keyboard button). After the change is made, touch Back button.

Ratio to maximum PTP velocity (axis-specific parameter No. 28)

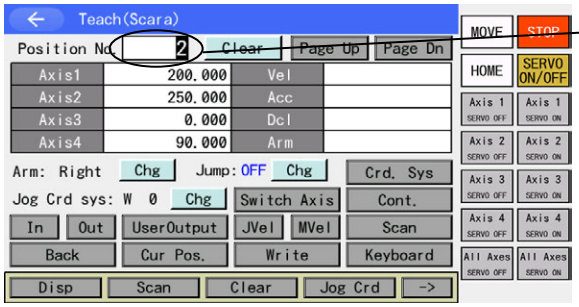
Ratio to maximum PTP acceleration (axis-specific parameter No. 134)

Ratio to maximum PTP deceleration (axis-specific parameter No. 135)

* The maximum setting in the velocity (Vel) depends on All Axes Common Parameter No. 35 (Input Range from 1 to 10%).

(9) Continuous movement

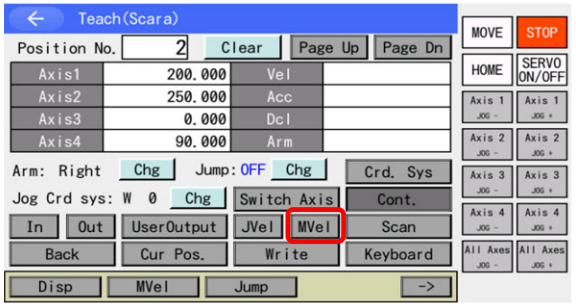
The actuator is continuously moved to the location of the position data transferred to the controller.



Position No. to move first

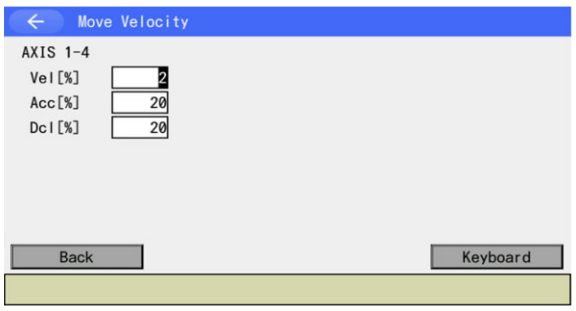
In Teaching screen, use the numeric keys, Page Up and Page Dn buttons to select the position number to operate first.
Touch the SERVO ON/OFF button and then the Servo all axes ON button to turn the servo ON.
To check if servo is turned ON or OFF, it is necessary to switch to the current position screen. It shows the servo is ON when SV mark beside the position in the current position screen screen is in light blue.

Touch Cont. button.

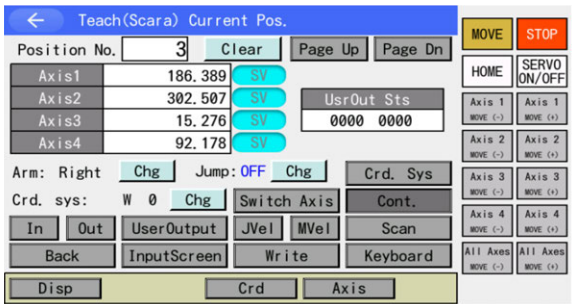


Once the status gets in the continuous operation mode, the background color of Cont. button turns darker.

To check or change the movement velocity, touch MVel button to open the edit screen for velocity and others.



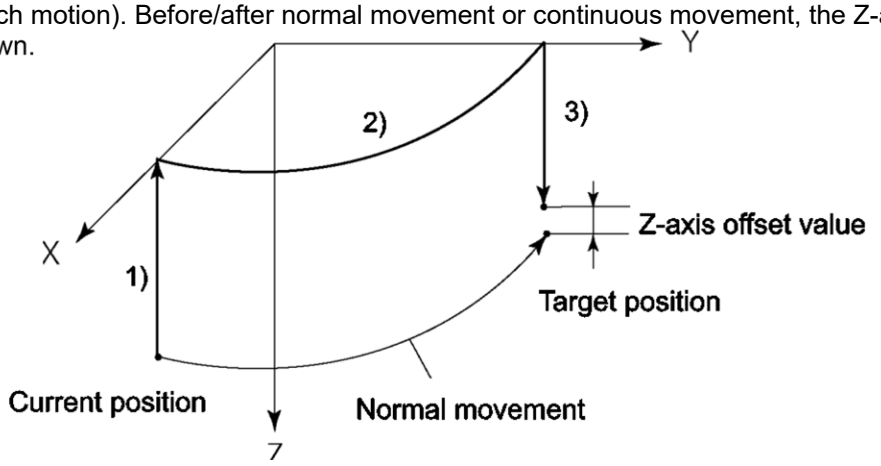
After change or confirmation of parameters, touch Back button to go back to the previous screen.



Touch MOVE button, and then touch all axes moves+ or all axes moves- to have the actuator start the continuous operation.

(10) Jump movement

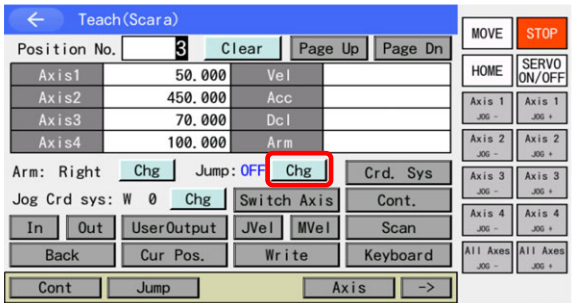
The actuator is moved to the location of the position data transferred to the controller by jump motion (arch motion). Before/after normal movement or continuous movement, the Z-axis is moved up and down.



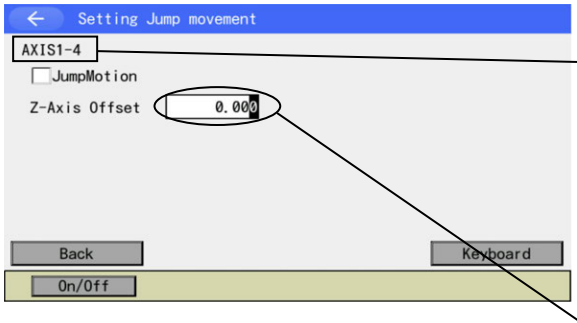
Motion sequence

1) Raise the Z-axis from the current position to the top position (Z = 0). (Motion of the Z-axis only)
2) Movement is performed to above the target position by PTP motion while the Z-axis stays at the top position. (Motion of the X-axis, Y-axis and R-axis only)
3) Lowering is performed to the target position. (Motion of the Z-axis only). When the Z-axis offset value is set, the Z-axis stops before (above) the target position by the same amount.
   Z-axis offset value: Specify how many millimeters before the target position to stop the Z-axis. No minus value can be input.
   (Example) When the Z-axis target position is 100.000 mm and the Z-axis offset value is 30.000 mm, the Z-axis stops at the position of 70.000 mm.

Setting of jump movement is performed on the Teaching screen.



Touch Jump Chg button.

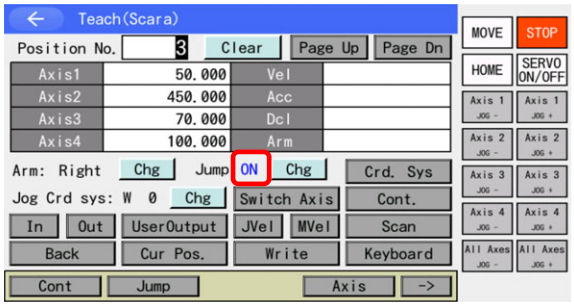


Displayed only in XSEL-RXD/SXD and RAXD/SAXD axis number in teach window

To set the jump operation valid/invalid, touch in the check box at JumpMotion, to put or remove a check mark.

Enter the Z-axis offset value.
Enter the offset value (mm) from the Z-axis target position coordinate.

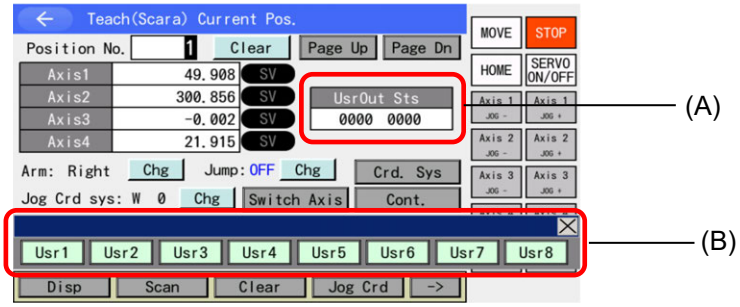
The set value is effective until the Teaching Pendant is reset or reconnected.



Touch Back button to return to Teaching screen.
After selecting the target position number, touch MOVE button, and then touch all axes moves button to start the jump operation.
When the jump operation is active, the right of Jump: is turned to 'ON'. ('OFF' when inactivated)

(11) User-specified output port operation

The output ports set in the parameter can easily be turned ON/OFF. In Teaching screen (or the current position screen in Teaching), touch UserOutput button. When in Teaching screen, it automatically changes to the current position screen.



When UserOutput button is touched

(A) User-specified output port status

The conditions of user-specified output ports are displayed as '1' (=ON) and '0' (=OFF).
(The conditions are displayed from the first specified port for the number of the specified ports from the left.)

(B) User-Specified Output Port Operation Panel Window

It is a panel window to perform the operation to turn ON/OFF the user-specified output ports.
Assignment is made for the number of specified ports in the order of 'Usr1', 'Usr2', 'Usr3' … from the top of the user-specified output ports.
By touching a Usr1 to Usr8 buttons, an operation can be performed to turn each output port ON/OFF.
(Port ON Command is executed when the port status display is '0' (OFF) and Port OFF Command when the status display is '1' (ON)).
To close this panel window, touch × on the top right.

1) Setting of user-specified output port parameters

For the operation method for parameter setting, refer to [13. Parameter Edit].
The first port No. and the number of ports are set with the following parameters:

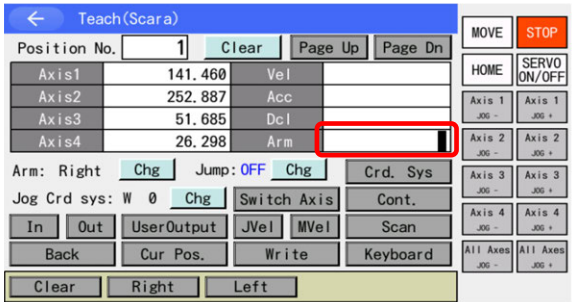
- Number of ports
  I/O parameter No. 74 "QntPrtUsrOut" (Number of output ports used by TP user (hand, etc.))
- First port No.
  I/O parameter No. 75 "TopNo.UseOut" (First output port No. by TP user (hand, etc.))

(Setting example) When the first port No. is set to 308 and the number of ports is set to 8:

'Usr1' ····· Output port 308
'Usr2' ····· Output port 309
'Usr3' ····· Output port 310
'Usr4' ····· Output port 311
'Usr5' ····· Output port 312
'Usr6' ····· Output port 313
'Usr7' ····· Output port 314
'Usr8' ····· Output port 315

(12) Arm System setting

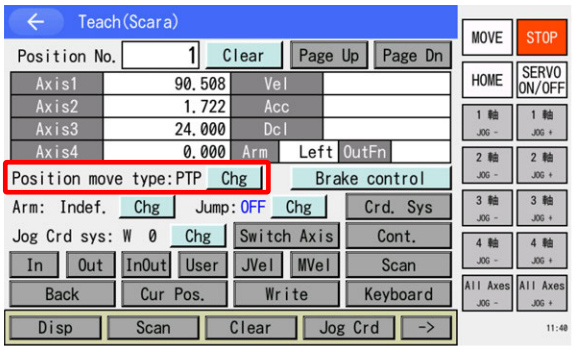
In the case of the XSEL-RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD, MSEL-PCX/PGX or XSEL2-TX Controller, the arm system data can be set on the position data.



The arm system settings for Axis1 to 4 (Axis 1 to 3 for 3-axis SCARA) or Axis5 to 8 (Axis5 to 8 are for XSEL-RXD/SXD, RAXD/SAXD only) that is currently shown can be established.
Touch in Arm box to show the cursor.
Refer to [8.1.1 Input of Target Arm System Data (Arm1 or Arm) and (Arm2)] for show to input.

(13) Changing Position Movement Type (for applicable models only)

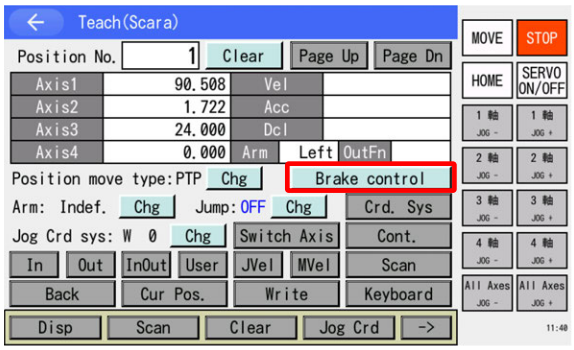
An operation type (CP/PTP) for position movement can be indicated.

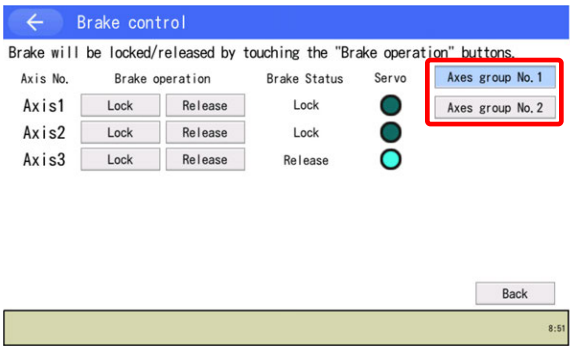


Touch the Chg button in the "Position Movement Type" label before the movement starts to select the operation type for the next movement. Change cannot be made during movement or continuous movement.
The default of SCARA axis should be PTP operation.

(14) Brake Control (for applicable models only)

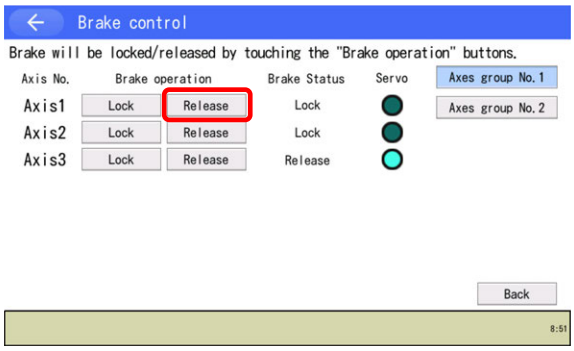
When it is connected to the brake control applicable model, the Brake control button should be displayed. Touch it and the screen should shift to the brake control window.



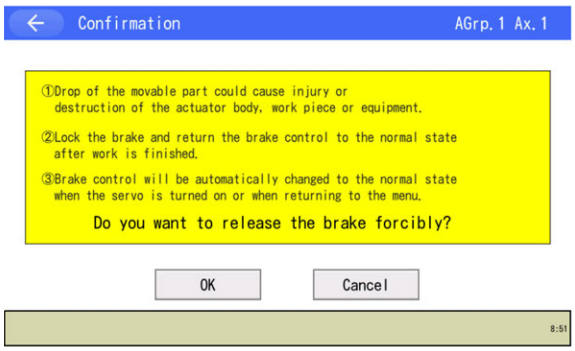


When several axis group are set, an axis group of an axis that you would like to have a brake control should be selected with the Axes group No. 1 and Axes group No. 2 buttons.

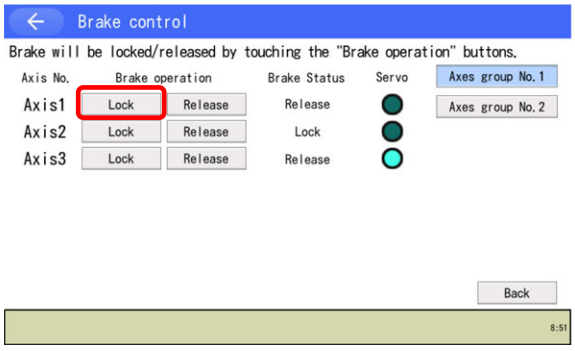
The brake operation button and the status of an effective axis should be displayed.



To release an axis in brake lock status compulsorily, touch the Release button in the brake operation column.



As the screen shifts to the confirmation window, confirm the contents and touch the OK button when having a compulsory release, and touch the Cancel button when cancel.



When the brake is to be locked, confirm the servo in the axis number to lock is off, and touch the Lock button in the brake operation column. When it is locked, the brake status should be shown “Lock”. When the servo is on, touch the Back button to return to the teach window, turn the servo off and turn it back on to lock it.

Warning: Caution for Brake Compulsory Release

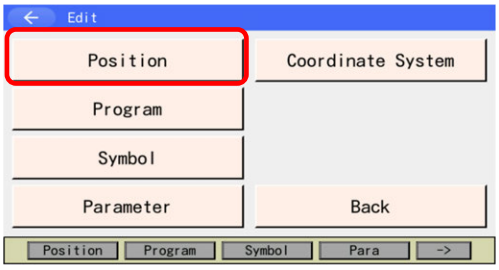
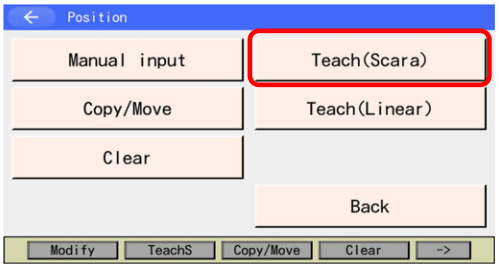
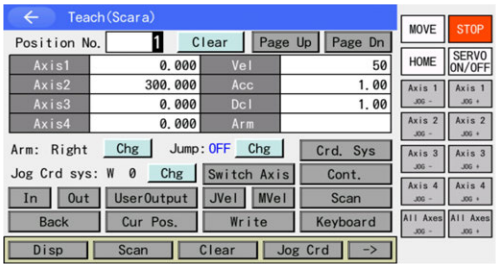
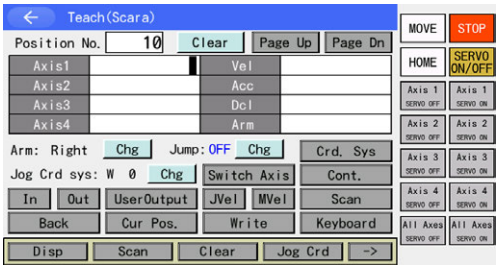
(1) The moving part may drop, which may cause injury or cause damage on the actuator main unit, workpiece or equipment. Pay special attention.

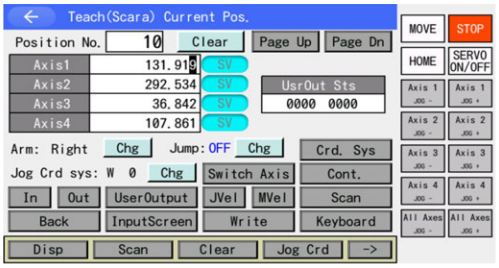
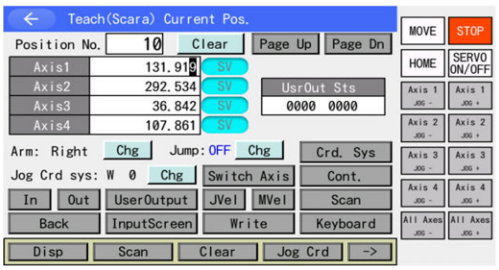
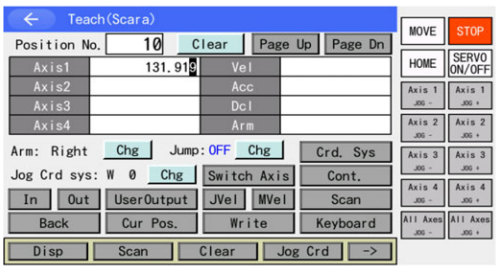
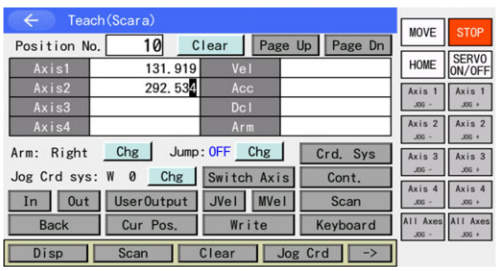
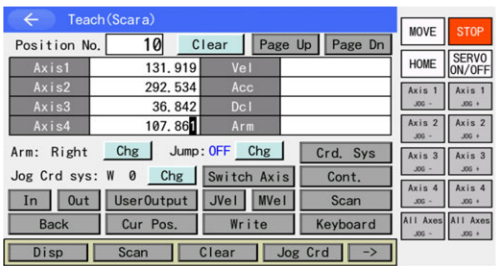
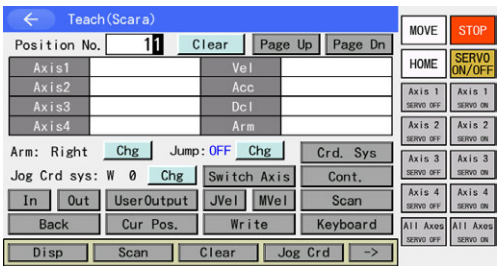
(2) Make sure to lock the brake after the work is finished to set the brake control back to the normal condition.

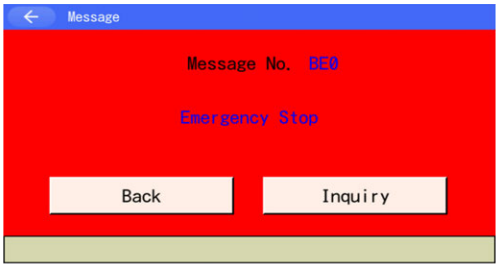
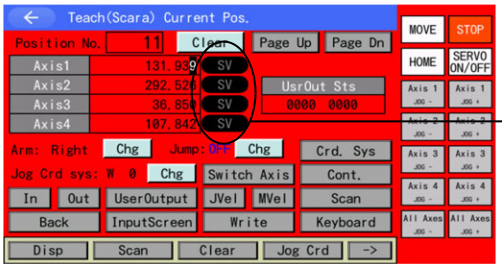
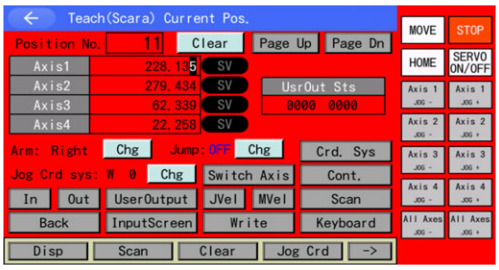
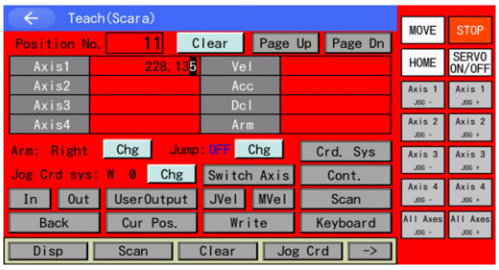
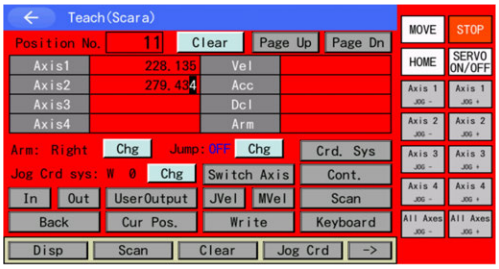
(3) When the servo is turned on and when it gets back to the menu window, the brake control should get back to the normal condition automatically.

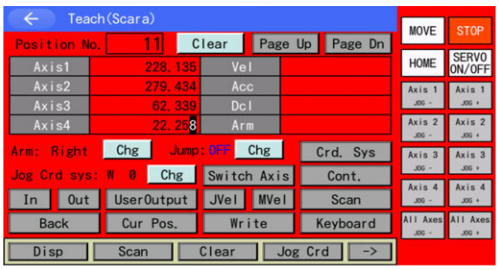
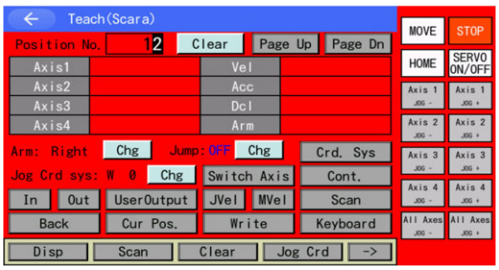
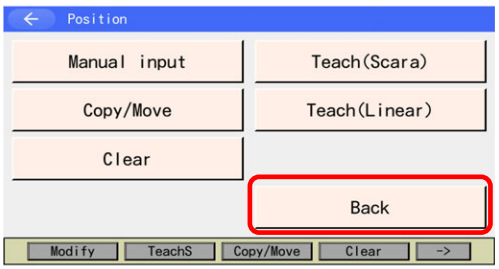
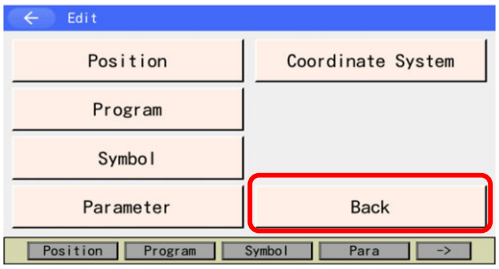
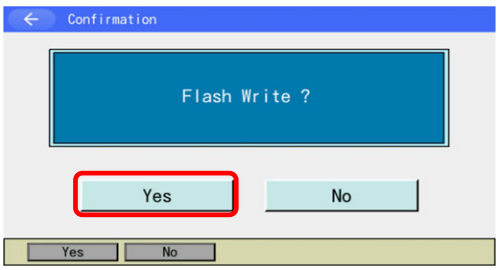
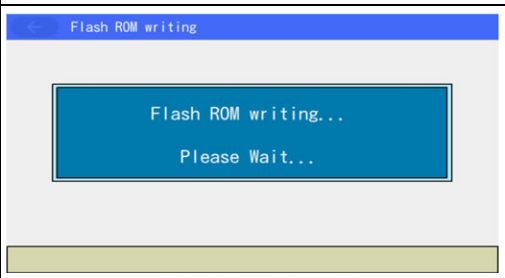
8.3.4 Example of Teaching Input

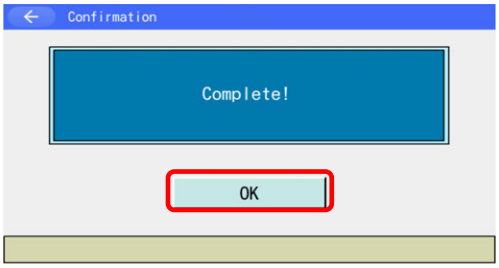
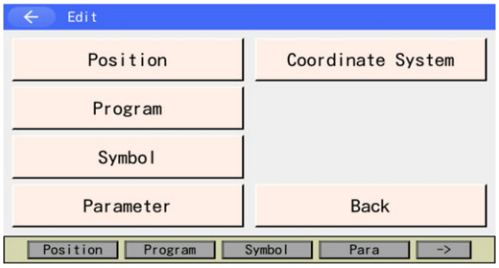
Entering the data into position No. 10 using the jog and into position No. 11 by manual movement (direct teaching) with Servo OFF status.

No.	Operation		
1	Touch Edit button.		
2	Touch Position button. .		
3	Touch Teach(Scara) button.		There is no Teach(Linear) button in XSEL-JX/KX.
4	Either use Page Up button and Page Dn button in the touch panel or input “10” in the position number on the software numeric key, and then touch ENT button for confirmation.		
5	Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.		

No.	Operation		
6	Touch the jog buttons Axis 1 JOG-, Axis 1 JOG+ through Axis 4 JOG-, Axis 4 JOG+ to move the robot to a desired position.		
7	Touch the Scan button to load the current position of the axis No., where there is the cursor, to the input screen. Touch Cur Pos. button to confirm that the data has been loaded.		When the jog coordinate system is each axis system “A” display, the current position cannot be loaded.
8	Touch in the input area for Axis2 to move the cursor to the next axis and touch Scan button.		
9	Also, load the data for Z-axis and R-axis in the same manner.		
10	Touch Write button to transfer the position data to the controller. The position moves to No. 11.		If the screen is switched with Page Up or Page Dn buttons before the data is transferred, the input data will become invalid.
11	Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo OFF.		

No.	Operation		
12	Press the EMERGENCY STOP button. Touch Back button.		⚠ *Warning:* *Be sure to execute manual movement when the EMERGENCY STOP button is pressed.* To have manual operation on Z-axis/R-axis, it is necessary to release the brake. As a result, the Z-axis may drop by the weight of such as a hand installed on the end when the brake is released. Do not attempt to conduct teaching manually on the Z-axis/R-axis.
13	Touch Cur Pos. button to confirm that the servo is OFF. Move each axis manually to a desired position.		Servo OFF It turns to light blue when the servo is turned ON.
14	Touch Scan button to load the axis number current position where the cursor is to the input screen.		
15	Touch in the input area for Axis2 to move the cursor to the next axis and touch Scan button.		
16	Also, load the data for Z-axis and R-axis in the same manner.		

No.	Operation		
17	Touch Write button to transfer the position data to the controller. The position moves to No. 12.		If the screen is switched with Page Up or Page Dn buttons before the data is transferred, the input data will become invalid.
18	Finish the position data input with teaching. Touch Back button.		
19	Touch Back button.		The figures shown hereafter are in the condition of the emergency stop being cancelled.
20	Touch Back button.		
21	To write the data to the flash ROM, touch Yes button. If writing is not necessary, touch No button.		
22	While in writing process to flash ROM, the display 'Flash ROM writing…' flashes.		***Never shut off the power to the controller during Flash ROM writing.***

No.	Operation		
23	The flash ROM writing process is finished. Touch OK button. The screen returns to Edit menu.		
24			

8.4 Teaching for 6-axis Cartesian Construction Axes RSEL 6-axis Cartesian Construction Axes

8.4.1 Teaching

Teaching is one way to input position data (moving the actuator to an arbitrary position and getting that actuator's current position as data).
Methods for moving the actuators to an arbitrary position are the jog operation, inching operation.
The fundamental flow of teaching is as follows:

1) Move the actuator (Jog operation • inching operation).Select position No. and axis No. for data input.

↓

2) Take the data of the current position of the actuator into the Teaching screen.

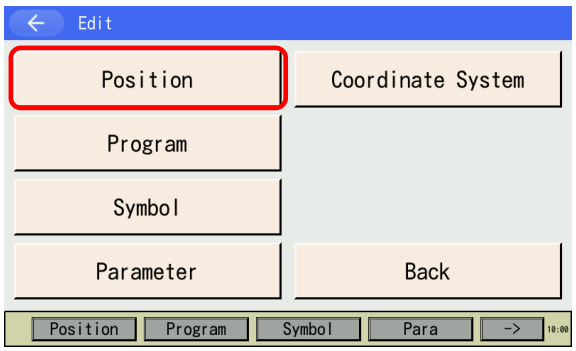
↓

3) Transmit the data to the controller.

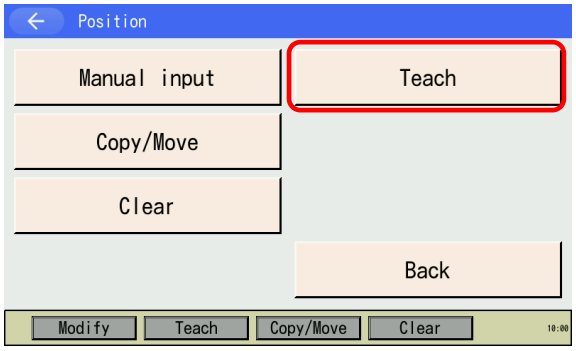
Input the position data by teaching and repeating 1) to 3).
Teaching is transacted mainly at the Teaching screen.



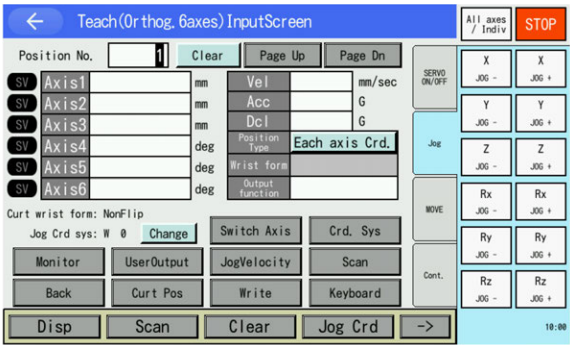
Touch Edit button in the Menu screen.



Touch Position button on the Edit screen.

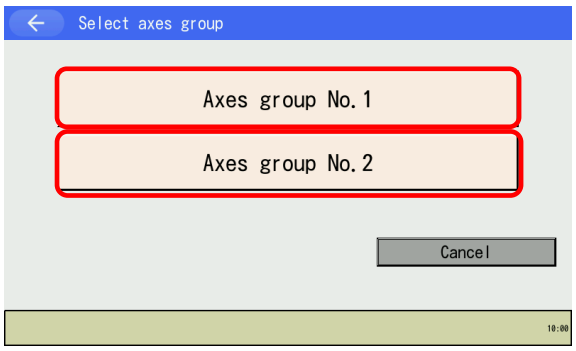


Touch Teach button in Position menu screen.

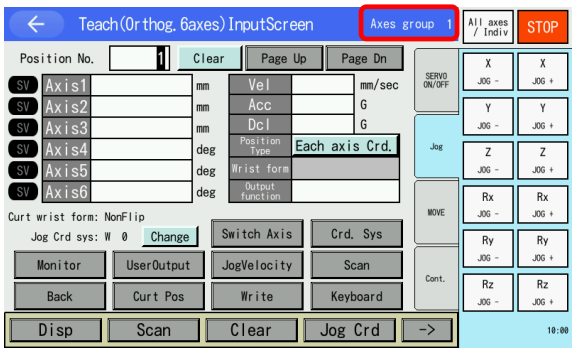


Teach window appears.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group window should appear after you touch the Teach button. Touch an axes group number button to select the axes group number that is to be subject to.



The select axes group window should appear after you touch the Teach button.
Touch an Axes group No. button.



Teach window appears.

* The axes group number that was selected should be shown on the top right of the screen.

Explanation for each Display Area

Position No.	: Currently displayed position number
SV MARKS	: Servo-on status of each axis (Light blue: Servo on / Black: Servo off)
Axis1-6 (X-Rz)	: Position data for axis from 1 to 6 Label switches over in response to the coordinate system. (Input window: position type, Current position window: Jog coordinate system) X-Rz display for orthogonal coordinates, Axis1-6 display for each axis coordinates
Vel	: Velocity
Acc	: Acceleration
Dcl	: Deceleration
Position Type	: Indication of position type (orthogonal coordinates or each axis coordinate)
Wrist form	: Indication of wrist form (Flip/Non Flip/Not Indicated) It can be indicated only when the position type is the orthogonal coordinates.
Output Function	: Output function in position output operation feature
Curt wrist form	: Current wrist form
Jog Crd sys	: Coordinate system in JOG operation Wn : Work Coordinate System, n represents the work coordinate system number (0 is the base coordinate system) Tn : Tool Coordinate System, n represents the tool coordinate system number A : Each Axis System

Explanation for each Touch Panel Button

Curt Pos	: Switch the input data screen to the current position display.
Scan	: The current position is to be read into the screen. When the cursor is placed on either of the axes from 1 to 6 (X to Rz), the current position of the axis with the cursor on, and the position of all the axes from 1 to 6 (X to Rz) should be read in when the cursor is placed on somewhere else or the cursor is not shown. Scanning on single axis includes the position data and wrist form. It is available to scan only when there is no position data (all blank in axes from 1 to 6 (X to Rz)) or the position type and the JOG coordinate system match to each other. When there is no position data, the JOG coordinate system should be read in as the position type. Scanning on all axes includes the position data, wrist form and the coordinate system. (The JOG coordinate system should be read in as the position type.)
Clear	: It clears all the axes data in the displayed position number.
Jog Crd sys Change	: It switches over the coordinate system for jog operation.
Crd. Sys	: Selection of the coordinate system number can be performed.
Switch Axis	: Axis to display can be switched when there is an additional axis.
JogVelocity	: Setting can be established for such commands as the JOG velocity.
Monitor	: The monitor menu can be shown in a pop-up window. Select an item and the screen switches to the corresponding monitoring window.
User	: The output ports (eight points max. in a row) get turned on/off. (It is necessary to set up Parameters No. 74 and 75 in advance)

8.4.2 Jog Movement Direction and Coordinate System

(1) Jog buttons and movement directions

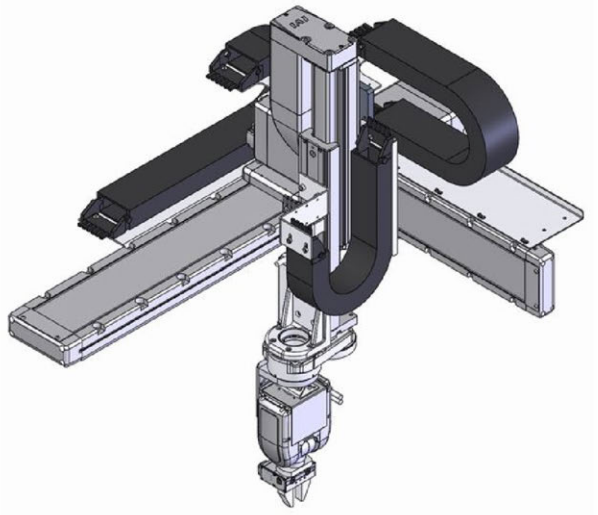
The movement direction during jog operation changes according to the coordinate system No. selected.

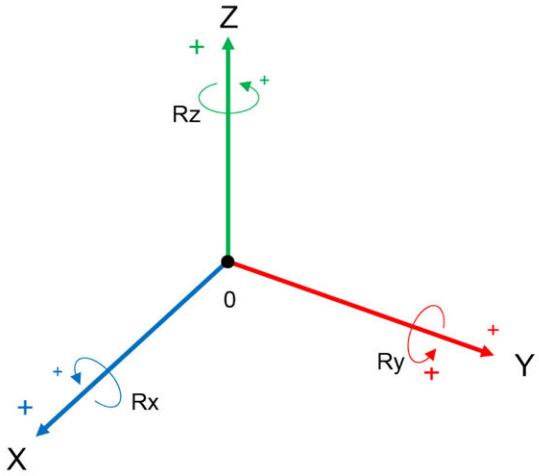
The status before shipment is the base coordinate system (work coordinate system No. 0) and tool coordinate system No. 0.

For the setting of coordinate system data, refer to [11. Coordinate System Data Edit].

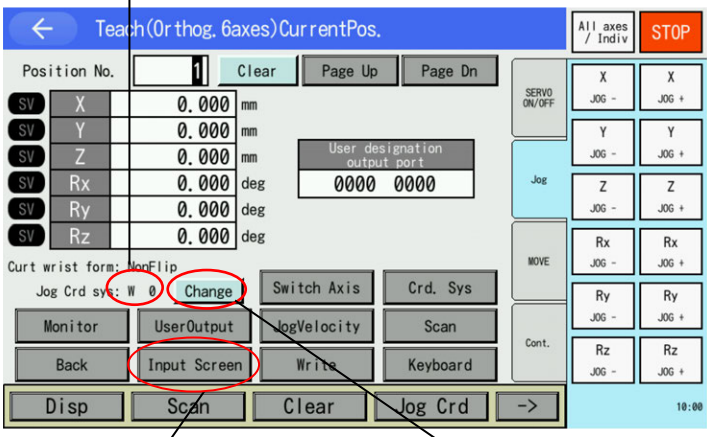
1) Jog operation on base coordinate system

The jog buttons and movement directions on the base coordinate system are as shown below.





Jog movement on base coordinate system (work coordinate system No. 0)

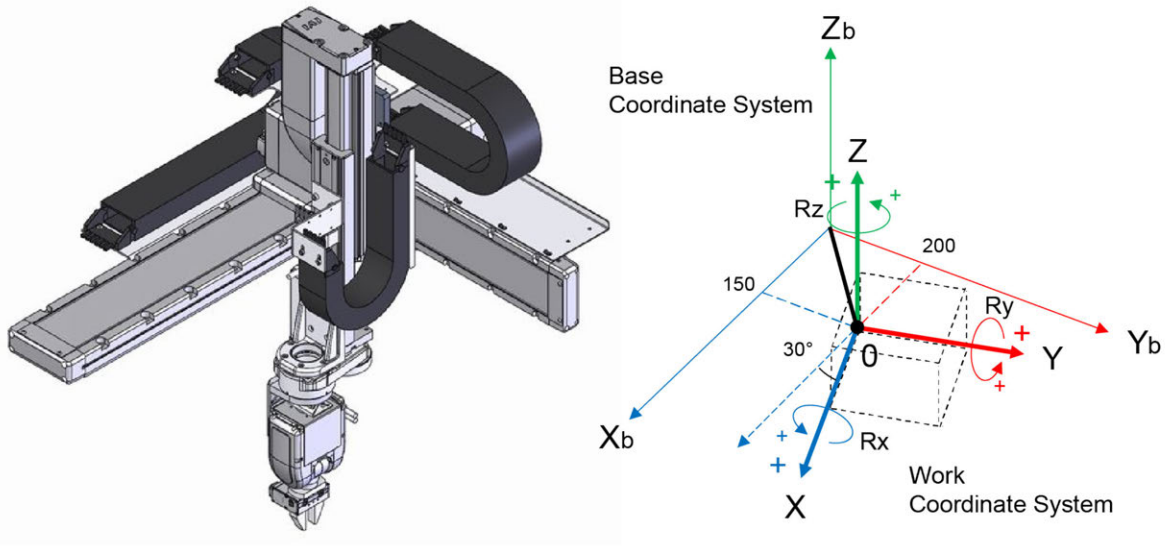


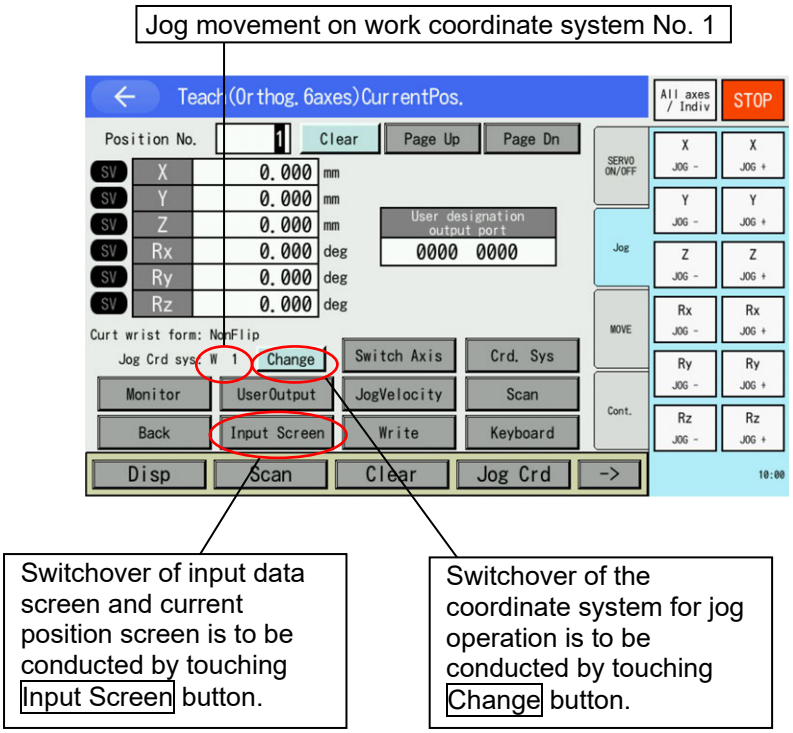
Switchover of input data screen and current position screen is to be conducted by touching Input Screen button.

Switchover of the coordinate system for jog operation is to be conducted by touching Change button.

2) Jog operation on work coordinate system

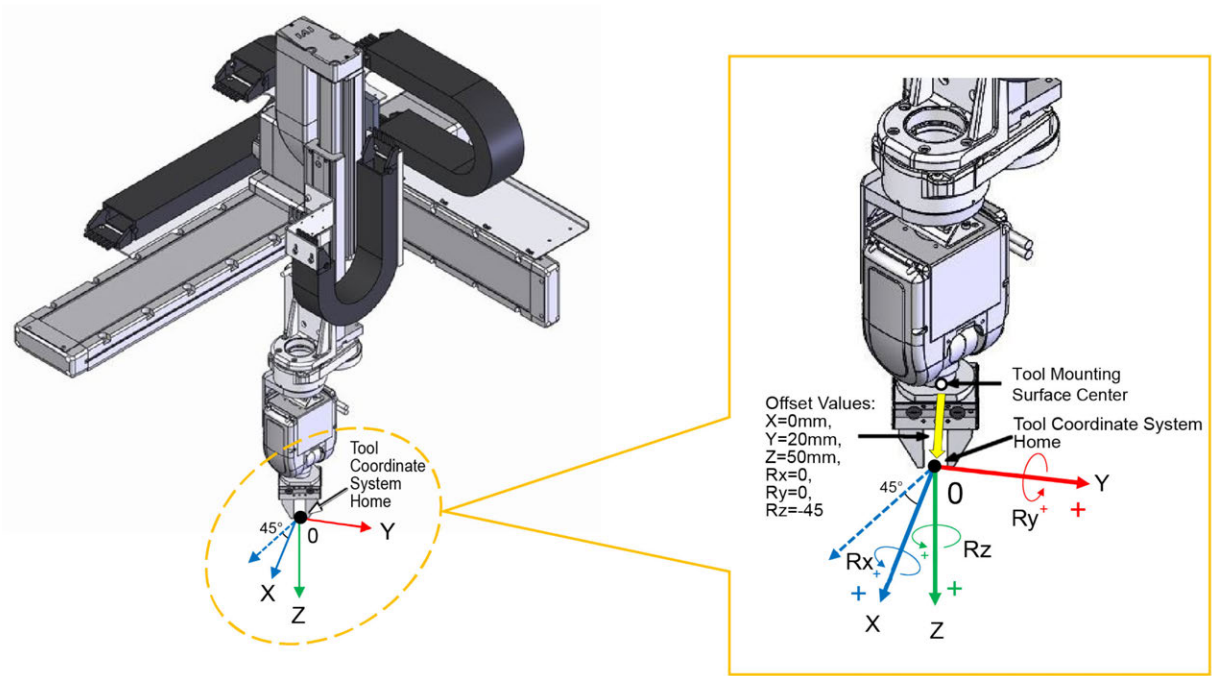
Example) The jog buttons and movement directions on the work coordinate system No. 1 are as shown below.
The offset values from the work coordinate system No. 1 become Xofw1=150, Yofw1=200, Zofw1=0, Rxofw1=0, Ryofw1=0, Rzofw1=30

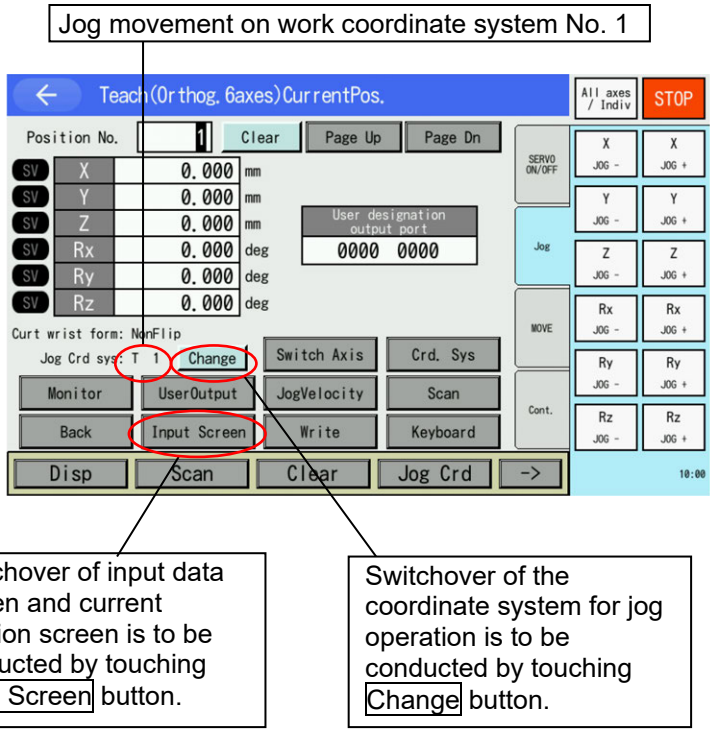




3) Jog operation on tool coordinate system

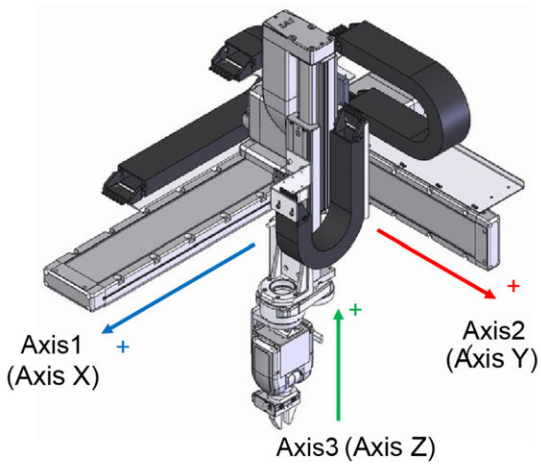
Example) The jog buttons and movement directions on the tool coordinate system No. 1 are as shown below.
The offset values from the tool coordinate system No. 1 become Xoft1=0, Yoft1=20, Zoft1=-50, Rxoft1=0, Ryoft1=0, Rzoft1=-45

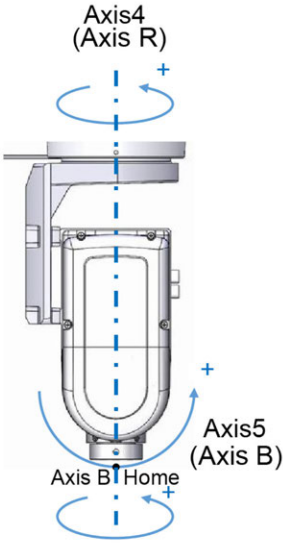




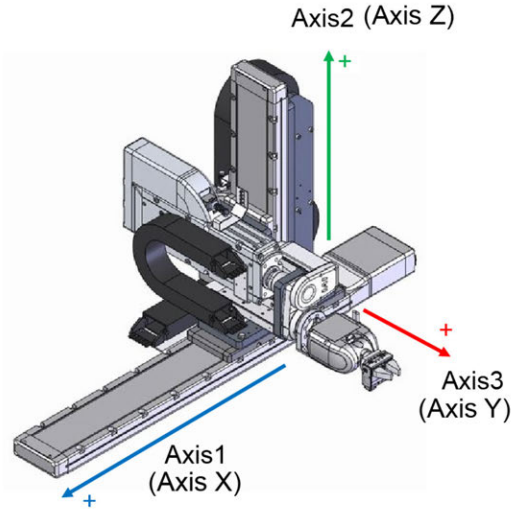
4) Jog operation on each axis system (JOG operation for each actuator)
The JOG buttons and the directions of movement in each axis should be as shown in the figure below.

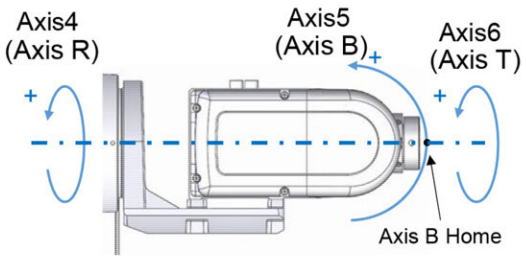
For CRS-XB□

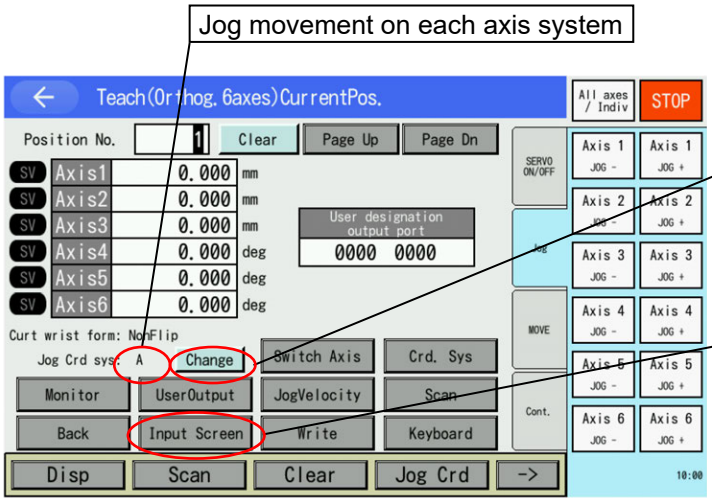




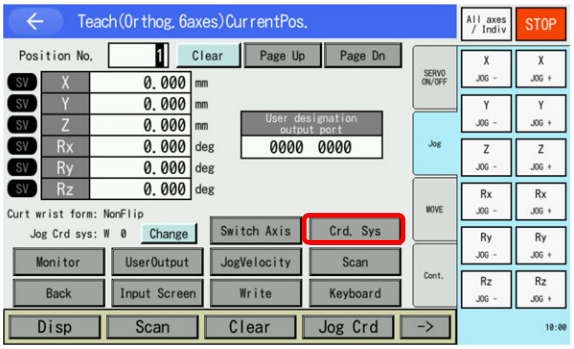
For CRS-XZ□Y



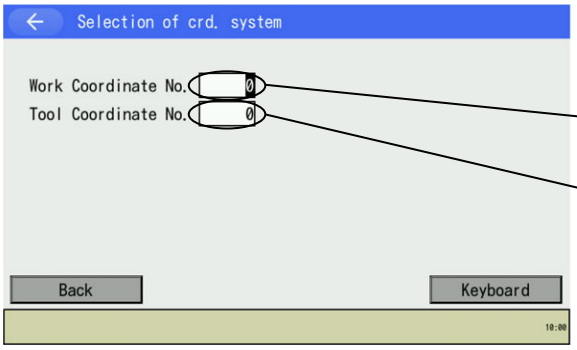




(2) Selection of coordinate system No.

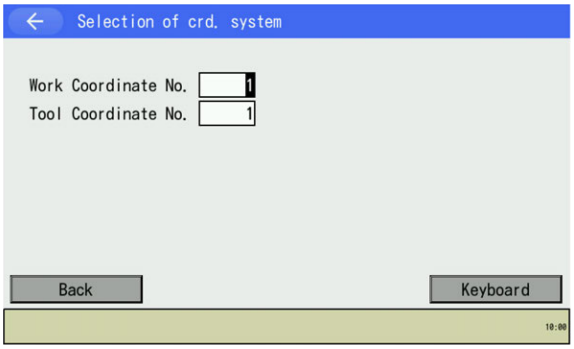


Touch Crd. Sys button.

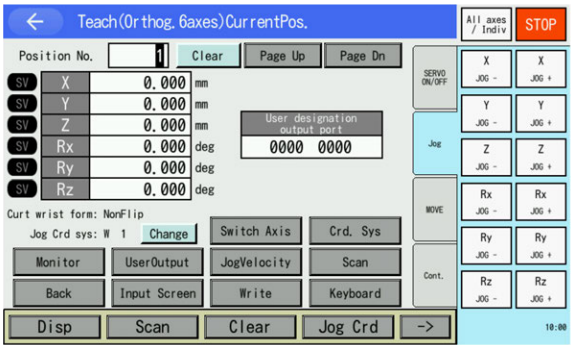


Enter the work coordinate system No.

Enter the tool coordinate system No.



This is a screen displayed when the work coordinate system No. 1 and the tool coordinate system No. 1 are selected.
Touch Back button to return to Teaching screen.



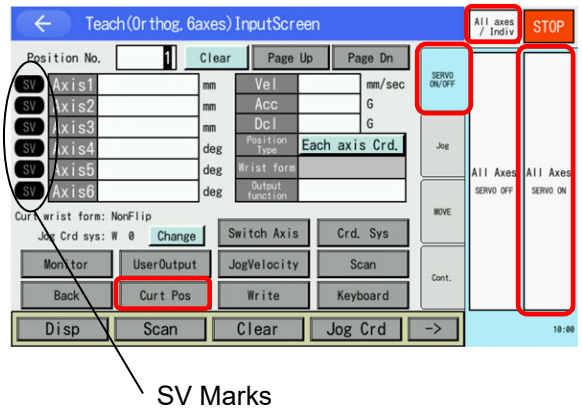
The coordinate values displayed indicate the tool tip position of the tool coordinate system No. 1 on the work coordinate system No. 1.

8.4.3 Actuator Operation

Jog the actuator or move it to the input (transferred) position data by using the Teaching Pendant. Operate the actuator on the Teaching screen.

How to Open to Teaching Screen
Go to Edit → Position → Teach in touch panel operation

(1) Jog operation

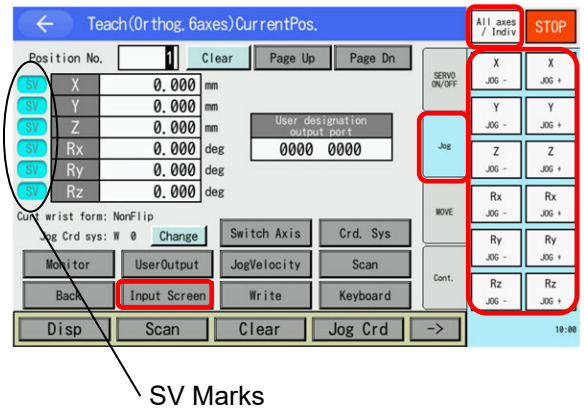


Turn the servo ON condition by touching the SERVO ON/OFF button and then the All Axes SERVO ON button in the Teaching screen condition.

* Turning the servo on/off is to be performed on all the axes at once
* If you cannot find the All Axes SERVO ON button, touch the All axes / Indiv button to switch the display.

The status of servo on/off can be checked on the SV marks.
(Light blue: Servo on, Black: Servo off)

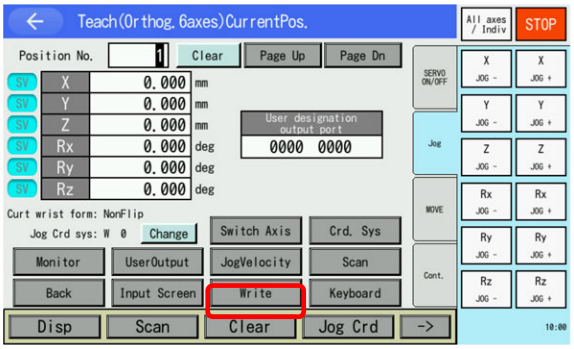
Curt Pos. (Input Screen) button



Before operation, check the jog operation coordinate system selected.

Select the JOG tab, and then touch the Axis 1 JOG - Axis 1 JOG + ~ Axis 6 JOG - Axis 6 JOG + buttons or X JOG - X JOG + ~ Rz JOG - Rz JOG + buttons to move the actuator to a required position.

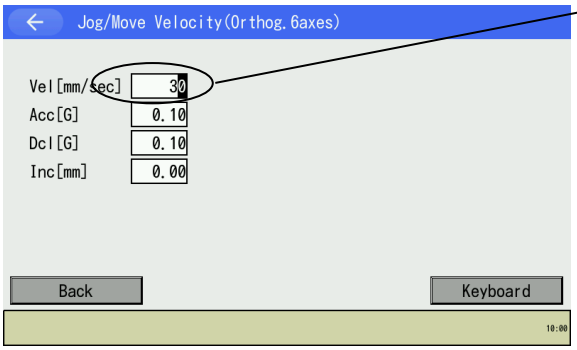
* JOG operation should be performed on each axis (coordinate axis).
* When you cannot find the buttons for each axis (coordinate axis), touch the All axes / Indiv button to switch the display.



Change of jog velocity

The actuator movement velocity under jog operation is changed.

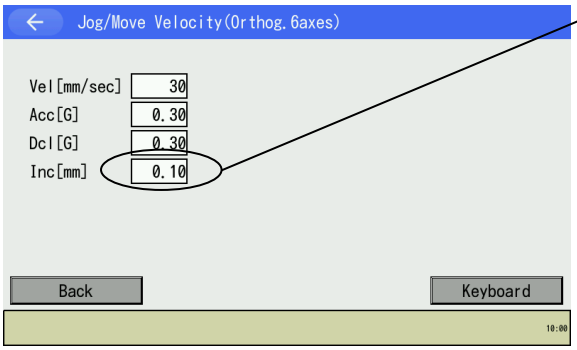
Touch JogVelocity button.



JogVelocity

Input the Vel (velocity), Acc (acceleration) and Dcl (deceleration) in the jog operation on the touch panel numeric keys. Inc (inching distance) should be 0.000. (The numeric key touch panel can be opened by touching the Keyboard button.)
Also, inching distance setting is available in this window.
Touch the Back button to return to the teaching window and perform the JOG operation.

(2) Inching operation



Inching distance

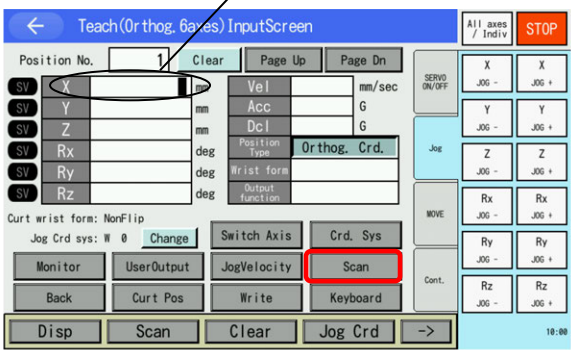
Setting for inching distance (movement distance for each time of touch on the JOG button) can be established.
Input a number in Inc (inching distance) in the JOG velocity change window. (The numeric key touch panel can be opened by touching the Keyboard button.)
The range of numbers for input is from 0.01 to 1.00. (Unit: mm)
Touch the Back button to return to the teaching window and perform the inching operation.

(3) Scanning Current Position as Data

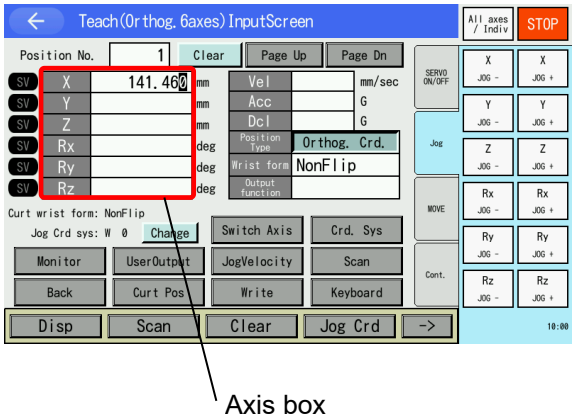
Check in advance the work coordinate system number and tool coordinate system number currently being selected.

(Window transfer: Edit → Position → Teach → Coordinate System Setting from touch panel)

The determined actuator position should be read in as the position data.



Indicate the position number to scan the data from. Touch the position number input box to show the cursor and input a number on the touch panel numeric keys. (The numeric key touch panel can be shown by touching the Keyboard button) Otherwise, touch the Page Up Page Dn buttons to select the position number to scan the data from. Touch the Scan button.



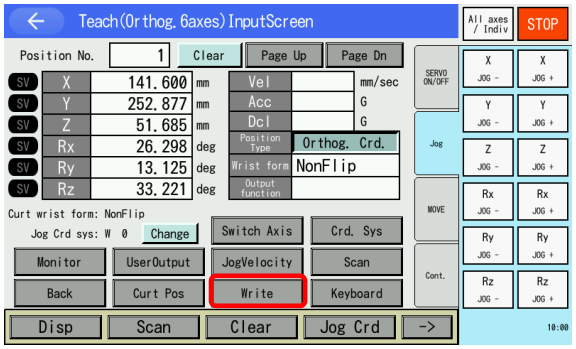
Touching the Scan button while the cursor placed at an axis box should read in the current position data and the wrist form of the axis where the cursor is currently placed at. (Coordinate system data also gets scanned when the current position data is all blank.)

When there is no cursor shown or the cursor is placed somewhere other than the axis boxes, touch the Scan button and the current position data, wrist form and coordinate systems for all the axes should be read in

* The wrist form can be scanned only when the position type is the orthogonal coordinates.

* Coordinate system scan should read in the JOG coordinate system as the position type.

(4) Controller Data Transfer
Scanned data can be transferred to the controller.

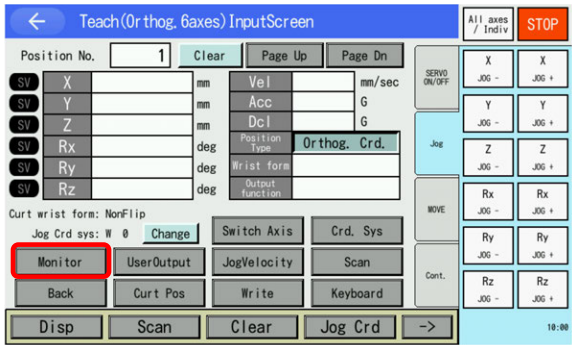


Touch the Write button in the teaching window. The scanned data can be saved in the memory in the controller. Once the data transfer to the controller is completed, the position number should be incremented by 1. It should be one set of the position data in display that is capable for data transfer to the controller. It is not available to transfer data in several position numbers at once.

> Data input will become invalid if the screen is switched by touching Page Up, Page Dn or Back button before the data is transferred.

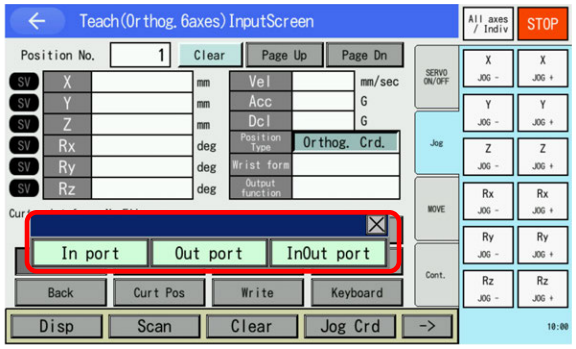
Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted*1. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have [8.1.2 Flash ROM Writing] conducted.
(*1 Except for controllers which possess feature to retain data)

(5) I/O Monitor
Each port can be monitored during the teaching operation.



Touch Monitor in the teaching window.

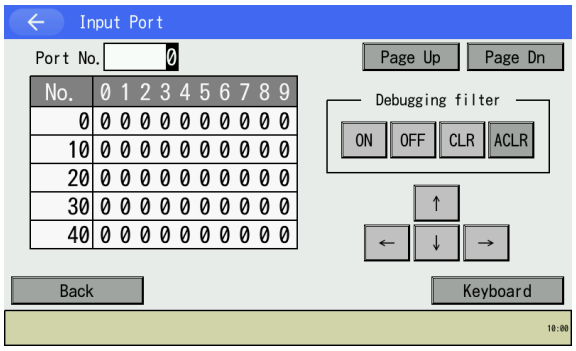
The monitor menu pop-up window will show up.



Touch the port type you would like to monitor. The pop-up monitor closes and the each port monitor window will open.

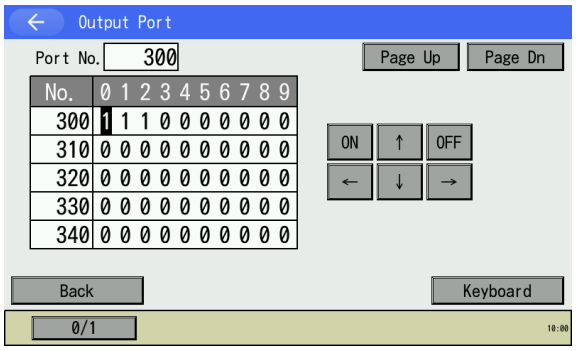
Touch the x button on the top right of the pop-up window when it is required to cancel. The pop-up window closes and the teaching window will come back on.

Input ports



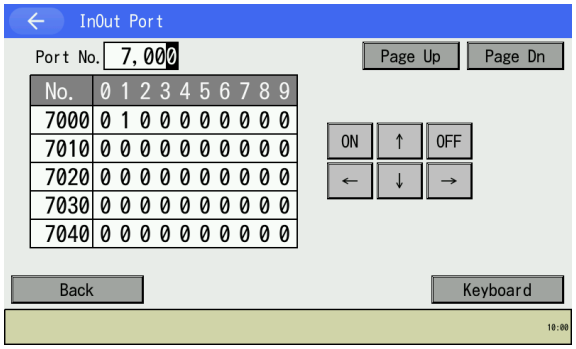
Refer to [14.2 Input Port] for debug filters.

Output ports



Touching ON and OFF buttons, the output port of the cursor position can be turned ON/OFF (1/0).

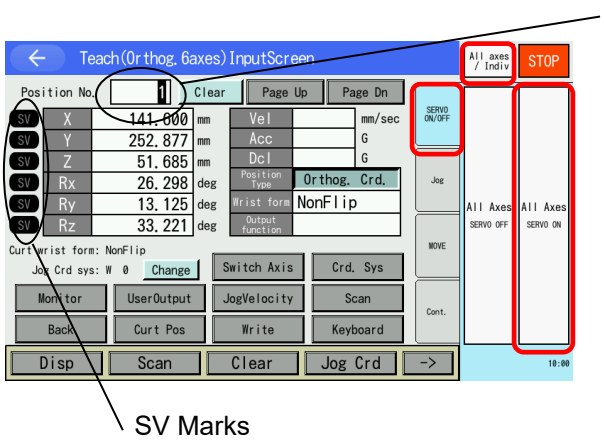
InOut Port



The way to operate is the same as the output port.

(6) Move

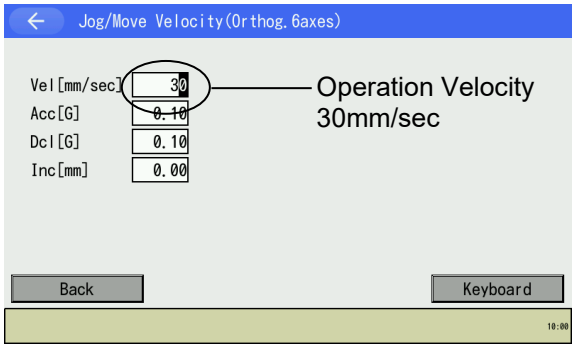
Move the actuator to the position of the position data transferred to the controller.
(Position check of position data that teaching was conducted)



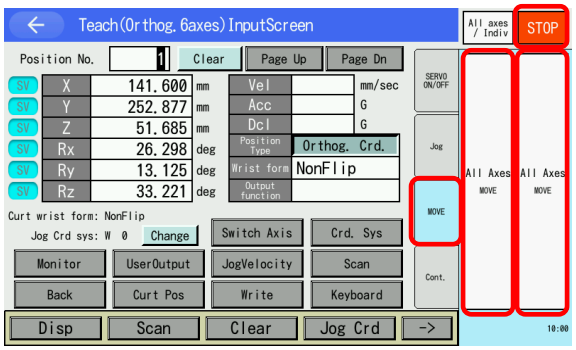
Select the position number that you would like to have the actuator moved to in the teaching window.
Touch the Servo ON/OFF tab and then touch the All Axes SERVO On button to turn the servo on.
The status of servo on/off can be checked on the SV marks beside the positions. Light blue shows the servo is turned on.

* If you cannot find the All Axes SERVO On button, touch the All axes / Indiv button to switch the display.

To check the movement speed or to have a change, touch the JOG Velocity button.



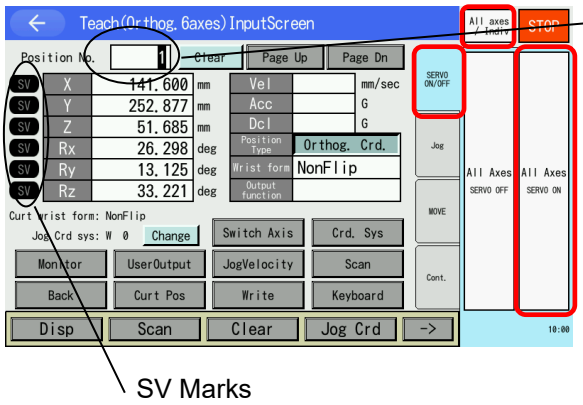
Touch the Keyboard button to show the numeric key touch panel. (When the cursor is not in the Vel box, touch in the Vel box to show the cursor.) Input the change data on the numeric keys and touch ENT.
Touch the Back button after the change is made.
If the velocity and acceleration/deceleration are set in the position data, they should be prioritized.
Priority: Parameter < JVel < Position Data



Touch the Move tab and then touch the All Axes Move button. The actuator will start moving.
To stop the actuator on the way, touch the Stop button.

(7) Continuous Move

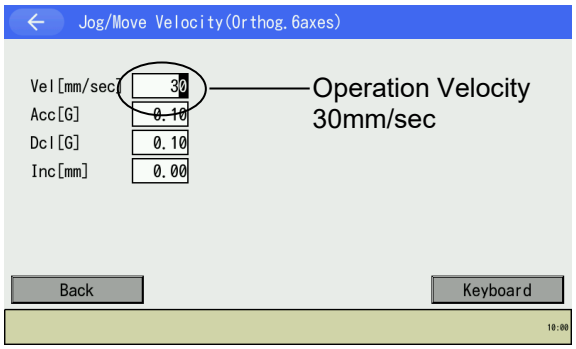
Move the actuator to the position of the position data transferred to the controller continuously.



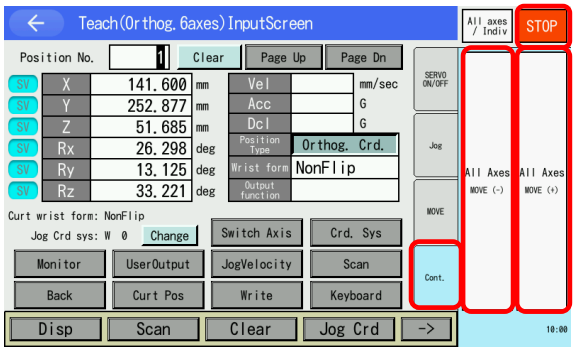
Select the position number that you would like to have the actuator moved to in the first step by using the numeric keys or the Page Up Page Dn buttons in the teaching window.
Touch the Servo ON/OFF tab and then touch the All Axes SERVO On button to turn the servo on.
The status of servo on/off can be checked on the SV marks beside the positions. Light blue shows the servo is turned on.

* If you cannot find the All Axes SERVO On button, touch the All axes / Indiv button to switch the display.

To check the movement speed or to have a change, touch the JOG Velocity button.



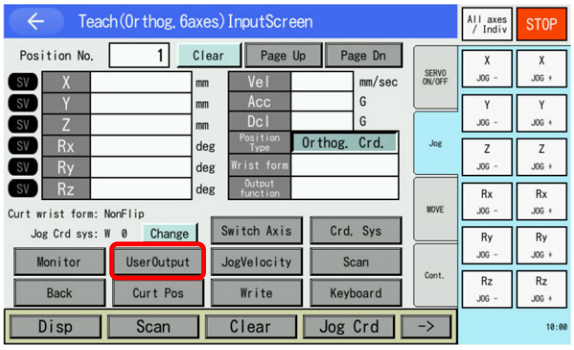
Touch the Keyboard button to show the numeric key touch panel. (When the cursor is not in the Vel box, touch in the Vel box to show the cursor.) Input the change data on the numeric keys and touch ENT.
Touch the Back button after the change is made.
If the velocity and acceleration/deceleration are set in the position data, they should be prioritized.
Priority: Parameter < JVel < Position Data



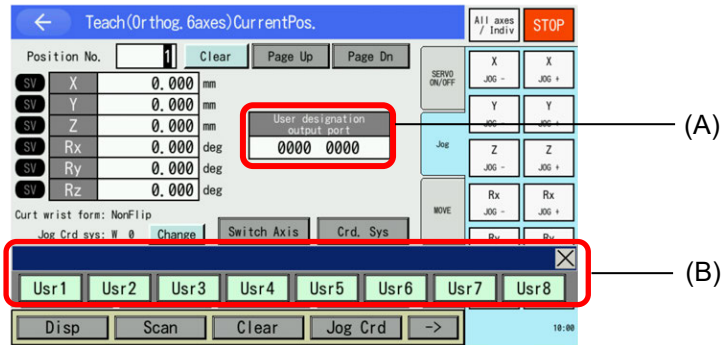
Touch the Cont. Tab and then touch the All Axes MOVE (+) or All Axes MOVE (-) button. The actuator will start making a continuous moving.
To stop the actuator on the way, touch the Stop button.

(8) User Indicated Output Port Operation

The output port indicated in the parameter can easily be turned on/off.



Touch the UserOutput button in the teaching window.



(A) User-specified output port status

The conditions of user-specified output ports are displayed as '1' (=ON) and '0' (=OFF).
(The conditions are displayed from the first specified port for the number of specified ports from the left.)

(B) User-Specified Output Port Operation Panel Window

It is a panel window to perform the operation to turn ON/OFF the user-specified output ports.
Assignment is made for the number of specified ports in the order of 'Usr1', 'Usr2', 'Usr3' … from the top of the user-specified output ports.
By touching a Usr1 to Usr8 buttons, an operation can be performed to turn each output port ON/OFF.
(Port ON Command is executed when the port status display is '0' (OFF) and Port OFF Command when the status display is '1' (ON)).
To close this panel window, touch × on the top right.

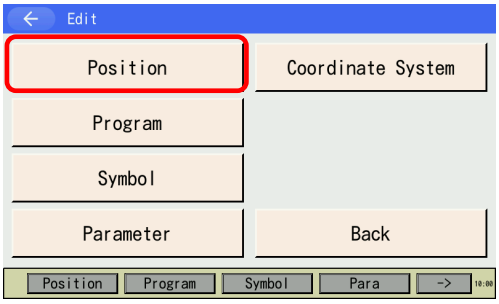
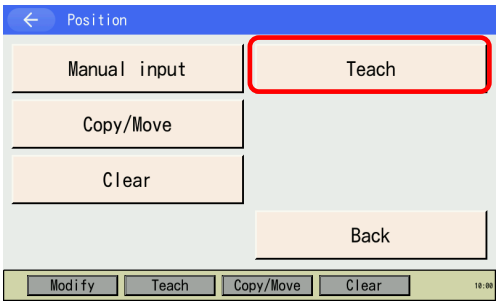
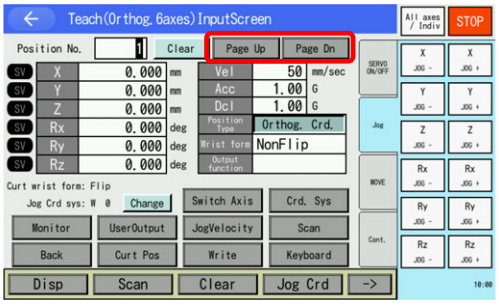
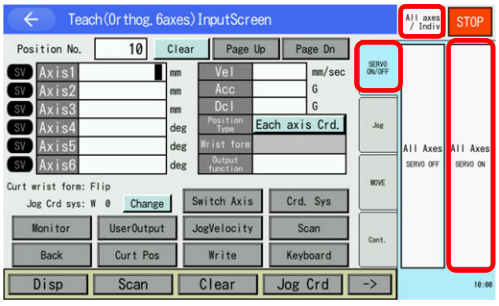
1) Setting of user-specified output port parameters
   For the operation method for parameter setting, refer to [13. Parameter Edit].
   The first port No. and the number of ports are set with the following parameters:
   - Number of ports
     I/O parameter No. 74 “QntPrtUsrOut” (Number of output ports used by TP user (hand, etc.))
   - First port No.
     I/O parameter No. 75 “TopNo.UseOut” (First output port No. by TP user (hand, etc.))

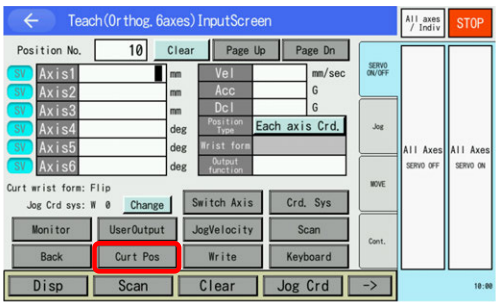
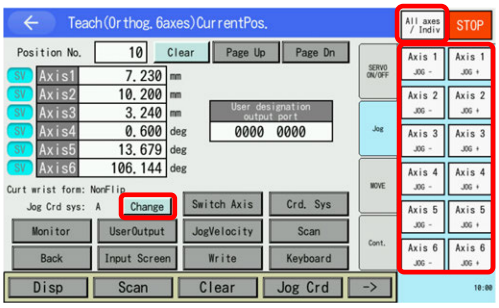
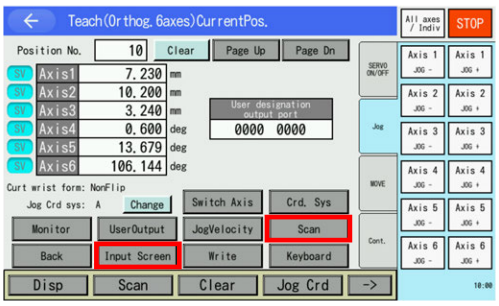
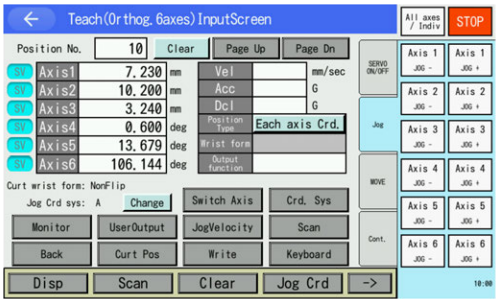
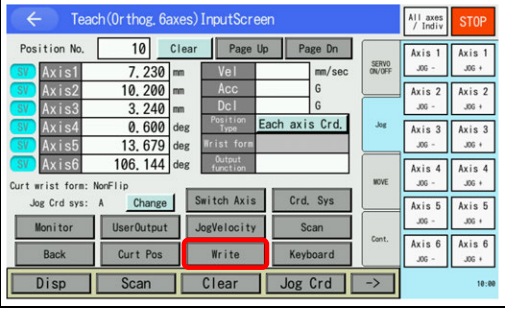
   (Setting example) When the first port No. is set to 308 and the number of ports is set to 8:

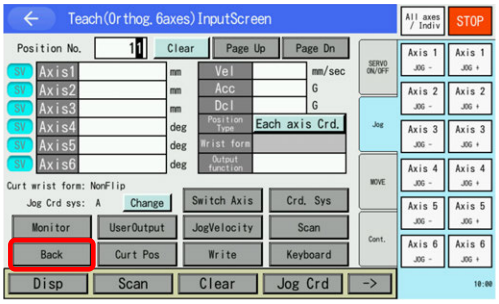
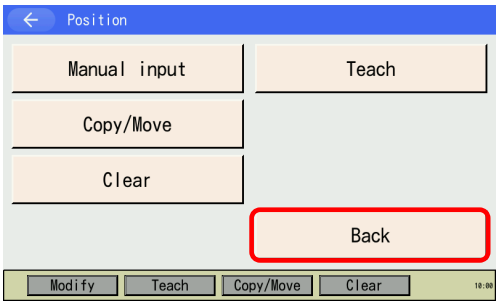
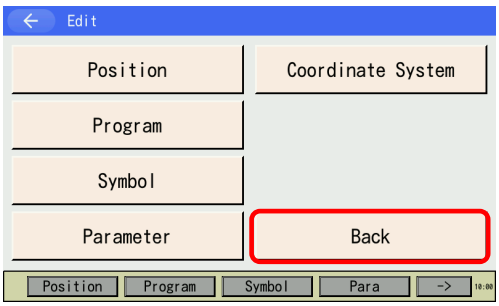
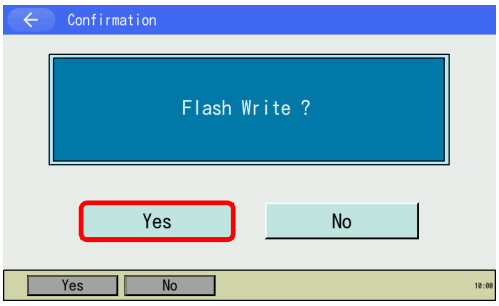
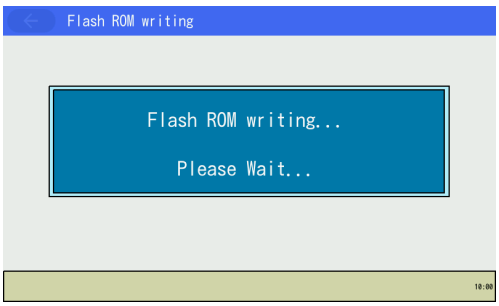
   ‘Usr1’ ····· Output port 308
   ‘Usr2’ ····· Output port 309
   ‘Usr3’ ····· Output port 310
   ‘Usr4’ ····· Output port 311
   ‘Usr5’ ····· Output port 312
   ‘Usr6’ ····· Output port 313
   ‘Usr7’ ····· Output port 314
   ‘Usr8’ ····· Output port 315

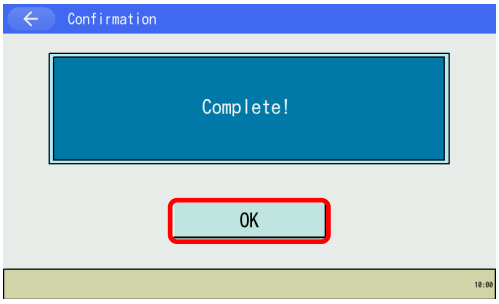
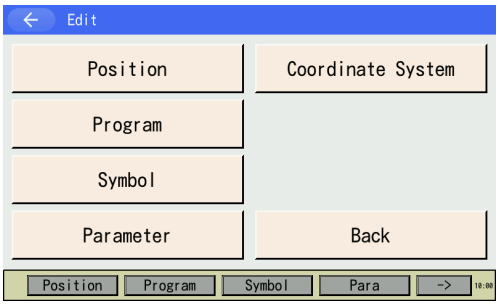
8.4.4 Example for Teaching Input

Perform data input to Position No. 10 with jog operation.

No.	Operation		
1	Touch Edit button.		
2	Touch Position button. .		
3	Touch Teach button.		
4	Either use Page Up button and Page Dn button in the touch panel or input “10” in the position number on the software numeric key, and then touch ENT button for confirmation.		
5	Touch SERVO ON/OFF button and then touch All Axes SERVO ON button to turn the servo ON.		If All Axes SERVO ON button is not found, touch All axes / Indiv button to switch the display Once the servo gets turned on, the SV lamp on the left in the screen turns into light blue.

No.	Operation		
6	Touch the Curt Pos button to switch the screen to the current position display.		
7	Touch the Change button for the jog coordinate system to select the coordinate system to perform the jog operation. Touch the jog buttons from Axis 1 jog - and Axis 1 jog + to Axis 6 jog - and Axis 6 jog + (or from X jog - and X jog + to Rz jog - and Rz jog +) to move the robot to a desired position.		If the jog buttons from Axis 1 jog - and Axis 1 jog + to Axis 6 jog - and Axis 6 jog + (or from X jog - and X jog + to Rz jog - and Rz jog +) are not found, touch All axes / Indiv button to switch the display
8	Touch the Scan button and the current position of an axis number where the cursor is pointing at should get scanned to the input window.		Touch the Scan button while the cursor is not shown or it is at the position number box, and the current positions of all the axes for the 6-axis Cartesian should be scanned.
9	Touch the Input Screen button to confirm that the data has been scanned.		*The figure on the left is the window after touching Input Screen
10	Touch Write button to transfer the position data to the controller. The position proceeds to No. 11.		If the screen is switched with Page Up or Page Dn buttons before the data is transferred, the input data will become invalid.

No.	Operation		
11	Finish the position data input with a teaching tool. Touch the Back button.		
12	Touch Back button.		
13	Touch Back button.		
14	Write to the flash ROM. Touch the Yes button.		
15	While in writing process to flash ROM, the display 'Flash ROM writing...'flashes.		***Never shut off the power to the controller during Flash ROM writing.***

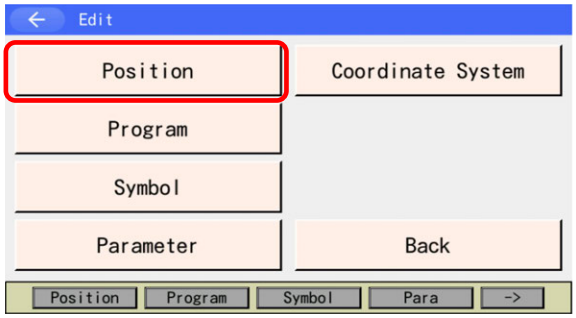
No.	Operation		
16	The flash ROM writing process is finished. Touch OK button. The screen returns to Edit menu.		
17			

8.5 Copy and Movement of Position Data

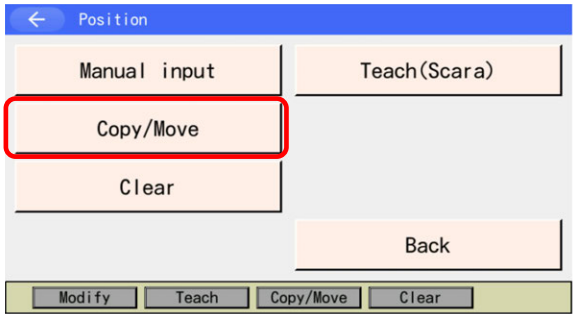
It is a way to copy or move the position data to another position number.



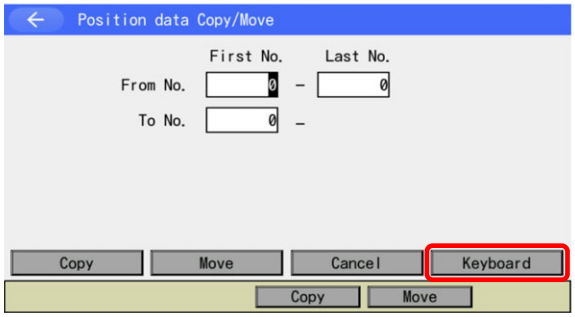
Touch Edit button in the Menu screen.



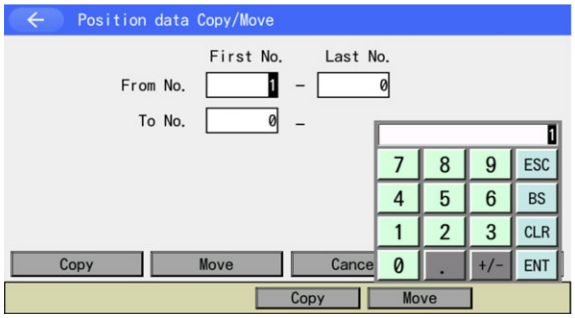
Touch Position button on the Edit screen.



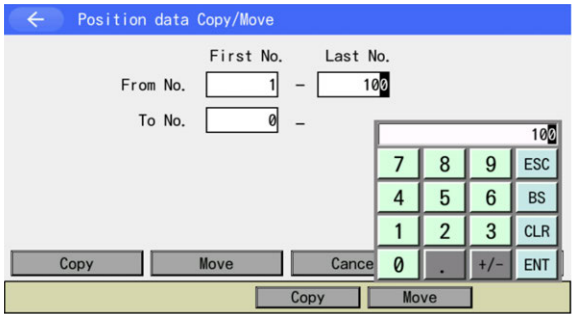
Touch Copy/Move button in Position screen.



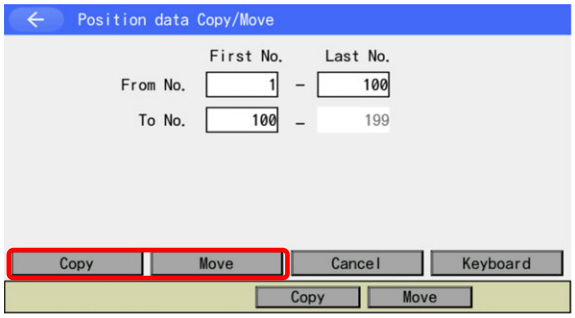
Touch Keyboard button to show the touch panel keyboard.
If the cursor is not on From No. First No., touch on From No. First No. to show the cursor.



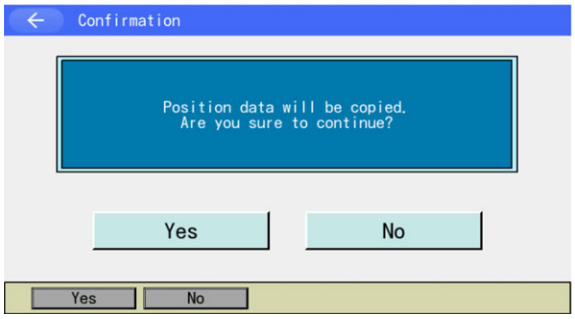
Input a value in From No. First No. and touch ENT button.
The cursor moves to From No. Last No. and touch panel keyboard closes.



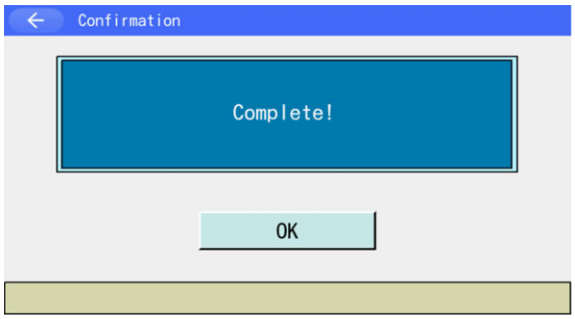
Touch Keyboard button again to show the touch panel keyboard.
Input a value in From No. Last No. and touch ENT button.



Input a value in To No. First No. in the same manner.
After completing the input, To No. Last No. will be shown.
When you want to copy, touch Copy button. When you want to move, touch Move button.
Execution Confirmation screen appears.

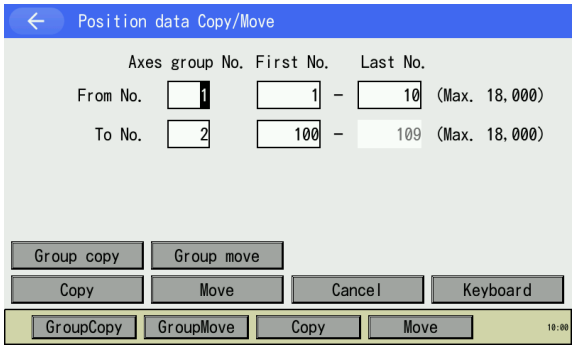


If you want to copy, touch Yes button.
If copy is not necessary, touch No button.



Touch OK button to go back to the previous screen.
When you want to write in the flash ROM, go back to Flash ROM Writing screen by touching Back button and so on. Write the data in the Flash ROM referring to [8.1.2 Flash ROM Writing].

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (refer to [15.17 Axis Number Assignment]), position data copy/move in an axes group and also among axes groups can be performed.



Each contents and button operations are as shown below.

[Copy / Move]

Axes group No. : Indicate the axes group number of the data to copy/move from

First No. : Indicate the top number of the data to copy/move from
It is available only for copy/move with Copy / Move buttons

Last No. : Indicate the last number of the data to copy/move
It is available only for copy/move with Copy / Move buttons

Max Display : It is the maximum position number on the indicated axes group number.
Indicate the top and last numbers in the range of this number.

[Copy / Move]

Axes group No. : Indicate the axes group number of the data to copy/move to.
Indicating the same axes group number as the one to copy/move from determines as the copy/move in the axes group, and indicating a different axes group number determines as the copy/move between axes groups.

First No. : Indicate the top number to copy/move to.
It is available only for copy/move with Copy / Move buttons

Last No. : It is the last number to copy/move to. It should automatically be calculated.
It is available only for copy/move with Copy / Move buttons

Max Display : Indicate the top number so the last number falls in the range of this number.
The position data in the range indicated with the top number and last number to copy from get copied to the top number and last number to copy to.

[Button]

Copy : The position data in the range indicated with the top number and last number to move from get moved to the top number and last number to move to.

Move : Copy between axes groups is to be performed. Data in the positions from No. 1 to the maximum position number in the axes group to copy from can be copied to the positions from No. 1 in the axes group to copy to.

Group copy : Copy between axes groups is to be performed. Data in the positions from No. 1 to the maximum position number in the axes group to copy from can be copied to the positions from No. 1 in the axes group to copy to.
Indicate different axes group numbers for the group to copy from and the group to copy to.

Group move : Move between axes groups is to be performed. Data in the positions from No. 1 to the maximum position number in the axes group to move from can be moved to the positions from No. 1 in the axes group to move to.
Indicate different axes group numbers for the group to move from and the group to move to.

Cancel : The screen goes back to the position menu.

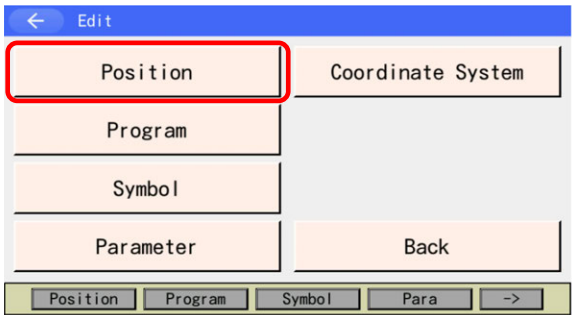
Keyboard : It should show the keyboard. Touch a box to input data to show the cursor and then touch the Keyboard button.

8.6 Deletion of Position Data

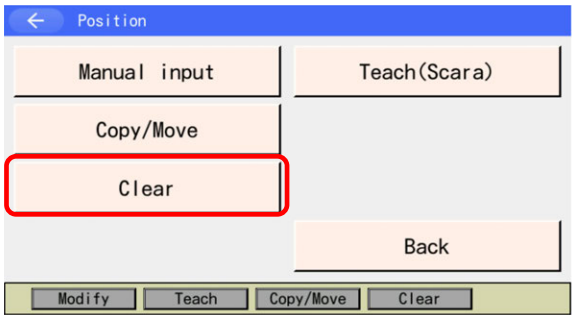
The following operating instructions are to delete the position data.



Touch Edit button in the Menu screen.

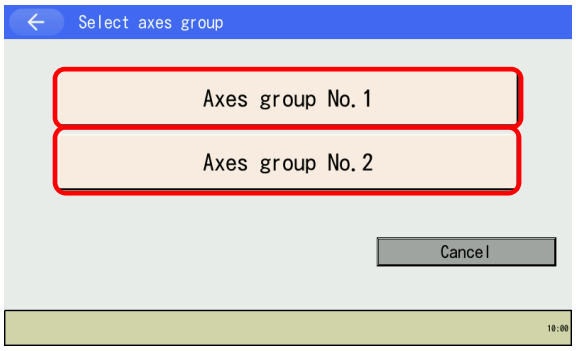


Touch Position button on the Edit screen.

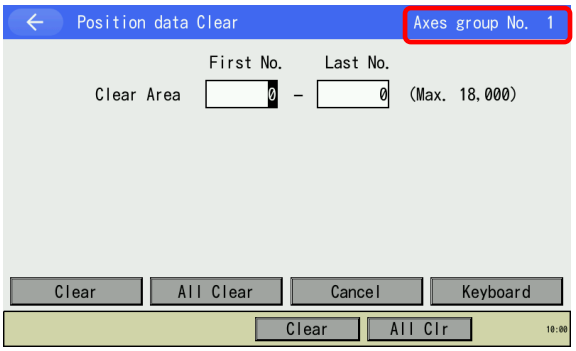


Touch Clear button on the Position screen.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Clear button. Touch an axes group number button to select the axes group number that is to be subject to.

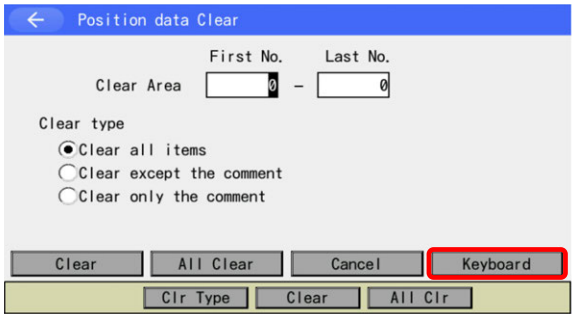


The select axes group screen should appear after you touch the Manual Input button.
Touch an Axes group No. button.

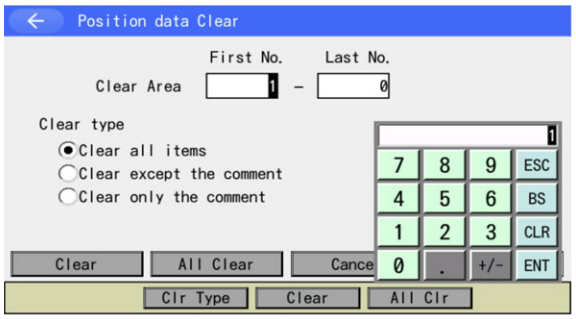


The position data clear window will appear.

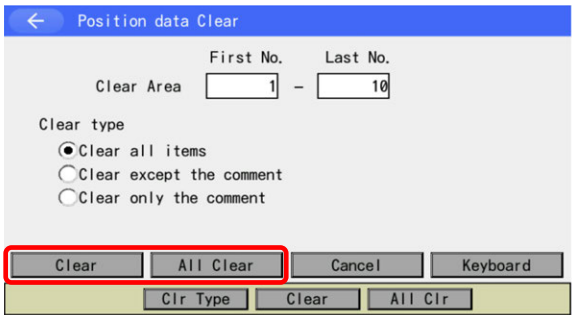
* The axes group number that was selected should be shown on the top right of the screen.



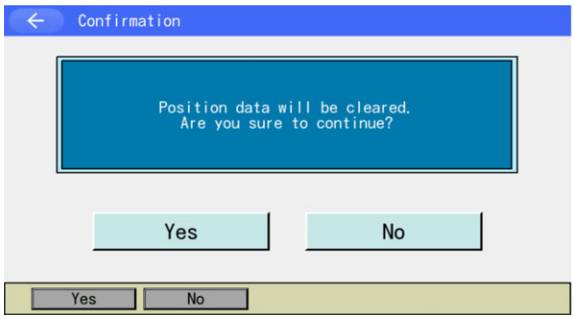
Touch Keyboard button to show the touch panel keyboard.
If the cursor is not on the top number, touch the top number to show the cursor.



Input the First No. and touch ENT button. The cursor moves to the Last No. and the touch panel keyboard closes.



Touch Keyboard button again to show the touch panel keyboard.
Input the Last No. and touch ENT button. When you want to delete the selected position data, touch Clear button.
When you want to delete all the positions, touch ALL Clear button.
Execution Confirmation screen appears.



If you want to delete, touch Yes button.
If deletion is not necessary, touch No button.



Touch OK button to go back to the previous screen.
When you want to write in the flash ROM, go back to Flash ROM Writing screen by touching Back button and so on. Write the data in the Flash ROM referring to [8.1.2 Flash ROM Writing].

9. Program Edit

(Excluding the positioner mode of the SSEL, ASEL and PSEL controller.)

9.1 How to Input Program

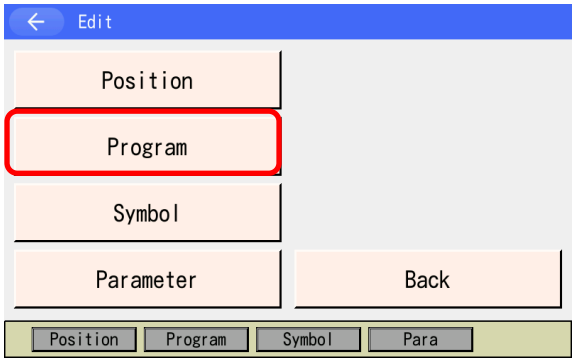
Input the program step below as an example.
Program No. 2

No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1			601					
2	A	N	600	CPGE	200	*201	900	Compare Data
3				SCPY	1	‘1234		

Only input conditions for Step No. 1 and all for Step No. 2 are input.



Touch Edit button in the Menu screen.

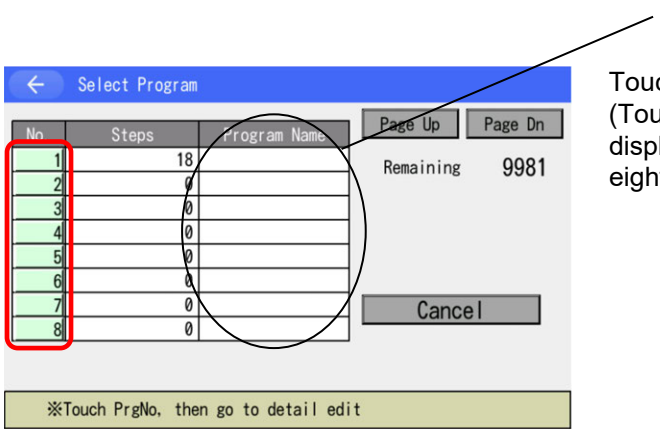


Touch Program button in the Edit screen.



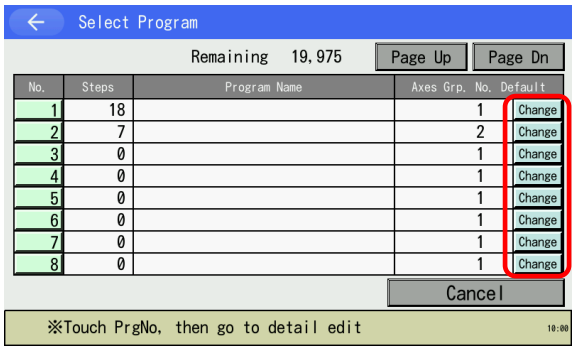
Touch Modify button in the Program screen.

* Touch the Change/New button when it is shown.

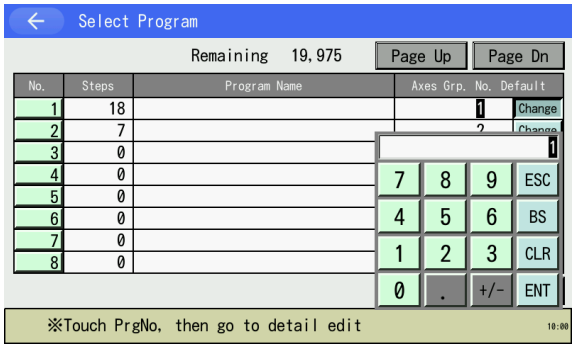


Touch the number you want to edit.
(Touch Page Up and Page Dn buttons and the displayed program numbers go up and down by eight items.)

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (refer to [15.17 Axis Number Assignment]), the initial setting values* in the axes group numbers will be displayed in the select program number screen. Establish the initial settings in the axes group number as well as the program step edit.
(* Axes group numbers subject to control at the program execution start)

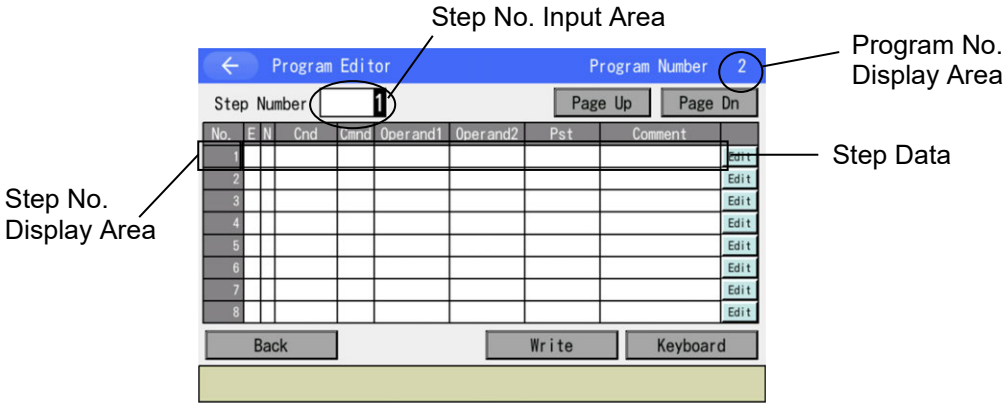


Touch the Change button at a program number that you would like to edit. The keyboard will comes up.



Input the initial value for an axes group number and then touch the ENT button.

After the setting is changed, follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.



[Items Shown in Program Step Edit Screen]

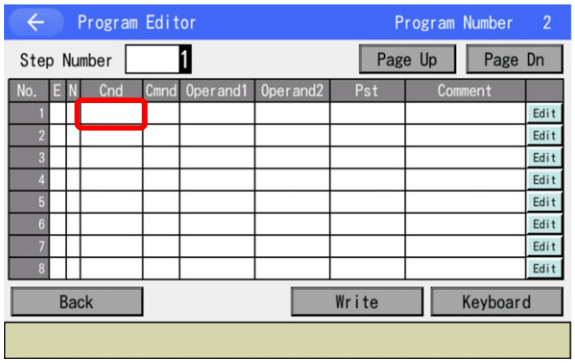
Program No. Display Area : It shows the editing program No.

Step No. Input Area : Is to input Step No.
By the input values, Display Area is changed.

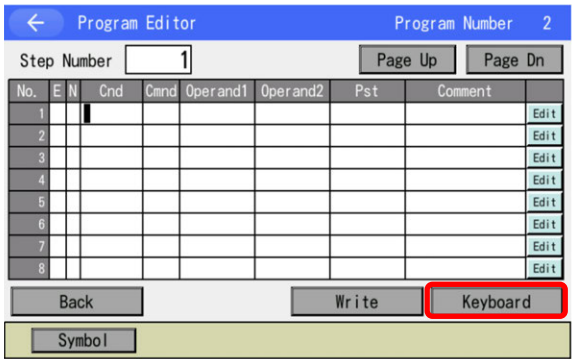
Step No. Display Area : Is to display Step No.

Step Data

- E : Input an extension condition.
- N : Input the reversion of input condition.
- Cnd : Input the input condition.
- Cmnd : Input a SEL command language.
- Operand1 : Input Operation 1 (Operand1).
- Operand2 : Input Operation 2 (Operand2).
- Pst : Input the output part (Operand3).
- Comment : Input a comment if necessary (18 letters with half-size font at max. and In RSEL and XSEL2-T/TX, 32 letters with half-size font at max.)
  (Hiragana, Katakana and Kanji (1st standard) characters can be displayed, but cannot be input.)

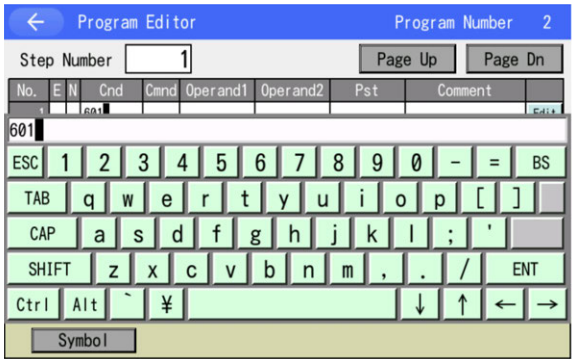


Move the cursor to No.1, Cnd area by touching.

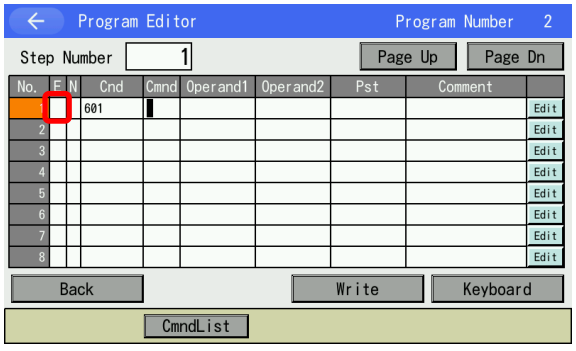


With the cursor being in Cnd input area, touch the keyboard button to show the touch panel keyboard and input 601.

Condition of Touch Panel Keyboard Displayed

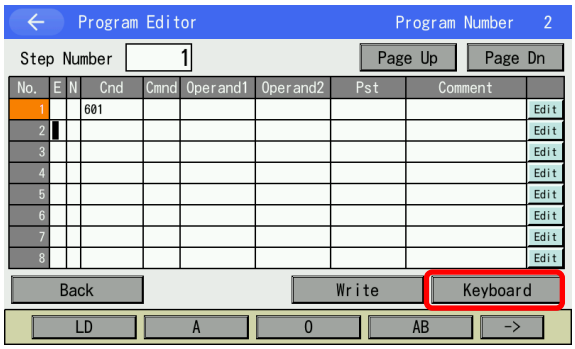


Input 601 and touch ENT.
The touch panel keyboard closes and 601 is input in Cnd.

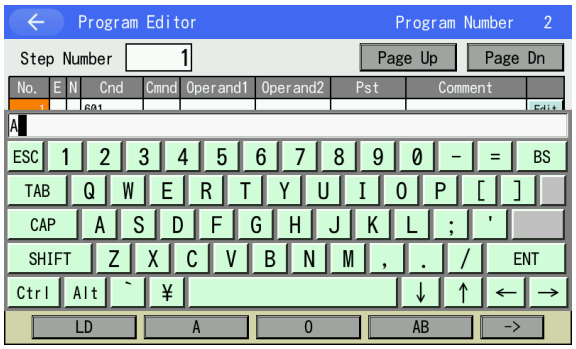


The cursor moves to Cmnd column. Also, to show that it is being edited (controller writing not yet done), the background color in the step number display box turns to orange.

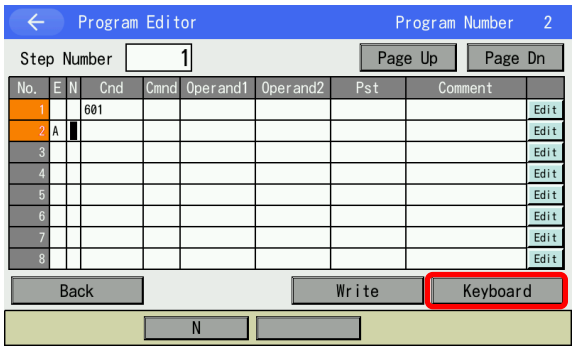
Touch No. 2, Column E to move the cursor.



Touch the keyboard button with the cursor being displayed at E Column to show the touch panel keyboard in order to A.



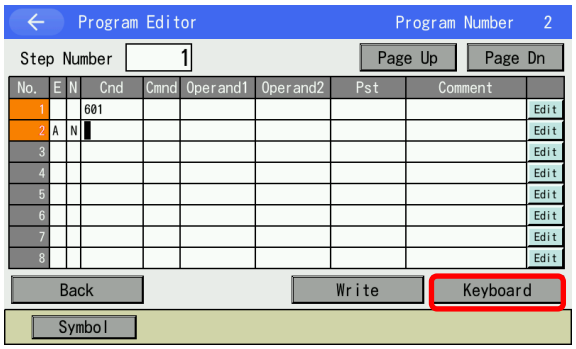
Input A and touch ENT.
The touch panel keyboard closes and A gets to be input to E Column.



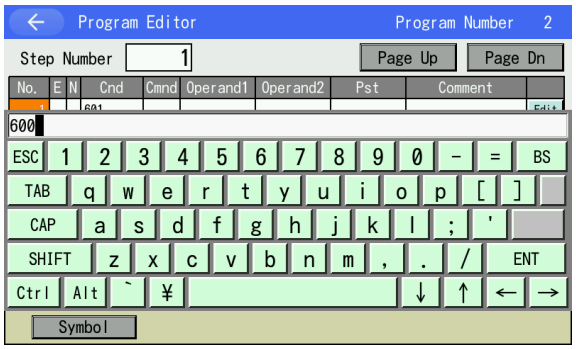
The cursor moves to N Column. Touch Keyboard button to show the touch panel keyboard, and input 'N'.



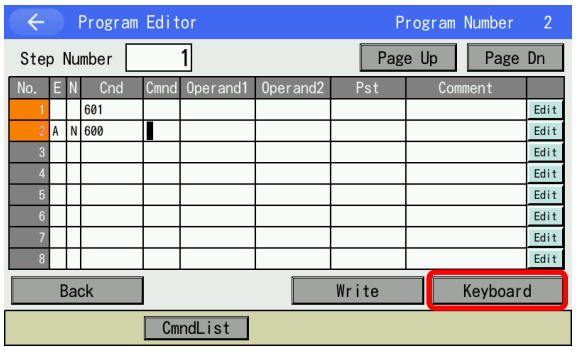
Example for input on touch panel keyboard



The cursor moves to the Cnd input area. Touch Keyboard button to show the touch panel keyboard, and input 600.



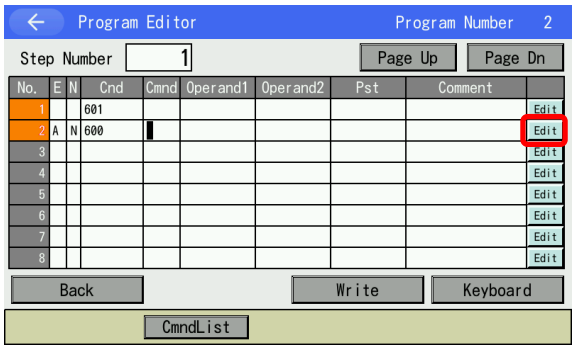
Example for input on touch panel keyboard



The cursor moves to the Cmnd input area. Touch Keyboard button to show the touch panel keyboard, and input CPGE.

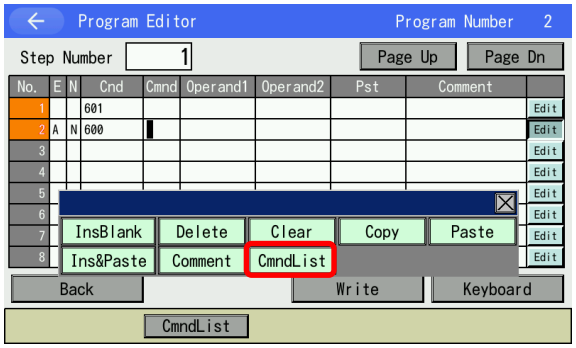


Example for input on touch panel keyboard

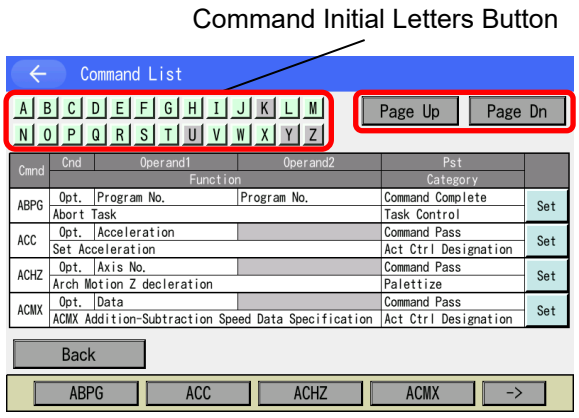


For Cmnd Column, command list is also available to input from.

Have the cursor displayed in Cmnd Column and touch Edit button.



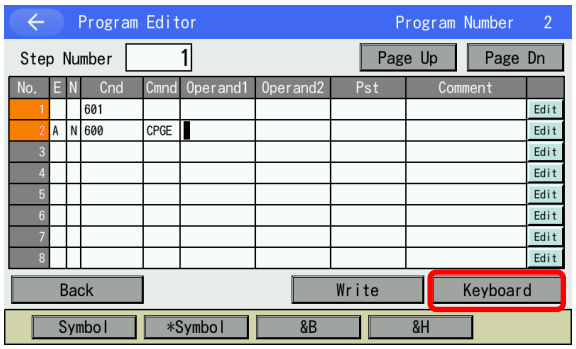
Touch ComdList button in the edit menu.



The command list window appears. Touch the command initial letters or Page Up / Page Dn buttons to switch the display in order to show the command that you would like to input.

Touch Set button of the command that you would like to input.

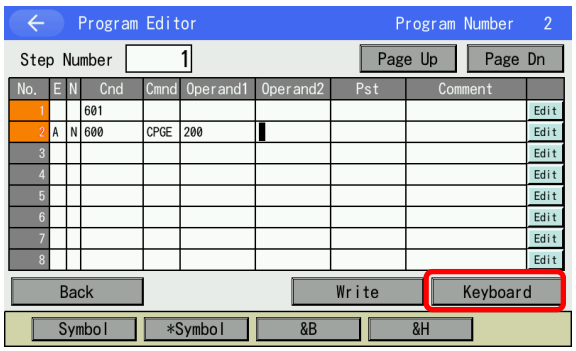
Return to the previous screen.



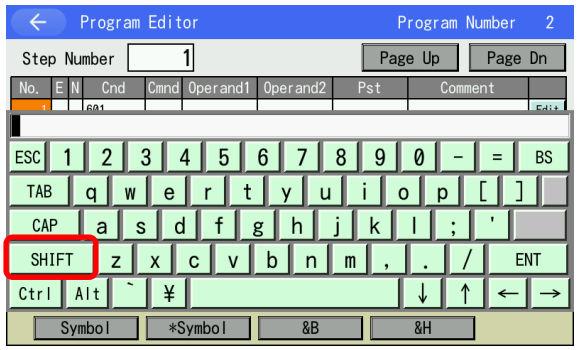
The cursor moves to the Operand1 input box. Touch Keyboard button to show the touch panel keyboard, and input 200.



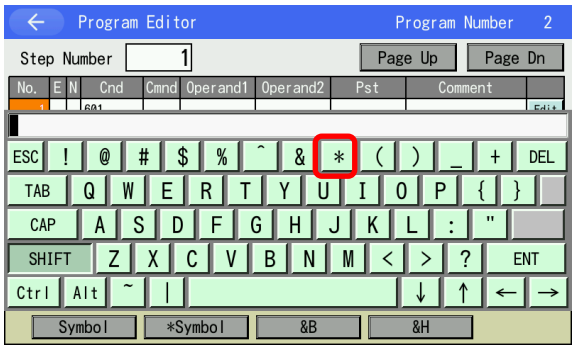
Example for input on touch panel keyboard



The cursor moves to the Operand2 input box. Touch Keyboard button to show the touch panel keyboard.



Touch SHIFT button to switch the letters displayed on the keyboard.



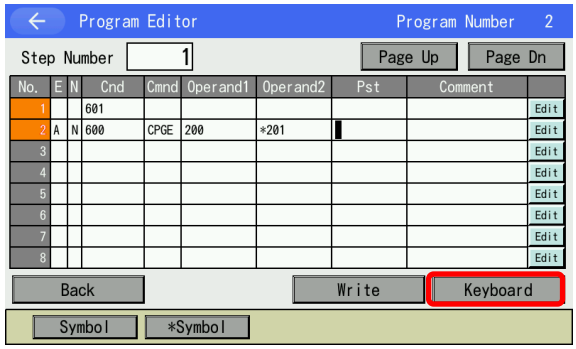
Touch [*].



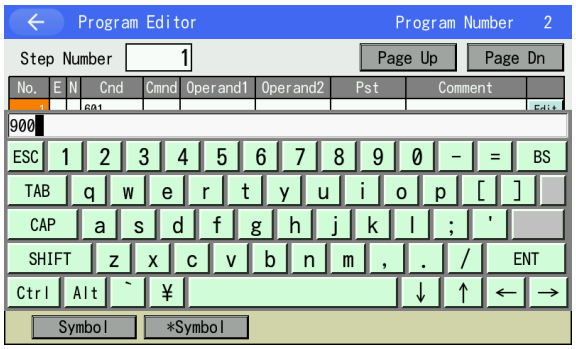
The letters displayed on the keyboard return to normal.



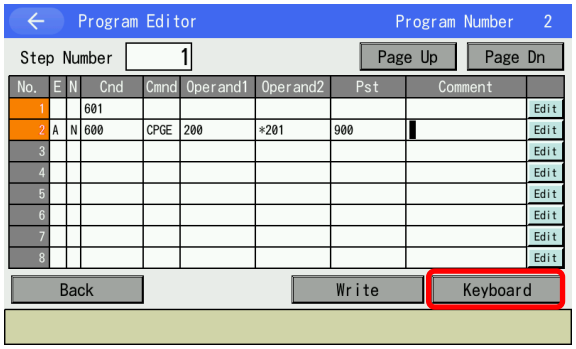
Input * followed by 201, and then touch [ENT].



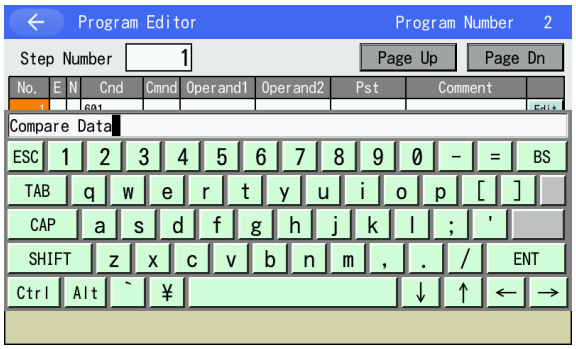
The touch panel keyboard closes and the cursor moves to Pst box.
Touch [Keyboard] button to show the touch panel keyboard, and input 900.



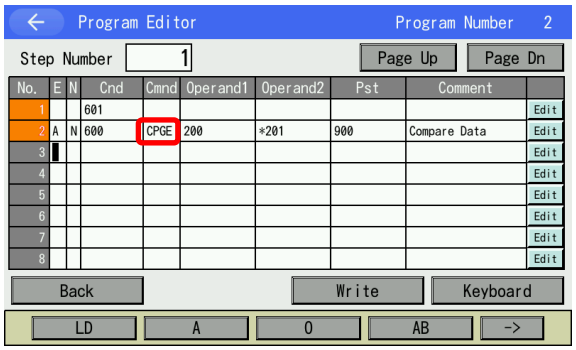
Example for input on touch panel keyboard



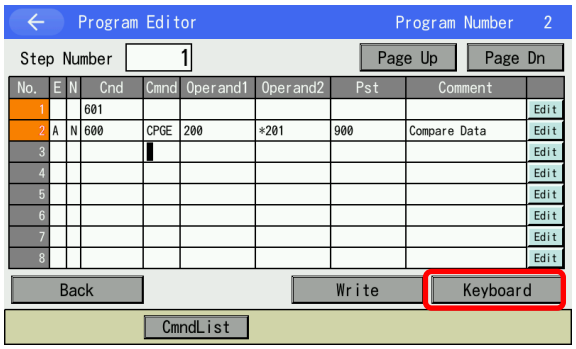
The cursor moves to the Comment input area.



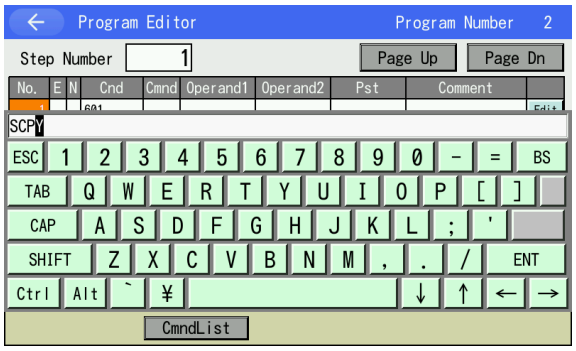
Touch Keyboard button to show the touch panel keyboard. Any alphabetical and numerical letters can be used for input.
If you touch SHIFT button, buttons with capital letters show up, and go back to small letters once a letter is input.
If you touch CAP button, buttons with capital letters show up, and capital letters will be kept unless CAP button is pressed again.
Touch ENT for confirmation and the touch panel keyboard closes.



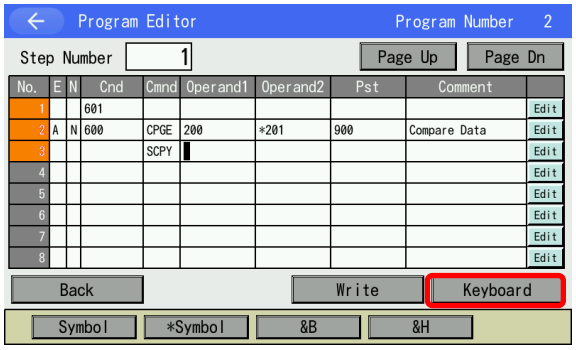
Touch No. 3, Cmnd Column to move the cursor.



Touch Keyboard button to show the touch panel keyboard.



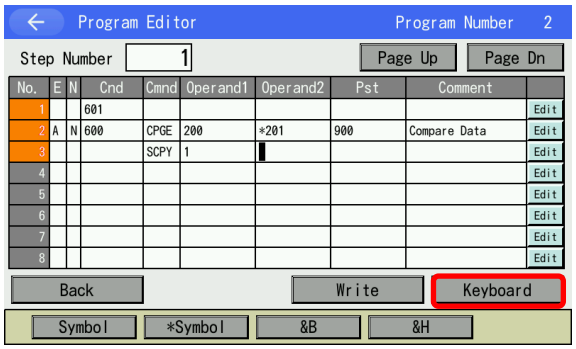
Input SCPY, and then touch ENT. The touch panel keyboard closes and SCPY gets displayed in Cmnd Column.



The cursor moves to the Operand1 input box. Touch Keyboard button to show the touch panel keyboard, and input 1.



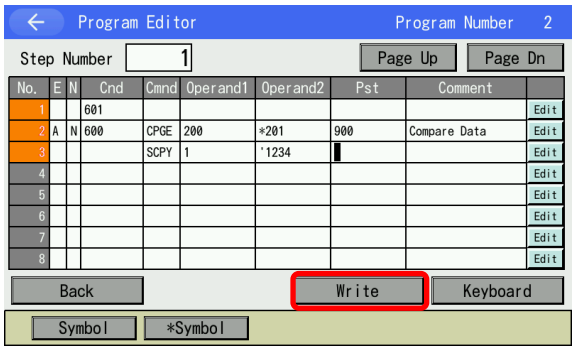
Example for input on touch panel keyboard



The cursor moves to the Operand2 input box. Touch Keyboard button to show the touch panel keyboard.

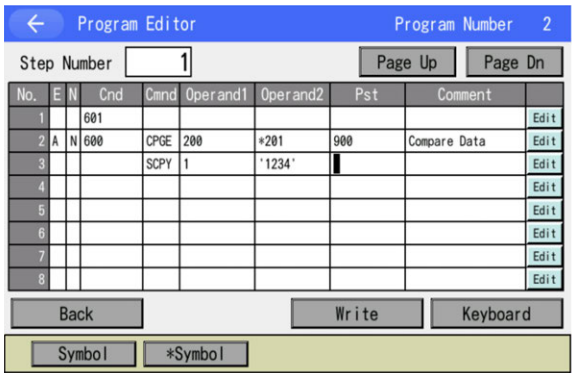


Input ‘1234 and touch ENT.



The touch panel keyboard closes and the cursor moves to Pst box. Touch Write button to transfer the data to the controller.

When the screen is changed with the Page Up and Page Dn buttons and Back button before data transfer, the input data becomes invalid.



Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

Finish the program input. Return to the flash ROM writing window by using the return button.

Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

[For Operand Binary/Hexadecimal Digit Input]
For XSEL-RA/SA/RAX/SAX/RAXD/SAXD, RSEL and XSEL2-T/TX binary/hexadecimal digits can be used for Operand 1 and 2.

- Only constant value can be used. They cannot be used for indirection.
- When binary digits are to be used, input them each with “&B” before the value, and hexadecimal digits are to be used, “&H” before the value (When there is no such prefix, the figures are treated as decimal digits).
  * When Operand is for axis pattern, input the figure without prefix “&B” (The figure is treated as binary digit).
- For binary/Hexadecimal digits, max. 8 figures can be input.
- For binary digits, they are treated as integral numbers without codes (ex. &B11111111 = 255). For hexadecimal digits, they are treated as integral numbers with codes (ex. &HFFFFFFFF = -1).
- Even in the case that binary/hexadecimal digits are to be used, the input range is unchanged.
- In the case that the program using binary/hexadecimal digits is backed up and transmitted to the incompatible controller, the binary/hexadecimal digits are converted to decimal numbers.

9.2 Symbol Input During Program Edit

Symbol input is available when the cursor is on Operand1 or 2 (Operation 1 or 2) or Pst (output).

Method 1: In case symbol registration has already been conducted, direct input is available from the touch panel keyboard.

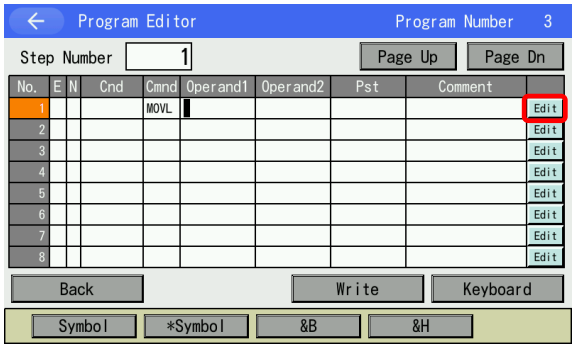
Method 2: Access the symbol edit screen to have symbol registration, and symbol input becomes available.

Example:
Input of following program steps
Program No. 3

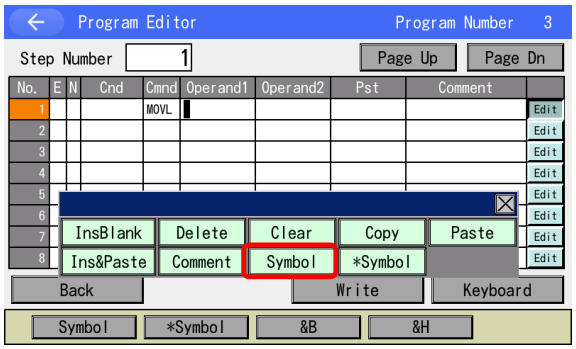
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				MOVL	TAIKIITI			

Position No. 10 is registered as 'TAIKIITI'.

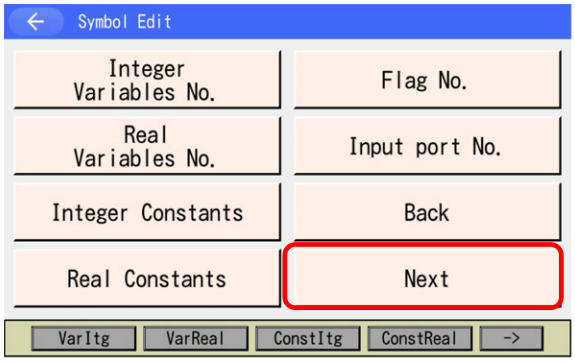
9.2.1 When Symbol Not Defined



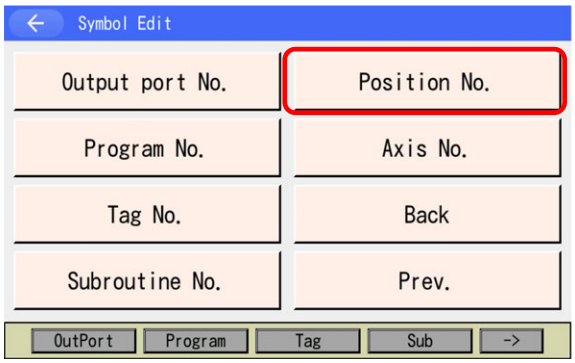
Touch Edit button area within the state of the cursor that has been located in Operand1 input box.



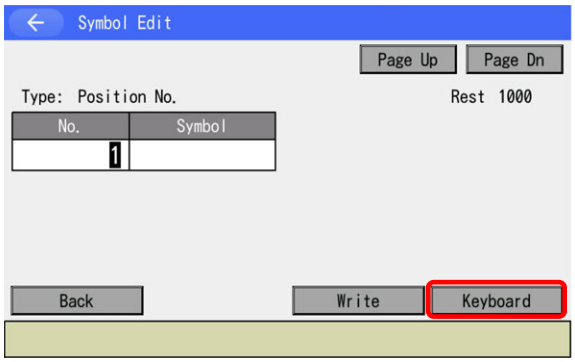
Touch Symbol button in the edit menu.



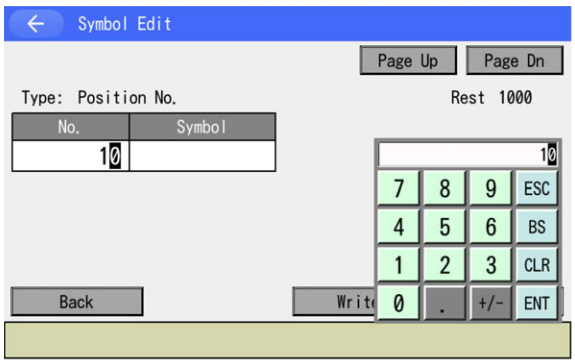
Touch Next button.



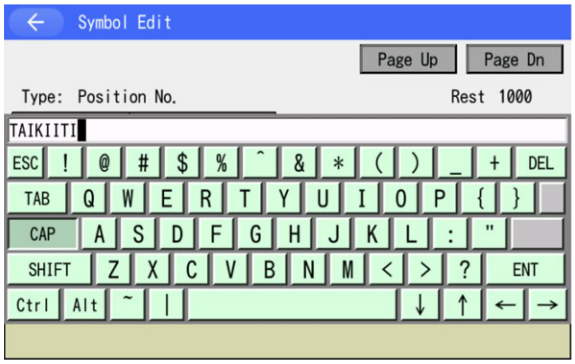
Touch Position No. button



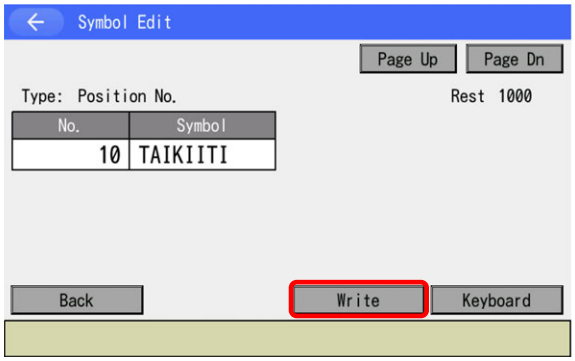
Touch Keyboard button to show the touch panel numeric keys.



Input 10 on the touch panel numeric keys and then touch ENT. Touch panel keyboard will close.



With the cursor being in the symbol input box, touch Keyboard button. Input TAIKIITI on the touch panel keyboard and touch ENT.
(If you touch CAP button, the keyboard changes to capital-letter input. If you touch CAP button again, it goes back to small-letter input.)

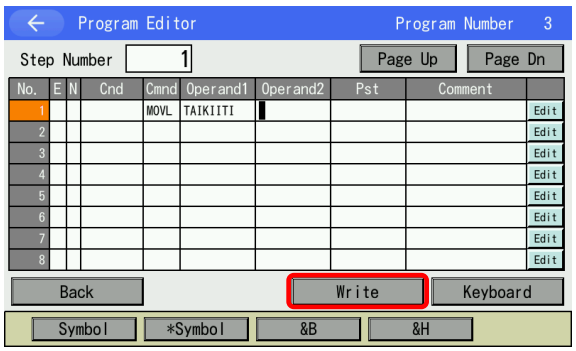


Touch Write button to transfer the symbol data to the controller. Once the transfer to the controller is complete, the display returns to the original program edit screen.

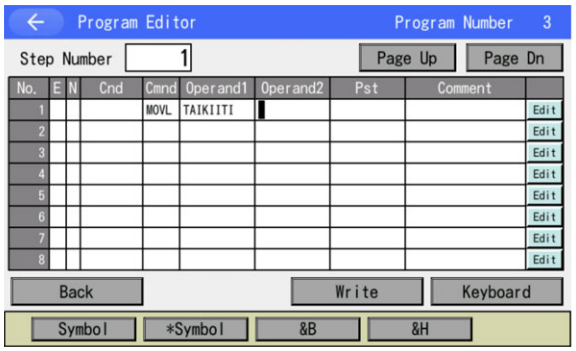
9.2.2 When There is Symbol Definition



With the cursor being in Operand1 input box, touch Keyboard button to show the touch panel keyboard. Input 'TAIKIITI' and touch ENT.



The touch panel keyboard closes and the cursor moves to Operand2 input box. Touch Write button to transfer the data to the controller.



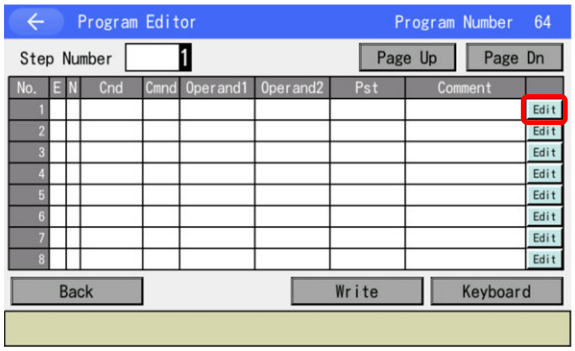
Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

Finish the program input. Return to the flash ROM writing window by using the return button.

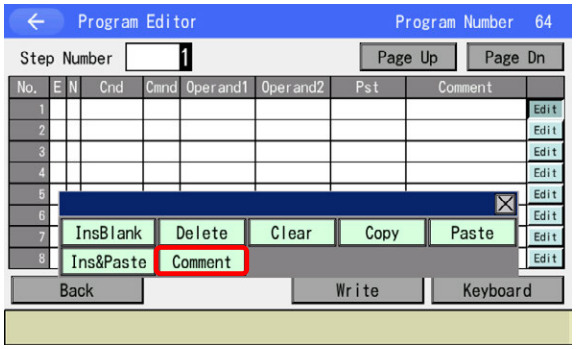
Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

9.3 Single Line Comment Input

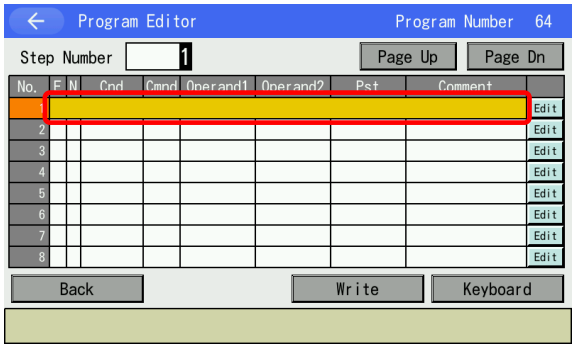
Turns a step from a program into a comment (invalid step) and you can input numbers, alphabets and signs.



After switching the display range with Page Up / Page Dn buttons or the step number direct input, touch the edit button in the step number that you would like to input a comment.

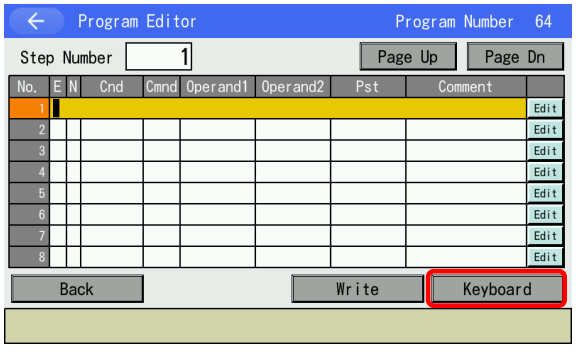


Touch Comment.

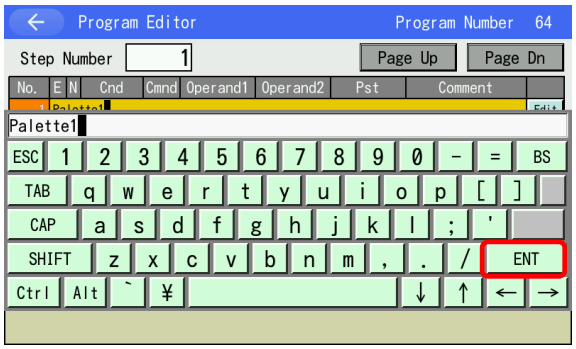


After the edit menu is closed, the display of the step data box changes.
The background color turns into dark yellow, and the boundary for E and N columns will disappear.

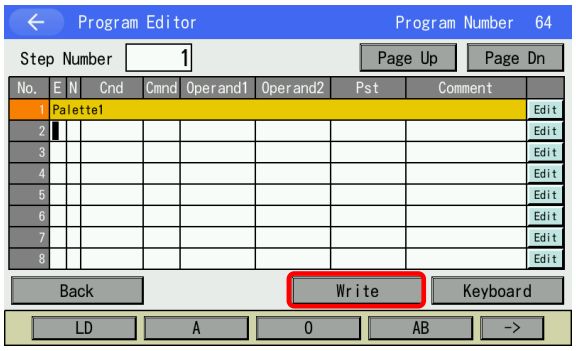
Touch in the input box.



The cursor gets displayed in the input box. Touch Keyboard button to show the touch panel keyboard.

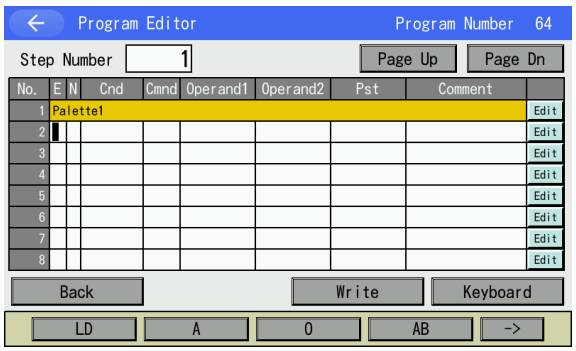


Input desirable letters on the keyboard.
An example for when Palette1 is input is shown in the figure on the left.
(To input capital letters, touch CAP key or SHIFT key to switch the mode.)
Touch ENT for confirmation.



Once the comment input is finished, touch Write button to transfer the input data to the controller.

When the screen is changed with the Page Up and Page Dn buttons, and Back button before data transfer, the input data becomes invalid.



Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

Finish the program input. Return to the flash ROM writing window by using the return button.

Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

9.4 To Change Program Steps

Program No. 4
It is assumed the top line program below is already input. And it is assumed that the contents will be changed to those in the bottom line below by editing.

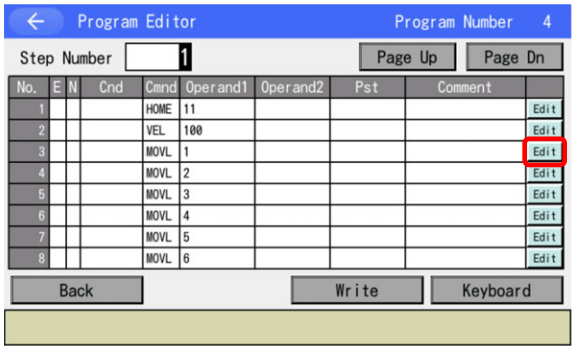
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				HOME	11			
2				VEL	100			
3				MOVL	1			
4				MOVL	2			
5				MOVL	3			
6				MOVL	4			
7				MOVL	5			
8				MOVL	6			
9				EXIT				

Modify

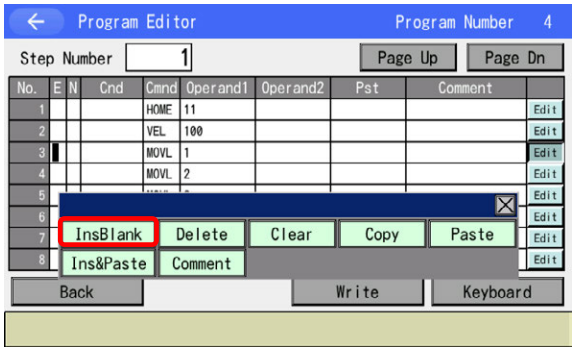
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				HOME	11			
2				VEL	100			
3				TAG	1			
4				MOVL	1			
5				MOVL	2			
6				MOVL	3			
7				MOVL	4			
8				~~MOVL~~	~~5~~			
9				GOTO	1			

(Insert TAG 1 to Step 3, inactivate MOVL 5 (single line comment), delete MOVL 6 and overwrite EXIT to GOTO 1)

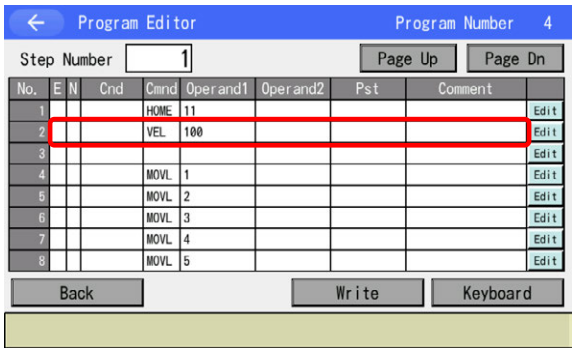
Open Program No. 4.



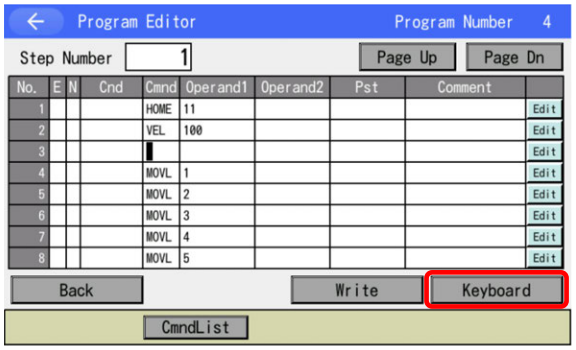
Insert a line of step between Program Step No. 2 and No. 3. Touch Edit button on No. 3.



Touch InsBlank button in the edit menu.



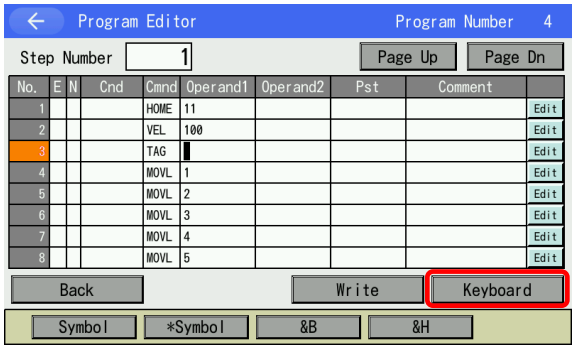
The original data in Step No. 3 and below move to No. 4 and below.
Also, the line for Step No. 3 gets blank.



Touch No. 3, Cmnd Column to move the cursor.
Touch Keyboard button to show the touch panel keyboard.



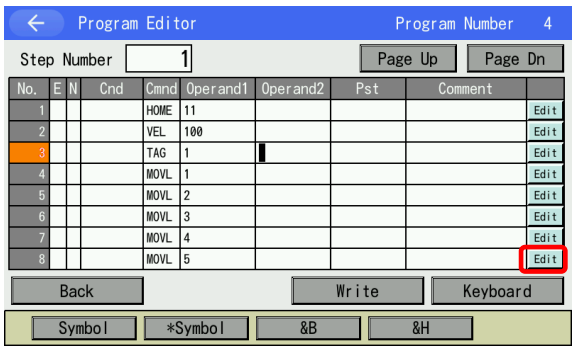
Input TAG and touch ENT.



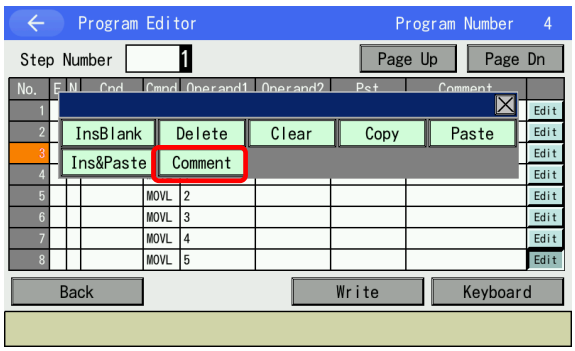
The cursor moves to the Operand1 input box.
Touch Keyboard button to show the touch panel keyboard again.



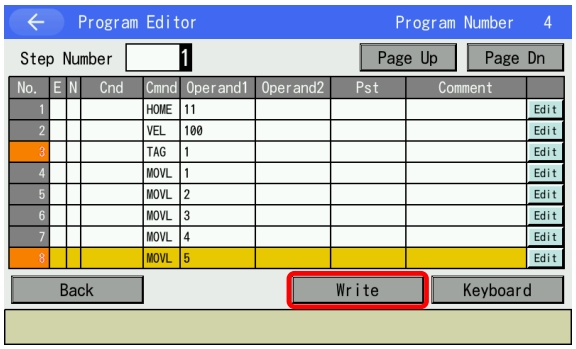
Input 1 and touch ENT.



Inactivate MOVL 5 next.
Touch Edit button in Step No.8.



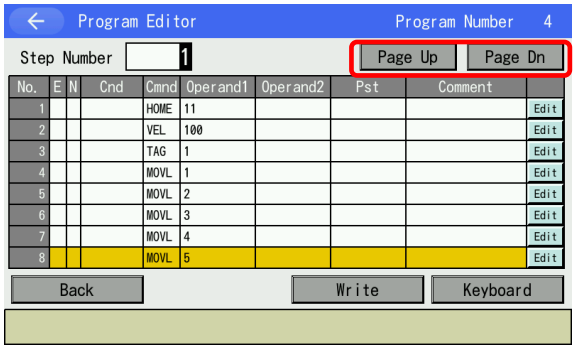
Touch Comment in the Edit menu.



The background color of the step data box in Step No. 8 turns to dark yellow, which shows it is invalid (Comment status).
(To cancel the invalid condition, show the edit menu again and touch the comment cancel button.)

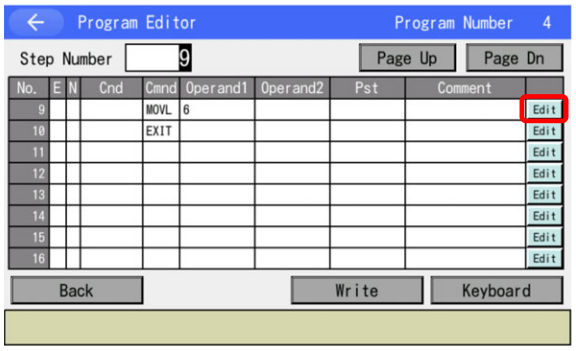
It is only the displayed range available for editing at once. Touch the writing button to transfer the program data to the controller.

> When the screen is changed with the Page Up and Page Dn buttons, and Back button before data transfer, the input data becomes invalid.

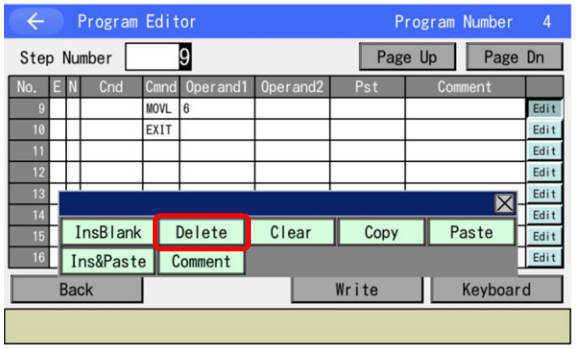


Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

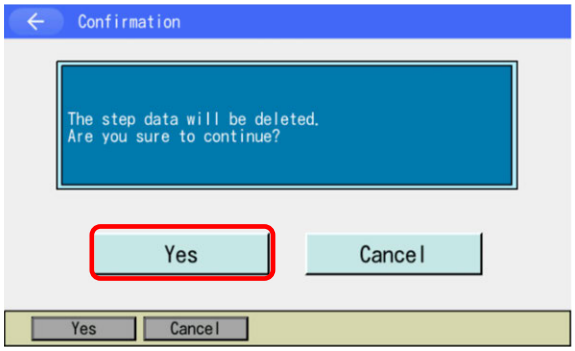
Switch the display range with Page Up / Page Dn or the step number direct input in order to show the data in Step No. 9.



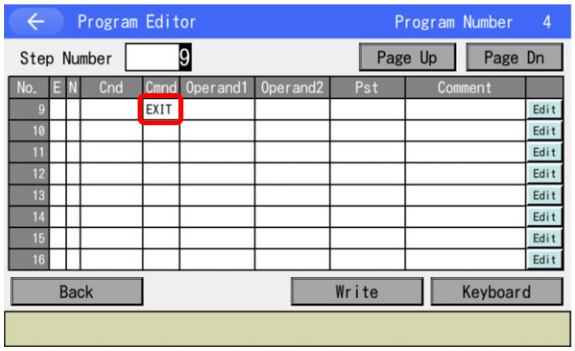
Touch Edit button in Step No.9.



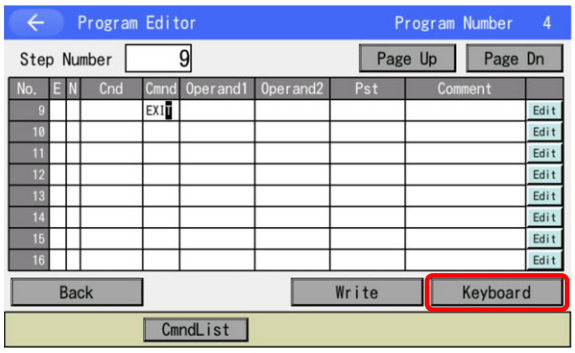
Touch Delete button in Edit Menu.



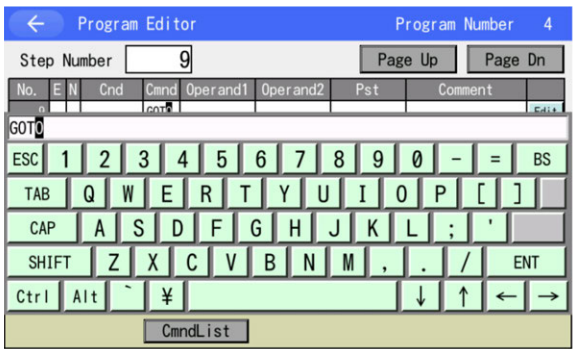
Confirmation window gets displayed. Touch the Yes button.
(If you wish to cancel the deletion, touch the Cancel button.)



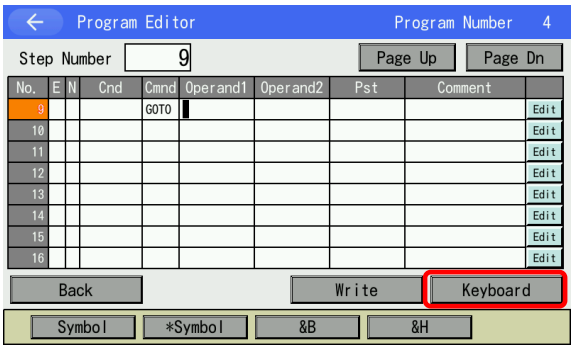
Touch No. 9, Cmnd Column to move the cursor.



Touch Keyboard button to show the touch panel keyboard.



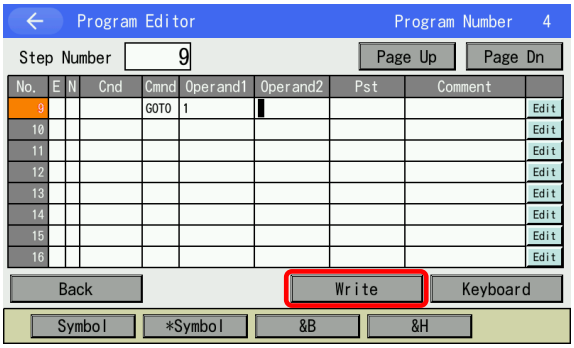
Input GOTO on the touch panel keyboard and touch ENT.



The touch panel keyboard closes and the cursor moves to Operand1 box.
Input the same value as that input in Operand1 box in Step No. 3 TAG Command to Operand1 box.
Touch Keyboard button to show the touch panel keyboard.



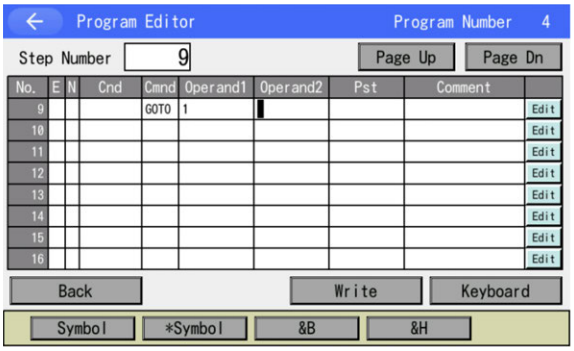
Input 1 and touch ENT.



The touch panel keyboard closes and the cursor moves to Operand2 box.

Touch the writing button.

When the screen is changed with the Page Up and Page Dn buttons, and Back button before data transfer, the input data becomes invalid.



Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

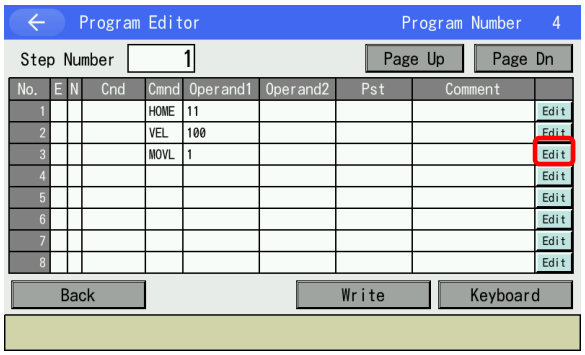
Finish the program input. Return to the flash ROM writing window by using the Back button or cancel button.

Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

9.5 Other Editing Features

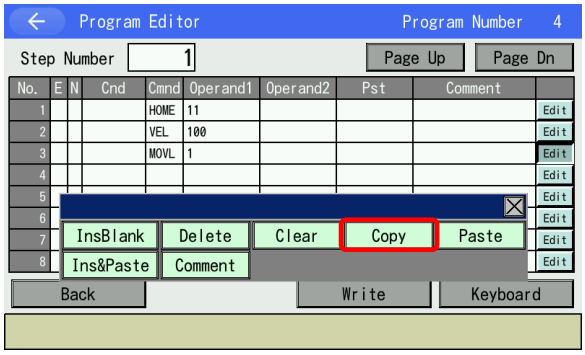
Copy and Clear of the step data can be conducted.

[Copy of Step Data]
For example, here explains the case to copy the step data in Step No. 3 to Step No. 4.



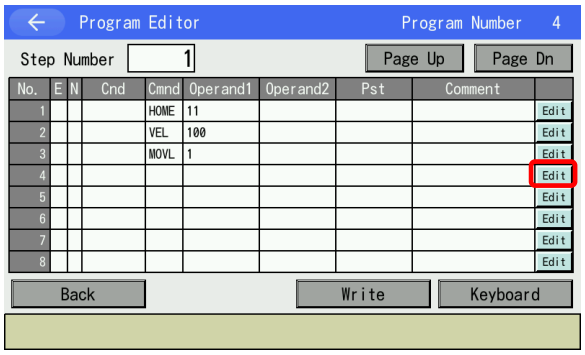
Switch the display range with Page Up / Page Dn or the step number direct input in order to show the data in Step No. 3.

Touch Edit button in Step No.3.

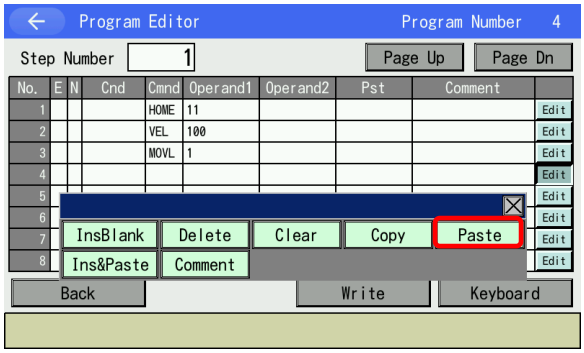


Touch Copy button in Edit Menu.

Edit menu is closed.

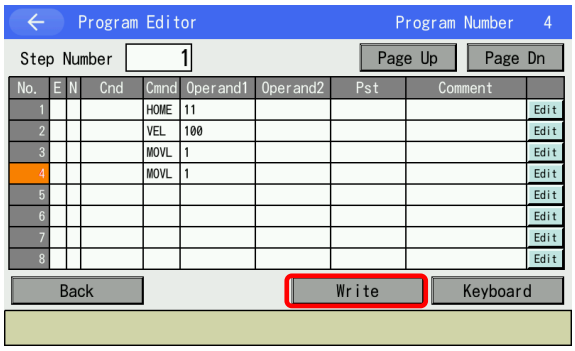


Touch Edit button in Step No.4.



Touch Paste button in Edit Menu.

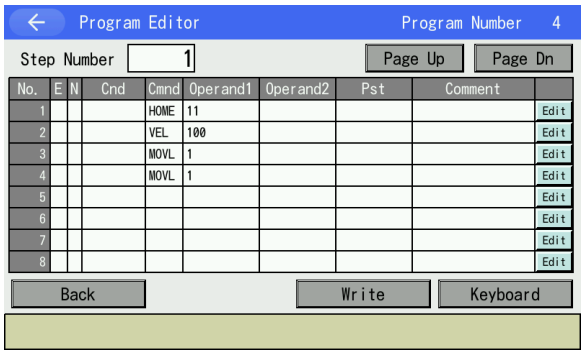
Edit menu is closed.



The step data copied in Step No. 4 gets displayed. Also, to show that it is being edited (controller writing not yet done), the background color in the step number display box turns to orange.

Touch Write button.

When the screen is changed with the Page Up and Page Dn buttons, and Back button before data transfer, the input data becomes invalid.

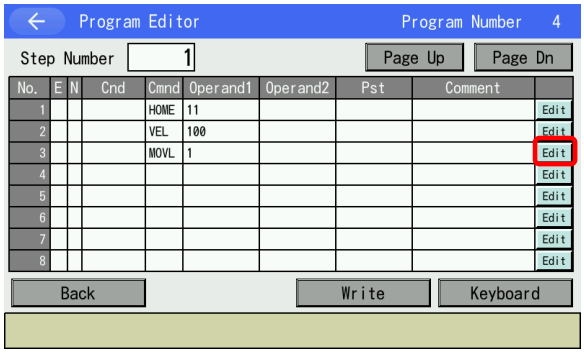


Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

Finish the program input. Return to the flash ROM writing window by using the Back button or cancel button.

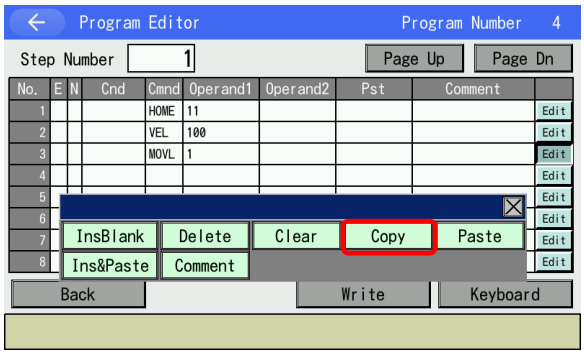
Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

[Insertion of Step Data]
For example, here explains the case to copy the step data in Step No. 3 to Step No. 2.



