Touch Panel Teaching Pendant
TB-03

Program Controller Wired Link

Instruction Manual　Eighth Edition

ME0375

This instruction manual describes the contents for Program (SEL system) Controllers Wired Link.

For how to use the ELECYLINDER wireless link, refer to the following instruction manual.
"Touch Panel Teaching Pendant TB-03 ELECYLINDER Wireless Link Instruction Manual" (ME0375)

ME0376

For how to use the position (CON/SEP/MEC system) controllers, refer to the following instruction manual.
"Touch Panel Teaching Pendant TB-03 Position Controller, ELECYLINDER Wired Link Instruction Manual" (ME0376)

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

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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.
- Use or reproduction of this instruction manual in full or in part without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the text are registered trademarks.

Supported Models

This Instruction Manual is for the Program Controller Wired Link.

For details on handling the ELECYLINDER wireless link, refer to the separate “Touch Panel Teaching Pendant TB-03 ELECYLINDER Wireless Link Instruction Manual (ME0375)”.

For details on handling the position controller (ERC3, ERC2, ACON, PCON, SCON, SCON2, DCON, RACON, RPCON, MSCON, MCON, RCON, ASEP, PSEP, DSEP, MSEP, AMEC, PMEC, RCP6S, RCM-P6PC,RCM-P6AC, RCM-P6DC), refer to the separate “Touch Panel Teaching Pendant TB-03 Applicable for Position Controller Wired Link Instruction Manual (ME0376)”.

Program Controller Supported Model List

Controller Model Name	Support Started Version
XSEL-K/KX/KT/KET	V1.80
XSEL-J/JX	Not Supported
XSEL-P/Q/PX/QX/PCT/QCT	V1.80
XSEL-R/S/RX/SX/RXD/SXD	V1.80
XSEL-RA/SA/RAX/SAX/RAXD/SAXD	V1.80
MSEL-PC/PG/PCF/PGF/PCX/PGX	V1.80
TT/TTA	V1.80
ASEL/PSEL/SSEL	V1.80
RSEL	V2.70
XSEL2	V4.80

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 Model Name	Support Started Version (Note 1)
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

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

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

Table of Contents

Safety Guide

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

Safety Precautions for Our Products

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

No.	Operation Description	Description
1	Model election	● 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.

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 touch panel teaching pendant TB-03, 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 TB-03 as it may cause malfunction.

- When operating TB-03, 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.

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

⚠ *Caution: Touch panel teaching pendant TB-03 is exclusively designed for use with IAI controllers. Never connect it to other equipment. Failure may occur.*

International Standards Compliances

This TB-03 comply with the following international standards.

Revised RoHS Directive	CE Marking	UL
○	○	-

1. Introduction

Thank you very much for purchasing our XSEL, TT/TTA, SSEL, ASEL, PSEL, MSEL, RSEL and XSEL2 Controller touch panel teaching pendant TB-03. 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 TB-03, 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 TB-03 is left connected, "Effect" is valid for the safety velocity.
  Therefore, in the case of the orthogonal axis, the maximum velocity is 250mm/s or lower when the program is started from the TB-03. In the case of the SCARA axis, the maximum velocity is 250mm/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)

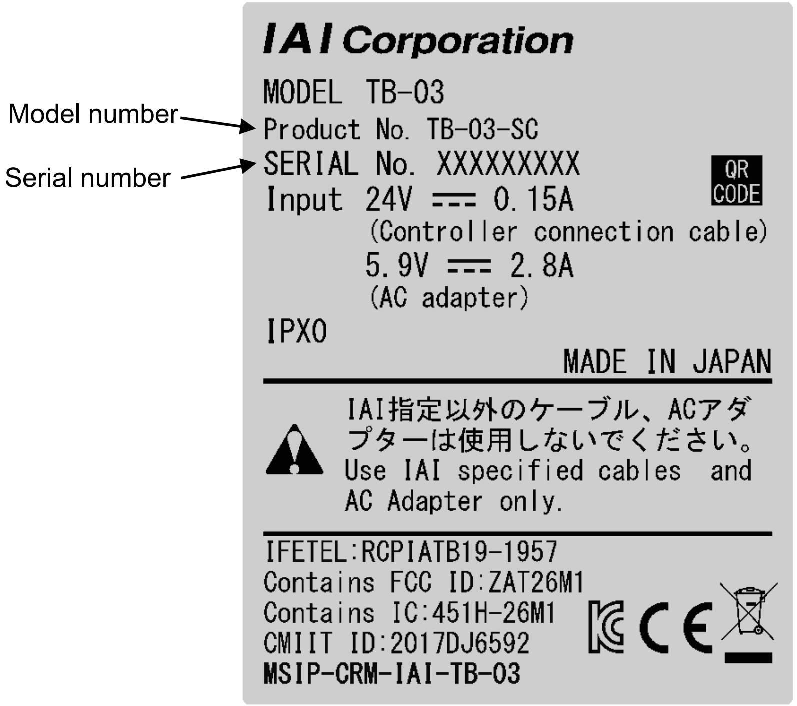
No.	Product name	Model number	Number	Remarks
1	Touch Panel Teaching Pendant	Refer to [How to Read Model Nameplate] and [How to Read Product Number].	1	
Accessories				
2	Battery unit	AB-7 	1	Provided with the touch panel teaching pendant
3	Touch pen	TCH-TB03	1	Provided with the touch panel teaching pendant ϕ4.5×100.5mm
4	Position controller / ELECYLINDER cable	CB-TB3-C050	1	When model <Cable Type> C or SC is selected
5	Program controller cable	CB-TB3-S050	1	When model <Cable Type> S or SC is selected
6	Conversion Cable	CB-SEL-SJS002	1	When model <Cable Type> S or SC is selected
7	AC adapter	(For use in Japan, North America, Mexico and Thailand) UN318-5928 (For use in China) UNZ318-5928 (For use in Europe) UNE318-5928 (For use in Korea) UNR318-5928	1	Depends on model code <Enclosed Adapter Type>
8	Safety guide	M0194 IAI 安全ガイド　第５版 Safety Guide　Fifth Edition ご案内	1	The picture shows an image.
9	First step guide	ME0375 IAI Touch Panel Teaching Pendant　TB-03 ELECYLINDER Wireless Link Position Controller, ELECYLINDER Wired Link Program Controller Wired Link First Step Guide　Second Edition Product Check	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-03 program controller wired link	ME0377
2	Instruction manual for XSEL-J/K 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

(Note) XSEL-J/JX cannot be controlled with10 TB-03. (Note applicable)

2.1.3 How to Read Model Nameplate



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MODEL TB-03
Product No. TB-03-SC
SERIAL No. XXXXXXXXX
Input 24V ⎓ 0.15A
(Controller connection cable)
5.9V ⎓ 2.8A
(AC adapter)
IPX0
MADE IN JAPAN

IAI指定以外のケーブル、ACアダプターは使用しないでください。
Use IAI specified cables and AC Adapter only.

IFETEL:RCPIATB19-1957
Contains FCC ID:ZAT26M1
Contains IC:451H-26M1
CMIIT ID:2017DJ6592
MSIP-CRM-IAI-TB-03

2.1.4 How to Read Product Number

TB-03-SCN-E-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)

<Model code for enclosed adapter>
No Indication : For use in Japan, North America, Mexico and Thailand
C : For use in China
E : For use in Europe
K : For use in Korea
N : No AC adapter enclosed

<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

Cable Type

Connected Controller	Model	Enclosed Cable	
		For Position Controller / ELECYLINDER	For Program Controller
ELECYLINDER / Position controller	TB-03-C	1) CB-TB3-C050	Not Enclosed
Program controller	TB-03-S	Not Enclosed	2) CB-TB3-S050 3) CB-SEL-SJS002
ELECYLINDER / Position controller / Program controller	TB-03-SC	1) CB-TB3-C050	2) CB-TB3-S050 3) CB-SEL-SJS002
ELECYLINDER (Wireless link)	TB-03-SCN	Not Enclosed	Not Enclosed

Model code for enclosed adapter

Type	Model	Model Code of Enclosed AC Adapter
For use in Japan, North America, Mexico and Thailand	TB-03-<Enclosed Cable Type>	For use in Japan, North America, Mexico and Thailand : UN318-5928
For use in China	TB-03-<Enclosed Cable Type>-C	For use in China : UNZ318-5928
For use in Europe	TB-03-<Enclosed Cable Type>-E	For use in Europe : UNE318-5928
For use in Korea	TB-03-<Enclosed Cable Type>-K	For use in Korea : UNR318-5928
No AC adapter enclosed	TB-03-<Enclosed Cable Type>-N	No AC adapter enclosed

Language option

Model Code for Language Option
It is available to indicate the language displayed when the power gets turned on by defining <Language Option> on the last digit of the unit model code. (Language can be changed during operation.) (Displayed in Japanese when no indication) Screens are displayed in English. : -ENG Screens are displayed in Chinese. : -CHI

Model Code for Cable Itself

Model Code for Cable Itself			Remark
Separately sold cable	1)	CB-TB3-C050	For position controller/ELECYLINDER connection
	2)	CB-TB3-S050	For program controller connection
	3)	CB-SEL-SJS002	For ASEL, PSEL, SSEL, MSEL, RSEL and XSEL2 Connection (used together with CB-TB3-S050)

Option model code

Option Model Code		Remark
Strap	STR-1	
Spiral Cord	SIC-1	Connect the stylus pen on the main unit in order to avoid loosing or dropping it
Grip Belt	GRP-2	Prepare your own and attach. Refer to [2.10.1 Grip Belt (GRP-2)]

Maintenance part code

Maintenance Part Code		Remark
Battery Unit for Main Unit	AB-7	
Touch Pen	TCH-TB03	ϕ4.5 × 100.5mm

2.2 Specifications

2.2.1 Basic Specifications

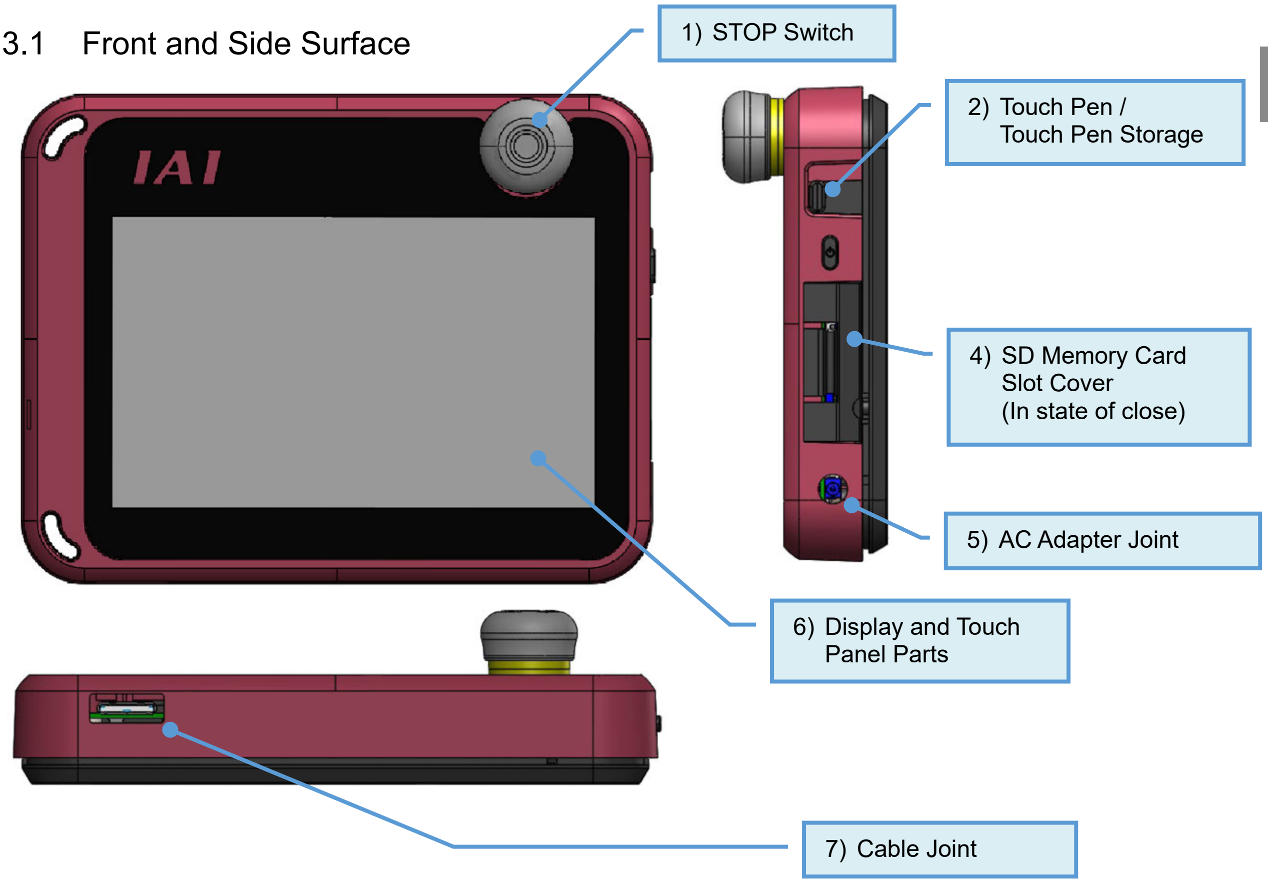
Item	Specifications
Rated Voltage	24V DC ±10% (Supplied from controller) 5.9V DC (5.7 to 6.3V) (Supplied from AC adapter)
Power Current	150mA (24V DC : Supplied from controller) 2.8A (5.9V DC : Supplied from AC adapter)
Insulation Resistance	Between GND and FG 500V DC 10MΩ
Ground	Functional grounding (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 (800 × 480)
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)
Touch Pen (Accessory)	ϕ4.5 × 100.5mm
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 SD 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	155mm (H) × 200mm (W) × 34 [54] mm (D) Stop switch included in [ ]
Mass	485g approx. (Main body) + 175g approx. (Battery)
Note 1	SD 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.
Vibration resistance	Frequency 10 to 57Hz / Swing width: 0.075mm Frequency 57 to 150Hz / Acceleration: 9.8m/s^2 XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
Dropped in package	From height 800mm, dropped on 1 corner + 3 edges + 6 surfaces
Pollution degree	II
Protection class	IPX0
Heat generation volume	3.6W
Protection function against electric shock	III

2.3 Explanation of Each Part

2.3.1 Front and Side Surface


1) STOP Switch
2) Touch Pen / Touch Pen Storage
4) SD Memory Card Slot Cover (In state of close)
5) AC Adapter Joint
6) Display and Touch Panel Parts
7) Cable Joint
IAI

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

2) Touch Pen / Touch Pen Storage
The pen to touch on the touchscreen should be stored here.

3) Power Supply Switch
It should be not used in wired link.

4) SD Memory Card Slot Cover
There is an inlet for SD memory card inside the cover.
Refer to [2.4 How to Set in/out SD Memory Card] to set in or out a SD memory card.

5) AC Adapter Joint
It is a connector to have the AC adapter joined in.

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

*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.

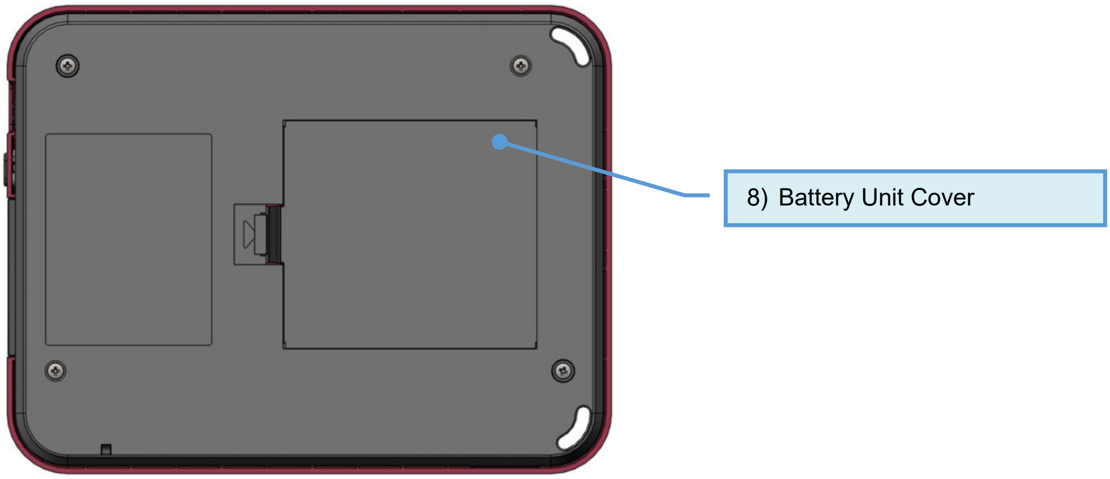
*2 This touch panel is of analog resistance membrane type, so do not touch two or more locations on the screen at the same time.
If two or more locations are touched at the same time, the centers of all touched locations may respond and trigger multiple operations.

*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)

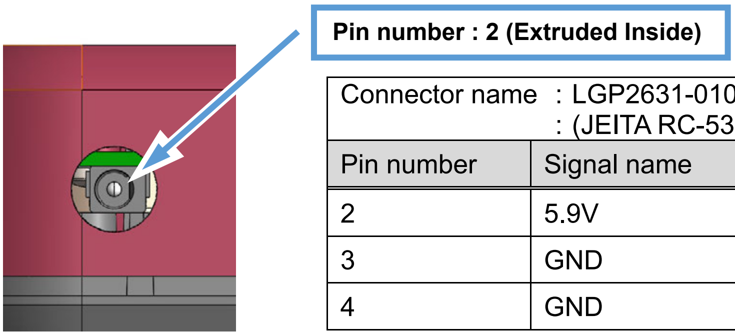
7) Cable Joint
Insert a cable applicable for each controller to establish wired link with controllers.

2.3.2 Back



8) Battery Unit Cover
There is the battery unit AB-7 inside the cover.
For how to attach or detach the battery unit, refer to [2.5 How to Set in/out Battery Unit].

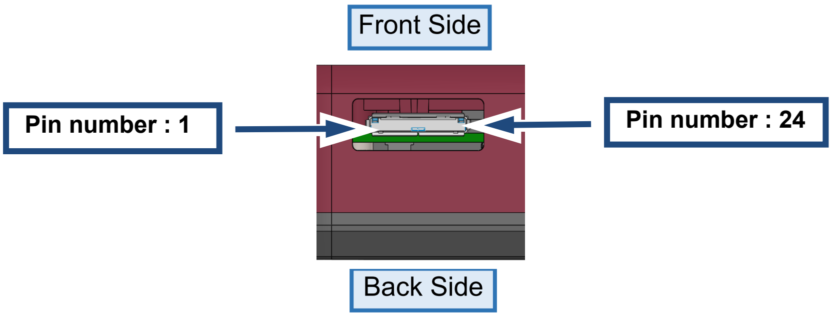
2.3.3 AC Adapter Joint



Connector name : LGP2631-0101F (SMK)
: (JEITA RC-5320A Voltage Classification 2)

Pin number	Signal name	Explanation
2	5.9V	Power supply input 5.9V
3	GND	Signal ground
4	GND	Signal ground

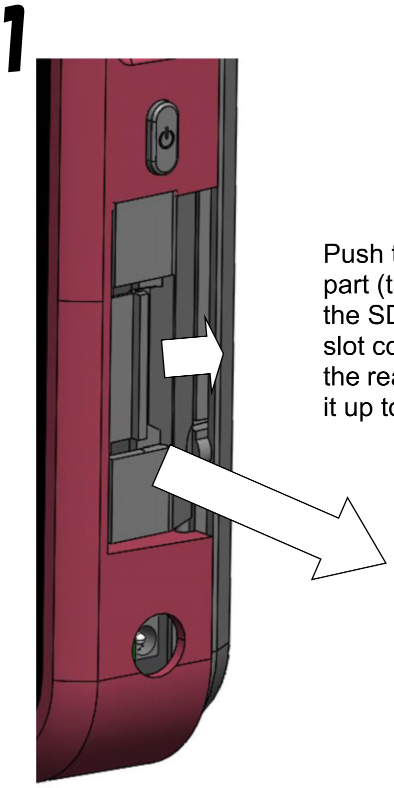
2.3.4 Cable Joint



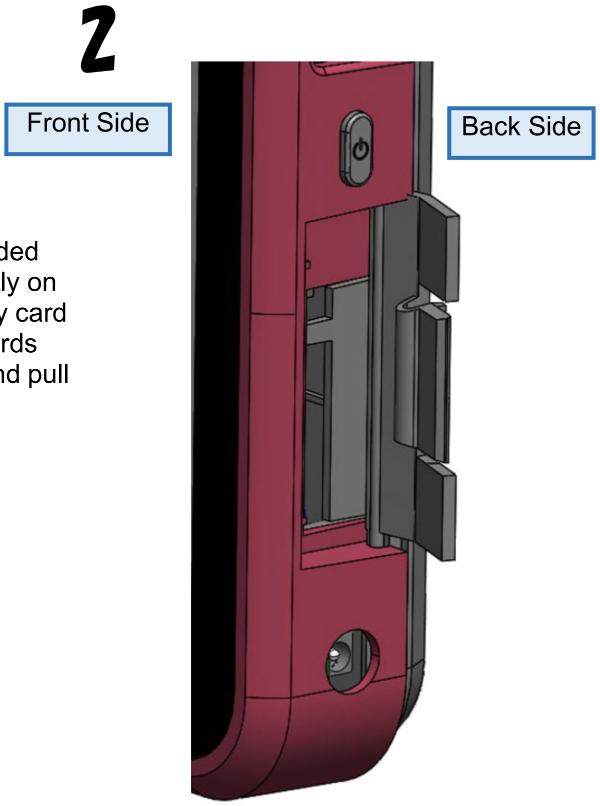
Connector name : ST60-24P (30) (HIROSE)		
Pin number	Signal name	Explanation
1	EMG1+	Stop Switch Line 1
2	EMG1-	
3	EMG2+	Stop Switch Line 2
4	EMG2-	
5	ENB1+	Enable Signal Line 1 To be short-circuited internally
6	ENB1-	
7	ENB2+	Enable Signal Line 2 To be short-circuited internally
8	ENB2-	
9	NC	Not connected
10	NC	Not connected
11	GND	Signal ground
12	TXD	Data Transmission for SEL System Controller
13	RXD	Data Reception for SEL System Controller
14	6.5V	Detection Signal for SEL System Controller
15	SRD+	Transmission and Reception Data Positive for EC/CON System Controller
16	SRD-	Transmission and Reception Data Negative for EC/CON System Controller
17	T5V	TP Connection Detection Signal for EC/CON System Controller
18	T24V	24V Power Input
19	GND	Signal ground
20	GND	Signal ground
21	NC	Not connected
22	NC	Not connected
23	NC	Not connected
24	FG	Frame ground
Shell	FG	Frame ground

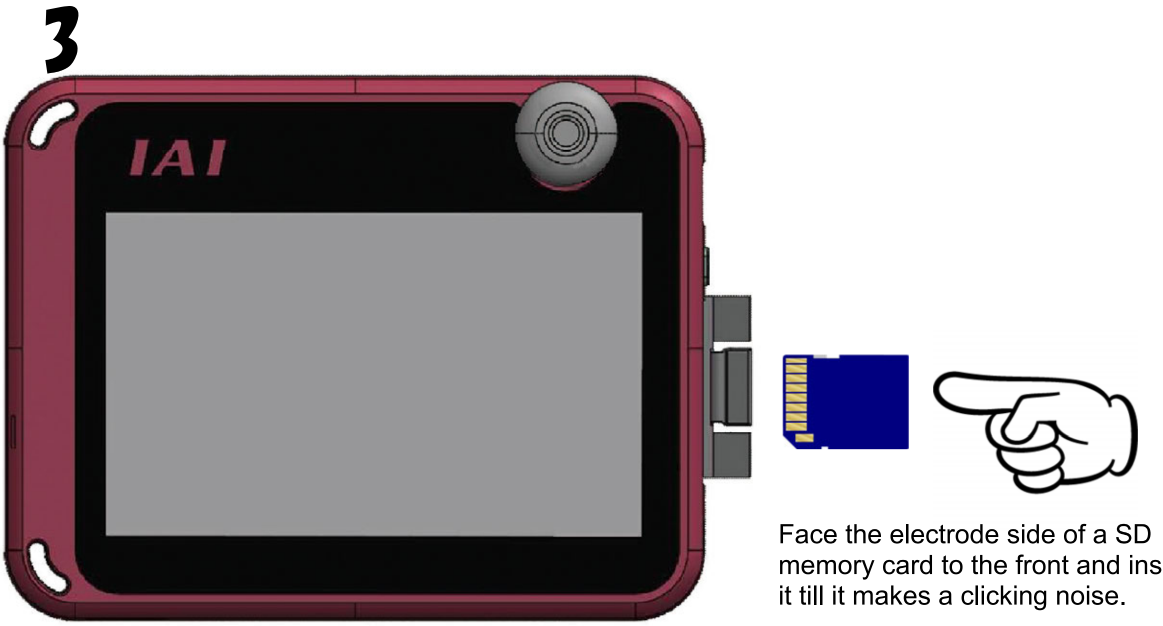
2.4 How to Set in/out SD Memory Card

2.4.1 How to Insert SD Memory Card



Push the extruded part (tab) slightly on the SD memory card slot cover towards the rear side and pull it up to open.

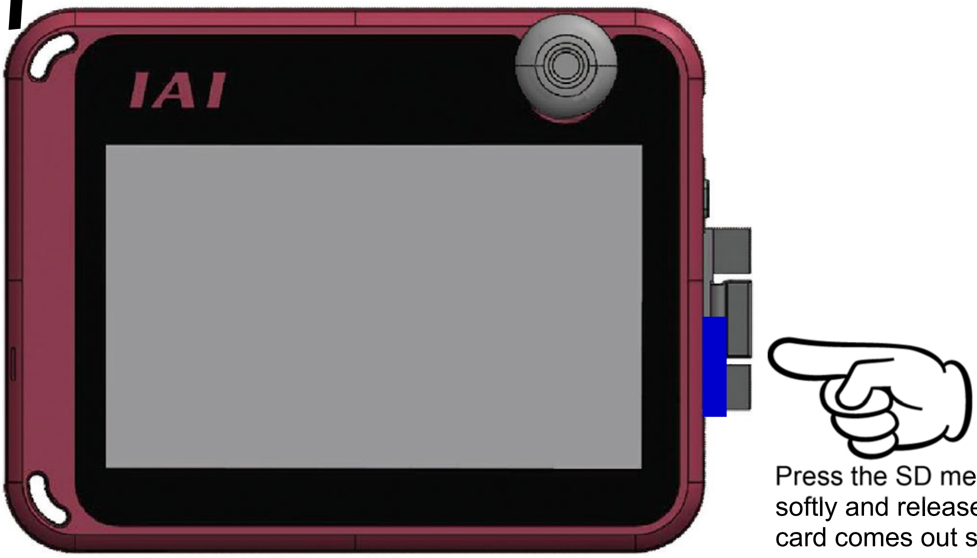




Face the electrode side of a SD memory card to the front and insert it till it makes a clicking noise.

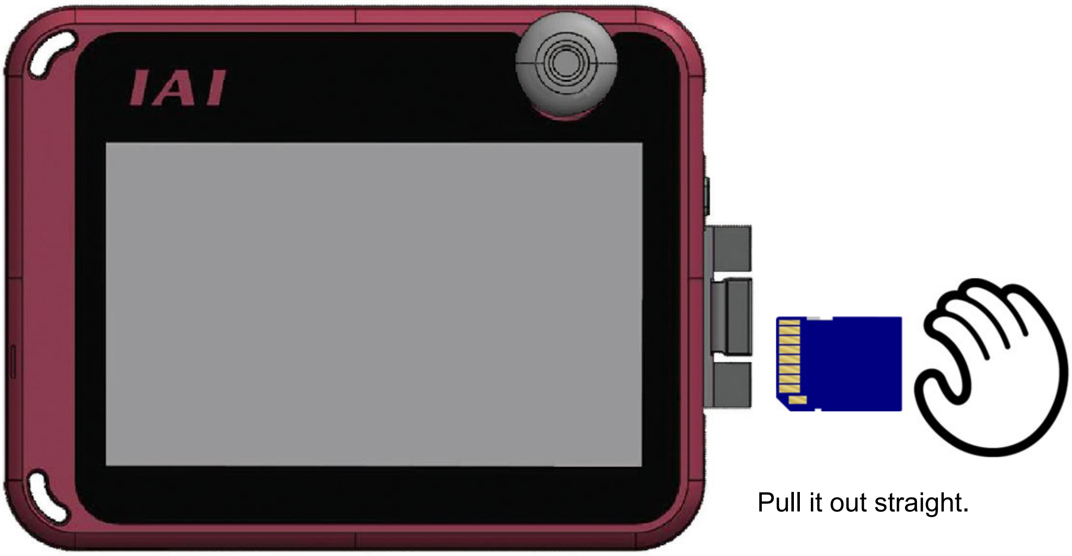
2.4.2 How to Take out SD Memory Card

1



Press the SD memory card softly and release, and the card comes out slightly.

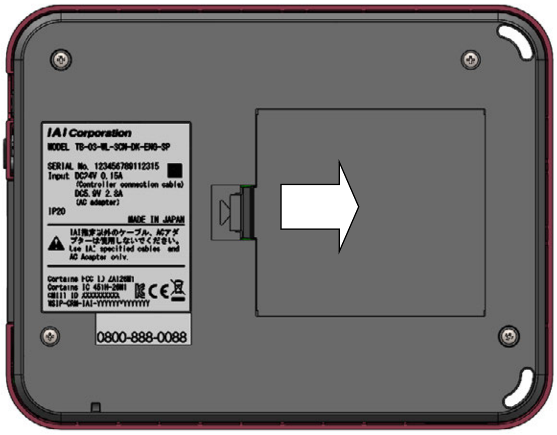
2

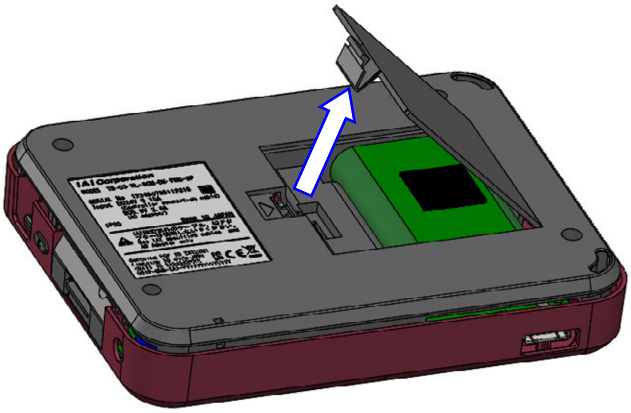


Pull it out straight.

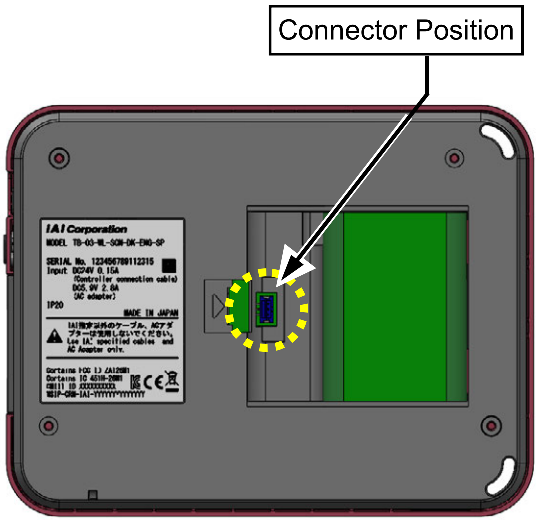
2.5 How to Set in/out Battery Unit

2.5.1 How to Take Out Battery Unit

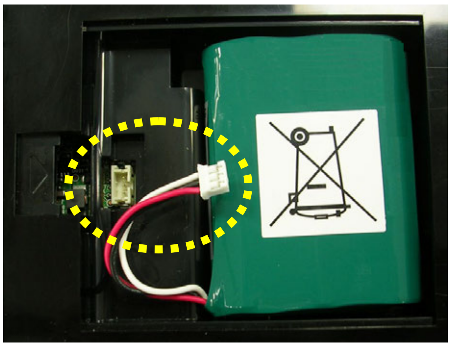




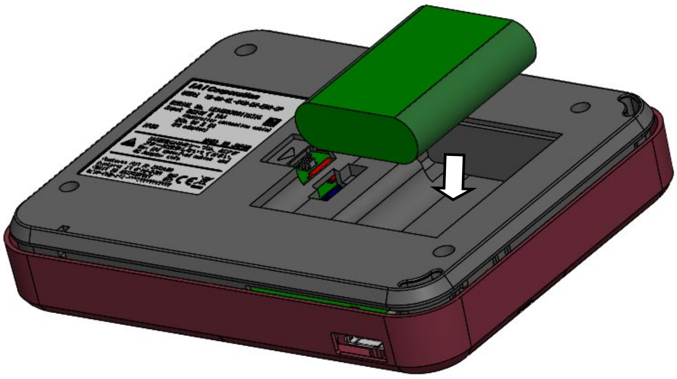
1) Push the tab towards the battery cover and the pull up batter cover.



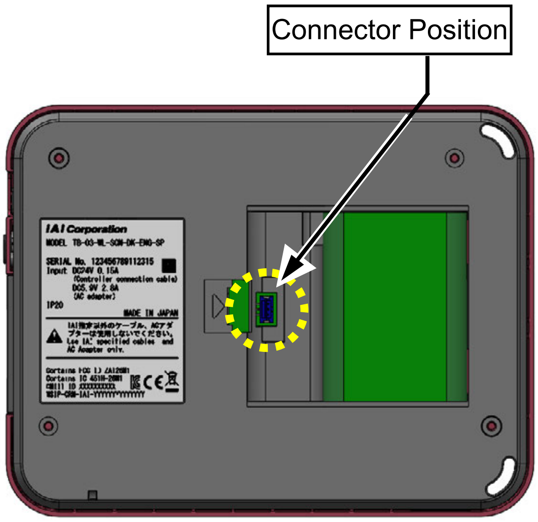
2) Pull out the connector and take out the battery unit.



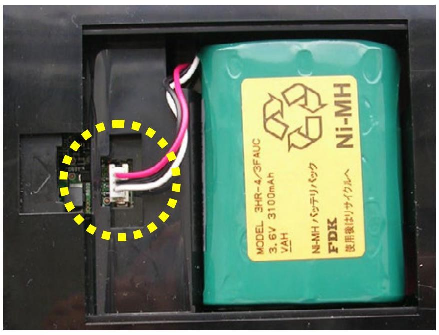
2.5.2 How to Attach Battery Unit

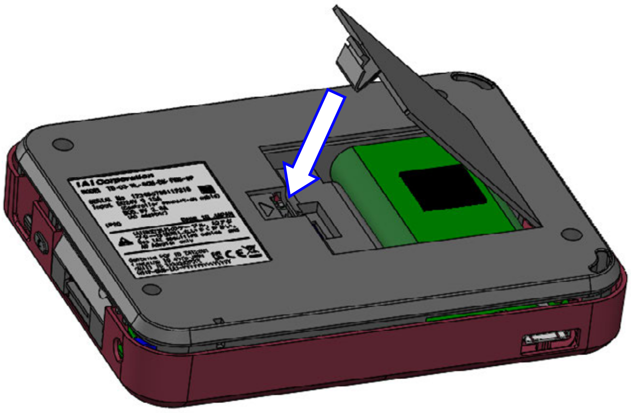


1) Set the battery unit in.



2) Join the connector.



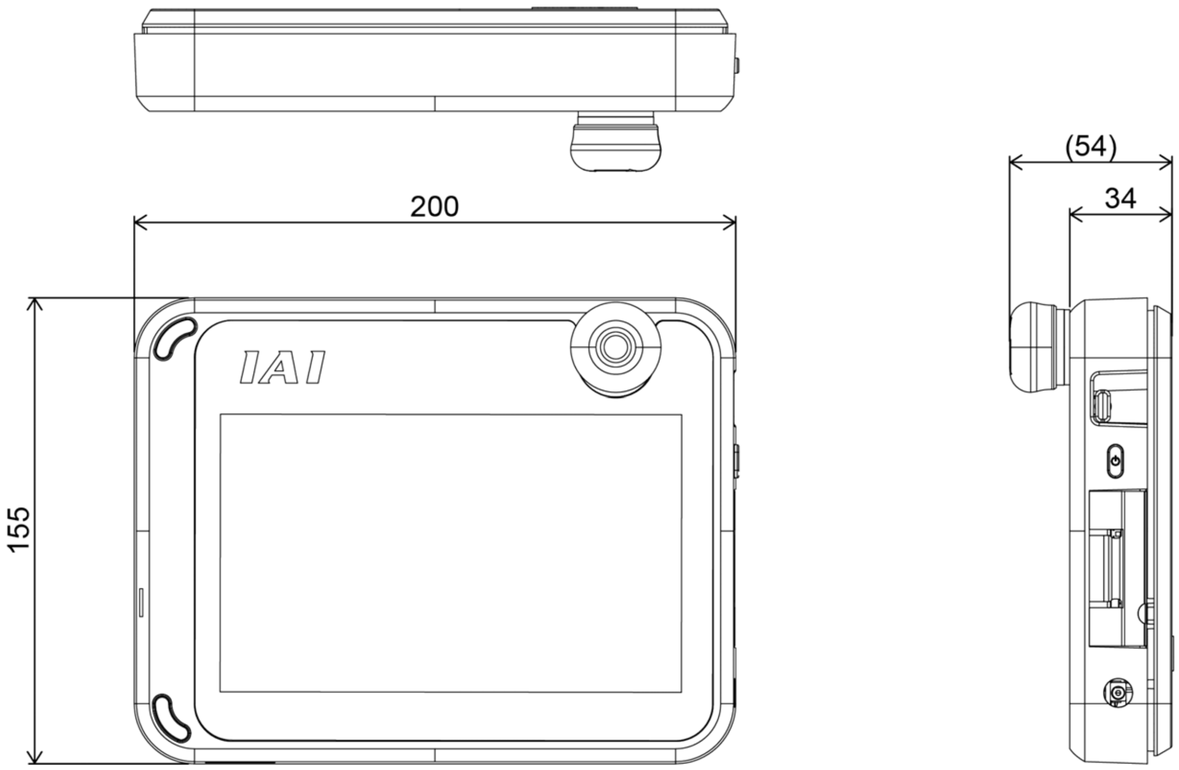


3) Attach the battery cover.

Pay attention not to get the cable pinched.

⚠ *Caution : When a battery is taken off and then put back on, the power would not turn on even with the power supply switch being pressed. Establish a start by connecting with controller or AC adaptor.*

2.6 External Dimensions



2.7 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)

2.8 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.

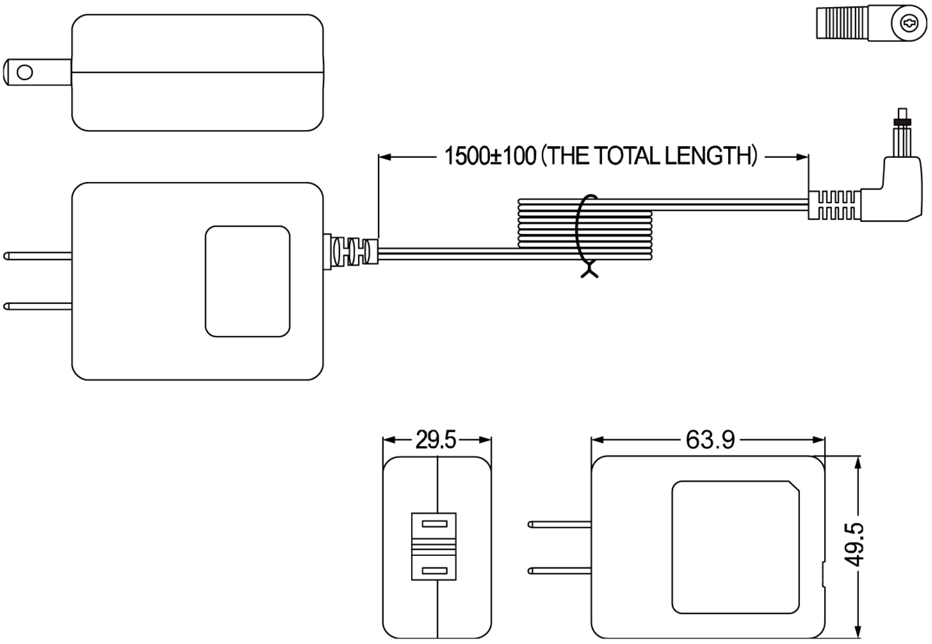
2.9 AC Adapter

2.9.1 Common Specifications for AC Adapter

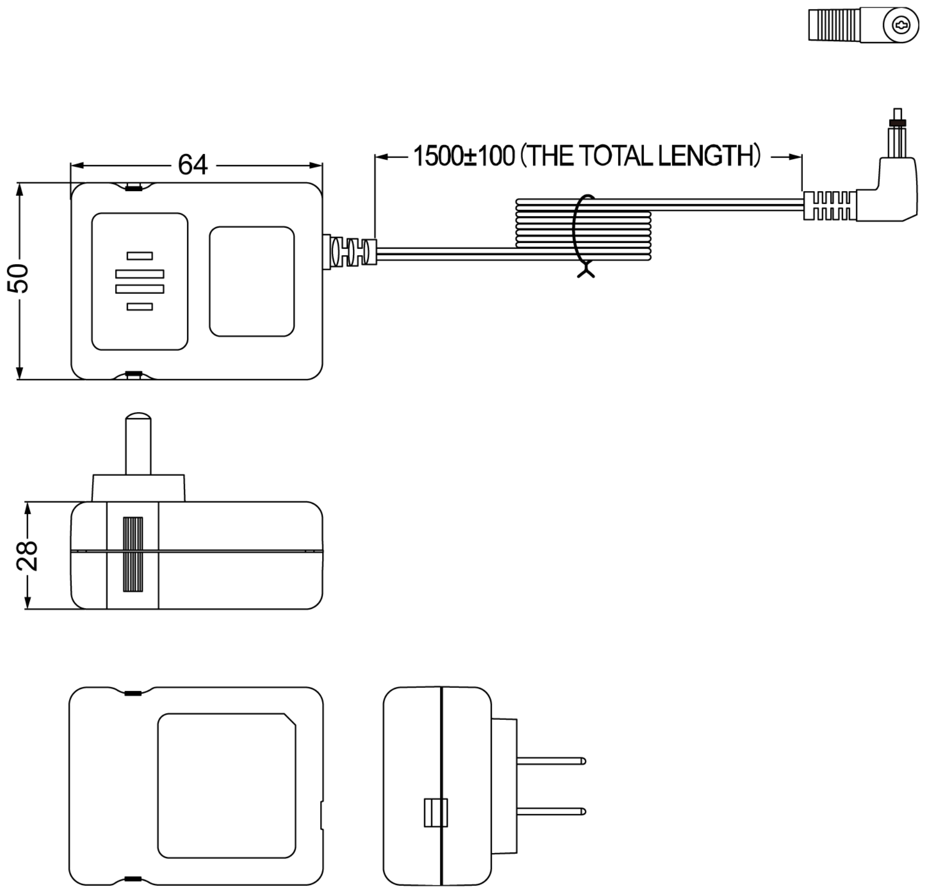
Item	Specifications
Power Input Voltage Range	Single-Phase 100 to 240V AC ±10%
Power Current	0.4Amax.
Power Frequency Range	50/60Hz ±5%
In-Rush Current	50A (at 25°C)
Output Voltage	5.9V DC (5.7 to 6.3V)
Output Current	2.8Amax.
Cable Length	1500 ±100mm

2.9.2 AC adapter appearance

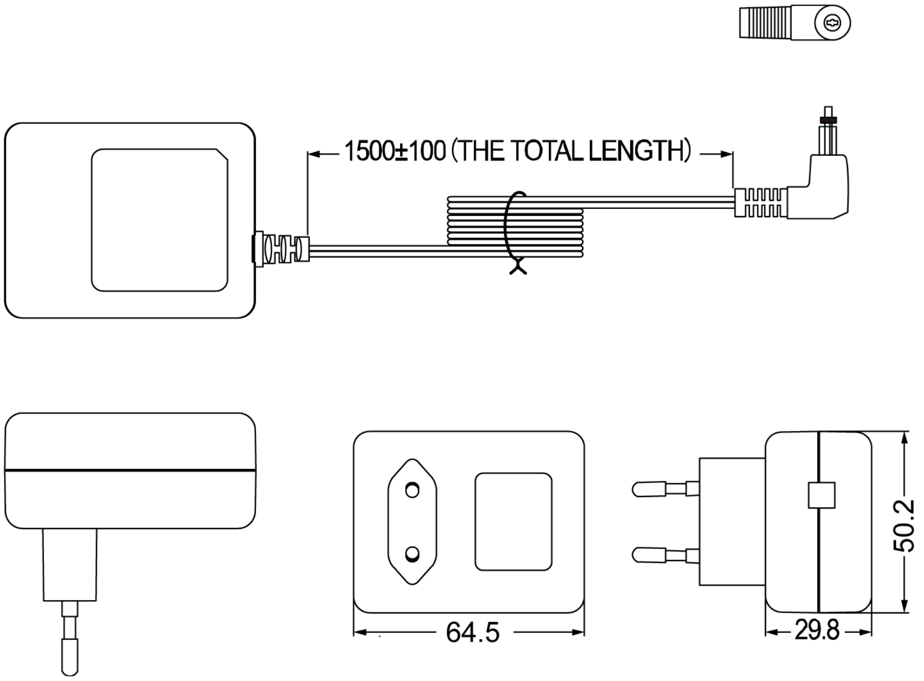
[For use in Japan, North America, Mexico and Thailand : UN318-5928]



[For use in China : UNZ318-5928]

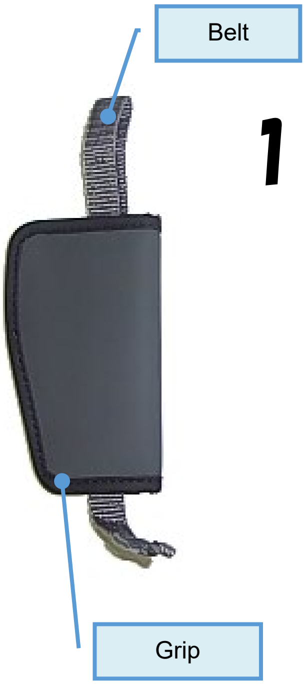


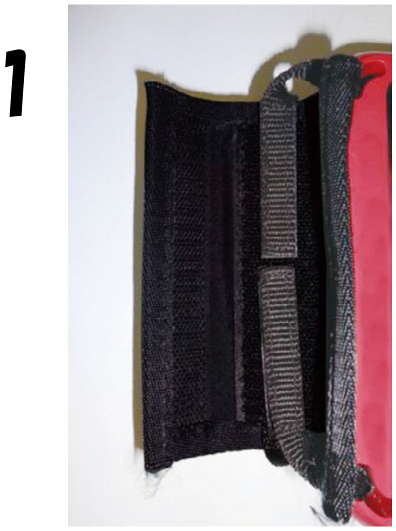
[For use in Europe : UNE318-592] [For use in Korea : UNR318-5928]



2.10 Optional Items

2.10.1 Grip Belt (GRP-2)

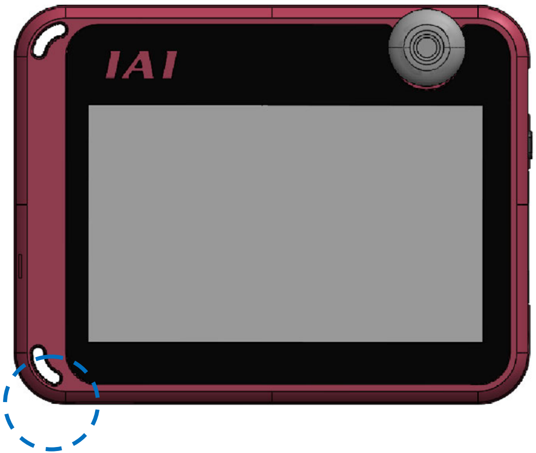




1) Put the belt through the slit on the left of the main body, and fix it on the fabric hook-and-loop fastener on the open grip.