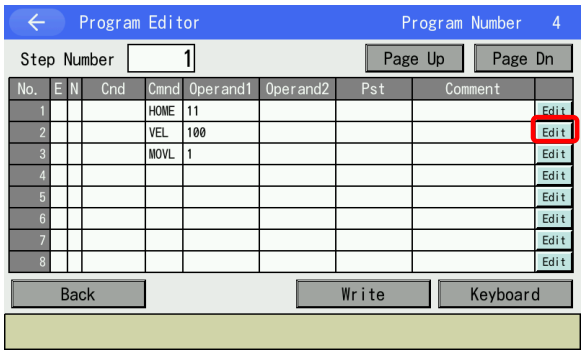
Switch the display range with Page Up / Page Dn or the step number direct input in order to show the data in Step No. 3.

Touch Edit button in Step No.3.

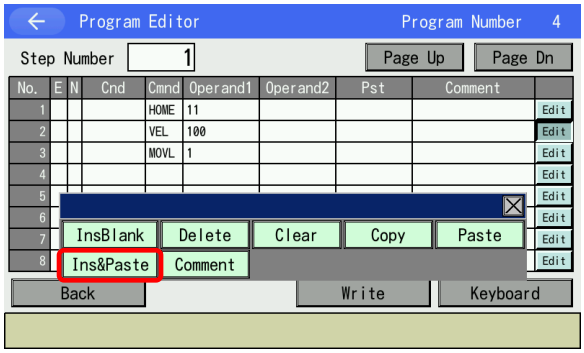


Touch Copy button in Edit Menu.

Edit menu is closed.

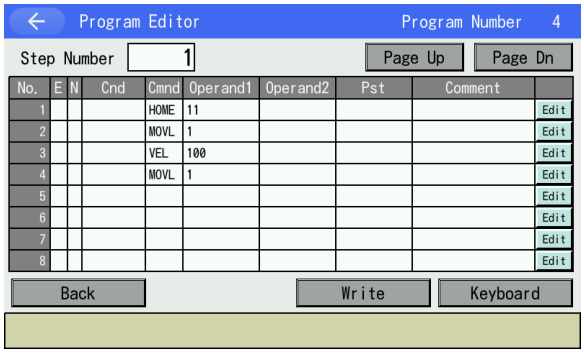


Touch Edit button in Step No.2.



Touch Ins&Paste button in the edit menu.

Edit menu is closed.



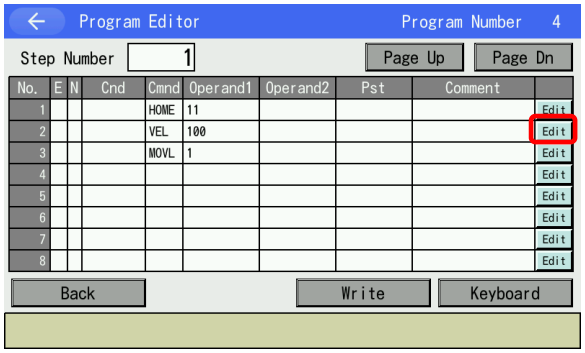
The step data copied in Step No. 2 gets inserted.

Data transfer (step data writing) to the controller is automatically conducted for Ins&Paste button.

Finish the program input. Return to the flash ROM writing window by using the Back button or cancel button.

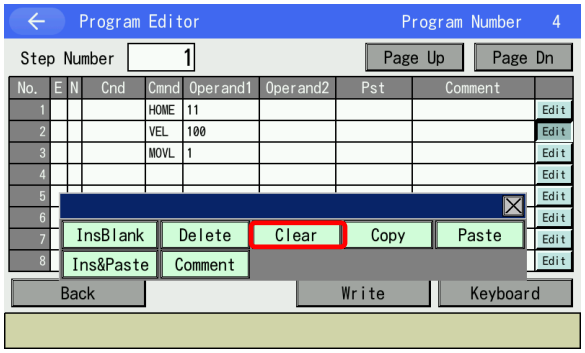
Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

[Clear of Step Data]
For example, here explains the case to clear the step data in Step No. 2.



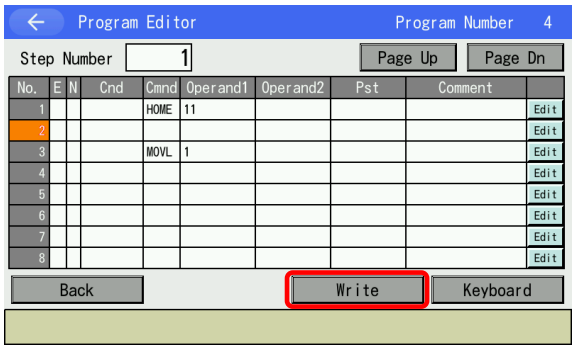
Switch the display range with Page Up / Page Dn buttons or the step number direct input in order to show the data in Step No. 2.

Touch Edit button in Step No.2.



Touch Clear button in Edit Menu.

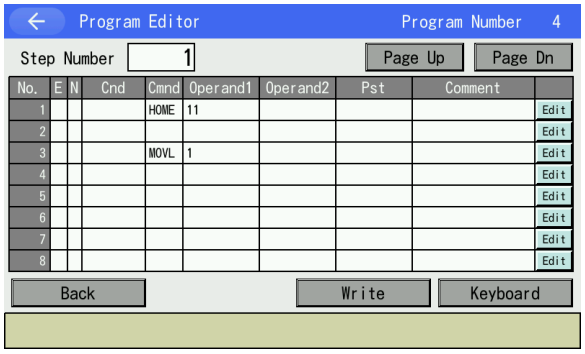
Edit menu is closed.



The step data in Step No. 2 gets deleted. Also, to show that it is being edited (controller writing not yet done), the background color in the step number display box turns to orange.

Touch Write button.

When the screen is changed with the Page Up and Page Dn buttons, and Back button before data transfer, the input data becomes invalid.



Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

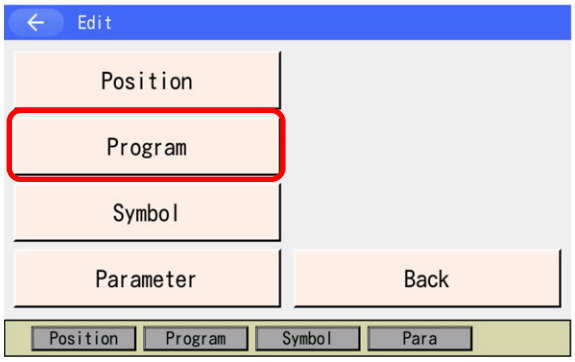
Finish the program input. Return to the flash ROM writing window by using the Back button or cancel button.

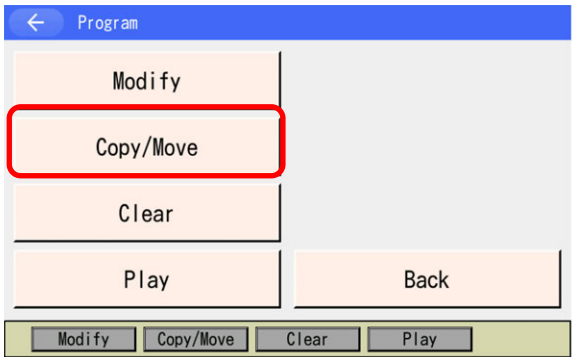
Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

9.6 Program: Copy or Move

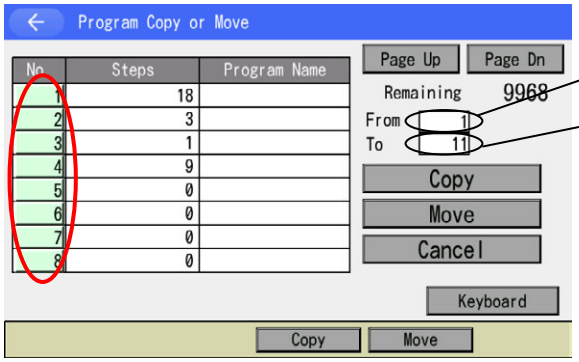
The following operating instructions are to copy or move a program to another program No.







Touch Edit → Program → Copy/Move

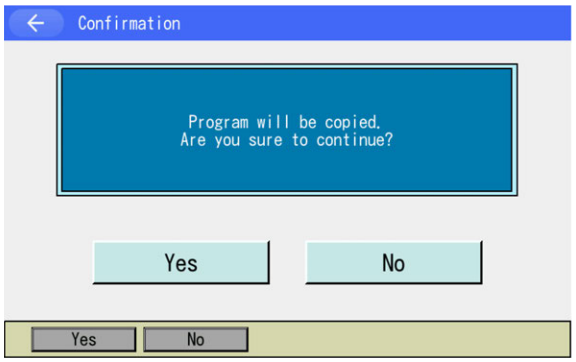


Copy/Origin Program Number

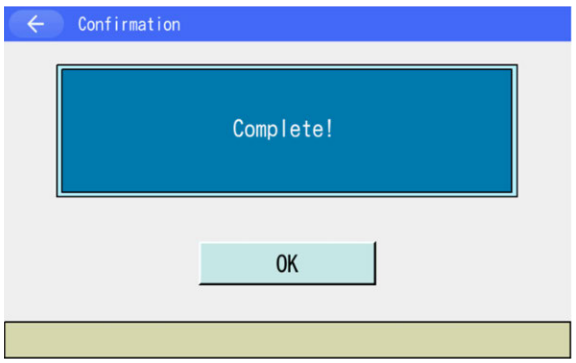
Copy/Destination Program Number

Touch Keyboard button and input the program number on the touch panel keyboard. If the cursor is in “From” or “To” box, touch the No. column in the table and the number you touched gets input in the box. The table can be changed with Page Up and Page Dn buttons.

When you want to copy, touch Copy button.
When you want to move, touch Move button.
Execution Confirmation screen appears.



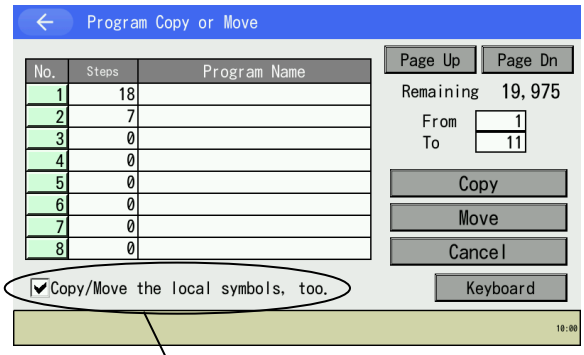
To execute, touch Yes button. To cancel, touch No button.



Touch OK button to go back to the previous screen. In addition, touch Back or Cancel button several times to go to Flash ROM writing screen.

Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

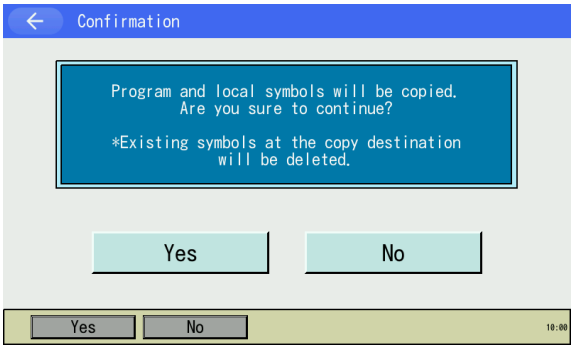
For the models applicable for the local symbol simultaneous copy/move, it is available to have the local symbol copy/move at the same time as program copy/move. In order to perform the local symbol simultaneous copy/move, turn on the checkbox for the local symbol simultaneous copy/move indication in the program copy/move screen and then touch the Copy or Move button.



Checkbox for Local Symbol Simultaneous Copy/Move
(displayed only for applicable models)

Touch in the checkbox for Copy/Move the local symbols, too and the checkmark can be turned on/off.

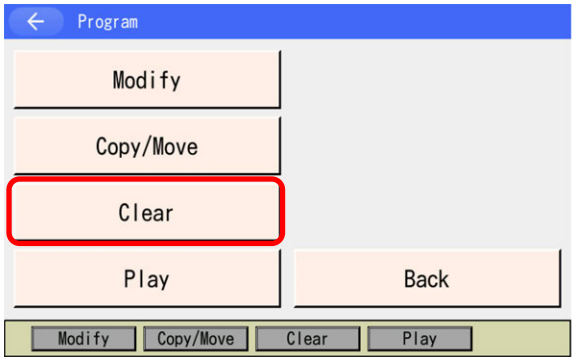
* The checkbox for the local symbol simultaneous copy/move is to be displayed only for the applicable models.



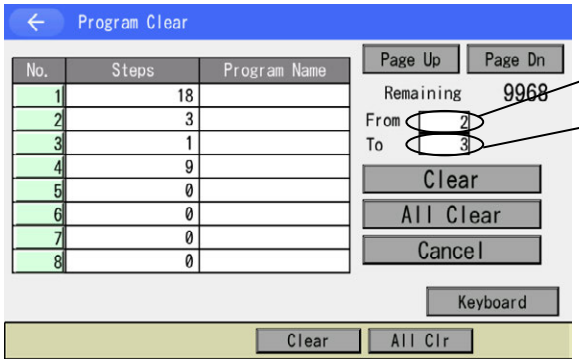
To execute, touch Yes button. To cancel, touch No button.

* Figure in the left shows an example for copy
* When the local symbol simultaneous copy/move is executed, the existing local symbols in the program number to copy/move to should all be discarded.

9.7 Program: Clear



Touch Clear button in the program menu screen.
Refer to [Section 9.5] for how to go to the program menu screen.

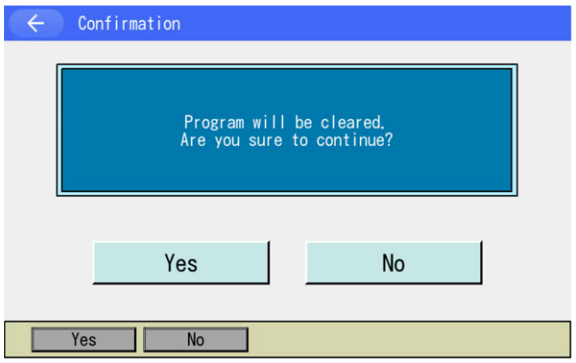


Top number to be deleted

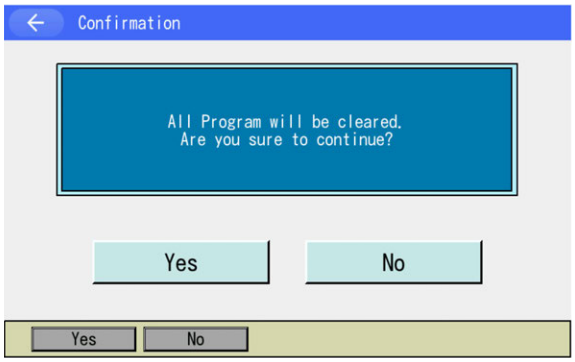
Last number to be deleted

Input the program number to be deleted on the touch panel numeric keys. To show the touch panel numeric keys, touch Keyboard button. If the cursor is in From or To box, touch the No. column and the number you touched gets set in From or To input box.
When the same number is input in the top number and the last number, just one program will be deleted.

Touch Clear button, and the execution confirmation screen opens.

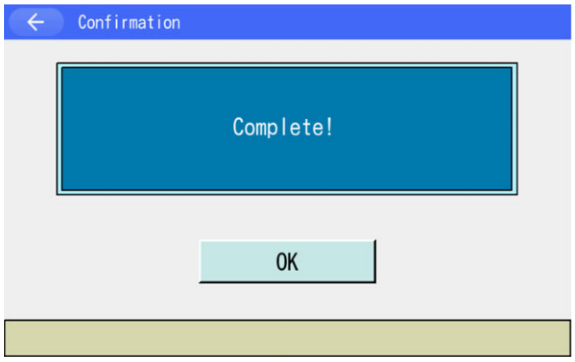


To execute, touch Yes button. To cancel, touch No button.



Touch All Clear button in the program number select screen to delete all the programs.

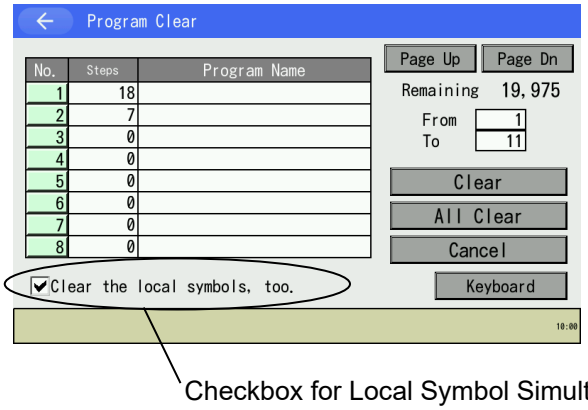
To execute, touch Yes button. To cancel, touch No button.



Touch OK button to go back to the previous screen. In addition, touch Back or Cancel button several times to go to Flash ROM writing screen.

Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

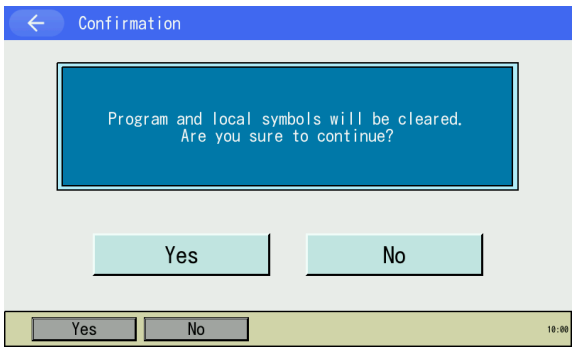
For the models applicable for the local symbol simultaneous copy/move, it is available to have the local symbol clear at the same time as program clear. In order to perform the local symbol simultaneous clear, turn on the checkbox for the local symbol simultaneous clear indication in the program clear screen and then touch the Clear or All Clear button.



Checkbox for Local Symbol Simultaneous Clear (displayed only for applicable models)

The Touch in the checkbox for Clear the local symbols, too and the checkmark can be turned on/off.

* The checkbox for the local symbol simultaneous clear is to be displayed only for the applicable models.

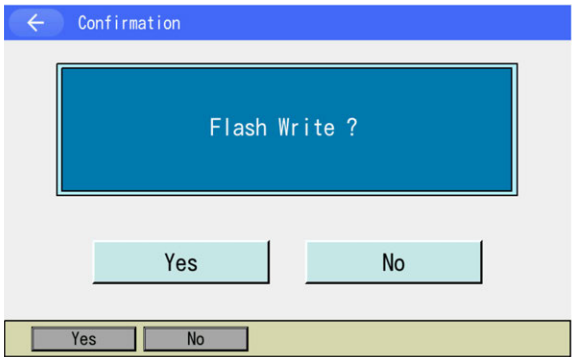


To execute, touch Yes button. To cancel, touch No button.

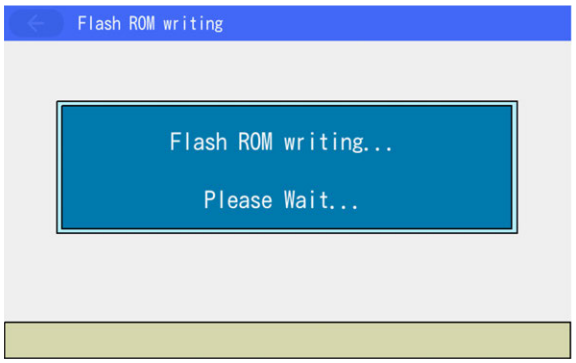
* Figure in the left shows an example for clear
* When the local symbol simultaneous clear is executed, the existing local symbols in the program number subject to clear should all be discarded.

9.8 Flash ROM Writing

The edit data will be cleared by restoring the power and executing software reset, only if the program edit data was transmitted to the controller.
To save the data after restoring the power and executing software reset, write the data to Flash ROM.
From the final editing screen, return to Flash ROM writing screen with Back button.

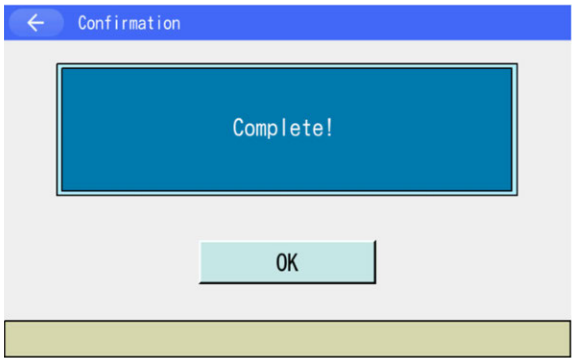


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

10. Program Execution

(Excluding the positioner mode of the SSEL, ASEL and PSEL controller.)

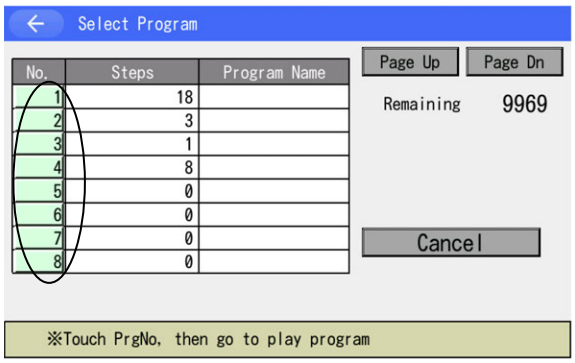
10.1 Operation Confirmation



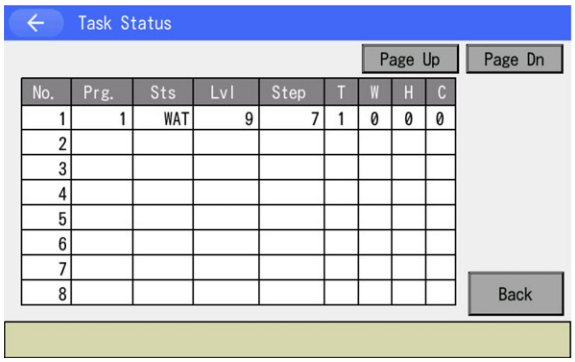
Touch Play in the main menu.
Also, in the program edit menu, there is Play button.

Touch Select Program button.

There are three items in the program operation menu.
Select Program : It opens the screen to select the program to be executed.
Task Status : It opens the screen to show the task status.
All Stop : It terminates all the programs.



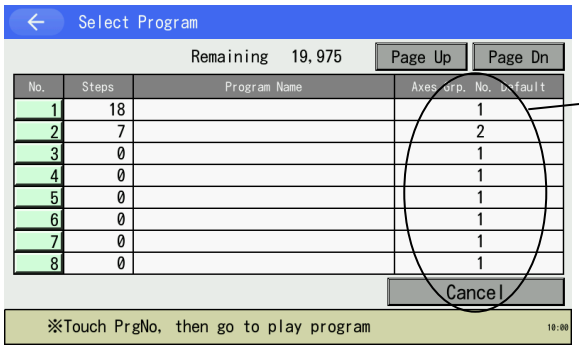
Touch the number box (where marked with a circle in the figure in the left) on the table of the program number that you would like to run the program in. To show No. 9 and further, use Page Up and Page Dn buttons to change the display.



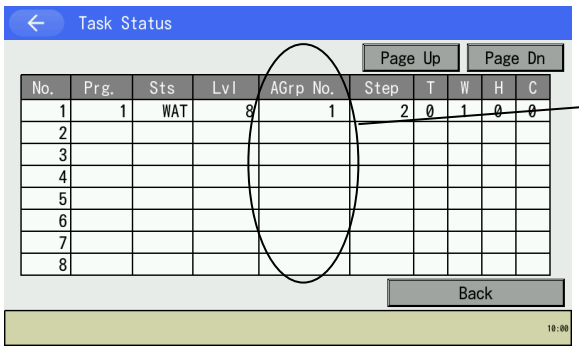
To show Task No. 9 and further, use Page Up and Page Dn buttons to change the display.
Touch Back button to return to Program Operation Menu screen.

No. : Task No.
Prg. : Program No.
Sts : Task Status (Task status in OS administration inside) (For XSEL-J/K, the main application is applicable in Ver. 0.14 and later.)
Lvl : Task Level
Step: Step number in execution
T : In execution stop command (Stop by step operation, stop at break point and stop by pause button)
W : WAIT in process (In condition to wait for completion of TIMW, WTxx, WZxx, WRIT, READ, servo command, etc.)
H : HOLD input (For XSEL-J/K, the main application is applicable in Ver. 0.26 and later.)
C : CANC input (For XSEL-J/K, the main application is applicable in Ver. 0.26 and later.)

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (refer to [15.17 Axis Number Assignment]), the initial setting values* in the axes group numbers will be displayed in the select program number screen. Also, the axes group numbers subject to control should be displayed in the task status screen.
(* Axes group numbers subject to control at the program execution start)

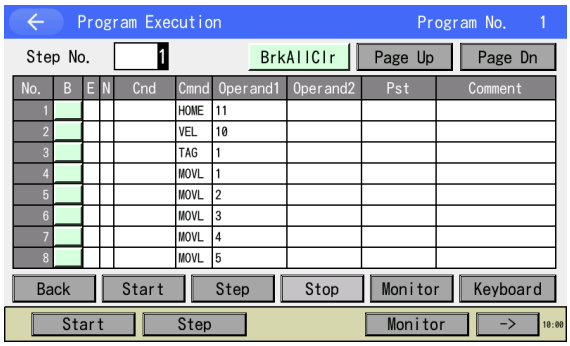


Initial Values in Axes Group Numbers



Axes Group Numbers Subject to Control

Once a program is selected in the program select screen, the display is switched to the following screen. (Figure below is the case Program No. 1 is selected.)
Select whether to operate one step by one or have the continuous operation.



Touch Start button to start operation.

Start

Stop

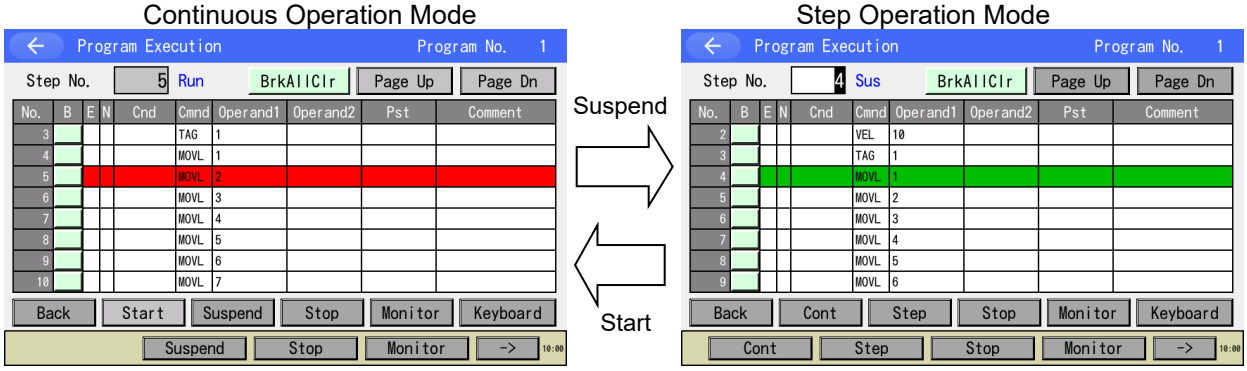
Continuous Operation Mode

Touch Step button to start step operation.

Stop

Step

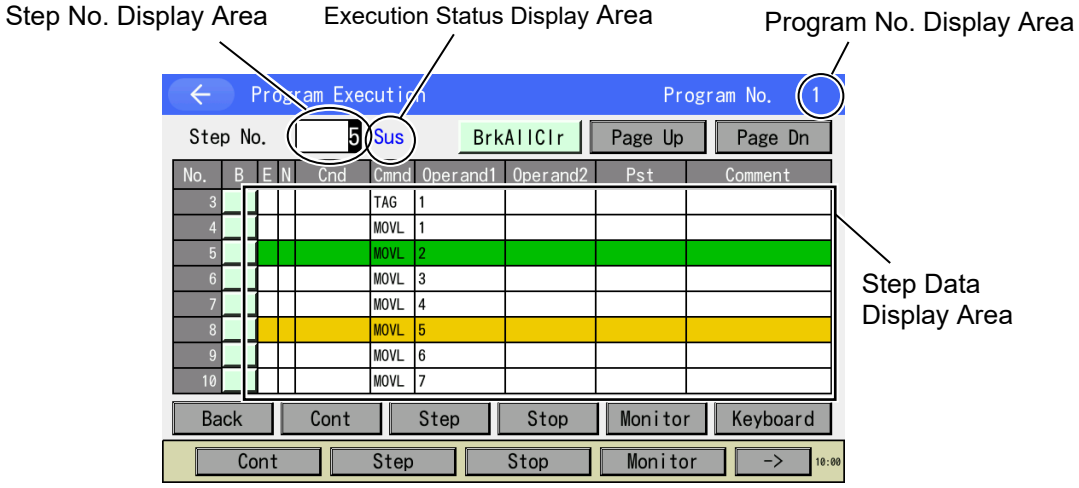
Step Operation Mode



It shows the currently on-going program step and the status before and after it.
Touch Suspend button and the operation program switches to the step operation.
Touch Stop button to terminate the operation.

After the completion of the on-going program step, it shows the next step and the status before and after it. Then, the step operation is stopped.
Touch Step button to execute one step.
Touch Start button and the operation program switches to the continuous operation.
Touch Stop button to terminate the operation.

⚠ *Caution: When a teaching pendant is connected, the condition is in 'limited for safety speed'. Therefore, the maximum velocity for the orthogonal axis is limited to 250mm/s or lower no matter the setting in the programs or parameters. The maximum velocity for the SCARA axis is limited to 250mm/s or lower in CP operation, and 3% or less in PTP operation.*
Refer to [15.8 Safety Speed] for how to activate/inactivate the safety speed.



[Items Shown in Program Operation Screen]

Program No. Display Area : Selected program No. is displayed.

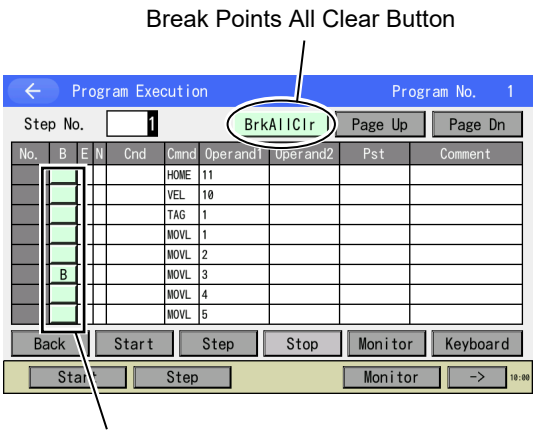
Step No. Display Area : Is to input Step No.
By the input values, Display Area is changed.
(The display range change is available also using the PageUp or PageDn button).
The display range change using parameter input is available only during the operation stop or pause condition. During the continuous operation, the display range is changed automatically and on-going step No. is displayed in the Step No. input area.

Execution Status Display Area: Execution status of the selected program is displayed.
(Blank: Operation Stop, Run: Continuous Operation, Sus: Pause)

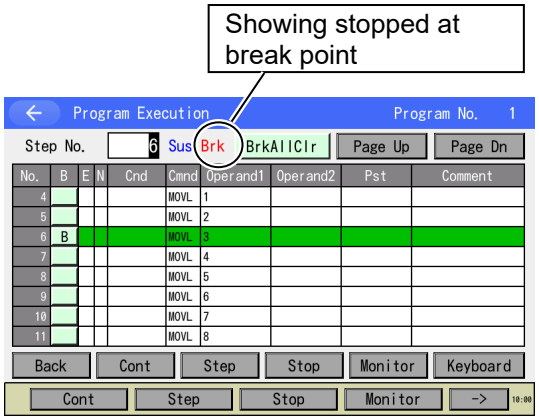
Step Data Display Area : Step data for the selected program is displayed.
The background color shows the each step type and status.
- White : Normal step
- Mustard : Comment step
- Green : Step number in execution (Pause)
- Red : Step number in execution (WAIT section processing)
- Blue : Step number in execution (Others)

10.2 Setting of Break Point

Break point can be set with the continuance operation.



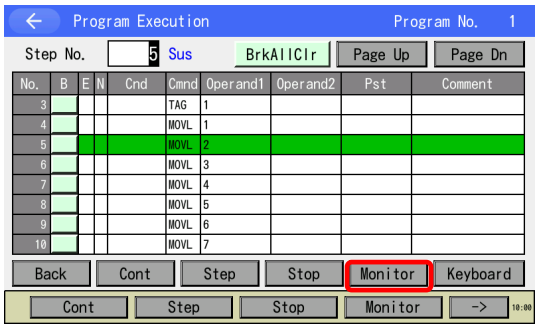
Change the display range so that the step No. for setting the break point, is displayed in the screen, by means of direct input of Step No. using the touch panel ten-key pad, or touching the Page Up or Page Dn button.
Each touching of the break point setting button, sets or cancels the break point.
When the [BrkAllClr] button is touched, all the break points in the selected program, are cleared.



When the continuous operation is carried out with the break point setting established, the program gets paused before executing a command in the step number that the setting is conducted in.
To resume the continuous operation after the pause, touch Start button. Also, if you touch Step button, the step operation starts executed.
The break points are all cleared if the power supply to the controller is turned OFF/ON or the software reset is conducted.

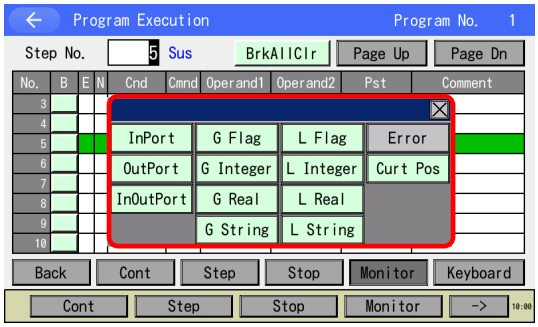
10.3 Monitoring in Program Operation

The current position of the actuator and the data in the local and global domains can be monitored during the continuous operation or step operation.



Touch Monitor button.

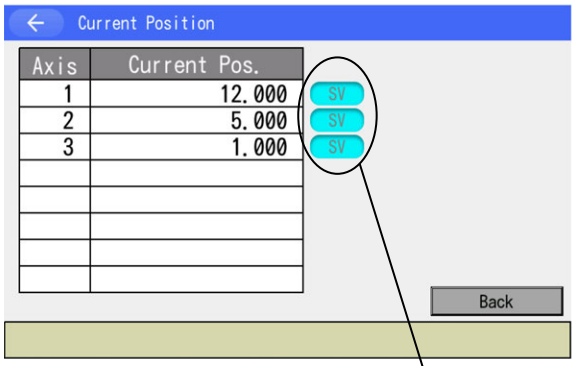
The monitor menu is opened.



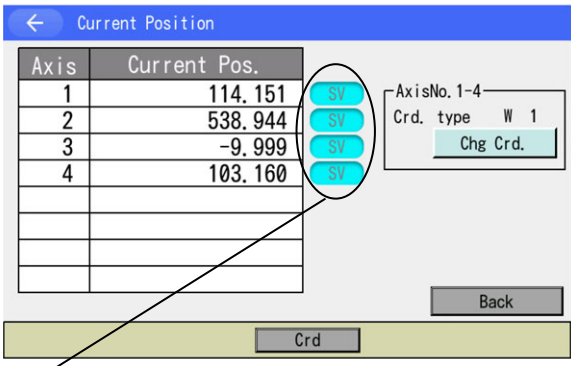
Touching the button selects the monitor item.

When the monitor menu screen is closed, the selected monitor screen appears.

(1) Display the Current Position
Display the current position of the actuators.
Touch Cur pos. button in the monitor menu.



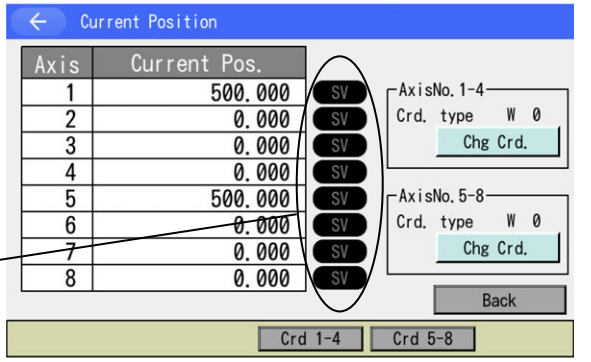
Orthogonal Axis



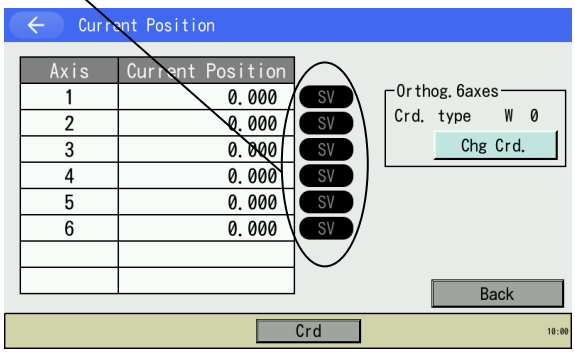
SCARA Axis

Servo ON Status

Servo OFF status



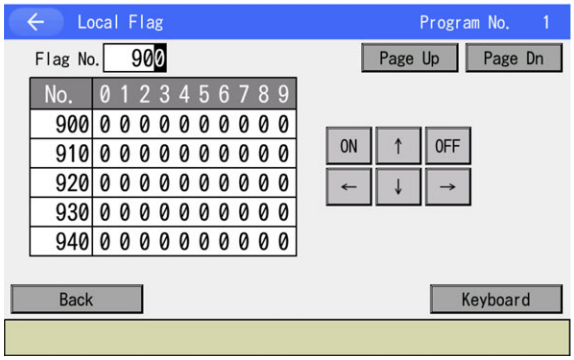
For XSEL-RXD/SXD or RAXD/SAXD Controllers

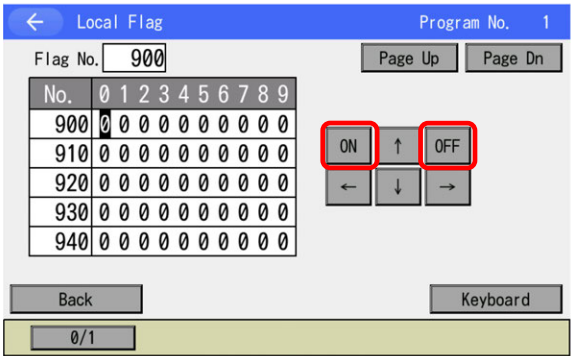


When 6-axis Cartesian Activated

The coordinate system type in display can be switched over for SCARA Type and the 6-axis cartesian type.

(2) Local Flag
This is the local flag ON/OFF display. It can be switched ON/OFF.
Touch L-Flag button in the monitor menu.



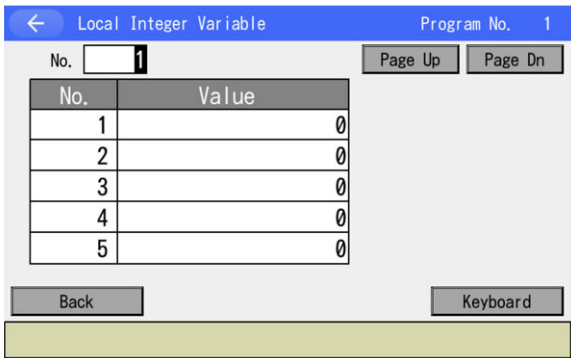


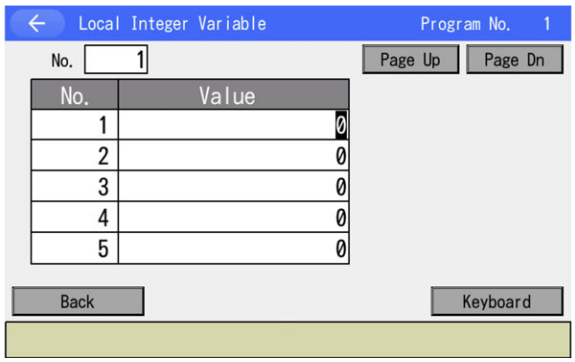
When the cursor is in the flag data box as the figure on the top right shows, switchover of ON/OFF is available for the flag which the cursor is placed on.
To move the cursor from a flag number box to a flag data box, touch a flag data box.
To switch ON/OFF at the cursor place, either touch ON or OFF button in the touch panel, for switchover.
To operate the cursor, either touch ← ↑ ↓ → in the touch panel.
Every touch of Page Up and Page Dn buttons scrolls up/down the flag numbers by 50 items.

(3) Local Variables

Displays the contents of the local variable. Moreover, values can be substituted for a local integer variable and a local real variable, and then the character sequence can be substituted for a local string.
Touch L Integer L Real L String buttons in monitor menu.

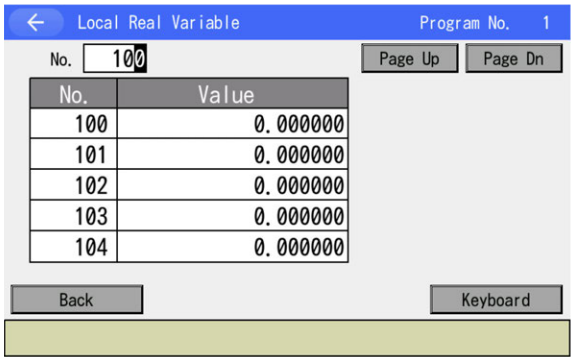
1) Local Integer Variables

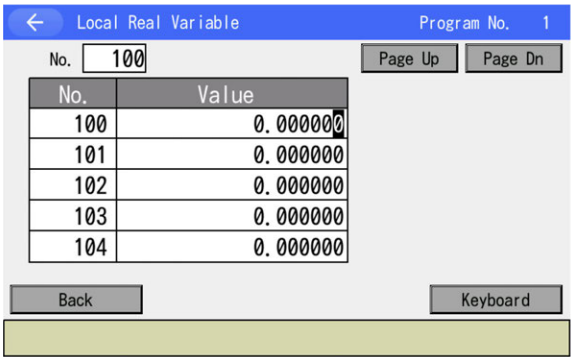




When the Local Integer Variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the Value input box.
The data with the cursor placed on can be substituted by inputting on the touch panel numeric keys and touching ENT.
To move the cursor, touch in the Value input box.

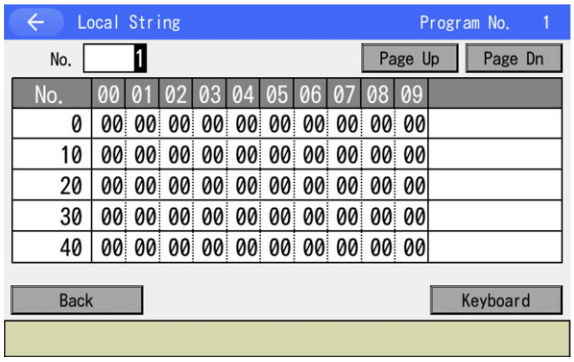
2) Local Real Variables

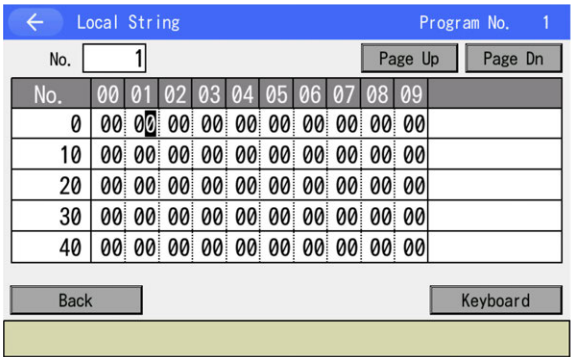




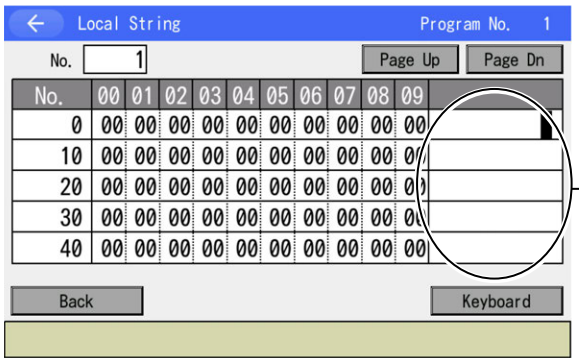
When the Local Real Variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric key is also available. The cursor moves to the Value input box.
The data with the cursor placed on can be substituted by inputting on the touch panel numeric keys and touching ENT.
To move the cursor, touch in the Value input box.

3) Local String Variables



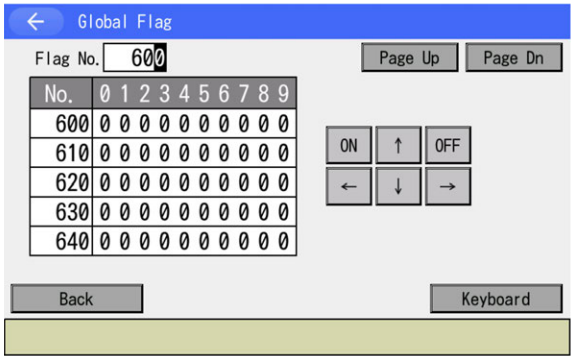


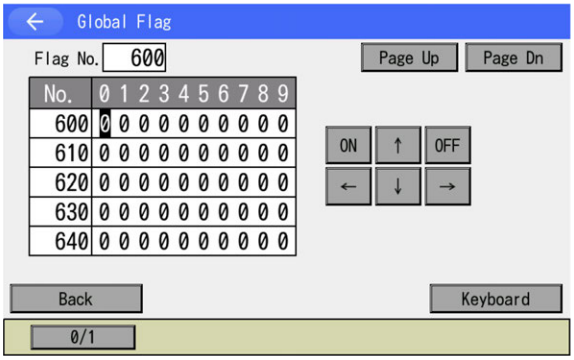
When the Local String variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the data box.
The data with the cursor placed on can be substituted by inputting ASCII code on the touch panel numeric keys and touching ENT.



Touch in a character strings display and input box to show the cursor in it, and input of character strings is available.
Touch Keyboard button to show the touch panel keyboard to input.
In order to move the cursor among the character string displays, input columns and data columns, touch a place where you would like to show the cursor.
In the character display column, only alphabetical and numerical letters and half-size font Kana characters can be displayed. Input is available only with the alphabetical and numerical letters.

(4) Global Flag
It shows the status ON/OFF of the global flags. In this screen, the global flags can be switched ON/OFF.
Touch G-Flag button in Monitor menu.

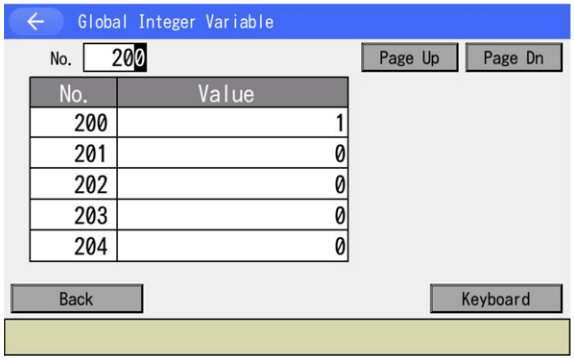


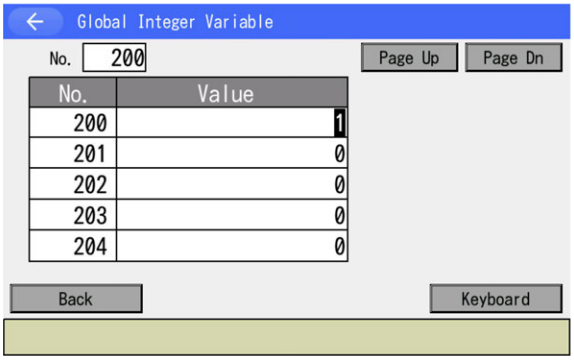


The way to operate is the same as (2) Local Flag.

(5) Global Variables
Touch G Integer G Real G String buttons in monitor menu.

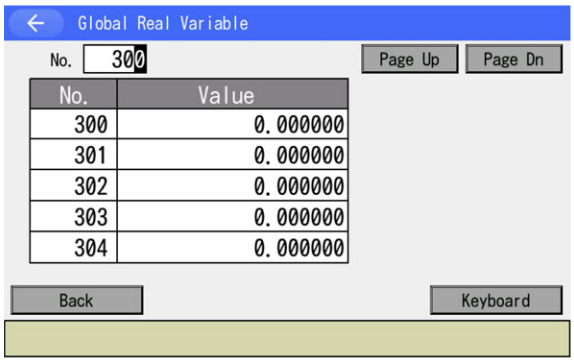
1) Global Integer variables

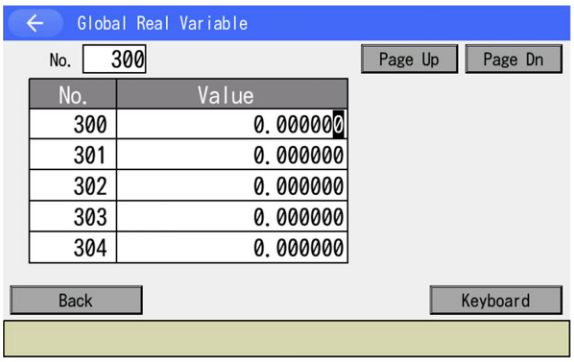




When the Global Integer Variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the Value input box.
The way to substitute a value is the same as (3) 1) Local Integer Variables.

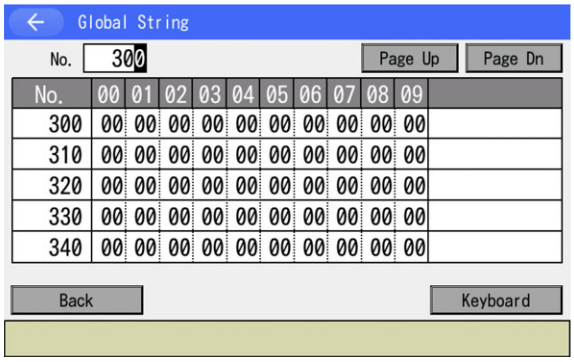
2) Global Real Variables

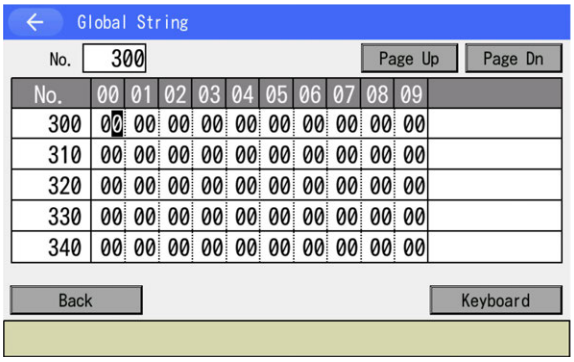




When the Global Real Variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the Value input box.
The way to substitute a value is the same as (3) 2) Local Real Variables.

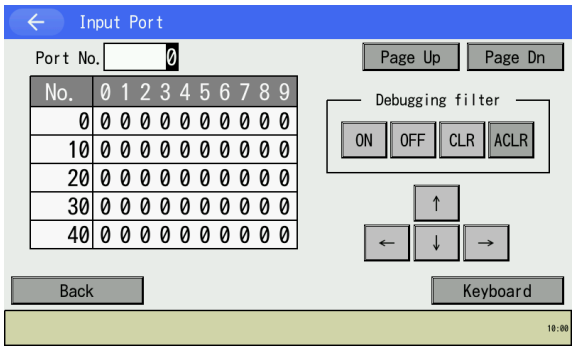
3) Global String Variables





When the Global String variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the data box.
The way to substitute a value is the same as (3) 3) Local String Variables.
In the character display column, only alphabetical and numerical letters and half-size font Kana characters can be displayed. Input is available only with the alphabetical and numerical letters.

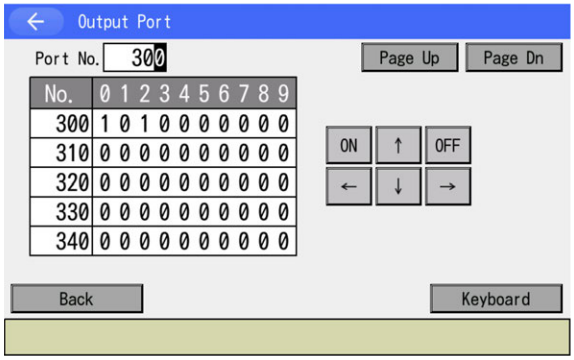
(6) Input Port
Touch In port button in monitor menu.

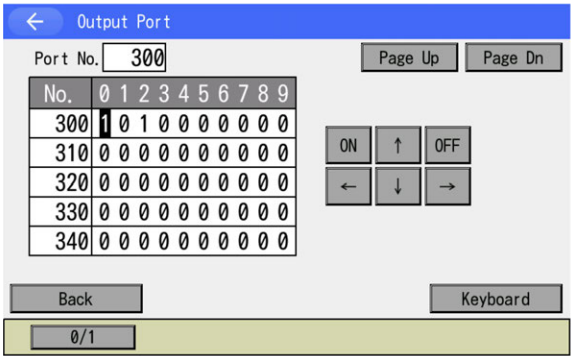


Touch Keyboard button to open the touch panel numeric keys, input a port number that you want to show, and touch ENT for confirmation.
Every touch of Page Up and Page Dn buttons scrolls up/down the displayed input port numbers by 50 items.

Refer to [14.2 Input Port] for debug filters.

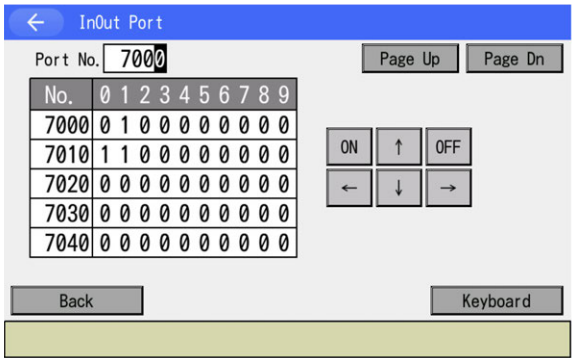
(7) Output Port
Touch Out port button in monitor menu.





When the cursor is in the output port data box as the figure on the top right shows, switchover of ON/OFF is available for the output port which the cursor is placed on.
To move the cursor from a port number box to an output port data box, touch an output port data box.
To switch ON/OFF at the cursor place, either touch ON or OFF button in the touch panel for switchover.
To operate the cursor, touch ← ↑ ↓ → in the touch panel .
Every touch of Page Up and Page Dn buttons scrolls up/down the output port numbers by 50 items.

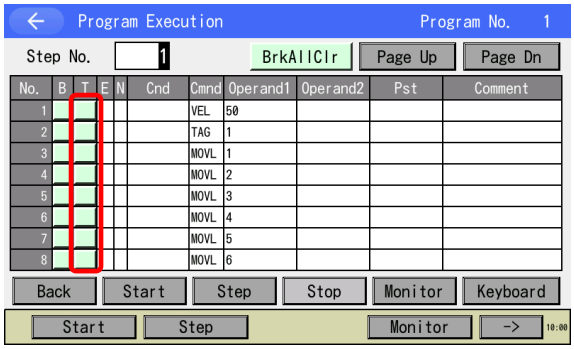
(8) Input/Output Port (for applicable models only)
Touch InOutPort button in monitor menu.



The way to operate is the same as (7) Output Port.

10.4 Program Execution Time Measurement Function

In the program execution window, the period of time while the program was executed in the indicated section can be measured.



Open the program execution window.
For the models that support the program execution time measurement function, the program execution time measurement section indication button (T Button) should be displayed between the break point setting button (B Button) and Column E.
Touch T Button and the program execution time measurement section can be indicated.

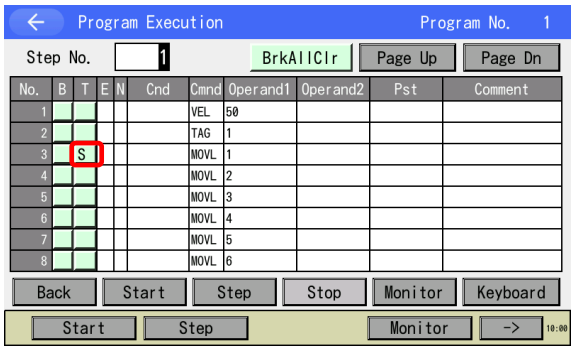
Touch T Button of the step you would like to edit setting and the display of the touched button should change.
The meanings of each type of display are as shown below.

- (Blank) : Setting not established
- S : Execution time measurement start point
- E : Execution time measurement end point
- SE : Execution time measurement start and end points in the same step

* The area between the point before execution of a step that the execution time measurement start point is indicated and the point after execution of a step that the execution time measurement end point is indicated should be the execution time measurement section.
(In case the execution time measurement start and end points are set in the same step, the area between the point before that step and after it should be the execution time measurement section.)

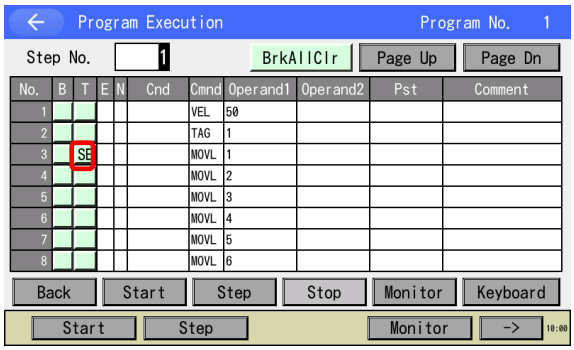
10.4.1 Indication of Execution Time Measurement Section

Indicate the execution time measurement section while the program is stopped.

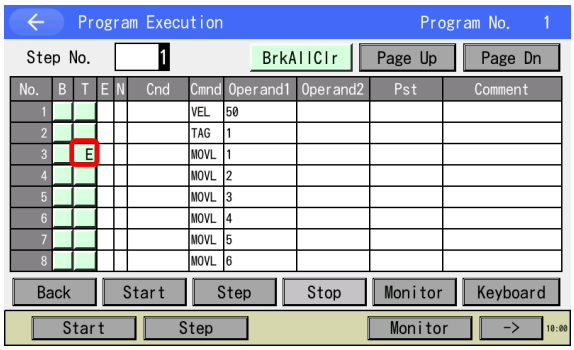


1) Touch a blank T Button, and the display of the touched button turns to S as shown in the figure in the left and the execution time measurement start point can be established.

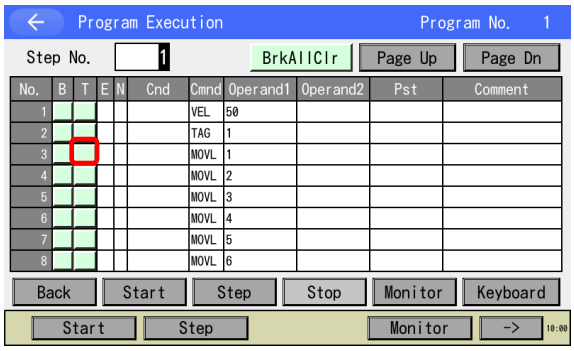
* Shown in the left is an example of T Button in Step 3 being touched.



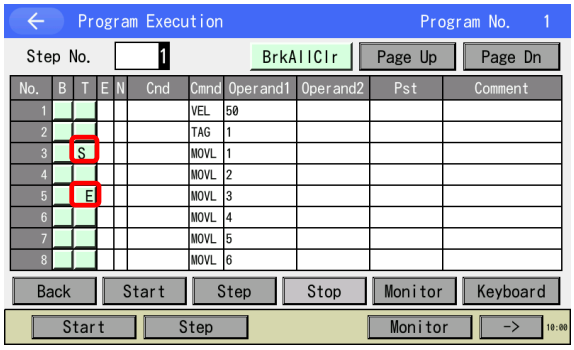
2) Touch a T Button with S being shown while S is shown in the T Button, and the display of the touched button turns to SE as shown in the figure in the left and the execution time measurement start and end points can be established in the same step.
Also, if you touch a button other than that with S being shown, the display of the touched button turns to E and the execution time measurement end point can be established.



3) Touch a T Button with SE being shown while SE is shown in the T Button, and the display turns from SE to E as shown in the figure in the left and the execution time measurement end point can be established.



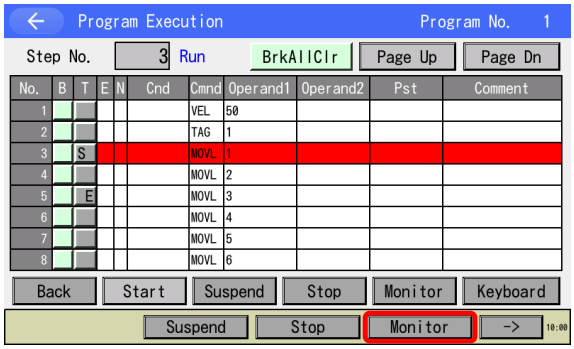
4) Touch a T Button with E being shown while E is shown in the T Button, and the display of E disappears as shown in the figure in the left and the execution time measurement start and end points become not set.
Also, if you touch a button other than that with E being shown, the display of the touched button turns to S and the execution time measurement start point can be established.



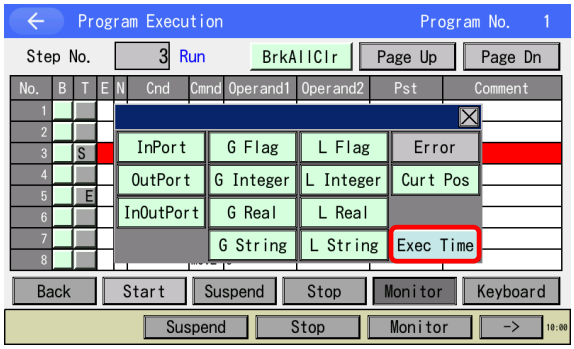
5) Touch a T Button with S being shown while S and E are shown in two T Buttons, and the display of S disappears as shown in the figure in the left and the execution time measurement start point becomes not set.
Also, touch a T Button with E being shown, and the display of E disappears and the execution time measurement end point becomes not set.

10.4.2 Display of Execution Time Measurement Result

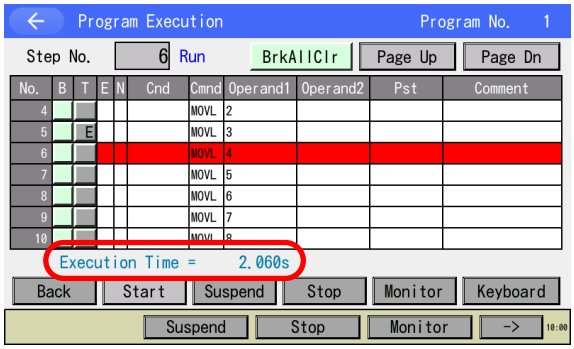
Follow the procedures below to display the result of the execution time measurement.



1) Touch Monitor button.



2) Touch Exec Time button.



3) The monitor menu closes automatically and the it becomes that the execution time measurement result gets displayed in the program operation window.

* Switchover of the display can be conducted both during program operation and stop.

* Touch Exec Time button again in the monitor menu and the display goes back to normal.

The status of the execution time measurement in each type of display should be as stated below.

- (Not Displayed) : Execution time not measured
- Displayed as -----.--- : In process of execution time measurement
- Time displayed : Execution time measurement completed

* If any change gets applied to the execution time measurement section after measurement is completed, the condition becomes measurement not conducted.

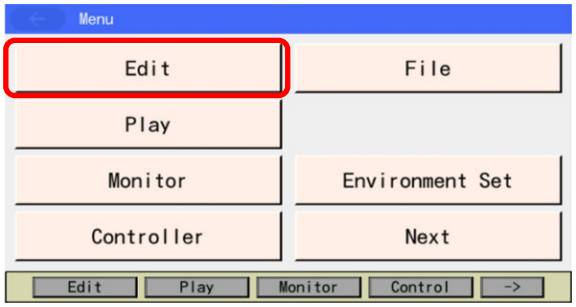
* If the step which the execution time measurement start point has been set to gets executed after the measurement has been completed, measurement will be restarted.

10.4.3 Cautions

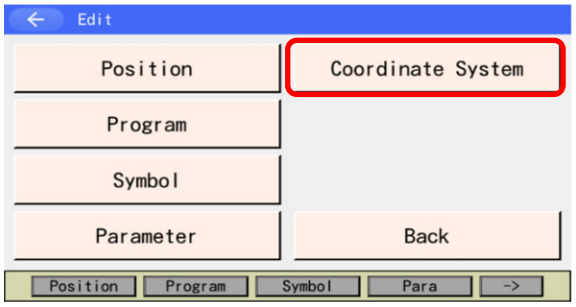
- It should be only one section that the execution time measurement section is available to set up.
- Once measurement gets started, measurement will be kept on until the step which the end point has been set to completes.
- In case a section gets set to an area that loops in a short period of time, as a cycle of measurement starts straight after another one finishes, the display may look as if it keeps showing -----.---s.
- The execution time should keeps added up even during the program being stopped at the break point or by pause.
- The execution time measurement start and end points should be set to the command (Cmnd Box) statement step.
  In case they are set up in the step only for input / extension condition or comment step, measurement will not start or end.
- In case the input / extension condition are set up in the execution time measurement start and end points setting step, measurement will start or end only if the condition is satisfied.
- In case a break point is set up in the execution time measurement start and end points setting step, measurement of the execution time will start after execution of the program gets resumed.
- The maximum duration of time to measure should be 99999.999 seconds.

11. Coordinate System Data Editing

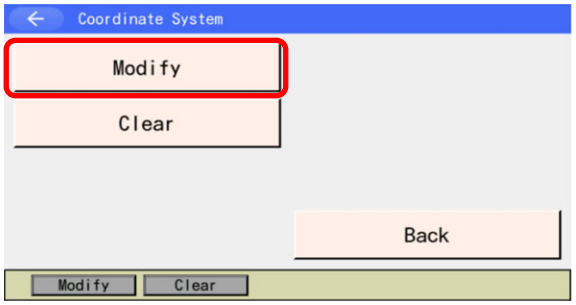
1st to 4th* Axes of XSEL-JX/KX/PX/QX/RX/SX/RAX/SAX and XSEL2-TX (Axes Group No. 1) 1st to 4th Axes or 5th to 8th Axes of XSEL-RXD/SXD/RAXD/SAXD, 1st to 4th* Axes on MSEL-PCX/PGX, RSEL 6-axis Cartesian
(* 1st to 3rd Axes for 3-axis SCARA Type)



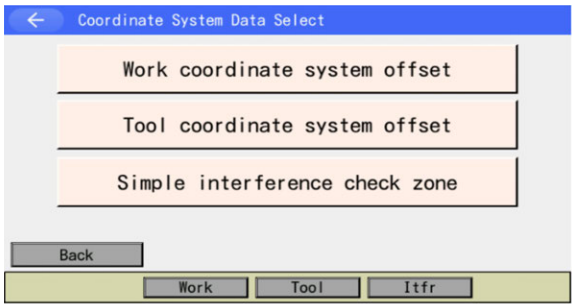
Touch Edit button.



Touch Coordinate System button.



Touch Modify button.

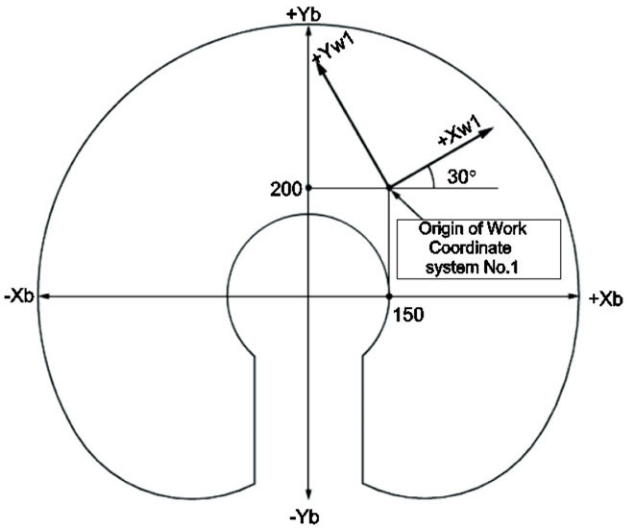


Select the coordinate system subject to editing in this screen.

11.1 Editing of Work Coordinate System Data

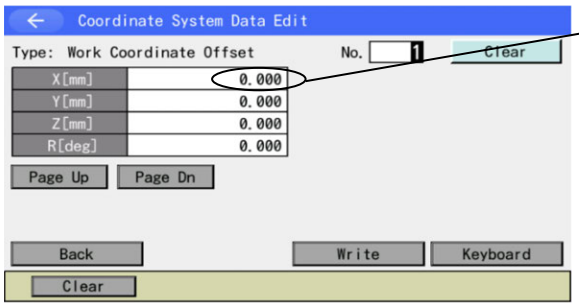
As an input example of the work coordinate system data, a coordinate system as shown below is set for the work coordinate system No. 1.

(Motion range at the arm length 500-type stroke)



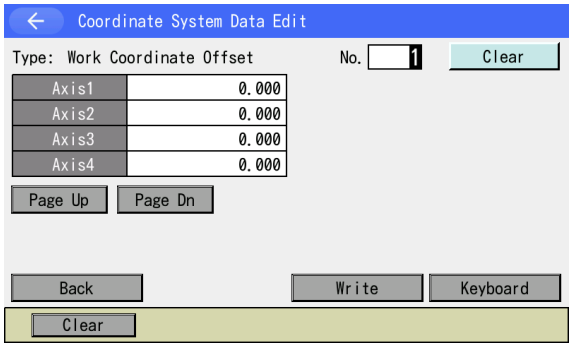
The offset values from the work coordinate system No. 1 are Xofw1 = 150, Yofw1 = 200, Zofw1 = 0 and Rofw1 = 30.

Touch Work coordinate system offset button in the all Coordinate System Data Edit screen.

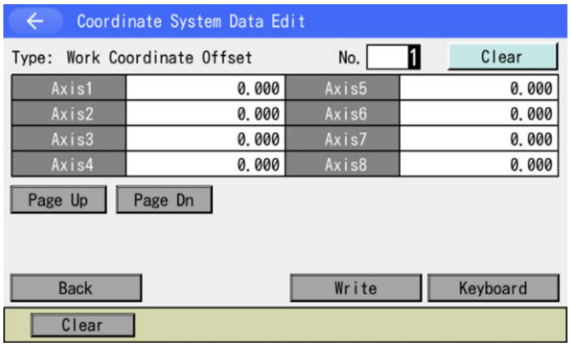


X-axis Offset Input Box

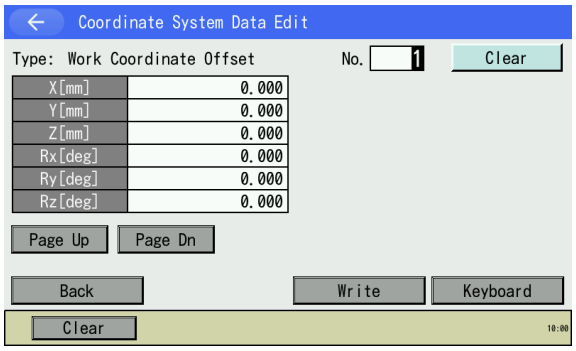
The cursor is placed at the number. To select the work coordinate system number, touch Keyboard button to show the touch panel keyboard to input, input on the hardware numeric keys, or use Page Up and Page Dn buttons.
Touch in an X-axis offset input box.



For XSEL-RX/SX, RAX/SAX, XSEL2-TX

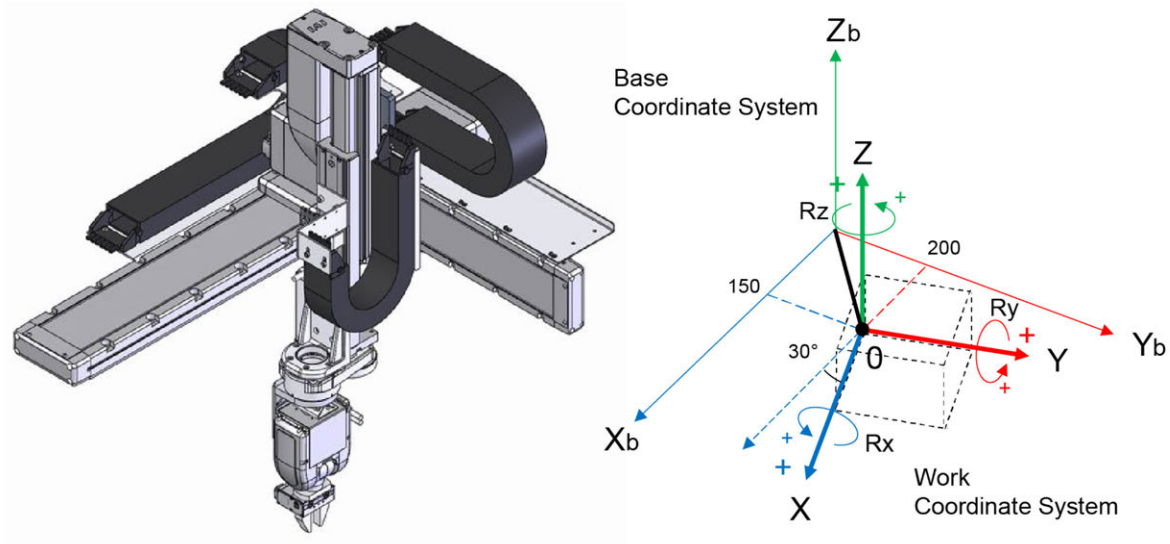


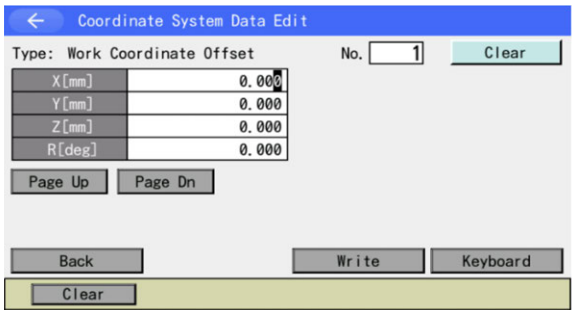
For XSEL-RXD/SXD, RAXD/SAXD



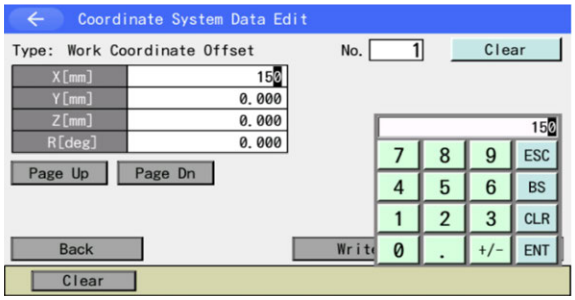
For 6-axis Cartesian

Work Coordinate System in 6-Axis Cartesian Robot
When offset at Xofw1 = 150, Yofw1 = 200, Zofw1 = 0, Rxofw1 = 0, Ryofw1 = 0 and Rzofw1 = 30.

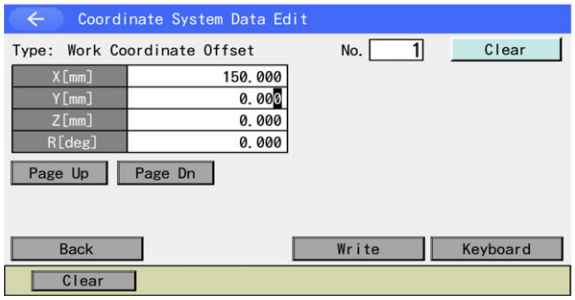




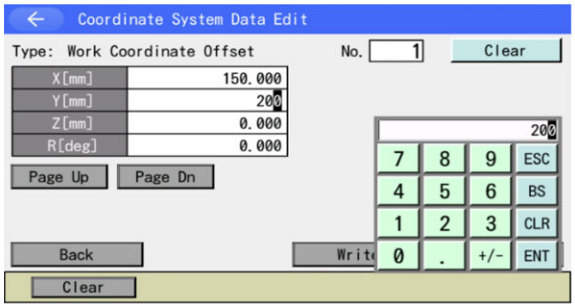
With the cursor placed at the X-axis offset data, touch the Keyboard button to show the touch panel keyboard.



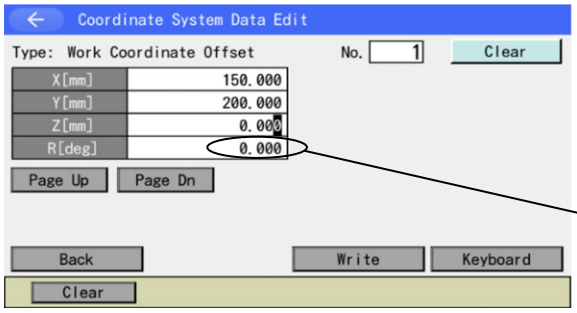
Input 150 and touch ENT.



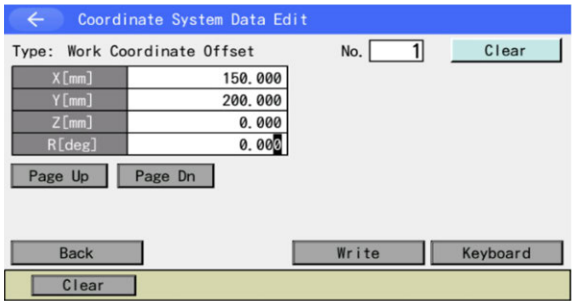
The cursor is placed on the Y-axis offset data. Touch Keyboard button to show the touch panel keyboard.



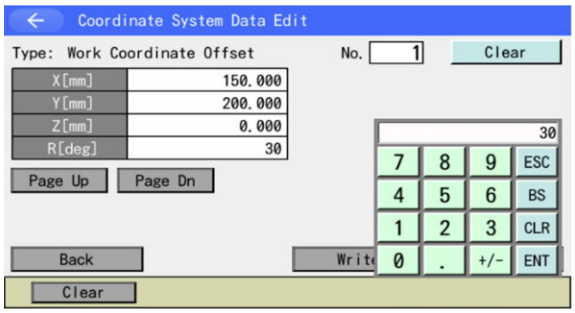
Input 200 and touch ENT.



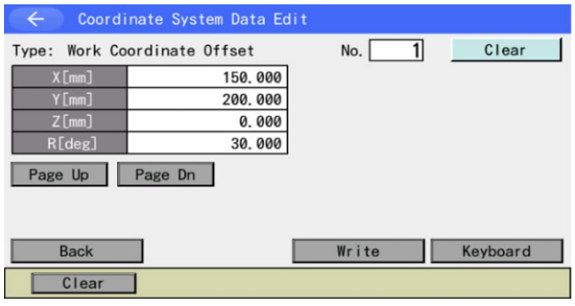
The cursor is placed on the Z-axis offset data. As the offset of Z-axis remains at 0, touch in the R-axis offset input box.



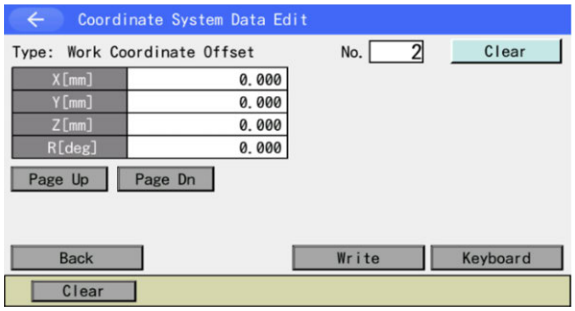
The cursor is placed on the R-axis offset data. Touch Keyboard button to show the touch panel keyboard.



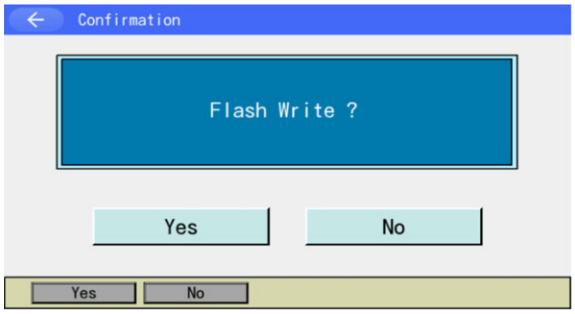
Input 30 and touch ENT.



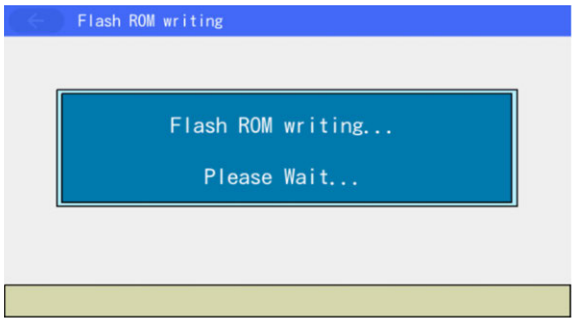
Touch Write button to transfer the data to the controller. The position moves to Work Coordinate Offset No. 2.



Touch Back button or Cancel button to go to Flash ROM writing screen.

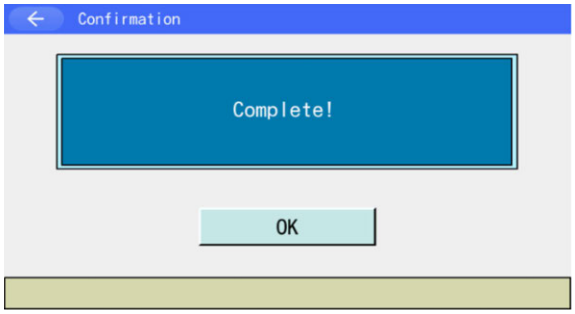


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



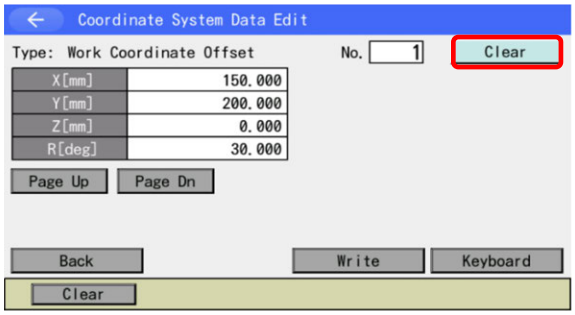
While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



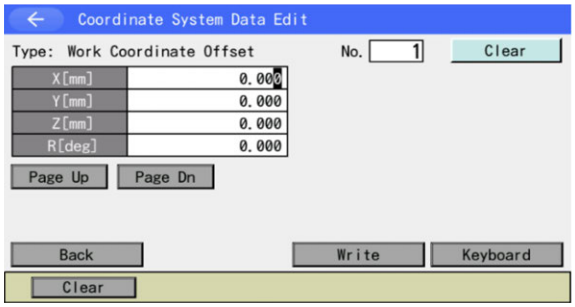
Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

Regarding Clear button in Work Coordinate System Data Edit screen



No matter where the cursor is placed, all the values in X, Y, Z and R-axes offset are set to 0. (All of X, Y, Z, Rx, Ry and Rz for the 6-axis cartesian)

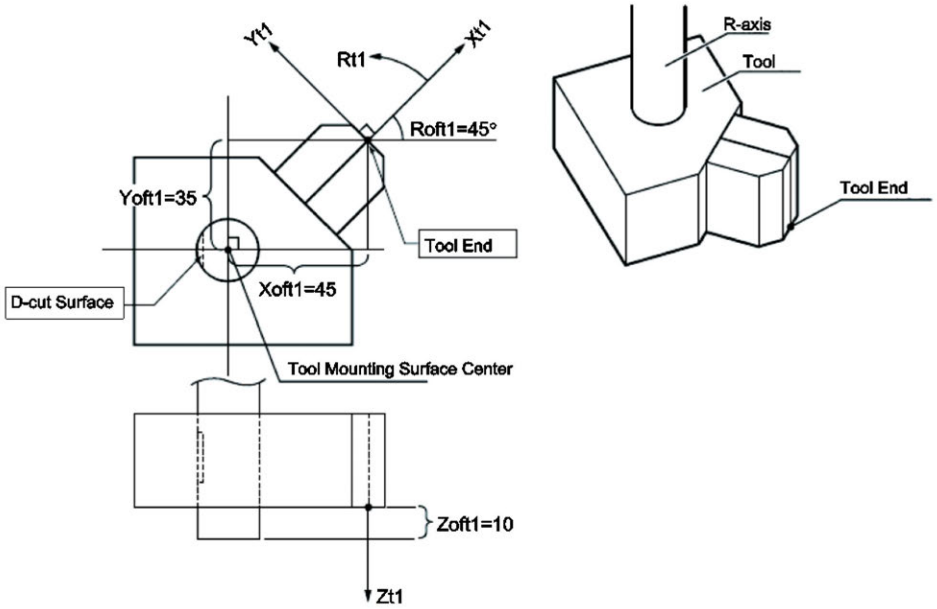
To transfer the data to the controller, touch Write button.



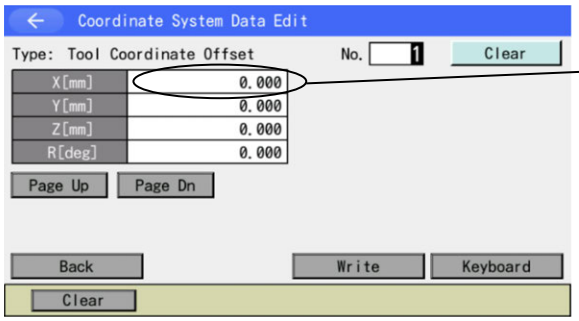
Example of Screen after Touching Clear Button

11.2 Editing of Tool Coordinate System Data

As an input example of the tool coordinate system data, a tool as shown below is set for the tool coordinate system No. 1.

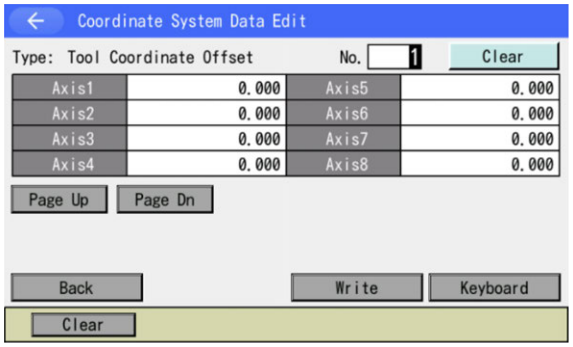


The offset values from the tool coordinate system No. 1 become Xoft1 = 45, Yoft1 = 35, Zoft1 = -10 and Roft1 = 45.
(For 3-axis SCARA type, Roft will not be taken into account)

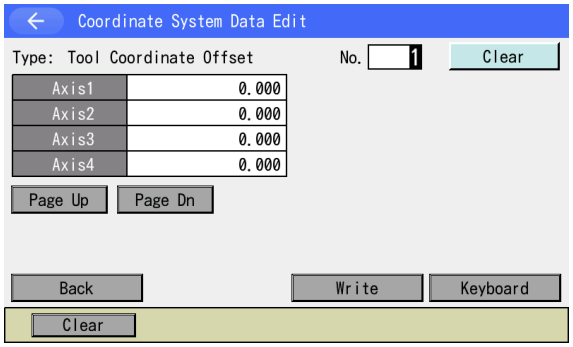


X-axis Offset Input Box

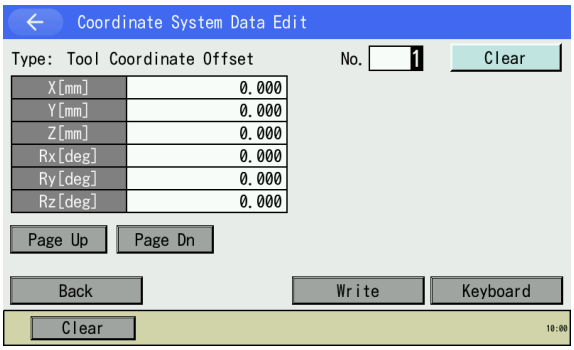
The cursor is placed at the number. To select the tool coordinate system number, touch Keyboard button to show the touch panel keyboard to input, input on the hardware numeric keys, or use Page Up and Page Dn buttons.
Touch in an X-axis offset input box.



For XSEL-RX/SX, RAX/SAX, XSEL2-TX

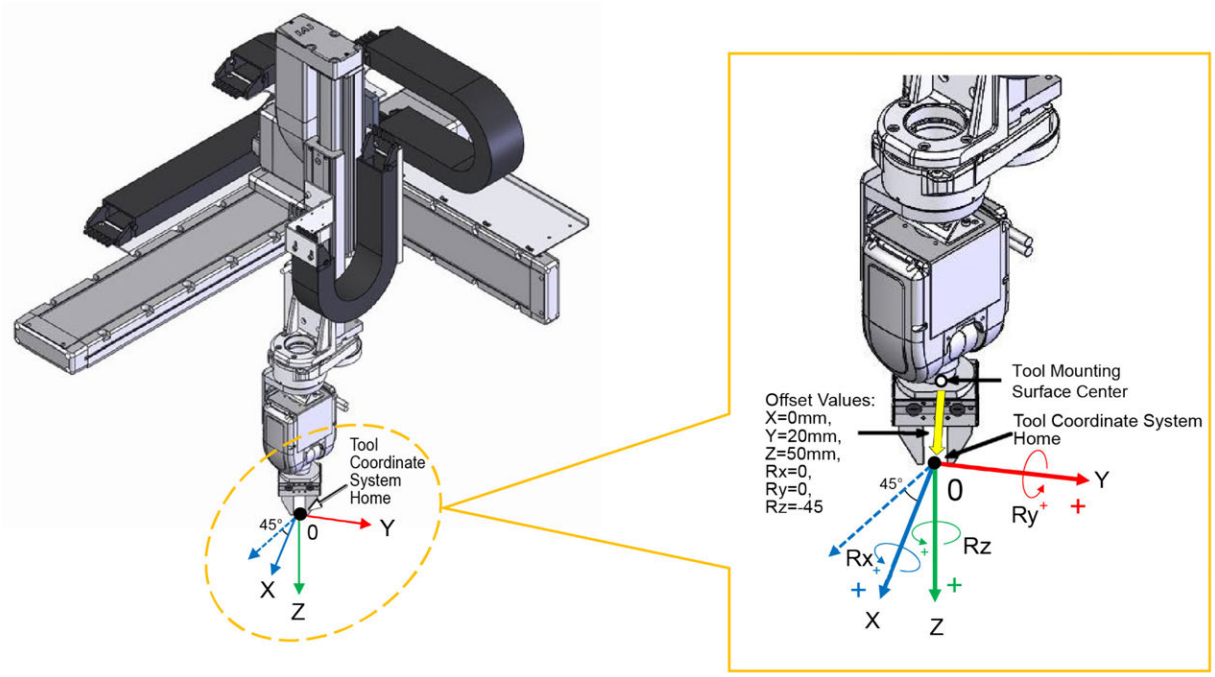


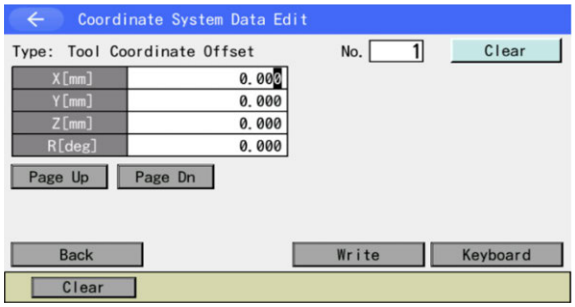
For XSEL-RXD/SXD, RAXD/SAXD



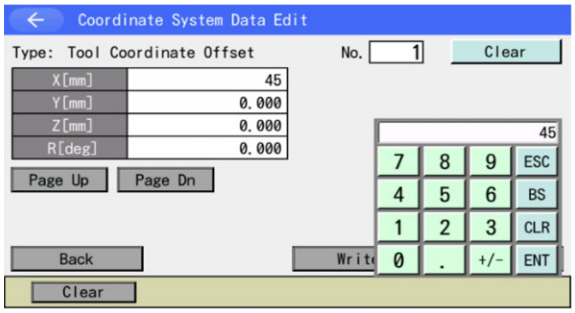
For 6-axis Cartesian

Tool Coordinate System in 6-Axis Cartesian Robot
When offset at Xoft1 = 0, oft1 = 20, Zoft1 = 50, Rxoft1 = 0, Ryoft1 = 0 and Rzoft1 = -45.

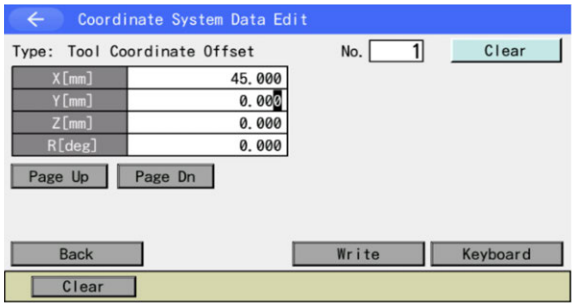




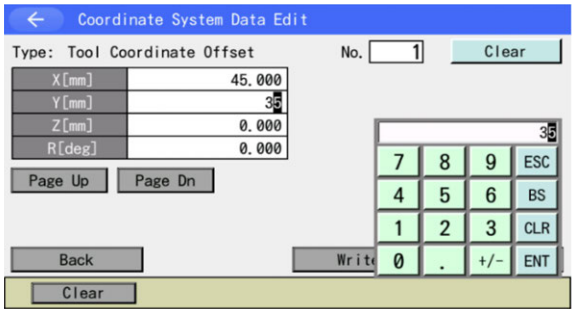
With the cursor being on the X-axis offset data, touch Keyboard button to show the touch panel keyboard.



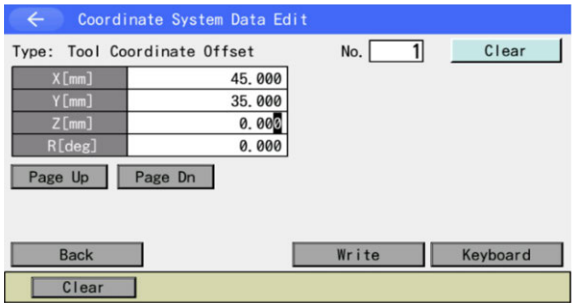
Input 45 and touch ENT.



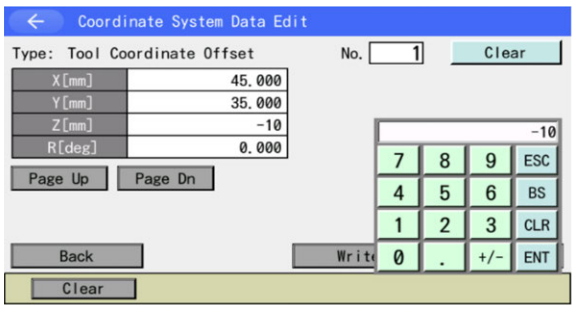
The cursor is placed on the Y-axis offset data. Touch Keyboard button to show the touch panel keyboard.



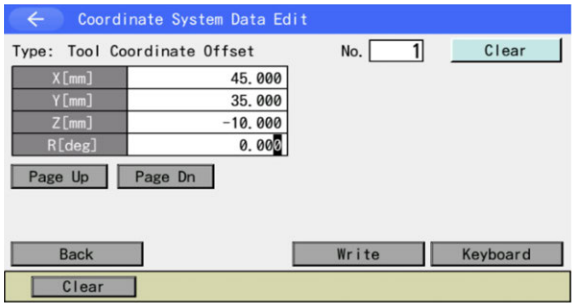
Input 35 and touch ENT.



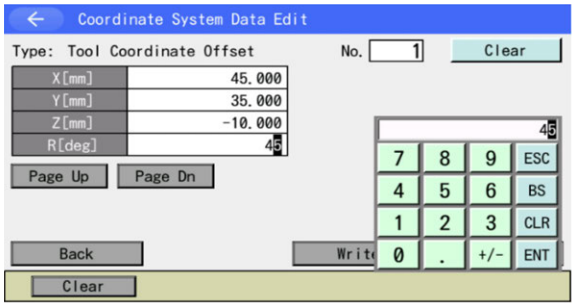
The cursor is placed on the Z-axis offset data. Touch Keyboard button to show the touch panel keyboard.



Input -10 and touch ENT.

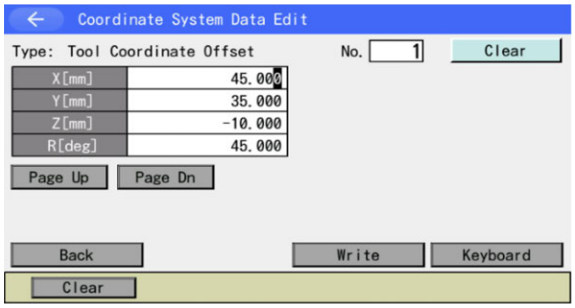


The cursor is placed on the R-axis offset data. Touch Keyboard button to show the touch panel keyboard.

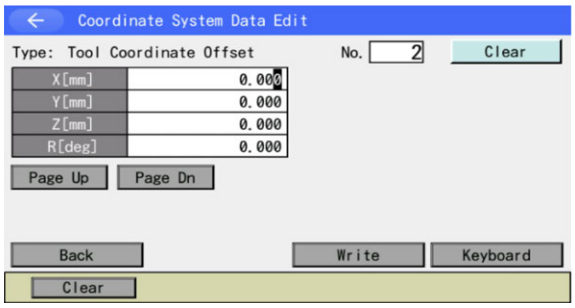


Input 45 and touch ENT.

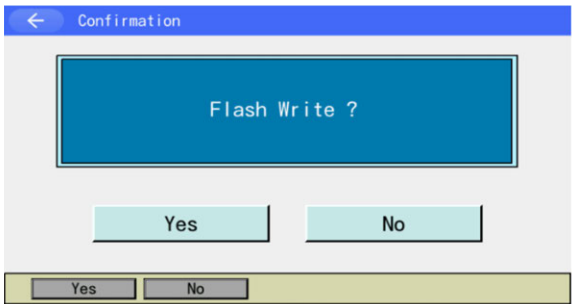
* In 3-axis SCARA type, the offset of R-axis is not taken into account on the controller side.



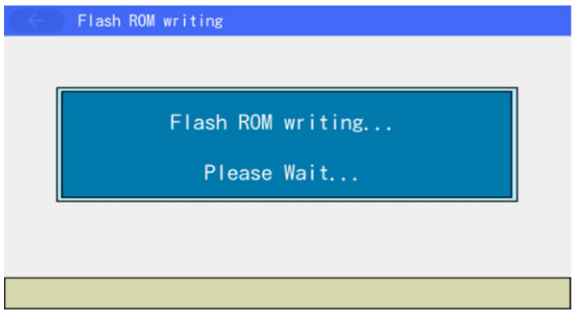
Touch Write button to transfer the data to the controller. The position moves to Tool Coordinate Offset No. 2.



Touch Back button or Cancel button to go to the Flash ROM writing screen.



To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



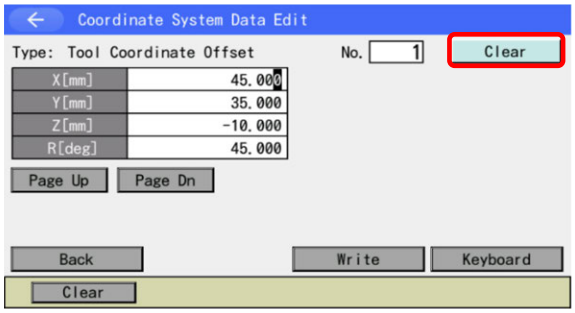
While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



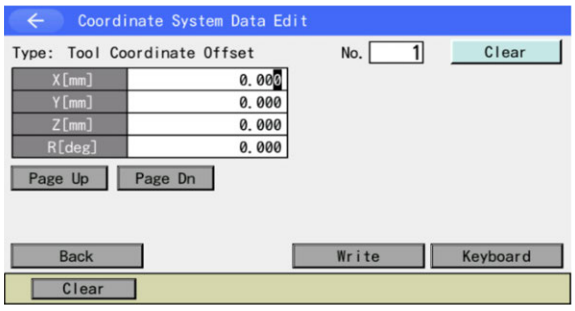
Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

Regarding Clear button in Tool Coordinate System Data Edit screen



No matter where the cursor is placed, all the values in X, Y, Z and R-axes offset are set to 0. (All of X, Y, Z, Rx, Ry and Rz for the 6-axis cartesian)

To transfer the data to the controller, touch Write button.



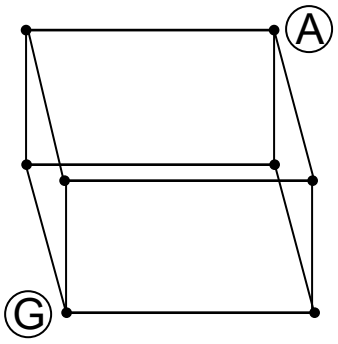
Example of Screen after Touching Clear Button

11.3 Editing of Simple Interference Check Zone

It is required to input the following 3 items to set the simple interference check zone:

- 2-point position data to define the zone. (Input the values of the base coordinate system.)
- Output port No. or global flag No. for output during zone invasion.
- Error type at zone invasion time. (0: No error-handling,
  1: Message level error,
  2: Motion reset level error.)

As an input example of the simple interference check zone, a zone as shown below is set for the simple interference check zone No. 1.



Base coordinate values of Ⓐ: Xb = 475, Yb = -50, Zb = 150, Rb = 0

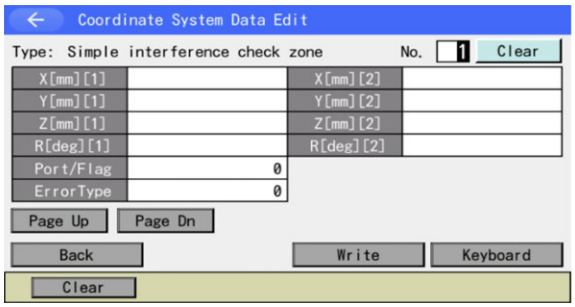
Base coordinate values of Ⓖ: Xb = 400, Yb = 50, Zb = 200, Rb = 180

Output port for output during zone invasion: No. 311

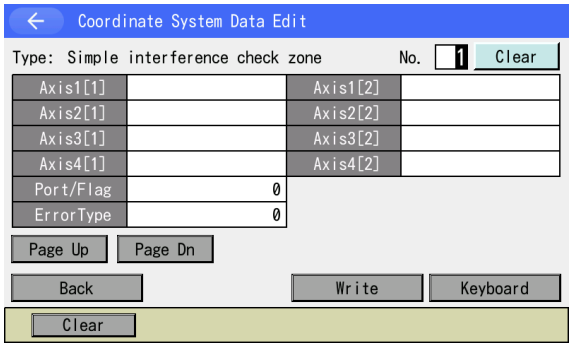
Error type at zone invasion time: 1.

* In 3-axis SCARA type, the setting of Rb does not have a meaning. (It gets out of account on controller side.)

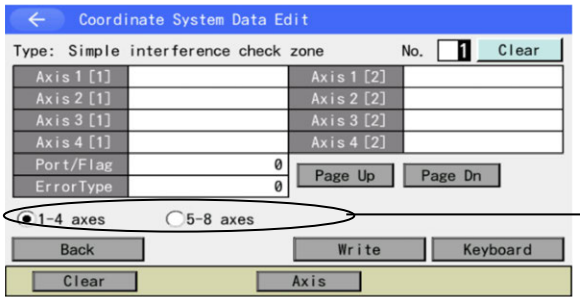
* The domain definition should be done only in X, Y and Z for the 6-axis cartesian.



This is the simple interference check zone No. selection screen.
The cursor is located at the simple interference check zone No.
To select the simple interference check zone number, input a number on the touch panel numeric keys or by using Page Up and Page Dn buttons in this screen.
This example indicates the setting of the simple interference check zone No. 1. Touch on the coordinate input position that you want to input.



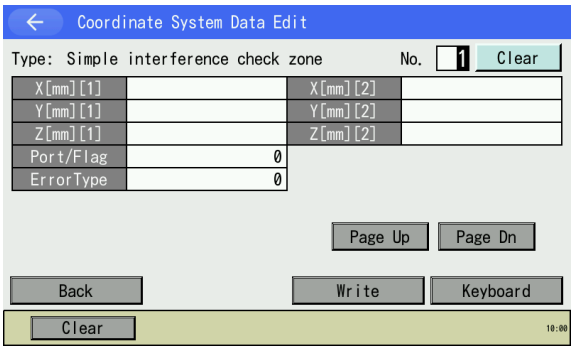
For XSEL-RX/SX, RAX/SAX, XSEL2-TX



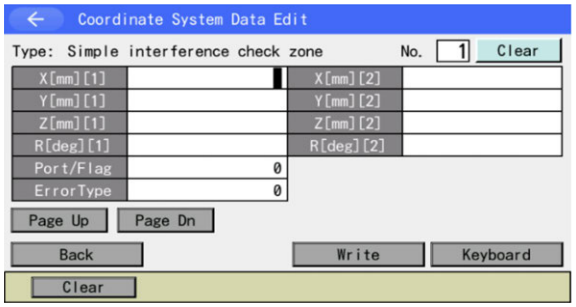
To switch the axis in XSEL-RXD/SXD and RAXD/SAXD, touch a radio button.

Axis Switchover

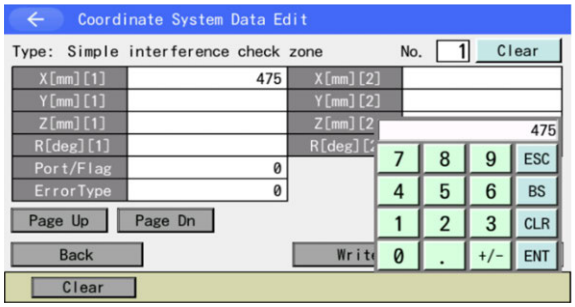
For XSEL-RXD/SXD, RAXD/SAXD



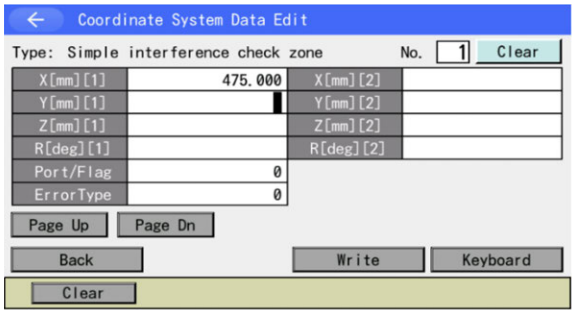
For 6-axis Cartesian



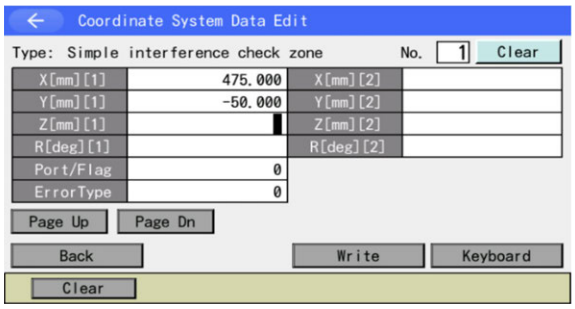
Input of base coordinate values of A.
The cursor is located at the X-axis data.
Touch Keyboard button to show the touch panel keyboard.



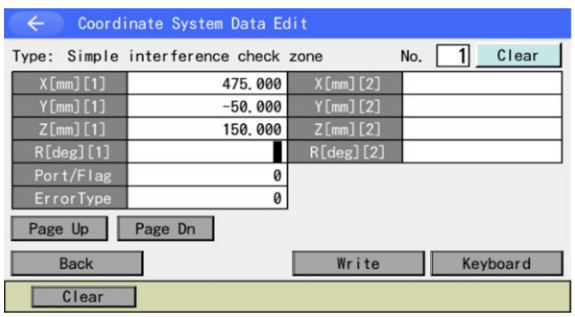
Input 475 and touch ENT.



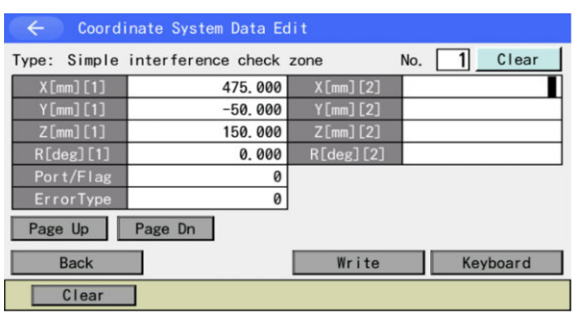
The cursor is located at the Y-axis data.
Touch Keyboard button to show the touch panel keyboard to input -50 and touch ENT.



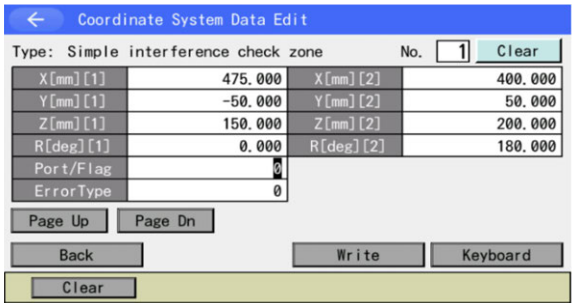
The cursor is located at the Z-axis data.
Touch Keyboard button to show the touch panel keyboard to input 150 and touch ENT.



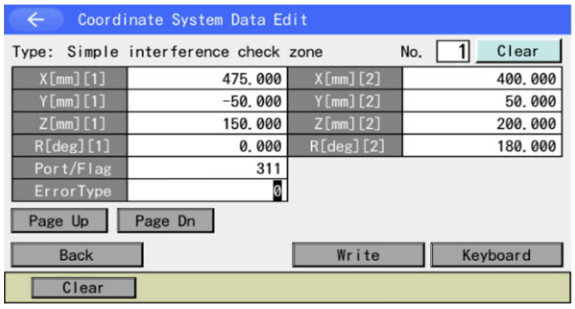
The cursor is located at the R-axis data.
Touch Keyboard button to show the touch panel keyboard to input 0 and touch ENT.



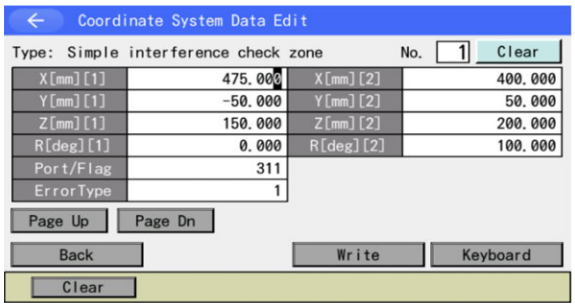
The cursor moves to the other X-axis data.
Enter the base coordinate values of G in the same way as A.



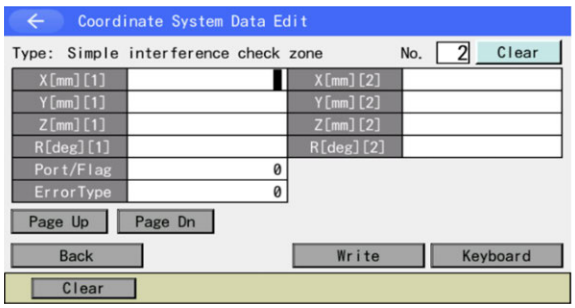
Once the input of coordinate data is finished (the input for R-axis is confirmed), the cursor moves to the input port/flag input box.



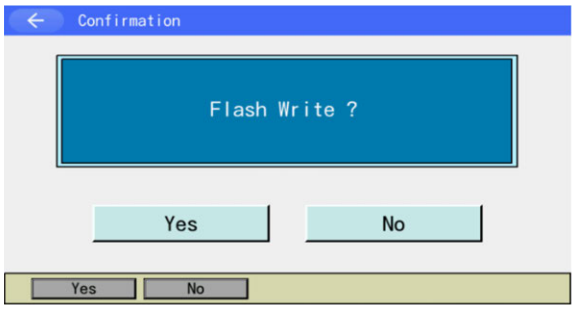
Touch Keyboard button to show the touch panel keyboard to input 311 and touch ENT.
The cursor moves to the Error Type input area.



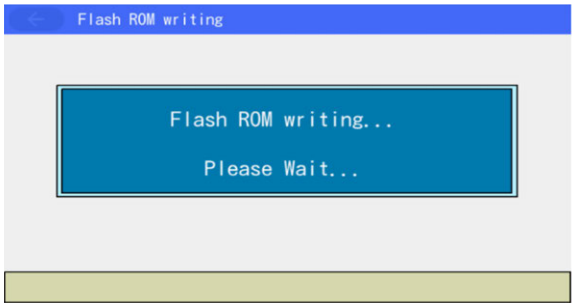
Touch Keyboard button to show the touch panel keyboard to input 1 and touch ENT.
Touch Write button to transfer the data.



The screen advances to the edit screen for the simple interference check zone No. 2.
When the axial pattern of A does not agree with that of G, the “9F0” error (“312” Error in RSEL and XSEL2-TX) occurs.
When the axial pattern of A and G is 0, if the output port/flag or error type is specified, the “9F1” error (“312” Error in RSEL and XSEL2-TX) occurs.
Touch Back button to go to Flash ROM writing screen.



To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



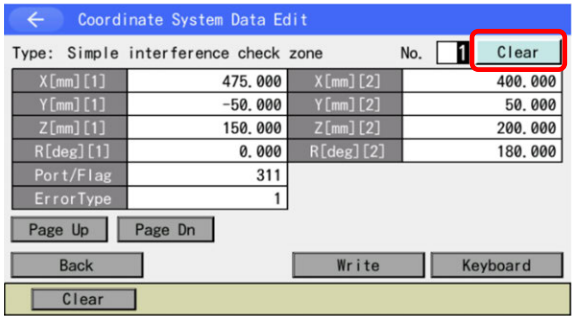
While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



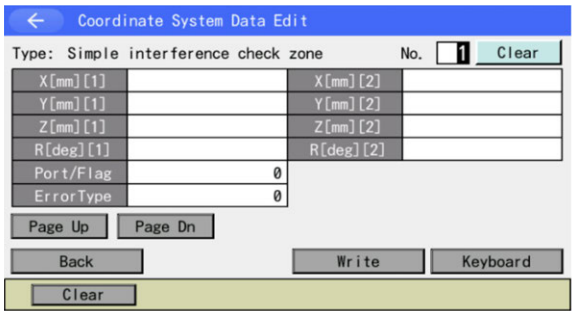
Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

Regarding Clear button in Simple interference check zone Data Edit screen



No matter where the cursor is placed, all the coordinate values in X, Y, Z and R-axes are turned invalid and the output port/flag box and error type box are set to 0.
(Set the coordinate values in X, Y and Z-axes invalid and the columns for output port / flag and error type to 0 for the 6-axis Cartesian.)

To transfer the data to the controller, touch Write button.



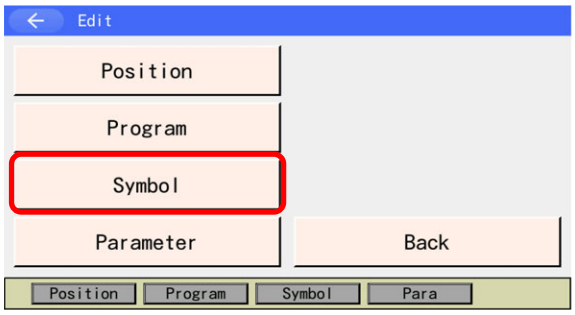
Screen after Touching Clear Button

12. Symbol Edit
(Excluding the positioner mode of the SSEL, ASEL and PSEL Controller.)

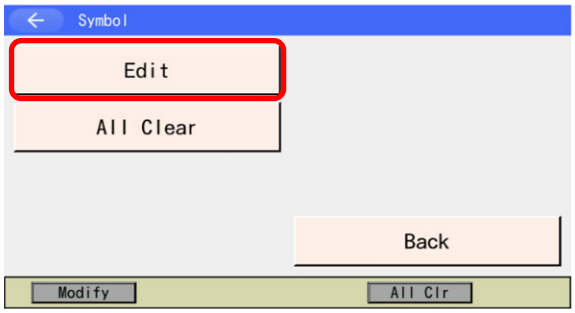
Symbol (Names) can be applied to variables, ports, flags, position, etc.



Touch Edit button in the menu screen.



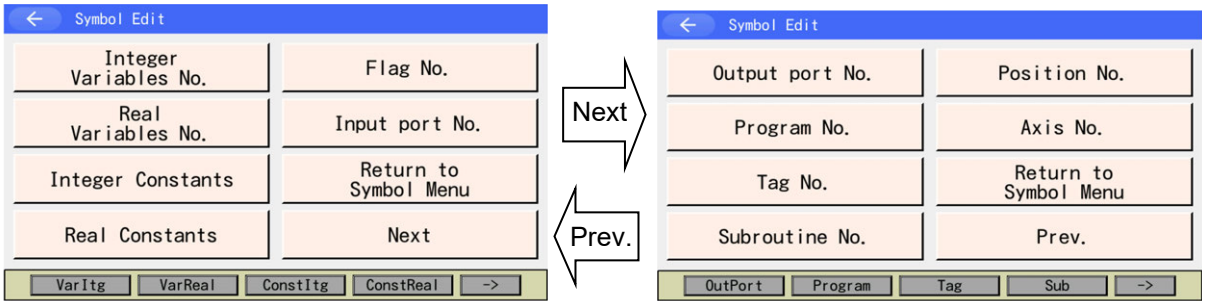
Touch Symbol button in the edit screen.



Touch Edit button.

* Touch the Change/New button when it is shown.

12.1 Symbol Edit Items



Symbol Select Menu (some models excluded)

(1) The items object to editing is as stated below;
* Editing is available on the input and output port numbers in the input and output port applicable models.

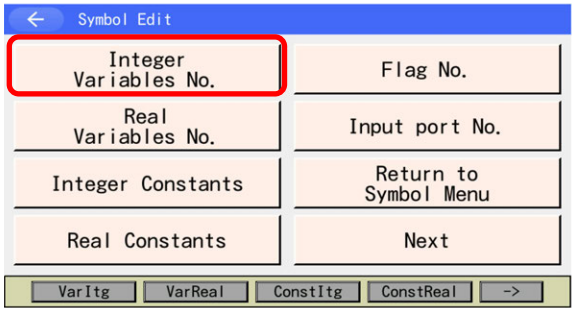
Integer Variables No., Real Variables No., Integer Constants, Real Constants
Flag No., Input port No.
Output port No., Program No., Tag No., Subroutine No.
Program No., Axis No.

(2) Articles for Symbol Descriptions
1) The top letter[*1] needs to be an alphabet or underscore.
2) The second letter and after[*1] should be ASCII Code 0x21 to 0x7e.
3) The maximum number of letters[*2] should be 9 single-byte characters. (String literal should be 8 single-byte characters letters at maximum.)
4) It is not accepted to have the same symbol definition name in the same function. (It is allowed to be in different locals in a program.)
5) It is not accepted to have the same symbol definition name in the flag number/input port number/output port number/input output port number group. (It is allowed to be in different locals in a program.)
6) It is not accepted to have the same symbol definition name in the integer variable number/real variable number group. (It is allowed to be in different locals in a program.)
7) It is not accepted to have the same symbol definition name in the integral constant/real constant group.

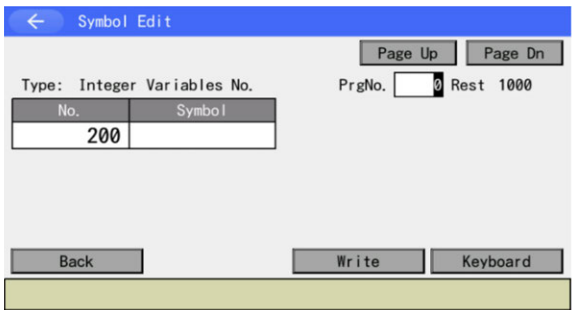
*1 In RSEL and XSEL2-T/TX, it is available to use the characters in ASCII code 80h and later (half-width katakana and two-byte characters). However, this touch panel teaching pendant is available only for display (not for input).
*2 RSEL and XSEL2-T/TX are available for use of up to 40 single-byte characters (39 single-byte characters max. for string literal).

12.2 Input Example: Symbolize Local Integer Variable No.

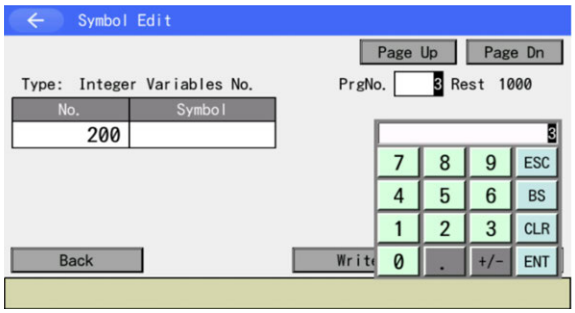
Assuming Variable No. 5 in Program No. 3 is symbolized as 'Cnt5'.



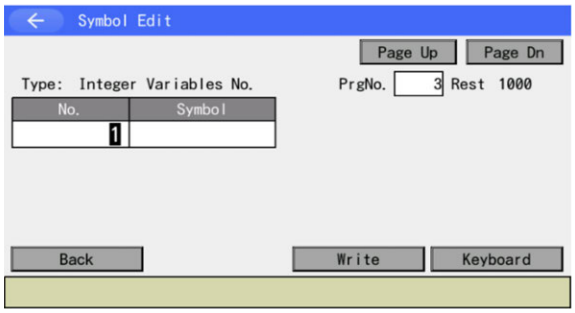
Touch Integer Variables No. button.



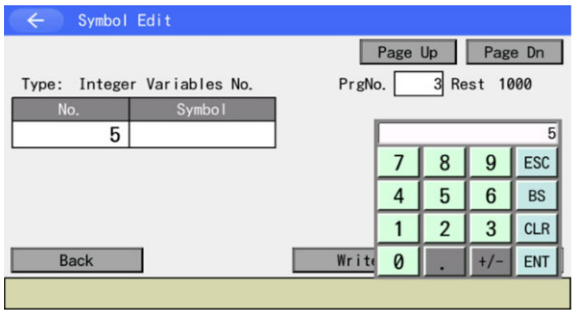
The cursor is located at program No. box
Input the local area program No.
(To symbolize global area, leave 0.)
Touch Keyboard button to show the touch panel numeric keys.



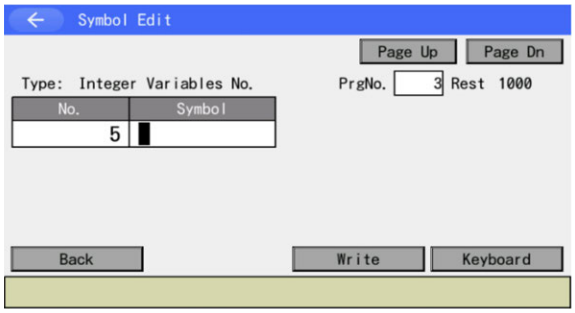
Input 3 and touch ENT.



The cursor moves to the number box.
Touch Keyboard button to show the touch panel numeric keys.

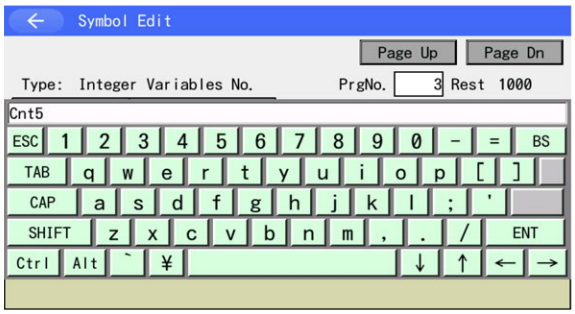


Input 5 and touch ENT.

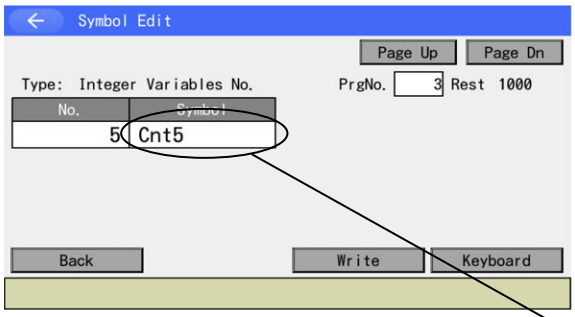


The cursor moves to the Symbol box.

Touch Keyboard button to show the touch panel numeric keys.



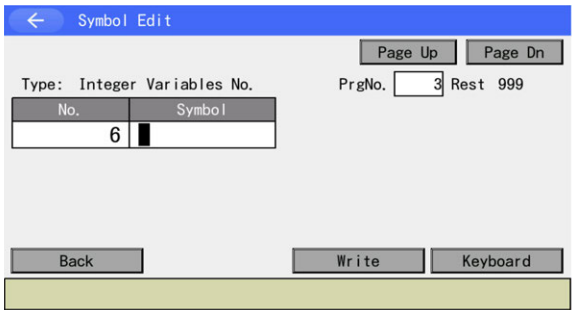
To input 'C', touch SHIFT and then touch C. The keyboard automatically returns to small letter input. Continue to type in n t 5, and touch ENT.



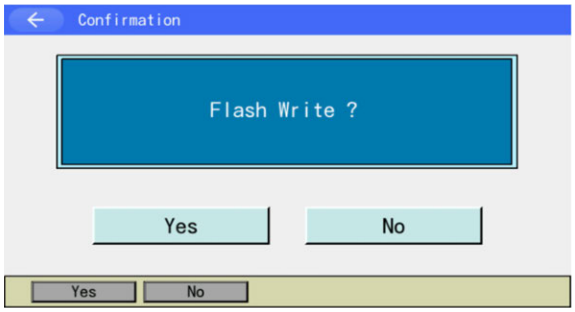
Once the input is confirmed, the cursor disappears. If you want to input again, touch in the symbol input box.
Touch Write button to transfer the symbol data to the controller.

When the screen is changed with the Page Up and Page Dn buttons, Back button before data transfer, the input data becomes invalid.

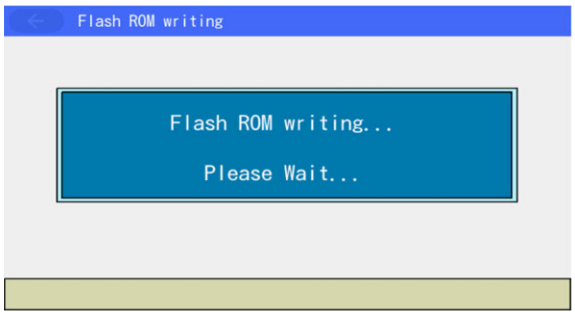
Symbol Input Box



Touch Back button or Cancel button to go to Flash ROM writing screen.



To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



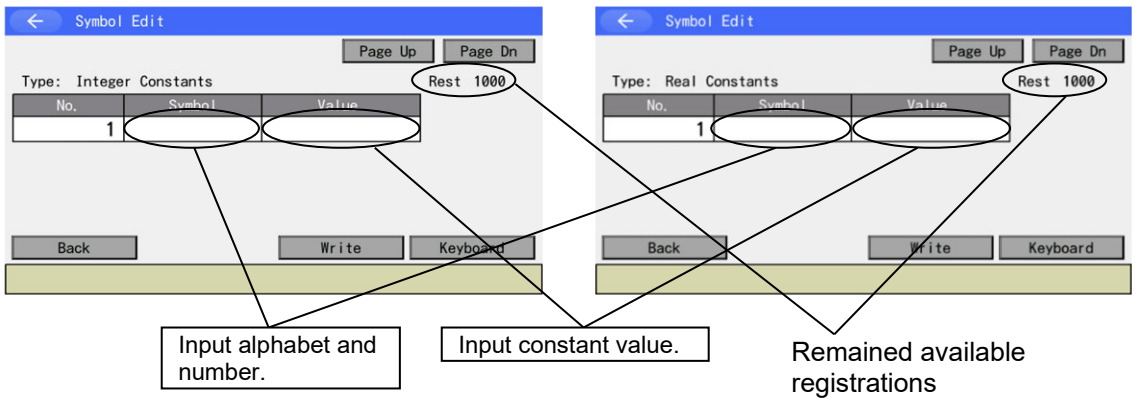
Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

(Note) There may be a case that C47 "Symbol Search Error" (44C for RSEL and XSEL2-T/TX) occurs when a SEL program is executed after a symbol in use in the SEL program is deleted or changed. In such a case, save all the programs in the file backup to a Secure Digital memory card and then transfer the saved files to the controller by file restoring.
* In case the error cannot be solved, it may be necessary to reorganize the SEL program.

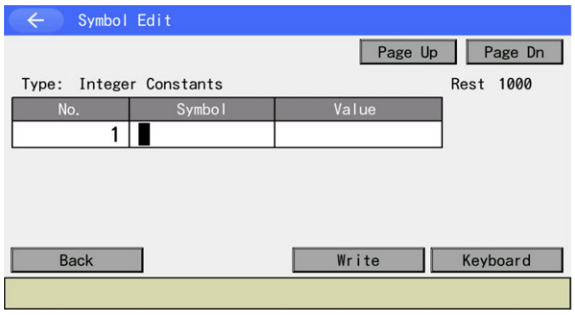
12.3 Symbol Edit Screen of Each Items

(1) Constant Number

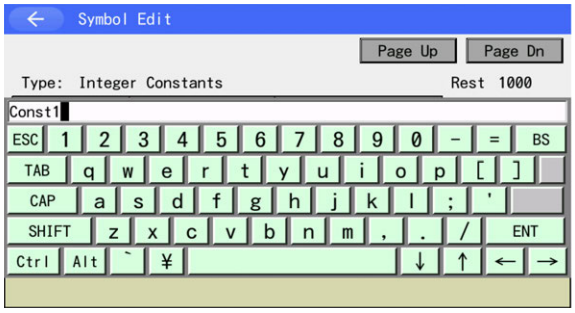
Integer Type Constant Number Symbol Edit Screen　Real Type Constant Number Symbol Edit Screen



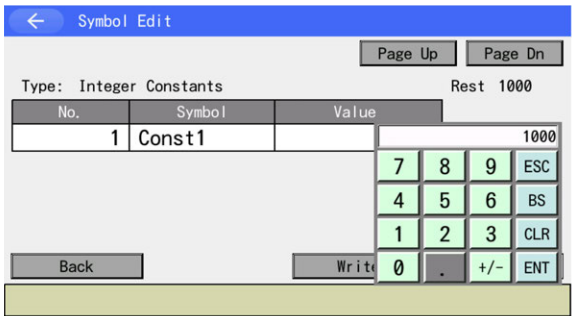
Example for input of integer constants:
Define 1000 to the symbol name ‘Const1’ using the touch panel keyboard.



Touch in the symbol input box to move the cursor there.
Touch Keyboard button to show the touch panel keyboard.



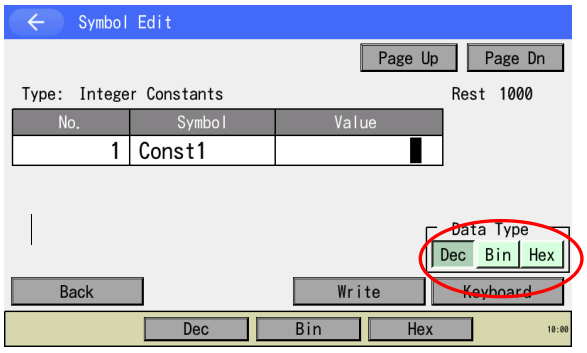
Input Const1 and touch ENT.
Input SHIFT C o n s t 1 .
The cursor moves to the Value input box.



Touch Keyboard button to show the touch panel numeric keys.
Input 1000 and touch ENT.

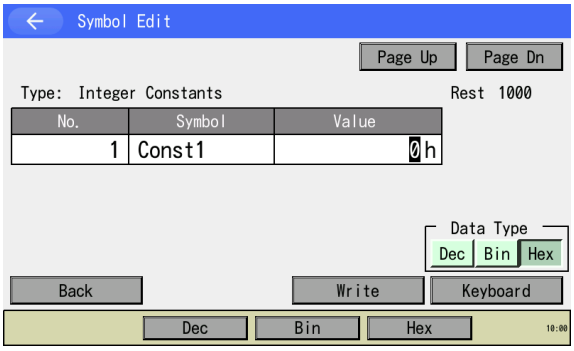
After input, touch the Write button to transfer the symbol data to the controller. After that, perform the Flash ROM writing referring to [12.2].

In the case of integer constant symbol binary/hexadecimal digit input applicable model, the integer constant symbol defined value can be input using the binary or hexadecimal system.



In the case of an applicable model, the data type selection button appears on the lower right of the screen with the cursor shown in the defined value box.

When the data type is to be changed, touch one of these buttons.



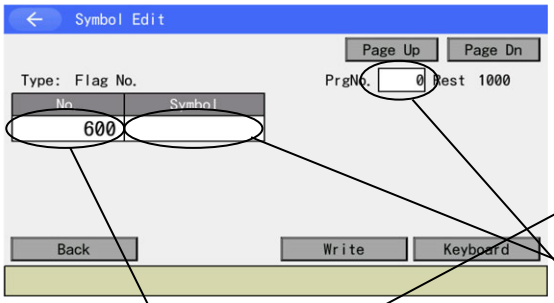
The display in the defined value box is changed based on the data type. (The left figure shows the case when the hexadecimal digit (Hex) has been selected). The fundamental number is shown after the defined value (for binary: b, for hexadecimal: h, for decimal: (blank)).

Touch the Keyboard button to input the defined value using the touch panel ten-key pad.

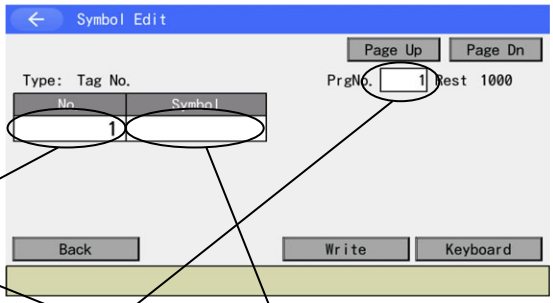
After the value input, touch the Write button to transfer the symbol data to the controller. After that, perform the Flash ROM writing referring to [12.2].

(2) Program Number Indicative Definition Data
Integer variable number, real variable number, flag number, tag number and subroutine number

Flag Number Symbol Edit Screen



Tag Number Symbol Edit Screen

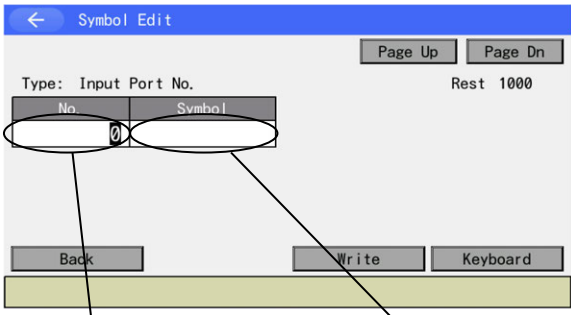


Number Input Box:
Input values with numeric keys, Page UP and Page Dn buttons.

Program Number Input Box:
As the integer variable numbers, real variable numbers and flag numbers can have data in the global domains, it is available to input 0.
As the tag numbers and subroutine numbers are for the local domains, it is available only to set the program numbers.
Input values with numeric keys, Page UP and Page Dn buttons.
* When you move the cursor to the program number box, the program number goes up/down if you use Page Up and Page Dn buttons.

Symbol Input Box:
Input values with touch panel keyboard.

(3) Program Number Non-indicative Definition Data
Input port No., Output port No., Input/Output port No. (for applicable models only), Program No., Position No. Axis No.



Number Input Box: Input values with numeric keys, Page UP and Page Dn buttons.

Symbol Input Box: Input values with touch panel keyboard.

13. Parameter Edit

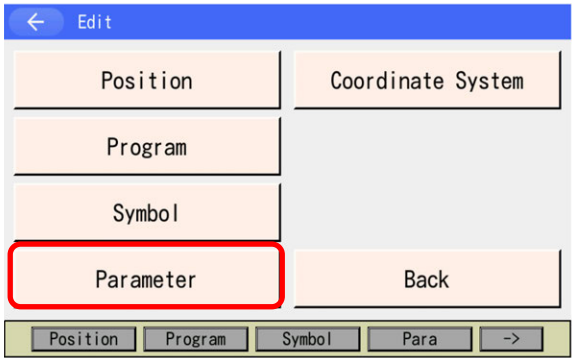
You can change the parameters corresponding to your system.
When you change the parameters by yourself, please note the parameter contents.

The parameter will be effective after flash ROM writing is finished and performing a software reset or power reboot.

⚠ *Caution: In the case of SSEL, ASEL or PSEL in the positioner mode, parameter transfer cannot be performed when the controller is executing.*
Stop the controller before changing or transferring parameters.
To stop, touch Positioner Mode → Stop in the main menu.

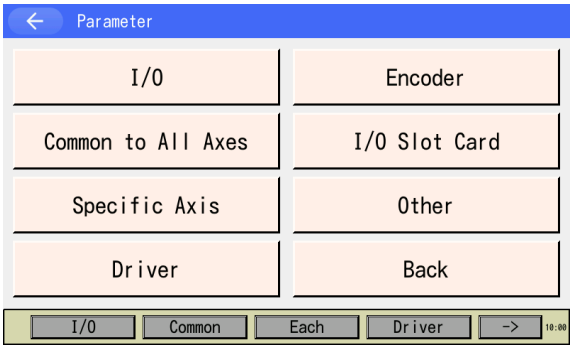


Touch Edit button in the Menu screen



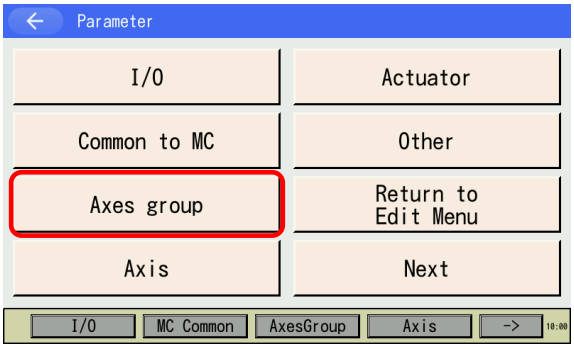
Touch Parameter button in the Edit screen

13.1 Parameter Edit Items



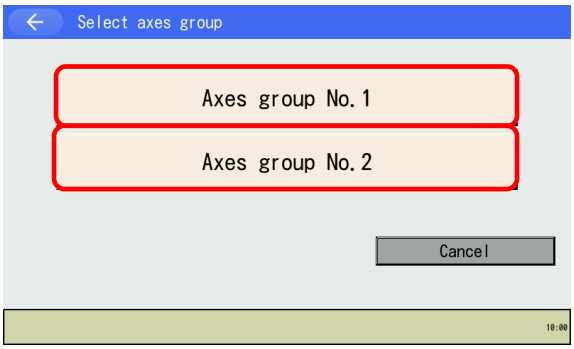
In some controllers, "I/O Slot Card" changes to names of "I/O System Device". Also, the contents to be displayed differ depending on the controllers.

The axis related parameters (axis groups, axes and actuators) of RSEL and axis group parameters of XSEL2-T/TX have setting values for each axis group. Touch an item button and then the select axes group window will appear.
Touch the Axes group No. button to select an axes group number subject to.
(Refer to [15.17.2 Axis Number Assignment Mode Switchover] for axes groups)

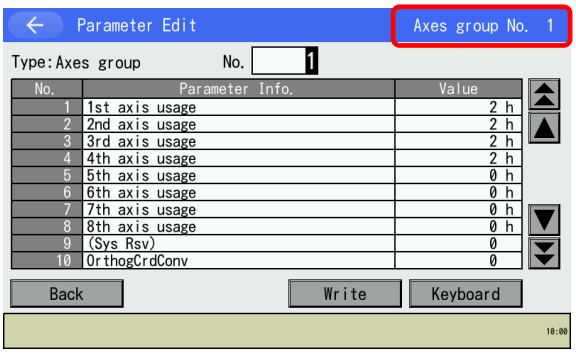


Touch the Axes group button when required to display or edit the axes group parameters.

* Example in the figure on the left shows that of RSEL

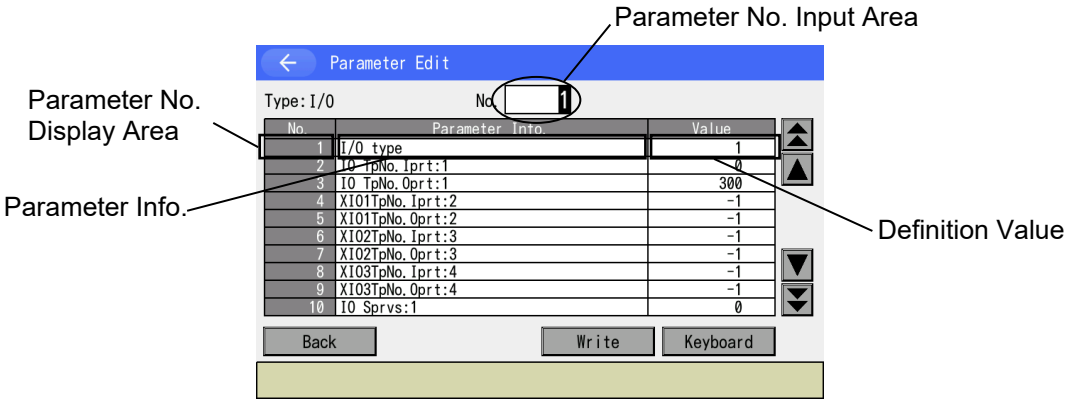


The select axes group window should appear after you touch the Axes Group button.
Touch an Axes group No. button.

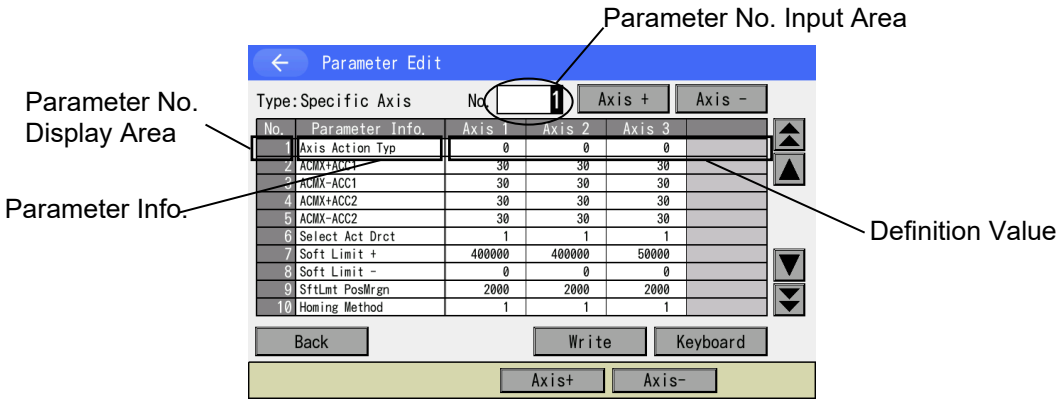


The parameter edit window should appear.

* The axes group number that was selected should be shown on the top right of the screen.



For Device Independent Parameters (figure shows example of I/O parameter)



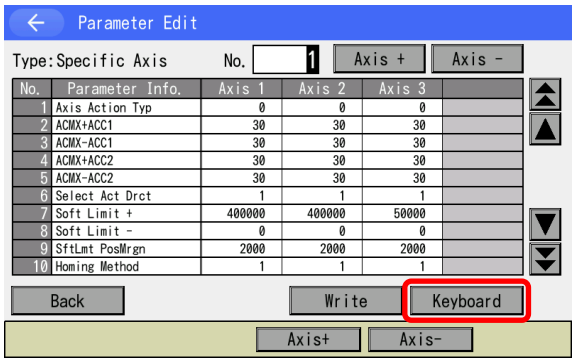
For Device Dependent Parameters (figure shows example of each axis parameter)

[Displayed Contents in Parameter Edit Window]

Parameter Number Input Column	: Input a parameter number. The displayed range differs depending on the input value.
Parameter Number Display Column	: Displays a parameter number.
Parameter Name	: Shows a parameter name.
Definition Value	: Displays a parameter value. For parameters available to change value, inputting of a value is also available.

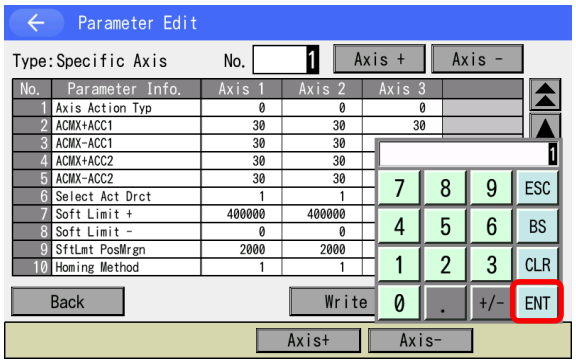
13.2 Input Example: Edit Specific-Axis Parameter

Establish the setting in specific-axis parameter No. 7 soft limit + to axis 1 = 300mm, axis 2 = 200mm.



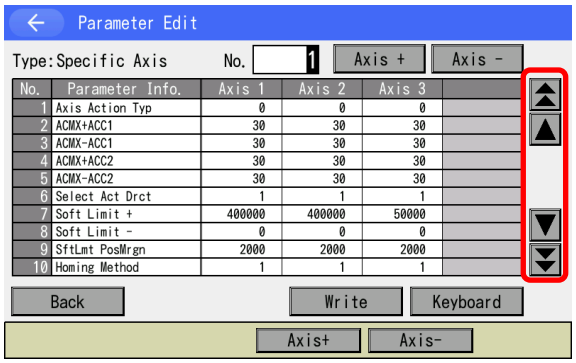
Have the cursor displayed in the parameter number input column. (If not, touch the parameter number input column so the cursor goes there.)

Touch Keyboard button to show the touch panel numeric keys.



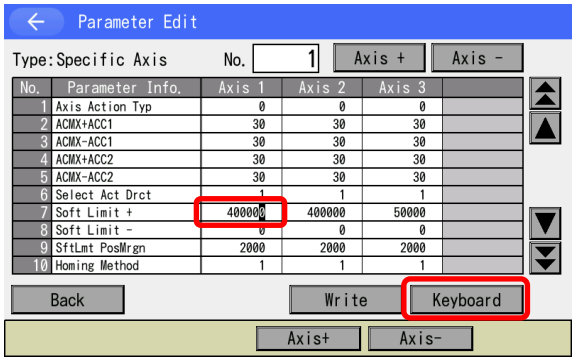
Switch the displayed range so the parameter number that you would like to edit can be displayed.

Input a value for the parameter number and touch the ENT.



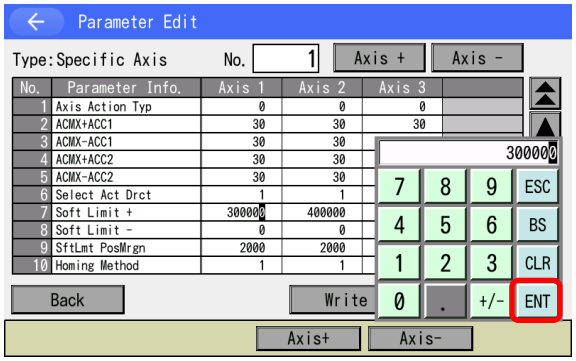
Switching displayed range can also be conducted with ▲▼ buttons.

Touch ▲▼ buttons so the parameter number that you would like to edit can be displayed.

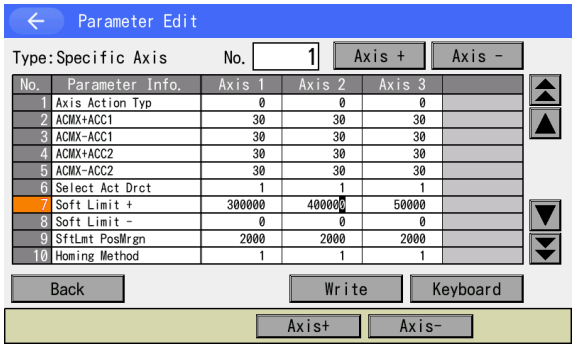


Touch the place you would like to edit (1st axis in No. 7) in order to move the cursor.

Touch the keyboard button after the cursor has been moved to show the touch panel numeric keys.

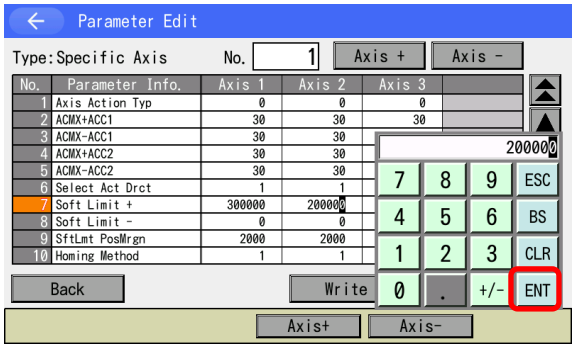


Input 300000 on the touch panel numeric keys and touch ENT. [Unit: 0.001mm]



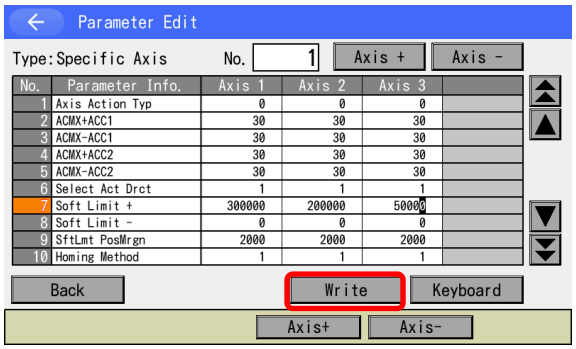
Once a number gets confirmed, the cursor moves to the input column for the 2nd axis. Also, to show that it is being edited (controller writing not yet done), the background color in the position number display box turns to orange.

If you would like to input again, touch the keyboard button after touching the input column to move the cursor there.



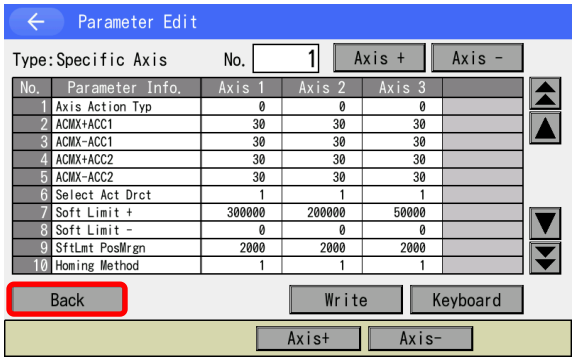
Perform in the same manner as the 1st axis for the 2nd axis.

After touching the keyboard button to show the touch panel numeric keys, input 200000 and touch the ENT.



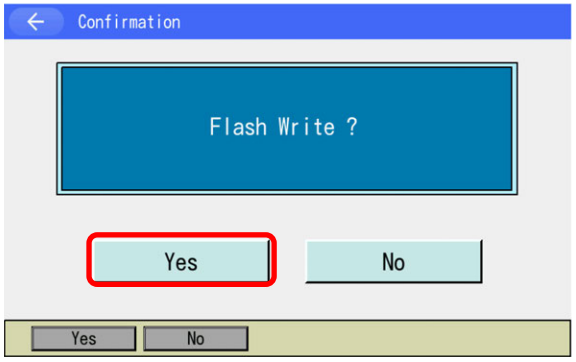
Touch Write button to transfer the parameter data to the controller.

> ⚠ *Caution: In the teaching pendant, only the data in the displayed range is to be retained in the memory. Therefore, writing (transfer to a controller) is necessary to be conducted one by one for each displayed screen.*
> *Without writing, the edited data will be ineffective at the time the screen is switched over.*

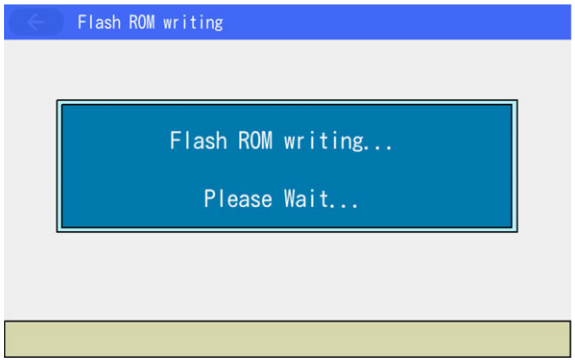


Once the transfer to the controller is complete, the background color in the parameter number display column will turn to the normal condition.

If you wish to continue editing each axis parameter, do it in the same manner. To finish editing each axis parameter, return to the flash ROM writing window by using the Back button.

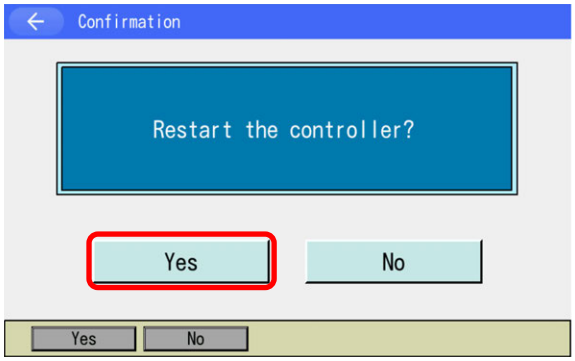


Conduct the flash ROM writing.
Touch the Yes button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the Software Reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset. Touch Yes button.



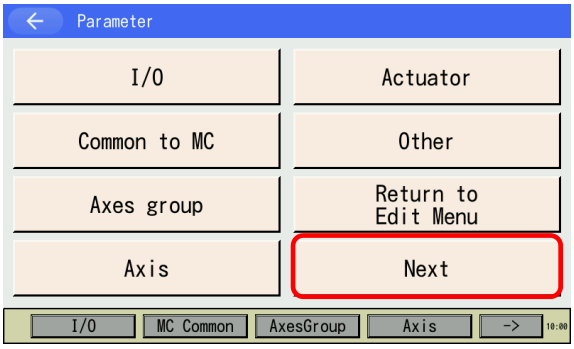
The screen shown on the left is displayed during the software reset.



Once the software reset is complete, the display returns to the main menu screen.

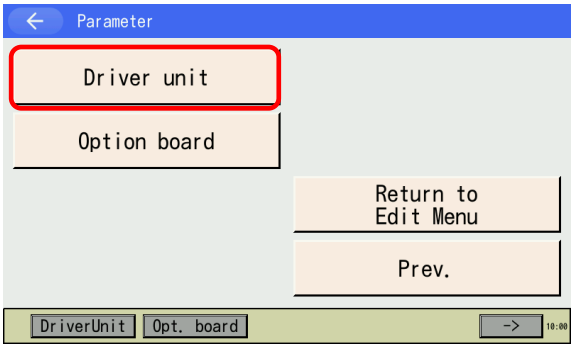
13.3 Example for Input) Edit Driver Unit Parameters

Edit Driver Unit Parameter No. 3 Soft Limit Positive Side.

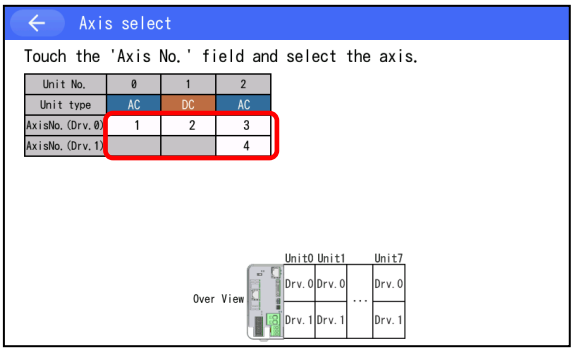


Touch the Next button.

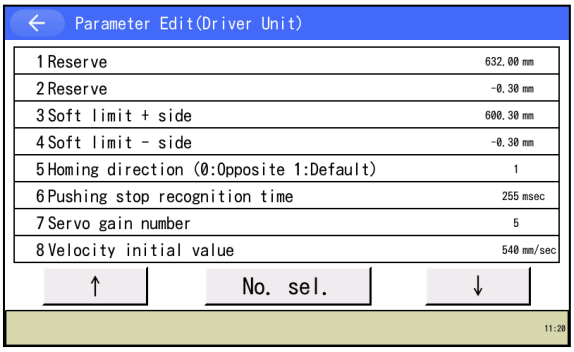
* Example in the figure on the left shows that of RSEL



Touch the Driver Unit button.



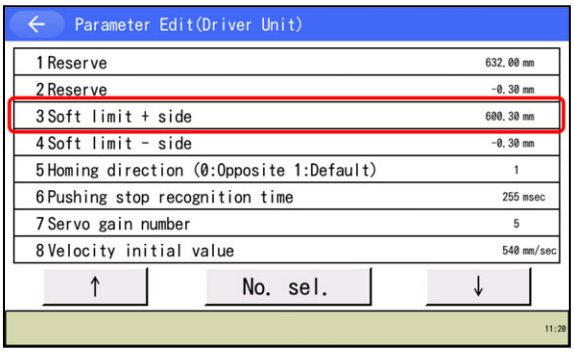
The select axis window should appear after you touch the Driver Unit button.
Touch an axis number that you would like to edit the parameters.



The parameter edit window should appear.

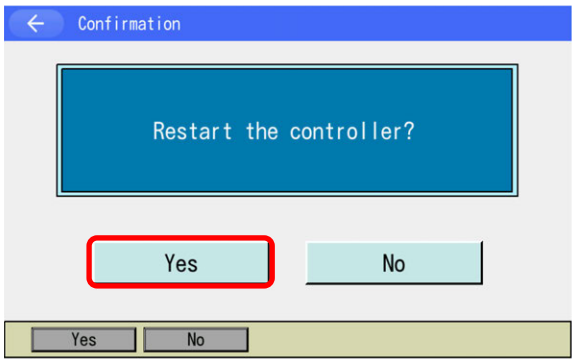
Touch the ⇑ or ⇓ button and the range of displayed parameter numbers should be switched over. Touch Indicate Number and input a parameter number, and the window of parameter to establish the setting can be displayed.

Set the soft limit positive side as an example.



Touch the soft limit positive side, and the numeric key touch panel should come out.
Input a number on the touch panel numeric keys and then touch the ENT button.

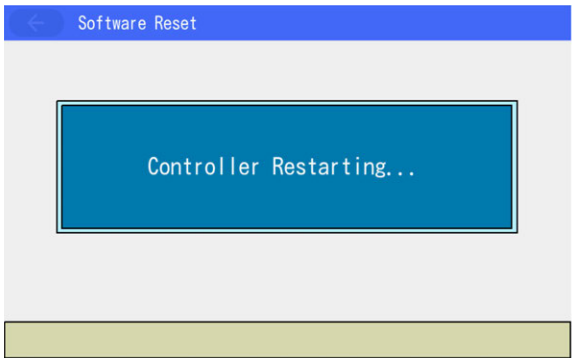
When required to cancel the change while the numeric key touch panel is out, touch the ESC button.



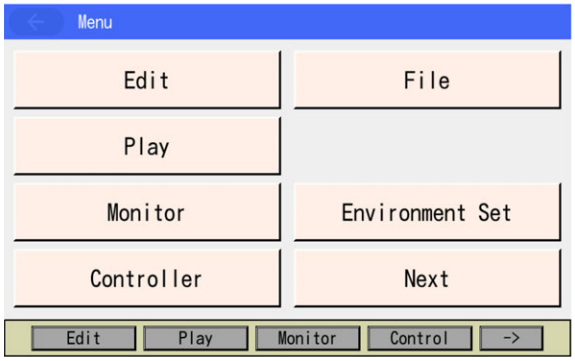
Use the ← button to move to the software reset window.
It is necessary to conduct the software reset in order to activate the change made to the parameters. Touch the Yes button.

If you touch the No button, the controller will not be rebooted and the screen will go back to the parameter edit window without any change reflected to the parameters. In order to reflect the parameters to the controller, have the controller rebooted.

> ⚠ *Caution: With no reboot of the controller, the parameters should be overwritten, but operation will not be performed with the revised parameters.*
> *The parameters should be valid after the controller reboot or the power being turned on.*



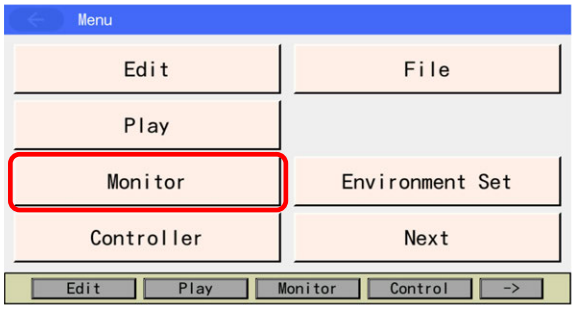
The screen shown on the left is displayed during the software reset.



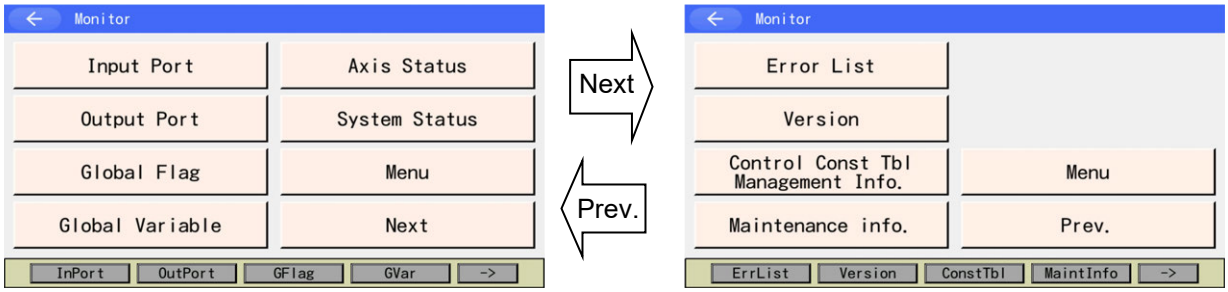
Once the software reset is complete, the display returns to the main menu screen.

14. Monitor

Monitor each status, global variable, port status, etc.

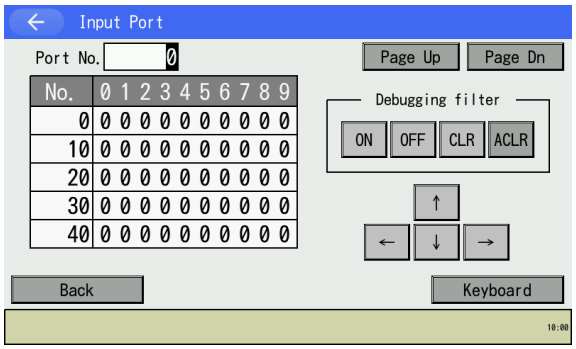


14.1 Monitor Items



Input Port	:	Displays the input port monitor screen
Output Port	:	Displays the output port monitor screen
Input/Output port	:	Displays the input/output port monitor screen (for applicable models only)
Global Flag	:	Displays the global flag monitor screen
Global Variable	:	Displays the select screen in the global variable monitor
Axis Status	:	Displays the screen in the axis status monitor
System Status	:	Displays the screen in the system status monitor
Error List	:	Displays the error list screen
Version	:	Displays the version display screen (Some models show this information in Main Menu 2 → Information → Version Information)
Control Const Tbl Management Info.	:	Displays the control constant table administration Information screen (for applicable models only)
Maintenance info.	:	Displays the maintenance information screen (for applicable models only)
Servo Additional Data	:	The servo additional data monitoring window should be displayed (only for applicable models and when the feature is activated).
Monitor Data	:	The monitoring values of the monitor contents set in the monitor data output and EC monitor data output setting should be displayed (for applicable models only). Refer to [15.19.1 Monitor Data Output Setting] and [15.19.4 EC Monitor Data Output Setting] for how to set it up.

14.2 Input Port



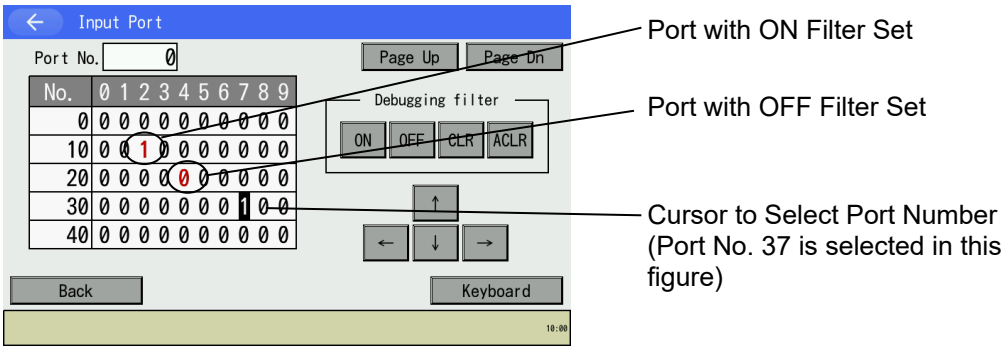
1: ON, 0: OFF
Input the port number that you want to show in the port number input box by using the touch panel numeric keys, and then touch ENT.
Every touch of Page Up and Page Dn buttons scrolls up/down the input port numbers by 50 items.

In the input port monitor screen, it is available to set up the input port debug filter.
The input port debug filter is a feature to make any physical input port being identified as being on or being off regardless of the actual input condition of the physical input port. (Valid in Manual Mode only)

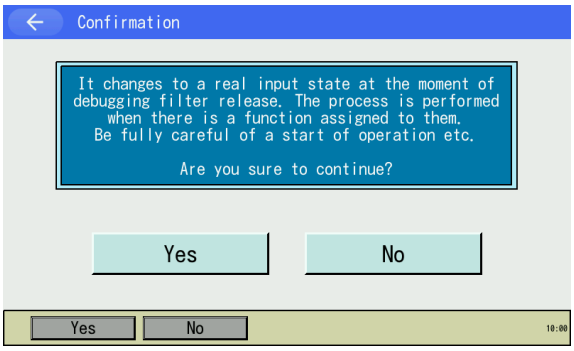
Touch the input port data box, and the cursor appears at the point you touched at. Touch directly at the input port data box for the port number that you would like to change the setting, or touch the ↑, ↓, ← or → button to move the cursor to the input data box for the port number that you would like to change the setting, and then touch a button allocated the debug filter frame.

ON Button:	Set ON filter to the input port at the position of the cursor. The port being set gets identified as being turned on.
OFF Button:	Set OFF filter to the input port at the position of the cursor. The port being set gets identified as being turned off.
CLR Button:	The debug filter set to the input port at the position of the cursor should be cancelled.
ACLR Button:	All the debug filters set to all of the physical input ports should be cancelled. The position of the cursor can be anywhere when touching ACLR button.

* While the debug filter is activated, the status of the ports (“0”, “1”) that ON filter or OFF filter is set should be displayed in red. (Other ports should be displayed in black.)



A warning message appears when you touch CLR button and ACLR button.
Check what is written in the message and touch the Yes (Execute Filter Release) button or select the No (Cancel) button.



Touch CLR button or ACLR button and a confirmation window appears.

When required to release the filter, touch the Yes button. When not required to release the filter, touch the No button.

⚠ *Warning:*

As soon as the debug filter is released and the controller operation mode (MANUAL / AUTO) is switched over, the status (ON / OFF) of the input port that the controller recognizes changes.

(1) At Filter Release

Actual Input Status / Filter Type	ON	OFF
ON		ON → OFF
OFF	OFF → ON	

(2) At Switchover MANUAL Mode → AUTO Mode

Actual Input Status / Filter Type	ON	OFF
ON		ON → OFF
OFF	OFF → ON	

(3) At Switchover (MANUAL Mode →) AUTO Mode → MANUAL Mode

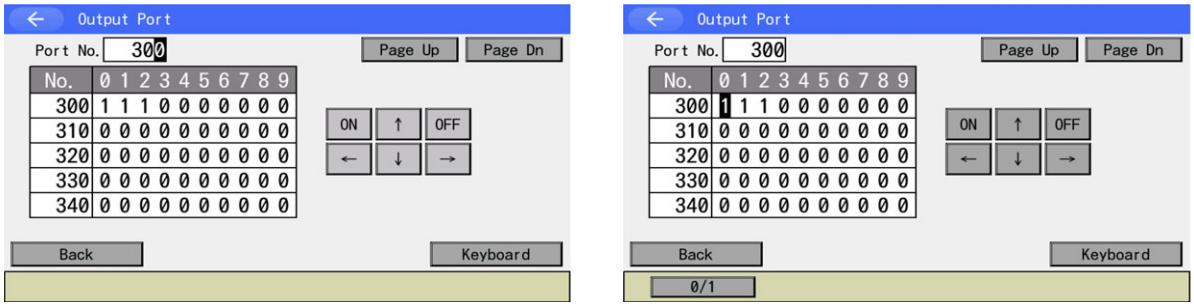
Actual Input Status / Filter Type	ON	OFF
ON		OFF → ON
OFF	ON → OFF	

* In the switchover of the mode (MANUAL / AUTO), the setting of the debug filter should not be cleared. By switching from AUTO to MANUAL, the debug filter with setting already established should be reactivated.

In case there is a feature assigned to the input port, the process of it should be executed. Pay attention at the start of operation and so on.

- Feature assigned to input port such as program startup and all activated axes home-return operation
- SEL program that branches off with input conditions
- SEL program that uses commands to monitor status of input port (WTON, WTOF, IN, INB, HOLD, CANC, JBWF, JBWN, JFWF, JFWN, etc.)
- Other processes executed with input port status being monitored

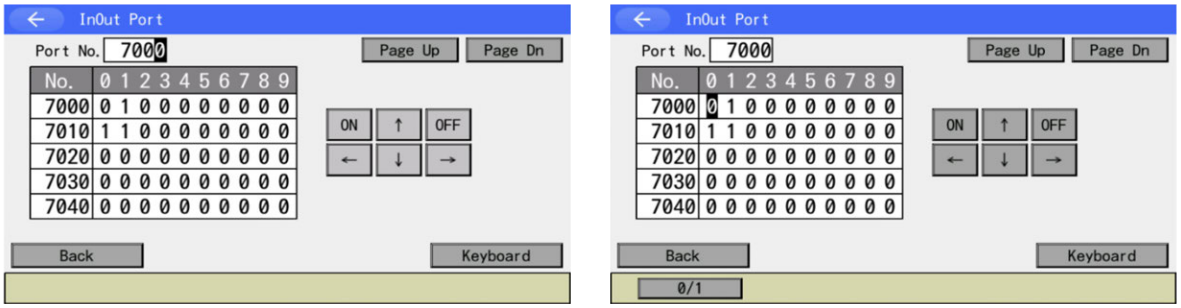
14.3 Output Port



As shown in the figure in the top right, it is available to switch ON/OFF the output port that the cursor is placed on when the cursor is in the output port data box. 1: ON, 0: OFF
To move the cursor from a port number box to an output port data box, touch the output port data box.
To switch ON/OFF at the cursor place, touch ON or OFF button in the touch panel.
To operate the cursor, touch ← ↑ ↓ → in the touch panel.
Every touch of Page Up and Page Dn buttons scrolls up/down the output port numbers by 50 items.

14.4 Input/Output Port

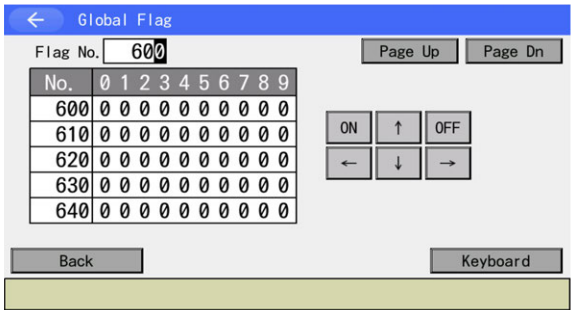
(for applicable models only)

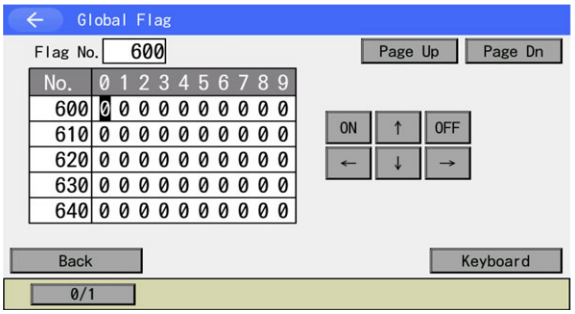


It is available to display and operate the input and output ports for those models applicable for input and output ports.
The way how to operate is the same as [14.3 Output Port].

14.5 Global Flag

Displays the ON/OFF status of global flag. Also, it can switch the ON/OFF status of the global flags.
1: ON, 0: OFF

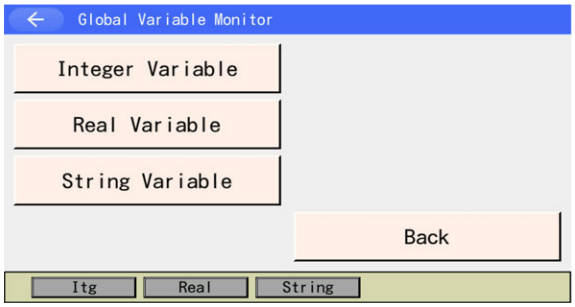




To move the cursor from a flag number box to a flag data box, touch a flag data box.
To switch ON/OFF at the cursor place, touch ON or OFF button in the touch panel.
To operate the cursor, touch ← ↑ ↓ → in the touch panel.
Every touch of Page Up and Page Dn buttons scrolls up/down the flag numbers by 50 items.

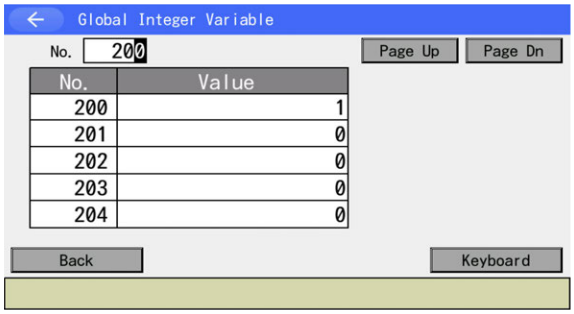
14.6 Global Variable

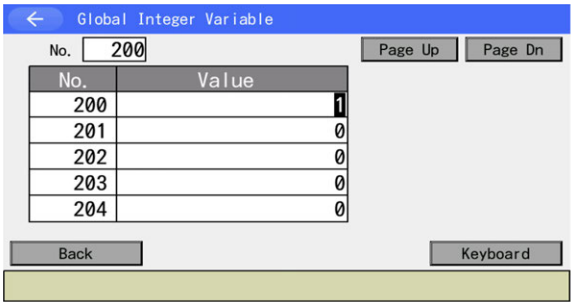
Displays the contents of global variable and global string. Also, a numerical value can be substituted for a global variable and letter string can be substituted for a global string.



There are three types of global variables.
Touch each button to show each monitor screen.

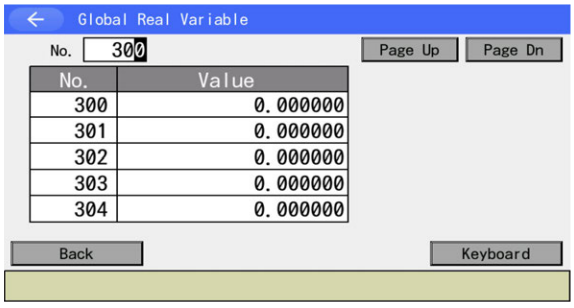
1) Global Integer variables

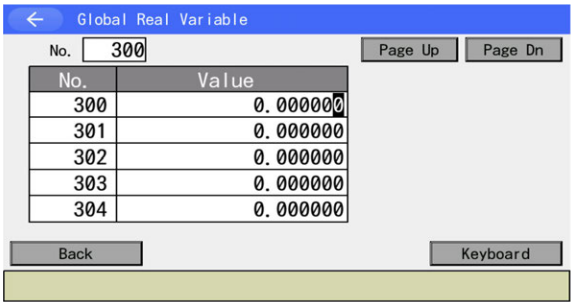




When the global Integer variables screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the data box.
The data with the cursor placed on can be substituted by inputting on the touch panel numeric keys and touching ENT.
To move the cursor, touch in the value input box.

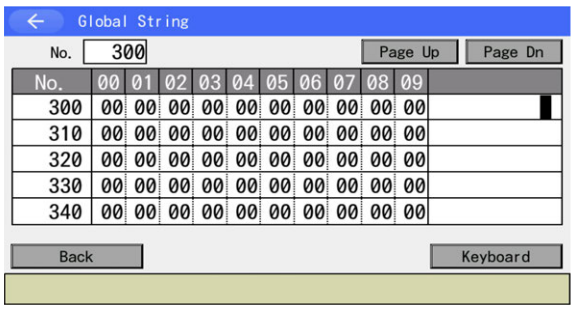
2) Global Real Variables

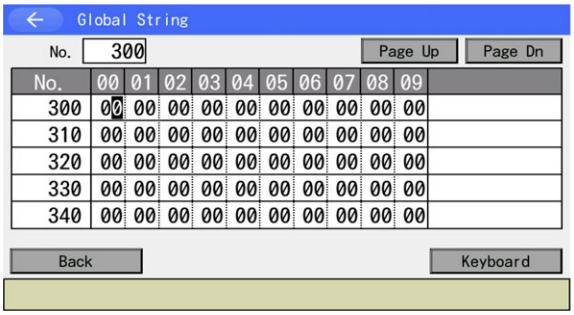




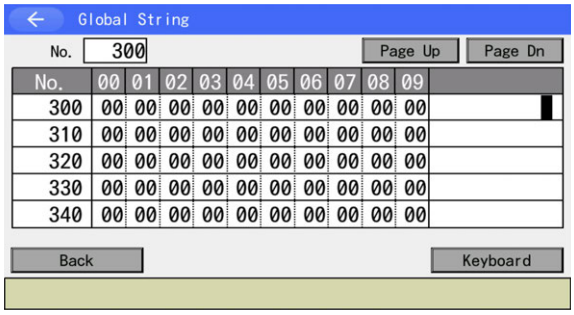
When the global real variables screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the data box.
The data with the cursor placed on can be substituted by inputting on the touch panel numeric keys and touching ENT.
To move the cursor, touch in the value input box.

3) Global String Variables





When the global string variables screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the data box.
The data with the cursor placed on can be substituted by inputting ASCII code using the touch panel numeric keys and touching ENT.



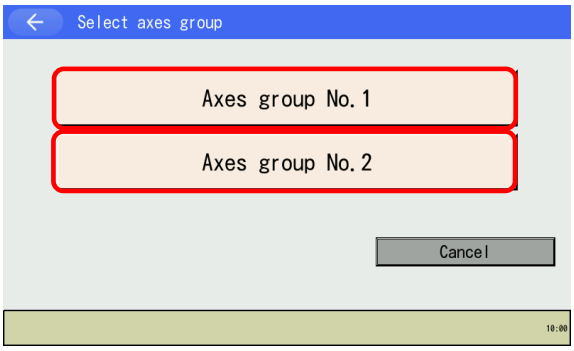
Touch in a character strings display and input box to show the cursor in it, and input of character strings is available.
Touch Keyboard button to show the touch panel keyboard to input.
In order to move the cursor among the character string displays, input columns and data columns, touch a place where you would like to show the cursor.
In the character display column, only alphabetical and numerical letters and half-size font Kana characters can be displayed. Input is available only with the alphabetical and numerical letters.

14.7 Axis Status

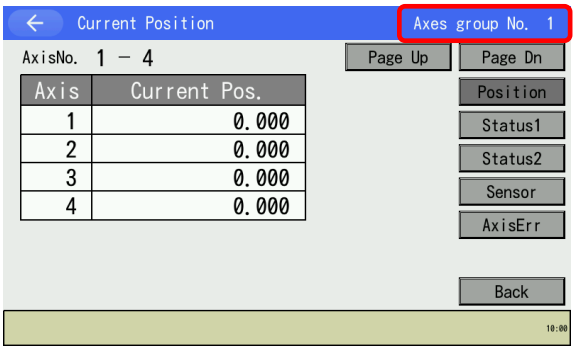
Displays the current position of each axis, servo status, sensor status, etc.
The status items may vary depending on the model.
Select the item to be displayed on the monitor using the buttons on the right side of the monitor screen.

Position	:	Displays the current position
Servo	:	Displays the servo status (Display should be either Status 1 or Status 2 depending on models)
Sensor	:	Displays the status of the sensor input
Encoder	:	Displays the encoder status (for applicable models only)
Axis Err	:	Displays the errors related to axis
Crd#	:	Displays the work coordinate system number and tool coordinate system number for the work piece currently being selected (Valid only for applicable models and when the feature is activated)

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Axis Status button. Touch an axes group number button to select the axes group number that is to be subject to.



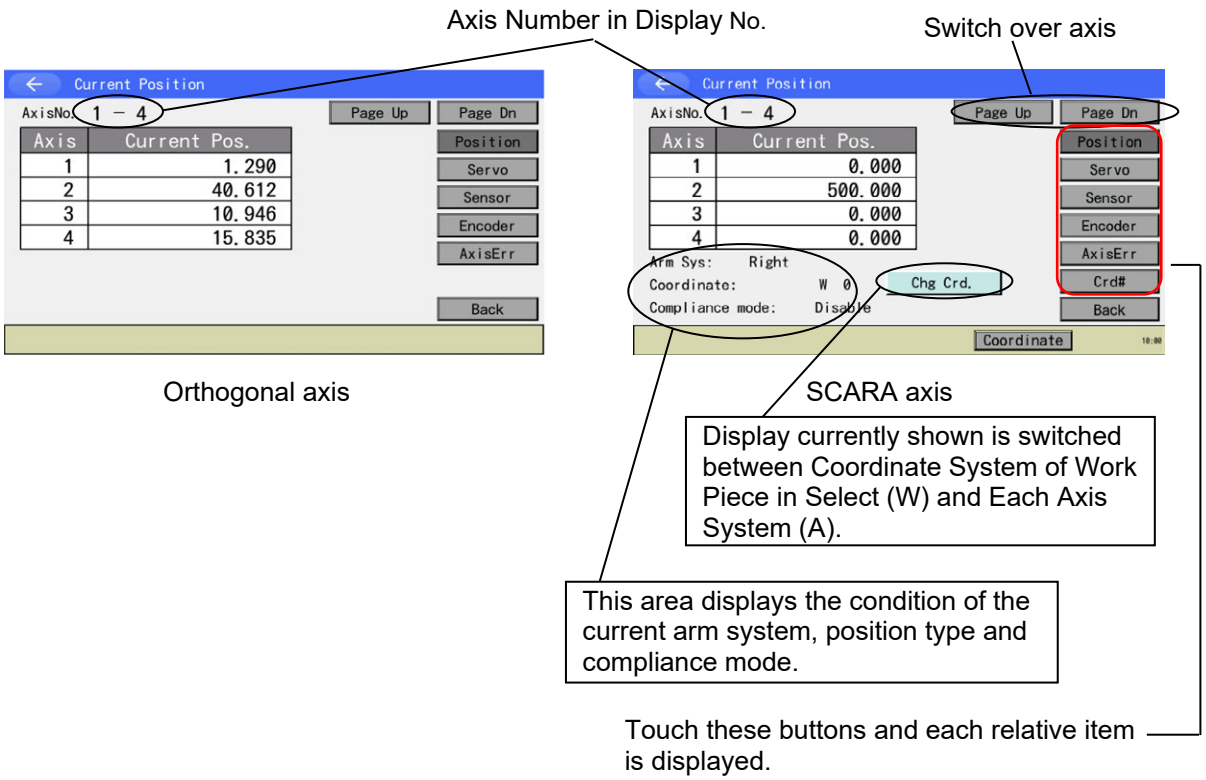
The select axes group window should appear after you touch the Axis Status button.
Touch an Axes group No. button.

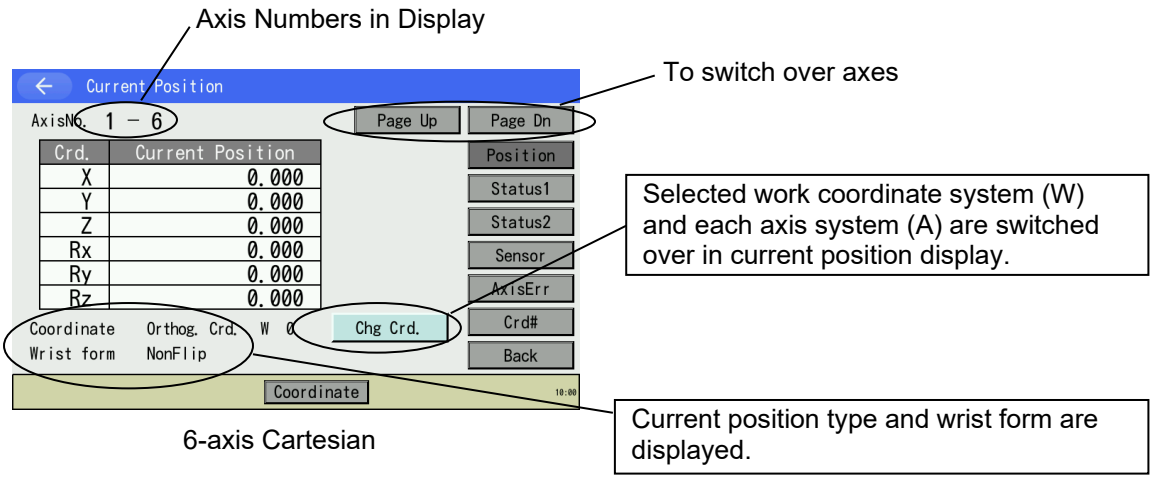


The axis status current position window opens.

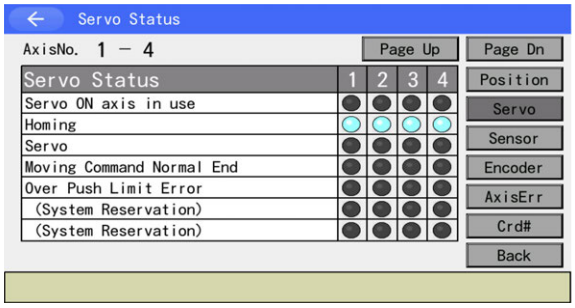
* The axes group number that was selected should be shown on the top right of the screen.

(1) Current position





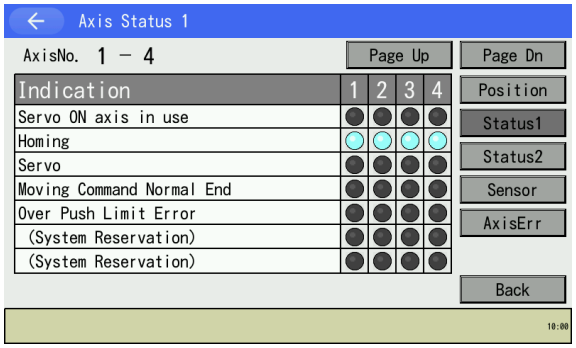
(2) Servo status

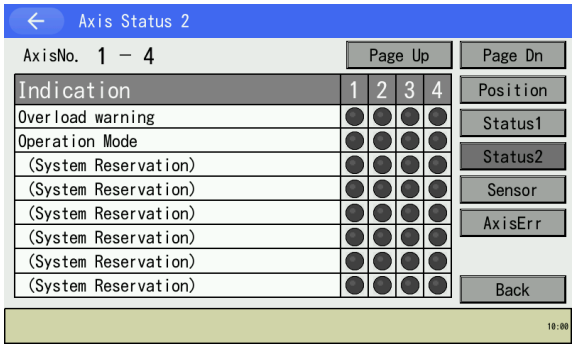


It is available to switch the axis number with Page Up and Page Dn buttons.

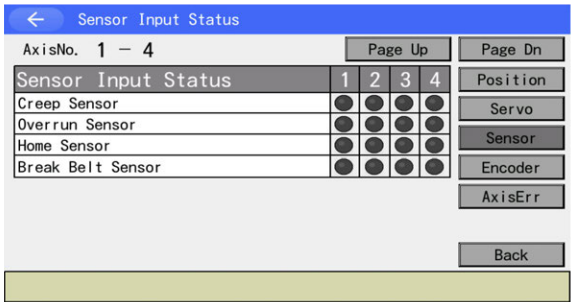
The status of ON/OFF is displayed with ○ (ON) and ● (OFF).

Display should be either Status 1 or Status 2 depending on models

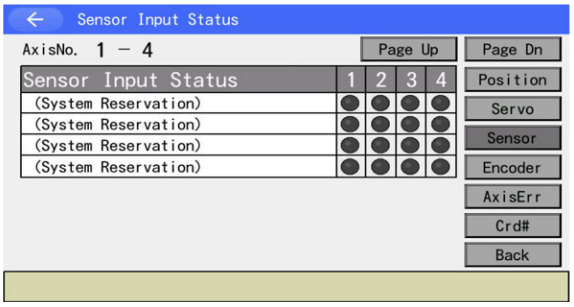




(3) Sensor Input Status

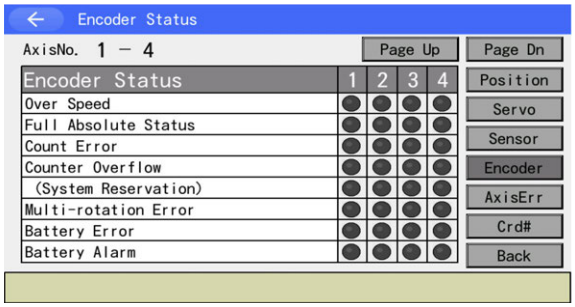


Orthogonal axis



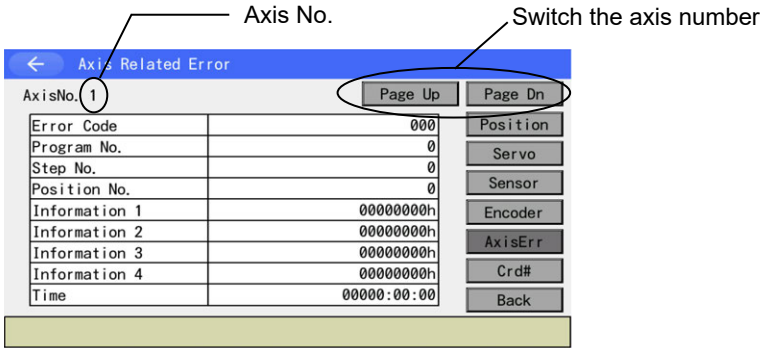
SCARA axis

(4) Encoder Status (for applicable models only)

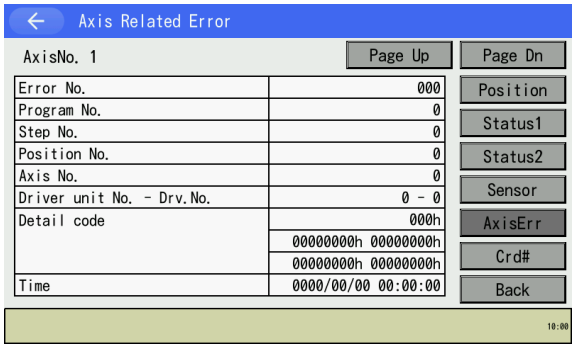


* The items displayed on each status screen differ depending on the models.

(5) Axis Related Error



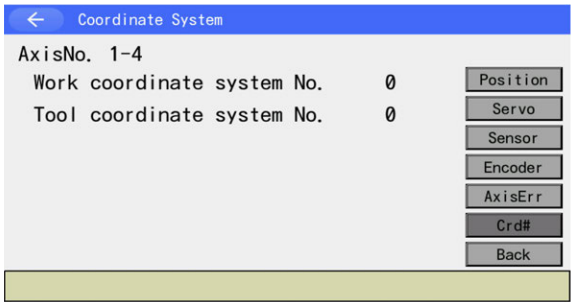
The contents of display differ depending on models.



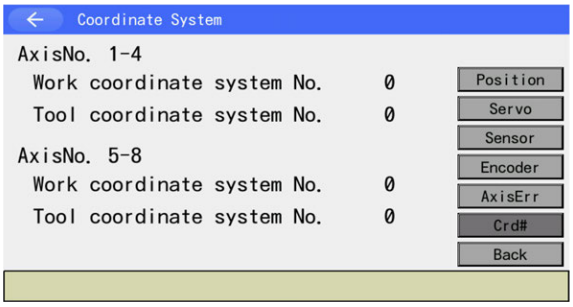
For RSEL

(6) Selected Coordinate System (Valid only for applicable models and when the feature is activated)

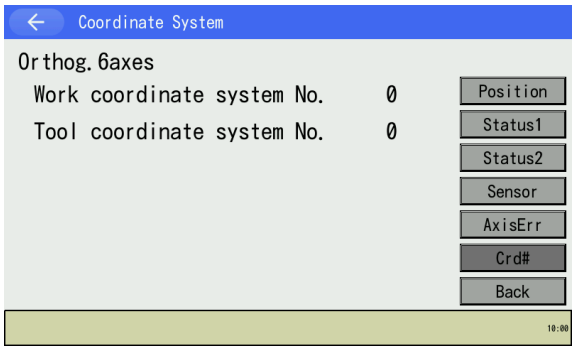
The coordinate system number currently selected in displayed.



XSEL-JX/KX, PX/QX, RX/SX, RAX/SAX
MSEL-PCX/PGX, XSEL2-TX
(Shown as Axis No. 1-3 in 3-aixs SCARA type)



XSEL-RXD/SXD, RAXD/SAXD

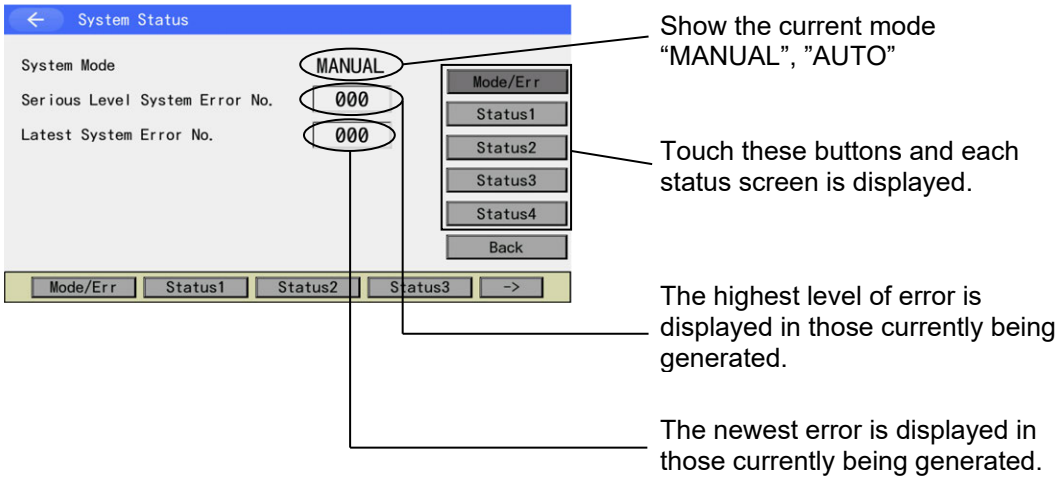


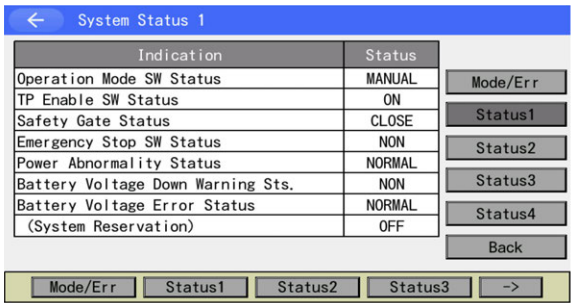
6-axis Cartesian

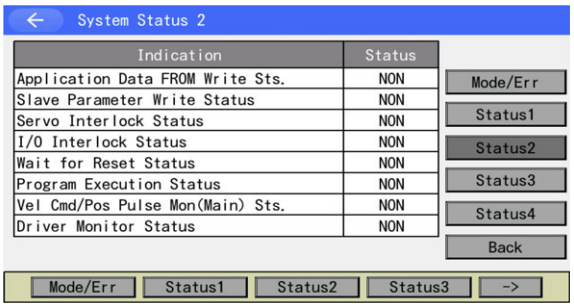
14.8 System Status

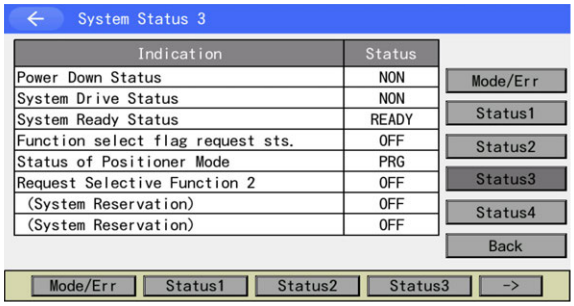
Display system status.
The status items may vary depending on the model.
Select the item to be displayed on the monitor using the buttons on the right side of the monitor screen.

Mode/Error : Displays the current operation mode and error number
Status1 : Displays System Status 1
Status2 : Displays System Status 2
Status3 : Displays System Status 3
Status4 : Displays System Status 4





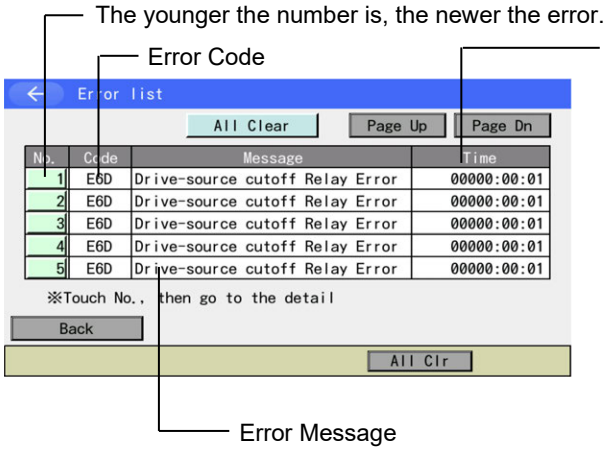


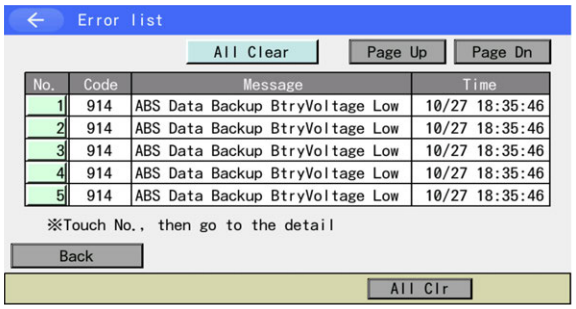


14.9 Error List

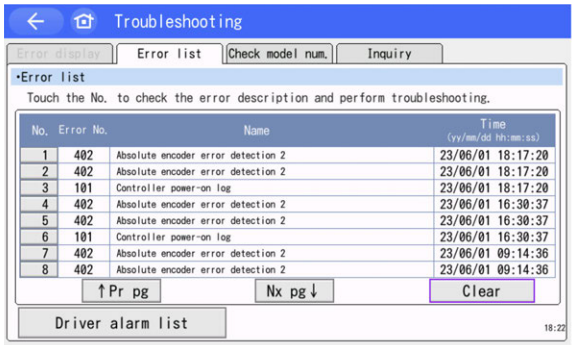
14.9.1 Error List

Select Error List in the monitor items.



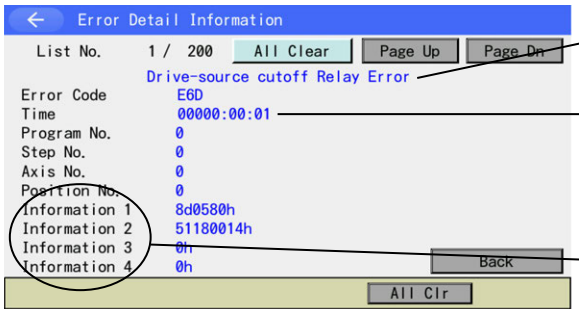


For XSEL-R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX, RAXD/SAXD TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF, the content of generated time is the time of generation.



For RSEL and XSEL2-T/TX, the window shown in the figure on the left should be displayed.

(1) Error Detail Information

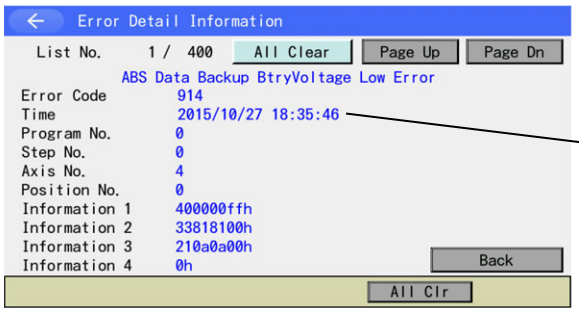


Error Message

Time after power started to be supplied to controller or after software reset

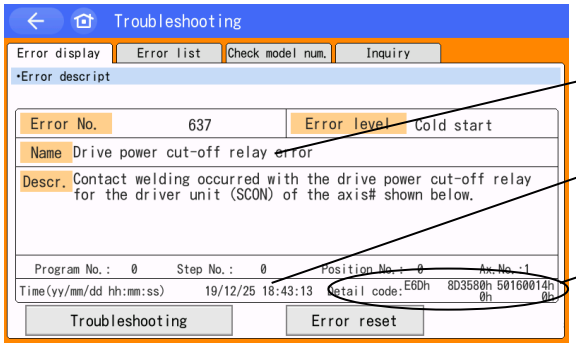
Information 1 to 4 are the information for IAI to analyze the cause of an error. (The content differs depending on the error number.)

Touch Back button to return to the error list display screen.



Time of generation (Year/month/day hour: minute: second)

For XSEL-R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX, RAXD/SAXD, TTA, MSEL-PCX/PGX/PC/PG/PCF/PGF



Error Message

Time of generation (Year/month/day hour: minute: second)

Detail Code is the information for IAI use in order to analyze a cause of error. (Contents should differ depending on the error number.)

For RSEL, XSEL2-T/TX

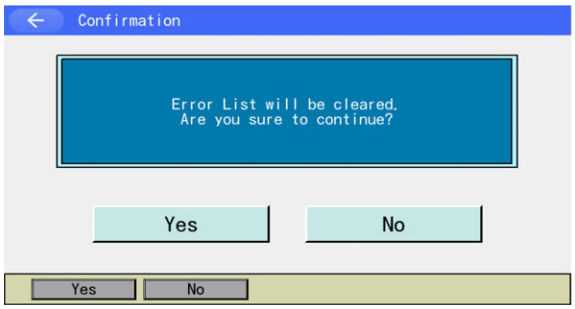
Touch the button and the screen goes back to the main menu.
Touch the button and the screen goes back to the error list display screen.

(2) Delete Error List

Touch All Clr button (Clear button for RSEL and XSEL2-T/TX) to show the confirmation screen to clear the error list.

Touch Yes button when you want to clear the error list.

If you do not want to clear, touch No button.



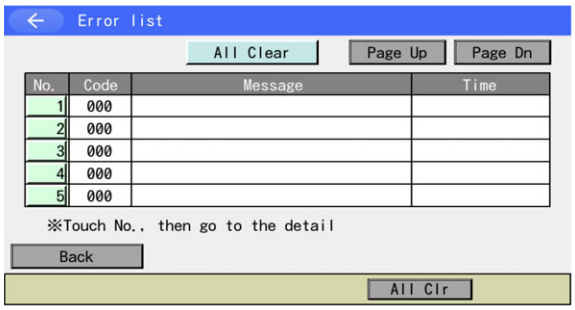
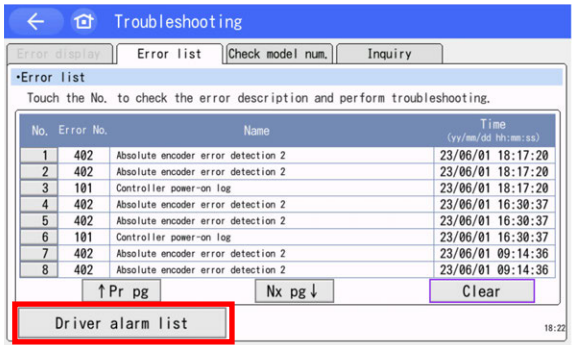


Image after Completing to Clear

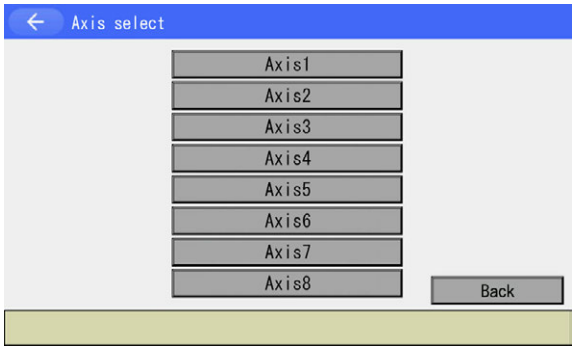
14.9.2 Driver Alarm List (for applicable models only)

(1) Display of Driver Alarm List

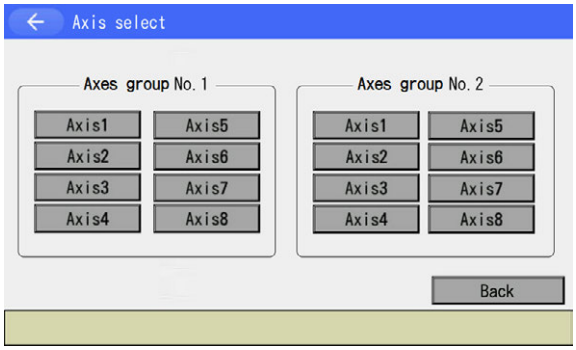


Touch Driver alarm list button in the error list screen.

Select an axis to be displayed in the list in the axis select screen.

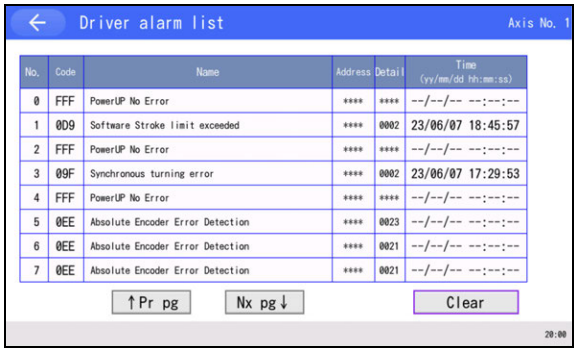


When Axes Group Disabled

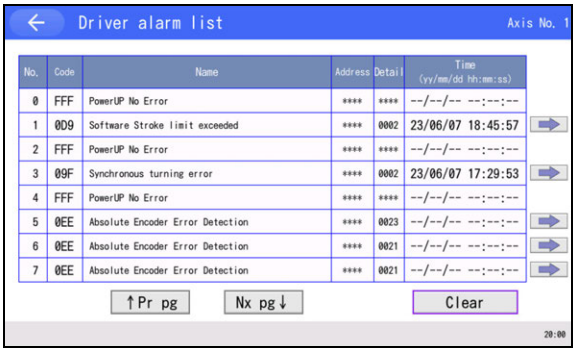


When Axes Group Enabled

The driver alarm list of the axis selected in the axis select screen should be displayed.

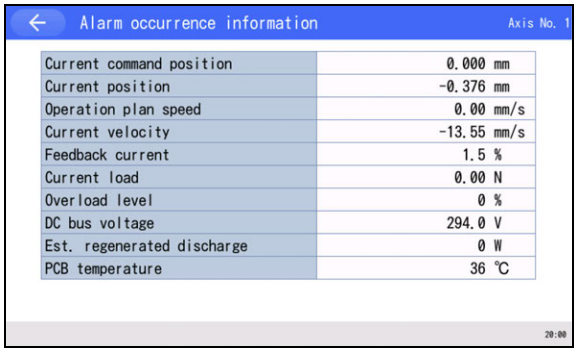


When Not Applicable for
Alarm Generation Information



When Applicable for
Alarm Generation Information

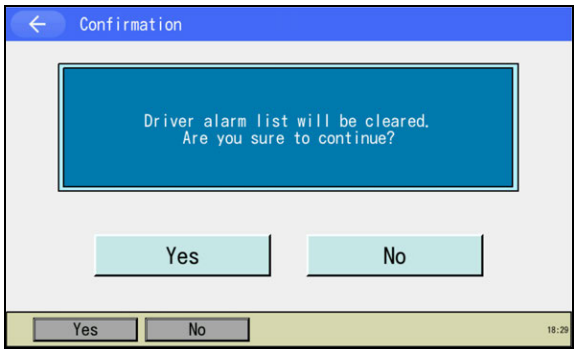
When the driver unit is applicable for the alarm generation information, there should be buttons appeared on the right of the alarms. Touch a button and the alarm generation information should be shown.



The information at the moment of a controller alarm being generated should be shown.

(2) Deleting Driver Alarm List

Touch the Clear button in the driver alarm list screen and the clear confirmation screen for the driver alarm list should appear. If you desire to clear the driver alarm list, touch the Yes button. If not to clear it, touch the No button.



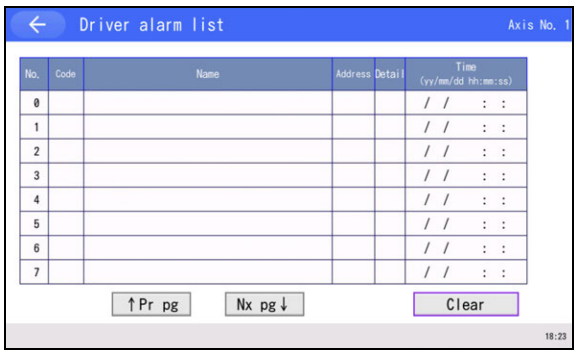
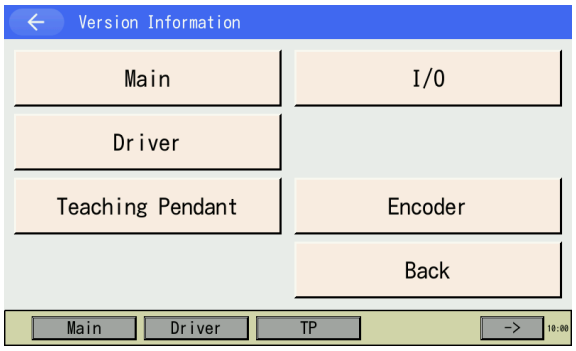


Image after Completing to Clear

14.10 Version Information

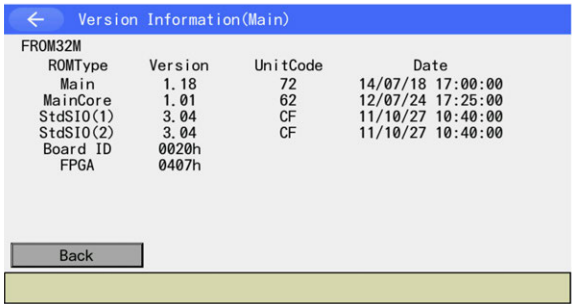
Displays version information.

* Items available to select from and the content of display in each screen should differ depending on models.
* Some models show this information in Main Menu 2 → Information → Version Information

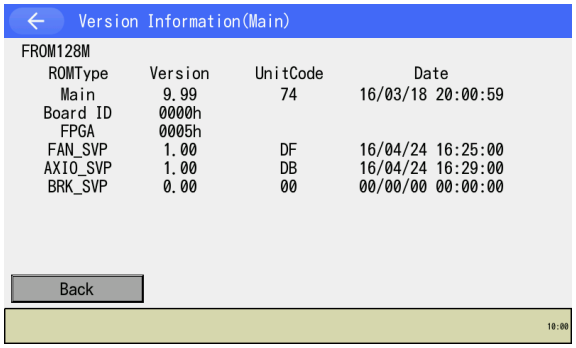


Depending on the controller, the I/O button may be changed to the Field Bus button.

(1) Main

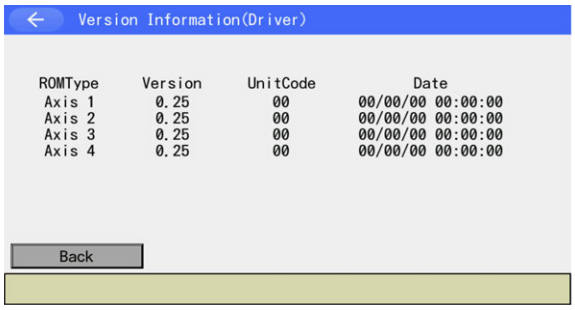


Main : Controller application version
MainCore : Controller core version
StdSIO (1) : Channel 1 version *1
StdSIO (2) : Channel 2 version *1
Board ID : Board ID (HEX)
FPGA : FPGA version (HEX)
FAN_SVP : FAN_SVP version
AXIO_SVP : AXIO_SVP version
BRK_SVP : BRK_SVP version
*1: 'Nouse' is shown in channel's set as "Not to Use" in I/O Parameter No. 201 and 213.



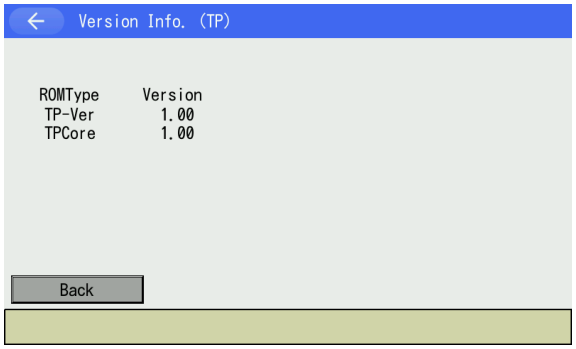
For XSEL-RA/SA/RAX/SAX/RAXD/SAXD

(2) Driver



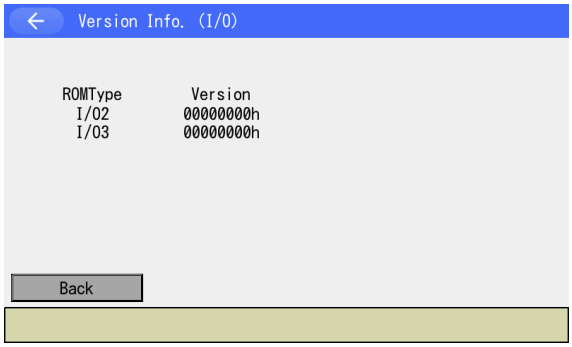
The driver CPU version is displayed.

(3) Teaching Pendant



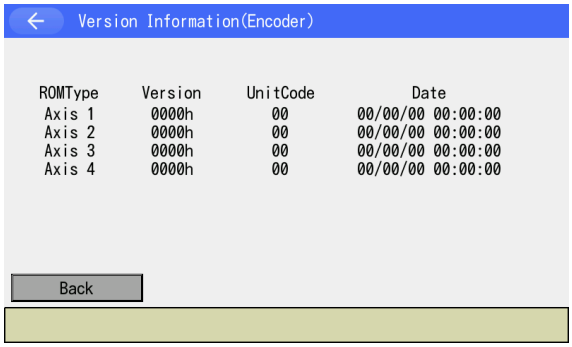
The version of this product is shown.
TP-Ver : (Application version)
TPCore: Core version

(4) I/O



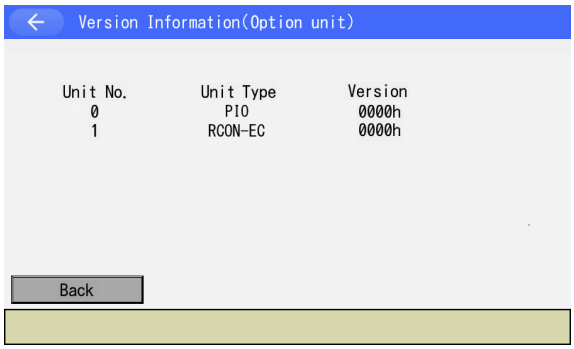
Version of extension I/O module is displayed

(5) Encoder



Version of encoder CPU is displayed

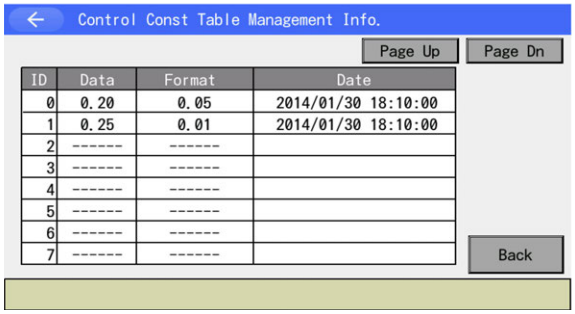
(6) Option Unit



Version of option unit is displayed.

14.11 Control Constant Table Management Information

(for applicable models only)



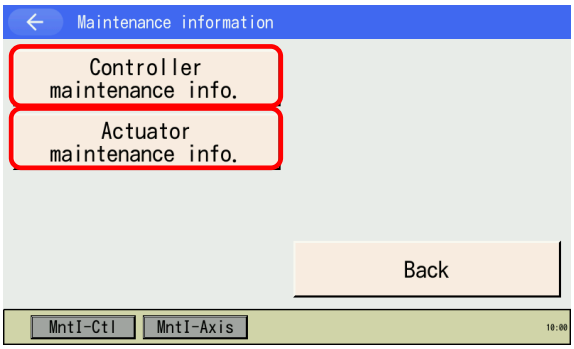
It is available to check the version of the control constant table for the encoder and monitor.

14.12 Maintenance Information

(for applicable models only)

Displays the number of actuator movement and distance.
Some models show also the overload warning level, FAN total drive time, actuator replaced time, grease supplied time and drive distance after grease supply (only when features are supported). Also, some models are available to show the controller related maintenance information (only when the feature is supported).

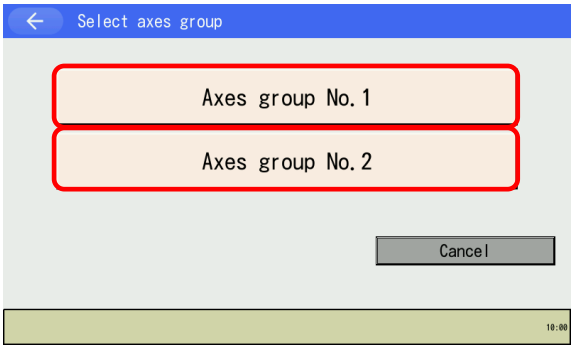
When the controller related maintenance information is supported, touch the Maintenance Information button and the maintenance information menu should appear. Touch the Controller maintenance info. button to open the maintenance information (controller) screen and the Actuator maintenance info. button to open the maintenance information (actuator) screen.



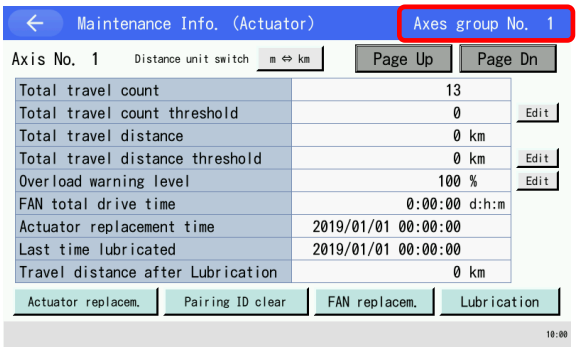
When the controller related maintenance information is supported, touch the Maintenance Information button and the maintenance information menu should appear.

Touch the Controller maintenance info. button to open the maintenance information (controller) window and the Actuator maintenance info. button to open the maintenance information (actuator) window.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Maintenance Information button (or the Actuator maintenance info. button in the maintenance information menu when the maintenance information menu is in display). Touch an axes group number button to select the axes group number that is to be subject to.



The select axes group window should appear after you touch the Maintenance information button (or the Actuator maintenance info. button in the maintenance information menu when the maintenance information menu is in display). Touch an Axes group No. button.



The maintenance information (actuator) window opens.

* The axes group number that was selected should be shown on the top right of the screen.

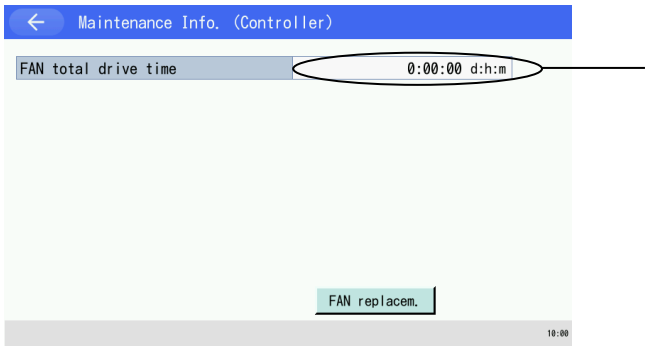
14.12.1 Maintenance Information Screen

One of the following maintenance information screen should be shown in response to the controller type.

14.12.1.1 Maintenance Information (Controller) Screen

This screen will show up when you touch the Controller maintenance info. button in the maintenance information menu.

[Displayed Items in Maintenance Information (Controller) Screen]



1) FAN total drive time
The fan total drive time (day : hour : minute) of the controller should be displayed.

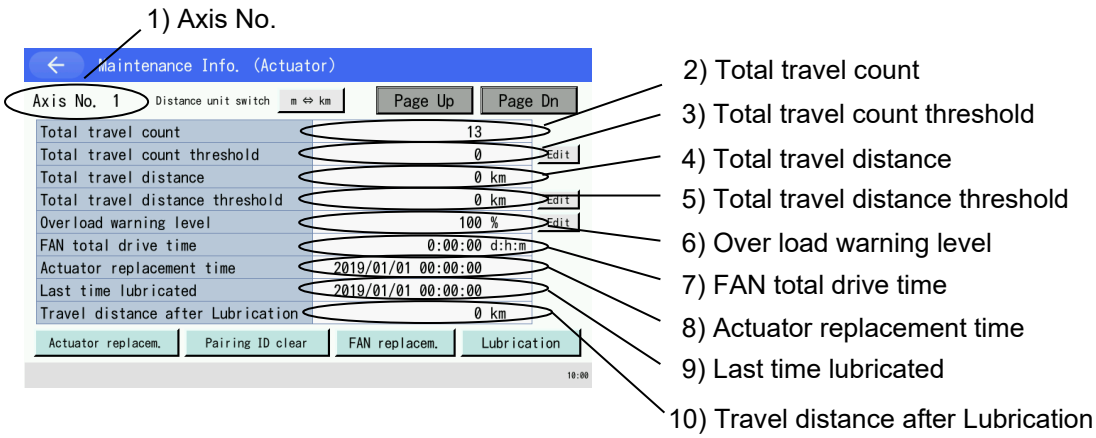
Touch the FAN replacem button and the fan total drive time can be initialized (zero-cleared). Refer to [14.12.4 Fan Replacement] for detail.

Touch the ← button on the top left and the screen goes back to the previous.

14.12.1.2 Maintenance Information (Actuator) Screen

This screen will show up when you touch the Maintenance Information button (or the Actuator maintenance info. button in the maintenance information menu when the maintenance information menu is in display) when connection is established to RSEL or XSEL2-T/TX.

[Displayed Items in Maintenance Information (Actuator) Screen]



1) Axis No.
It shows the axis number.

2) Total travel count
Displays the total No. of actuator movement times.

3) Total travel count threshold
An alarm will warn you when the total number of drive has exceeded this setting.
Touch the Edit button on the right side of the display box to change the setting value.

4) Total travel distance
The total of the travel distance of the actuator is shown.

5) Total travel distance threshold
An alarm will warn you when the total travel distance has exceeded this setting.
Touch the Edit button on the right side of the display box to change the setting value.

6) Over load warning level
This shows the threshold for the output of the overload warning.
Touch the Edit button on the right side of the display box to change the threshold setting.

7) FAN total drive time *1
This shows the total drive time (day : hour : minute) of the fan on the driver unit that the axis in display is connected to.

8) Actuator replacement time
This shows the date that the actuator was replaced.

9) Last time lubricated *2
This shows the date of grease supply.

10) Travel distance after Lubrication *2
This shows the travel distance after grease supply.

Every time [Page Up] or [Page Dn] button is touched, the axis number is switched in the screen.

Touch the [Actuator replacem] button and the total number of drives and the total drive distance can be initialized (zero-cleared) and the actuator replaced time can be updated.
Refer to [14.12.2 Actuator Replacement] for detail.

Touch the [Pairing ID clear] button and the ID that was paired can be cleared.
For details, refer to [14.12.3 Pairing ID Clear].

Touch the [FAN replacem] button*1 and the fan total drive time can be initialized (zero-cleared).
Refer to [14.12.4 Fan Replacement] for detail.

Touch the [Lubrication] button*2 and the grease supplied time can be updated and the total drive distance after grease supply can be initialized (zero-cleared).
Refer to [14.12.5 Grease Supply] for detail.

Touch the distance display unit switchover button ([m ⇔ km] button) and the unit for display of total drive distance, total drive distance setting and drive distance after grease supply can be switched over.

Touch the [←] button on the top left and the screen goes back to the previous.

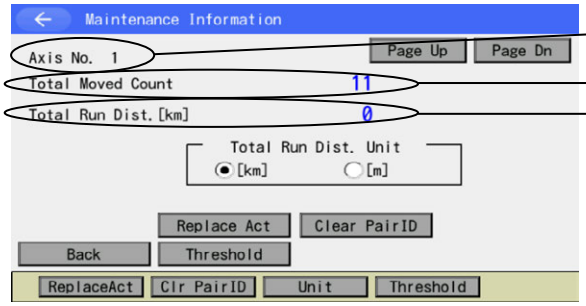
The items and buttons to be displayed should differ depending on the controller type and supported features.

*1 It should be displayed only when the driver unit that is connected to the axis in display is equipped with a fan.
*2 It should be displayed only when the controller and actuators are applicable for the information management feature.

14.12.1.3 Maintenance Information Screen

This screen should appear when you touch the Maintenance Information button in the monitor menu when connection is established to models other than RSEL and XSEL2-T/TX.

[Items Shown in Maintenance Information Screen]



1) Axis No.
2) Total moved count
3) Total run distance [km]

* Clear PairID button is displayed only when the battery-less absolute encoder is connected and the pairing I.D. clear feature is activated.

1) Axis No.
It shows the axis number.

2) Total moved count
Displays the total No. of actuator movement times.

3) Total run distance [km]
Displays the total distance of the actuator movement. Display in [km] or [m] is available. (Numbers are shown in an integer with the nearest decimal rounded down.)

By touching each button in the total operation distance display unit box, the unit of the total operation distance display can be switched over.

Every time Page Up or Page Dn button is touched, the axis number is switched in the screen.

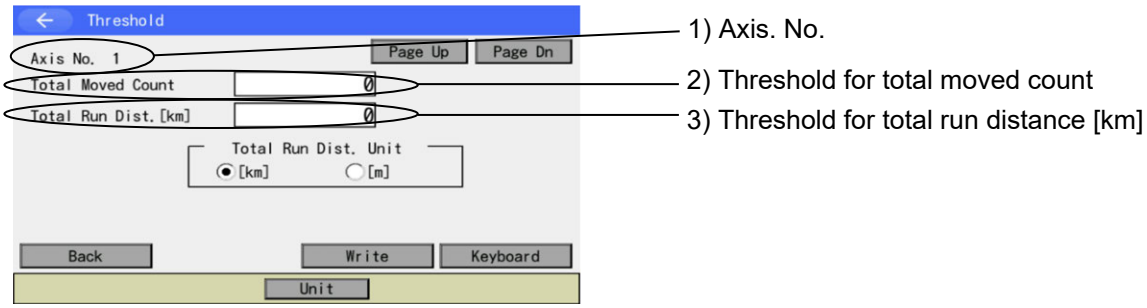
By touching Replace Act button, the total operation times and total operation distance can be initialized (cleared).
Refer to [14.12.2 Actuator Replacement] for detail.

By touching Clear PairID button, the paired I.D. can be cleared.
For details, refer to [14.12.3 Pairing ID Clear].

Touch Threshold button, and the display changes to the Threshold screen.

Touch Back button to return to Monitor Menu screen.

[Output Timing (Threshold) Setting of Signals]



1) Axis No.
   It shows the axis number.
2) Threshold for total moved count
   It shows the threshold for the total moved count.
3) Threshold for total run distance [km]
   It shows the threshold for the threshold for total run distance. Display in [km] or [m] is available. (Numbers are shown in an integer with the nearest decimal rounded down.)

   By touching each button in the threshold for total run distance display unit box, the unit of the threshold for threshold for total run distance can be switched over.

   The threshold for the total moved count and the threshold for threshold for total run distance are available for edit.
   (1) Touch the item you want to edit and the cursor is shown on the item.
   (2) Touch Keyboard button to show the touch panel keyboard, input a value and then touch ENT.
   (3) After inputting data, touch Write button to transfer the data to the controller.

   In case writing was conducted, when you return to the menu screen with Back button, confirmation screen for flash ROM writing and software reset appears. In order to apply the written data, import the data on the flash ROM and reset the software.

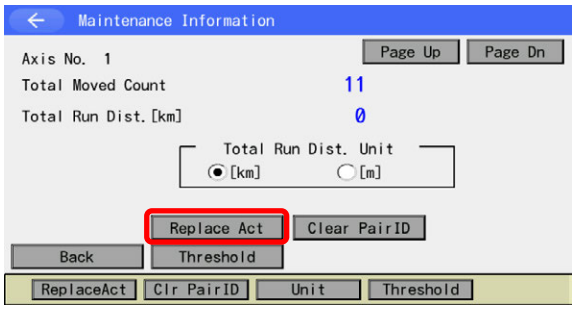
   (Note) In the case that the Axis No. or Maintenance Information screen is changed without importing the data, the input data is erased.

   Every time Page Up or Page Dn button is touched, the axis number is switched in the screen.

   Touch Back button to return to Maintenance Information screen.

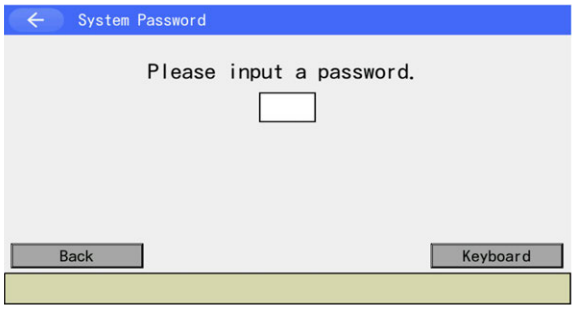
14.12.2 Actuator Replacement

When the actuator is replaced, the total operation times and total operation distance can be initialized (cleared). In [14.12.1.2 Maintenance Information (Actuator) Screen], actuator replaced time also gets updated.



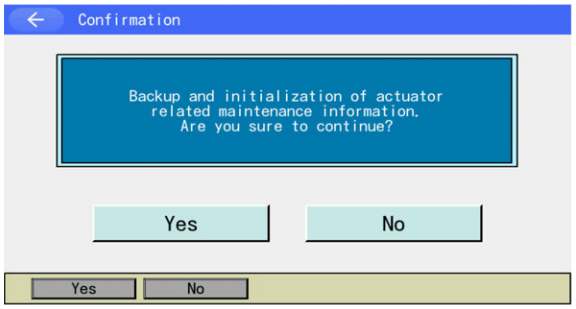
Touch Replace Act button.

* The figure on the left shows a case of [14.12.1.3 Maintenance Information Screen] as an example



The password input window appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information window.



Touch Yes button when initializing of the total operation times and total operation distance is required.
Touch No button when initializing of the total operation times and total operation distance is not required.



Once the process is completed, the screen changes to the figure shown in the left. Touch OK button.

When the battery-less absolute encoder is connected and the pairing I.D. clear feature is activated, the pairing I.D. clear execution confirmation window appears continually.
Refer to [14.12.3 Pairing ID Clear] to conduct the pairing I.D. clear if necessary.

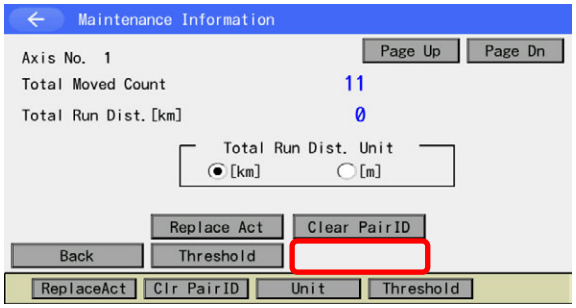
In any cases other than above, back to maintenance information screen (or to the maintenance information (actuator) screen).

14.12.3 Pairing ID Clear

The controller possesses a feature to output an absolute error when it checks the encoder I.D. and detects it is wrong. In case replacement is conducted with an actuator which the absolute reset has been executed, it is necessary to clear the existing I.D. (pairing I.D.).

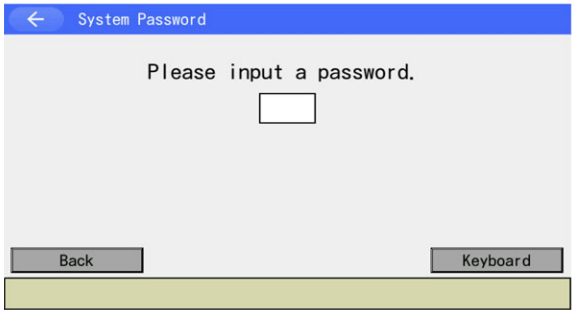
This feature is available only when the battery-less absolute encoder is connected and the pairing I.D. clear feature is activated.

* This feature is the same as the pairing ID clear feature in the controller menu.



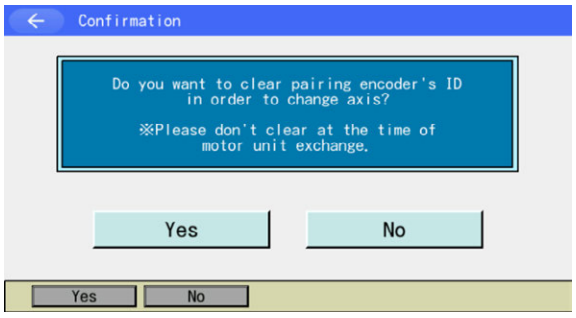
Touch Clear PairID button.

* The figure on the left shows a case of [14.12.1.3 Maintenance Information Window] as an example



The password input window appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information screen.



Touch Yes button when the paired I.D. is to be cleared.
Touch No button when the paired I.D. is not to be cleared.

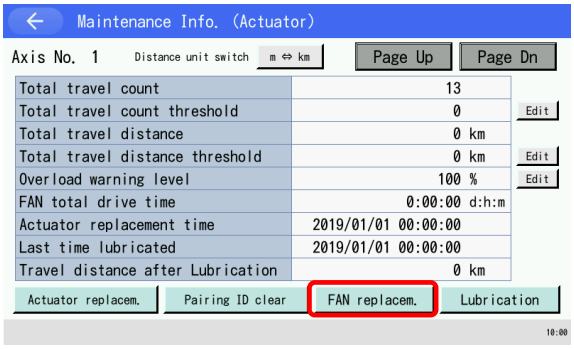


Once the process is completed, the screen changes to the figure shown in the left. Touch OK button to go back to maintenance information screen.

14.12.4 FAN Replacement

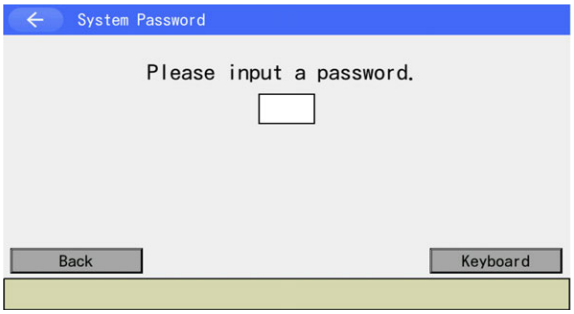
After the FAN gets replaced, the FAN total drive time can be initialized.

This feature is valid only when the controller is equipped with a FAN.



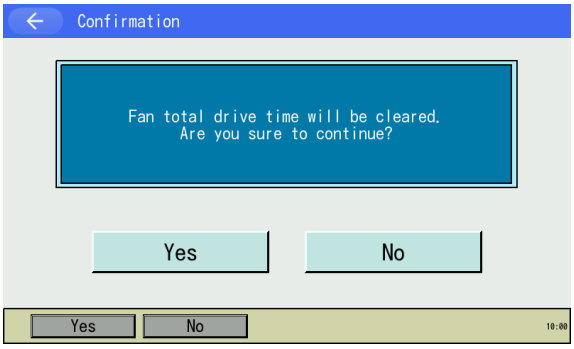
Touch the FAN replacem. button.

* The figure on the left shows a case of [14.12.1.2 Maintenance Information (Actuator) Screen] as an example



The password input screen appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information screen.



Touch the Yes button when required to clear the fan total drive time.
Touch the No button when not required to clear the fan total drive time.

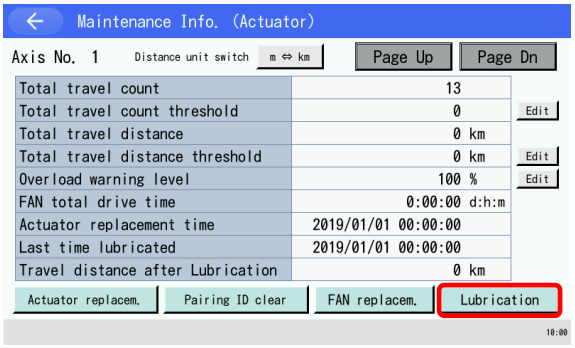


Once the process is completed, the screen changes to the figure shown in the left. Touch OK button to go back to maintenance information screen.

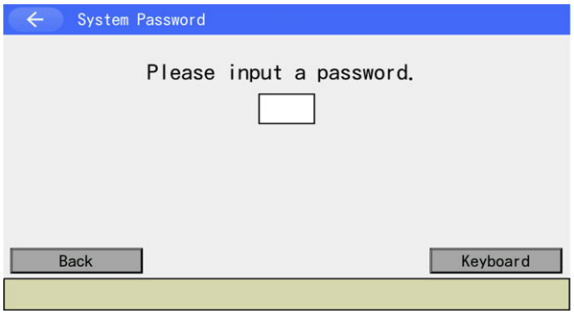
14.12.5 Grease Supply

After grease supply, update can be held on the maintenance information regarding grease supply (update of grease supplied time and initializing of drive distance after grease supply).

This feature is valid only when the controller and actuators are applicable for the information management feature.

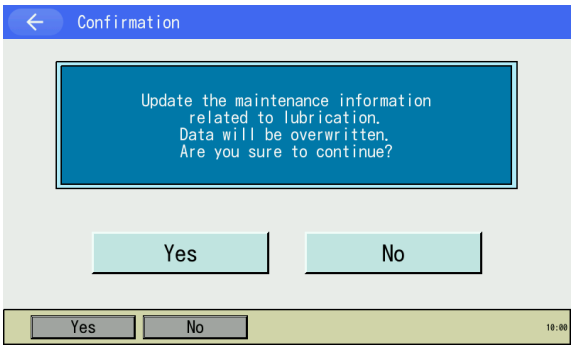


Touch the Lubrication button.



The password input window appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information window.



Touch the Yes button when required to update the maintenance information regarding grease supply. Touch the No button when not required to update the maintenance information regarding grease supply.



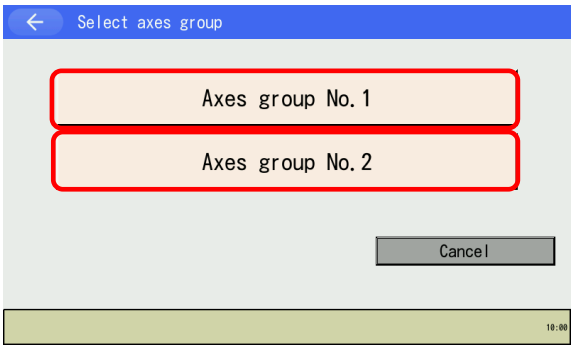
Once the process is completed, the screen changes to the figure shown in the left. Touch OK button to go back to maintenance information screen.

14.13 Servo Additional Data Monitor

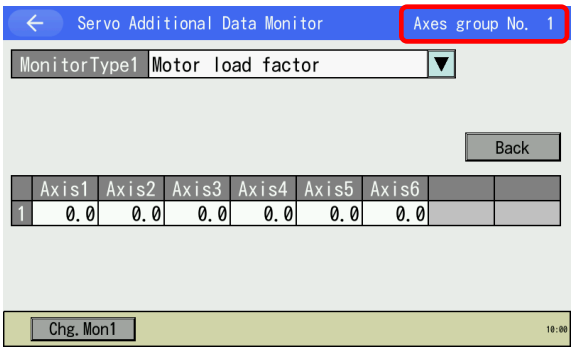
(for applicable models only)

The servo additional data should be monitored in the display. The contents available to monitor differ depending on the model.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Servo Additional Data button. Touch an axes group number button to select the axes group number that is to be subject to.



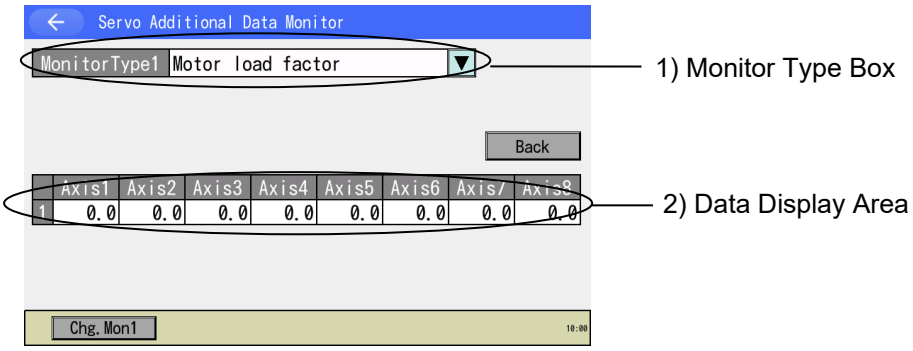
The select axes group window should appear after you touch the Servo Additional Data button.
Touch an Axes group No. button.



The servo additional data monitor window opens.

* The axes group number that was selected should be shown on the top right of the screen.

[Displayed Items in Servo Additional Data Monitor Screen]



1) Monitor Type Box
Show and select the monitoring type to be displayed in the data display area.

2) Data Display Area
The servo additional data selected in the monitor type box should be displayed for monitoring.

Touch ▼ button in the monitor type box, and the items available for monitoring will get listed down. Touch an item that you would like to monitor so it gets selected.

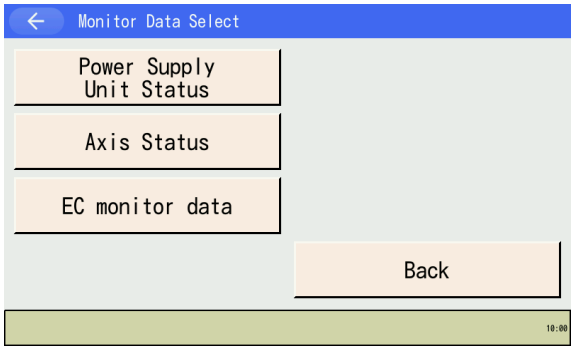
Four types of data can be monitored at the same time at the maximum. (Display will be adjusted automatically for the number of items to monitor.)

Monitoring is available only on valid axes. Servo Additional Data button in the monitoring menu will be hidden when there is no valid axis existed.

14.14 Monitor Data Output Display

(for applicable models only)

The monitor value in the monitor item set in the monitor data output setting and the EC monitor data output setting screen should be displayed.
(Refer to [15.19.1 Monitor Data Output Setting] and [15.19.4 EC Monitor Data Output Setting] for how to set it up.)



If there are multiple preconfigured monitoring items, touch the monitor data button and the monitor data select window should open.

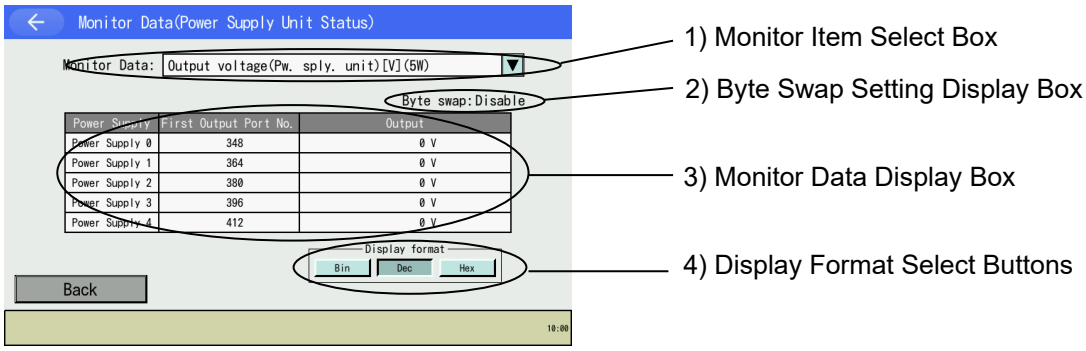
Touch the power supply unit status button to open the monitor data (power supply unit status) window or touch the axis status button to open the monitor data (axis status) and touch the EC monitor data button to open the EC monitor data display screen.

* If only one monitor item is set, the screen will directly go to the applicable window.

14.14.1 Monitor Data (Power Supply Unit Status) Screen

This shows the monitor values in the power supply unit status. This screen is available to go only when the power supply unit status is set as a monitor item.

[Displayed Items in Monitor Data (Power Supply Unit Status) Screen]



1) Monitor Item Select Box
A monitor item to show in Monitor Data Display Box should be shown and selected.
Touch the ▼ button and the power supply unit status monitor items set in the monitor data output setting screen are shown in a list. Touch the item that you require to monitor to select it.

2) Byte Swap Setting Display Box
The byte swap status of the signal output from the output ports should be shown. The value set in the monitor data output setting screen should be shown.

3) Monitor Data Display Box
The motor value of an item selected in Monitor Item Select Box should be shown.

Power Supply	:	Power supply unit number is shown
Top Output Port Number	:	The top port number of the output ports assigned as the destination of the monitor data output for each power supply unit is shown.
Output	:	Monitor values of each power supply unit are shown. There are displays in binary/decimal/hexadecimal numbers in response to the condition of the display format select buttons.

In Monitor Data Display Box, display of five units is available no matter the number of units connected to the power supply unit (setting value in Other Parameter No. 61).

4) Display Format Select Buttons
The format to display output in Monitor Data Display Box should be shown and selected. The display should be switched to the display format of a button that you touched.

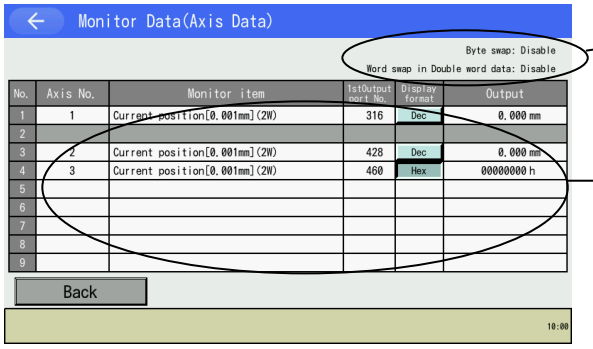
Binary System	:	The outputs (monitor values) are shown in decimal numbers. It shows the display in four digits * 4 followed by 'b' as a representative of binary system.
Decimal System	:	The outputs (monitor values) are shown in decimal numbers. It shows the display of monitor values in real numbers or integral numbers followed by a unit.
Hexadecimal System	:	The outputs (monitor values) are shown in hexadecimal numbers. It shows the display in four digits followed by 'h' as a representative of hexadecimal system.

Touch the Back button and the screen goes back to the previous.

14.14.2 Monitor Data (Axis Status) Screen

This shows the monitor values in the axis status. This screen is available to go only when the axis status is set as a monitor item.

[Displayed Items in Monitor Data (Axis Status) Screen]



1) Swap Setting Display Box
The swap status of the signal output from the output ports (byte swap and double-word data word swap) should be shown. The value set in the monitor data output setting screen should be shown.

2) Monitor Data Display Box
The monitor values in the axis status monitor item should be shown.

No.	: Monitor numbers are shown (1 ~ 9).
Axis Number	: Axis numbers are shown. When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), it should be displayed in axes group number - axis number.
Monitor Item	: The monitor item set in the monitor data output setting screen is displayed.
Top Output Port Number	: The top port number of the output ports assigned as the destination of the monitor data output is shown.
Display Format	: The output display format is shown and can be selected. Touch a button and the display switches between decimal/hexadecimal numbers.
Output	: The axis status monitor values are shown. There are displays in decimal/hexadecimal numbers in response to the condition of the display format select buttons.

When the display format is in the decimal system, it shows the display in real numbers or integral numbers followed by a unit. When the display format is in the hexadecimal system, it shows the display in hexadecimal numbers followed by ‘h’ as a representative of hexadecimal system.

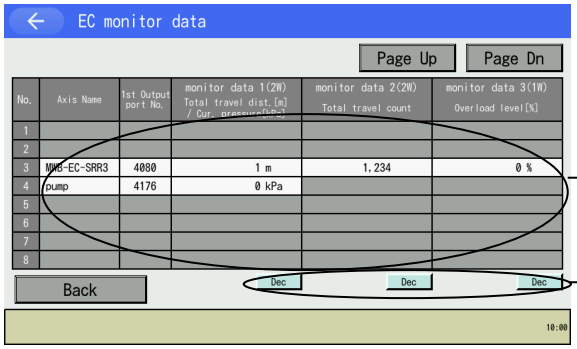
The items with grey in the background are those for the power supply unit status. They should be displayed in the monitor data (power supply unit status) screen.

Touch the Back button and the screen goes back to the previous.

14.14.3 EC Monitor Data Display Screen

This shows the monitor values in the axis status. This screen is available to go only when the axis status is set as a monitor item.

[Displayed Items in EC Monitor Data Display Screen]



1) Monitor Data Display Box

2) Display Format Buttons

1) Monitor Data Display Box
The monitor values in the axis status monitor item should be shown.

No.	: Monitor numbers are shown (1 to).
Axis Number	: Axis numbers or series name are shown.
Top Output Port Number	: The top port number of the output ports assigned as the destination of the monitor data output is shown.
Display Format	: The output display format is shown and can be selected. Touch a button and the display switches between decimal/hexadecimal numbers.
monitor data 1 to 3	: For ELECYLINDER units, the output values of the monitor items configured on the EC monitor data setting screen (3 items) are displayed. For Robo Pump units, only the current pressure is output regardless of the settings on the EC monitor data setting window. Therefore, the current pressure output value is displayed.

2) Display Format Buttons
It displays and allows selection of the display format for the EC monitor data. Touching the button toggles the display format between decimal and hexadecimal.

When the display format is in the decimal system, it shows the display in real numbers or integral numbers followed by a unit. When the display format is in the hexadecimal system, it shows the display in hexadecimal numbers followed by ‘h’ as a representative of hexadecimal system.

Fields with a gray background indicate that the axis is not subject to EC monitor data output (e.g., unsupported axes).

Page Up Page Dn button
Displayed when all axes cannot fit on a single screen (up to 8 axes). Touching this button switches the range of axis numbers displayed.

Touch the Back button and the screen goes back to the previous.

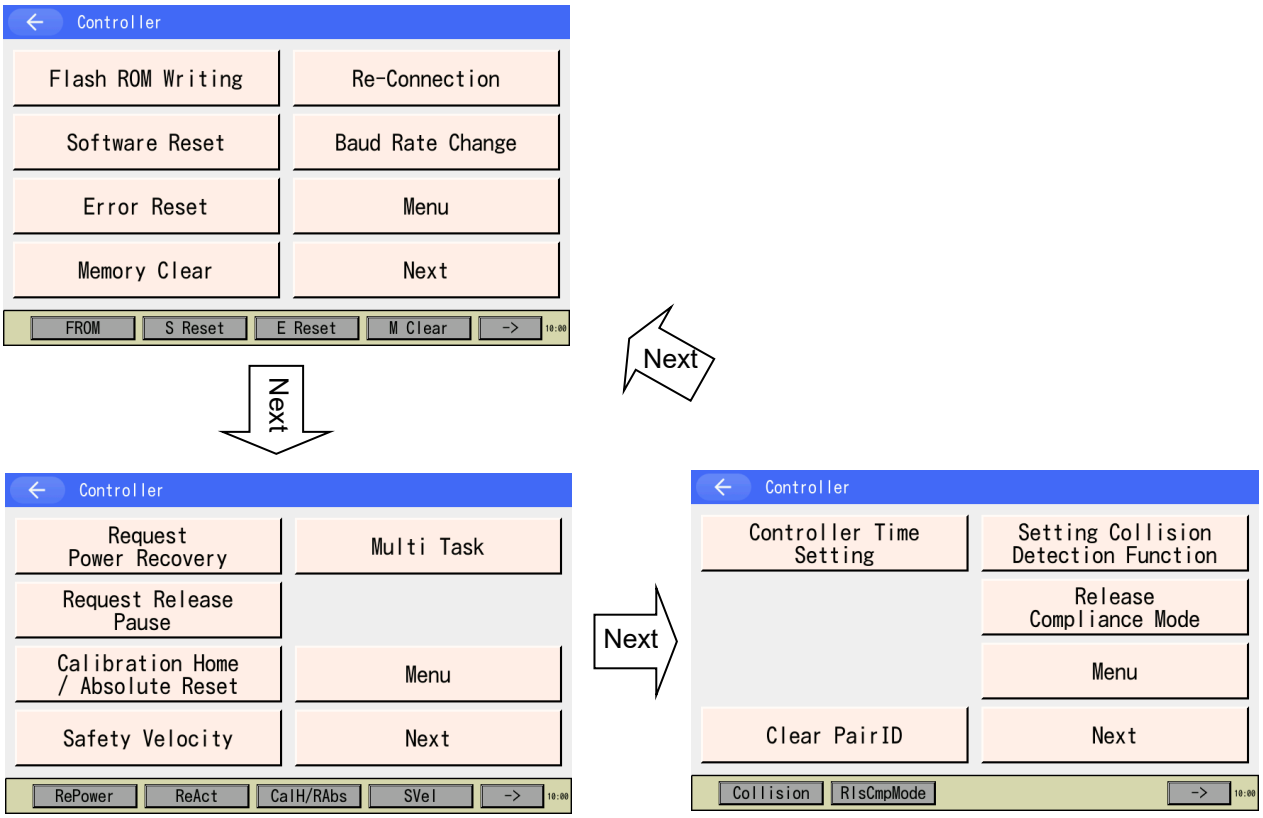
15. Controller

How to execute operation related to the controller such as a software reset and an error reset.



Touch Controller button in the menu screen.

15.1 Controller Items

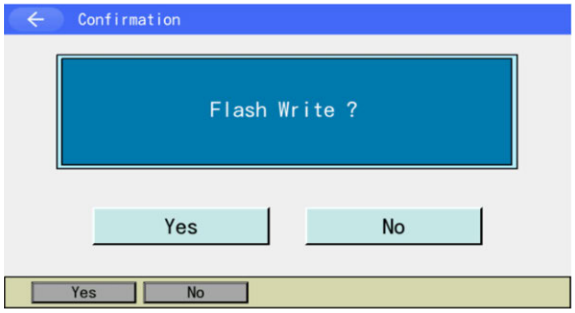


* The types and the positions of the buttons shown on the screen differ depending on the model types.

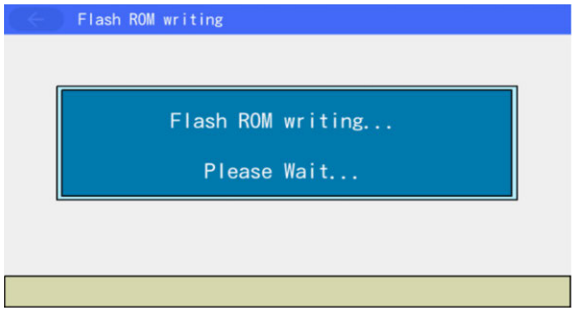
Flash ROM Writing	:	Conducts flash ROM writing
Software Reset	:	Conducts software reset on controller
Error Reset	:	Resets the controller error
Memory Clear	:	Clears each memory on controller
Re-Connection	:	Conducts reconnection of the controller
Baud Rare Change	:	Changes the baud rate for communication with the controller
Request Power Recovery	:	Demands the drive source recovery to the controller
Request Release Pause	:	Demands the cancellation of pause to the controller
Absolute Reset	:	Resets the absolute data. (In some models, it may be displayed as Home Position Adjustment / Absolute Reset. In such a case, adjust the home position and reset the absolute data.)
Safety Velocity	:	Switches valid/invalid of safety speed limit at Manual Mode
Multi Task	:	Allows simultaneous operation of multiple programs at Manual Mode. (for applicable models only)
Time Setting	:	Time setting should be established in the controller. (for applicable models only)
Clear PairID	:	The battery-less absolute encoder identification (Pairing ID) should be cleared (only for applicable models and when the feature is activated).
Setting Collision Detection Function	:	Collision detection function should be switched valid/invalid (only for applicable models and the feature is enabled).
Release Compliance Mode	:	Compliance mode can should be release (only for applicable models and the feature is enabled).
Axis Number Assignment	:	Axis number assignment that is necessary after change of unit construction should be conducted (for applicable models only).
Input/Output Port Assignment	:	Assignment of the input and output ports should be conducted on the fieldbus and option unit (for applicable models only).
Input/Output Port Data Assignment	:	Assignment of the monitor data output, output feature select and input feature select and also port assignment should be conducted (for applicable models only).
Option Unit	:	The setting for the option unit should be performed (only for applicable models and the feature is enabled).
EC Operation Mode	:	ELECYLINDER operation mode should be switched over (only for applicable models and the feature is enabled).
Brake Control	:	Switch over brake compulsory release and lock (for applicable models only)

15.2 Flash ROM Writing

After clearing the data from Flash ROM, write data which is saved in controller memory to Flash ROM.

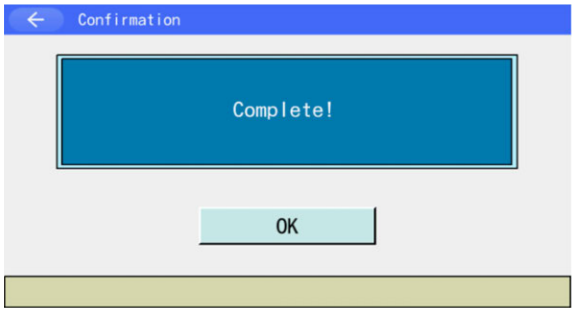


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

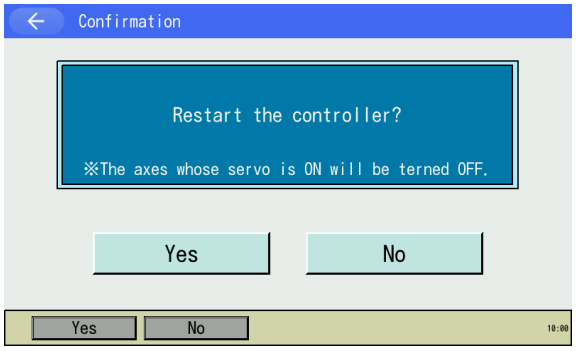
Never turn off the power to the Controller at this time.



Flash ROM writing is completed.
Touch OK button to return to the Controller menu screen.

15.3 Software Reset

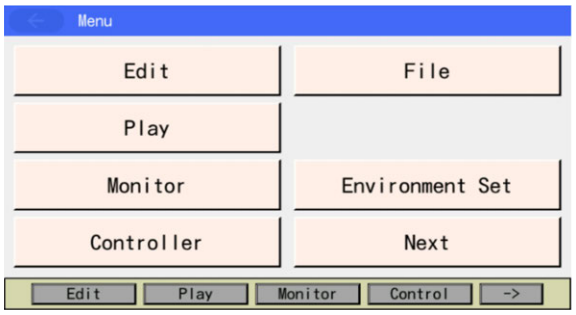
Executes software reset of the controller. The data which is not written to Flash ROM will be cleared.



Touch Yes button when you want to have a software reset.
When the software reset is not necessary, touch No button. The display returns to Controller Menu.



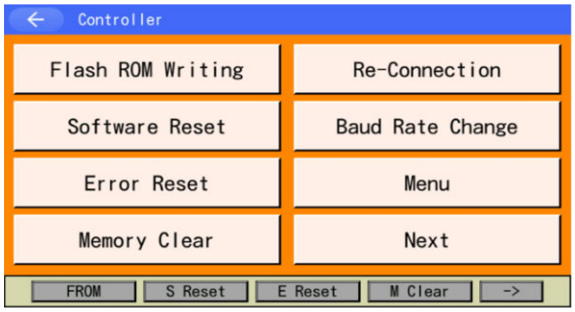
The screen shown on the left is displayed during the software reset.



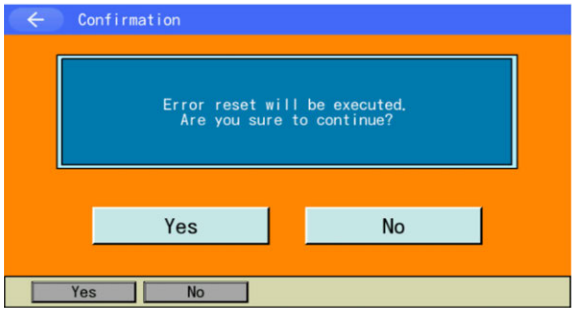
Once the software reset is complete, the display returns to the main menu screen.

15.4 Error Reset

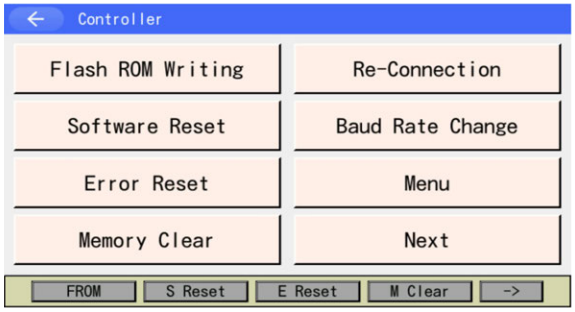
Executes error reset of the controller. Reset the message-level and action-release-level errors. If the cause of an error is already removed, the background color is changed from orange to white which shows in normal condition.



The background color is orange when an error is being generated.
Touch Error Reset button.



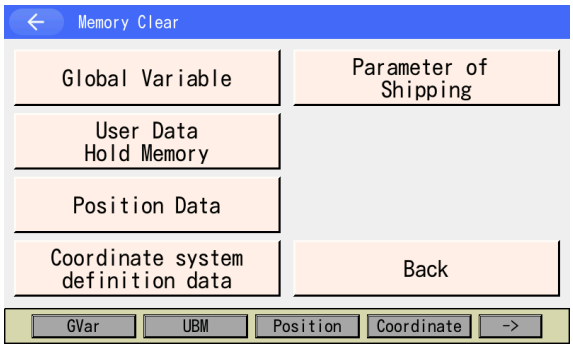
Touch Yes button when you want to have an error reset.
When the error reset is not necessary, touch No button.



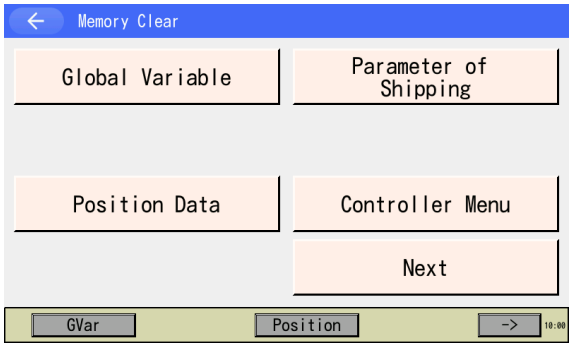
As shown in the figure on the left, if the cause of an error is already removed, the background color is changed from orange to white which shows in normal condition.

15.5 Memory Clear

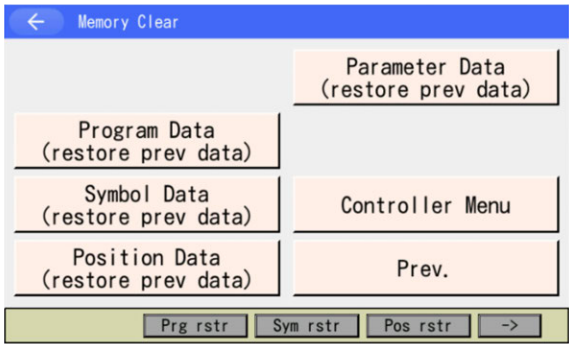
15.5.1 Memory Initialization Items



Example for Memory Initializing Menu Screen (XSEL-RXD/SXD)



Example for Memory Initializing Menu Screen (TTA)



(2nd page in the same section)

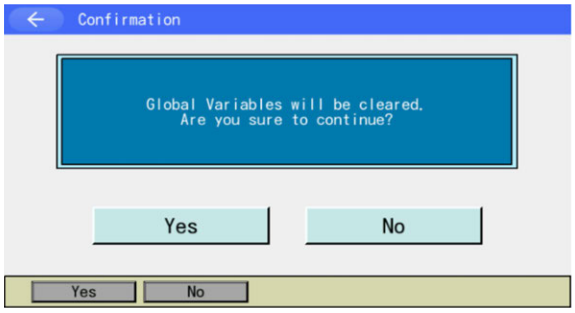
* The types of buttons to be displayed will differ depending on models.

Global Variable	:	Conducts Zero-Clear to global variables
User Data Hold Memory	:	Initializes the user data hold memory (for XSEL-P/Q, PX/QX, R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX and RAXD/SAXD equipped with gateway function)
Position Data	:	Clears all the position data (XSEL- R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX, RAXD/SAXD TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF, RSEL and XSEL2-T/TX only)
Coordinate system definition data	:	Clears all the coordinate system definition data (XSEL-RX/SX, RXD/SXD RA/SA, RAX/SAX, RAXD/SAXD, MSEL-PCX/PGX, RSEL and XSEL2-TX only)
Parameter of Shipping	:	Set the parameters back to the condition of delivery from the production plant. (For SSEL, ASEL, PSEL, XSEL-R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX and RAXD/SAXD, TTA AC Servo Type / High-Resolution Type, MSEL High-Resolution Type, RSEL and XSEL2-T/TX)

Program Data (restore prev data)	:	Recover the flash ROM writing data for the program data to the writing data of one generation before. (TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF only)
Symbol Data (restore prev data)	:	Recover the flash ROM writing data for the symbol data to the writing data of one generation before. (TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF only)
Position Data (restore prev data)	:	Recover the flash ROM writing data for the position data to the writing data of one generation before. (TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF only) (Note) No. 1 to 10000 cannot be recovered.
Parameter Data (restore prev data)	:	Recover the flash ROM writing data for the parameter data to the writing data of one generation before. (TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF only)

15.5.2 Global Variable

Conducts Zero-Clear (initialization) to global variables



Touch Yes button when you want to initialize the global variables.
When the initialization of the global variables is not necessary, touch No button.



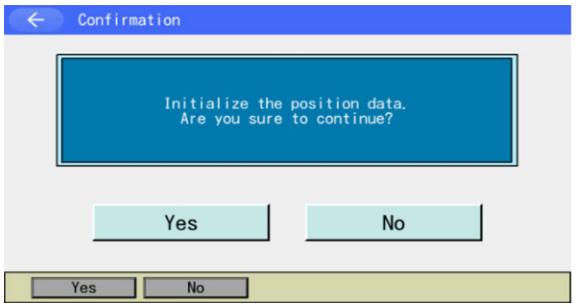
If the initialization of the global variables is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

15.5.3 User Data Hold Memory

Refer to [17.3 User Data Hold Memory Initialization].

15.5.4 Position Data (XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/RAXD/SAXD, TTA , MSEL-PC/PG/PCF/PGF/PCX/PGX, RSEL and XSEL2-T/TX Only)

Position data is cleared.
Initialize the position data by using this function in case 6BD “Position Data Construction Change Error” or 6BF “Position Data Sum Check Error” (20B "Position Error" for RSEL and XSEL2-T/TX) is occurred.
Note) 22B “Position Data Comment Loss Error” (409 "Position Data Comment Error" for RSEL and XSEL2-T/TX) will be generated if a software reset is conducted or the power is turned off without writing the position data to the flash ROM after this function is used.

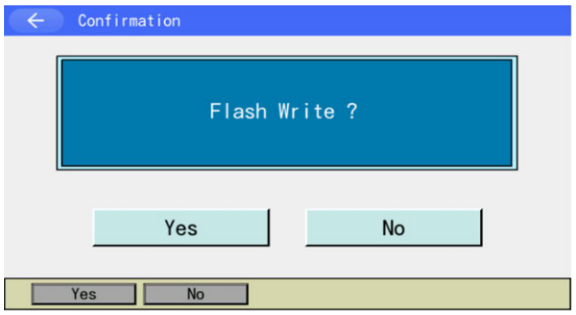


Touch Yes button when you want to initialize the position data.
When the initialization of the position data is not necessary, touch No button.

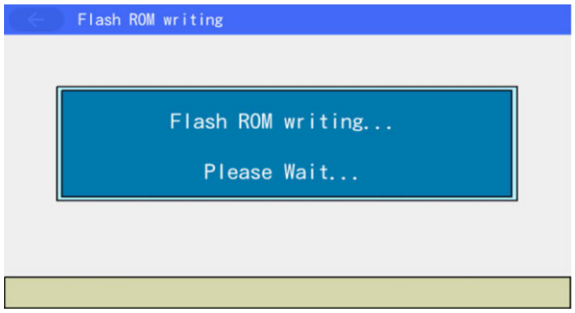


If the initialization of the position data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

Touch Back button to return to Flash ROM writing screen.

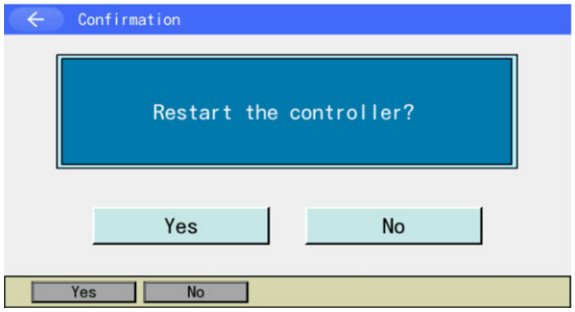


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

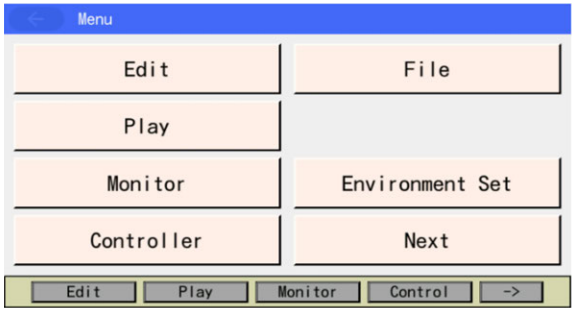
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
Touch Yes button.

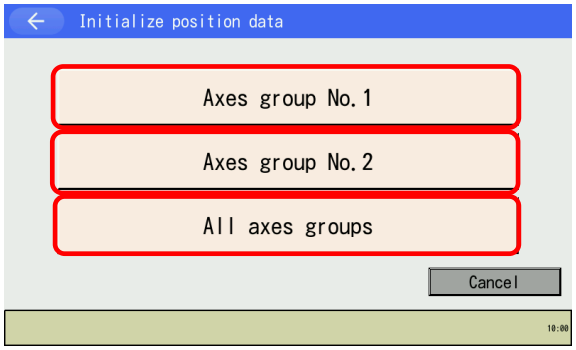


The screen shown on the left is displayed during the software reset.



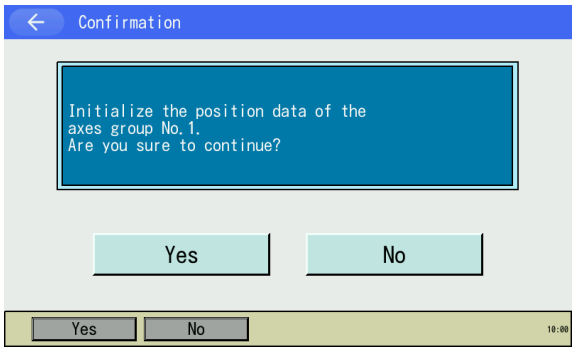
Once the software reset is complete, the display returns to the main menu screen.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Position button. Touch (an) axes group number button or all axes groups at once button to select the axes group number(s) that is/are to be subject to.



Touch a button to select (an) axes group number(s) that you require to have the position data initialized.

If you touch the All axes groups button, all the axes groups fall into that to be subject to.

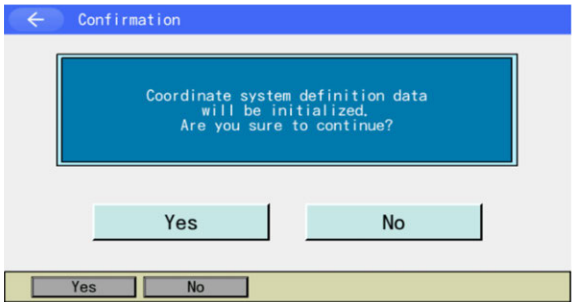


Touch the Yes button when required to initialize the position data.
Touch the No button when not required to initialize the position data.

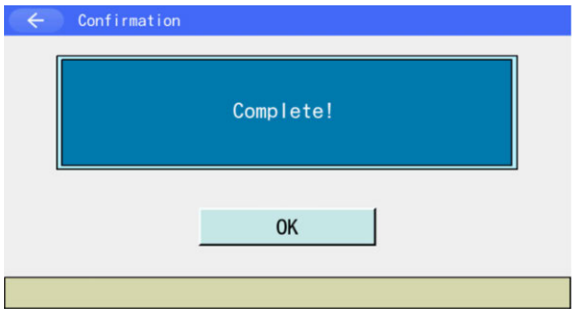
* The figure on the left shows a case of selecting Axis Group No. 1 as an example

15.5.5 Coordinate System Data (XSEL-RX/SX/RXD/SXD/RAX/SAX/RAXD/SAXD, MSEL-PCX/PGX, RSEL and XSEL2-TX Only)

All the coordinate system definition data is cleared.
Initialize the coordinate system definition data by using this function in case D40 “Coordinate System Data Control Area Sum Check Error”, D41 “Coordinate System Control Area ID Error” or D42 “Coordinate System Data Sum Check Error” (623 “Coordinate System Error” for RSEL and XSEL2-TX) is occurred.

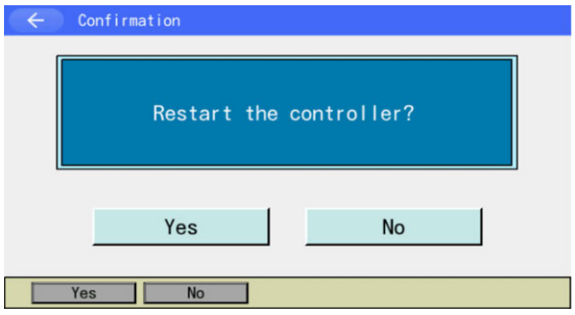


Touch Yes button when you want to initialize the coordinate system data.
When the initialization of the coordinate system data is not necessary, touch No button.



If the initialization of the coordinate system data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

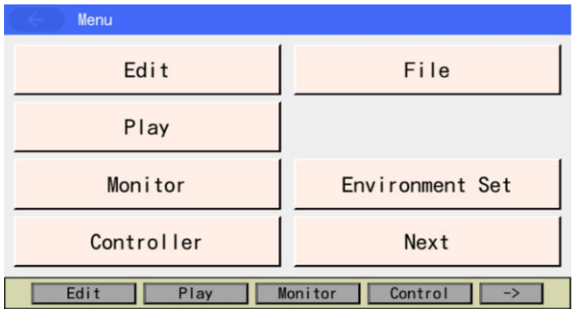
Touch Back button to return to the controller reset screen.



Touch Yes button.



The screen shown on the left is displayed during the software reset.

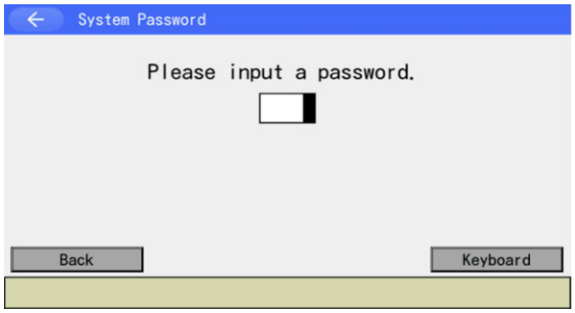


Once the software reset is complete, the display returns to the main menu screen.

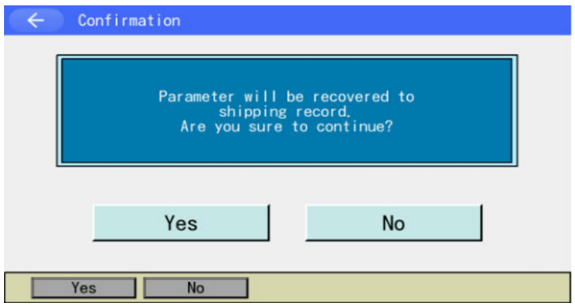
15.5.6 The value of this parameter at the factory

(SSEL, ASEL, PSEL, XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/ RAXD/SAXD, TTA AC Servo Type / High-Resolution Type, MSEL High-Resolution Type, RSEL and XSEL2-T/TX)

Set the parameters back to the condition of delivery from the production plant.



The password input window appears.
Input 5119
on the keyboard.

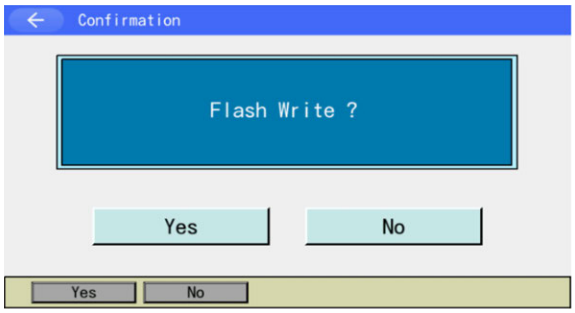


To set the parameters back to the condition of delivery from the production plant, touch Yes button.
If not to set the parameters back to the condition of delivery from the production plant, touch No button.

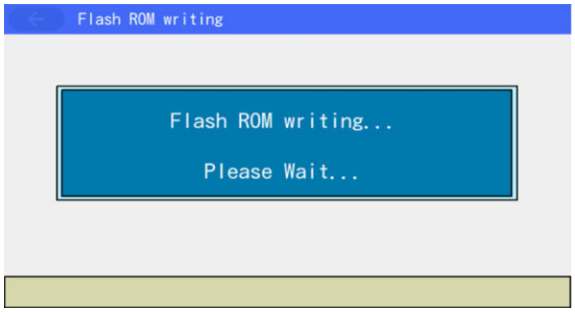


Once the process is complete, the window changes as shown in the figure in the left. Touch OK button, and returns to the memory initializing menu window.

Return to the flash ROM writing window by using the return button.

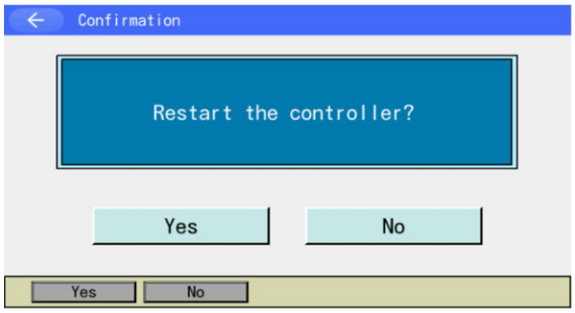


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

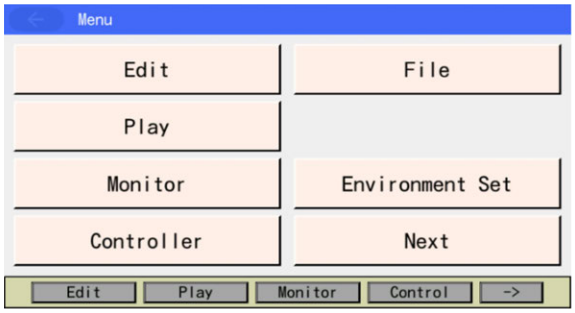
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
Touch Yes button.



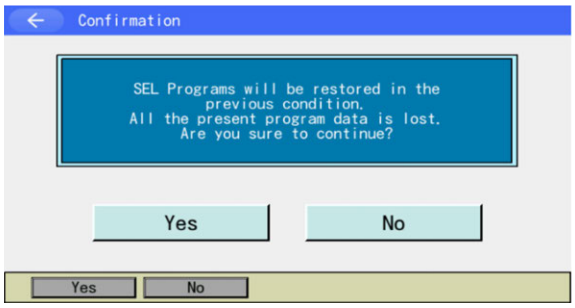
The screen shown on the left is displayed during the software reset.



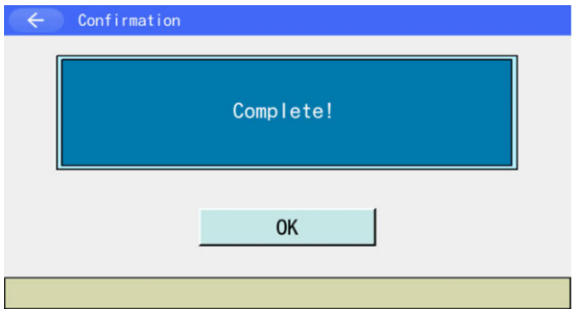
Once the software reset is complete, the display returns to the main menu screen.

15.5.7 Program Data (Previous Value Restore)

The flash ROM writing data in the program data is recovered to the writing data of one generation before.

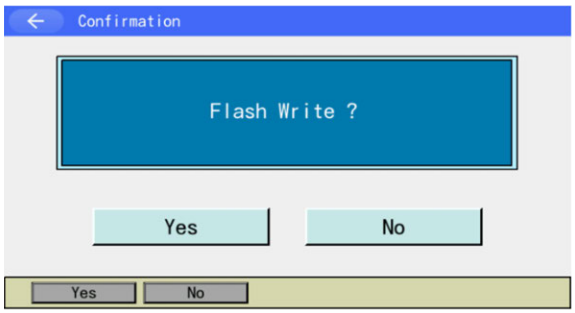


Touch Yes button when you want to set the program data one generation before.
When it is not necessary to set the program data one generation before, touch No button.

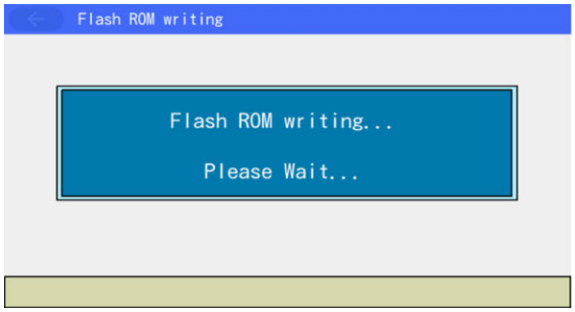


If the recovery of the program data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

Touch Back button to return to Flash ROM writing screen.

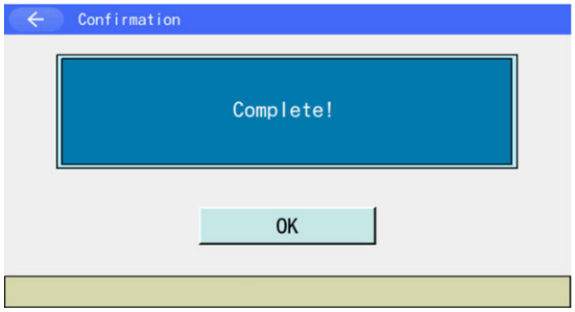


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

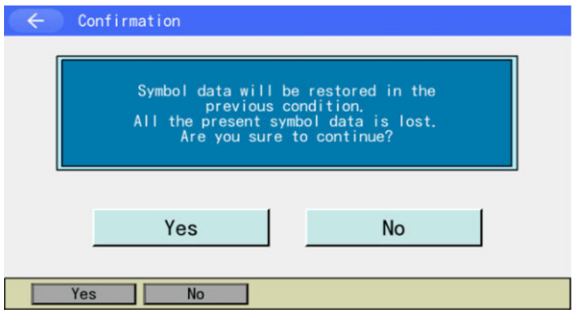
Never turn off the power to the Controller at this time.



Flash ROM writing is complete.
Touch OK button to return to the edit menu screen.

15.5.8 Symbol Data (Previous Value Restore)

The flash ROM writing data in the symbol data is recovered to the writing data of one generation before.



Touch Yes button when you want to set the symbol data one generation before.
When it is not necessary to set the symbol data one generation before, touch No button.



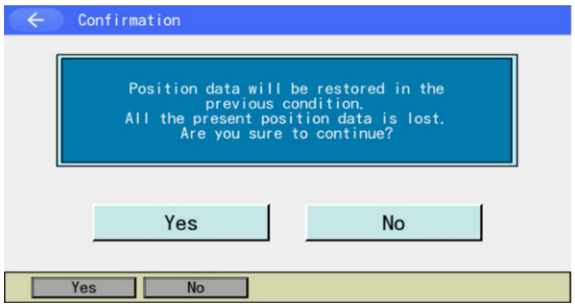
If the recovery of the symbol data is finished, the display changes to the screen shown on the left. Touch OK button to return to Memory Initialization Menu screen.

Touch Back button to return to Flash ROM writing screen.

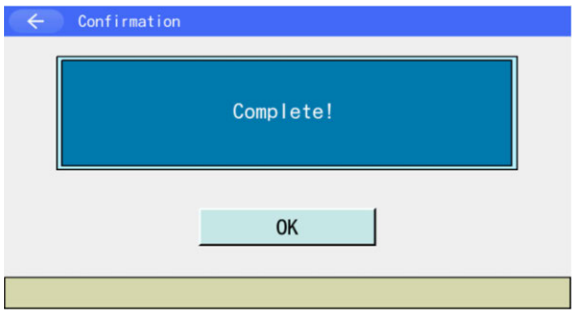
The way to write to the flash ROM is the same as [15.5.7 Program Data (Previous Value Restore)].

15.5.9 Position Data (Previous Value Restore)

The flash ROM writing data in the position data is recovered to the writing data of one generation before.
Also, Position Data No. 1 to 10000 cannot be recovered.



Touch Yes button when you want to set the position data one generation before.
When it is not necessary to set the position data one generation before, touch No button.



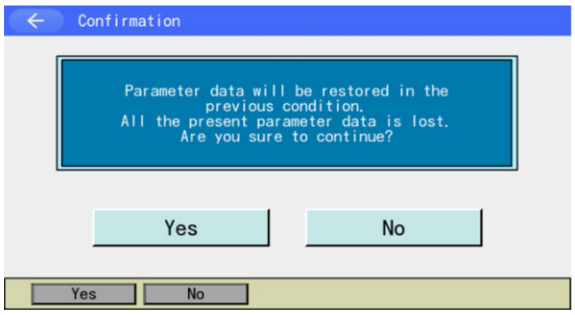
If the recovery of the position data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

Touch Back button to return to Flash ROM writing screen.

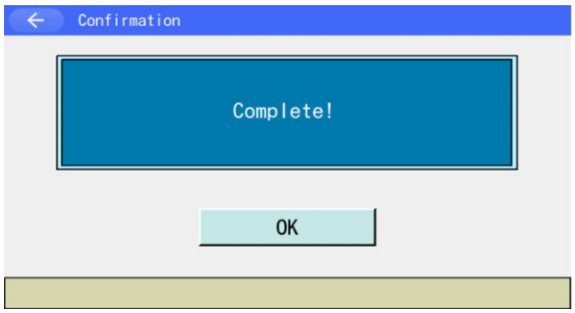
The way to write to the flash ROM is the same as [15.5.7 Program Data (Previous Value Restore)].

15.5.10 Parameter Data (Previous Value Restore)

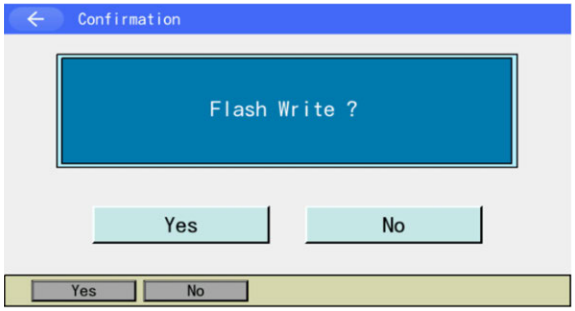
The flash ROM writing data in the Parameter data is recovered to the writing data of one generation before.



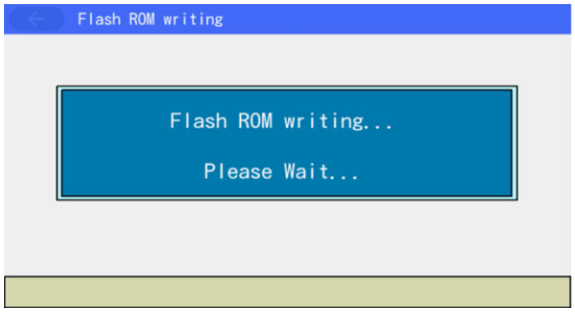
Touch Yes button when you want to set the parameter data one generation before.
When it is not necessary to set the parameter data one generation before, touch No button.



If the recovery of the parameter data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.
Touch Back button to return to Flash ROM writing screen.

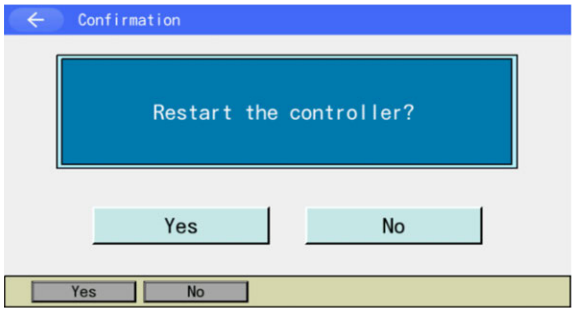


To write the data to Flash ROM, touch Yes button.
If writing is not necessary, touch No button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

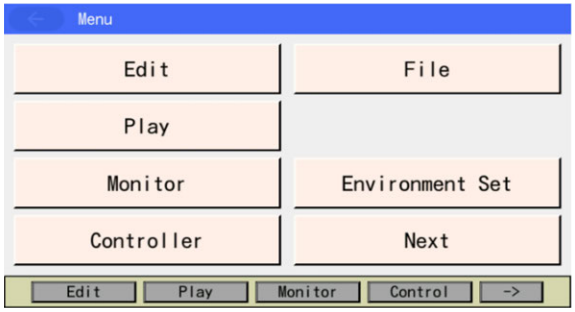
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset.
Touch Yes button.



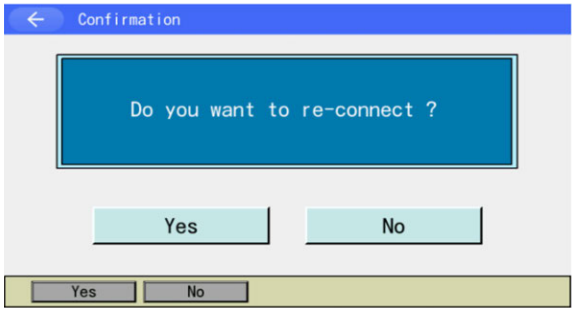
The screen shown on the left is displayed during the software reset.



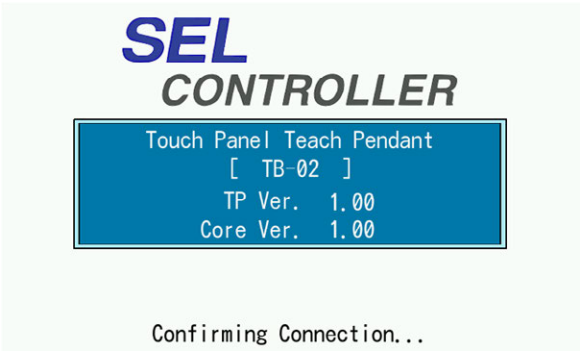
Once the software reset is complete, the display returns to the main menu screen.

15.6 Re-Connection

Re-connect to the controller.



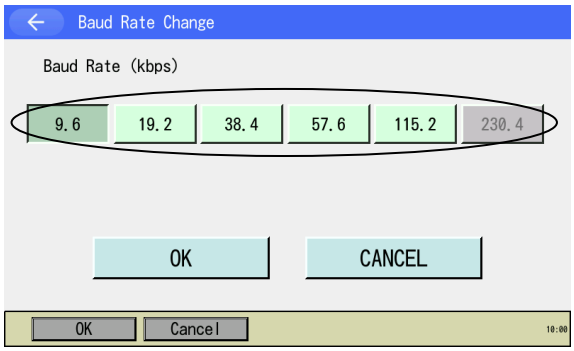
Touch Yes button when you want to reconnect the controller.
When it is not necessary to reconnect the controller, touch No button.
Once you touch Yes button, the reboot of this teaching pendant starts.



The screen shown on the left is displayed after IAI logo mark is shown.
“Confirming Connection …” flashes during reconnection process.
The display returns to the menu screen after reboot.

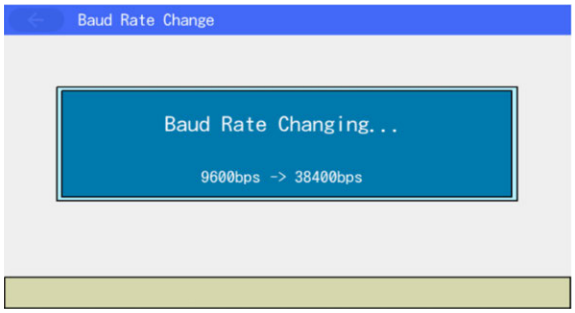
15.7 Baud Rate Change

Changes the communication baud rate between the controller and the teaching pendant.



Touch a button for the baud rate of change.
Touch OK button when you change the baud rate.
When change of the baud rate is not necessary, touch CANCEL button.
If the baud rate is changed, the connection will be established with the changed baud rate from the next connection.

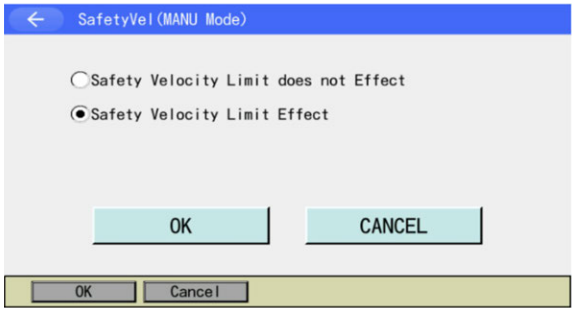
* The button for the baud rate unsupported by the connected controller, is displayed in gray. Selection is not available.
* When the unsupported baud rate has been set due to the connection to the other controller, the baud rate is changed to the connection available baud rate automatically and the controller is connected.



"Baud Rate Changing …" flashes during the baud rate change.
The display returns to Controller Menu screen after the baud rate change.

15.8 Safety Velocity

Switches the safety velocity limit status at manual mode.

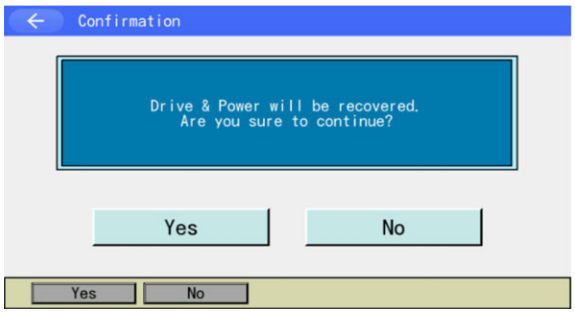


Safety Velocity Limit does not Effect…
There is no safety speed limitation
Safety Velocity Limit Effect…
There is safety speed limitation

(No matter what the settings are for the programs and parameters, the maximum velocity for orthogonal axis is 250mm/s or less, CP operation 250mm/s or less for SCARA and PTP operation at 3% or below.)
Touch a radio button and select.
Touch OK button when you switch the valid/invalid of the safety speed limitation.
When the valid/invalid of the safety speed limitation is not necessary to be changed, touch CANCEL button.

15.9 Driver Power Recovery Request

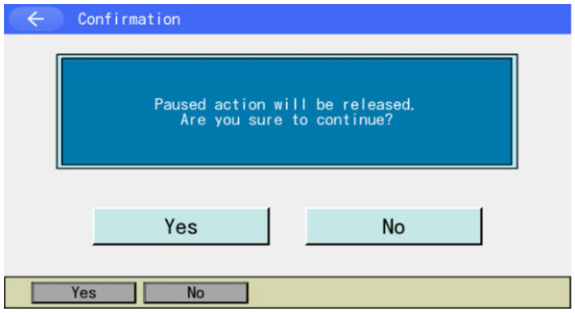
Requests to recover driver power to the controller.



To demand the driver power recovery request, touch Yes button. The display returns to the previous screen.
When it is not necessary to demand the driver power recovery request, touch No button. The display returns to the previous screen.

15.10 Action Pause Release Request

Requests to release action pause to the controller.

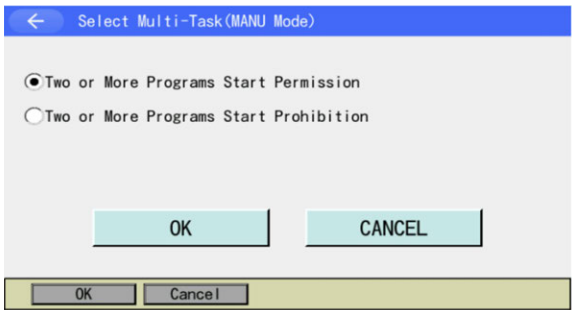


To demand the cancellation of the operation pause, touch Yes button. The display returns to the previous screen.
When it is not necessary to demand the cancellation of the operation pause, touch No button. The display returns to the previous screen.

15.11 Simultaneous Operation of Multiple Programs

Set whether to allow simultaneous operation of multiple programs or not at Manual Mode.
When it is set to forbid, multiple programs cannot be executed at the same time. (Error No. 913 Multiple Program Simultaneous Operation Forbidden Error (No. 21D for RSEL and XSEL2-T/TX)

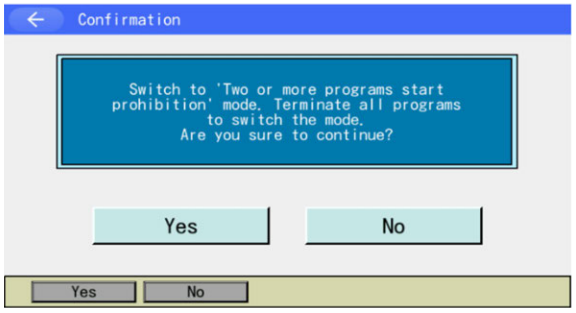
* This function is valid only for the following models :
  - XSEL-P/Q (MAIN Application from Version 0.36)
  - XSEL-PX/QX (MAIN Application from Version 0.17)
  - XSEL-R/S, RX/SX, RXD/SXD (MAIN Application from Version 0.01)
  - XSEL-RA/SA, RAX/SAX, RAXD/SAXD (MAIN Application from Version 0.01)
  - SSEL, ASEL, PSEL (MAIN Application from Version 0.01) (* only in the program mode.)
  - MSEL-PCX/PGX/PC/PG/PCF/PGF (MAIN Application from Version 0.01)
  - RSEL (MAIN Application from Version 0.01)
  - XSEL2-T/TX (MAIN Application from Version 1.00)



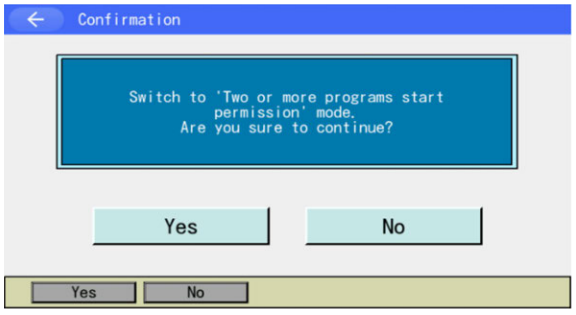
Two or More Programs Start Permission
Simultaneous operation of multiple programs is allowed.

Two or More Programs Start Prohibition
Simultaneous operation of multiple programs is forbidden.

Touch a radio button and select.
When you want to change the condition of allowance for the simultaneous operation of multiple programs, touch OK button.
When it is not necessary to change the condition of allowance for the simultaneous operation of multiple programs, touch CANCEL button.



When you select to forbid the simultaneous operation of multiple programs, the confirmation screen will be displayed.
To establish the setting, touch Yes button.
When it is not necessary to establish the setting, touch No button.



When you select to allow the simultaneous operation of multiple programs, the confirmation screen will be displayed.
To establish the setting, touch Yes button.
When it is not necessary to establish the setting, touch No button.

15.12 Driver Power Recovery Request and Action Pause Release Request

15.12.1 In the Case of Controller Other Than SSEL, ASEL and PSEL Controllers

(1) Driver Power Recovery Request

1) Case which requires executing Driver Power Recovery Request
   Only the following case requires executing Driver Power Recovery Request:
   - When you set 1 in I/O parameter No. 44, Driver Power Cut-off cause occurs → Recovery after the main cause of cut-off is solved.
2) How to execute Driver Power Recovery Request
   Select Controller → Next → Request Power Recovery from the menu to execute.

(2) Action Pause Release Request

1) Case which requires Action Pause Release Request
   Each of the following cases requires executing Action Pause Release Request:
   - When you set 2 on other parameter No. 9 (Deadman SW recovery type = action continuation recovery [during automatic operation only]), stop according to deadman SW during automatic operation → recovery after releasing stop (action pause release).
   - When you set 2 on other parameter No. 10 (emergency stop recovery type = action continuation recovery [during automatic operation only]), emergency stop during automatic operation → recovery after emergency stop release (action pause release).
   - When you set 2 on other parameter No. 11 (safety gate OPEN time recovery type = action continuation recovery [during automatic operation only]), safety gate OPEN during automatic operation → recovery after safety gate CLOSE (action pause release).
   - When you set 1 on I/O parameter No. 36 (input selection function 006 = pausing action signal), OFF level input on input port No. 6 during automatic operation (pausing action) → recovery after ON level input on input port No. 6 (action pause release).
2) How to execute Action Pause Release Request
   Select Controller → Next → Request Release Pause from the menu to execute.

* If case (1) 1) and (2) 1) occur at the same time, you need to first execute Driver Power Recovery Request. After completing it, execute the Action Pause Release Request.

15.12.2 In the Case of SSEL, ASEL or PSEL Controller

(1) Driver Power Recovery Request

1) Case which requires executing Driver Power Recovery Request
   Only the following case requires executing Driver Power Recovery Request:
   - When you specify any input port for the driver power cut-off release input signal (dedicated function), driver power cut-off occurs → recovery after the main cause of cut-off is solved.
2) How to execute Driver Power Recovery Request
   Select Controller → Next → Request Power Recovery from the menu to execute.

(2) Action Pause Release Request

1) Action Pause Release Request
   Each of the following cases requires executing Action Pause Release Request:
   - When you set 2 on other parameter No. 10 (emergency stop recovery type = action continuation recovery [during automatic operation only]), emergency stop during automatic operation → recovery after emergency stop release (action pause release).
   - When you set 2 on other parameter No. 11 (deadman SW/enable SW recovery type = action continuation recovery [during automatic operation only]), stop according to deadman SW or enable SW during automatic operation → recovery after releasing stop (action pause release).
   - Specify any input port for the action pause input signal (dedicated function). Set “8” (specified input function value) in the I/O parameter (No. 30 - No. 45, No. 251 - No. 258) corresponding to the input port No. (Refer to the [List of I/O functions and I/O parameters].) OFF level input in the input port No. specified during automatic operation (action pause) → recovery after ON level input on the input port No. (action pause release)
2) How to execute Action Pause Release Request
   Select Controller → Next → Request Release Pause from the menu to execute.

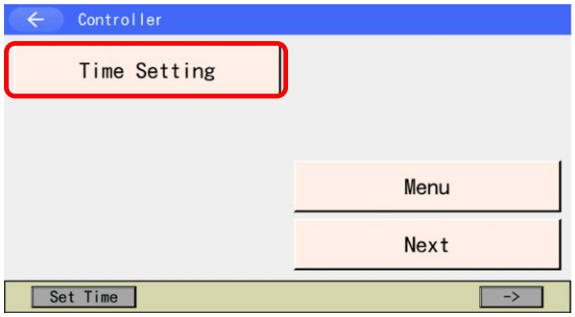
* If case (1) 1) and (2) 1) occur at the same time, you need to first execute Driver Power Recovery Request. After completing it, execute the Action Pause Release Request.

15.13 Time Setting

Time setting should be established in the controller.
The time displayed in the Error Detailed Data screen is the error occurrence time.

* This function is valid only for the following models :

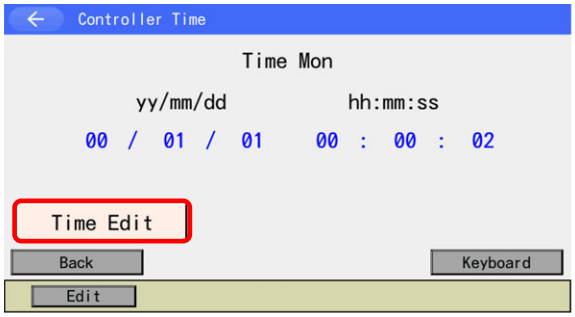
- XSEL-R/S, RX/SX, RXD/SXD (MAIN Application from Version 0.01)
- XSEL-RA/SA, RAX/SAX, RAXD/SAXD (MAIN Application from Version 0.01)
- TTA (MAIN Application from Version 0.01)
- MSEL-PCX/PGX/PC/PG/PCF/PGF (MAIN Application from Version 0.01)
- RSEL (MAIN Application from Version 0.01)
- XSEL2-T/TX (MAIN Application from Version 1.00)



Touch Time Setting button in Controller Menu screen.

* The position of the button may differ depending on the model to connect.
When the button is not displayed, touch Next button to switch the screen.

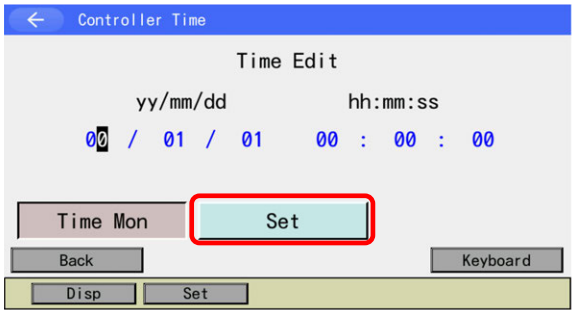
* The button would not be displayed when the connection is established to a model that does not support the controller clock.



Controller clock is displayed.

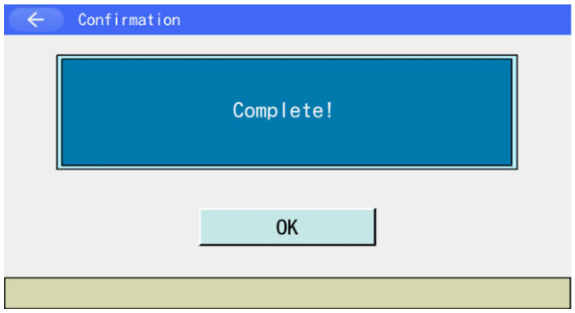
Touch Time Edit button to move to the edit screen.

Touch Time Edit button.



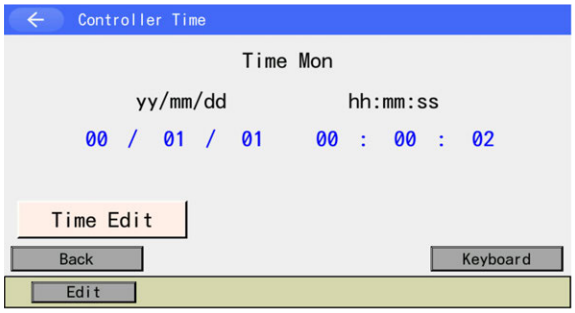
The controller clock can be edited.

1. Input the time on Keyboard.
2. Touch Set button.



The display turns to the confirmation screen when the controller clock setting is finished.

Touch OK button to return to the clock display screen.



The display returns to this screen.

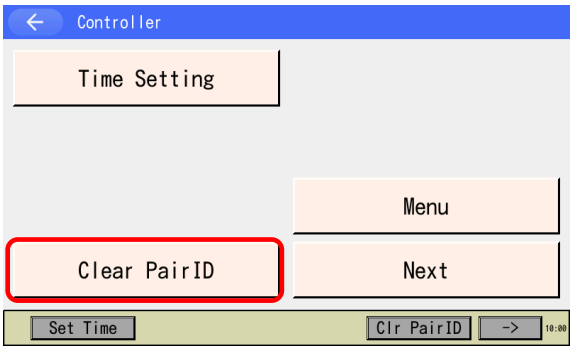
Touch Back button to return to Controller Menu screen.

15.14 Pairing ID Clear

The controller possesses a feature to output an absolute error when it checks the encoder I.D. and detects it is wrong. In case replacement is conducted with an actuator which the absolute reset has been executed, it is necessary to clear the existing I.D. (pairing I.D.).

This feature is available only when the battery-less absolute encoder is connected and the pairing I.D. clear feature is activated.

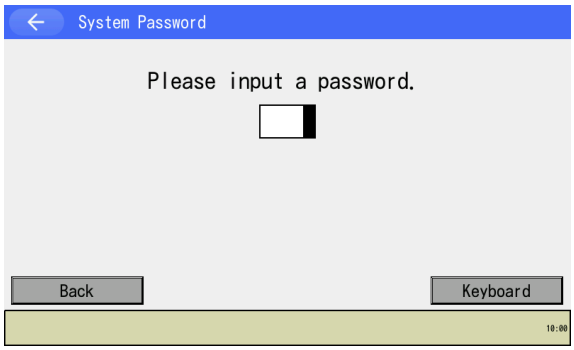
* This feature is the same as the pairing ID clear feature in the maintenance information.



Touch Clear PairID button in Controller Menu screen.

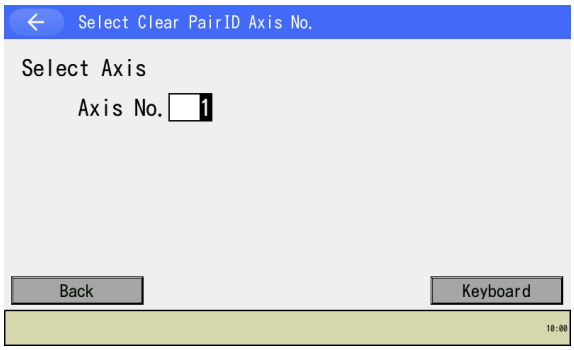
* The position of the button may differ depending on the model to connect.
  When the button is not displayed, touch Next button to switch the screen.

* The button will not be shown when the pairing ID clear feature is not activated.

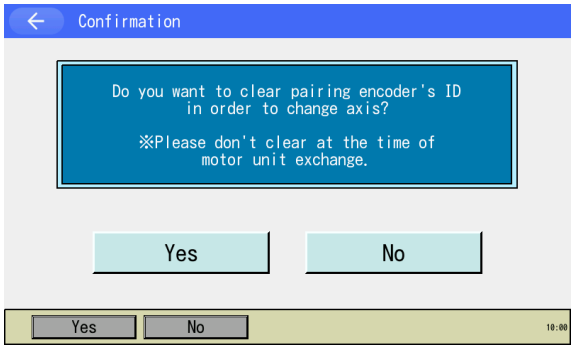


The password input window appears.
Input 5119 on the software numeric keys.

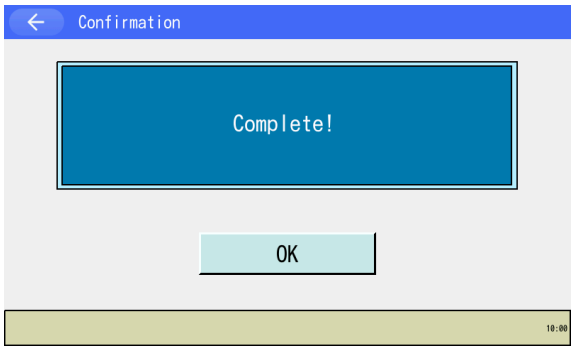
* Password will be kept valid once it has been set up until the connection gets established again or the power gets rebooted.



Input the axis number that you would like to have pairing ID clear conducted in Axis No. box using the software numeric keys.

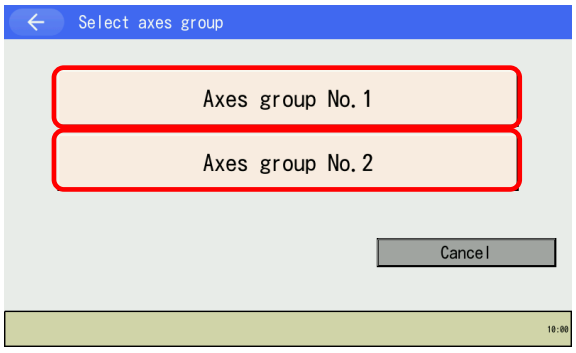


Touch Yes button when the paired I.D. is to be cleared.
Touch No button when the paired I.D. is not to be cleared.

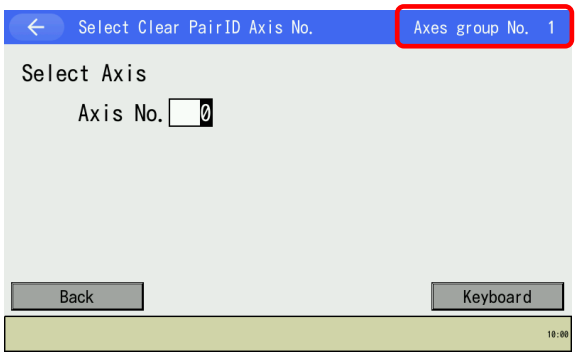


Once the process is completed, the screen changes to the figure shown in the left. Touch OK button to go back to axis number select screen.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you enter the password. Touch an axes group number button to select the axes group number that is to be subject to.



The select axes group window should appear after you enter the password.
Touch an Axes group No. button.



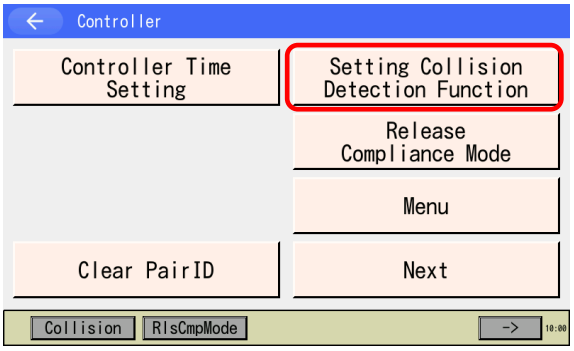
Select Clear Pair ID Axis No. window appears.

* The axes group number that was selected should be shown on the top right of the screen.

15.15 Setting Collision Detection Function

Collision detection function should be switched Enable/Disable. If the collision detection function is valid, there is a case that an axis cannot move after getting into a condition of collision detected when the servo gets turned while the axis is in contact with a peripheral. Use this feature to disable the collision detection function temporarily.

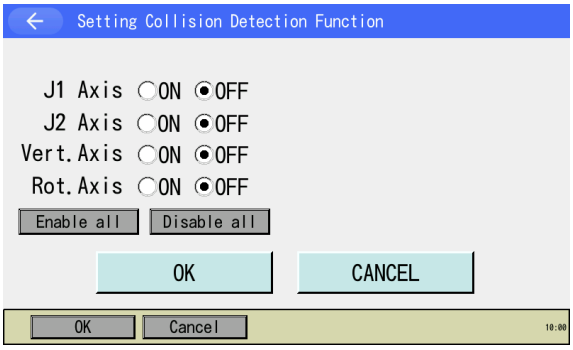
This feature is valid only when the controller and robot support the collision detection function and also the collision detection function is enabled.



Touch Setting Collision Detection Function button in Controller Menu screen.

* The position of the button may differ depending on the model to connect.
  When the button is not displayed, touch Next button to switch the screen.

* The button will not be shown when the pairing collision detection function is not activated.



The setting collision detection function window should be displayed.
(Initial display should be the current setting condition)

ON • • • • Collision detection function enable
OFF • • • • Collision detection function disable

Touch a radio button and select.
Touch OK button if you would like to change the setting. Touch CANCEL button if you would not change the setting.

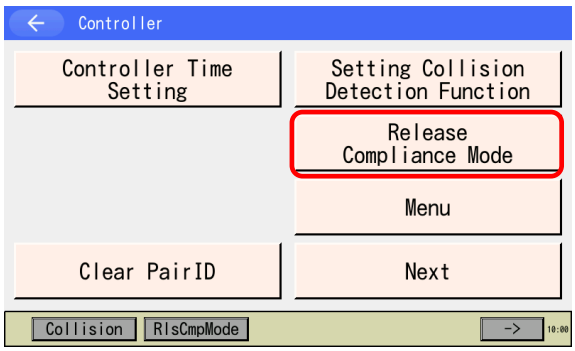
* Touch Enable all / Disable all buttons and radio button select can be switched over in SCARA unit.

* Rotary axis should not be displayed for three-axis SCARA.

15.16 Release Compliance Mode

Compliance mode should be release. When a SEL program using the compliance control gets interrupted due to such an occasion as an error occurrence, there may be a case that the compliance mode is kept valid. If it is required to switch back to the normal control, cancel the compliance mode using this feature.

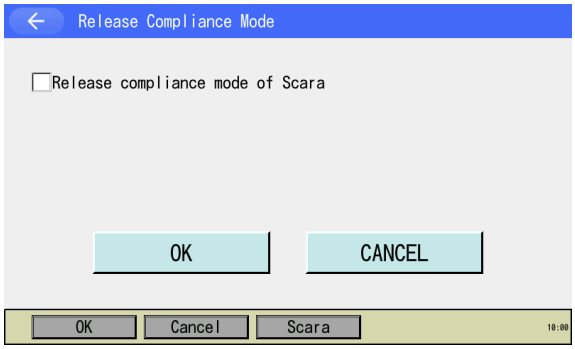
This feature is valid only when the controller and robot support the compliance control feature and also the compliance control function is enabled.



Touch Release Compliance Mode button in Controller Menu screen.

* The position of the button may differ depending on the model to connect.
  When the button is not displayed, touch Next button to switch the screen.

* The button will not be shown when the pairing compliance control function is not activated.

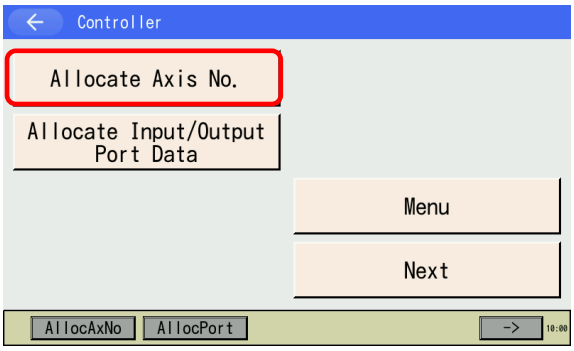


Turn on the check boxes for those you would like to have the compliance mode release, and then touch OK button.

Touch CANCEL button if you would not release the compliance mode.

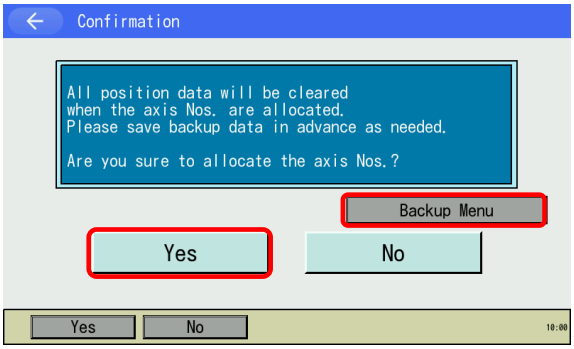
15.17 Axis Number Assignment

It is necessary to have an assignment of the axis numbers after a change to the unit construction for RSEL and XSEL2-T/TX. Assign the axis numbers using this feature.



Touch the Allocate Axis No. button in the controller menu window.

* The position of the buttons may differ depending on the connected models. In case of this button not displayed, touch the Next button to switch the window.
* The button should not appear if the axis number assignment feature is not activated.

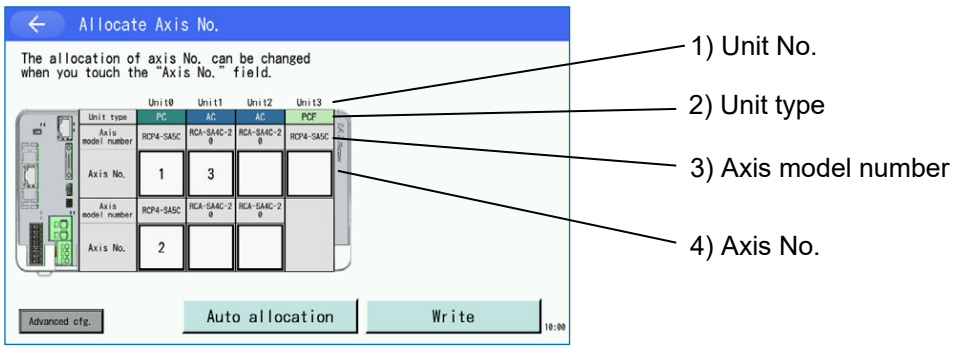


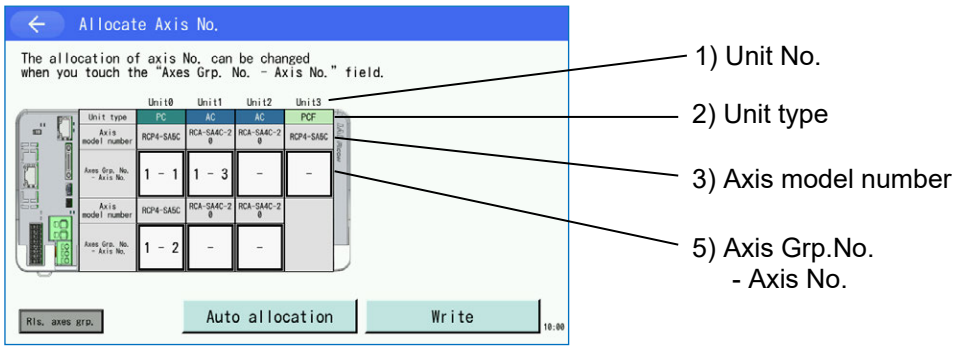
Once touching the Allocate Axis No. button, a confirmation window should come up. Conduct a data backup if necessary.
(Touch the Backup Menu button and it goes to the backup menu window.)

Touch the Yes button when required to assign the axis numbers.

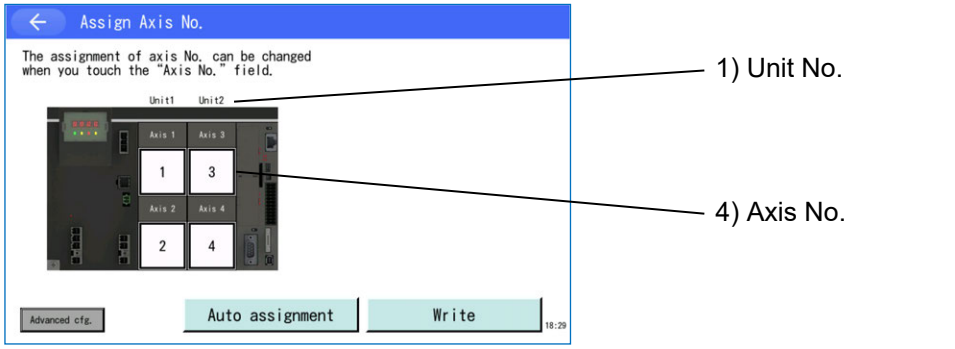
Once the axis number assignment is carried out, the current position data will be all cleared.

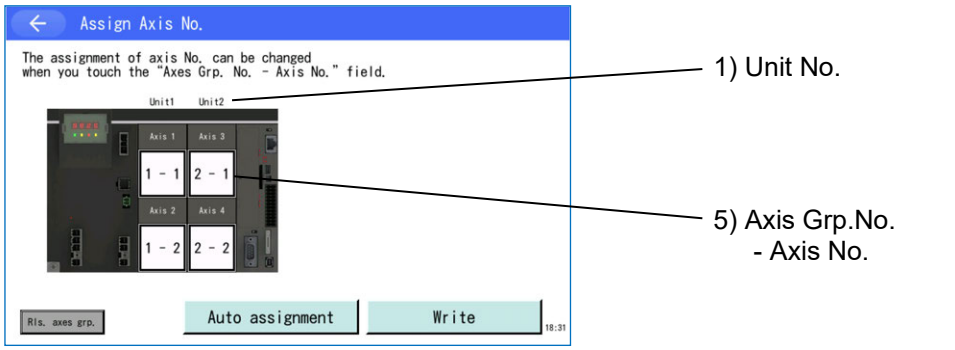
[Displayed Items in Allocate Axis No. Window (RSEL)]





[Displayed Items in Allocate Axis No. Window (XSEL2-T/TX)]





* The figure on the top shows a case of normal setting (axis number assignment without using axis groups). The one on the bottom shows the advanced setting (axis number assignment with using axis groups).

1) Unit Number Display
It shows the unit number of the driver unit.

2) Unit Type Display
It shows the unit type of the driver unit.

3) Axis Model Code Display
It shows the axis model code information acquired from the driver unit or the actuator unit.
It should show “Unknown” in case no axis model code information is acquired.

4) Axis Number Input Box
In the figure shows the position of the connectors to connect actuators.
The one on the top is for the 1st axis and bottom for the 2nd axis.
Input the axis number to assign to an actuator.
The axis number setting range is 1 to 8. Enter a not duplicated value for the axis number.

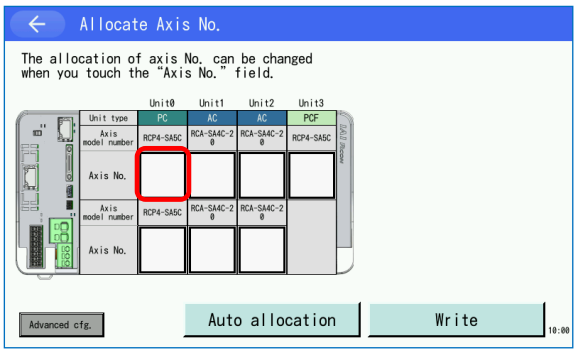
5) Axes Group Number - Axis Number Input Box
In the figure shows the position of the connectors to connect actuators.
The one on the top is for the 1st axis and bottom for the 2nd axis.
Input the axes group number - axis number to assign to an actuator.
The axis group number setting range is 1 to 2.
The axis number setting range is 1 to 8.
Make sure the axis group number you input - axis number are not duplicated.

Note: Make sure that there is a limit to the input values for RSEL combined axes.
(Refer to [15.17.3 Axis Number Assignment for Combined Axes])

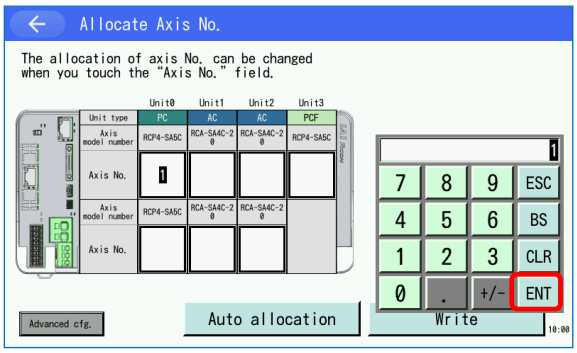
15.17.1 Basic Operation

[Assignment Change by Direct Input of Axis Number]

When it is preferred to indicate an axis number to assign to an actuator expressly, follow the procedures below to assign an axis number.

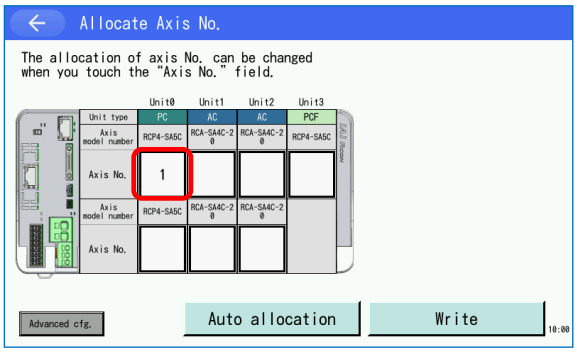


Touch in an input box for an axis number that you require to have an assignment change. A keyboard appears.

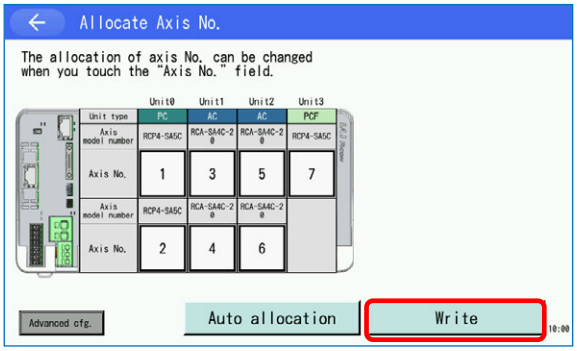


Input an axis number and touch the ENT button. The keyboard closes.

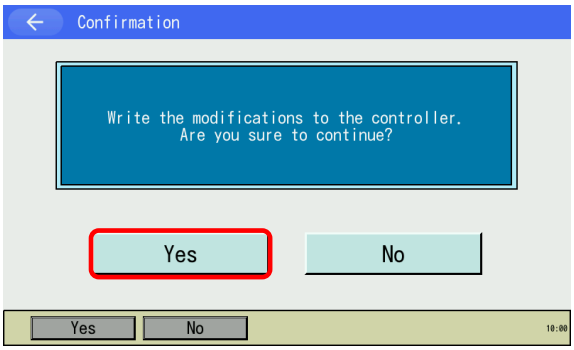
If it is required to cancel the assignment, touch CLR and ENT.



The value you input shows up in the axis number input box.

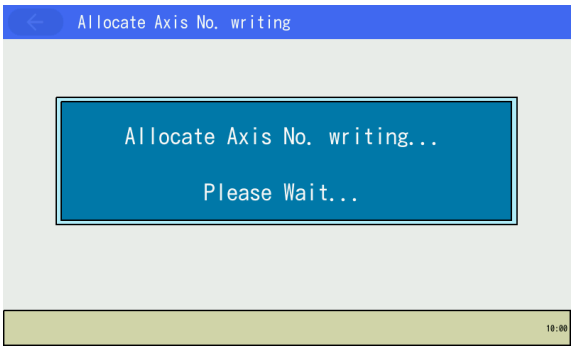


Have an input to all the points that you require to make assignment changes, and then touch the Write button. A confirmation window shows up.



Touch the Yes button. The contents that you edited should be written to the controller.

Note that the process cannot be cancelled once touching the Yes button.

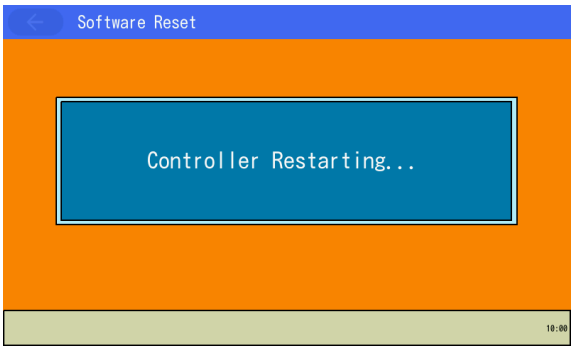


While in the process of axis number assignment writing, "Allocate Axis No. Writing..." flashes.

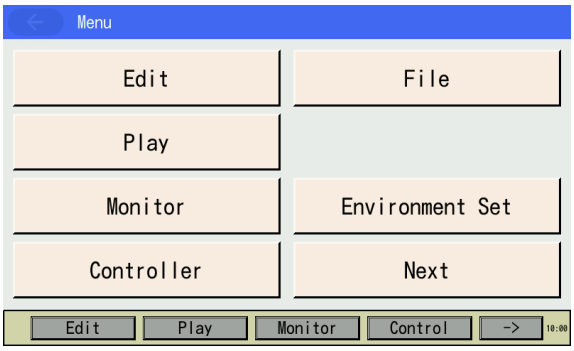
Never turn off the power to the Controller at this time.



Once the axis number assignment writing is complete, a confirmation window for controller reboot shows up. Touch the OK button. The software reset will be executed.

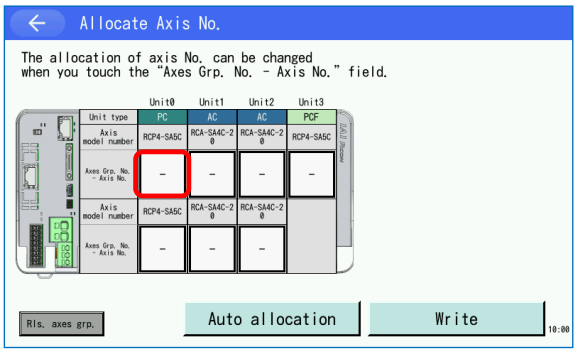


While in the process of controller reboot, “Controller Restarting...” flashes.