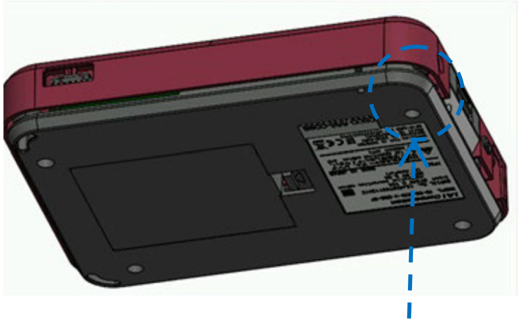
2) Close the grip.

2.10.2 Strap (STR-1)



Put it through the slit on the left bottom of the main body.

2.10.3 Spiral Cord (SIC-1)

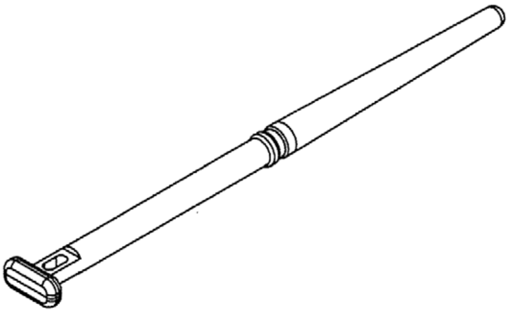


Putting it through the hole on the touch pen, and then put it through the hole allocated on the bottom the main body. (In case the spiral code would not go through the hole well, pull the cord using a tool such as tweezers.)

2.11 Maintenance Parts

2.11.1 Battery Unit (AB-7) (Enclosed to Main Unit)

2.11.2 Touch Pen (TCH-TB03) (Enclosed to Main Unit, For purpose of lost and damaged)



2.12 Specifications Related to Battery Change

2.12.1 Types of Charger Mode

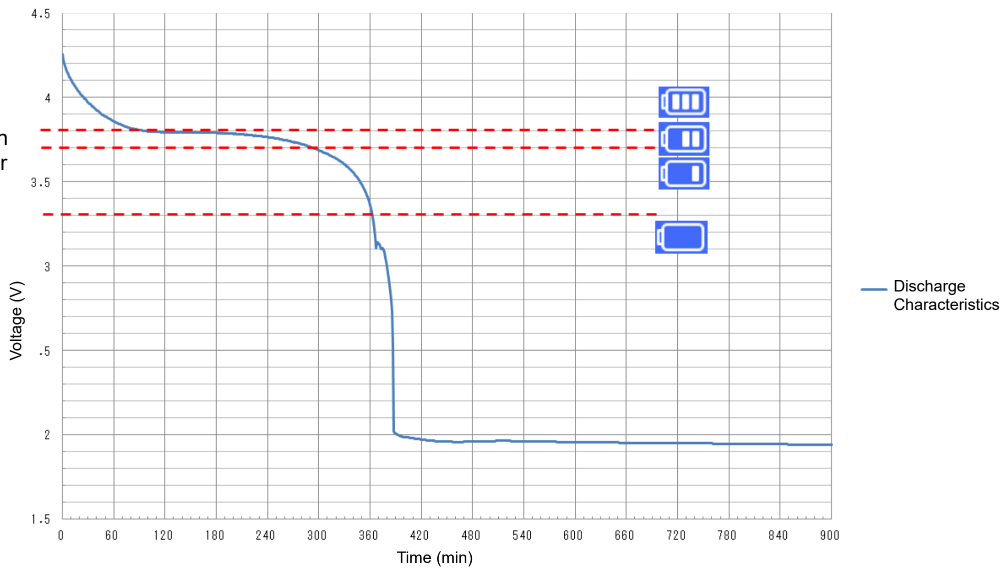
Charger Mode	Condition of Operation	Contents
Quick Charging of AC Adapter	• AC adapter connected • Battery not fully charged	• Battery should be fully charged from empty in approximately three hours.
AC Adapter Additional Charging	• AC adapter connected • Battery fully charged	• Battery should be remained almost fully charged.
Wired Link Additional Charging	• AC adapter not connected • Connected to controller with wire	• Battery should be remained almost at the condition of start.

2.12.2 Caution Related to Battery Charging

2.12.2.1 Display of Battery Remained

Due to the voltage characteristics of NiMH battery electrical discharge, the duration of the battery remained display should not be constant. (Duration of battery full or remained small should be short)

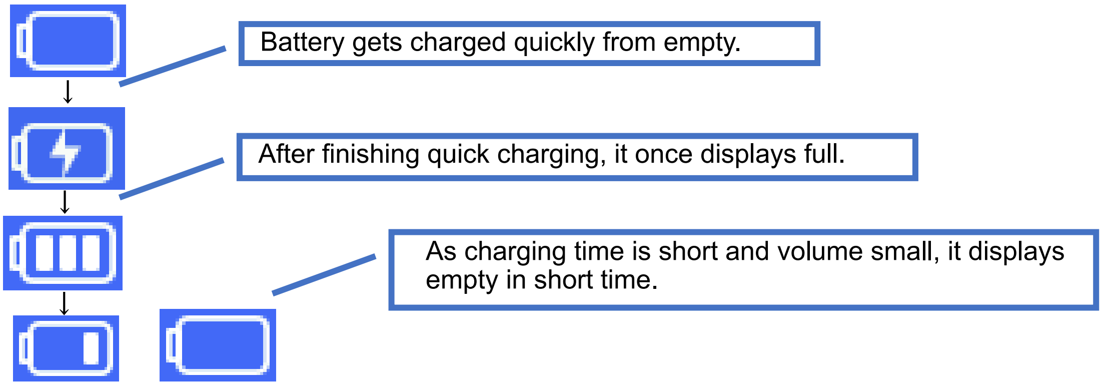
TB-03 Device Battery Discharge Characteristics



It should be taken as a reference for the voltage of display switching for battery remaining.

In case when the battery remained at start and the duration for charging is short, the display may show the battery condition full but show empty in short period.

(Example)



Battery gets charged quickly from empty.

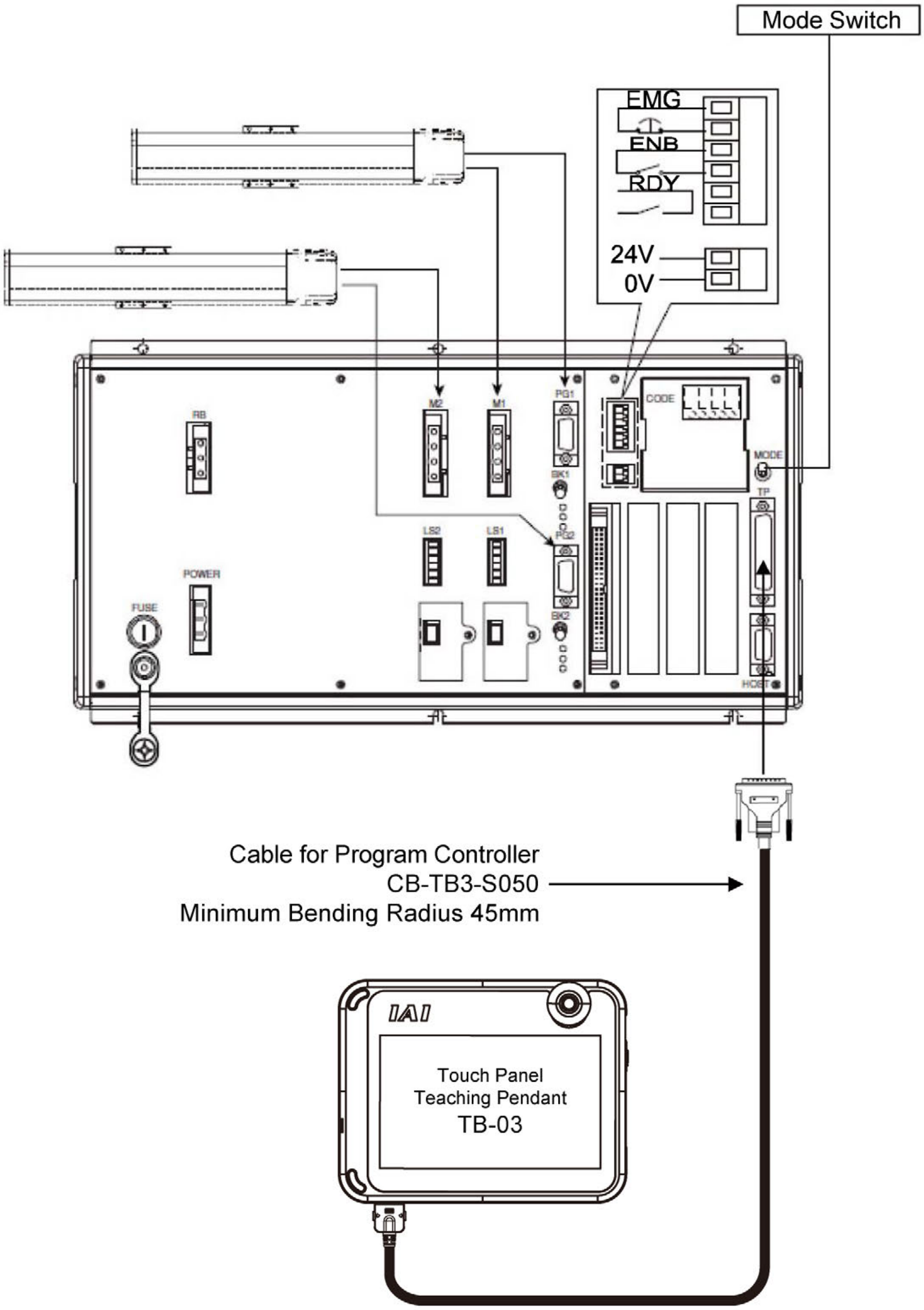
After finishing quick charging, it once displays full.

As charging time is short and volume small, it displays empty in short time.

3. Connection with the Controller

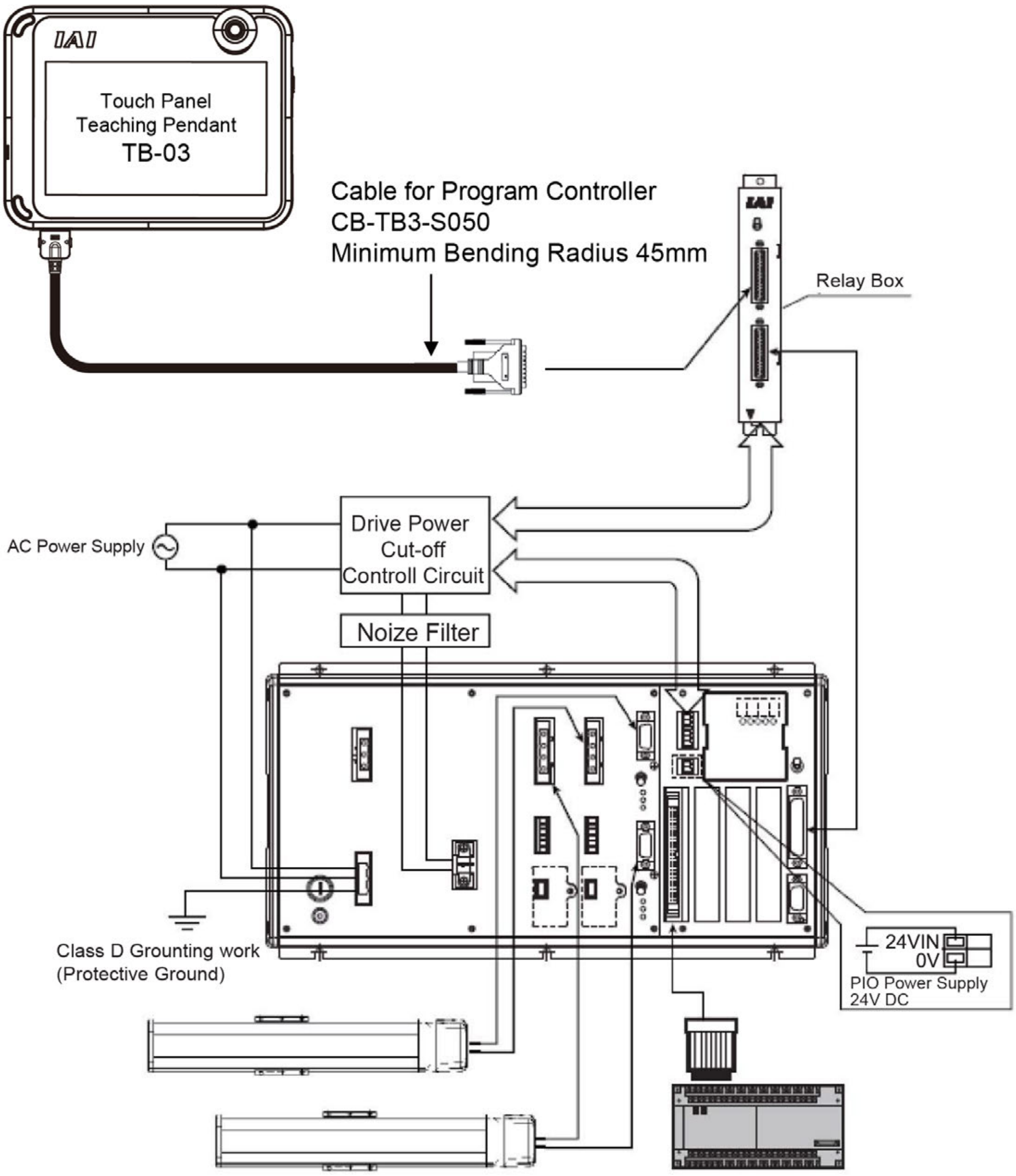
3.1 XSEL-K Type Controller

(Note) It cannot be connected to XSEL-J type controllers.

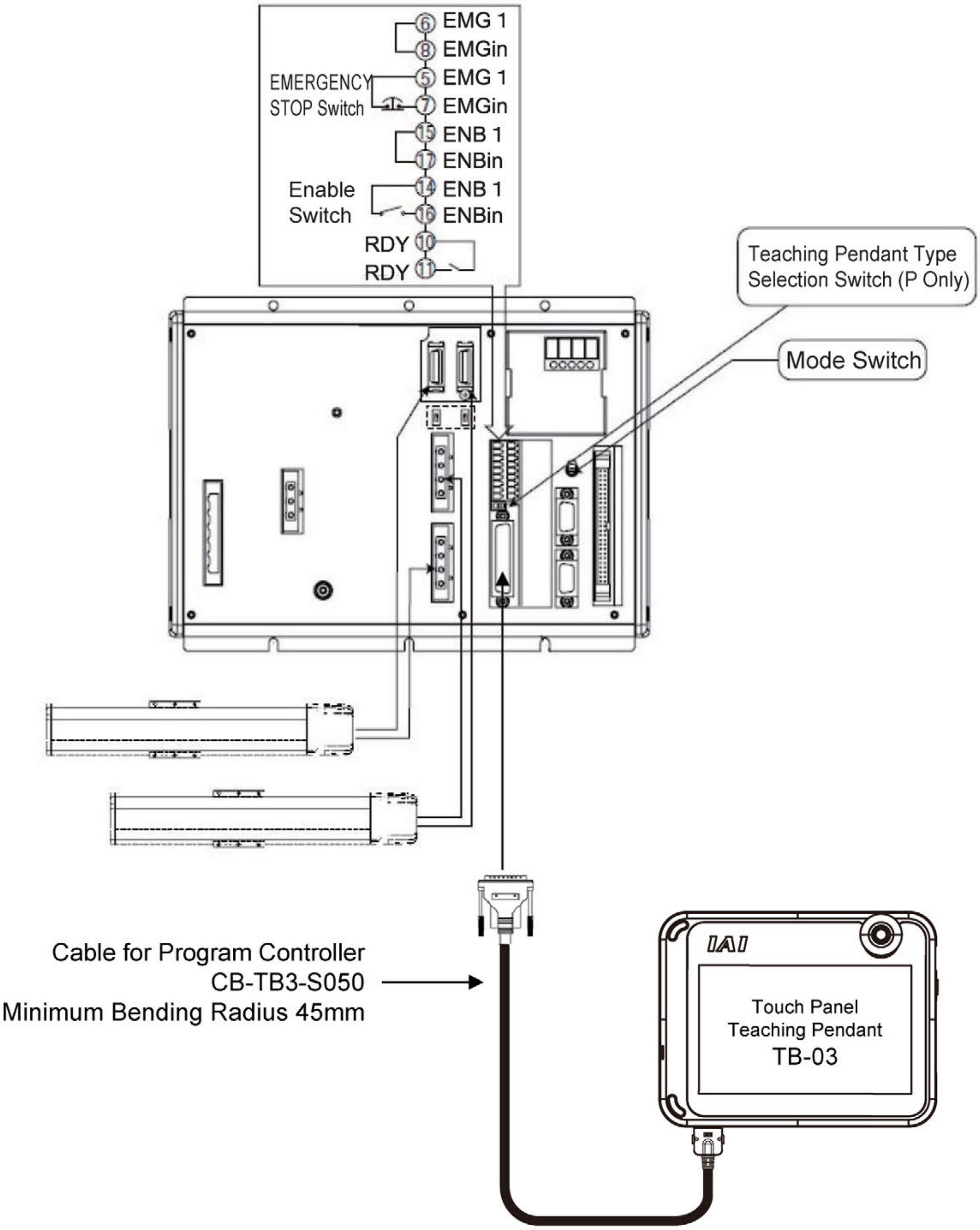


Cable for Program Controller
CB-TB3-S050
Minimum Bending Radius 45mm

3.2 XSEL-KT/KET Type Controller



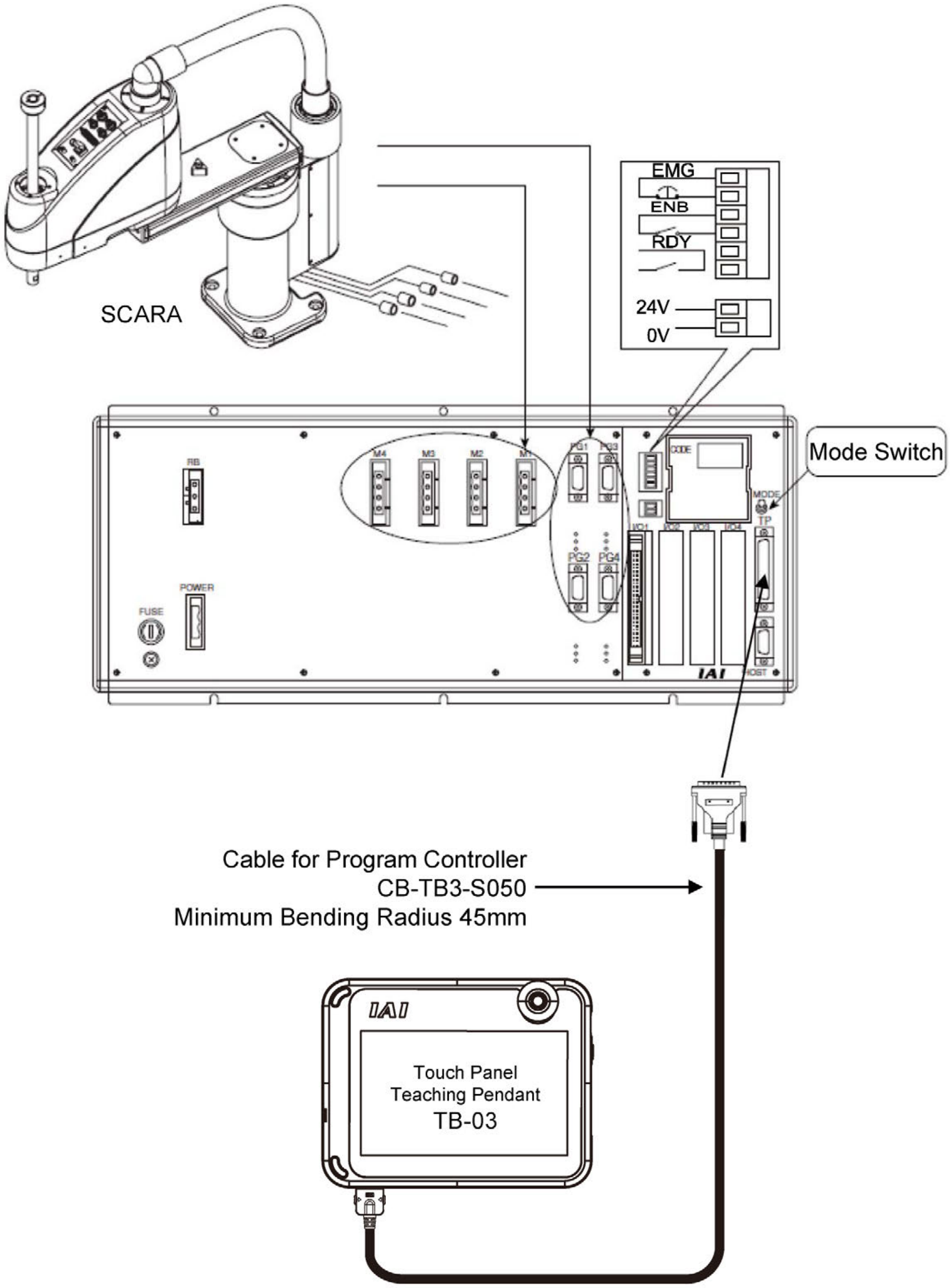
3.3 XSEL-P/Q/R/S/RA/SA Type Controller



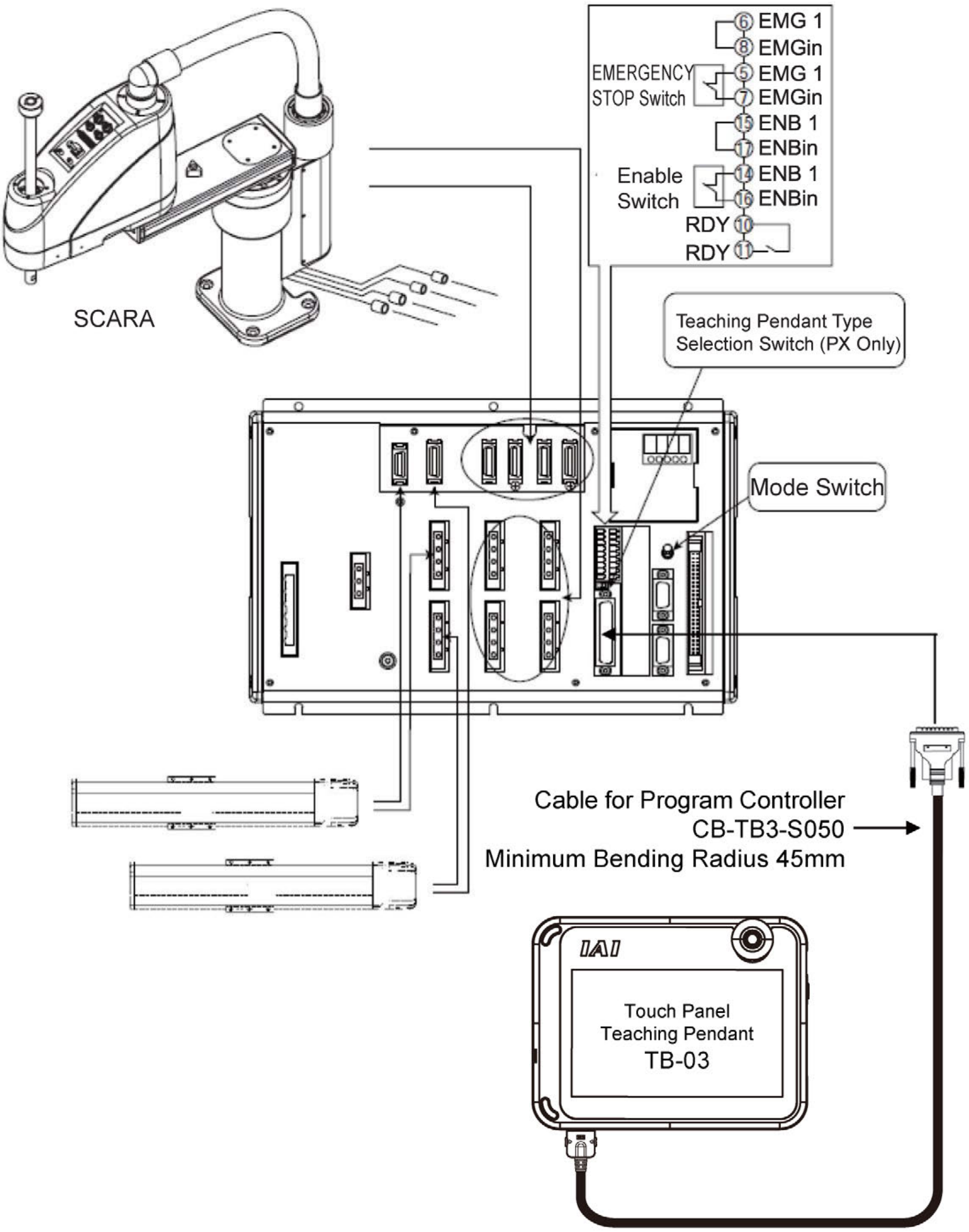
⚠ *Caution: Set the Teaching Pendant Type Selection Switch of the XSEL-P type to the left.*

3.4 XSEL-KX Type Controller

(Note) It cannot be connected to XSEL-JK type controllers.

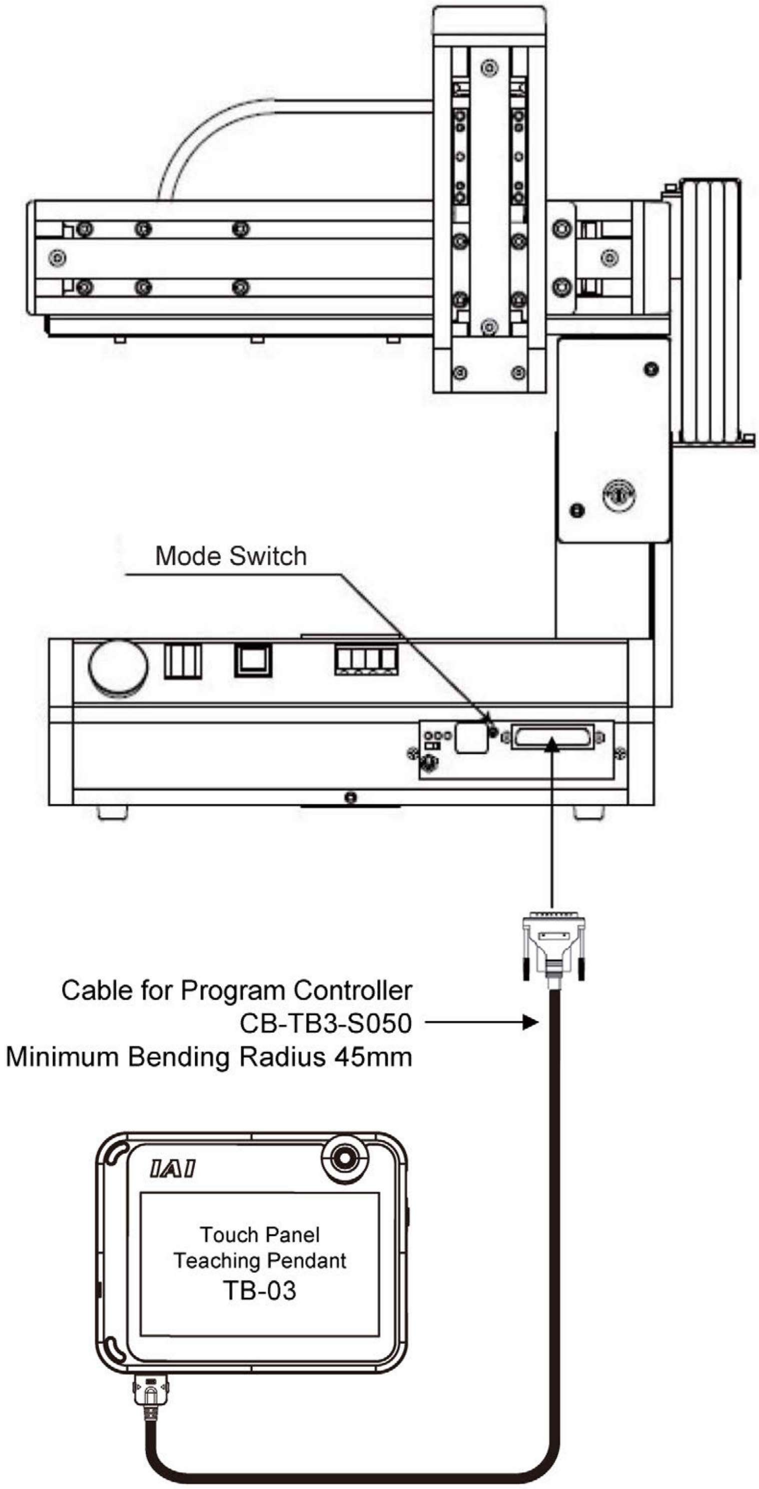


3.5 XSEL-PX/QX/RX/SX/RXD/SXD/RAX/SAX/RAXD/SAXD Type Controller

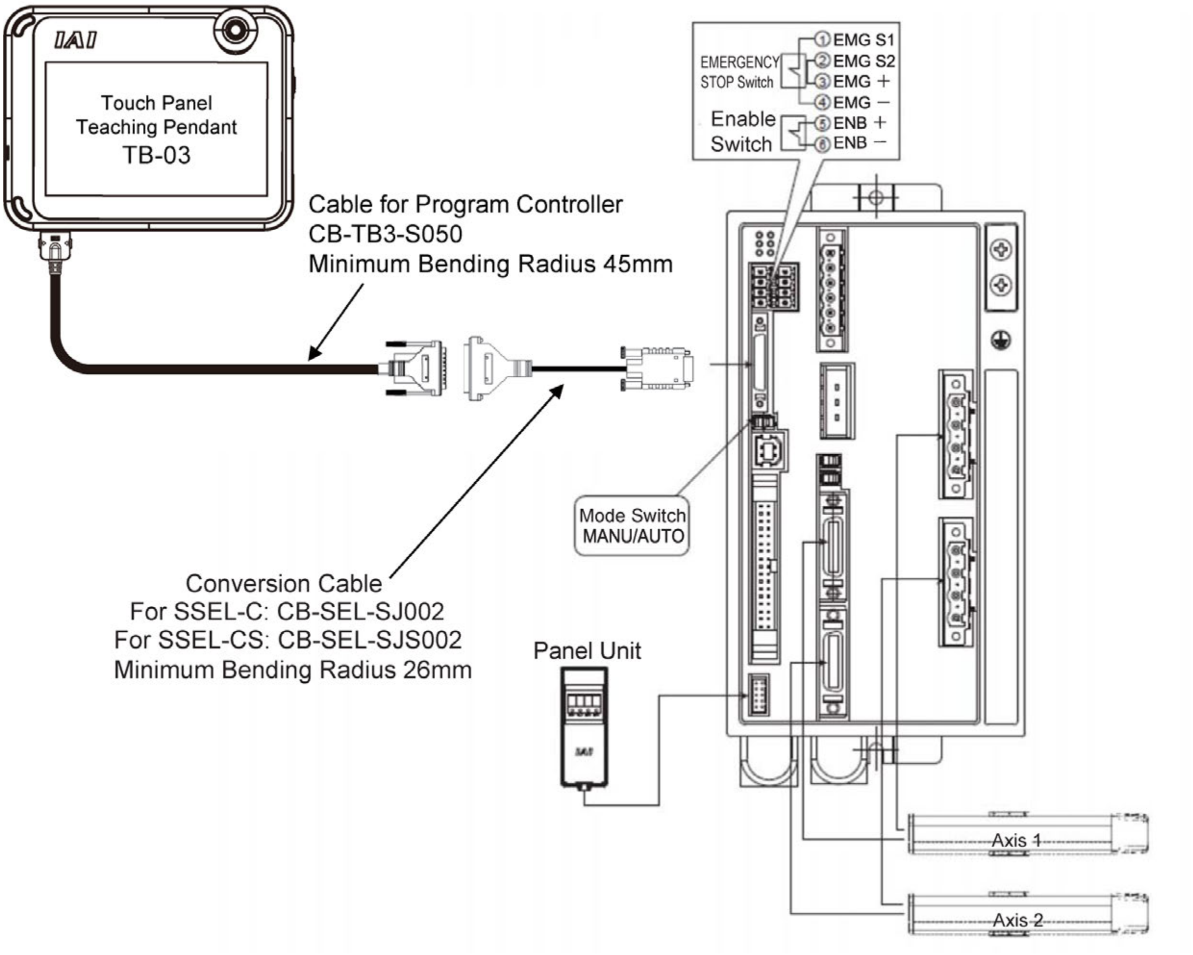


⚠ *Caution: Set the Teaching Pendant Type Selection Switch of the XSEL-PX type to the left.*

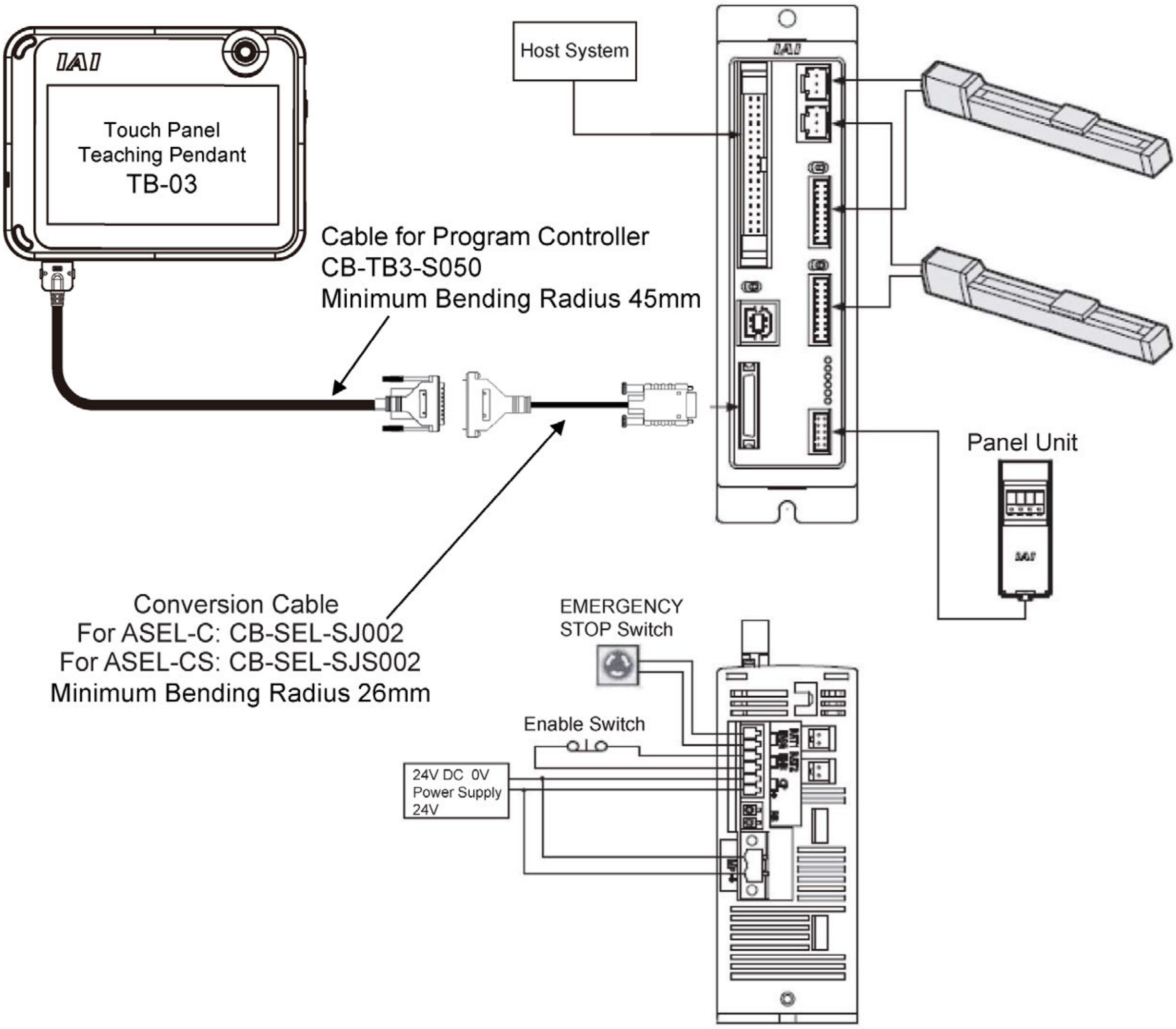
3.6 TT/TTA Type Controller



3.7 SSEL Type Controller



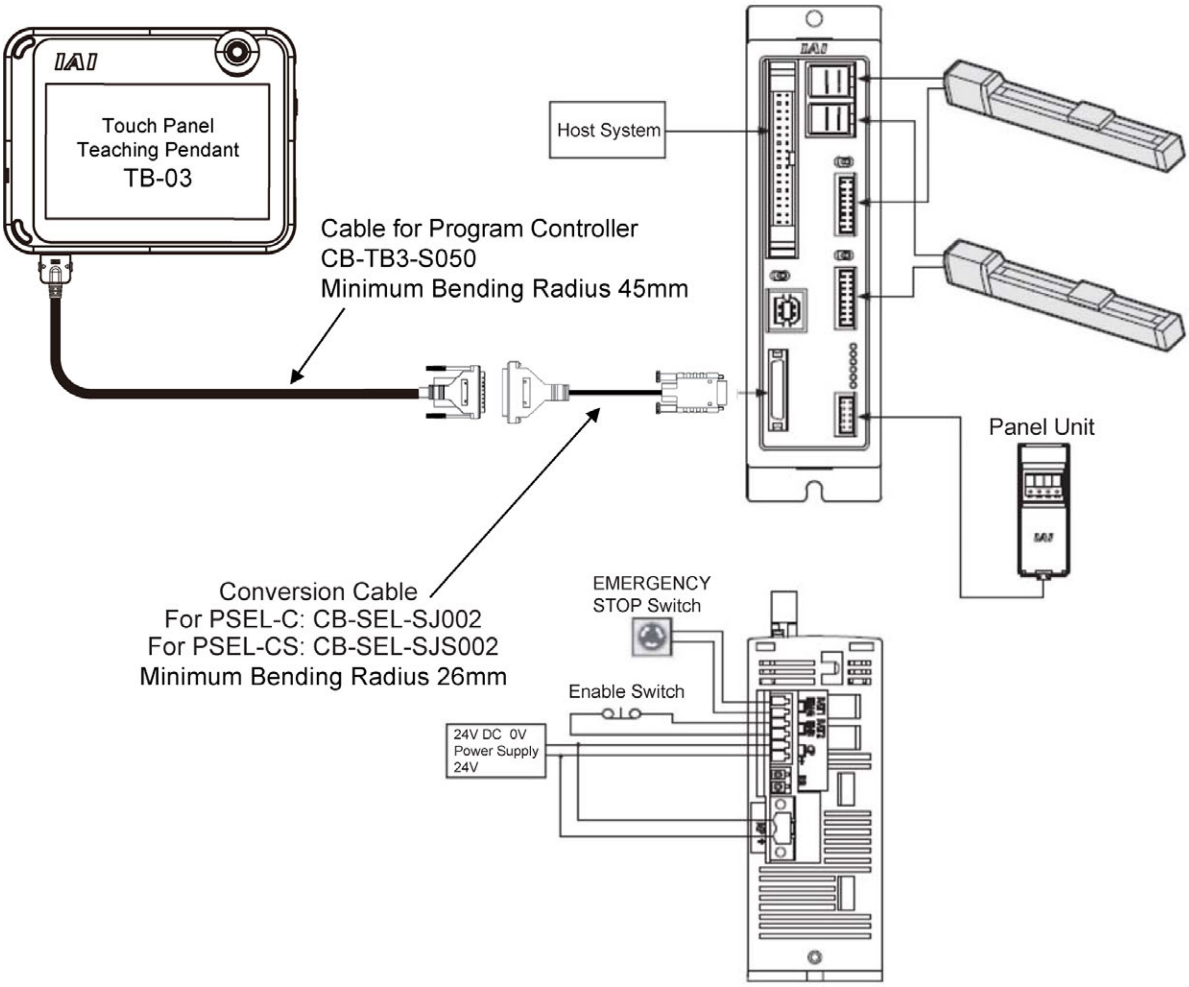
3.8 ASEL Type Controller



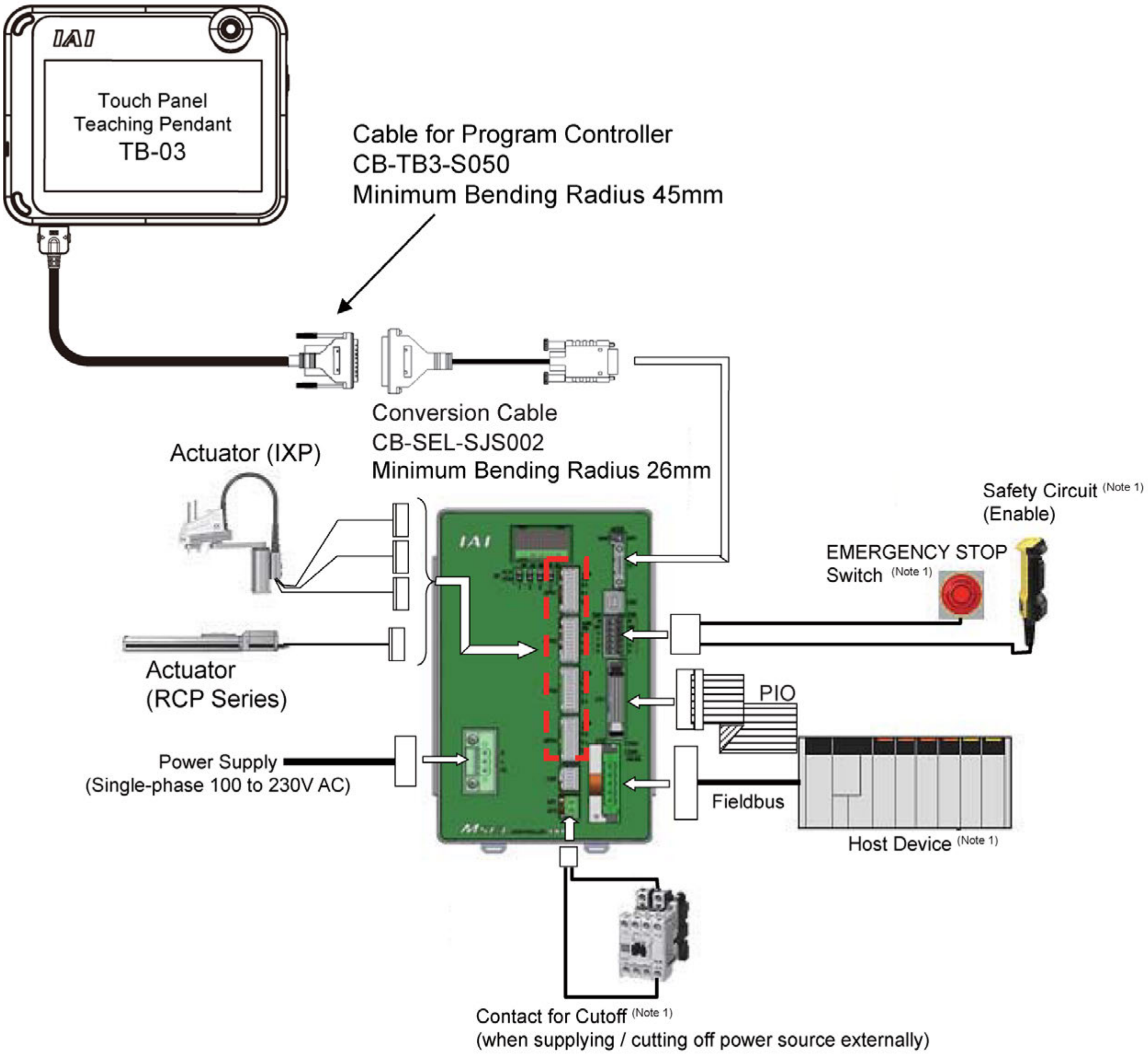
Cable for Program Controller
CB-TB3-S050
Minimum Bending Radius 45mm

Conversion Cable
For ASEL-C: CB-SEL-SJ002
For ASEL-CS: CB-SEL-SJS002
Minimum Bending Radius 26mm

3.9 PSEL Type Controller

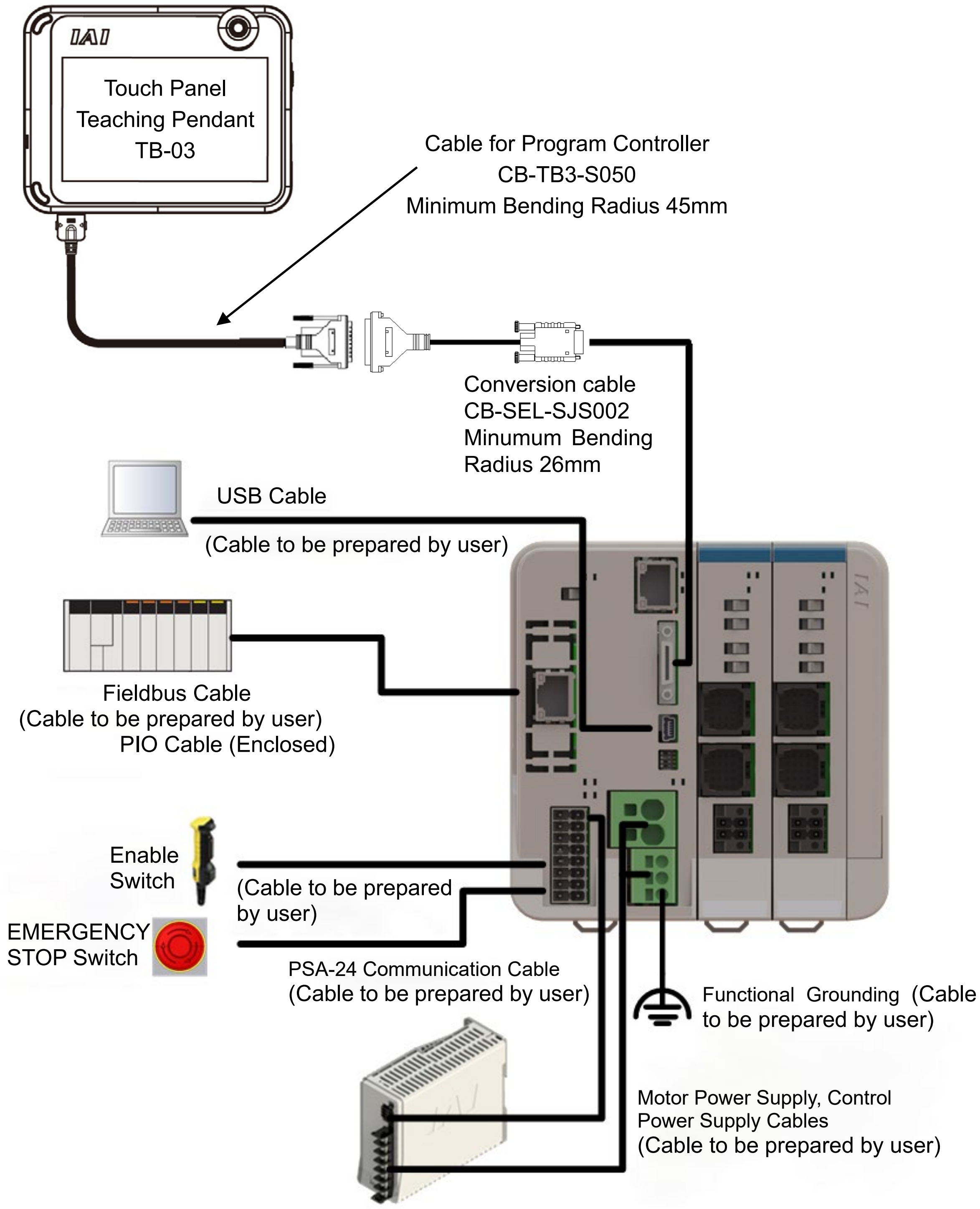


3.10 MSEL Type Controller

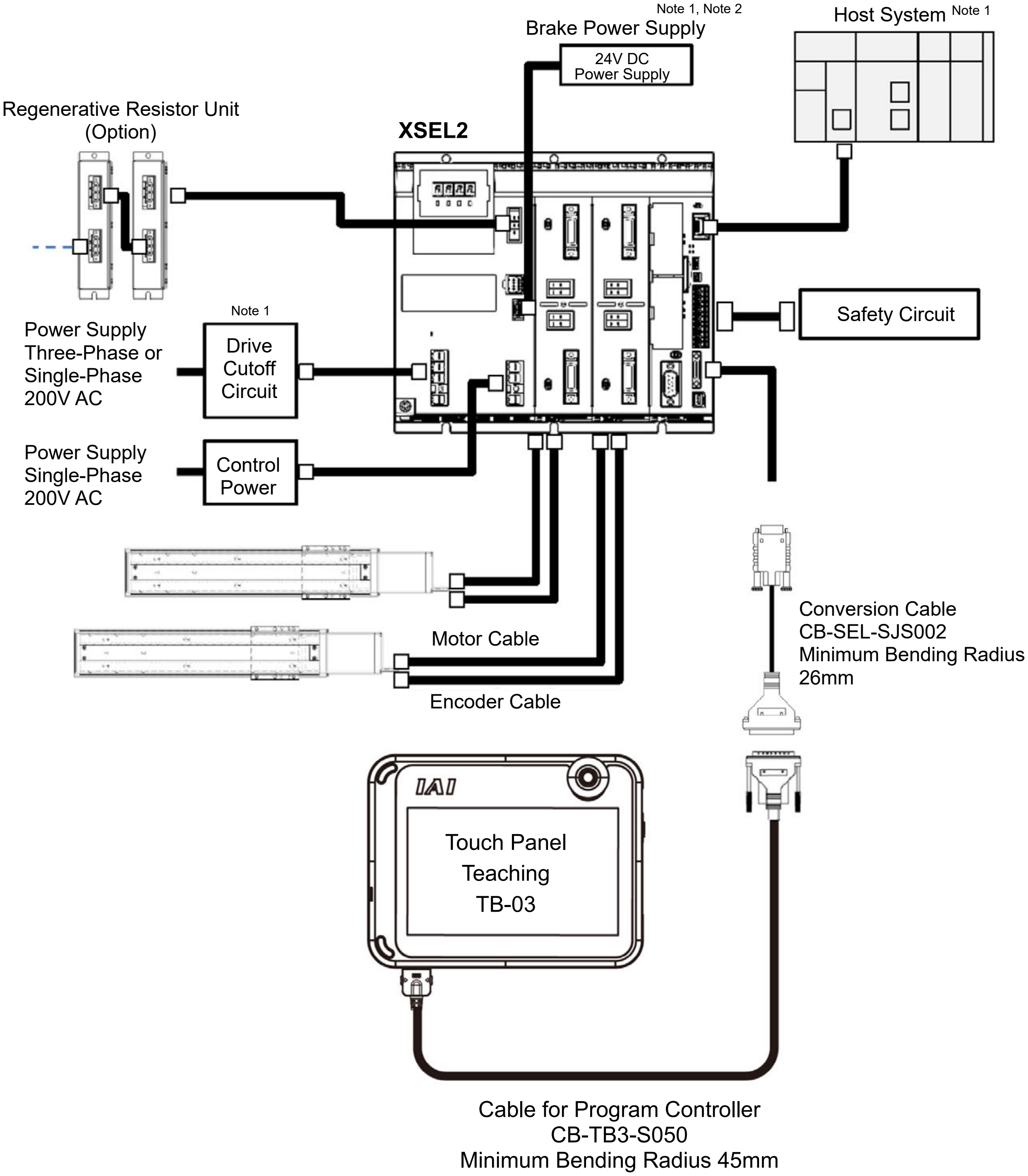


Note 1 Please prepare separately

3.11 RSEL Type Controller


Touch Panel
Teaching Pendant
TB-03
Cable for Program Controller
CB-TB3-S050
Minimum Bending Radius 45mm
Conversion cable
CB-SEL-SJS002
Minumum Bending
Radius 26mm
USB Cable
(Cable to be prepared by user)
Fieldbus Cable
(Cable to be prepared by user)
PIO Cable (Enclosed)
Enable
Switch
(Cable to be prepared
by user)
EMERGENCY
STOP Switch
PSA-24 Communication Cable
(Cable to be prepared by user)
Functional Grounding (Cable
to be prepared by user)
Motor Power Supply, Control
Power Supply Cables
(Cable to be prepared by user)

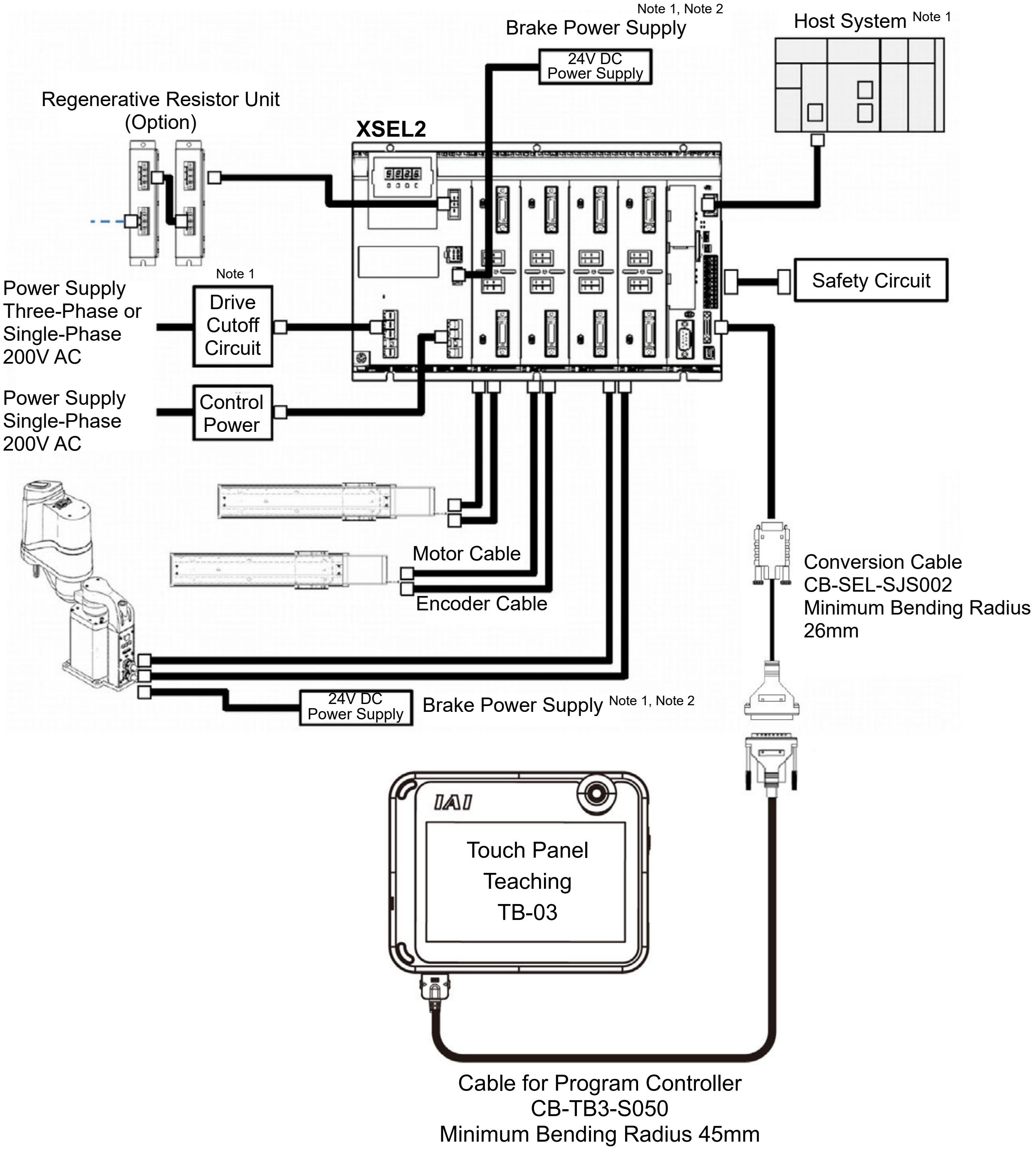
3.12 XSEL2-T Type Controller


Brake Power Supply Note 1, Note 2
24V DC Power Supply
Host System Note 1
Regenerative Resistor Unit (Option)
XSEL2
Power Supply Three-Phase or Single-Phase 200V AC
Note 1
Drive Cutoff Circuit
Safety Circuit
Power Supply Single-Phase 200V AC
Control Power
Motor Cable
Encoder Cable
Conversion Cable CB-SEL-SJS002 Minimum Bending Radius 26mm
Touch Panel Teaching TB-03
Cable for Program Controller CB-TB3-S050 Minimum Bending Radius 45mm

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


Brake Power Supply Note 1, Note 2
24V DC Power Supply
Host System Note 1
Regenerative Resistor Unit (Option)
XSEL2
Power Supply Three-Phase or Single-Phase 200V AC
Note 1
Drive Cutoff Circuit
Safety Circuit
Power Supply Single-Phase 200V AC
Control Power
Motor Cable
Encoder Cable
Conversion Cable CB-SEL-SJS002 Minimum Bending Radius 26mm
24V DC Power Supply
Brake Power Supply Note 1, Note 2
IAI
Touch Panel Teaching TB-03
Cable for Program Controller CB-TB3-S050 Minimum Bending Radius 45mm

Note 1 *Please prepare separately.*

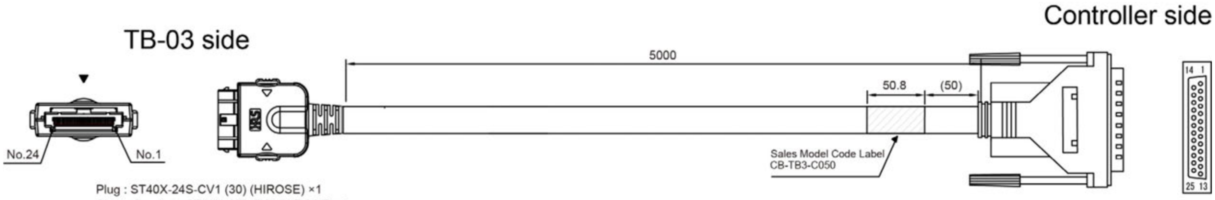
Note 2 *For an actuator equipped with a brake, it is necessary to supply +24V power for brake to the controller.*

3.14 Connection Cable

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

3.14.1 Program Controller Connection Cable

Model	CB-TB3-S050
Name	Program Controller Connection Cable
Connector Model on Controller Side	E25-403N-140 (Manufactured by TECHNICAL ELECTRON)
Connector Model on TB-03 Unit Side	ST60-24P (30) (HIROSE)
Mass	285g approx. (5m)
Minimum cable bending radius	45mm

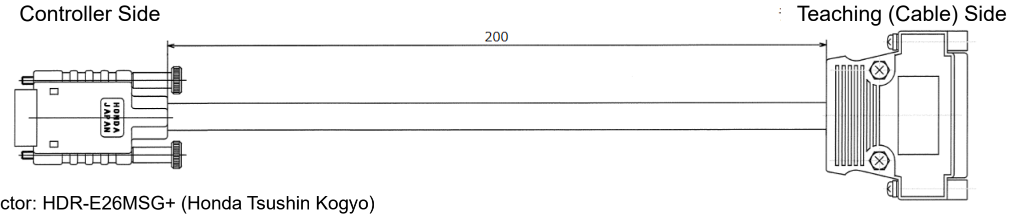


Plug : ST40X-24S-CV1 (30) (HIROSE) ×1
Clamp Bracket : ST40X-CM (5.8) (HIROSE) ×1
Bushing : ST40X-BS (5.8) (HIROSE) ×1

Plug : E25-403N-140 (TECHNICAL ELECTRON) ×1

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 Cable Side	XM3D-2521 (Omron)
Minimum Cable Bending Radius	26mm



Male Connector: HDR-E26MSG+ (Honda Tsushin Kogyo)
Cable Case : HDR-E26LPH (Honda Tsushin Kogyo)

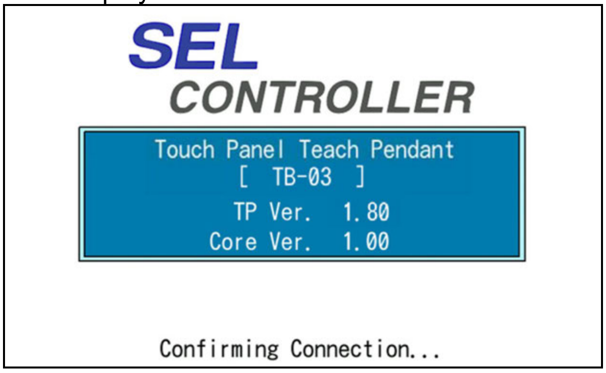
Socket : XM3D-2521 (Omron)
Hood : XM2S-2511 (Omron)
Fixing Bracket : XM2Z-001 (Omron)

3.15 Teaching Pendant Connection Procedure

1) Connect actuators, I/O 24V DC 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



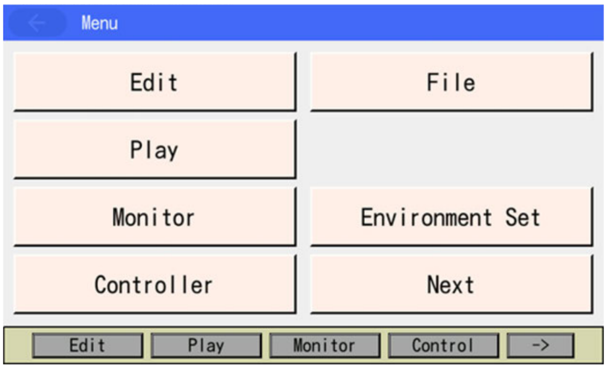
SEL
CONTROLLER

Touch Panel Teach Pendant
[TB-03]
TP Ver. 1.80
Core Ver. 1.00

Confirming Connection...

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

Main Menu Screen



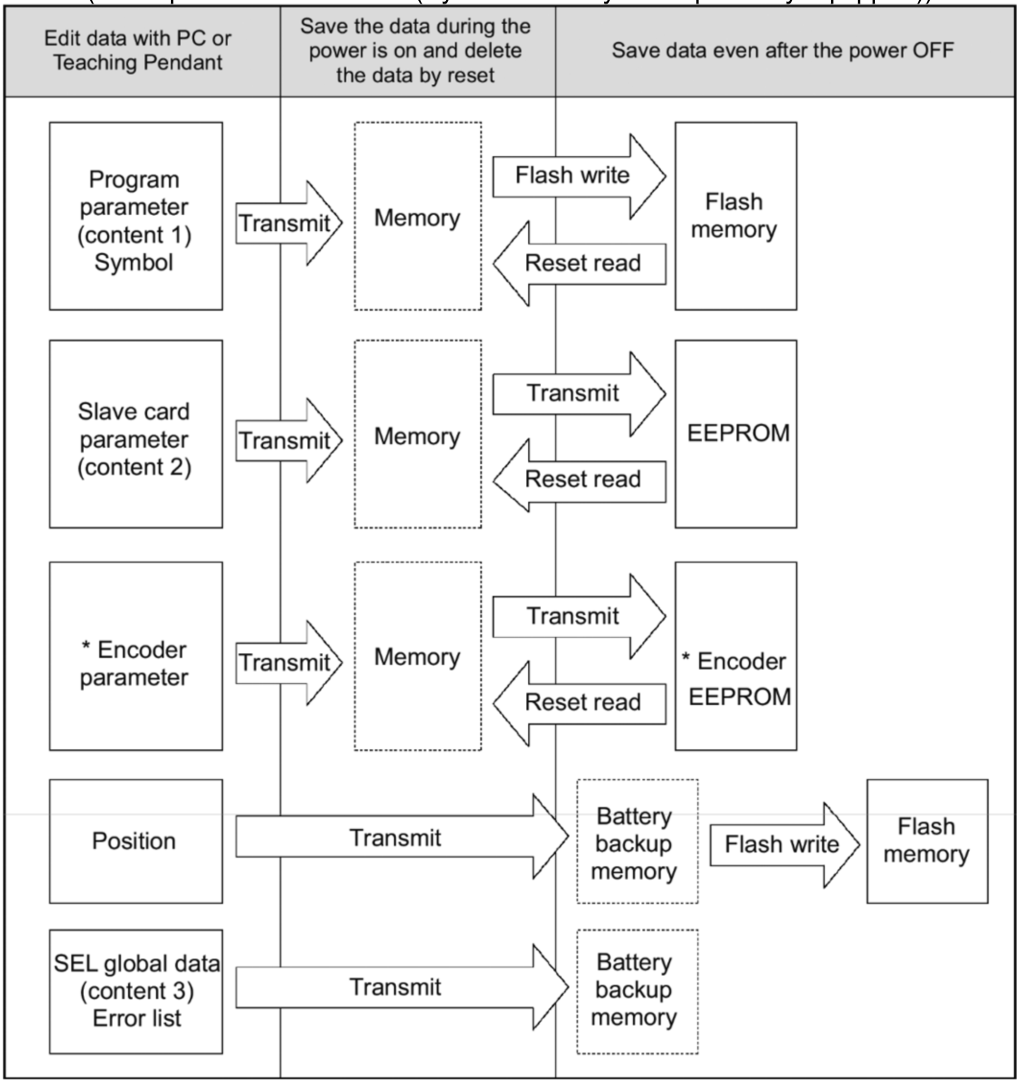
This will be the basic window for all operations.

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))


Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
Program parameter (content 1) Symbol
Transmit
Memory
Flash write
Reset read
Flash memory
Slave card parameter (content 2)
Transmit
Memory
Transmit
Reset read
EEPROM
* Encoder parameter
Transmit
Memory
Transmit
Reset read
* Encoder EEPROM
Position
Transmit
Battery backup memory
Flash write
Flash memory
SEL global data (content 3) Error list
Transmit
Battery backup memory

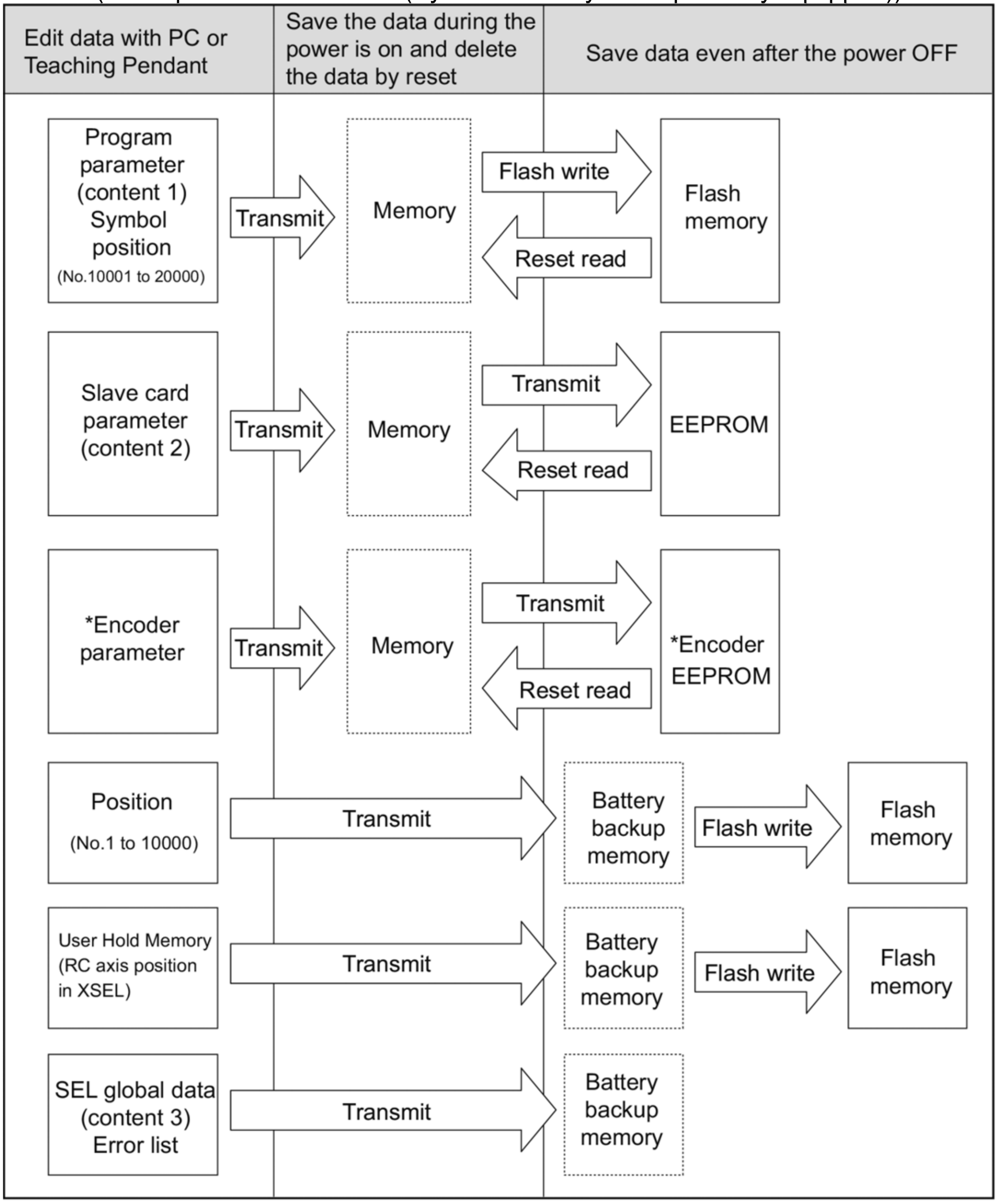
* Encoder parameters are not stored within the controller but in the EEPROM of the actuator's encoder itself. They are read into the controller at power-on or software-reset time.

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, I/O slot card (electric power type card) parameter (XSEL-K, KX, TT/TTA) : I/O 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.

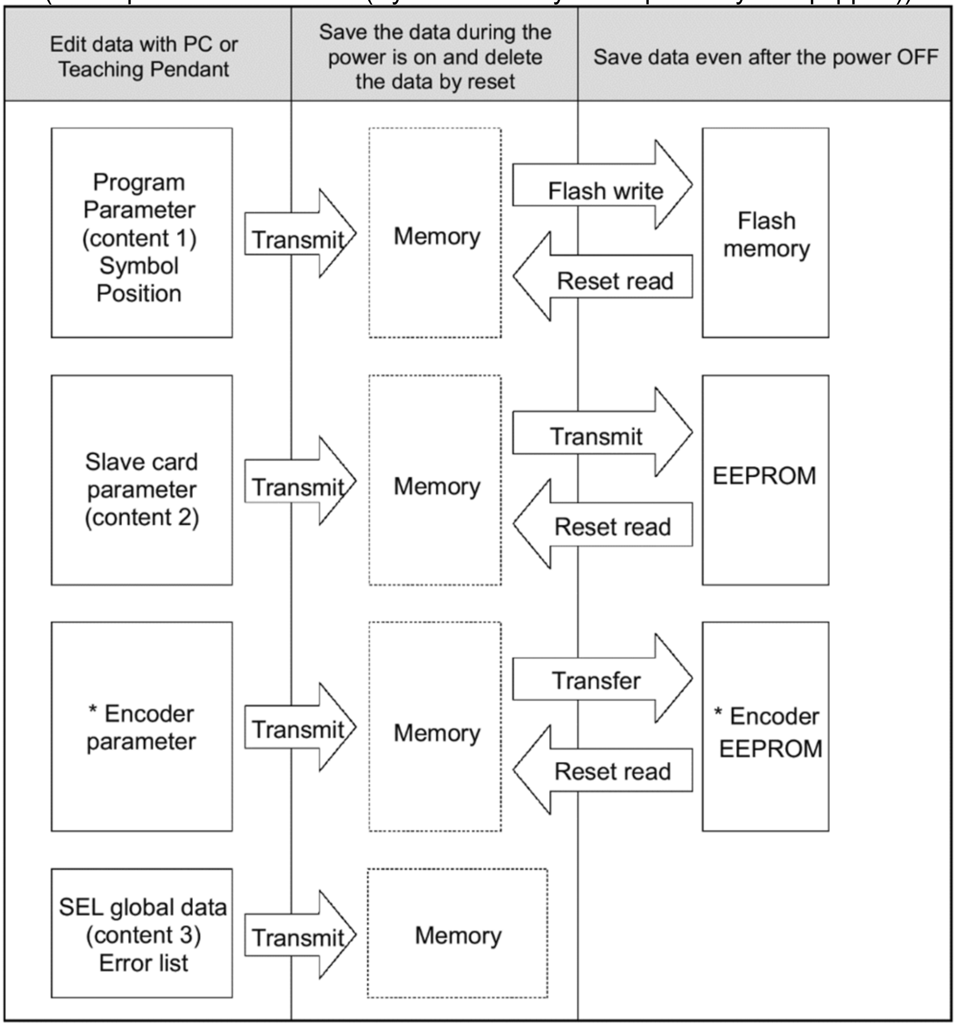
(Other parameter No.20=2 (System memory backup battery equipped))


Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
Program parameter (content 1) Symbol position (No.10001 to 20000)
Transmit
Memory
Flash write
Reset read
Flash memory
Slave card parameter (content 2)
Transmit
Memory
Transmit
Reset read
EEPROM
*Encoder parameter
Transmit
Memory
Transmit
Reset read
*Encoder EEPROM
Position (No.1 to 10000)
Transmit
Battery backup memory
Flash write
Flash memory
User Hold Memory (RC axis position in XSEL)
Transmit
Battery backup memory
Flash write
Flash memory
SEL global data (content 3) Error list
Transmit
Battery backup memory

* 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))

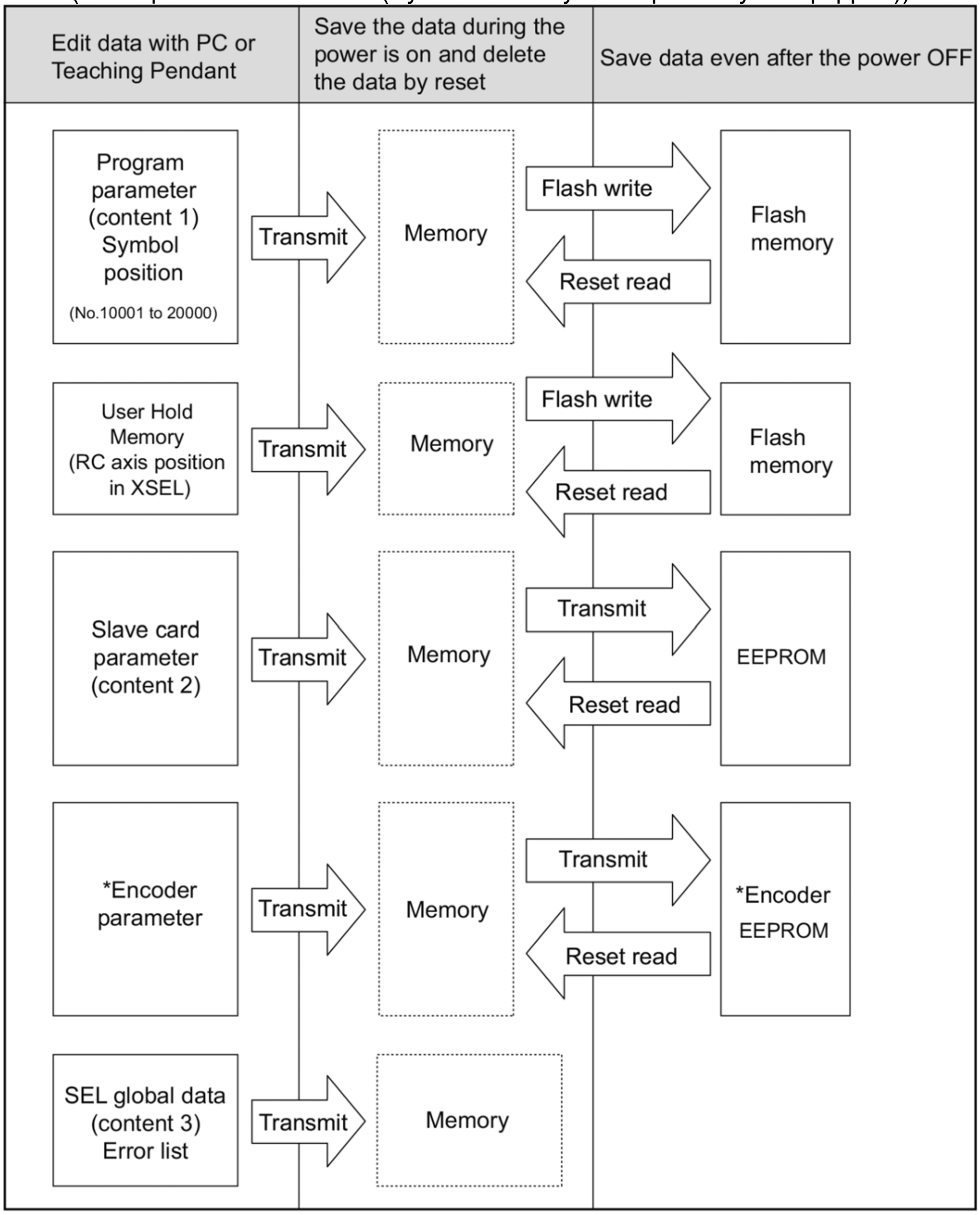

Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
Program Parameter (content 1) Symbol Position
Transmit
Memory
Flash write
Reset read
Flash memory
Slave card parameter (content 2)
Transmit
Memory
Transmit
Reset read
EEPROM
* Encoder parameter
Transmit
Memory
Transfer
Reset read
* Encoder EEPROM
SEL global data (content 3) Error list
Transmit
Memory

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.

Note: 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))

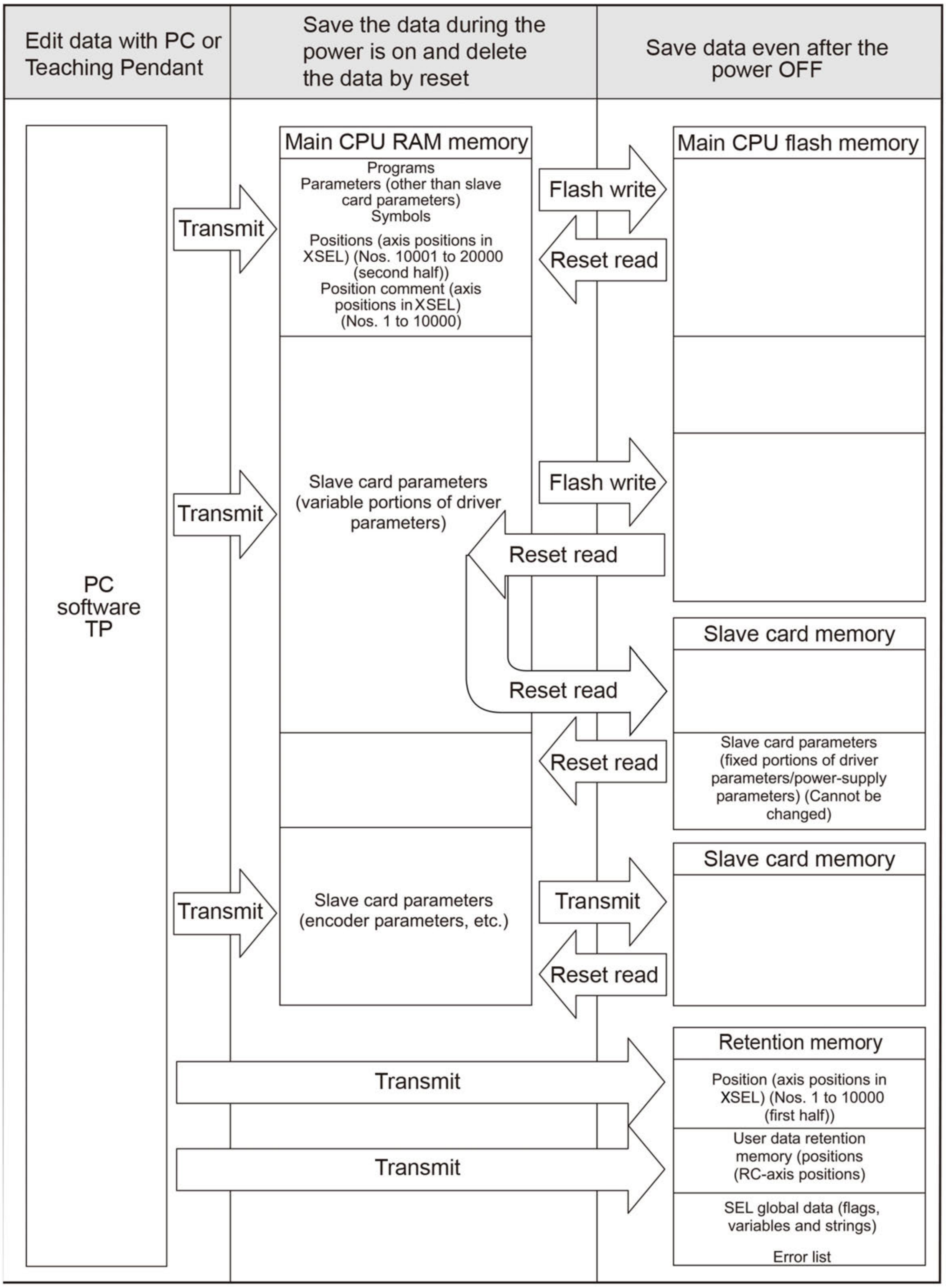

Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
Program parameter (content 1) Symbol position (No.10001 to 20000)
Transmit
Memory
Flash write
Reset read
Flash memory
User Hold Memory (RC axis position in XSEL)
Transmit
Memory
Flash write
Reset read
Flash memory
Slave card parameter (content 2)
Transmit
Memory
Transmit
Reset read
EEPROM
*Encoder parameter
Transmit
Memory
Transmit
Reset read
*Encoder EEPROM
SEL global data (content 3) Error list
Transmit
Memory

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.

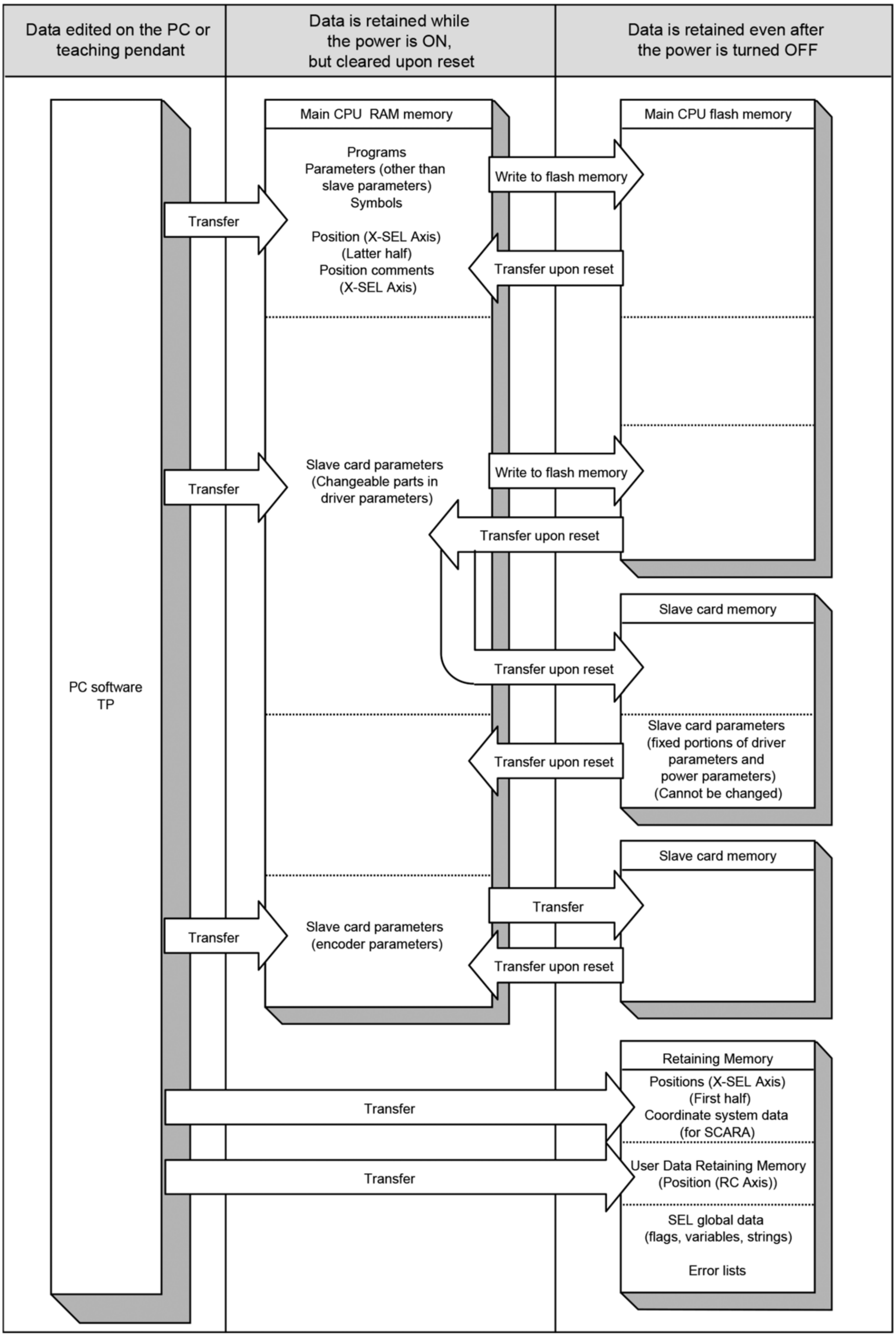
⚠ *Caution: SEL global data can’t be saved without the backup battery.*

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

An example of 20,000 positions is given below.