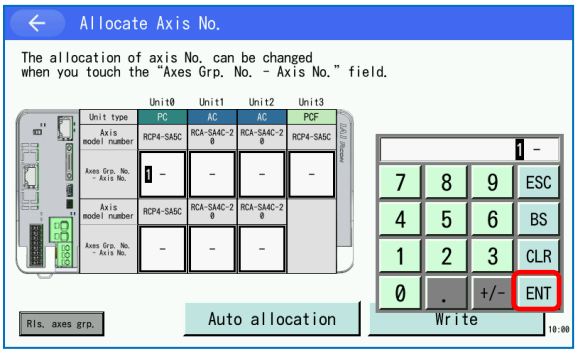


Once the reboot is complete, the main menu will appear.

When the axis number assignment mode is the advanced setting (axis number assignment with using axes groups), it is necessary to input an axes group number and axis number in a row in the axis number input.
(Refer to [15.17.2 Axis Number Assignment Mode Switchover] for how to switch over the axis number assignment mode.)

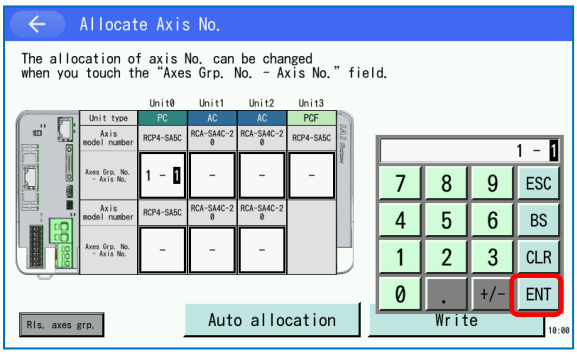


Touch an input box for Axes Grp. No. - Axis No. that you require to have an assignment change. A keyboard appears.



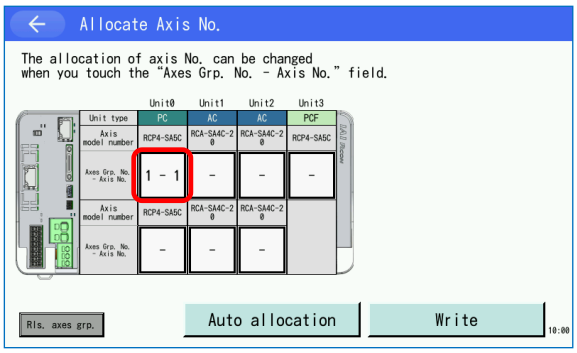
Input an axes group number and touch the ENT button.
The cursor moves to the axis number input position.

If it is required to cancel the assignment, touch CLR and ENT.



Input an axis number and touch the ENT button.
The keyboard closes.

Touch the ESC button and the input can be redone from the axes group number input.

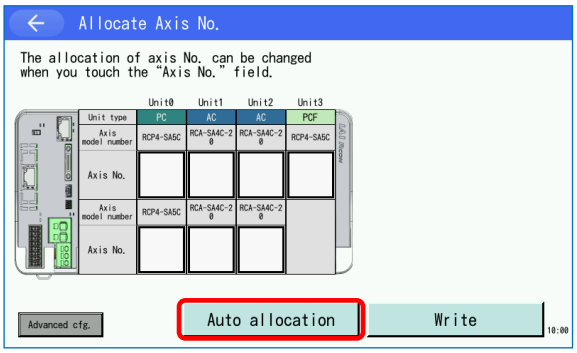


The value you input shows up in the axes group number - axis number input box.

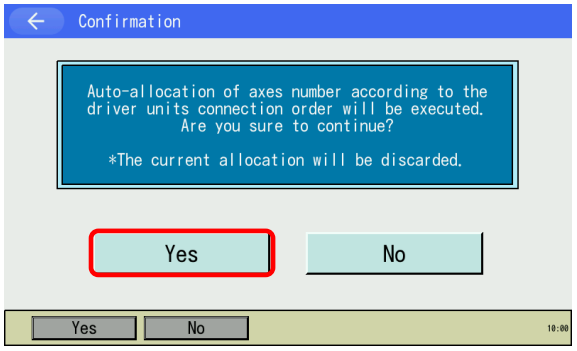
The process for writing in to the controller and other processes should be the same as those in the normal setting (axis number assignment without using axes group numbers).

[Axis Number Assignment Change by Axis Number Auto Assignment]

If you require to have an automatic input of an axis number to be assigned to an actuator, follow the procedures below to assign axis numbers.



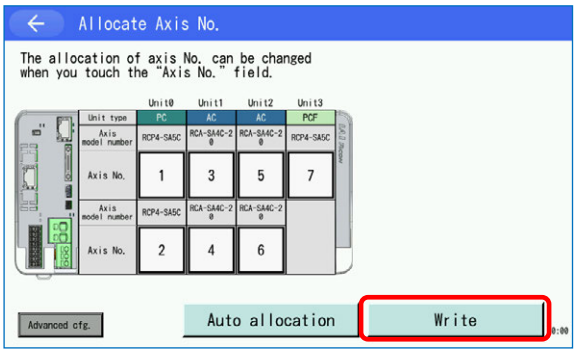
Touch the Auto allocation button. A confirmation window shows up.



Axis numbers should be assigned automatically in the order of the driver unit connection.

Touch the Yes button. It should go back to the axis number assignment window.

Touch the Yes button and the current assignment information will be discarded.



Axis numbers automatically assigned are shown in the axis number input boxes.

The further procedures are the same as those stated in [Assignment Change by Direct Input of Axis Number]. Touch the write button to transfer the edited contents to the controller.

* Touch in an input box for axis number and correction can be made to an axis number.

Axis number automatic assignment should be conducted considering the followings.

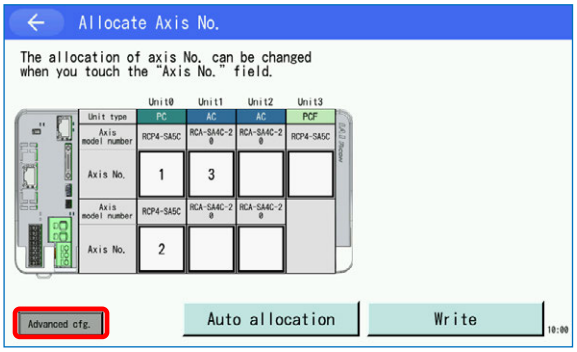
- Limit to the input values of axis numbers for combined axes (Refer to [15.17.3 Axis Number Assignment])
- Exclusion of combination axes that are short of constructed axe

Axis numbers are assigned in the order of the driver unit numbers (order of the driver unit connectors in the same driver unit) considering the conditions above.

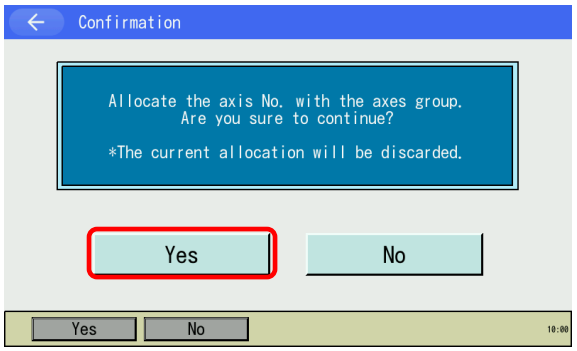
15.17.2 Axis Number Assignment Mode Switchover

There is the advanced setting (axis number assignment with using axes groups) as well as the normal setting (axis number assignment without using axes groups) in the axis number assignment. Follow the procedures below to switch over between the normal setting and advanced setting.

Advanced Setting : System to manage several axes as a “axes group”

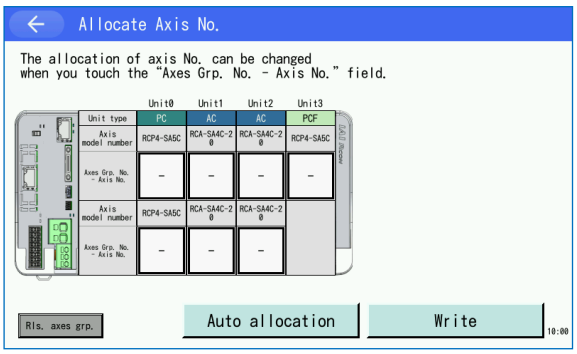


If the axis number assignment mode is in the normal setting, touch the Advanced cfg. button. A confirmation window shows up.



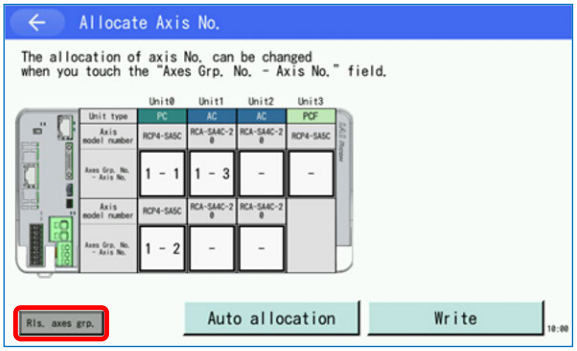
Touch the Yes button.

Touch the Yes button and the current assignment information will be discarded.

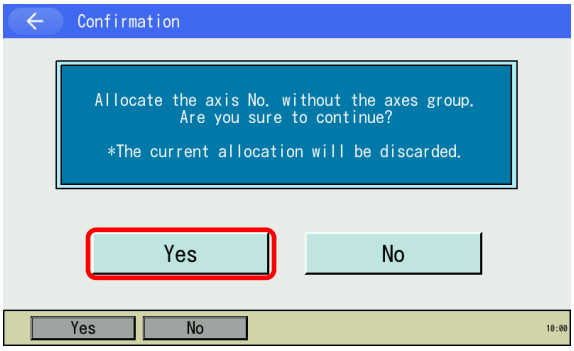


The axis number assignment mode switches over to the advanced setting (axis number assignment with using axes groups)

In order to switch the axis number assignment mode back to the normal setting from the advanced setting, follow the procedures below.

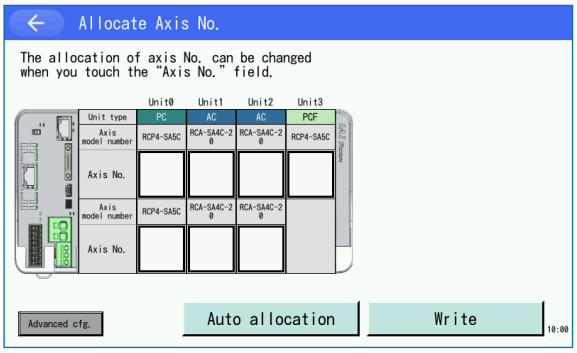


Touch the Rls. axes grp. button. A confirmation window shows up.



Touch the Yes button.

Touch the Yes button and the current assignment information will be discarded.



The axis number assignment mode switches over to the normal setting (axis number assignment without using axes groups)

15.17.3 Axis Number Assignment for Combined Axes

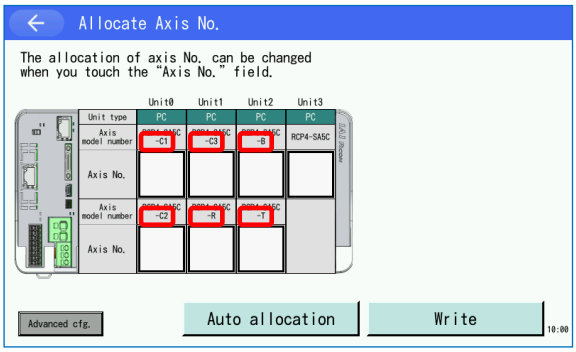
For RSEL, there is a limit to the assigned axis numbers for the combined axes. Make sure to consider the limit of the axis number input when inputting an axis number.
(Automatic assignment of axis numbers considering the limit should be performed when the automatic assignment is executed.)

* When activating the combined axes, have all the axis numbers that construct combined axes being assigned. It will cause an error when only some axis numbers are assigned.
* It is necessary to have all the axes that construct combined axes assigned in the same axes group when having the advanced setting (axis number assignment with using axes groups).

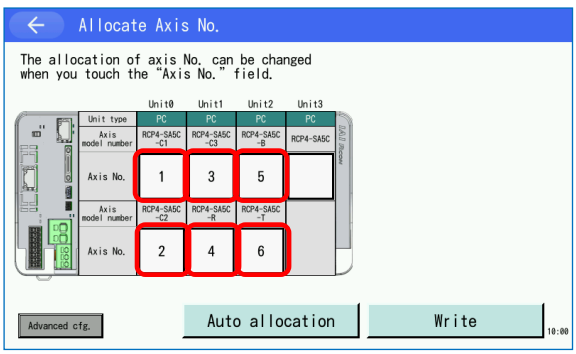
15.17.3.1 6-axis Cartesian

Axis number assignment for 6-axis cartesian should be performed following the procedures below.

* It is necessary to have C1-axis, C2-axis, C3-axis, R-axis, B-axis and T-axis existed.



For the driver unit of 6-axis cartesian, the constructing axes information (C1, C2, C3, R, B, T) should be displayed after the axis model code.



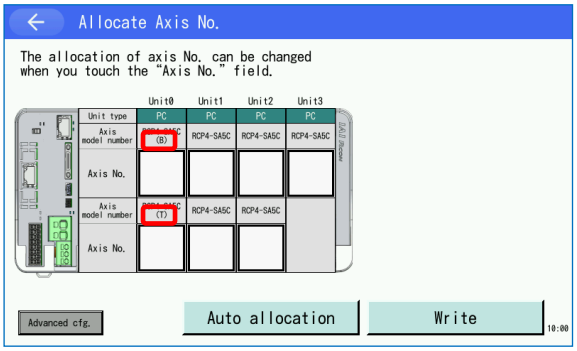
Assign C1 = 1, C2 = 2, C3 = 3, R = 4, B = 5, T = 6.

* For 6-axis cartesian, the axis numbers available for assignment are fixed.
* In the advanced setting, assign 6-axis cartesian to Group No. 1.

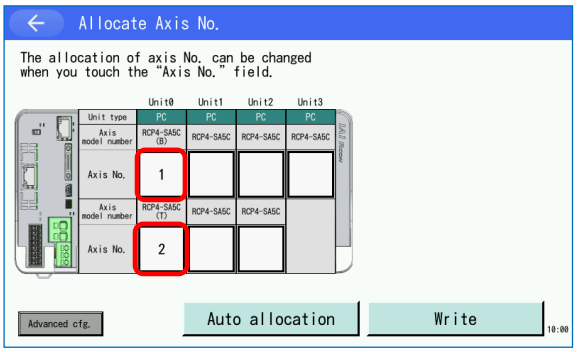
15.17.3.2 Wrist Unit

Axis number assignment for the wrist unit should be performed following the procedures below.

* It is necessary to have B-axis and T-axis existed.

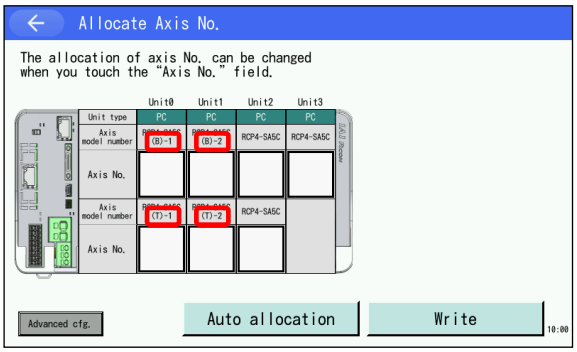


For the driver unit of the wrist unit, the constructing axes information ((B) and (T)) should be displayed after the axis model code.



Assign the axis numbers so they came in order of axis number for B-axis < axis number for T-axis.

In case there are several wrist units, there should be an identification number displayed after the constructing axes information ((B) and (T)). (The same identification number shows the same serial number.) In all identification numbers, make sure to assign the axis numbers so they come in order of axis number for B-axis < axis number for T-axis.

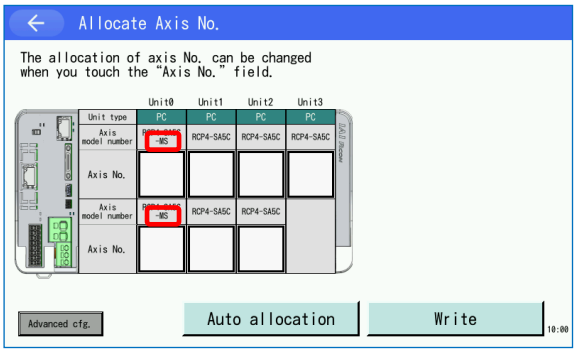


* Shown in the figure on the left is a case that there are two wrist units as an example

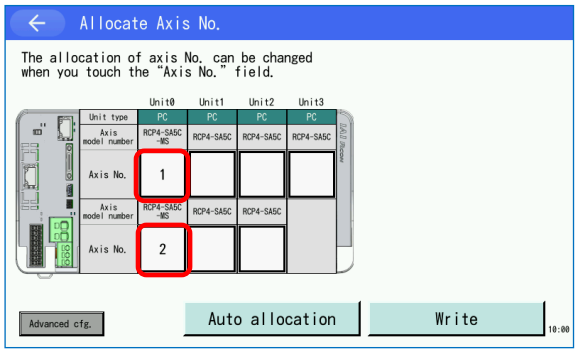
15.17.3.3 Multi-Slider

Axis number assignment for the multi-slider should be performed following the procedures below.

* It is necessary to have axes for all multi-slider units existed.

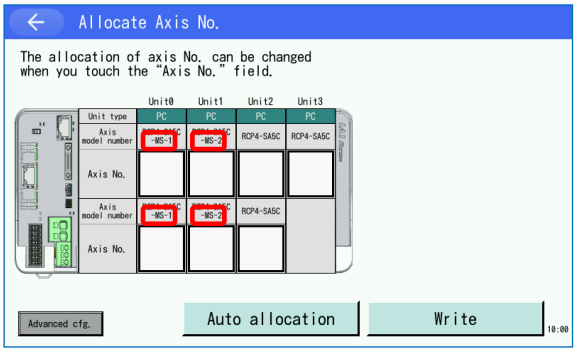


For the driver unit of the multi-slider, the constructing axes information (MS) should be displayed after the axis model code.



It is not necessary to consider the order of axis numbers for the multi-slider. Make sure that all the axis numbers constructing the multi-slider units are assigned.

In case there are several multi-slider units, there should be an identification number displayed after the constructing axes information (MS). (The same identification number shows the same serial number.)

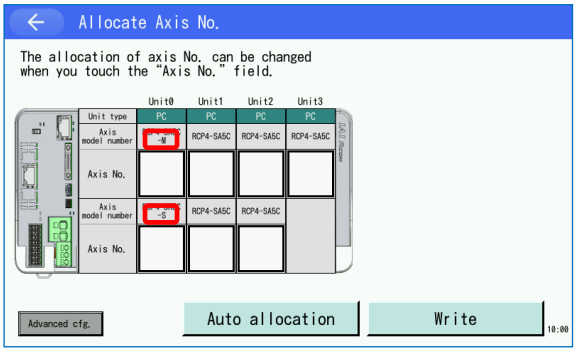


* Shown in the figure on the left is a case that there are two multi-slider units as an example

15.17.3.4 Synchronized Axes

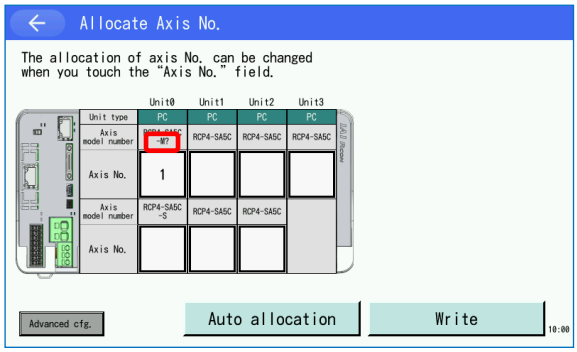
Axis number assignment for the synchronized axes should be performed following the procedures below.

* It is necessary to have both synchronized master axis and synchronized slave axes existed.



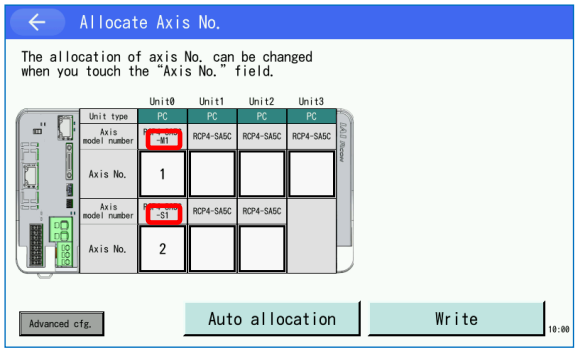
For the driver unit of the synchronized axes, the constructing axes information (M (= master axis) and S (= slave axes)) should be displayed after the axis model code.

Input the axis numbers so they come in order of the axis number of the master axis < axis numbers of slave axes.



Synchronized axes should be constructed combinations at the input of axis numbers. There should be ? mark displayed after the constructing axes information (M and S) while the combination axes are unestablished after axis number input is done.

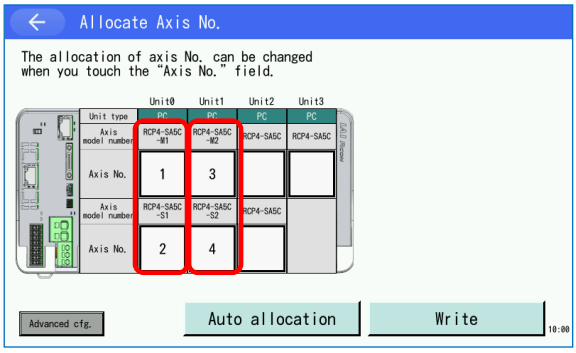
* Shown in the figure on the left is a condition that only the axis number for the synchronized master axis is input.



Once a combination gets established, the ? mark displayed after the constructing axes information (M and S) turns into an identification number.

* Shown in the figure on the left is a condition that the combination is established after inputting axis numbers for the synchronized master axis and synchronized slave axes

In the axis number input, a synchronized axis searches a mating axis that the axis number is already input but combination is unestablished (an axis with its identification number shown as ?), and constructs a combination with the lowest axis number in the found ones. If a combination comes to what is not expected, clear up the axis number once and input an axis number again.

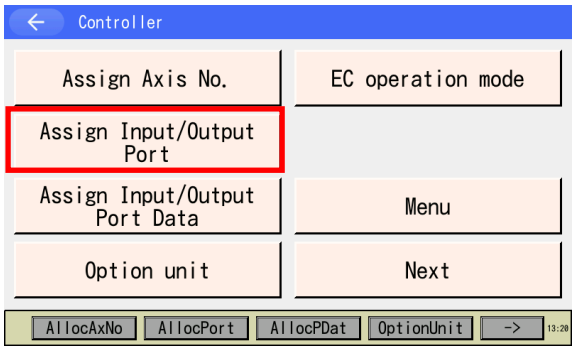


* Shown in the figure on the left is a condition that two combinations of synchronized axes are established.
  (It is the combination that the same identification number is constructed)
* If it is an unexpected combination, clear the axis number at once and input a number again.

15.18 Input/Output Port Assignment

(for applicable models only)

Assignment of the input and output ports should be conducted on the fieldbus and option unit.

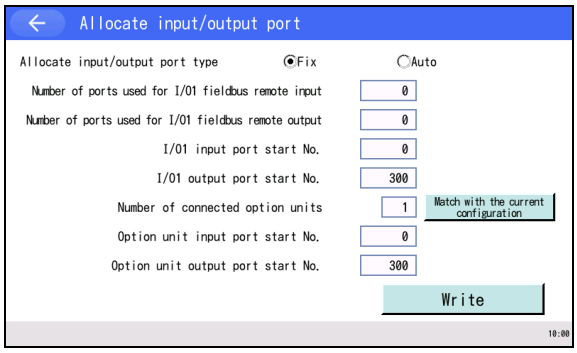


Touch the Assign Input/Output Port button in the controller menu window to show the input and output port assignment window.

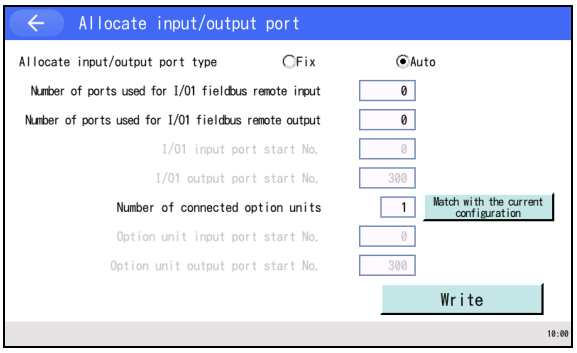
* The position of the button may differ depending on the model to connect. When the button is not displayed, touch Next button to switch the window.

The contents to be displayed should differ depending on connected controllers.

[Displayed Window for RSEL]

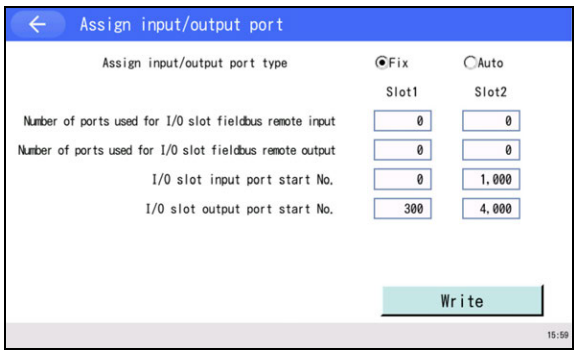


Allocate input/output port type: Fixed

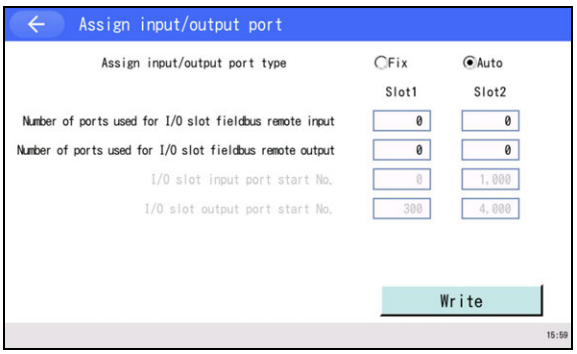


Allocate input/output port type: Automatic

[Displayed Window for XSEL2-T/TX]

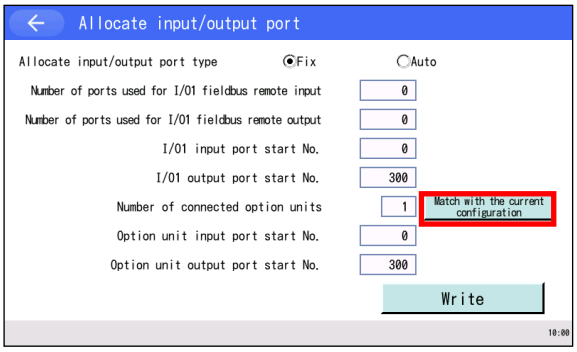


Assign input/output port type: Fixed

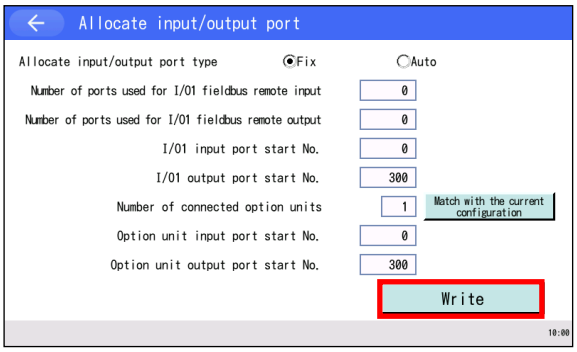


Assign input/output port type: Automatic

- Allocate input/output port type :
  The assignment type can be selected from "Fix" and "Auto".
- Number of ports used for fieldbus remote input :
  Setting can be established for the number of the remote input ports used in I/O Fieldbus.
- Number of ports used for fieldbus remote output :
  Setting can be established for the number of the remote output ports used in I/O Fieldbus.
- Input port start No. :
  I/O Input Port Start Number should be set for when the assignment type is "Fix".
- Output port start No. :
  I/O Output Port Start Number should be set for when the assignment type is "Fix".
- Number of connected option units (RSEL only) :
  Setting should be established for the number of connected units of the option units.
- Option unit input port start No. (RSEL only) :
  Option Unit Input Port Start Number should be set for when the assignment type is "Fix".
- Option unit output port start No. (RSEL only) :
  Option Unit output Port Start Number should be set for when the assignment type is "Fix".

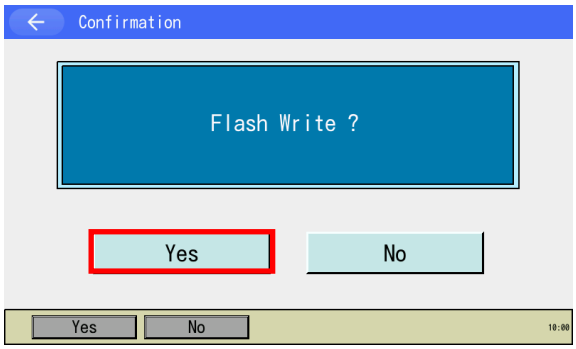


For the number of connected option units, touch the Match with the current configuration button and the number of unit currently connected should automatically get input.

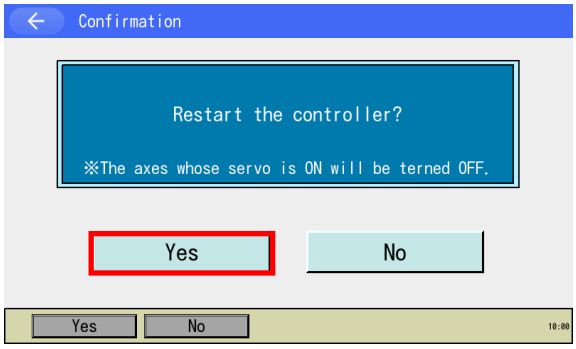


Touch the Write button after all the settings inputs are done, and the data should get transferred to the controller.

Return to the flash ROM writing window by using such as the ← button.



Touch Yes button to start flash ROM writing.



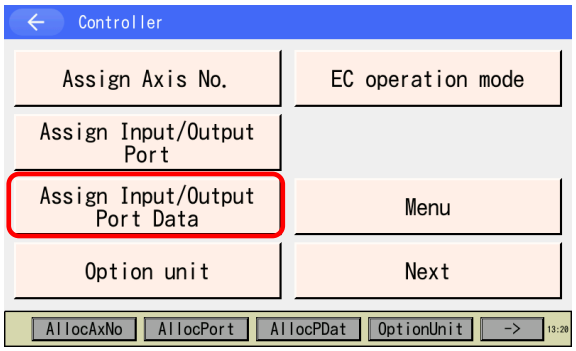
After finishing the flash ROM writing, the screen should switch to the controller rebooting confirmation window.
Touch the Yes button in order to activate the changed settings to allow the reboot.

Any axis with the servo being on should get the servo turned off.

15.19 Input/Output Port Data Assignment

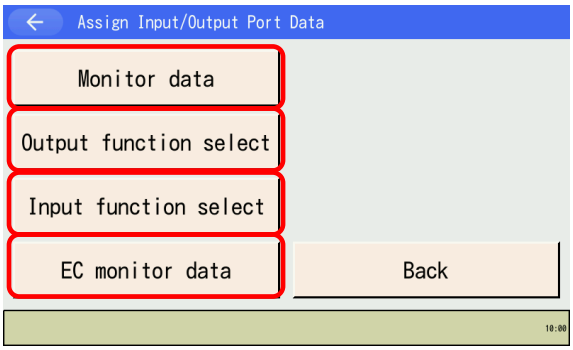
(for applicable models only)

Conduct the feature assignment and port assignment for monitor data output, output feature select and input feature select.
Also, it allows selection of the monitor items for EC monitor data.



Touch the Assign Input/Output Port Data button in the controller menu window. The input/output port data assignment menu should appear.

* The position of the buttons may differ depending on the connected models. In case of this button not displayed, touch the Next button to switch the window.
* The position of the buttons may differ depending on connected models.

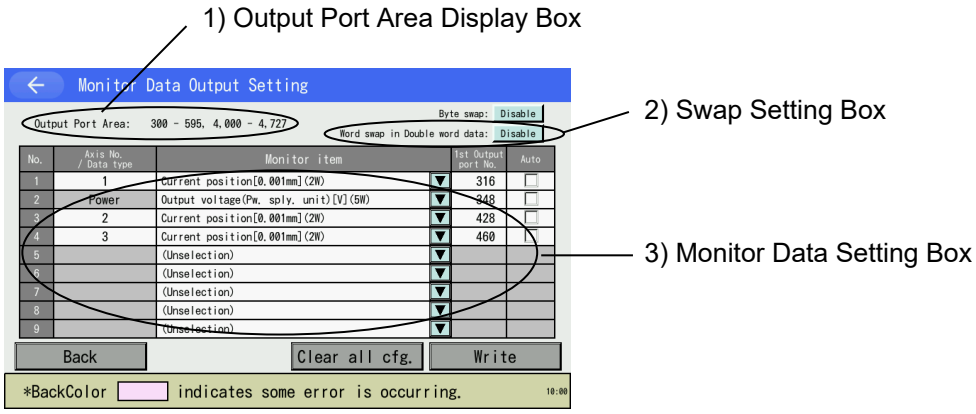


Touch a button that you require to activate.

15.19.1 Monitor Data Output Setting

Set the monitor data output from the output port. The output value of the monitor data can be monitored on the output port and also can be checked in the monitor data output display screen. (Refer to [14.14 Monitor Data Output Display] for how to display on the monitor data output display window.)

[Displayed Items in Monitor Data Output Setting Screen]



1) Output Port Area Display Box
The output port range to be assigned as the fieldbus domain should be displayed. Monitor data is available for output only in this range.

2) Swap Setting Box
Set the swap status of the signal output from the output ports (byte swap and double-word data word swap). Enable/disable can be switched over on the button.

Byte swap : Output should be made with the top 8 bits and bottom 8 bits in the word data (16 bits) swapped with each other. For the double-word data (32 bits), the top 8 bits and bottom 8 bits in both of the top word (16 bits) and bottom word (16 bits) should be swapped and output.

Word swap in Double word data
: Output should be made with the top word (16 bits) and bottom word (19 bits) swapped with each other.

This setting is valid for all the monitor data output setting items. The monitor items in the power supply unit status give an influence to every (1W = 1 word data) in every power supply unit. The monitor items in the EC status, system status, and axis status give an influence to the byte swap when 1W = 1 word data and both byte swap and double-word data word swap when 2W = 2 word data.

3) Monitor Data Setting Box

Select/set the monitor data output from the output ports.

No. : Monitor numbers are shown (1 to 9)

Axis No./Data type : Types of monitor items are shown. When the monitor item is the power supply unit status (RSEL only), it shows “Power Supply”, when EC status (RSEL, XSEL2-T/TX), it shows “EC”, when system status (XSEL2-T/TX only), it shows “system” and when axis status, shows the axis number that is subject to monitoring.
When an axis number assignment to activate several axes groups is performed in the axis number assignment function (Refer to [15.17 Axis Number Assignment]), display should be shown in axes group number - axis number. When it is displayed in the axis number (axes group number - axis number), changed can be made in the axis number (axes group number - axis number) by touching it.

Monitor item : Select/set the items for monitor output.
Touch the ▼ button and the items available for monitor setting are shown in a list. Touch the item that you require to monitor to select it.
The power supply unit status monitor items (RSEL only) appear when the number of the connected power supply units (setting value in Other Parameter No. 61) is something other than 0. The monitoring items of the EC status (RSEL, XSEL2-T/TX) should be displayed when EC Interface (RCON-EC or ELECYLINDER connection module board) is connected.
The system status monitor item (XSEL2-T/TX) is displayed only when the controller firmware version supports this function. The axis status monitor items appear when axis numbers are assigned with the axis number assignment function.

1st Output port No. : Set the top port number of the output ports range to be used as the destination of the monitor data output. Make sure to set it so the range of the used ports (with the top output port number as the start, number of ports in respond to the monitor items) suits in the fieldbus domain range. Also, make sure the range does not duplicate with any other monitor items or port range in use for other function.
If there is an error in the setting, the background of the top output port number will turn into pink.

Auto : A port number available for setting should be automatically searched from the start of the train as the top output port number. The status can be switched between enable/disable by touching the checkbox. The search should be conducted in the port range next to a port range in use for the monitor number one before. If a domain not in use with number of necessary ports in found in the word boundary, the top port number in it should be set as the top output port number.
In case the monitor number one before is in error or monitor item not being selected, the search should be conducted in the port range next to a port range in use for the monitor number another one before. In case there is no valid monitor setting, the search should be conducted from the start of the fieldbus domain.

Touch the All setting clear button and all the monitor numbers should go unselected.

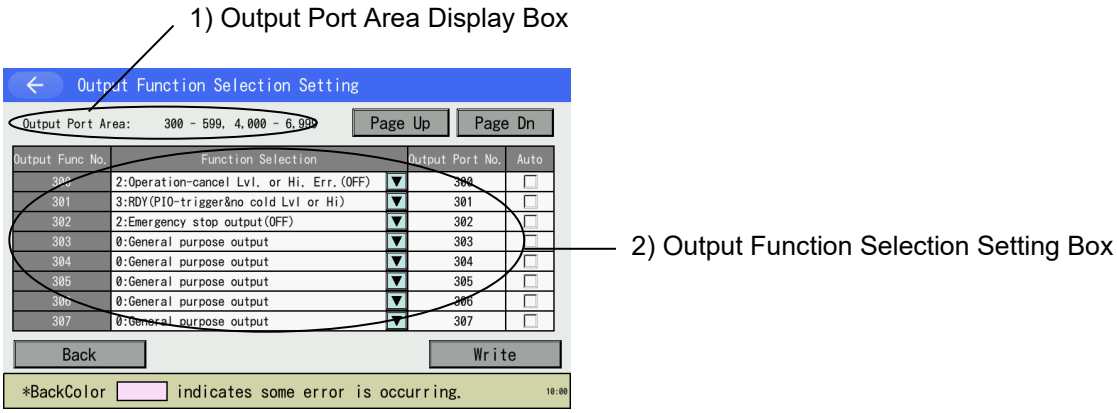
After setting input is complete, touch the Write button to transfer the settings to the controller. Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

Touch the Back button and the screen goes back to the previous.

15.19.2 Output Function Selection Setting

Select a function to be assigned to the output port. Also, set an output port number to assign the feature.

[Displayed Items in Output Function Selection Setting Screen]



1) Output Port Area Display Box
This shows the range of output ports. The output port number to assign a function should be selected in this range.

2) Output Function Select Setting Box
Select/set the function to be assigned to the output port.

Output Func No. : Output function number is shown. (300 to 315, 300 (Area 2) to 315 (Area 2))

Function Selection : Select/set the function to be assigned to the output port.
Touch the ▼ button and the functions available for setting are shown in a list. Touch the function that you require to assign to select it.
The functions available for setting may differ depending on output function numbers.

Output Port No. : Set an output port number to assign a function. Make sure not to have the output port numbers duplicated with another output function number or an output in use for another function.
If there is an error in the setting, the background of the output port number will turn into pink.

Auto : Port numbers available for setting as a destination to assign a function should be searched from the start automatically.
The status can be switched between enable/disable by touching the checkbox.
The search should be conducted from the port after a port in use for an output port number one before. If an output port number not in use is found, this port number should be set as the output port number.
In case the output function number one before is in error or function assignment not being done, the search should be conducted from the port number next to a port number in use for the output function number another one before. In case there is no valid output function select setting, the search should be conducted from the start of the output port domain.

Touch the Page Up or Page Dn button and the range of the displayed output function numbers will switch.

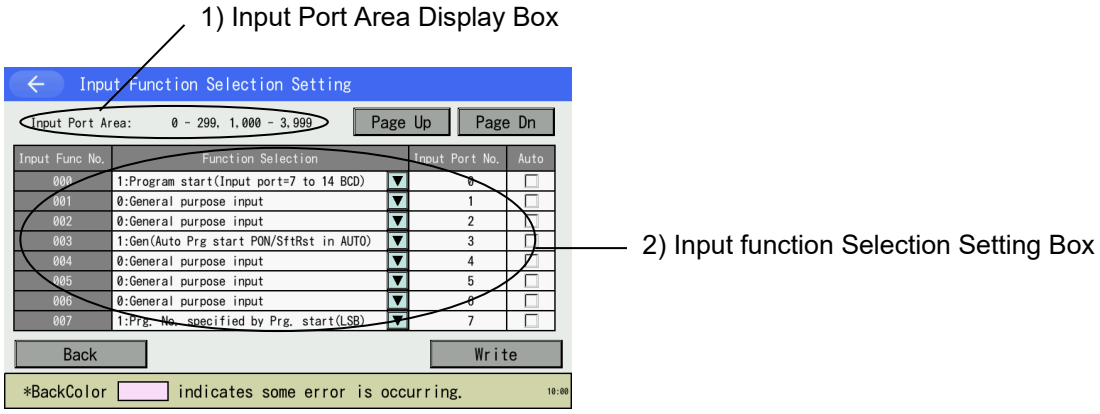
Touch the Back button and the screen goes back to the previous.

After setting input is complete, touch the Write button to transfer the settings to the controller. Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

15.19.3 Input Function Selection Setting

Select a function to be assigned to the input port. Also, set an input port number to assign the function.

[Displayed Items in Input Function Selection Setting Screen]



1) Input Port Area Display Box
This shows the range of input ports. The input port number to assign a function should be selected in this range.

2) Input Function Selection Setting Box
Input function number is shown. (000 to 015)

Input Func No. : Input function number is shown. (000 to 015)

Function Selection : Select/set the function to be assigned to the input port.
Touch the ▼ button and the functions available for setting are shown in a list. Touch the function that you require to assign to select it.
The functions available for setting may differ depending on input function numbers.

Input Port No. : Set an input port number to assign a function. Make sure not to have the input port numbers duplicated with another input function number or an input in use for another function.
If there is an error in the setting, the background of the input port number will turn into pink.

Auto : Port numbers available for setting as a destination to assign a function should be searched from the start automatically.
The status can be switched between enable/disable by touching the checkbox.
The search should be conducted from the port after a port in use for an output port number one before. If an output port number not in use is found, this port number should be set as the output port number.
In case the output function number one before is in error or function assignment not being done, the search should be conducted from the port number next to a port number in use for the output function number another one before. In case there is no valid output function select setting, the search should be conducted from the start of the output port domain.

Touch the Page Up or Page Dn button and the range of the displayed output function numbers will switch.

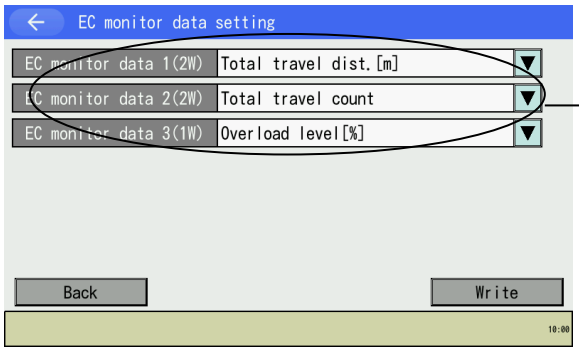
Touch the Back button and the screen goes back to the previous.

After setting input is complete, touch the Write button to transfer the settings to the controller. Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

15.19.4 EC Monitor Data Output setting

Select EC monitor data to be output from the output port.

[Displayed Items in EC monitor data setting Screen]



EC monitor data selection box

In the EC monitor data selection field, select the type of EC monitor data to be output. For EC monitor data 1 and 2, data items with a data width of either 2 words or 1 word can be selected. For EC Monitor Data 3, only data items with a data width of 1 word can be selected.

Touch the Write button to transfer the settings to the controller.

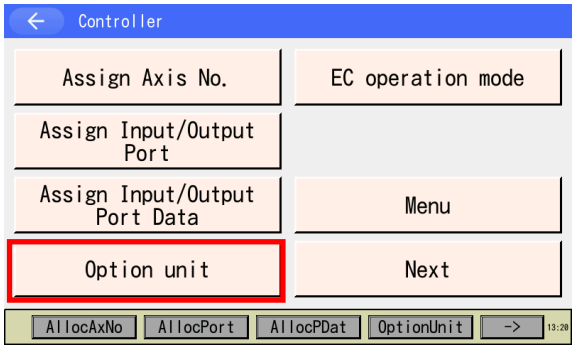
Touch the Back button and the screen goes back to the previous.

Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

15.20 Option Unit Setting

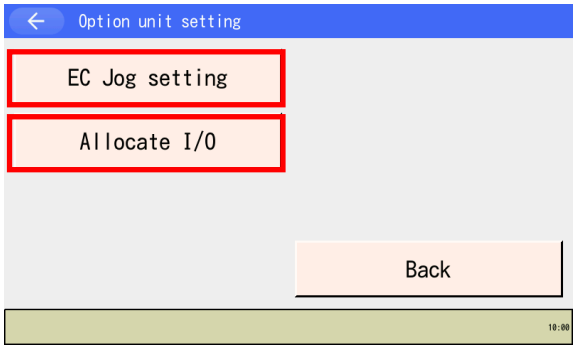
(only for applicable models and the feature is enabled)

The setting for the option unit (e.g. switching enable/disable of JOG Switch on RCON-EC) should be performed.



Touch the Option unit button in the controller menu window to show the option unit setting window.

* The position of the button may differ depending on the model to connect. When the button is not displayed, touch Next button to switch the window.
* The button should not be displayed unless the option unit is connected.

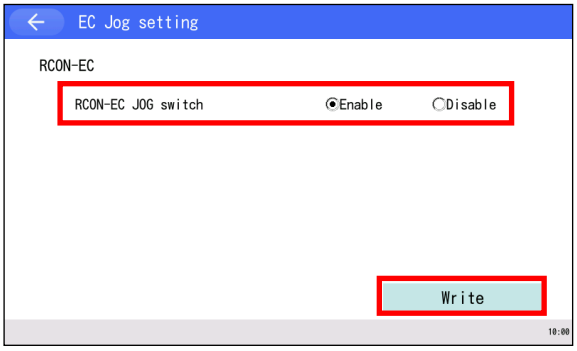


If RCON-EC is connected, the option unit setting menu window should be displayed.
Touch a button of the feature that you would establish the settings.

This menu window should not be displayed unless RCON-EC is connected, and the screen would go to the option unit I/O assignment window.

15.20.1 EC Jog Setting

Enable/Disable of the jog switch on RCON-EC should be selected if RCON-EC is connected.

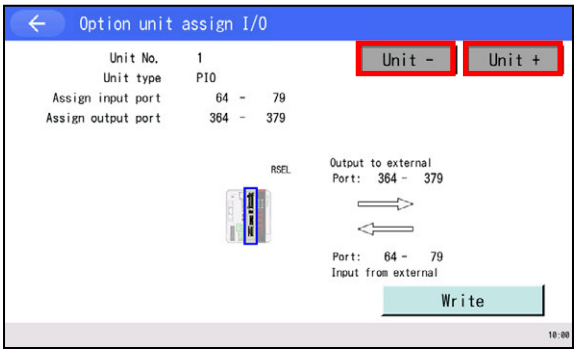


Touch the radio buttons of Enable or Disable for the jog switch, and touch the Write button to transfer the contents of the setting to the controller.

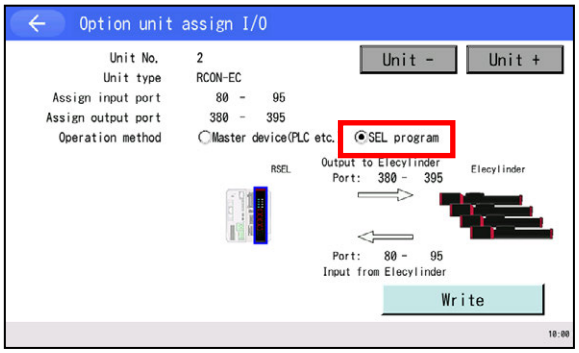
Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

15.20.2 Option Unit Assign I/O

Display and setting of the option unit I/O assignment should be conducted.

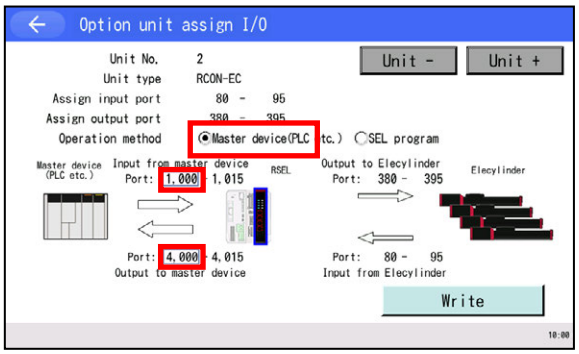


Touch either the Unit + or Unit - button and the unit number should change.



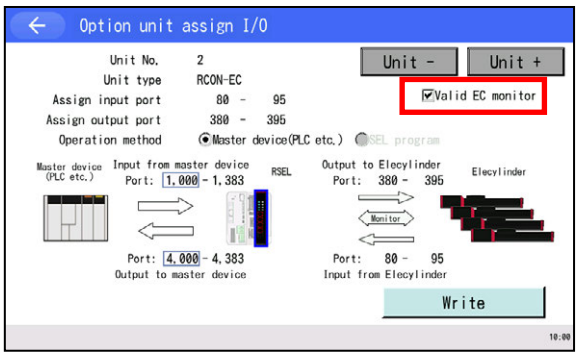
When the unit type is RCON-EC, the control system should be set in a host device (such as PLC) or in the SEL program.

If it is set in the SEL program, the input and output port assignment with ELECYLINDER should be displayed.



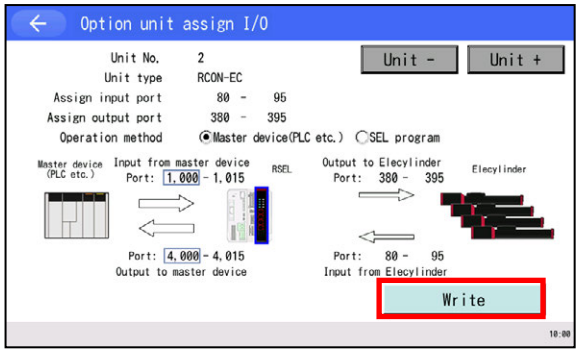
When the control system is set in a host device (such as PLC), the input and output port assignment with the host device and ELECYLINDER should be displayed.

Touch the input box for the top port number to input from the host device or to output to the host device, and the numeric keys should appear and inputing of a port number should become available.



If the controller supports the EC Monitor function, the EC Monitor Enable check box is displayed. To use the EC Monitor function, turn on the checkbox.

The EC Monitor function can be used only when the control method is set to a mode other than the SEL Program.



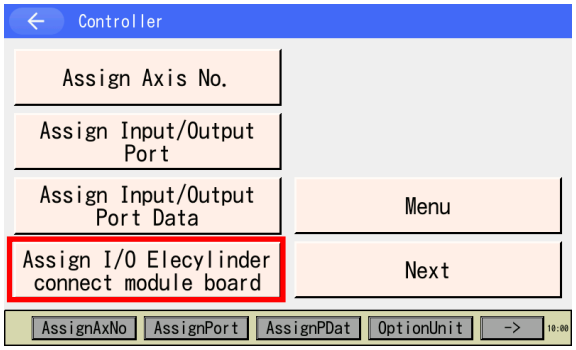
Touch the Write button to transfer the contents of the setting to the controller.

Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

15.21 Assign I/O ELECYLINDER connect module board

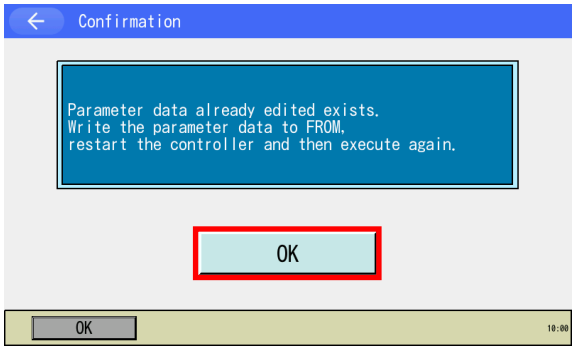
(for applicable models only)

I/O assignment and setting of the ELECYLINDER connect module board should be performed in this feature.

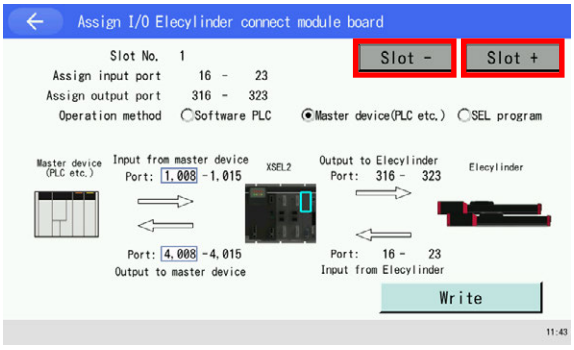


Touch the Assign I/O Elecylinder connect module board button in the controller menu window.

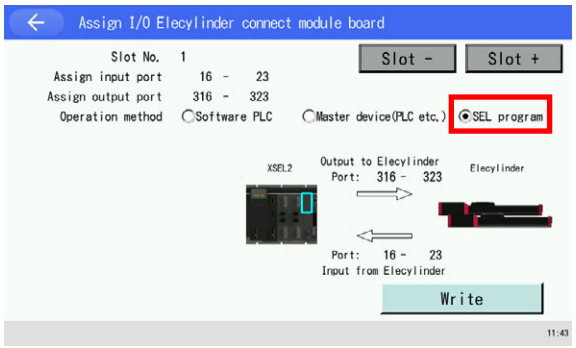
* The position of the button may differ depending on connected models.
In case it is not shown, touch the [Next] button to switch over the window.
* The button should not be displayed if the ELECYLINDER connection module board is not effective.



When there is a parameter already edited, a confirmation window should come out.
Touch the OK button to return to the controller menu and execute a reboot.

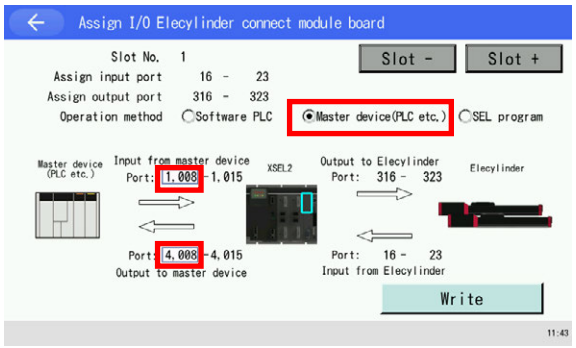


Touch the Slot + or Slot - button, and the slot number should change.



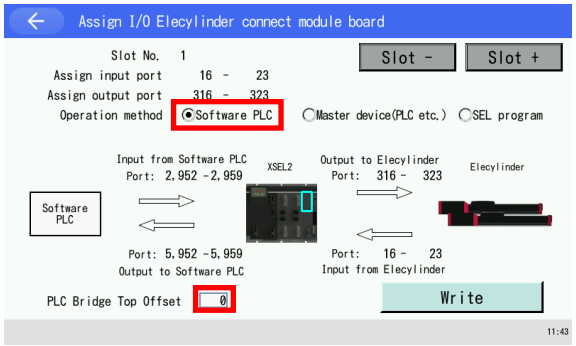
Set up the control system to the software PLC, host device (such as PLC) or SEL program.

If it is set to a SEL program, ELECYLINDER and the input and output port assignment should be displayed.



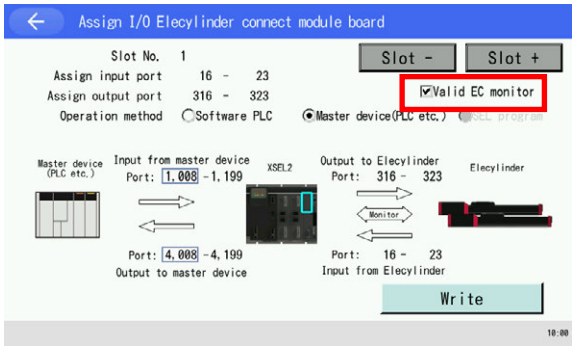
If the control system is set to the host device (such as PLC), the host device, ELECYLINDER and input and output port assignment should be displayed.

Touch the top port number input box for input from the host device or output to the host device, and the numeric keys should be displayed and a port number can be input.



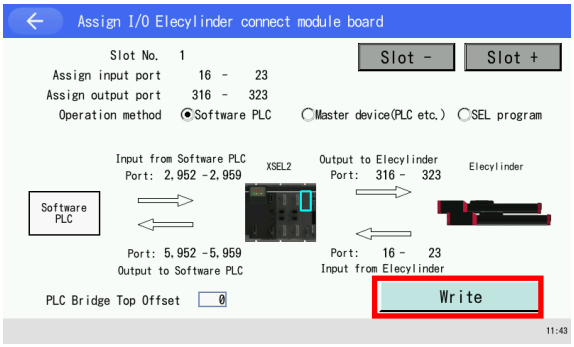
If the control system is set to the software PLC, the software PLC, ELECYLINDER and the input and output port assignment should be displayed.

Touch the PLC bridge top offset input box, and the numeric keys should be displayed and the PLC bridge top offset can be input.



If the controller supports the EC Monitor function, the EC Monitor Enable check box is displayed. To use the EC Monitor function, turn on the checkbox.

The EC Monitor function can be used only when the control method is set to a mode other than the SEL Program.



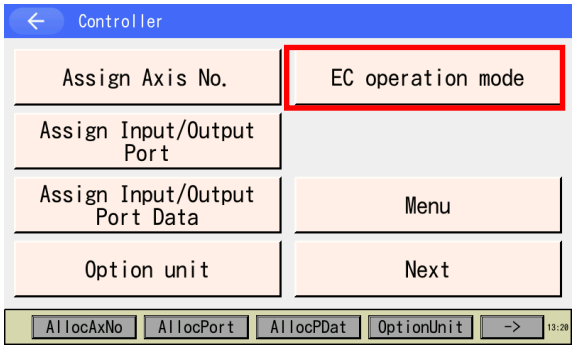
Touch the Write button to transfer the settings to the controller.

If writing is conducted, there should be a confirmation of flash ROM writing and a confirmation of software reset displayed when returning to the menu window with the Back button. In order to reflect the written data, write into the flash ROM and conduct the software reset.

15.22 EC Operation Mode

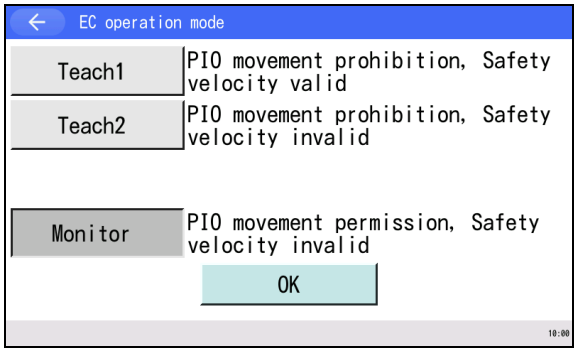
(only for applicable models and the feature is enabled)

The ELECYLINDER operation mode setting in the manual mode (MANU) should be established.



Touch the EC operation mode button in the controller menu window to show the EC operation mode change window.

* The position of the button may differ depending on the model to connect. When the button is not displayed, touch Next button to switch the window.
* The button should not be displayed unless the EC Interface is connected.



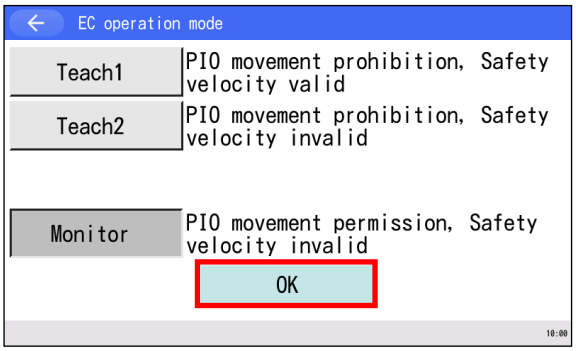
The EC operation mode should be selected from the three types of menus as described below.

- Teach1 (PIO movement prohibition / Safety velocity valid)
  PIO movement prohibition : Data writing to ELECYLINDER (for such as simple data settings and parameters) and indications in 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 window.

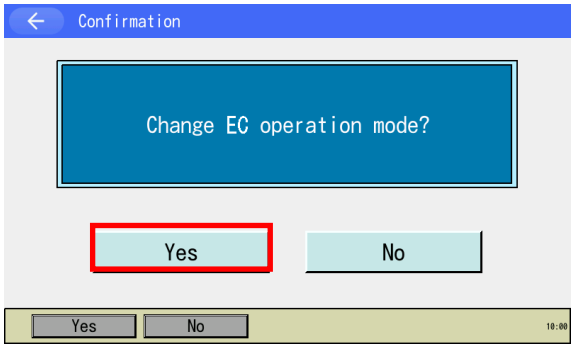
- Teach2 (PIO movement prohibition / Safety velocity invalid)
  PIO movement prohibition : Data writing to ELECYLINDER (for such as simple data settings and parameters) and indications in the actuator operation system are available.
  Safety velocity invalid : Operation in the velocity set in the simple data setting window (higher than the safety velocity) becomes available.

- Monitor (PIO movement permission / Safety velocity invalid)
  PIO movement permission : Control should be made with I/O commands. Data writing to ELECYLINDER (for such as simple data settings and parameters) and indications in 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 : Operation in the velocity (higher than the safety velocity) commanded from a host device (such as PLC) or the SEL program should be available.

* Set it to either Teach 1 or Teach 2 when operating the jog switch on EC Interface.

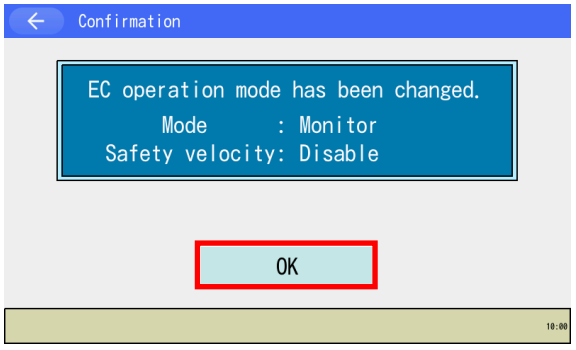


Touch a button of a mode to be selected and touch the OK button.



Touch Yes button in the confirmation window.

Touch the No button and the screen returns to the EC operation mode change window.



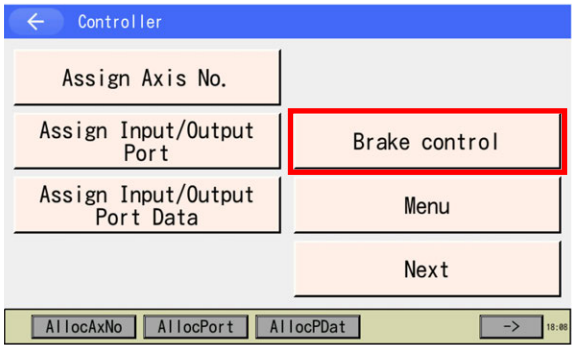
Once the change is complete, the confirmation window should show up.

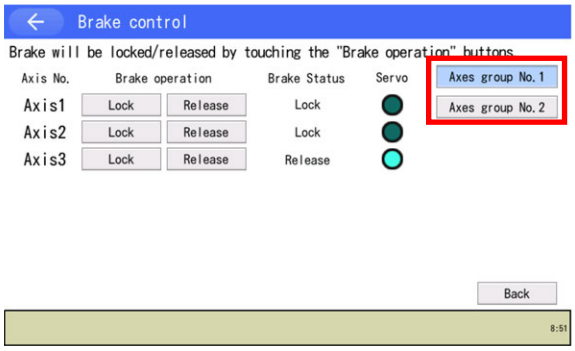
Touch the OK button and the screen returns to the controller menu.

15.23 Brake Control

(for applicable models only)

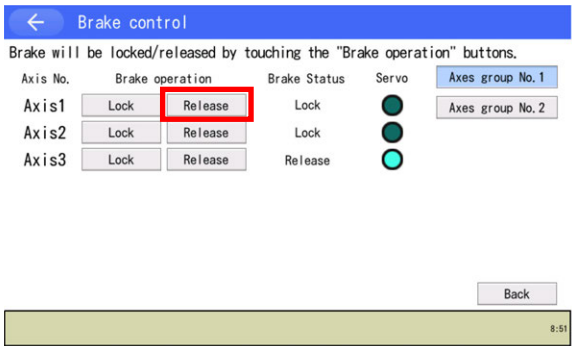
When connected to a brake control applicable model, the Brake control button should be displayed in the controller menu window. Touch it and the screen shifts to the brake control window.



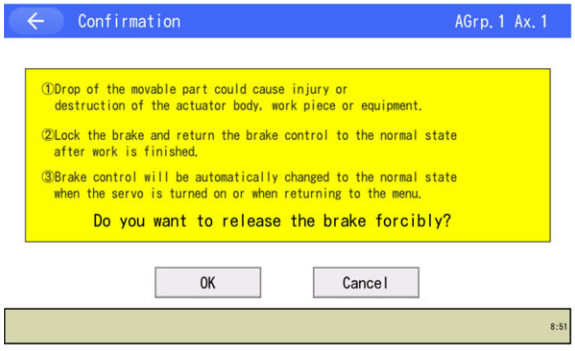


When several axis group are set, an axis group of an axis that you would like to have a brake control should be selected with the Axes group No. 1 and Axes group No. 2 buttons.

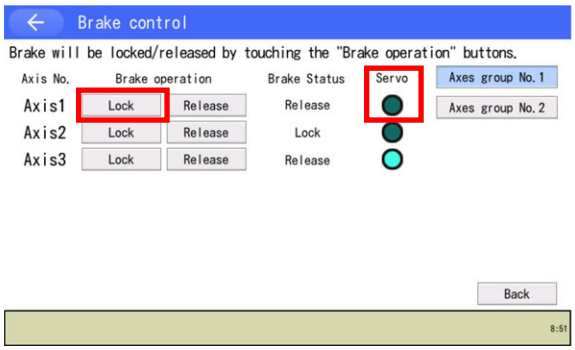
The brake operation button and the status of an effective axis should be displayed.



To release an axis in brake lock status compulsorily, touch the Release button in the brake operation column.



As the screen shifts to the confirmation window, confirm the contents and touch the OK button when having a compulsory release, and touch the Cancel button when cancel.



When the brake is to be locked, confirm the servo in the axis number to lock is off, and touch the Lock button in the brake operation column. When it is locked, the brake status should be shown “Lock”. When the servo is on, touch the Back button to return to the teach window, turn the servo off and turn it back on to lock it.

⚠ Warning: Caution for Brake Compulsory Release

(1) The moving part may drop, which may cause injury or cause damage on the actuator main unit, workpiece or equipment. Pay special attention.

(2) Make sure to lock the brake after the work is finished to set the brake control back to the normal condition.

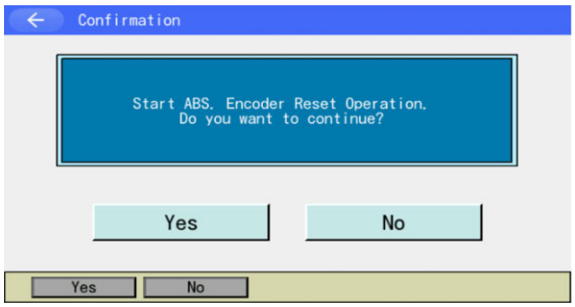
(3) When the servo is turned on and when it gets back to the menu window, the brake control should get back to the normal condition automatically.

16. Absolute Reset

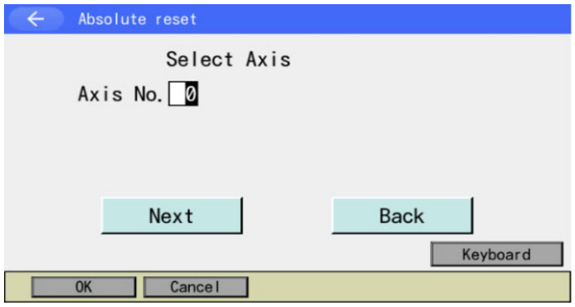
16.1 Absolute Reset of the Orthogonal Axis Axes of XSEL-J/K/P/Q/R/S, or 5th and 6th Axes of XSEL-PX/QX, 5th to 8th Axes of XSEL-RX/SX, SSEL and ASEL Controller

When the controller is applicable to the “battery-less absolute reset”, the procedure is different. In such case, perform the absolute reset operation following the [16.8.1 Battery-less Absolute Reset Applicable Absolute Reset Procedure].

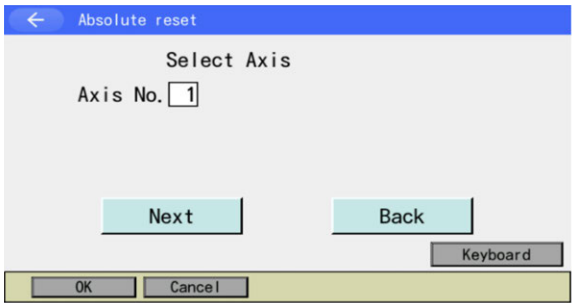
Select Absolute Reset from Controller Menu.



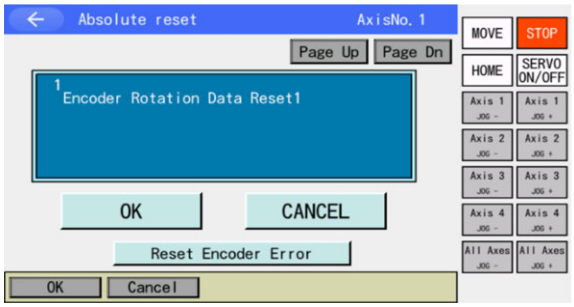
To have an absolute reset, touch Yes button.
When not to have an absolute reset, touch No button. The display returns to the previous screen.



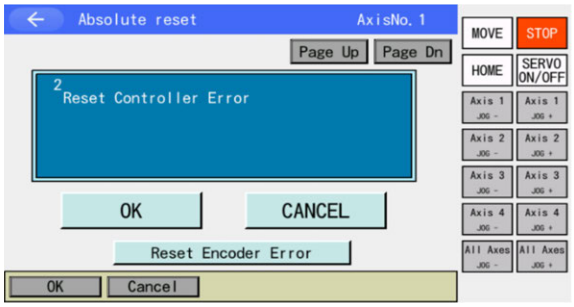
Axis No. Input
Input the axis number that you want to have an absolute reset on the touch panel numeric keys and then touch ENT for confirmation.



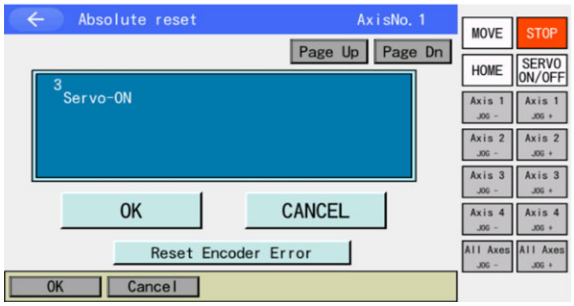
Once the input is confirmed, the cursor disappears.
If you want to redo the input, touch the axis number input box.
If you want to continue absolute reset, touch Next button.
When you cancel absolute reset, touch Back button.
When canceling an absolute reset on any screen of the following 1) through 6) touch CANCEL button.



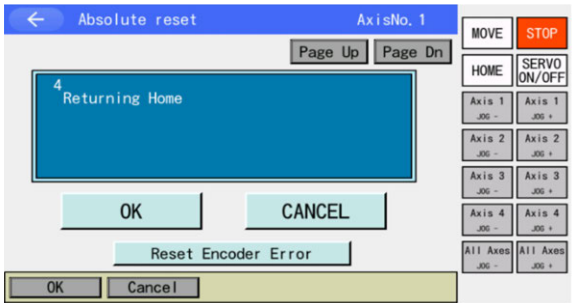
1) Encoder Rotation Data Reset 1
Touch OK button.



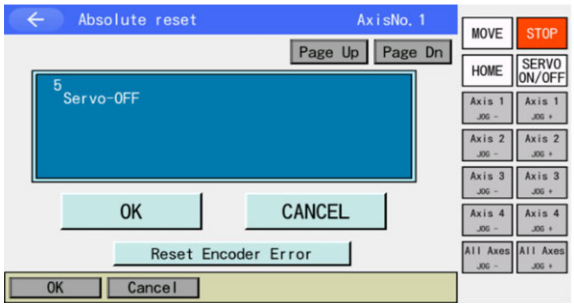
2) Reset Controller Error
Touch OK button.



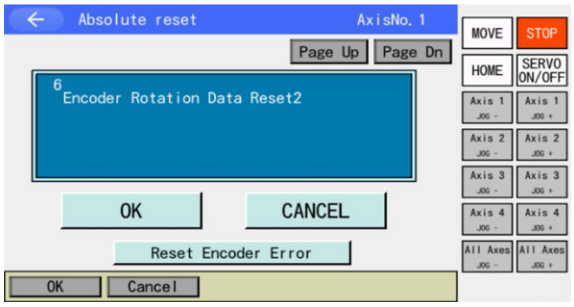
3) Servo-ON
Touch OK button.



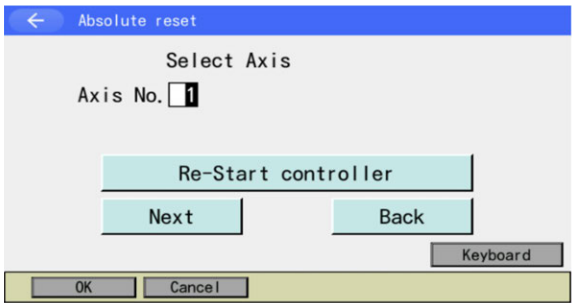
4) Returning Home
Touch OK button.



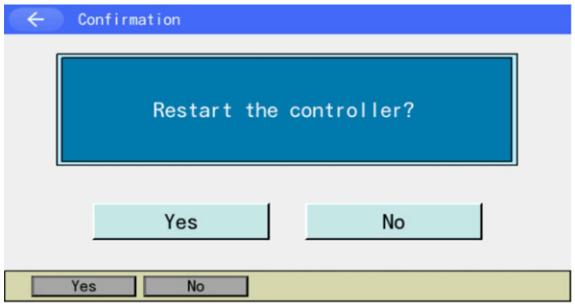
5) Servo-OFF
Touch OK button.



6) Encoder Rotation Data Reset 2
Touch OK button.



Return to the axis No. input screen.
When you want to have another axis conduct absolute reset, input the axis number and touch OK button.
To finish absolute reset, touch Re-Start controller button.



Restart the controller.
Touch Yes button.
The display returns to the main menu when the reboot is finished.

After executing absolute reset, be sure to reset software or reconnect the power.

16.2 Absolute Reset of the SCARA Axis

16.2.1 XSEL-JX/KX/RXD/SXD or 1st to 4th Axes of XSEL-PX/QX/RX/SX

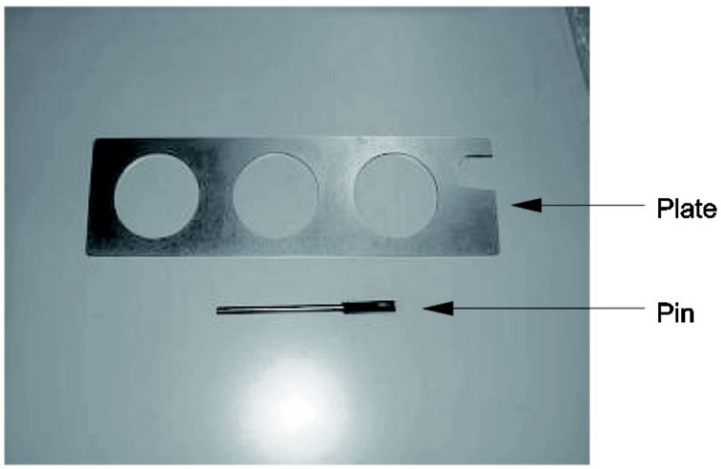
When the controller is applicable to the “battery-less absolute reset”, the procedure is different. In such case, perform the absolute reset operation following the [16.2.2 Battery-less Absolute Reset Applicable Absolute Reset Procedure].

Absolute Reset Preparation
The following jigs are required to perform an absolute reset:

• Absolute Reset Adjustment jigs

Type	Remarks
JG-1	Arm length 500/600
JG-2	Arm length 250/300/350
JG-3	Arm length 700/800
JG-4	Arm length 500/600 high-speed type
JG-5	Arm length 120/150/180

Connect the robot, controller and teaching pendant to make an operable status from the teaching pendant.
Always check operation of the EMG switch before performing work.
The absolute reset adjustment jig is always required to perform an absolute reset for the rotation axis and vertical axis, but not always required for Arm1 and Arm2.
(Rotation data can be reset as long as positioning accuracy of “center of positioning mark label ±1 graduation” is ensured.)

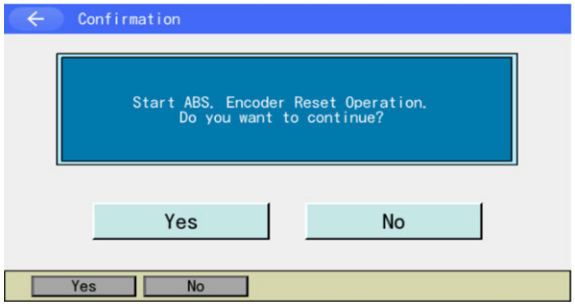


Example of Absolute Reset Adjustment Jig (Type JG-1)

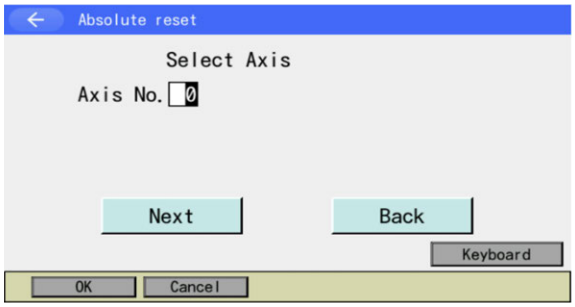
⚠ *Warning:*
- *Performing work without understanding inspection and maintenance work thoroughly may cause an accident resulting in injury or death.*
- *Post a sign “MEN WORKING” to prevent other workers from operating the controller, operation panel or other equipment.*

There are three types of absolute reset, Arm1, Arm2 and Z-axis + R-axis.

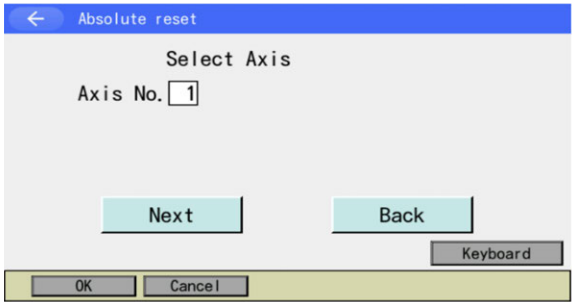
(1) Absolute Reset on Arm1 and Arm2
Select Absolute Reset from Controller Menu.



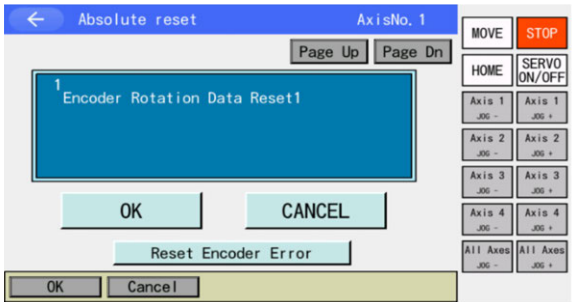
To have an absolute reset, touch Yes button.
When not to have an absolute reset, touch No button. The display returns to the previous screen.



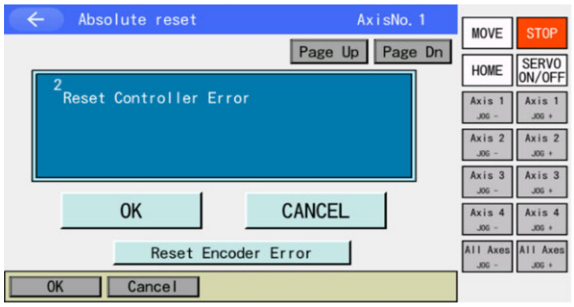
Axis No. Input
Input the axis number that you want to have an absolute reset on the touch panel numeric keys and then touch ENT for confirmation.
Input 1 when you conduct the absolute reset on Arm1 and 2 when on Arm2.



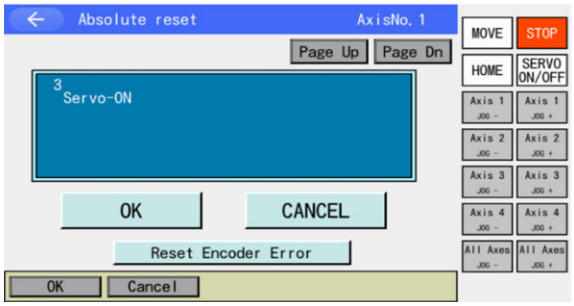
Once the input is confirmed, the cursor disappears.
If you want to redo the input, touch the axis number input box.
If you want to continue absolute reset, touch Next button .
When you cancel absolute reset, touch Back button.
When canceling an absolute reset on any screen of the following 1) through 9) touch CANCEL button.



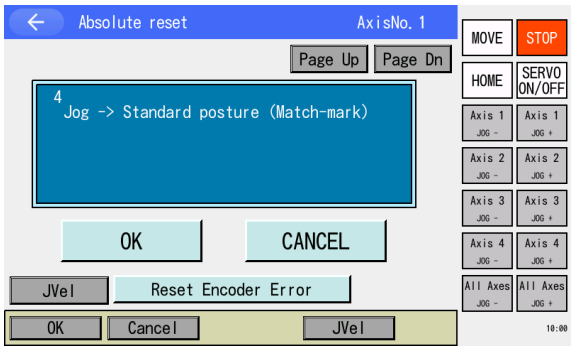
1) Encoder Rotation Data Reset 1
Touch OK button.



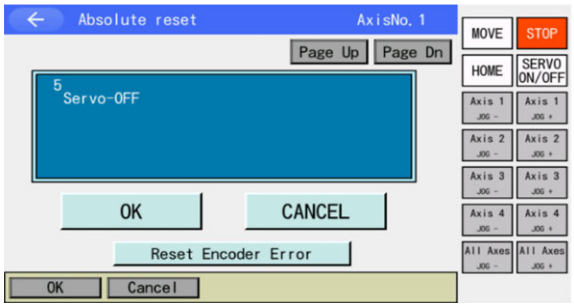
2) Reset Controller Error
Touch OK button.



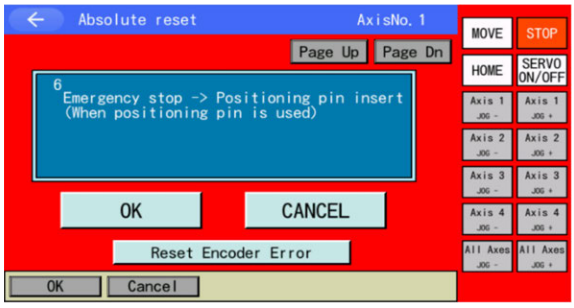
3) Servo-ON
Touch OK button.



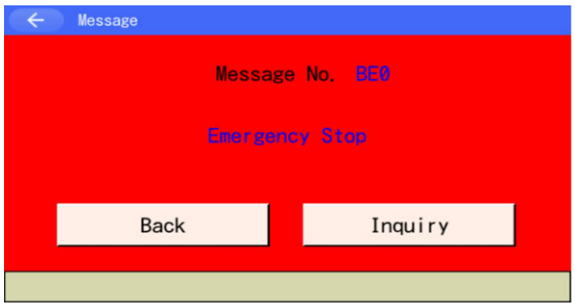
4) Jog Movement
Move the actuator with jog to a point near the standard posture (refer to the figures for standard posture in the following pages), and touch OK button.



5) Servo-OFF
Touch OK button.



6) Emergency stop input and adjusting jig set
Press the EMERGENCY STOP button and set an adjusting jig.
Fix at the datum posture described in the next page, and touch OK button.



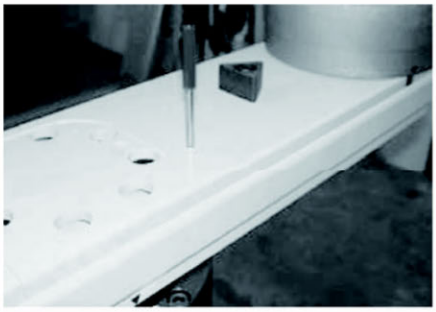
Back

Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.

Check that the EMERGENCY STOP button has been pressed.

When performing an absolute reset for Arm1, set an adjustment jig (pin) in Arm1 to fix the arm at the reference position. In that case, Arm2 may be moved.
When performing an absolute reset for Arm2, set an adjustment jig (pin) in Arm2 to fix the arm at the reference position. In that case, Arm1 may be moved.

- After checking that the EMERGENCY STOP button has been pressed, set the jig.
- Decide the basic position referring to the positioning mark seal and set the jig.
- Only the Arm1 is covered with a lid with setscrews. Remove them and set the jig.
- An absolute reset on the arm with the adjusting jig is recommended. However, a multi-rotation reset is possible if the arm position is within the range of the mark seal ±1 scale.



Arm1
(Arm length 500/600, arm length 700/800)



Arm2
(Arm length 500/600, arm length 700/800)

Arm length 500/600/700/800 Standard Posture Drawing

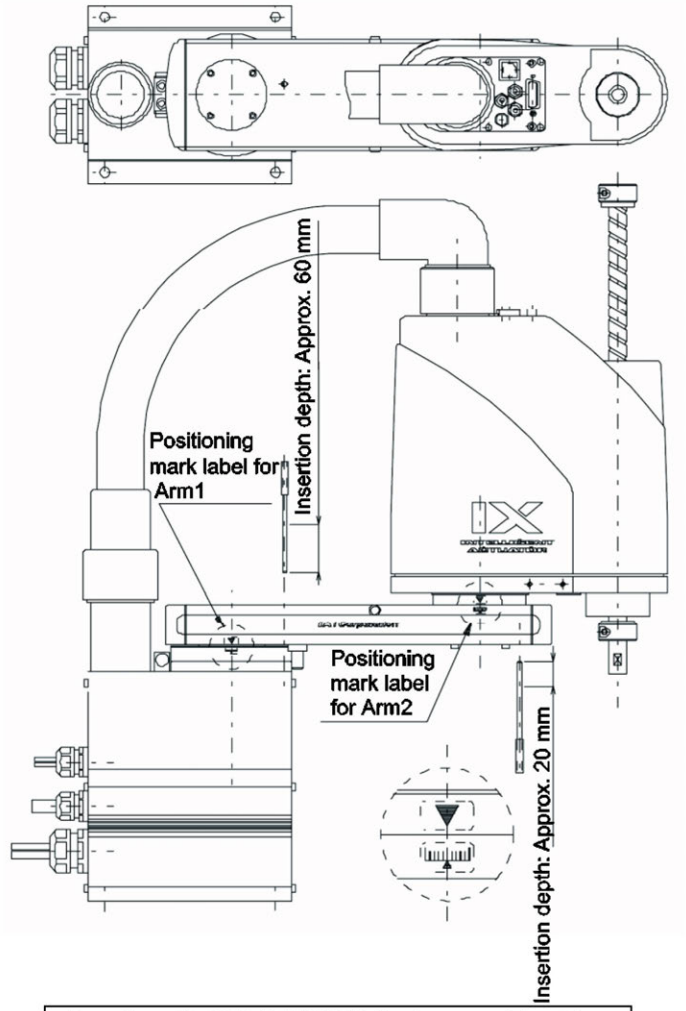
⚠ *Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*



Arm1
(Arm length 250/300/350)

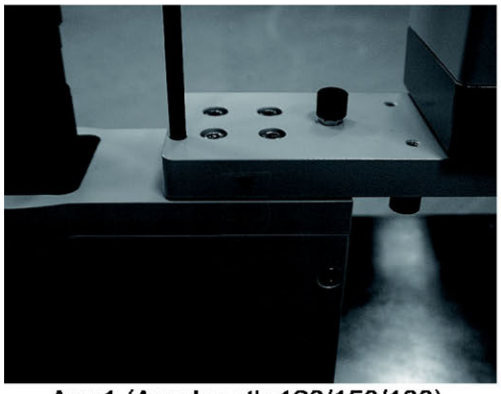


Arm2
(Arm length 250/300/350)



Arm length 250/300/350 Reference Position

(Note) When performing an absolute reset for Arm1 of IX-NNN2515, rotate Arm2 slightly then set with an adjustment jig (pin) to set it.



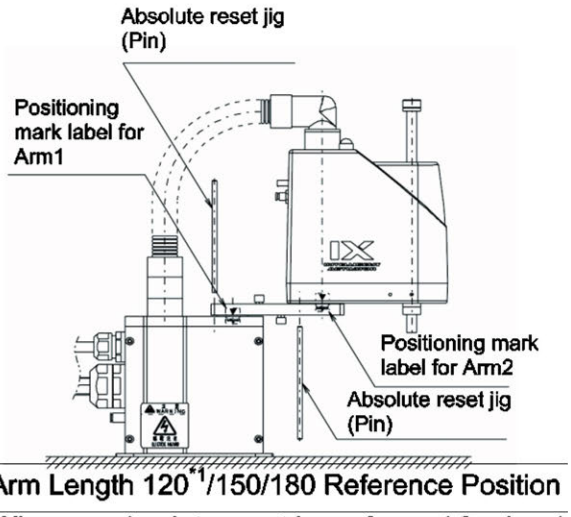
Arm1 (Arm length 120/150/180)



Arm2 (Arm length 150/180)

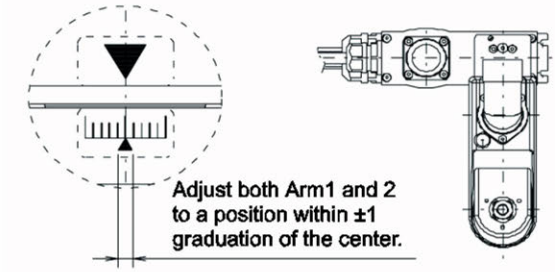


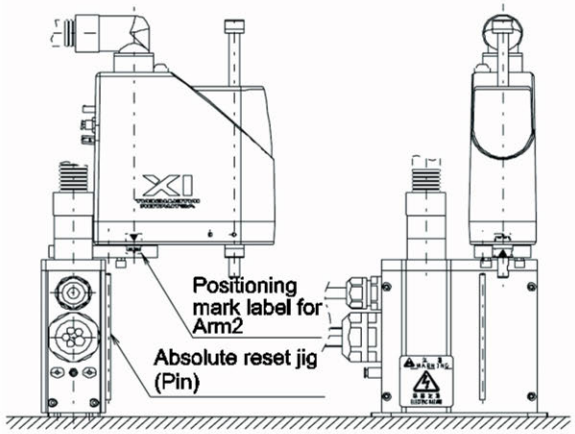
Arm2 (Arm length 120)



Arm Length 120*1/150/180 Reference Position

*1: When an absolute reset is performed for Arm1 (arm length: 120)

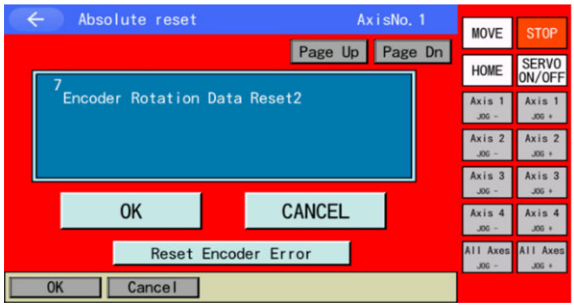




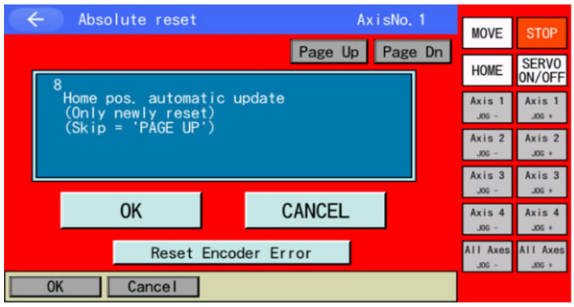
Arm Length 120*2 Reference Position

*2: When an absolute reset is performed for Arm2 (arm length: 120)

⚠ *Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*

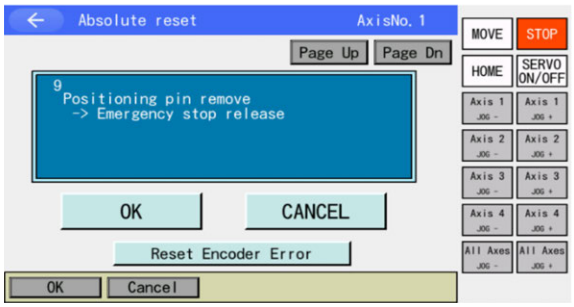


7) Encoder Rotation Data Reset 2
Touch OK button.

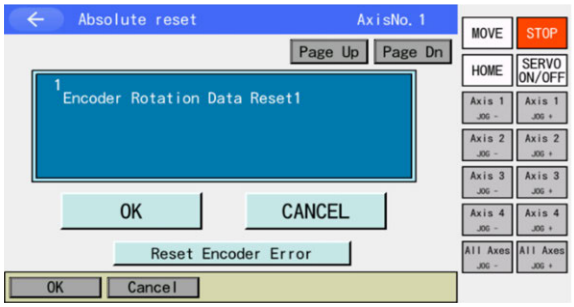


8) Home pos. automatic update
Touch Page Up button. Make sure not to touch OK button

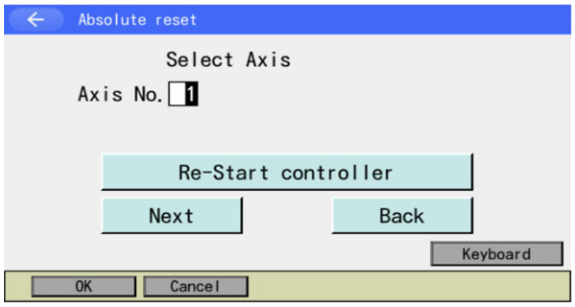
- Do not execute the item of “Home pos. automatic update” (Be careful especially when performing an absolute reset without a jig.)
- If “Home pos. automatic update” is executed by mistake, perform absolute reset work without writing to Flash ROM. (The status will be the same as the one in which “Home pos. automatic update” is not executed.)



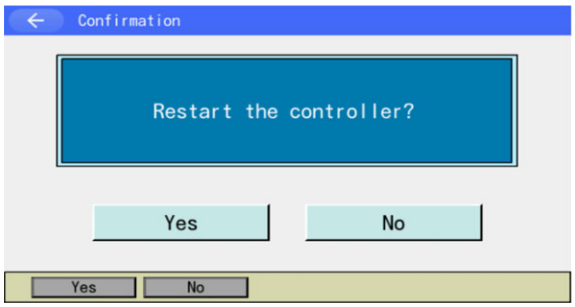
9) Detach adjusting tool and cancel emergency stop
Detach the adjusting tool if it has been set on.
Release the EMERGENCY STOP button before touching OK button.



The display returns to the first screen.
Touch CANCEL button.



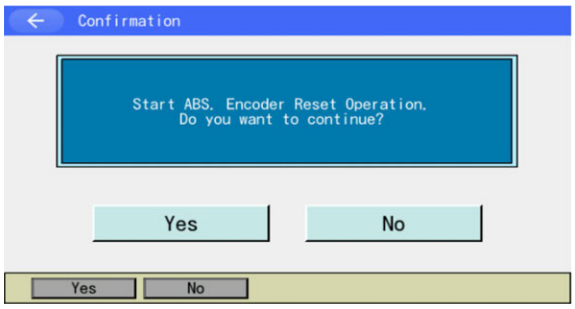
Touch Re-Start controller button.



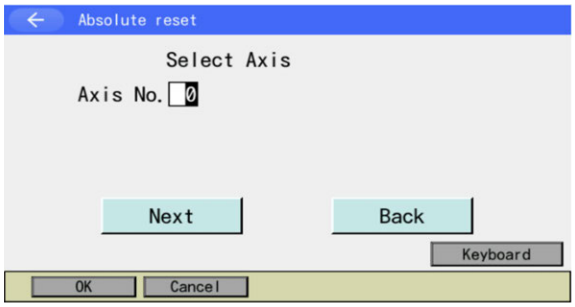
Restart the controller.
Touch Yes button.
The display returns to the main menu when the reboot is finished.

> ⚠ *Caution: Be careful not to perform reset using an incorrect sequence, since it may cause the arm position to become offset.*
> *Execute "home preset value auto refresh" only when any mechanical change such as arm change has been made. (Joint part only)*

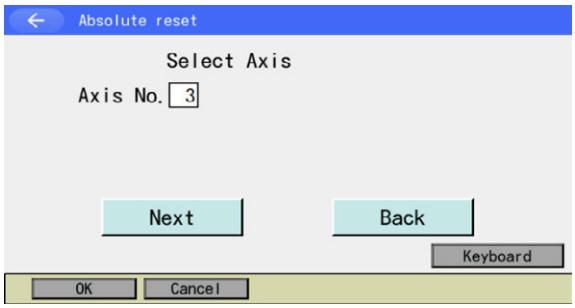
(2) Absolute reset on Z-axis + R-axis
Select Absolute Reset from Controller Menu.



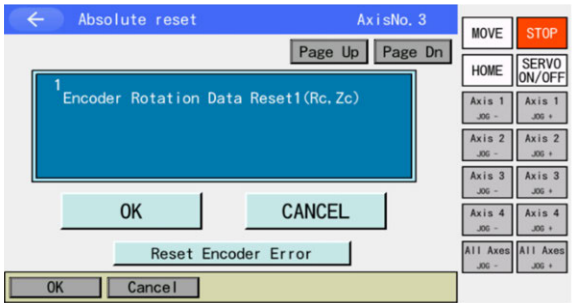
To have an absolute reset, touch Yes button.
When not to have an absolute reset, touch No button. The display returns to the previous screen.



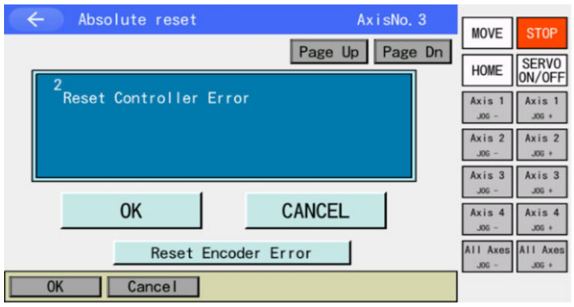
Axis No. input
Input 3 on the touch panel numeric keys to indicate the axis number to have the absolute reset conducted, and touch ENT for confirmation.



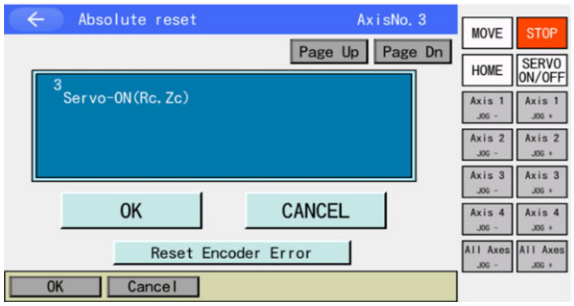
Once the input is confirmed, the cursor disappears.
If you want to redo the input, touch the axis number input box.
If you want to continue absolute reset, touch Next button.
When you cancel absolute reset, touch Back button.
When canceling an absolute reset on any screen of the following 1) through 15) touch CANCEL button.



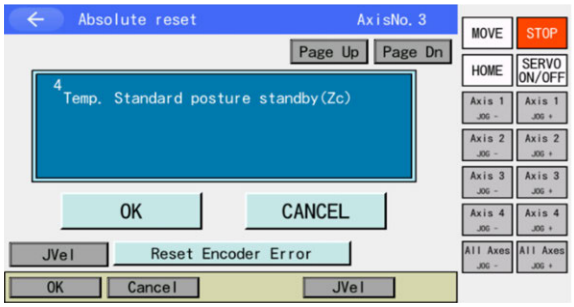
1) Encoder Rotation Data Reset 1
Touch OK button.



2) Reset Controller Error
Touch OK button.

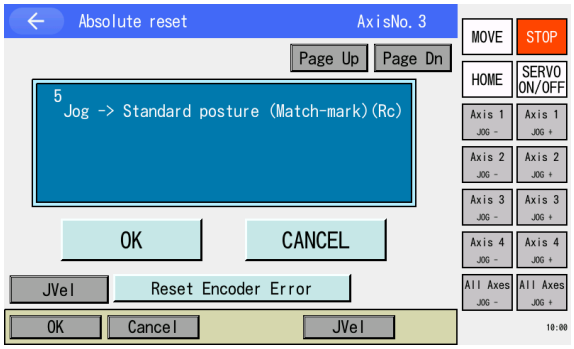


3) Servo-ON
Touch OK button.

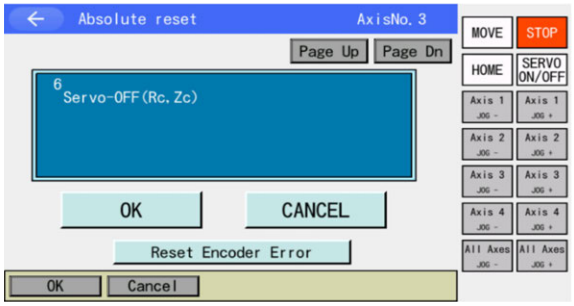


4) Temp. standard posture standby
Touch OK button.

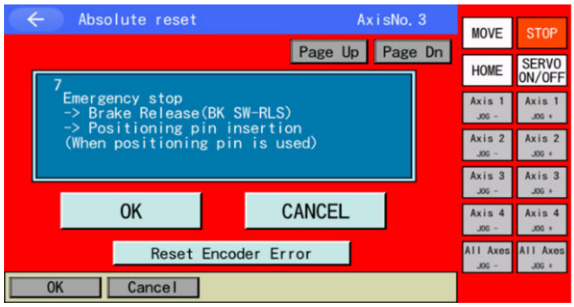
> ⚠ *Caution:*
> *The Z-axis returns to the home position.*



5) Jog Movement
Move the R-axis with the jog button to a place around the standard posture (refer to the figures of standard posture in the next page and after), and touch OK button.

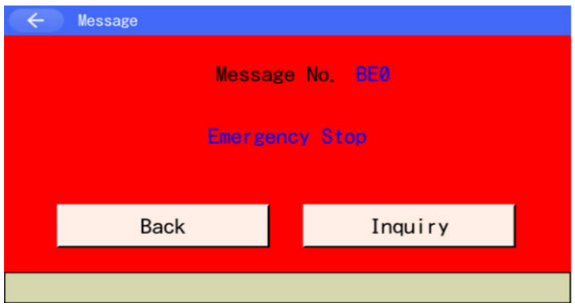


6) Servo-OFF
Touch OK button.



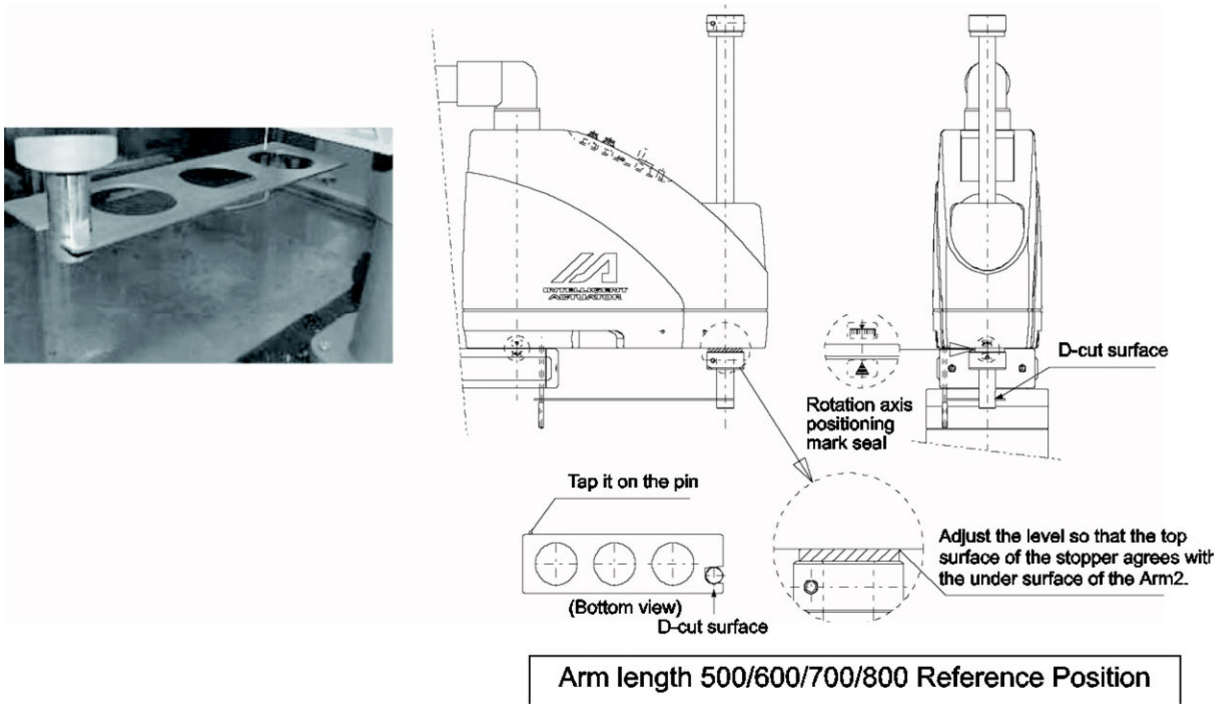
7) Emergency stop input and adjusting jig set
Press the EMERGENCY STOP button.
Press the brake release switch to release the brake.
Fix at the datum posture described in the next page, and touch OK button.





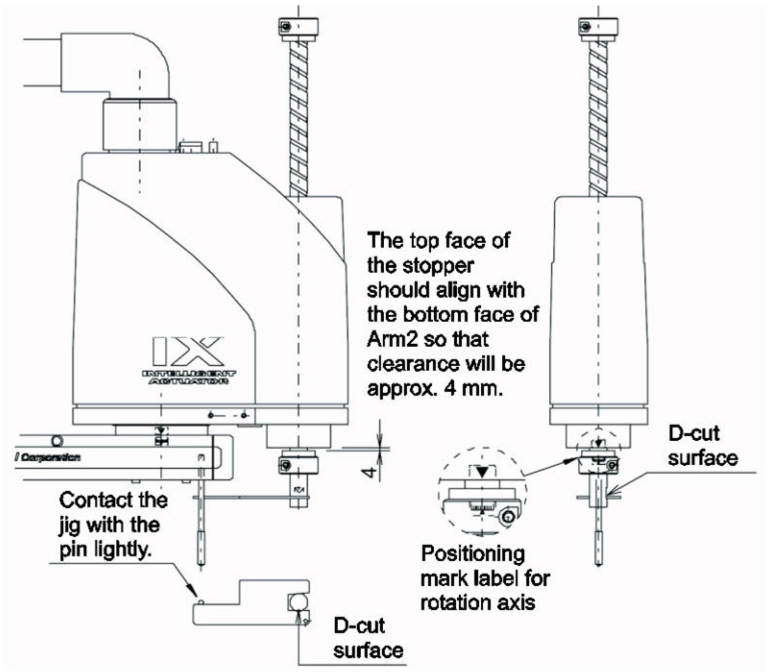
Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

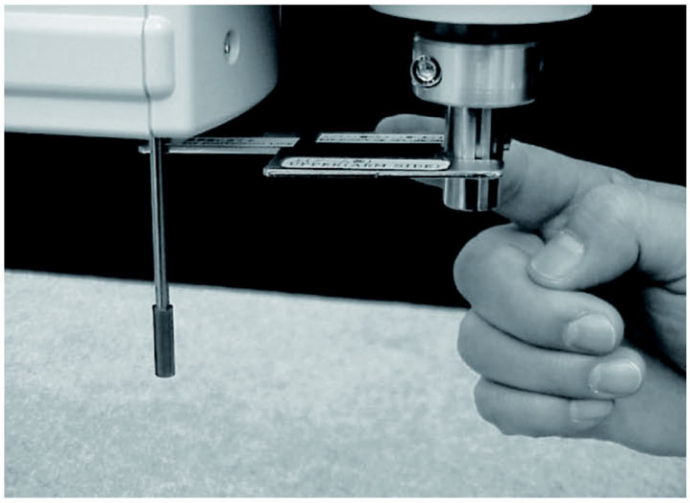
Place the adjusting jig plate and pin as shown below and fix the standard posture.
- After checking that the EMERGENCY STOP switch has been pressed, set the jig.
- Set the jig by referring to the positioning mark.
- Adjust the level so that the top surface of the stopper approximately agrees with the under surface of the Arm2.



Arm length 500/600/700/800 Reference Position

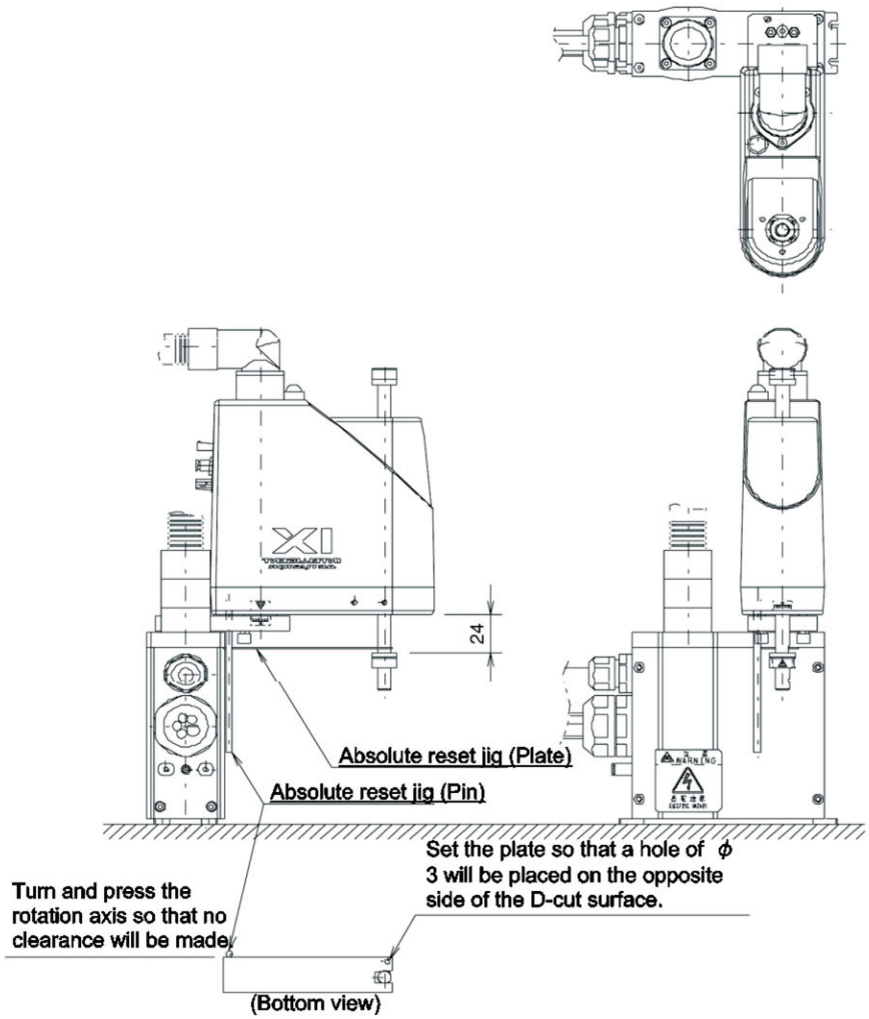
⚠ *Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*



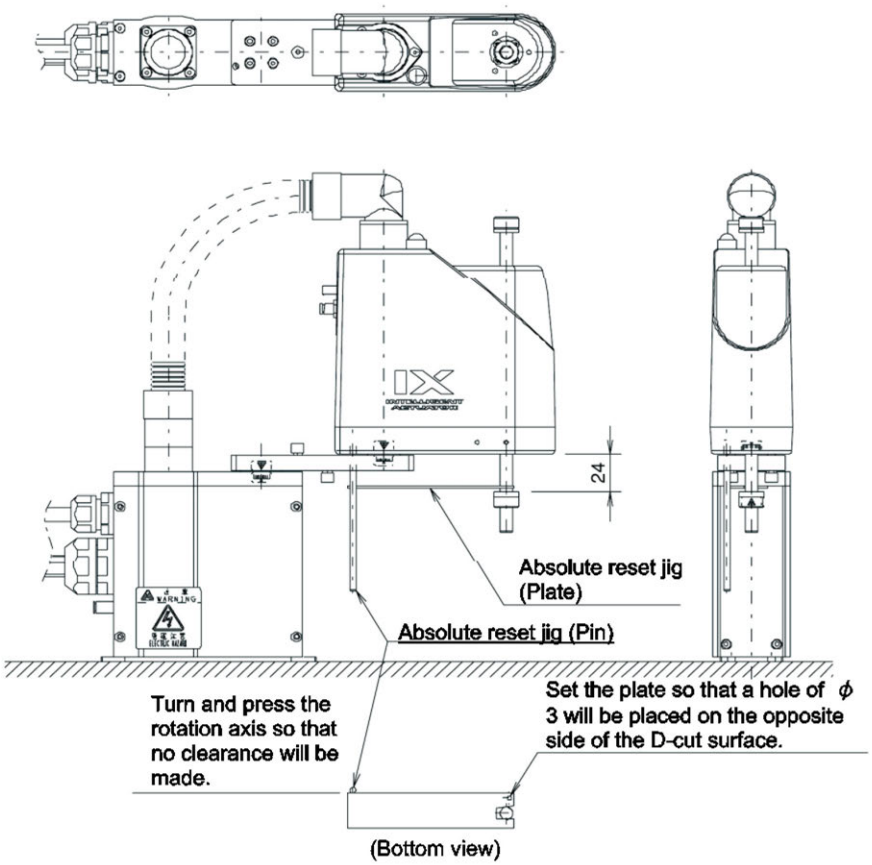


Arm Length 250/300/350 Reference Position

⚠ *Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*

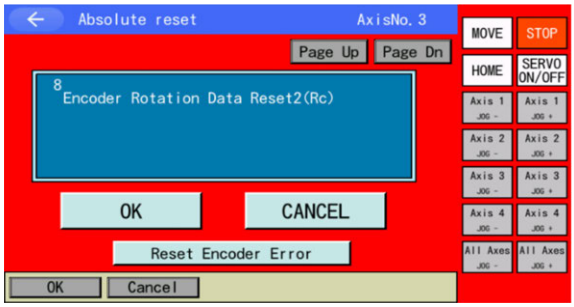


Arm Length 120 Reference Position

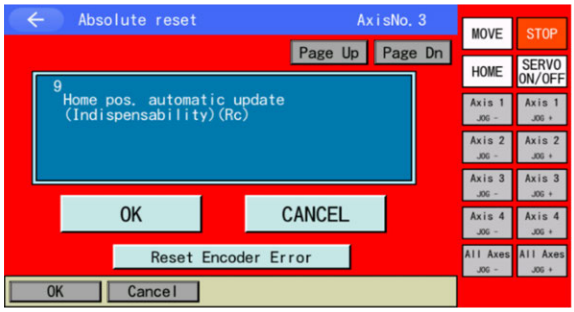


Arm Length 150/180 Reference Position

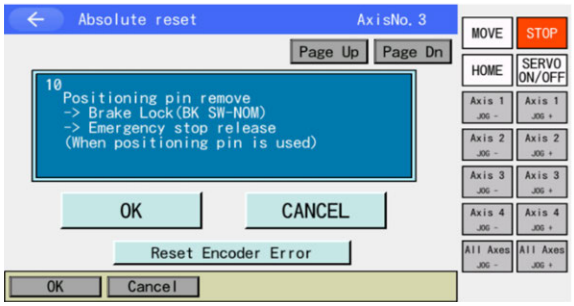
⚠ *Warning:*
- *Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*
- *Pay attention to the orientation of the D-cut surface of the plate jig.*



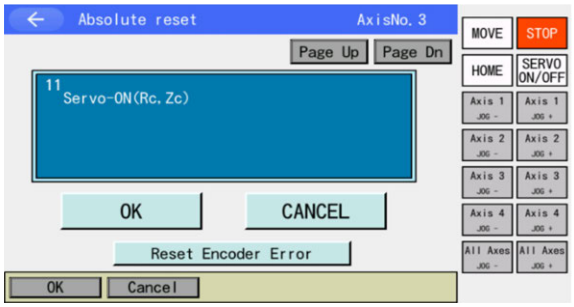
8) Encoder Rotation Data Reset 2
Touch OK button.



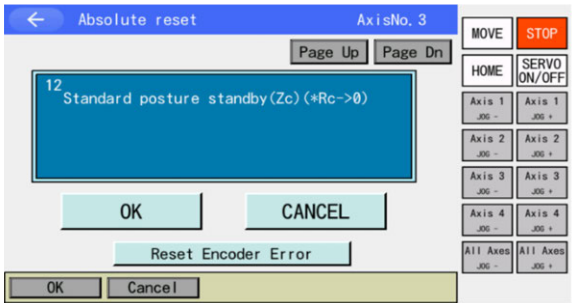
9) Home pos. automatic update
Touch OK button.



10) Adjusting jig removal and emergency off
Remove the adjusting jig.
Turn off the brake release switch to enable the brake.
Turn off the EMERGENCY STOP button.
Touch OK button.

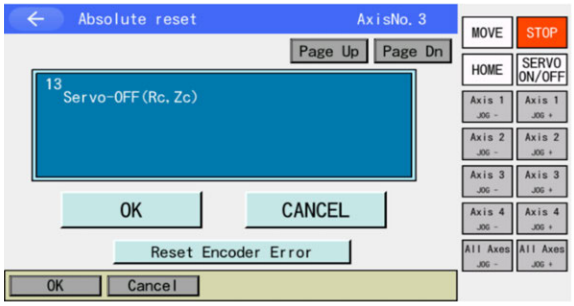


11) Servo-ON
Touch OK button.

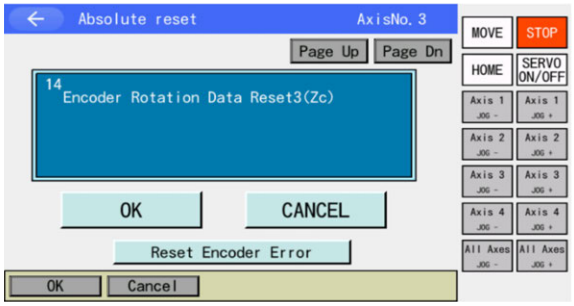


12) Standard posture standby
Touch OK button.

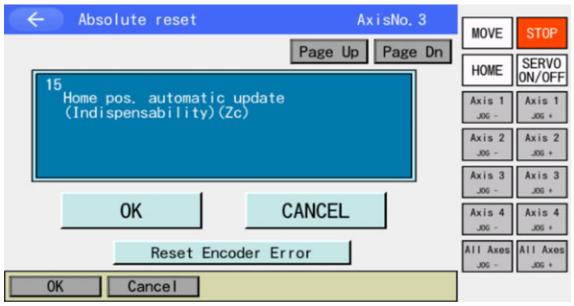
> ⚠ *Caution:*
> *The Z-axis returns to the home position.*



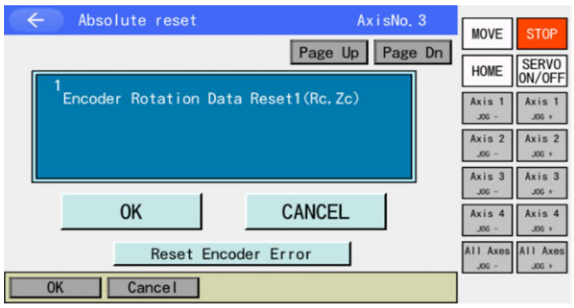
13) Servo-OFF
Touch OK button.



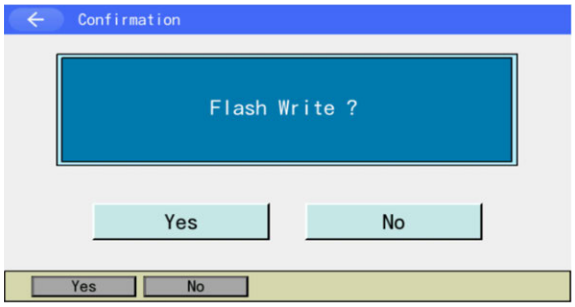
14) Encoder Rotation Data Reset 3
Touch OK button.



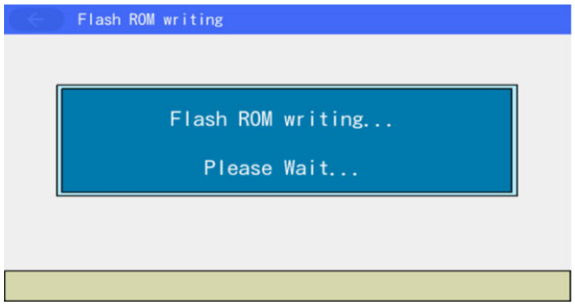
15) Home pos. automatic update
Touch OK button.



The display returns to the first screen.
Touch CANCEL button.
The display returns to the previous screen.

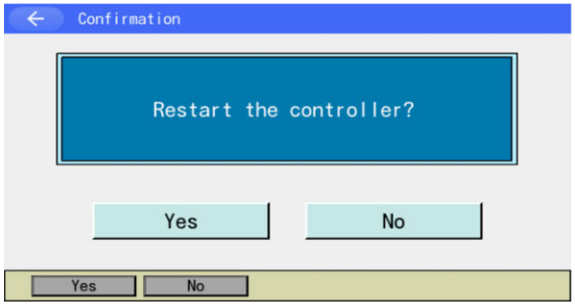


Do not fail to conduct Flash ROM Writing → Software Reset after the home preset automatic updating.



While in writing process to flash ROM, the screen shown in the left will be displayed.

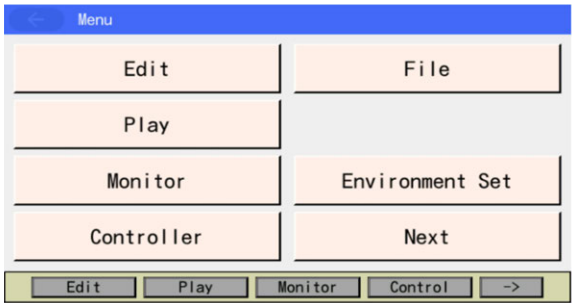
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset.
Touch Yes button.



The screen shown on the left is displayed during the software reset.
Once the software reset is complete, the display returns to the main menu screen.

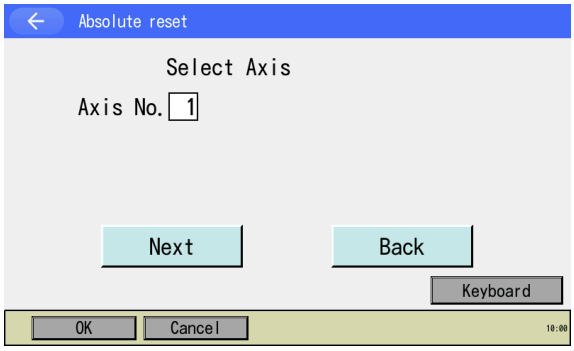


16.2.2 How to Conduct Absolute Reset for Battery-less Absolute SCARA Type

Absolute Reset on SCARA Axes: Follow the procedures below to conduct the absolute reset on 1st to 4th[*1] Axes of XSEL-RAX/SAX and XSEL2-TX (axes group No. 1), 1st to 4th Axes or 5th to 8th Axes of XSEL-RAXD/SAXD.
(*1 1st to 3rd Axes for 3-axis SCARA type)

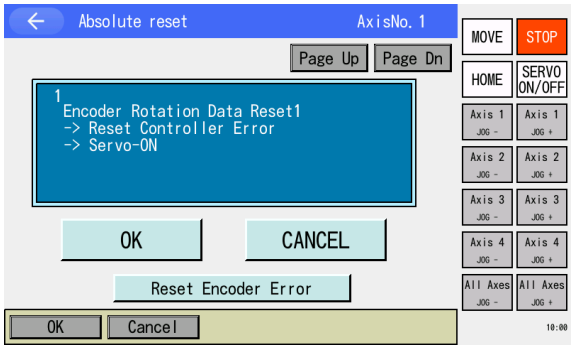
There are some types as shown below for the absolute reset.
For 4-Axis SCARA : Arm1, Arm2 and Z-axis + R-axis
For 3-Axis SCARA : Arm1, Arm2 and Z-axis

(1) Absolute Reset on Arm1 and Arm2



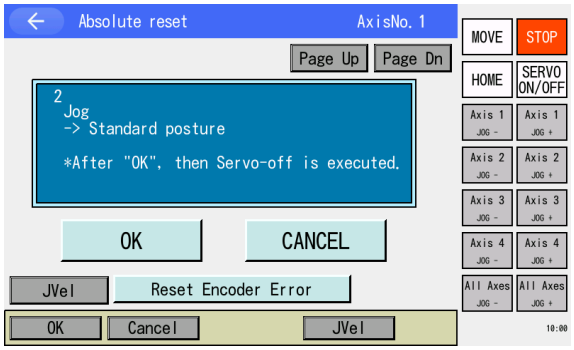
1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.

* Input 1or 5 when you conduct the absolute reset on Arm1 and 2 or 6 when on Arm2.



2) Encoder Rotation Data Reset 1 to Servo-ON
Touch OK button

* After touching OK, the process will be carried out in order from Encoder Multi-Rotation Data Reset 1 to Servo-ON.

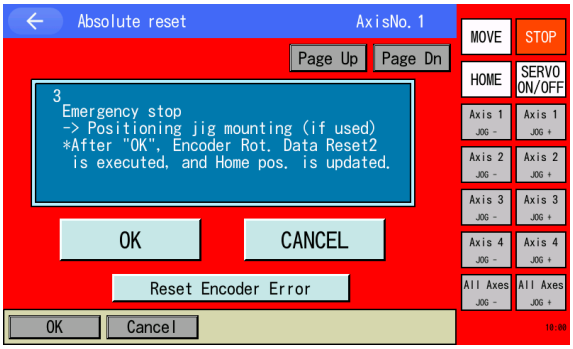


3) Jog Movement
Move the actuator with jog to a point near the standard posture (refer to [figures for standard posture in 16.2.1 (1)]), and touch OK button.

* After touching OK, the servo will get automatically turned OFF.

The following procedures should differ for when the SCARA axis is the battery-less absolute encoder and when it is other than the battery-less absolute encoder.

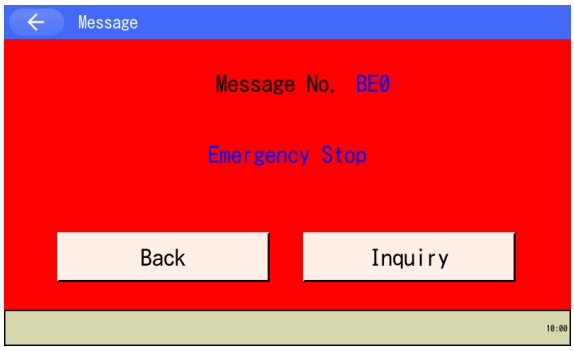
(i) For battery-less absolute encoder



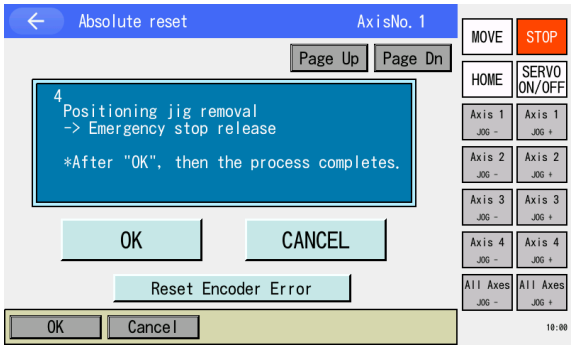
4) Emergency stop and Positioning jig mounting
Press the EMERGENCY STOP button, and then attach the positioning tool.
Affix to the standard posture (refer to [figure of standard posture in 16.2.1 (1)]), and then touch OK button.

* After touching OK, Encoder Multi-Rotation Data Reset 2 and Home Position Preset Automatic Update should be conducted.



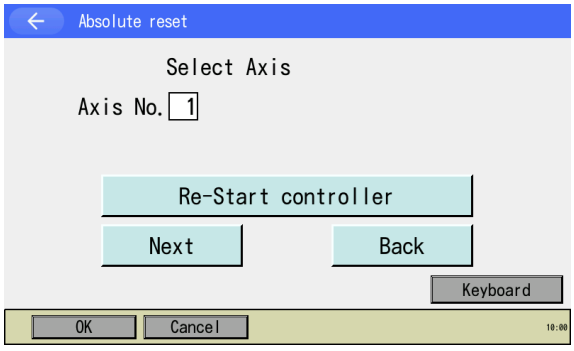


Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.

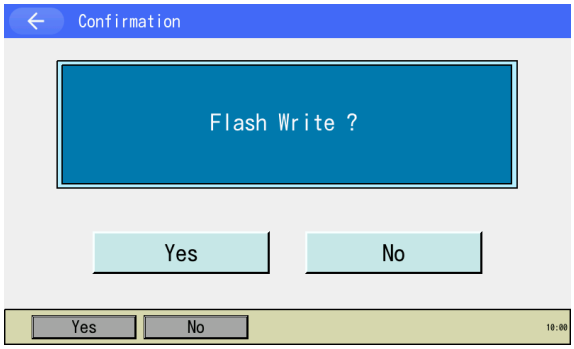


5) Positioning jig removal and Emergency stop release
Detach the positioning tool.
Release the EMERGENCY STOP button before touching OK button.

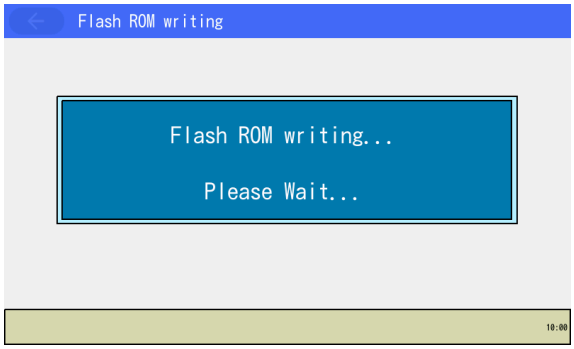
* After confirming OK, the screen automatically returns to the axis select screen.



6) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

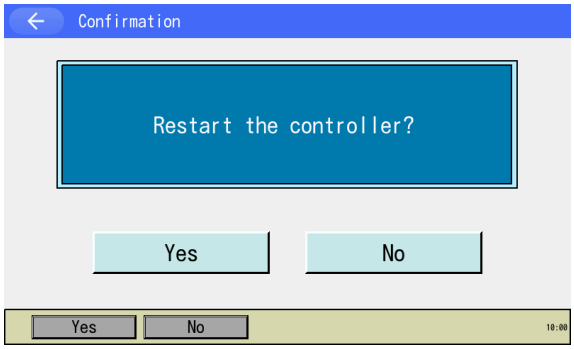


7) Touch Yes button to start flash ROM writing.



8) While in writing process to flash ROM, the screen.

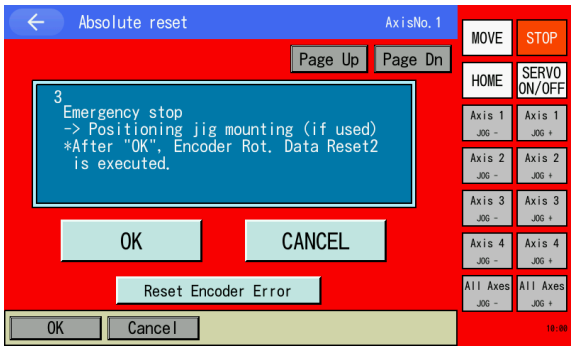
Never turn off the power to the Controller at this time.



9) Once the flash ROM writing is finished, the screen changes to the screen for software reset. To activate the parameters that you had changed, it is necessary to have a software reset. Touch Yes button

Once the software reset is complete, the display returns to the main menu screen.

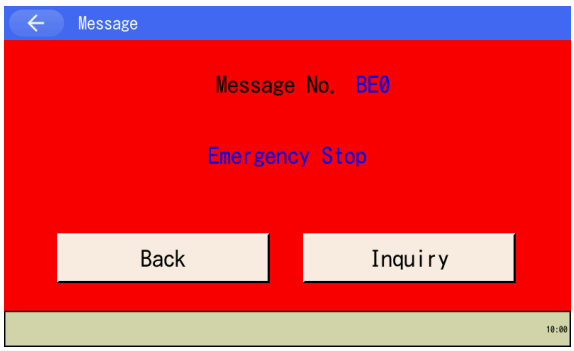
(ii) For other than battery-less absolute encoder



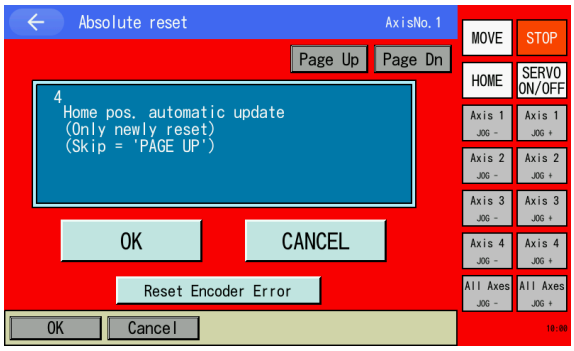
4) Emergency stop and Positioning jig mounting
Press the EMERGENCY STOP button, and then attach the positioning tool.
Affix to the standard posture (refer to [figure of standard posture in 16.2.1 (1)]), and then touch OK button.

* After touching OK, Encoder Multi-Rotation Data Reset 2 should be conducted.



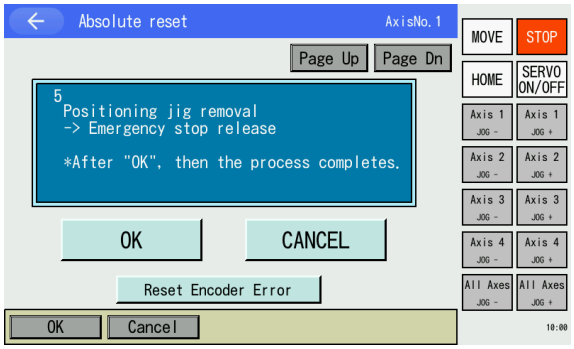


Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.



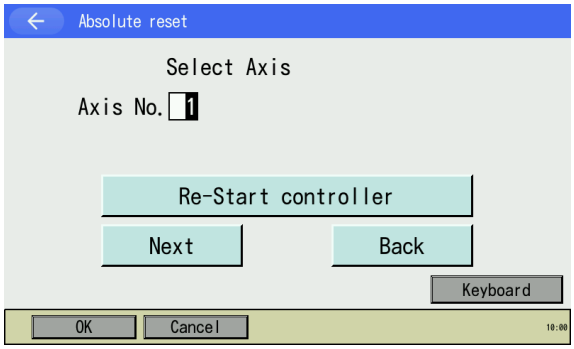
5) Home pos. automatic update
Touch Page Up button. Make sure not to touch OK button.

- Do not execute the item of “Home pos. automatic update” (Be careful especially when performing an absolute reset without a jig.)
- If “Home pos. automatic update” is executed by mistake, perform absolute reset work without writing to Flash ROM. (The status will be the same as the one in which “Home pos. automatic update” is not executed.)

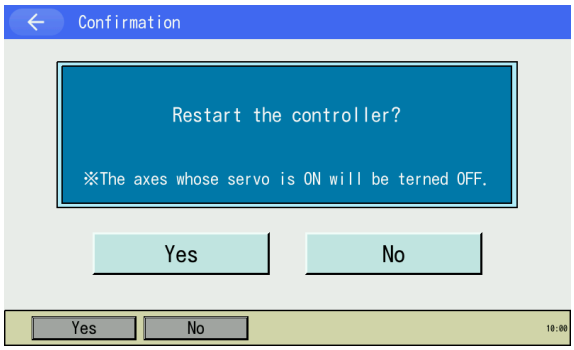


6) Positioning jig removal and Emergency stop release
Detach the positioning tool.
Release the EMERGENCY STOP button before touching OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



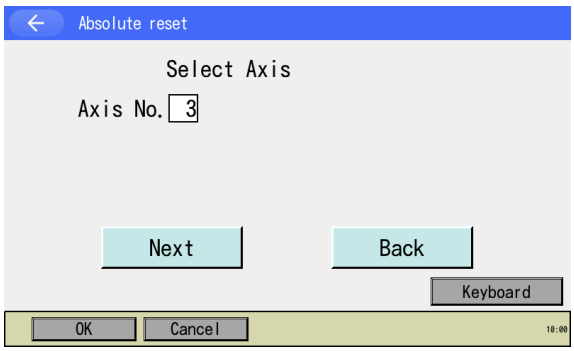
Touch Re-Start controller button.



Restart the controller. Touch Yes button.
The display returns to the main menu when the reboot is finished.

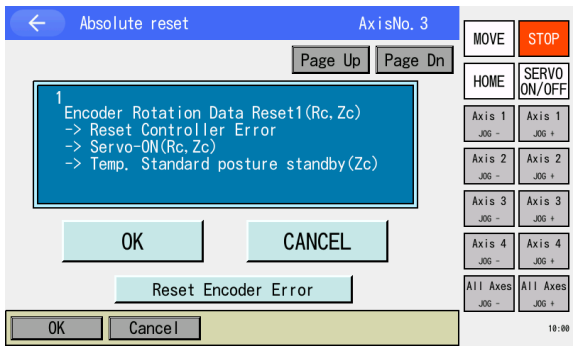
Caution: Be careful not to perform reset using an incorrect sequence, since it may cause the arm position to become offset.
Execute "home preset value auto refresh" only when any mechanical change such as arm change has been made. (Joint part only)

(2) Absolute reset on Z-axis + R-axis　　* For 4-Axis SCARA



1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.

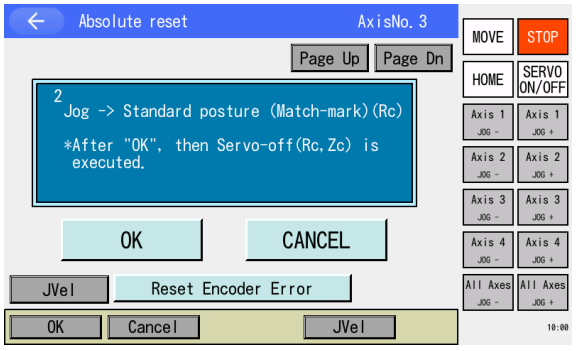
* Input the axis number of the Z-axis (either 3 or 7).



2) Encoder Rotation Data Reset 1 (Rc, Zc) to Temp. Standard posture standby (Zc)
Touch OK button.

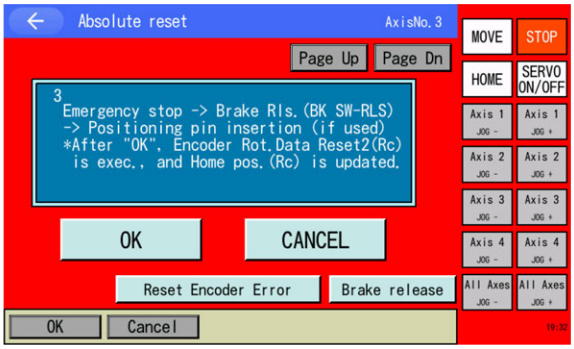
* After touching OK, the process will be carried out in order from Encoder Multi-Rotation Data Reset 1 (Rc, Zc) to Temp. Standard posture standby (Zc).

> ⚠ *Caution:*
> *The Z-axis returns to the home position.*



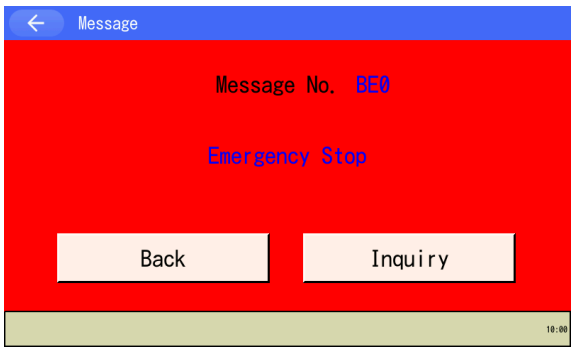
3) Jog Movement
Move the R-axis with the jog button to a place around the standard posture (refer to [figures for standard posture in 16.2.1 (2)]), and touch OK button.

* After touching OK, the servo will get automatically turned OFF (Rc, Zc).

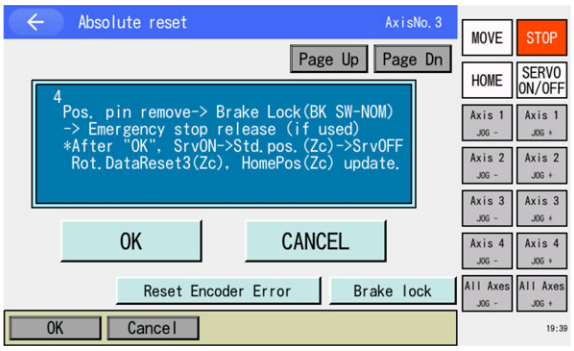


4) Emergency stop input and Positioning pin set
Press the EMERGENCY STOP button.
Set the brake release switch on the controller to the RLS side or touch the Brake release button (when the button is activated) to release the brake in the confirmation window.
Affix to the standard posture (refer to [figure of standard posture in 16.2.1 (2)]), and then touch OK button.

* After touching OK, the process will be carried out in order from Encoder Multi-Rotation Data Reset 2 (Rc) to Home preset value automatic update (Rc).



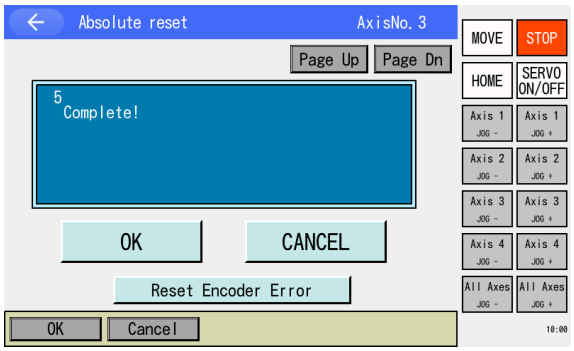
Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.



5) Pos. pin remove and Emergency stop release
Detach the positioning pin.
Set the brake releasee switch back to the NOM side or touch the Brake lock button (when the button is activated) to lock the brake.
Set back the EMERGENCY STOP button, and touch OK button.

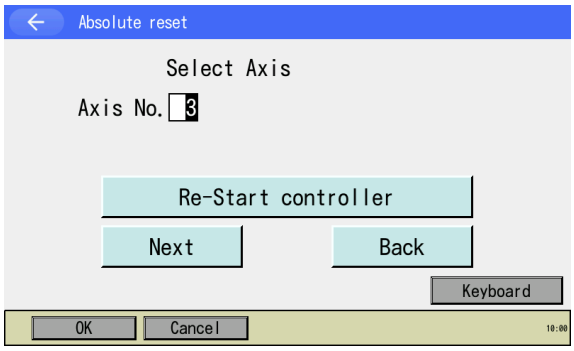
* After touching OK, the process will be carried out in order from Servo ON to Home preset value automatic update (Zc).

> ⚠ *Caution:*
> *The Z-axis returns to the home position.*

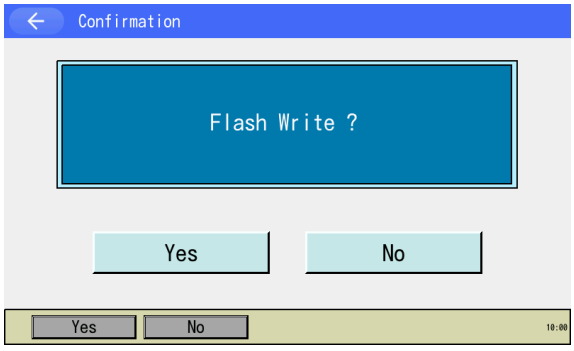


6) Complete!
Touch OK button.

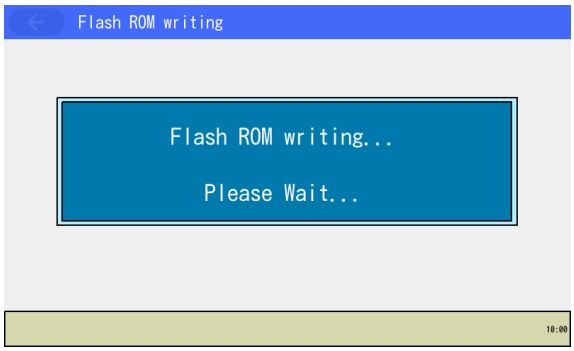
* After confirming OK, the screen automatically returns to the axis select screen.



7) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

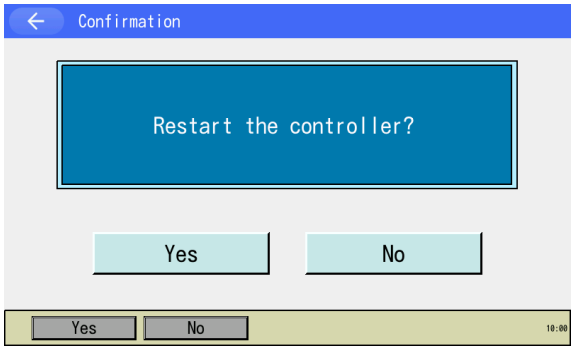


8) Touch Yes button to start flash ROM writing.



9) While in writing process to flash ROM, the screen.

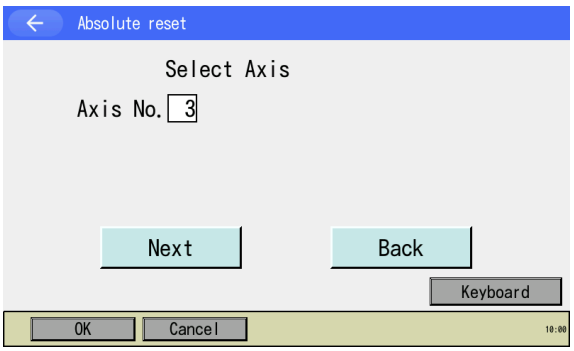
Never turn off the power to the Controller at this time.



10) Once the flash ROM writing is finished, the screen changes to the screen for software reset. To activate the parameters that you had changed, it is necessary to have a software reset.
Touch Yes button

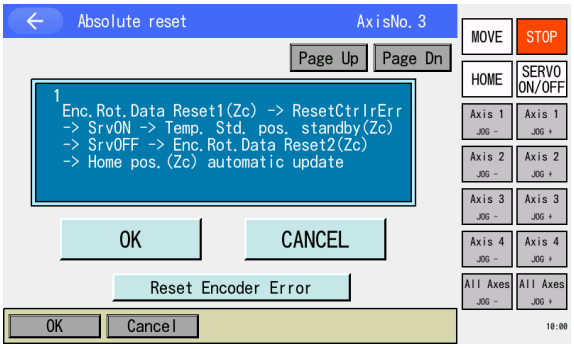
Once the software reset is complete, the display returns to the main menu screen.

(3) Absolute reset on Z-axis　　* For 3-Axis SCARA



1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.

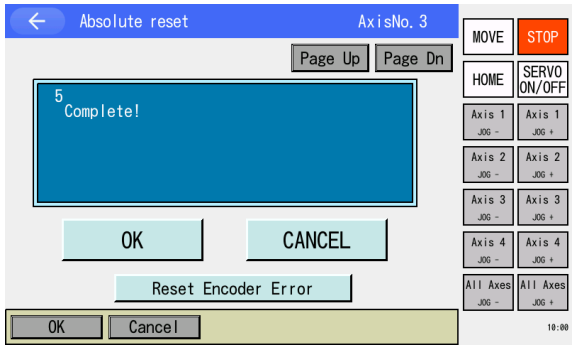
* Input the axis number of the Z-axis (either 3).



2) Absolute Reset
Touch OK button.

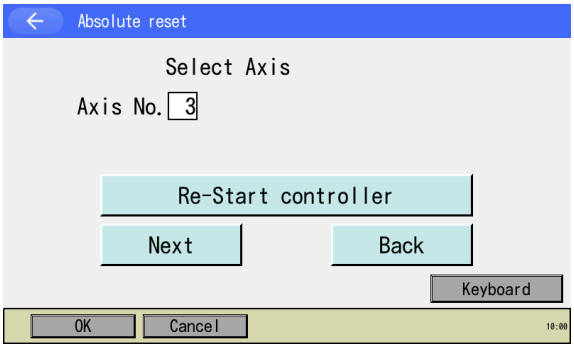
* After touching OK, steps from Encoder Multi-Rotation Data Reset 1 (Zc) to the home preset value (Zc) automatic update should be performed in order.

> ⚠ *Caution:*
> *The Z-axis returns to the home position.*

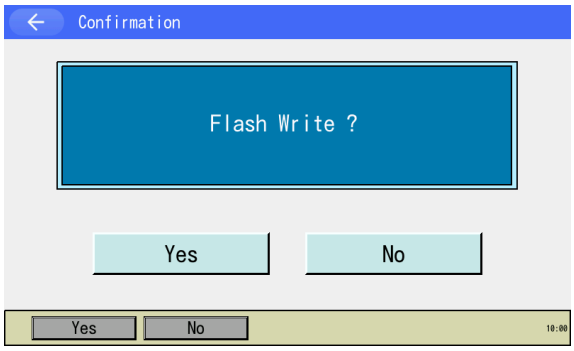


3) Complete!
Touch OK button.

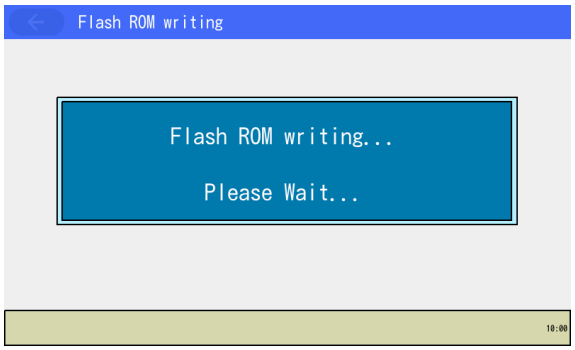
* After confirming OK, the screen automatically returns to the axis select screen.



4) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

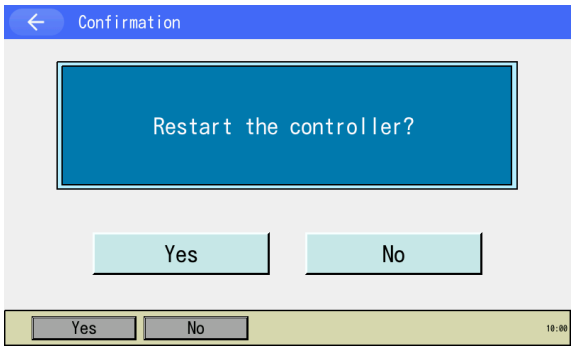


5) Touch Yes button to start flash ROM writing.



6) While in writing process to flash ROM, the left screen.

Never turn off the power to the Controller at this time.



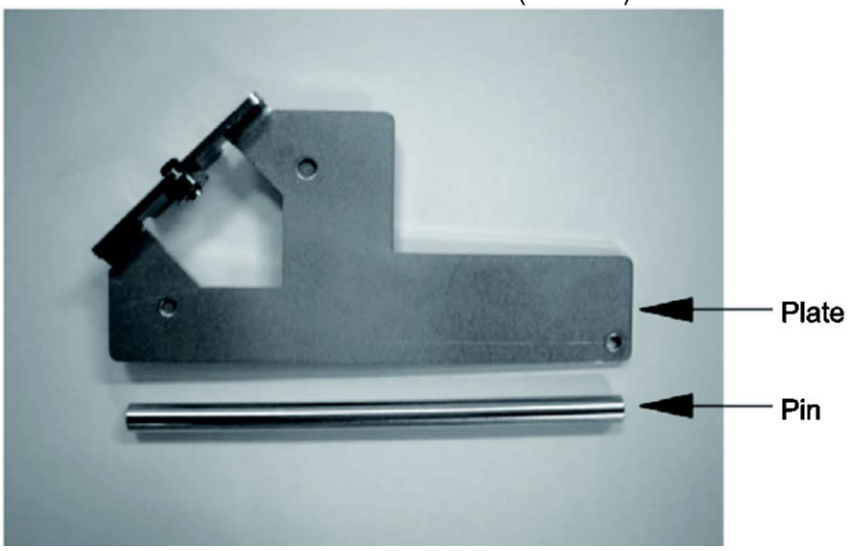
7) Once the flash ROM writing is finished, the screen changes to the screen for software reset.
To activate the parameters that you had changed, it is necessary to have a software reset.
Touch Yes button.

Once the software reset is complete, the display returns to the main menu screen.

16.3 Perform Absolute Reset on ZR Unit (Absolute Type)

Under certain conditions such as when the ZR unit is connected to the controller for the first time, absolute encoder battery voltage is abnormal, or encoder cable has been disconnected, an encoder battery error will generate and absolute reset will be required.

[1] Preparing for Absolute Reset
You also need a special jig to perform an absolute reset.
• Absolute-reset adjustment jig Model number : JG-ZRS (for ZRS)
JG-ZRM (for ZRM)



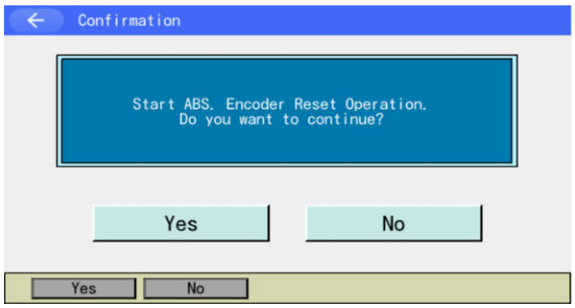
Connect the cables for the robot, controller and teaching pendant to enable operation from the teaching pendant.
Before proceeding, be sure to confirm that the EMG switch operates properly.

> ⚠ *Warning:*
> • *Carrying out any inspection or maintenance work without fully understanding the work may result in serious injury.*
> • *Put up a sign that says "Work in Progress" so as to prevent other operators from accidentally operating the controller, operation panel, etc.*
> • *After having a backup of the parameters, conduct the absolute reset.*

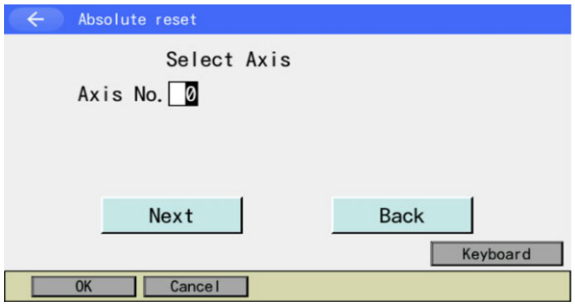
[2] Absolute Reset Procedures

For absolute reset for the ZR unit, a series of operations of the vertical axis and rotation axis is performed. Because there is an item for operating the robot in the adjustment procedure, perform the adjustment in the condition where the actuator is available by setting the appropriate moving range of the actuator and arranging it so there are no obstacles etc. for the actuator.

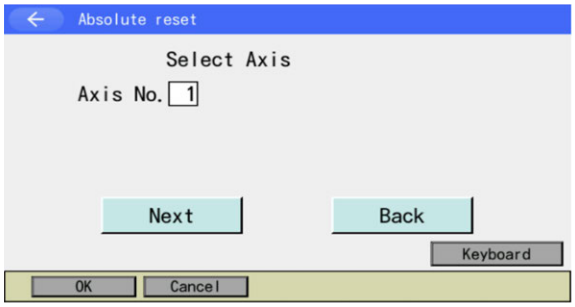
Select Absolute Reset from Controller Menu.



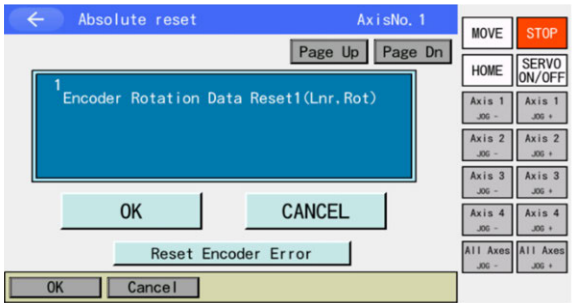
To have an absolute reset, touch Yes button. When not to have an absolute reset, touch No button. The display returns to the previous screen.



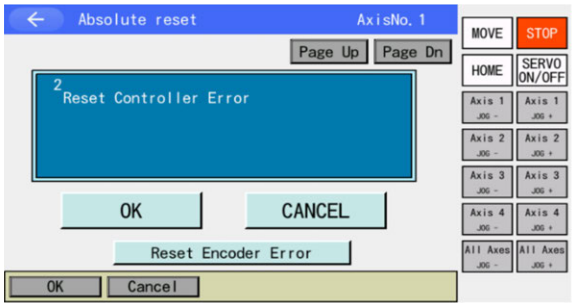
Axis No. input
Input the axis number of the vertical axis on ZR Unit on the touch panel numeric keys , and confirm the input with ENT.



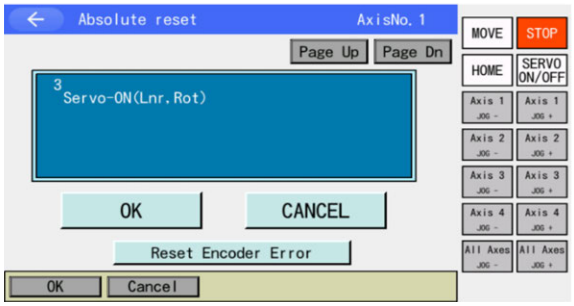
Once the input is confirmed, the cursor disappears.
If you want to redo the input, touch the axis number input box.
If you want to continue absolute reset, touch Next button.
When you cancel absolute reset, touch Back button.
When canceling an absolute reset on any screen of the following 1) through 15) touch CANCEL button.



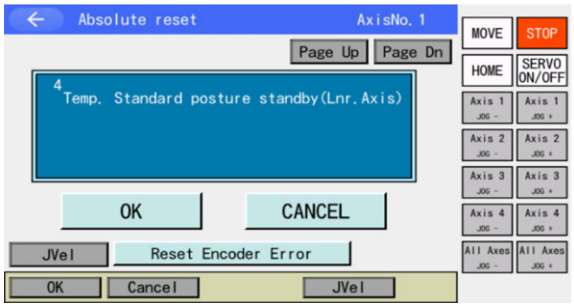
1) Encoder Rotation Data Reset 1
Touch OK button.



2) Reset Controller Error
Touch OK button.

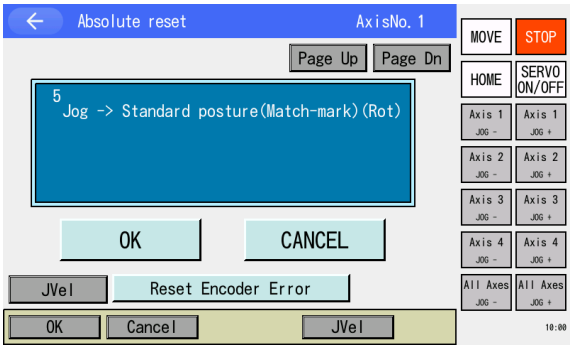


3) Servo-ON
Touch OK button.

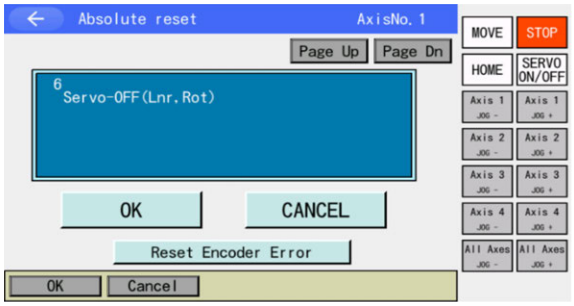


4) Temp. standard posture standby
Touch OK button.

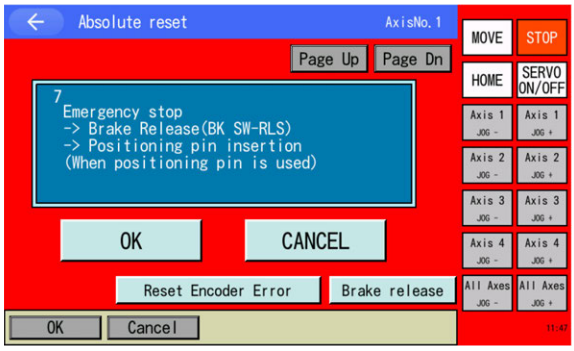
> ⚠ *Caution:*
> *The vertical axis returns to the home position*



5) Jog Movement
Move the rotary axis with the jog button to a place around the standard posture (refer to the figures of standard posture in the next page and after), and touch OK button.

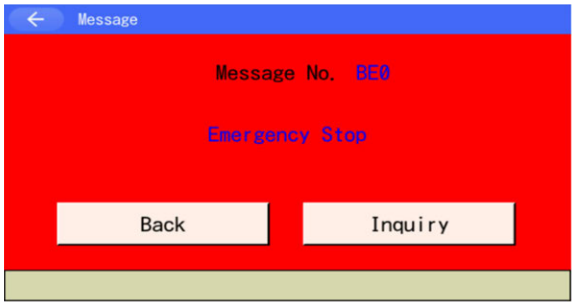


6) Servo-OFF
Touch OK button.



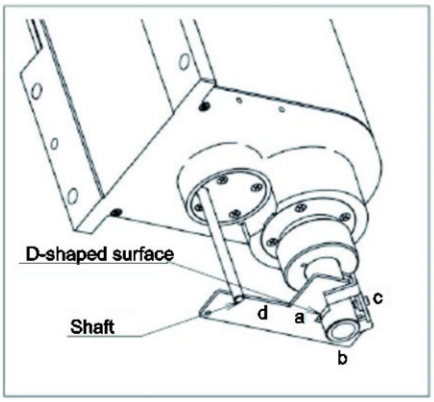
7) Emergency stop input and adjusting jig set
Press the EMERGENCY STOP button.
Set the brake release switch on the controller to the RLS side or touch the Brake release button (when the button is activated) to release the brake in the confirmation window.
Fix at the datum posture described in the next page, and touch OK button.

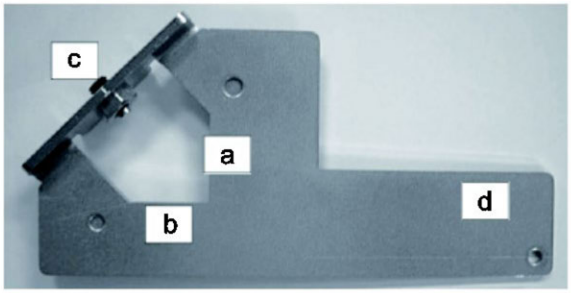




Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

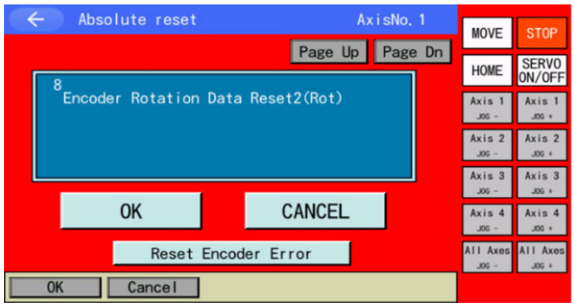
Jig Attachment Procedure



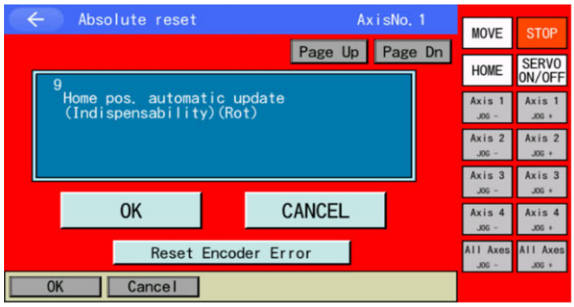


1) Insert the ball screw spline shaft into the jig hole from the lower side.
2) Put the D-cut surface of the ball screw spline shaft onto the surface “a”.
3) Put the ball screw spline shaft side surface onto the surface “b”.
4) Fasten the screw “c” and fix the jig onto the ball screw spline shaft.
   * At that time, make sure that the adjusting jig is placed vertically to the ball screw spline shaft and the D-cut surface closely contacts the surface “a”.
   * Screws to be used : Hexagon socket head set screw M5
   * Tightening Torque : 20 [N▪cm] (reference)
5) Insert the attached shaft into the hole on the ZR unit body.
   * Be careful because the shaft comes off easily when your hand is released.
6) Turn the ball screw spline shaft and put the attached shaft onto the surface “d” of the jig.

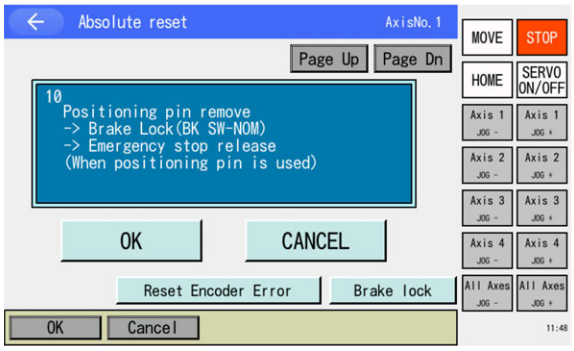
⚠Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.



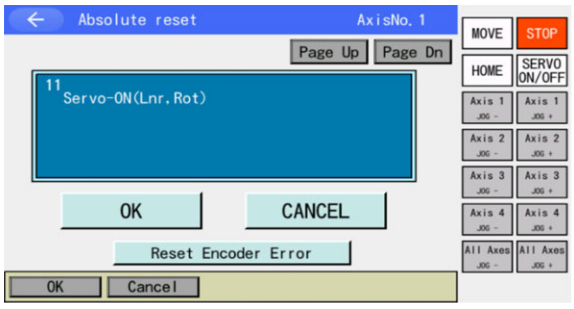
8) Encoder Rotation Data Reset 2
Touch OK button.



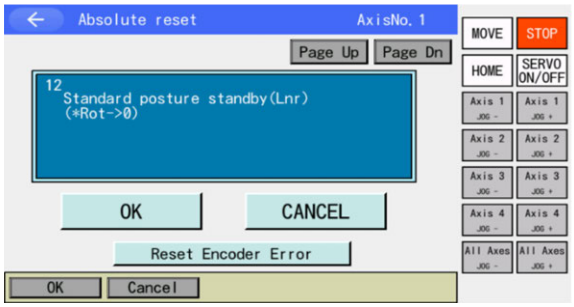
9) Home pos. automatic update
Touch OK button.



10) Adjusting jig removal and emergency off
Remove the adjusting jig.
Set the brake releasee switch back to the NOM side or touch the Brake lock button (when the button is activated) to lock the brake.
Turn off the EMERGENCY STOP button.
Touch OK button.

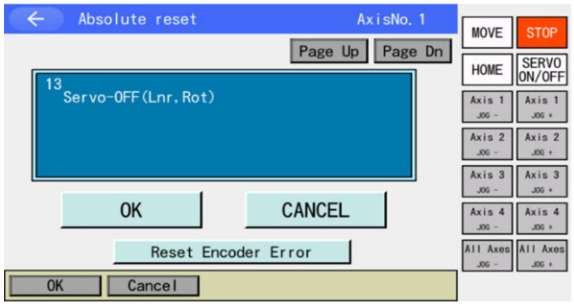


11) Servo-ON
Touch OK button.

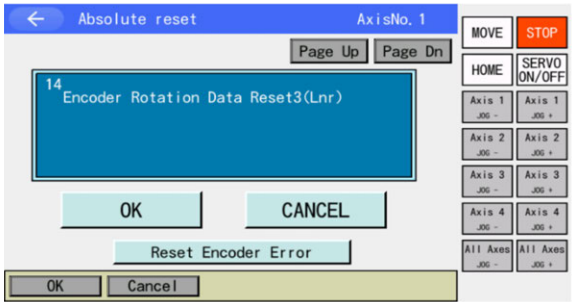


12) Standard posture standby
Touch OK button.

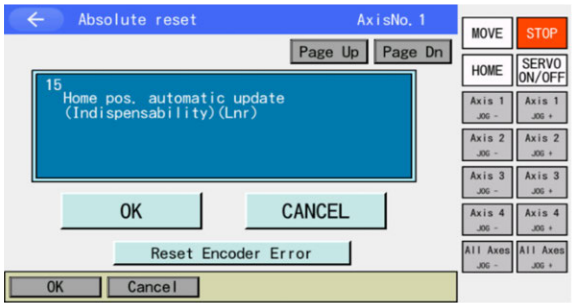
> ⚠ *Caution:*
> *The vertical axis returns to the home position*



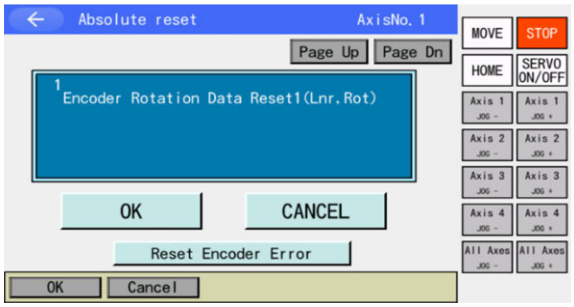
13) Servo-OFF
Touch OK button.



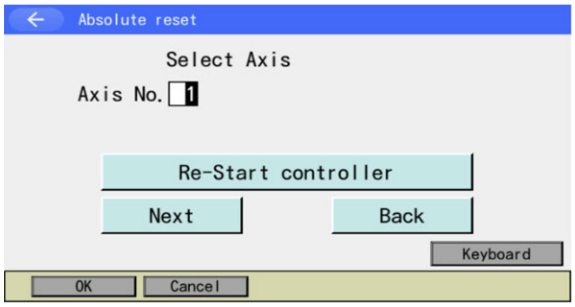
14) Encoder Rotation Data Reset 3
Touch OK button.



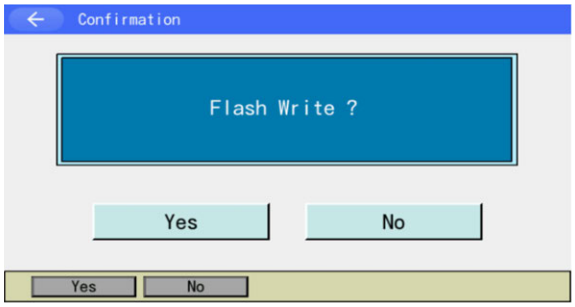
15) Home pos. automatic update
Touch OK button.



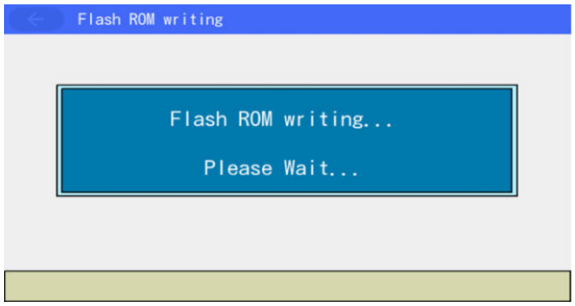
Touch CANCEL button



Touch Re-Start controller button.

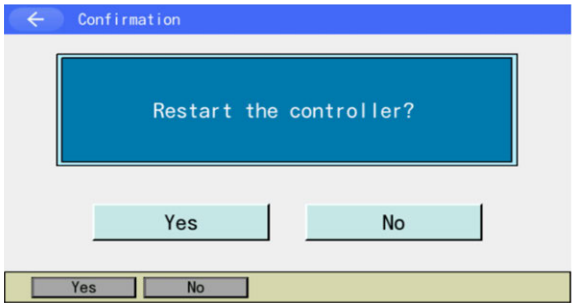


Do not fail to conduct Flash ROM Writing → Software Reset after the home preset automatic updating.



While in writing process to flash ROM, the screen shown in the left will be displayed.

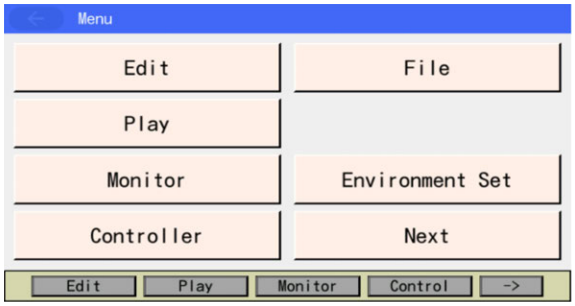
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset.
Touch Yes button.



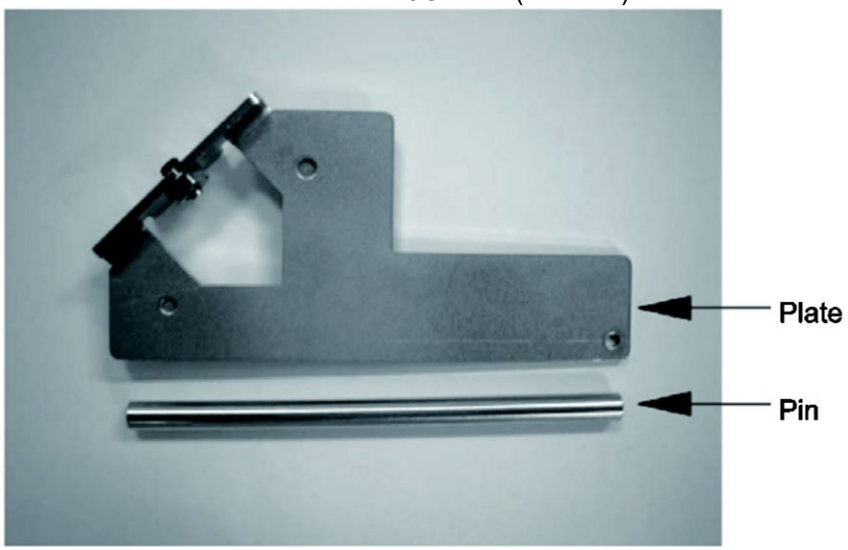
The screen shown on the left is displayed during the software reset.
Once the software reset is complete, the display returns to the main menu screen.



16.4 Perform Ball Screw Spline Shaft Adjusting on ZR Unit (Incremental Type)

Normally, adjustment of the ball screw spline shaft adjusting is not required.
Perform it only when the combination of the main unit and the controller is changed because the ZR unit or controller is changed.

[1] Ball Screw Spline Shaft Adjusting Preparation
The absolute rest jig is required for the adjustment of the ball screw spline shaft adjusting for the ZR unit.
• Absolute-reset adjustment jig Model number : JG-ZRS (for ZRS)
JG-ZRM (for ZRM)



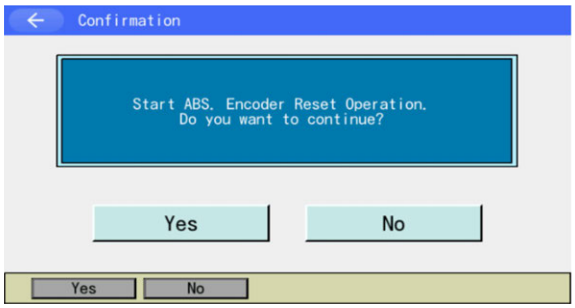
Connect the cables for the robot, controller and teaching pendant to enable operation from the teaching pendant.
Before proceeding, be sure to confirm that the EMG switch operates properly.

> ⚠ *Warning:*
> • *Carrying out any inspection or maintenance work without fully understanding the work may result in serious injury.*
> • *Put up a sign that says "Work in Progress" so as to prevent other operators from accidentally operating the controller, operation panel, etc.*
> • *After having a backup of the parameters, conduct the absolute reset.*

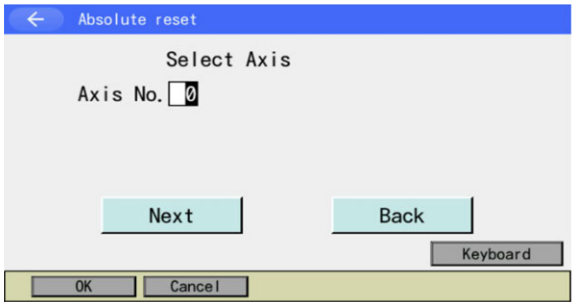
[2] Ball Screw Spline Shaft Adjusting Procedure

For ball screw spline shaft adjusting for the ZR unit, a series of operations of the vertical axis and rotation axis is performed. Because there is an item for operating the robot in the adjustment procedure, perform the adjustment in the condition where the actuator is available by setting the appropriate moving range of the actuator and arranging it so there are no obstacles etc. for the actuator.

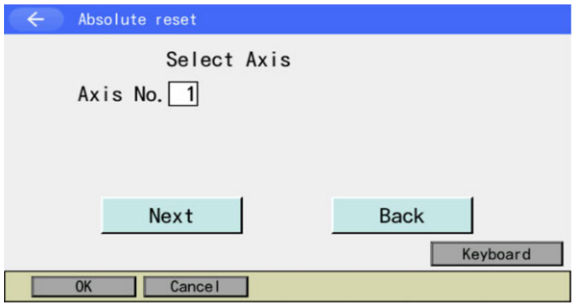
Select Absolute Reset from Controller Menu.



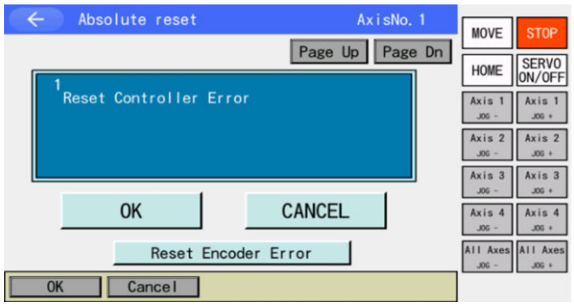
To have an absolute reset, touch Yes button.
When not to have an absolute reset, touch No button. The display returns to the previous screen.



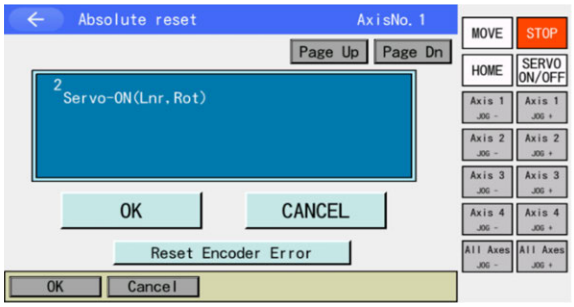
Axis No. Input
Input the axis number of the vertical axis on ZR Unit on the touch panel numeric keys , and confirm the input with ENT.



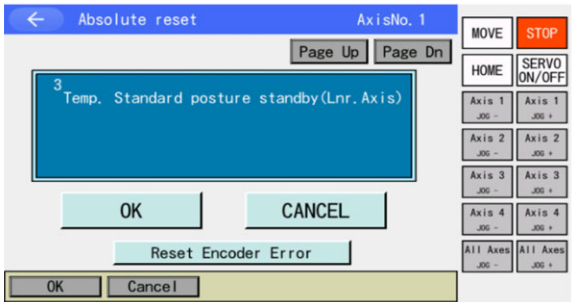
Once the input is confirmed, the cursor disappears.
If you want to redo the input, touch the axis number input box.
If you want to continue absolute reset, touch Next button.
When you cancel absolute reset, touch Back button.
When canceling an absolute reset on any screen of the following 1) through 9) touch CANCEL button.



1) Reset Controller Error
Touch OK button.

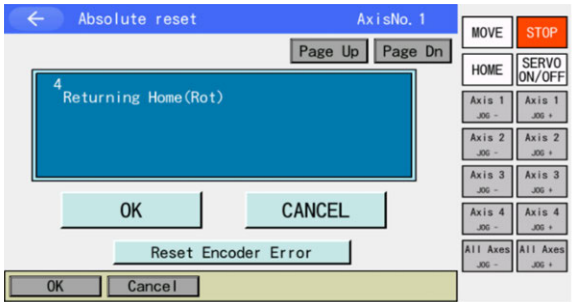


2) Servo-ON
Touch OK button.



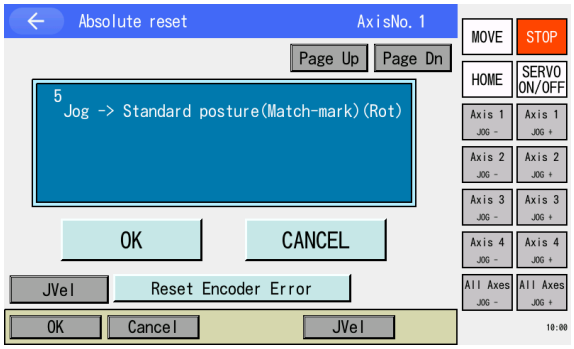
3) Temp. standard posture standby
Touch OK button.

> ⚠ *Caution:*
> *The vertical axis returns to the home position*

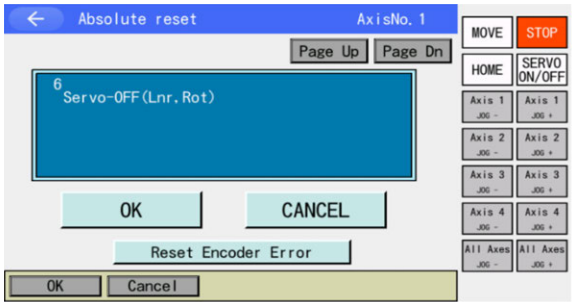


4) Returning Home
Touch OK button.

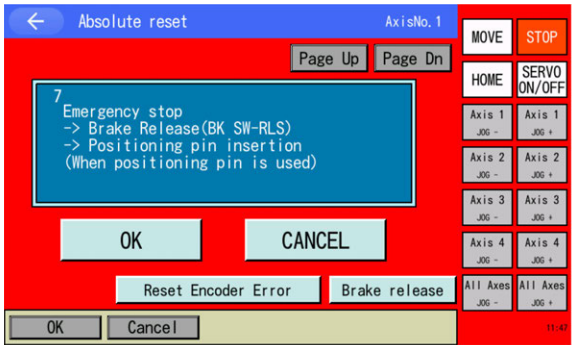
> ⚠ *Caution:*
> *The rotation axis returns to the home position.*



5) Jog Movement
Move the rotation axis to the vicinity of the standard position with jog button (see the “Standard Posture Drawing” on the next page).
Touch OK button.



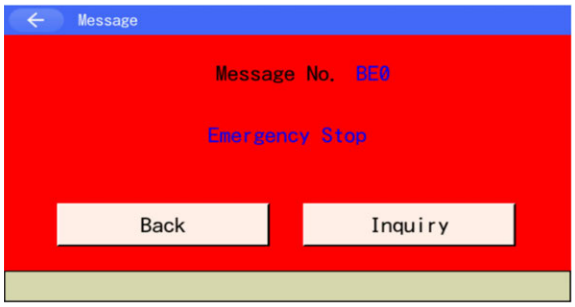
6) Servo-OFF
Touch OK button.



7) Emergency stop input and adjusting jig set
Press the EMERGENCY STOP button.
Set the brake release switch on the controller to the RLS side or touch the Brake release button (when the button is activated) to release the brake in the confirmation window.

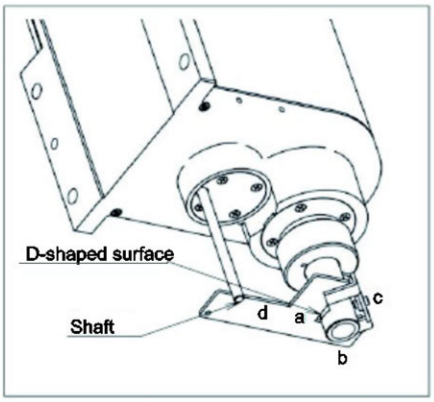
Fix at the datum posture described in the next page with using a jig, and touch OK button.

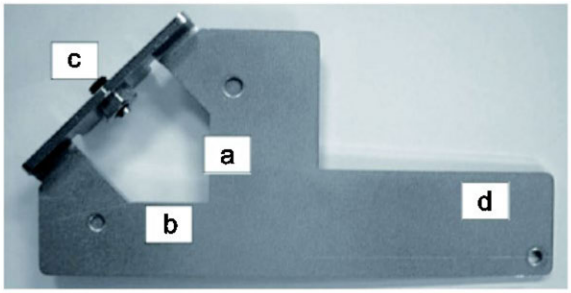




Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

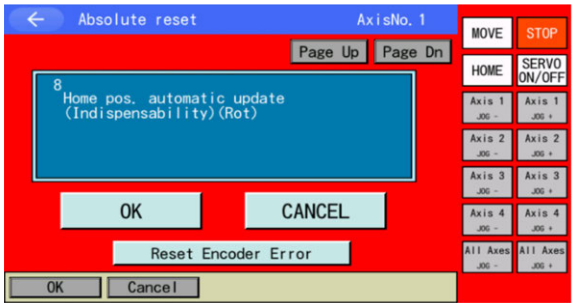
Jig Attachment Procedure



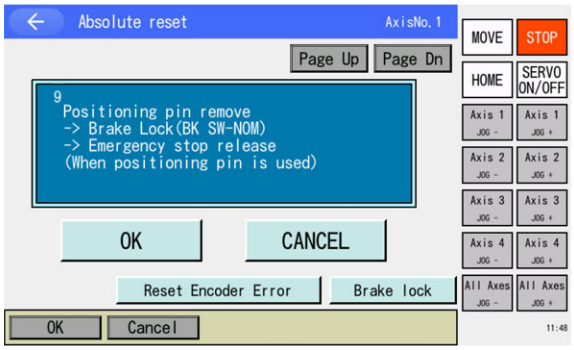


1) Insert the ball screw spline shaft into the jig hole from the lower side.
2) Put the D-cut surface of the ball screw spline shaft onto the surface “a”.
3) Put the ball screw spline shaft side surface onto the surface “b”.
4) Fasten the screw “c” and fix the jig onto the ball screw spline shaft.
   * At that time, make sure that the adjusting jig is placed vertically to the ball screw spline shaft and the D-cut surface closely contacts the surface “a”.
   * Screws to be used : Hexagon socket head set screw M5
   * Tightening Torque : 20 [N▪cm] (reference)
5) Insert the attached shaft into the hole on the ZR unit body.
   * Be careful because the shaft comes off easily when your hand is released.
6) Turn the ball screw spline shaft and put the attached shaft onto the surface “d” of the jig.

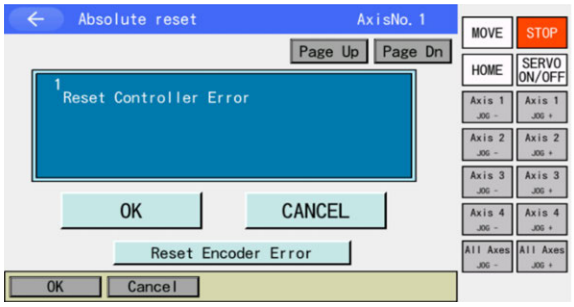
⚠ *Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*



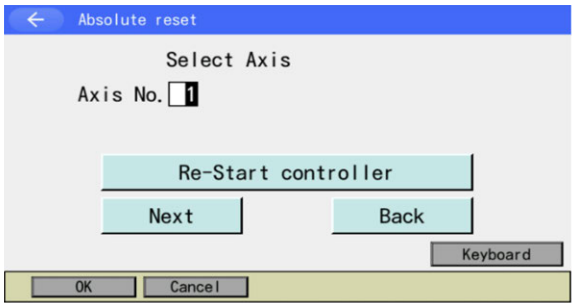
8) Home pos. automatic update
Touch OK button.

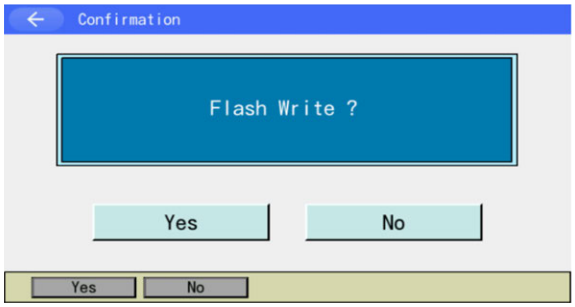


9) Adjusting jig removal and emergency off
Remove the adjusting jig.
Set the brake releasee switch back to the NOM side or touch the Brake lock button (when the button is activated) to lock the brake.
Touch OK button.

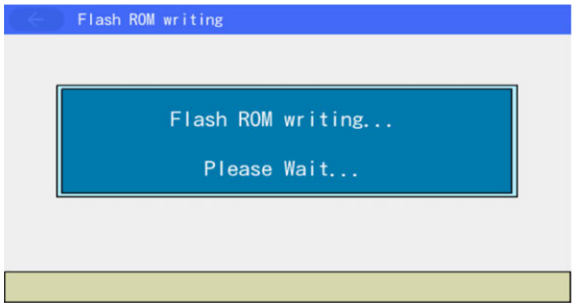


Touch CANCEL button.



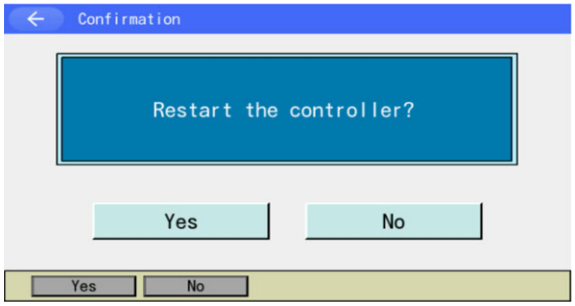


Do not fail to conduct Flash ROM Writing → Software Reset after the home preset automatic updating.



While in writing process to flash ROM, the screen shown in the left will be displayed.

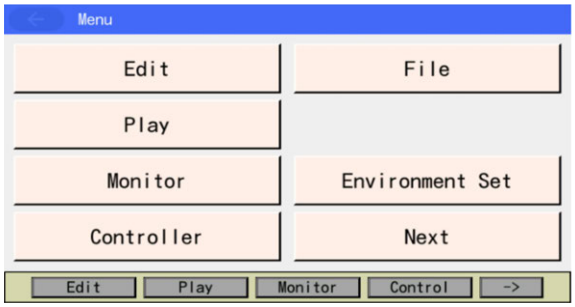
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
Reset software.
Touch Yes button.



The screen shown on the left is displayed during the software reset.
Once the software reset is complete, the display returns to the main menu screen.


Menu
Edit
File
Play
Monitor
Environment Set
Controller
Next
Edit
Play
Monitor
Control
->

16.5 Orthogonal Axis Synchro Specification Absolute Reset

The following are descriptions about the absolute reset methods for synchro specification axes.
The products ordered as the synchro specification are shipped after setting parameters to the synchro specification. However, change the parameters when executing an absolute reset.

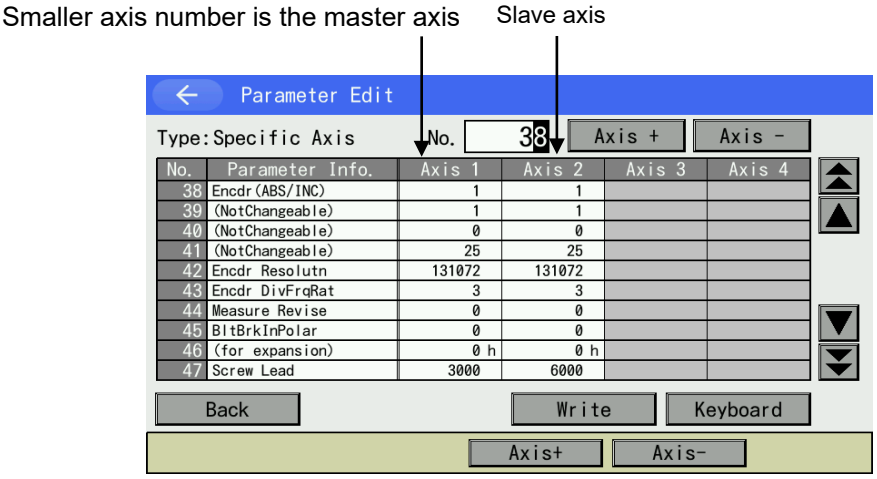
16.5.1 Synchro Axes

Synchro axes are comprised of the master axis (main axis) and the slave axis (sub-axis). The axis of which the number is smaller becomes the master axis.
Program commands are valid only for the master axis. (Commands to the slave axis are prohibited.)
As the absolute reset methods, there is the standard procedure and the special procedure. Which procedure to be used is determined by the “specific-axis parameter No. 38 encoder ABS/INC type” values for the master and slave axes.

“Specific-Axis Parameter No. 38 Encoder ABS/INC Type” Values		Absolute Reset Methods
Master Axis	Slave Axis	
1	1	Special procedure
1	0	Standard procedure
0	0	

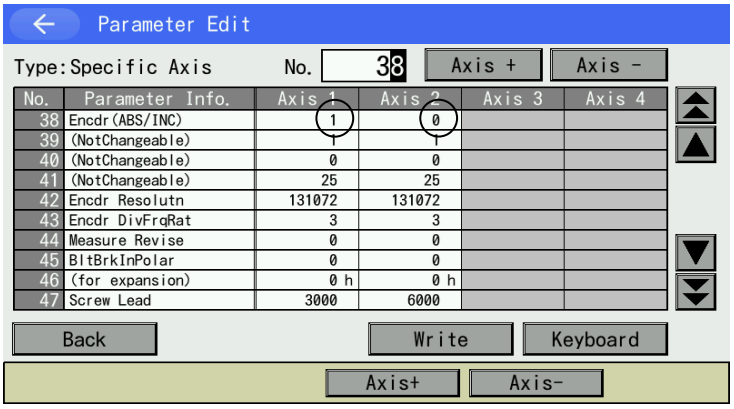
(When the value is 0 for both the master axis and the slave axis, both the axes are of the increment specification.)

Example 1) When special procedure is executed for 2-axis controller:
Display Transition: Edit → Parameter → Specific Axis



> ⚠ *Caution: To change the axis number in a controller with five axes or more, touch Axis + and Axis - buttons.*

Example 2) When standard procedure is executed for 2-axis controller:



16.5.2 Location Adjustment of Synchro Axes Sliders

Align the synchro axes sliders. (Physical parallel adjustment)

(1) Adjust the relative locations between the sliders of the master and slave axes and connect them while the axes are not connected to the controller via cables (controller main power OFF).
(2) If location adjustment cannot be made while the axes are not connected to the controller via cables (such as with the brake), follow the steps below.

1) Disconnect the sliders temporarily and connect the axes to the controller via cables.
2) Record the current values of the “Specific-axis parameter No. 65 synchro other axis No.” For the master and slave axes. (Record them to return to their original values in a later process.)
3) To cancel the synchro function temporarily, input 0 to the “Specific-axis parameter No. 65 synchro other axis No.” for both the master and slave axes, and execute the data transfer to the controller, Flash ROM writing and controller restart (software reset) in this order.
4) Execute an absolute reset (standard procedure) for specific of the master and slave axes as a single axis.
5) Adjust the relative locations of the sliders by jog operation, etc., and connect them.
6) To activate the synchro function again, input the values recorded in 2) above to the “Specific-axis parameter No. 65 synchro other axis No.” for the master and slave axes, and execute the data transfer to the controller, Flash ROM writing and controller restart (software reset) in this order.

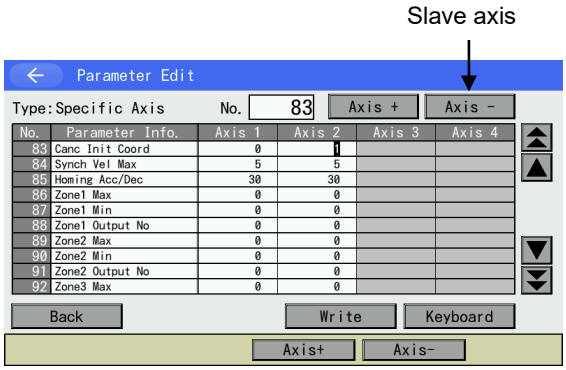
16.5.3 Special Procedure Absolute Reset

In the case of “Specific-axis parameter No. 38 encoder ABS/INC type”: master axis = 1 and slave axis = 1:

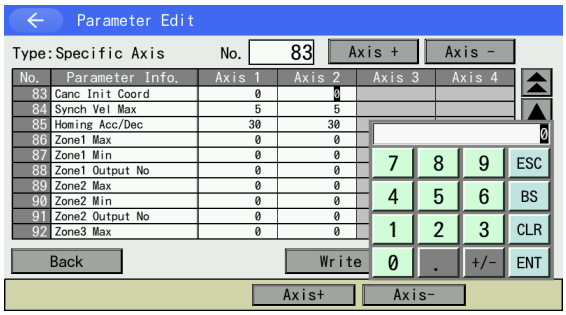
> When a connected controller is XSEL2-T/TX, refer to 16.14 “Absolute Reset for Synchronizing Axis: XSEL2-T/TX”.
> When a connected controller is other than XSEL2-T/TX and it is a battery-less absolute applicable model, refer to 16.8.2 “Battery-less Absolute Applicable Synchronizing Type Absolute Reset Procedures”.

(1) Record the current value of the “Specific-axis parameter No. 83 ABS synchro slave axis coordinate initialization cancel” for the slave axis.
(Record it to return to the original value in a later process.)

Display Transition: Edit → Parameter → Specific Axis

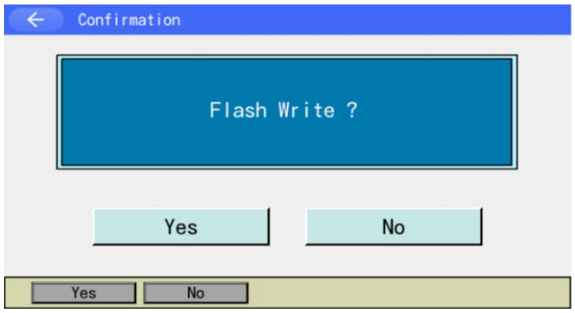


(2) Input 0 for the “Specific-axis parameter No. 83 ABS synchro slave axis coordinate initialization cancel” for the slave axis.

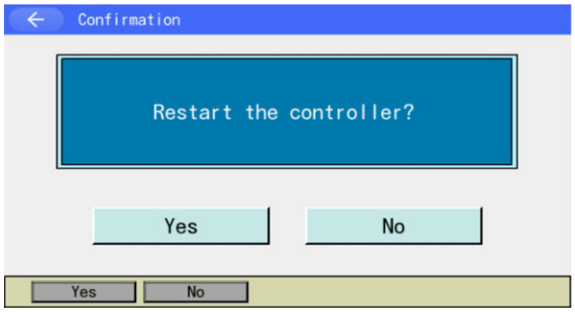


Input 0 on the touch panel numeric keys, and then touch ENT to confirm the input.
Once it is confirmed, the background color of the number display column turns to orange, which shows that it is being edited (controller writing not yet done), and the cursor moves to the next input column.
Touch Write button to transfer the data to the controller.

Touch Back button several times to go to Flash ROM writing screen.



Write the data to Flash ROM.
Touch Yes button.



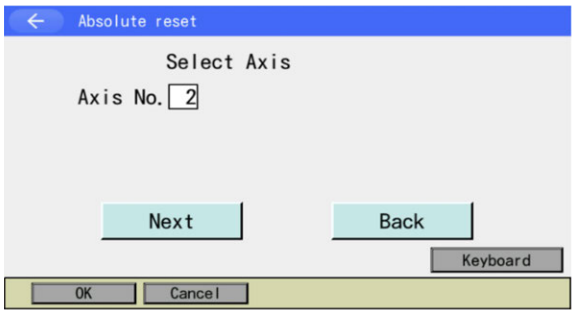
Conduct the reboot (software reset) on the controller.
Touch Yes button.

(3) Execute an absolute reset according to the following special procedure (forced operation by ignoring the screen steps):

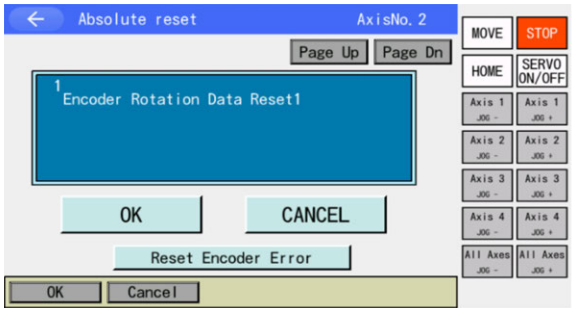
> When the controller is applicable to the “battery-less absolute reset”, the procedure is different. In such case, perform the absolute reset operation following the [16.8.2 Special Procedure: How to Conduct Absolute Reset Battery-less Absolute Synchronizing Type].

Select Absolute Reset in the controller menu.

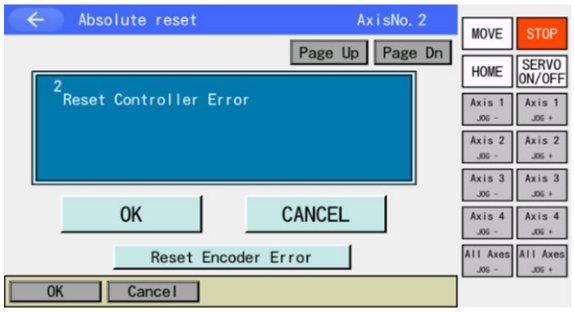
1) Execute the “Encoder Rotation Data Reset1“ for the slave axis.



Input the axis number of the slave axis by using the touch panel numeric keys, and then touch ENT to confirm the input.
Touch Next button.

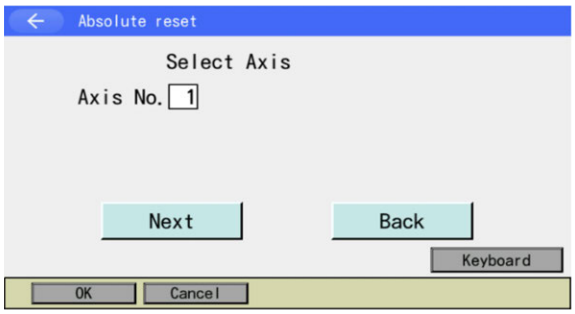


Touch OK button.

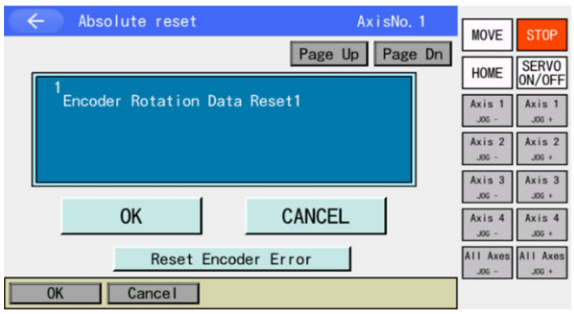


Touch CANCEL button. Make sure not to touch OK button.
Get out of Absolute Reset Mode now.

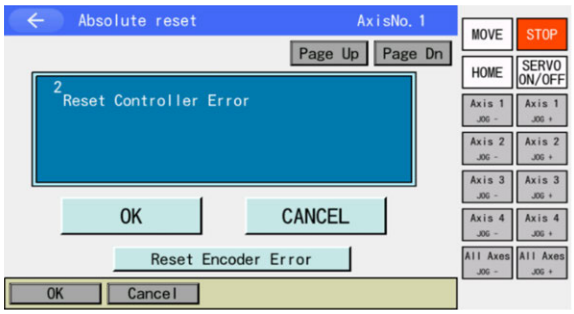
2) Execute an absolute reset for the master axis according to the screen steps.



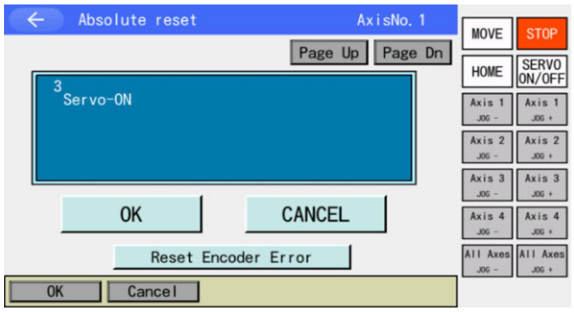
Input the axis number of the master axis by using the touch panel numeric keys, and then touch ENT to confirm the input.
Touch Next button.



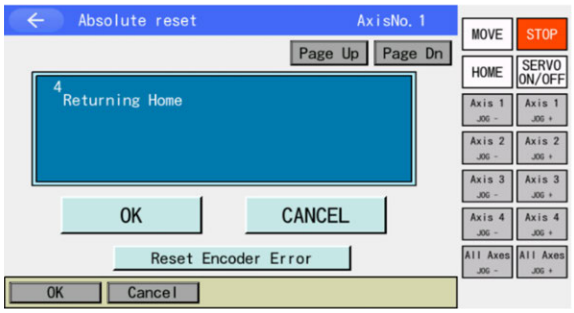
Touch OK button.



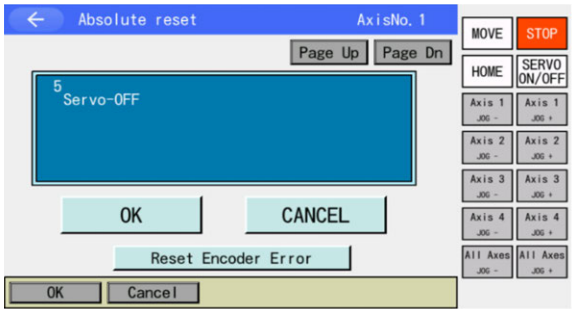
Touch OK button.



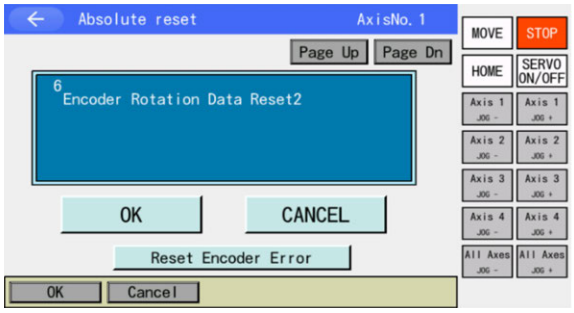
Touch OK button.



Returning Home
Touch OK button.

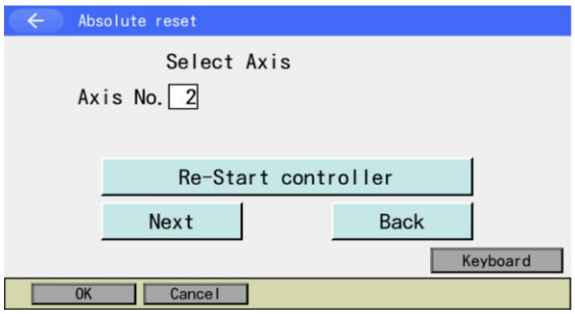


Servo-OFF
Touch Page Up button to forward the screen.
Make sure not to touch OK button.

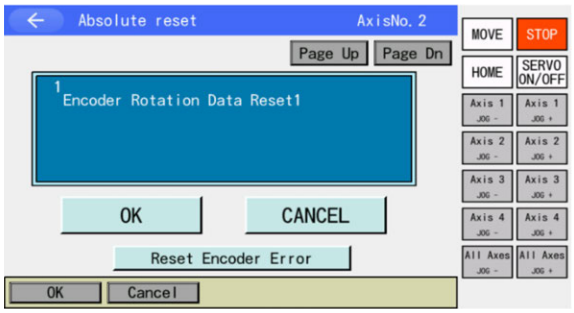


Touch OK button.

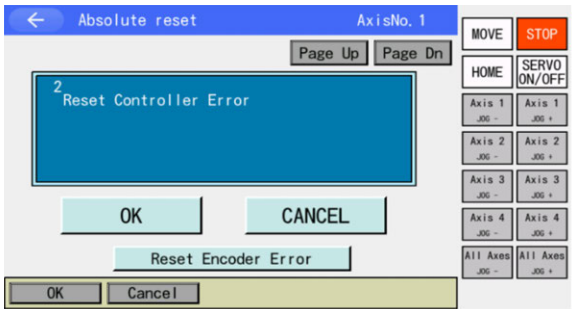
3) Execute the “Encoder Rotation Data Reset1” for the slave axis again



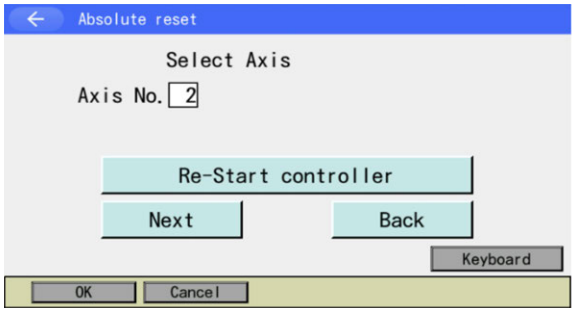
Input the axis number of the slave axis by using the touch panel numeric keys, and then touch ENT to confirm the input.
Touch Next button.



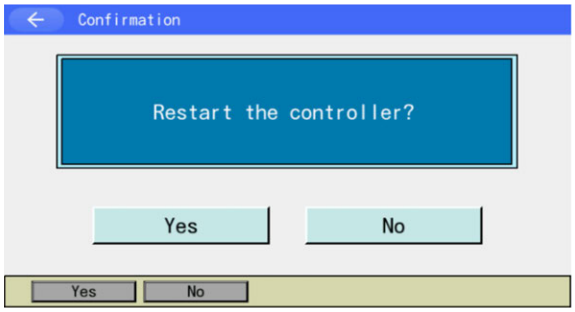
Touch OK button.



Touch CANCEL button. Make sure not to touch OK button.
Get out of Absolute Reset Mode.



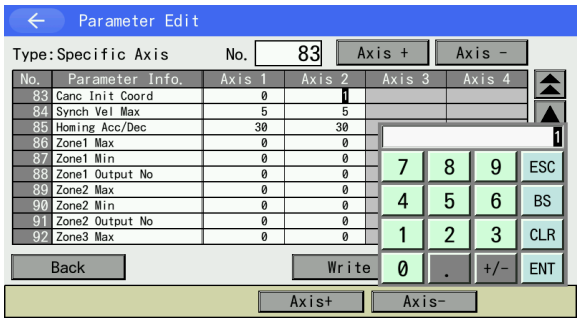
Touch Re-Start controller button.



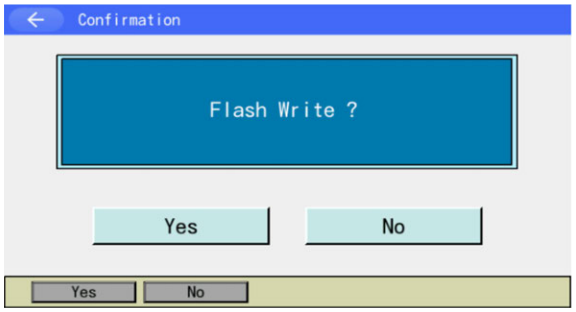
Restart the controller.
Touch Yes button.

4) Return the slave-axis value for the “specific-axis parameter No. 83 ABS synchro slave axis coordinate initialization cancel” to the original value.

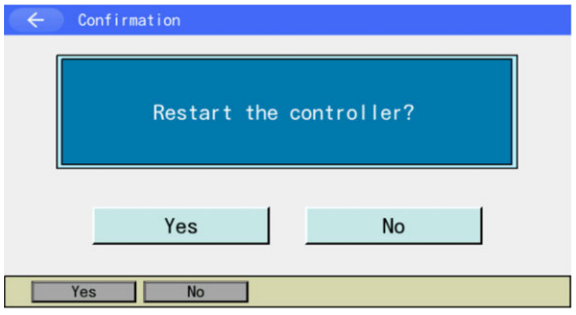
Display Transition: Edit → Parameter → Specific Axis



Input 1 on the touch panel numeric keys, and then touch ENT to confirm the input. Once it is confirmed, the background color of the number display column turns to orange, which shows that it is being edited (controller writing not yet done), and the cursor moves to the next input column.
Touch Write button to transfer the data to the controller.
Once the transfer is complete, the display proceeds to the next parameter number.
Use Back button to go to the flash ROM writing screen.



Write the data to Flash ROM.
Touch Yes button.

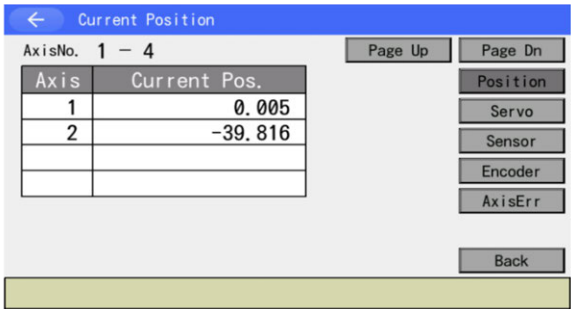


Restart the controller.
Touch Yes button.

(5) Set the preset home value to uniform the coordinate values of the master and slave axes.

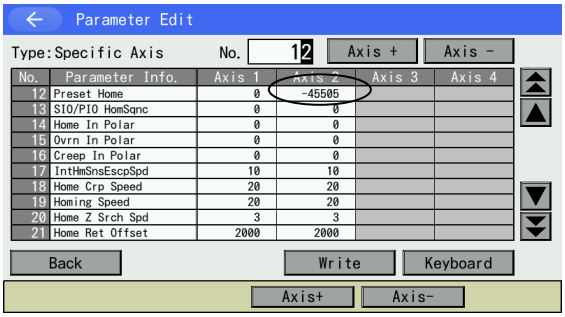
1) If the controller 7 segment display is “rdy” while the servo is OFF, read the displayed current positions of the master and slave axes.
(If the error No. C74 real position soft limit over error occurs, reset the error. When “rdy” is displayed, the displayed current positions can be read.)

Display Transition: Monitor → Specific Axis → Cur pos.



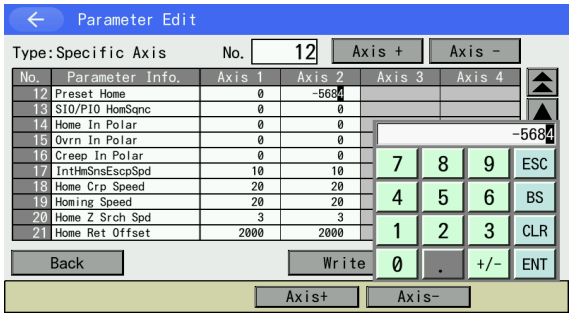
* If the servo is turned ON at this stage, error No. D0A driver overload error, error No. C6B deviation overflow error, error No. CA5 stop deviation overflow error, etc., occurs.

2) Calculate the following:
Specific-axis parameter No. 12 preset home value for slave axis [0.001 mm]
+ ((displayed current position value for master axis [mm] - displayed current position value for slave axis [mm]) × 1000)

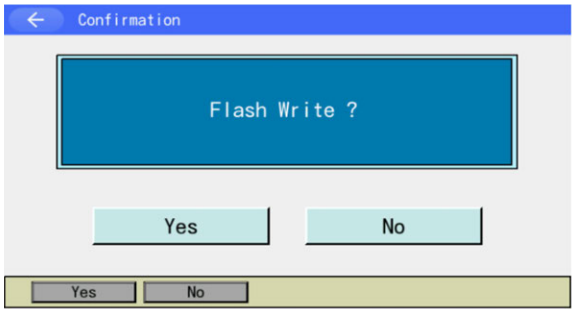


In this example: -45505 + ((0.005 - (-39.816)) × 1000) = -5684

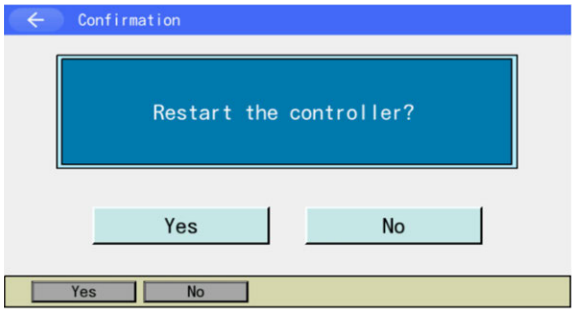
3) Input the calculation result in 2) above to the “Specific-axis parameter No. 12 preset home value” for the slave axis.



After touching ENT, touch Write button to transfer the data to the controller.
Use Back button to go to Flash ROM writing screen.



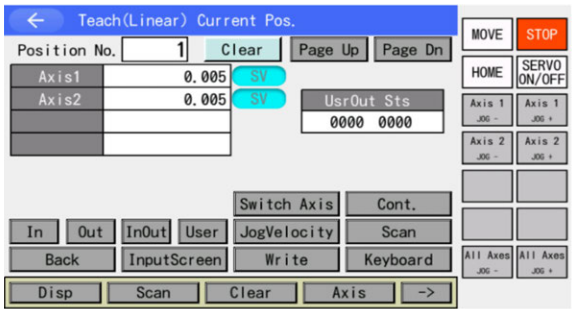
Write the data to Flash ROM .
Touch Yes button.



Restart the controller.
Touch Yes button.

(6) Display the current positions on the teaching screen.
After turning the servo ON, execute action check by jogging. (Master axis operation)

Display Transition: Edit → Position → Teach(Linear)



Use Disp button to switch to the Cur Pos..
To turn the servo ON/OFF,
use the SERVO ON/OF, Axis 1 JOG-,
Axis 1 JOG+, Axis 2 JOG-, Axis 2 JOG+,
Axis 3 JOG-, Axis 3 JOG+, Axis 4 JOG- and
Axis 4 JOG+ buttons.

If the error No. D0A driver overload error, error No. C6B deviation overflow error, error No. CA5 stop deviation overflow error, etc., occurs, check the following items:

- If the current position of the master axis is greatly different from that of the slave axis, setting in (5) may be wrong.
- Confirm that there are no input errors or change omissions as for the parameters below.
  “Specific-axis parameter No. 65 synchro other axis No.”
  “Specific-axis parameter No. 83 ABS synchro slave axis coordinate initialization cancel”
- Confirm that slider actions are not restrained.

16.5.4 Standard Procedure Absolute Reset

In the case of “Specific-axis parameter No. 38 encoder ABS/INC type”: master axis = 1 and slave axis = 0:
After “2. Location Adjustment of Synchro Axes Sliders,” execute a normal absolute reset only for the master axis.
For the operating method, refer to the [16.1. Absolute Reset of the Orthogonal Axis].

Note: The synchro axis for which the standard procedure absolute reset has been executed does not have the function of correcting the slider displacement during power OFF after the servo is turned ON.

When a connected controller is a battery-less absolute applicable model, refer to 16.8.1 “How to Conduct Absolute Reset for Battery-less Absolute Type”.

16.6 Push Type Absolute Reset on IX-1000/1200

Have “Push Type Absolute Reset” conducted in case the absolute data is lost in Ultra Large SCARA Robot IX-NNN10040/NNN12040.

Also, in the following cases, have “Stopper Pressing Position Acquirement” before conducting the absolute reset to change the initial posture.

- When the absolute reset cannot be performed in the direction of the stopper interfering movement with the initial posture at the delivery from the factory due to such reasons as interference to the peripheral equipment.
- There was a change in the stopper position due to such reasons as a removal of the stopper of the vertical axis.

Refer below for each procedure.

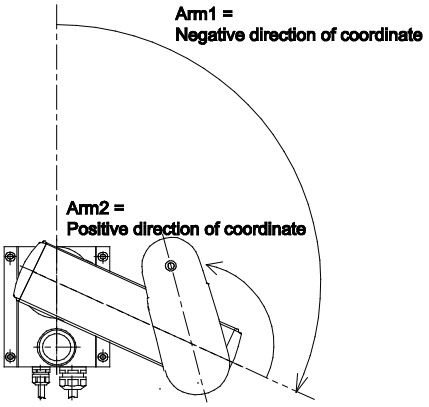
Item	Push Type Absolute Reset	Stopper pressing position acquirement
All axes	Conduct [16.6.2.1 Procedures for All Axes in Batch]	Conduct [16.6.1.1 Procedures for All Axes in Batch] and then [16.6.2.1 Procedures for All Axes in Batch].
Individual axis	Conduct [16.6.2.2 Procedures for Individual Axis]	Conduct [16.6.1.2 Procedures for Individual Axis] and then [16.6.2.2 Procedures for Individual Axis].
(Applicable Axes)	How to Operate Each Axis Conduct [16.6.2.2(1) Arm1 and Arm2] Conduct [16.6.2.2(2) Vertical Axis + Rotation Axis] or [16.6.2.2(3) Vertical Axis]	How to Operate Each Axis Conduct [16.6.1.2(1) Arm1 and Arm2] Conduct [16.6.1.2(2) Vertical Axis + Rotation Axis] or [16.6.1.2(3) Vertical Axis]

⚠ *Caution: “Stopper pressing position acquirement” may not be available in the situation that the absolute reset is required. Have it done while the normal operation can be performed.*

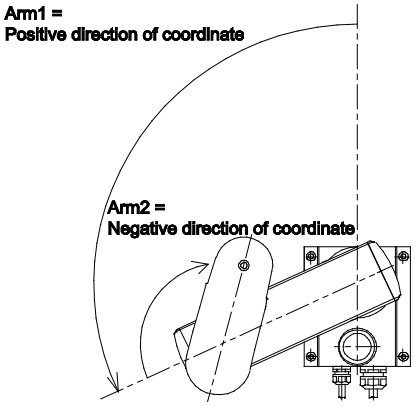
[Initial posture]

◎ Arm1, Arm2
Considering the stopper pressing position, adjust the posture to either of right arm system or left arm system.
When the product is delivered, it is set to the right arm system.
In case the arm interferes with the peripheral in the right arm system, set it to the left arm system in advance, conduct “Push stopper position acquisition” and then adjust to the left arm system.

For the position of the initial posture, have the arm away for 10deg or more from the position where it was pressed to the stopper.
Error No. B0D “Push Stopper Operation Start Position Error” (Error No. 4BE “Absolute Reset Error” for XSEL2-TX) will occur if the arm is too close to the position where it was pressed to the stopper.

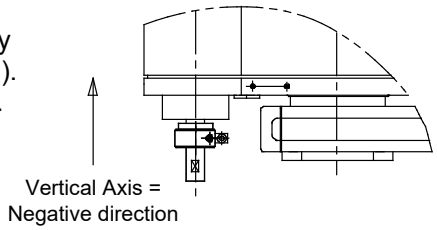


Initial posture of right arm system (At the delivery)
Arm1 = Negative direction of coordinate
Arm2 = Positive direction of coordinate

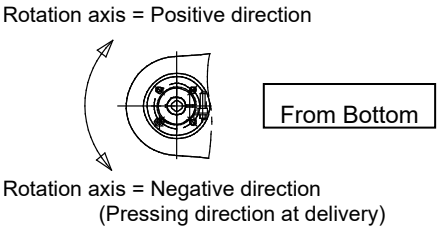


Initial posture of left arm system
Arm1 = Positive direction of coordinate
Arm2 = Negative direction of coordinate

◎ Vertical Axis
For the position of the initial posture, have the arm away for 10mm or more from the coordinate 0mm (upper end).
“Push Stopper Operation Start Position Error” (Error No. 4BE “Absolute Reset Error” for XSEL2-TX) will occur if the arm is too close to the upper end.



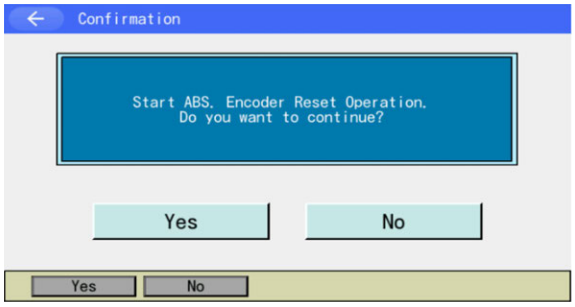
◎ Rotation axis
There is no indication in specific for the position of the initial posture of the rotation axis.
It can be set at any position.



16.6.1 How to Acquire Stopper Pressing Position

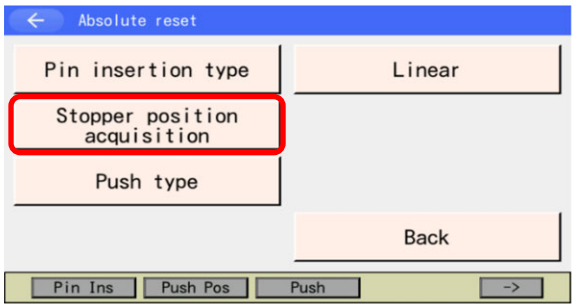
Backup the parameters so that they can be put back anytime to those before changing them.
(Go to File – Backup – Parameter in the main menu to open the parameter backup screen and save the file.)

1) Select Absolute Reset from Controller Menu.



2) To have an absolute reset, touch Yes button.

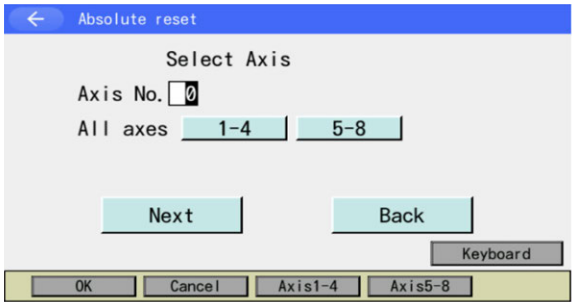
When not to have an absolute reset, touch No button. The display returns to the previous screen.



3) Touch Stopper position acquisition button.

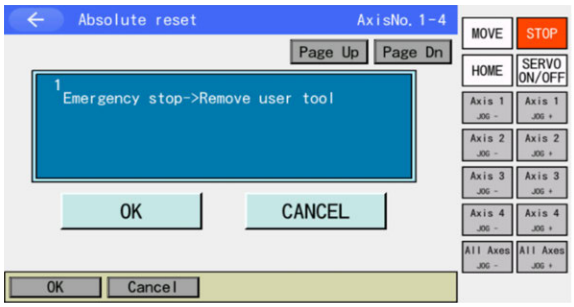
* Linear button should be shown only when there is a linear axis.

16.6.1.1 Procedures for All Axes in Batch



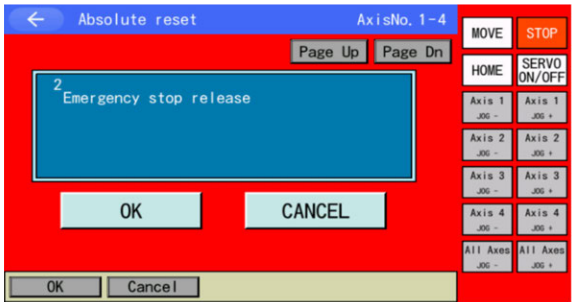
1) Either touch 1-4 or 5-8 button, and touch Next button.

* There is 5-8 button equipped in XSEL-RXD/SXD/RAXD/SAXD only.
* It should be from 1-3 button for 3-axis SCARA

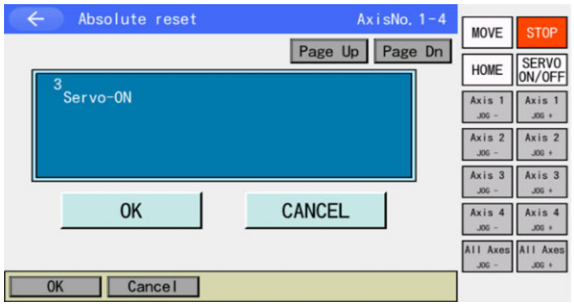


2) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

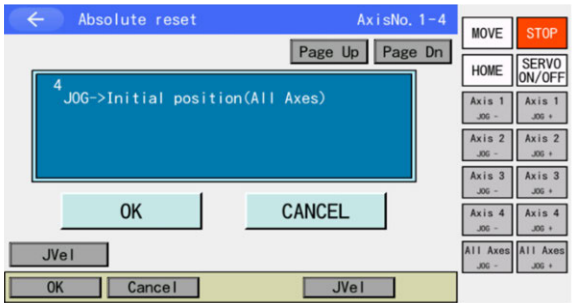


3) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



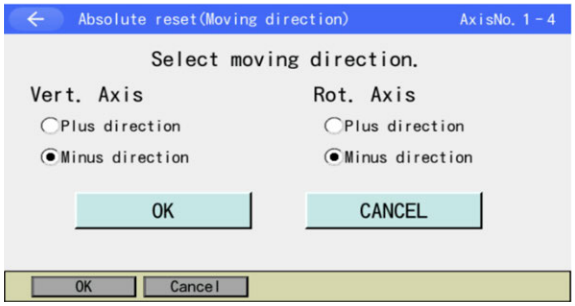
4) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.



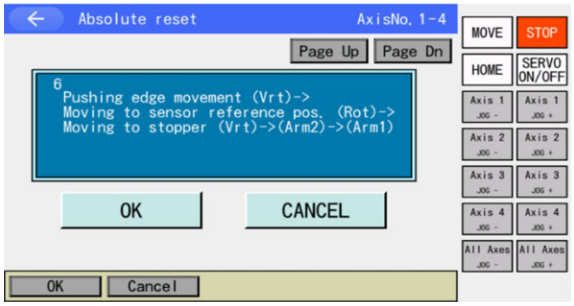
5) Moving to Initial Posture

1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align each axis to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn on the emergency stop. Align each axis to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.



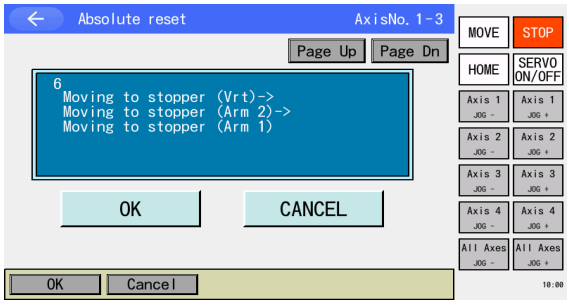
6) Selection for Moving Direction of Vertical Axis and Rotation Axis
It is not necessary to change the moving direction in ordinary use. Make sure to set the vertical axis to the negative side of the coordinate.
To select the moving direction, touch on a radio button.
Touch OK button.

* The rotary axis should not be shown for 3 axis SCARA.

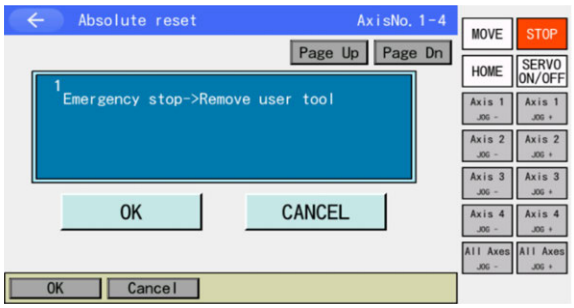


7) Acquirement of Stopper Pressing Position / Sensor Datum Position for All Axes
Touch OK button.

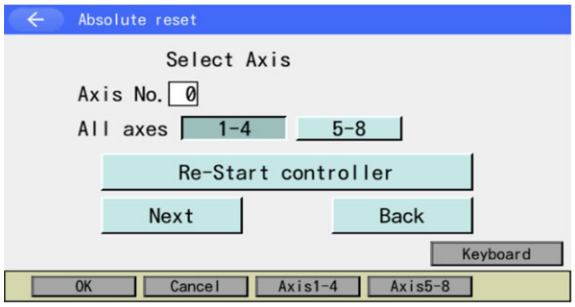
The axes shift in the order of vertical pressing position movement, rotation axis sensor datum position movement, vertical axis stopper pressing movement, Arm2 stopper pressing movement and Arm1 stopper pressing movement to acquire the pressing position.



* The figure shown on the left should be shown for 3 axis SCARA.
Touch the OK button.
The axis shifts in the order from the vertical axis stopper pressing movement to the Arm 2 stopper pressing movement and then to the Arm 1 stopper pressing movement in order to acquire the pressing positions.

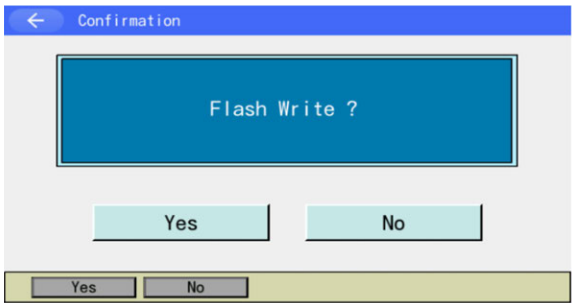


8) The screen goes back to the first screen once the process is complete.
Touch CANCEL button.

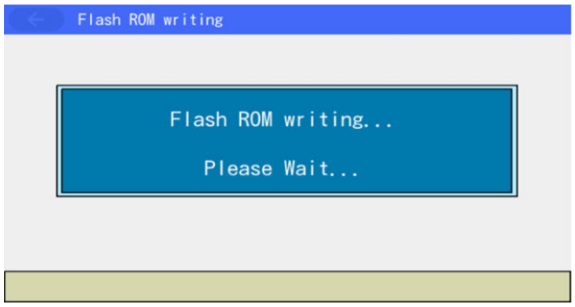


9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

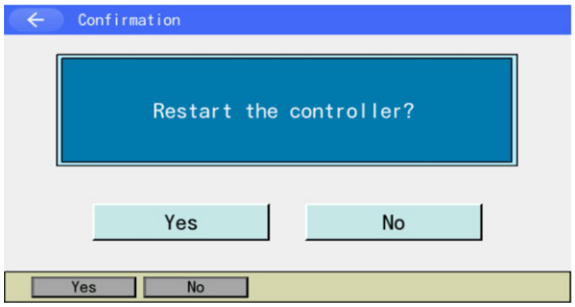


10) Touch Yes button to start flash ROM writing.



11) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.

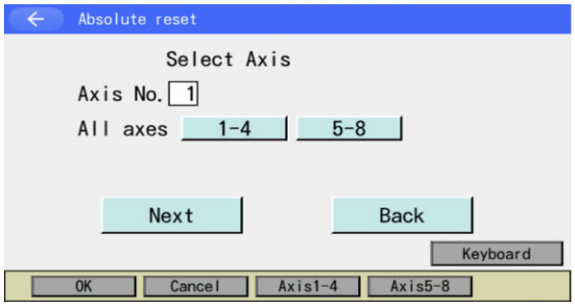


12) Once the flash ROM writing is finished, the screen changes to the screen for software reset.
Touch Yes button to reflect the pressing position.

After finished, conduct the stopper pressing absolute reset.

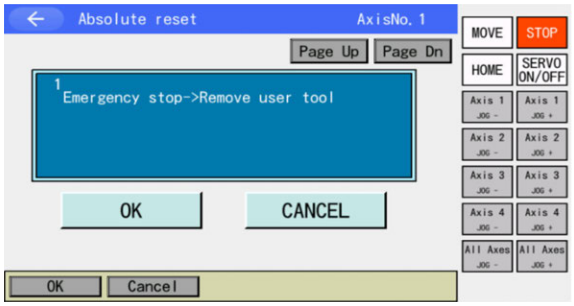
16.6.1.2 Procedures for Individual Axis

16.6.1.2 (1) Arm1 and Arm2



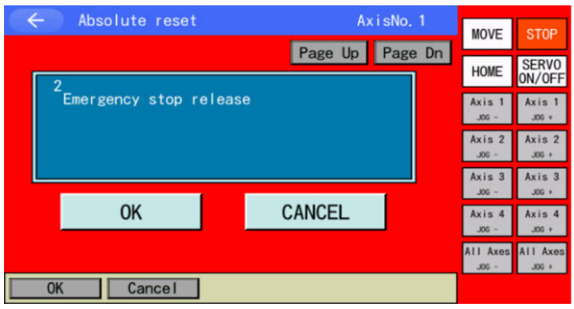
1) Input either 1 or 2 (5 or 6) in Axis No. box with using the software numeric keys, and then touch Next button.

Shown in the figure on the left is the condition that Arm1 on the 1st SCARA in XSEL-RXD/SXD is selected.

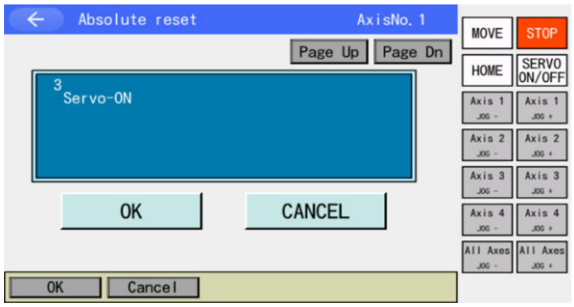


2) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

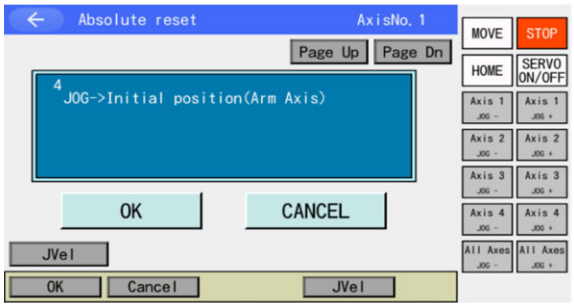


3) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



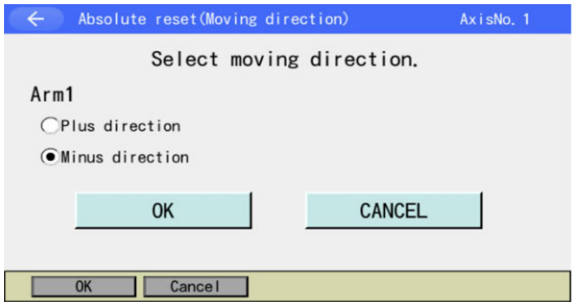
4) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.

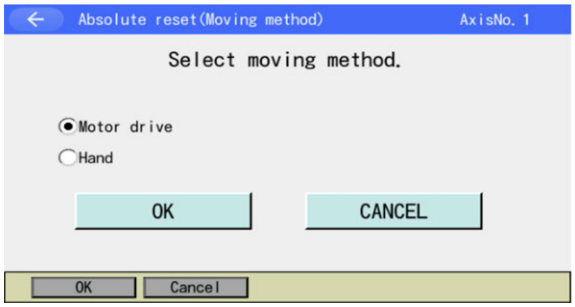


5) Moving to Initial Posture

1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align Arm1 (2) to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn ON the emergency stop. Align Arm1 (2) to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.



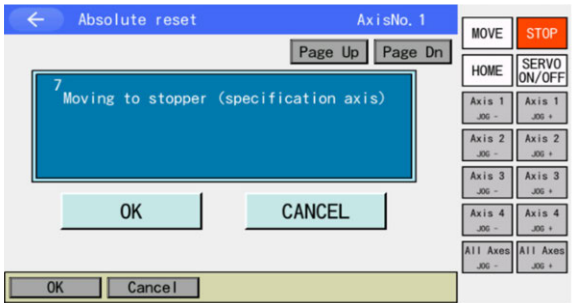
6) Selection for Moving Direction of Arm1 (2)
The vicinity stopper position direction is selected as the moving direction in the initial setting.
To select the moving direction, touch the applicable radio button.
Touch OK button.



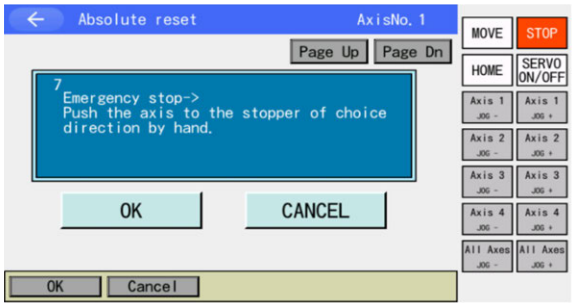
7) Selection for Moving Direction of Arm1 (2)

1. If conducting with motor drive
   Touch the radio button for motor drive.
   Touch OK button.
2. If conducting manually
   Touch the radio button for manual (hand) .
   Touch OK button.

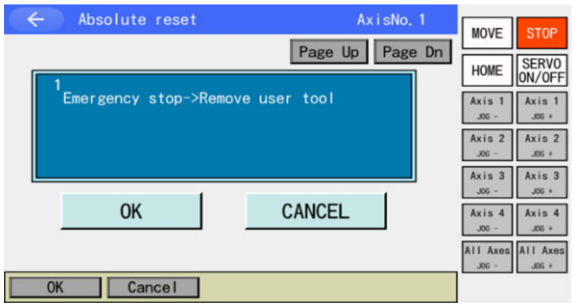
Note: Touch CANCEL button to finish the absolute reset.



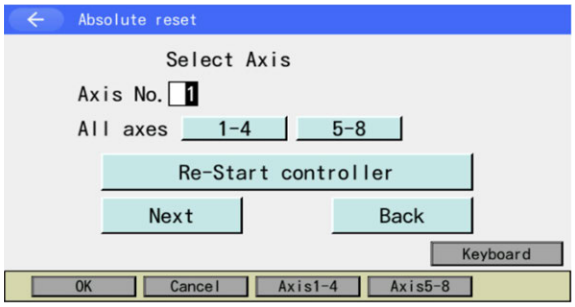
8) Moving to stopper of Arm1 (2) (in motor drive)
Touch OK button.
Arm1 or 2 moves for stopper pressing to acquire the pressing position.



9) Moving to stopper of Arm1 (2) (in hand operation)
Turn ON the emergency stop, and have Arm1 or Arm2 pressed manually against the stopper.
Touch OK button.

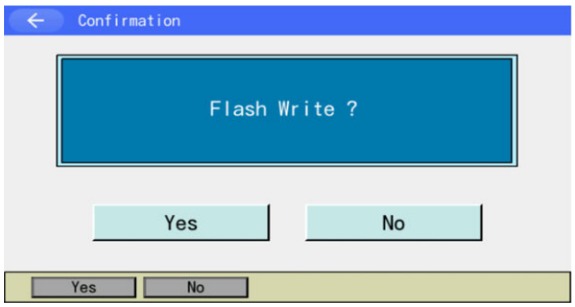


10) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

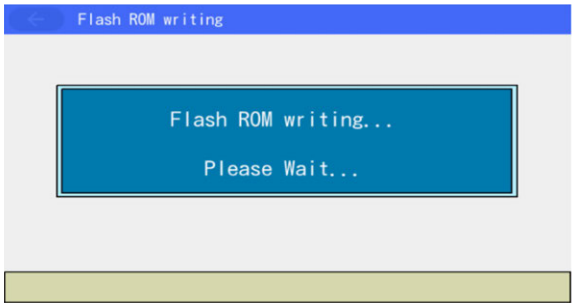


11) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

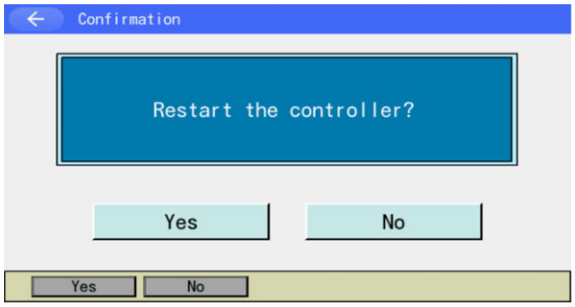


12) Touch Yes button to start flash ROM writing.



13) While in writing process to flash ROM, the screen.

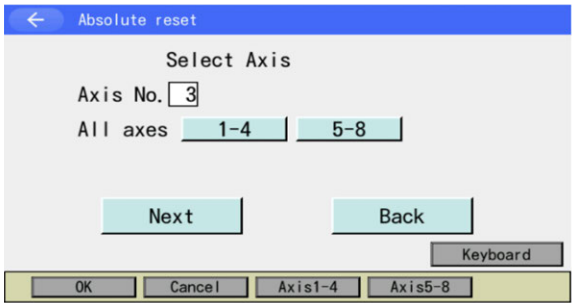
Never turn off the power to the Controller at this time.



14) Once the flash ROM writing is finished, the screen changes to the sceen for software reset. Touch Yes button to reflect the pressing position.

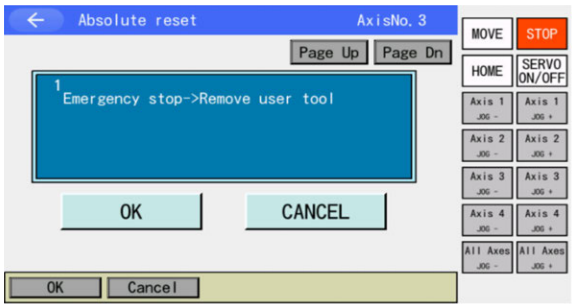
After finished, conduct the stopper pressing absolute reset.

16.6.1.2 (2) Vertical Axis + Rotation Axis * For 4-Axis SCARA



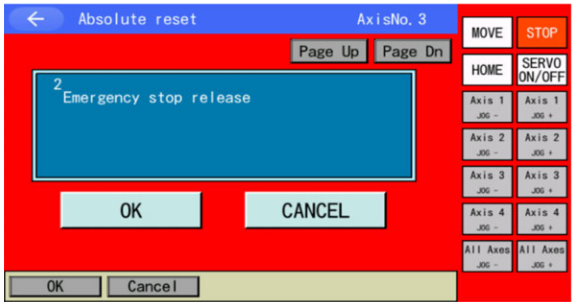
1) Input either 3 or 7 (7 for XSEL-RXD/SXD/ RAXD/SAXD only) in Axis No. box with using the software numeric keys, and then touch Next button.

Shown in the figure on the left is the condition that vertical axis + rotation axis on the 1st SCARA in XSEL-RXD/SXD are selected.

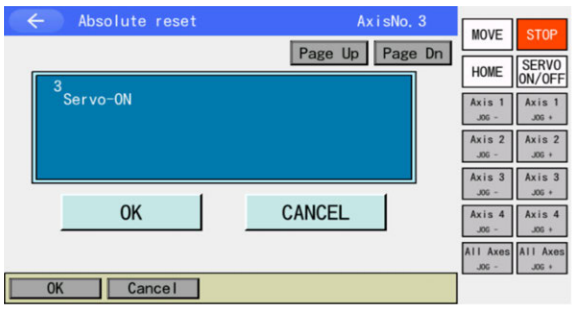


2) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

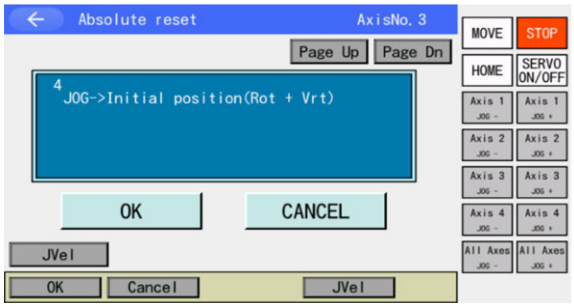


3) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



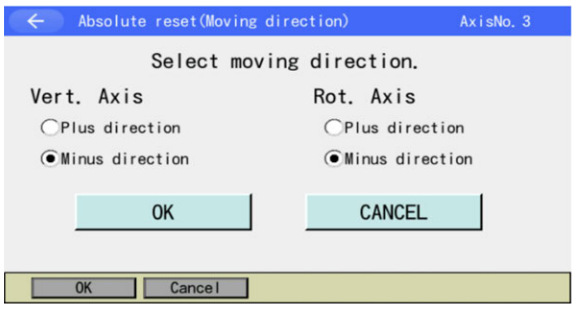
4) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.

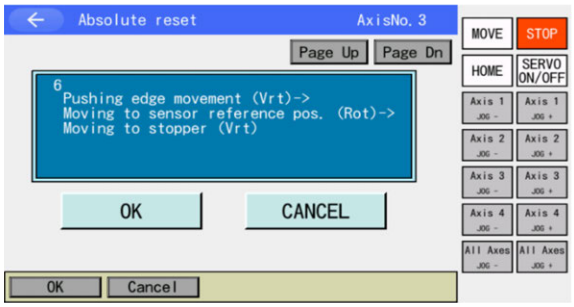


5) Moving to Initial Posture

1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align the vertical axis and rotary axis to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn ON the emergency stop. Align the vertical axis and rotary axis to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.

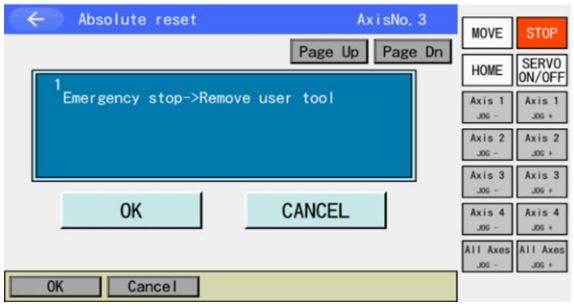


6) Selection for Moving Direction of Vertical Axis and Rotation Axis
The vicinity stopper position direction is selected as the moving direction in the initial setting.
To select the moving direction, touch on a radio button.
Touch OK button.

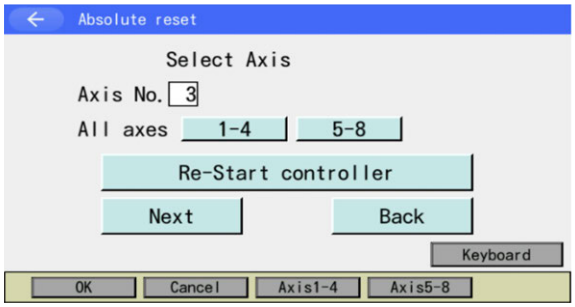


7) Acquirement of Stopper Pressing Position / Sensor Datum Position
Touch OK button.

The axes shift in the order of vertical pressing position movement, rotation axis sensor datum position movement, vertical axis stopper pressing movement to acquire the pressing position.

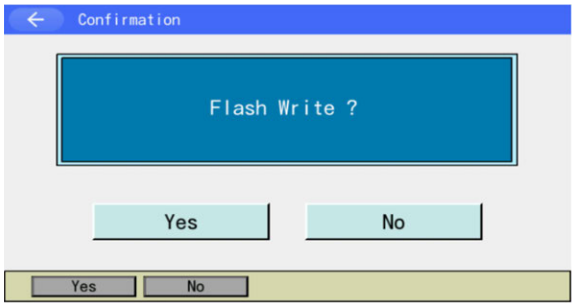


8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

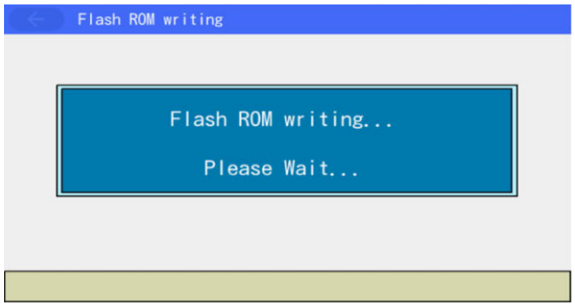


9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

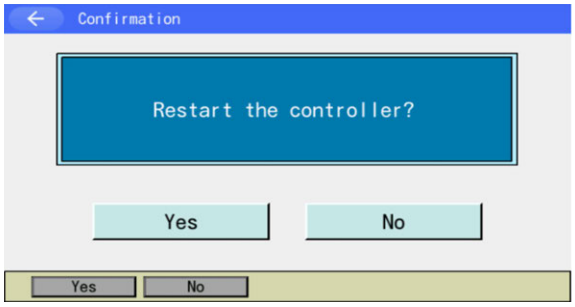


10) Touch Yes button to start flash ROM writing.



11) While in writing process to flash ROM, the screen.

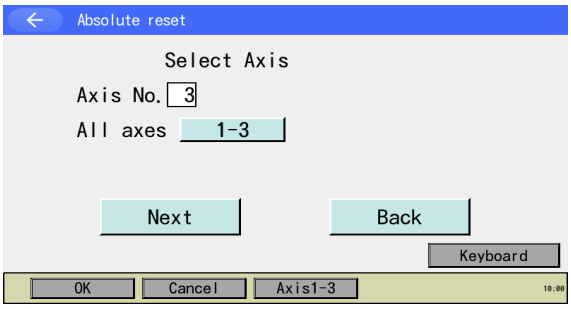
Never turn off the power to the Controller at this time.



12) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button to reflect the pressing position.

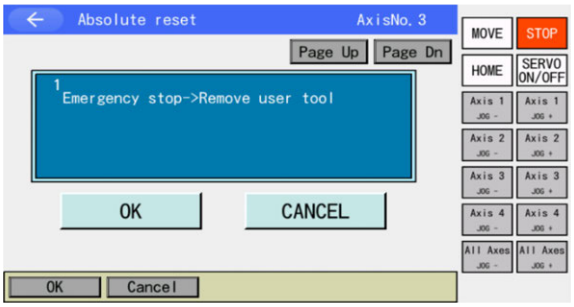
After finished, conduct the stopper pressing absolute reset.

16.6.1.2 (3) Vertical Axis * For 3-Axis SCARA



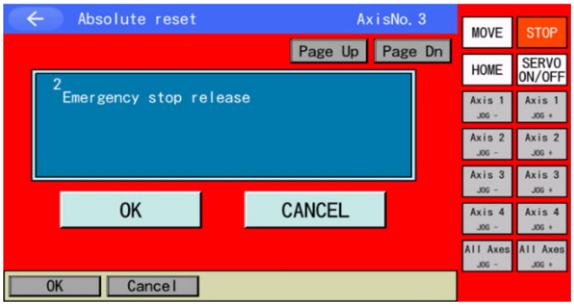
1) Input a number in “Axis No.” box with using the software numeric keys, and then touch the Next button.

The figure on the left shows the condition that the vertical axis has been selected in XSEL-RAX/SAX or XSEL2-TX (3 axis SCARA).

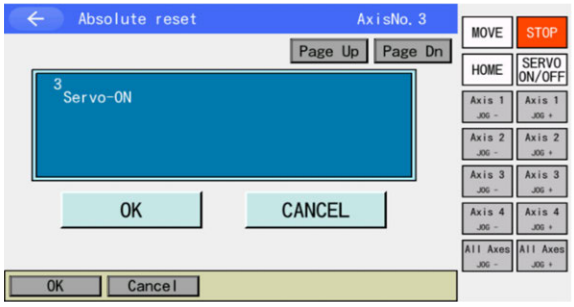


2) Remove user tool
In case there is a concern of interference during operation, remove the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

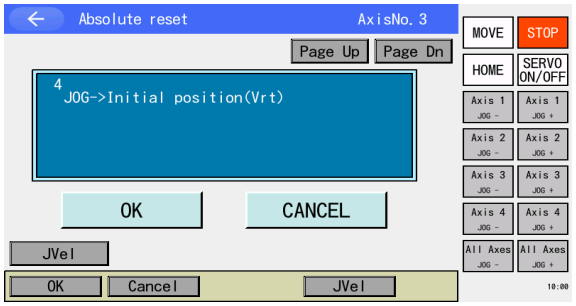


3) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



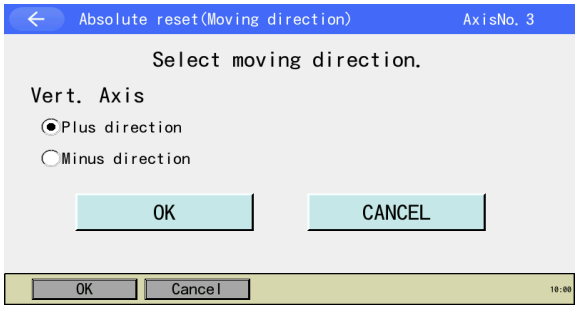
4) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.

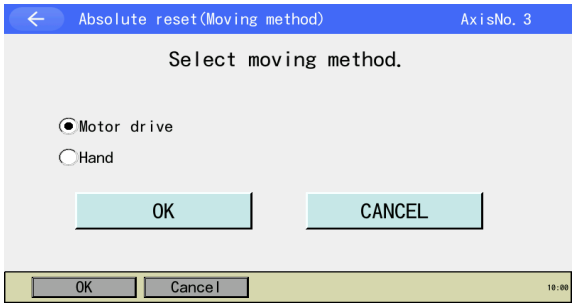


5) Moving to Initial position

1. If using JOG operation to align to initial position
   To avoid interference, use JOG operation to align the vertical axis and rotary axis to the initial position.
   Touch OK button.
2. If aligning to initial position manually
   Turn ON the emergency stop. Align the vertical axis and rotary axis to the initial position manually. Turn OFF the emergency stop.
   Touch OK button.



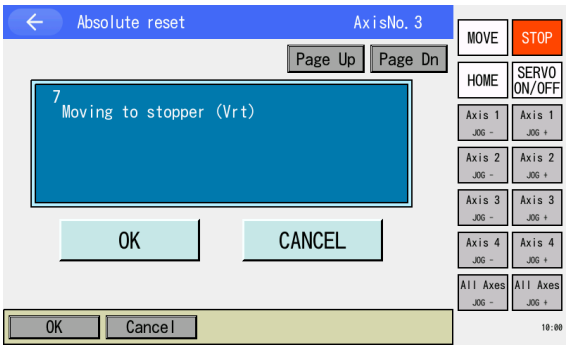
6) Selection for Moving Direction of Vertical Axis and Rotation Axis
The vicinity stopper position direction is selected as the moving direction in the initial setting.
To select the moving direction, touch on a radio button.
Touch OK button.



7) Selecting Moving Method of Vertical Axis

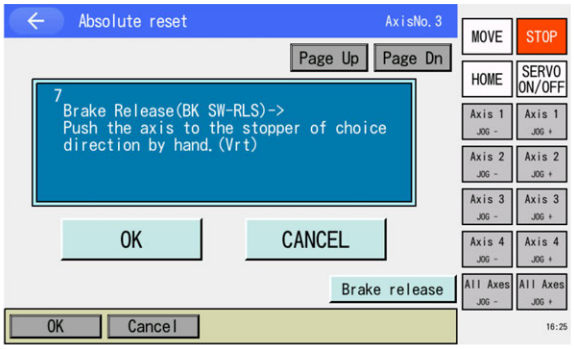
1. When Moving with Motor
   Touch the radio button for the motor drive.
   Touch OK button.
2. When Moving Manually
   Touch the radio button for manual (hand-pressed).
   Touch OK button.

Caution : Touch Cancel and the whole process of absolute reset will be closed.

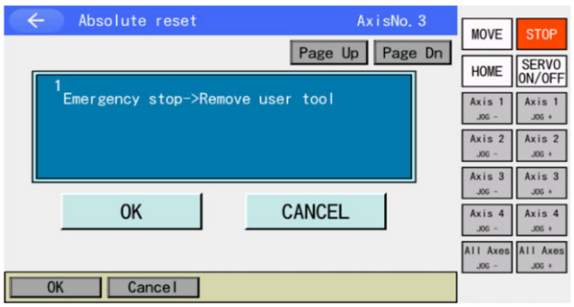


8) Stopper Pressing Movement of Vertical Axis (in Motor Drive)
Touch OK button.

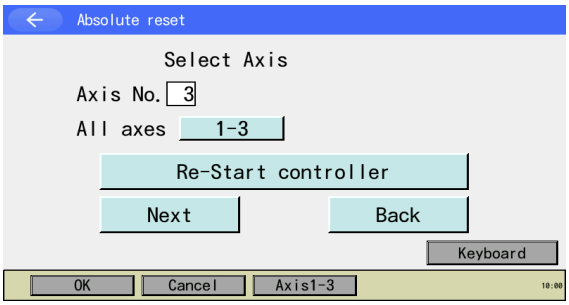
The vertical axis moves in the stopper pressing movement and acquire the pressing position.



9) Stopper Pressing Movement of Vertical Axis (in Manual)
Set the brake release switch to the RLS side or touch the Brake release button (when the button is activated) to release the brake in the confirmation window.
Push the vertical axis against the stopper with hand.
Touch OK button.

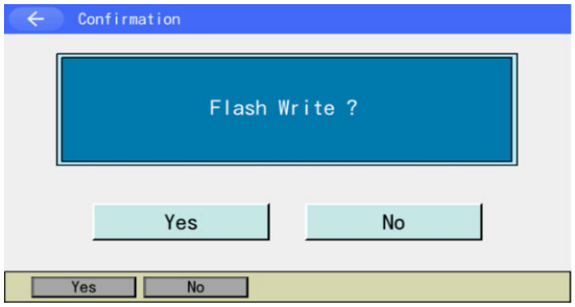


10) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

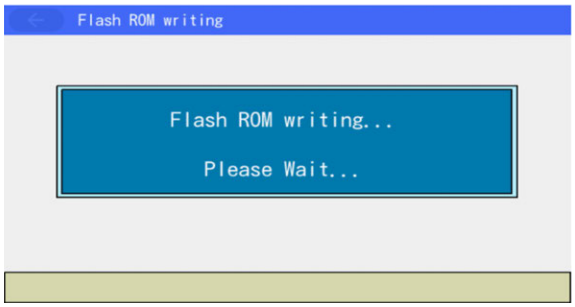


11) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears

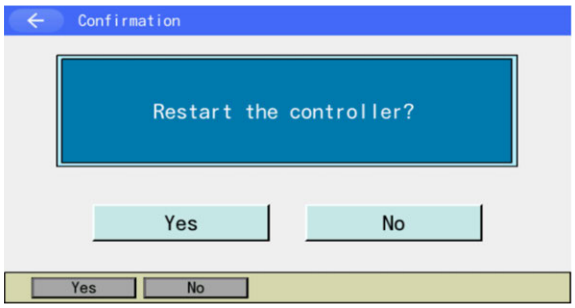


12) Touch Yes button to start flash ROM writing.



13) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



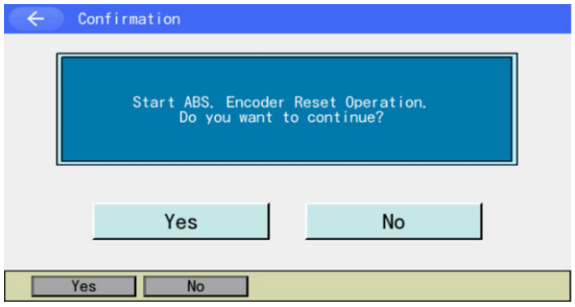
14) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button to reflect the pressing position.

After finished, conduct the stopper pressing absolute reset.

16.6.2 How to Conduct Stopper Pressing Absolute Reset

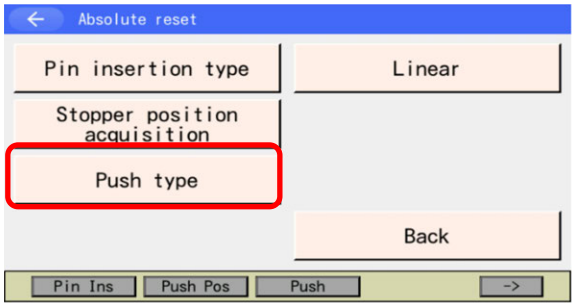
Backup the parameters so that they can be put back anytime to those before changing them.
(Go to File – Backup – Parameter in the main menu to open the parameter backup screen and save the file.)

1) Select Absolute Reset from Controller Menu.



2) Touch Yes button to conduct the absolute reset.

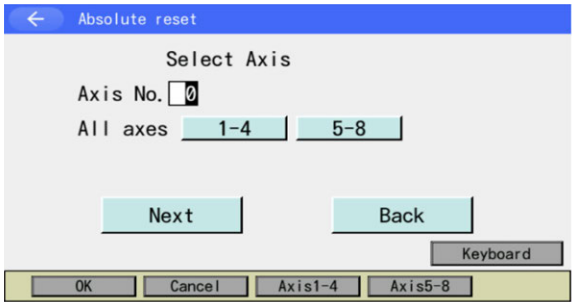
If the absolute reset is not required, touch No button.
The screen goes back to the previous screen.



3) Touch Push type button.

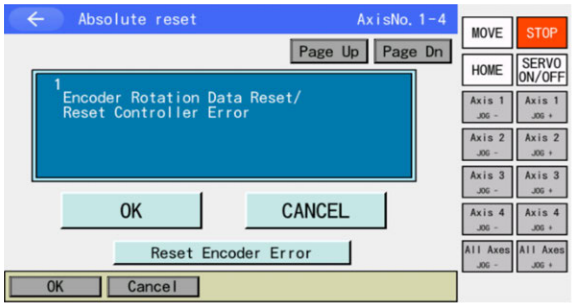
* Linear button should be shown only when there is a linear axis.

17.6.2.1 Procedures for All Axes in Batch

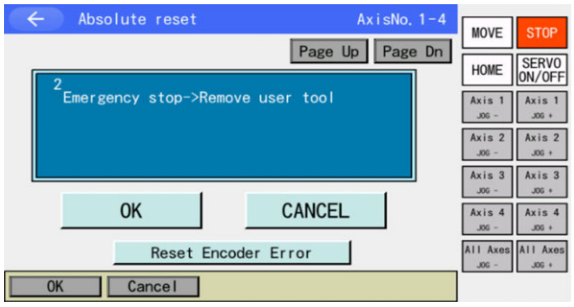


1) Touch 1-4 or 5-8 button, and touch Next button.

* There is 5-8 button equipped in XSEL-RXD/SXD/RAXD/SAXD only.
* It should be from 1-3 button for 3-axis SCARA.

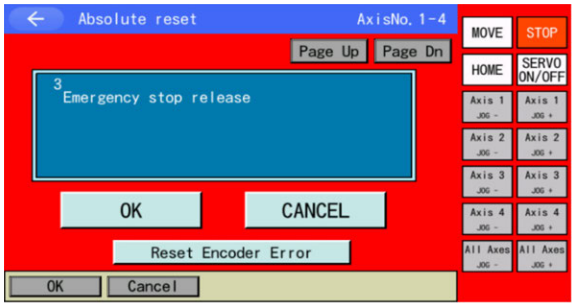


2) Encoder Rotation Data Reset / Reset Controller Error
Touch OK button.

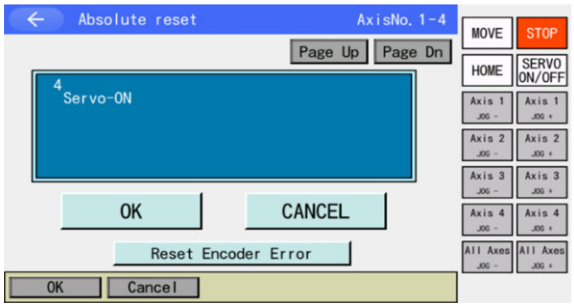


3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.



4) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.

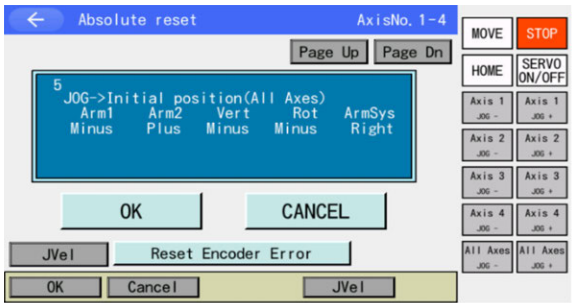


5) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo on.
2. If aligning to initial posture manually
   Touch Page Up button.

The 4 axis SCARA and 3 axis SCARA require different steps to take in the following procedures.

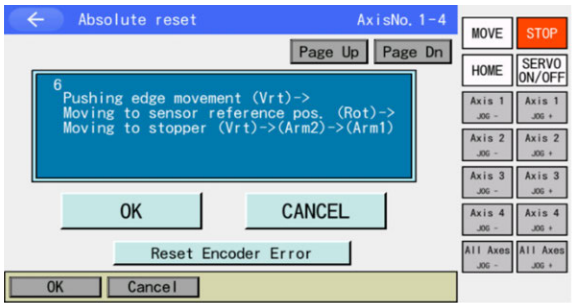
(i) For 4-Axis SCARA



6) Moving to Initial Posture

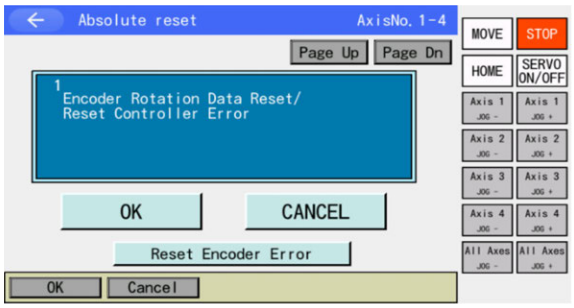
1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align each axis to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn ON the emergency stop. To avoid interference, align each axis to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.

* With the operation in Step 7), each axis moves to the direction shown in this screen.

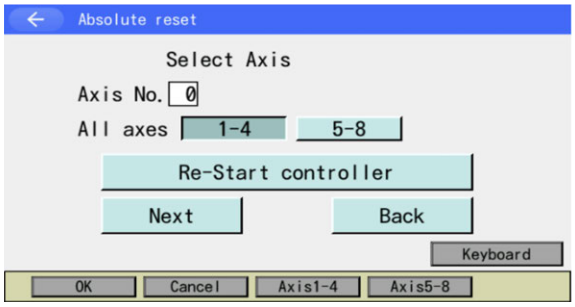


7) Stopper Pressing Absolute Reset on All Axes
Touch OK button.

The axes shift in the order of vertical pressing position movement, rotation axis sensor datum position movement, vertical axis stopper pressing movement, Arm2 stopper pressing movement and Arm1 stopper pressing movement.

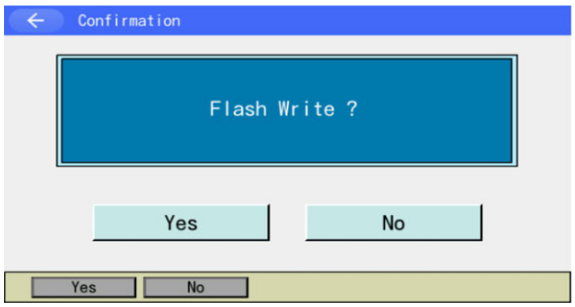


8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

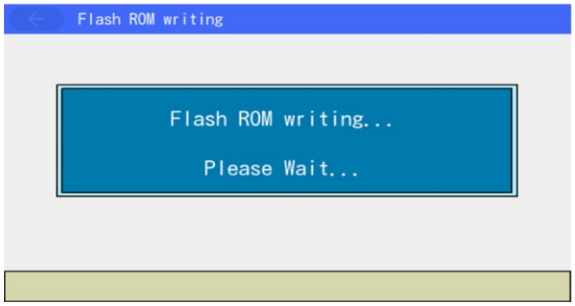


9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

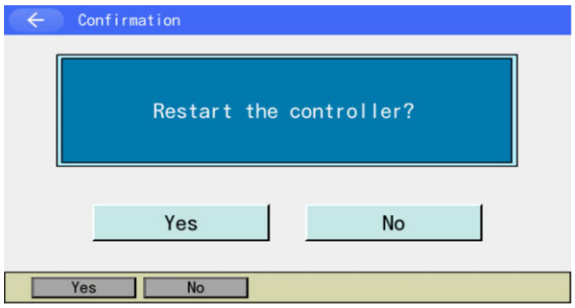


10) Touch Yes button to start flash ROM writing.



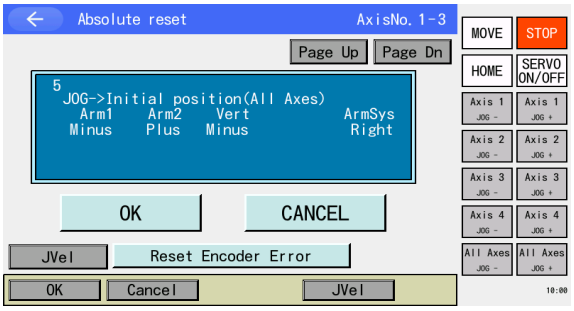
11) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



12) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button.

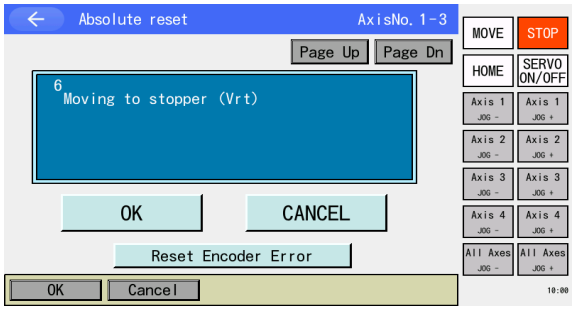
(ii) For 3-Axis SCARA



6) Moving to Initial Posture

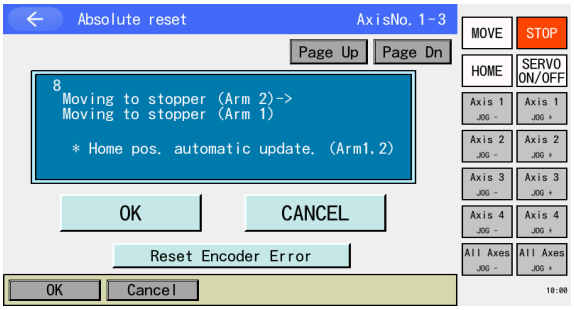
1. <u>If using JOG operation to align to initial posture</u>
   To avoid interference, use JOG operation to align each axis to the initial posture.
   Touch OK button.
2. <u>If aligning to initial posture manually</u>
   Turn ON the emergency stop. To avoid interference, align each axis to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.

* With the operation in Step 7), each axis moves to the direction shown in this screen.



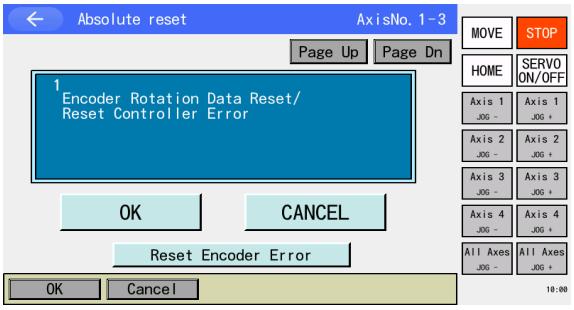
7) Vertical Stopper Pressing Style Absolute Reset
Touch OK button.

Conduct the vertical axis stopper pressing movement.



8) Arm 1 and Arm 2 Stopper Pressing Style Absolute Reset
Touch OK button.

The axis moves in the order from the Arm 2 stopper pressing movement to the Arm 1 stopper pressing movement.

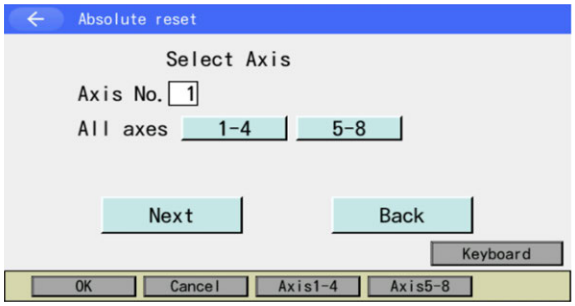


9) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

For the further operation, refer to the steps from Step (9) in [(i) For 4-Axis SCARA].

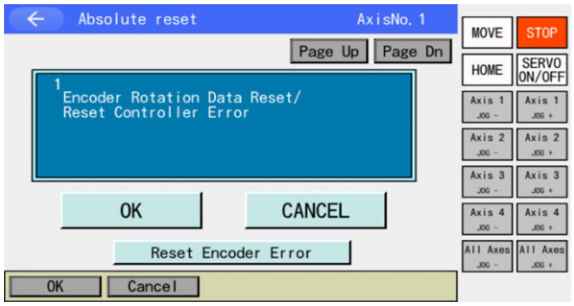
16.6.2.2 Procedures for Individual Axis

16.6.2.2 (1) Arm1 and Arm2

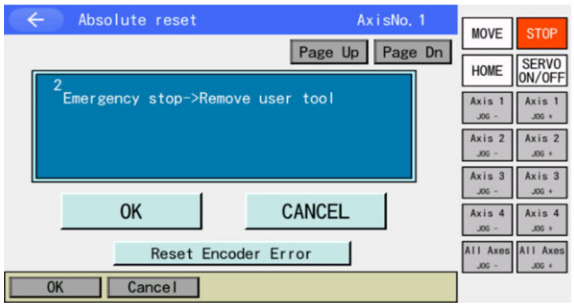


1) Input either 1 or 2 (5 or 6) in Axis No. box with using the software numeric keys, and then touch Next button.

Shown in the figure on the left is the condition that Arm1 on the 1st SCARA in XSEL-RXD/SXD is selected.

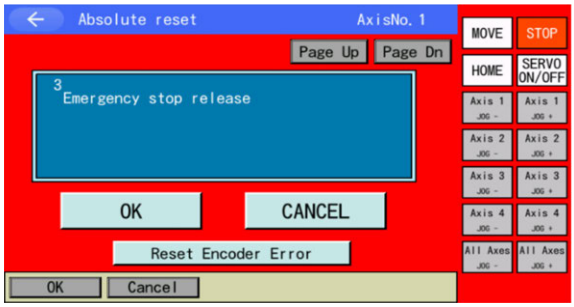


2) Encoder Rotation Data Reset / Reset Controller Error
Touch OK button.

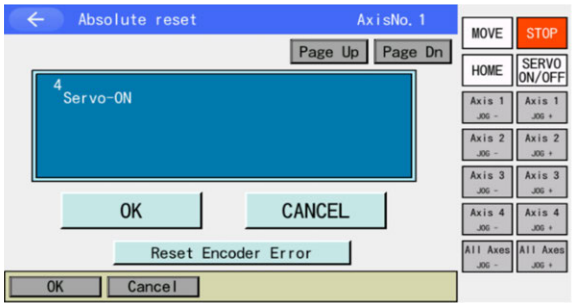


3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

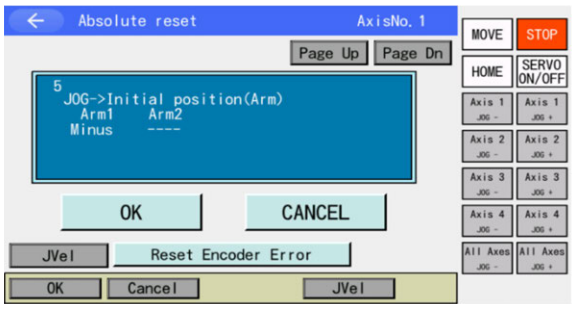


4) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



5) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

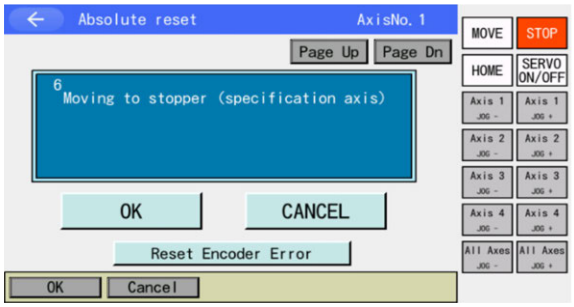
1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.



6) Moving to Initial Posture

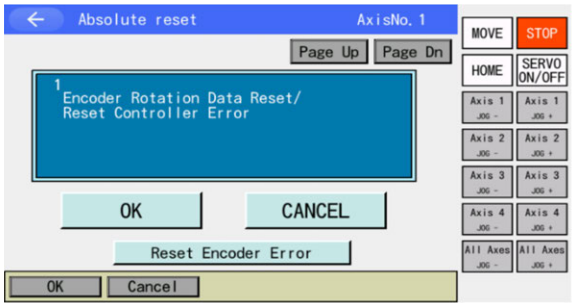
1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align Arm1 (2) to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn ON the emergency stop. To avoid interference, align indicated axis to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.

* With the operation in Step 7), the axis moves to the direction shown in this screen.

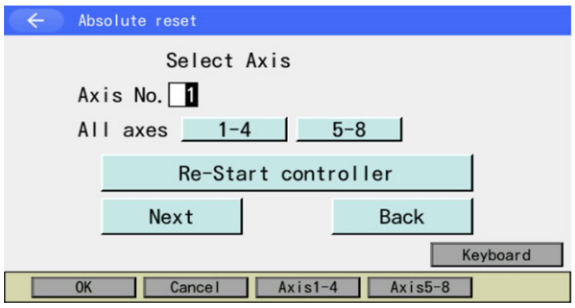


7) Stopper Pressing Absolute Reset on Indicated Axis
Touch OK button.

Arm1 (2) moves for stopper pressing.

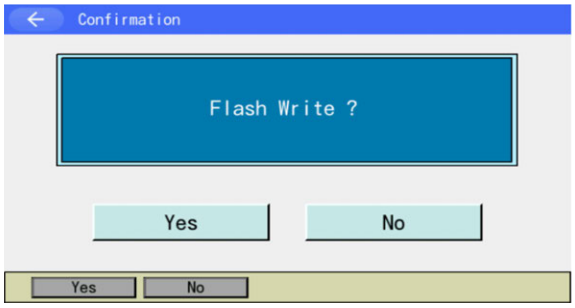


8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

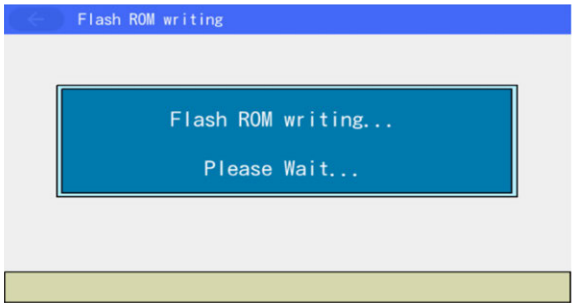


9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

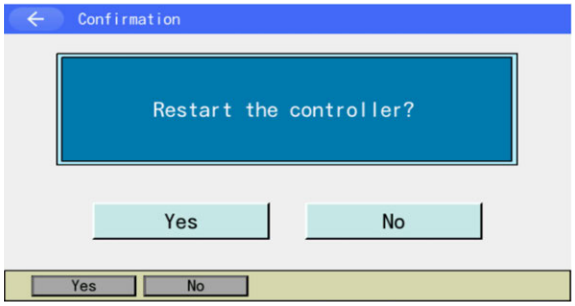


10) Touch Yes button to start flash ROM writing.



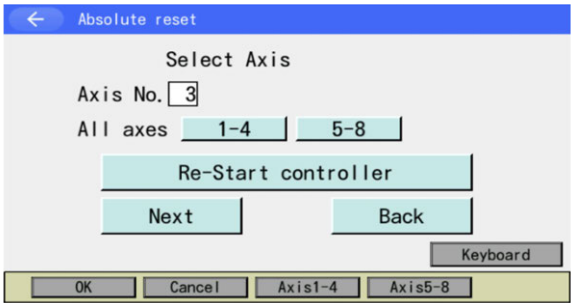
11) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



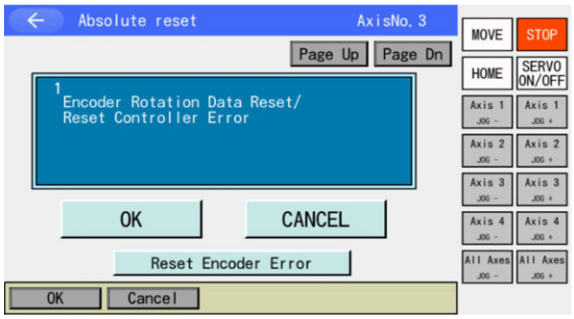
12) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button.

16.6.2.2 (2) Vertical Axis + Rotation Axis * For 4-Axis SCARA

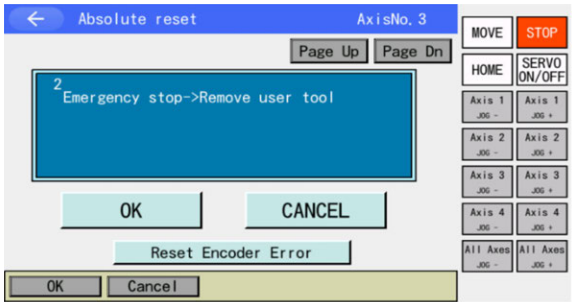


1) Input either 3 or 7 (7 for XSEL-RXD/SXD/ RAXD/SAXD only) in Axis No. box with using the software numeric keys, and then touch Next button.

Shown in the figure on the left is the condition that vertical axis + rotation axis on the 1st SCARA in XSEL-RXD/SXD are selected.

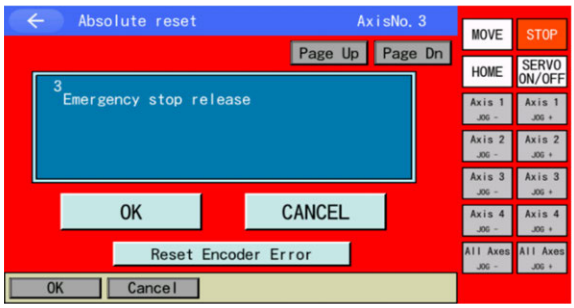


2) Encoder Rotation Data Reset / Reset Controller Error
Touch OK button.

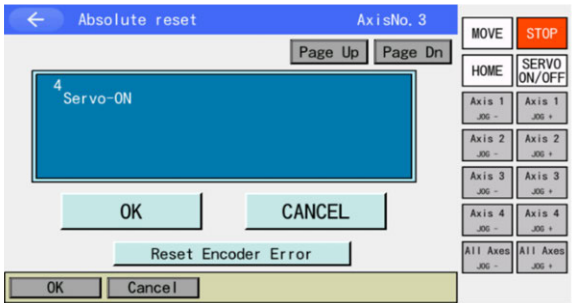


3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

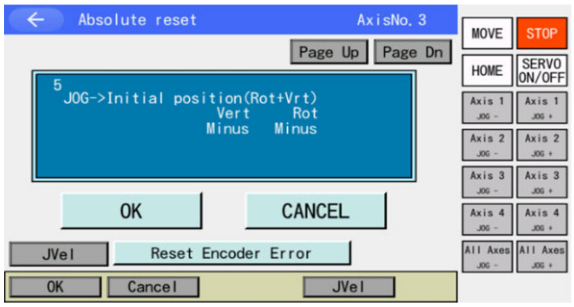


4) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



5) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

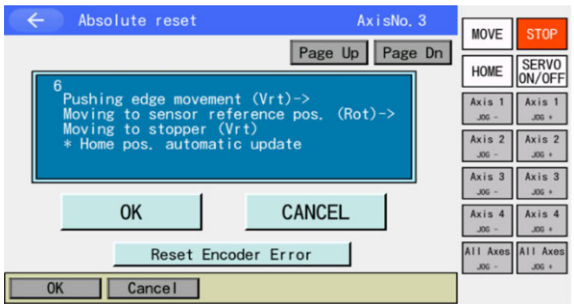
1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.



6) Moving to Initial Posture

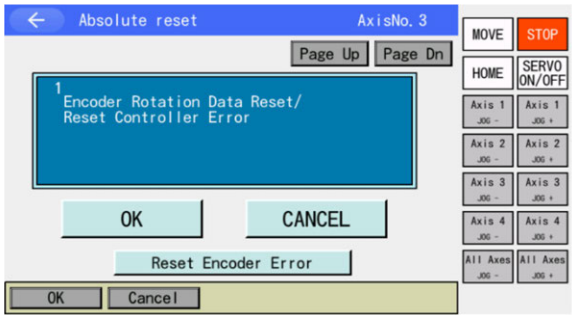
1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align the vertical axis and rotary axis to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn ON the emergency stop. To avoid interference, align each axis to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.

* With the operation in Step 7), the axis moves to the direction shown in this screen.

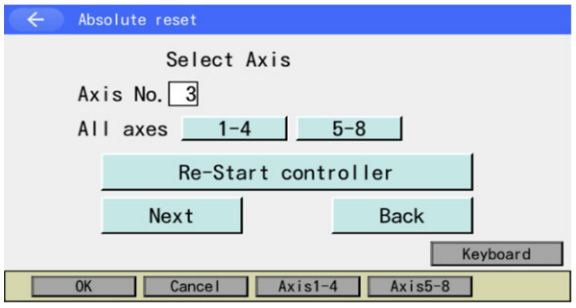


7) Stopper Pressing Absolute Reset on Vertical and Rotation Axes
Touch OK button.

The axes shift in the order of vertical axis pressing end movement, rotation axis sensor datum position movement and vertical axis stopper pressing movement.

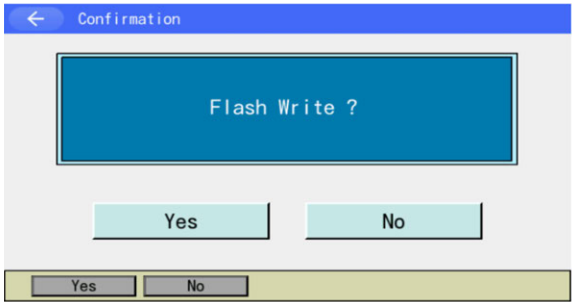


8)The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

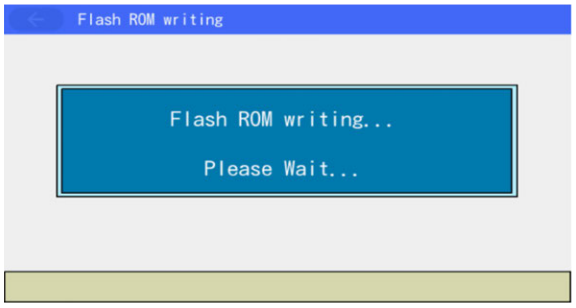


9)Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

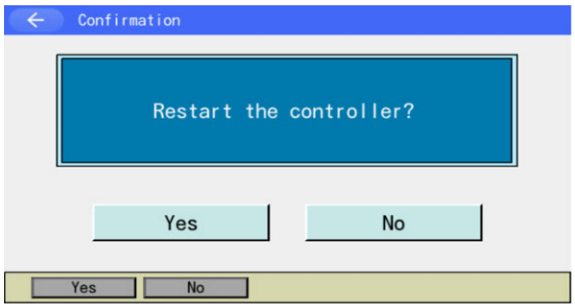


10) Touch Yes button to start flash ROM writing.



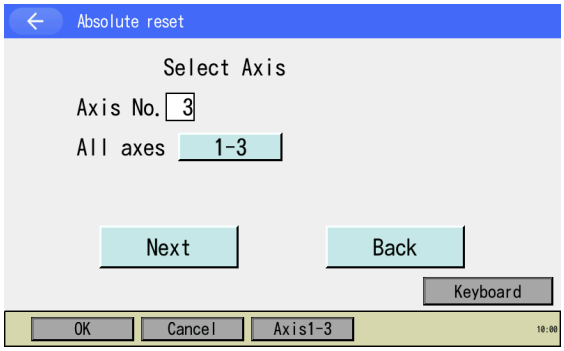
11) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



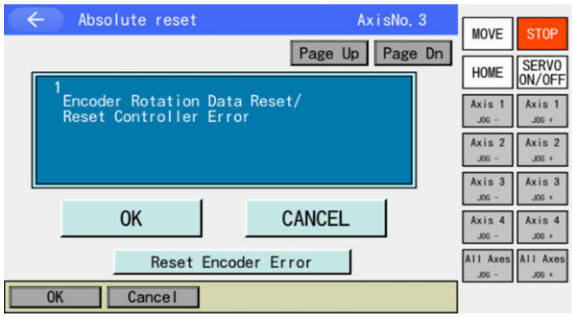
12) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button.

16.6.2.2 (3) Vertical Axis　　* For 3-Axis SCARA

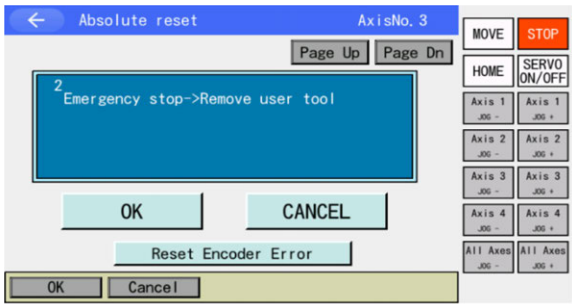


1) Input 3 in “Axis No.” box with using the software numeric keys, and then touch the Next button.

The figure on the left shows the condition that the vertical axis has been selected in 3-axis SCARA.

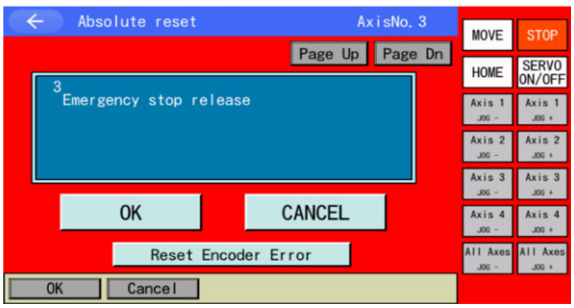


2) Encoder Multi-Rotation Data Reset / Controller Error Reset
Touch OK button.

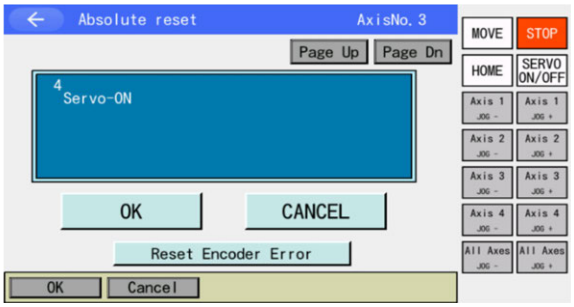


3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.

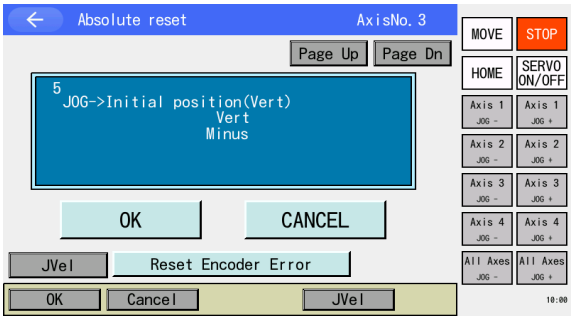


4) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



5) Align the arm to the initial posture with JOG operation or manually.
(The initial posture is the position stated in the beginning of 16.6.)

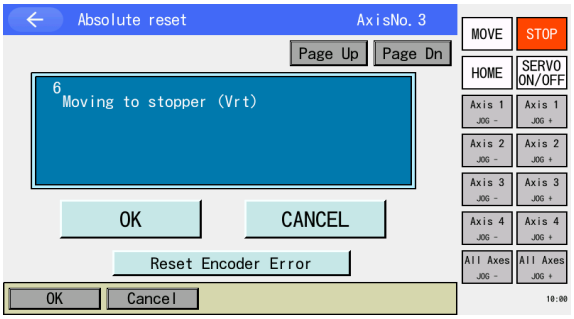
1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.



6) Moving to Initial position

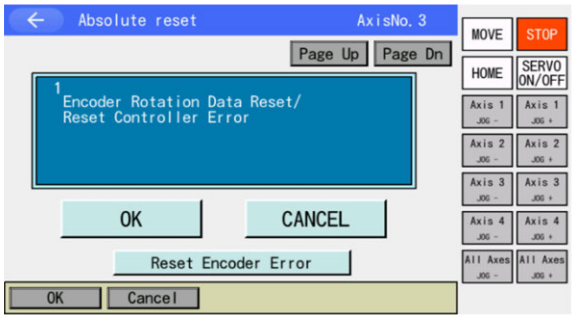
1. If using JOG operation to align to initial position
   To avoid interference, use JOG operation to align the vertical axis and rotary axis to the initial posture.
   Touch OK button.
2. If aligning to initial position manually
   Turn ON the emergency stop. To avoid interference, use manually operation to align the vertical axis and rotary axis to the initial posture. Turn OFF the emergency stop.
   Touch OK button.

* With the operation in Step (7), the axis should move in the direction shown in this window.

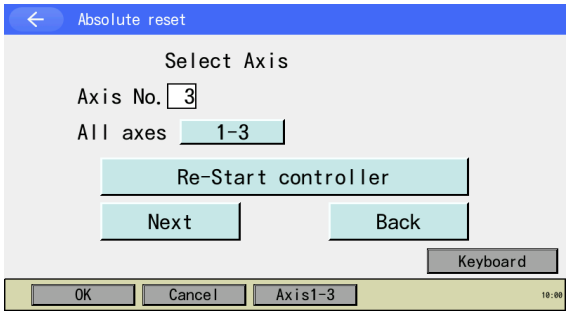


7) Vertical Axis Stopper Pressing Style Absolute Reset
Touch OK button.

The vertical axis performs the stopper pressing movement.

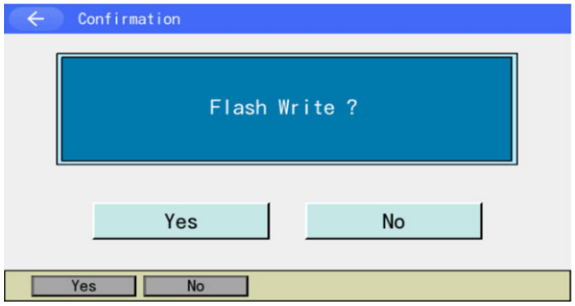


8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.

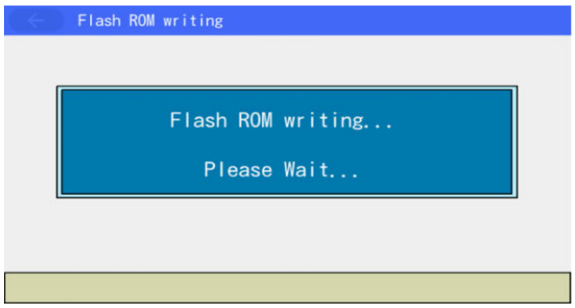


9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

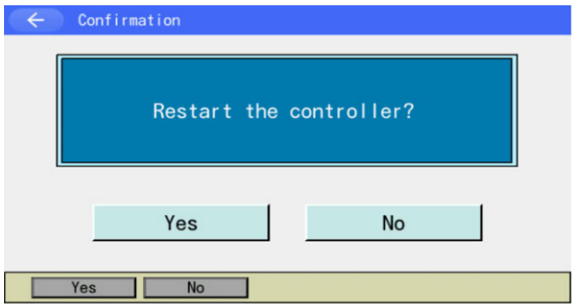


10) Touch Yes button to start flash ROM writing.



11) While in writing process to flash ROM, the screen.

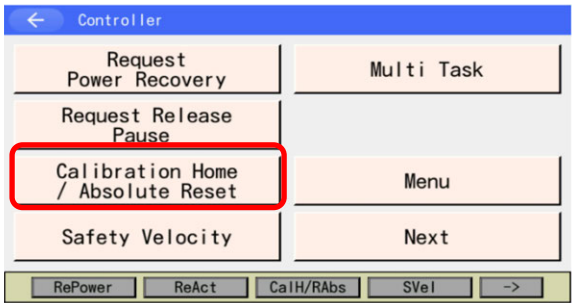
Never turn off the power to the Controller at this time.



12) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button.

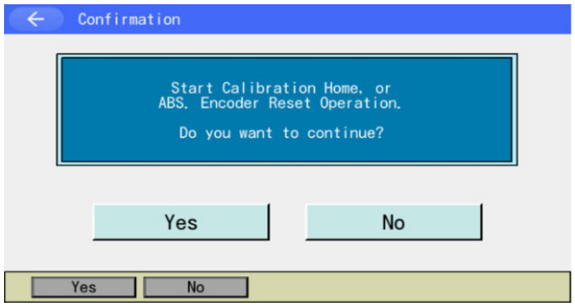
16.7 Home Adjustment / Absolute Reset on MSEL-PC/PG/PCF/PGF/PCX/PGX, PSEL

Backup the parameters so that they can be put back anytime to those before changing them.
(Go to File – Backup – Parameter in the main menu to open the parameter backup screen and save the file.)



1) Select Calibration Home / Absolute Reset from Controller Menu.

* Depending on the controller, Absolute Reset may be displayed. In such case, select it.



2) Touch Yes button to conduct home adjustment / absolute reset.
If the absolute reset is not required, touch No button. The screen goes back to the previous screen.

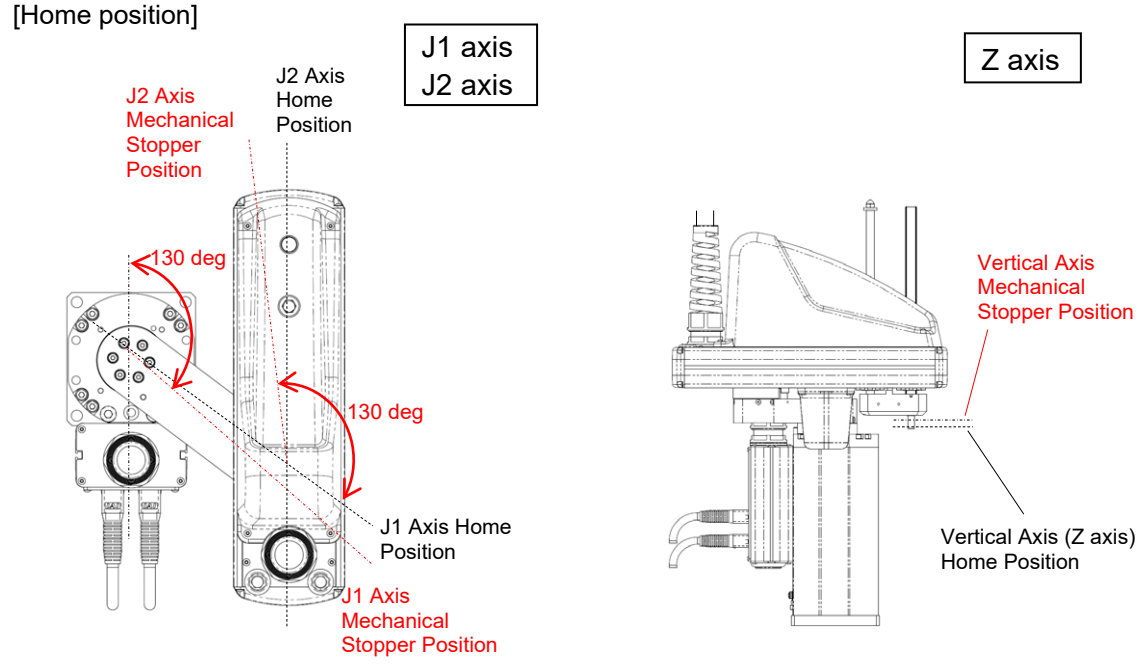
It is available to perform operation on SCARA Robot without having anything special as an absolute reset has already been conducted before delivered out from our factory. It is necessary to have an absolute reset when an absolute error generates or the robot is dismantled for such a reason as motor replacement work.

> ⚠ *Caution: In case of not having the absolute reset conducted, it may cause malfunction of the robot or a critical operational error.*

The way to have the home adjustment / absolute reset differs depending on the axis types. (It will be selected automatically considering the specifications of the axis.) Refer to each chapter for details.

Model of the Robot	3N3515-WA / 3N4515-WA (3-axis Absolute Type)	4N3515-WA / 4N4515-WA (4-axis Absolute Type)
J1 axis	16.7.1.1 Calibration Home / Absolute reset	16.7.1.1 Calibration Home / Absolute reset
J2 axis	16.7.1.1 Calibration Home / Absolute reset	16.7.1.1 Calibration Home / Absolute reset
Z axis	16.7.2.1 Absolute reset	16.7.2.1 Absolute reset
R axis		16.7.1.1 Calibration Home / Absolute reset
Added Axis	16.7.2.1 Absolute reset	

[Home position]

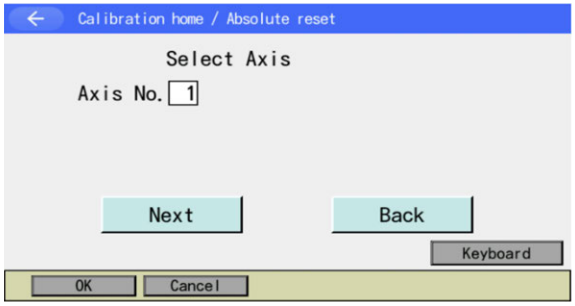


> ⚠ *Caution: Home-return operation is to have the actuator pressed against the mechanical stopper. Make sure that the home-return posture shown in the figure above can be performed at the standard home position or that there is no interference to peripheral devices during home-return operation.*

16.7.1 SCARA J1, J2 and R Axes

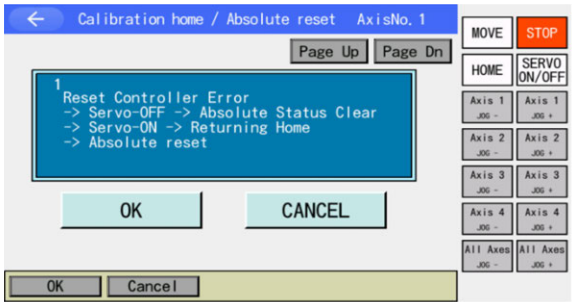
16.7.1.1 How to Home Adjustment / Absolute Reset

Have the absolute reset and home adjustment (home preset automatic update) conducted with the following steps for SCARA J1, J2 and R axes.



1) Input a number in Axis No. box with using the software numeric keys, and then touch Next button.

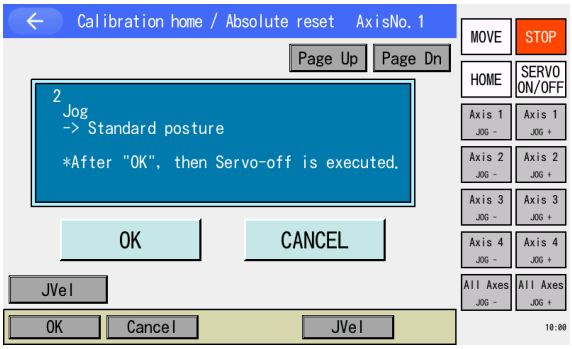
* 1, 2 or 4 for 4-axis SCARA and 1 or 2 for 3-axis SCARA is available to indicate.
(1: J1 axis, 2: J2 axis, 4: R axis)



2) Home-Return Operation and Absolute Reset
Touch OK button.

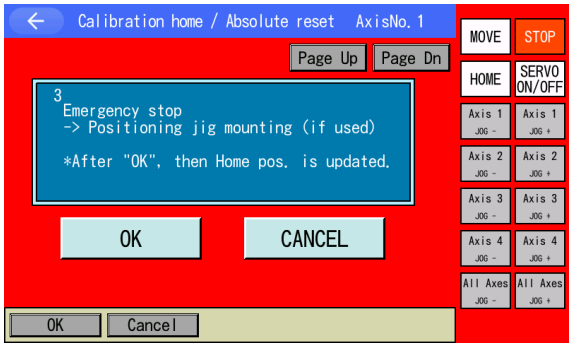
* After confirming OK, the process is carried out from the controller error reset to the absolute reset in order.

> ⚠ *Caution: Home-return operation starts as soon as either touching OK button. The standard home position is the posture described in the beginning of 16.7. In case there is any interference to peripheral equipment during the home-return operation, the home-return operation completes at the position of interference, and the proper home position cannot be acquired. In such cases, it may cause a crash or unexpected operation, which could cause malfunction or critical operation error to the robot or the peripherals. Make sure to secure enough space for home-return posture to avoid any interference to the peripherals during the home-return operation.*

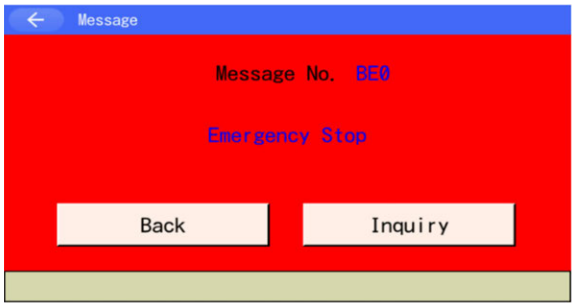


3) Jog -> Standard posture
Align the indicated axis to the vicinity of the datum position with JOG operation. (Refer to the figure in Step 6) for the datum position.)
After finished, touch OK button.

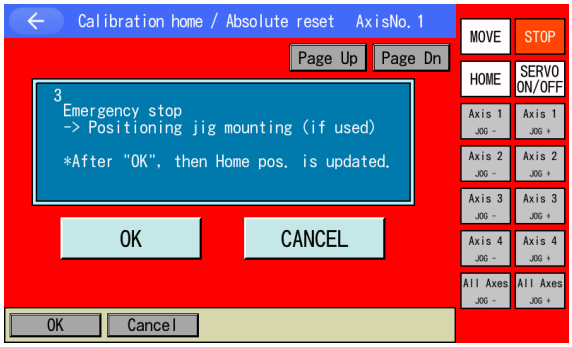
* After confirming OK, the indicated axis turns off automatically.



4) Emergency stop
Press the EMERGENCY STOP button.



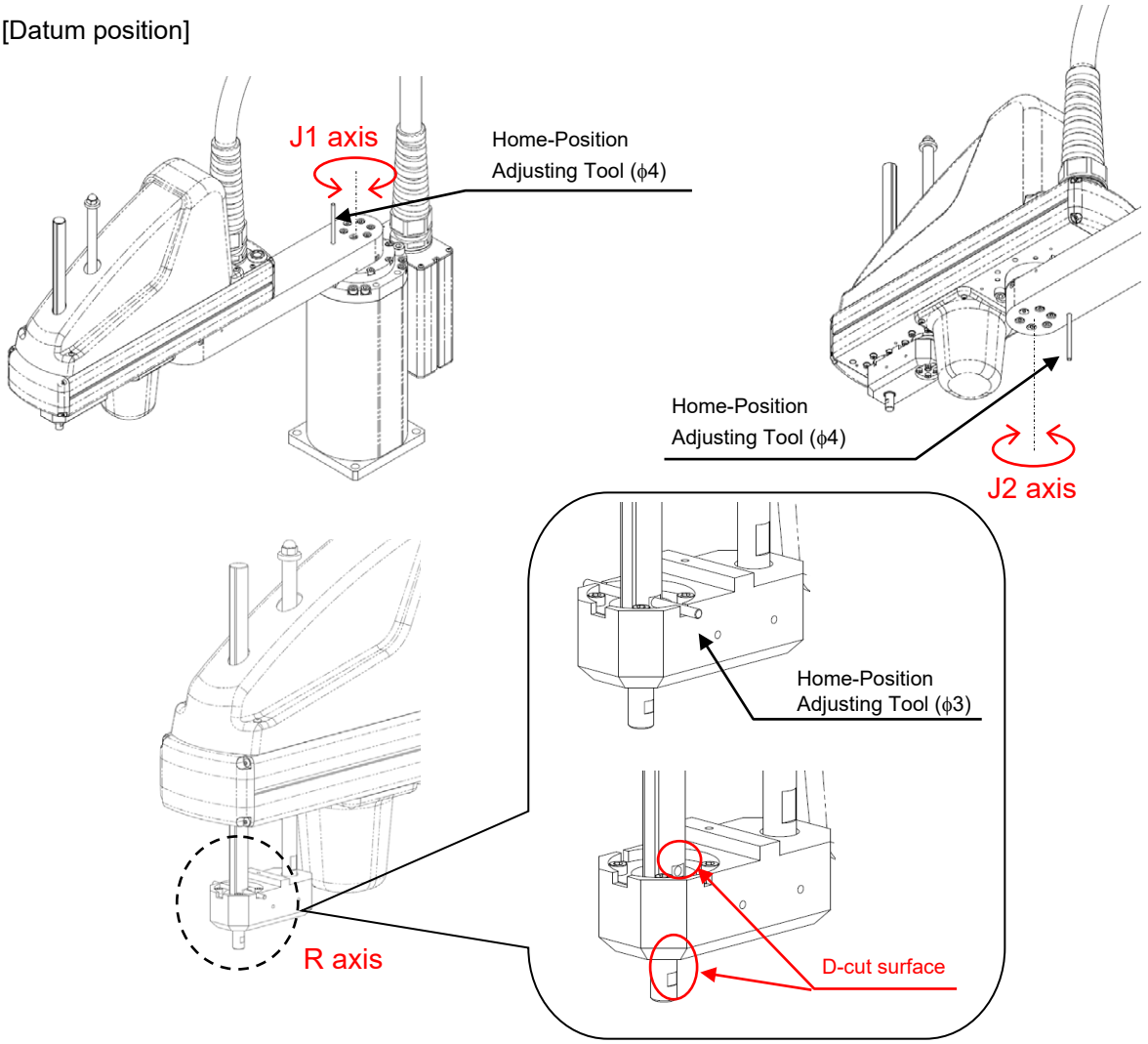
5) Once the emergency stop is input, the screen turns to the screen shown in the figure on the left.
Touch Back button to go back to the previous screen.



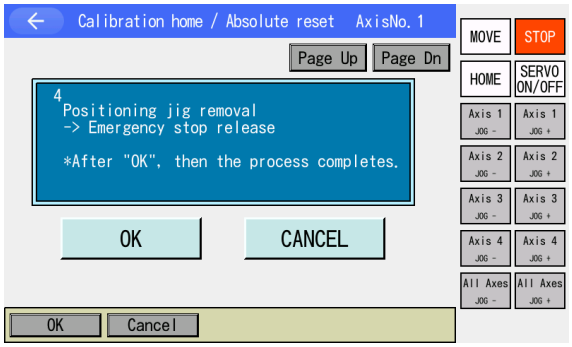
6) Fixture Set for Home Adjustment
Set the fixture (positioning pin) for home adjustment.
After setting is complete and fixed at the datum posture, touch OK button.

* After confirming OK, home preset gets automatically updated.

[Datum position]

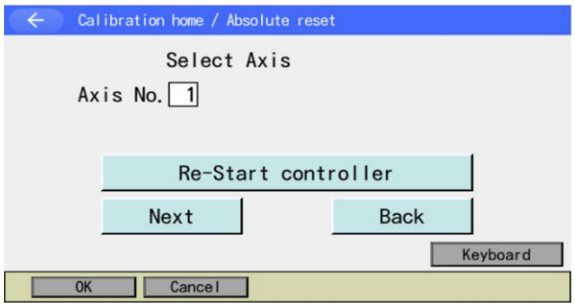


⚠ *Caution: Pay attention not to get the cables and pipes on the tool twisted.*



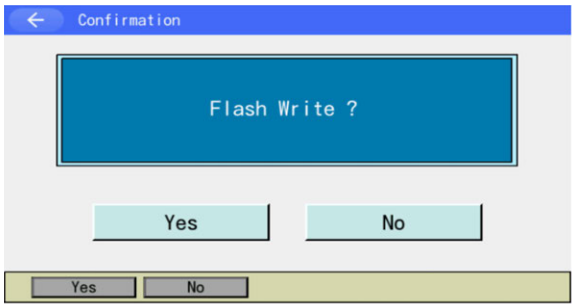
7) Removal of Fixture for Home Adjustment and Cancel of Emergency Stop
Remove the fixture for home adjustment (positioning jig) if it is attached.
After releasing the EMERGENCY STOP button, touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.

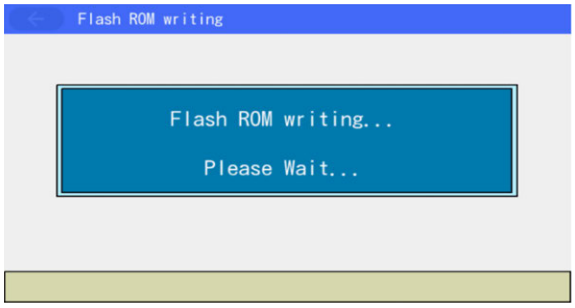


8) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

(Reference) Flash ROM writing can be conducted at once after absolute reset completes on each axis.

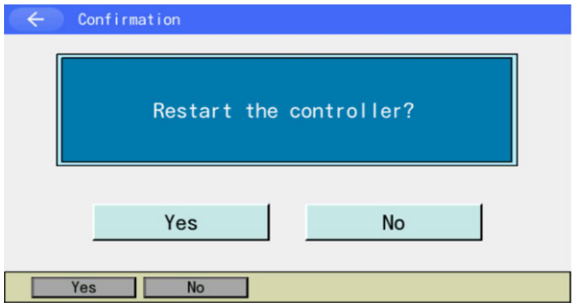


9) Make sure to conduct flash ROM writing and then software reset as the parameters are updated.



10) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



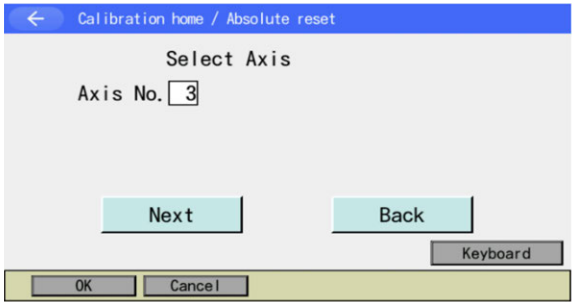
11) After flash ROM writing is complete, the display changes to the Software Reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset. Touch Yes button.

Once the software reset is complete, the screen automatically returns to the main menu screen.

16.7.2 SCARA Z-Axis, Battery-less Absolute Type Additional Axes and Linear Axes

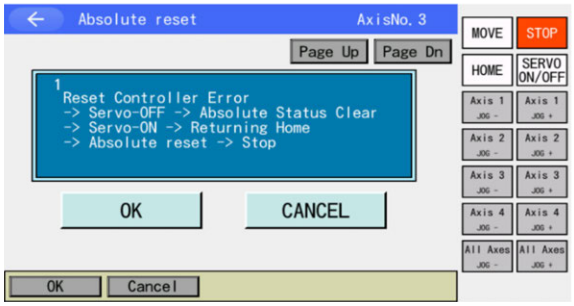
16.7.2.1 How to Absolute Reset

For SCARA Z-axis, the battery-less absolute type additional axes and the linear axes, have the absolute reset conducted with the following steps.



1) Input a number in Axis No. box with using the software numeric keys, and then touch Next button.

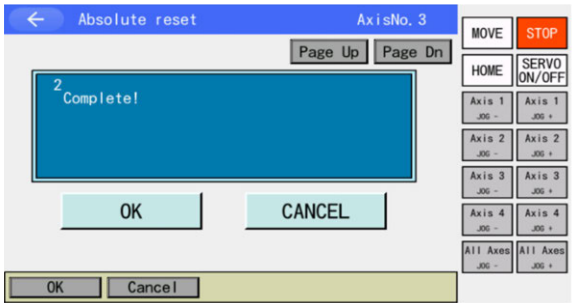
* For axis Nos., the following Nos. can be designated.
MSEL-PCX/PGX : 3 (for Z-Axis), 4(for Additional Axis) (“4” is selectable, only when there is an additional axis).
MSEL-PC/PG/PCF/PGF : 1～4
PSEL : 1～2



2) Home-Return Operation and Absolute Reset
Touch OK button.

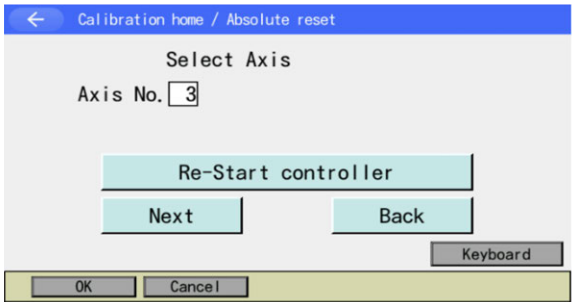
* After confirming OK, the process is carried out from the controller error reset to the stop in order.

> ⚠ *Caution: Home-return operation starts as soon as touching OK button. The standard home position is the posture described in the beginning of 16.7.*
> *In case there is any interference to peripheral equipment during the home-return operation, the home-return operation completes at the position of interference, and the proper home position cannot be acquired. In such cases, it may cause a crash or unexpected operation, which could cause malfunction or critical operation error to the robot or the peripherals. Make sure to secure enough space for home-return posture to avoid any interference to the peripherals during the home-return operation.*



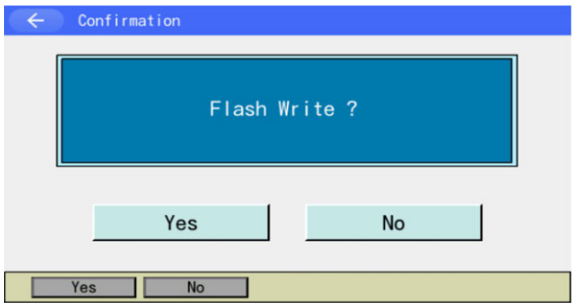
3) Complete!
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.

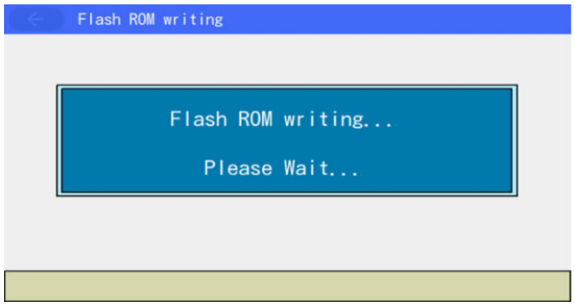


4) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

(Reference) Flash ROM writing can be conducted at once after absolute reset completes on each axis.

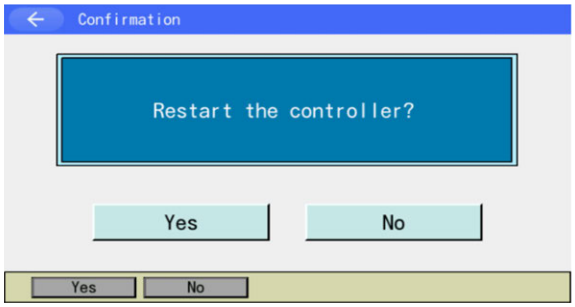


5) Make sure to conduct flash ROM writing and then software reset as the parameters are updated.



6) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



7) After flash ROM writing is complete, the display changes to the Software Reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset. Touch Yes button.

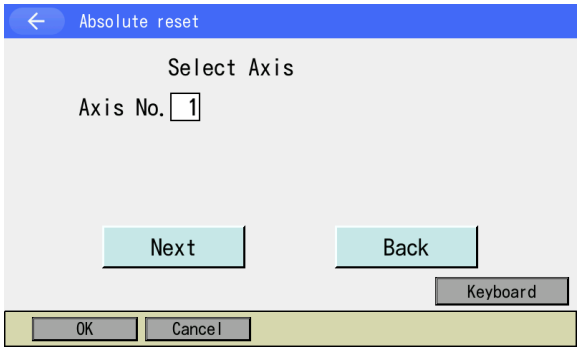
Once the software reset is complete, the screen automatically returns to the main menu screen.

16.8 Absolute Reset for Battery-less Absolute Type

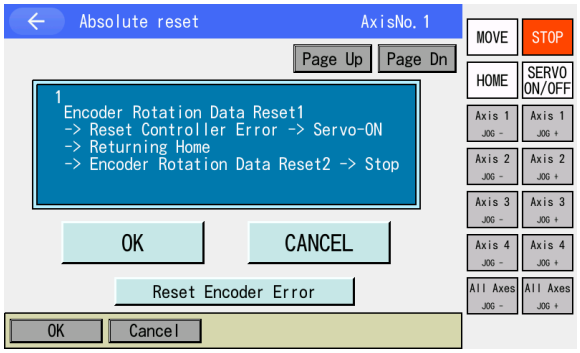
Make sure to have a backup before conducting it so the parameters can be set back any time.
(Go to File - Backup - Parameter from the main menu to open the parameter backup screen to save a file.)

16.8.1 How to Conduct Absolute Reset for Battery-less Absolute Type

Absolute Reset on Cartesian Axes:
Absolute reset should be performed in the following procedures for AC servo motor type TTA, XSEL-P/Q (V1.52 and later), XSEL-R/S/RA/SA, XSEL2-T, 5th to 8th Axes of XSEL-RX/SX (V1.23 and later), 5th to 8th Axes of XSEL-RAX/SAX (4th to 8th Axes if 3-axis SCARA), SSEL (V0.57 and later), ASEL (V0.45 and later) and XSEL2-TX (Axis 5 to 8 in Axis Group No. 1 and all axes in Axis Group No. 2).



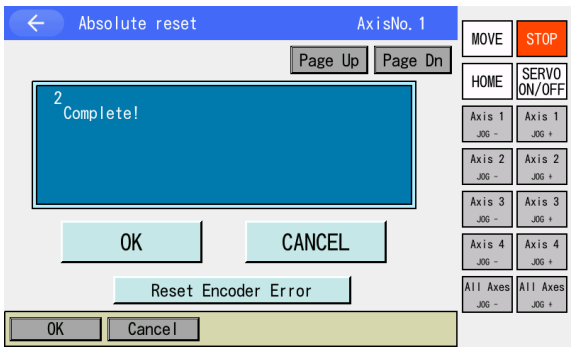
1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.



2) Touch Absolute Reset OK button.

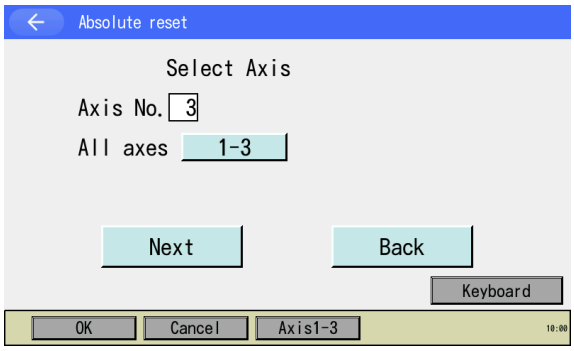
* After touching OK, the process is carried out in order from Encoder Multi-Rotation Data Reset 1 till it stops.

> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*

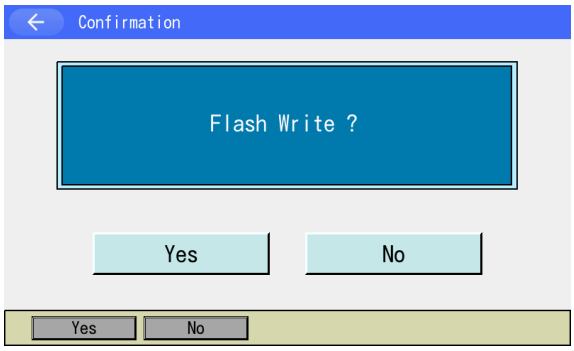


3) Complete screen
Touch OK button.

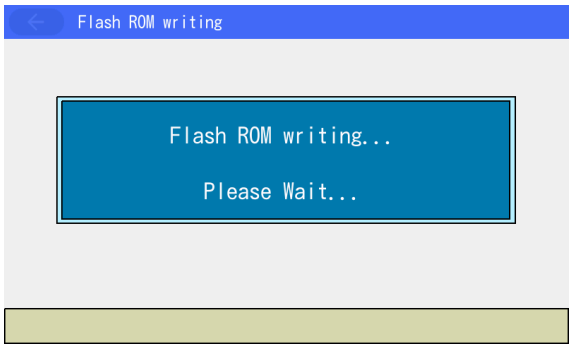
* After touching OK, the screen automatically goes back to the axis select screen.



4) Touch Re-Start Controller button.
Flash ROM writing confirmation screen opens.

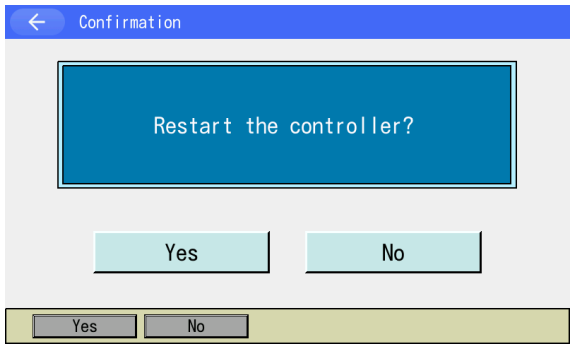


5) Touch Yes button.



6) While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



7) After flash ROM writing is complete, the display changes to the Software Reset screen.

Touch Yes button.

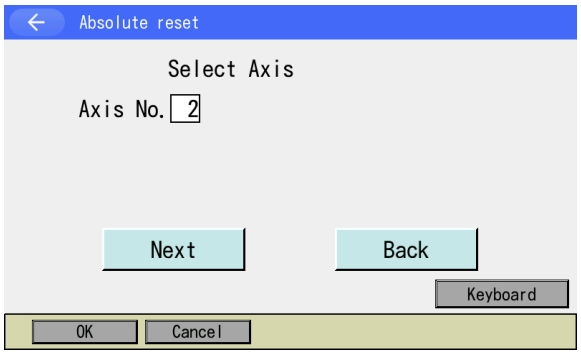
Once software reset is finished, the screen automatically goes back to the main menu screen.

16.8.2 Special Procedure: How to Conduct Absolute Reset Battery-less Absolute Synchronizing Type

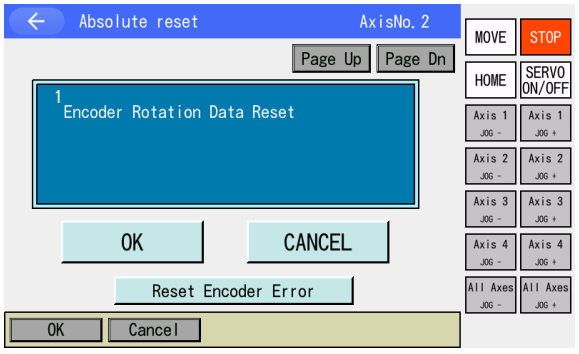
Synchronizing Type Absolute Reset
Synchronizing type absolute reset be performed in the following procedures for XSEL-P/Q (V1.52 and later), XSEL-R/S/RA/SA, 5th to 8th Axes of XSEL-RX/SX (V1.23 and later), 5th to 8th Axes of XSEL-RAX/SAX (4th to 8th Axes if 3-axis SCARA), SSEL (V0.57 and later) and ASEL (V0.45 and later).
For XSEL2-T/TX, conduct it in the procedures in [16.14 Absolute Reset for Synchronizing Axis: XSEL2-T/TX].

> This section describes only the corresponding section to (3) Special Procedure Absolute Reset in the [16.5.3 Special Procedure Absolute Reset] procedures. Perform the procedures before (2) or after (4) the same as above, referring to [16.5.3 Special Procedure Absolute Reset].

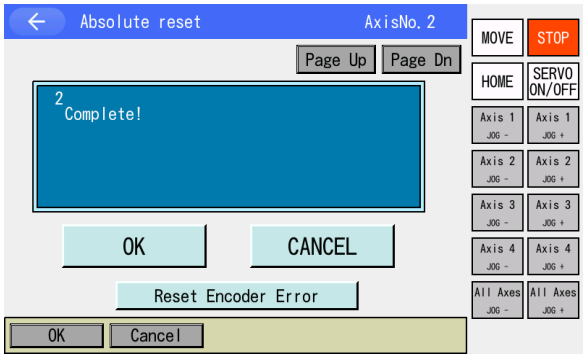
1) Conduct the absolute reset on the slave axes.



Input the axis number of the slave axis using the touch panel numeric keys, and then touch Next button.



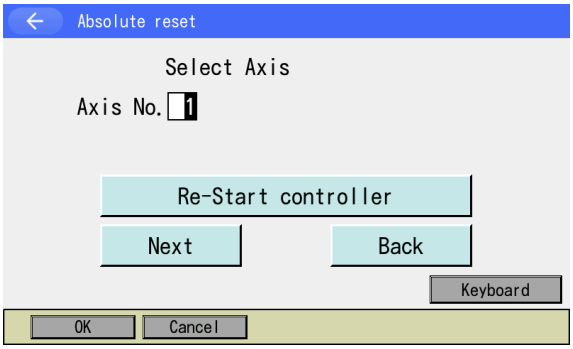
Touch OK button.



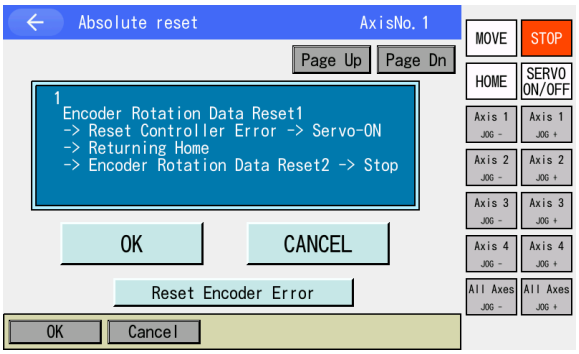
Touch OK button.

* After touching OK, the screen automatically goes back to the axis select screen.

2) Conduct the absolute reset on the master axis.



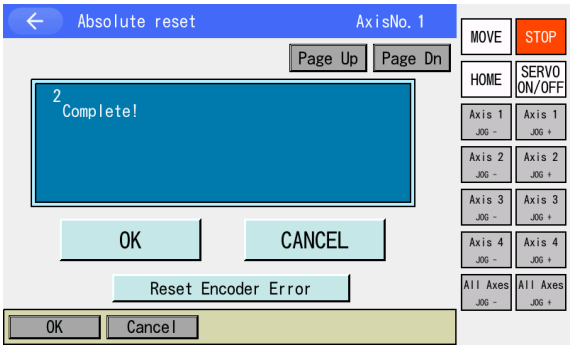
Input the axis number of the master axis using the touch panel numeric keys, and then touch Next button.



Touch OK button.