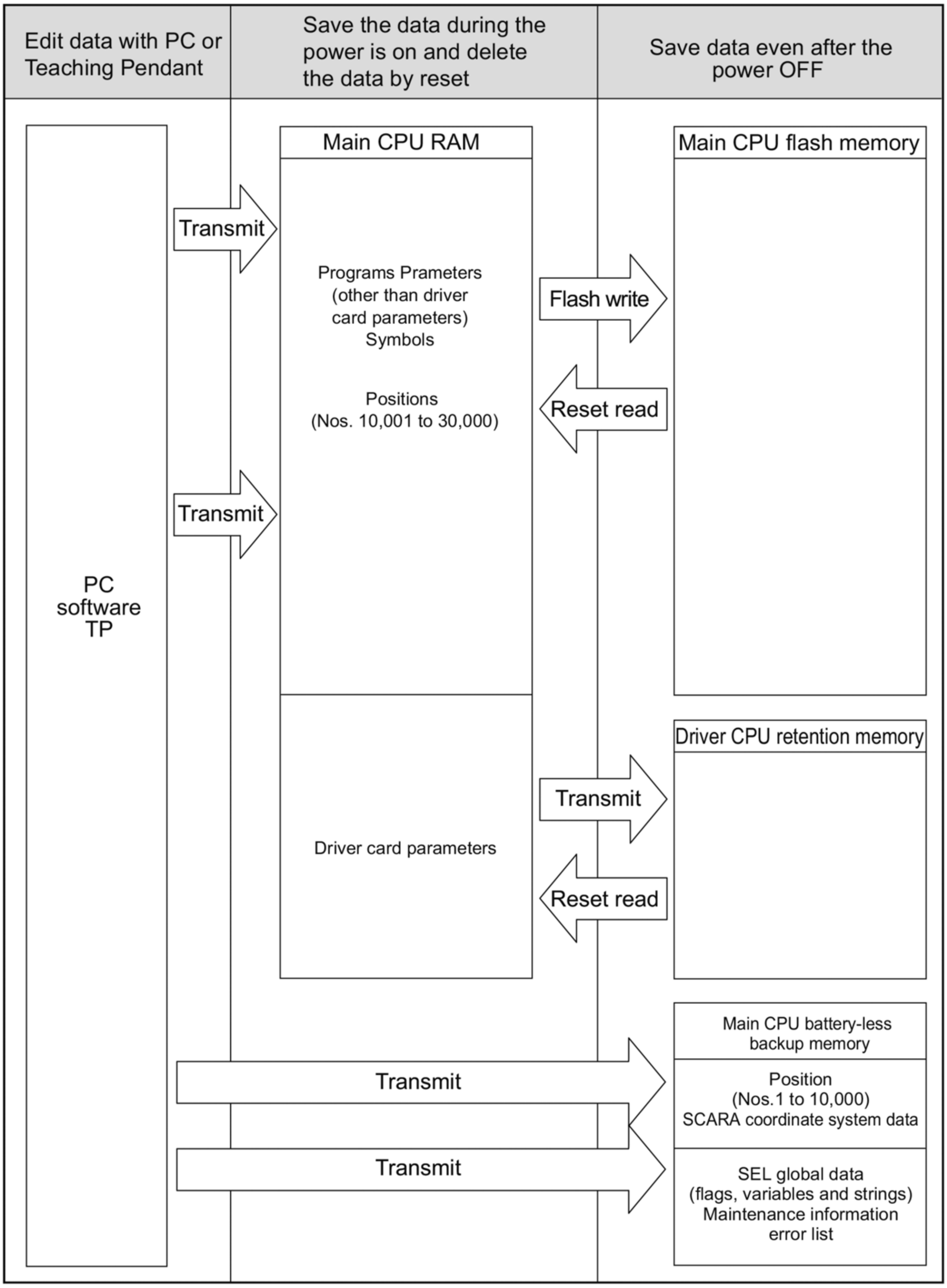

Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
PC software TP
Transmit
Transmit
Transmit
Main CPU RAM memory
Programs
Parameters (other than slave card parameters)
Symbols
Positions (axis positions in XSEL) (Nos. 10001 to 20000 (second half))
Position comment (axis positions in XSEL) (Nos. 1 to 10000)
Slave card parameters (variable portions of driver parameters)
Slave card parameters (encoder parameters, etc.)
Flash write
Reset read
Flash write
Reset read
Reset read
Reset read
Transmit
Reset read
Main CPU flash memory
Slave card memory
Slave card parameters (fixed portions of driver parameters/power-supply parameters) (Cannot be changed)
Slave card memory
Transmit
Transmit
Retention memory
Position (axis positions in XSEL) (Nos. 1 to 10000 (first half))
User data retention memory (positions (RC-axis positions)
SEL global data (flags, variables and strings)
Error list

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


Data edited on the PC or teaching pendant
Data is retained while the power is ON, but cleared upon reset
Data is retained even after the power is turned OFF
PC software
TP
Transfer
Transfer
Transfer
Main CPU RAM memory
Programs
Parameters (other than slave parameters)
Symbols
Position (X-SEL Axis) (Latter half)
Position comments (X-SEL Axis)
Slave card parameters (Changeable parts in driver parameters)
Slave card parameters (encoder parameters)
Write to flash memory
Transfer upon reset
Write to flash memory
Transfer upon reset
Transfer upon reset
Transfer upon reset
Transfer
Transfer upon reset
Main CPU flash memory
Slave card memory
Slave card parameters (fixed portions of driver parameters and power parameters) (Cannot be changed)
Slave card memory
Transfer
Transfer
Retaining Memory
Positions (X-SEL Axis) (First half)
Coordinate system data (for SCARA)
User Data Retaining Memory (Position (RC Axis))
SEL global data (flags, variables, strings)
Error lists

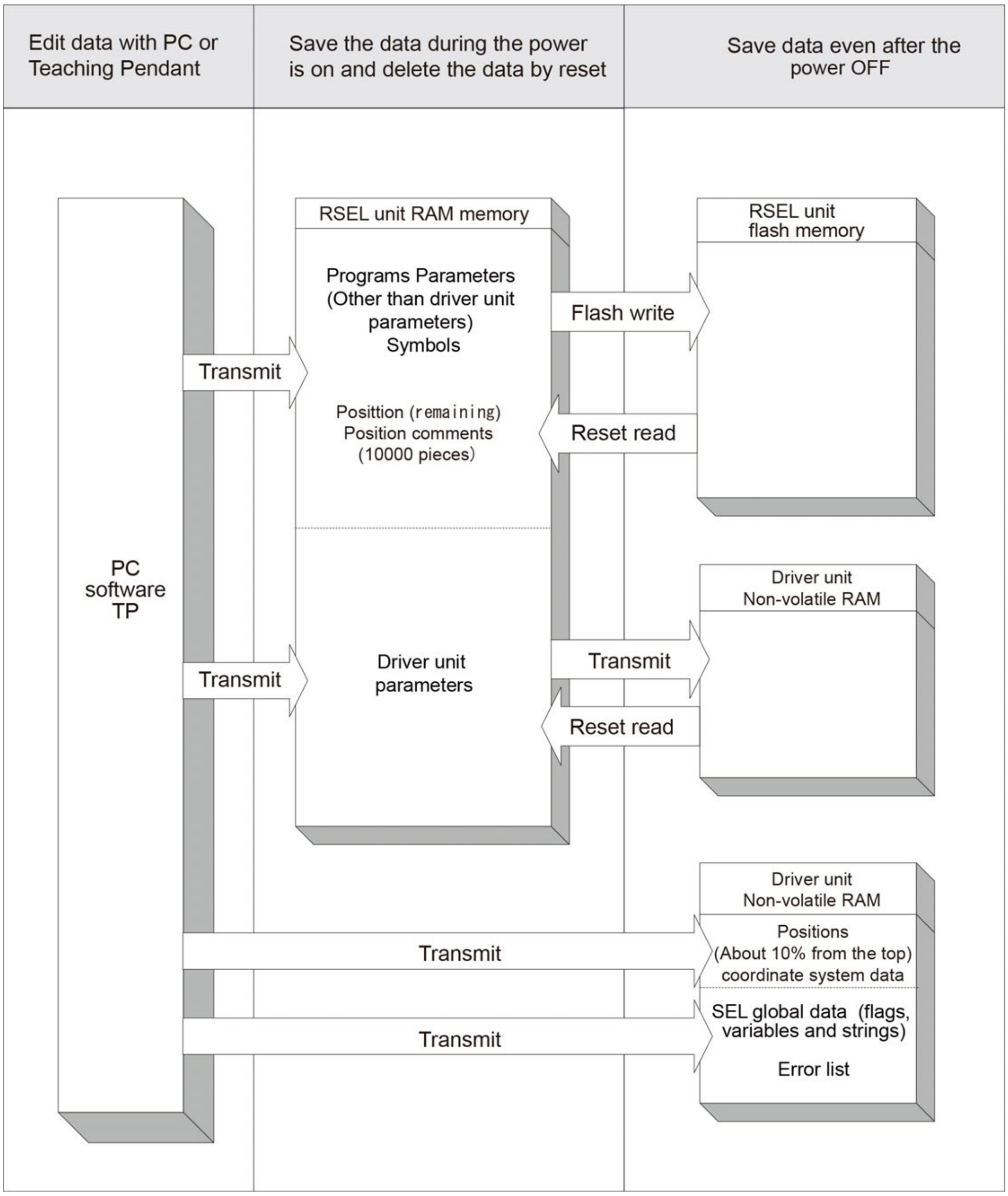
4.5 TTA, MSEL-PCX/PGX/PC/PG/PCF/PGF

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.


Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
PC software TP
Transmit
Transmit
Main CPU RAM
Programs Prameters (other than driver card parameters) Symbols
Positions (Nos. 10,001 to 30,000)
Driver card parameters
Flash write
Reset read
Main CPU flash memory
Transmit
Reset read
Driver CPU retention memory
Transmit
Transmit
Main CPU battery-less backup memory
Position (Nos.1 to 10,000) SCARA coordinate system data
SEL global data (flags, variables and strings) Maintenance information error list

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.

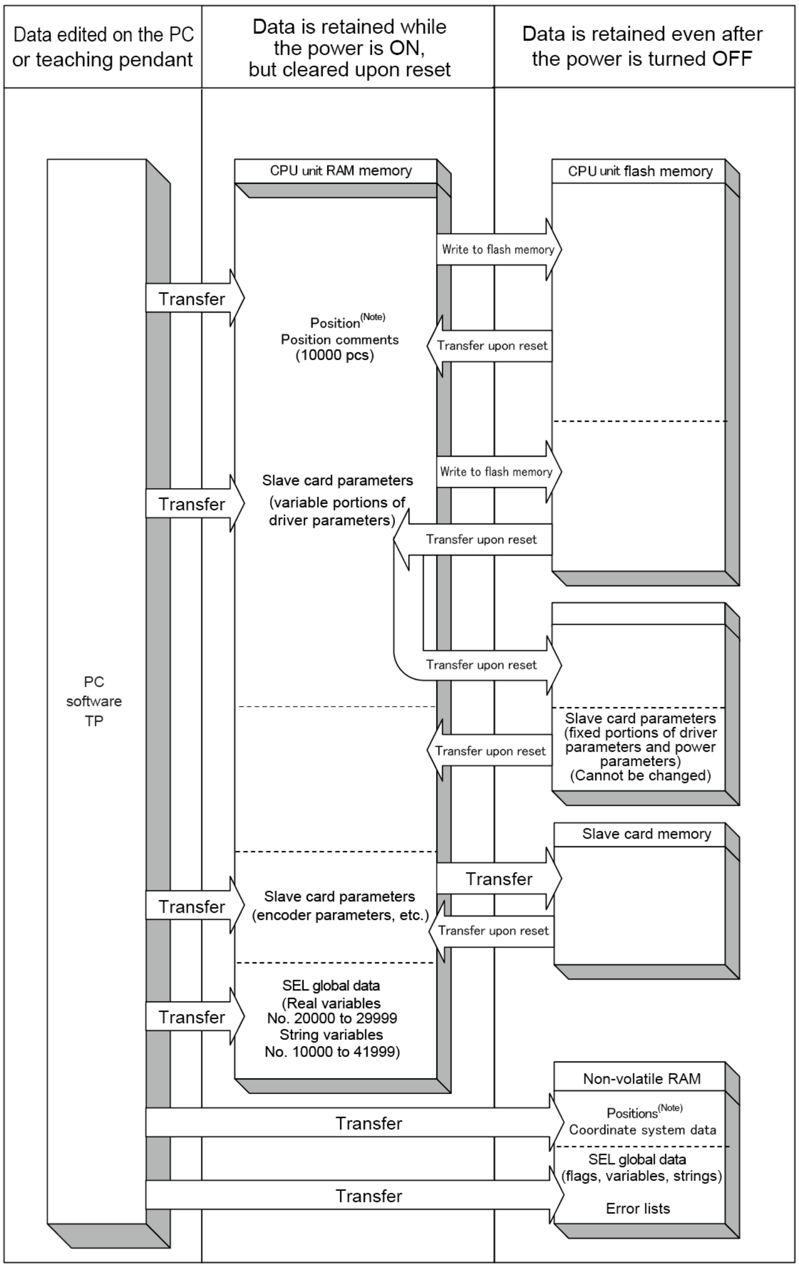

Edit data with PC or Teaching Pendant
Save the data during the power is on and delete the data by reset
Save data even after the power OFF
PC software TP
Transmit
Transmit
RSEL unit RAM memory
Programs Parameters (Other than driver unit parameters) Symbols
Positition (remaining) Position comments (10000 pieces)
Driver unit parameters
Flash write
Reset read
Transmit
Reset read
RSEL unit flash memory
Driver unit Non-volatile RAM
Driver unit Non-volatile RAM
Positions (About 10% from the top) coordinate system data
SEL global data (flags, variables and strings)
Error list
Transmit
Transmit

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.


Data edited on the PC or teaching pendant
Data is retained while the power is ON, but cleared upon reset
Data is retained even after the power is turned OFF
PC software TP
CPU unit RAM memory
CPU unit flash memory
Transfer
Write to flash memory
Position(Note) Position comments (10000 pcs)
Transfer upon reset
Write to flash memory
Transfer
Slave card parameters (variable portions of driver parameters)
Transfer upon reset
Transfer upon reset
Slave card parameters (fixed portions of driver parameters and power parameters) (Cannot be changed)
Transfer upon reset
Slave card memory
Transfer
Transfer
Slave card parameters (encoder parameters, etc.)
Transfer upon reset
Transfer
SEL global data (Real variables No. 20000 to 29999 String variables No. 10000 to 41999)
Non-volatile RAM
Transfer
Positions(Note) Coordinate system data
SEL global data (flags, variables, strings)
Transfer
Error lists

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.

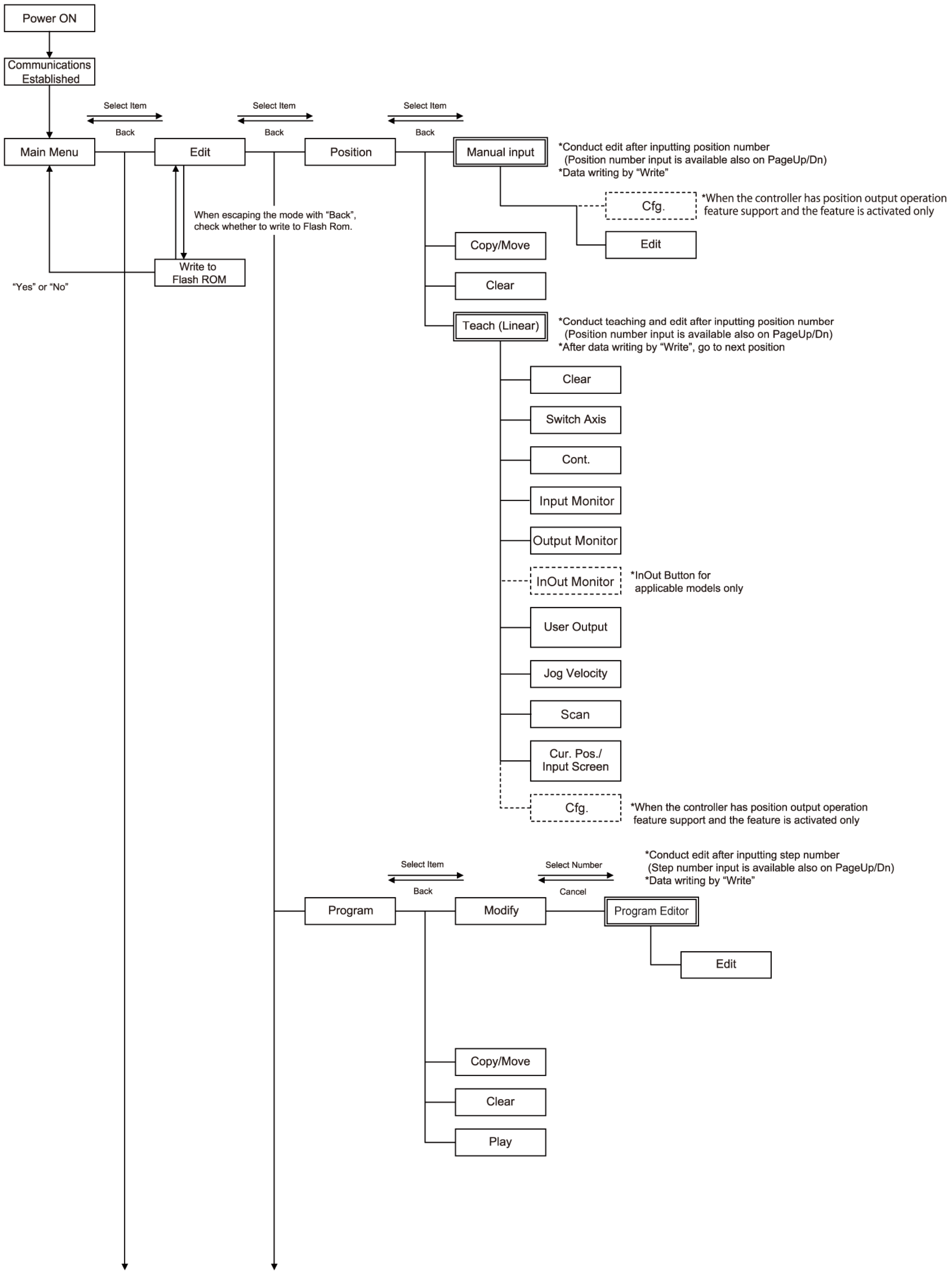
For position data, write in the flash ROM together after initializing.

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



When escaping the mode with "Back", check whether to write to Flash Rom.

*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"

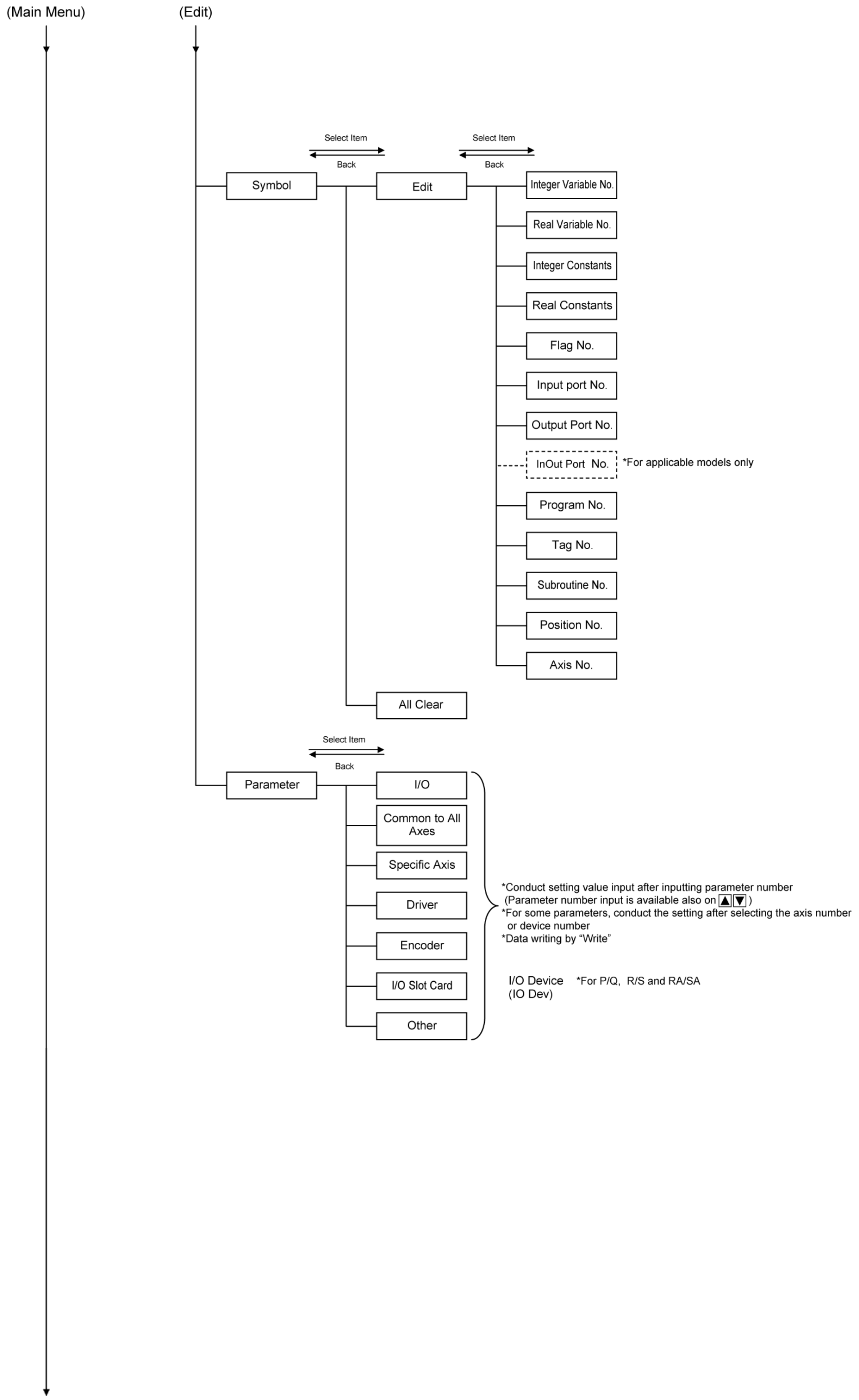
*When the controller has position output operation feature support and the feature is activated only

*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

*InOut Button for applicable models only

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

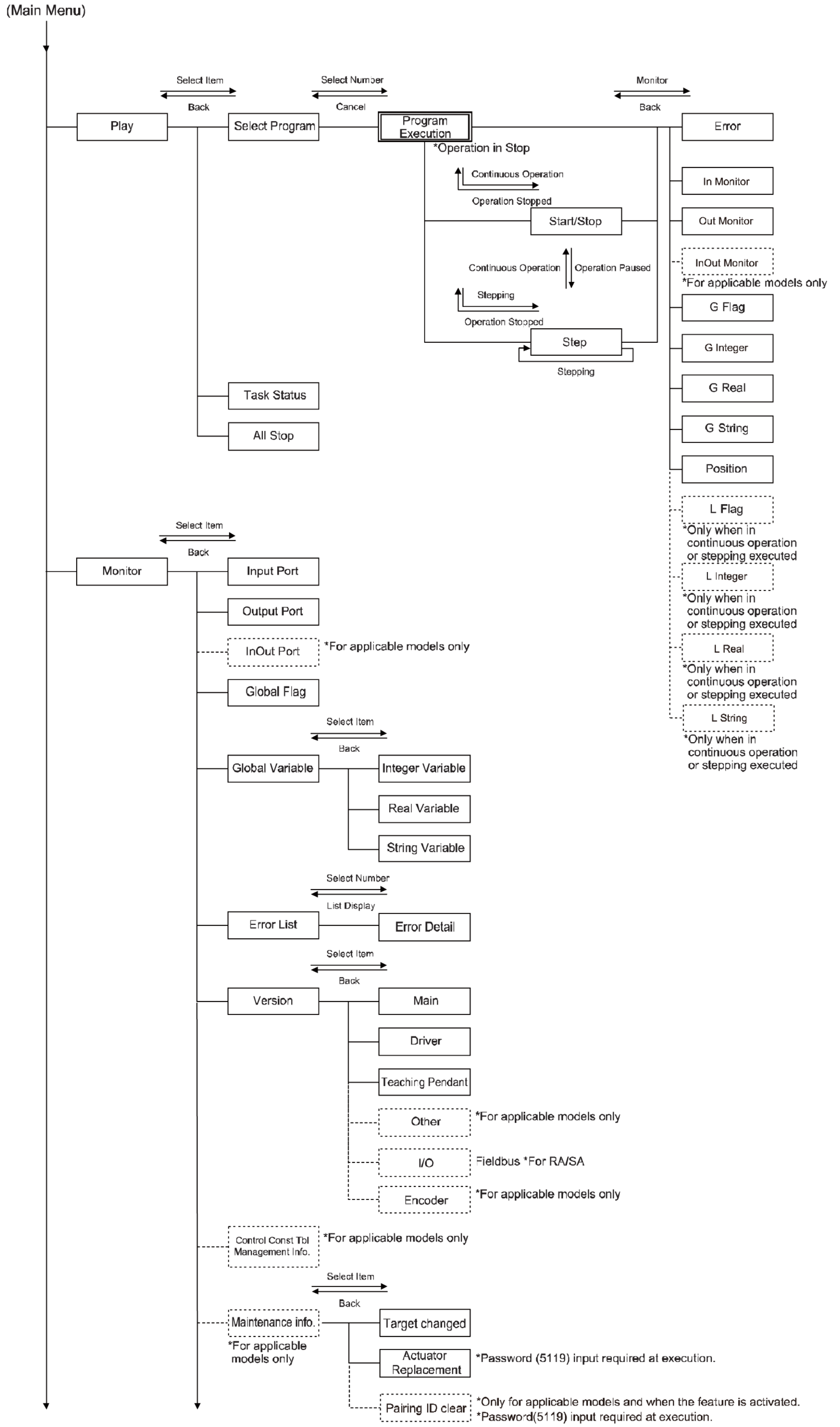
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"

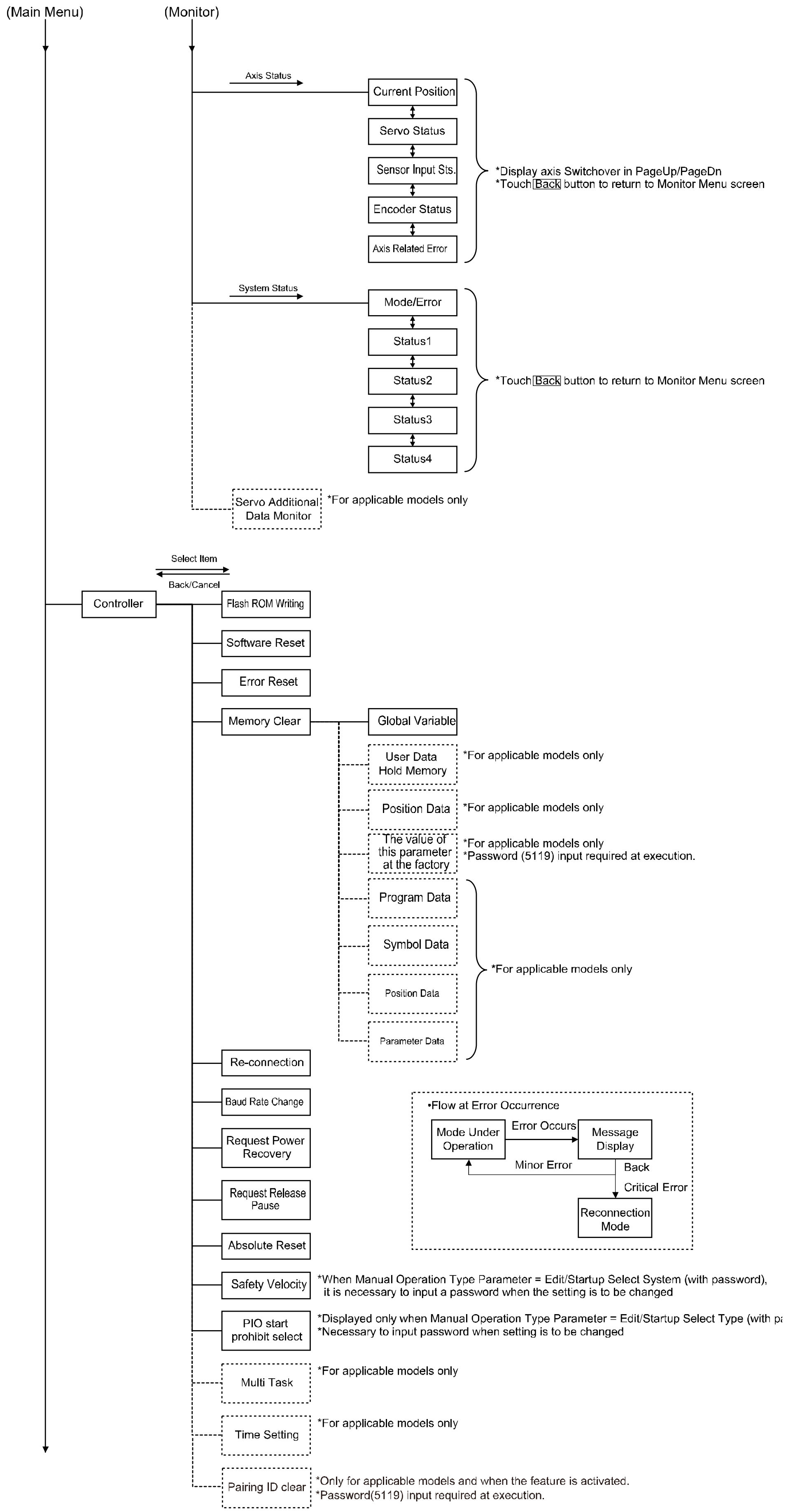


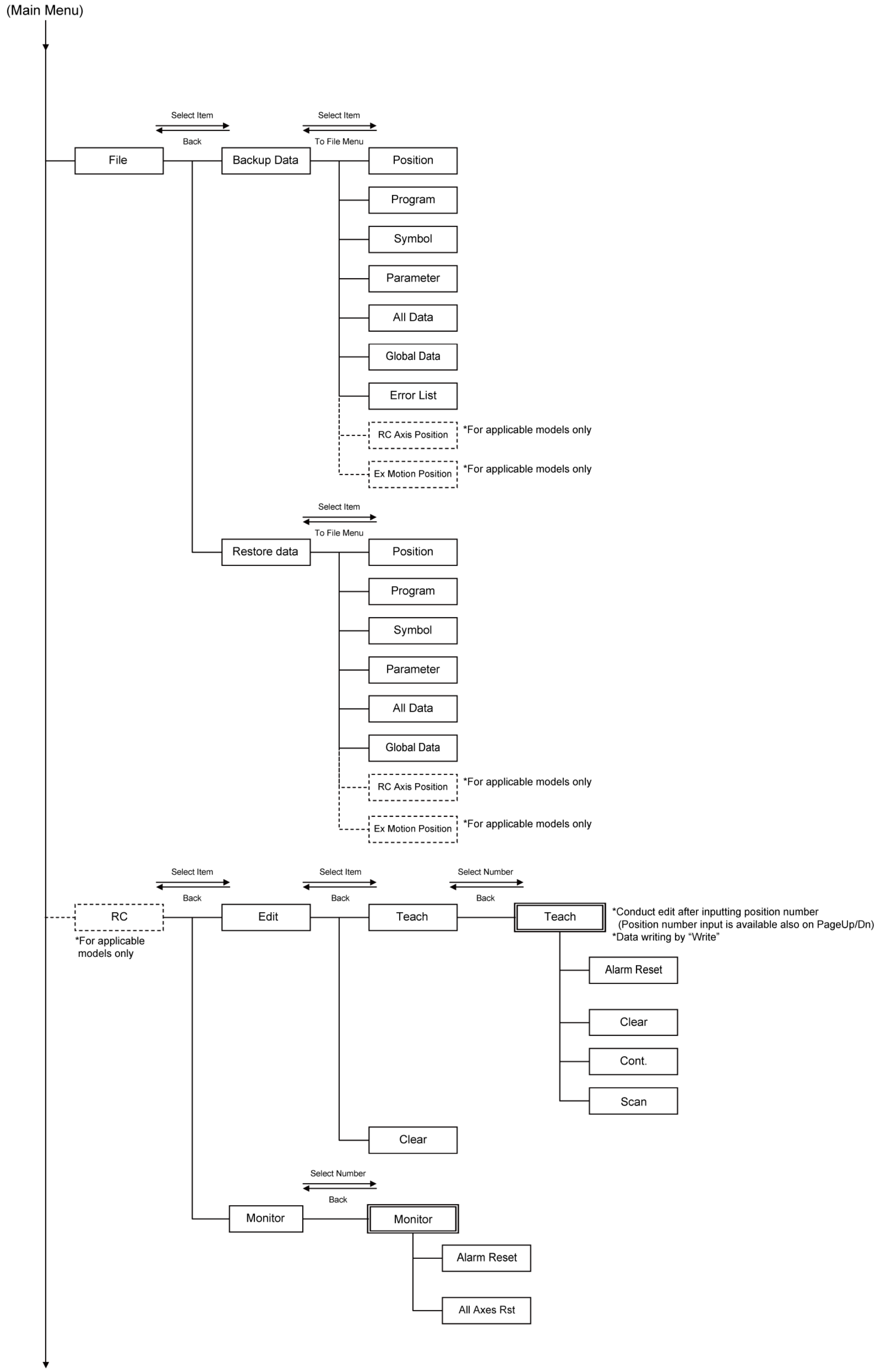
*For applicable models only

*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”

*For P/Q, R/S and RA/SA

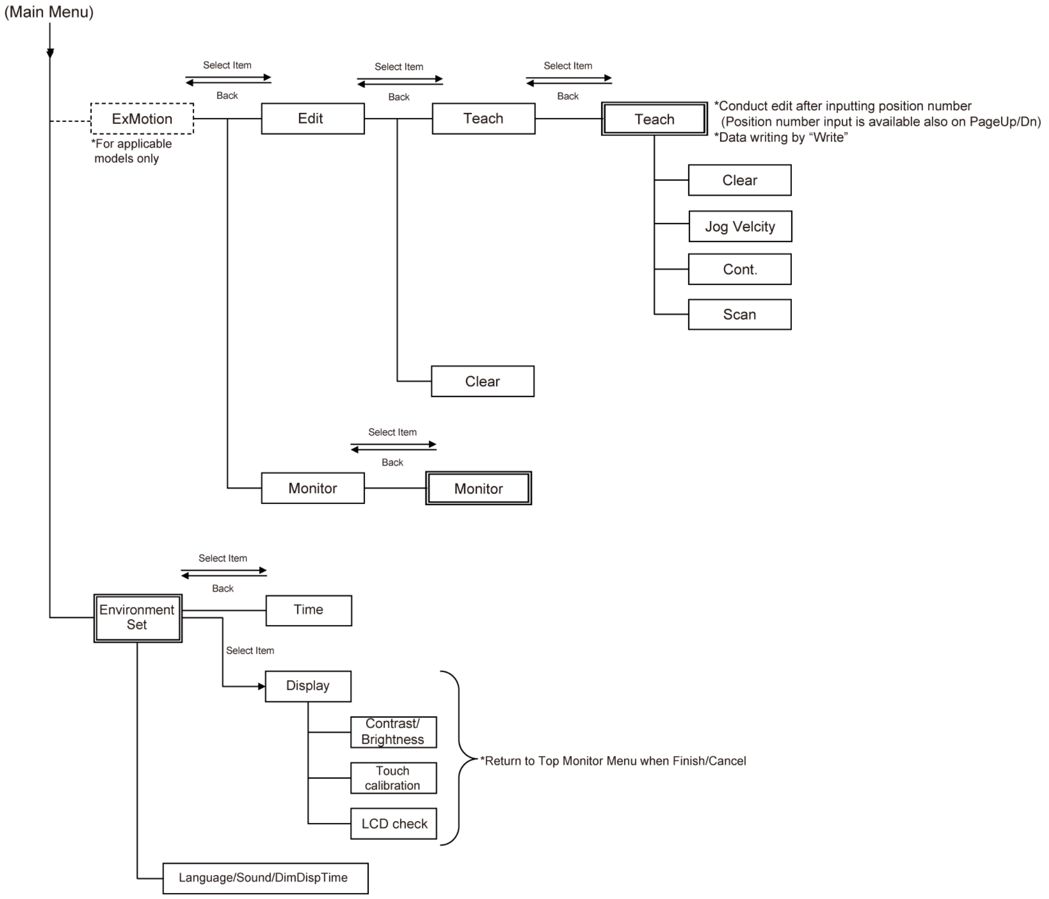

(Main Menu)
Select Item
Back
Select Number
Cancel
Monitor
Back
Play
Select Program
Program Execution
*Operation in Stop
Error
Continuous Operation
Operation Stopped
In Monitor
Start/Stop
Out Monitor
Continuous Operation
Operation Paused
InOut Monitor
*For applicable models only
Stepping
Operation Stopped
G Flag
Step
G Integer
Stepping
G Real
Task Status
G String
All Stop
Position
L Flag
*Only when in continuous operation or stepping executed
Select Item
Back
Monitor
Input Port
L Integer
*Only when in continuous operation or stepping executed
Output Port
InOut Port
*For applicable models only
L Real
*Only when in continuous operation or stepping executed
Global Flag
L String
*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
Select Item
Back
Version
Main
Driver
Teaching Pendant
Other
*For applicable models only
I/O
Fieldbus *For RA/SA
Encoder
*For applicable models only
Control Const Tbl Management Info.
*For applicable models only
Select Item
Back
Maintenance info.
*For applicable models only
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
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
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 p
*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.
•Flow at Error Occurrence
Mode Under Operation
Error Occurs
Message Display
Minor Error
Back
Critical Error
Reconnection Mode

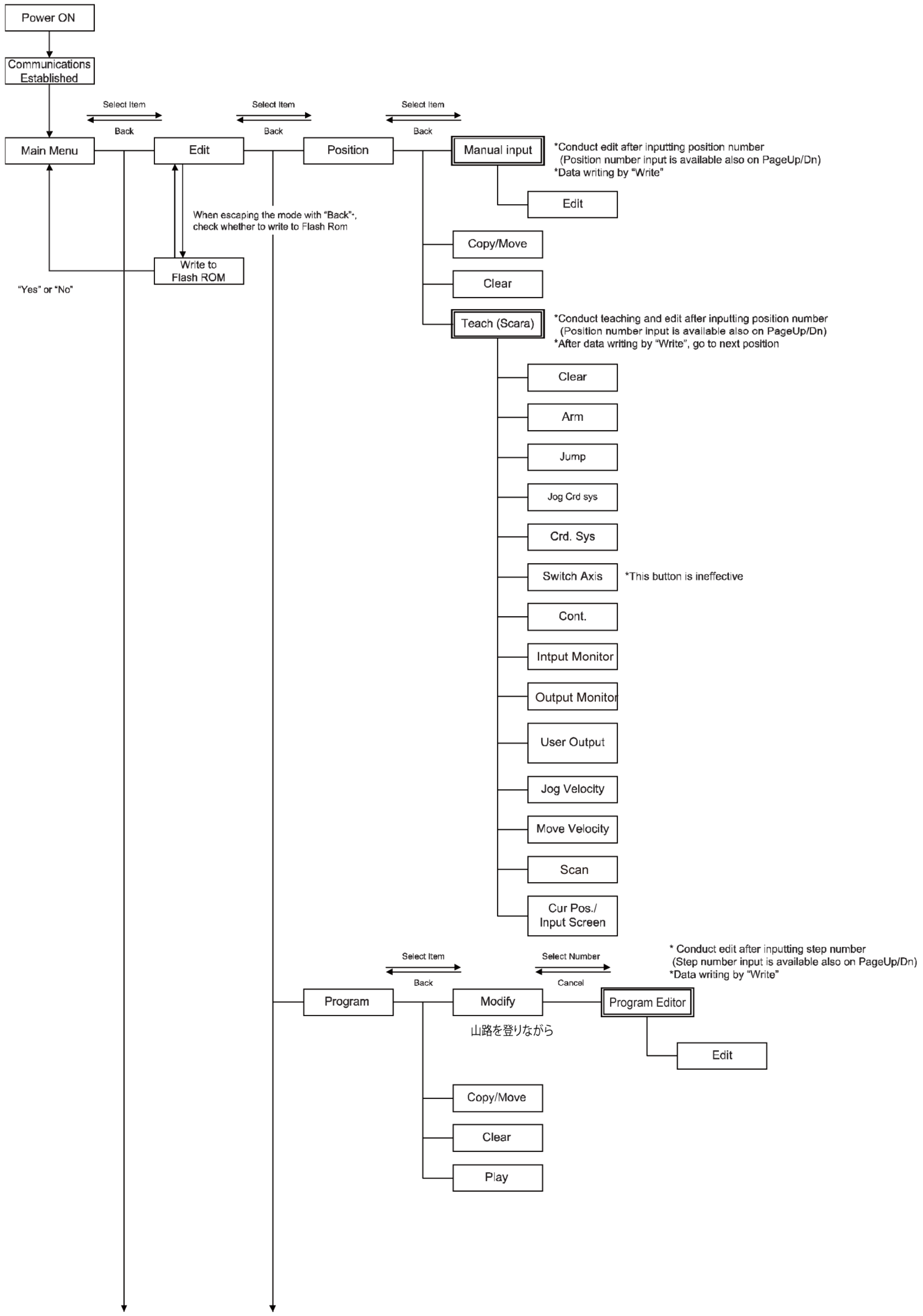


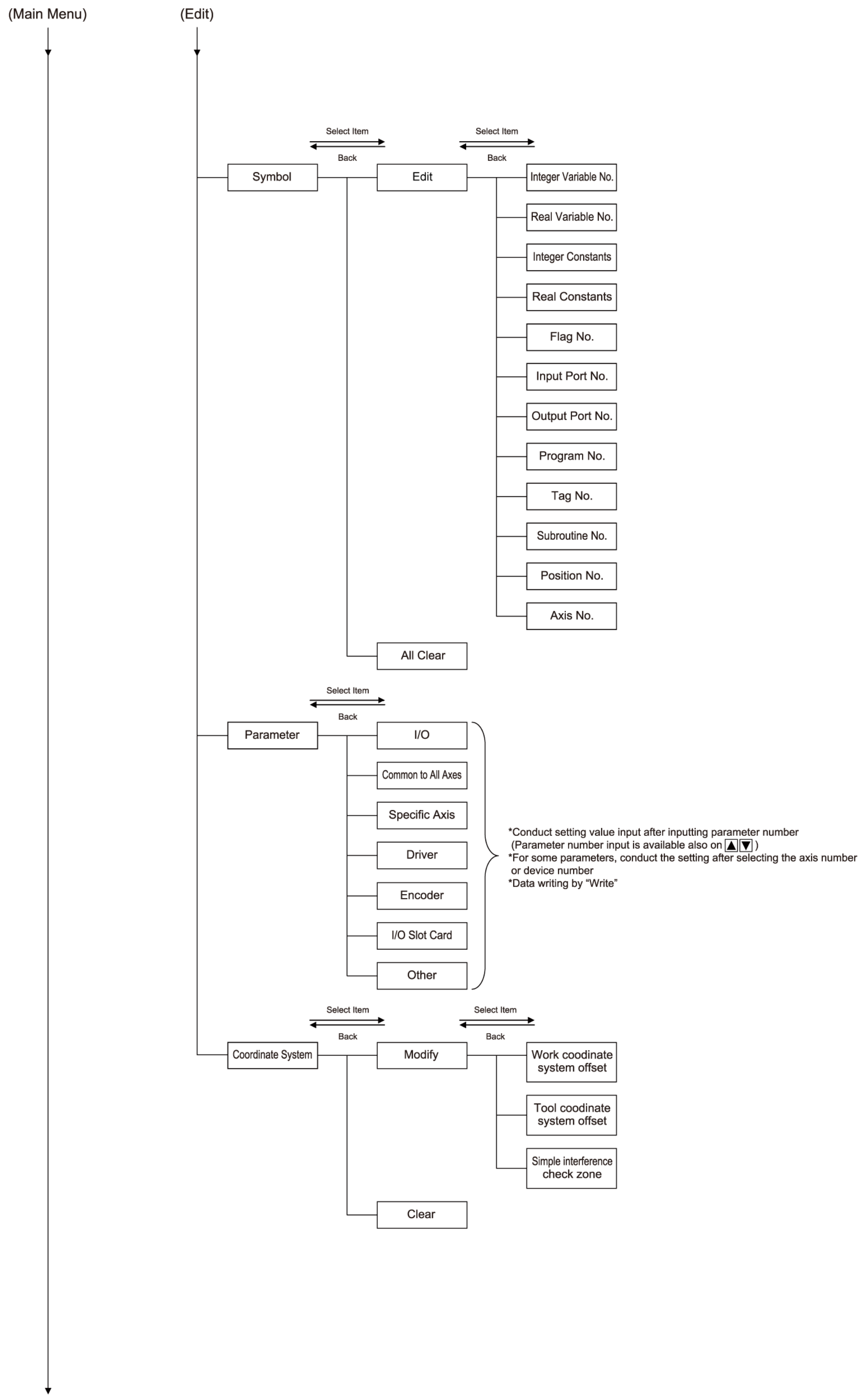
*For applicable models only

*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"

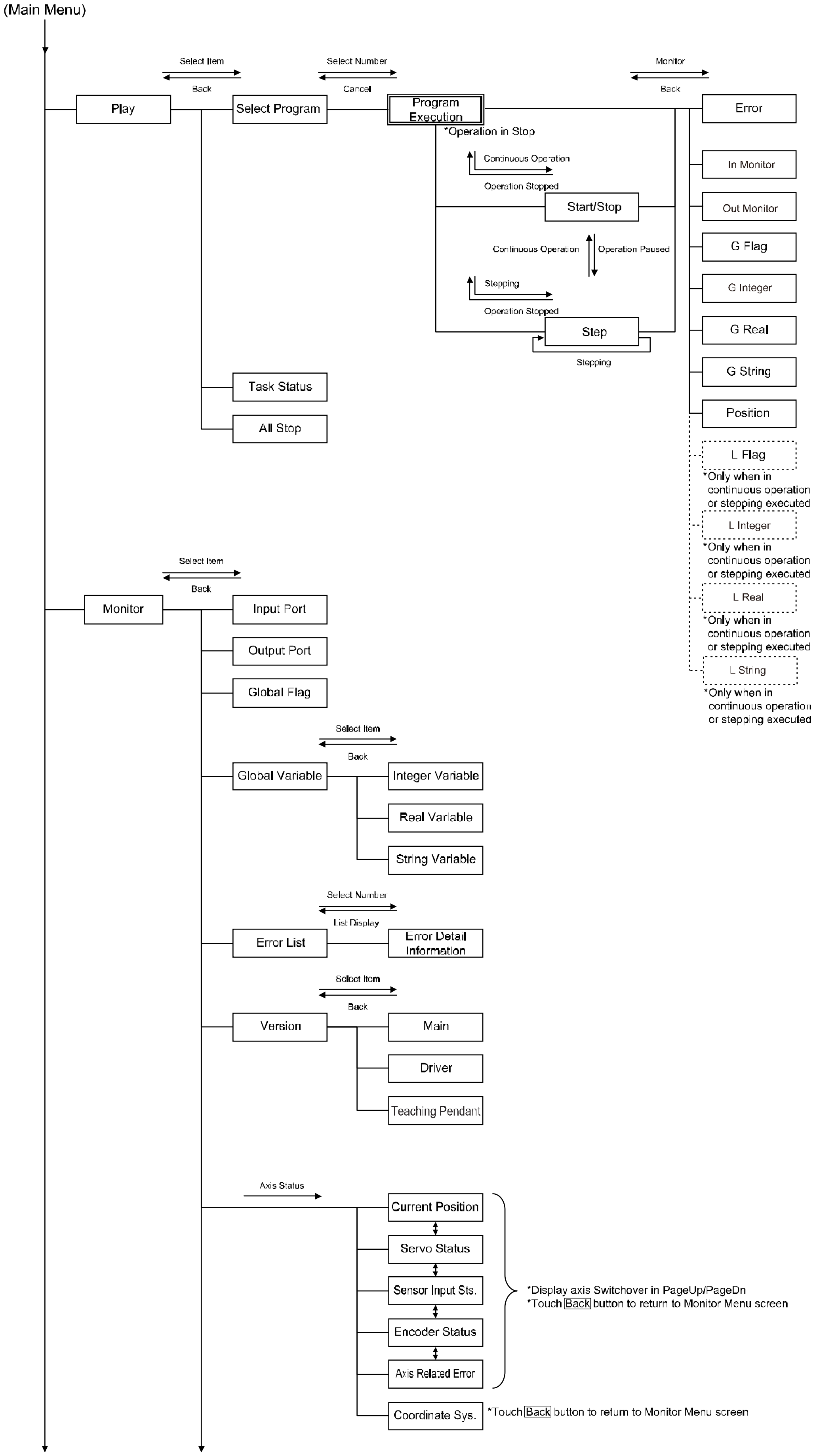

(Main Menu)
Select Item
Back
ExMotion
*For applicable models only
Edit
Teach
Teach
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by “Write”
Clear
Jog Velcity
Cont.
Scan
Clear
Monitor
Monitor
Environment Set
Time
Display
Contrast/ Brightness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