* After touching OK, the process is carried out in order from Encoder Multi-Rotation Data Reset 1 till it stops.

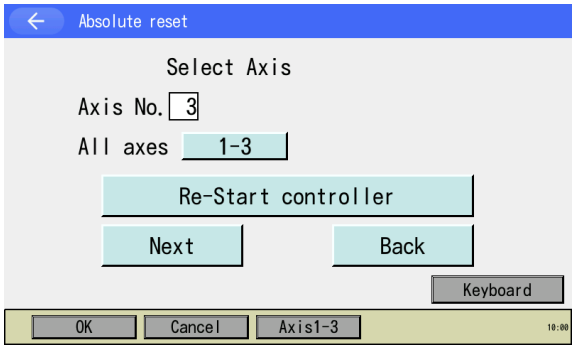
> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*



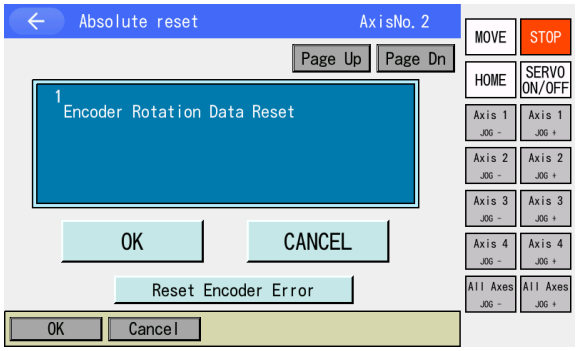
Touch OK button.

* After touching OK, the screen automatically goes back to the axis select screen.

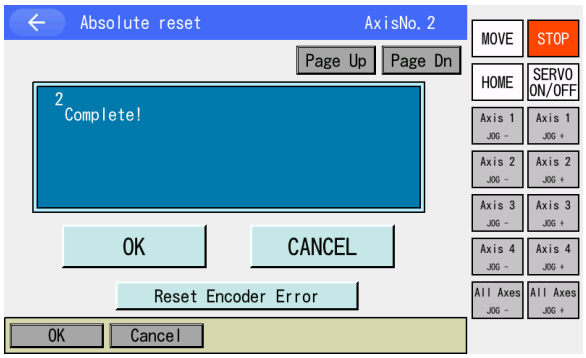
3) Conduct the absolute reset on the slave axes again.



Input the axis number of the slave axis using the touch panel numeric keys, and then touch Next button.

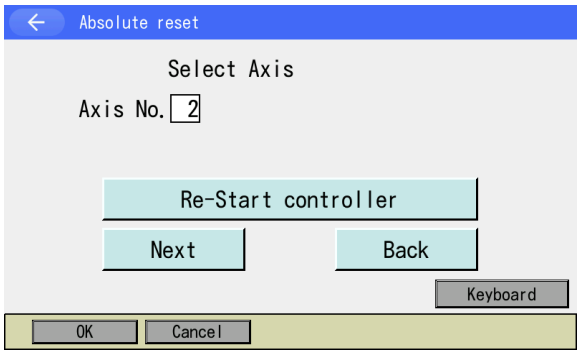


Touch OK button.

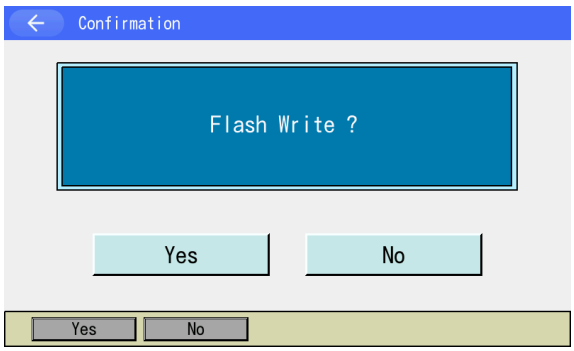


Touch OK button.

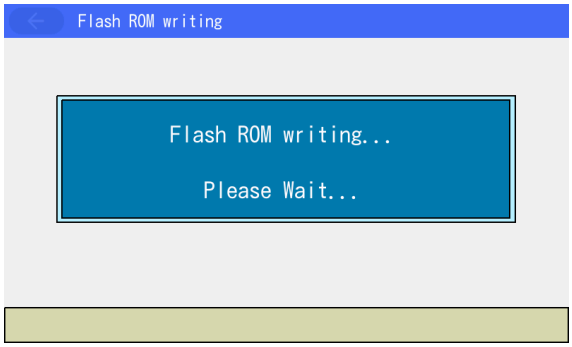
* After touching OK, the screen automatically goes back to the axis select screen.



Touch Re-Start Controller button.
Flash ROM writing confirmation screen opens.

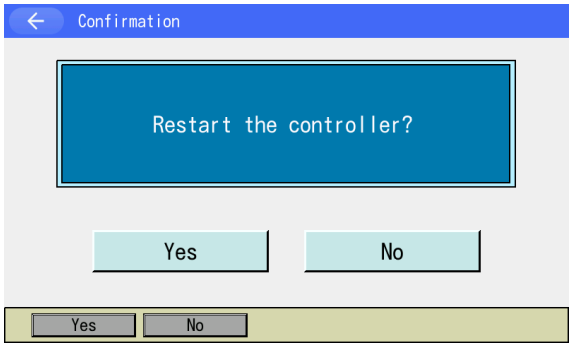


Touch Yes button.



While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the Software Reset screen.

Touch Yes button.

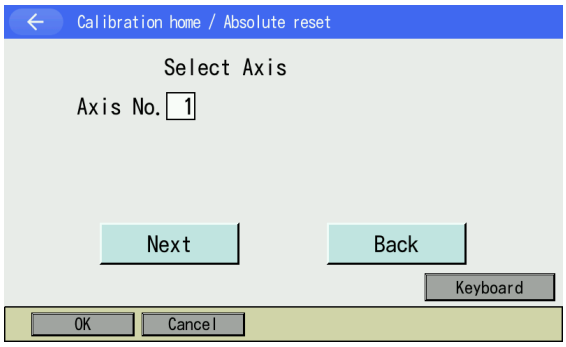
Once software reset is finished, the screen automatically goes back to the main menu screen.

16.9 Absolute Reset on Pulse Motor Type TTA

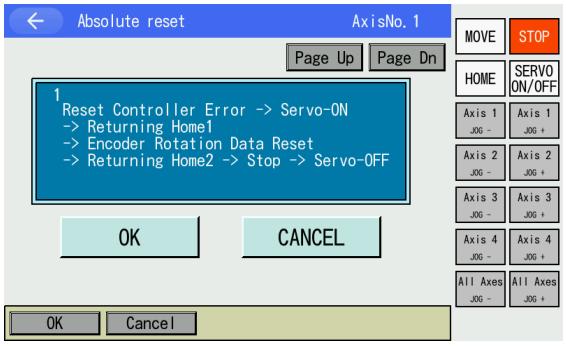
Make sure to have a backup before conducting it so the parameters can be set back any time.
(Go to File - Backup - Parameter from the main menu to open the parameter backup screen to save a file.)

16.9.1 How to Conduct Absolute Reset on Pulse Motor Type TTA

For Pulse Motor Type TTA, conduct the absolute reset in the following procedures.



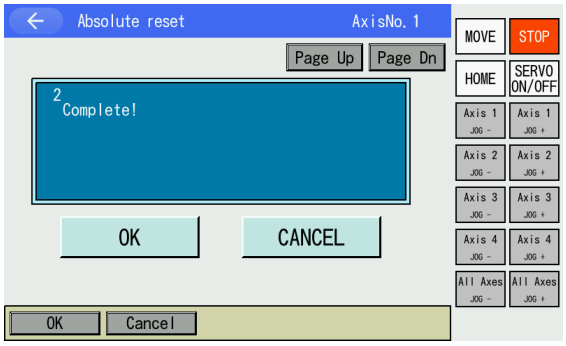
1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.



2) Absolute Reset
Touch OK button.

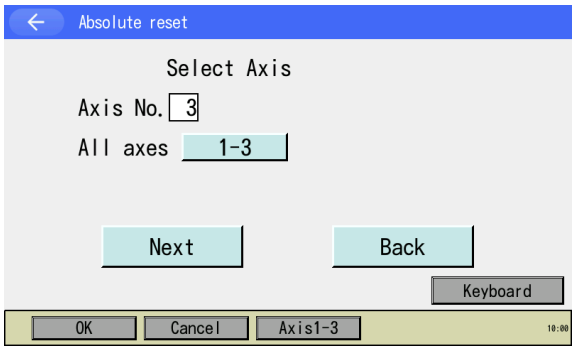
* After touching OK, the process is carried out in order from Controller Error Reset till the servo is turned off.

> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*

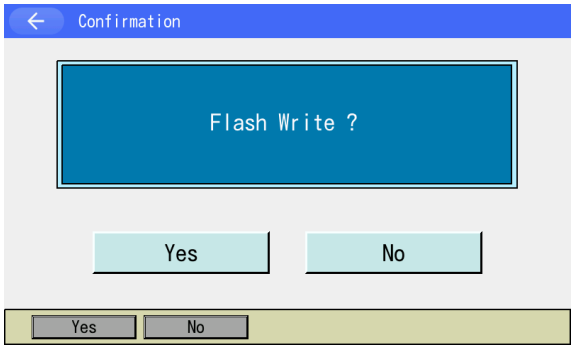


3) Complete!
Touch OK button.

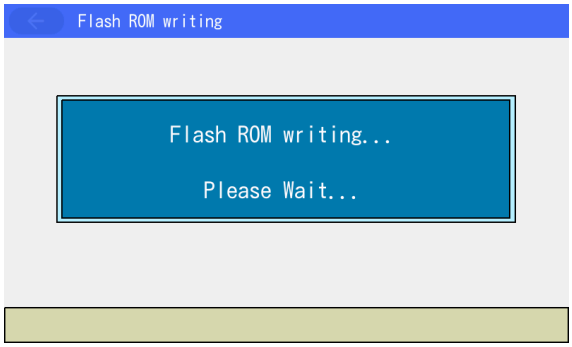
* After touching OK, the screen automatically goes back to the axis select screen.



4) Touch Re-Start Controller button.
Flash ROM writing confirmation screen opens.

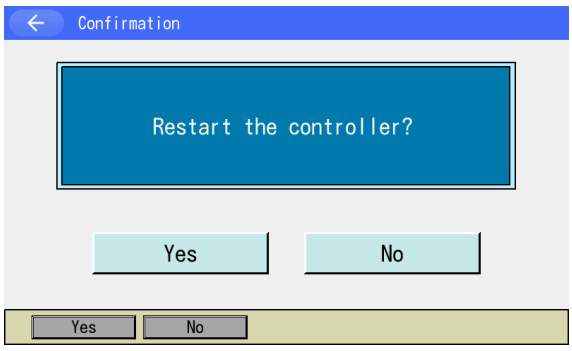


5) Touch Yes button.



6) While in writing process to flash ROM, the screen shown in the left will be displayed.

Never turn off the power to the Controller at this time.



7) After flash ROM writing is complete, the display changes to the Software Reset screen.

Touch Yes button.

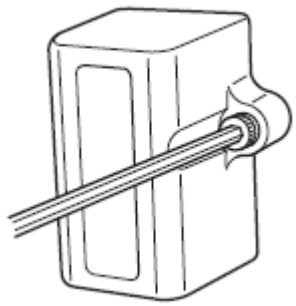
Once software reset is finished, the screen automatically goes back to the main menu screen.

16.10 Resetting Absolute-Battery Voltage-Down Warning Error for Orthogonal Axis

XSEL-J/K/P/Q/R/S/RA/SA, XSEL2-T, 5th and 6th Axes of XSEL-PX/QX, 5th to 8th Axes of XSEL-RX/SX/RAX/SAX (4th to 8th Axes if 3-axis SCARA), XSEL2-TX (Axis 5 to 8 in Axis Group No. 1 and all axes in Axis Group No. 2), SSEL, ASEL and PSEL Controller

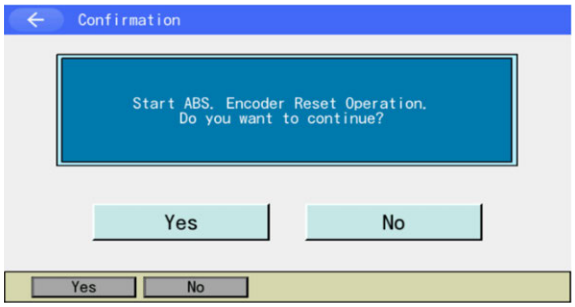
The encoder error reset / software reset should be conducted when replacing a battery for occurrence of No. A03 "Absolute Data Backup Battery Voltage Drop Warning" (No. 247 for XSEL2-T/TX) or error not occurred. Homing in the absolute reset procedures does not have to be attempted again.
Keep the controller's main power ON until the following procedures have been completed:

1) Turn the servo OFF for all the axes for error resetting. (Use the SERVO ON/OFF, 1st axis servo-off to 4th axis servo-off buttons on the teaching screen.)
2) Replace the batteries of the axes for error resetting.
   When the voltage of absolute data holding batteries decreases, replace them together with the battery unit.

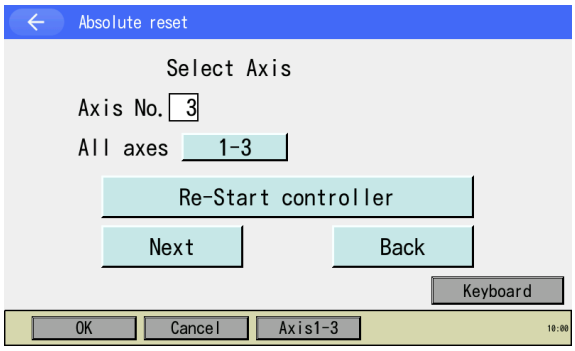


For XSEL-J/K Controllers, detach the screw holding the battery unit on the front panel as shown in the figure on the left with using a hex wrench.
Pull the battery unit towards you.
Replace it with a new one.
For battery replacement work for models other than XSEL-J/K Controllers, refer to [Instruction Manual for Each Controller].

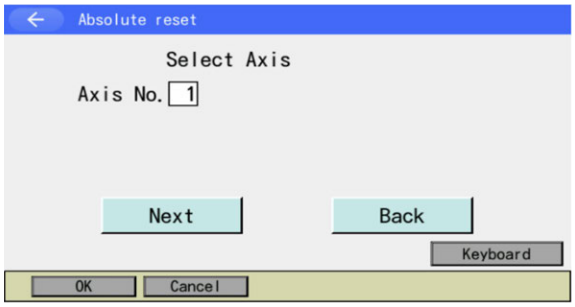
Select Absolute Reset from Controller Menu.



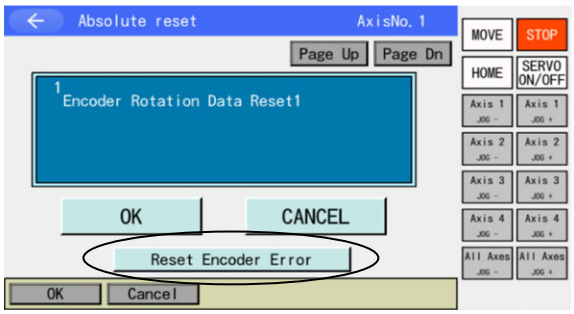
3) To have an encoder error reset, touch Yes button.
When not to have an encoder error reset, touch No button. The display returns to the previous screen.



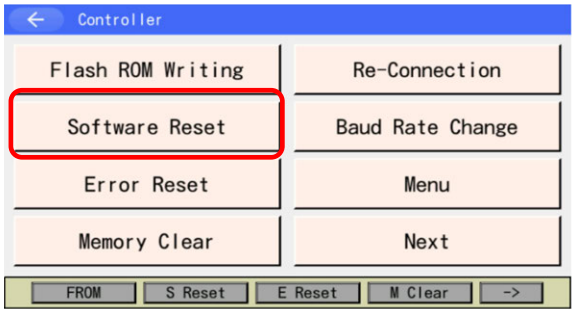
4) Axis No. Input
Input a number on the touch panel numeric keys to indicate the axis number to have the encoder error reset conducted, and touch ENT for confirmation.



5) Once the input is confirmed, the cursor disappears. If you want to redo the input, touch the axis number input box.
If you want to continue encoder error reset, touch Next button.
When you cancel encoder error reset, touch Back button.



6) Encoder error reset
Touch Reset Encoder Error button.
Touch CANCEL button.
When you want to have the encoder error reset on other axes, repeat the steps in (4) to (6).
To finish the process, touch Back button to return to Controller Menu screen.



7) Reset software.
Touch Software Reset button.
For the following operations, refer to [15.3. Software Reset].

16.11 Home Adjust / Absolute Reset for Wrist Unit: MSEL-PC/PG/PCF/PGF

Absolute reset for the wrist unit should be conducted on the B-axis and T-axis in a series of operations. As you will need to operate the robot in the process of adjustment, make sure that there is nothing to interrupt the robot movement in the actuator working area.

(1) Preparing for Absolute Reset

[Necessary Items for Absolute Reset]

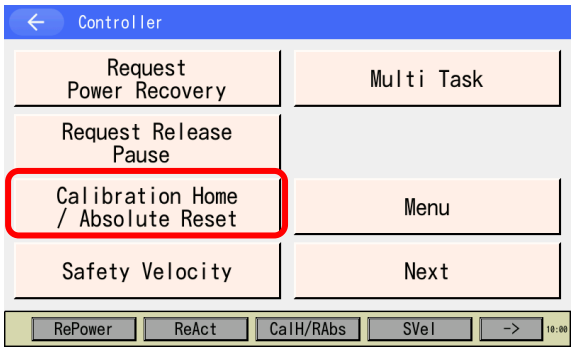
Model Number : For S Type JG-WUS
For M Type JG-WUM

(Note) The model numbers stated above are those that an absolute reset tool, screws and pins come in a set.

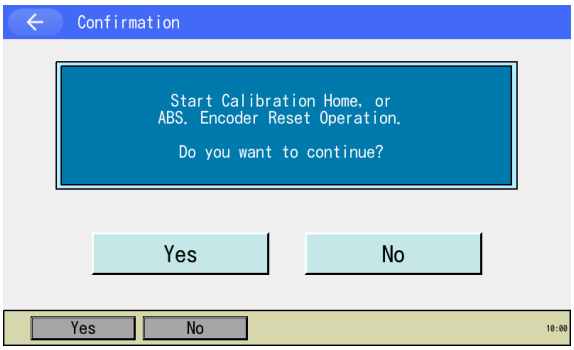
- Absolute Reset Tool (in common for S Type and M Type)
- Bolt Size S : Hexagonal Socket Head Bolt, M6 x 6, 1 piece
  Size M : Hexagonal Socket Head Bolt, M6 x 10, 1 piece
- Pin Size S : ϕ4 B Type Parallel Pin, Length 40mm, 1 piece
  ϕ3 B Type Parallel Pin, Length 40mm, 2 piece
  Size M : ϕ4 B Type Parallel Pin, Length 40mm, 3 piece



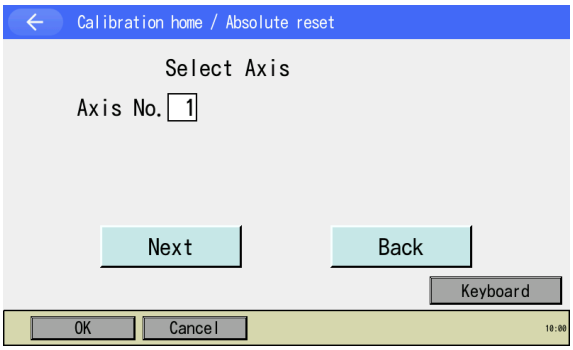
(2) How to Absolute Reset



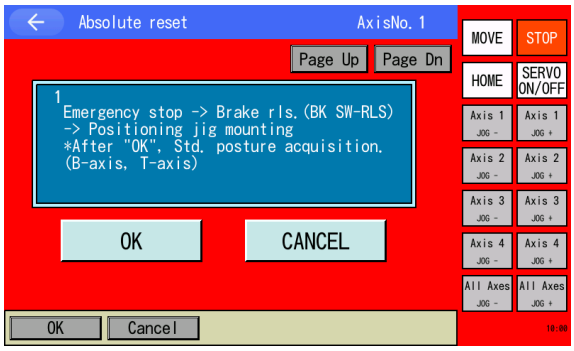
1) Select Calibration Home / Absolute Reset from Controller Menu.



2) Touch Yes button to conduct calibration home / absolute reset.
If the calibration home / absolute reset is not required, touch No button. The screen goes back to the previous screen.



3) Input a number in Axis No. box with using the software numeric keys, and then touch Next button.

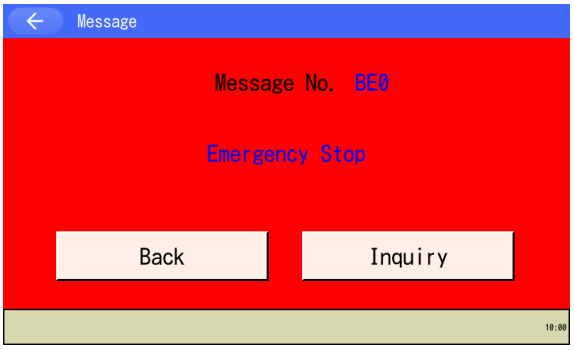


4) Emergency stop input and adjusting jig set

Press the EMERGENCY STOP button.
Press the brake release switch to release the brake.
Fix at the standard posture described in the following figure with using a jig, and touch OK button.

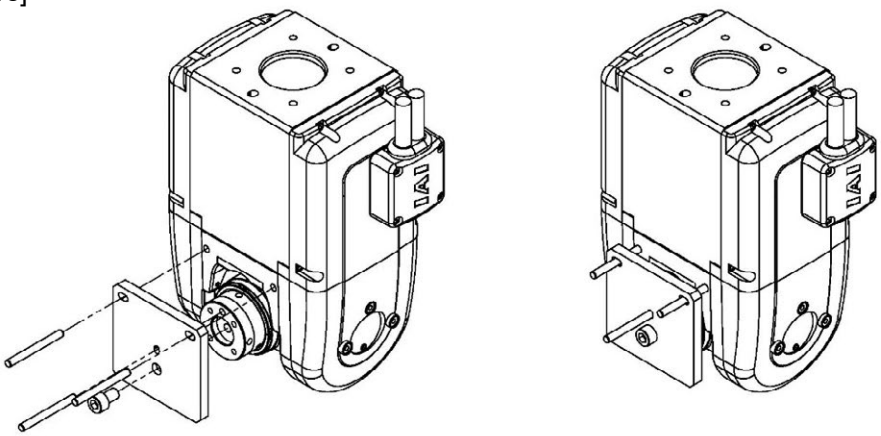
* After touching OK, acquirement of B-axis and T-axis standard posture should be performed.

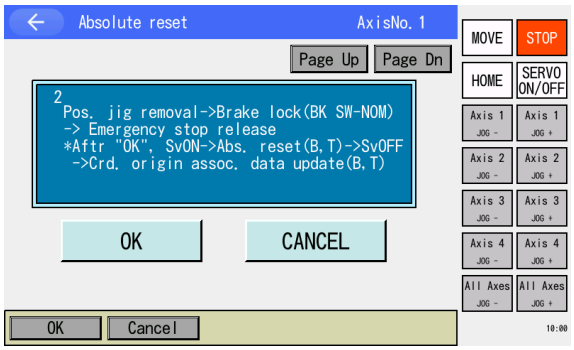




Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

[Standard posture]

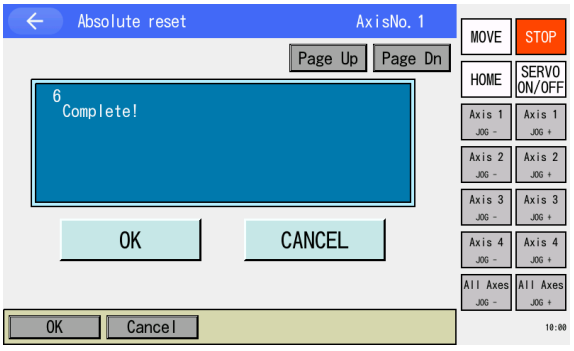




5) Adjusting jig removal and Emergency stop release

Remove the adjusting jig.
Turn off the brake release switch to enable the brake.
Release the EMERGENCY STOP button, before touching OK button.

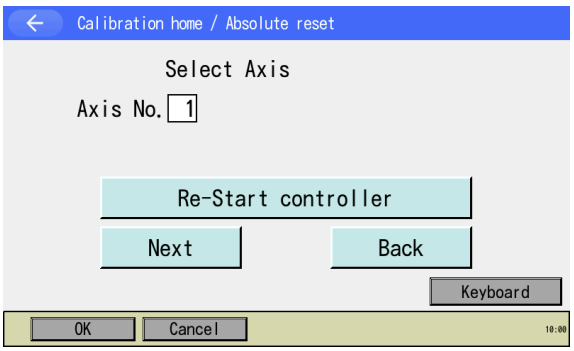
* After confirming OK, the process is carried out from the Servo-ON to the coordinate origin association data update (B, T) in order.



6) Complete!

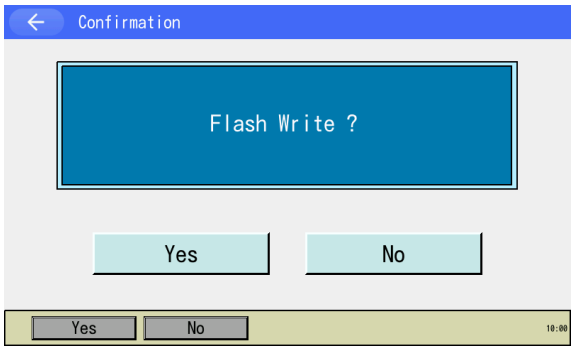
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.

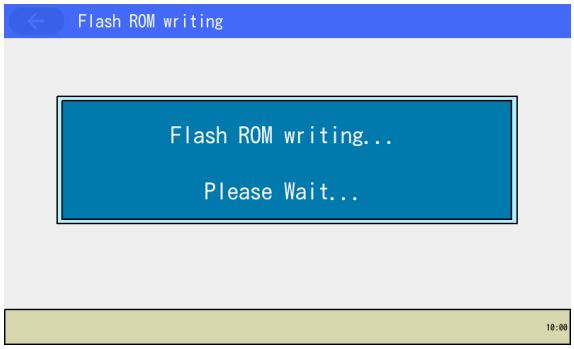


7) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.

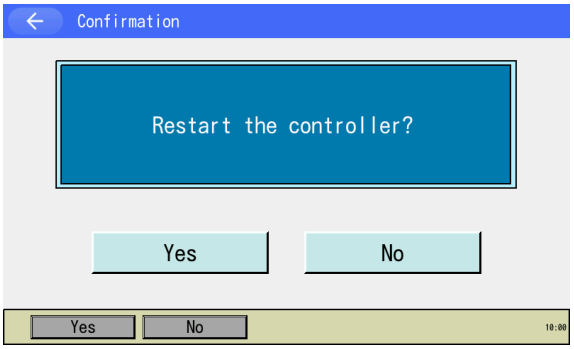


8) Make sure to conduct flash ROM writing and then software reset as the parameters are updated.



9) While in writing process to flash ROM, the screen.

Never turn off the power to the Controller at this time.



10) After flash ROM writing is complete, the display changes to the Software Reset screen. To activate the parameters that you had changed, it is necessary to have a software reset. Touch Yes button.

Once the software reset is complete, the screen automatically returns to the main menu screen.

16.12 Absolute Reset for 6-axis Cartesian : RSEL

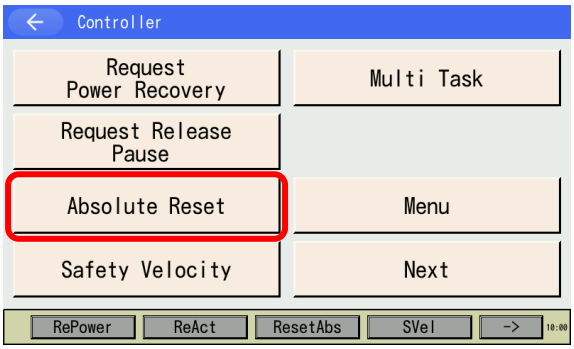
Make sure to have a backup before conducting so the parameters can get back any time.
(Open the parameter backup window from File - Backup - Parameter in the main menu and save the file.)

The absolute reset on the 6-axis cartesian should be conducted individually to X-, Y-, Z- and R-axes and in a set for B- and T-axes. In the process of tuning, there will be some cases to operate the robot. Make sure that there is no obstacles in the operation area of the actuator before start operating it.

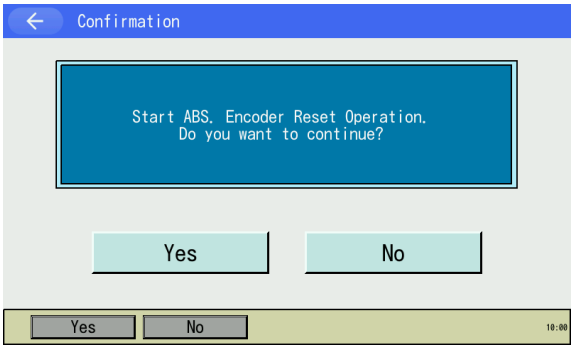
(1) Preparing for Absolute Reset
[Necessary Items for Absolute Reset]
Model Number : For S Type JG-WUS
For M Type JG-WUM
(Note) The model numbers stated above are those that an absolute reset tool, screws and pins come in a set.
• Absolute Reset Tool (in common for S Type and M Type)
• Bolt Size S : Hexagonal Socket Head Bolt, M6 x 6, 1 piece
Size M : Hexagonal Socket Head Bolt, M6 x 10, 1 piece
• Pin Size S : ϕ4 B Type Parallel Pin, Length 40, 1 piece
ϕ3 B Type Parallel Pin, Length 40, 2 piece
Size M : ϕ4 B Type Parallel Pin, Length 40, 3 piece



(2) How to Absolute Reset



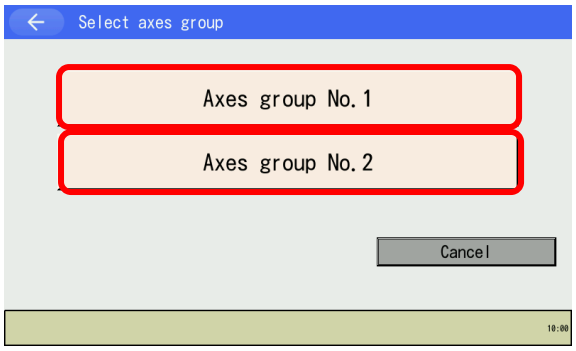
1) Select Absolute Reset from Controller Menu.



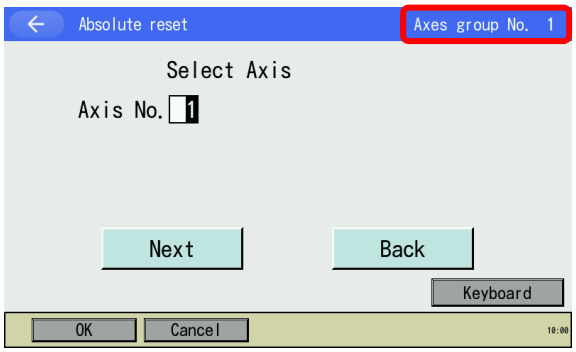
2) Touch Yes button to conduct absolute reset.

Absolute reset is not required, touch No button.
The screen goes back to the previous screen.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Yes button. Touch an axes group number button to select the axes group number that is to be subject to.



Touch the Yes button, and the select axes window should appear.
Touch an Axes group No. button



The axis number input window should open.

* The axes group number that was selected should be shown on the top right of the screen.

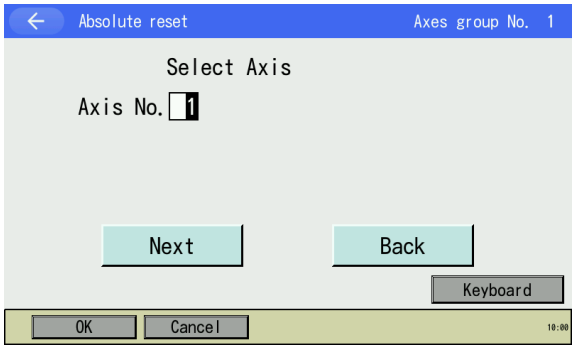
Refer to each chapter below for details.

X Axis	[16.12.1.1 Absolute Reset]
Y Axis	[16.12.1.1 Absolute Reset]
Z Axis	[16.12.1.1 Absolute Reset]
R Axis	[16.12.2.1 Absolute Reset]
B and T Axis	[16.12.3.1 Absolute Reset]

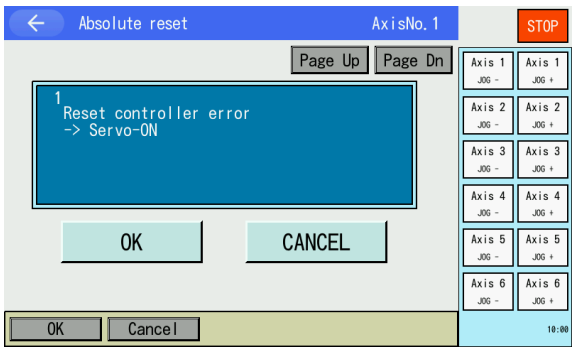
16.12.1 X-, Y- and Z-Axes of 6-axis Cartesian

16.12.1.1 How to Absolute Reset

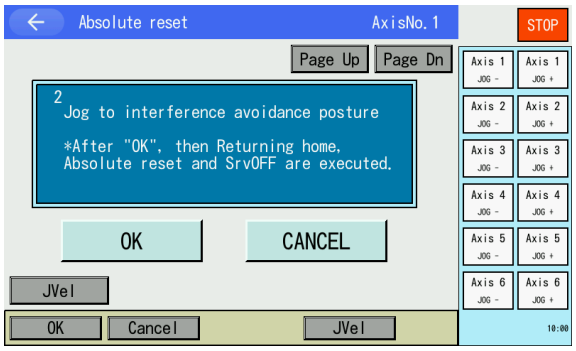
For X-, Y- and Z-axes of the 6-axis cartesian, conduct the absolute reset in the procedures below.



1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.



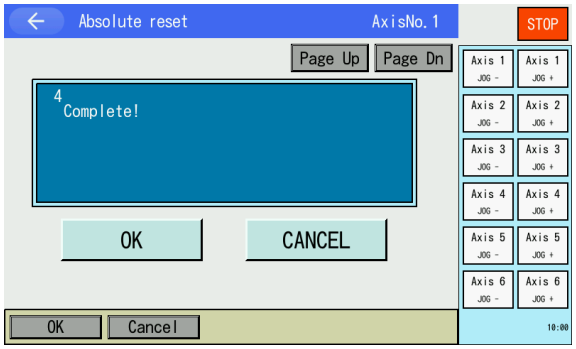
2) Reset controller error → Servo-on shows up. Touch the OK button.



3) Jog to interference avoidance posture
Move with the jog operation to the posture that would not have any interference during the home-return operation.
Touch the OK button after finished.

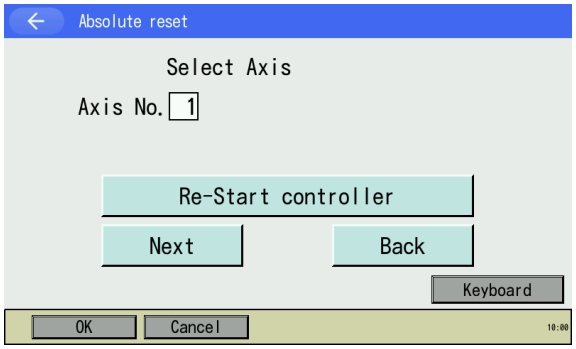
* After touching OK, process from the home-return operation to turning the servo off should take place in the order.

> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*

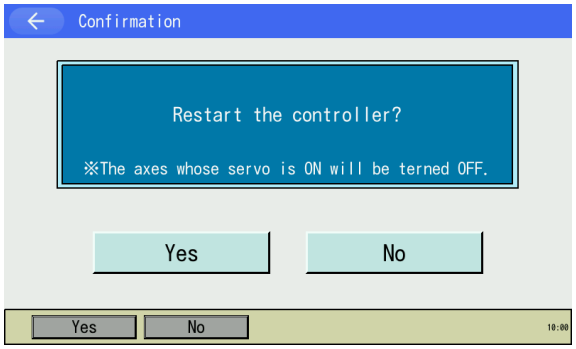


4) Complete!
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



5) Touch Re-Start controller button.
Touch the re-start controller button.



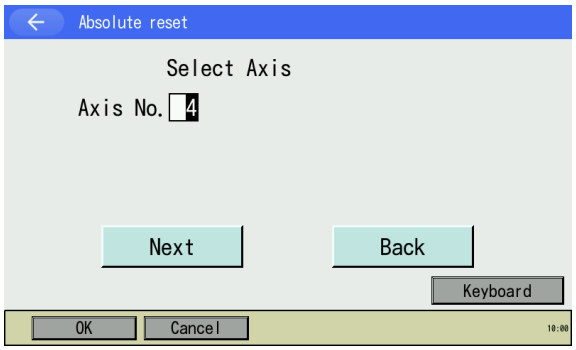
6) Conduct the software reset.
Touch the OK button.

Once the software reset finishes, it automatically goes back to the main menu.

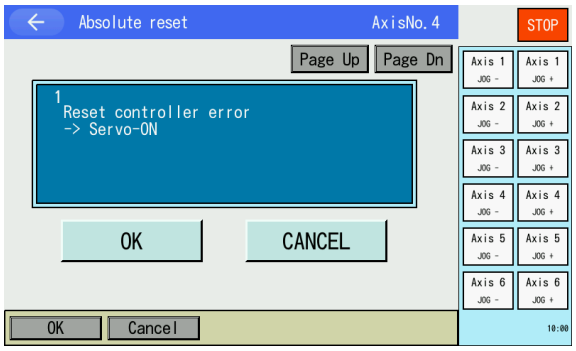
16.12.2 R-Axis of 6-axis Cartesian

16.12.2.1 How to Absolute Reset

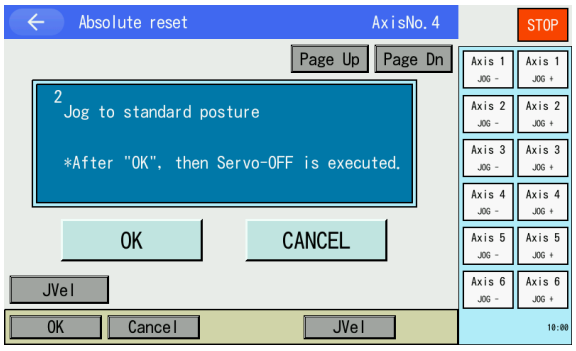
For R-axis of the 6-axis cartesian, conduct the absolute reset in the procedures below.



1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.



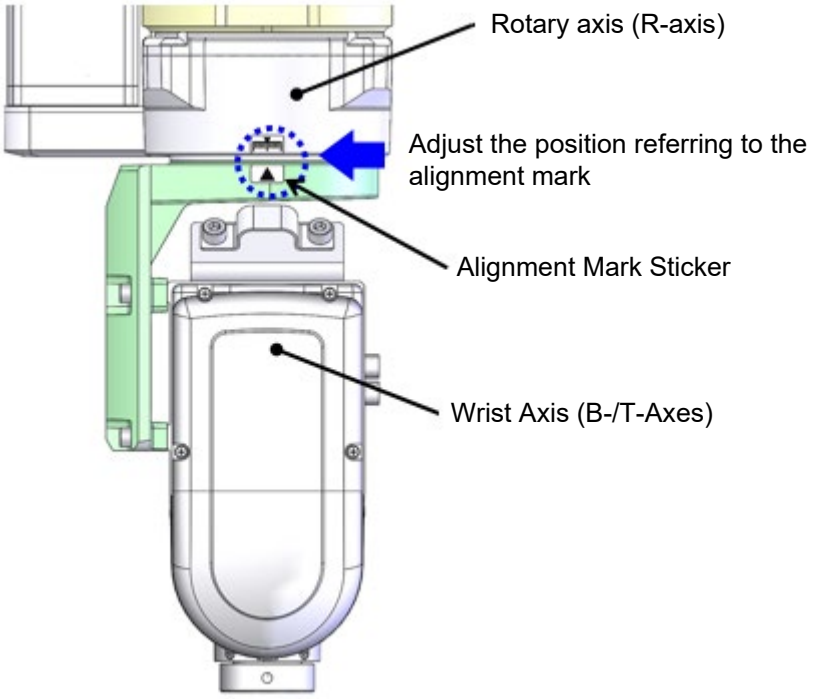
2) Reset controller error → Servo-on shows up. Touch OK button.



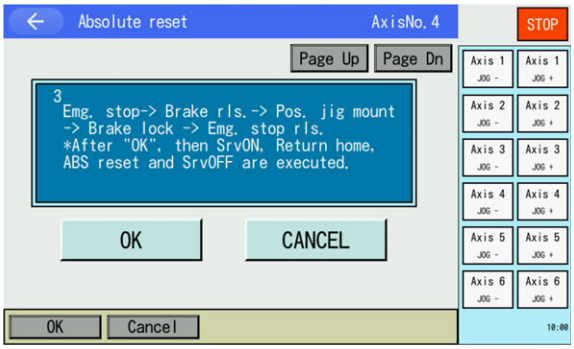
3) Jog to standard posture
Move the indicated axis with the jog operation to the posture vicinity.
Touch the OK button after finished.

* After touching OK, the indicated axis should automatically turn the servo off.

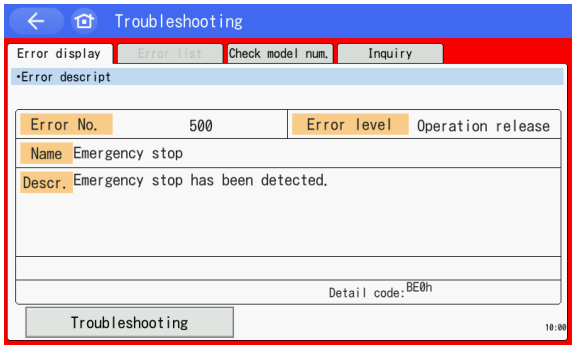
[Standard Posture]



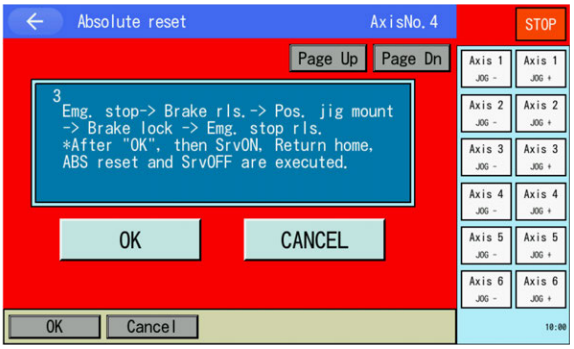
Home position



4) Emergency STOP
Press the Emergency STOP button.



5) Inputting emergency stop displays the screen at the left.
Touch ← button to go back to the previous screen.

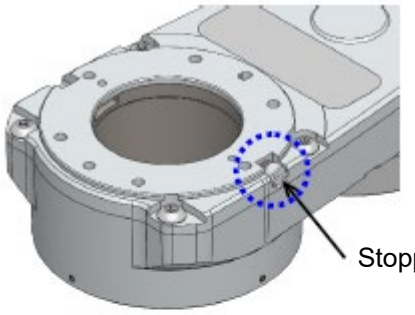


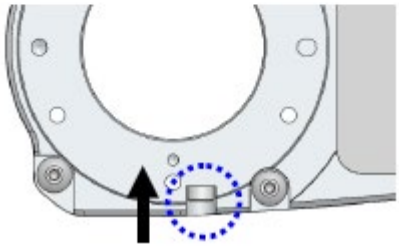
6) Put on positioning tool
Put the positioning tool on after the brake release. After putting it on, lock the brake and then cancel the emergency stop button.
Touch OK button.

* After touching OK, process from turning the servo on to servo off should take place in the order.

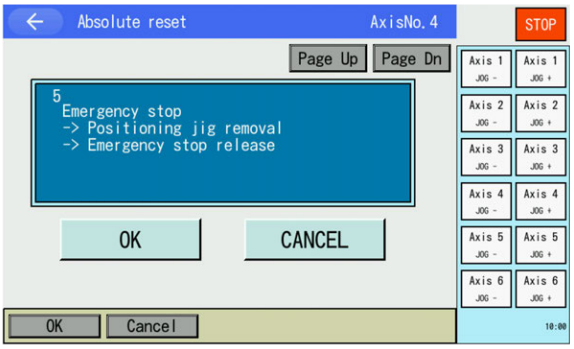
> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*

[To put on positioning tool]
Screw in the stop bolt till it stops with a slotted screwdriver.

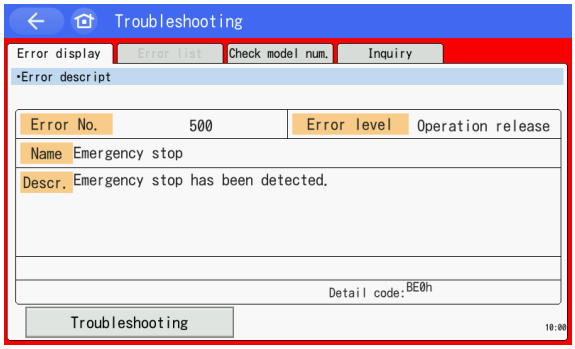




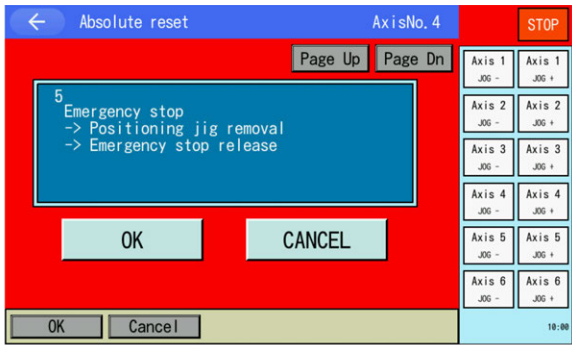
Screw it in till the end



7) Emergency STOP
Press the Emergency STOP button.

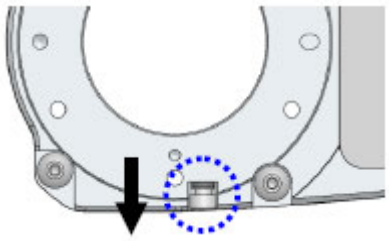


8) Inputting emergency stop displays the screen at the left.
Touch ← button to go back to the previous screen.

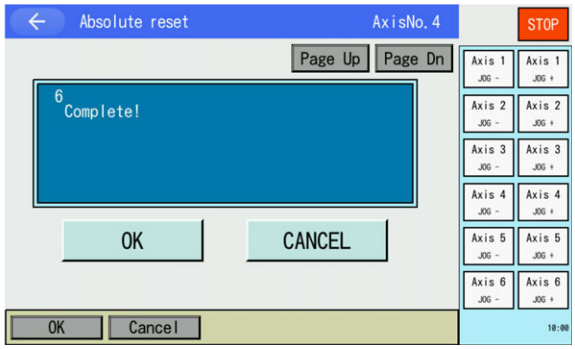


9) Take off positioning tool
Take the positioning tool off. After taking it off, cancel the emergency stop button.
Touch OK button.

[To take off positioning tool]
Set the position of the stopper bolt back to where it was.
Align the head of the stopper bolt to the edge of the main unit.

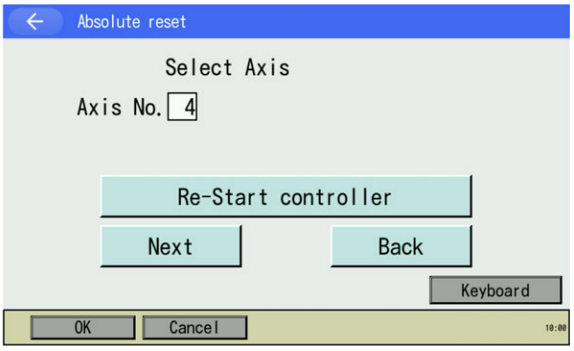


Set back to previous position

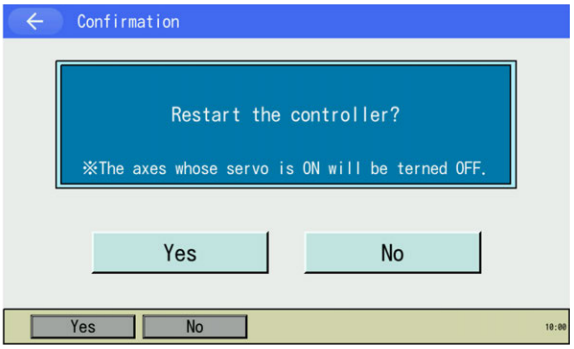


10) Complete!
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



11) Touch Re-Start controller button.
The screen turns to the software reset window.



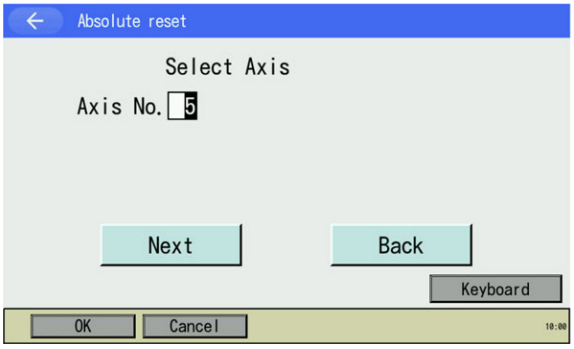
12) Conduct the software reset.
Touch Yes button.

Once the software reset finishes, it automatically goes back to the main menu.

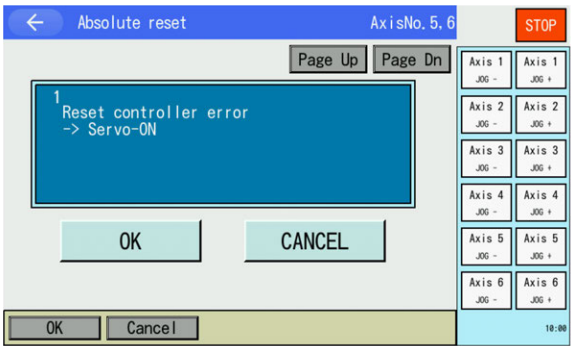
16.12.3 B- and T-Axes of 6-axis Cartesian

16.12.3.1 How to Absolute Reset

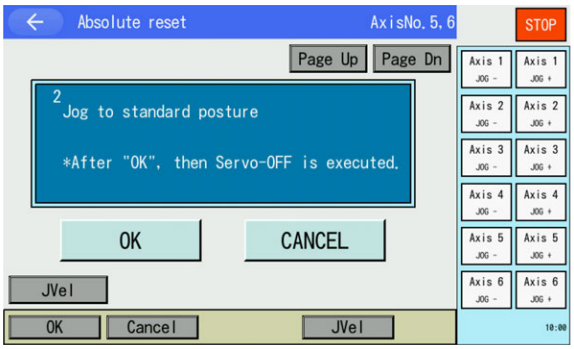
For B- and T-axes of the 6-axis cartesian, conduct the absolute reset in the procedures below.



1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.
(Input an axis number of the B-axis)



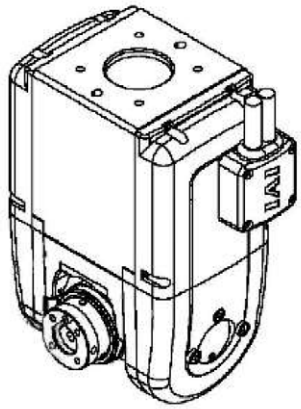
2) Reset controller error → Servo-on shows up.
Touch OK button.

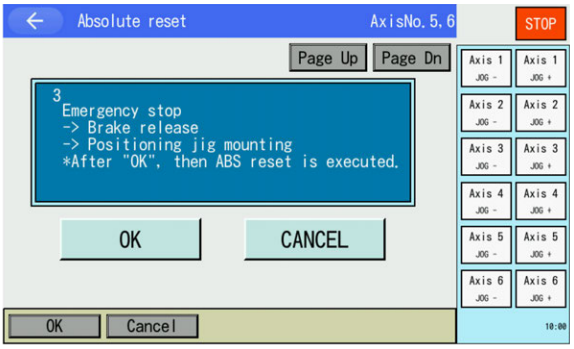


3) Jog to standard posture show up.
Move the indicated axis with the jog operation to the posture vicinity.
Touch the OK button after finished.

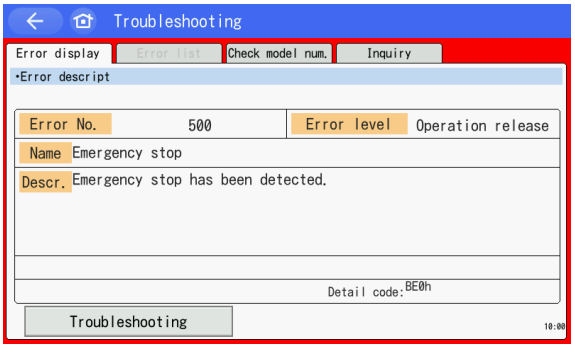
* After touching OK, the indicated axis should automatically turn the servo off.

[Standard Posture]

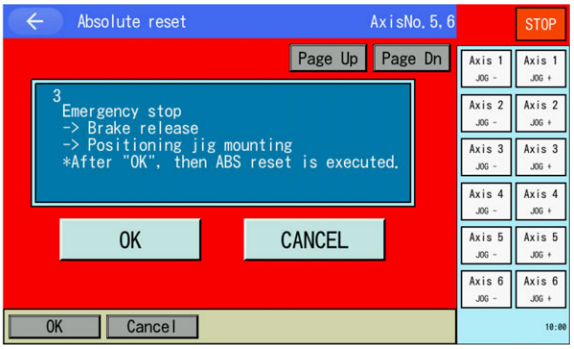




4) Press the Emergency STOP button.



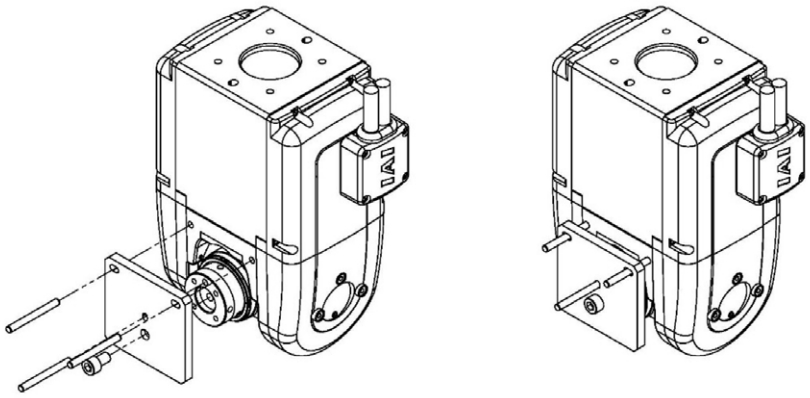
5) The display turns to the window shown on the left.
Touch ← button to go back to the previous screen.

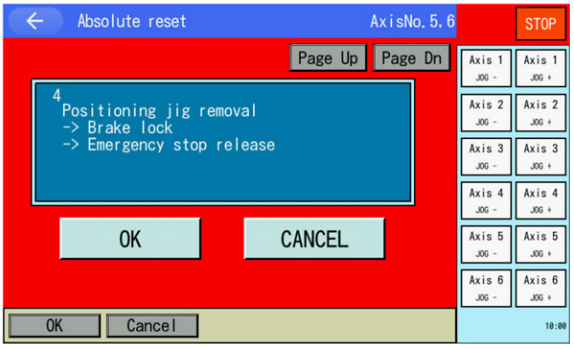


6) After brake release, put on the positioning tool. After putting it on, touch the OK button.

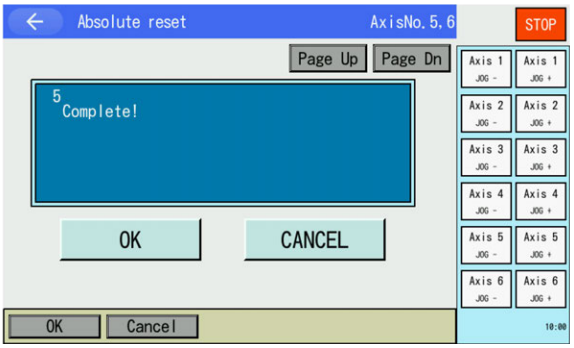
* After touching OK, the absolute reset should get conducted.

[To put on positioning tool]



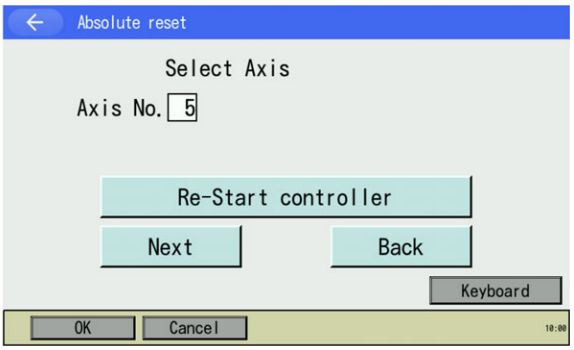


7) Take the positioning tool off. After taking it off, lock the brake and then cancel the emergency stop button.
Touch OK button.

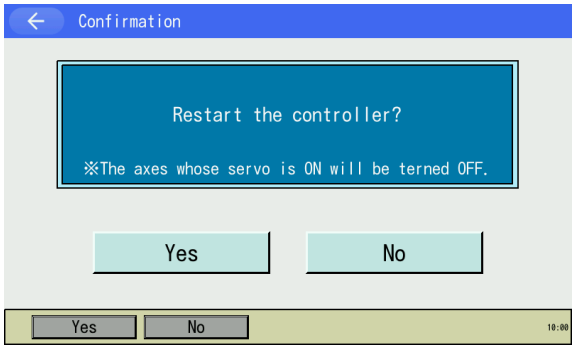


8) Complete! Should come out.
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



9) Touch Re-Start controller button.
The display turns to the software reset window.



10) Conduct the software reset.
Touch Yes button.

Once the software reset finishes, it automatically goes back to the main menu.

16.13 Absolute Reset on Wrist Unit : RSEL

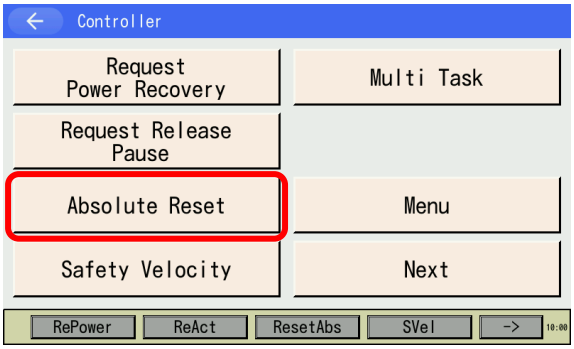
Make sure to have a backup before conducting so the parameters can get back any time.
(Open the parameter backup window from File - Backup - Parameter in the main menu and save the file.)

The absolute reset on the wrist unit should be conducted in a set for B- and T-axes.
In the process of tuning, there will be some cases to operate the robot. Make sure that there is no obstacles in the operation area of the actuator before start operating it.

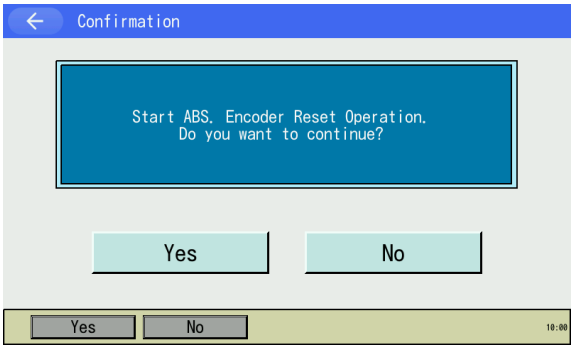
(1) Preparing for Absolute Reset
[Necessary Items for Absolute Reset]
Model Number : For S Type JG-WUS
For M Type JG-WUM
(Note) The model numbers stated above are those that an absolute reset tool, screws and pins come in a set.
• Absolute Reset Tool (in common for S Type and M Type)
• Bolt Size S : Hexagonal Socket Head Bolt, M6 x 6, 1 piece
Size M : Hexagonal Socket Head Bolt, M6 x 10, 1 piece
• Pin Size S : ϕ4 B Type Parallel Pin, Length 40, 1 piece
ϕ3 B Type Parallel Pin, Length 40, 2 piece
Size M : ϕ4 B Type Parallel Pin, Length 40, 3 piece



(2) How to Absolute Reset



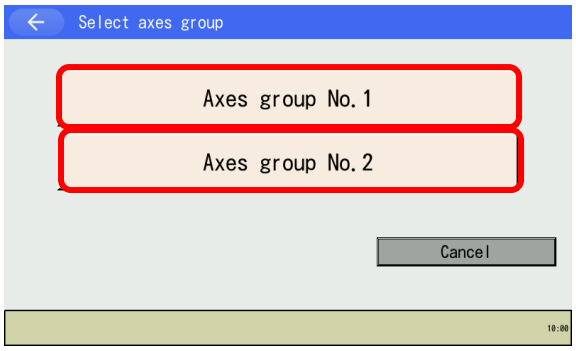
1) Select Absolute Reset from Controller Menu.



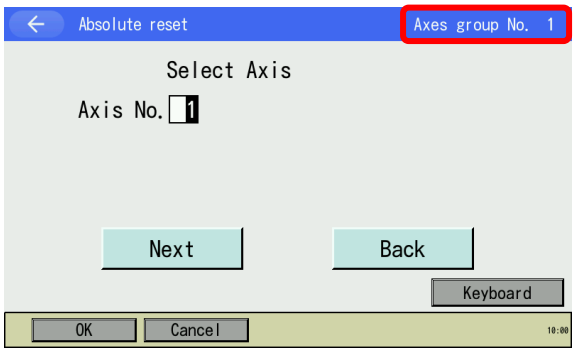
2) Touch Yes button to conduct absolute reset.

Absolute reset is not required, touch No button.
The screen goes back to the previous screen.

When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), the select axes group screen should appear after you touch the Yes button. Touch an axes group number button to select the axes group number that is to be subject to.



Touch YES button.
The select axes group window should appear.
Touch an Axes group No. button.



The axis number input window should open.

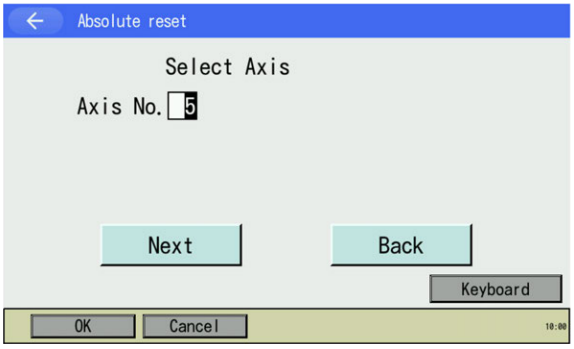
* The axes group number that was selected should be shown on the top right of the screen.

Refer to [16.13.1.1 How to Absolute Reset] in the following page for detail.

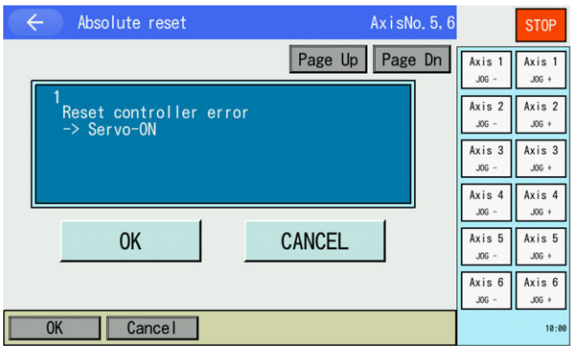
16.13.1 B- and T-Axes of the Wrist Unit

16.13.1.1 How to Absolute Reset

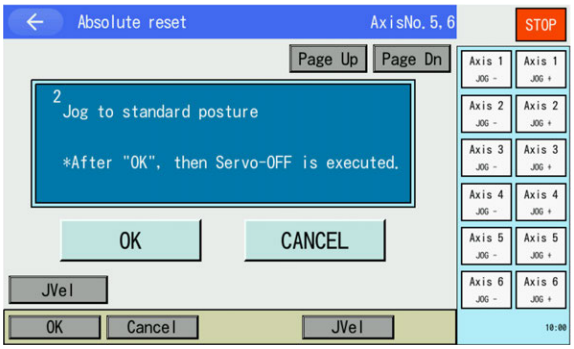
For B- and T-axes of the wrist unit, conduct the absolute reset in the procedures below.



1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.
(Input an axis number of the B-axis)



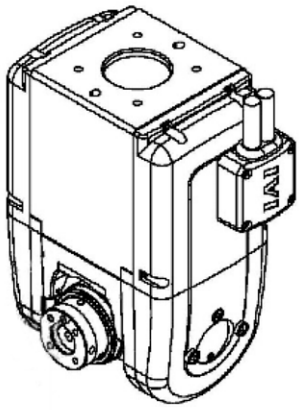
2) Reset controller error → Servo-on shows up.
Touch OK button.

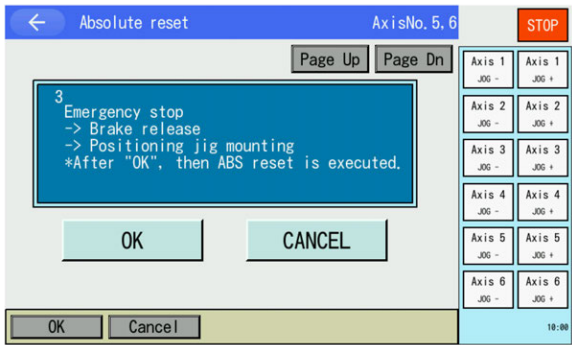


3) Jog to standard posture show up.
Move the indicated axis with the jog operation to the posture vicinity.
Touch the OK button after finished.

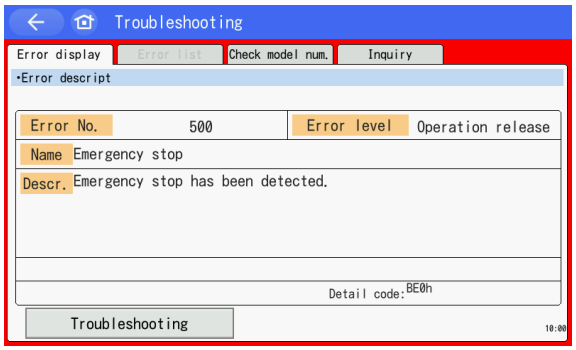
* After touching OK, the indicated axis should automatically turn the servo off.

[Standard Posture]

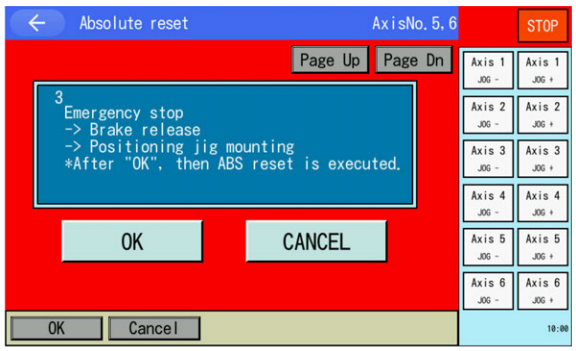




4) Press the Emergency STOP button.



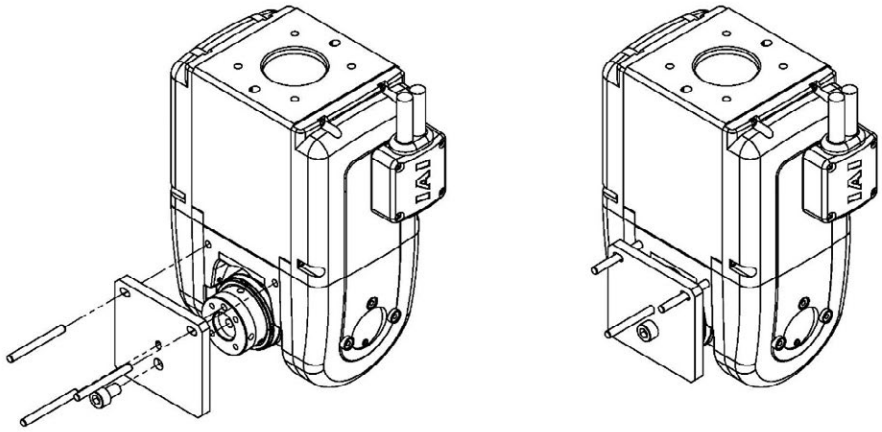
5) The display turns to the window shown on the left.
Touch ← button to go back to the previous screen.

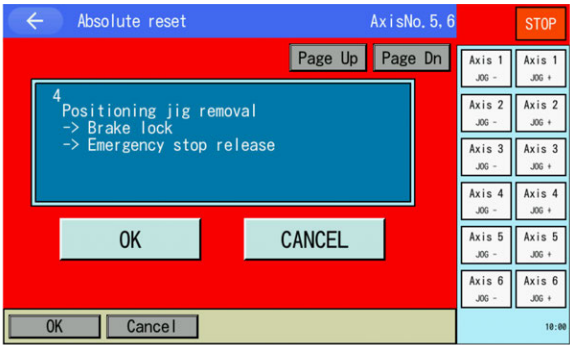


6) After brake release, put on the positioning tool. After putting it on, touch the OK button.

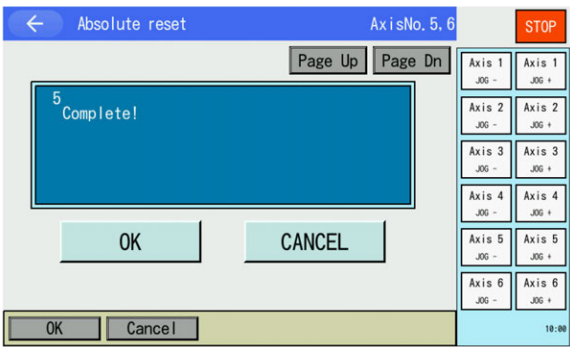
* After touching OK, the absolute reset should get conducted.

[To put on positioning tool]



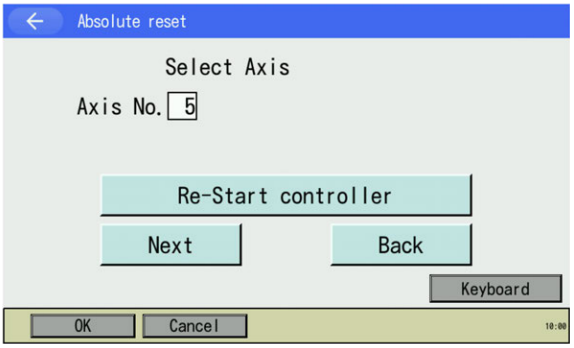


7) Take the positioning tool off. After taking it off, lock the brake and then cancel the emergency stop button.
Touch OK button.

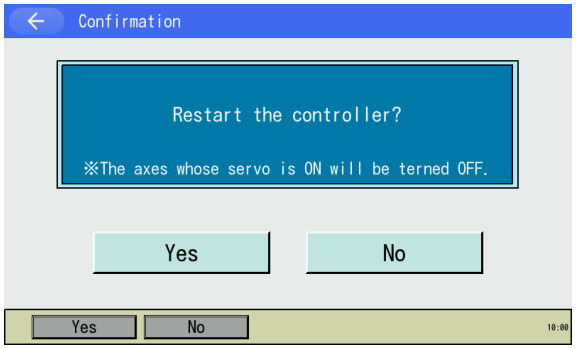


8) Complete! Should come out.
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



9) Touch Re-Start controller button.
The display turns to the software reset window.



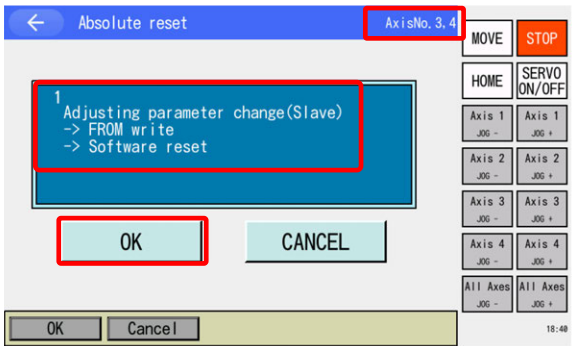
10) Conduct the software reset.
Touch Yes button.

Once the software reset finishes, it automatically goes back to the main menu.

16.14 Absolute Reset for Synchronizing Axis : XSEL2-T/TX

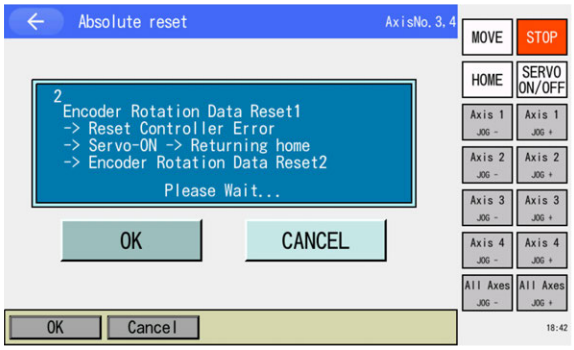
When “Axis-Specific Parameter No. 38: Encoder ABS/INC Type” is Master Axis = 1, Slave Axis = 1, the absolute reset can be conducted in the following procedures.

(1) Select the master axis or slave axis in the Select Axis Number window, and the screen shifts to the synchronizing axis absolute reset window.

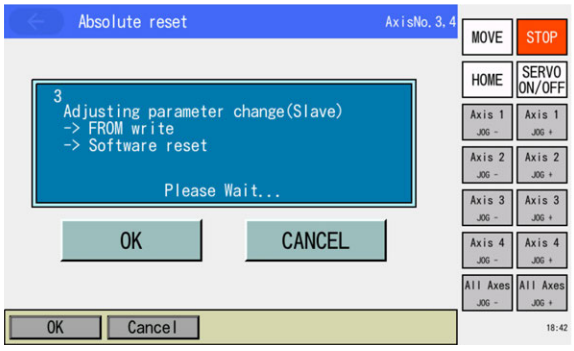


The synchronizing axis absolute reset window should show both of the master axis number and slave axis number as shown in the figure on the left.
Also, it shows “Adjusting parameter change (Slave)...” In the message box.
Touch the OK button and the displayed content should automatically be executed.
The screen should shift to the next window once all the procedures are completed.

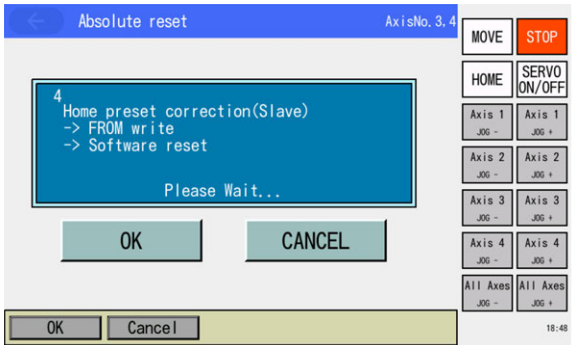
> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*



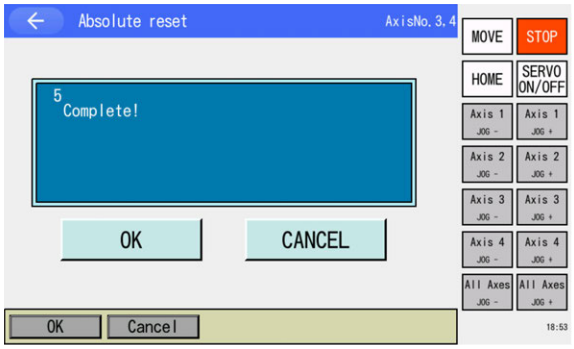
The content in the message box should be executed in the window shown in the figure on the left.
The screen should shift to the next window once all the procedures are completed.



The content in the message box should be executed in the window shown in the figure on the left.
The screen should shift to the next window once all the procedures are completed.



The content in the message box should be executed in the window shown in the figure on the left.
The screen should shift to the next window once all the procedures are completed.



“Complete!” should be displayed.
Touch the OK button.

* The screen should go back to the Select Axis window after touching OK.

17. Gateway Function Associated

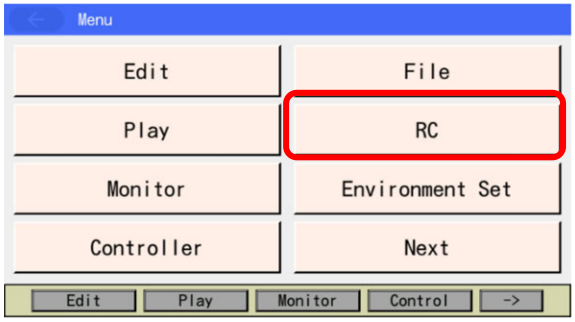
In the case of the XSEL-P/Q/PX/QX,XSEL-R/S/RX/SX/RXD/SXD controllers with the RC gateway function, the following operations are available.

- Editing of the RC Position Data in XSEL
- RC-axis Monitoring

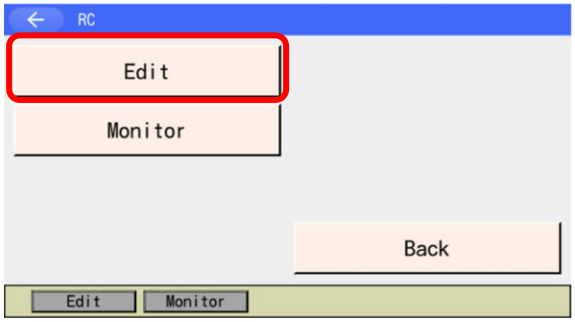
17.1 Editing of the RC Position Data in XSEL

17.1.1 RC Position Data Creation

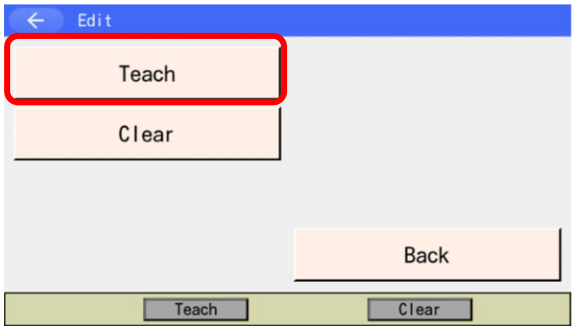
The RC position data to be set in the XSEL controller is edited.



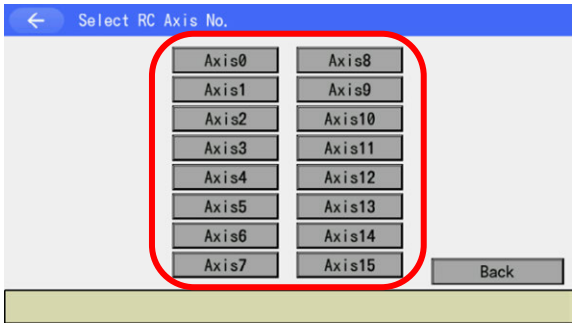
Touch RC button in the menu screen.



Touch Edit button in the RC menu screen.

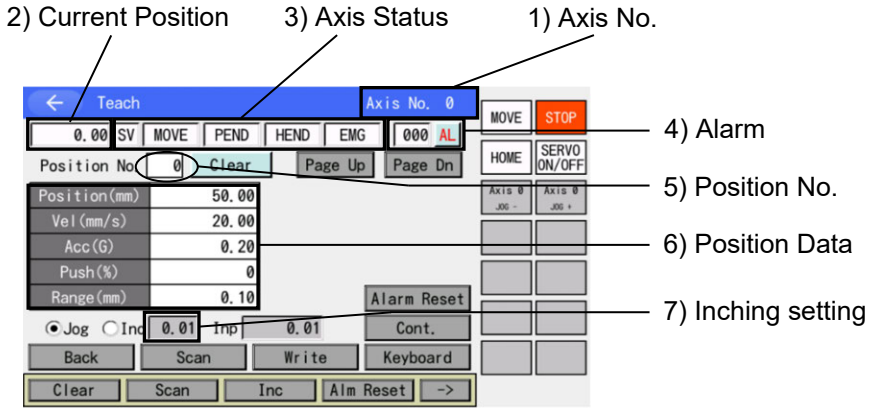


Touch Teach button in the RC edit menu screen.



Select the RC axis number to have the position edit by touching the appropriate button.
The display returns to the RC edit menu screen if you touch Back button.

[Items Displayed in RC Teach Screen]



1) Axis No.
The axis number in edit is displayed.
2) Current Position
The current position [mm] of the actuator is displayed.

3) Axis Status
The status of the actuator is displayed.
SV : Turns on when the servo is on
MOVE : Turns on during operation
PEND : Turns on when positioning is finished
HEND : Turns on when home-return operation is finished
EMG : Turns on during emergency stop

4) Alarm
An alarm code is displayed.
If you touch AL button, an alarm reset is held on the axis in edit.

5) Position No.
The position number is shown.

6) Position Data
Position (mm)
The target position for the actuator to be moved is indicated.
Absolute coordinate specification : Distance from home position of actuator
Incremental coordinate specification : Relative amount (movement amount) from current position
It is determined by the command in SEL language if the target position is indicated in absolute coordinates or relative coordinates (*).
(e.g.: RMVP Command → Absolute coordinates indication, RMP Command → Relative coordinates indication)

Vel (mm/s)
The velocity of the actuator in operation is indicated.

Acc (G)
The acceleration/deceleration of the actuator in operation is indicated.
The Acceleration and Deceleration can not be set separately.

Push (%)
Current limit in the pressing operation (RPUS Command) is indicated. Indicate 0 when pressing is unnecessary.

Range (mm)
Indication made to determine how much before the target position the positioning should finish. In pressing operation (RPUS Command), indication of maximum pressing amount from the target position is to be made.

7) Inching setting
The distance in the inching operation (distance of movement in each press of the jog button) is indicated. [Unit: mm]

[Explanation on each Touch Panel Button]

Clear : Clears the displayed position data.

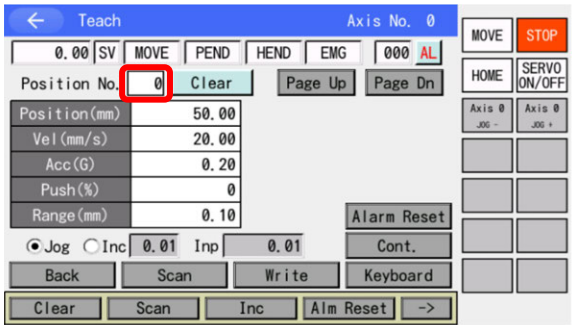
> ⚠ *Caution: At the time when this function is executed, the position data is cleared. Please take care.*

Scan : Inputs the current position in the target position data section.
Jog/Inc : Operation is switched during jog execution (jog/inching).
Alm Reset : Have an alarm reset conducted on the indicated axis.
Cont. : Execute continuance operation.

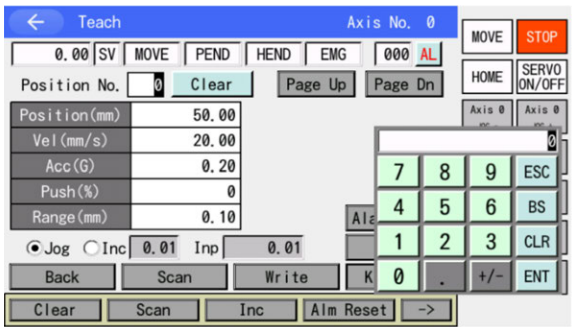
[Addition and Change of Position Data]

First, indicate the position number that an addition or a change is required.
When the screen is opened for the first time, a cursor is flashing in the position number input box.
(When no flashing is confirmed, touch in the position number input box.)

> ⚠ *Caution: The position data starts from No. 0 unlike XSEL.*



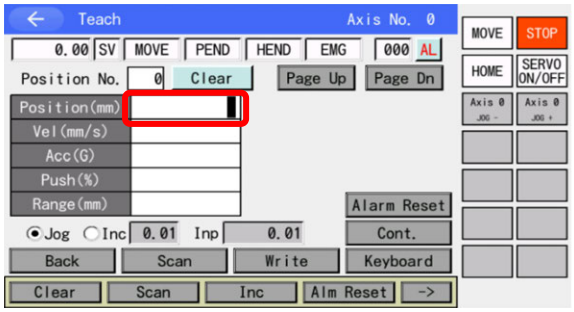
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.



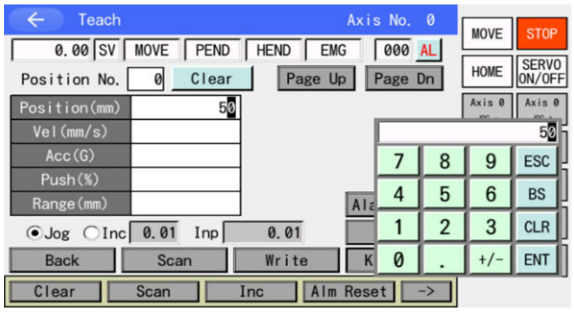
Touch the numerical part when it is desired to input number on the touch panel numeric keys when inputting the position number.
The contents of input will be shown in the box above the touch panel numeric keys.
When confirming the input number, touch ENT.
The touch panel numeric keys close and the data of the indicated position number is displayed.
When redoing the input, touch ESC.
When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.

* The position number can also be changed on Page Up/Page Dn buttons in the screen.

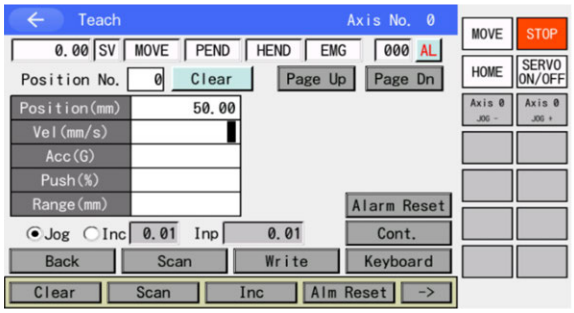
Next, show the cursor to the input part in the item you want to make an input.
To show the cursor, touch on the input part (the white area in the background, or area in the red frame for target position [mm]) in the item you want to make an input.



With the cursor shown in the appropriate area, touch Keyboard button to make the touch panel numeric keys appear on the screen to input a number.

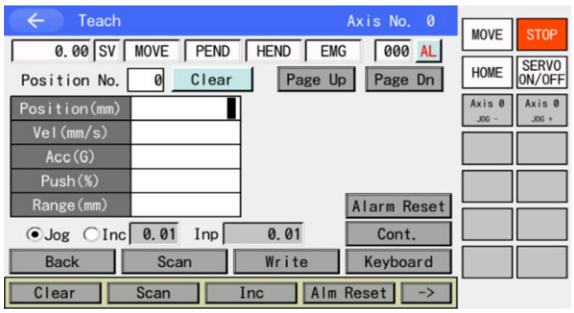


If you want to input 50 to Position (mm), touch Keyboard button to show the touch panel numeric keys, and touch 5 0 ENT on the touch panel numeric keys.



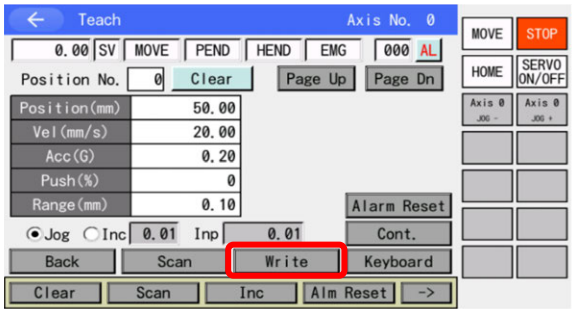
If the input is accepted, the cursor moves to the input box for Vel (mm/s).
Then, input values for Vel (mm/s), Acc (G), Push (%) and Range (mm).

> ⚠ *Caution: In the TB-02, the input range check is not performed. Confirm the specifications for the RC actuator in using, and input the data.*



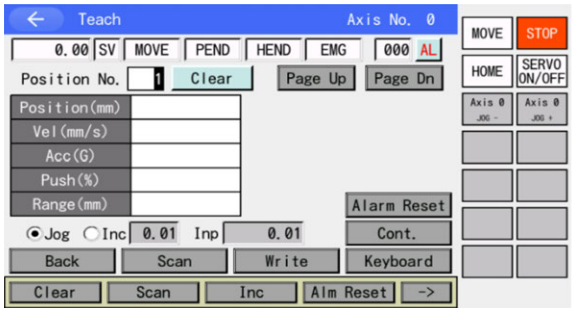
When you want to erase the data that is already input, touch CLR ENT on the touch panel numeric keys to delete what you want.

[Data Transfer]



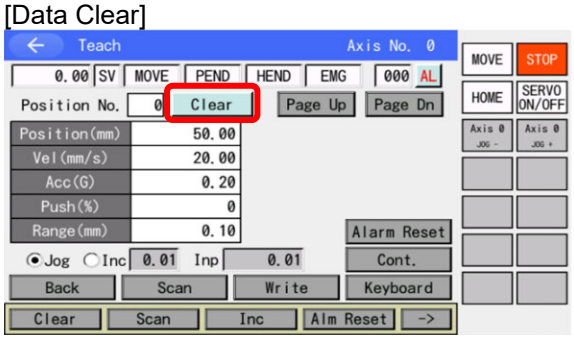
After data input is complete, touch Write button on the touch pane to transfer the data to the controller.

> ⚠ *Caution: The input data would not be written to the controller unless the operation above is conducted.*
> *In case the position number is changed without the operation above being conducted, the data remains the same as before change.*

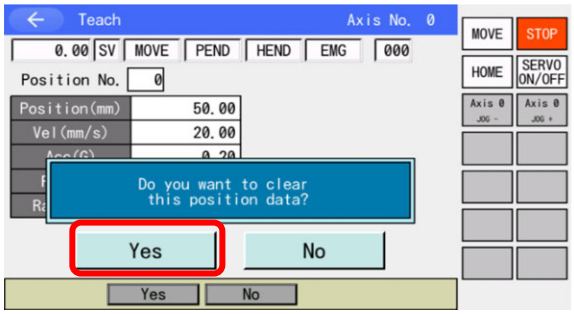


Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

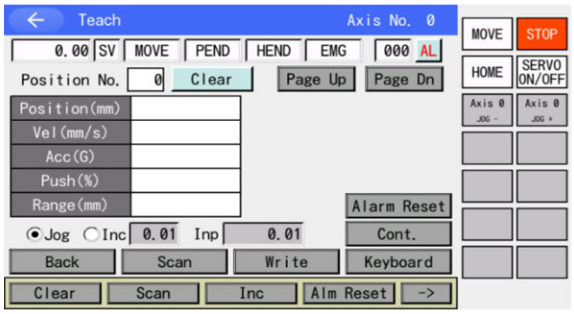
[Data Clear]



When you want to delete the data in the position number being displayed, touch Clear button in the touch panel.

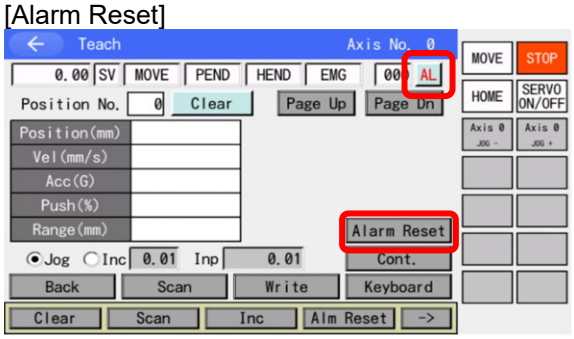


Touch Yes button on the touch panel and the data gets transferred to the controller.

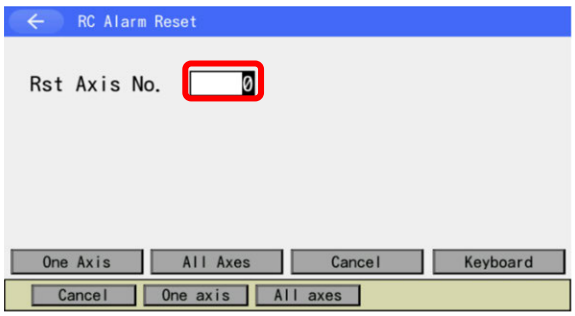


Once the clear is succeeded, the data in the same position number (after cleared) is displayed.

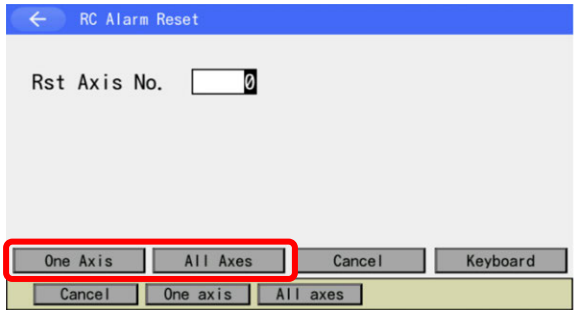
[Alarm Reset]



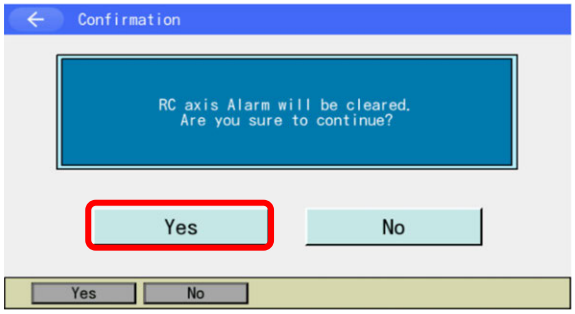
If you want to have an alarm reset on the RC axis in edit, touch AL button.
When you want to have an alarm reset on the RC axes you want to choose, touch Alarm Reset button.



When you want to have an alarm reset only on the indicated axis, set the axis number.
With the cursor shown in the appropriate area, touch Keyboard button to make the touch panel numeric keys appear on the screen to input a number



When you want to have an alarm reset only on the indicated axis, touch One Axis button.
When you want to have an alarm reset on all the RC axes, touch All Axes button.



Touch Yes button.
Touch No button, to return to the RC alarm reset screen.



The display shows this screen when the alarm reset is finished.
Touch OK button, to return to the RC alarm reset screen.

17.1.2 RC Position Data Input Using the Teaching Operation

One of the methods for the RC position data input is the teaching operation (The RC actuator is moved to any position and the RC actuator current position is captured as the data).
The methods for moving the RC actuator to any position are the jog operation • inching operation and manual movement (direct teaching) with the servo-motor turned OFF.

The basic flow of teaching is as follows:

1) Move the actuator. (jog operation • inching operation • manual movement (direct teaching) with a servo OFF status) select position No. and axis No. for data input.

↓

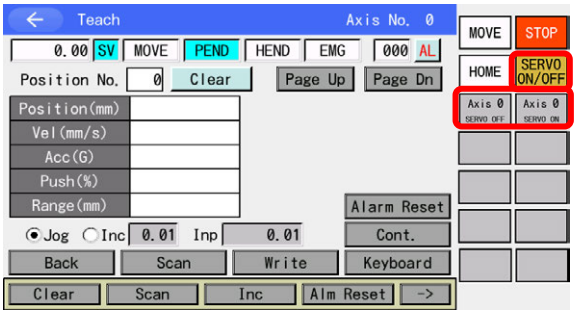
2) Take the data of the current position of the RC actuator into the teaching screen.

↓

3) Transmit the data to the controller.

(1) Servo ON/OFF Operation

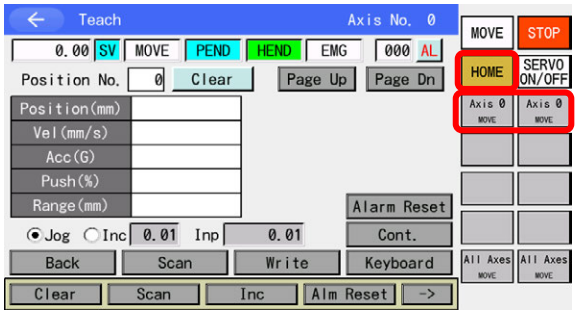
Using this operation, the RC actuator servo-motor is turned ON/OFF.
This operation is available only in the single axis.



Touch SERVO ON/OFF button.
After the background color of SERVO ON/OFF button has changed, touch the 0th axis servo-on button to turn the servo on.
(To turn the servo off, touch SERVO ON/OFF button and confirm that the background color of SERVO ON/OFF button has changed, and then touch the 0th axis servo-off button.)
The condition of servo-on/off can be checked on the axis status display “SV”, which turns on when the servo is on and turns off when the servo is off.

(2) Home Return Operation

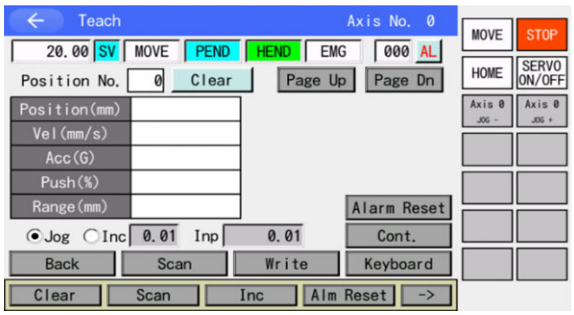
In the case of the incremental encoder applicable RC actuator, it is required to perform the home return operation after the power is turned on, or after the software reset and before the teaching operation.
This operation is available only in the single axis.



Turn the servo-motor ON.
Press HOME button.
After the background color of HOME button has changed, touch the 0th axis movement button to conduct home-return operation.
The axis status display “HEND” turns on when the home-return operation is finished.

(3) Actuator Movement

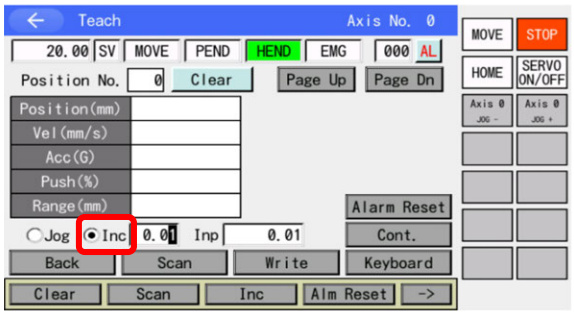
1) Jog operation
Perform the jog operation of the RC actuator.
This operation is available only in the single axis.



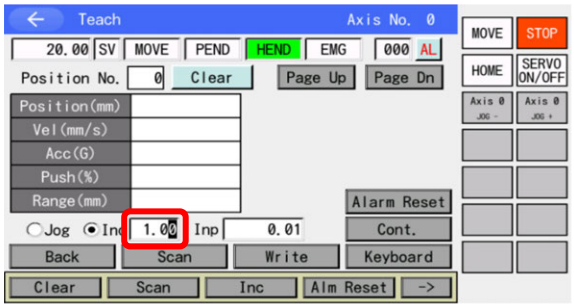
Turn the servo-motor ON.

Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
("+" means the movement to the plus direction on the coordinates and "-" means the movement to the minus direction on the coordinates).

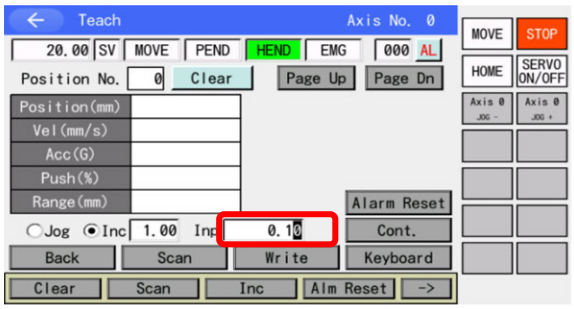
2) Inching operation
Perform the RC actuator inching operation.
This operation is available only in the single axis.



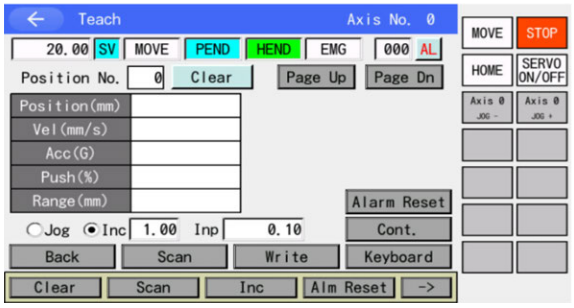
Touch Inc button directly to make Inc button selected.



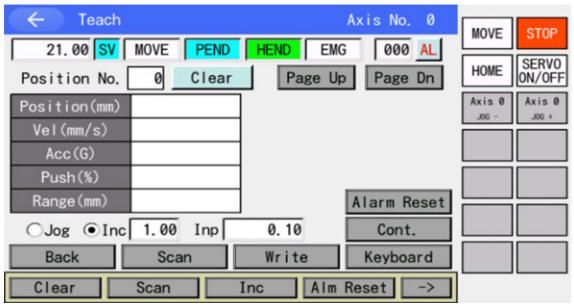
Set the inching distance (travel distance for each touching of the JOG button).
Show the cursor to the input part beside "Inc" and touch keyboard button to open the touch panel numeric keys to input a value and touch ENT.
The numerical value input range is from 0.00 to 1.00 (Unit: mm).



Set the positioning band (to set how much in front of the inching movement amount the positioning should complete).
Show the cursor to the input part beside "Inp" and touch keyboard button to open the touch panel numeric keys to input a value and touch ENT.
The numerical value input range is from 0.01 to 9999.99 (Unit: mm).

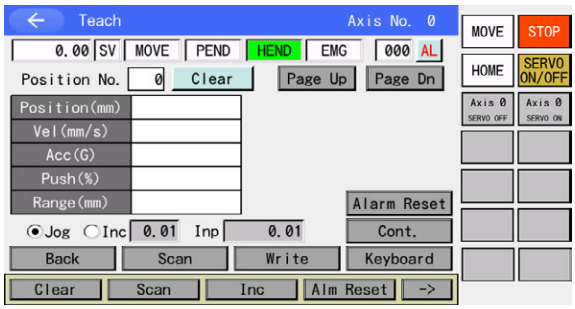


Turn the servo-motor ON.
The condition of servo-on/off can be checked on the axis status display “SV”, which turns on when the servo is on and turns off when the servo is off.

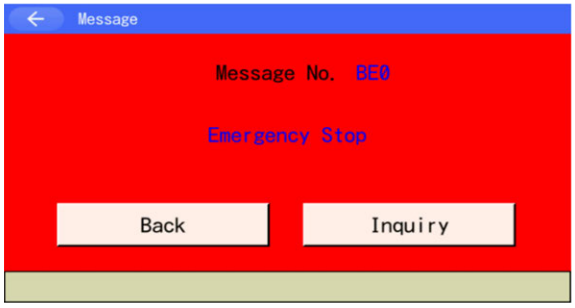


Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
(“+” means the movement to the plus direction on the coordinates and “-“means the movement to the minus direction on the coordinates).

3) Manual Movement (direct teaching) with the servo-motor turned OFF



Touch SERVO ON/OFF button.
After the background color of SERVO ON/OFF button has changed, touch the Axis 0 SERVO OFF button to turn the servo off.
The condition of servo-on/off can be checked on the axis status display “SV”, which turns on when the servo is on and turns off when the servo is off.
Move the RC actuators to the designated position via manual mode.
The background color in the screen turns to red during the emergency stop.



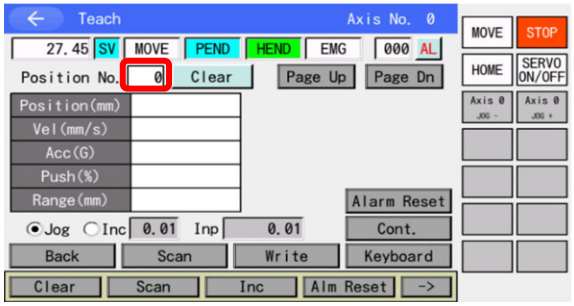
Pressing the EMERGENCY STOP button switches the display to the emergency stop screen.

Touch Back button to return to Teaching screen.

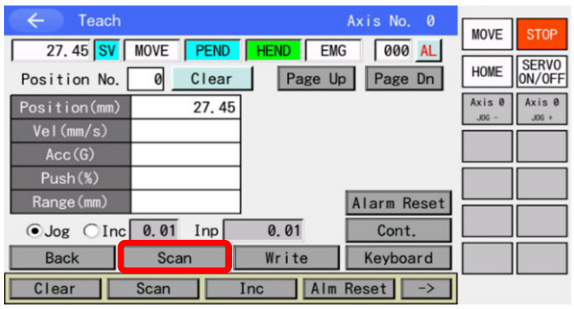
> ⚠ *Warning:*
> *Be sure to execute manual movement when EMERGENCY STOP button is pressed.*

(4) Current Position captured as the Data

The chosen RC actuator position is taken in the teaching window as the position data.



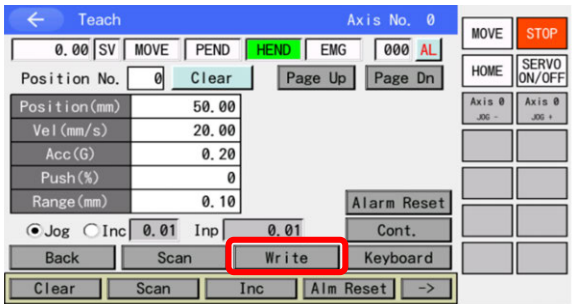
Set the position number from which the current position is to be loaded.



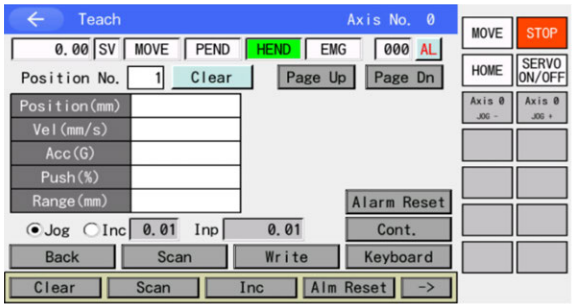
Touch Scan button to load the current position to the target position from with the data is loaded.

> ⚠ *Caution:* • *In order to capture the current position data in the target position data section, the home return operation has to be completed.*
> *Execute it after it is confirmed that "HEND" in the axis status display is turned on.*
> *If it is executed before the home return operation, the [(9E2) Not yet Homed TEACH] message is displayed and the current position cannot be captured.*
> • *Writing to the controller would not be executed unless you touch Write.*

(5) Data Transfer to the Controller



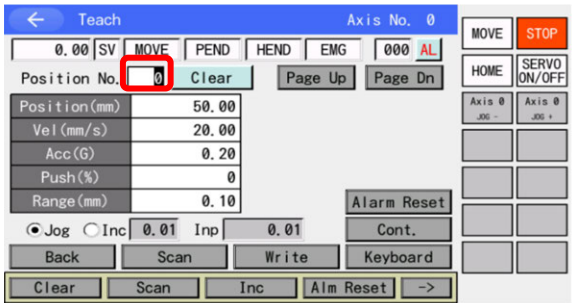
After data input is complete, touch Write button on the touch panel keys to transfer the data to the controller.



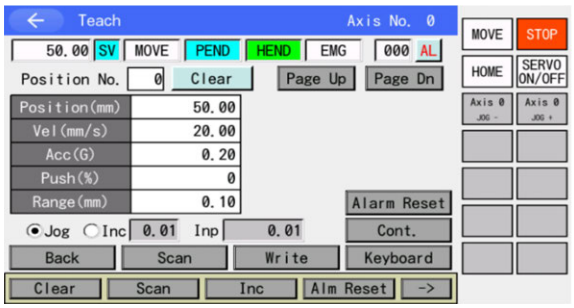
Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

(6) Position Check
When the RC actuator is moved to the place corresponding to the taught position data, the position check can be performed.

1) Movement
Move the RC actuator to the position corresponding to the position data transferred to the controller.



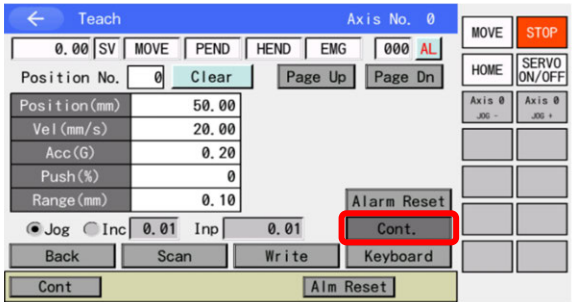
Set the position number you want to move to.



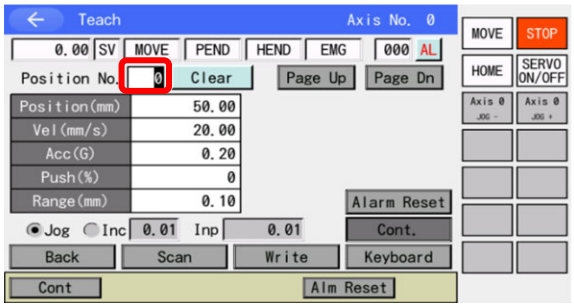
Turn the servo-motor ON.
Perform the home return operation.

Touch the MOVE button.
Touch the Axis 0 MOVE (-) button after the background color in the movement button has changed, and the axis starts moving.
When it is stopped on the way, touch the STOP button.

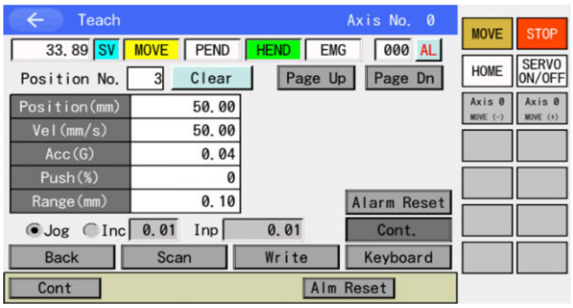
2) Continuous Movement
The RC actuator automatically follows the position corresponding to the position data transferred to the controller.



Touch Cont. button to switch to the continuous operation mode.



Set the position number you want to move to first.



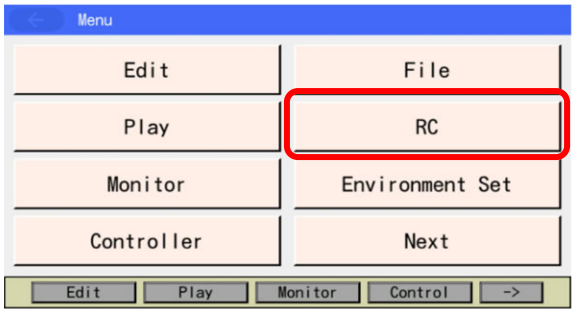
Turn the servo-motor ON.
Perform the home return operation.

Touch MOVE button.
Touch the Axis 0 MOVE (+) or Axis 0 MOVE (-) button after the background color in MOVE button has changed, and the axis starts moving.
When it is stopped on the way, touch STOP button.

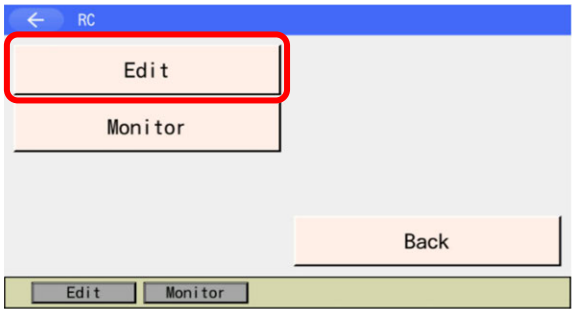
⚠ *Caution: Be careful as it may take a few seconds before start moving after touching the Axis 0 MOVE (+) or Axis 0 MOVE (-) button. (The time interval for movement start varies depending on the number of registered position data items).*

17.1.3 RC Position Data Deletion

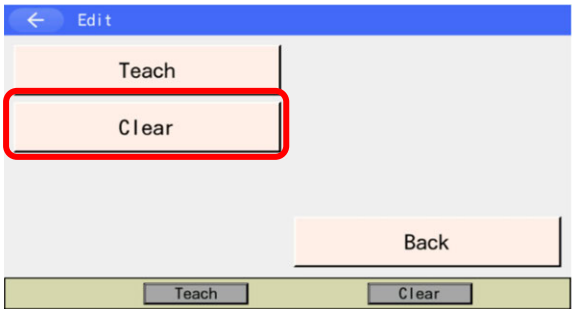
Position Data with the selected Axis No. and Position No., is deleted.



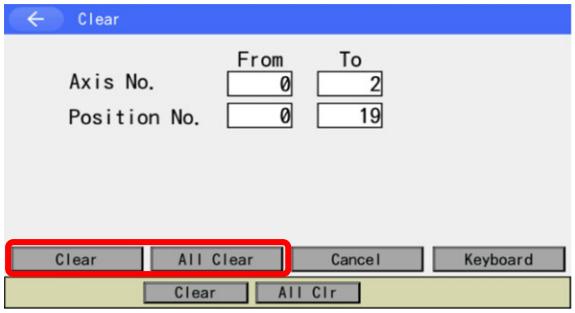
Touch RC button in the menu screen.



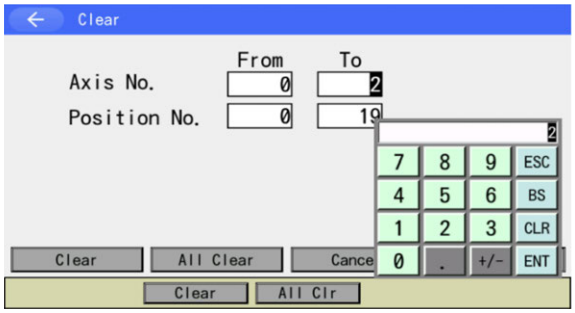
Touch Edit button.



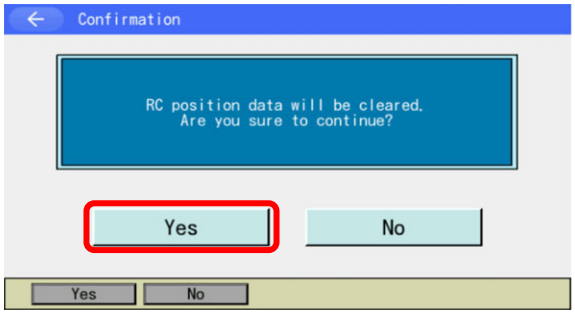
Touch Clear button.



Input the axis number to have the position delete and the range of the position number, and touch Clear button.
When you want to delete all the position data, touch All Clear button.
If you touch Cancel button, the display returns to the RC edit menu screen.



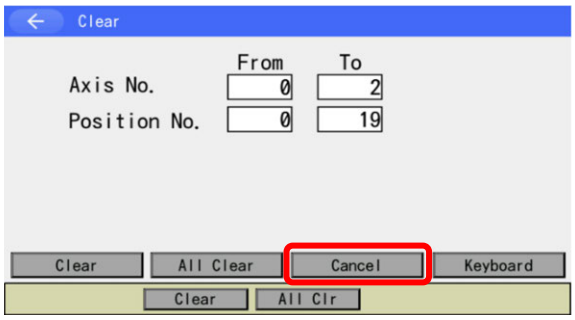
If you touch in the input area on “Axis No.” or “Position No.”, the cursor will be shown on the touched item.
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.
Touch on the numeric part if you want to input on the touch panel numeric keys. The contents of input will be shown in the box above the touch panel numeric keys. When confirming the input number, touch ENT. The touch panel numeric key close and the cursor moves to the next input box.
When redoing the input, touch ESC. When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.



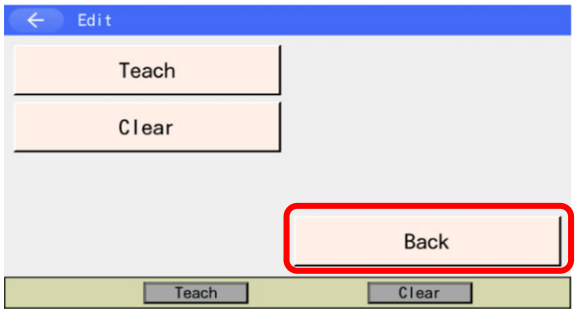
Touch Yes button.
Touch No button, to return to the RC position clear screen.



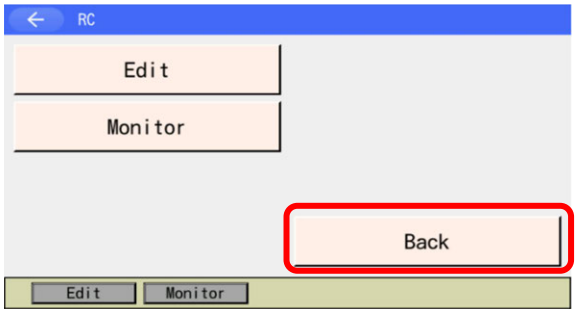
The display shows this screen when the position clear is finished.
Touch OK button, to return to the RC position clear screen.



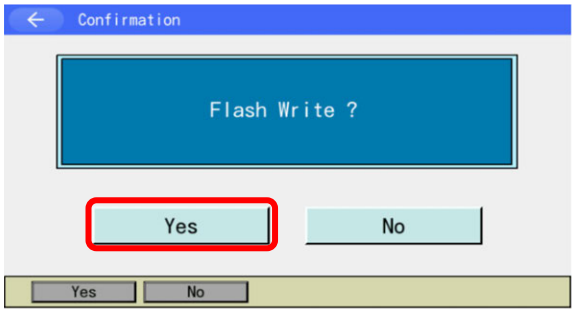
Touch Cancel button.



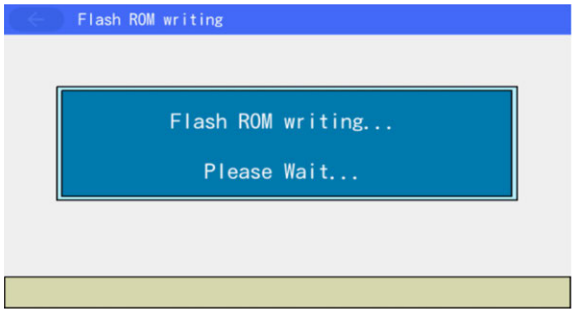
Touch Back button.



Touch Back button.



To write the data to the flash ROM, touch Yes button.
When it is not necessary to write the data to the flash ROM, touch No button.



"Flash ROM writing..." flashes during the flash ROM writing.

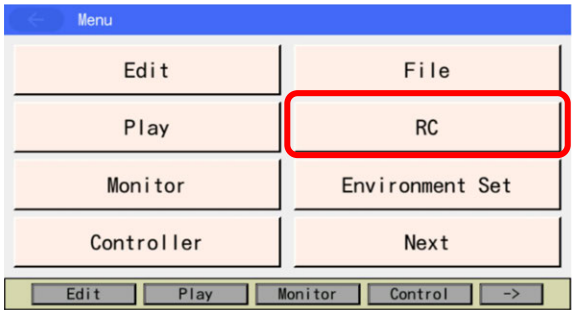
Never turn off the power to the Controller at this time.



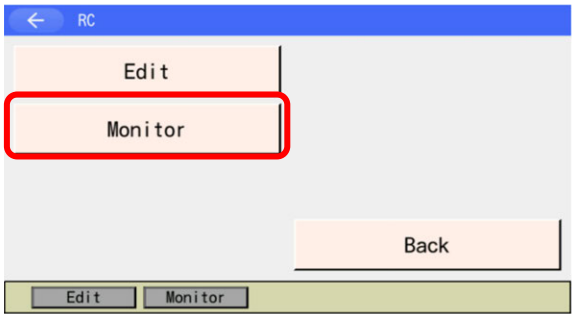
The display shows this screen when the flash ROM writing is finished.
Touch OK button, to return to the RC menu screen.

17.2 RC Actuator Monitoring

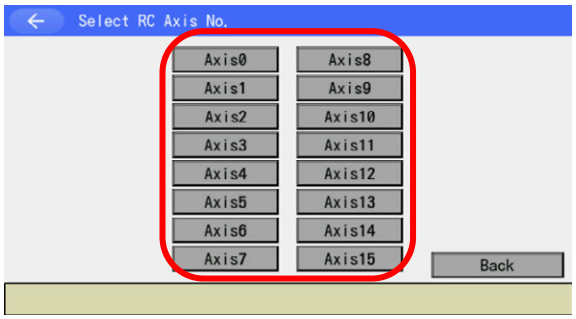
The RC actuator's status, current position and alarm code are displayed.



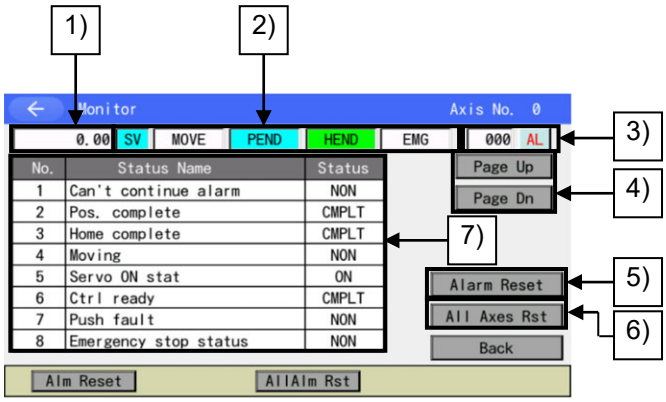
Touch RC button in the menu screen.



Touch Monitor button.

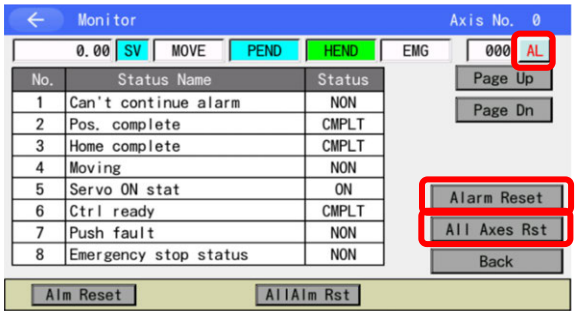


Select the RC axis number to monitor by touching the appropriate button.
The display returns to the RC menu screen if you touch Back button.

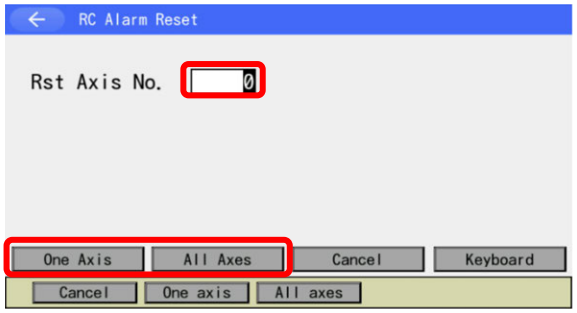


1) The current position [mm] is displayed.
2) The status of the actuator is displayed.
   SV : Turns on when the servo is on
   MOVE : Turns on during operation
   PEND : Turns on when positioning is finished
   HEND : Turns on when home-return operation is finished
   EMG : Turns on during emergency stop
3) An alarm code is displayed.
   If you touch AL button, an alarm reset is held on the axis in display.
4) Touch Page Up/Page Dn buttons and the status displayed in (7) switches.
5) Touch the alarm reset button and the RC alarm reset window opens.
6) Touch All Axes Rst button, and an alarm reset is held on all the axes.
7) The status of the actuators and RC controllers are displayed.

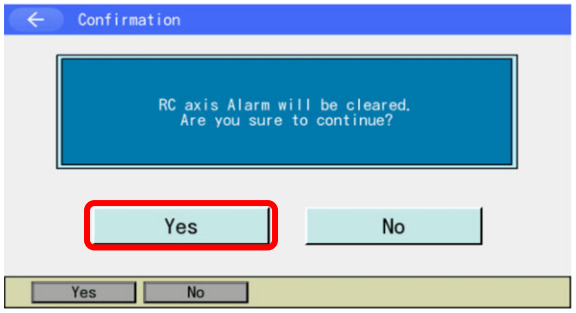
[Alarm Reset]



If you want to have an alarm reset on the axis in display, touch AL button.
When you want to have an alarm reset on the RC axes you want to choose, touch Alarm Reset button.
If you want to have an alarm reset on all the axes, touch All Axes Rst button.



RC alarm reset screen is displayed if Alarm Reset button is touched in RC Monitor screen.
Select the axis number you want to have an alarm reset, and touch One Axis button.
Touch All Axes button, and an alarm reset is held on all the RC axes.



Touch Yes button.
Touch No button, to return to the RC monitor screen.



The display shows this screen when the alarm reset is finished.
Touch OK button, to return to the RC monitor screen.

17.3 User Data Hold Memory Initialization

17.3.1 Description

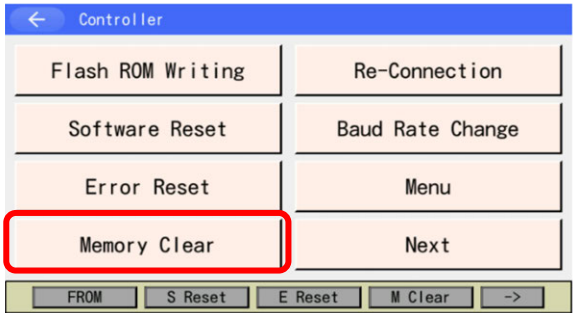
(6A1) “UBM Data Construction Change Error” will be generated if changes are made in I/O Parameter No. 502 “RC Gateway Position Data Definition Max. Axis Number” and 503 “RC Gateway Position Data Definition Position Data Points”, and software reset is held after the flash ROM writing.
When the error occurs, the initialization of the user data hold memory is required.

> ⚠ *Caution: When the user data hold memory is initialized, all the RC-axis position data items are cleared.*
> *Backup the RC position data items using the personal computer (PC) application software for XSEL or TB-02.*

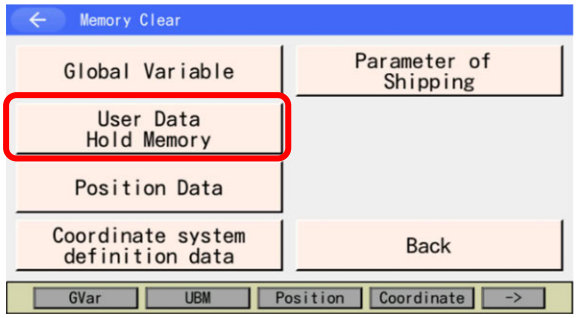
17.3.2 Operation Procedure



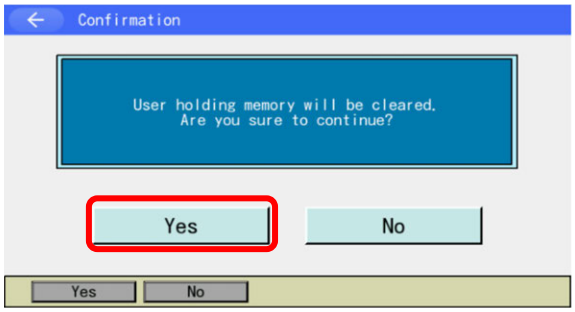
Touch Controller button.



Touch Memory Clear button.



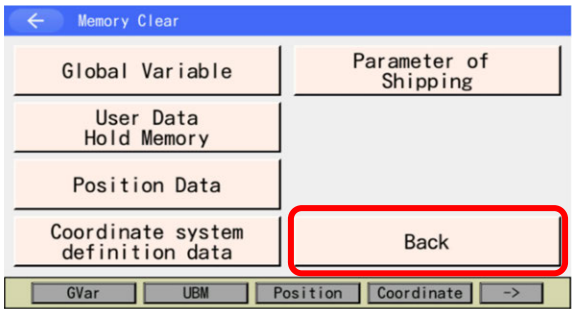
Touch User Data Hold Memory button.



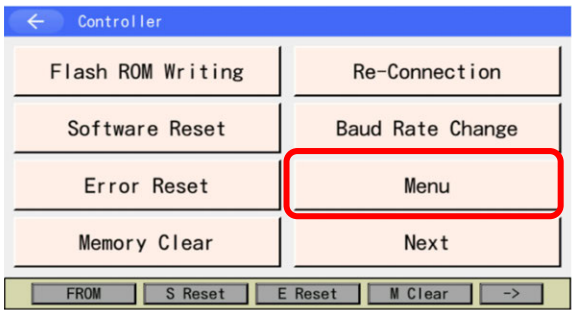
Touch Yes button.
Touch No button, to return to the memory initialization menu screen.



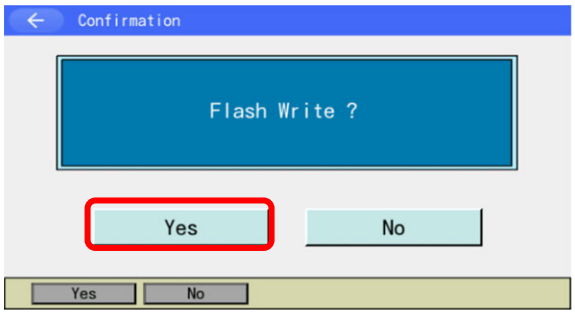
The display shows this screen when the initializing in the user data retaining memory is finished.
Touch OK button, to return to the memory initialization menu screen.



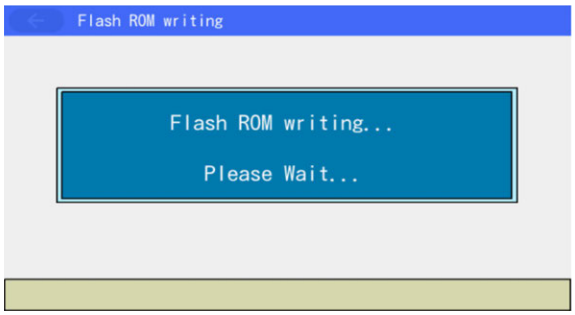
Touch Back button.



Touch Menu button.



To write the data to the flash ROM, touch Yes button.
When it is not necessary to write the data to the flash ROM, touch No button.



"Flash ROM writing..." flashes during the flash ROM writing.

Never turn off the power to the Controller at this time



The display shows this screen when the flash ROM writing is finished.
Touch OK button, to return to the main menu screen.

18. Extended Motion Control Function

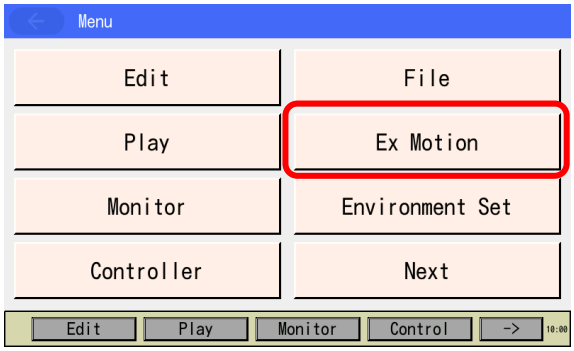
In the case of the XSEL-RA/SA/RAX/SAX/RAXD/SAXD controllers, the following operations are available.

- Extended Motion Control Position Data Editing
- Extended Motion Control Axis Monitoring

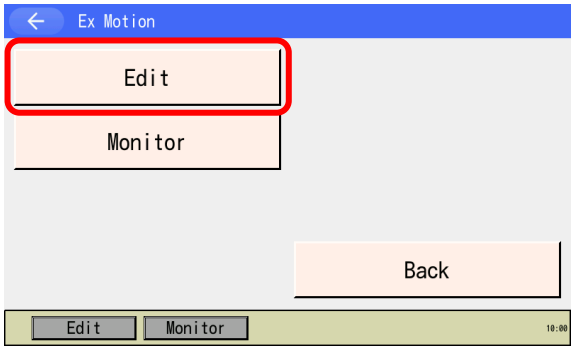
18.1 Extended Motion Control Position Data Editing

18.1.1 Extended Motion Control Position Data Creation

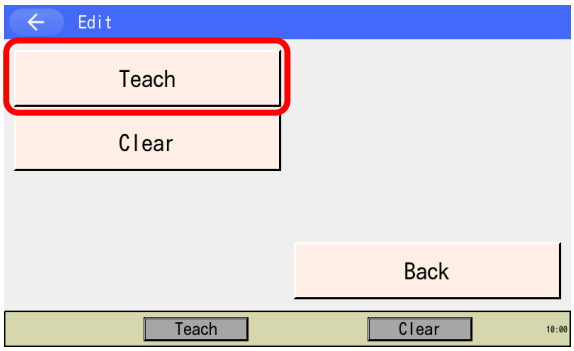
The extended motion control position data is to be edited.



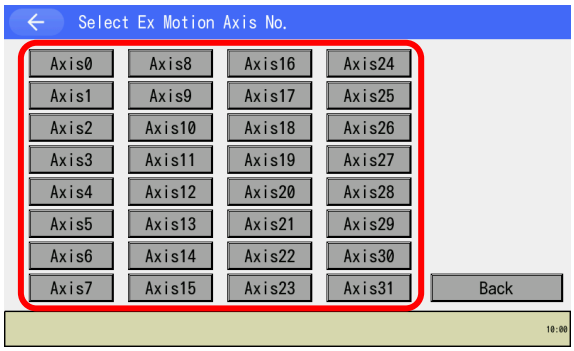
Touch Ex Motion button in the menu screen.



Touch Edit button in the Ex Motion menu screen.

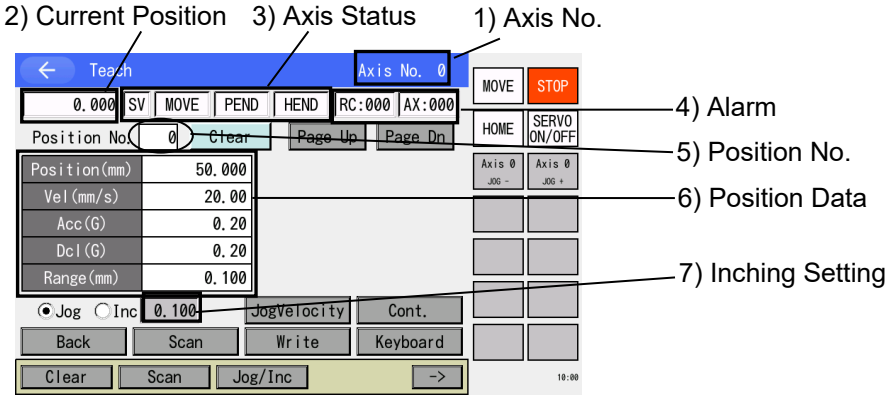


Touch Teach button in the Ex Motion Edit menu screen.



Select the extended motion control axis number to have the position edit by touching the appropriate button.
The display returns to the Ex Motion Edit menu screen if you touch Back button.

[Display Items in the Extended Motion Teaching Screen]



1) Axis No.
The axis number in edit is displayed.
2) Current Position
The current position [mm] of the actuator is displayed.
3) Axis Status
The status of the actuator is displayed.
SV : Turns on when the servo is on
MOVE : Turns on during operation
PEND : Turns on when positioning is finished
HEND : Turns on when home-return operation is finished
EMG : Turns on during emergency stop

4) Alarm
An alarm code is displayed.
RC : RC-Axis Alarm Code
(Alarm code for the alarm generated in the RC controller is displayed).
AX : Axis Related Alarm Code
(Alarm code for the alarm generated in the XSEL controller is displayed).
5) Position No.
The position number is shown.
6) Position Data
Position (mm)
The target position for the actuator to be moved is indicated.
Vel (mm/s)
The velocity of the actuator in operation is indicated.
Acc (G)
The acceleration of the actuator in operation is indicated.
Dcl (G)
The deceleration of the actuator in operation is indicated.
Range (mm)
Indication made to determine how much before the target position the positioning should finish.
7) Inching setting
The distance in the inching operation (distance of movement in each press of the jog button) is indicated. [Unit: mm]

[Explanation on each Touch Panel Button]

Clear : Clears the displayed position data.

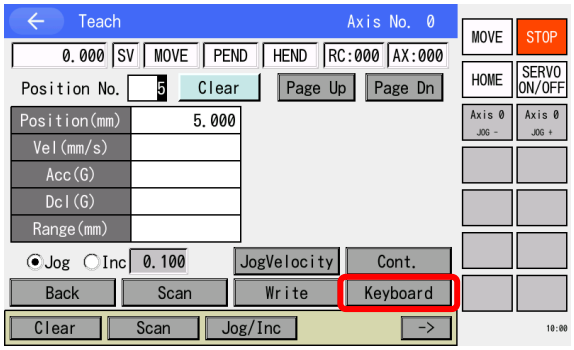
> ⚠ *Caution: At the time when this function is executed, the position data is cleared. Please take care.*

Scan : Inputs the current position in the target position data section.
Jog/Inc : Operation is switched during jog execution (jog/inching).
JogVelocity : The velocity at the time of jog feeding execution is designated.
Cont. : Execute continuance operation.

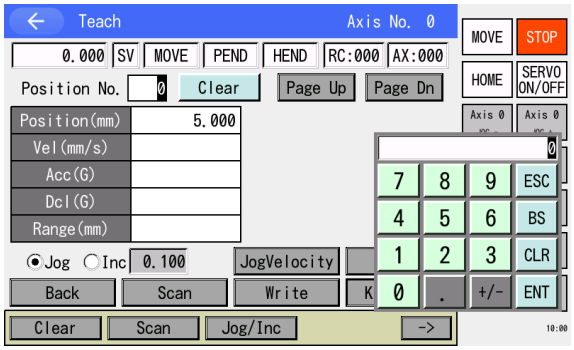
[Addition and Change of Position Data]

First, indicate the position number that an addition or a change is required.
When the screen is opened for the first time, a cursor is flashing in the position number input box.
(When no flashing is confirmed, touch in the position number input box.)

> ⚠ *Caution: The position data starts from No. 0 unlike XSEL.*



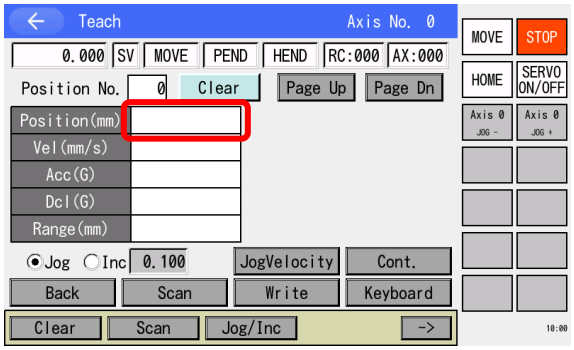
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.



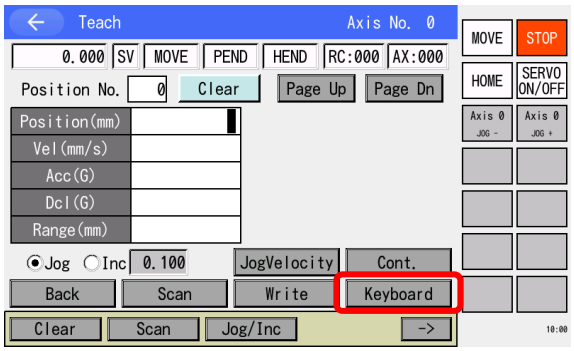
Touch the numerical part when it is desired to input number on the touch panel numeric keys when inputting the position number.
The contents of input will be shown in the box above the touch panel numeric keys.
When confirming the input number, touch ENT.
The touch panel numeric keys close and the data of the indicated position number is displayed.
When redoing the input, touch ESC.
When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.

* The position number can also be changed on Page Up/Page Dn buttons in the screen.

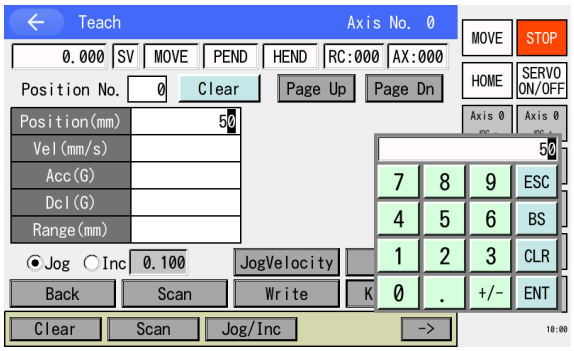
Next, show the cursor to the input part in the item you want to make an input.
To show the cursor, touch on the input part in the item you want to make an input.



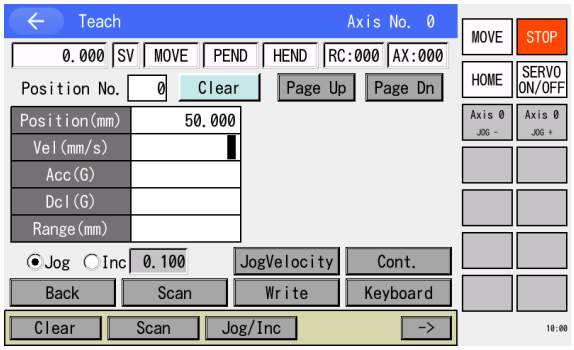
When the target position (mm) is to be input, touch the section inside the red frame.



With the cursor shown in the appropriate area, touch Keyboard button to make the touch panel numeric keys appear on the screen to input a number.

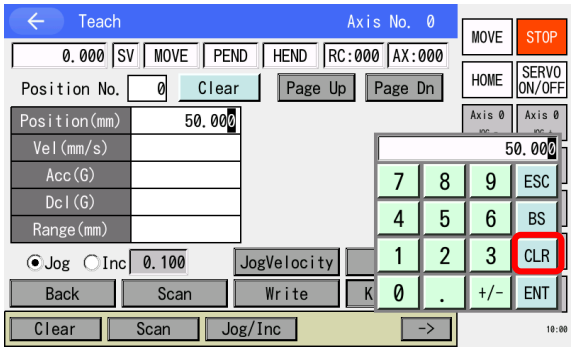


If you want to input 50 to Position (mm), touch Keyboard button to show the touch panel numeric keys, and touch 5 0 ENT on the touch panel numeric keys.



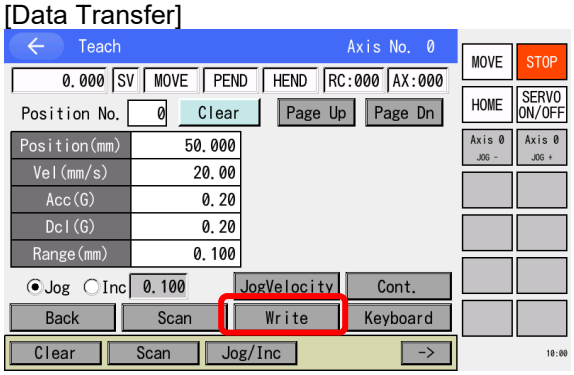
If the input is accepted, the cursor moves to the input box for Vel (mm/s).
Then, input values for Vel (mm/s), Acc (G), Push (%) and Range (mm).

> ⚠ *Caution: In the TB-02, the input range check is not performed. Confirm the specifications for the axis to be used, input the data.*



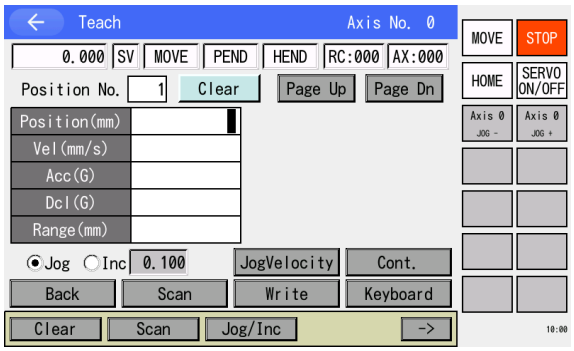
When you want to erase the data that is already input, touch CLR ENT on the touch panel numeric keys to delete what you want.

[Data Transfer]



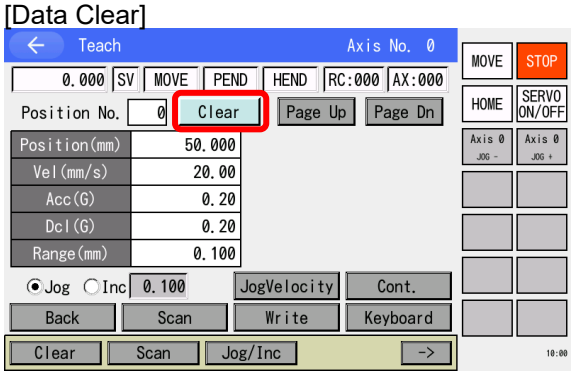
After data input is complete, touch Write button on the touch pane to transfer the data to the controller.

> ⚠ *Caution: The input data would not be written to the controller unless the operation above is conducted.*
> *When the position No. is changed without performing the above operation, the input data is cleared.*

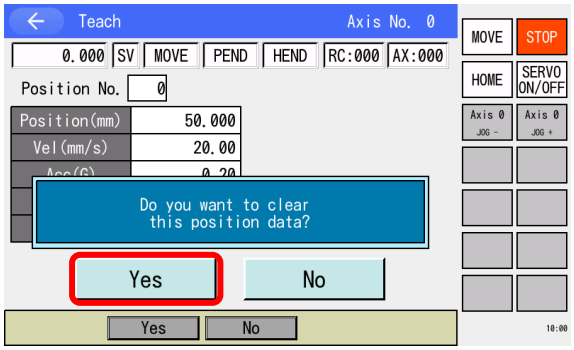


Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

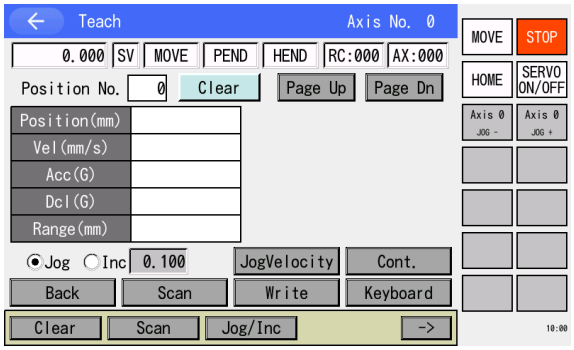
[Data Clear]



When you want to delete the data in the position number being displayed, touch Clear button in the touch panel.



Touch Yes button on the touch panel and the data gets transferred to the controller.



Once the clear is succeeded, the data in the same position number (after cleared) is displayed.

18.1.2 Extended Motion Control Position Data Input using the Teaching Operation

One of the extended motion control position data input method, is teaching (moving the extended motion control axis to the appropriate position and such extended motion control axis current position is captured as data).
The methods of moving the extended motion control axis to the appropriate position, are jog feeding/inching operation and manual movement (direct teaching) with the servo turned off.

The basic flow of teaching is as follows:

1) Move the extended motion control axis. (Jog operation • inching operation • manual movement (direct teaching) with a servo OFF status)
Select position No. and axis No. for data input.

↓

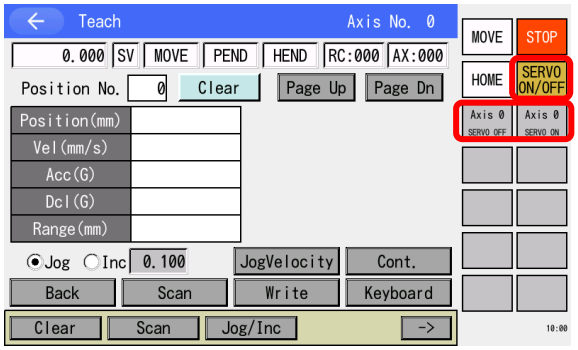
2) Take the data of the current position of the extended motion control axis into the teaching screen.

↓

3) Transmit the data to the controller.

(1) Servo ON/OFF Operation

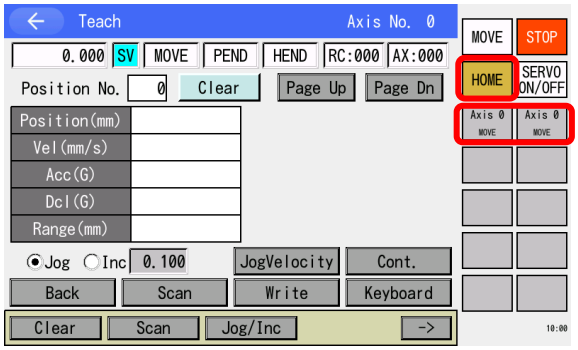
Using this operation, the extended motion control axis servo-motor is turned ON/OFF.
This operation is available only in the single axis.



Touch SERVO ON/OFF button.
After the background color of SERVO ON/OFF button has changed, touch the 0th axis servo-on button to turn the servo on.
(To turn the servo off, touch SERVO ON/OFF button and confirm that the background color of SERVO ON/OFF button has changed, and then touch the 0th axis servo-off button.)
The condition of servo-on/off can be checked on the axis status display “SV”, which turns on when the servo is on and turns off when the servo is off.

(2) Home Return Operation

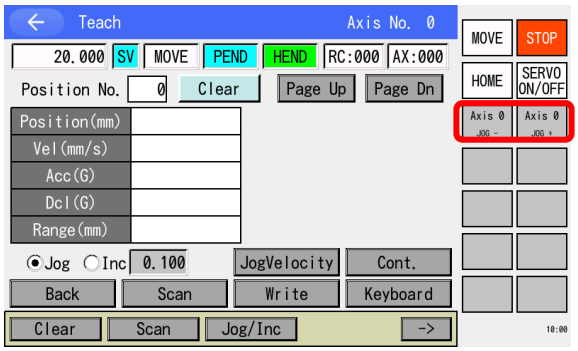
In the case of the incremental encoder type extended motion control axis, after the power is turned ON or software is reset, home return operation is required before the teaching operation.
This operation is available only in the single axis.



Turn the servo-motor ON.
Touch HOME button.
After the background color of HOME button has changed, touch the 0th axis movement button to conduct home-return operation.
The axis status display “HEND” turns on when the home-return operation is finished.

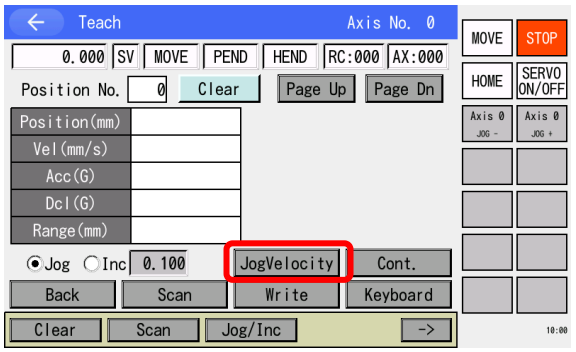
(3) Actuator Movement

1) Jogging Operation
Perform the jog feeding operation for the extended motion control axis.
This operation is available only in the single axis.

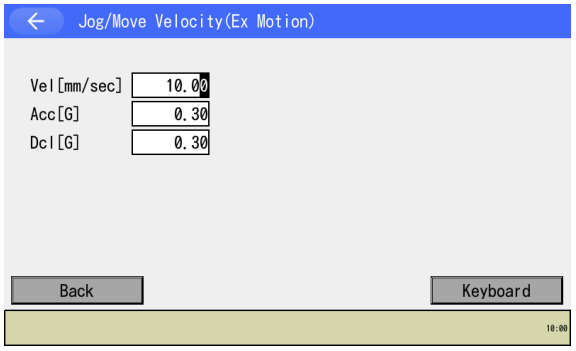


Turn the servo-motor ON.
Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
("+" means the movement to the plus direction on the coordinates and "-" means the movement to the minus direction on the coordinates).

The actuator movement speed, etc., at the time of jog feeding, can be changed using the JogVelocity button.

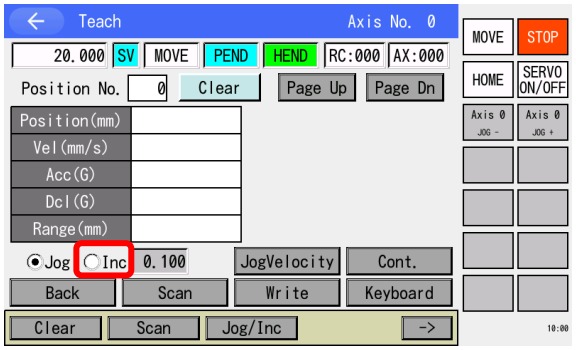


Touch JogVelocity button

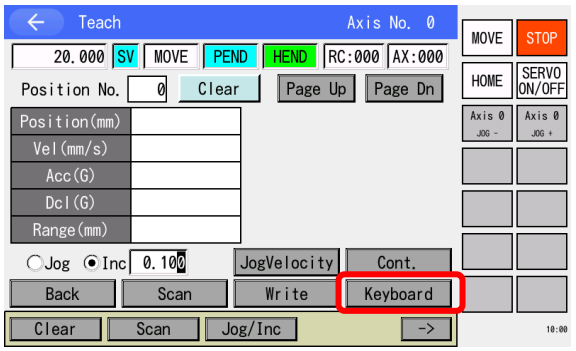


Input the parameters for the Vel (Velocity), Acc (Acceleration) and Dcl (Deceleration) at the time of jog feeding, using the touch panel ten-key pad.
The touch panel ten-key pad is opened by means of touching the Keyboard button.
Touch the Return button to return to the extended motion teaching screen and perform the jog feeding operation.

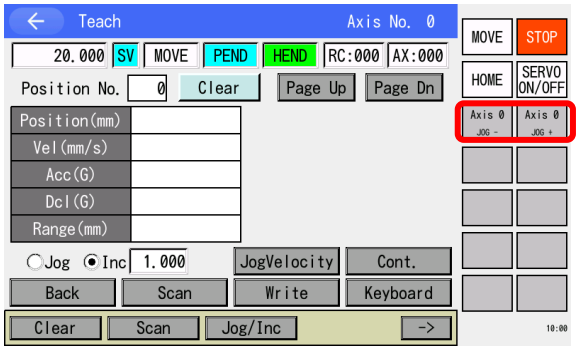
2) Inching Operation
Perform the inching operation for the extended motion control axis.
This operation is available only in the single axis.



Touch Inc button directly to make Inc button selected.

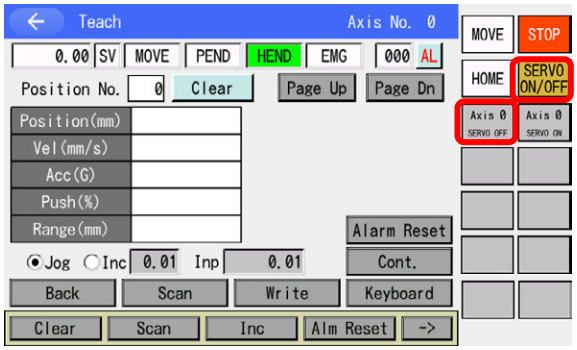


Set the inching distance (travel distance for each touching of the JOG button).
Show the cursor to the input part beside "Inc" and touch Keyboard button to open the touch panel numeric keys to input a value and touch ENT.
The numerical value input range is from 0.00 to 1.00 (Unit: mm).

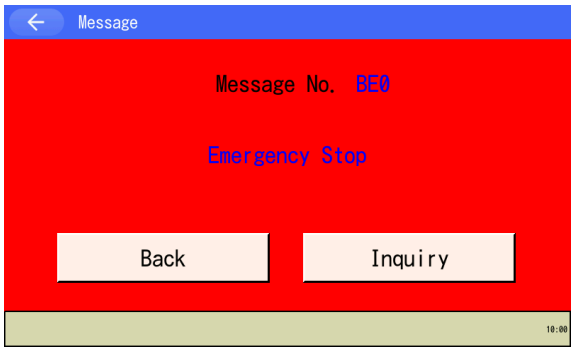


Turn the servo-motor ON.
Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
("+" means the movement to the plus direction on the coordinates and "-"means the movement to the minus direction on the coordinates).

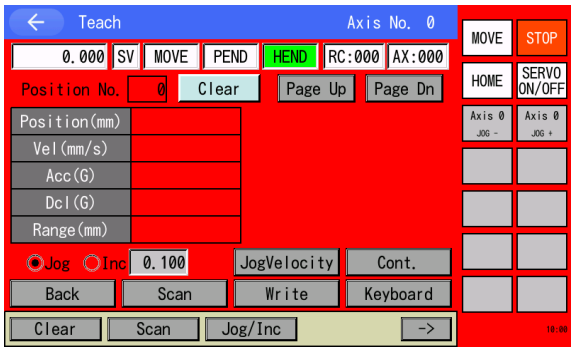
3) Manual Movement with the servo-motor turned OFF



Touch SERVO ON/OFF button.
After the background color of SERVO ON/OFF button has changed, touch the 0th axis servo-off button to turn the servo off.
The condition of servo-on/off can be checked on the axis status display “SV”, which turns on when the servo is on and turns off when the servo is off.
Move the RC actuators to the designated position via manual mode.



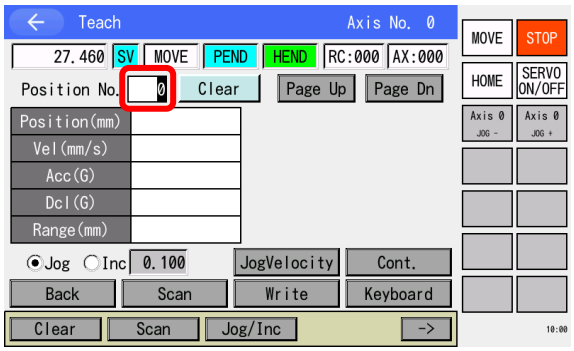
Pressing the EMERGENCY STOP button switches the display to the emergency stop screen.
Touch Back button to return to Teaching screen.



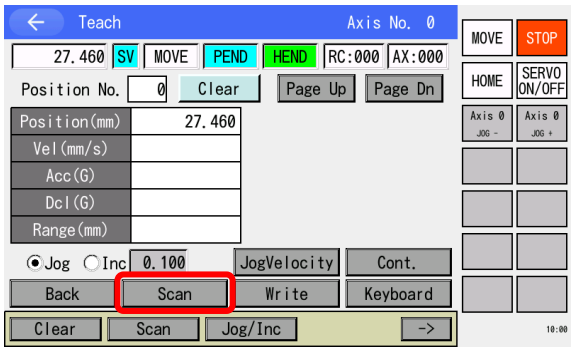
Move the actuator manually to an appropriate position.

> ⚠ *Warning:*
> *Be sure to execute manual movement when EMERGENCY STOP button is pressed.*

(4) Current Position captured as the Data
The chosen RC actuator position is taken in the teaching window as the position data.



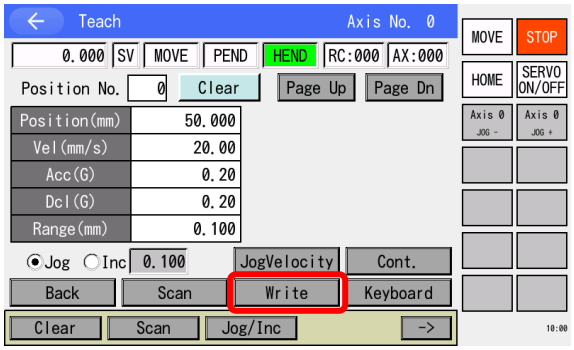
Set the position No. for the import destination.



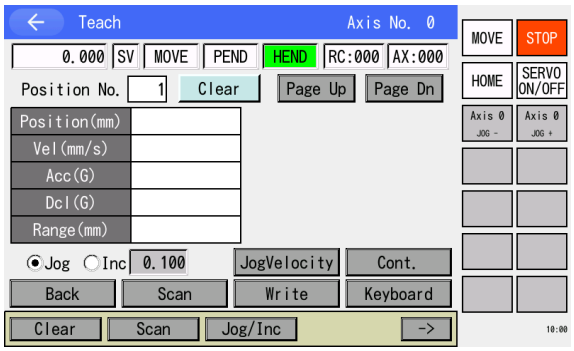
Touch Scan button to load the current position to the target position from with the data is loaded.

Caution:
- *In order to capture the current position data in the target position data section, the home return operation has to be completed. Execute it after it is confirmed that "HEND" in the axis status display is turned on. If it is executed before the home return operation, the [(9E2) Not yet Homed TEACH] message is displayed and the current position cannot be captured.*
- *Writing to the controller would not be executed unless you touch Write.*

(5) Data Transfer to the Controller



After data input is complete, touch Write button on the touch panel keys to transfer the data to the controller.



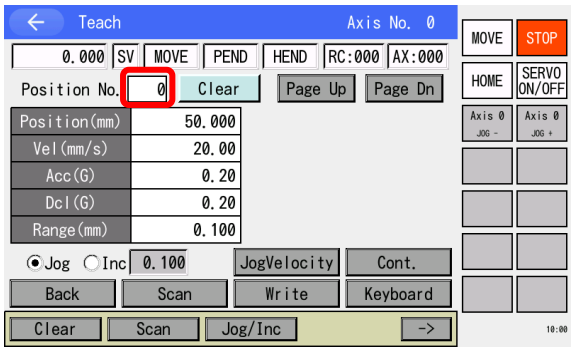
Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

(6) Position Check

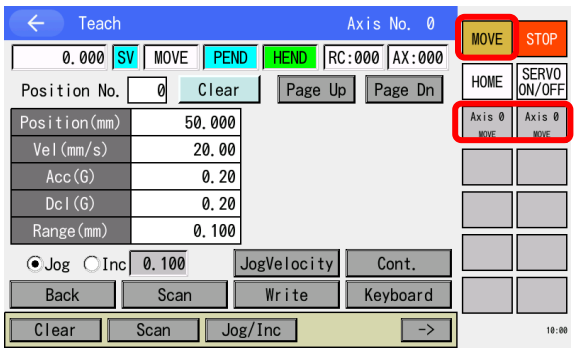
When the extended motion control axis is moved to the place corresponding to the taught position data, the position check can be performed.

1) Movement

Move the extended motion control axis to the position corresponding to the position data transferred to the controller.



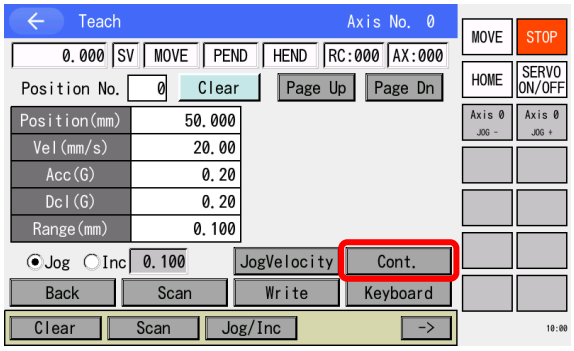
Set the position number you want to move to.



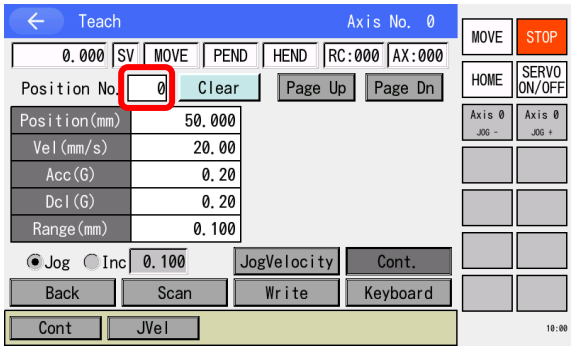
Turn the servo-motor ON.
Perform the home return operation.

Touch the MOVE button.
Touch the Axis 0 MOVE button after the background color in the MOVE button has changed, and the axis starts moving.
When it is stopped on the way, touch the STOP button.

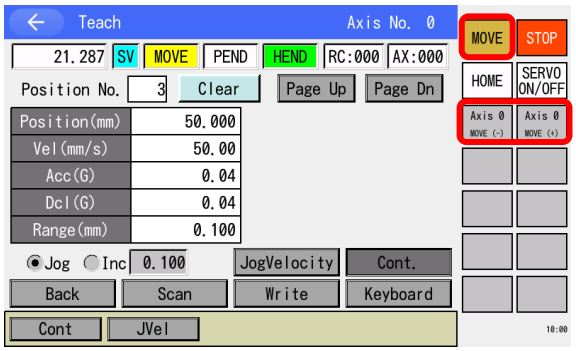
2) Continuous Movement
The RC actuator automatically follows the position corresponding to the position data transferred to the controller.



Touch Cont. button to switch to the continuous operation mode.



Set the position number you want to move to first.



Touch MOVE button.
Perform the home return operation.

Touch the Axis 0 MOVE (+) or Axis 0 MOVE (-) button after the background color in MOVE button has changed, and the axis starts moving. (+ is Position No. order, - is position No. inverse order) When it is stopped on the way, touch the STOP button.

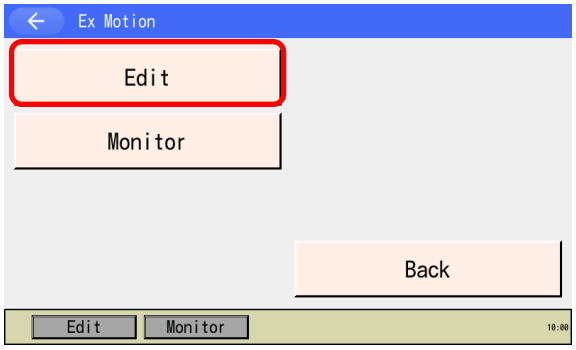
> ⚠ *Caution: Be careful as it may take a few seconds before start moving after touching the Axis 0 MOVE button. (The time interval for movement start varies depending on the number of registered position data items).*

18.1.3 Extended Motion Control Axis Position Data Deletion

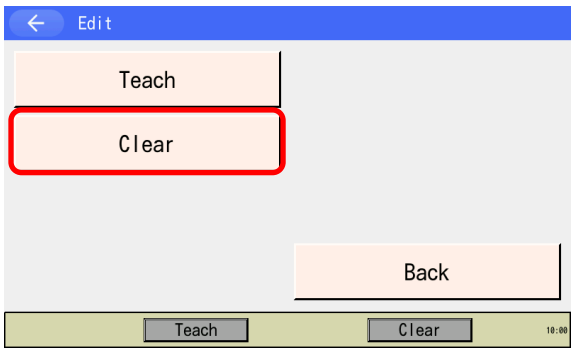
Delete the position data within the designated range.



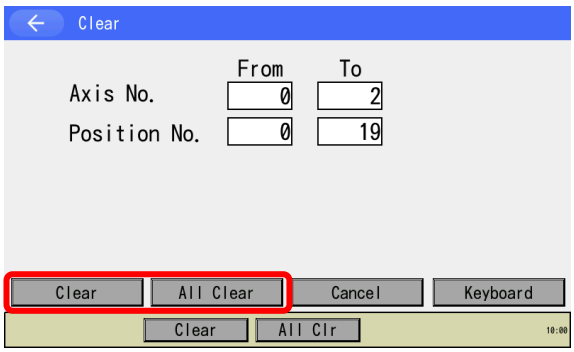
Touch Ex Motion button in the menu screen.