5.2 XSEL-KX Controller


Power ON
Communications Established
Main Menu
Select Item
Back
Edit
Select Item
Back
Position
Select Item
Back
Manual input
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"
Edit
When escaping the mode with "Back"-,
check whether to write to Flash Rom
Write to Flash ROM
"Yes" or "No"
Copy/Move
Clear
Teach (Scara)
*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
Clear
Arm
Jump
Jog Crd sys
Crd. Sys
Switch Axis
*This button is ineffective
Cont.
Intput Monitor
Output Monitor
User Output
Jog Velocity
Move Velocity
Scan
Cur Pos./ Input Screen
Select Item
Back
Program
Modify
山路を登りながら
Select Number
Cancel
Program Editor
* Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"
Edit
Copy/Move
Clear
Play



*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"



*Operation in Stop

*Only when in continuous operation or stepping executed

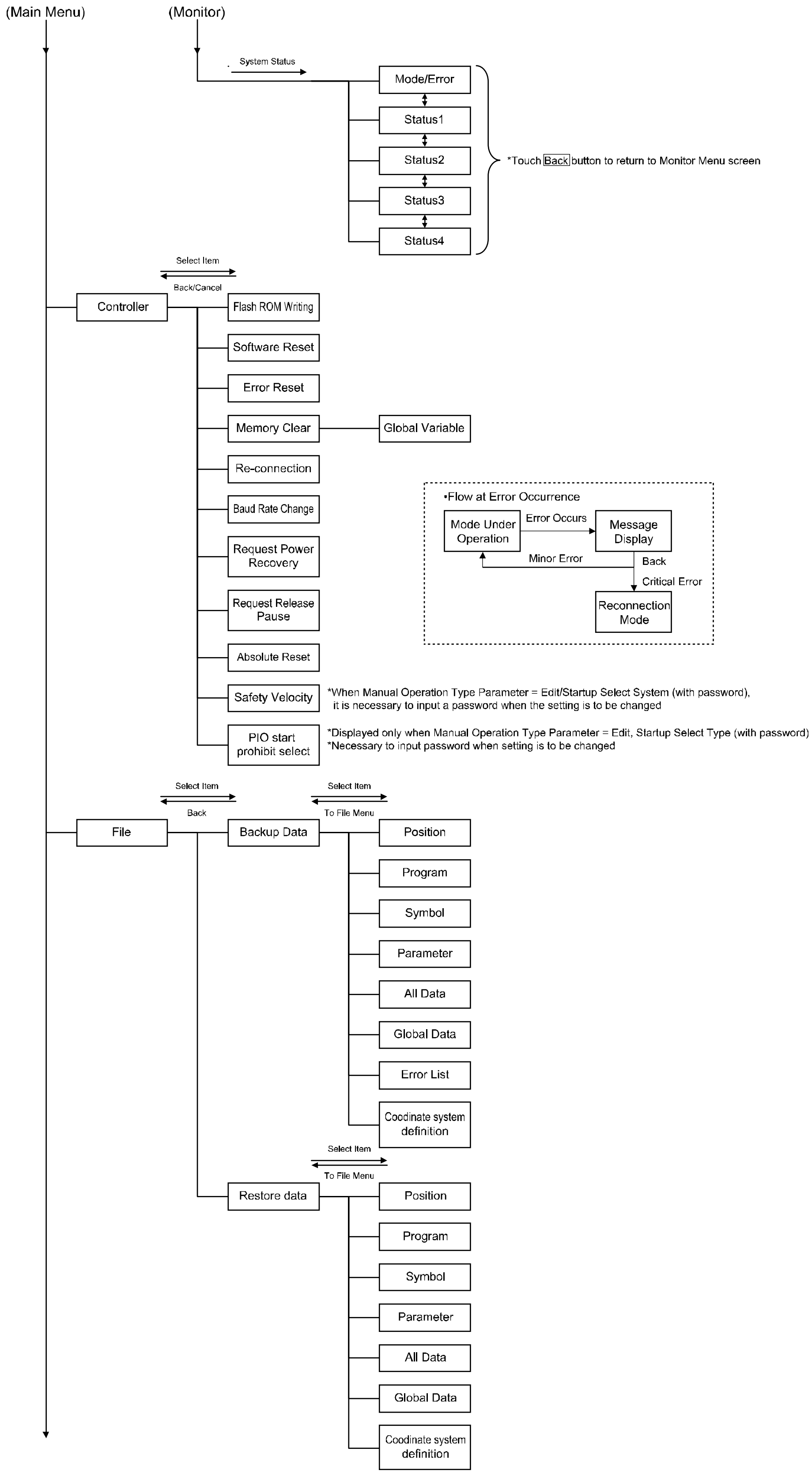
*Only when in continuous operation or stepping executed

*Only when in continuous operation or stepping executed

*Only when in continuous operation or stepping executed

*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen

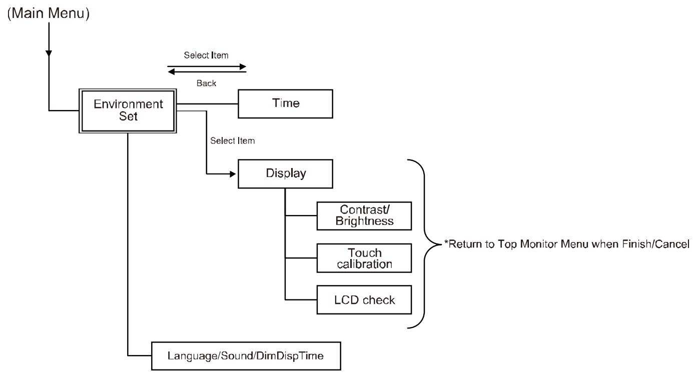
*Touch Back button to return to Monitor Menu screen



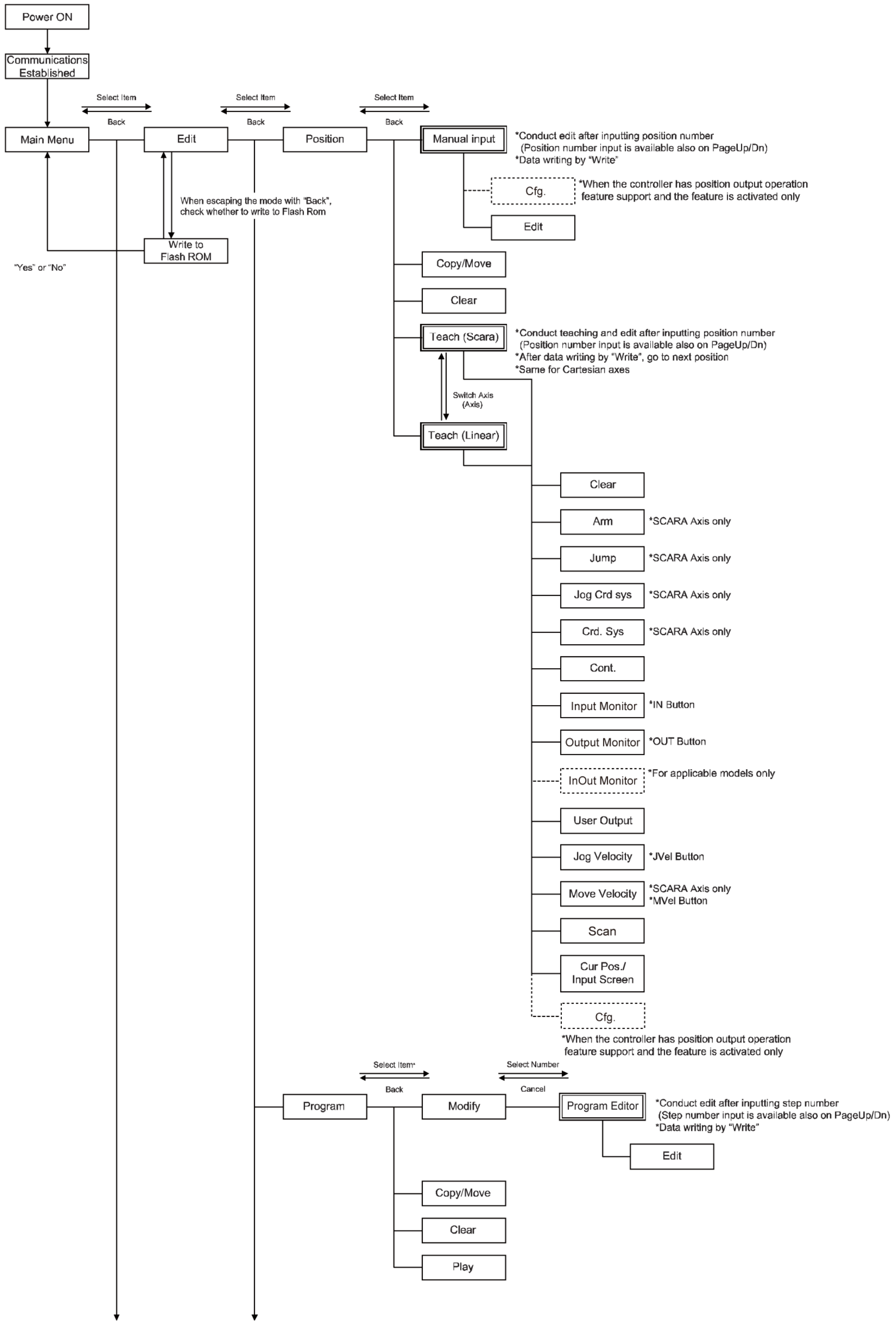
*Touch Back button to return to Monitor Menu screen

*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

*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed


(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



When escaping the mode with "Back", check whether to write to Flash Rom

*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"

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

*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
*Same for Cartesian axes

*SCARA Axis only

*SCARA Axis only

*SCARA Axis only

*SCARA Axis only

*IN Button

*OUT Button

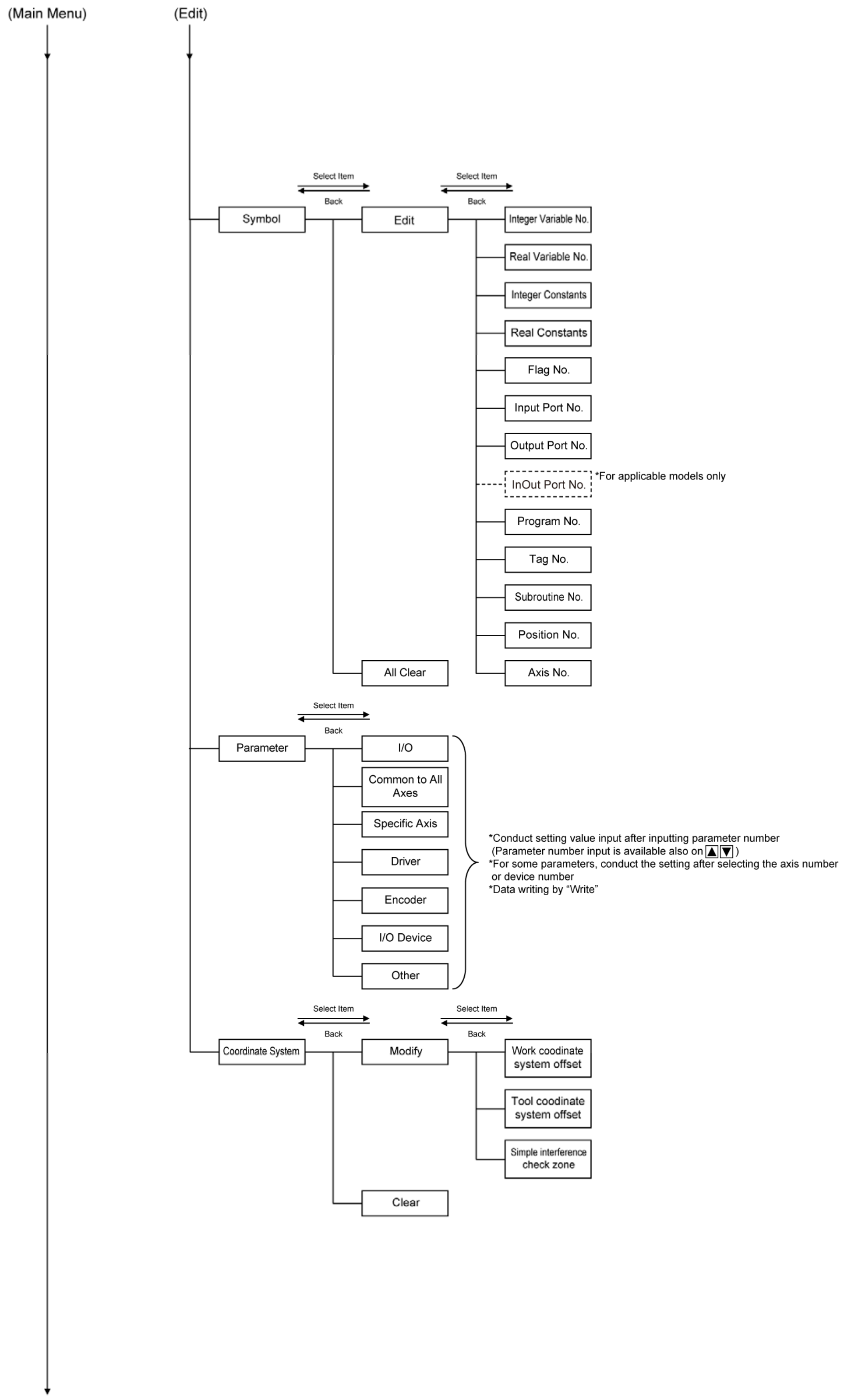
*For applicable models only

*JVel Button

*SCARA Axis only
*MVel Button

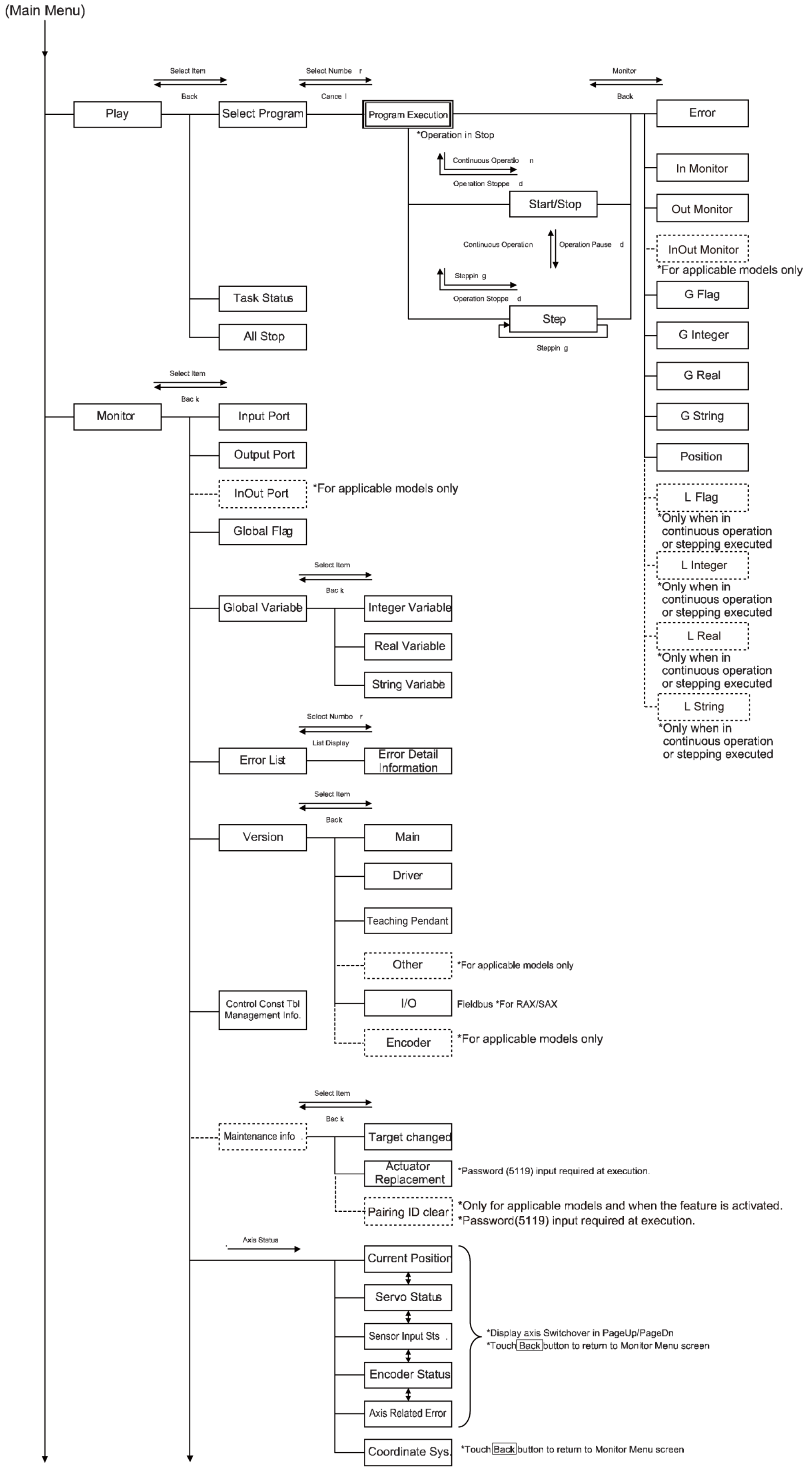
*When the controller has position output operation feature support and the feature is activated only

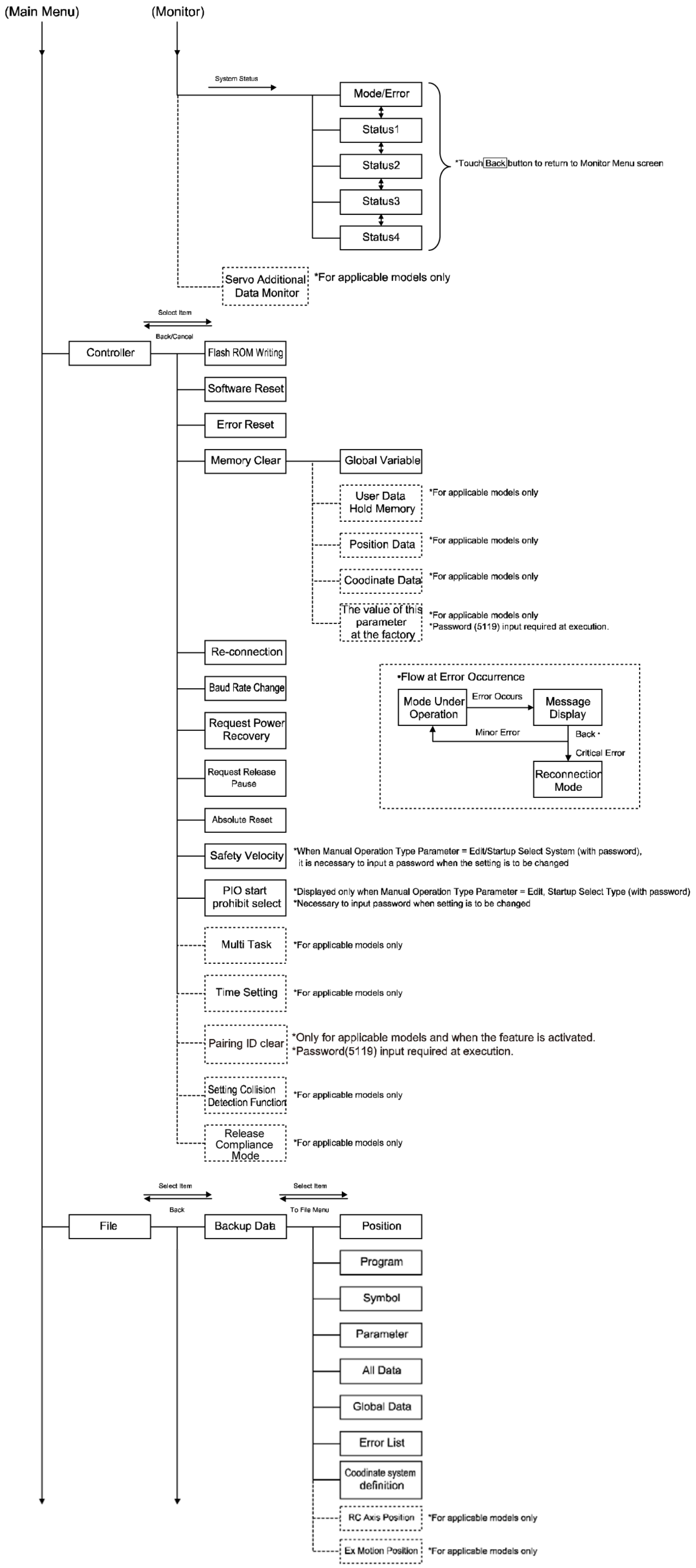
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"



*For applicable models only

*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”


(Main Menu)
Select Item
Back
Select Number
Cancel
Monitor
Back
Play
Select Program
Program Execution
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stopping
Operation Stopped
Step
Stepping
Task Status
All Stop
Error
In Monitor
Out Monitor
InOut Monitor
*For applicable models only
G Flag
G Integer
G Real
G String
Position
L Flag
*Only when in continuous operation or stepping executed
L Integer
*Only when in continuous operation or stepping executed
L Real
*Only when in continuous operation or stepping executed
L String
*Only when in continuous operation or stepping executed
Select Item
Back
Monitor
Input Port
Output Port
InOut Port
*For applicable models only
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
Other
*For applicable models only
Control Const Tbl Management Info.
I/O
Fieldbus *For RAX/SAX
Encoder
*For applicable models only
Select Item
Back
Maintenance info
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.
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



*Touch Back button to return to Monitor Menu screen

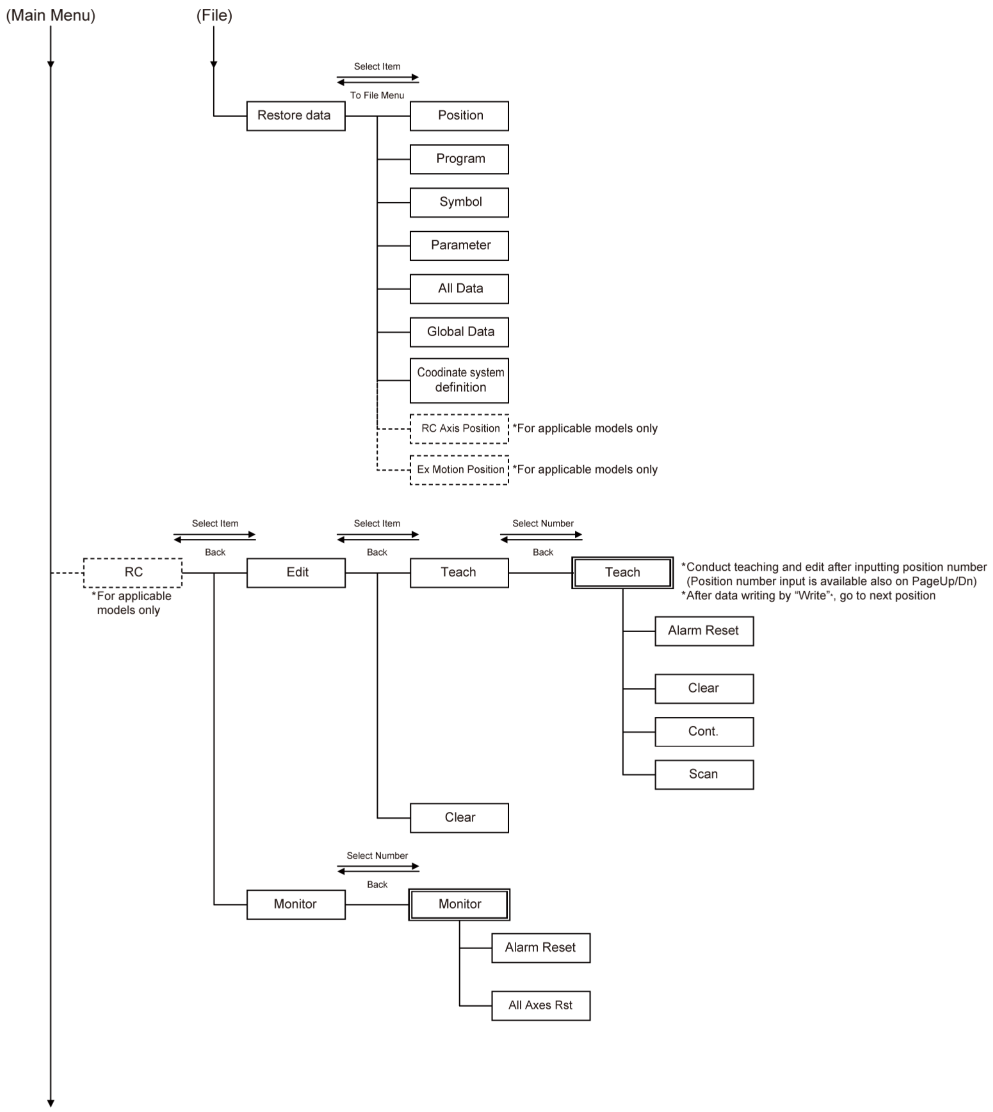
*For applicable models only

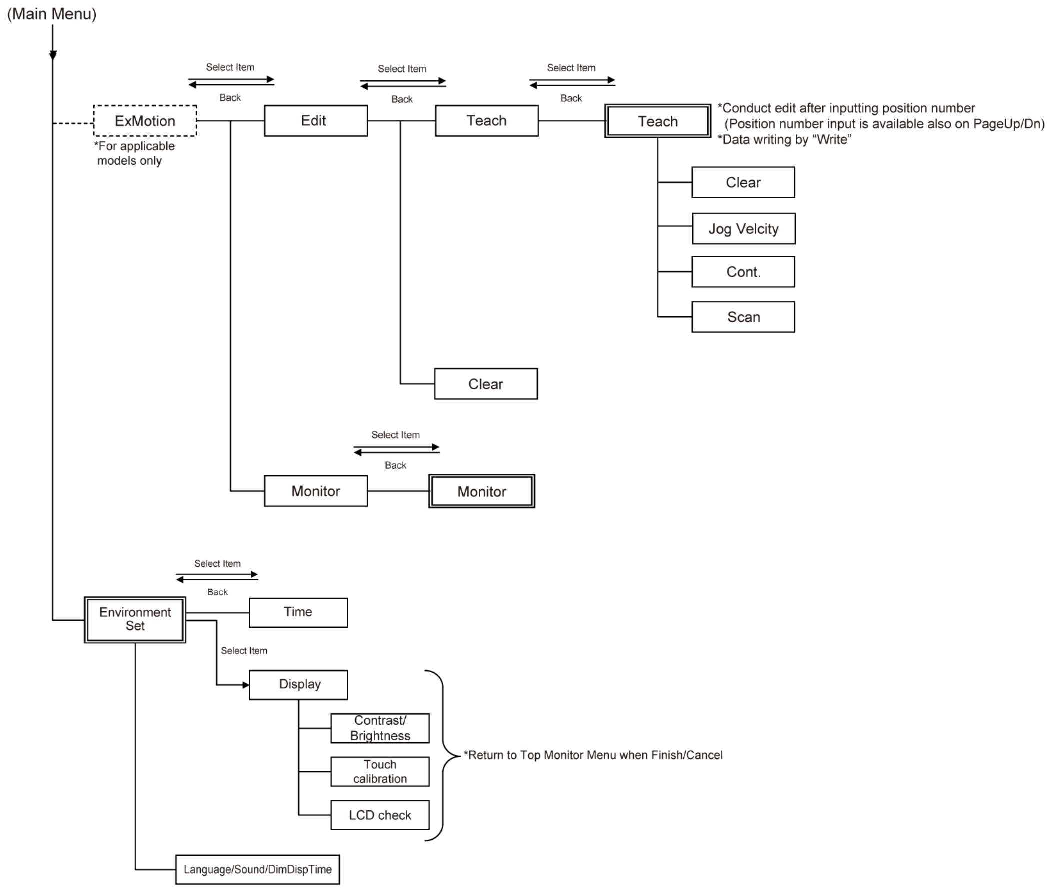
*Password (5119) input required at execution.

*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

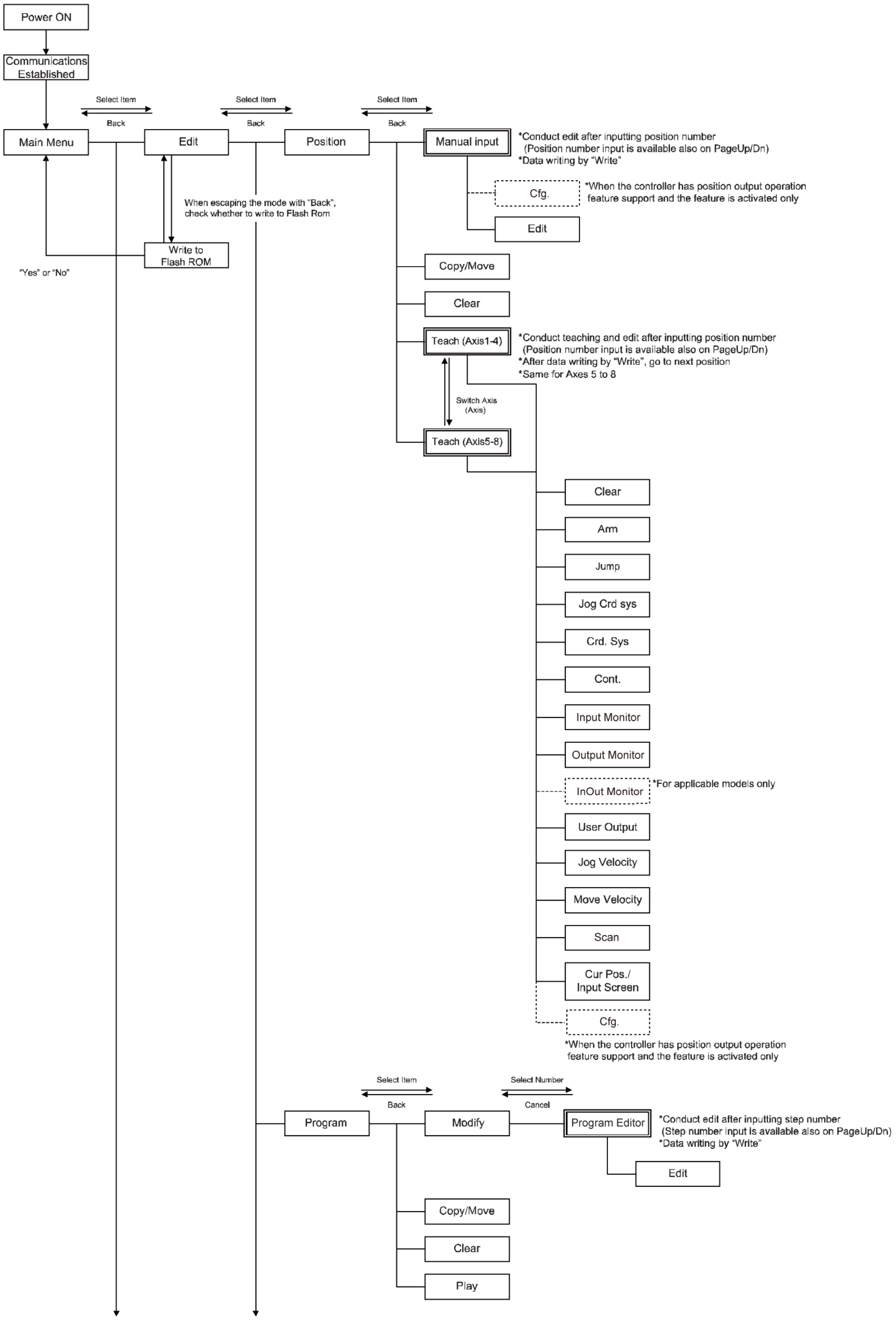
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed

*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.


(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)
ExMotion
*For applicable models only
Select Item
Back
Edit
Select Item
Back
Teach
Select Item
Back
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
Select Item
Back
Monitor
Monitor
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

5.4 XSEL-RXD/SXD/RAXD/SAXD Controller



*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"

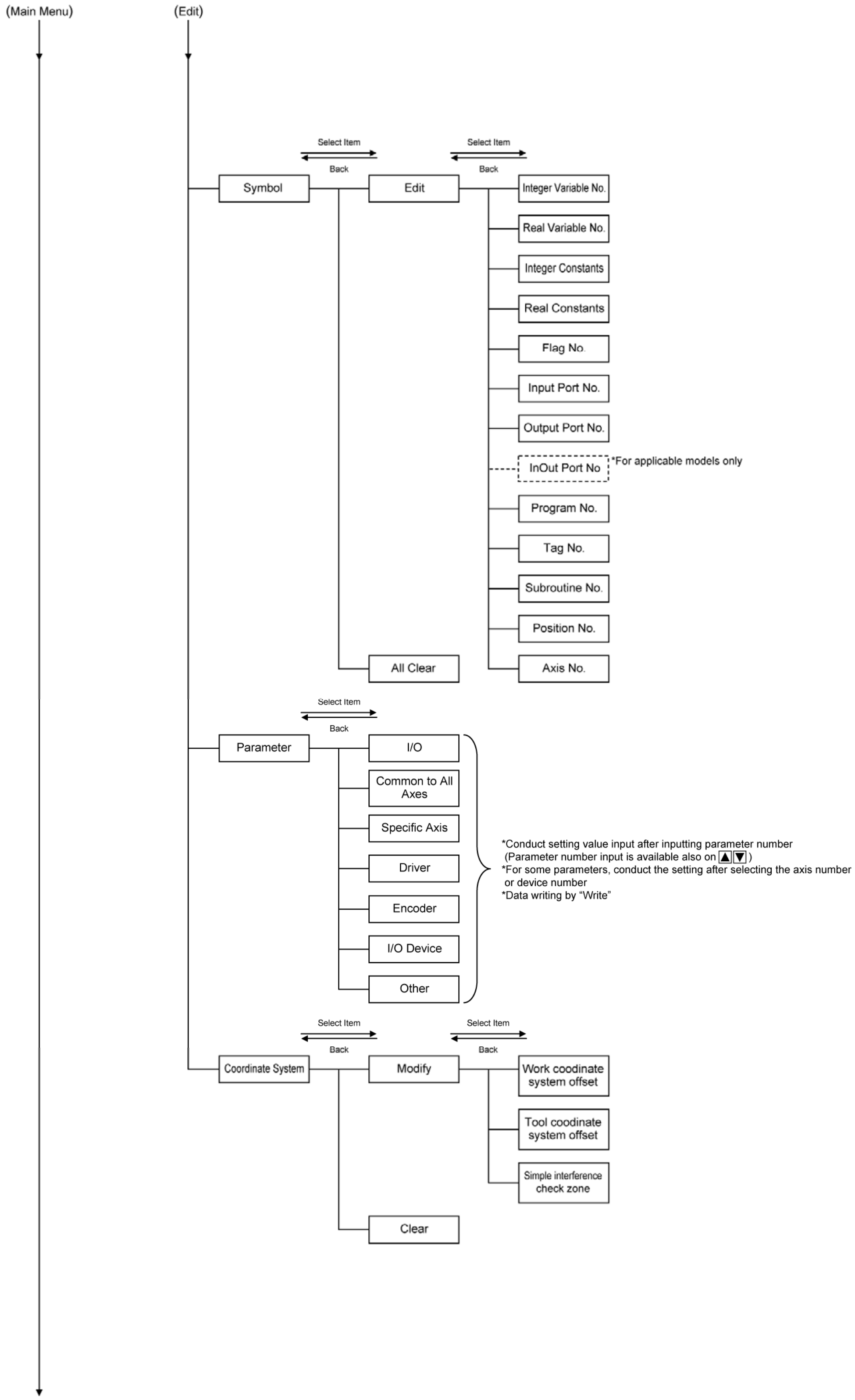
*When the controller has position output operation feature support and the feature is activated only

*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
*Same for Axes 5 to 8

*For applicable models only

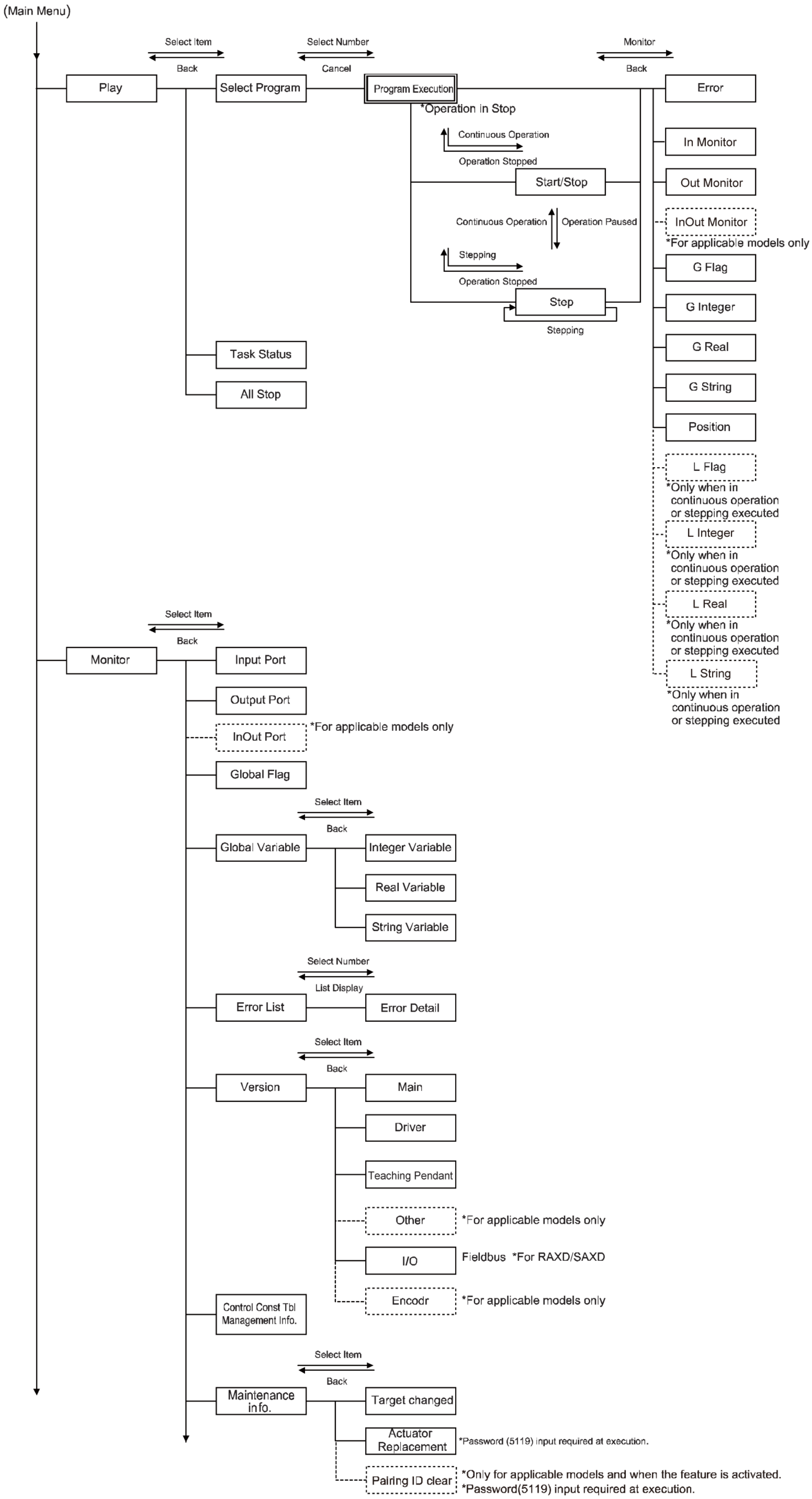
*When the controller has position output operation feature support and the feature is activated only

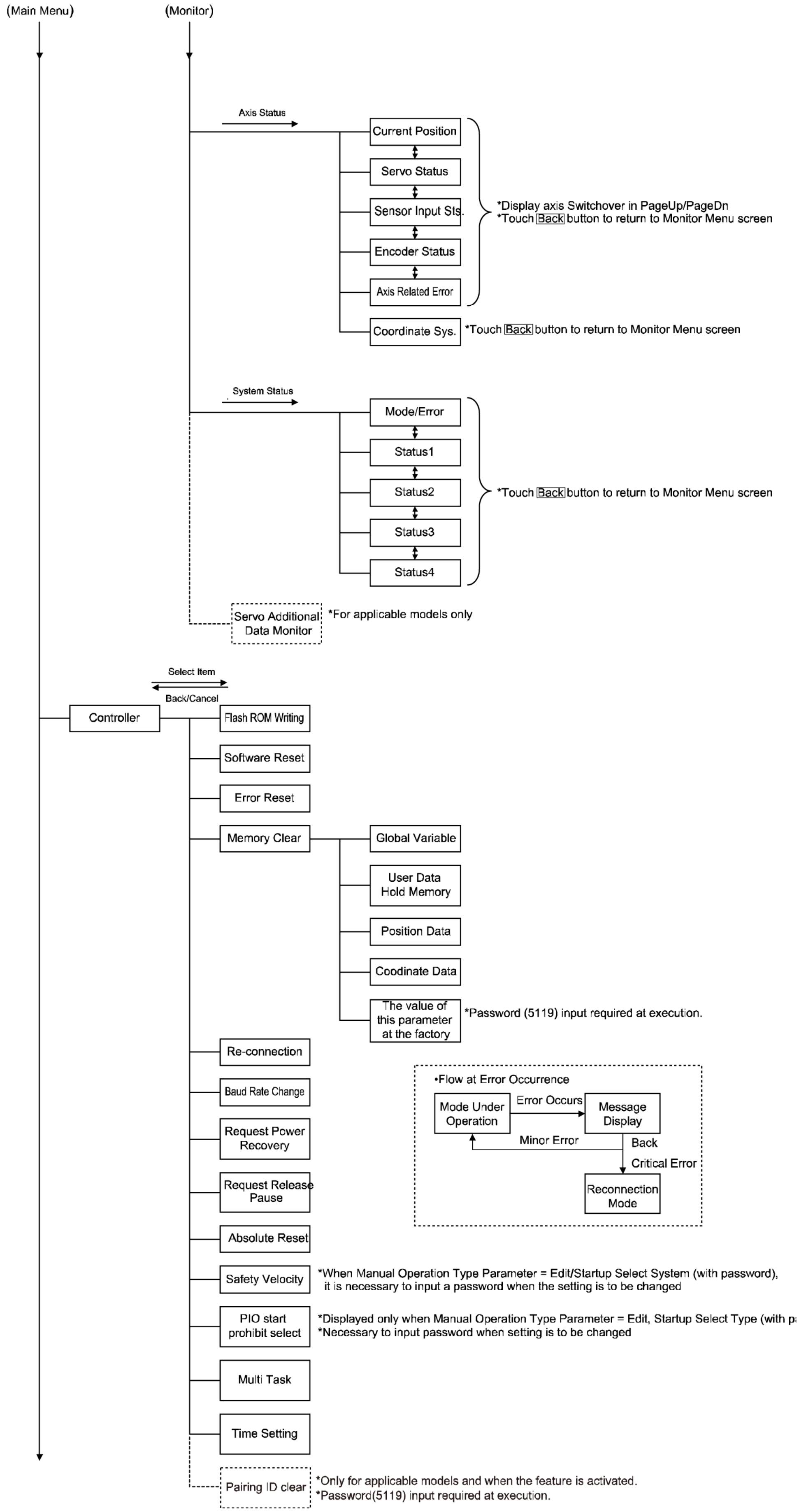
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"



*For applicable models only

*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”


(Main Menu)
Select Item
Back
Select Number
Cancel
Monitor
Back
Play
Select Program
Program Execution
Error
*Operation in Stop
Continuous Operation
Operation Stopped
In Monitor
Start/Stop
Out Monitor
Continuous Operation
Operation Paused
InOut Monitor
*For applicable models only
Stepping
Operation Stopped
G Flag
Stop
G Integer
Stepping
Task Status
G Real
All Stop
G String
Position
L Flag
*Only when in continuous operation or stepping executed
L Integer
*Only when in continuous operation or stepping executed
L Real
*Only when in continuous operation or stepping executed
L String
*Only when in continuous operation or stepping executed
Select Item
Back
Monitor
Input Port
Output Port
InOut Port
*For applicable models only
Global Flag
Select Item
Back
Global Variable
Integer Variable
Real Variable
String Variable
Select Number
List Display
Error List
Error Detail
Select Item
Back
Version
Main
Driver
Teaching Pendant
Other
*For applicable models only
I/O
Fieldbus *For RAXD/SAXD
Encodr
*For applicable models only
Control Const Tbl Management Info.
Select Item
Back
Maintenance info.
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.



*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen

*Touch Back button to return to Monitor Menu screen

*Touch Back button to return to Monitor Menu screen

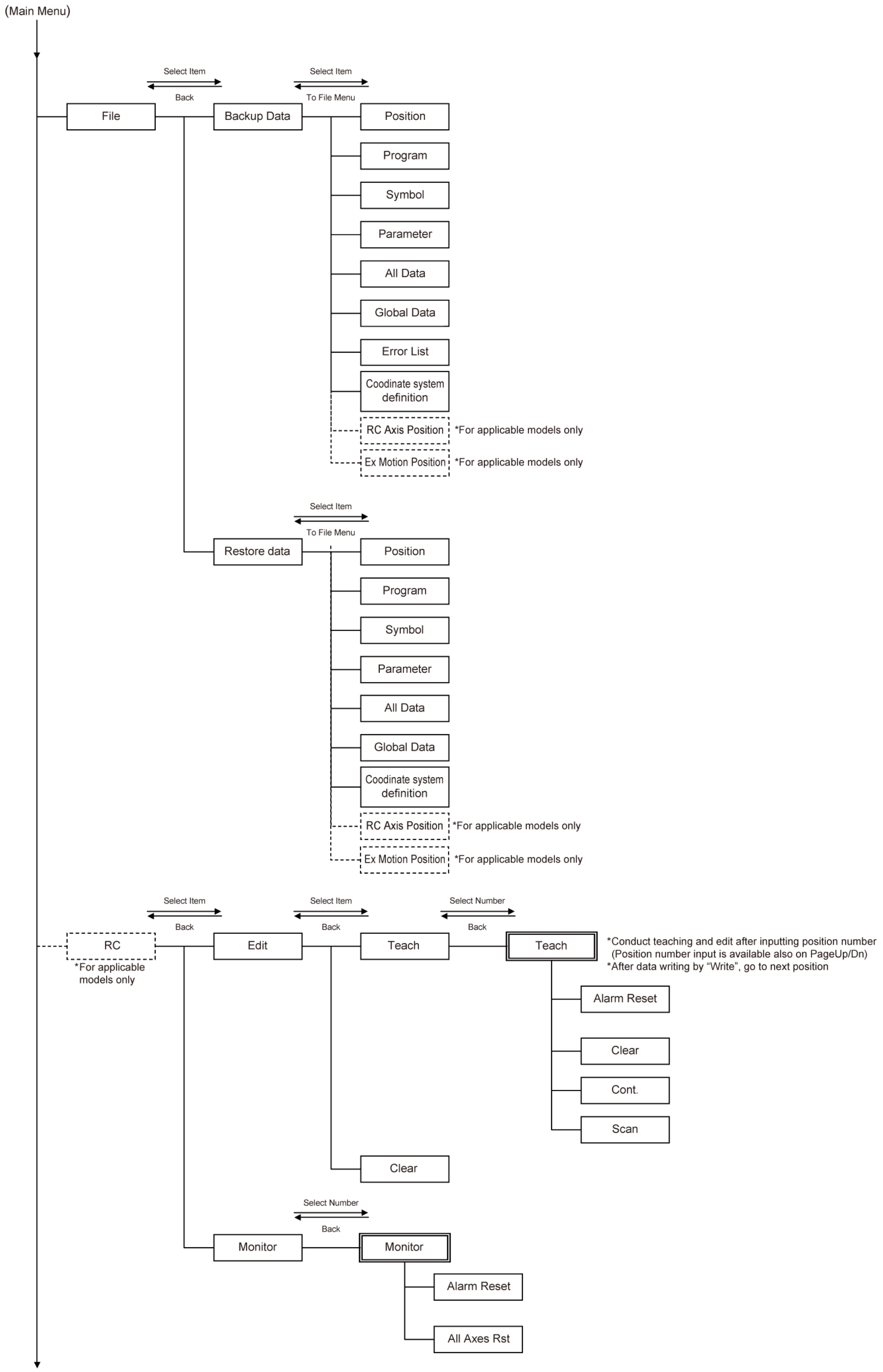
*For applicable models only

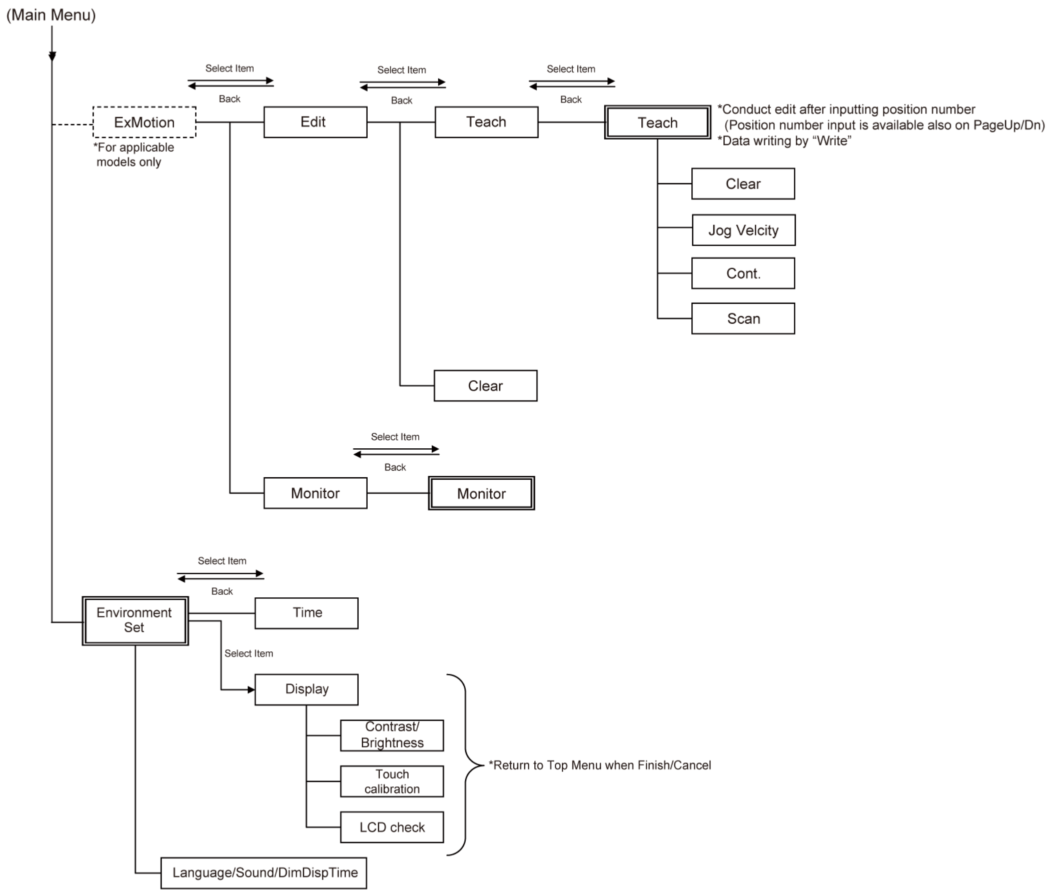
*Password (5119) input required at execution.

*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

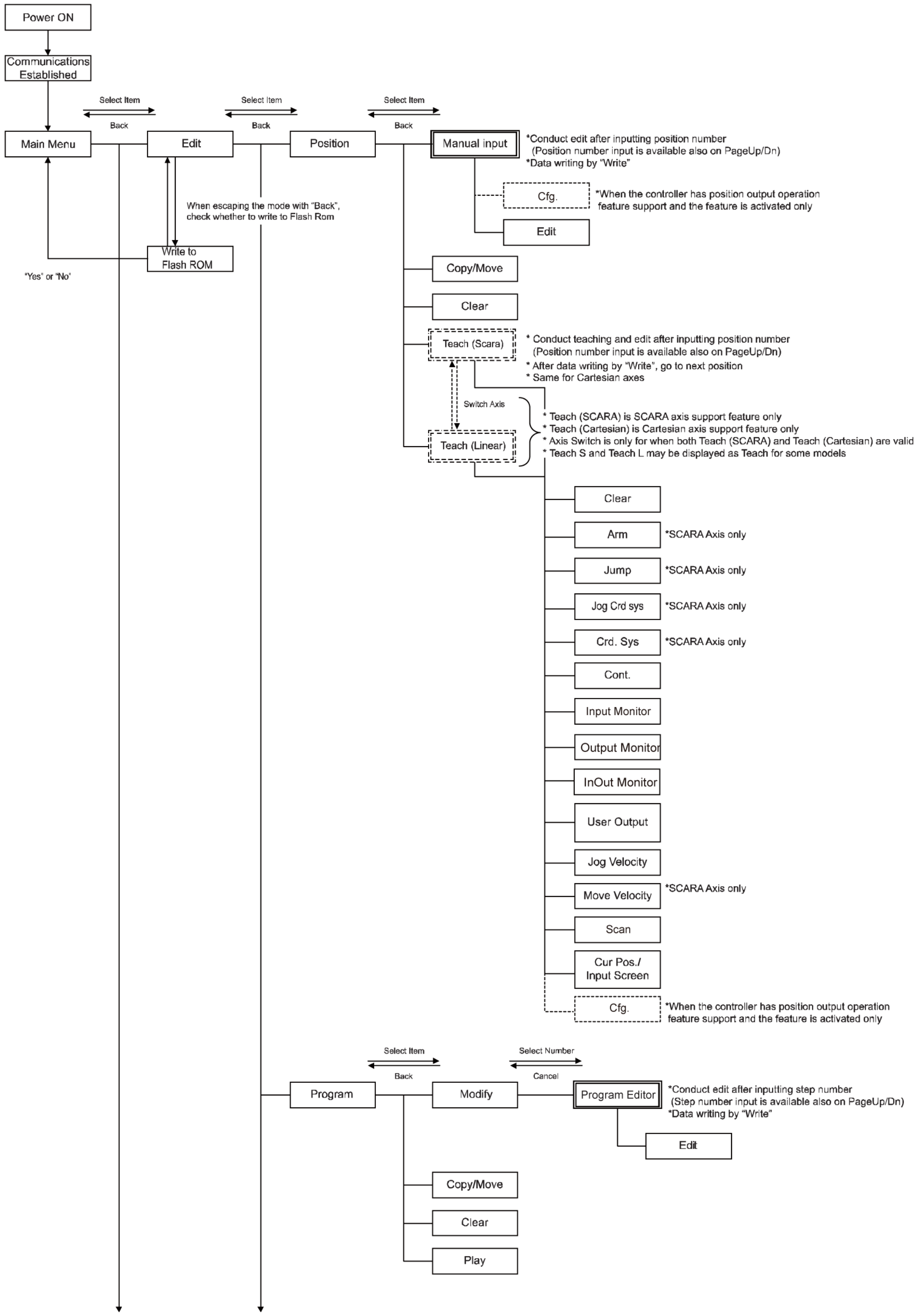
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with p
*Necessary to input password when setting is to be changed

*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.


(Main Menu)
Select Item
Back
File
Select Item
To File Menu
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
RC
*For applicable models only
Edit
Select Item
Back
Teach
Select Number
Back
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
Monitor
Select Number
Back
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



When escaping the mode with "Back", check whether to write to Flash Rom

*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"

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

* 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
* Same for Cartesian axes

* Teach (SCARA) is SCARA axis support feature only
* Teach (Cartesian) is Cartesian axis support feature only
* Axis Switch is only for when both Teach (SCARA) and Teach (Cartesian) are valid
* Teach S and Teach L may be displayed as Teach for some models

*SCARA Axis only

*SCARA Axis only

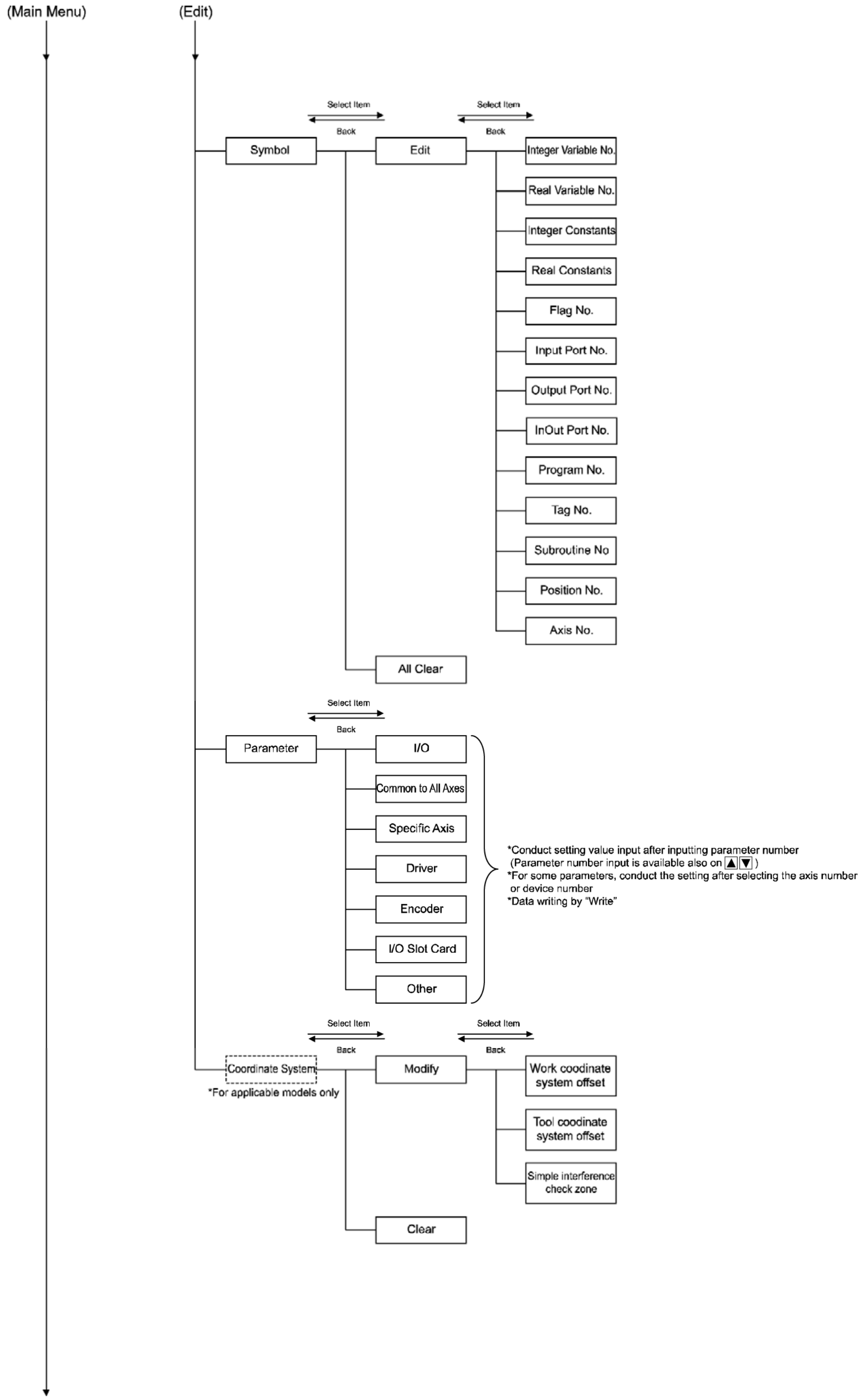
*SCARA Axis only

*SCARA Axis only

*SCARA Axis only

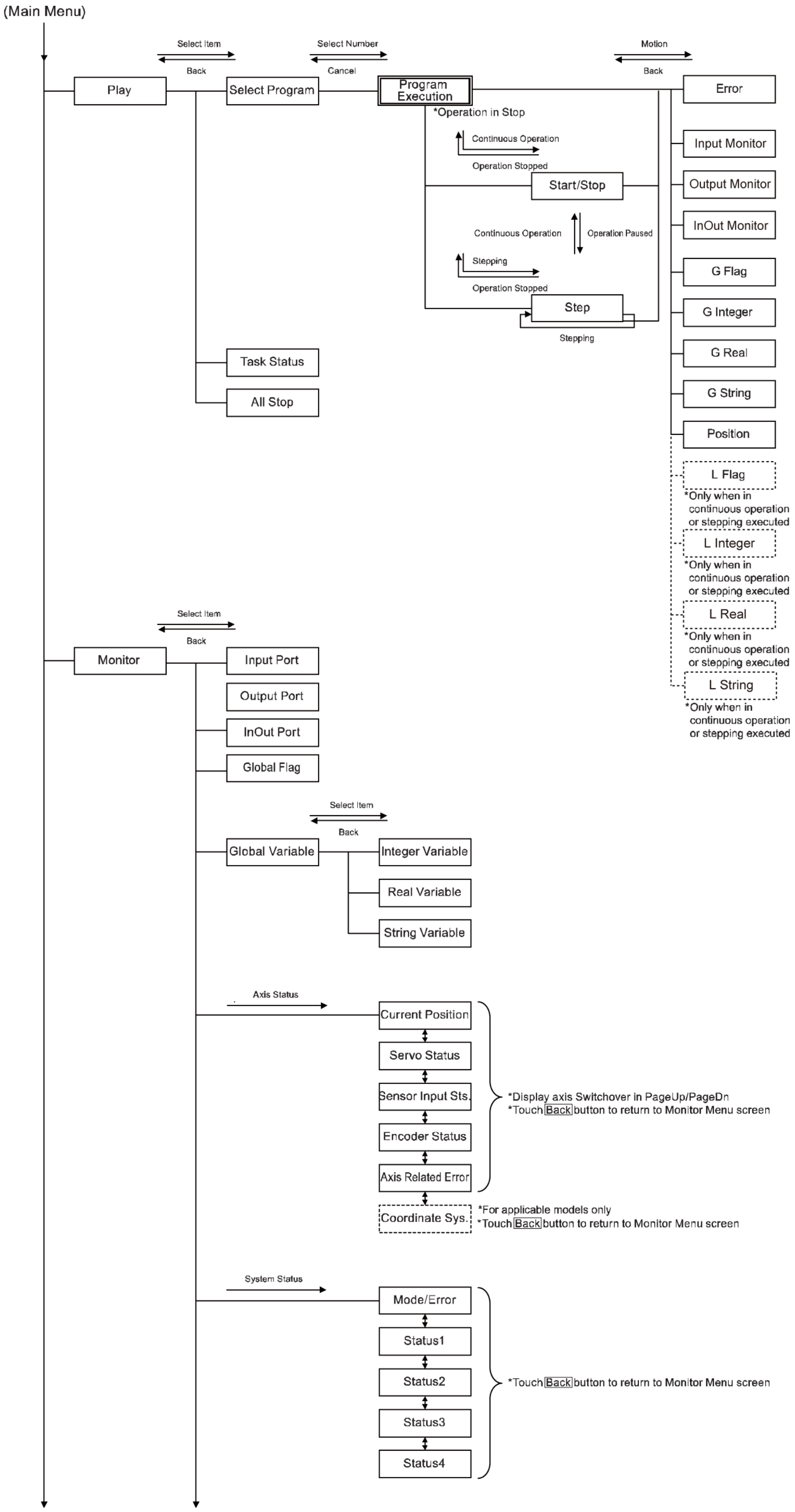
*When the controller has position output operation feature support and the feature is activated only

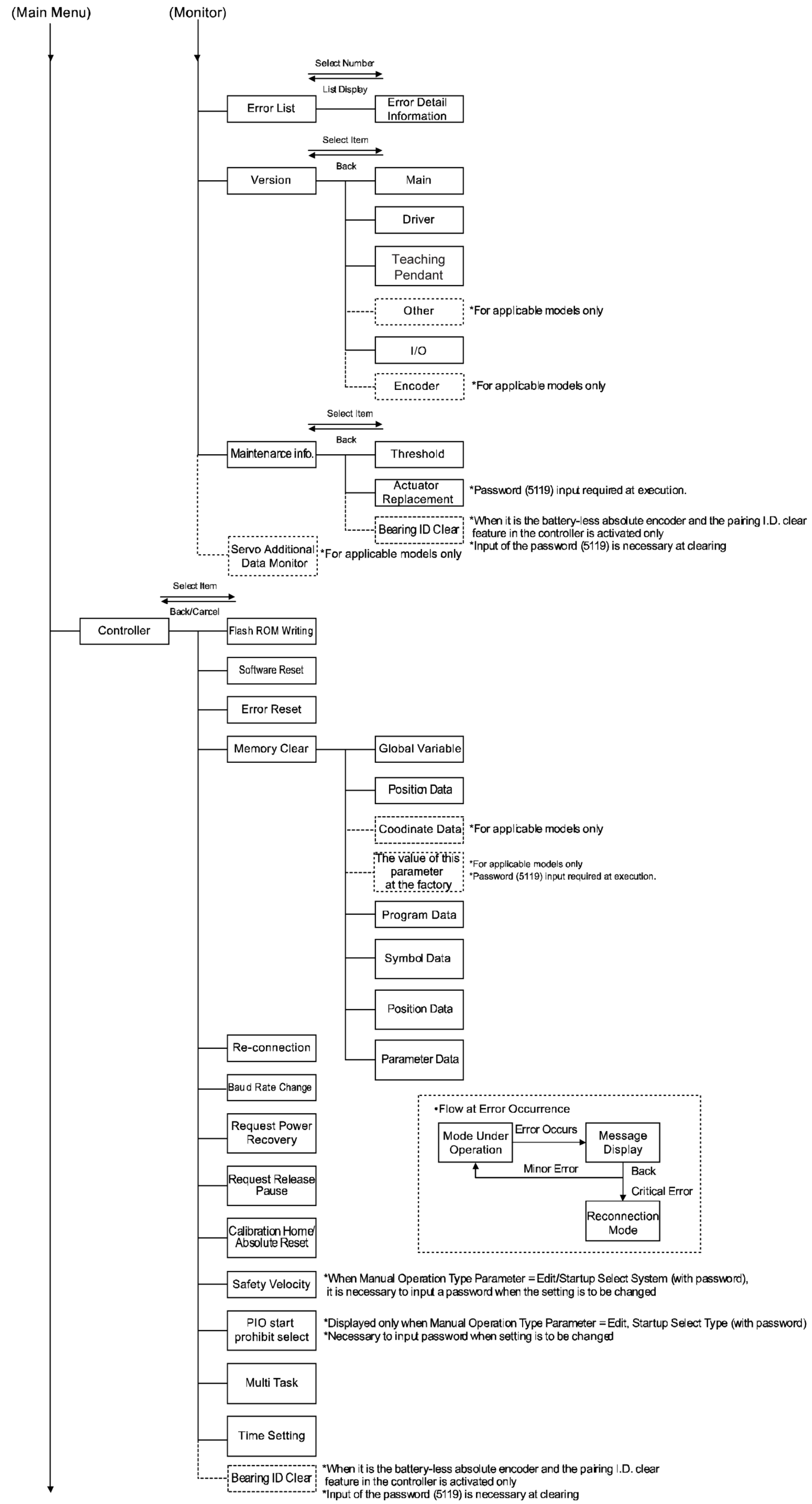
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"



*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"

*For applicable models only


(Main Menu)
Select Item
Back
Play
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
Motion
Back
Error
Input Monitor
Output Monitor
InOut Monitor
G Flag
G Integer
G Real
G String
Position
L Flag
*Only when in continuous operation or stepping executed
L Integer
*Only when in continuous operation or stepping executed
L Real
*Only when in continuous operation or stepping executed
L String
*Only when in continuous operation or stepping executed
Task Status
All Stop
Select Item
Back
Monitor
Input Port
Output Port
InOut Port
Global Flag
Global Variable
Select Item
Back
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



*For applicable models only

*For applicable models only

*Password (5119) input required at execution.

*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

*For applicable models only

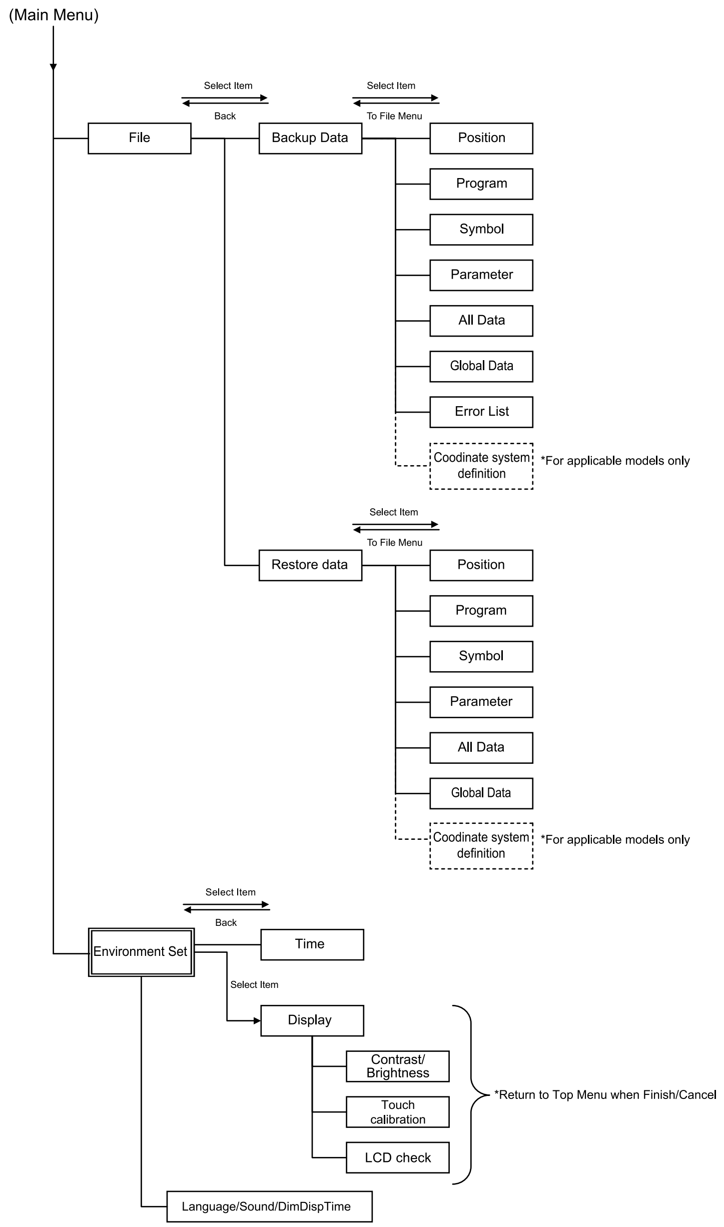
*For applicable models only

*For applicable models only
*Password (5119) input required at execution.

*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

*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed

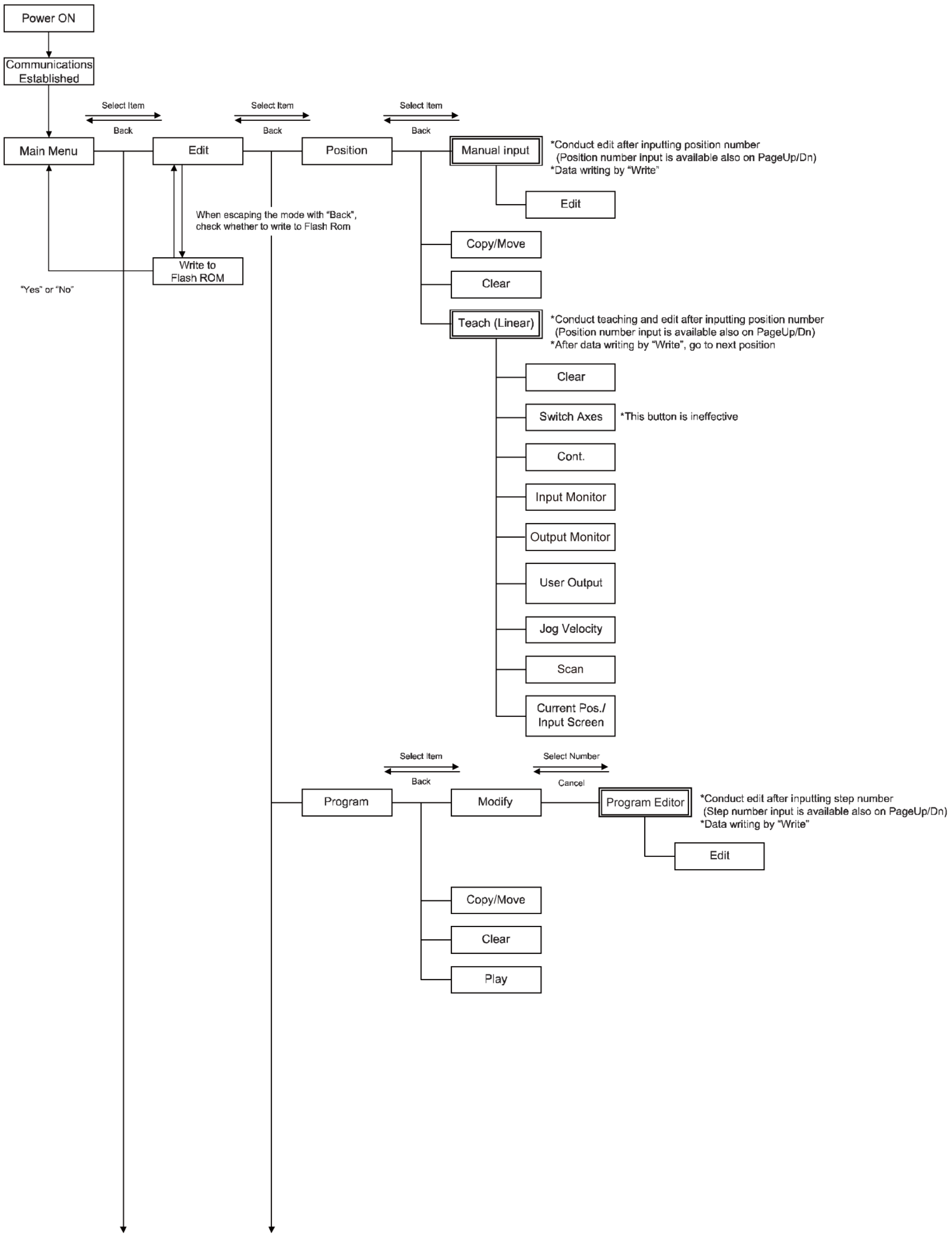
*When it is the battery-less absolute encoder and the pairing I.D. clear feature in the controller is activated only
*Input of the password (5119) is necessary at clearing


(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 or 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



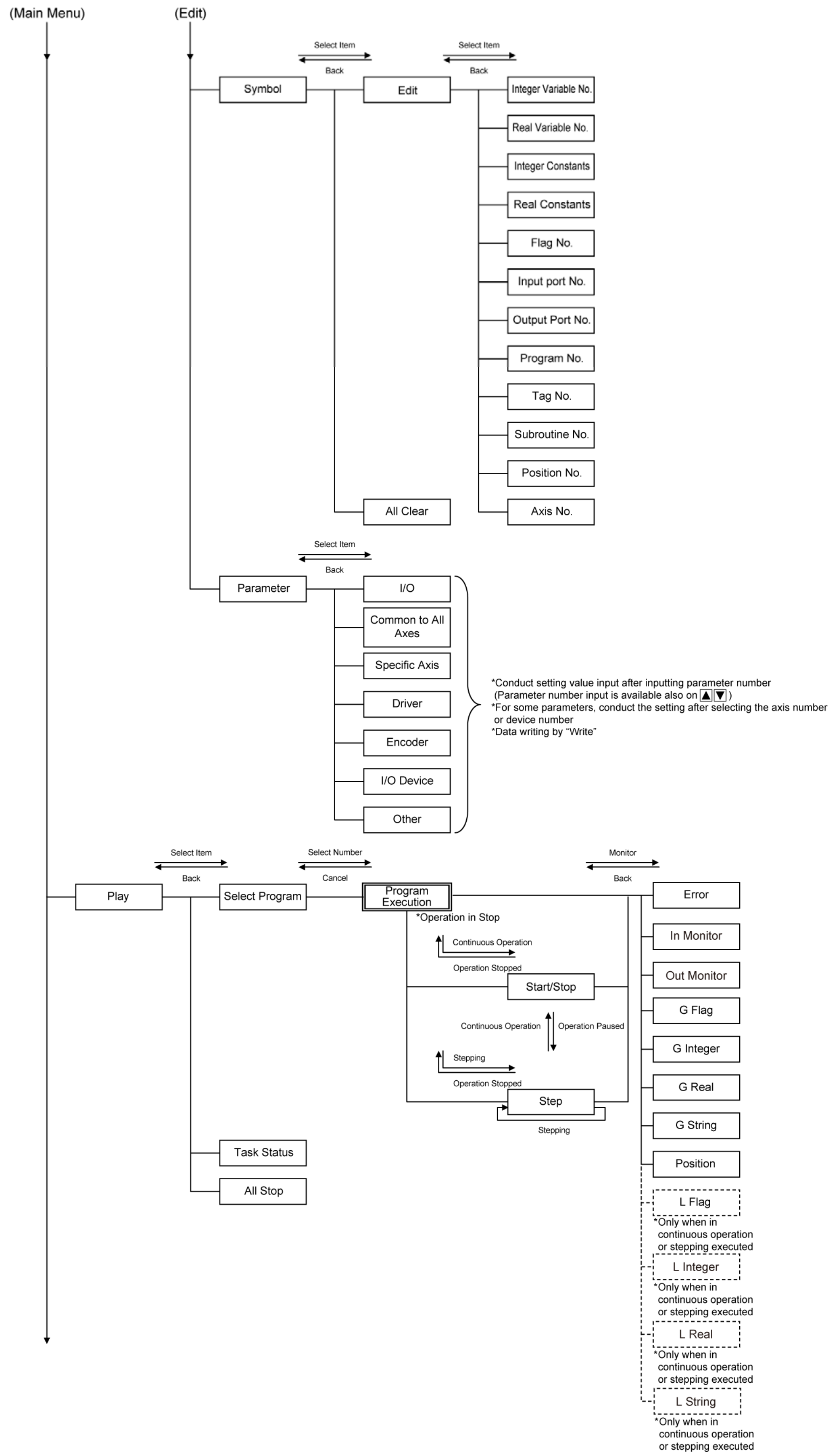
When escaping the mode with “Back”, check whether to write to Flash Rom

*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by “Write”

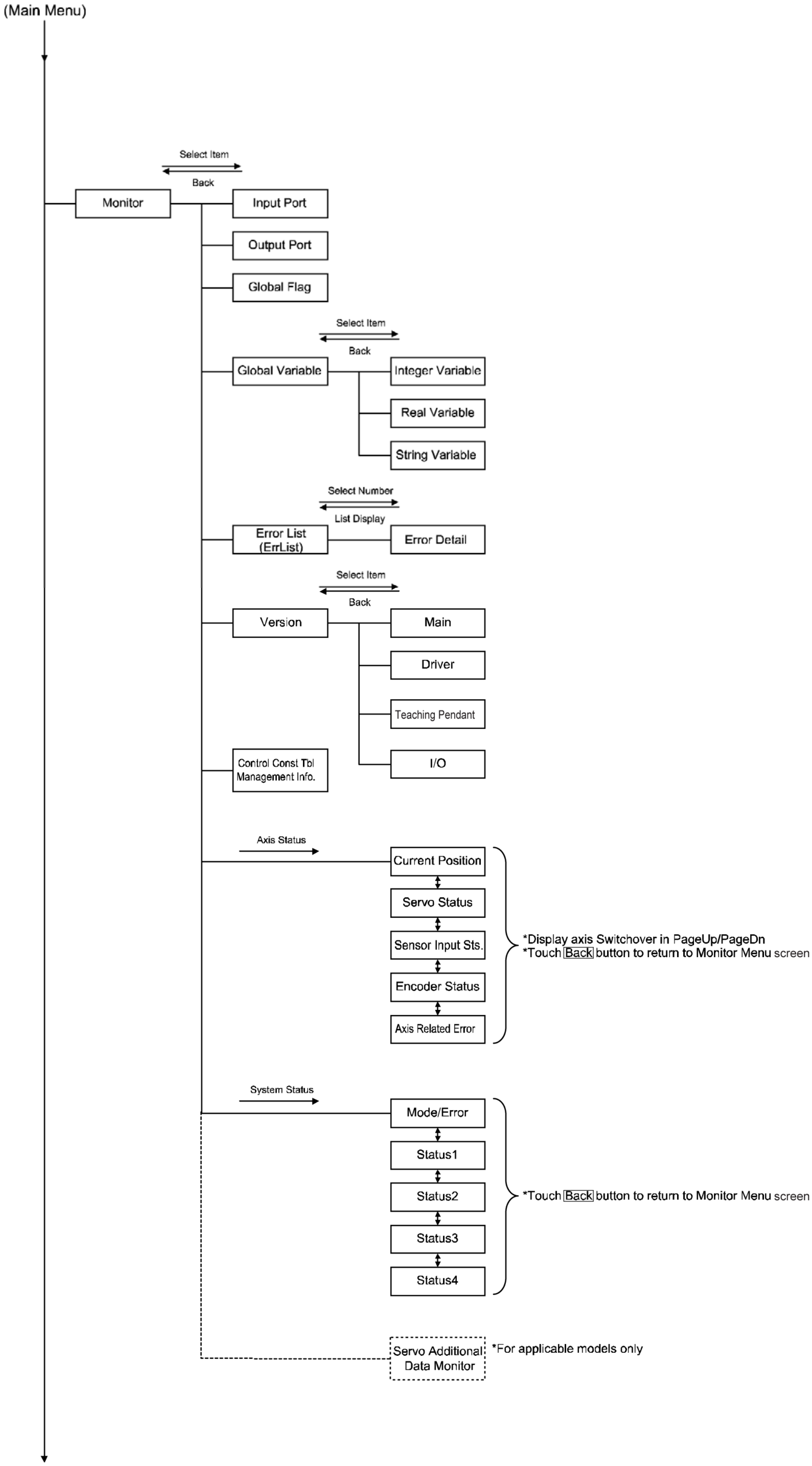
*Conduct teaching and edit after inputting position number
(Position number input is available also on PageUp/Dn)
*After data writing by “Write”, go to next position

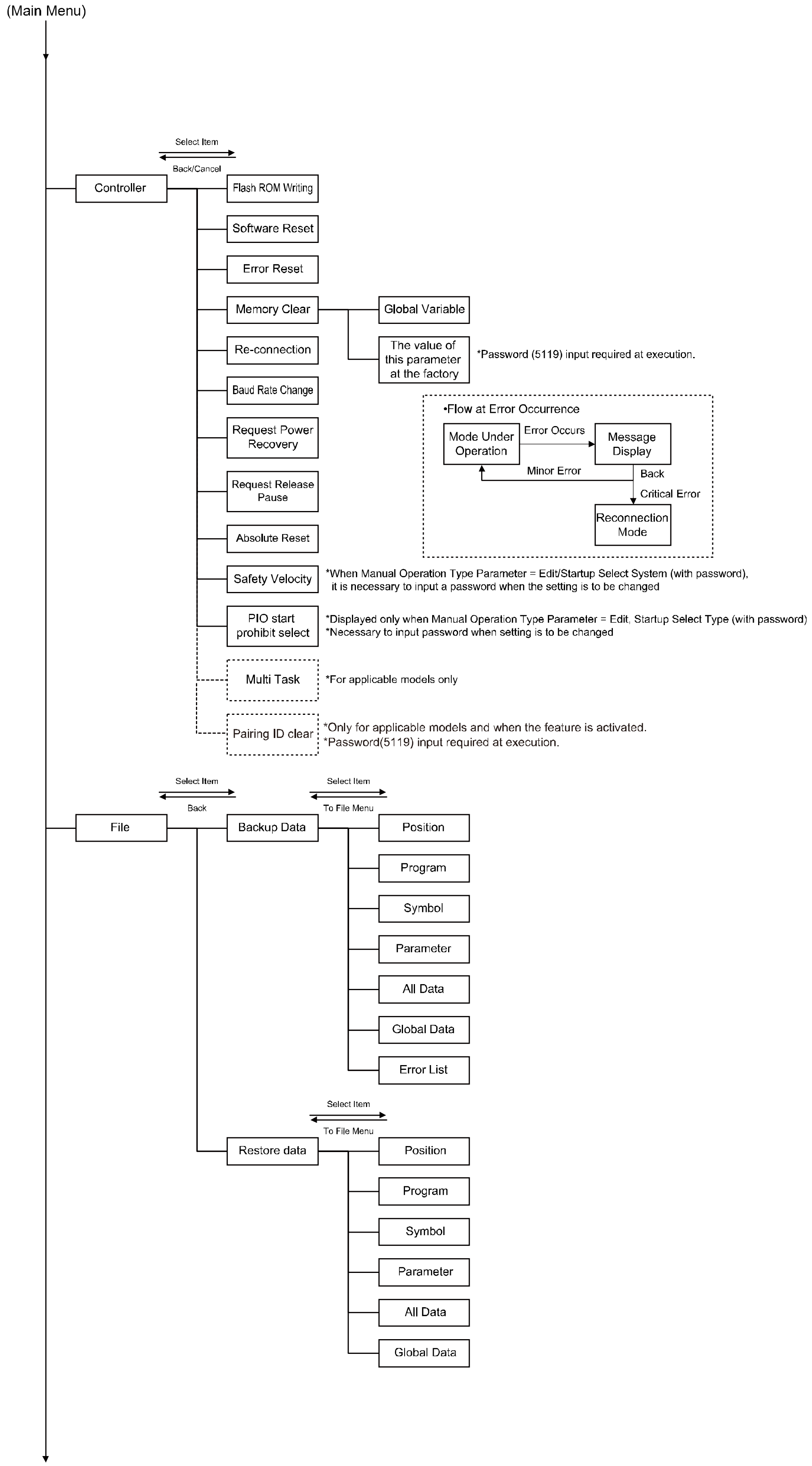
*This button is ineffective

*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by “Write”



*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"


(Main Menu)
Monitor
Select Item
Back
Input Port
Output Port
Global Flag
Global Variable
Select Item
Back
Integer Variable
Real Variable
String Variable
Error List (ErrList)
Select Number
List Display
Error Detail
Version
Select Item
Back
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



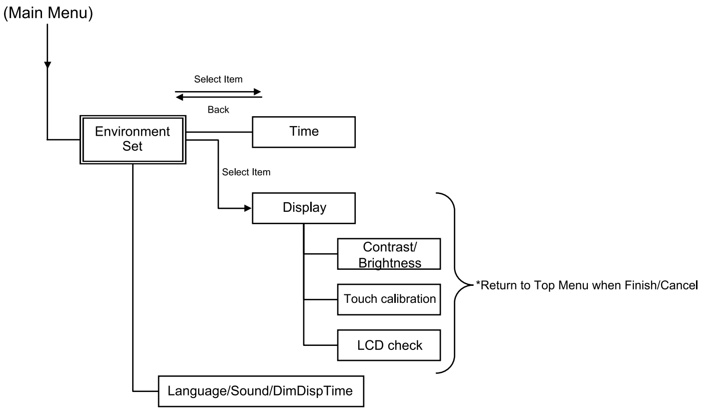
*Password (5119) input required at execution.

*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

*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed

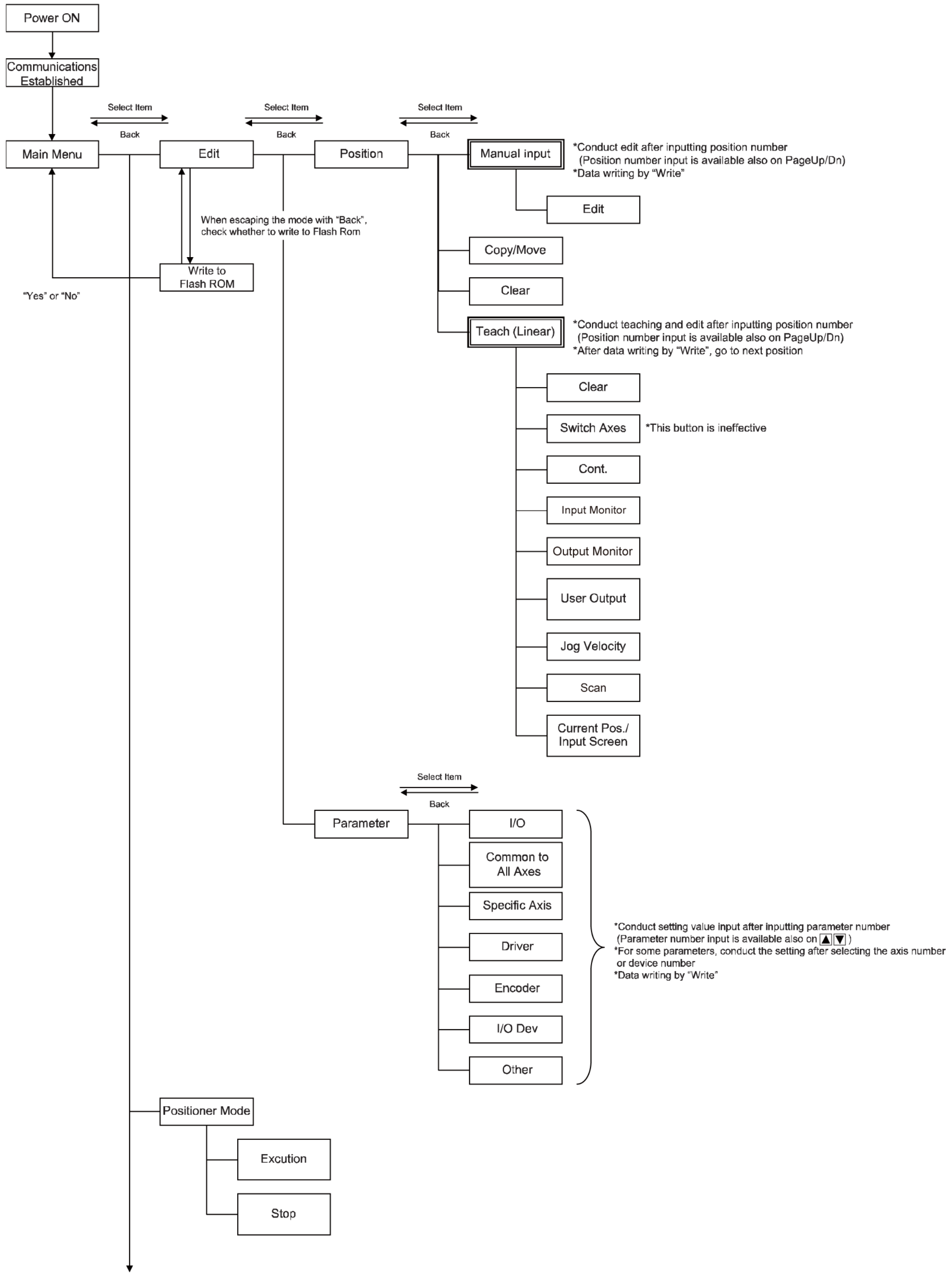
*For applicable models only

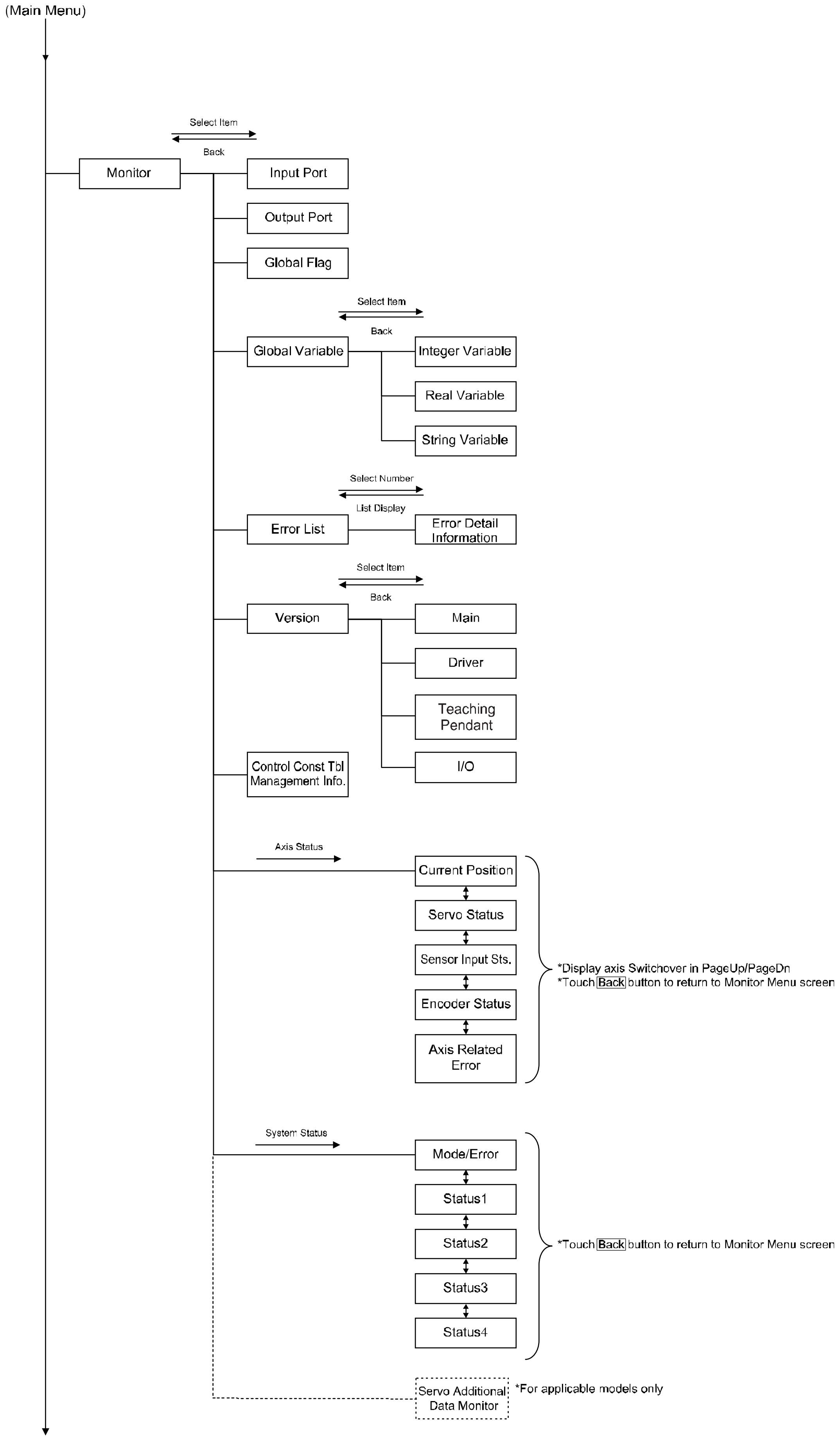
*Only for applicable models and when the feature is activated.
*Password(5119) input required at execution.