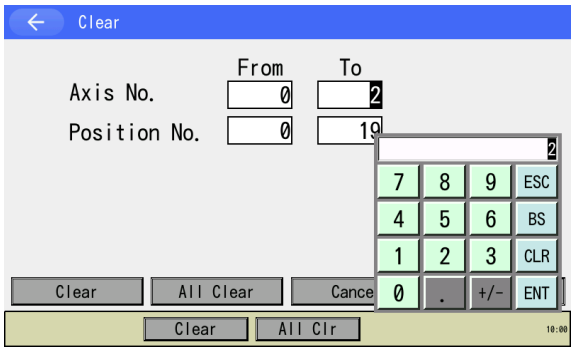
Touch Edit button.



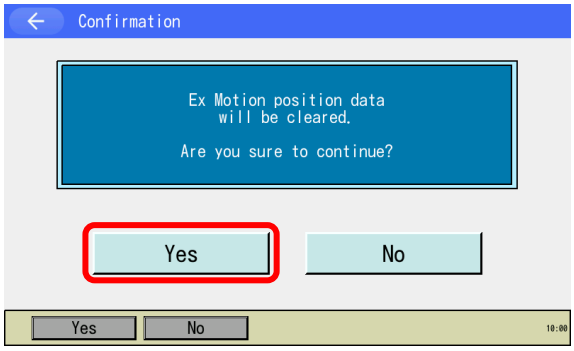
Touch Clear button.



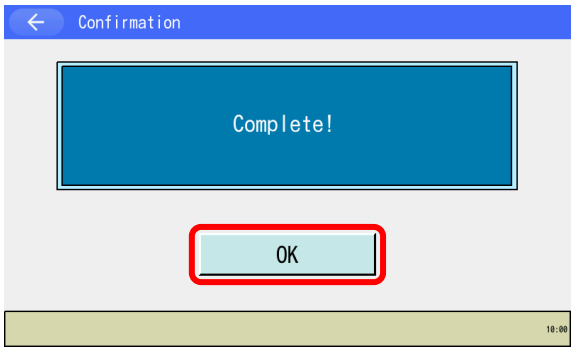
Input the axis number to have the position delete and the range of the position number, and touch Clear button.
When you want to delete all the position data, touch All Clear button.
If you touch Cancel button, the display returns to the Ex Motion Edit menu screen.



If you touch in the input area on “Axis No.” or “Position No.”, the cursor will be shown on the touched item.
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.
Touch on the numeric part if you want to input on the touch panel numeric keys. The contents of input will be shown in the box above the touch panel numeric keys. When confirming the input number, touch ENT. The touch panel numeric key close and the cursor moves to the next input box.
When redoing the input, touch ESC. When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.



Touch Yes button.
When the No button is touched, the Extended Motion Control Position Data Clear Screen is returned.



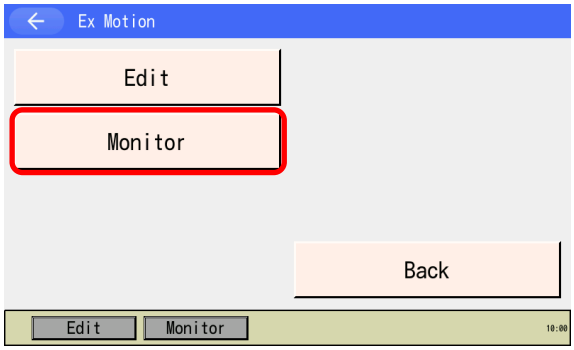
The display shows this screen when the position clear is finished.
When the OK button is touched, the Extended Motion Control Position Data Clear Screen is returned.

18.2 Extended Motion Control Axis Monitoring

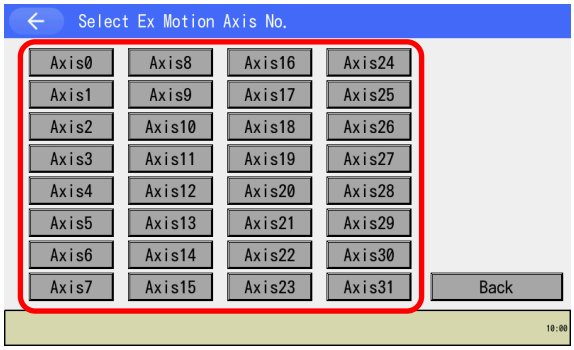
The extended motion control axis's status, current position and alarm code are displayed.



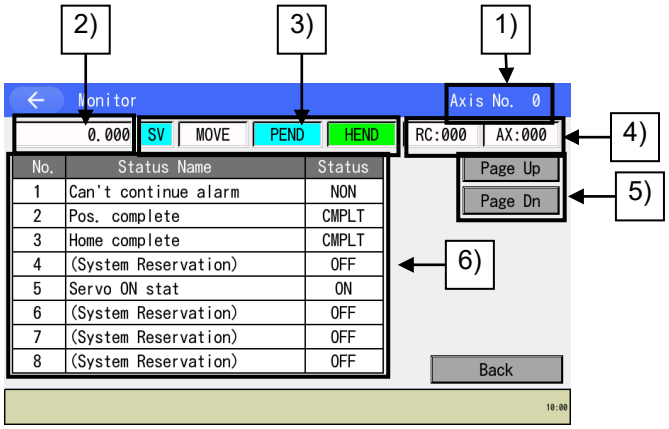
Touch Ex Motion button in the menu screen.



Touch Monitor button.



Select the extended motion control axis No. to be monitored, by means of touching the corresponding button.
The display returns to the Ex Motion menu screen if you touch Back button.



1) Axis No.
The axis No. that is being monitored is displayed.
2) Current position
The actuator current position [mm] is displayed.
3) Axis Status
The status of the actuator is displayed.
SV : Turns on when the servo is on
MOVE : Turns on during operation
PEND : Turns on when positioning is finished
HEND : Turns on when home-return operation is finished
4) Alarm
An alarm code is displayed.
RC : RC-Axis Alarm Code
(Alarm code for the alarm generated in the RC controller is displayed).
AX : Axis Related Alarm Code
(Alarm code for the alarm generated in the XSEL controller is displayed).
5) Page Up / Page Dn button
When touched, the items displayed in (6) are changed.
6) Status Display
The status of the actuators and RC controllers are displayed.

18.3 User Data Hold Memory Initialization

18.3.1 Description

When the I/O Parameter No. 531 “Extended Motion Control Position Data Defined Max. Axis No.”, and 532 “No. of Defined Extended Motion Control Position Data Items” are changed and software is reset after the Flash ROM writing, (6A1) “UBM Data Configuration Change Error” occurs.
When the error occurs, the initialization of the user data hold memory is required.

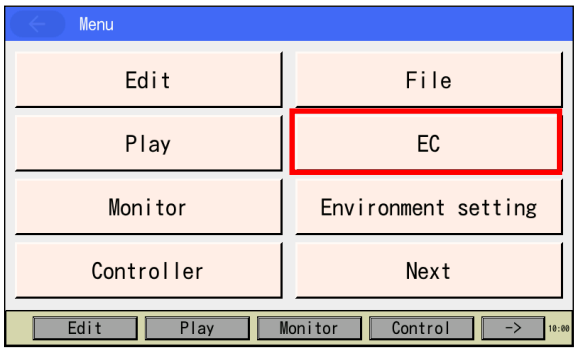
> ⚠ *Caution: When the user data hold memory is initialized, all the extended motion control axis position data items are cleared.*
> *Backup the extended motion control axis position data items using the personal computer (PC) application software for XSEL or TB-02.*

18.3.2 Operation Procedure

For the operation procedure, refer to [17.3.2 Operation Description].

19. ELECYLINDER, ROBO PUMP Operation Function

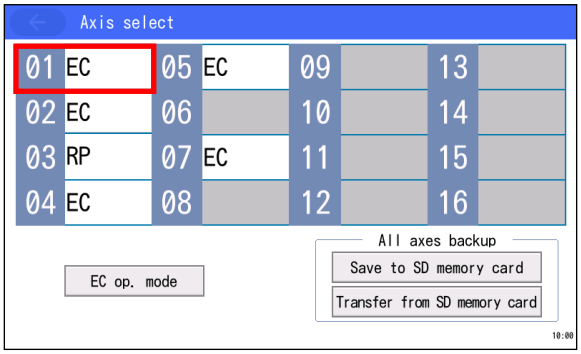
When the EC Interface (RCON-EC or ELECYLINDER connection module board) (hereinafter described as “EC Interface”) is connected to the RSEL or XSEL2-T/TX controller, it should be available to indicate an axis on ELECYLINDER or ROBO PUMP and to operate, show data, change settings and so on.
The EC button should not be shown if EC Interface is not activated.



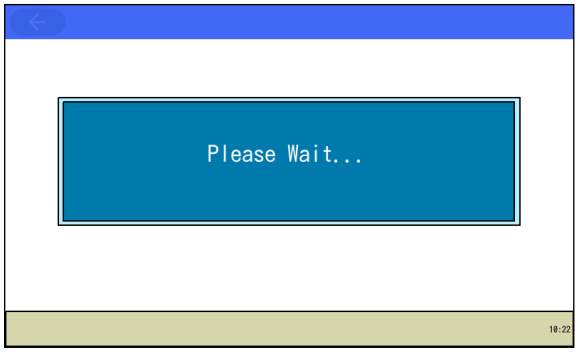
Touch the EC button in the main menu window and the screen goes to the axis select window.

19.1 Changing Operating Axis

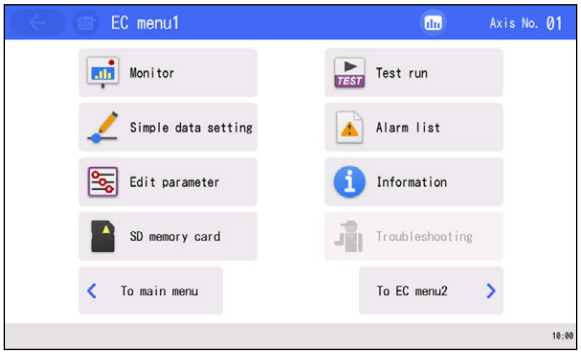
The axis select window should appear by touching the EC button in the main menu window or touching the Change operating axis button in EC menu 2 window.



Select the axis to be operated in the touch panel teaching pendant and touch it. (Axes enabled for EC should show "EC" or "RP" in the axis name display column or an axis name should be displayed and the background should be shown in white.)



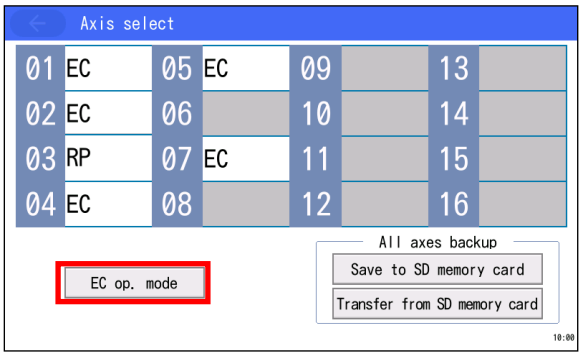
Acquirement of data for the selected ELECYLINDER or ROBO PUMP should start.



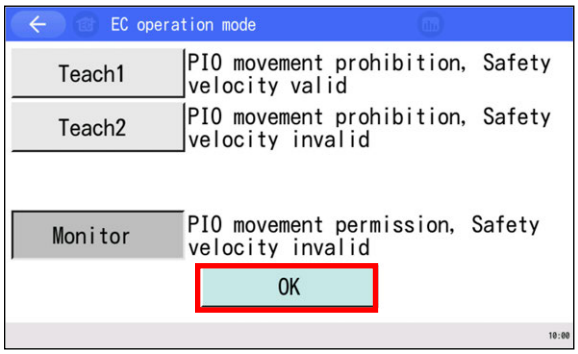
Once the data acquiring process for the ELECYLINDER or ROBO PUMP is complete, EC menu 1 window should show up.

19.1.1 EC Operation Mode

The ELECYLINDER, ROBO PUMP operation mode setting in the manual mode (MANU) should be established.



Touch the EC op. mode button in the axis select window and the EC operation mode change window should be displayed.



Touch any button such as the Teach1 to select the preferable mode, and touch the OK button.

The EC operation mode should be selected from the three types of menus as described below.

- Teach1 (PIO movement prohibition / Safety velocity valid)

PIO movement prohibition : Data writing to ELECYLINDER or ROBO PUMP (for such as simple data settings and parameters) and indications in the actuator operation system are available.

Safety velocity valid : The maximum velocity should be the safety velocity [100mm/s] regardless of the velocity indication in the simple data setting window.

(Note) As there is no safety velocity equipped in ROBO PUMP, the safety velocity should not activate.

- Teach2 (PIO movement prohibition / Safety velocity invalid)

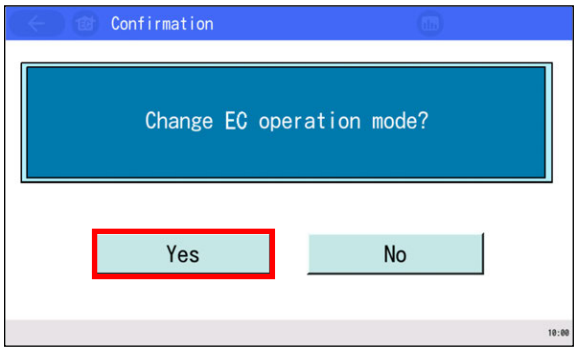
  PIO movement prohibition : Data writing to ELECYLINDER or ROBO PUMP (for such as simple data settings and parameters) and indications in the actuator operation system are available.

  Safety velocity invalid : Operation in the velocity set in the simple data setting window (higher than the safety velocity) becomes available.

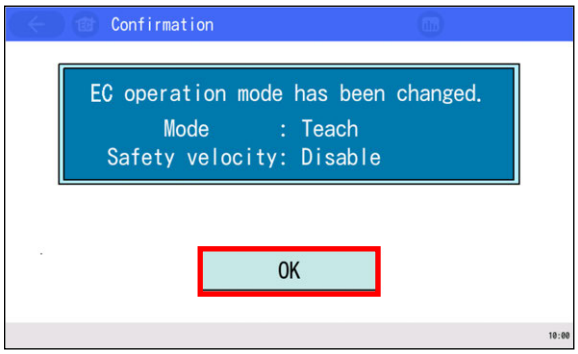
- Monitor (PIO movement permission / Safety velocity invalid)

  PIO movement permission : Control should be made with I/O commands. Data writing to ELECYLINDER or ROBO PUMP (for such as simple data settings and parameters) and indications in 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 : Operation in the velocity (higher than the safety speed) commanded from a host device (such as PLC) or the SEL program should be available.



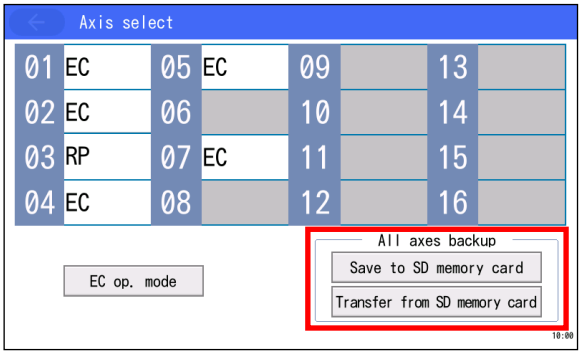
Touch Yes button in the confirmation window.



The changed modes and the safety speed setting should be displayed. Touch OK button.

(Note) As there is no safety velocity equipped in ROBO PUMP, the safety velocity should not activate.

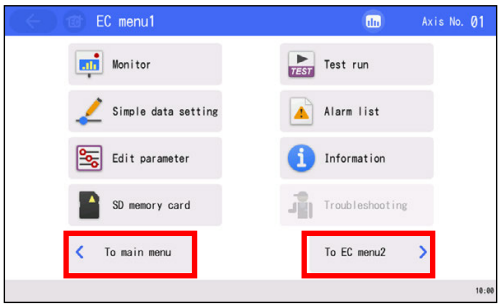
19.1.2 Backup for All Axis

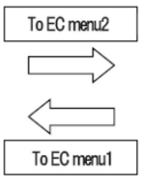


Backup (saving to a Secure Digital memory card) and restoring (transfer from a Secure Digital memory card) for all ELECYLINDER and ROBO PUMP data should be conducted.
For details, refer to [19.13 ELECYLINDER, ROBO PUMP Data Backup].

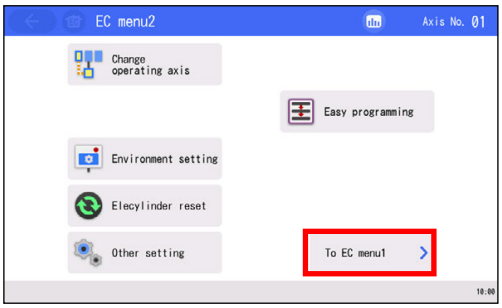
19.2 Menu Selection

EC menu 1





EC menu 2



There are two windows, EC Menu 1 and EC Menu 2, in the EC menu window.
Touch the To EC menu2 button in EC Menu 1 and the screen switches to the EC Menu 2 window, and touch the To main menu button and it returns to the main menu window.
Touch the To EC menu1 button in EC Menu 2 and the screen switches to the EC Menu 1 window.

In EC menu 1, EC menu 2 there are have the following menus. Select either of them and touch it. The screen should go to the selected feature.
(If the EC operation mode is in the monitoring mode, some of the menus would not be available to select. In order to select them, set the mode to the teaching mode. Refer to [19.1.1 EC Operation Mode].)

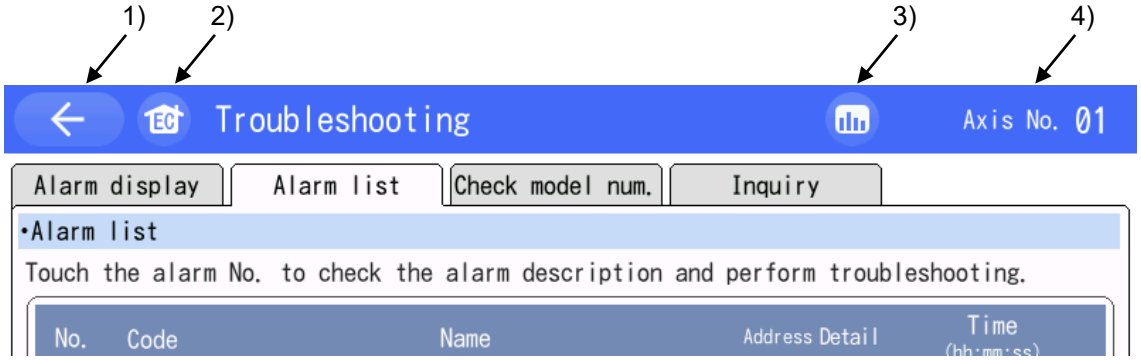
[EC menu 1]

• Monitor	Displays the ELECYLINDER or ROBO PUMP status, I/O signal status, maintenance information and manufacturing information. Refer to [19.3 Monitor]
• Simple data setting	The setting of position, velocity, acceleration/deceleration, etc. should be established to make operation of an actuator. Refer to [19.4 Simple Data Setting (Position Editing)]
• ROBO PUMP setting	Setting of suction, release and monitoring display of ROBO PUMP should be established. Refer to [19.5 ROBO PUMP setting]
• Edit parameter	Adjustment of the operation range and home position or change in direction of the home-return operation should be conducted. Refer to [19.6 Edit Parameter]
• SD memory card	Backup / restoring of position data and parameters or backup of the alarm list should be conducted. Refer to [19.13 Data Backup of ELECYLINDER, ROBO PUMP]
• Test run	Manual operations such as jog, inching, position operation and numerical indication movement and the operation test of I/O should be conducted. Refer to [19.7 Test Run] As there should only be I/O operation test conducted for ROBO PUMP, the menu should show “I/O Test”.
• Alarm list	Shows a list of alarms and the time when they occurred. Refer to [19.8 Alarm List]
• Information	Shows the software version, manufacturing information, maintenance information and inquiry for connection. Refer to [19.11 Information Display]
• Troubleshooting	Shows the contents of an alarm and the countermeasure when an alarm has been generated.

[EC menu 2]

• Change operating axis	Select ELECYLINDER or ROBO PUMP to operate Refer to [19.1 Changing Operating Axis]
• Environment setting	Conduct settings for data input warning, axis name display, ripple compensation and initial window setting at startup. Refer to [19.12 Environment Setting]
• ELECYLINDER, ROBO PUMP restart	Restart ELECYLINDER or ROBO PUMP. Refer to [19.9 Restarting ELECYLINDER, ROBO PUMP]
• Other setting	Initialization of a parameter or adjustment of operation sound should be conducted. Refer to [19.10 Other Setting]
• 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 [19.14 Easy Programming]

[About Buttons at Top Belt in Window]



1) Return Button : Returns to Previous window
2) EC Home Button : Returns to EC Menu 1 window
3) Monitor Button : Opens the Monitor window
4) Axis No. 01 Change operating axis Button : Displays the operation axis change window.

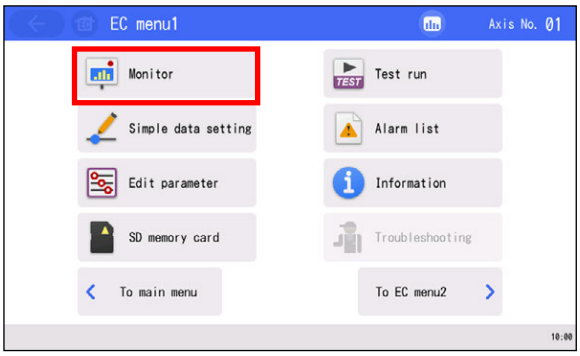
[When Alarm Occurred]



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.
Touch the gray area that the alarm information is displayed, and the screen switches to the window to display the alarm details.

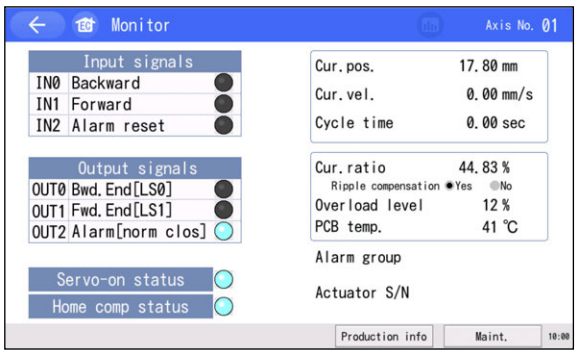
19.3 Monitor

The I/O statuses, current position and other information of ELECYLINDER or ROBO PUMP connected are displayed.

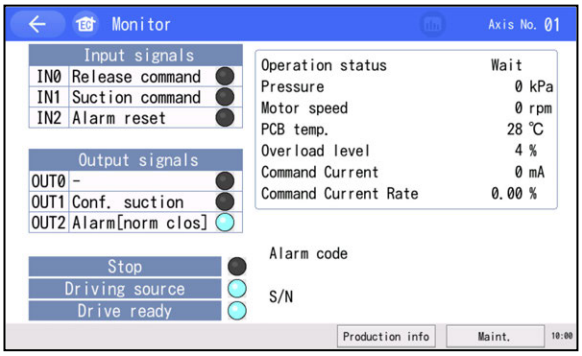


Touch Monitor button on the EC menu 1 window.

The monitoring window for ELECYLINDER or ROBO PUMP should show up



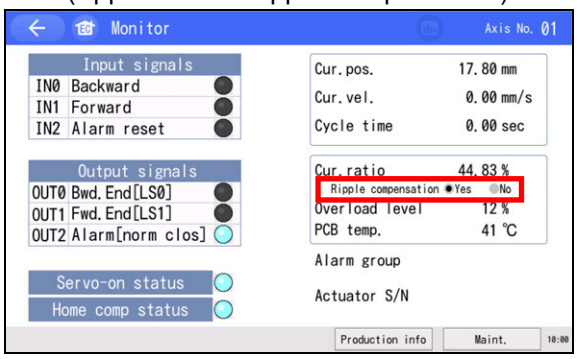
Monitoring Window for ELECYLINDER
Refer to [19.3.1 Monitor Window (ELECYLINDER)]



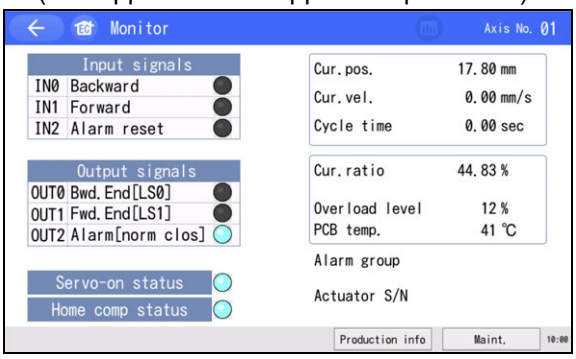
Monitoring Window for ROBO PUMP
Refer to [19.3.2 Monitor Window (ELECYLINDER)]

19.3.1 Monitor Window (ELECYLINDER)

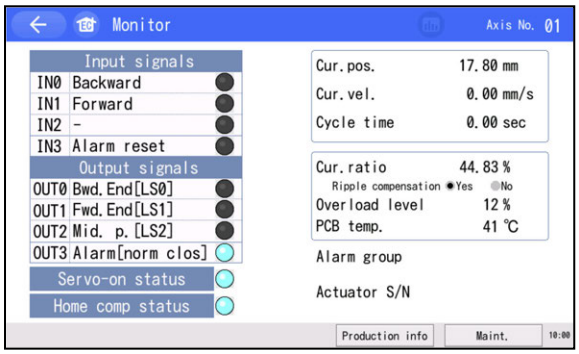
(Applicable for Ripple Compensation)



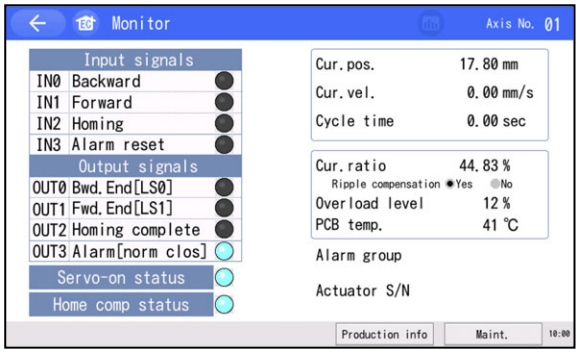
(Not Applicable for Ripple Compensation)



(3-position setting)



(Double (Multi-I/O enabled) when Solenoid Valve Type (operation mode) is selected)



Touch Production info button and the production information window will be displayed.
Refer to [19.11 Information Display]
Touch Maint. button and the maintenance information window will be displayed.
Refer to [19.3.3.1 Maintenance Information Window (ELECYLINDER)]

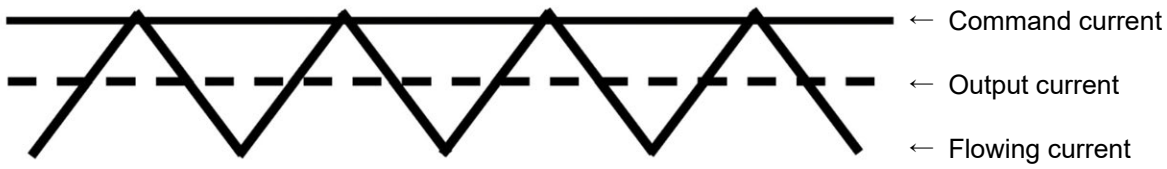
[Displayed Items]

- 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.
- Servo-on status — It displays the status of servo-on. The servo is on when it is lighted on and off when lighted off.
- Home comp status — It displays the status of the home-return completion. Completed when it is lighted on and incomplete when lighted off.
- Cur. pos. — The current position is shown.
- Cur. vel. — The current speed is shown.
- Cycle time — The cycle time calculated from the velocity and acceleration / deceleration set for the way forth and the way back is shown.
- 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.

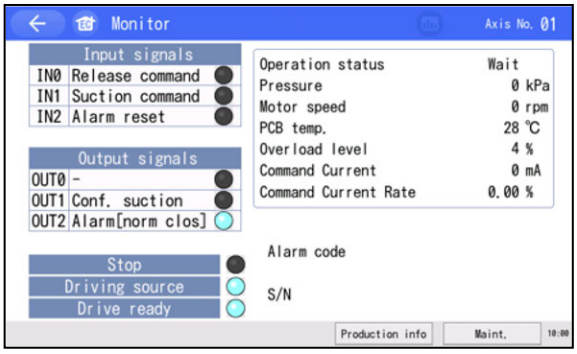
Note 1 The selection of the ripple compensation should only be displayed in ELECYLINDER with its version V0006 or later. For those models with no selections, calculations should be performed in command current (Note 2).

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.



19.3.2 Monitor Window (ROBO PUMP)



Touch Production info button and the production information window will be displayed.
Refer to [19.11 Information Display]
Touch Maint. button and the maintenance information window will be displayed.
Refer to [19.3.3 Maintenance Information Window]

[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. — It displays the status of emergency stop. ON is lit. OFF is unlit.
- Driving source. — It displays the status of driving source. ON is lit. OFF is unlit.
- Drive ready — It displays the status of servo-on. ON is lit. OFF is unlit.
- Operation status — It displays the of ROBO PUMP operation status.
- Pressure — The pressure of the vacuum pump should be displayed.
- Moror 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 level — The overload level is shown in the rate that the motor raising temperature assumed to generate the overload alarm set as 100%.
- Cmd. Current value — The command current should be displayed.
- Cmd. Current ratio — The ratio of the command current and the rating should be displayed.
- Alarm code — The applicable alarm code is shown.
- Serial No. — The serial number of ROBO PUMP should be displayed.

19.3.3 Maintenance Information Window

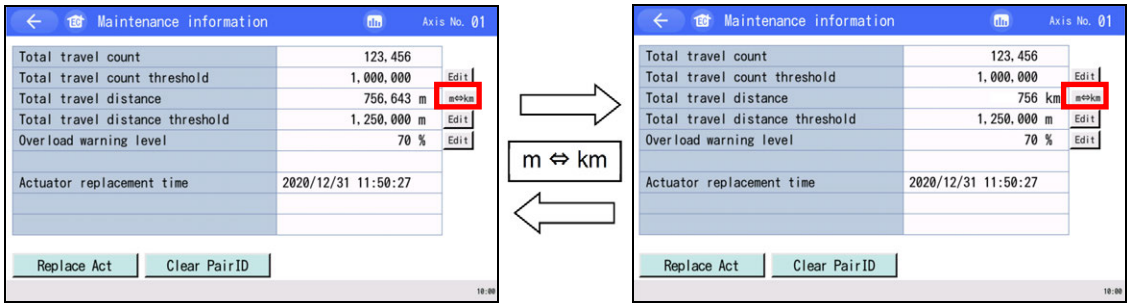
19.3.3.1 Maintenance Information Window (ELECYLINDER)

[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) (Display in km for distance)



[Contents of Display]

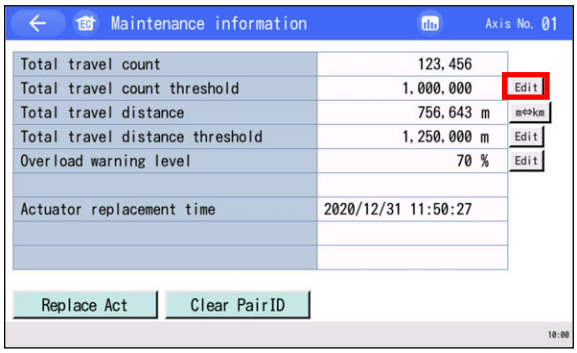
- Total travel count The cumulative total number of actuator movements is shown.
- Total travel distance The cumulative total distance travelled by the actuator is shown.

(Rotary type: Travel count for round trip between 0 and 180deg
(To be figured out from total drive distance))

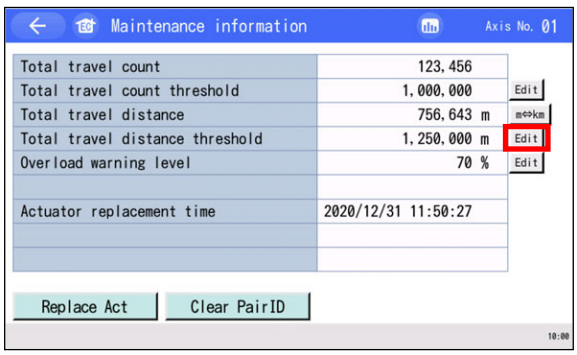
[Items of Setting]

- 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)

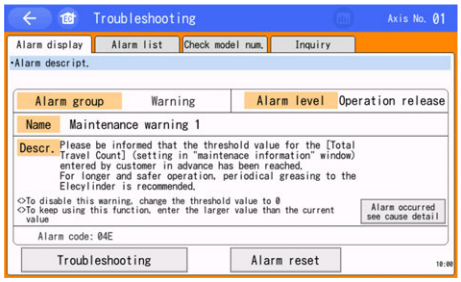


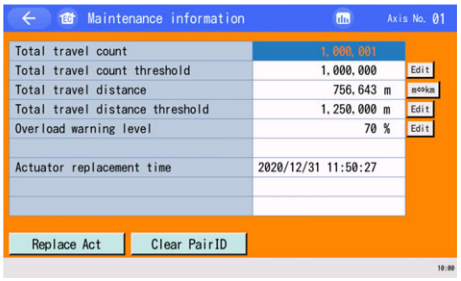
Touch Edit button on the right of Total travel count threshold to change the setting for the total travel count threshold.



Touch Edit button 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





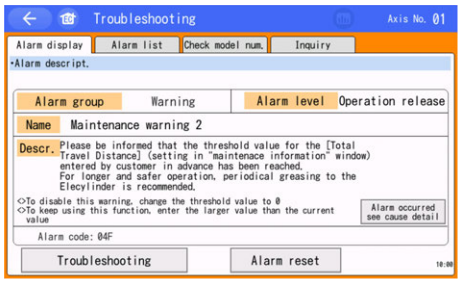
You will be notified in Maintenance warning 1 window.
The number in total travel count blinks in maintenance information window.

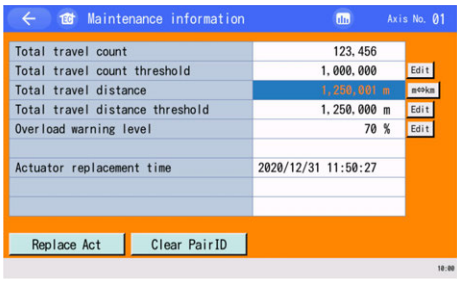
●/● flash in turn



LED lamps on ELECYLINDER flash red and green in turn in all of Maintenance Warning 1, 2 and 3.

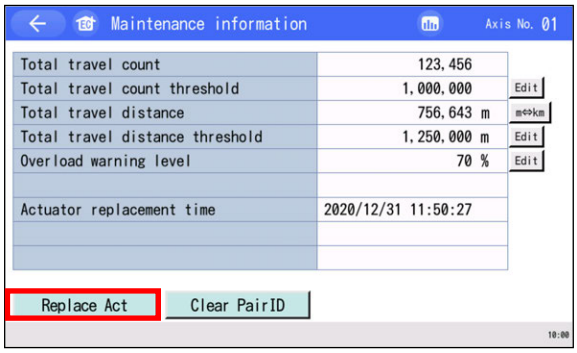
When Total Travel Distance has Exceeded Total Travel Distance Threshold





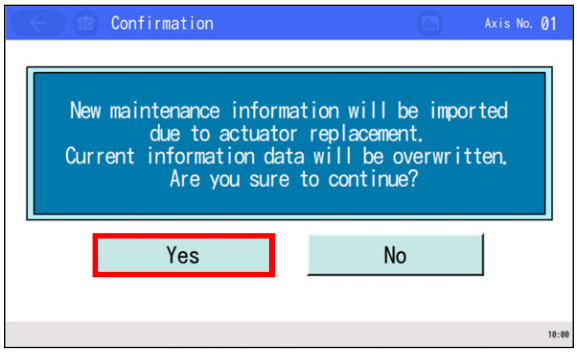
You will be notified in Maintenance warning 2 window.
The number in total travel distance blinks in maintenance information window.

[Resetting Total travel count and Total travel distance]



Touch Replace Act button to display the password entry window.

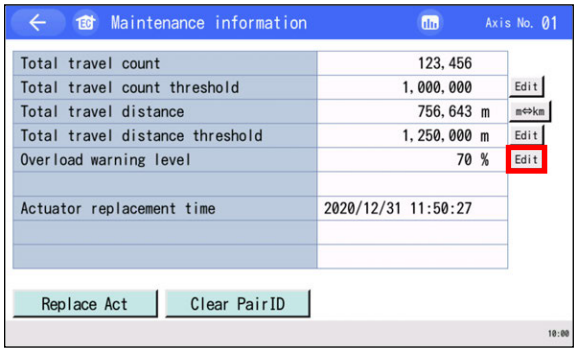
Input '5119' and touch ENT button.



The actuator replacement confirmation window appears.
Touch Yes button.
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.

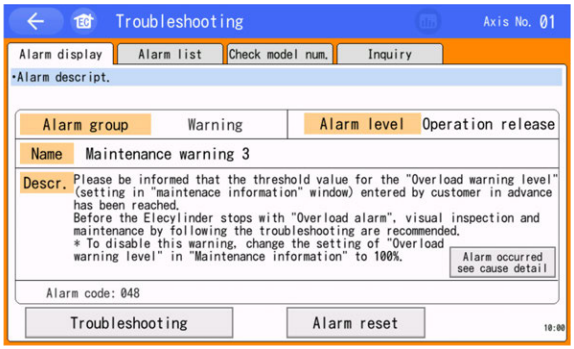


Touch Edit button on the right of Over load warning level to change the setting for the over load warning level.

[Items of Setting]

- Overload warning level — Set the level to generate the over load warning alarm. Set to 100, and a warning should be generated.

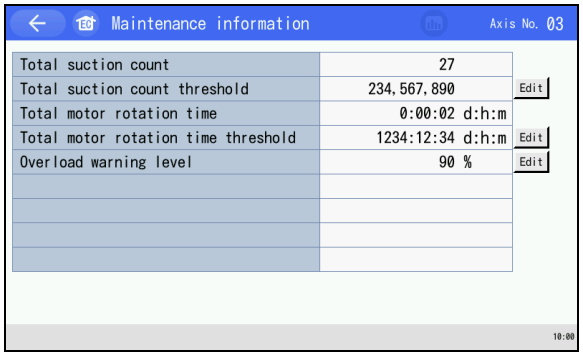
When Over load Level has Exceeded Setting Rate



You will be notified as an overload warning in Maintenance warning 3 window.
LED lamps on ELECYLINDER flash red and green in turn.

19.3.3.2 Maintenance Information Window (ROBO PUMP)

[1] Total suction count, Total motor rotation time
A warning should get output when the total suction count or total motor rotation time has exceeded each setting.

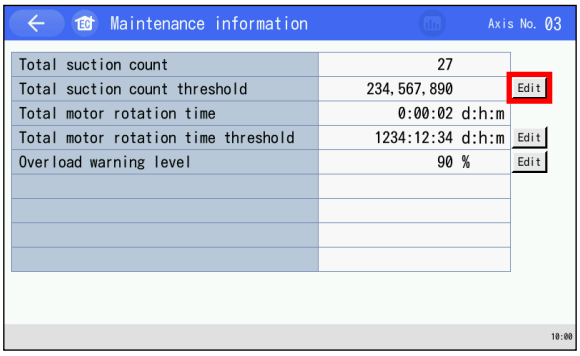


[Contents of Display]

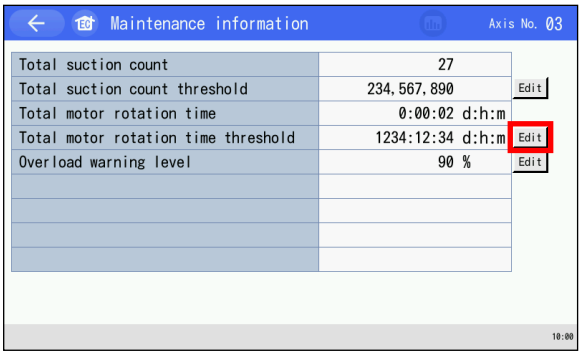
- Total suction count — The cumulative of suction count for ROBO PUMP should be displayed.
- Total motor rotation time — The cumulative of motor revolution time for ROBO PUMP should be displayed.

[Items of Setting]

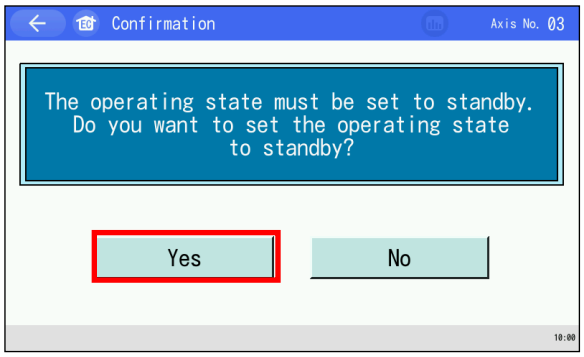
- Total suction count threshold — The setting for suction count of ROBO PUMP to output warnings should be established.
- Total motor rotation time threshold — The setting for motor revolution time of ROBO PUMP to output warnings should be established.



Touch Edit button on the right of total suction count threshold to change the setting for the total suction count threshold.

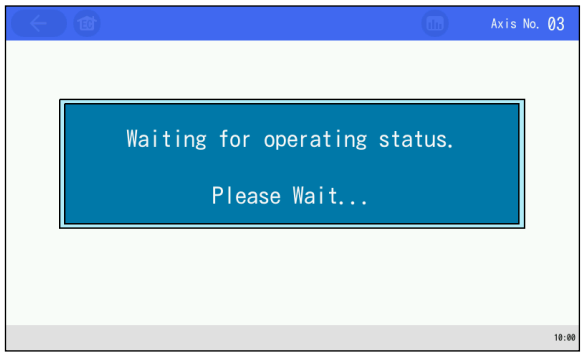


Touch Edit button on the right of total motor rotation time threshold to change the setting for the total motor rotation time threshold.



Touch the Edit button while ROBO PUMP is being suction or being release, and the confirmation window during standby should be displayed.
Touch Yes button.

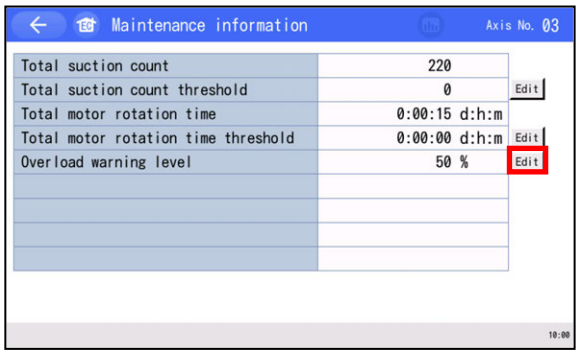
Touch the No button, and the screen goes back to the maintenance information window without making ROBO PUMP wait.



Make ROBO PUMP wait.
The setting should be changed after complete.

[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.

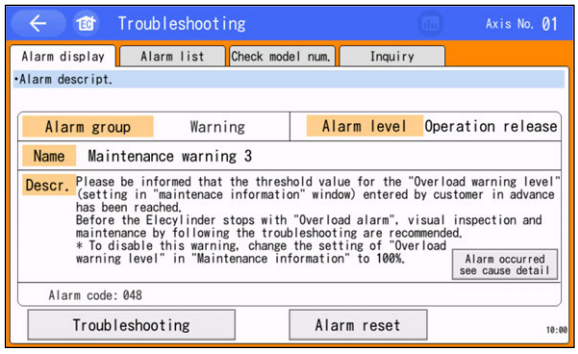


Touch Edit button on the right of Over load warning level to change the setting for the over load warning level.

[Items of Setting]

- Overload warning level — Set the level to generate the over load warning alarm. Set to 100, and a warning should be generated.

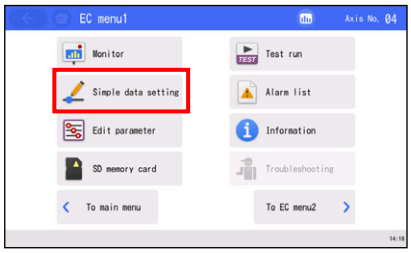
When Over load Level has Exceeded Setting Rate



You will be notified as an overload warning in Maintenance warning 3 window.
LED lamps on ROBO PUMP flash red and green in turn.

19.4 Simple Data Setting (Position Editing)

Setting and editing of data related to operation such as forward end, backward end, middle point, velocity (V), acceleration (A), deceleration (D) and pressing setting can be performed. Also, JOG operation can be performed.



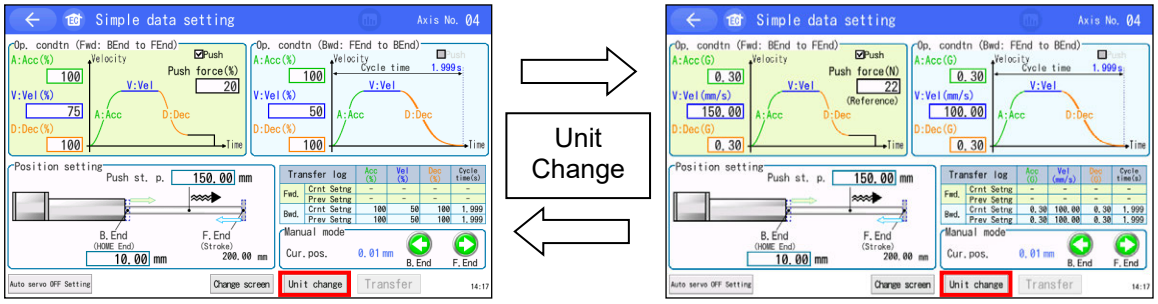
Touch Simple data setting on the Menu 1 screen.

The simple data setting window appears.

■ Unit Change

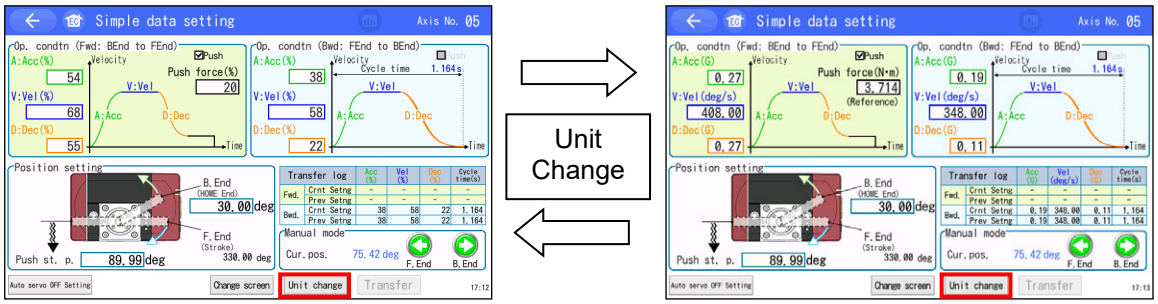
Unit Change switches the unit between % and mm/s for velocity, % and G for acceleration / deceleration and % and N for pressing force (Rotary type excluded).

Rod type: Simple data setting screen for pressing operation (2-position setting)

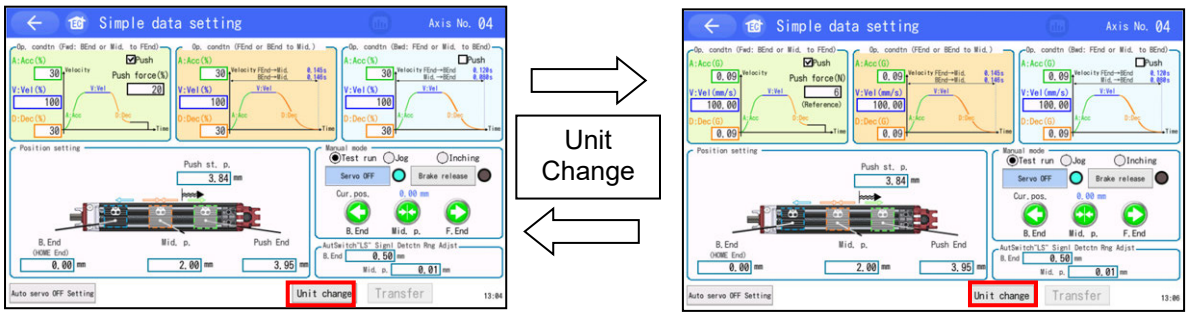


Unit Change switches the unit between % and deg/s for velocity, % and G for acceleration / deceleration and % and N•m for pressing force (Rotary type).

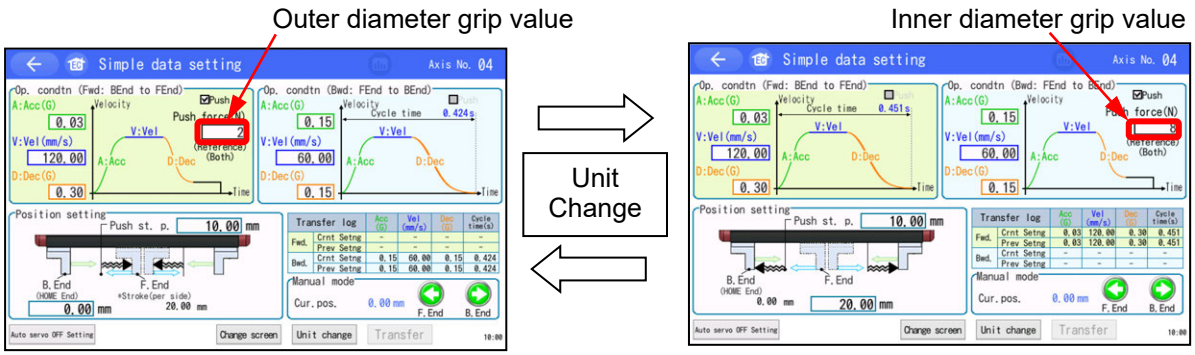
Rotary type: Simple data setting screen for pressing operation (2-position setting)



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 V5.10, 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.

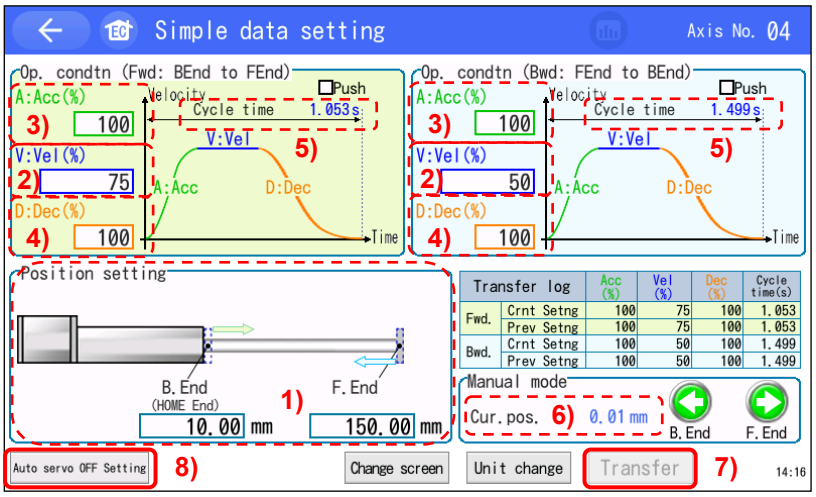


Therefore, when using the 3-finger gripper (EC-GRTR14) in versions earlier than V5.10 with gripping at the inner diameter, use the displayed unit in [%], not in [N], for grip force (pressing force).

- *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 [%].*

19.4.1 Positioning Operation

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Other than Rotary and 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 1 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 *Figure out the minimum velocity by using the formula below.*
Min. Velocity [mm/s] = Lead Length [mm] / 800 / 0.001 [s]
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at start.
Set a number from 1 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 1 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 velocity and acceleration / deceleration set is shown.

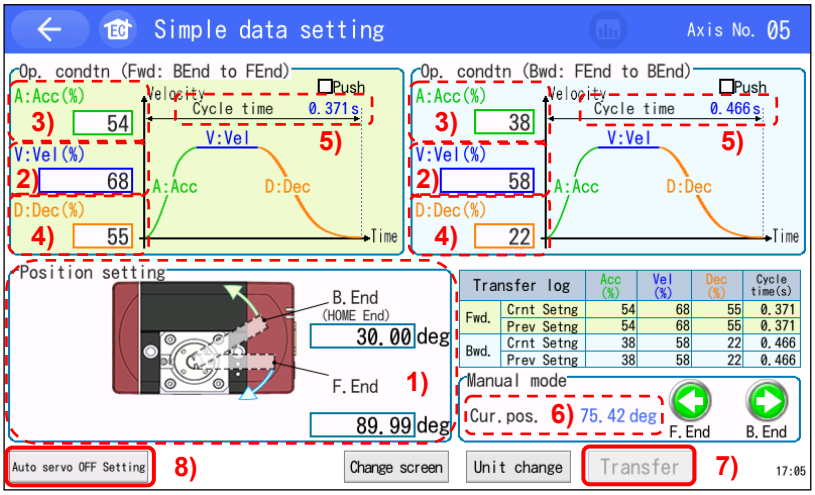
6) Cur. pos. [mm] : Displays the current position.

7) Transfer : Once the data setting is complete, press Transfer to transfer the data to the ELECYLINDER.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
[Refer to 19.4.5 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 button will not be available.*

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 1 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 *Min. Velocity: 20deg/s*

3) Acc [% or G] : Set the acceleration at start.
Set a number from 1 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 1 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 velocity and acceleration / deceleration set is shown.

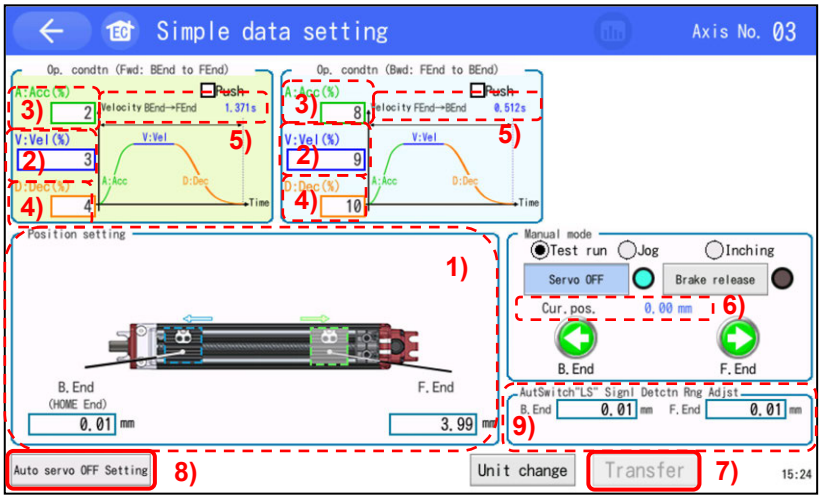
6) Cur. pos. [mm] : Displays the current position.

7) Transfer : Once the data setting is complete, press Transfer to transfer the data to the ELECYLINDER.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
[Refer to 19.4.5 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 button will not be available.

Shown below is the content of setting for the position data for the positioning operation. (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 1 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.

3) Acc [% or G] : Set the acceleration at start. Set a number from 1 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 1 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 velocity and acceleration / deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

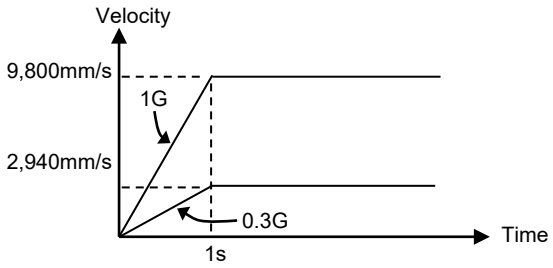
7) Transfer : Once the data setting is complete, press Transfer to transfer the data to the ELECYLINDER.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time. [Refer to 19.4.5 Auto servo OFF]

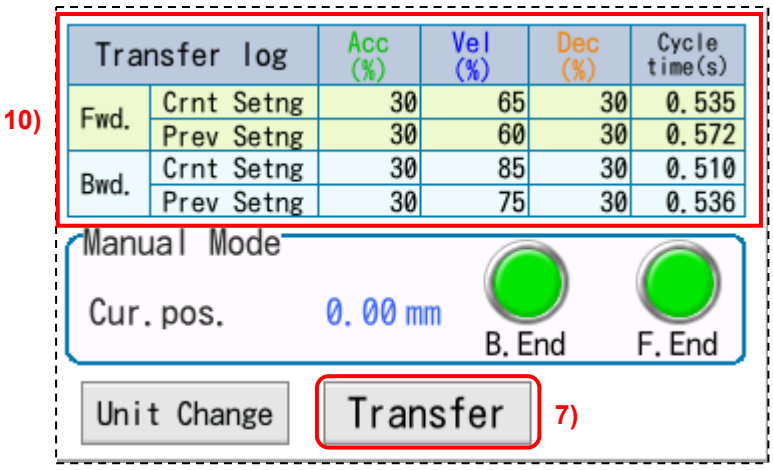
9) Auto Switch “LS” Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch “LS” signal. Input the backward end and forward end. The unit is mm and input can be made down to two decimal places.

⚠ *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 button will not be available.*

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



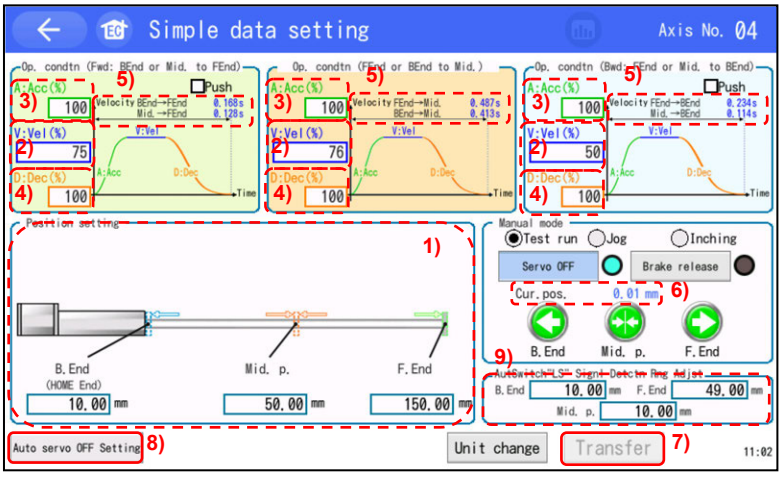
⚠ *Caution: If the actuator or work part receives impact or generates vibration, lower the acceleration/deceleration. If the system is used continuously with the actuator or work part receiving impact or generating vibration, the life of the actuator may be significantly reduced.*



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 1 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 *Figure out the minimum velocity by using the formula below.*
Min. Velocity [mm/s] = Lead Length [mm] / 800 / 0.001 [s]
(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 1 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 1 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 velocity, acceleration and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

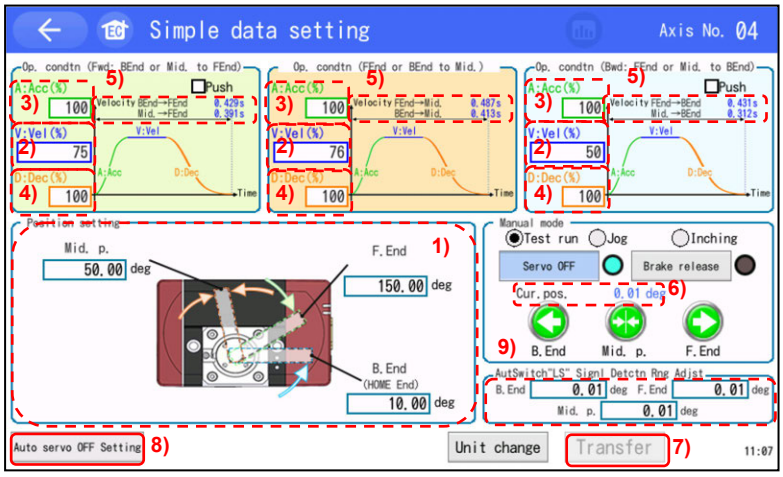
7) Transfer : Once the data setting is complete, touch Transfer to transfer the data to the controller.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
Refer to [19.4.5 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.

> ⚠ *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 button will not be available.*

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 degs] : Set the velocity of operation.
Set a number from 1 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 Min. Velocity: 20deg/s

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 1 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 1 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 velocity, acceleration and deceleration set is shown.

6) Cur. pos. [deg] : Displays the current position.

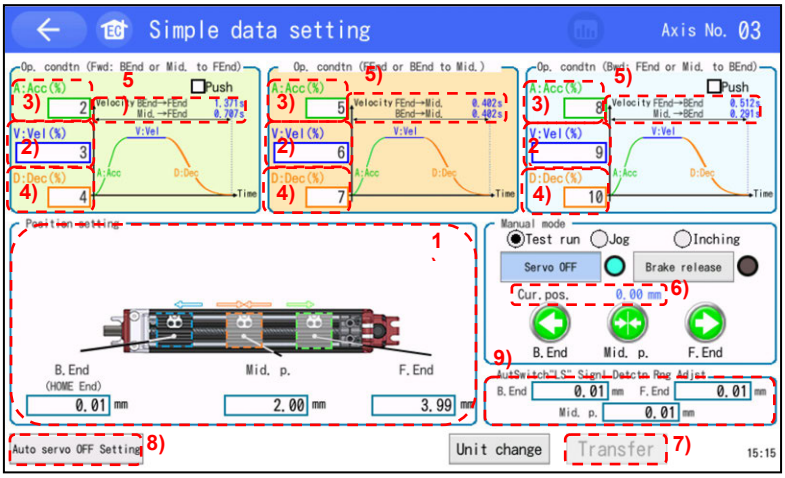
7) Transfer : Once the data setting is complete, touch Transfer to transfer the data to the controller.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
Refer to [19.4.5 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.

> ⚠ *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 button will not be available.*

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 1 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.

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 1 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 1 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 velocity, acceleration and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

7) Transfer : Once the data setting is complete, touch Transfer to transfer the data to the controller.

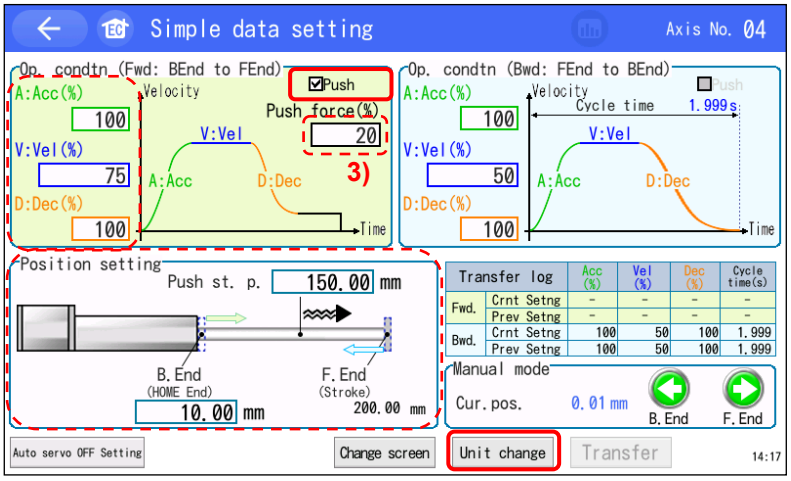
8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
Refer to [19.4.5 Auto servo OFF]

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.

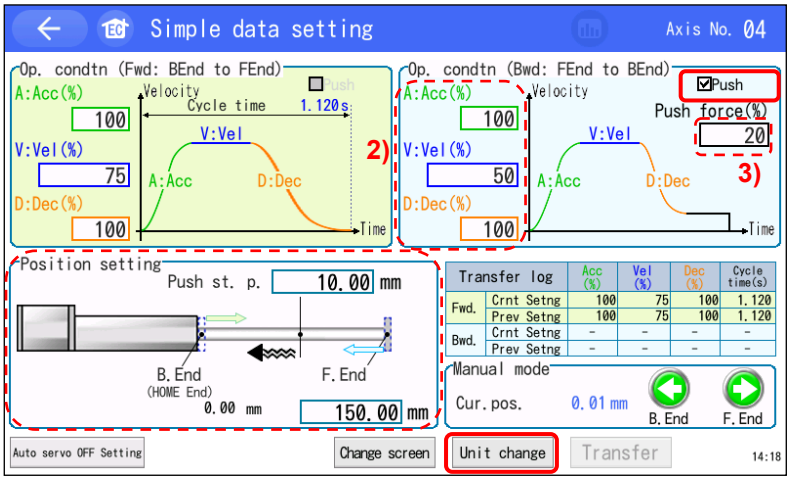
Caution: If moving to another window without transferring data, all the data settings will go back to those before.
Also, without transferring, operation by the manual operation button will not be available.

19.4.2 Pressing Operation

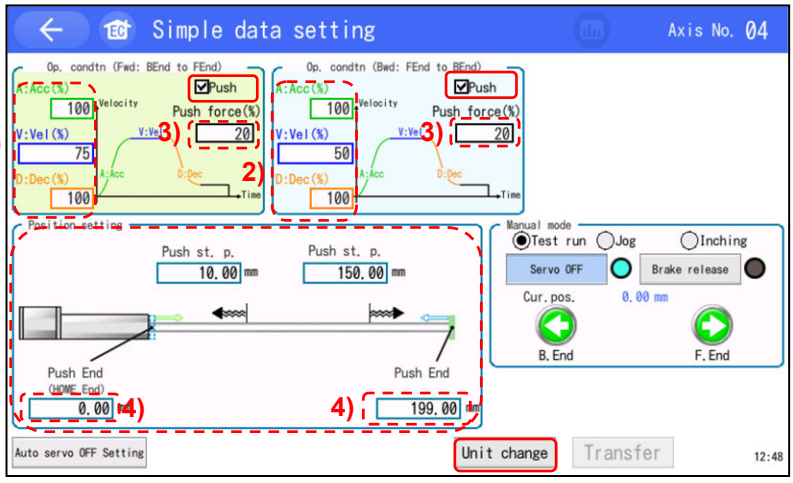
Shown below is the content of setting for the position data for the pressing operation. (Other than Rotary and Wire Cylinder)
Touch ☐ for pressing and put the check mark ✓ on, and the screen shows the pressing operation setting window.
(If ☐Push is not shown, the pressing operation should not be available.)



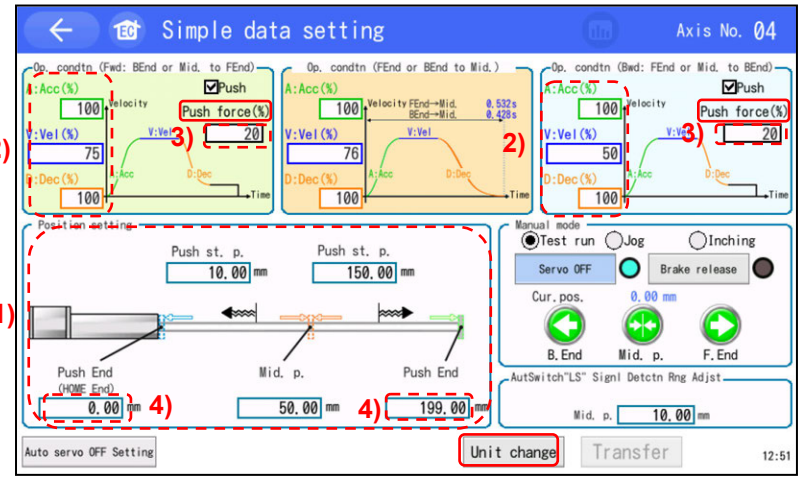
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (MF specification and 2-position setting)



2-end Pressing
(MF specification and
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 and 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.

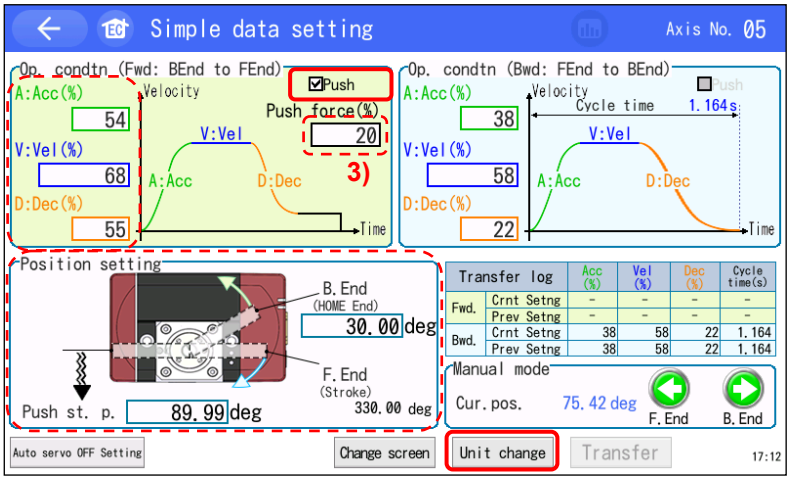
3) Push force [% or N] : Set a push force (limit current value) in %.
The unit can be switched to N by pressing Unit change.
The pressing velocity should be 20mm/s.
If the velocity is set to 20mm/s or less, pressing operation will be performed in the setting velocity.

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.

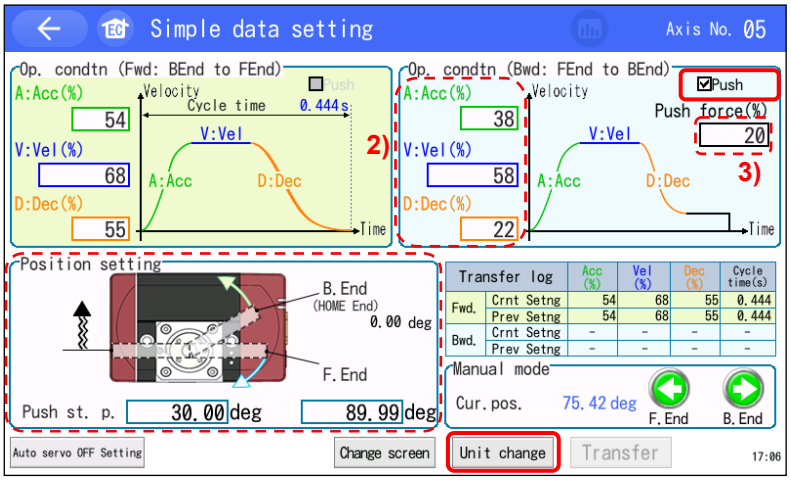
Transfer log : The transfer log will not be displayed in pressing operation.

The transfer operation and manual operation is the same as the positioning operation. [Refer to 19.4.1 Positioning Operation]

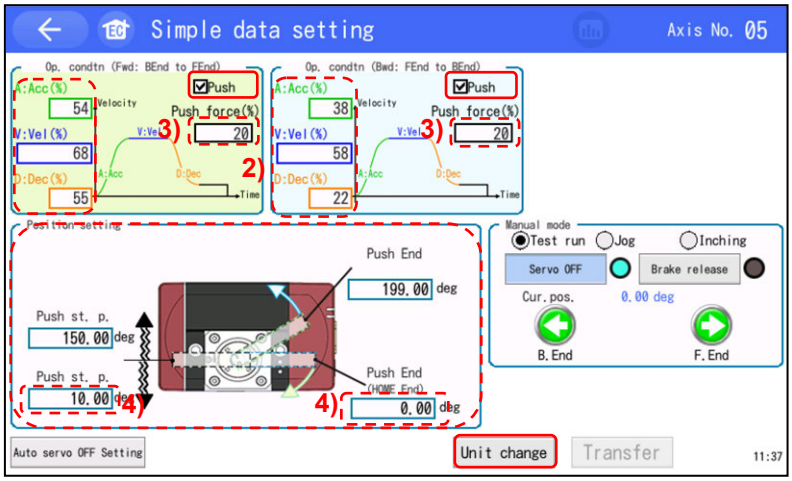
Shown below is the content of setting for the position data for the pressing operation. (Rotary)
Touch ☐ for pressing and put the check mark ✓ on, and the screen shows the pressing operation setting window.



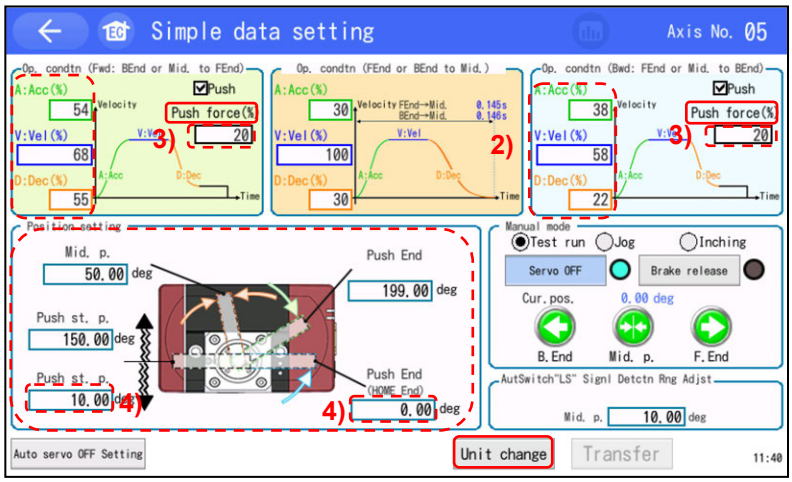
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (MF specification and 2-position setting)



2-end Pressing
(MF specification and
3-position setting)

1) Position setting [deg] : 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 deg and input can be made down to two decimal places.

2) Vel and 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.

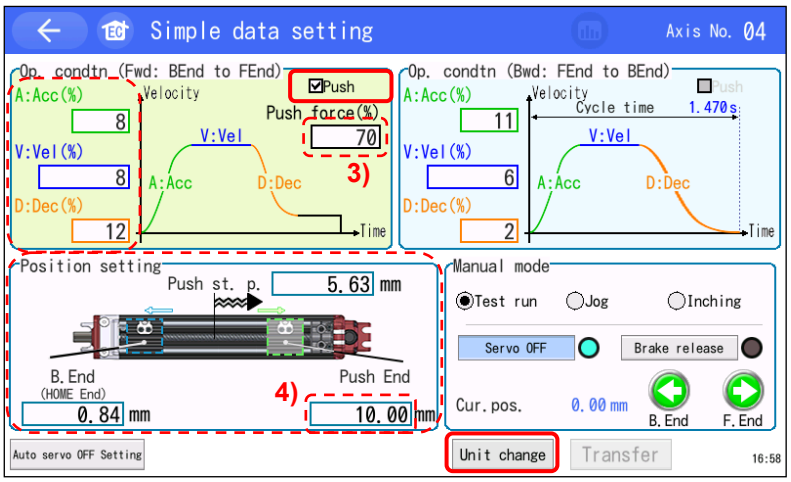
3) Push force [% or N•m] : Set a pressing torque (limit current value) in %. The unit can be switched to N•m by pressing Unit change. The pressing velocity should be 20deg/s. If the velocity is set to 20deg/s or less, pressing operation will be performed in the setting velocity.

4) Push End [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.

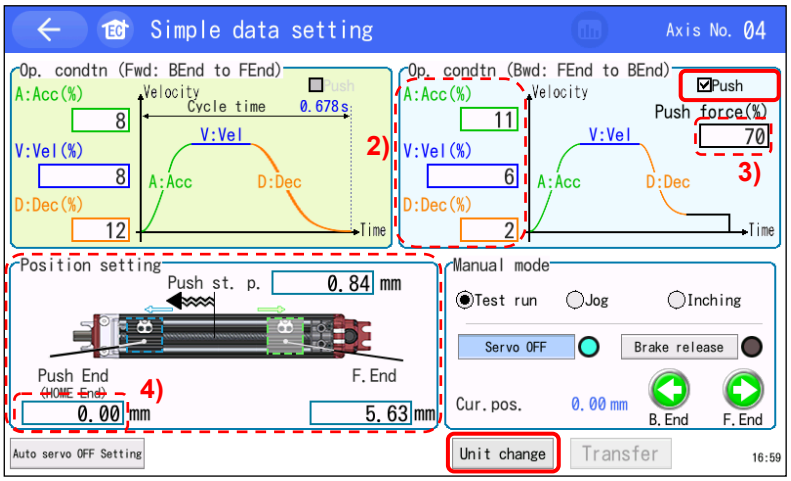
Transfer log : The transfer log will not be displayed in pressing operation.

The transfer operation and manual operation is the same as the positioning operation. [Refer to 19.4.1 Positioning Operation]

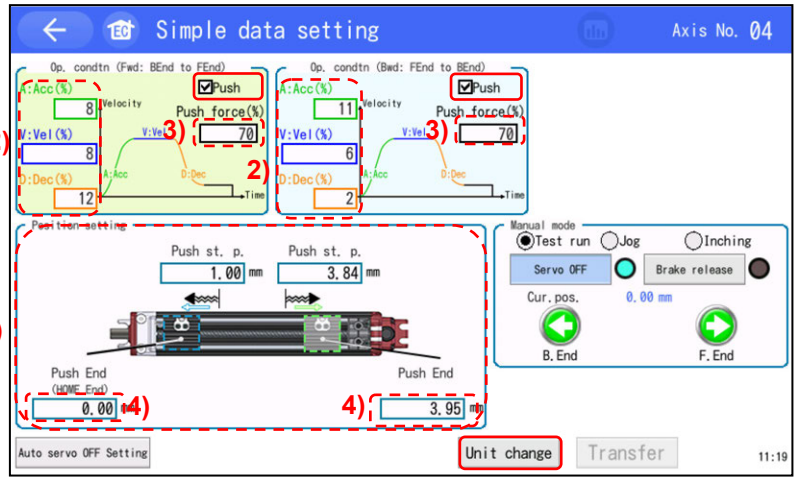
Shown below is the content of setting for the position data for the pressing operation.
(Wire Cylinder)
Touch ☐ for pressing and put the check mark ✓ on, and the screen shows the pressing operation setting window.



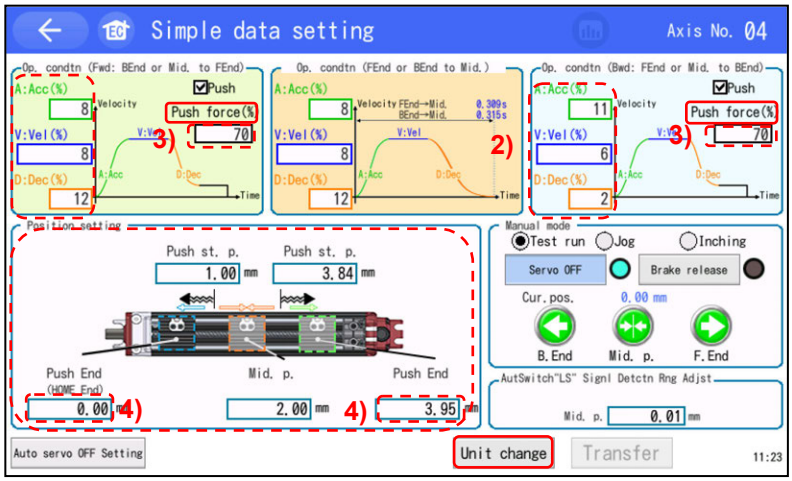
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (MF specification and 2-position setting)



2-end Pressing
(MF specification and
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.

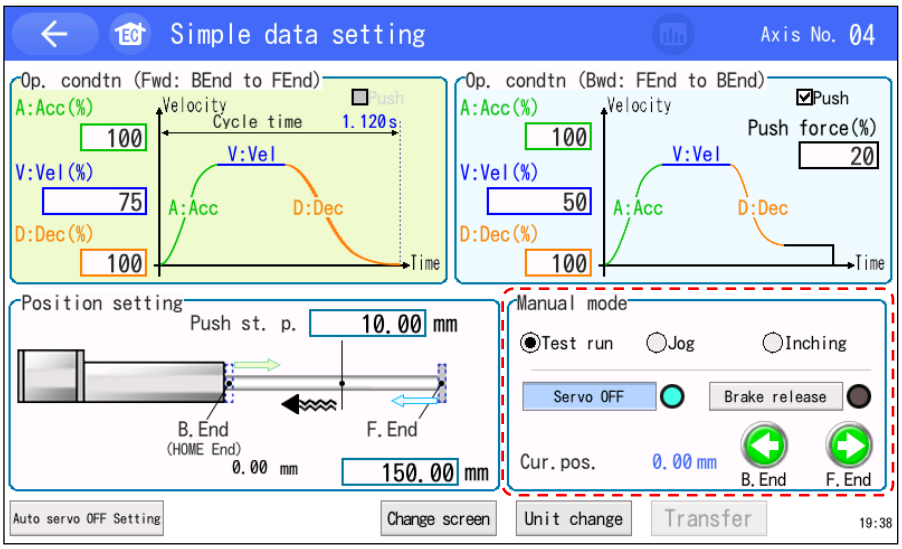
2) Vel and Acc/Dec : Setting can be made for the velocity, acceleration and deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation. The way to conduct settings is the same as that for positioning operation.

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.

The transfer operation and manual operation is the same as the positioning operation. [Refer to 19.4.1 Positioning Operation]

19.4.3 Manual Mode

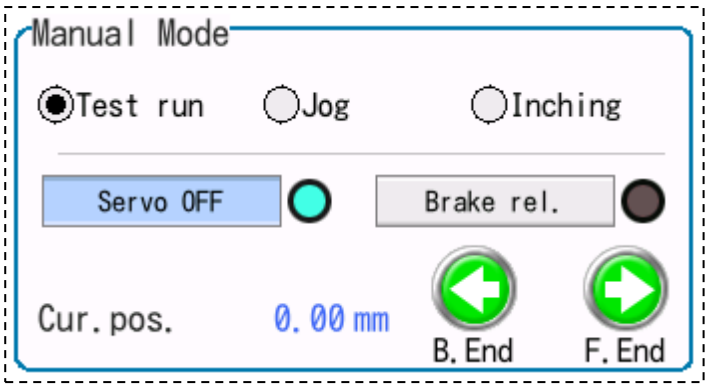


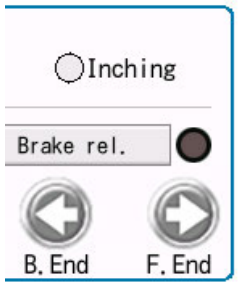
Once the simple data setup window is shown, the manual operation box should show up in the right bottom of the screen.
Selection can be made with ○ (radio buttons) from Trial Run, Jog and Inching.

(1) Test Run

Select Test run in radio buttons (○).

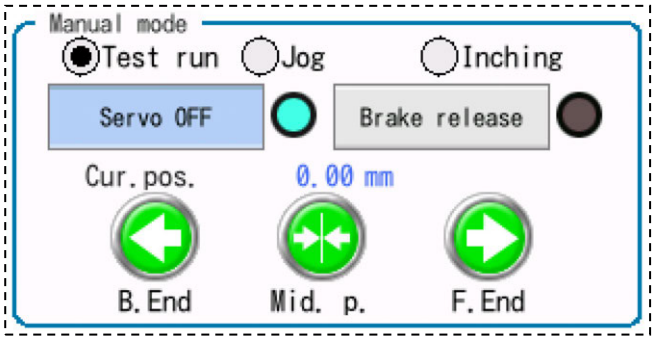
2-position setting

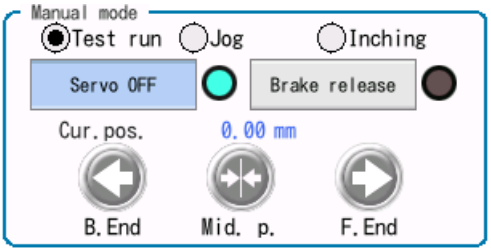




Set values not transferred

3-position setting





It should be switched over between power on and off by Servo OFF.
It should be switched over between brake compulsory release on and off by Brake rel..

The actuator moves to the backward end at B. End.
Make operation using velocity and acceleration/deceleration in the operation conditions (Way back: from F. End to B. End).
When 3-position setting, make operation using velocity and acceleration/deceleration in the operation conditions (Way back: from F. End/Mid. P. to B. End).

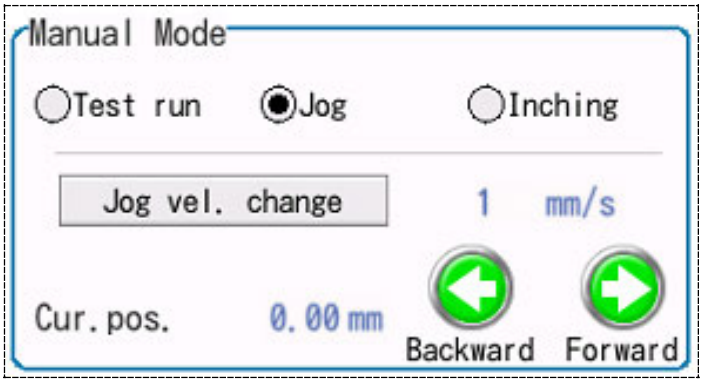
The actuator moves to the forward end at F. End.
Make operation using velocity and acceleration/deceleration in the operation conditions (Way forward: from B. End to F. End).
When 3-position setting, make operation using velocity and acceleration/deceleration in the operation conditions (Way forward: from B End/Mid. P. 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 and backward operations should activate while the button is touched and held. Release the button and the operation should stop.
B. End, F. End and 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 an ELECYLINDER in advance by pressing Transfer button.

(2) JOG

Select JOG in radio buttons (○).



An actuator keeps moving backward while touching Backward button.
Regardless of the backward end setting, the actuator should move backwards till the home position.

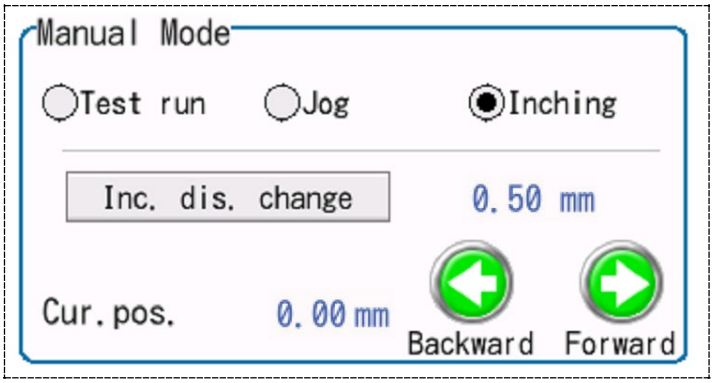
An actuator keeps moving forward while touching Forward button.
Regardless of the forward end setting, the actuator should move forwards till the stroke end.

Touch Jog vel. change button and the jog 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 (○).



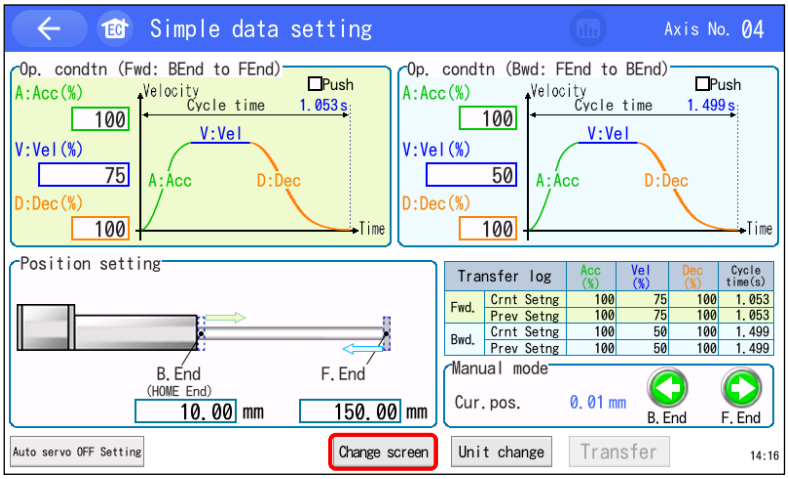
Touch Backward button and an actuator should move backward in a certain distance.
Regardless of the backward end setting, the actuator should move backwards till the home position.

Touch Forward button 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.

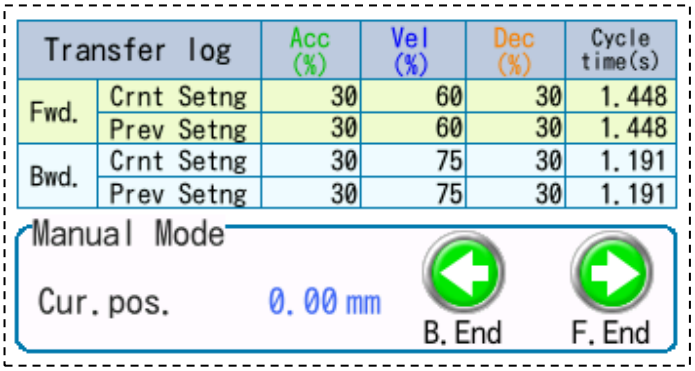
Touch Inc. dis. change button and the distance to move in one touch should change in the order below.

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)



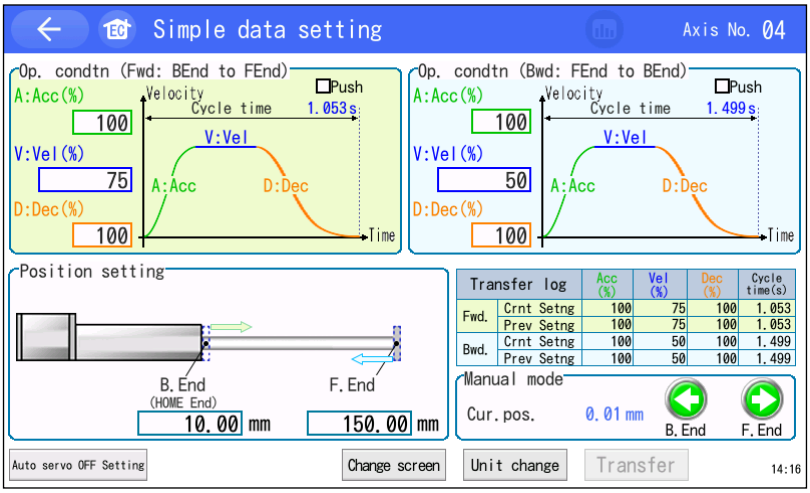
Touch Change screen button and the screen should be switched over between the manual operation display and data transfer history display.
Switchover is available in any condition of Test run, Jog and Inching.



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.

19.4.4 Mounting Orientation Setting / Payload Setting

By setting "Mounting Orientation" and "Payload [kg]" 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.

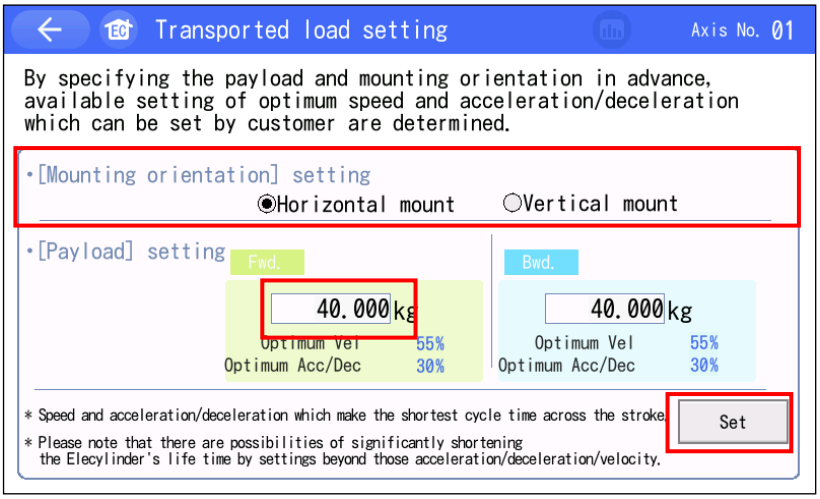


Touch either acceleration, velocity or deceleration.



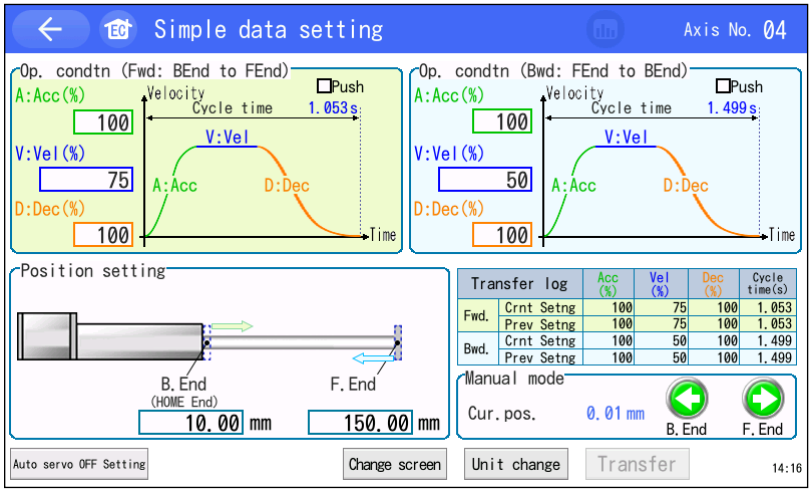
The numeric key pad should open. Touch Change on the right bottom.

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 Set.

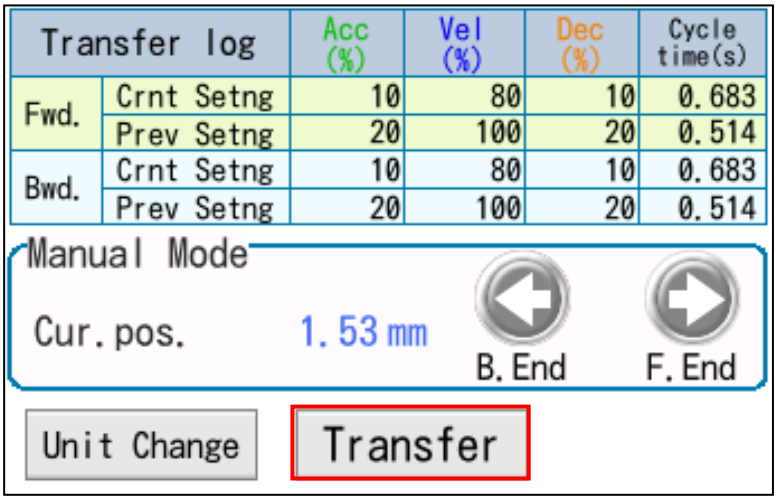
The unit is "kg-m^2" for rotary type



Touch an operational condition to be set or adjusted.



Input a value in the numeric keys and touch ENT.



Touch Transfer.

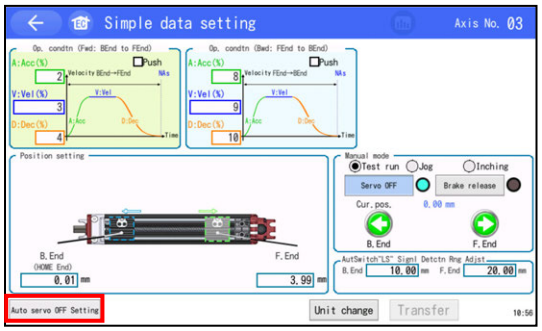
The values should get written to the controller, B. End and F. End should turn into green and "Transfer log" should be updated.

Payload Setting Not Applicable Model

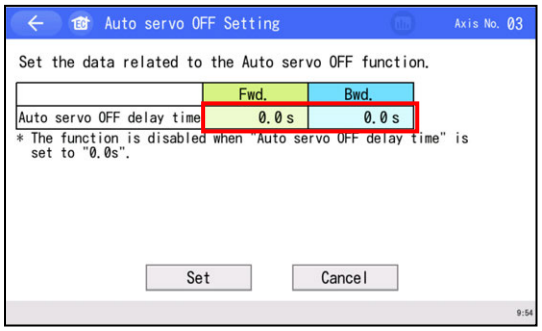
- Ultra Mini ELECYLINDER (EC-SL3□, GDS3L, GDB3□, T3□)
- Gripper Type (EC-GRB8M, GRB10M, GRB13M, GRB13L)
- Stopper Cylinder ECO Type (EC-ST15ME)
- Wire Cylinder: EC-WER1/WEGR2

19.4.5 Auto servo OFF

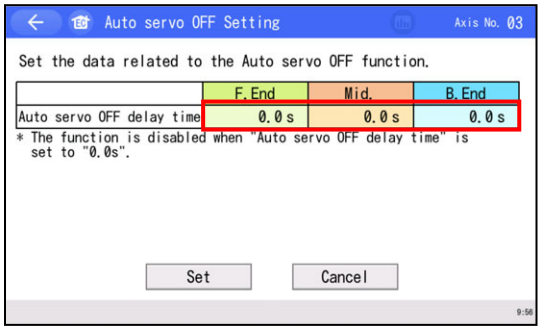
When the latency is set to the automatic servo-off, the servo should turn off once the set time has passed after the operation is completed. The automatic servo-off latency can be set to each of back and forth ways.



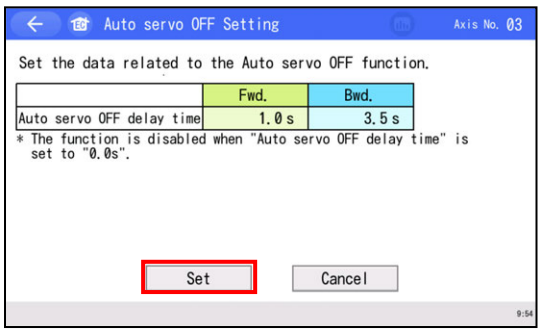
Touch Auto servo OFF Setting and the automatic servo-off setup window should appear.



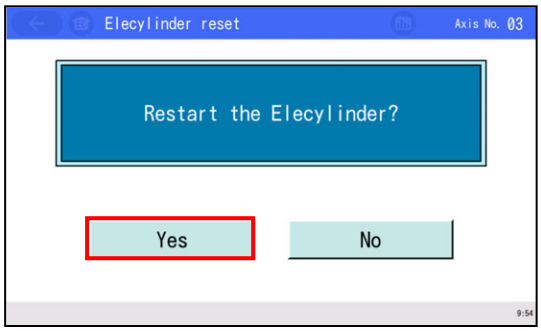
Set the automatic servo-OFF latency to back and forth ways.



In the 3-position setting, setup for the middle position comes available.



Touch Set after input.



Touch Yes.

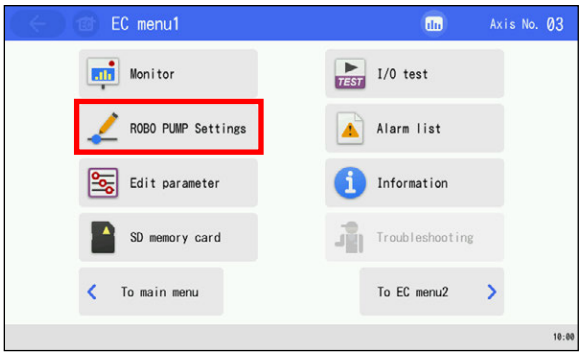
Reboot the controller and the automatic servo-off setup is complete.

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 wide ELECYLINDER	V0001 or later

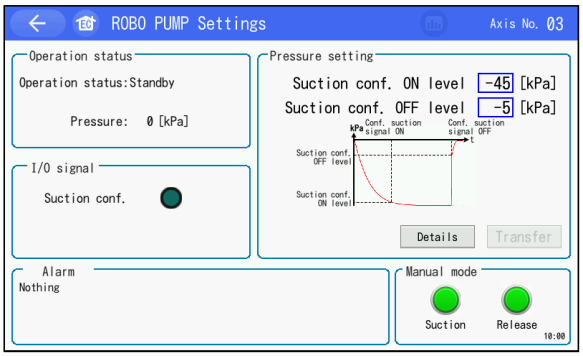
19.5 ROBO PUMP Setting

The ROBO PUMP Settings button should be displayed. Touch it and the screen shifts to the ROBO PUMP setting window.
In the ROBO PUMP setting window, settings for suction of ROBO PUMP, release, display of status monitor, pressure setting and detail settings are available.

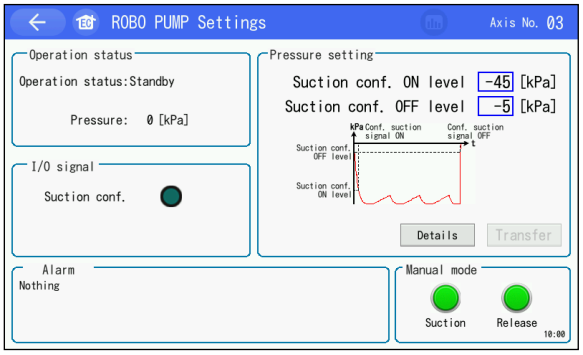


Touch [ROBO PUMP Settings] button on the EC Menu 1 window.

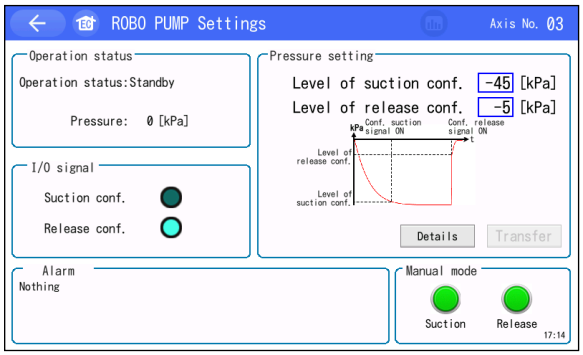
The ROBO PUMP setting window appears.
The contents of pressure setting may differ depending on the PIO patterns and enable or disable of the energy-saving mode.



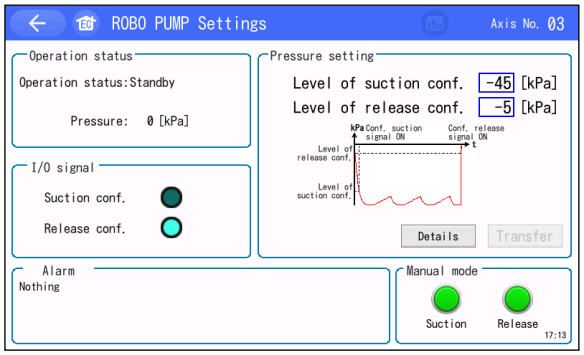
When PIO pattern is 0 or 1, and energy-saving mode is disabled



When PIO pattern is 0 or 1, and energy-saving mode is enabled

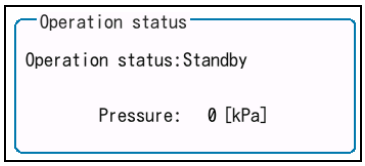


When PIO pattern is 2, and energy-saving mode is disabled



When PIO pattern is 2, and energy-saving mode is enabled

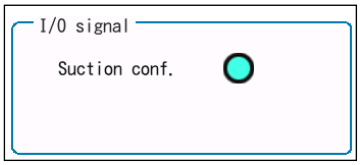
19.5.1 Operation Status



The detail of display is as follows:

1) Operation status : The operation status of ROBO PUMP should be displayed.
2) Pressure [kPa] : Pressure at the vacuum pump part should be displayed.

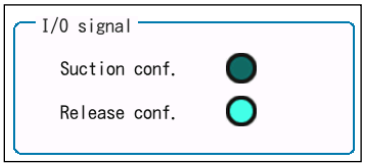
19.5.2 I/O Signal



When PIO pattern is 0 or 1

The detail of display is as follows:

1) Suction conf. : It should turn on when suction is complete.
It should be off when suction is not complete.

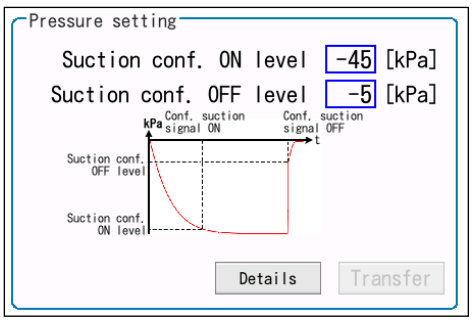


When PIO pattern is 2

The detail of display is as follows:

2) Suction conf. : It should turn on when suction is complete.
3) Release conf. : It should turn on when release is complete.

19.5.3 Pressure Setting



The display, setting details and process when each button is touched are as shown below.

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.

2) Suction conf. OFF level [kPa] : The lower 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.

3) Suction conf. 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.

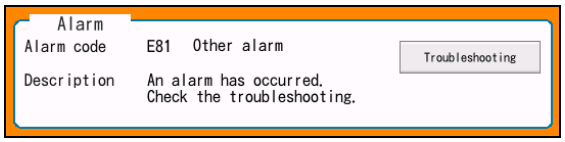
4) Release conf. level [kPa] : The lower limit of pressure to terminate release should be set up.
The unit is [kPa] and integers in negative can also be input.
Settings cannot be changed during suction or release in the monitoring mode.

5) Details button : The ROBO PUMP Advanced Settings window should be displayed
[Refer to 19.5.8.1 ROBO PUMP Advanced Settings 1 Window (Energy-saving mode) and 19.5.8.2 ROBO PUMP Advanced Settings 2 Window (Level Setting)]

6) Transfer button : The changed setting should be sent to ROBO PUMP.
When there is no change made to the settings or during suction or release, the Transfer button should be deactivated.

7) Pressure setting graph : The relation between the suction confirmation ON and OFF levels and the pressure should be shown.

19.5.4 Alarm



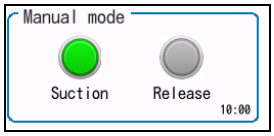
The display and process when each button is touched are as shown below.

1) Alarm code : An occurred alarm code should be displayed.
“None” should be shown when there is no alarm occurred.

2) Description : The details of an occurred alarm should be displayed.

3) Troubleshooting button : The screen moves to the troubleshooting window.

19.5.5 Manual Mode



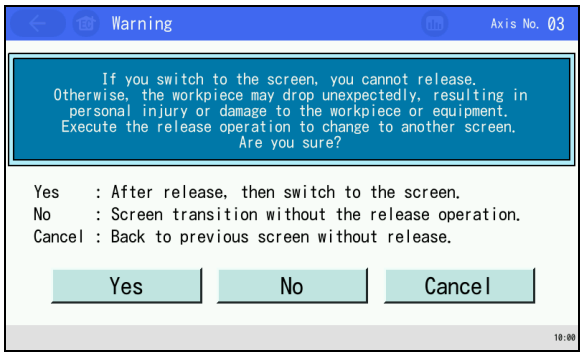
The process when each button is touched are as shown below.

1) 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.

2) 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.

19.5.6 Release Warning Confirmation Window

When it is attempted to move to the EC Menu 1 window or Select Axis window during suction, the release warning confirmation window should open.



The process when each button is touched are as shown below.

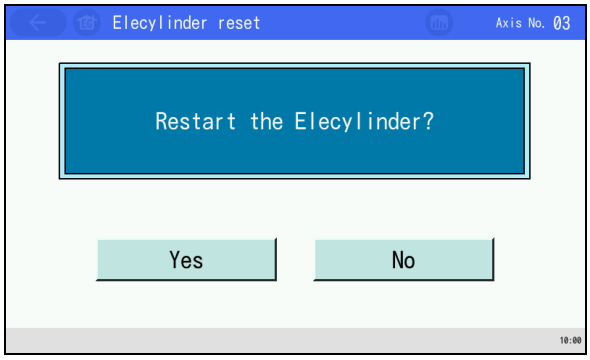
1) Yes button : The screen should go to the EC Menu 1 window or Select Axis window after the release process is completed.

2) No button : The release process should not be performed before the screen goes to the EC Menu 1 window or Select Axis window.

3) Cancel button : The release process should not be performed, and the screen should go back to the ROBO PUMP Settings (ROBO PUMP Advanced Settings) window.

19.5.7 Deleting Data in Edit Confirmation Window

When data has been edited, but the Transfer button was not touched and attempted to go to the EC Menu 1 window or Select Axis window, the Deleting Data in Edit Confirmation window should come out.



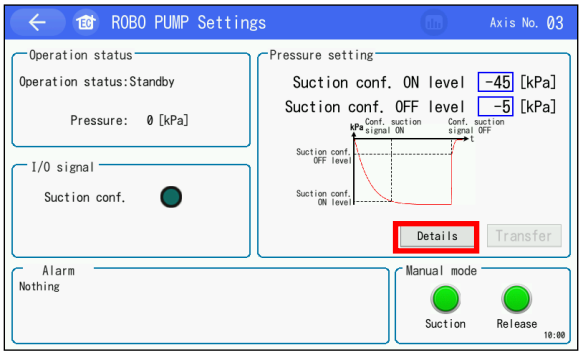
The process when each button is touched are as shown below.

1) Yes button : The data should be deleted and the screen goes to the EC Menu 1 window or Select Axis window.

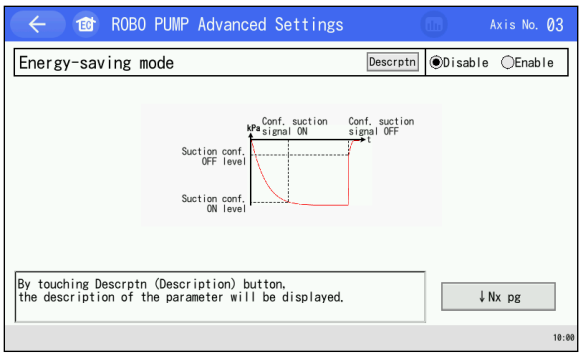
2) No button : The data should not be deleted, and the screen goes back to the ROBO PUMP Settings (ROBO PUMP Advanced Settings) window.

19.5.8 ROBO PUMP Advanced Settings Window

By touching the Details button in the ROBO PUMP Settings window, the screen goes to ROBO PUMP Advanced Settings Window 1. In ROBO PUMP Advanced Settings Window 1, the energy-saving mode enable/disable can be switched over.

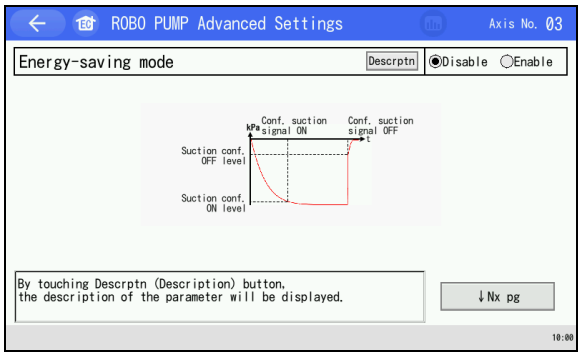


Touch the Details button in the ROBO PUMP Settings window.



The ROBO PUMP Advanced Settings window 1 should be displayed.

19.5.8.1 ROBO PUMP Advanced Settings 1 Window (Energy-saving mode)



The display, setting details and process when each button is touched are as shown below.

1) Descrptn button : Touch it and an explanation of the energy-saving mode should be shown at the bottom of the window.

2) Disable, Enable 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.

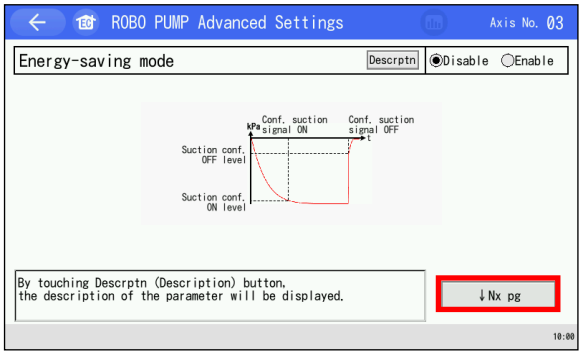
3) Pressure setting graph : The relation between the suction confirmation ON and OFF levels and the pressure should be shown.

4) Energy-saving mode : Touch the Descrptn button, and an explanation of the energy-saving mode should be shown.

5) ↓Nx pg button : ROBO PUMP Advanced Setting Window 2 (Level Setting) should be displayed.

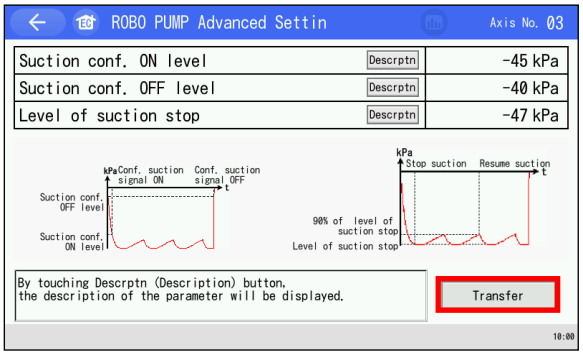
19.5.8.2 ROBO PUMP Advanced Setting 2 Window (Level setting)

By touching the ↓ Nx pg button in ROBO PUMP Advanced Settings Window 1, the screen goes to ROBO PUMP Advanced Settings Window 2. In ROBO PUMP Advanced Settings Window 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.

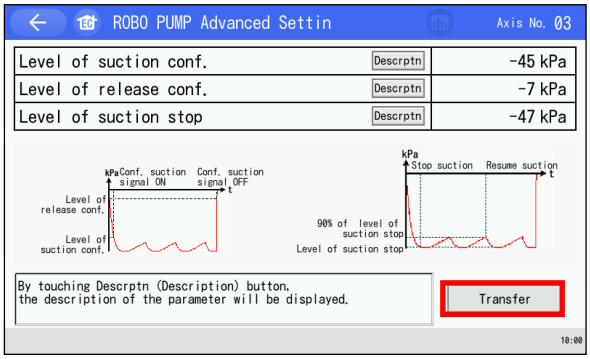


Touch the ↓ Nx pg button in the ROBO PUMP Advanced Settings window 1.

ROBO PUMP Advanced Settings Window 2 should be displayed.



When PIO pattern is 0 or 1



When PIO pattern is 2

The display, setting details and process when each button is touched are as shown below.

1) Suction conf. ON level : The pressure to turn the suction confirmation signal ON is set up.
Integers in negative can be input.
The suction confirmation signal should turn ON when the pressure gets below the set value.

2) Suction conf. OFF level : The pressure to turn the suction confirmation signal OFF is set up.
Integers in negative can be input.
The suction confirmation signal should turn OFF when the pressure gets above the set value.

3) Level of suction cont. : The pressure to turn the suction confirmation signal ON is set up.
Integers in negative can be input.
The suction confirmation signal should turn ON when the pressure gets below the set value.

4) Level of release conf. : The pressure to turn the release confirmation signal ON is set up.
Integers in negative can be input.
The release confirmation signal should turn ON when the pressure gets below the set value.
It should turn OFF when the suction signal turns on.

5) Level of suction stop : The pressure to stop the suction action is set up.
Integers in negative can be input. It is available to set up when the energy-saving mode is enabled. 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.

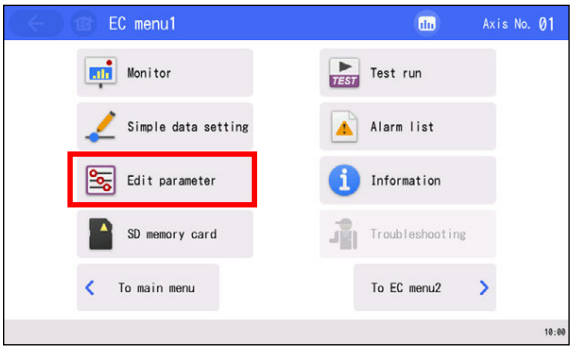
6) Descrptn button : Touch it and an explanation for the level setting should be shown at the bottom of the window.

7) Parameter Description Box : Touch the Descrptn button, and an explanation for the level setting should be shown.

8) Transfer button : The changed setting should be sent to ROBO PUMP.

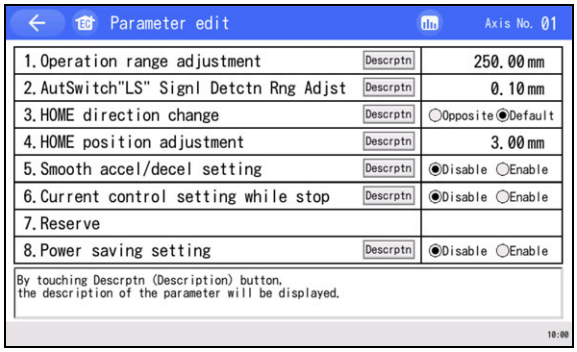
19.6 Edit Parameter

Parameters are displayed and edited.



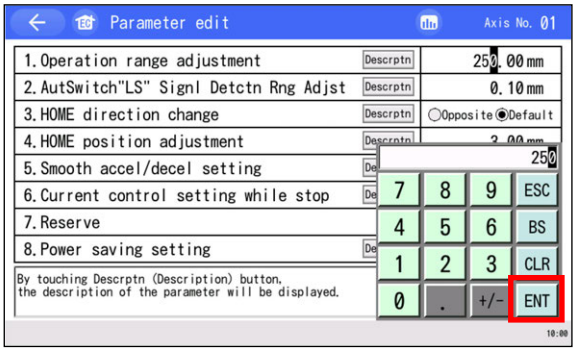
Touch Edit parameter button on the EC menu 1 window.

A parameter table is displayed. (The displayed items may differ depending on models.)



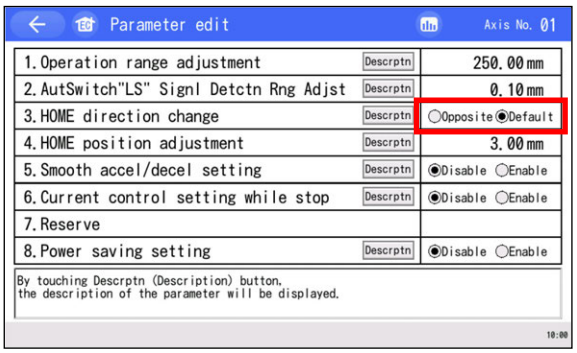
Next page shows the basic operation in the edit parameter window.

(1) Item to input a setting value



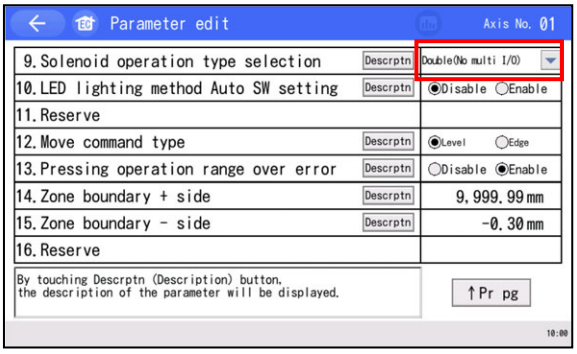
Touch a value that you would like to set up and the numeric keys should appear.
Touch numbers on the numeric keys to input and touch ENT button.
When the process needs to be cancelled after the numeric keys appear, touch ESC button.

(2) ○ (radio button) to select by touching

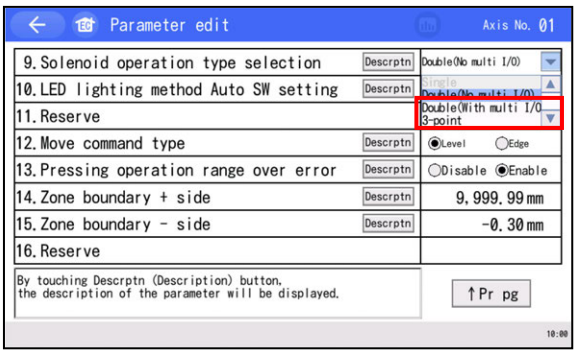


Touch ○ (radio button) of the item or the text itself that you would like to select.
A black dot will be marked in ○ (radio button) that you selected.

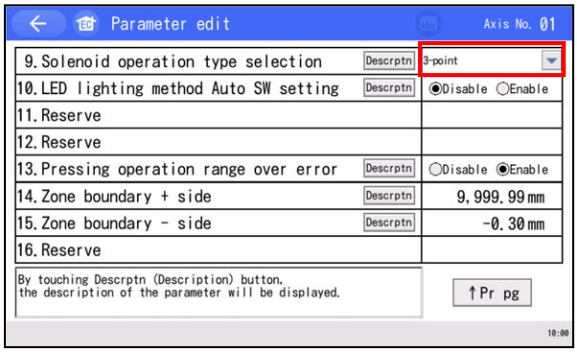
(3) Item to select by touching the combo box (list) to select



Touch ▼ button on the Combo Box.

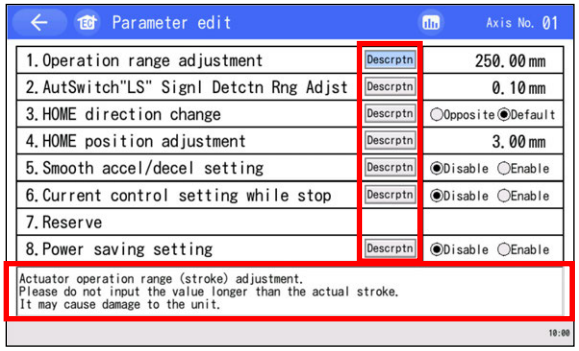


The list will be displayed.
Touch an item in the list.



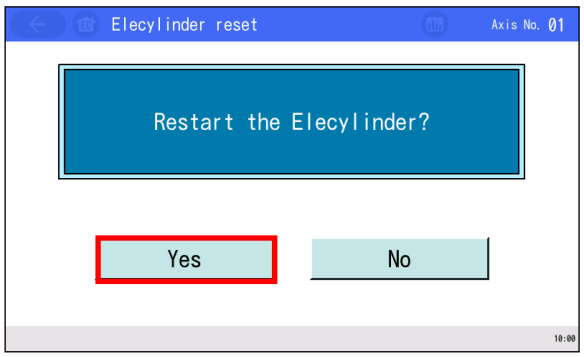
The list will be not displayed.
The selected items will be displayed in the combo box.

(4) Descriptions



Touch Descrptn button and the descriptions of the setting items will be shown in the bottom of the screen.

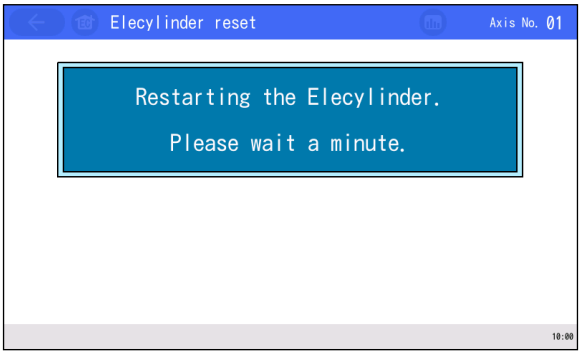
(5) Reflecting Parameters



Touch EC Home Button once all the settings are completed.
A confirmation window asking "Restart?" will come up. Touch Yes button if you have made a change.

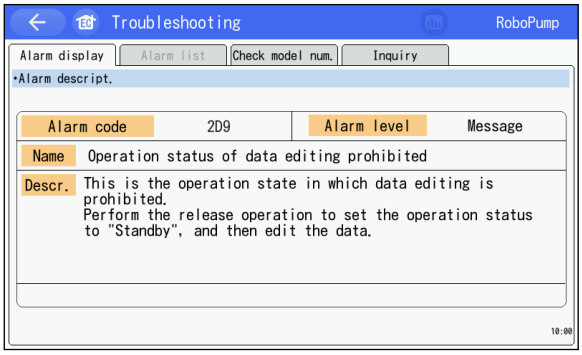
Touch the No button and the screen returns to the edit parameter window without reflecting the parameters you set up. To reflect the parameter you have set, you must restart ELECYLINDER or ROBO PUMP.

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



ELECYLINDER or ROBO PUMP is restarted, after which the parameter you have set will be reflected.

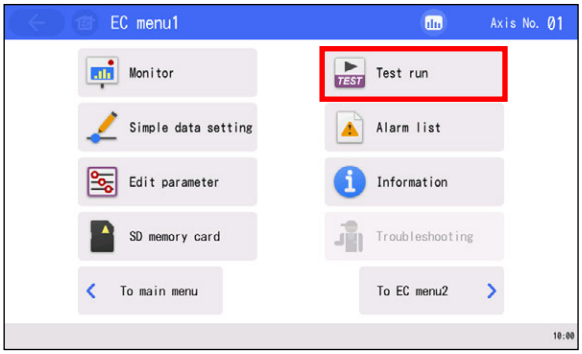
(6) Alarm



When it is attempted to change any settings during ROBO PUMP suction or release, alarm of the operation status of data editing prohibited will be displayed.
The parameter will not be reflected.

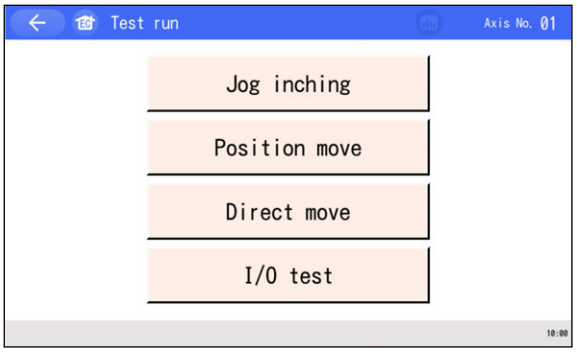
19.7 Test Run

Jog/inching operation, operation to a position registered in the position table, continuous movement, operation by indicating a position directly, monitoring of the input and output signals and compulsory output are available.
For ROBO PUMP, the screen should move directly to the I/O test from EC Menu 1.



Touch Test run button on the EC menu 1 window.
For ROBO PUMP, touch the I/O Test button.

The movement menu window appears.



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

(1) Jog inching
Perform jog/inching operation.
Refer to [19.7.1 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
  Movement should be made from the current position to either of the forward end, the backward end or the middle point which has been indicated. (One time of movement only)
- Continuous
  Movement should be made repeatedly between the forward end, the backward end and the middle point.

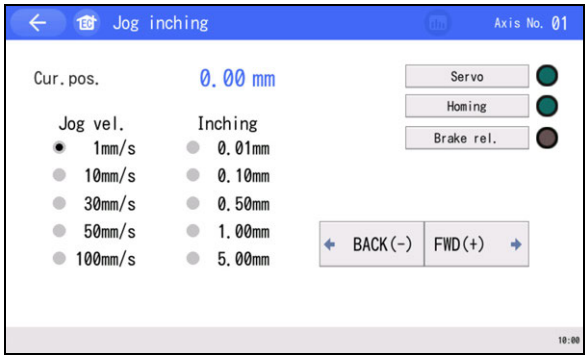
Refer to [19.7.2 Position Movement Operation] for details about how to operate.

(3) Direct move
Input the target position and the speed on the numeric keys to perform movement.
Refer to [19.7.3 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 [19.7.4 I/O Test] for details about how to operate.

19.7.1 Jog Inching Operation (for applicable models only)

You can perform jog/inching operation.



- 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 button : 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 button : It shows the status of completion of the home-return operation. When the home-return operation is incomplete, the display of ○ is inactivated. Touch Homing button and the axis starts home-return operation and the display of ○ gets activated.

- Brake rel. button : For an actuator equipped with a brake, touch Brake rel. button and the brake gets compulsorily released and the circle turns on. Touch Brake rel. button again and the brake works and the circle turns off.

- BACK (-), FWD (+) buttons : 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 (-) button performs JOG operation in negative direction.
  FWD (+) button performs JOG operation in positive direction.

  In inching operation, touch and hold them for 2 seconds, and JOG operation will be performed in 1mm/s. The speed increases in every 1 second afterwards.

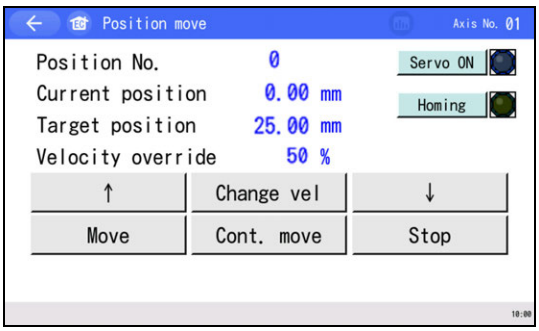
⚠ *Caution: An axis could drop if the brake compulsory release is performed while the servo is off when the axis is installed in the vertical orientation.*

19.7.2 Position Movement Operation (for applicable models only)

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 [19.1.1 EC Operation Mode]



When Safety Velocity is Valid



When Safety Velocity is Invalid

- Position No. : "1" should be shown when the forward end is selected, "0" when the backward end is selected and “2” when the middle point is selected. (The middle point can only be selected when 3-position setting)
- Current position : Displays the current position.
- Target position : Displays the target position set in the selected position number.

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

When Safety Velocity is Invalid;
- Velocity override : Displays the selected speed override (%).
- Servo ON button : It shows the status of the servo whether it is ON or OFF for the axis. Touch the Servo ON button and the axis turns the servo on. Touch it again and the axis turns the servo off. When the servo is ON, display of ○ is activated and it is inactivated when the servo is OFF.
- Homing button : It shows the status of completion of the home-return operation. When the home-return operation is incomplete, the display of ○ is inactivated. Touch Homing and the axis starts home-return operation and the display of ○ gets activated.
- ↑, ↓ buttons : Touch ↑ or ↓ buttons to select a position number (1: forward end/0: backward end/2: middle point) for the movement target.

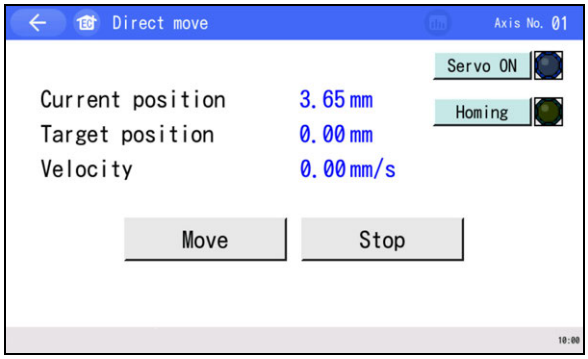
When Safety Velocity is Valid;
- Change vel button : Speed can be changed in order of 1mm/s, 10mm/s, 30mm/s, 50mm/s and 100mm/s every time touching Change vel button.

When Safety Velocity is Invalid;

- Change vel button : Speed override can be changed in order of 10%, 50% and 100% every time touching Change vel button.
- Move button : Touching Move button moves the axis to the target position.
- Cont. move button : Touch Cont. move button and the axis performs continuous operation between the forward end, the backward end and the middle point till touching Stop button.
- Stop button : Touching Stop button stops the axis.

19.7.3 Direct Movement Operation

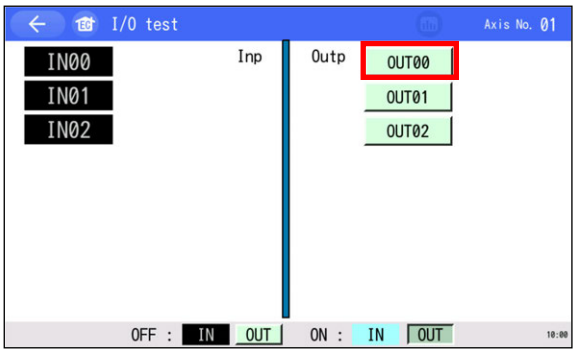
A position is specified directly to move the axis.



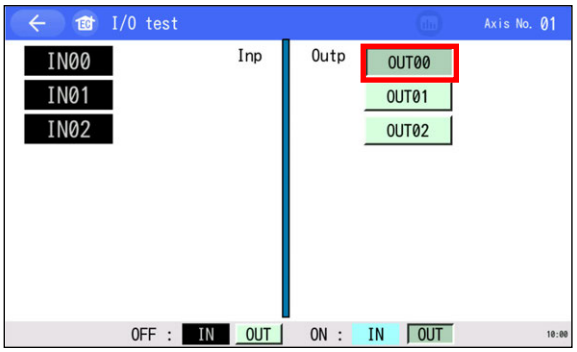
- Current position : Displays the current position.
- Target position : Touching "Target position" displays the numeric keypad. Enter a desired target position and then touch ENT button.
- Velocity : Touching "Velocity" displays the numeric keypad. Enter a desired speed and then touch ENT button.
- Servo ON button : It shows the status of the servo whether it is ON or OFF for the axis. Touch the Servo ON button and the axis turns the servo on. Touch it again and the axis turns the servo off. When the servo is ON, display of ○ is activated and it is inactivated when the servo is off.
- Homing button : It shows the status of completion of the home-return operation. When the home-return operation is incomplete, the display of ○ is inactivated. Touch Homing button and the axis starts home-return operation and the display of ○ gets activated.
- Move button : Touching Move button moves the axis to the target position you have set.
- Stop button : Touching Stop button stops the axis.

19.7.4 I/O Test

The input signal and the output signal can be monitored.
You can also touch OUT00 to OUT02 (for 3-position setting, OUT00 to OUT03) to forcibly turn ON/OFF the corresponding output signals.
Touch I/O test button in the trial operation menu window (or EC menu 1 window) to open the I/O test window.



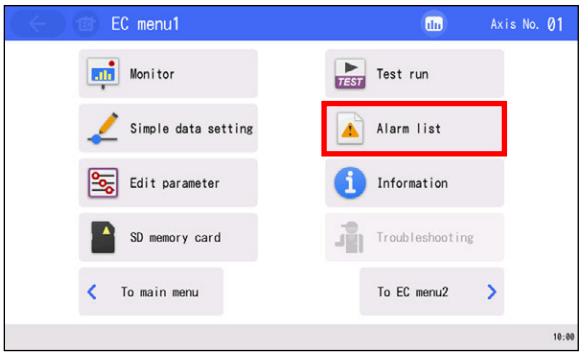
If it is necessary to turn on OUT00 which is currently off, touch OUT00 button.



OUT00 turns on.
Touch OUT00 button again and it turns off.

19.8 Alarm List

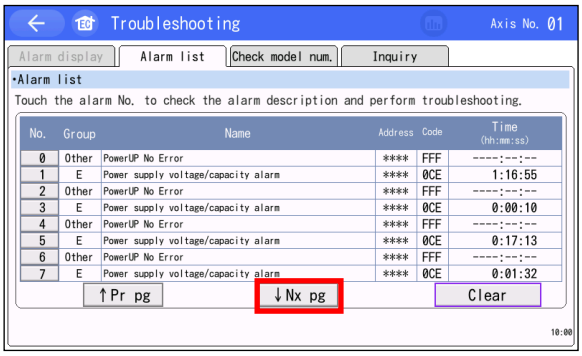
A list of alarms that may generate after ELECYLINDER or ROBO PUMP power is turned on is shown. The displayed items should differ for ELECYLINDER and ROBO PUMP.



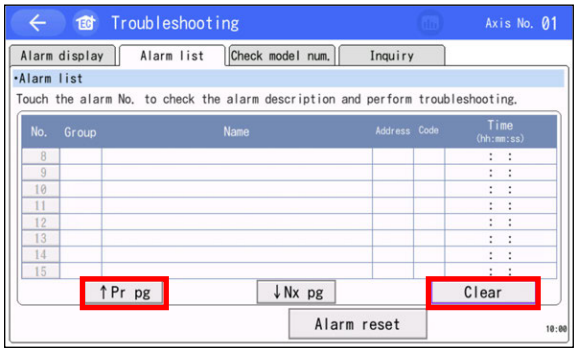
Touch Alarm list button on the EC menu 1 window. ELECYLINDER's or ROBO PUMP alarm list appears.

19.8.1 Display of Alarm List (ELECYLINDER)

For displayed should be numbers, groups, names, addresses, code and alarm occurred time (hour, minute, second).
The time of occurrence of each alarm is indicated by an elapsed time from this "PowerUP No Error".



Touching ↓ Nx pg button displays the list of the next window.

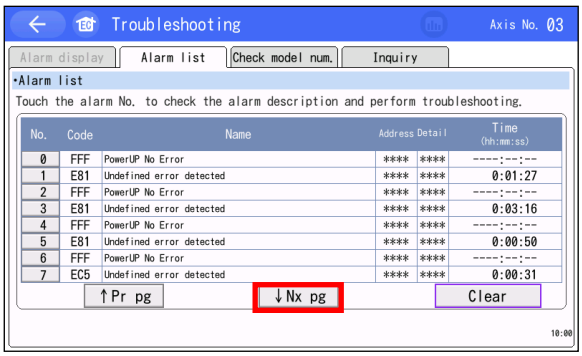


Touching ↑ Pr pg button displays the list of the previous window.

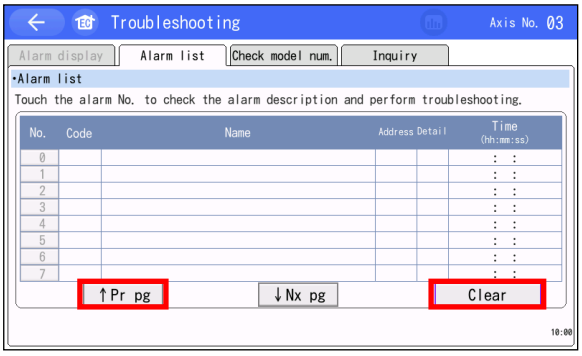
Touching Clear button clears all alarm details.

19.8.2 Display of Alarm List (ROBO PUMP)

For displayed should be numbers, code, names, addresses, details and alarm occurred time (hour, minute, second).
The time of occurrence of each alarm is indicated by an elapsed time from this "PowerUP No Error".



Touching ↓ Nx pg button displays the list of the next window.



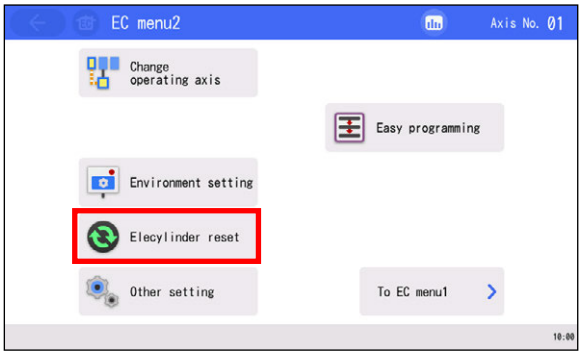
Touching ↑ Pr pg button displays the list of the previous window.

Touching Clear button clears all alarm details.

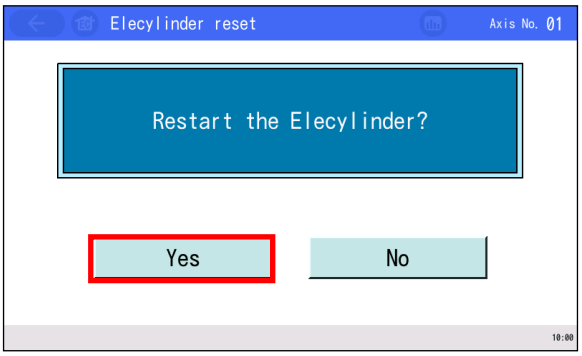
19.9 ELECYLINDER, ROBO PUMP Reset

ELECYLINDER or ROBO PUMP is restarted.

19.9.1 ELECYLINDER Reset

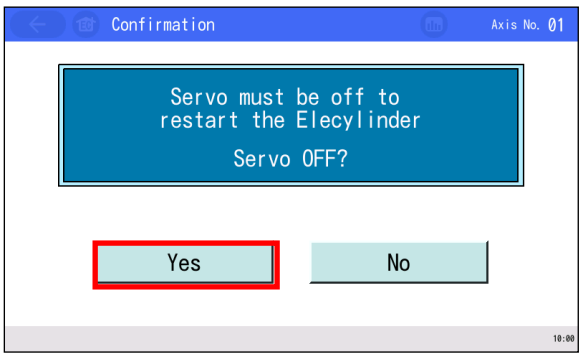


Touch Elecylinder reset button on the EC menu 2 window.



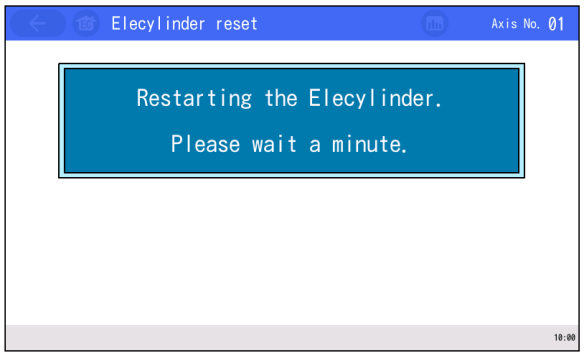
Touch Yes button.

Touch No button to return to the EC menu 2 window without restarting.

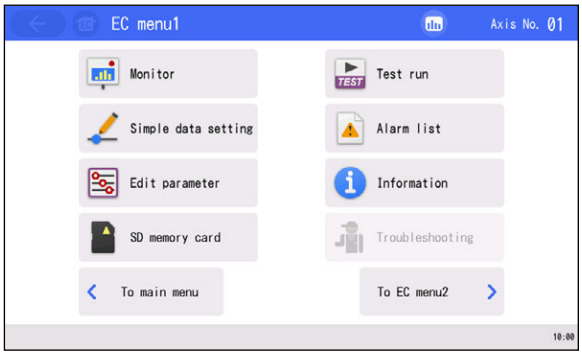


This window appears if the servo is ON.
Touch Yes button.

Touch No button to return to the EC menu 2 window without restarting.

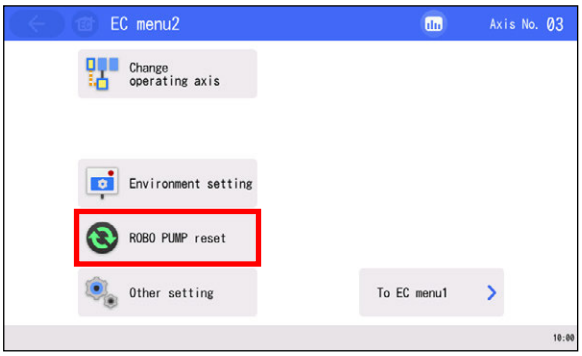


ELECYLINDER is restarted.

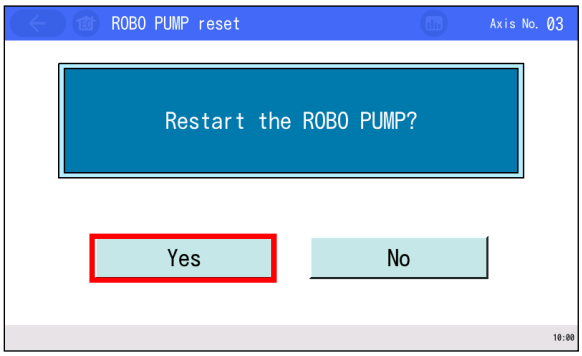


Returns to the EC menu 1 window.

19.9.2 ROBO PUMP Reset

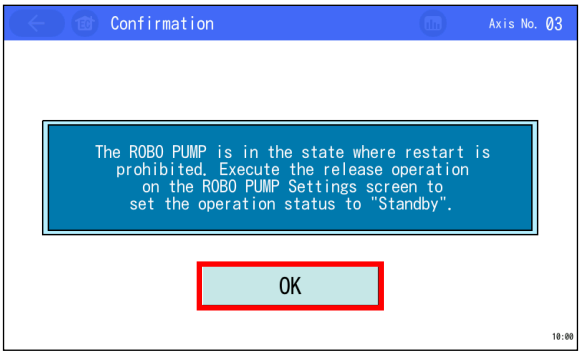


Touch ROBO PUMP reset button on the EC menu 2 window.

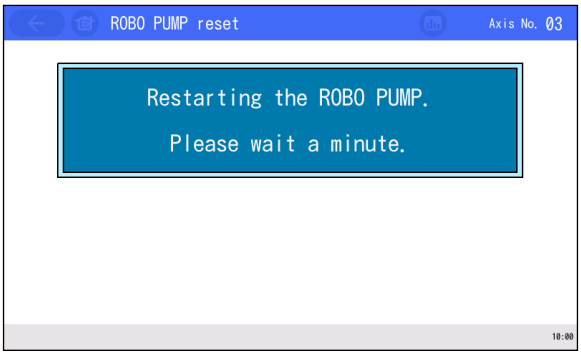


Touch Yes button.

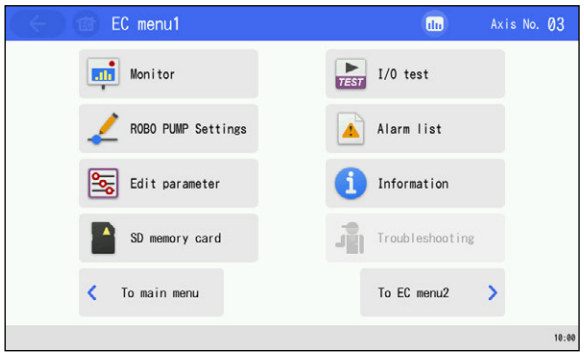
Touch No button to return to the EC menu 2 window without restarting.



The reboot prohibited window should show up when reboot is conducted while ROBO PUMP is in suction or release.
Touch the OK button, and the screen goes to EC Menu 2 Window.



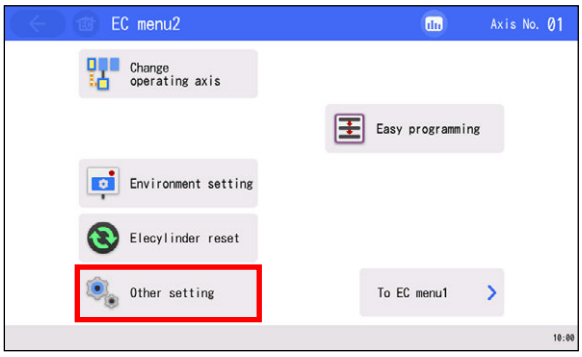
ROBO PUMP should get rebooted.



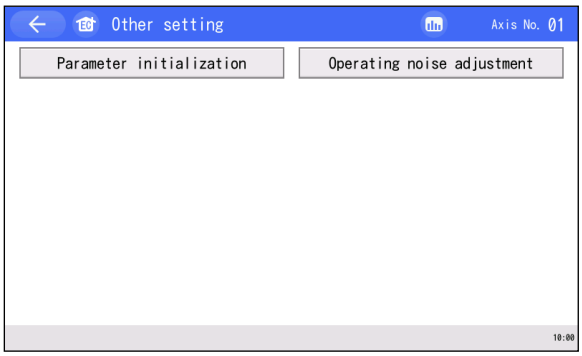
Returns to the EC menu 1 window.

19.10 Other Setting

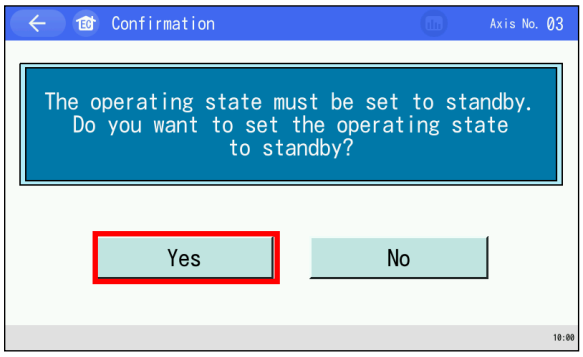
Parameter initialization and operation sound tuning should be conducted.
The displayed items may differ depending on models.



Touch Other setting button in EC menu 2 window.

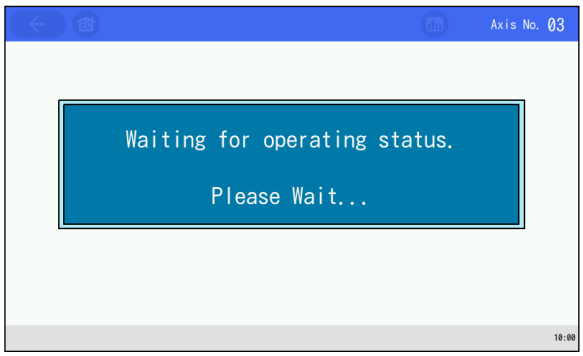


Other setting window opens.
For ROBO PUMP, the Parameter initialization button should be displayed.
Select one from Parameter initialization and Operating noise adjustment that you would like to carry on and touch the button.



Touch the Parameter initialization button during suction or release of ROBO PUMP, and the standby confirmation window should be displayed.
Touch Yes button.

Touch the No button, and the screen goes back to the Other Settings window without bringing ROBO PUMP to standby.



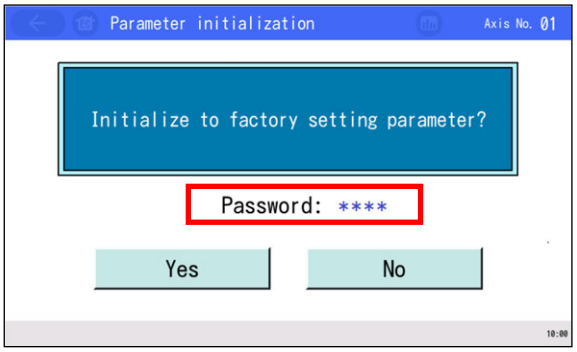
Make ROBO PUMP wait.
After it is completed, the screen goes to the Initialize Parameter window.

19.10.1 Parameter Initialization

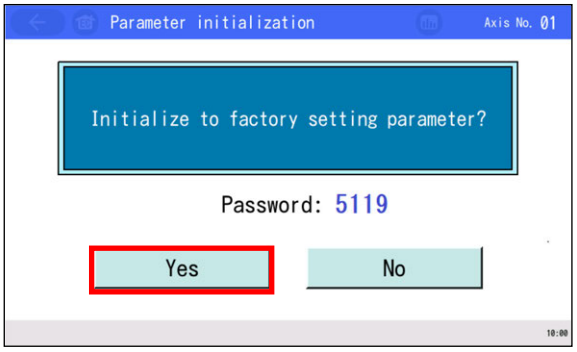
The parameters are reset to their factory default settings (initialized).

> ⚠ *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.*

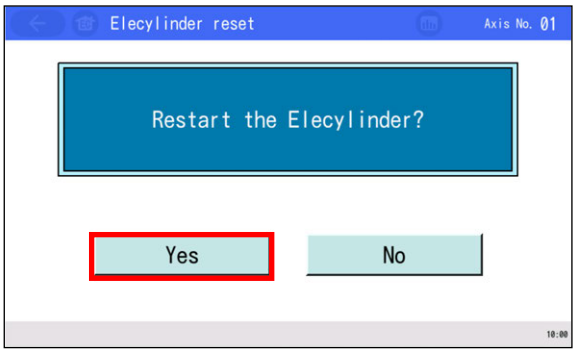
Touch Parameter initialization button in Other setting window to display Parameter initialization window.



Touching "Password" displays the numerical keypad. Input '5119' and touch ENT button.



Touch Yes button, and the confirmation window for ELECYLINDER or ROBO PUMP reboot appears.



Touch Yes button.

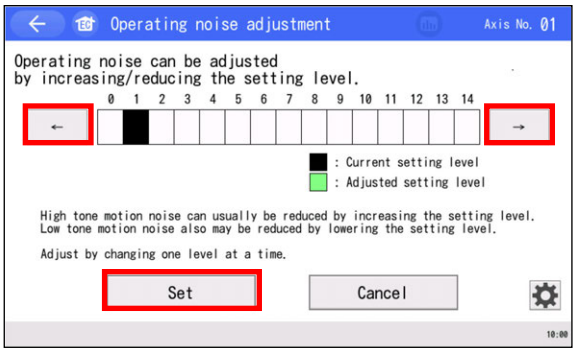
Touch No button, will not be rebooted and the screen returns to the previous.

> ⚠ *Caution: If ELECYLINDER, ROBO PUMP is not restarted, the parameters that have been rewritten to their factory settings do not translate to the factory-set operations. Although the settings are overwritten to the default settings on delivery, the operation should not be performed with the parameters on delivery. It should be effective after rebooting ELECYLINDER or ROBO PUMP or turning the power on again.*

19.10.2 Operation Noise Tuning (for 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 button in the Other Setting window to display the operating noise adjustment window.

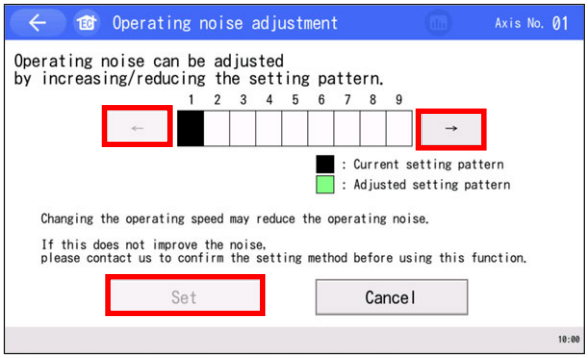
- When Models that Support Level Setting



Touch ← and → buttons on the right and left of the levels to adjust the level one by one to perform tuning.

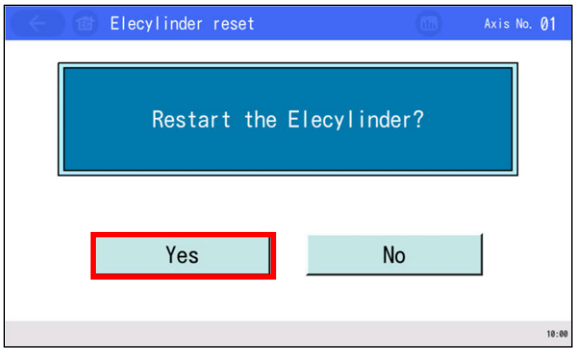
Once the tuning is finished, touch Set button.

- When Models that Support Pattern Setting



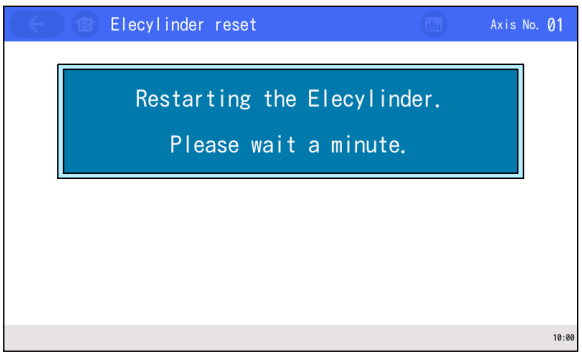
Touch ← and → buttons on the right and left of the patterns to adjust the level one by one to perform tuning.

Once the tuning is finished, touch Set button.

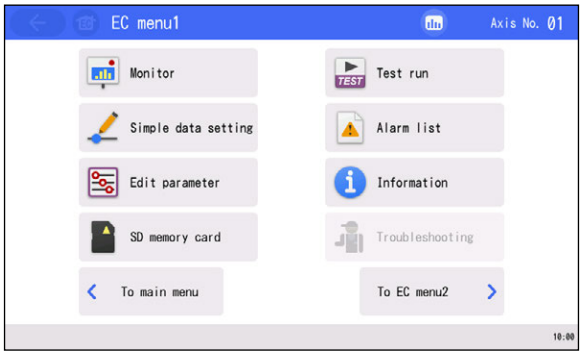


Touch Yes button.

Touch No button and a reboot of ELECYLINDER would not be performed and the screen goes back to the previous window.



ELECYLINDER should be rebooted.



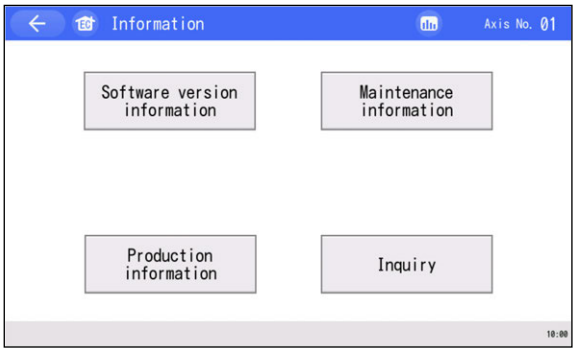
The screen goes back to EC menu 1 window.

19.11 Information Display

Information such as ELECYLINDER or ROBO PUMP version, manufacturing information and maintenance information is displayed.



Touch Information button on the EC menu 1 window.



The information menu window appears.

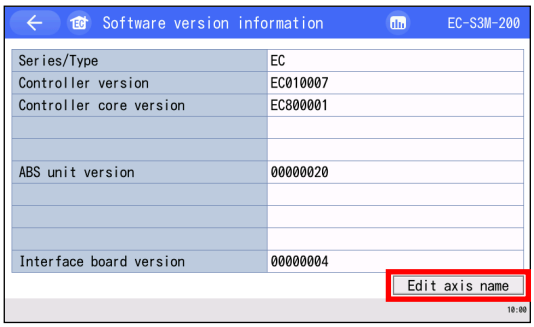
Touch a button of the feature that you would like to display such as Software version information.

19.11.1 Information Display Windows

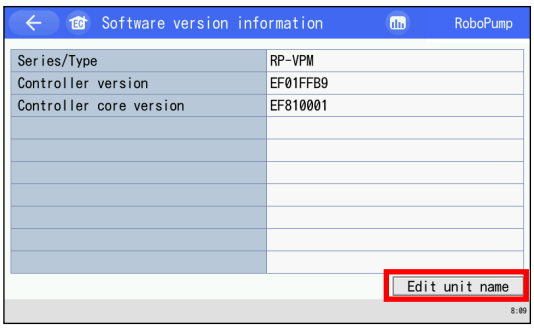
19.11.1.1 Software Version Information

Touch Software version information button in Information menu window.
Software version information window opens.

ELECYLINDER window



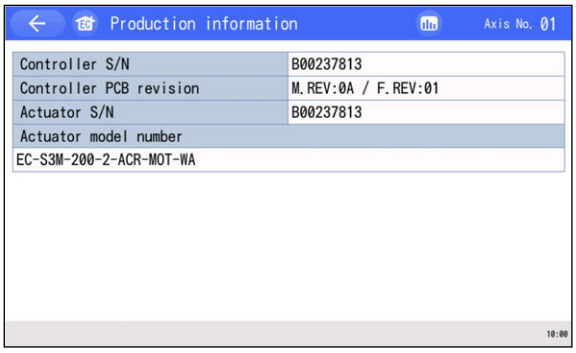
ROBO PUMP window



Touch the Edit Axis Name button or the Edit Unit Name button and the names of axes/units can be edited. (The button would not be displayed if there is no setting established in the axis name display in the configuration.)
For how to edit an axis/unit name, refer to [19.11.2 Editing Axis Name and Unit Name].

19.11.1.2 Production Information

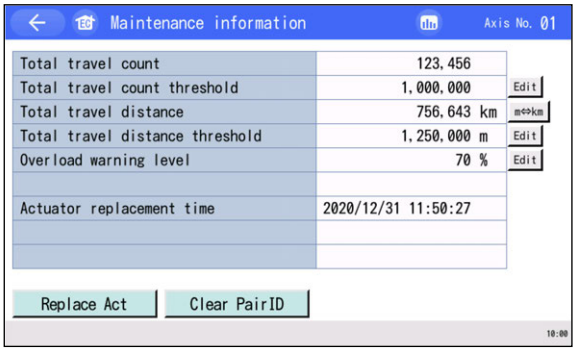
Touch Production information button in Information menu window.



Production information window opens.

19.11.1.3 Maintenance Information

Touch Maintenance information button in Information menu window.



Maintenance information window opens.
Refer to [19.3.3 Maintenance Information Window] for how to operate displayed button.

19.11.1.4 Inquiry

Touch Inquiry button in Information menu window.

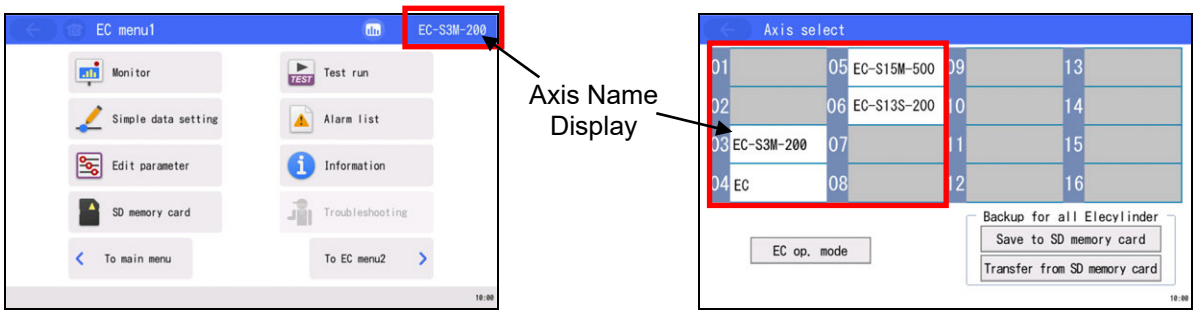


Inquiry window opens.

19.11.2 Editing Axis Name and Unit Name

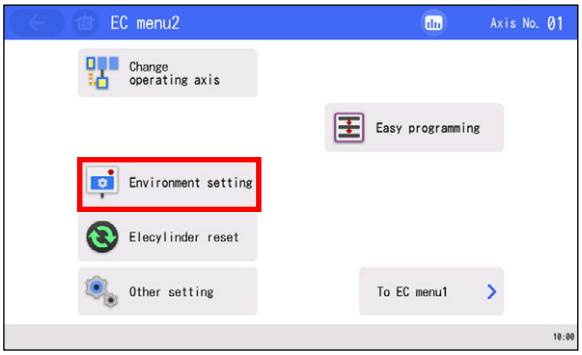
A name can be set on an axis. To show the axis name, select Axis Name at the axis name display section in the environment setting window.
Refer to [19.12 Environment Setting [Axis Name Display]]

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

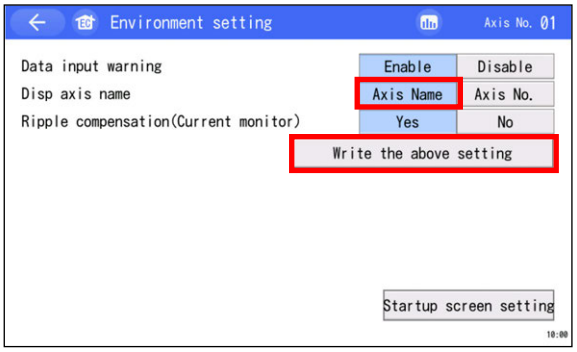


(Note) The characters available to set in TB-02 are the half-size font characters and symbols. Use the PC software for input with full size characters.

[Axis Name Edit Operation]



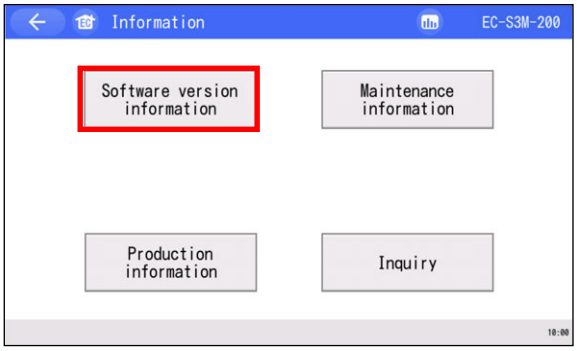
Touch Environment setting button on the EC menu 2 window.



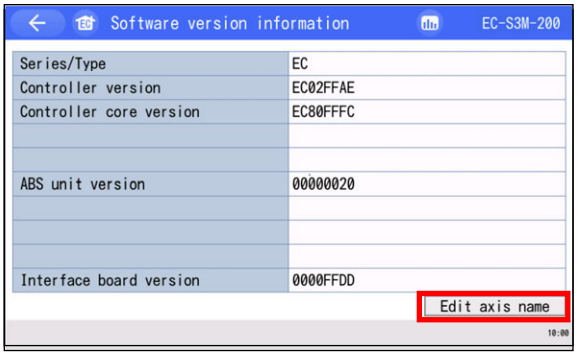
Touch the Axis Name button to switch the setting to the axis name, and then touch the Write the above setting button.
The setting will not be changed when you move to another screen without touching it.



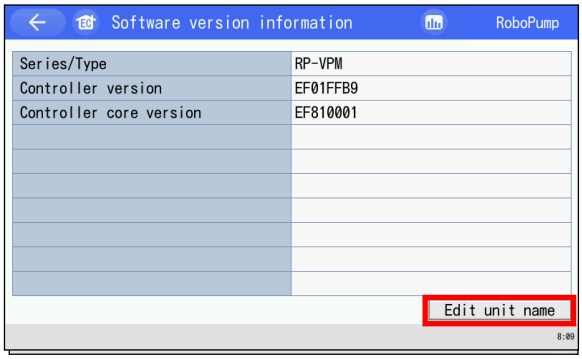
Touch Information button on the EC menu 1 window.



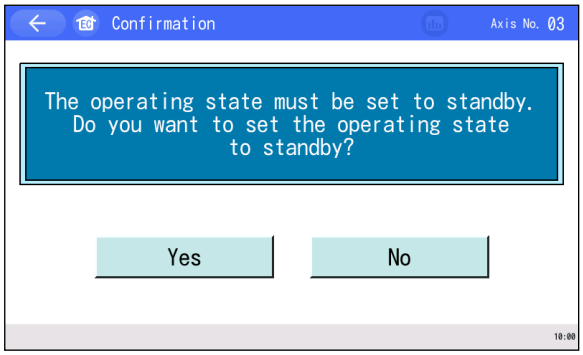
Information window opens.
Touch Software version information button.



For ELECYLINDER, touch Edit axis name button.

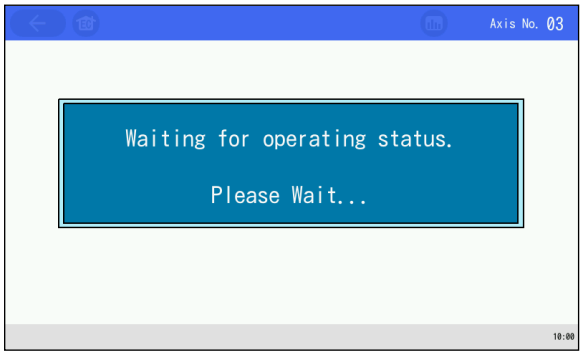


For ROBO PUMP, touch Edit unit name button.

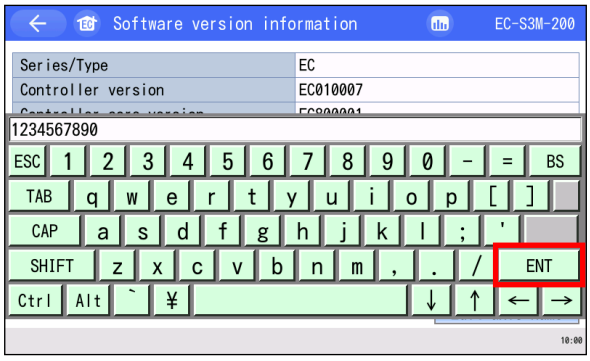


Touch the Edit Unit Name button during suction or release of ROBO PUMP, and the standby confirmation window should open.
Touch Yes button.