(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.

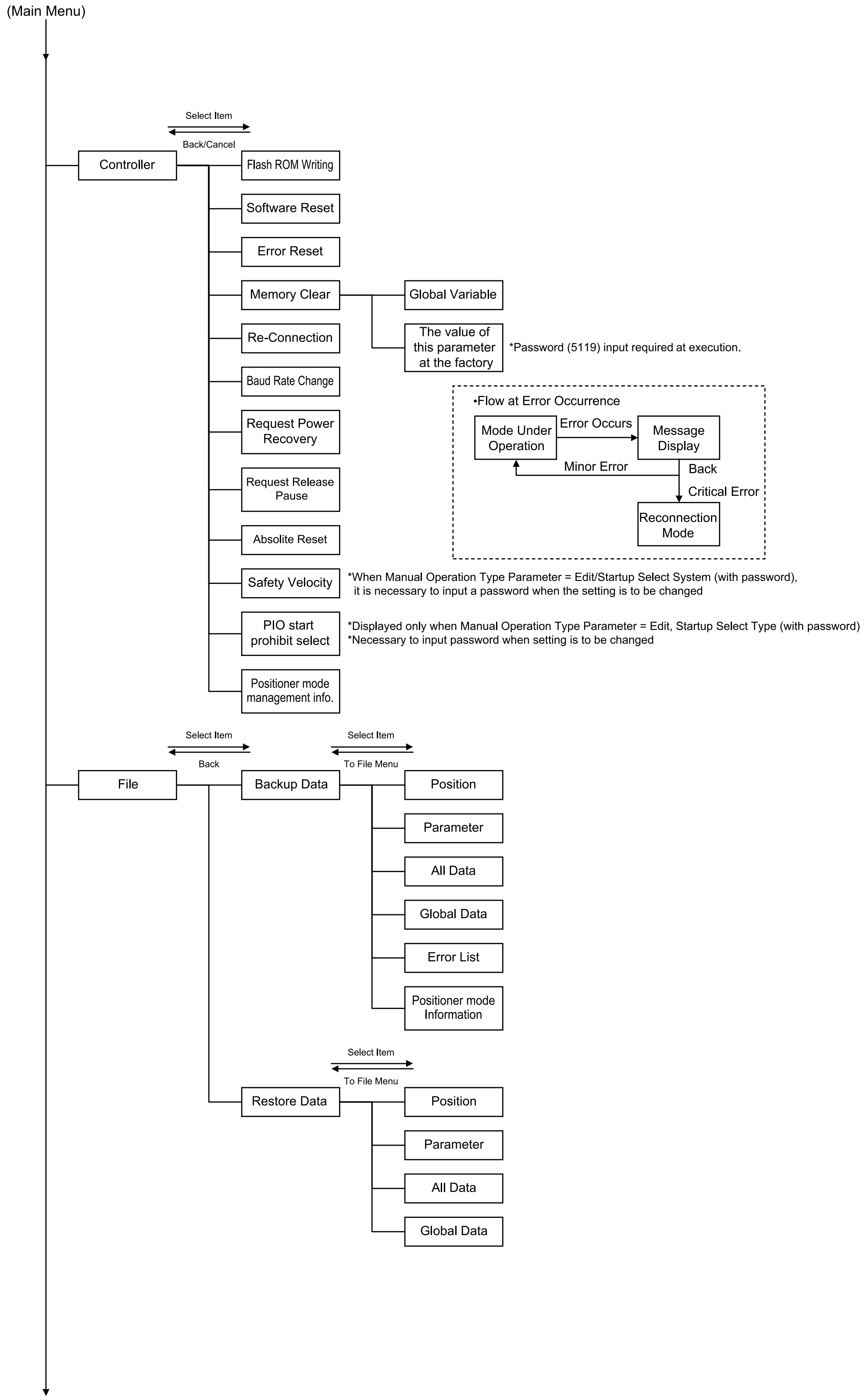

Power ON
Communications Established
Main Menu
Select Item
Back
Edit
Position
Manual input
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by “Write”
Edit
When escaping the mode with “Back”, check whether to write to Flash Rom
Write to Flash ROM
“Yes” or “No”
Copy/Move
Clear
Teach (Linear)
*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
Clear
Switch Axes
*This button is ineffective
Cont.
Input Monitor
Output Monitor
User Output
Jog Velocity
Scan
Current Pos./ Input Screen
Parameter
I/O
Common to All Axes
Specific Axis
Driver
Encoder
I/O Dev
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”
Positioner Mode
Excution
Stop



*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen

*Touch Back button to return to Monitor Menu screen

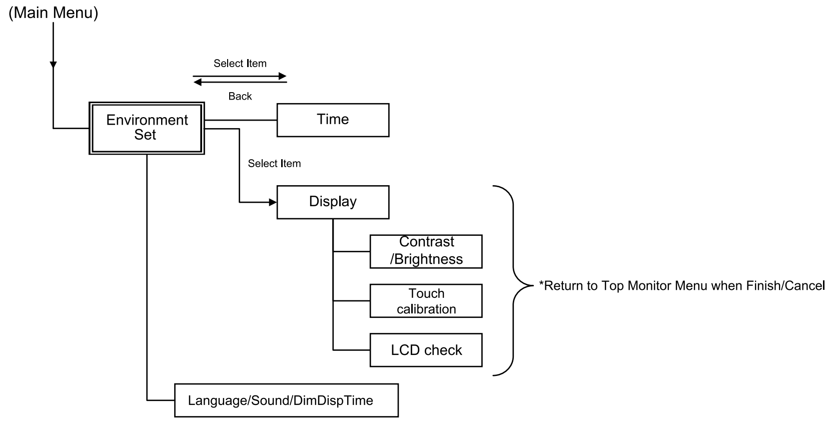
*For applicable models only



*Password (5119) input required at execution.

*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

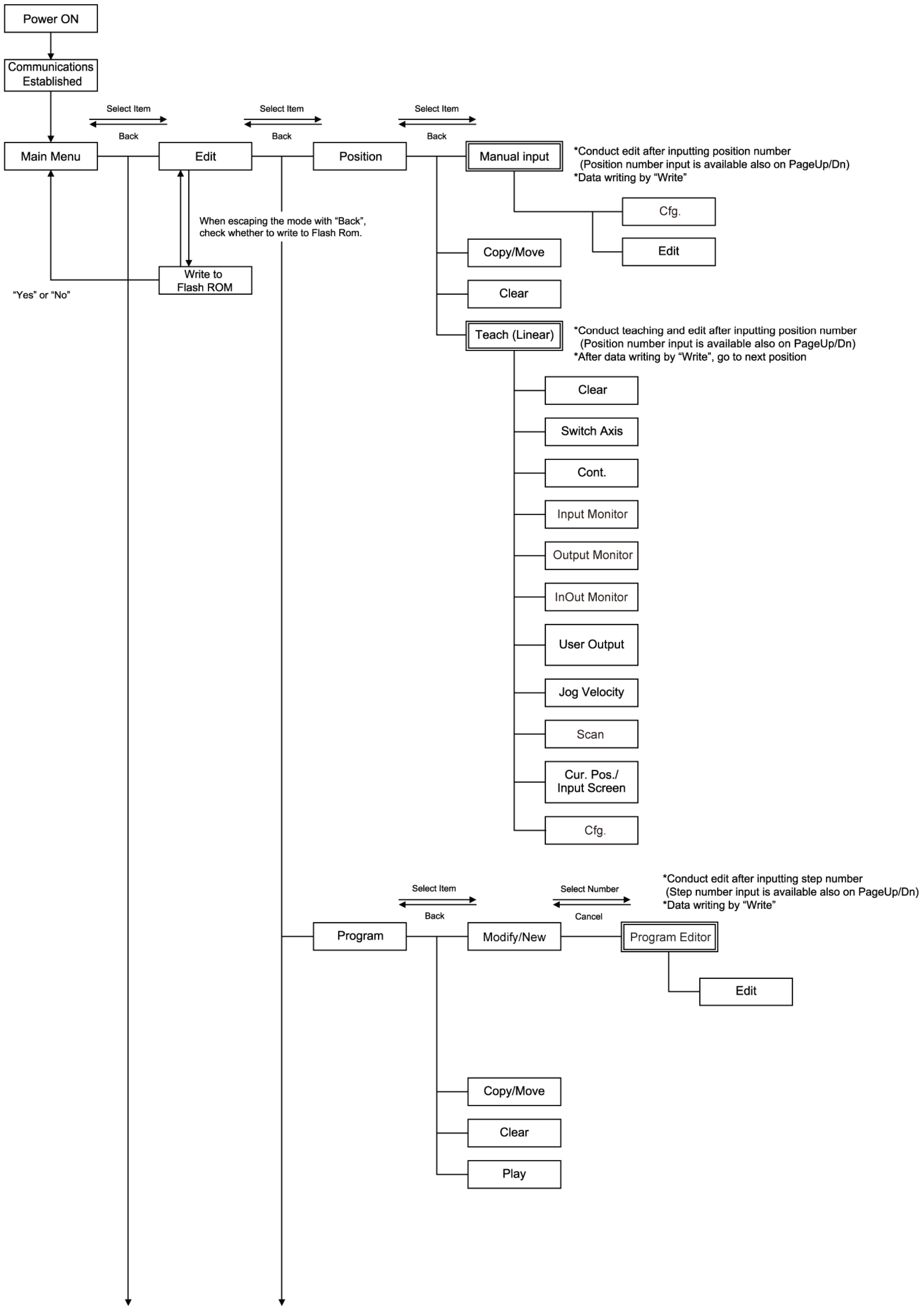
*Displayed only when Manual Operation Type Parameter = Edit, Startup Select Type (with password)
*Necessary to input password when setting is to be changed

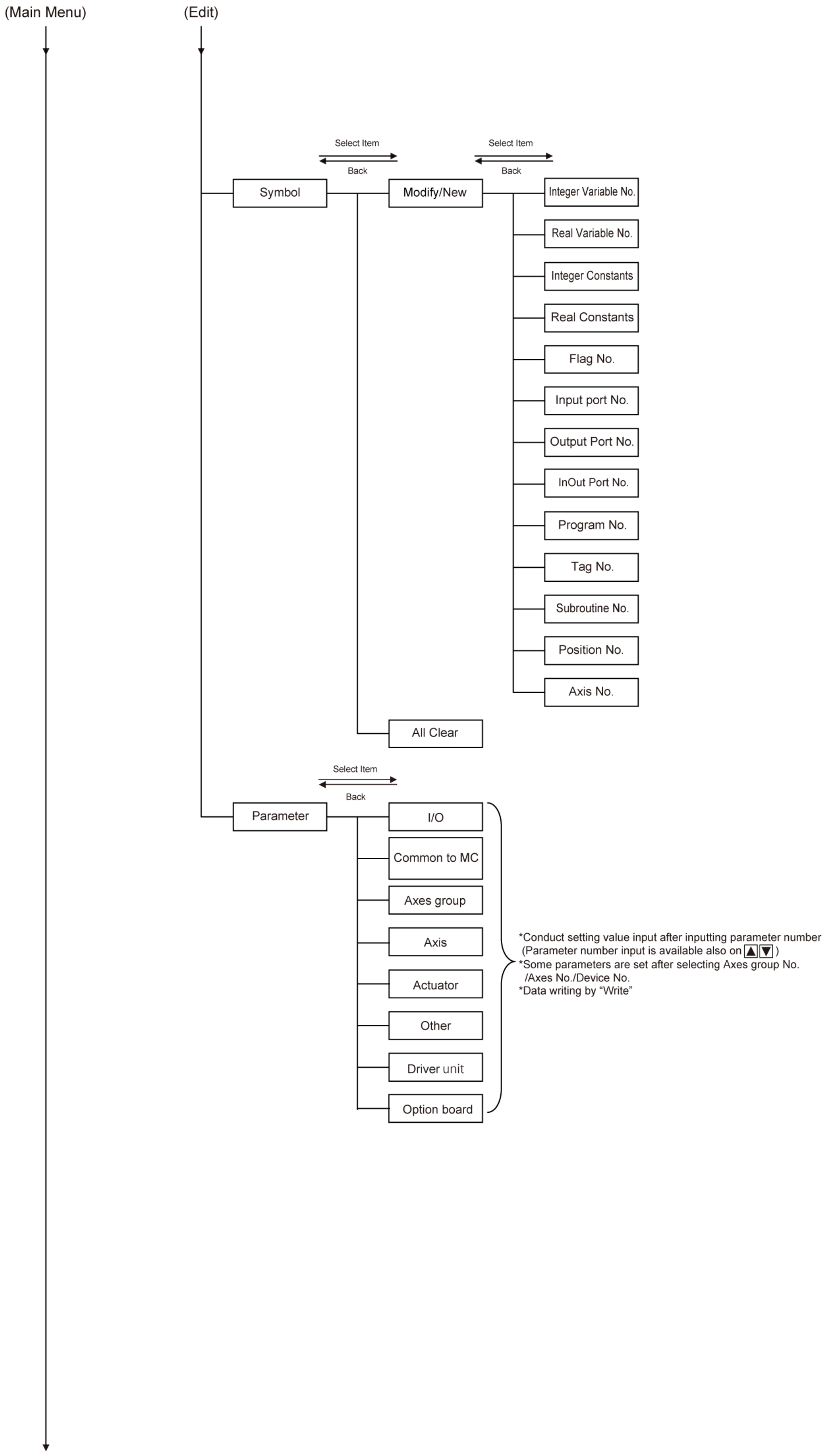

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast /Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime

5.7 RSEL Controller

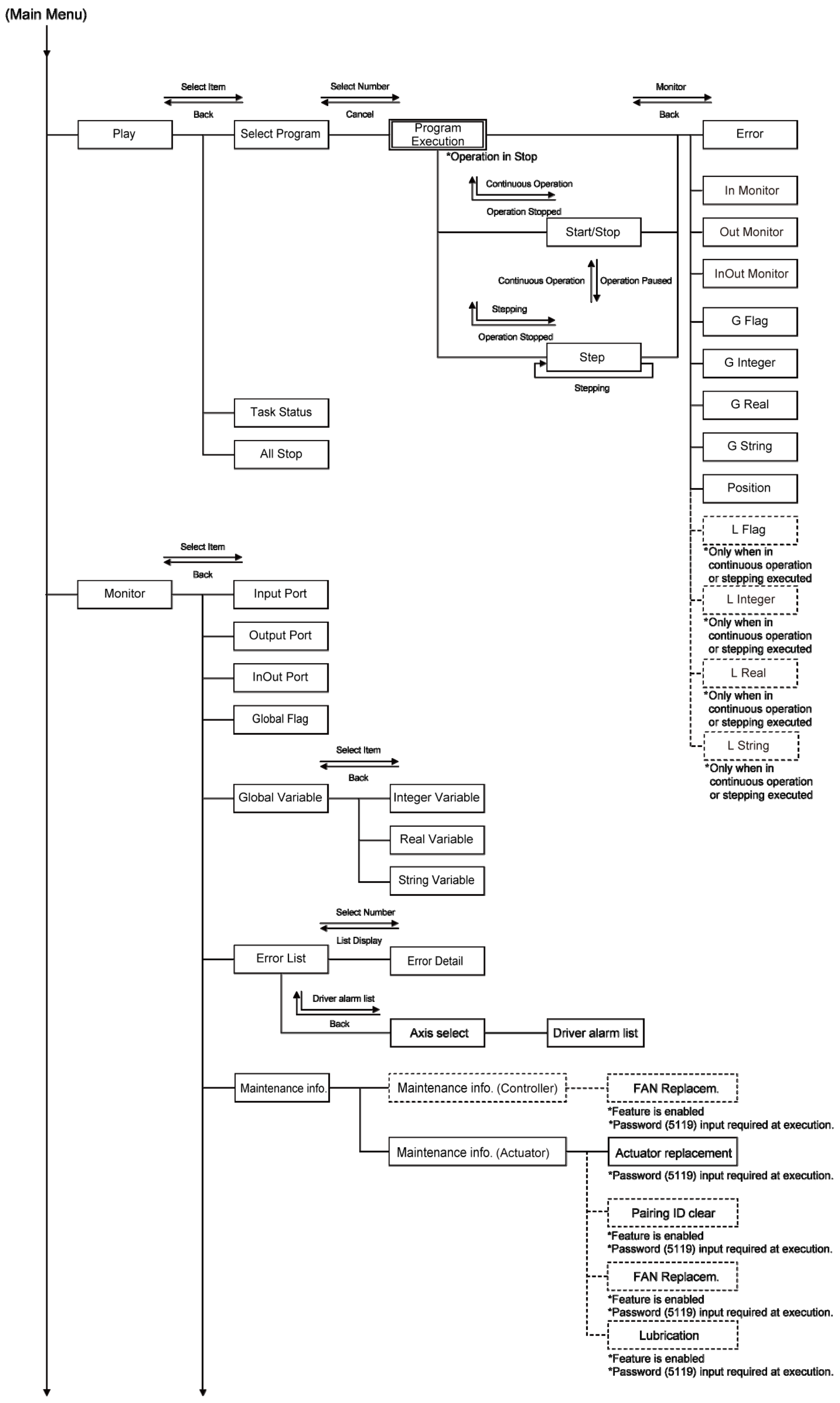
The menu construction should differ in the case of “When 6-axis Cartesian Robot is not connected” and “when 6-axis Cartesian Robot is connected” in RSEL Controller.

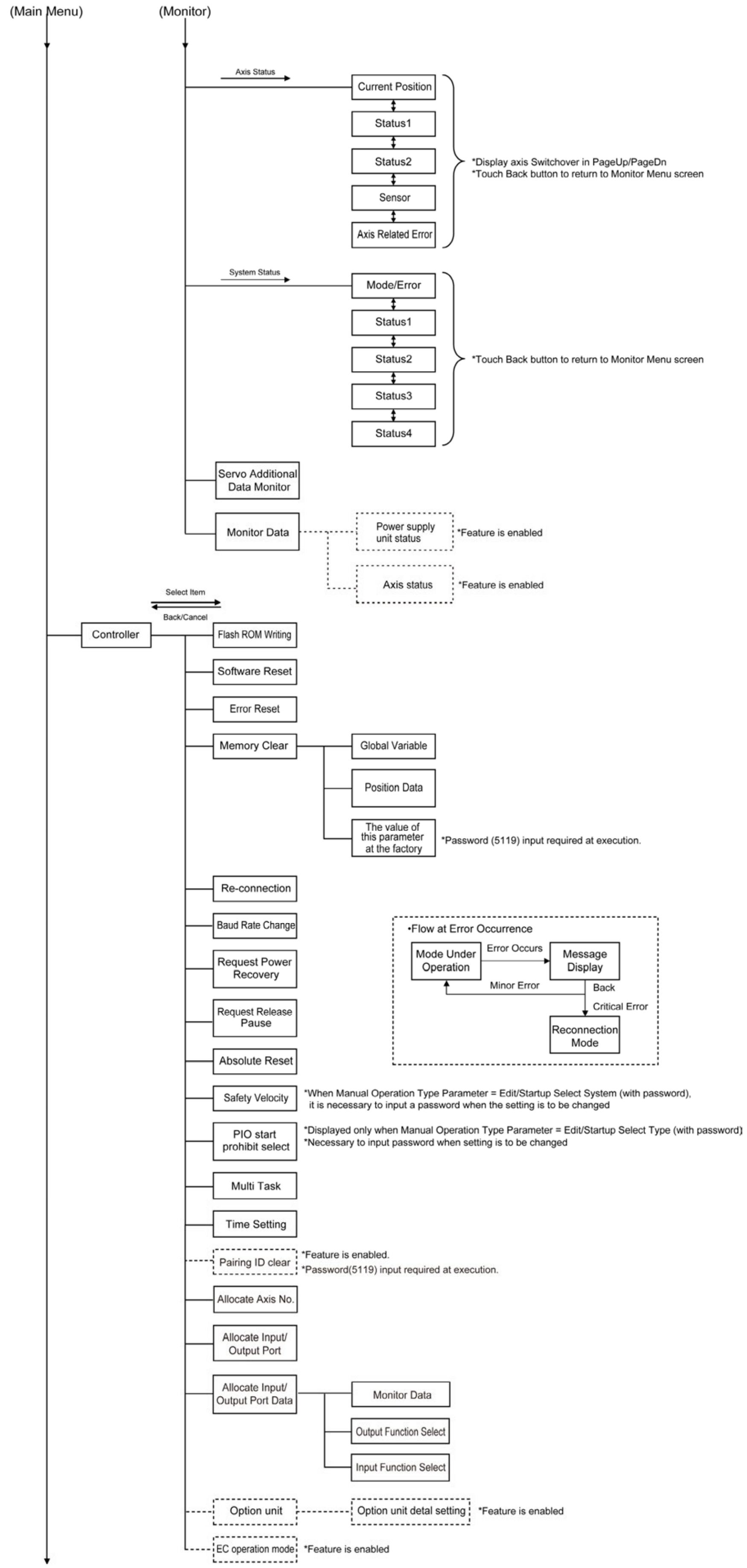
5.7.1 When 6-axis Cartesian Robot is not connected

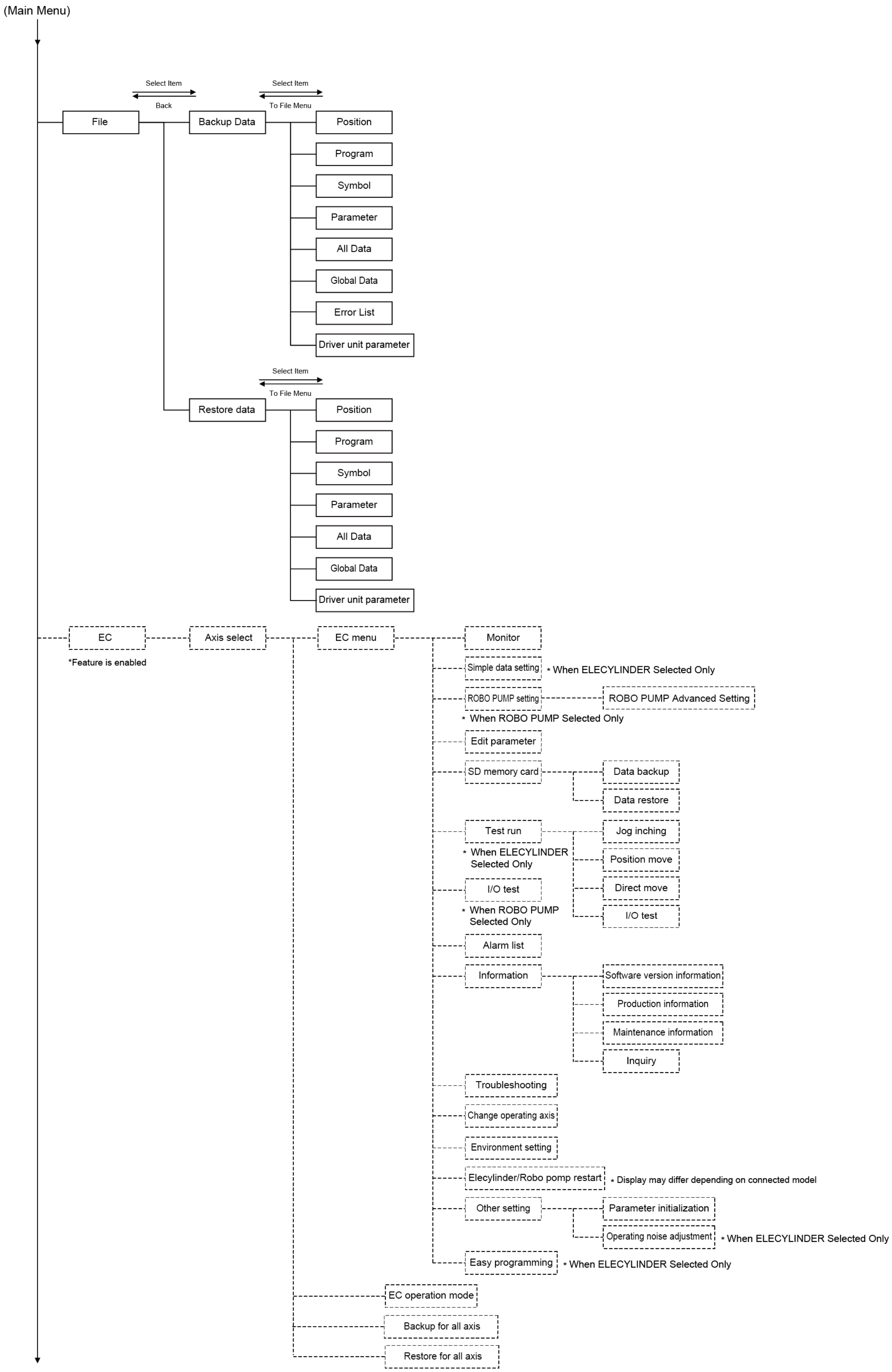

Power ON
Communications Established
Select Item
Back
Main Menu
Edit
Position
Manual input
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by “Write”
Cfg.
Edit
When escaping the mode with “Back”, check whether to write to Flash Rom.
Write to Flash ROM
“Yes” or “No”
Copy/Move
Clear
Teach (Linear)
*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
Clear
Switch Axis
Cont.
Input Monitor
Output Monitor
InOut Monitor
User Output
Jog Velocity
Scan
Cur. Pos./ Input Screen
Cfg.
Program
Modify/New
Select Number
Cancel
Program Editor
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by “Write”
Edit
Copy/Move
Clear
Play

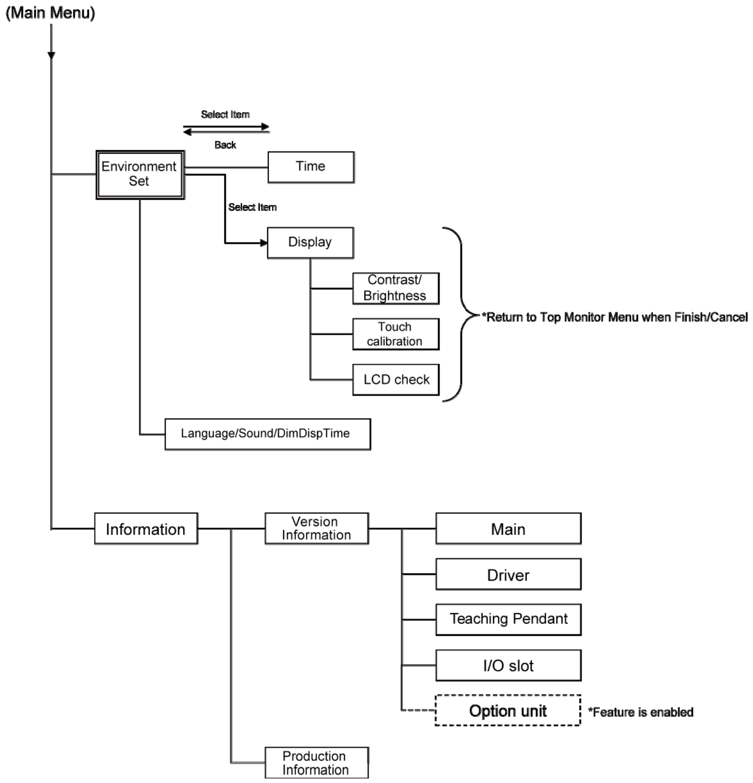


*Conduct setting value input after inputting parameter number
(Parameter number input is available also on ▲▼)
*Some parameters are set after selecting Axes group No.
/Axes No./Device No.
*Data writing by “Write”

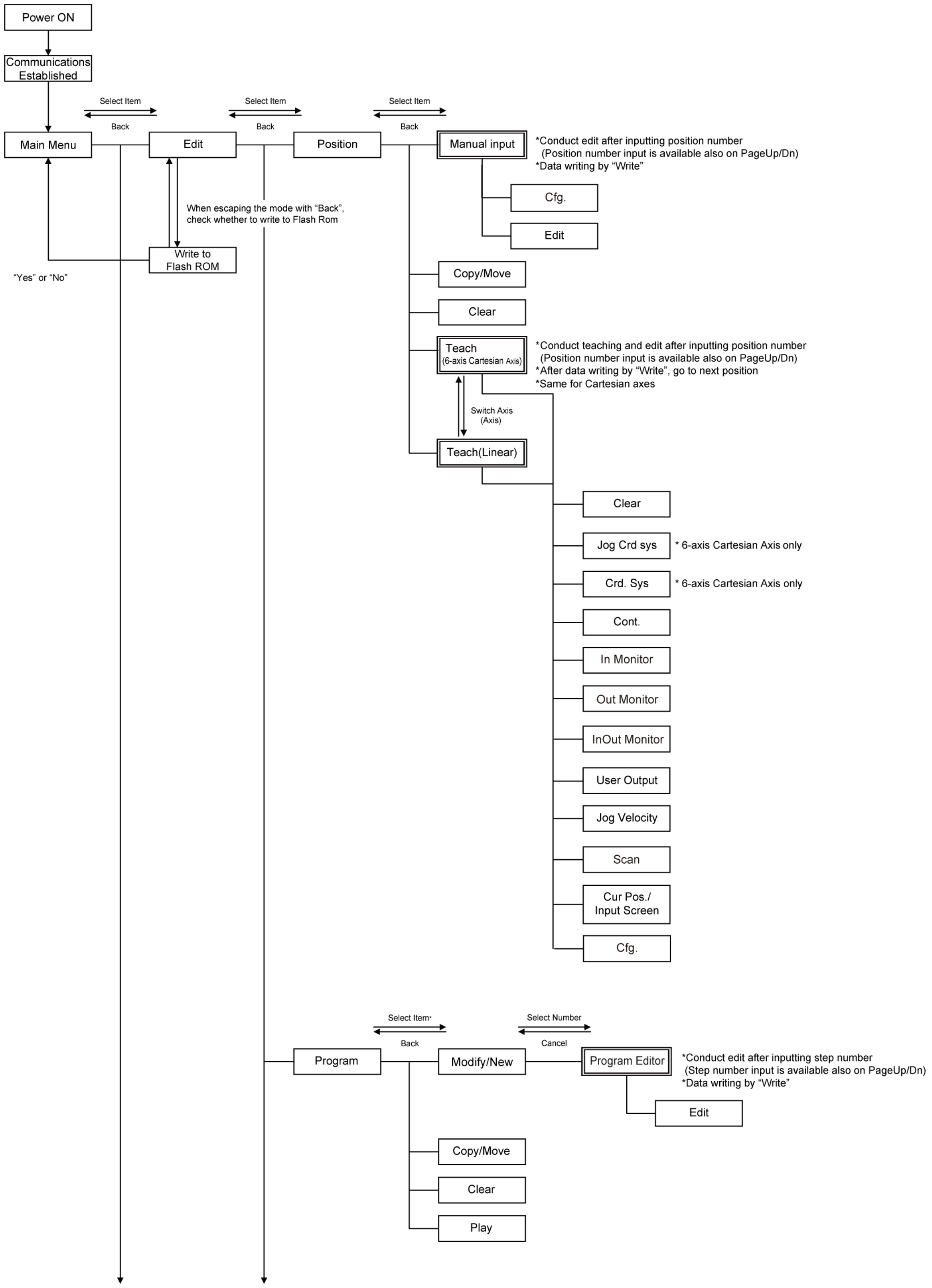

(Main Menu)
Select Item
Back
Select Number
Cancel
Monitor
Back
Play
Select Program
Program Execution
Error
*Operation in Stop
Continuous Operation
Operation Stopped
Start/Stop
Continuous Operation
Operation Paused
Stepping
Operation Stopped
Step
Stepping
In Monitor
Out Monitor
InOut Monitor
G Flag
G Integer
G Real
G String
Position
L Flag
*Only when in continuous operation or stepping executed
L Integer
*Only when in continuous operation or stepping executed
L Real
*Only when in continuous operation or stepping executed
L String
*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
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
*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
Option unit
Option unit detal setting
*Feature is enabled
EC operation mode
*Feature is enabled
•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
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
* When ROBO PUMP Selected Only
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

5.7.2 When 6-axis Cartesian Robot is connected



When escaping the mode with "Back", check whether to write to Flash Rom

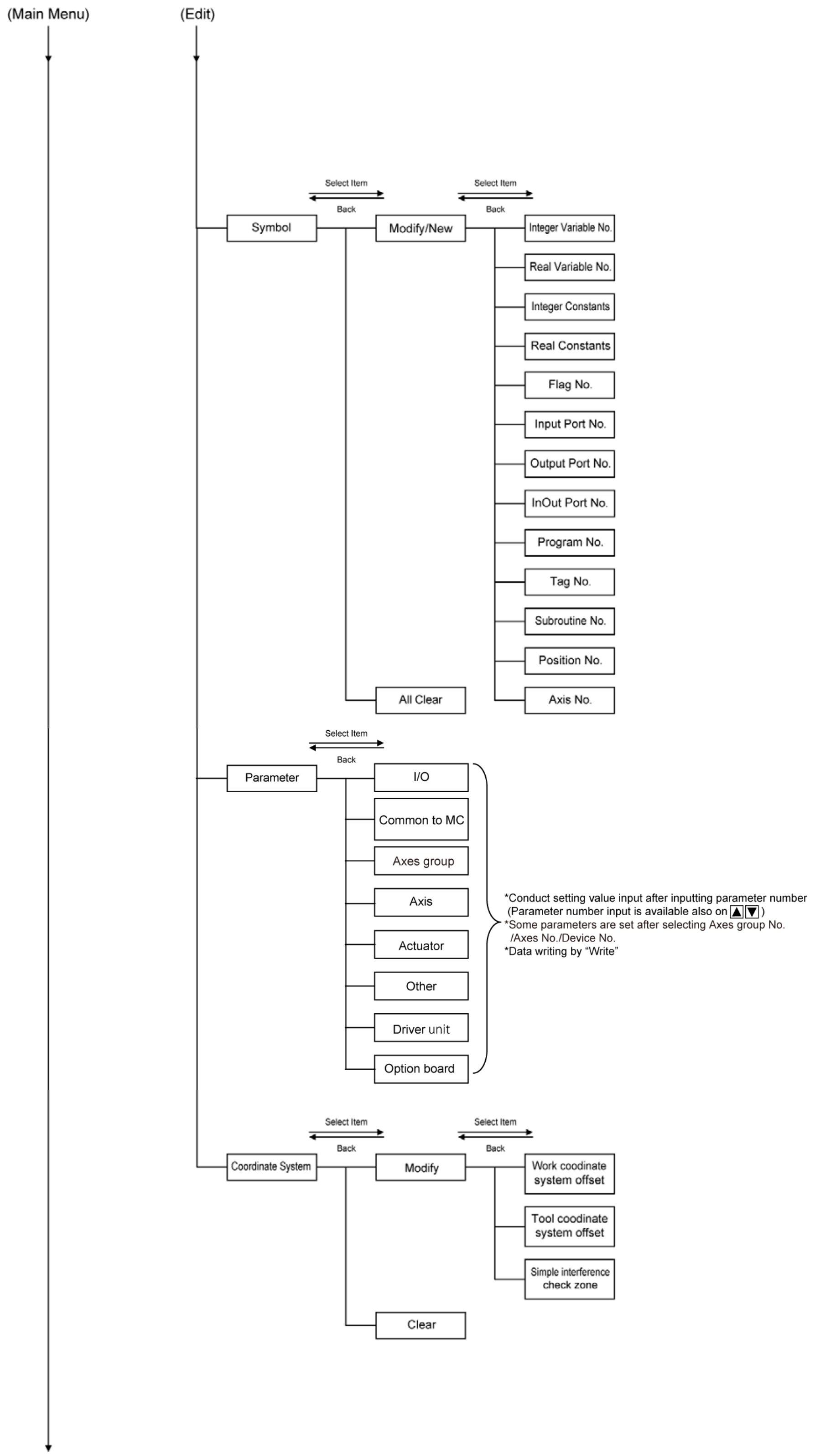
*Conduct edit after inputting position number
 (Position number input is available also on PageUp/Dn)
*Data writing by "Write"

*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
*Same for Cartesian axes

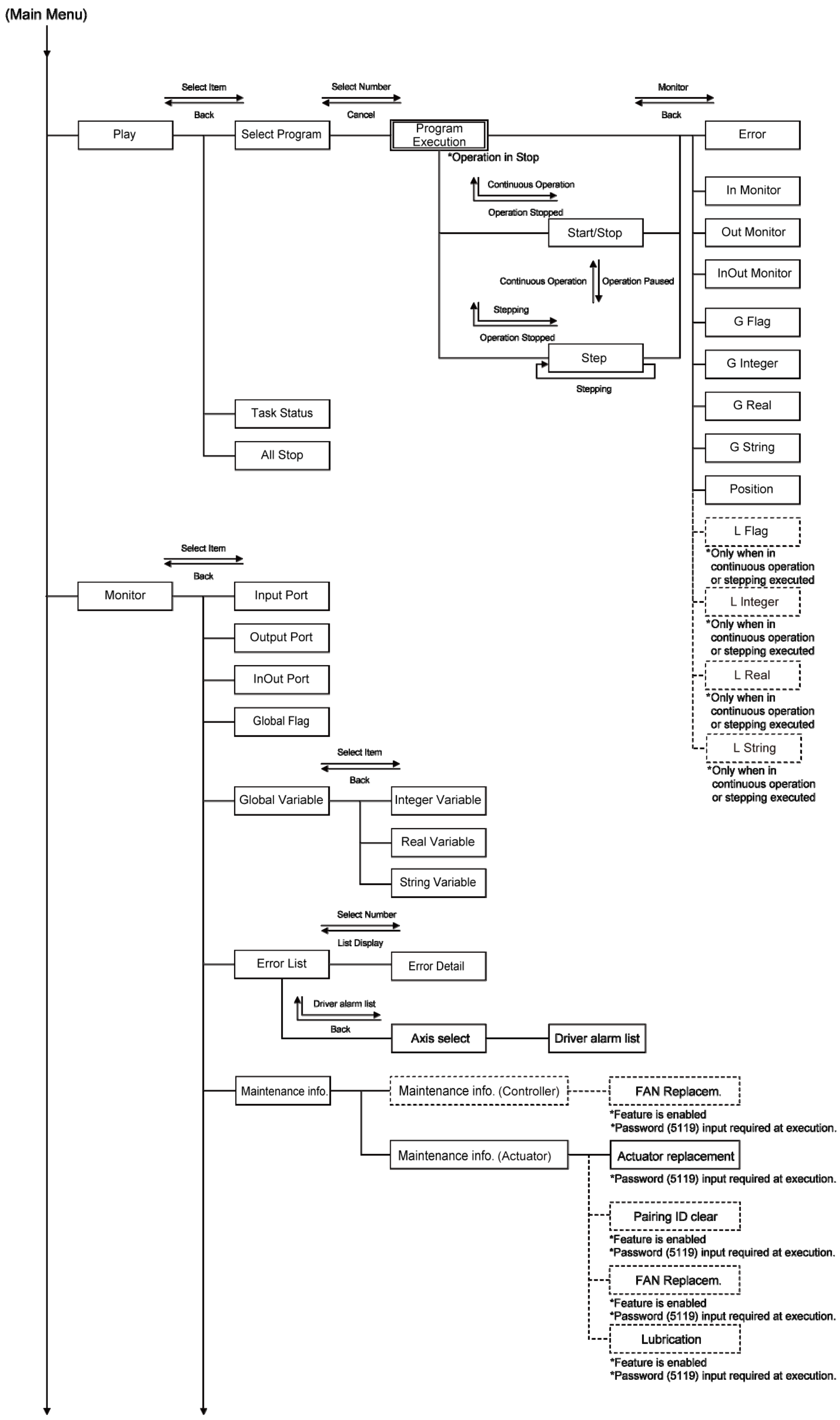
* 6-axis Cartesian Axis only

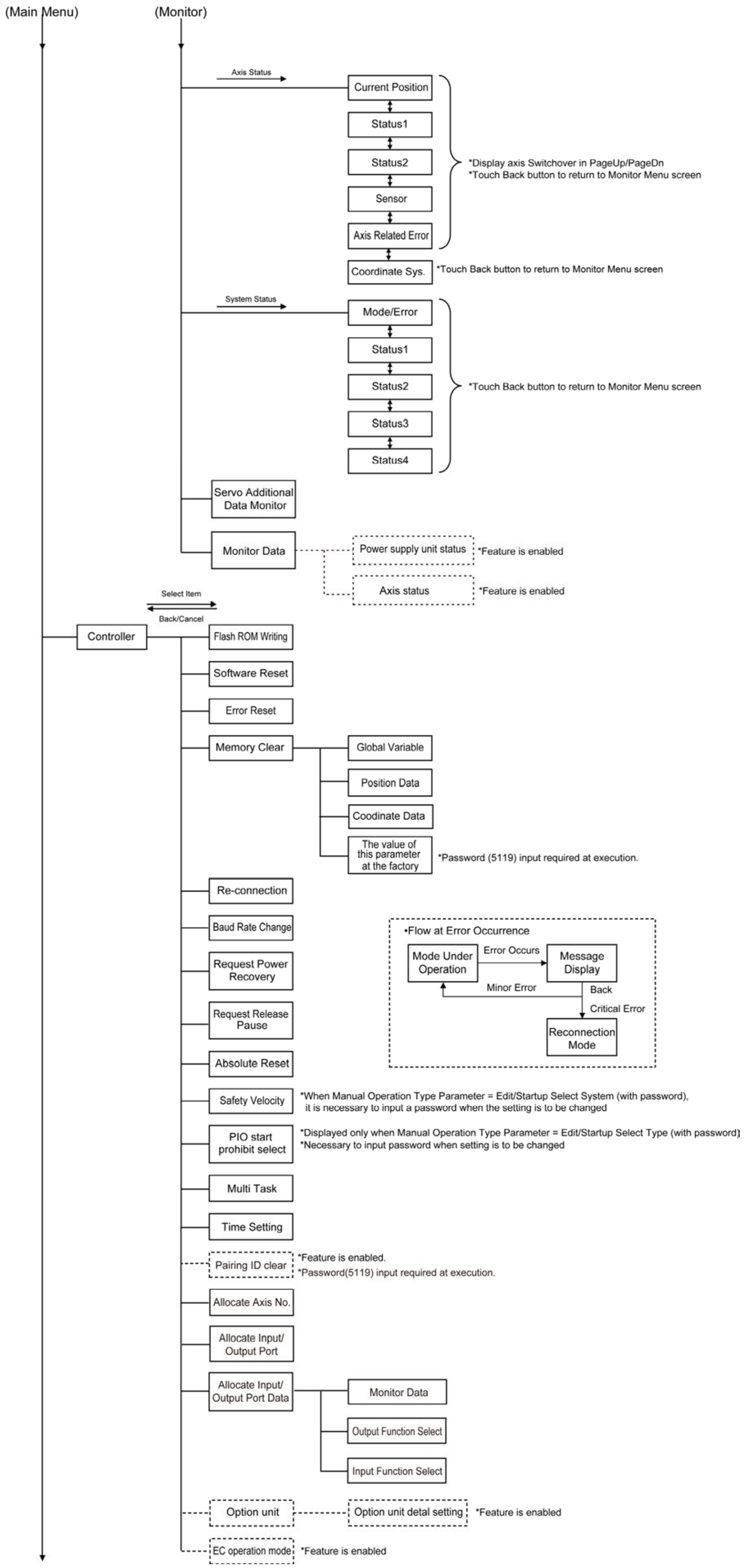
* 6-axis Cartesian Axis only

*Conduct edit after inputting step number
 (Step number input is available also on PageUp/Dn)
*Data writing by "Write"



*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 Monitor
Start/Stop
Out Monitor
Continuous Operation
Operation Paused
InOut Monitor
Stepping
Operation Stopped
G Flag
Step
G Integer
Stepping
G Real
Task Status
G String
All Stop
Position
L Flag
*Only when in continuous operation or stepping executed
Select Item
Back
Monitor
Input Port
L Integer
*Only when in continuous operation or stepping executed
Output Port
L Real
InOut Port
*Only when in continuous operation or stepping executed
Global Flag
L String
*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
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.