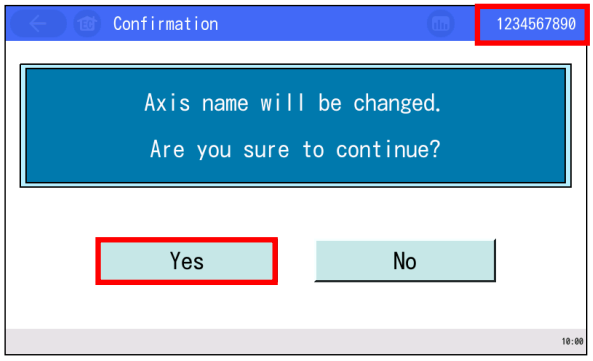
Touch the No button, and the screen goes to the software version information window without bringing ROBO PUMP to standby.



Make ROBO PUMP wait.



A full-size keyboard should be displayed in the bottom half of the window.
Input a name and touch ENT button.
The number of characters available to input is up to 12 half-size font characters.
Touch ENT button with nothing input, and it is defined as no setting. With no setting, an axis number will be shown.

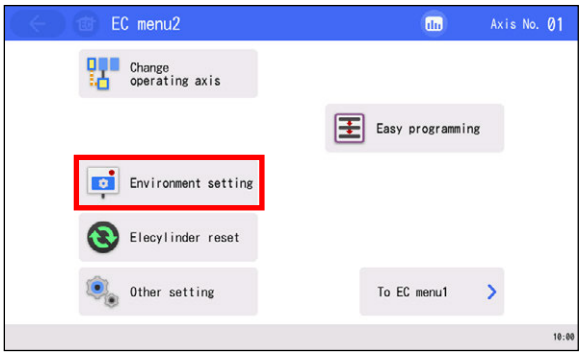


Displayed in the top right is the name of the axis. (Tentative setting condition)
Touch Yes button to confirm the setting.

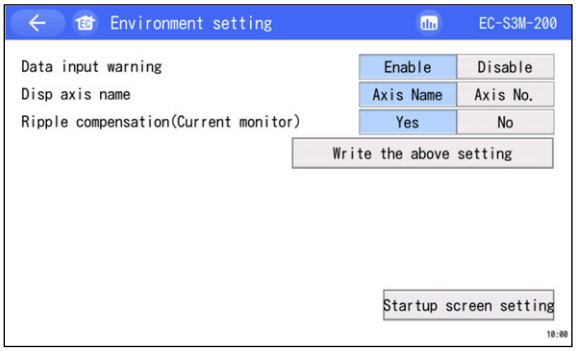
Touch the No button and the setting goes back to the one changed.

19.12 Environment Setting

Data input warning setting, axis name display setting, ripple compensation and startup initial window setting should be conducted. For other configurations, refer to [Environment Setting in Chapter 21].



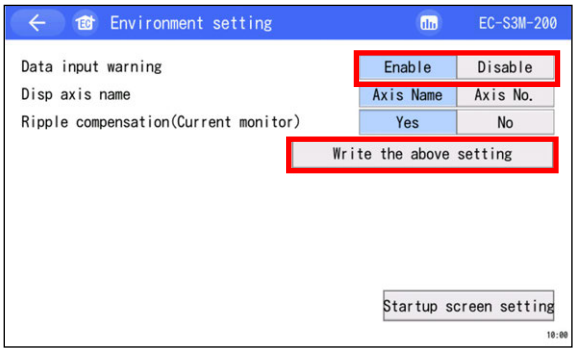
Touch Environment setting button on the EC menu 2 window.



The environment setting window appears.

[Data input warning]

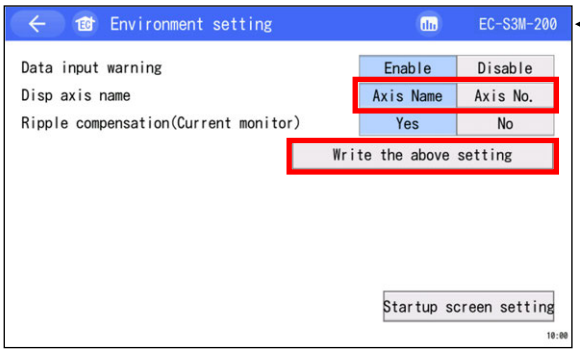
The warning can be output when a value less than the minimum speed and a value exceeding the rated acceleration/deceleration speed are entered in the position data. Note that the value is entered even if the warning occurs. Always use within the specification of the actuator.



Touch Enable button to give the warning.
Touch Disable button not to give the warning.

Select either Enable or Disable,
and then touch Write the above setting button.
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.



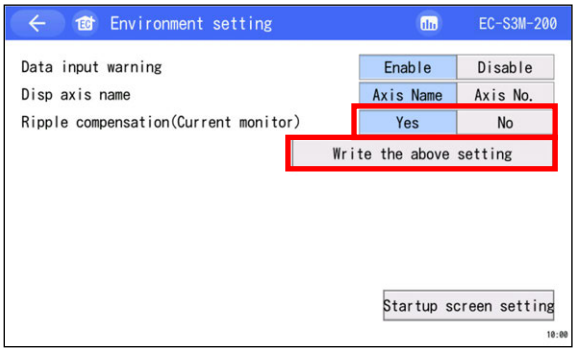
← Axis Name Display

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

Select either Axis Name or Axis No, and touch Write the above setting button. 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 window.
Refer to [19.11.2 Editing Axis Name and Unit Name]

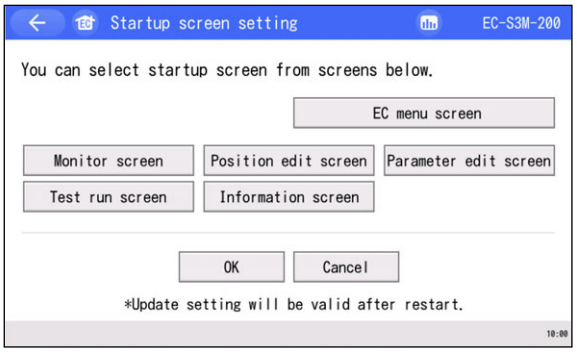
[Ripple Compensation]
Setting should be established to select whether to have ripple compensation or not to have it in the monitor window as the initial setting.



Touch Yes button and the setting should be established "with ripple compensation".
Touch No button and the setting should be established "without ripple compensation".

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

[Startup screen setting]
Setting can be established for the window shown in the screen first after the power is turned on.



Select a screen from those below for the screen shown first after the power is turned on.
EC menu screen
Monitor screen
Position edit screen *(Note 1)*
Parameter edit screen
Test run screen
Information screen

Touch either one to select and touch OK button.

Note 1 Select Position edit screen, and Simple Data Setting Screen should be displayed at the startup.

19.13 Data Backup of ELECYLINDER, ROBO PUMP

Data is transferred between the Secure Digital memory card in the touch panel teaching pendant and ELECYLINDER or ROBO PUMP.

(1) Type of Stored Data
- ELECYLINDER : Position data, parameters, alarm list and all data
- ROBO PUMP : Parameters, alarm list and all data

(2) Extensions of the Stored Data
- Position data : ptec (EC24V, EC200V, Ultra Mini EC, Compact Type EC, 20mm Width EC)
- Parameters : prec (EC24V), prec2 (EC200V), prec3 (Ultra Mini EC), prec4 (Compact Type EC), prec5 (20mm width EC), prrpv (RP)
- Alarm list : csv (EC24V, EC200V, Ultra Mini EC, Compact type EC, 20mm width EC, RP)
- All data : bkec (EC24V), bkec2 (EC200V), bkec3 (Ultra Mini EC), bkec4 (Compact Type EC), bkec (20mm width EC), prrpv (RP)

To the all data file of ELECYLINDER, the position data and the parameters should be stored.
To the all data file of ROBO PUMP, it should be the parameter files.
The alarm list should not be restored.

(3) Directories of the Stored Data
If the folder does not exist, it is automatically created.
- Position Data : \TB_SEL\EC\Position\
- Parameter : \TB_SEL\EC\Parameter\
- Alarm List : \TB_SEL\EC\Alarmlist\
- Whole Data : \TB_SEL\EC\Buckup\Folder Name\

The storage domain and destination of readout for data in restoring should be the folders above.
The folders to store the files cannot be changed. In the restoring process, any file existed in a folder other than those specified here should not be listed up in the file name list in the file select.
If the folder does not exist, it is automatically created.

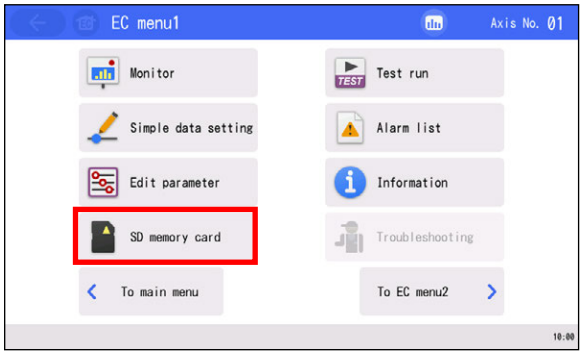
(Note) Files with Chinese names are not supported.

(Note) If the EC operation mode is set to the monitoring mode, restoring would not be available either individually or all at once for all axes. Set the EC operation mode to the teaching mode when restoring. Refer to [19.1.1 EC Operation Mode]

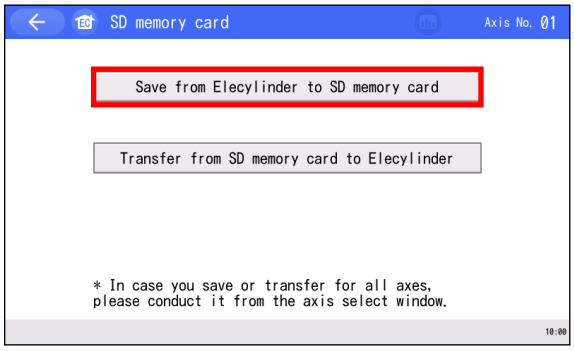
⚠ *Caution: For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, use FAT32 Format for the file system.*

19.13.1 Backup of Individual Data

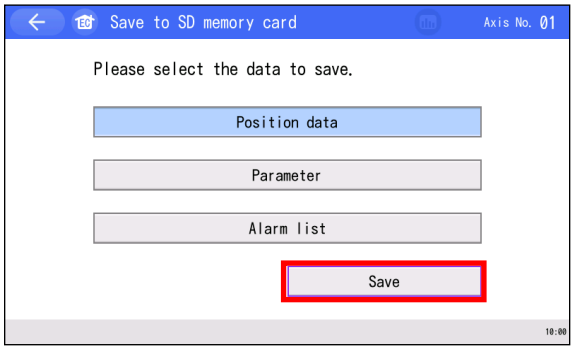
Backup should be made by transferring ELECYLINDER or ROBO PUMP individual data to a Secure Digital memory card.



Touch SD memory card button in EC menu 1 window.

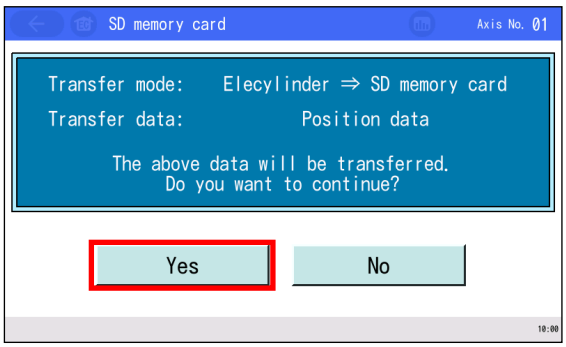


SD memory card window opens.
Touch Save from Elecylinder to SD memory card
or
Save from ROBO PUMP to SD memory card
button.



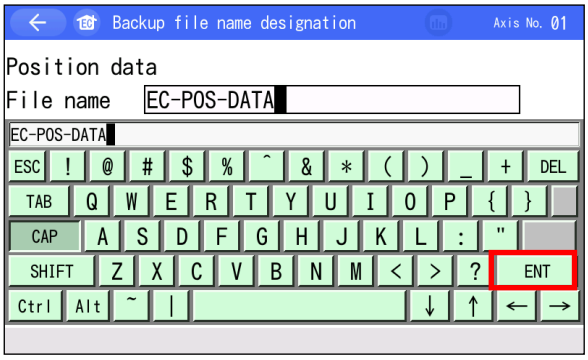
The Select button should only be displayed for the applicable models.
Select the data type button for the backup such as Position data button and touch it. (multiple options selectable)
The data type been selected will be shown in light blue.

Touch Save button.

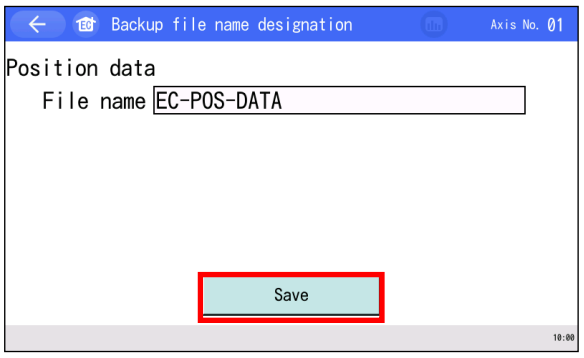


Touch Yes button.

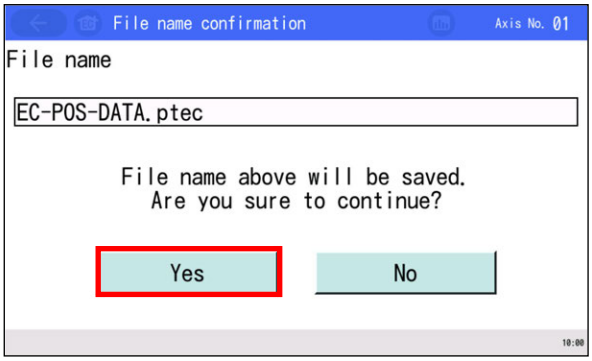
Touch No button, and the screen returns to the previous window.



A touch-panel keyboard should be displayed in the indicate backup file name window. Input a file name and touch the ENT button.
The file name should be with 31 half-size font characters at the maximum.

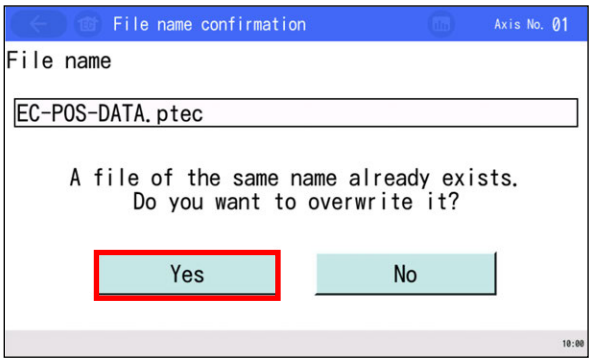


Touch Save button.



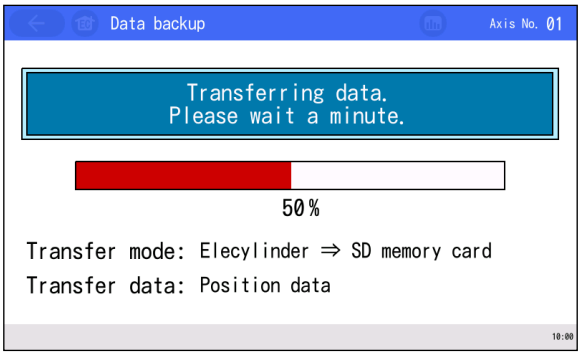
Touch Yes button in the file name confirmation window.

Touch the No button and the screen returns to the indicate backup file name window.

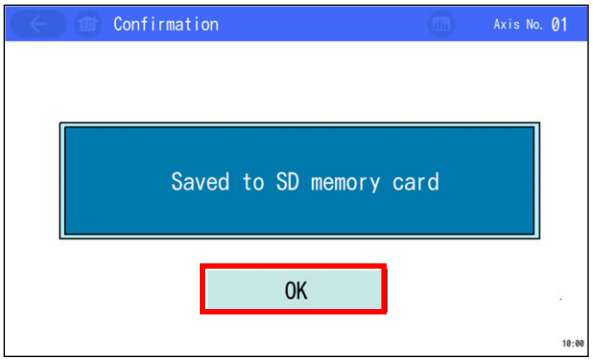


The screen below appears if the same name is found.
Touch Yes button.

Touch the No button and the screen returns to the indicate backup file name window.



Data transfer window will be shown.



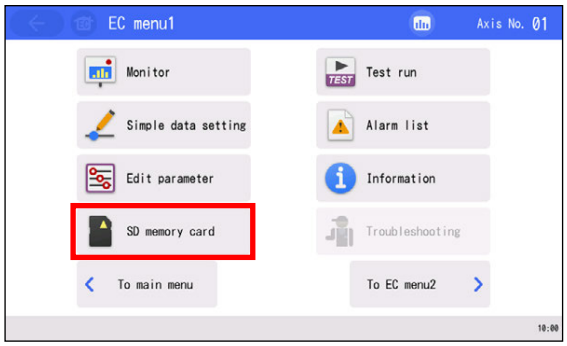
A message to tell the data transfer is complete pops up and the backup process is finished.

Touch OK button, and the screen returns to Save to SD memory card window.

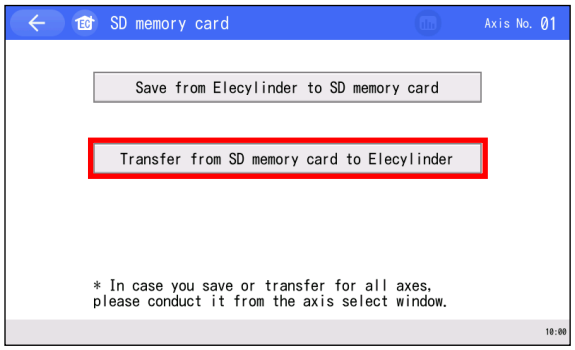
19.13.2 Restoring Individual Data

Restoring should be made by transferring ELECYLINDER or ROBO PUMP individual data from a Secure Digital memory card to ELECYLINDER or ROBO PUMP.

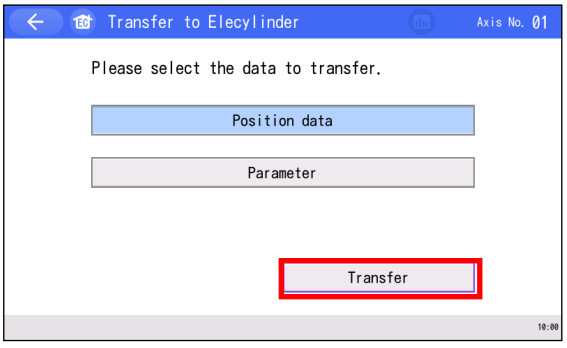
19.13.2.1 Restoring ELECYLINDER



Touch SD memory card button in EC menu 1 window.

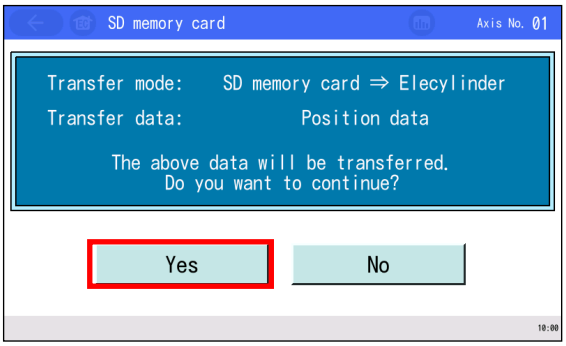


SD memory card window opens. Touch Transfer from SD memory card to Elecylinder button. (Valid only when EC operation mode is teaching mode)



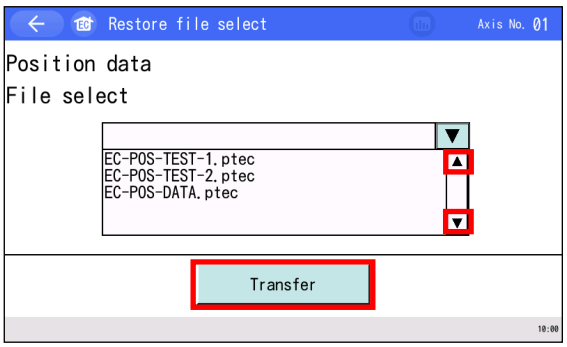
Select the data type button to transfer to ELECYLINDER, such as Position data button, and touch it. (multiple options selectable)
The data type been selected will be shown in light blue.

Touch Transfer button.



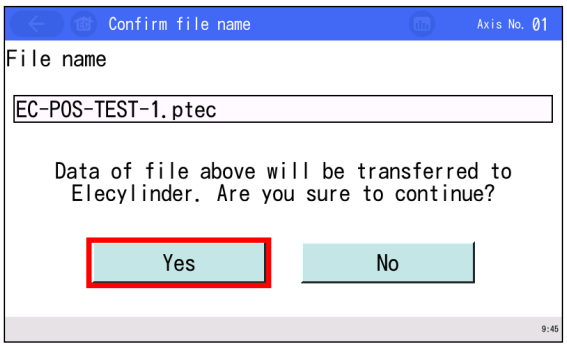
Touch Yes button.

Touch the No button and the screen returns to the previous window.



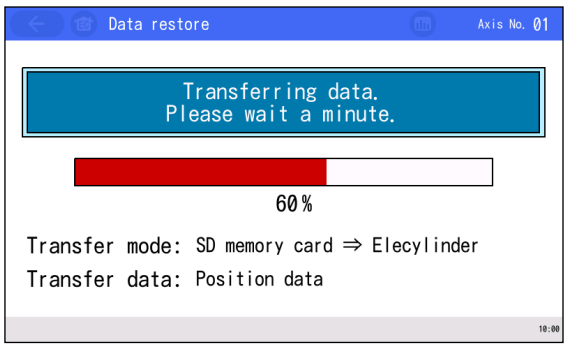
Touch the ▲ and ▼ buttons to scroll the display range of the file name list that is in the backup. Touch a file name to transfer to ELECYLINDER.

Touch Transfer button.

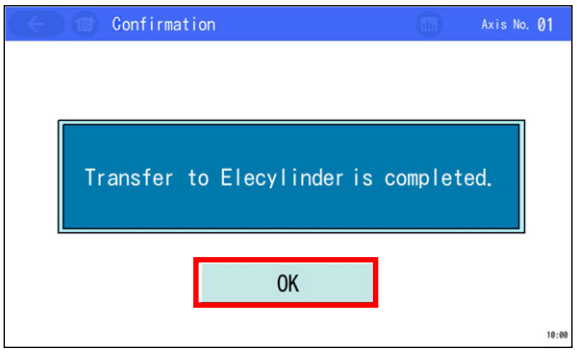


Touch Yes button.

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

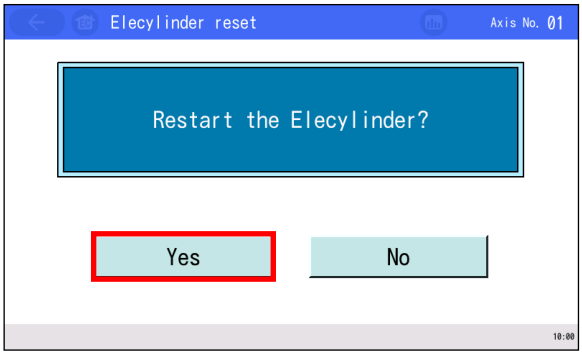


Data transfer window will be shown.



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

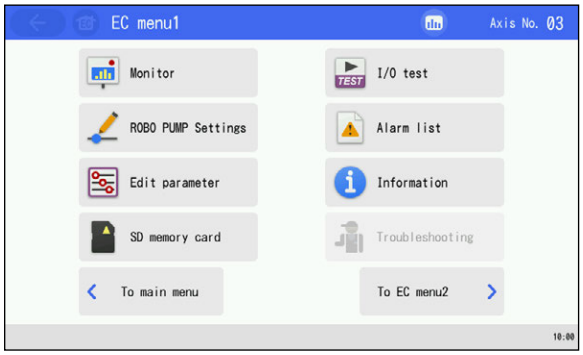
Touch OK button.



Touch Yes button to execute reboot.

(Note) Reboot screen will not appear if there is no difference between the data in ELECYLINDER and the data that was read out.

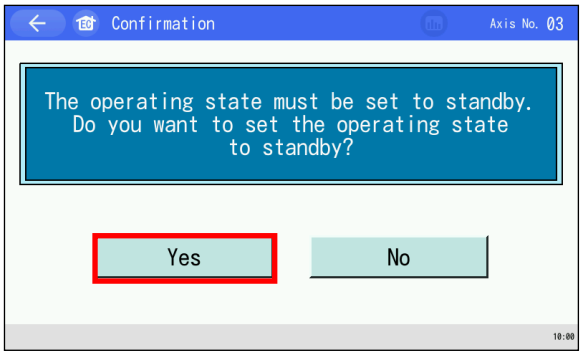
19.13.2.2 Restoring ROBO PUMP



Touch SD memory card button in EC menu 1 window.

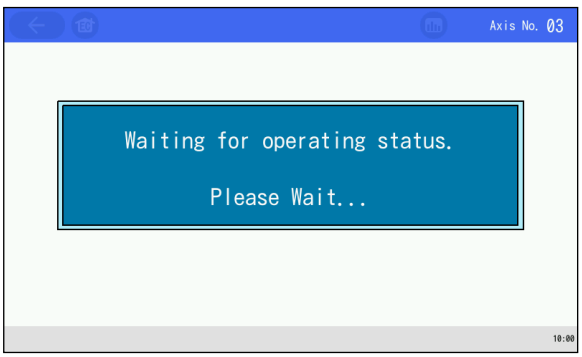


SD memory card window opens. Touch Transfer from SD memory card to ROBO PUMP button. (Valid only when EC operation mode is teaching mode)

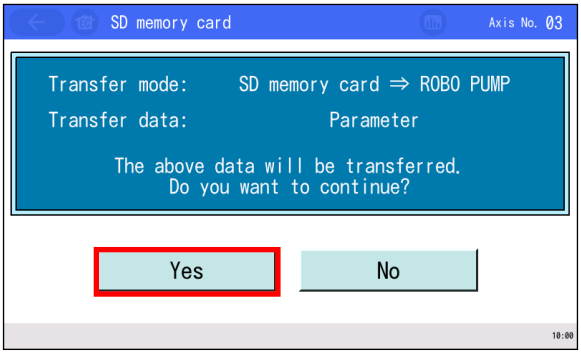


Touch the SD memory card button during suction or release of ROBO PUMP, and the standby confirmation window should open.
Touch Yes button.

Touch the No button, and the screen goes back to the Secure Digital Memory Card window without making ROBO PUMP wait.

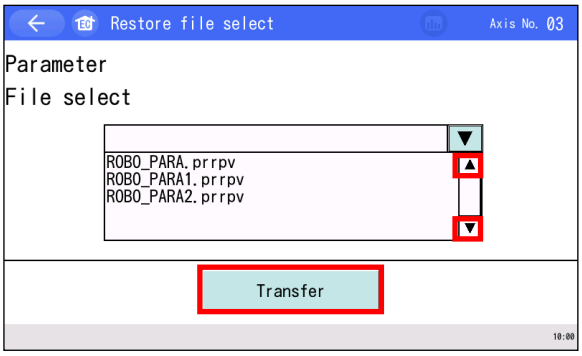


Make ROBO PUMP wait.



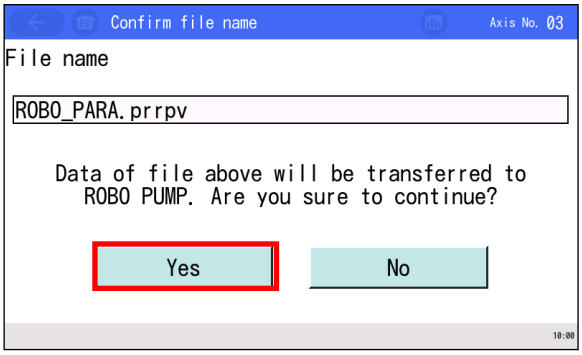
Touch Yes button.

Touch the No button and the screen returns to the previous window.



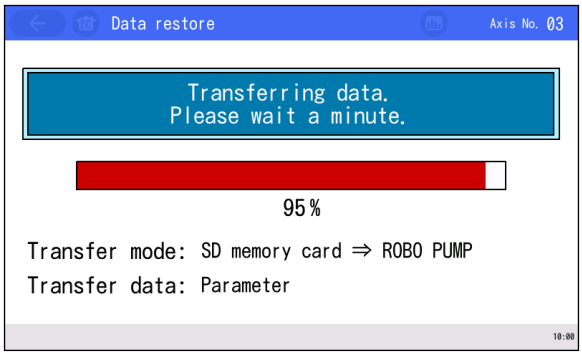
Touch the ▲ and ▼ buttons to scroll the display range of the file name list that is in the backup. Touch a file name to transfer to ROBO PUMP.

Touch Transfer button.



Touch Yes button.

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

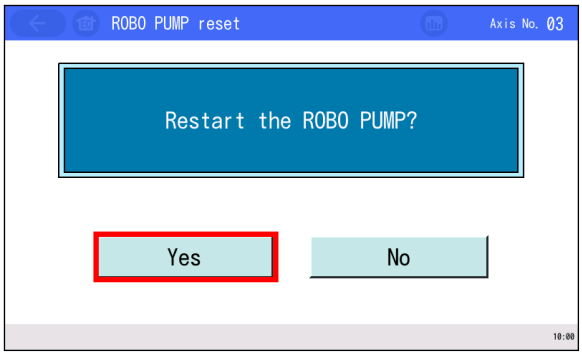


Data transfer window will be shown.



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

Touch OK button.

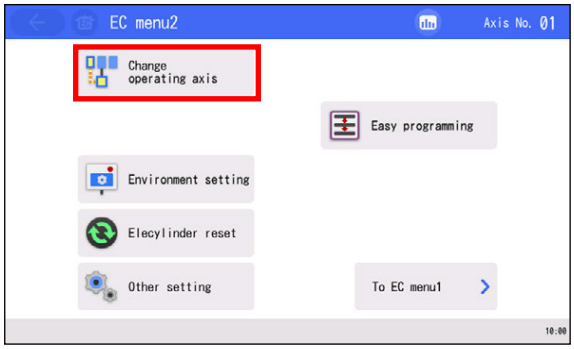


Touch Yes button to execute reboot.

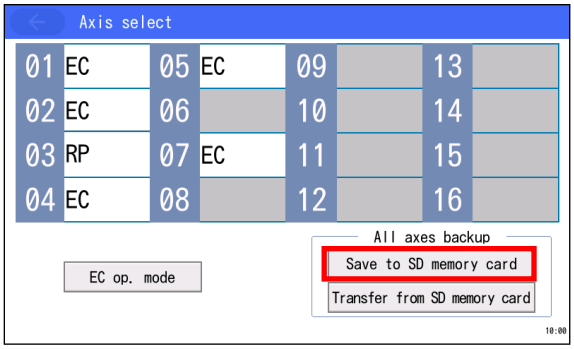
(Note) Reboot screen will not appear if there is no difference between the data in ROBO PUMP and the data that was read out.

19.13.3 Backup of All at Once for All Axes Data

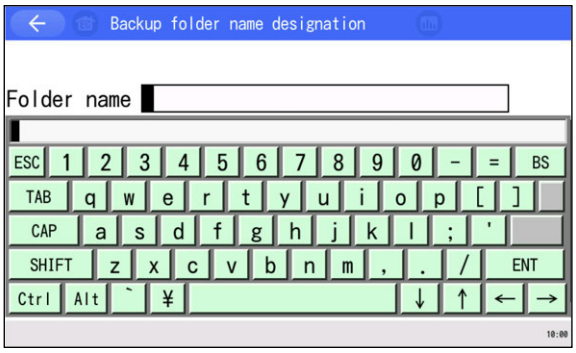
Backup should be made by transferring ELECYLINDER data for all axes from ELECYLINDER to a Secure Digital memory card.



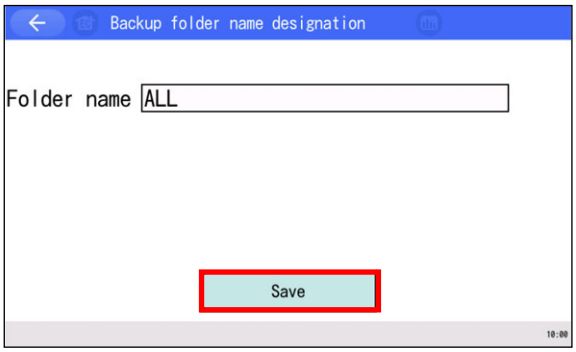
Touch Change operating axis button in EC menu 2 window.



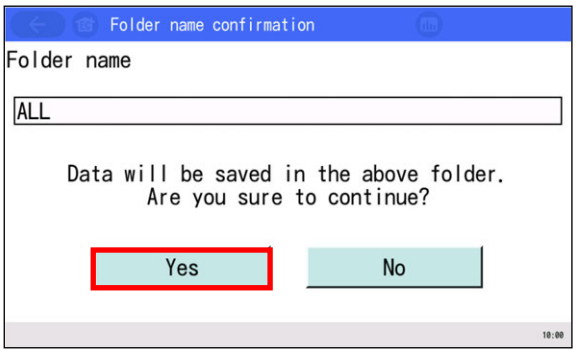
Axis select window opens.
Touch Save to SD memory card button.



A touch-panel keyboard should be displayed in the indicate backup folder name window. Input a folder name.
The folder name should be with 31 half-size font characters at the maximum.

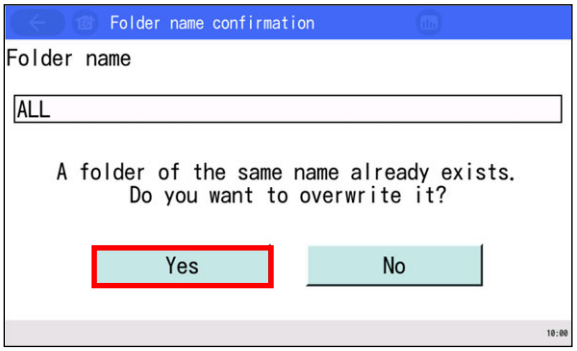


Touch Save button.



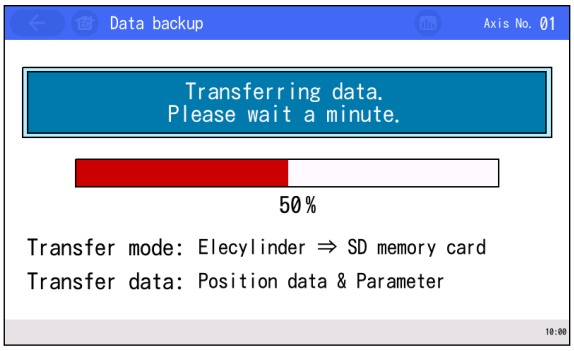
Touch Yes button.

Touch the No button and the screen returns to the indicate backup folder name window.

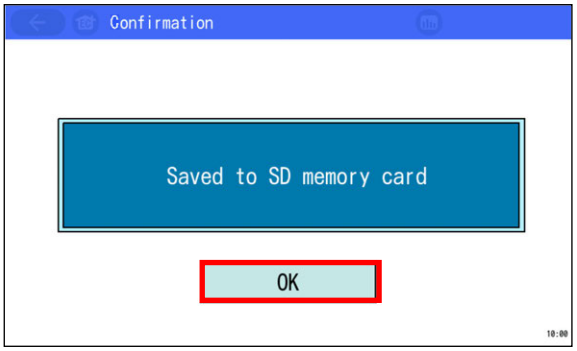


The screen below appears if the same name is found.
Touch Yes button.

Touch the No button and the screen returns to the indicate backup folder name window.



Data transfer window will be shown.

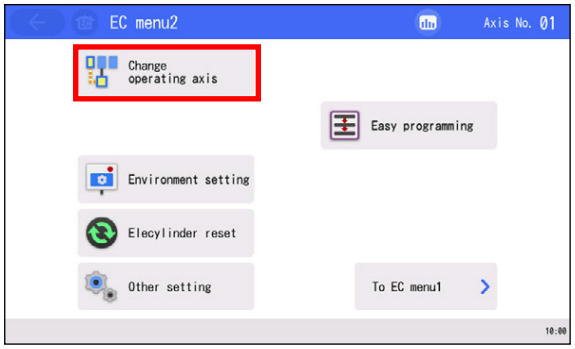


A message to tell the data transfer is complete pops up and the backup process is finished.

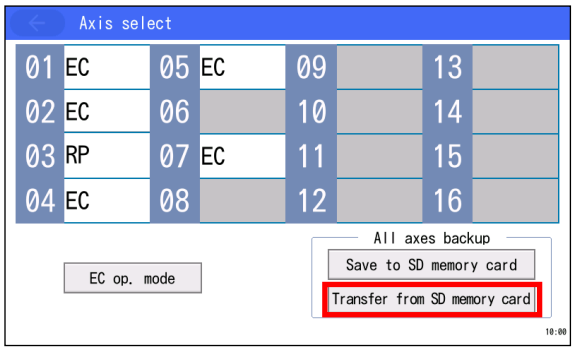
Touch OK button, and the screen returns to axis select window.

19.13.4 Restoring of All at Once for All Axes Data

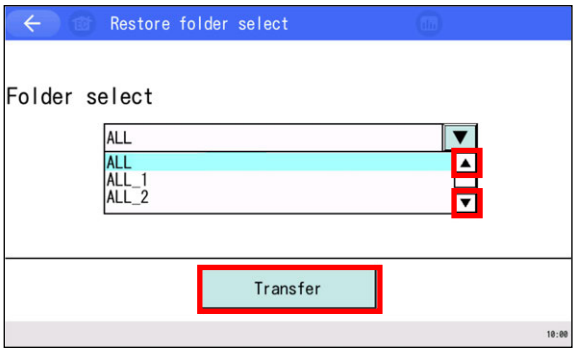
Restoring should be made by transferring ELECYLINDER or ROBO PUMP data for all axes from a Secure Digital memory card.



Touch Change operating axis button in EC menu 2 window.

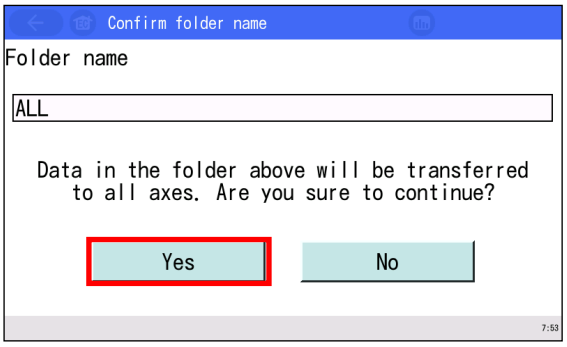


Axis select window opens.
Touch Transfer from SD memory card button.
(Valid only when EC operation mode is teaching mode)



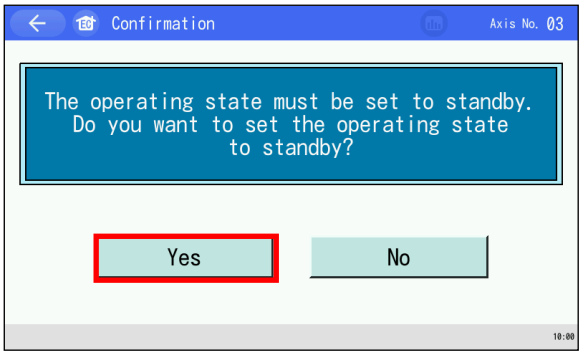
Touch the ▲ and ▼ buttons to scroll the display range of the folder name list that is in the backup.
Touch the folder to transfer to ELECYLINDER or ROBO PUMP.

Touch Transfer button.



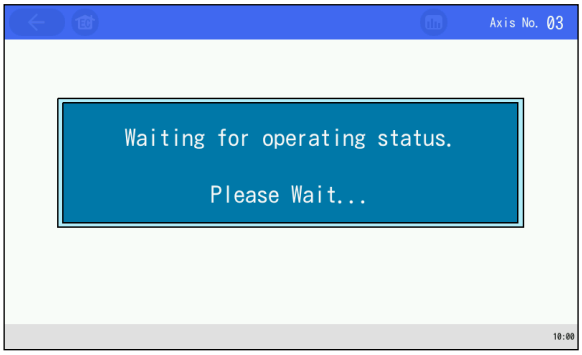
Touch Yes button.

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

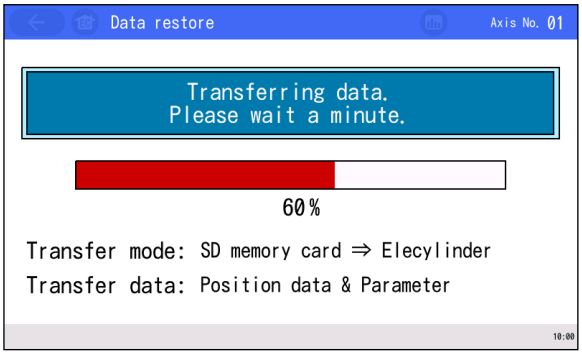


Touch the [Yes] button during suction or release of ROBO PUMP, and the standby confirmation window should appear.
Touch Yes button.

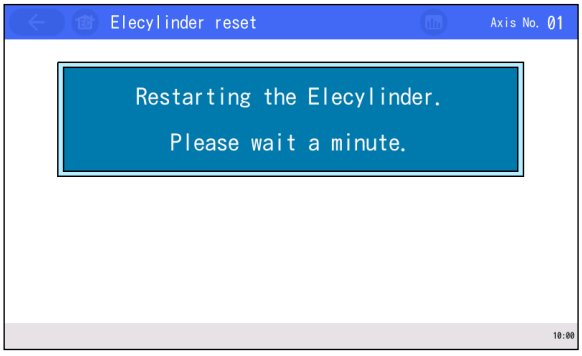
Touch the No button, and the screen goes back to the previous without making ROBO PUMP wait.



Make ROBO PUMP wait.



Data transfer window will be shown.



ELECYLINDER or ROBO PUMP start rebooting once the data transfer finishes.



The complete confirmation window should appear once the data transfer of data for all of the ELECYLINDER or ROBO PUMP units is complete.

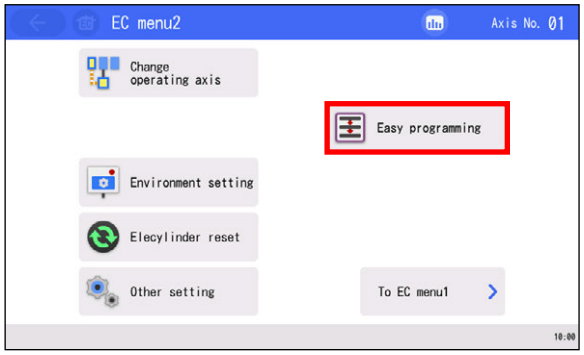
Touch OK button, and the screen returns to axis select window.

19.14 Easy Programming

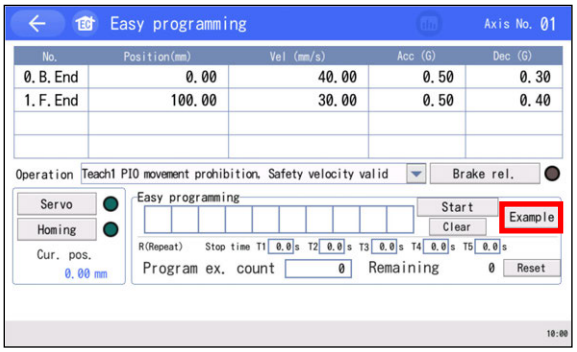
In the easy programming, pause duration can be set between sets of operations and continuous operation can be performed by indicating the number of repeating times.

[How to Establish Setting]

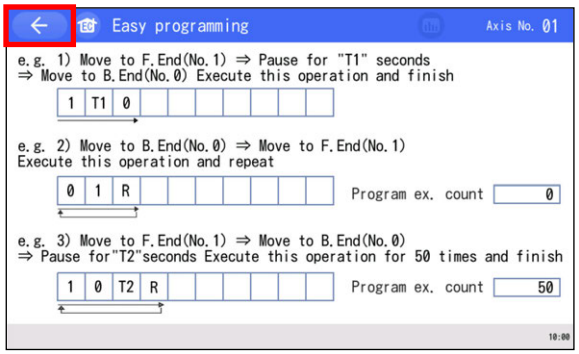
Set the position number (0: backward end, 1: forward end, 2: middle point) of the destination to the easy programming input part (step). In order to have a pause between operations, use prepared five timers T1 to T5. Timer can be set in 0.1 second unit from 0 to 99.9sec. When it is required to repeat 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 button in EC menu 2 window.

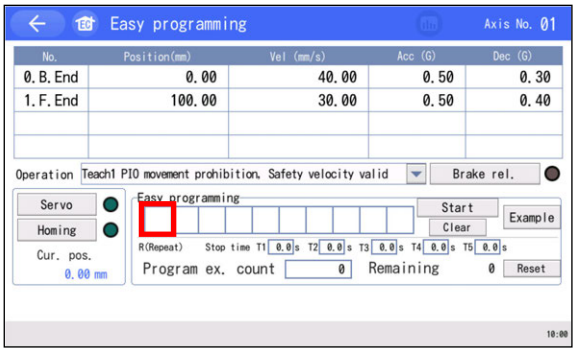


Easy programming window opens.
Touch Example button and examples for how to construct a program are displayed.

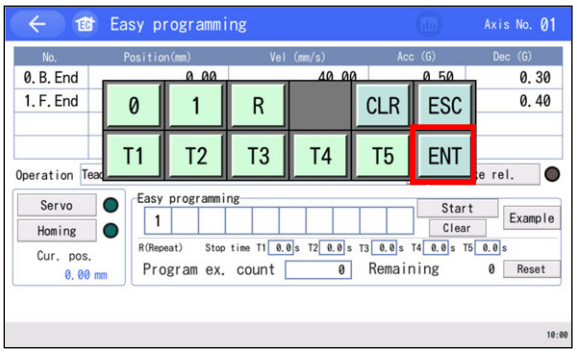


Touch ← to return to the previous window.
Take this as a reference when constructing an Easy programming.

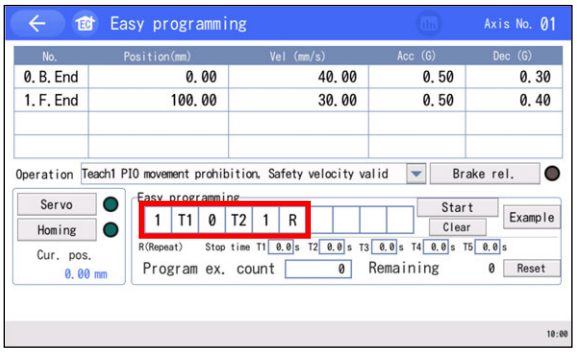
[Driving Easy Programming]



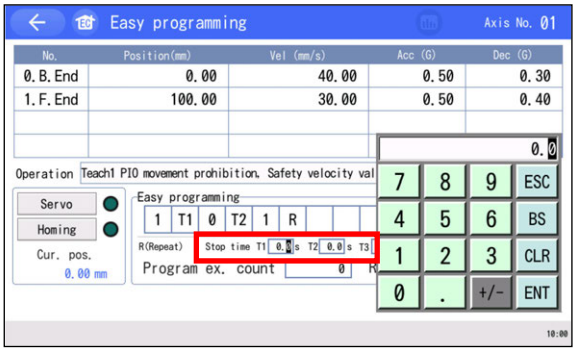
Touch the first (on the most left) step of the easy programming.



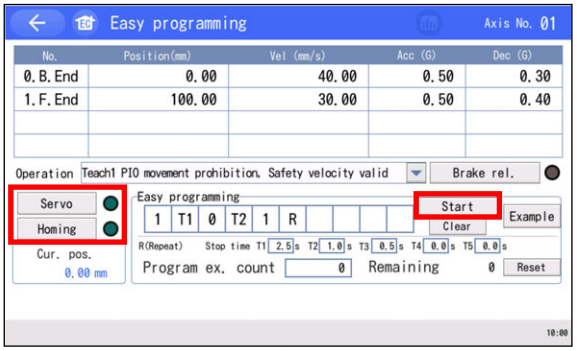
Input a position number or a timer (T1 to T5) and touch ENT button.



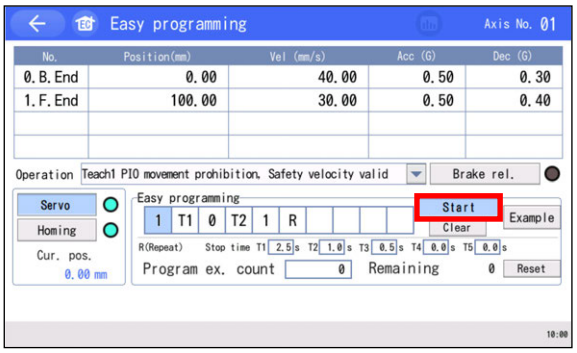
Set the next step and after in the same manner. Set R at the end when it is required to repeat the operation.



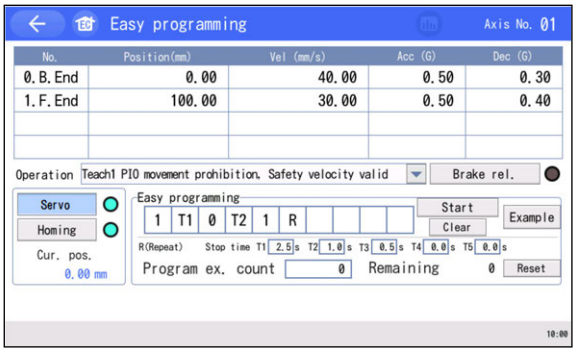
Use a timer (T1 to T5) if you would like to set a stop time. Touch a timer and input in the numeric keys.



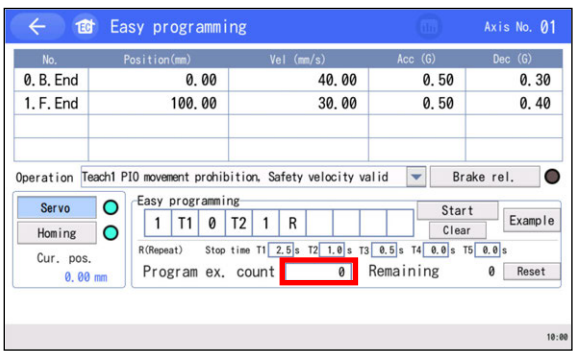
Have the servo ON and the home-return conducted, and then touch Start button to start the operation.



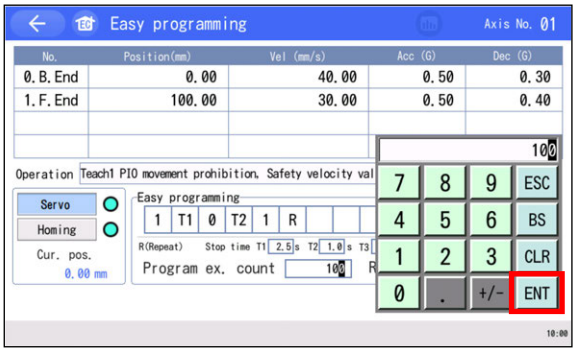
During the operation, the Start button and the step number in execution turn to blue.
To stop operation, touch the Start button again.



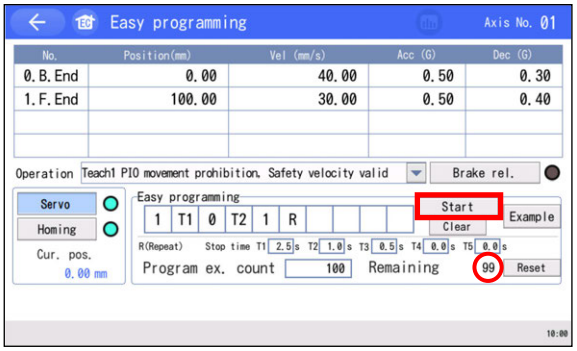
Operation stops.



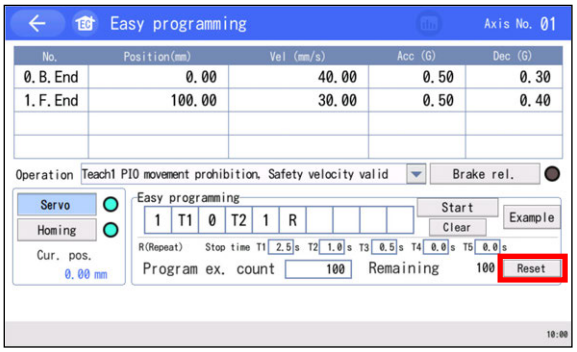
If you require to set the repeating count, touch on the number of the program execution count.



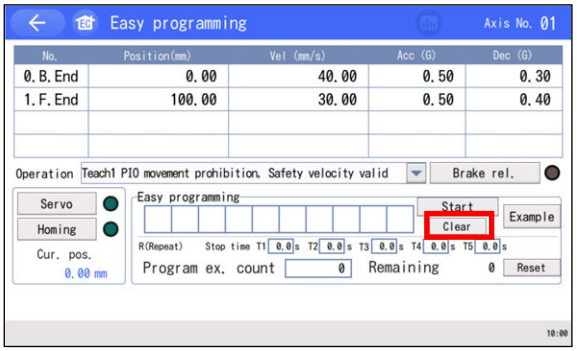
Set the count with the numeric keys and touch the ENT button.



Touch the Start button to start operation.
The repeating remaining count should be displayed and will count down as 100 → 99 → 98 → · · · · .



Touch the Reset button and the remaining count should return to the program execution count.



Touch Clear button, and the set Easy program will be all deleted.

(Note) An Easy programming cannot be saved.

20. Data Backup

Data is transferred between the Secure Digital Memory Card in the touch panel teaching pendant and the controller.

[Type of Stored Data]
- Position
- Program (individual, total)
- Symbol
- Parameter
- All data backup
- Global data
- Error list
- Coordinate system definition data
- Positions for RC axes
- Positioner mode information
- Driver unit parameter

[Compatibility of Stored Data]
- The extensions of the data to be stored in a Secure Digital Memory Card are the same as those handled in the PC software for XSEL, thus there is compatibility.
  The extension of the position data for XSEL-J/K for example is ".xpt".
  (Refer to [List of Supported Models] in PC Software Instruction Manual for XSEL.)
- The error list is object only to backup. It cannot be restored. Data is in a CSV file.

[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.

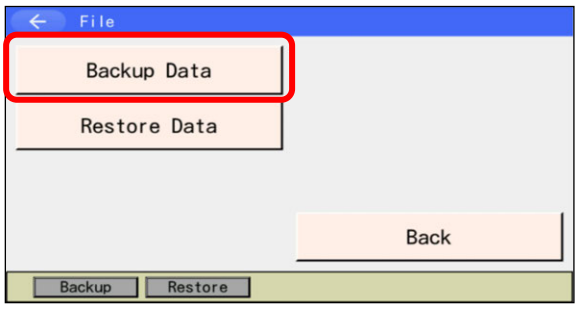
Data Type	Directory
Position	\TB_SEL\Position\File Name
Program (individual)	\TB_SEL\Program\File Name
Program (total)	\TB_SEL\ProgramAll\File Name
Symbol	\TB_SEL\Symbol\File Name
Parameter	\TB_SEL\Parameter\File Name
All data backup	\TB_SEL\Backup\File Name
Global data	\TB_SEL\Global\File Name
Error list	\TB_SEL\ErrorList\File Name
Coordinate system definition data	\TB_SEL\Coordinate\File Name
Positions for RC axes	\TB_SEL\RcPosition\File Name
Positioner mode information	\TB_SEL\PosMode\File Name
Extended Motion Position	\TB_SEL\ExMotionPos\File Name
Driver unit parameter	\TB_SEL\DrvUnitPara\File Name or Folder Name

20.1 Data Backup of the Controller

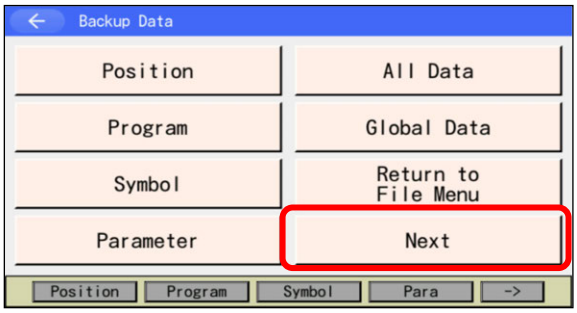
The data in the controller is transferred to the Secure Digital Memory Card for backup.



Touch File button in the menu screen.



Touch Backup Data button in the file menu screen.



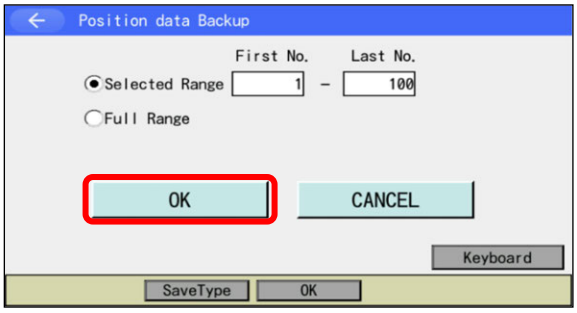
Select the data type that you want to store by touching the appropriate button.
Touch Next button and the data types displayed in the screen will be switched.

When you store the data stated below, it is necessary to select the range of file storage after the data type to store is selected.

(i) Position*
(ii) Program
(iii) Positions for RC axes
(iv) Driver unit parameter

* There should not be the select position data storage window displayed for RSEL and XSEL2-T/TX. (Position data in all the range should be stored.)

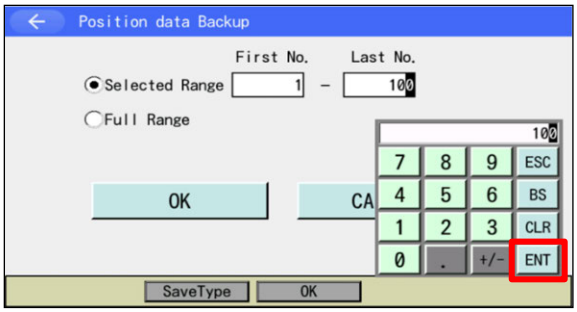
(i) Position



Input the position number range for backup and touch OK button.
If you touch CANCEL button, the display returns to the backup menu screen.

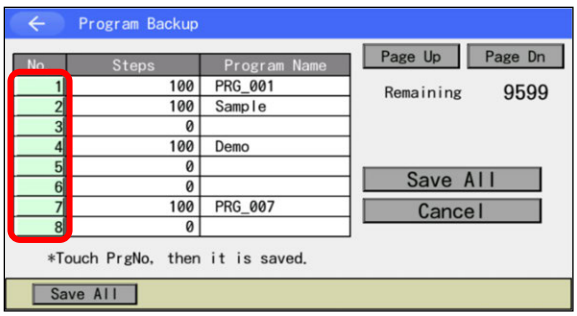
[Selected Range]: Only the position data in the range input in “First No.” and “Last No.” is stored.
[Full Range] : All the position data in the controller is stored.

Touch items to select in "Range Indication" and "All Data".



When you select “Selected Range”, input the position storage range. If you touch in the input area on “First No.” or “Last No.”, the cursor appears in the item you have touched.
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.
Touch on the numeric part if you want to input on the touch panel numeric keys. The contents of input will be shown in the box above the touch panel numeric keys. When confirming the input number, touch ENT. The touch panel numeric keys close and the cursor moves to the next input box. (The cursor will disappear if Last No. is input.)
When redoing the input, touch ESC. When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.

(ii) Program

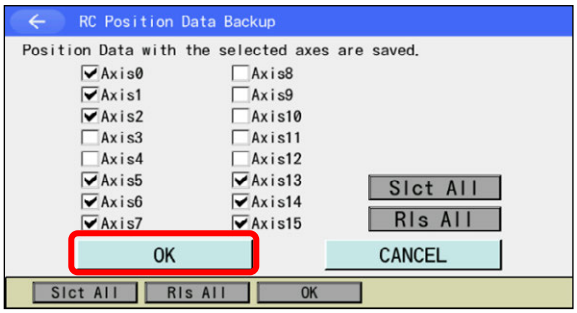


Touch the program number to have a backup.
If you touch CANCEL button, the display returns to the backup menu screen.

Touch Save All button, and all the programs in the controller can be stored at once as one file.

* A program number with 0 for number of steps cannot be indicated.

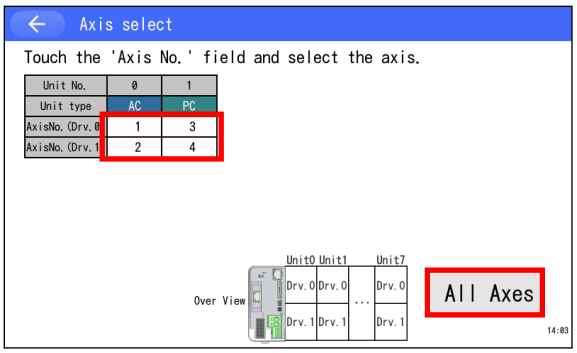
(iii) Positions for RC axes



Touch the RC axis numbers to store to put a check mark. (Only activated axes are subject to select.)
After selecting the RC axis numbers to be stored, touch OK button.
If you touch CANCEL button, the display returns to the backup menu screen.

Touch Slct All button, and all the activated axes can be selected.
Touch Rls All button, and all the activated axes can be released from selected.

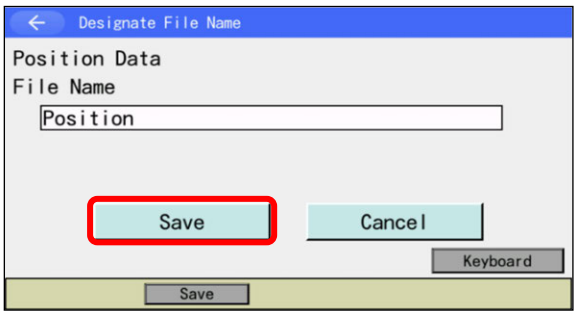
(iv) Driver Unit Parameter



Touch an axis number to save and select an axis.
If you would like to save parameters of all the axes, touch the All Axes button. Files for the valid axes should be saved in the indicated folder.

Touch the ← button and the screen returns to the backup menu window.

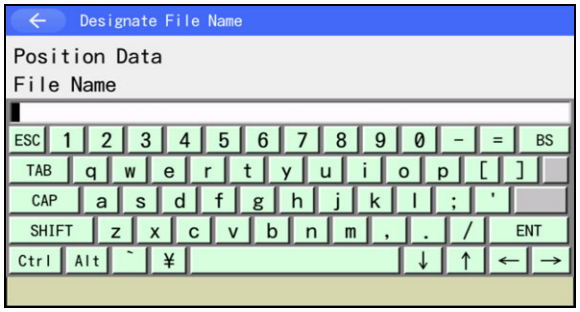
After the file storage range is selected, the display goes to the file name indication screen.
(When data other than programs, positions and RC axis positions is to be stored, the display immediately goes to the file name indication screen after the file data select.)



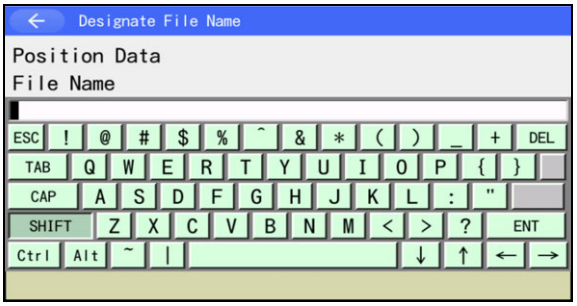
Input the stored file name, and touch Save button. Touch Cancel button, and the display returns to the previous screen.

* The number of letters available to input in the stored file name is 31 at maximum with half-size font characters.

Touch the input area for “File Name”, the cursor appears in the item you have touched.
With the cursor being displayed, touch Keyboard button to show the touch panel numeric keys to input words.



Initial Screen



SHIFT key being touched

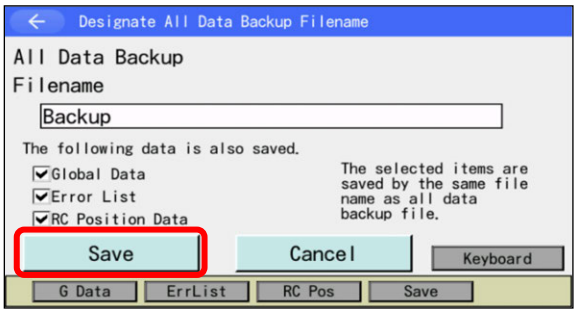
Use the keyboard shown in the figures above to input the file name. When you want to input a capital letter, either touch SHIFT key or touch CAP key to show the capital letters. (Figure on top right) SHIFT key gets released every time after a letter is input while CAP key is remained on until it is touched again. Touch ENT or TAB key to confirm the letter you have input.

* For the driver unit parameter (all at once for all axes), input a name of folder.

[Operation of Special Function Keys out of Letters]

ESC	cancels what was input and clear all the input conditions. When nothing is input, they keyboard closes by touching this key.
BS	It deletes a letter in front of the cursor. When nothing is input, all letters are deleted.
DEL	It deletes letters on the cursor.
TAB	It confirms the input letters and closes the keyboard.
←	It moves the cursor one step to the left.
→	It moves the cursor one step to the right.
↑	Move the cursor one step to the left.
↓	Move the cursor one step to the right.
SHIFT	It converts the letters on the keyboard to capital letters. It is released by inputting one letter or touching SHIFT key again.
CAP	It converts the letters on the keyboard to capital letters. Touch CAP key again and it is released.
ENT	It confirms the input letters and closes the keyboard.

When all the data backup files are to be stored, the following screen will be shown to designate the backup file names.



Input the stored file name, and touch Save button. (The way to input the file name is the same as the way to save other data.)
If you touch CANCEL button, the display returns to the backup menu screen.

* The number of letters available to input in the stored file name is 31 at maximum with half-size font characters.

When the backup file for all the data is stored, the global data, error list, RC position data and Extended Motion Position Data can be stored at the same time. When you store these sorts of data, put a check mark by touching on the data name (global data, error list, RC position data and Extended Motion Position Data).

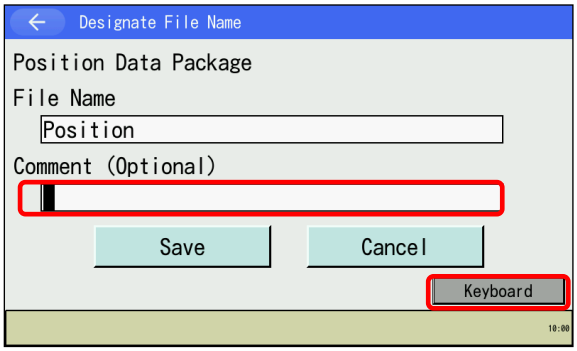
* The items of RC-axis Position Data and Extended Motion Position Data are displayed only when these functions have become available.
* The file names for the data stored at the same time are the same as that for the backup file for all the data. (Only the extensions differ.)
  For instance, if the backup file name for all the data is “Backup.xbk”, the file name for the global data stored together is “Backup.xgd).
* The global data should also be stored in the all data backup file for RSEL and XSEL2-T/TX.

Backup files for some controllers are applicable for storage of file comments.

In case it is applicable, there should be a file comment input box displayed below the file name input box.

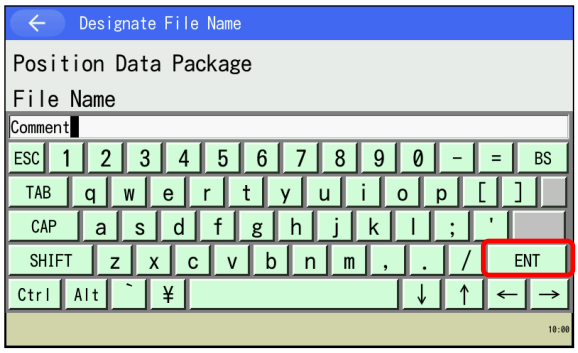
If it is required to input a comment, touch in the file comment input box to show the cursor, and then touch the keyboard button. A touch panel keyboard will appear. Input some character string, and touch the ENT button. It is not necessary to have a comment unless required.

The number of characters available for input in the file comment input box is up to 40 half-width characters.



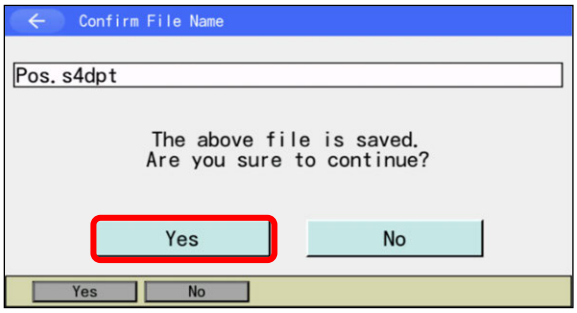
Touch in the file comment input box to show the cursor, and then touch the Keyboard button.

A touch panel keyboard appears.

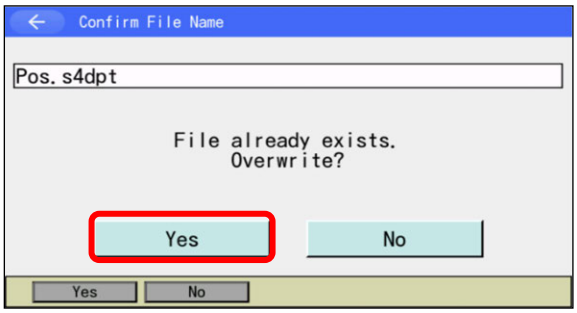


Input some character string, and touch the ENT button.

* The number of characters available for input in the file comment input box is up to 40 half-width characters.

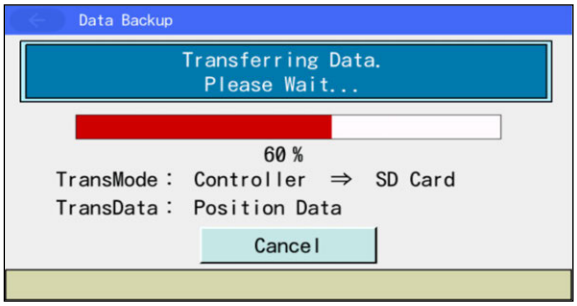


Check the storage file name, and touch Yes button.
Touch No button, to return to the backup file name indication screen.



When the same file name already exists, the screen below will be shown.
Touch Yes button.

Touch No button, to return to the backup file name indication screen.



Data transfer screen will be shown.

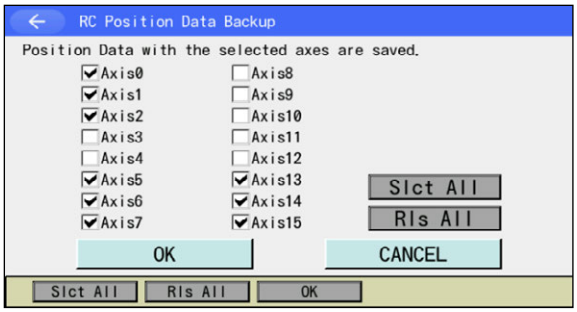
Touch Cancel button to cancel to save the file.

> ⚠ *Caution: In case the file storage process is cancelled, there is no guarantee of the saved data contents.*



The display shows this screen when the data transfer is finished.
Touch OK button, to return to the backup menu screen.

[Remark]
When the backup file for all the data and the data file for the RC axis positions are stored together, the select screen for the RC axis number to be stored opens after the backup file for all the data is stored. The way to operate this screen is the same as when you store the RC axis position data file individually.

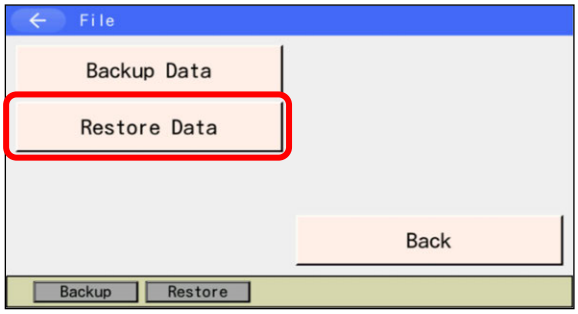


20.2 Restore to Controller

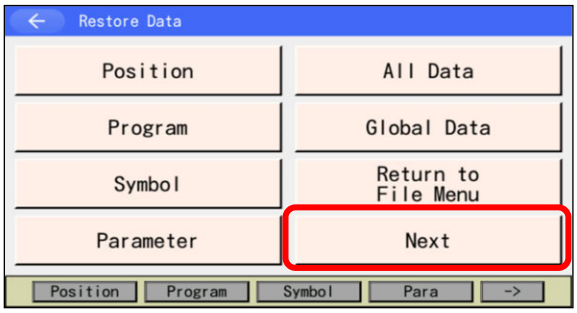
Data in the Secure Digital Memory Card is transferred to the controller.



Touch File button in the menu screen.

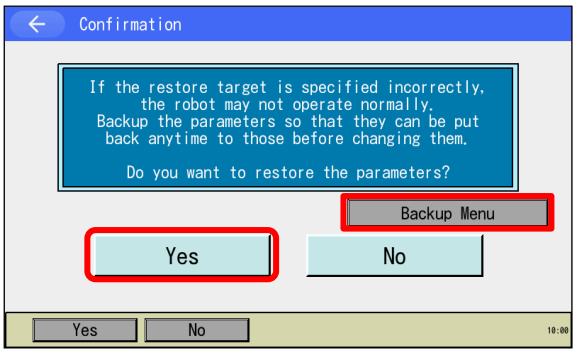


Touch Restore Data button in the file menu screen.

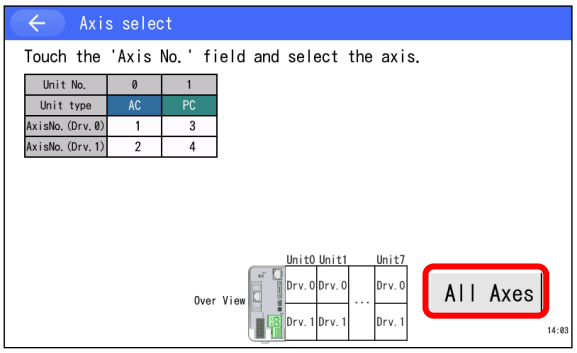


Select the data type that you want to transfer by touching the appropriate button.
Touch Next button and the data types displayed in the screen will be switched.

When the driver unit parameter (for applicable models only) is selected as the data type, the screen goes to the following window.

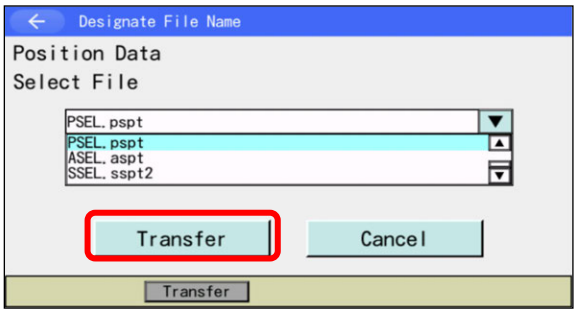


The confirmation window before restoring should appear. Touch the Yes button and the screen goes to the select restored axis window. Touch the No button and the screen returns to the file menu window. Touch the Backup Menu button and the screen goes to the backup menu window.



Touch an axis number in the select restored axis window to select an axis.
When you would like to transfer parameters for all the axes, touch the All Axes button. Files for the valid axes should be transferred from the indicated folder.

Touch the ↩ button and the screen returns to the confirmation window before restoring.

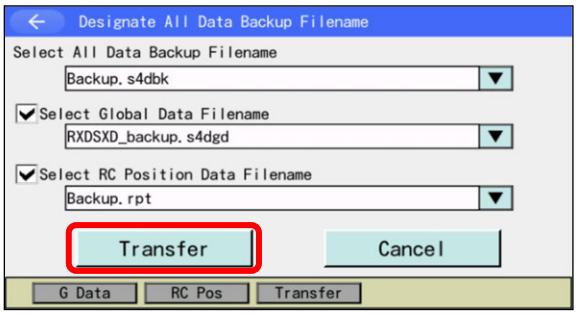


Touch ▲ and ▼ to select a file to transfer to the controller from the file list in a Secure Digital Memory Card.

Touch Transfer button.
If you touch Cancel button, the display returns to the restore menu screen.

* In case the name of the file name exceeds 38 characters in half-size font and the extension is in 3 characters, the short file name (8.3 Format) should be shown in the file list. Those files with the extension in 4 characters or more will not be displayed in the file list.
* The No. of files that can be displayed in the file list, is up to 300. The excessive files are not displayed in the file list.

The display moves to the restore file name indication screen as shown in the figure below only when the backup file is transferred for all the data.

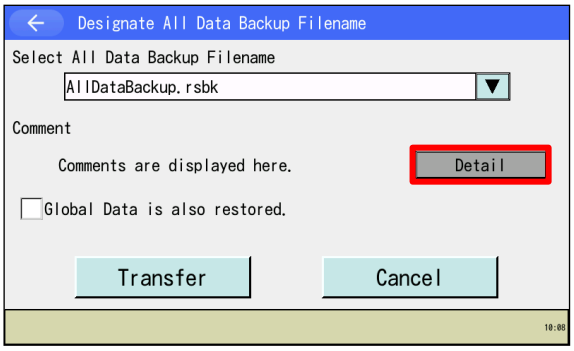


Touch ▲ and ▼ to select a file to transfer to the controller from the file list in a Secure Digital Memory Card.

Touch Transfer button.
If you touch CANCEL button, the display returns to the restore menu screen.

* In case the name of the file name exceeds 38 characters in half-size font and the extension is in 3 characters, the short file name (8.3 Format) should be shown in the file list. Those files with the extension in 4 characters or more will not be displayed in the file list.
* The No. of files that can be displayed in the file list, is up to 100. The excessive files are not displayed in the file list.

When the backup file is transferred for all the data, it is available to transfer the global data file, RC axis position data file and Extended Motion Position Data File at the same time.
To transfer these sorts of data, touch on the data name (global data, RC position data and Extended Motion Position Data File) to put a check mark.
Next, select the files you want to transfer from the file list.



The window shown in the figure on the left should be displayed for RSEL and XSEL2-T/TX.

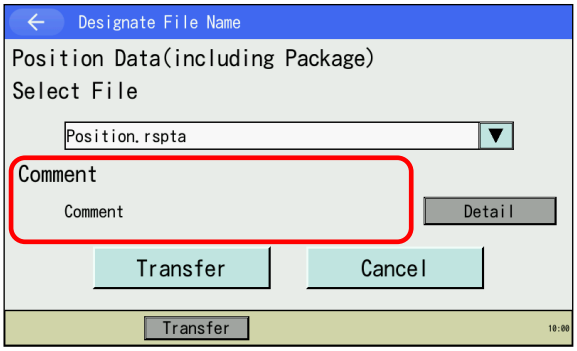
For RSEL and XSEL2-T/TX, when transferring all the data backup files, it is available to transfer the global data at the same time.
In order to transfer the global dat, touch the checkbox to put a checkmark.

Touch the Detail button and the tool information and the controller information in the backup file can be checked.

* For RSEL, when transferring all the data backup files, the files cannot be transferred if the driver unit construction information in the all data backup files and the construction of the actual driver unit are different from each other.

Backup files for some controllers are applicable for storage of file comments.

If the backup file and the controller under connection are applicable for the storage of file comment, there should be a file comment displayed below the file select box.

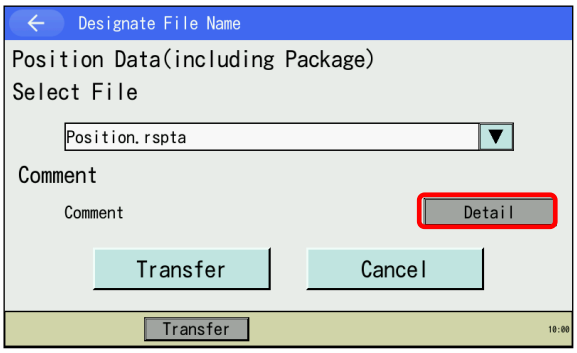


Select the backup file to transfer to the controller in the select file box.

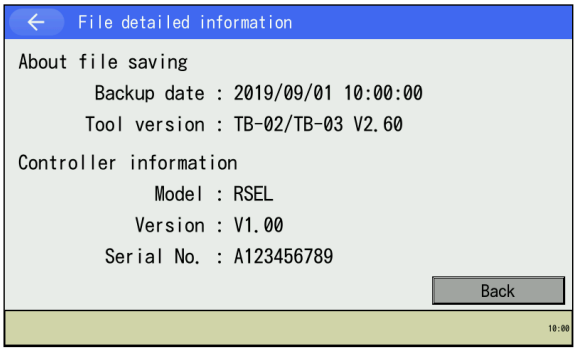
If the backup file and the controller under connection are applicable for the file comment, there should be a file comment displayed below the file select box.

If the backup file is applicable for the file comment, the tool information and controller information can also be stored in the backup file.

Touch the Detail button and the tool information and the controller information in the backup file can be checked.



Select a backup file to transfer to the controller in the select file box and touch the Detail button.



The tool information and controller information in the backup file are shown.

Contents of display are as shown below:

About file saving

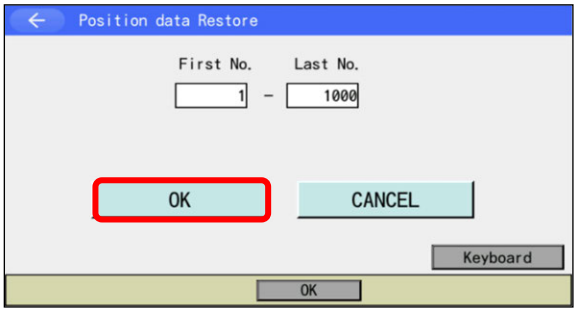
Backup data	:	The day and time of backup is shown.
Tool version	:	A tool used for the backup and the version of the tool are shown.
Controller information		
Model	:	Model name of a controller that the backup was conducted is shown.
Version	:	The application part version of a controller that the backup was conducted is shown.
Serial No.	:	The manufacturing number of a controller that the backup was conducted is shown.

* There should display a blank if there is no applicable data in the backup file.

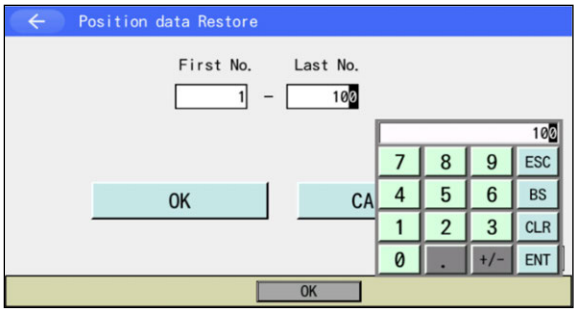
Touch the Back button and the screen goes back to the designate file name window.

After selecting the file to be transferred, set the controller transfer range.
(When the symbol files and backup file for all the data are transferred, the transfer range select screen will not be shown. The data stored in the file are all transferred.)

(i) Position



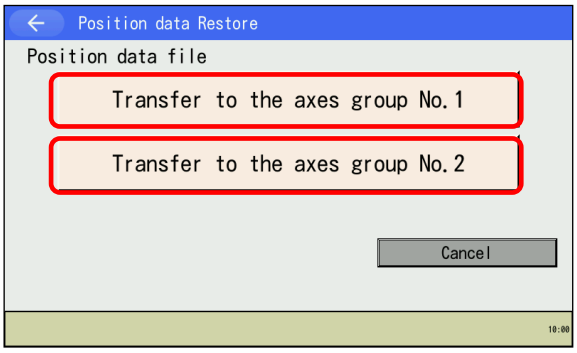
Input the position number range for the transfer to the controller and touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.



If you touch in the input area on “First No.” or “Last No.”, the cursor appears in the item you have touched.
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.
Touch on the numeric part if you want to input on the touch panel numeric keys. The contents of input will be shown in the box above the touch panel numeric keys. When confirming the input number, touch ENT. The touch panel numeric keys close and the cursor moves to the next input box. (The cursor will disappear if Last No. is input.)
When redoing the input, touch ESC. When it is desired to cancel the input, touch ESC again, and the touch panel numeric keys will close.

In RSEL and XSEL2-T/TX, each axes group retains the position data. When an axis number assignment to activate several axes groups is performed in the axis number assignment feature (Refer to [15.17 Axis Number Assignment]), a window to select the axes group that is subject to restoring at the position data restoring should be shown.
(Refer to [15.17.2 Axis Number Assignment Mode Switchover] for axes groups)

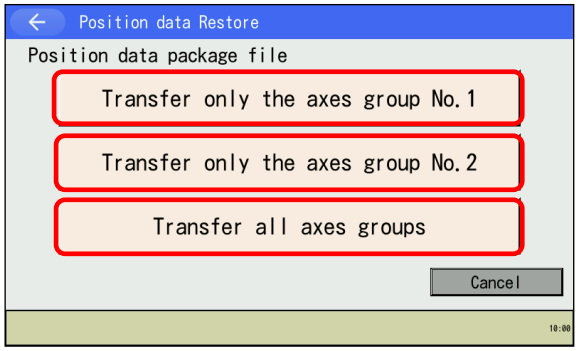
1) When restoring a backup file with axes group inactivated or backup file saved in the axis number assignment feature non-applicable controller to a controller with axes group activated



A position data file includes the position data for 1 group of axes group.

As the window shown in the figure on the left should be shown, select an axes group for the destination of restoring.

2) When restoring a backup file saved with axes group activated to a controller with axes group activated.

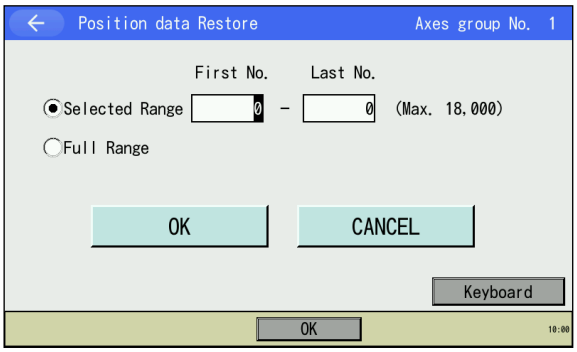


A position data file includes the position data for several axes groups.

As the window shown in the figure on the left should be shown, select an axes group for the destination of restoring.

* In this case, the position data will be restored to the same axes group number as that for backup.

When there is only one of the axes group subject to restoring, the select transfer range window should appear. Select a range and touch the OK button. When the all axes groups transferred is selected, the select transfer range window should not appear. (All the position data in the range should become the subject to restoring.)

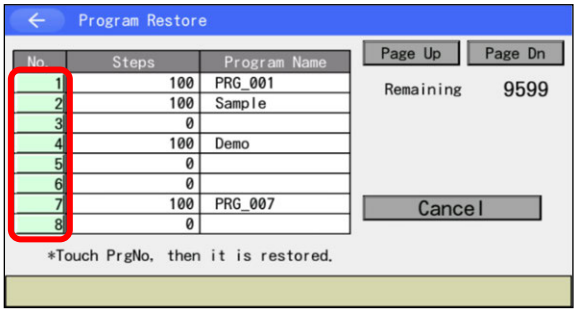


If there is only one of the axes group subject to restoring, the window shown in the figure on the left appears.
(Shown on the top right of the window is the destination axes group number for restoring)

Selected Range : The position data in the range input in “First No.” and “Last No.” should be restored.
Full Range : All the position data in the indicated axes group should be restored.

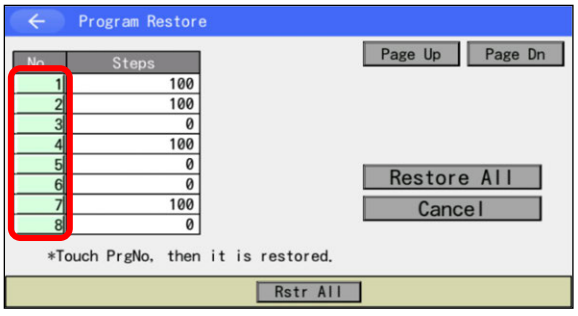
Touch an item to select either "Selected Range" or "Full Range".

(ii) Program (individual)



Touch the transferred program number.
If you touch Cancel button, the display returns to the restore file name indication screen.

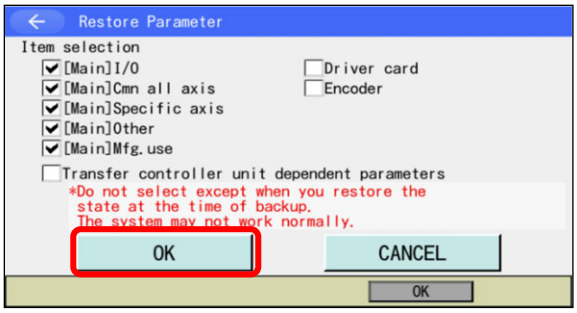
(iii) Program (total)



Touch the program number to be transferred individually.
If you touch Cancel button, the display returns to the restore file name indication screen.

Touch Restore All button, and all the programs in the file can be transferred at once to the controller.

(iv) Parameter

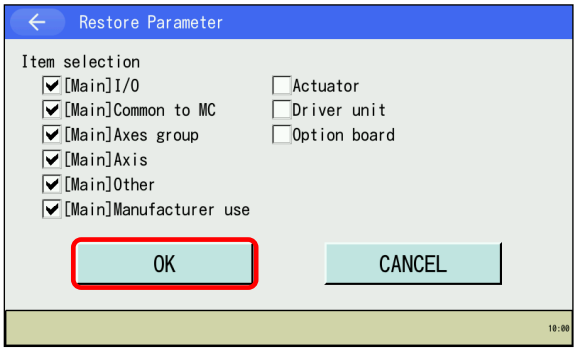


Touch the parameter type to be transferred to put a check mark.
Select the transferred parameter type individually and touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.

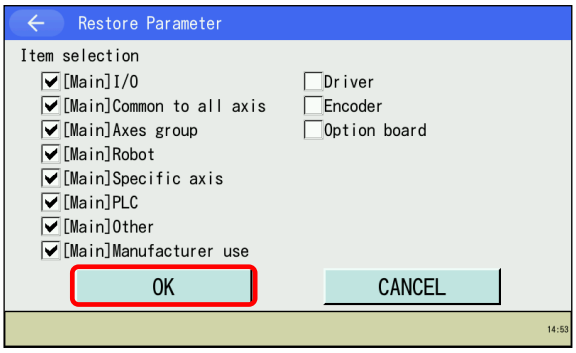
* The controller basic unit dependent parameters are transferred only when a check mark is on "Transfer controller unit dependent parameters". Do not attempt to put a check mark on this in normal use. This setting is to be conducted in following cases.
- When it is necessary to rewrite the parameters because the flash ROM data is broken
- When it is necessary to rewrite the parameters because the basic unit dependent parameters on a wrong controller type is accidently written
- When the status at the backup process needs to be recovered

* It is not available to have a parameter transfer on a specific axis. The parameters on all the axes stored in the file are transferred.

The parameter types to be displayed should differ in RSEL and XSEL2-T/TX.



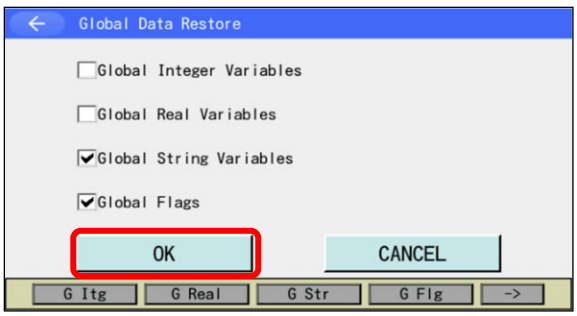
For RSEL



For XSEL2-T/TX

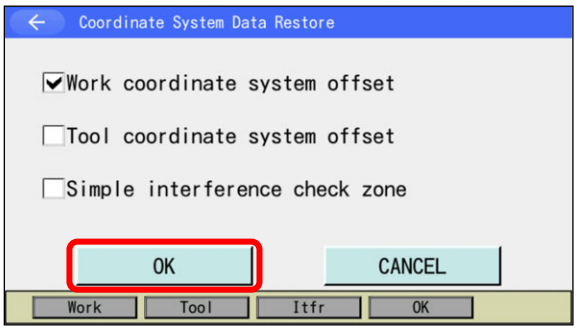
Touch the parameter types to be transferred to put a checkmark.
Touch the OK button after selecting the parameter types to be transferred.
If touching the CANCEL button, the screen goes back to the designate restore file name window.

(v) Global data



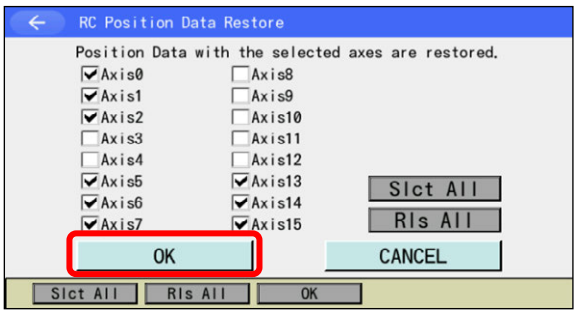
Touch on the global data types that you want to transfer to put a check mark.
After finishing selecting the transferred global data types, touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.

(vi) Coordinate system definition data



Touch on the coordinate system definition data types that you want to transfer, to put a check mark.
After finishing selecting the transferred coordinate system definition data types, touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.

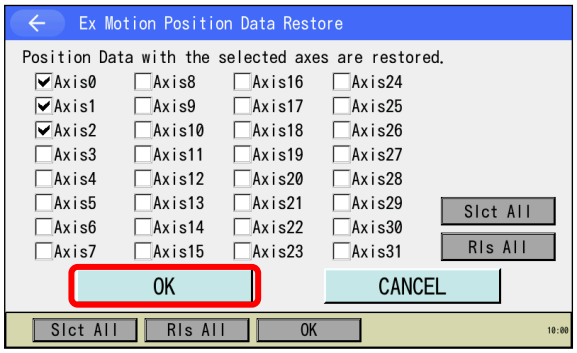
(vii) RC position data



Touch on the axis numbers that you want to transfer to put a check mark.
After finishing selecting the transferred axis numbers, touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.

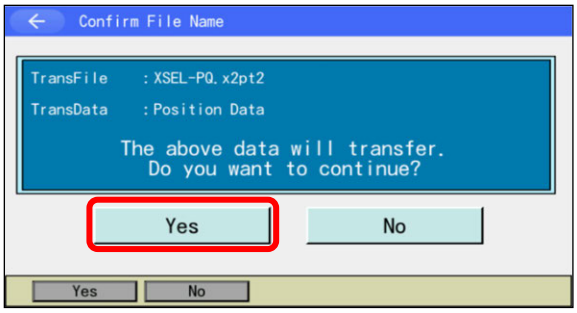
Touch Slct All button, and all the activated axes can be selected.
Touch Rls All button, and all the activated axes can be released from selected status.

(viii) Extended motion position data

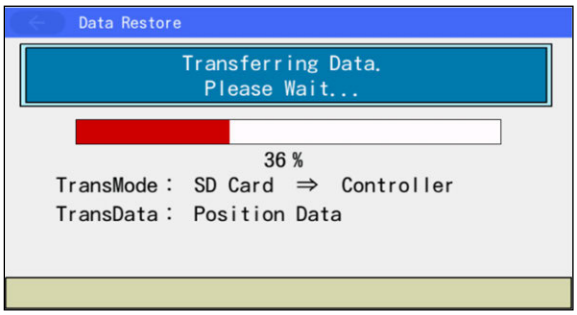


Touch on the axis numbers that you want to transfer to put a check mark.
After finishing selecting the transferred axis numbers, touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.

Touch Slct All button, and all the activated axes can be selected.
Touch Rls All button, and all the activated axes can be released from selected status.



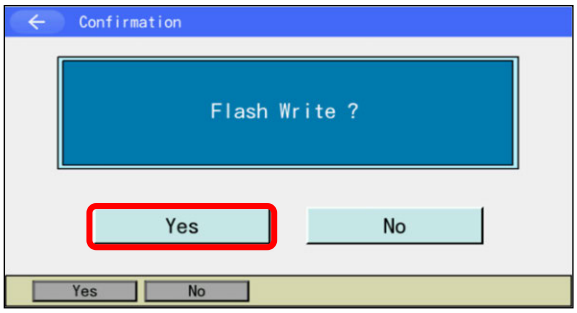
Check the contents of transfer, and touch Yes button.
If you touch No button, the display goes back to the previous screen.



Data transfer screen will be shown.

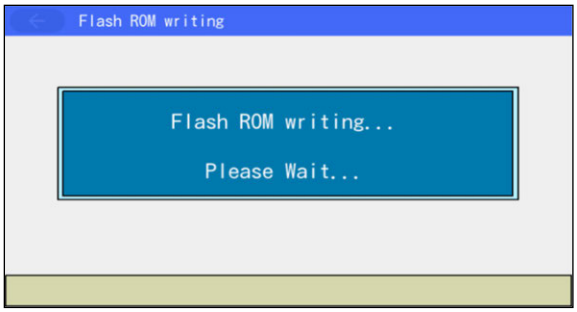


The display shows this screen when in the data transfer is finished.
If you touch OK button, the display returns to the restore menu screen.



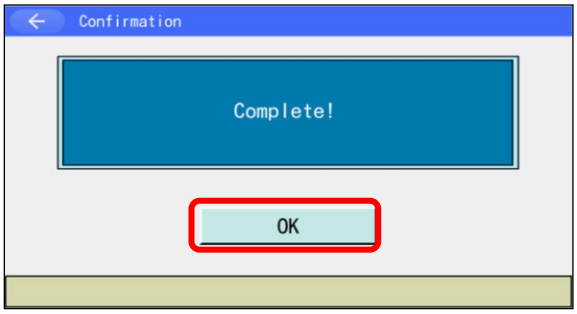
To write the transferred data to the flash ROM, touch Yes button.
When it is not necessary to write the data to the flash ROM, touch No button.

* This screen would not be shown when the flash ROM writing is not necessary (in such cases as global data file transfer).



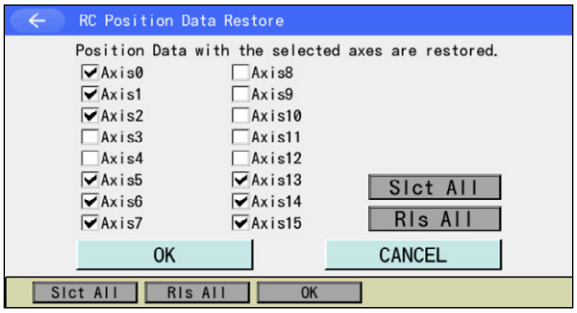
"Flash ROM writing..." flashes during the flash ROM writing.

Never turn off the power to the Controller at this time.

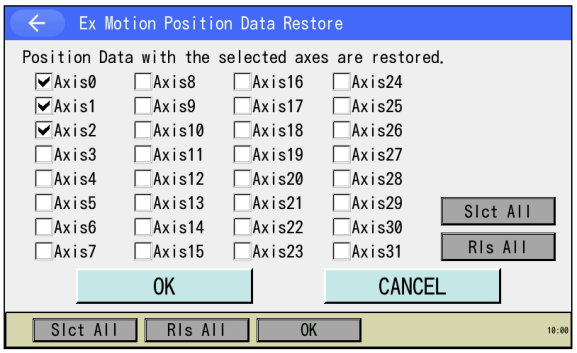


The display shows this screen when the flash ROM writing is finished.
If you touch OK button, the display returns to the restore menu screen.

[Remark]
When the backup file for all the data and the data file for the RC axis positions and extended motion position data are stored together, the select screen for the RC axis number and extended motion control axis to be stored opens after the backup file for all the data is stored.
The way to operate this screen is the same as when you store the RC axis position data and extended motion position data file individually.



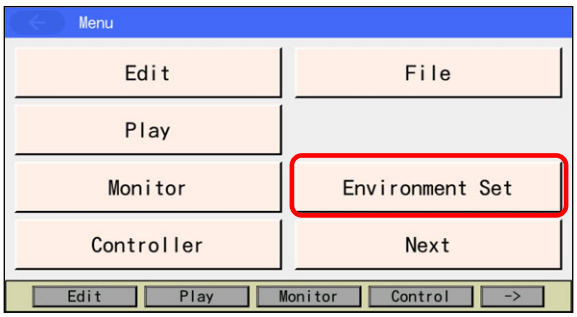
In the case that the RC-axis position data file is transferred at the same time



In the case that the extended motion position data file is transferred at the same time:

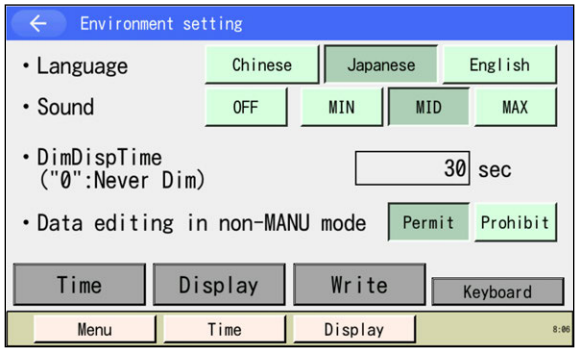
21. Environment Setting

Settings are established for the language, touch operation sound, sleep timer, clock and display.

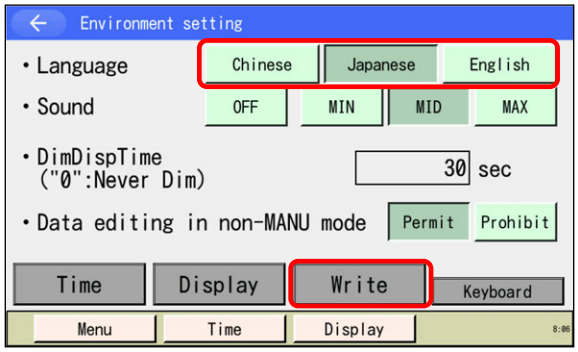


Touch Environment Set button in the menu screen.

The environment setting screen appears.

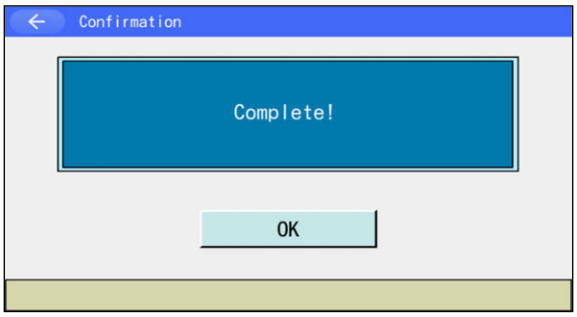


[Language]
Language can be selected and changed.



1. Select Chinese, Japanese or English and touch.
2. Touch Write button.

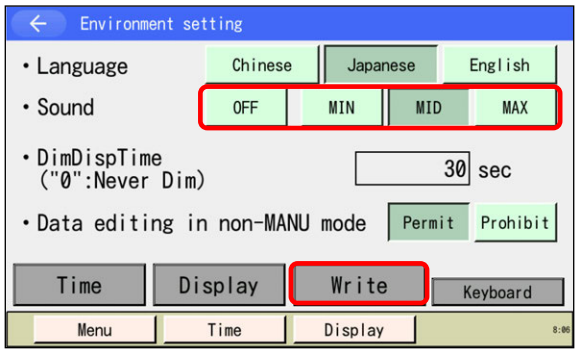
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another screen.



When the writing process is finished, the confirmation screen opens.

Touch OK button to return to the environment setting screen.
If the language is set to English, it shows "Complete!".

[Touch Operation Sound Setting]
Setting can be established whether to output the touch sound or not.



1. Select OFF, MIN, MID or MAX and touch.
2. Touch Write button.

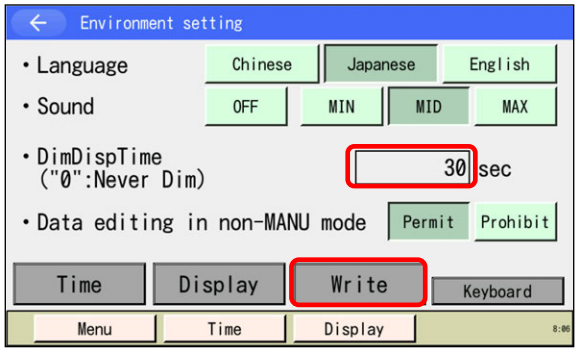
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another screen.



When the writing process is finished, the confirmation screen opens.

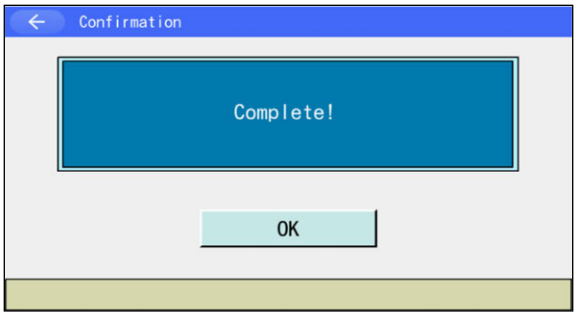
Touch OK button to return to the environment setting screen.

[Sleep Timer]
Timer setting can be established for the screen to go to the sleep mode when no operation is held.



1. Touch in the input box (highlighted in a square) at “DimDispTime”.
2. Input a value to set on the keyboard.
3. Touch Write button.

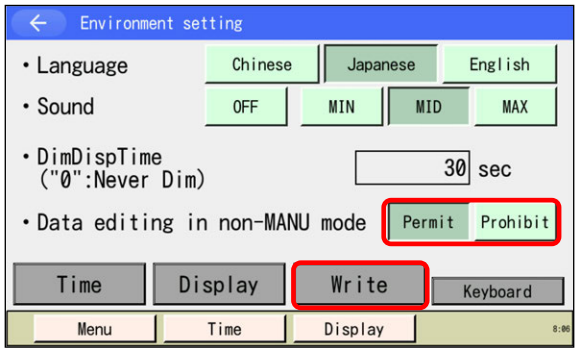
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another screen.



When the writing process is finished, the confirmation screen opens.

Touch OK button to return to the environment setting screen.

[Data Edit in Non-Manual Mode]
Permission and prohibition of data edit in AUTO Mode can be set.



1. Select either Permit or Prohibit and touch.
2. Touch Write button.

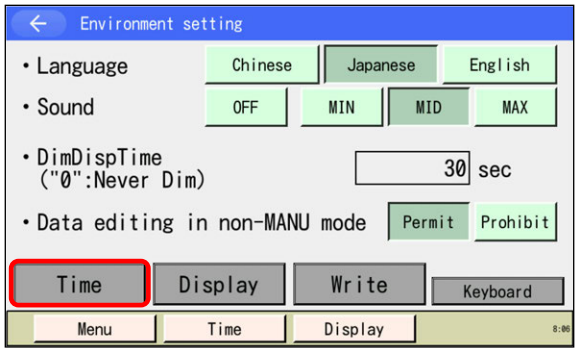
(Note) If writing is not conducted, the values will go back to those before making a change when moving to another screen.



When the writing process is finished, the confirmation screen opens.

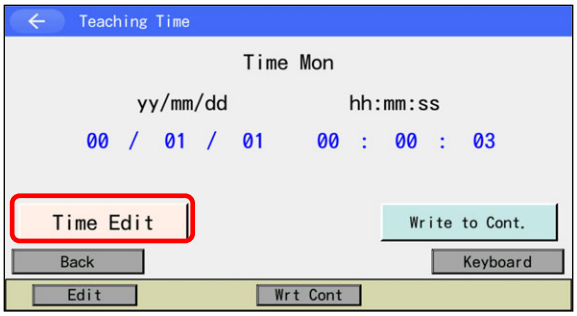
Touch OK button to return to the environment setting screen.

[Time Setting]
Clock setting can be established on TB-02. It is also available to set the TB-02 clock to the controller clock when a model that supports the controller clock is connected.



Touch Time button.

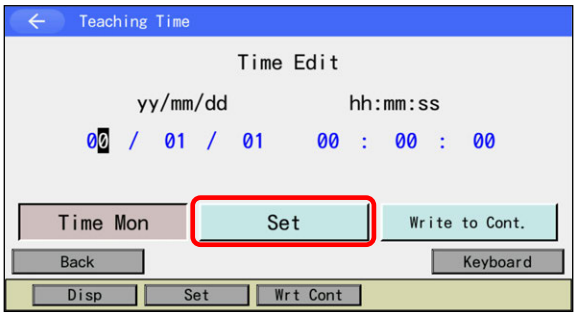
Touch Time button.



TB-02 clock is displayed.

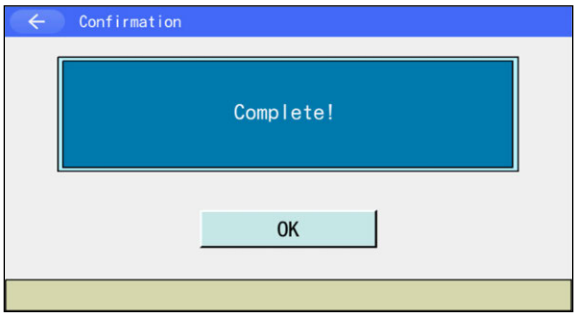
Touch Time Edit button, and the display proceeds to the edit screen.

Touch Time Edit button.



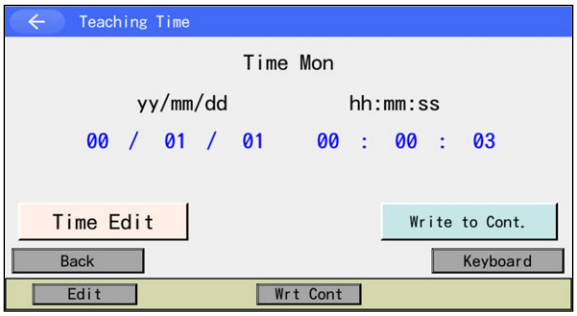
TB-02 clock can be changed.

1. Input the time on Keyboard.
2. Touch Set button.



When the TB-02 clock edit is finished, the confirmation screen opens.

Touch OK button to return to the clock display screen.

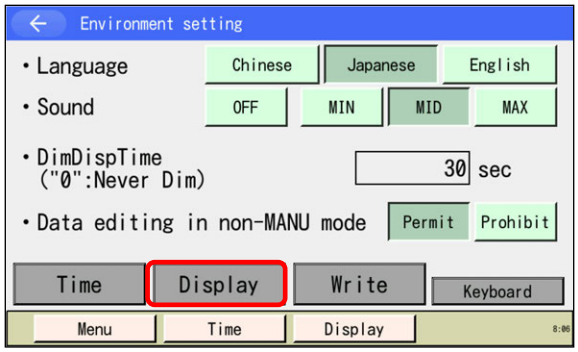


The display returns to this screen.

Touch Back button to return to the environment setting screen.

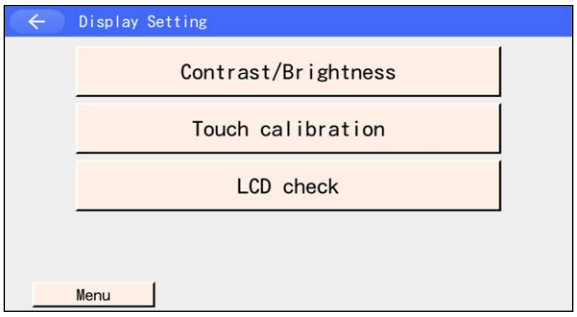
It is available to set the TB-02 clock to the controller clock if you touch Write to Cont. button either in the clock display screen or the clock edit screen.
(Write to Cont. appears only when a model that supports the controller clock is connected.)

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



Touch Display button.

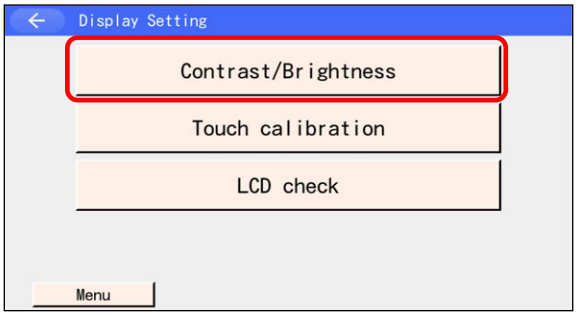
Display Setting menu screen is displayed.



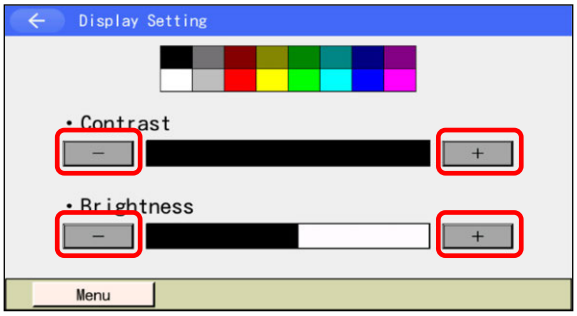
Select Display Setting menu.

Touch Menu button to return to the menu screen.

Change the Contrast/Brightness



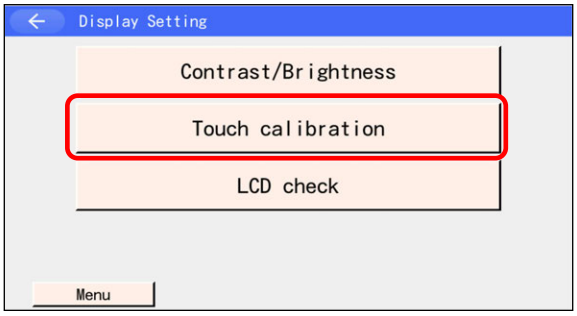
Touch [Contrast/Brightness] button.



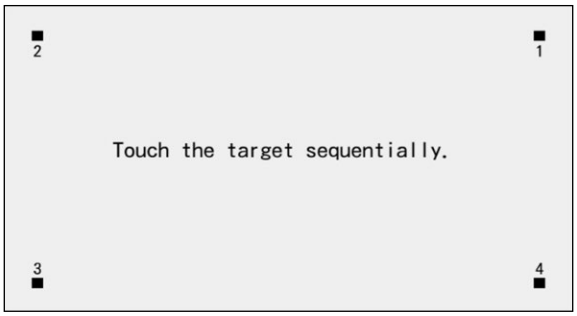
Touch [−] and [+] under Contrast to adjust the contrast of the screen.
Touch [−] and [+] under Brightness to adjust the brightness of the screen.

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

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



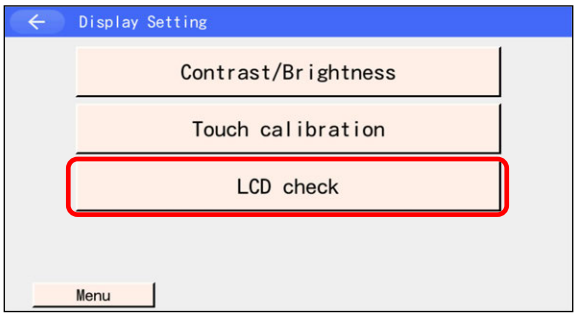
Touch [Touch calibration] button.



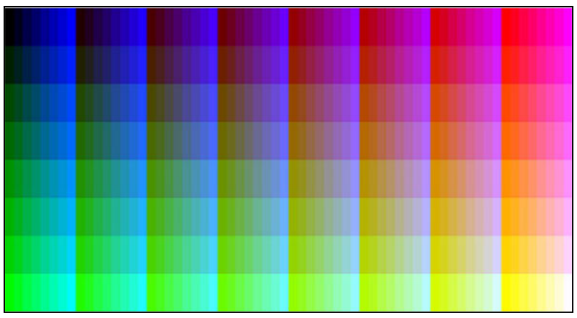
Touch ■ in the order of 1, 2, 3 and 4.

After finished, the display automatically returns to the menu screen.

LCD Check
LCD Display can be checked in the order of color pattern, White only and Black only.

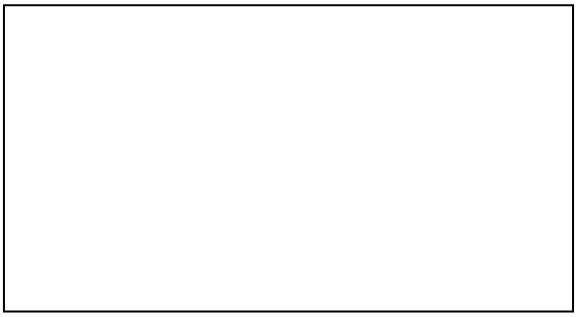


Touch LCD check button.



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.

After the color patterns are displayed again, the display automatically returns to the menu screen.

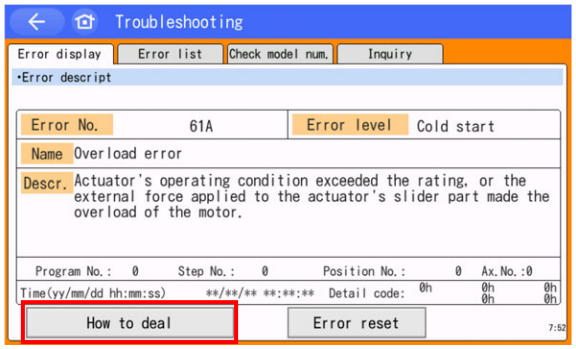
22. Error Display

22.1 RSEL and XSEL2-T/TX System

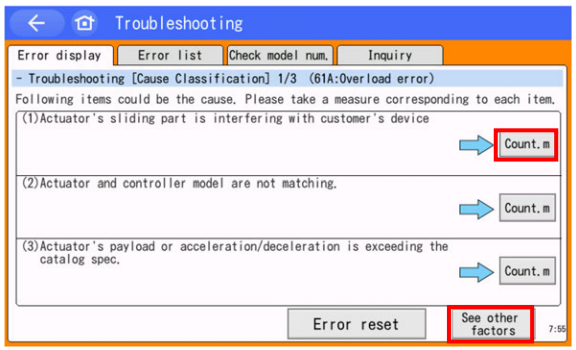
22.1.1 Display at Occurrence (Except for Those in Display for ELECYLINDER, ROBO PUMP Operation)

A troubleshooting window should show up when an error has been occurred.
Touch How to deal button in the troubleshooting window and the confirmation window opens.
Follow the instruction in the window to remove the cause and conduct the error reset.

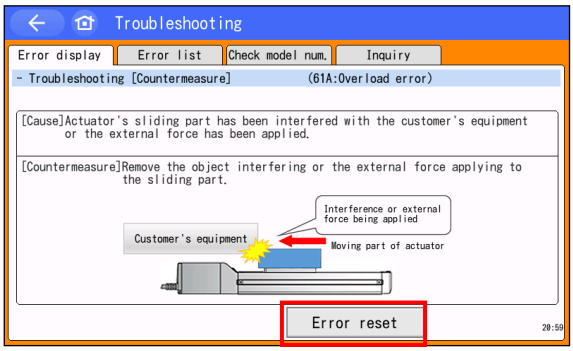
[Example of Window]



Touch How to deal button.



When there are several factors, touch Count.m button at the applicable factor.
If there is no applicable factor, touch See other factors button.
* This window should not be displayed if the factor is not more than one.



The countermeasure should be displayed. Follow the instruction in the window to remove the cause and touch Error Reset button.

22.1.2 Error List for Teaching Pendant (Except for Those in Display for ELECYLINDER, ROBO PUMP Operation)

Shown below is a list of errors related to teaching pendants. Refer to [Controller Instruction Manuals] for errors related to controllers.

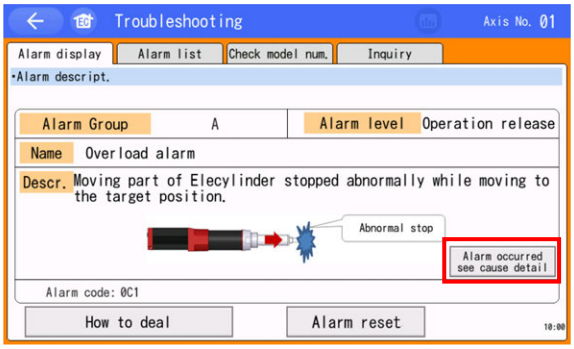
Error No.	Error message
300	SEL Command Language Input Error
301	Operand Input Incomplete Error
302	Operand Input Prohibited Error
303	Operand Data Error
304	Operand Undefined Symbol Use Error
305	Operand Symbol Type Error
306	Program in Process Edit Prohibited Error
307	Symbol Error
308	Input Condition Undefined Symbol Use Error
309	Symbol Use Count Excess Error
30A	Secure Digital Memory Card Error (TP)
30B	Battery Error (TP)
30C	Consolidated Position Data File Error
30D	Data Edit Prohibited in Non Manual Mode Error
30E	Input Data Error
30F	Input Too Small
310	Input Too Big
311	Protect Data Error
312	Coordinate 1 / Coordinate 2 Valid Axis Pattern Error
313	Password Error
314	Home-Return Incomplete Error (TP/PC)
315	Servo off in Operation
316	Input Condition Input Prohibited Error
317	Input Condition Data Error
318	Input Condition Out of Input Range Error
319	Input Condition Input Incomplete Error
31A	Absolute Reset Execution Condition Failure Error
31B	Excess Break Point Settings
31C	Axis Number Error
31D	No Valid Axis Error
31E	Teaching Prohibited in Axis-Specific System Error
31F	Data Pairing Inconsistent
320	Absolute Value Too Small
321	Input below Min. Velocity Warning

Error No.	Error message
322	Communication Error (Driver Unit Related)
323	I/O Feature Indication Error
324	Excess Position Data Comment Definition Count (TP/PC)
325	Position Type Inconsistent Error
326	Feature Unsupported Error
327	Calendar Feature Error
328	Position Error
329	Lacking Empty Step
32A	Movement / Continuous Movement Prohibited at Position Data Change Error
32B	Undefined SEL Command Detection Error
32C	AUTO Mode Execution Command Prohibited Error
32D	Servo-on Multiple Rotation Data Reset Prohibited Error
32E	Servo-on Encoder Error Reset Prohibited Error
32F	Execution Prohibited Error Without Safety Circuit
500	Emergency Stop
700	Communication Error

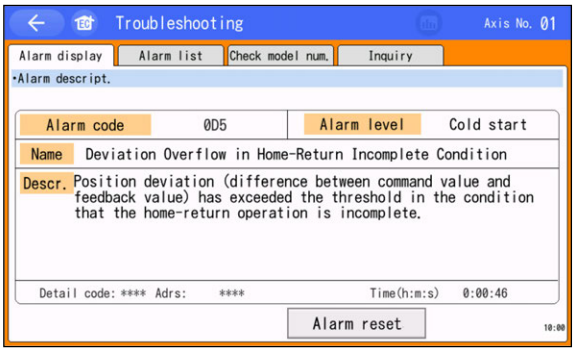
22.1.3 Display at Occurrence (Those in Display for ELECYLINDER, ROBO PUMP Operation)

When an alarm is generated in ELECYLINDER, the troubleshooting window (alarm group) as shown in the figure below should be displayed.

[Example of Window]



Touch the Alarm occurred see cause detail button and the screen goes to the troubleshooting window (alarm code) and the detailed contents of the alarm cause should be displayed. Other operations should be the same as the troubleshooting window for those other than ELECYLINDER.



The figure shown on the left is detail display with an alarm code in the troubleshooting window.

22.1.4 Alarm Code List for Teaching Pendant (Those in Display for ELECYLINDER, ROBO PUMP Operation)

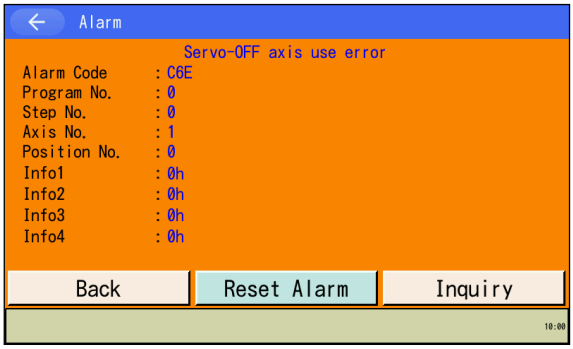
Shown below is a list of the alarm codes related to a teaching pendant. For the alarm codes related to ELECYLINDER, refer to [Instruction Manual of ELECYLINDER].

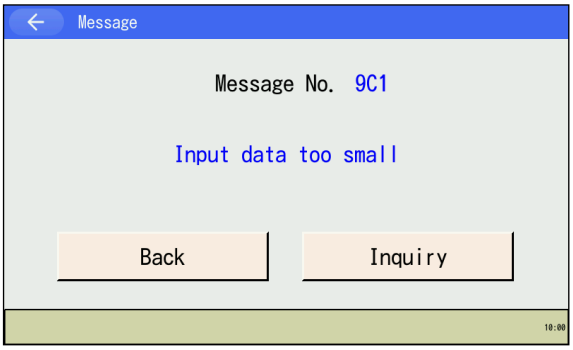
Alarm Code	Alarm Name
2D6	No Movement Data
2D7	Drive Cutoff Operation Command
2D8	Suction or Release Command Prohibited
2D9	Data Edit Prohibited Operation Status
9C0	Input Data Error
9C1	Input Value Too Small
9C2	Input Value Too Big
9EB	Password Error
AD1	Secure Digital Card Writing Error
AD2	Secure Digital Card Reading Error
AD9	Secure Digital Card Open Error
BE0	Emergency Stop
BE2	Register Writing Forbidden at AUTO Mode
BE3	Register Writing Forbidden at Monitoring Mode
BE4	Operation Forbidden in AUTO Mode
BE5	Operation Forbidden at Monitoring Mode
BE6	Motor Voltage Drop
BE7	Servo Turned off During Operation
BE8	Over soft-limit

22.2 Connection of Controllers other than RSEL and XSEL2-T/TX System

22.2.1 Display at Occurrence

An alarm window should appear when an error detected on a controller is occurred. Also when an error detected on a teaching pendant is occurred, a message window should appear.





If the error detected on the controller is in the operation cancel level, the error can be reset with Reset Alarm button. Touch Reset Alarm button after a cause is removed. It is necessary to reboot the power to the controller or conduct the software reset in case of a cold start level error.

22.2.2 About Error Level Management

Error level	System error assignment source	Error No. (HEX)	Display (7-segment display, etc.)	Error list (Application only)	Error LED output (MAIN only)	Program operation		Error reset	Remarks
						Other parameter No. 4 = 0	Other parameter No. 4 = 1		
Secret level	Main application	800 to 88F		○					Special maintenance error level
	Main core	890 to 8AF							
	PC	8B0 to 8DF							
	TP	8E0 to 8FF							
Message level	Main application		○	Δ (Battery-related and field-bus-related are registered in the error list.)				Enabled	Indicates Status, Input Error, etc.
	Main core	-							
	PC								
	PC (Update tool)								
	TP								
	Flash ACK Time Out	200 to 24F							
	Main core	-							
	PC	AA0 to ACF							
	TP	AD0 to AFF							
Operation-cancellation level	Main application		○	○		Release the program at the source. (Errors other than axis-related errors become release factors only in an error-occurring moment.)	Release all the programs except for the “I/O processing program at action-abort time.” (Errors other than axis-related errors become release factors only in an error-occurring moment.)	Enabled	Errors interfering with action. For any minor errors with a level lower than this, error release is attempted with the auto-reset function at the external active command (SIO/PIO) receipt.
	Main core	-							
	PC								
	TP								
	Main application	400 to 4CF							
	Main core	-							
		4D0 to 4DF							
	PC	4E0 to 4EF							
	TP	4F0 to 4FF							
Cold start level	Main application	500 to 5CF	○	○	○ (Core only)	Release the program at the source. * However, release all the programs except for the “I/O processing program at action-abort time” when driving-power-down requiring errors (initialization error, power error, etc.) occur.	Release all the programs except for the “I/O processing program at action-abort time.”	Not enabled.	Need to turn ON power again. (CPU and OS will operate normally.)
	Main core	-							
	PC								
	PC (Update tool)								
	TP								
	Main application	600 to 6CF							
	Main core	-							
		6D0 to 6DF							
	PC	6E0 to 6EF							
	TP	6F0 to 6FF							
System down level	Main application		○	○	○	All release		Not enabled.	Need to turn ON power. (CPU and OS will not operate.)
	Main core	-							
	PC								
	TP								

TP: Teaching Pendant PC: PC Softrware

22.2.3 Teaching Pendant Error List (Application Section)

(These are the errors specific to the Teaching Pendant For the controller errors, refer to [Instruction Manual for Each Controller].)

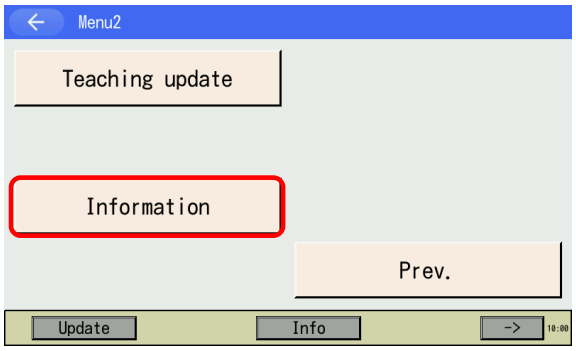
Error No.	Error name	Description, action, etc.
9C0	Input data error	Input data error. Check the input data.
9C1	Input data too small	Too-small input data. Check the allowable input range.
9C2	Input data too large	Too-large input data. Check the allowable input range.
9C3	SEL Cmnd Input Error	Invalid data is input for the SEL command.
9C4	Inputting Conditions are not allowed	The input condition is used in the step where use of such condition is not allowed.
9C5	Input Condition DataError	An invalid value is input for the input condition.
9C6	Input Condition is out of range	A value out of the input range is input for the input condition.
9C7	No Input Condition yet	No input condition is input in the step where such condition is essential.
9C8	Undefined Symbol (Input Condition)	An undefined symbol is used for the input condition.
9C9	Operand not inputted(Oprnd1)	The operand 1 is not input in the step where the operand 1 is essential.
9CA	Operand not inputted(Oprnd2)	The operand 2 is not input in the step where the operand 2 is essential.
9CB	Operand not inputted(Oprnd3)	The operand 3 is not input in the step where the operand 3 is essential.
9CC	Inputting Oprnd is not allowed (Oprnd1)	The operand 1 is used in the step where use of the operand 1 is prohibited.
9CD	Inputting Oprnd is not allowed (Oprnd2)	The operand 2 is used in the step where use of the operand 2 is prohibited.
9CE	Inputting Oprnd is not allowed (Oprnd3)	The operand 3 is used in the step where use of the operand 3 is prohibited.
9CF	Operand1 is invalid	An invalid data is input for the operand 1. Check the data.
9D0	Operand2 is invalid	An invalid data is input for the operand 2. Check the data.
9D1	Operand3 is invalid	An invalid data is input for the operand 3. Check the data.
9D2	Inputted Operand is out of range(Oprnd1)	A value out of the allowable input range is input for the operand 1.
9D3	Inputted Operand is out of range(Oprnd2)	A value out of the allowable input range is input for the operand 2.
9D4	Inputted Operand is out of range(Oprnd3)	A value out of the allowable input range is input for the operand 3.
9D5	Undefined symbol (Oprnd1)	An undefined symbol is used for the operand 1.
9D6	Undefined symbol (Oprnd2)	An undefined symbol is used for the operand 2.
9D7	Undefined symbol (Oprnd3)	An undefined symbol is used for the operand 3.
9D8	Symbol type error (Oprnd1)	A symbol of the type not allowable for the operand 1 or outside of the scope is used.
9D9	Symbol type error (Oprnd2)	A symbol of the type not allowable for the operand 2 or outside of the scope is used.
9DA	Symbol type error (Oprnd3)	A symbol of the type not allowable for the operand 3 or outside of the scope is used.
9DB	Symbol type error (Input Condition)	A symbol of the type not allowable for the input condition or outside of the scope is used.
9DC	Invalid Symbol String	An invalid character is used at the head of the symbol or in the character string.
9DD	Multiple declaration of a Symbol	The same symbol has multiple definitions.
9DE	Symbol value not inputted	No symbol-defined value is input.
9E0	Servo OFF while in Action	It is forbidden to make an operation or continuous operation when the home-return operation is incomplete. Turn on the servo first.

Error No.	Error name	Description, action, etc.
9E1	Not yet Homed MOVE	It is forbidden to have teaching when the home-return operation is incomplete. Complete homing first.
9E2	Not yet Homed TEACH	Teaching prohibition error at not-yet-homed time. Complete homing first.
9E3	Function not Supported	An unsupported function is attempted to execute.
9E4	Encoder type error	Encoder type error. Check the ABS/INC type (each-axis parameter No. 38) of the operation target axis.
9E5	Axis number error	The specification of the axis No. is invalid.
9E6	No effective axis	There is no effective axis that can be edited and operated. Check the effective axis pattern (all-axis common parameter No. 1).
9E7	EEPROM write error (1)	EEPROM write error.
9E8	EEPROM write error (3)	EEPROM write error.
9E9	EEPROM read error (4)	EEPROM read error.
9EA	EEPROM read error (5)	EEPROM read error.
9EB	Password error	The password is invalid.
9EC	Position Data has been changed	It is forbidden to make an operation or continuous operation while the position data is being changed. After writing the changed data in the controller, make a reattempt.
9ED	Can not edit while running program (TP)	Editing operation cannot be performed for the running program. Exit from the program first.
9EE	Too many Symbol Definitions	The number of symbol definitions has exceeded the limit.
9EF	Can not reset M-Dat when servo is ON.	It is forbidden to reset the ABS encoder multi-rotation data when the servo is on.
9F0	Crd[1] and Crd[2] donot have consistency	The indicated axis patterns in Coordinate [1] and Coordinate [2] in the simple interference check zone definition data do not match with each other.
9F1	No effective data in Crd[1] and Crd[2]	No coordinate value is input in the simple interference check zone definition data.
9F2	'Scan' prohibition at each axis system	“Scan” (current position load) cannot be conducted on each axis coordinate system.
9F3	Can't read the protected data	Such operation as readout, copy or move cannot be conducted to the readout protected data.
9F4	Can't write to the protection area	Such operation as white, move or clear cannot be conducted to the write protected data.
9F5	Protection setting prmtr is abnormal	An appropriate value is set in the protection setting parameter (Other Parameter No. 36 to 39 or No. 55 to 57).
9F6	Mismatch Md RC Gateway Error	There is a mismatch in RC Gateway Mode.
9F7	Non Lnk Axis Error	There is no RC link axis.
9F8	Error without axis which can be moved	There is no axis available for operation.
9F9	I/O Selective Function Error	There is a mistake in I/O function indication.
9FA	Execute Condtion Fail Error	The condition is not established to execute the command.
9FB	No effective position	There is no effective position.
9FC	Can not reset Enc-Err when servo is ON.	It is forbidden to reset an error on ABS encoder when the servo is on.
9FD	Too many BreakPoints	The number of the brake point settings has exceeded the limit.
9FE	Position Output Operation Data Designation Error	The data designation for the position output operation is faulty.
AD0	File Open Error	It is a Secure Digital memory card error. The file cannot be opened.
AD1	Failed in Writing File	It is a Secure Digital memory card error. The file cannot be written in.

Error No.	Error name	Description, action, etc.
AD2	Failed in Reading File	It is a Secure Digital memory card error. The file cannot be read out.
AD3	File Close Error	It is a Secure Digital memory card error. An error has occurred when the file was closed.
AD4	Undefined Command Detection Error	Undefined SEL command was detected.
AD5	Can not Edit Data in NON-MANUAL Mode	It is forbidden to edit data in Non-Manual Mode.
AD6	Lacking Empty Step	Number of the empty steps is not enough.
AD7	RTC voltage reduction	The voltage on the RTC backup battery has dropped.
AD8	Symbol outside support range	A symbol out of the range of numbers supported in the controller was attempted to be edited.
AD9	Secure Digital memory card Open Error	Secure Digital memory card was not identified.
DE0	Receive Data Invalid	The received data has an error. When it is not eliminated even through re-connection, contact the manufacturer.
DE1	Header Logic Error (IAI Protocol Send)	It is a communication error. IAI protocol send data header logic error
DE2	Command ID Logic Err(IAI Protocol Send)	It is a communication error. IAI protocol send data command ID logic error
DE3	Receive Data Error (IAI Protocol Recv)	It is a communication error. IAI protocol receive data error
DE4	Response Time-out (IAI Protocol Recv)	It is a communication error. IAI protocol response time-out error
DE5	Overrun Error (Master Mode)	It is a communication error. Overrun error (in Master mode)
DE6	Framing Error (Master Mode)	It is a communication error. Framing error (in Master mode)
DE7	Parity Error (Master Mode)	It is a communication error. Parity error (in Master mode)
DE8	Send Que Overflow (Master Mode)	It is a communication error. SCI send queue overflow (in Master mode)
DE9	Receive Que Overflow(Master Mode)	It is a communication error. SCI receive queue overflow (in Master mode)
DEA	Send Buffer Overflow(IAI Protocol Send)	It is a communication error. IAI protocol send buffer overflow (in Master mode)
DEB	Receive Buf Overflow(Master Mode)	It is a communication error. IAI protocol receive buffer overflow (in Master mode)
DEC	Send Que Overflow (IAI Protocol Send)	It is a communication error. IAI protocol send queue overflow
DED	Receive Que Overflow(IAI Protocol Recv)	It is a communication error. IAI protocol receive queue overflow
DEE	CTL Not Connected	Controller no connection error. Communications cannot be established or an unsupported controller is connected. The probable causes are as follows: 1) It is a communication failure due to a break in or noise from the communication line. 2) The communication baud rate of the controller is not supported by the teaching pendant. (The failure may be resolved by the controller power reconnection.) 3) The model not supported by the teaching pendant is connected. (Refer to Support Models.)
DEF	Emergency Stop	The stop switch of the teaching pendant is pressed.
DF0	Unsupported CTL is connected	Non-supported controller is connected.
DF1	Communication string unmatch error	There is a mismatch in the communication string.

23. Information Display

Information such as version and production information should be shown.

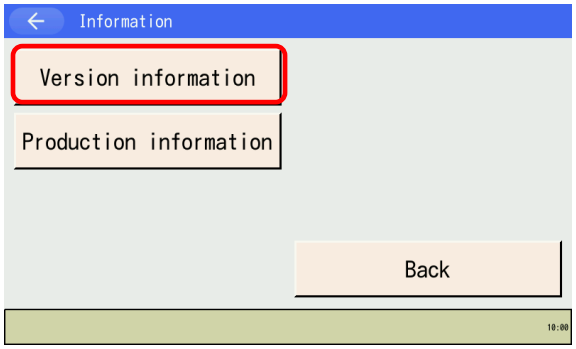


Touch the Information button in the main menu window.

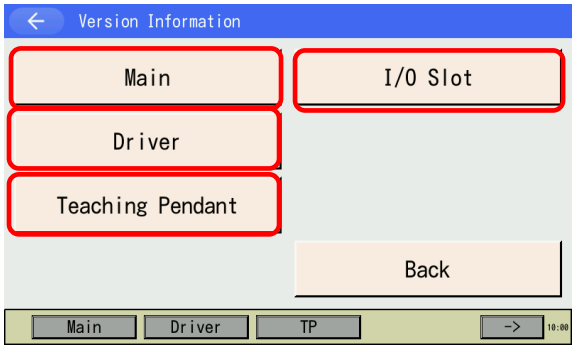
23.1 Version Information

Version of each device should be shown.

* Some models show this information in Main Menu → Monitor → Next → Version Information



Touch the Version information button in the information menu window.



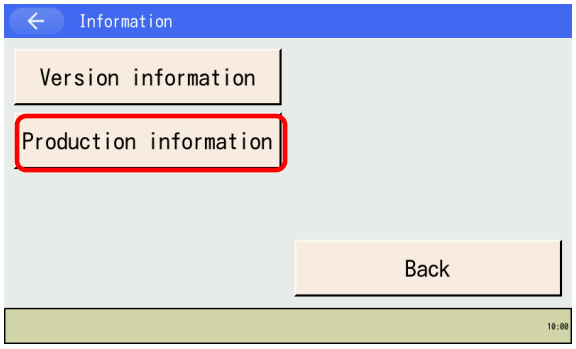
Touch a button for the desirable version.

Refer to [14.10 Version Information] for the contents of display in each window.

23.2 Production Information

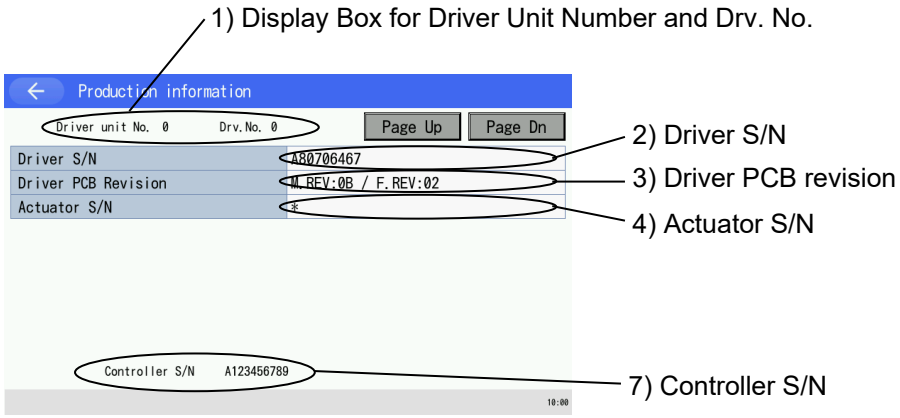
(for applicable models only)

Production information for the controller and actuators should be shown.

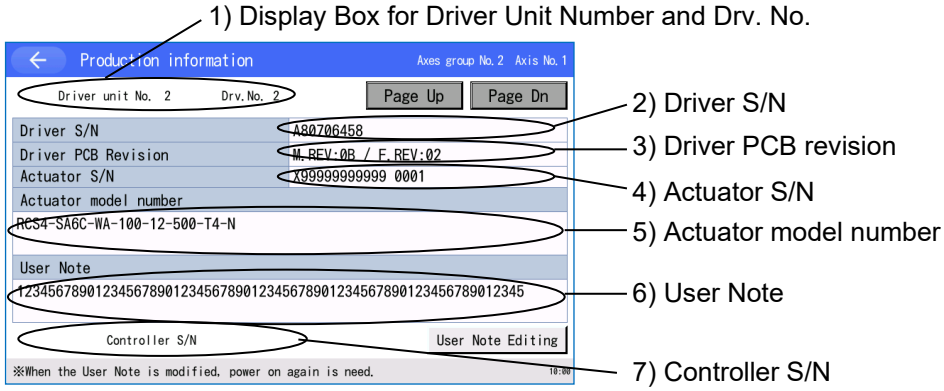


Touch the Production information button in the information menu window.

[Displayed Items in Production Information Window]



If both the controller and actuators are applicable for the information management feature and the actuator signification feature use flag in Driver Unit Parameter No. 192 is set to 1: Activated, the display should be as shown in the figure below.
(For XSEL2-T/TX, Bit 0-3 in All Axes Common Parameter No. 118 Actuator Identification Feature Setting also needs to be set to 1: Feature Enabled.



1) Display Box for Driver Unit Number and Drv. No.
   The unit number and Drv. No. Of the driver unit should be shown. The information of the connected actuator should be shown here.
   When an axis number is assigned, a theoretical axis number should be displayed on the right top of the window.

2) Driver S/N
   The production number of the driver unit should be shown.

3) Driver PCB revision
   PCB revision of the driver unit should be shown.

4) Actuator S/N
   The production number of the actuator saved in the encoder should be shown.

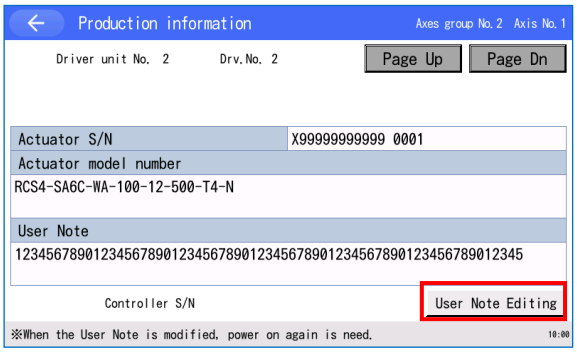
5) Actuator model number
   The model code of the actuator saved in the encoder should be shown.

6) User Note
   The user note saved in the encoder should be shown.

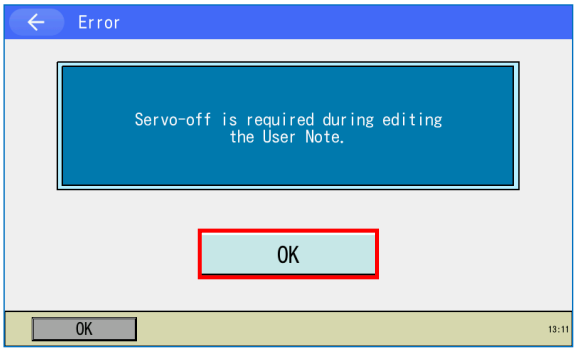
7) Controller S/N
   The production number of the controller should be shown.

Touch the User Note Editing button, and a keyboard should be displayed after a confirmation window. Input some character string, and touch the ENT button to edit the user note.

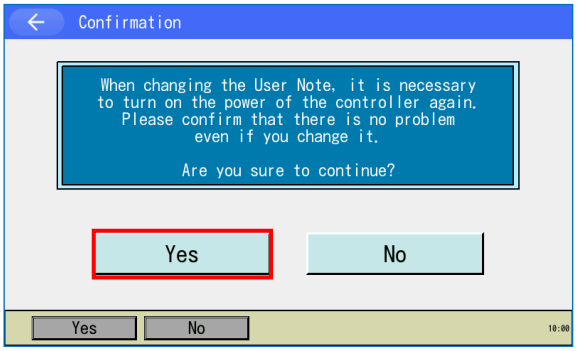
In TB-02, only the half-width characters and numbers and half-width symbols are available for input. The number of characters available for input is up to 65 half-width characters.



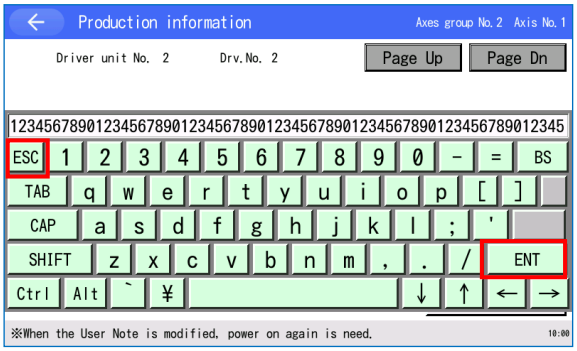
Touch the User Note Editing button.



When the servo of a selected axis is on, a warning should be shown and it should be terminated as an error.
Touch the OK button, and the screen goes to production information window.



When editing the user memo for the first time after the power is turned on, a confirmation window should be displayed.
Touch the Yes button, and a keyboard should be shown.
Touch the No button, and the screen goes to production information window.



Input some character string and touch the ENT button to edit the user note.
Touch the ESC button, and the edited contents should get eliminated.

* The number of characters available for input is up to 65 half-width characters.

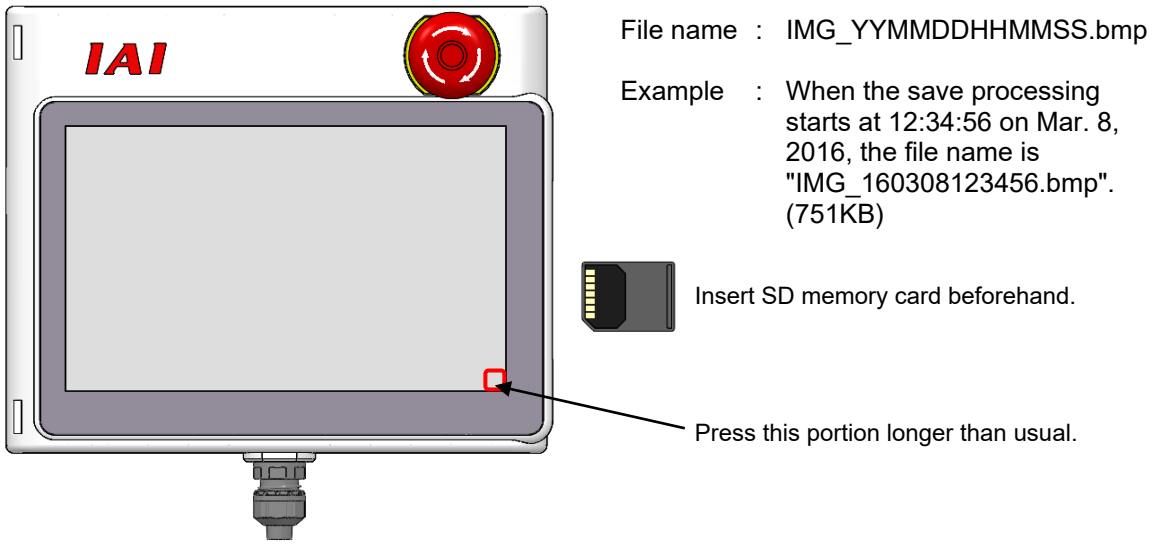
Touch the Page Up or Page Dn button and the window switches over between the driver unit number and Drv. No..

When the user memo has already been edited, touch the ← button on the left top of the window and the power supply reboot request message should show up. While the power supply reboot request message is displayed, any operation other than power supply reboot cannot be conducted. Reboot the power supply.
When the user memo has not been edited, touch the ← button on the left top of the window and the screen returns to the production information menu.

24. Appendix

24.1 Screenshot

It is possible to save the image on the current screen (screenshot) into SD memory card.
When you want to capture a screenshot, press the lower right portion on the screen for about 2 seconds longer than usual on condition that SD memory card is inserted.
After a short sound is heard, saving the screenshot starts. (If the touch tone is set to "OFF", the sound is not heard.) When saving is completed, the save file name is displayed for 3 seconds on the screen.



[Cautions]
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.

> ⚠ *Warning: As buttons do not work on the screen during saving process, emergency stop will not work. Do not attempt to use this feature when an actuator is operated (continuous movement, Program Execution, etc.) from the teaching.*

24.2 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 only.
It should not update the softwares of each controller or ELECYLINDER.

Regardless of condition of connection, this update updates all the TB-02 softwares for ELECYLINDER (for wireless connection / wired connection) / ROBO PUMP / CON / SEP / MEC / SEL.

Update takes approximately 35 minutes.

Conduct either of the following update procedures in accordance with each conditions.

- 24.2.1 How to Update when SEL controller Connected
- 24.2.2 How to Update when Alarm Code DEE Displayed
- 24.2.3 How to and Compulsorily Update

◆Preparation

Preparation 1 Prepare a SD memory card or a SD High-Capacity memory card with 1GB to 32GB formatted in FAT32 (hereafter described as a SD memory card).

Preparation 2 Access homepage http://www.iai-robot.co.jp/download/tb-02/ and download the TB-02/03 update file TB-02_$$$.zip and unzip it. ($$$ should be replaced by the version number in three digits.)

Preparation 3 Copy the unzipped update file TB-02_$$$.pct to the root folder of the SD memory card. ($$$ 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 is open, and insert a SD memory card while the power to TB-02 is off. [Refer to 2.4 How to Set in/out SD Memory Card.]

Preparation 5 Supply power to the controller to which TB-02 is connected and start up TB-02.

24.2.1 How to Update when SEL controller Connected

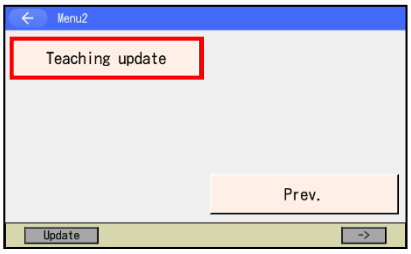
(Note) Refer to [24.2.2 How to Update when Alarm Code DEE Displayed] if Alarm Code DEE gets shown after the power is turned on.

[Step 1] Perform from Preparation 1 to Preparation 5 in [24.2 ◆Preparation].



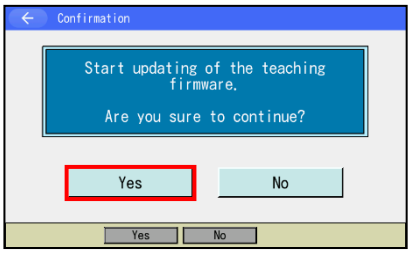
[Step 2]

Touch Next button in the menu window.



[Step 3]

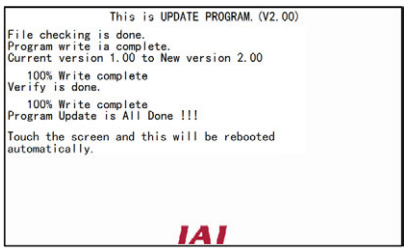
Touch Teaching update button.



[Step 4]

A confirmation window for update appears.

Touch Yes button.



[Step 5]

Update starts.

Touch the screen after you confirm the following messages;
“Program Update is All Done !!!”
“Touch the screen and this will be rebooted automatically.”

TB-02 will start up in the new version.

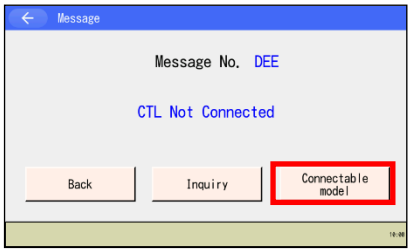
In case there is nothing shown on the screen even after more than one minute has passed after starting update, refer to how to recover in [24.2.4 Troubleshooting] No. 5 to perform the compulsory update.

⚠ *Caution: Do not attempt to turn off the power to TB-02 while in updating.*

24.2.2 How to Update when Alarm Code DEE Displayed

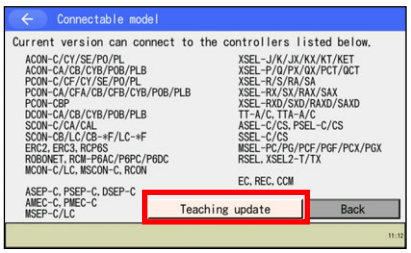
Follow the procedures below to make an update in case of a SEL system controller and it displays Controller Unconnected Error (Alarm Code DEE) after the power gets turned on.

[Step 1] Perform from Preparation 1 to Preparation 5 in [24.2 ◆Preparation].



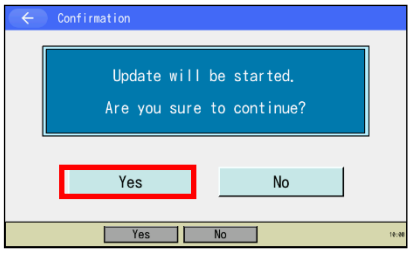
[Step 2]

Touch Connectable model button.



[Step 3]

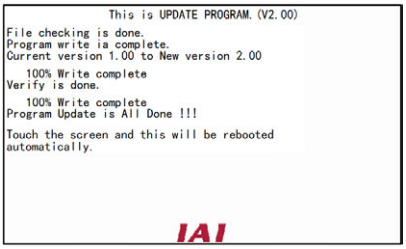
Touch Teaching update button.



[Step 4]

A confirmation window for update appears.

Touch Yes button.



[Step 5]

Update starts.

Touch the screen after you confirm the following messages;
“Program Update is All Done !!!”
“Touch the screen and this will be rebooted automatically.”

TB-02 will start up in the new version.

In case there is nothing shown on the screen even after more than one minute has passed after starting update, refer to how to recover in [24.2.4 Troubleshooting] No. 5 to perform the compulsory update.

> ⚠ *Caution: Do not attempt to turn off the power to TB-02 while in updating.*

24.2.3 How to Compulsorily Update

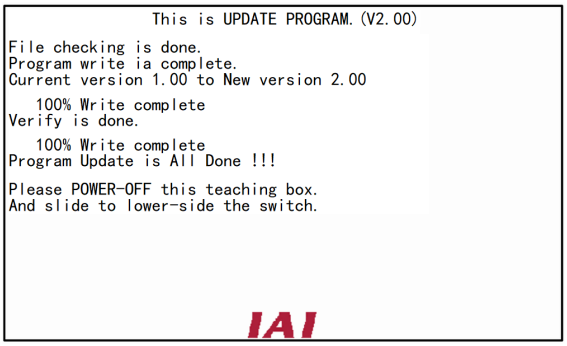
Follow the procedures below to update again in case the menu window of TB-02 would not be displayed due to a failure in updating for reasons such as the power got shut during updating process.

[Step 1] Perform from Preparation 1 to Preparation 4 in [24.2 ◆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). Refer to《Figure 1》

[Step 3] Follow Preparation 5 in [24.2 ◆Preparation] to turn on the power to TB-02.
Once the power gets supplied, updating process starts without any confirmation window.

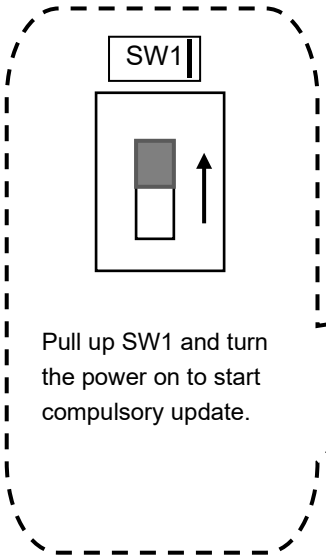
[Step 4] Once the update is complete, a window showing “Program Update is All Done !!!” appears.



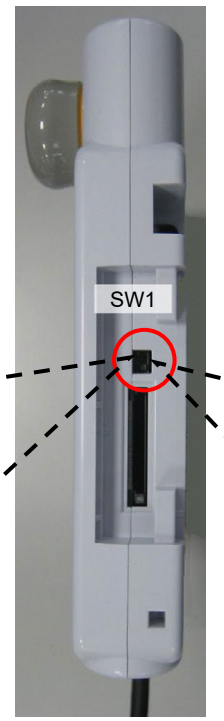
There may be a case that the black and white are in opposite depending on the version of the software.

[Step 5] Shut (turn off) the power slide SW1 downwards (towards the SD memory card), and then supply (turn on) the power again. Refer to《Figure 2》

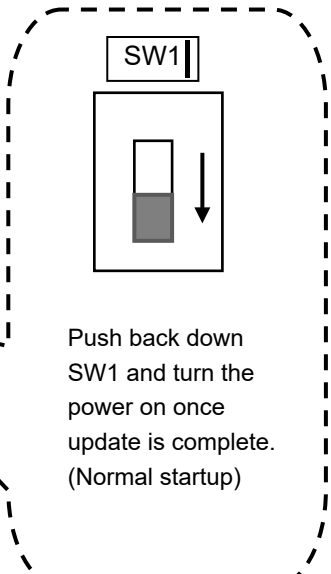
《Figure 1》



Pull up SW1 and turn the power on to start compulsory update.



《Figure 2》



Push back down SW1 and turn the power on once update is complete. (Normal startup)

24.2.4 Troubleshooting

No.	Condition	Considerable Cause	Check Items and Counteractions
1	[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_$$$.pct” (three digits of version number come in $$$).
2	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 [24.2.3 How to Compulsorily Update]
3	Display appears stating “File Format Error (Check sum Error)” at the start of update.	“TB02_$$$.pct” (three digits of version number come in $$$) saved in the memory card is either not an update file or destroyed.	Save the update file again and try updating again.
4	Display appears stating “SD Card Access NG !!!” at the start of update.	The memory card is inappropriate.	Try another memory card and update.
5	There is nothing shown on the screen after more than 1 minute passed after the update has started.	There is nothing shown on the screen after more than 1 minute passed after the update has started.	[Process for Recovery] 1. Take out the memory card. 2. Turn the power off. 3. Conduct the compulsory update. Refer to [24.2.3 How to Compulsorily Update]
6	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.
7	Display appears stating “SD Card Not Inserted !!!” at the start of compulsory update.	1. No memory card is inserted 2. Cannot be identified.	Make sure that a SD memory card with 1GB to 32GB capacity formatted in FAT32 is firmly inserted.
8	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_$$$.pct” (three digits of version number come in $$$).

25. Warranty

25.1 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

25.2 Scope of Warranty

Our products are covered by warranty when all of the following conditions are met. Faulty products covered by warranty will be replaced or repaired free of charge:

(1) The breakdown or problem in question pertains to our product as delivered by us or our authorized dealer.
(2) The breakdown or problem in question occurred during the warranty period.
(3) The breakdown or problem in question occurred while the product was in use for an appropriate purpose under the conditions and environment of use specified in the Operation Manual and catalog.
(4) The breakdown or problem in question was caused by a specification defect or problem, or by a quality issue with our product.

Note that breakdowns due to any of the following reasons are excluded from the scope of warranty:

- 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.

25.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.

25.4 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.

25.5 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 Operation Manual.

25.6 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	Revision Description
2016.3	First Edition
2016.4	Second Edition ● Applicable for language switching function ● Chapter 21 Appendix (Screenshot, Teaching Update) added ● Terms integrated, correction made
2016.7	Third Edition ● Applicable for XSEL-RA/SA/RAX/SAX/RAXD/SAXD ● 3.8.1 How to Attach Grip Belt added ● Chapter 17 Absolute Reset Description Reviewed ● Chapter 19 Extended Motion Control Function Added ● Terms integrated, correction made
2017.08	Fourth Edition ● Applicable for Wrist Unit (WU) ● Applicable for MSEL-PCF/PGF ● 11.4 Program Execution Time Measurement Function added ● 15.13 Servo Additional Data Monitor added ● 16.14 Pairing ID Clear Function added ● 22.2.3 Note added stating how to make update when Controller Unconnected Error occurred ● Terms integrated, correction made
2017.12	Fifth Edition ● XSEL-RAX/SAX　IXA Applicable Support （Applied to 3-axis SCARA, Applied to SCARA axis battery-less absolute） ● Correction made
2018.01	Edition 5B ● Applicable for collision detection function ● Applicable for compliance control function
2018.06	Edition 5C ● Note added in Support Models ● 4.1 to 4.12 Note added for cable minimum bending radius ● 22.2 Time for teaching update revised
2018.10	Edition 5D ● 4.12 Connection cable wiring diagram deleted
2020.02	Sixth Edition ● Applicable for RSEL Controller
2020.04	Edition 6B ● Correction made

Revision Date	Revision Description
2020.06	Seventh Edition ● Applicable for 6-axis Cartesian Robot ● Applicable for Wrist Unit
2021.08	Eighth Edition ● Changes made to the Cover ● Changes made to the Safety Guide ● Chapter Contents table of deleted ● Product Check 3. How to Read Model Nameplate the replaced ● Mode Transition Diagram of 6.7 RSEL Controller the replaced ● Descriptions added for the maximum setting in 9.3.3 (1) Jog Operation, (2) Inching Operation and (8) Movement ● 15.9.2 Driver Alarm List added ● 15.10 Version Information (6) Optional unit added ● 6.1 Controller Items "I/O port allocation", "Option unit", and "EC operation mode" added. ● 16.18 Input/Output Port Assignment added. ● 16.19 Input/Output Port Data Assignment Item number, figure and part of text changed. ● 16.20 Optional Unit Setting added. ● 16.21 EC Operation Mode added. ● Chapter 20 ELECYLINDER Operation Function ● Chapter 21 Data Backup "driver unit parameters" backup and restore added ● 23.1 RSEL System Explanation during screen display for ELECYLINDER operation added ● Terms integrated, correction made
2022.06	Edition 8B ● Supported models for ELECYLINDER added ● Correction due to the abolition of DVD ● 3.7 Description revised regarding built-in battery ● 20.4.4 Descriptions added for Payload Setting Not Applicable Model ● 20.9.2 The when of the Models that Support Pattern Setting to the Operation Noise Tuning added
2022.08	Edition 8C ● Support Models added
2023.07	Edition 8D ● Models change and added for ELECYLINDER supported ● Product Check 3. How to Read Model Nameplate the replaced ● 15.9 Description revised of the error list ● 20.4 Change made to Simple Data Setting content ● 20.4.5 Auto servo OFF added ● 23.1.1, 23.1.3 Screen image changed for troubleshooting ● 25.2.2, 25.2.3 Black and white display change of the update start screen image

Revision Date	Revision Description
2023.08	Edition 8E ● Move Product Check to chapter 3 ● 3.1.2 Added ELECYLINDER instruction manual ● 20.4 Unification of contents of simple data setting, correction of typos.
2024.06	Edition 8F ● 20.4 Note added related to grip force of ELECYLINDER 3-finger gripper ● 25.2 Teaching Update change made to contents (25.2.3 How to Compulsorily Update, 25.2.4 Troubleshooting added) ● Correction made
2024.07	Ninth Edition ● Applied to ROBO PUMP Standard Type (RP-VPM)
2024.09	Tenth Edition ● Applicable for XSEL2 Controller
2025.02	Edition 10B ● Chapter structure change
2025.03	Eleventh Edition ● 16.2.2 Absolute Reset Procedures description changed to order by type ● 19.4.1, 19.4.2 Wire Cylinder setting added ● 19 4 Simple Data Setting (Position Editing) screen image changed
2025.08	Edition 11B ● GRP-2 added
2025.10	Edition 11C ● Changes due to discontinuation of including the First Step Guide
2026.07	Twelfth Edition ● Applied to EC function expansion added

Manual No.: ME0356-12A (July 2026)

IAI
Quality and Innovation

IAI Corporation

Head Office: 1210 Ihara Shimizu-KU Shizuoka City Shizuoka 424-0114, Japan
TEL +81-54-364-5105 FAX +81-54-364-2589
website: www.iai-robot.co.jp/

IAI America, Inc.

Head Office: 2690 W. 237th Street, Torrance, CA 90505
TEL +1-310-891-6015 FAX +1-310-891-0815
Chicago Office: 110 East State Parkway, Schaumburg, IL 60173
TEL +1-847-908-1400 FAX +1-847-908-1399
Atlanta Office: 1220 Kennestone Circle, Suite 108, Marietta, GA 30066
TEL +1-678-354-9470 FAX +1-678-354-9471
website: www.intelligentactuator.com

Technical Support available in Europe

IAI Industrieroboter GmbH

Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany
TEL +49(0)6196-88950 FAX +49(0)6196-889524
website:www.iai-automation.com

Technical Support available in Great Britain

LC Automation
control & safety

Duttons Way, Shadsworth Business Park, Blackburn, Lancashire, BB1 2QR, United Kingdom
TEL +44(0)1254-685900
website: www.lcautomation.com

IAI (Shanghai) Co., Ltd.

SHANGHAI JIAHUA BUSINESS CENTER A8-303, 808, Hongqiao Rd. Shanghai 200030, China
TEL+86-21-6448-4753 FAX +86-21-6448-3992
website: www.iai-robot.com

IAI Robot (Thailand) Co., Ltd.

825 PhairojKijja Tower 7th Floor, Debaratana RD., Bangna-Nuea, Bangna, Bangkok 10260, Thailand
TEL +66-2-361-4458 FAX +66-2-361-4456
website:www.iai-robot.co.th

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