*Display axis Switchover in PageUp/PageDn
*Touch Back button to return to Monitor Menu screen

*Touch Back button to return to Monitor Menu screen

*Touch Back button to return to Monitor Menu screen

*Feature is enabled

*Feature is enabled

*Password (5119) input required at execution.

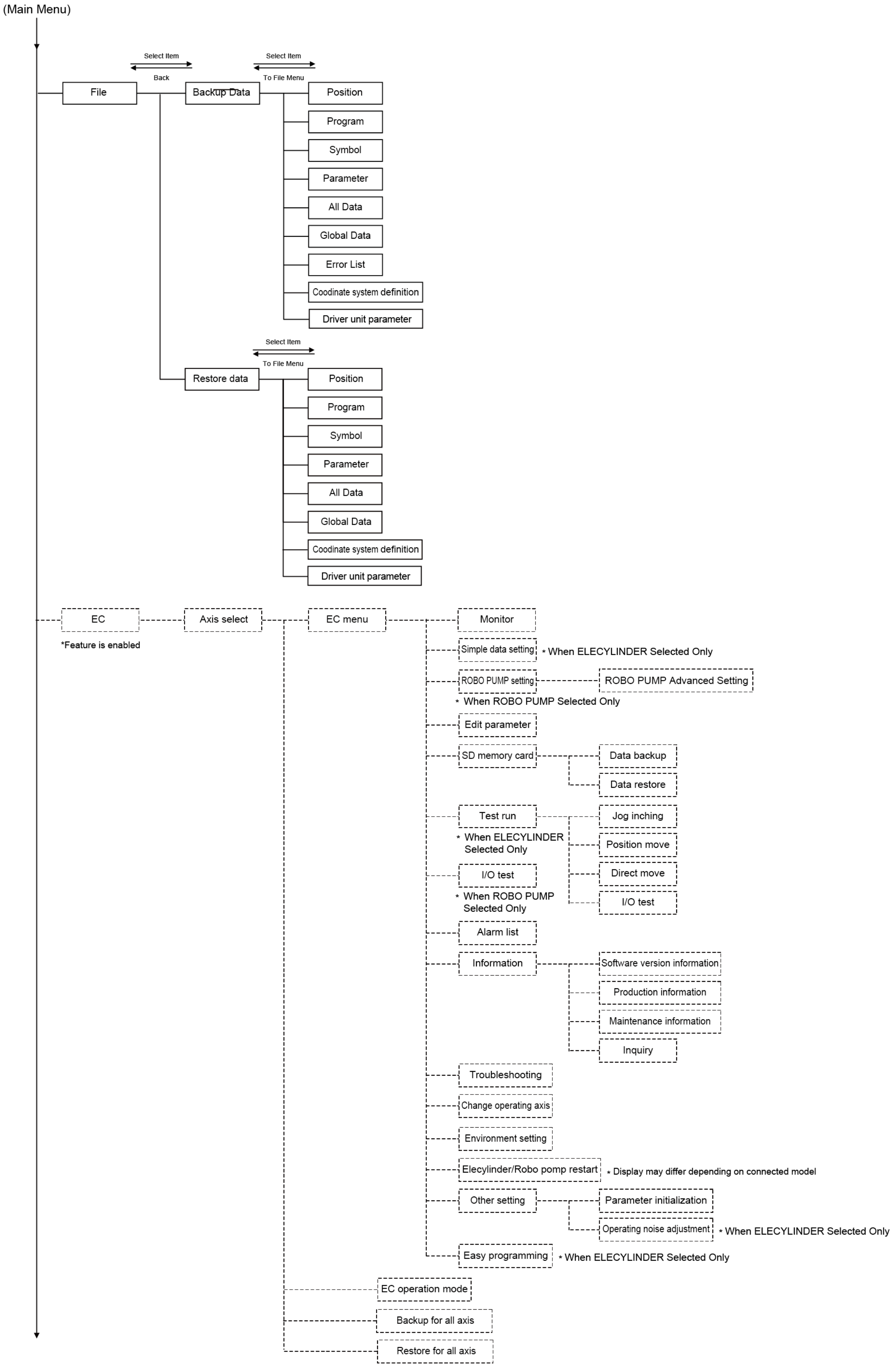
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed

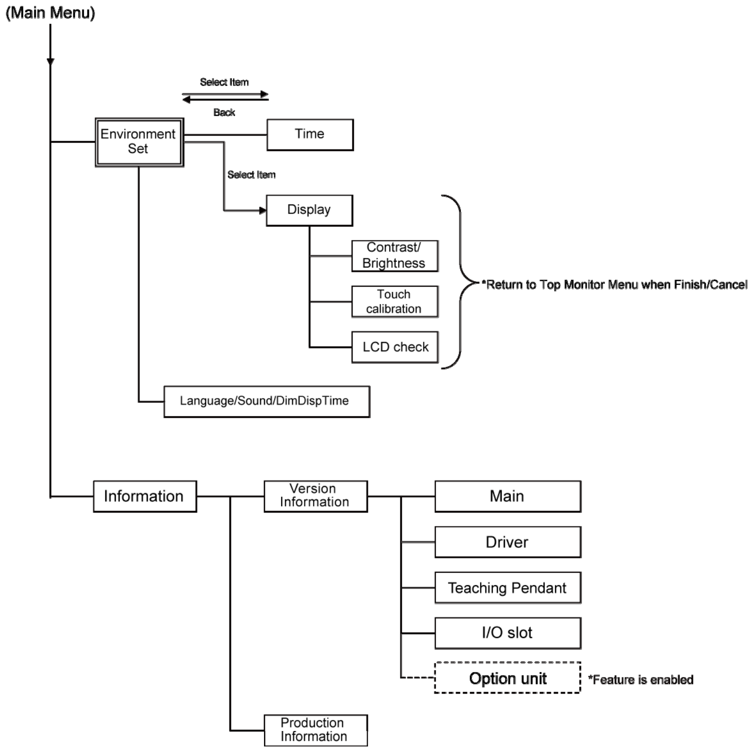
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed

*Feature is enabled.
*Password(5119) input required at execution.

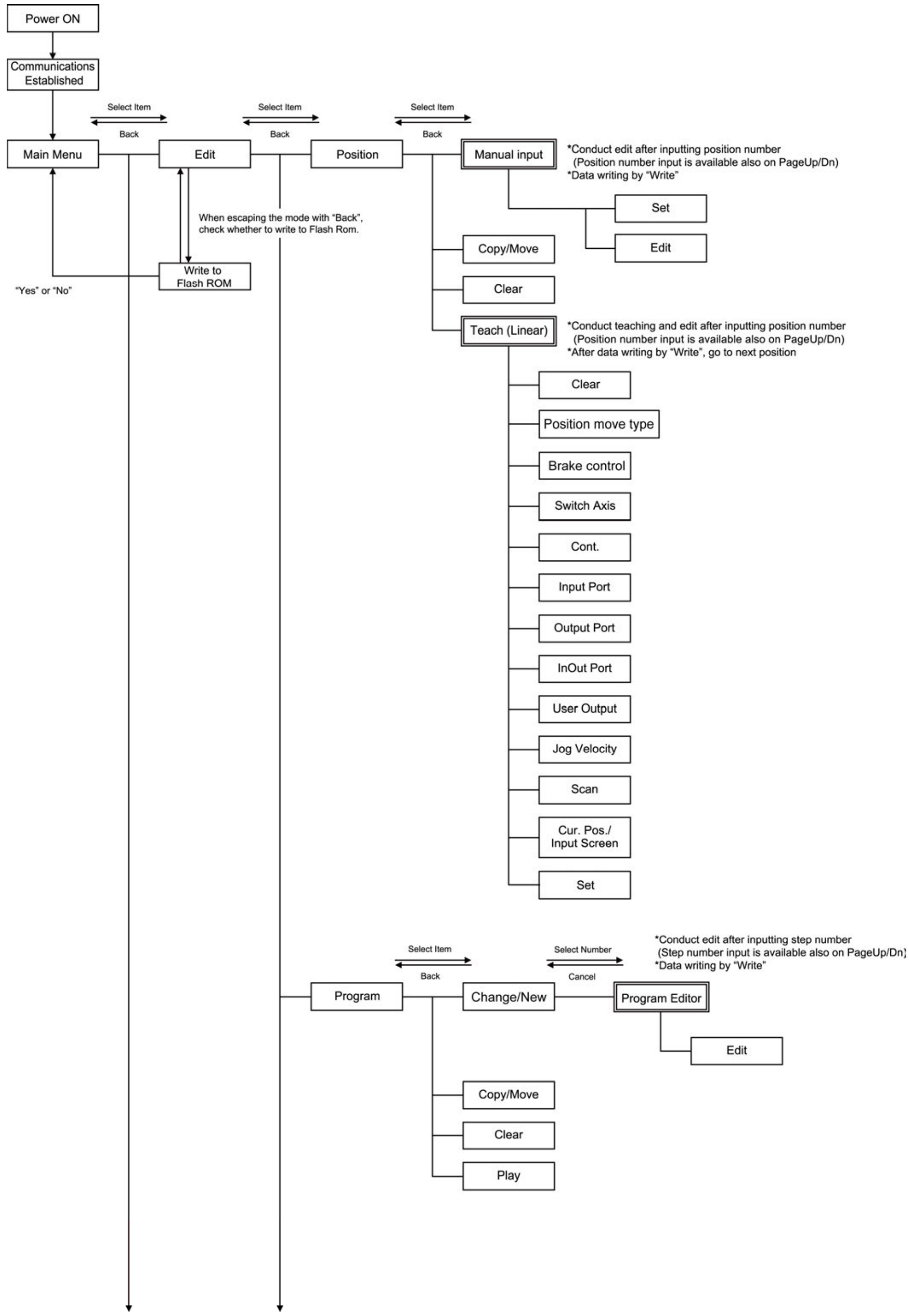
*Feature is enabled

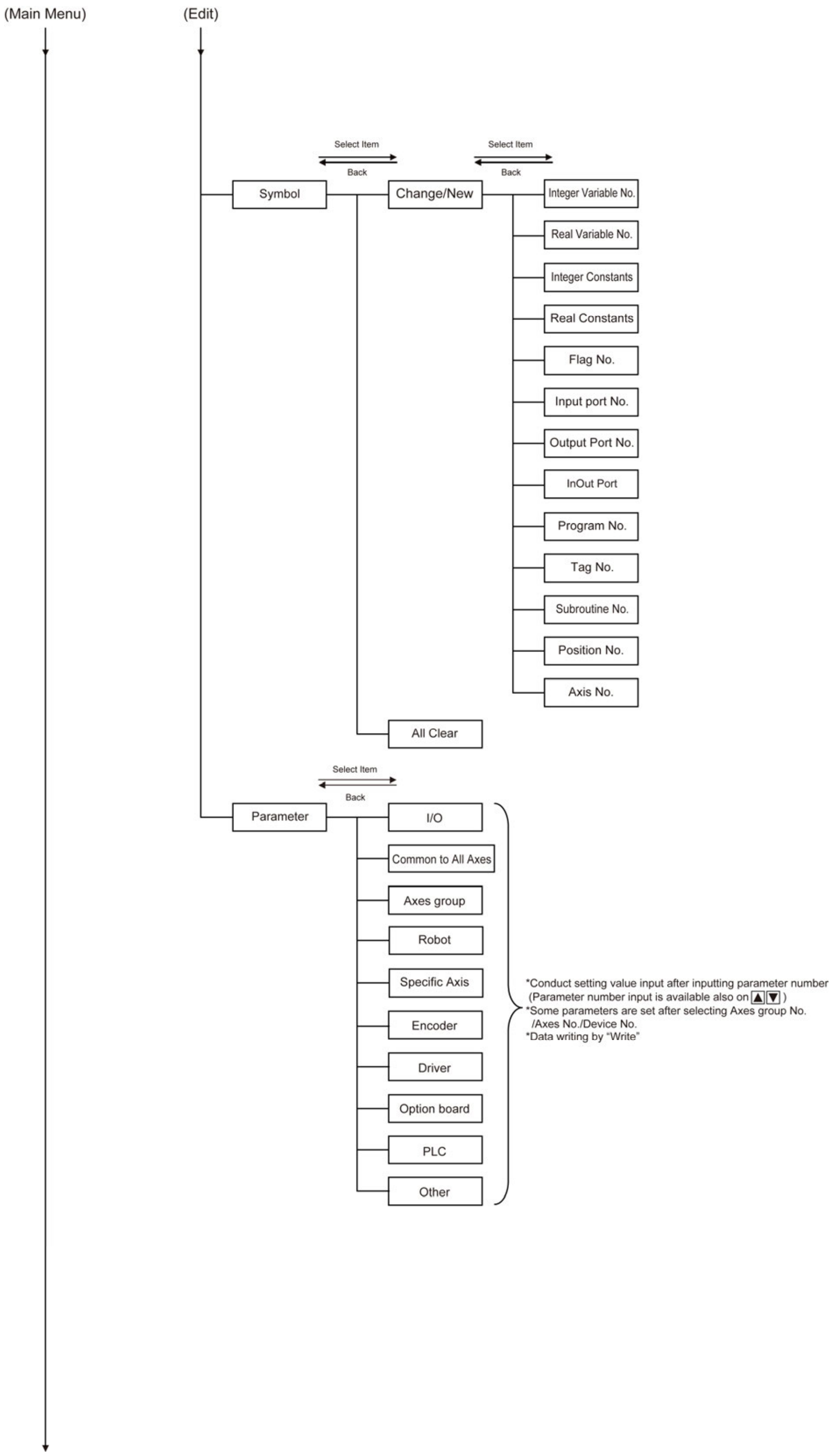
*Feature is enabled


(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
Jog inching
Position move
Direct move
I/O test
* When ROBO PUMP Selected Only
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

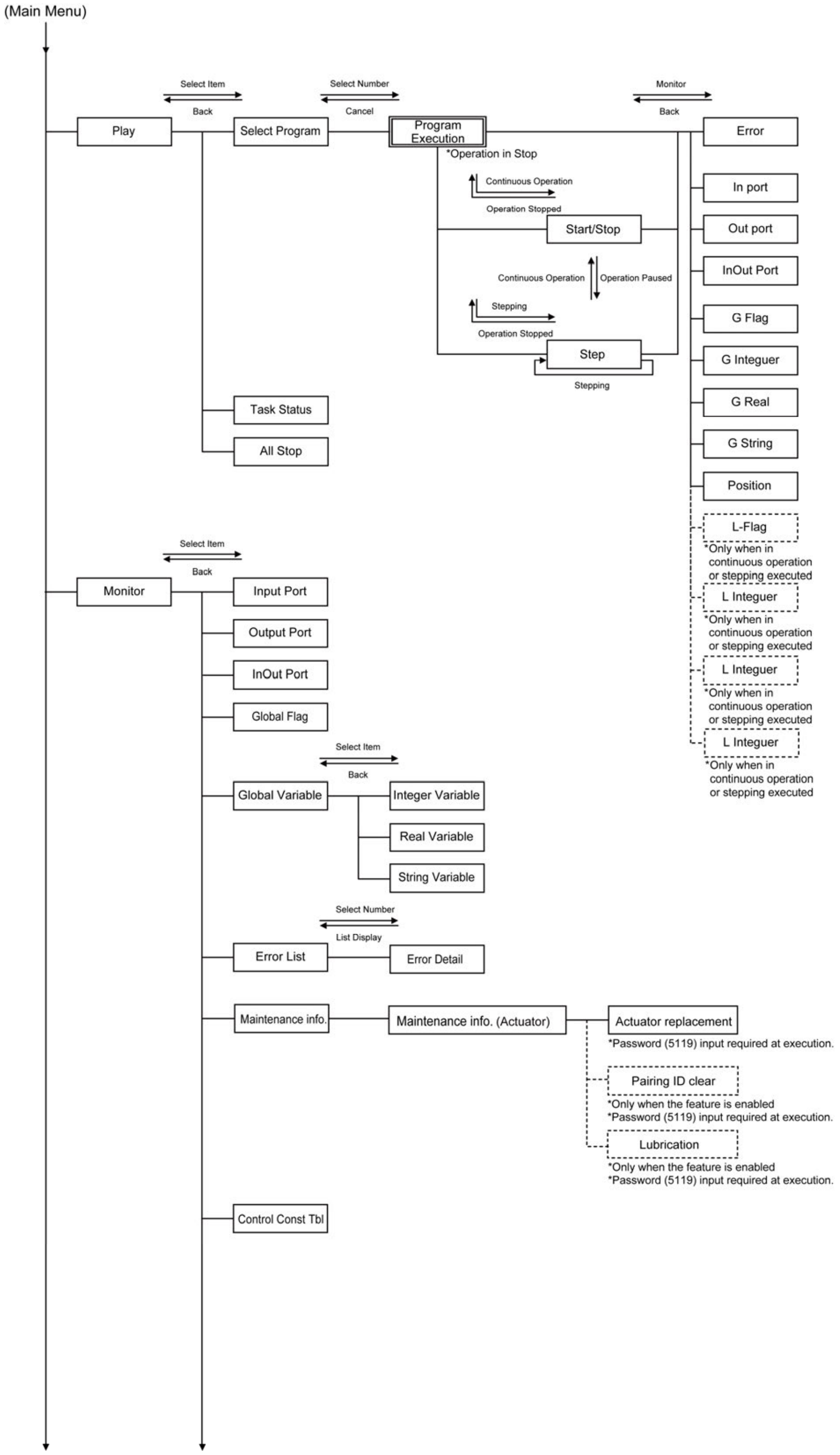

(Main Menu)
Select Item
Back
Environment Set
Time
Select Item
Display
Contrast/ Brightness
Touch calibration
LCD check
*Return to Top Monitor Menu when Finish/Cancel
Language/Sound/DimDispTime
Information
Version Information
Main
Driver
Teaching Pendant
I/O slot
Option unit
*Feature is enabled
Production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

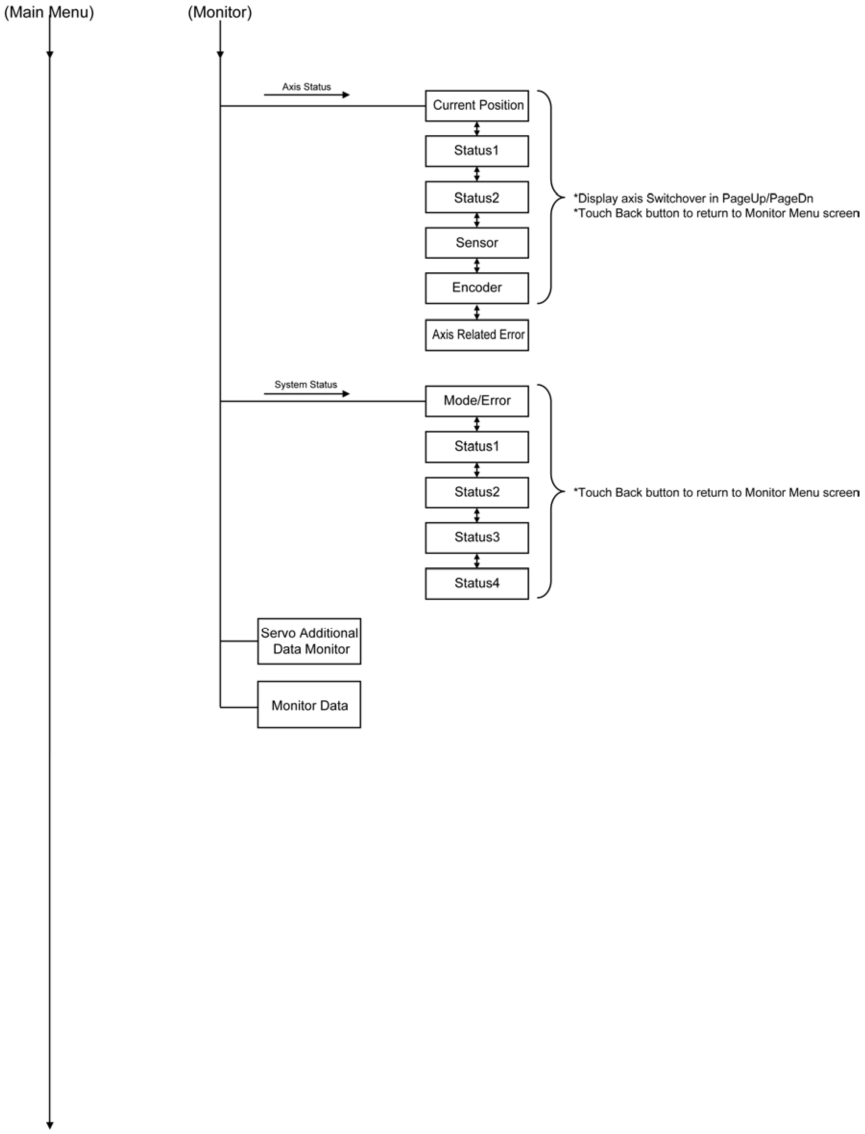
5.8 XSEL2-T Controller

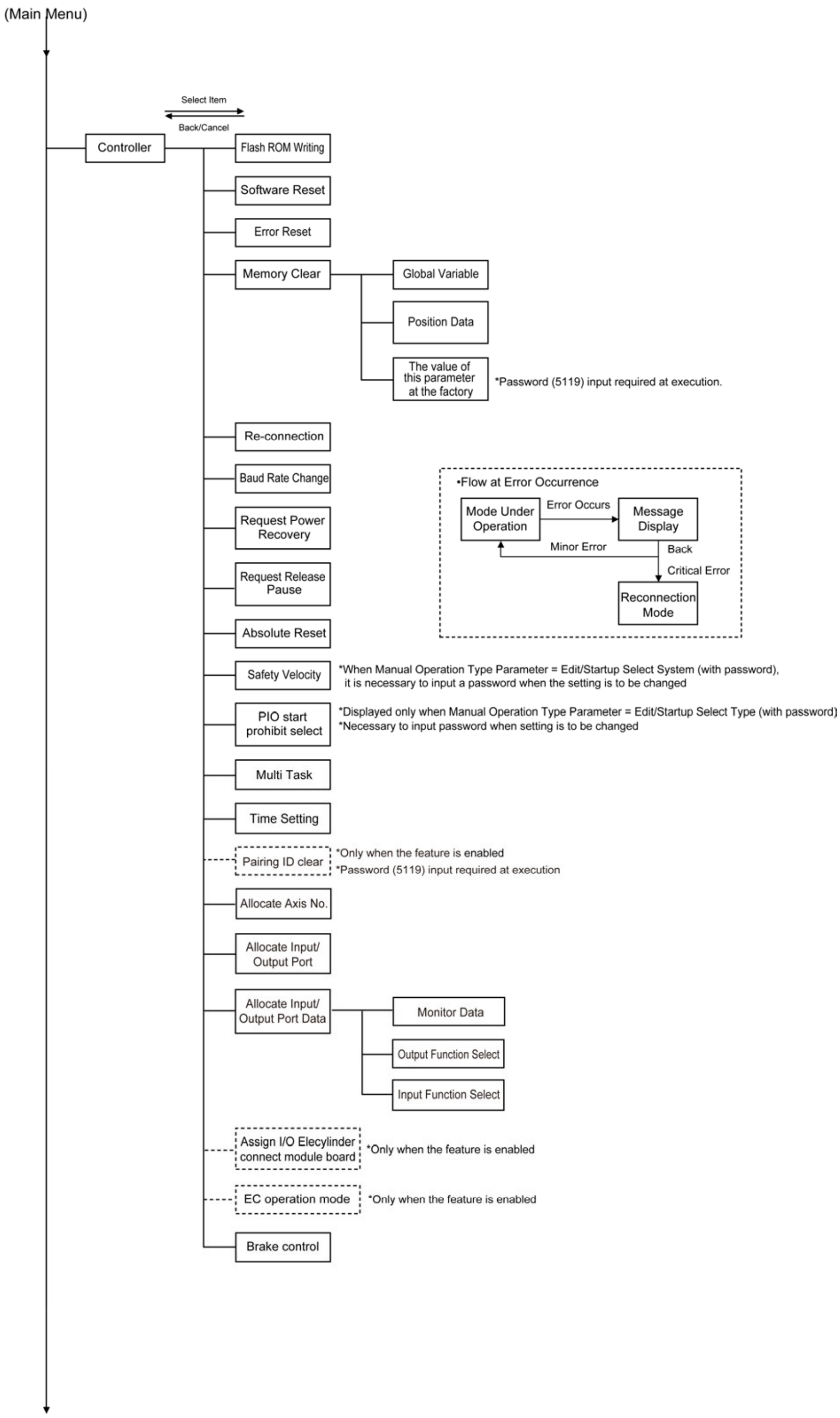

Power ON
Communications Established
Main Menu
Select Item
Back
Edit
Select Item
Back
Position
Select Item
Back
Manual input
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"
Set
Edit
When escaping the mode with "Back", check whether to write to Flash Rom.
Write to Flash ROM
"Yes" or "No"
Copy/Move
Clear
Teach (Linear)
*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
Clear
Position move type
Brake control
Switch Axis
Cont.
Input Port
Output Port
InOut Port
User Output
Jog Velocity
Scan
Cur. Pos./ Input Screen
Set
Select Item
Back
Program
Change/New
Select Number
Cancel
Program Editor
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"
Edit
Copy/Move
Clear
Play



*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
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
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



*Password (5119) input required at execution.

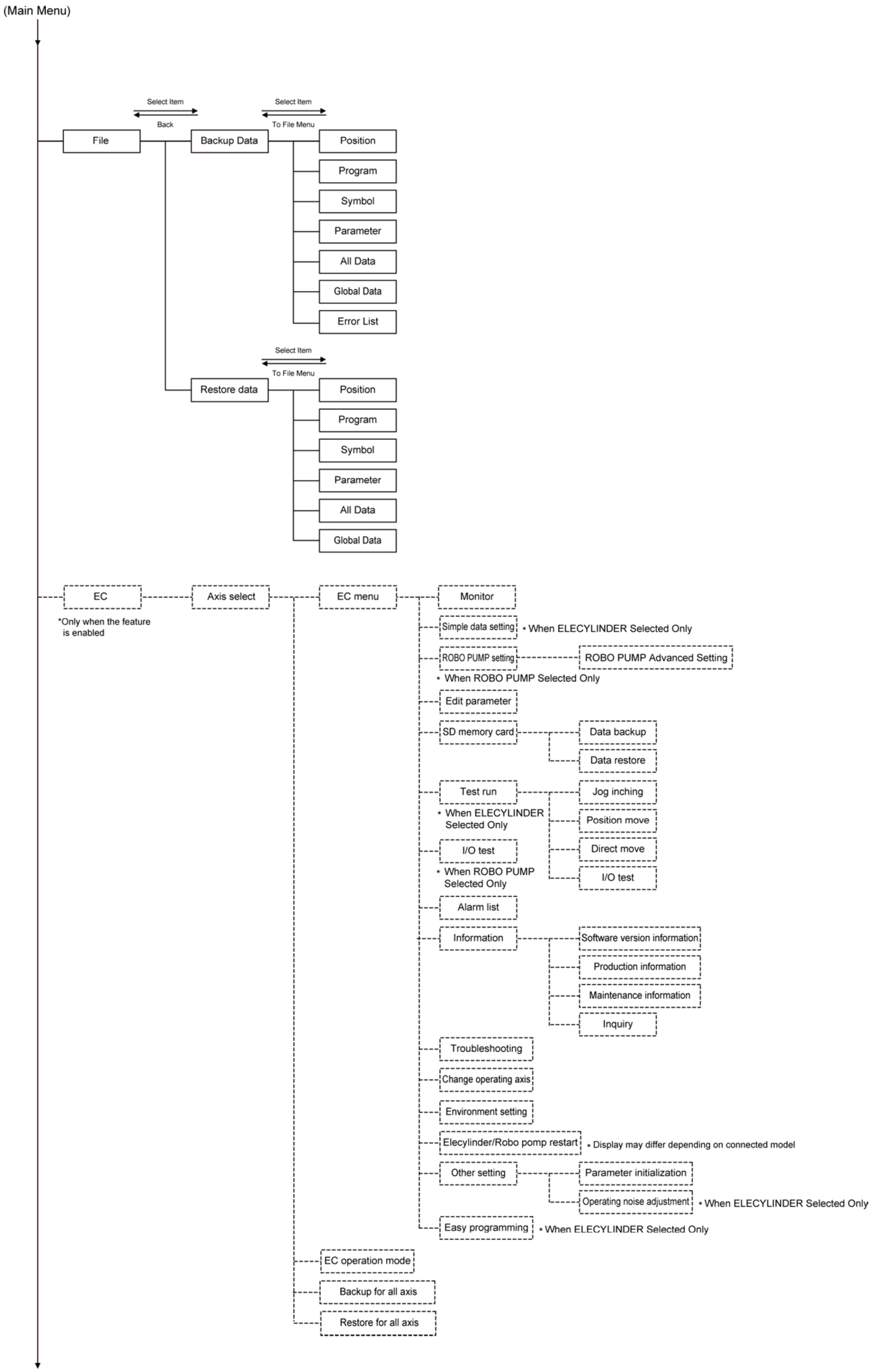
*When Manual Operation Type Parameter = Edit/Startup Select System (with password), it is necessary to input a password when the setting is to be changed

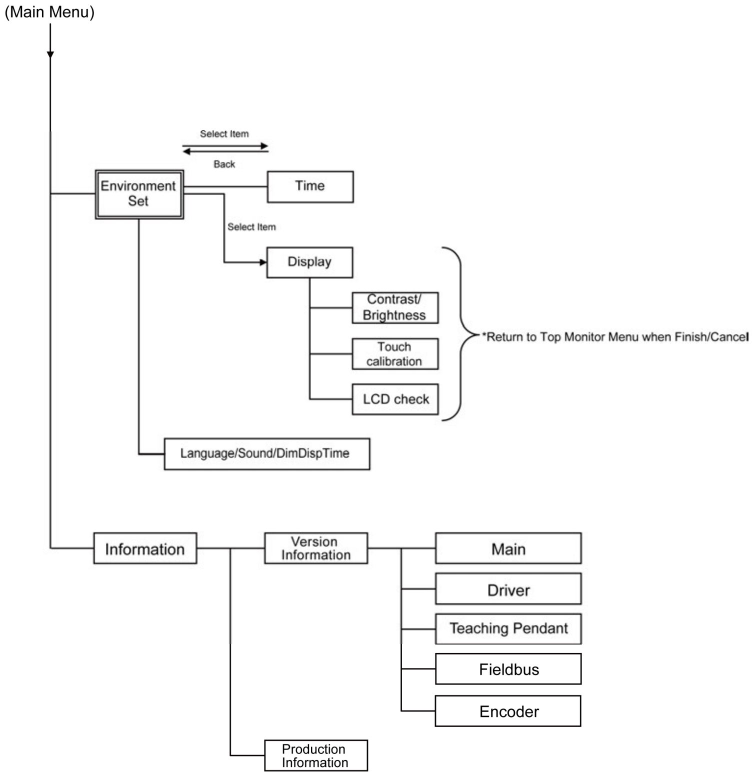
*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed

*Only when the feature is enabled
*Password (5119) input required at execution

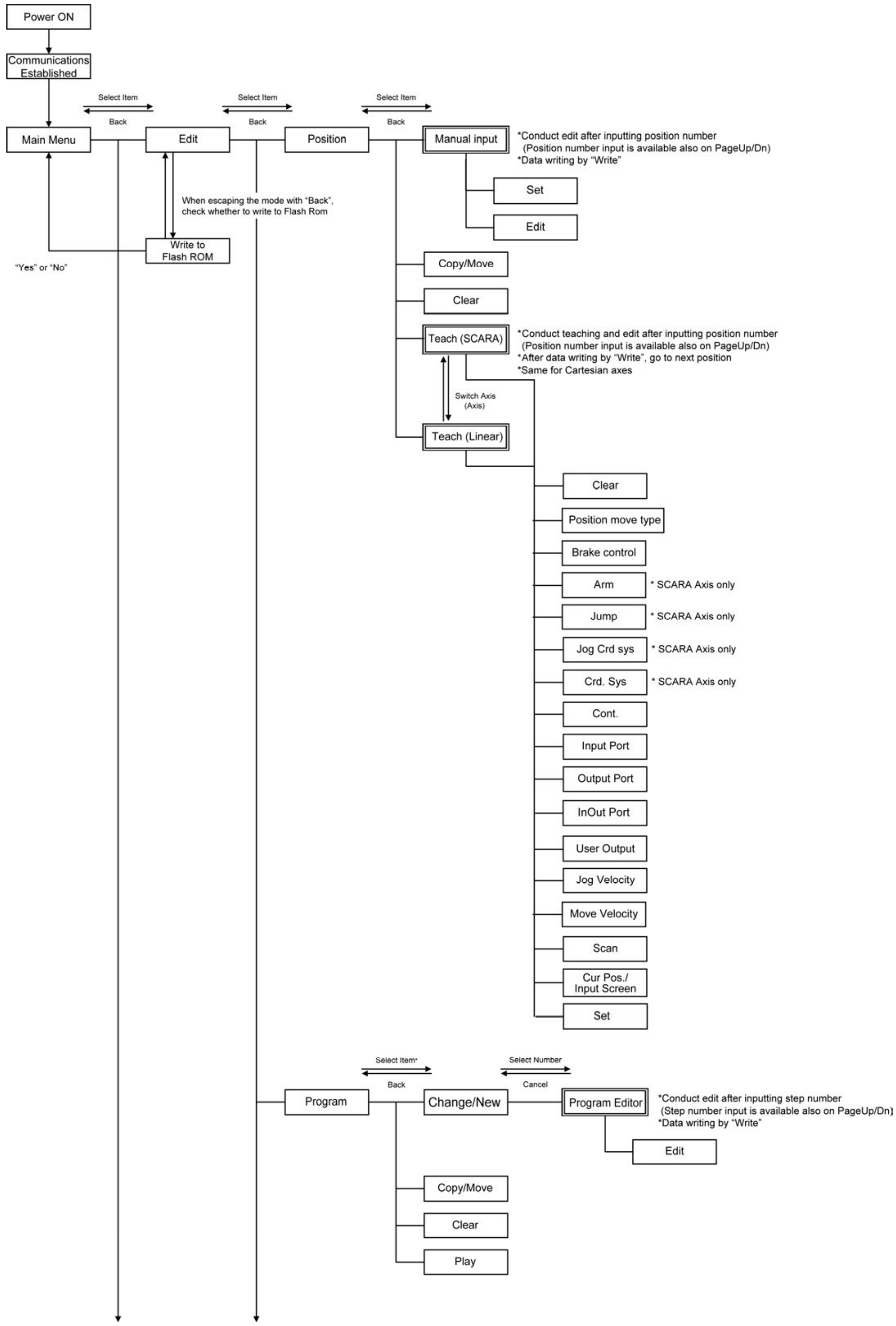
*Only when the feature is enabled

*Only when the feature is enabled


(Main Menu)
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
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

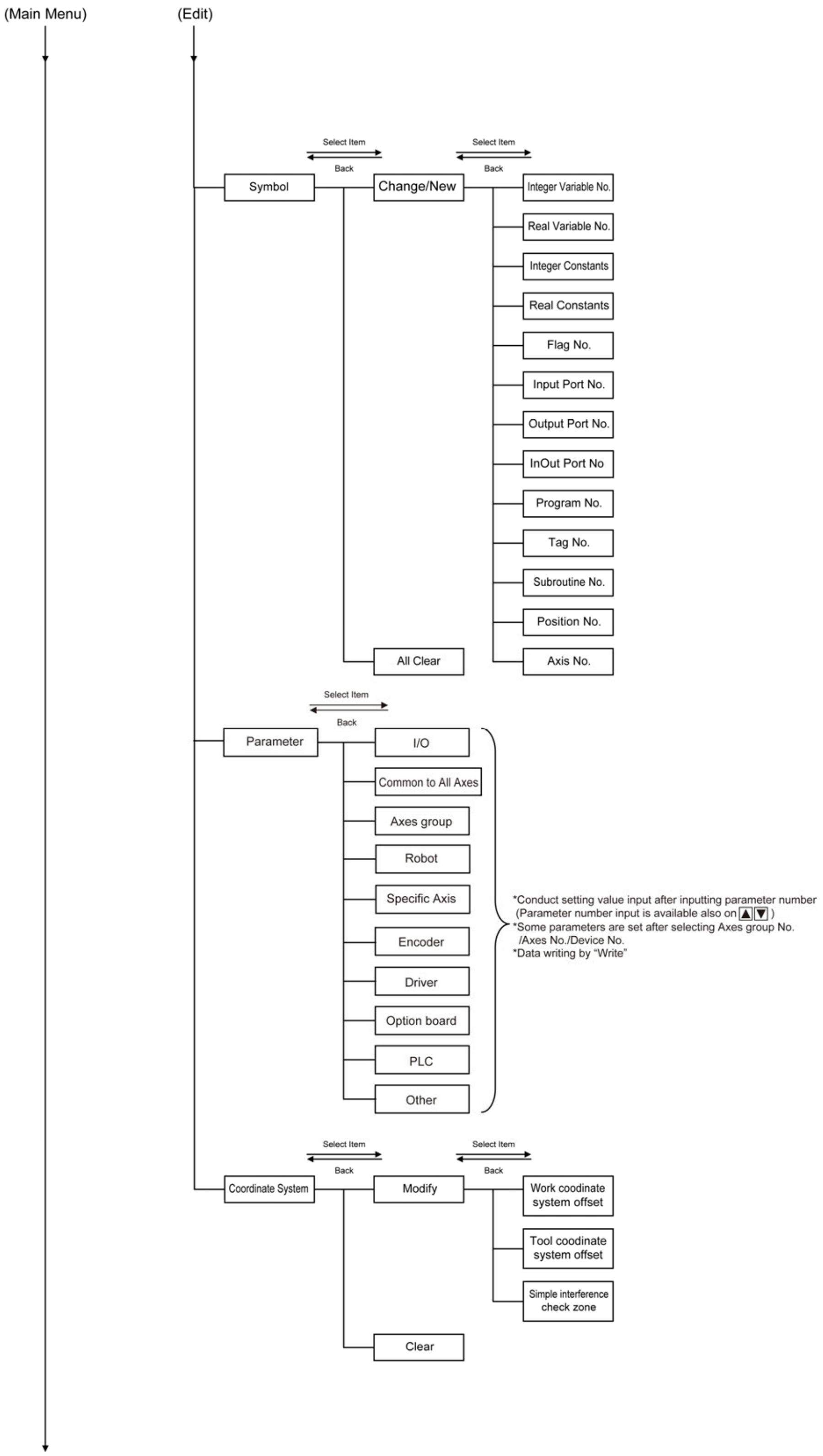
5.9 XSEL2-TX Controller



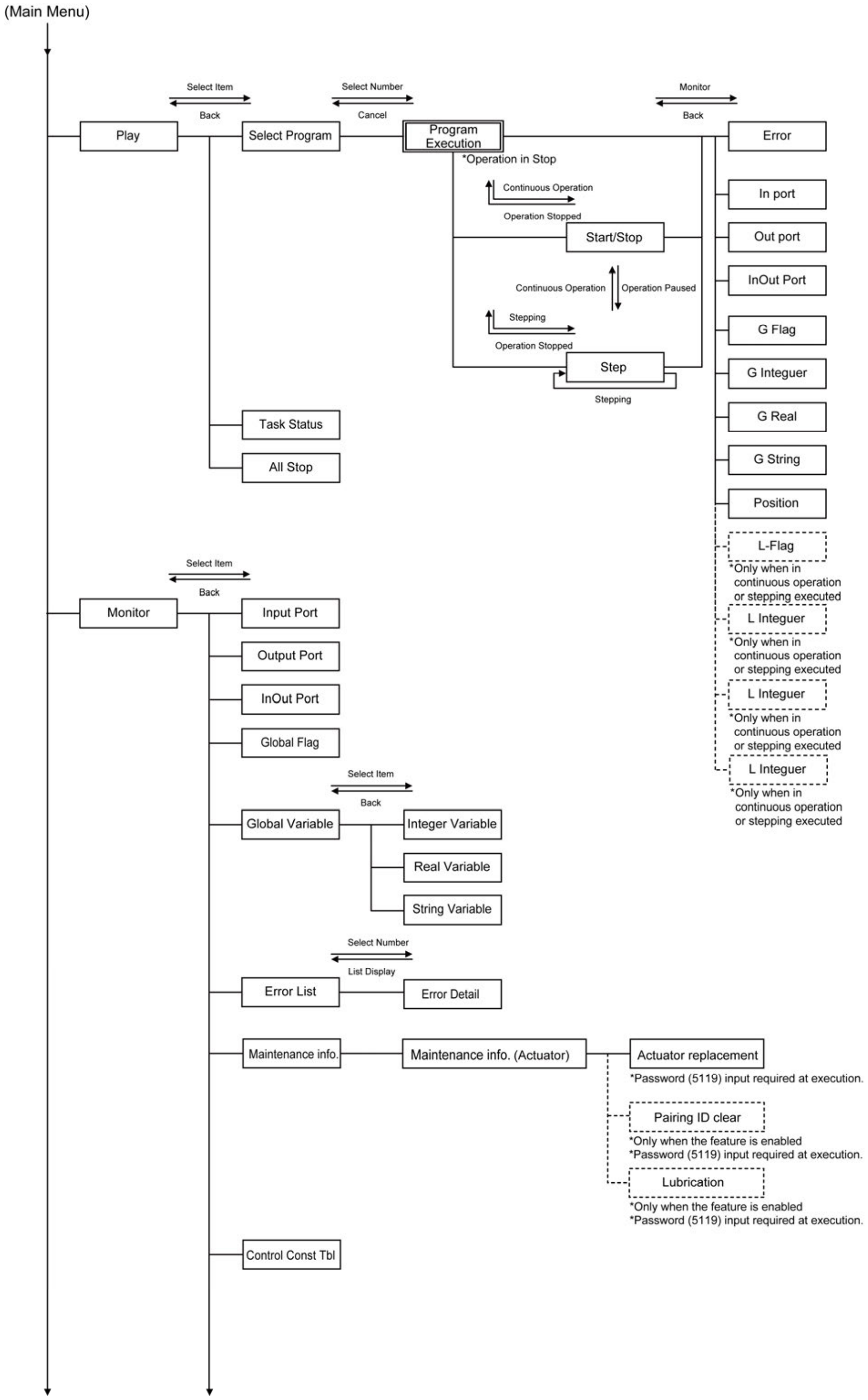
*Conduct edit after inputting position number
(Position number input is available also on PageUp/Dn)
*Data writing by "Write"

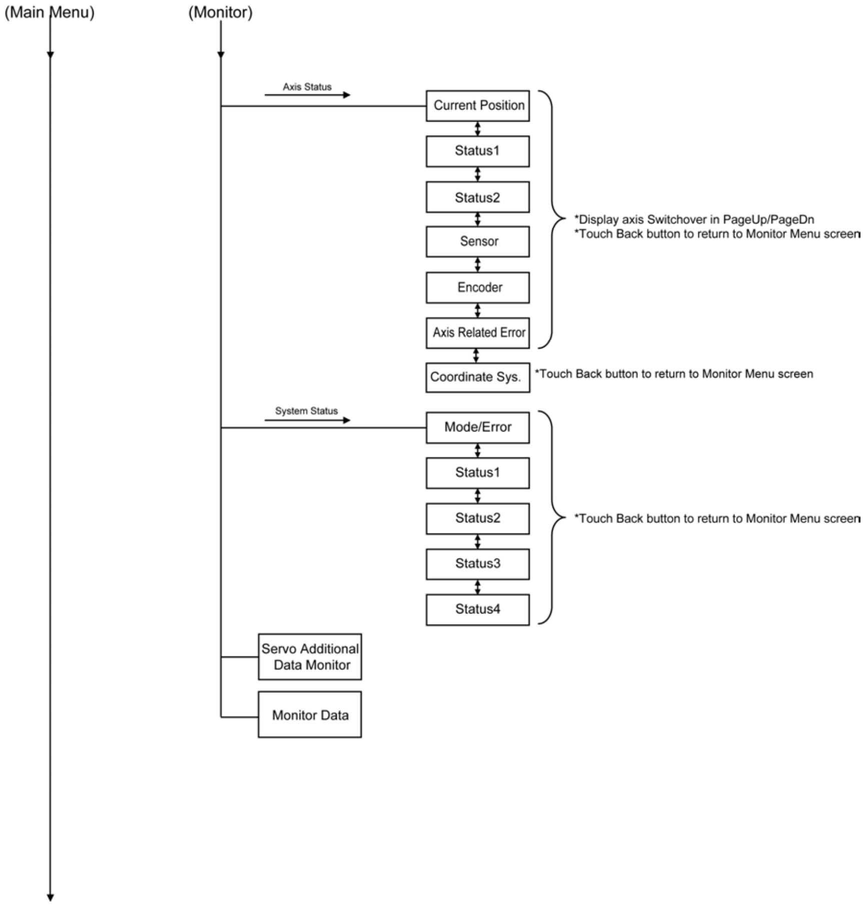
*Conduct teaching and edit after inputting position number
(Position number input is available also on PageUp/Dn)
*After data writing by "Write", go to next position
*Same for Cartesian axes

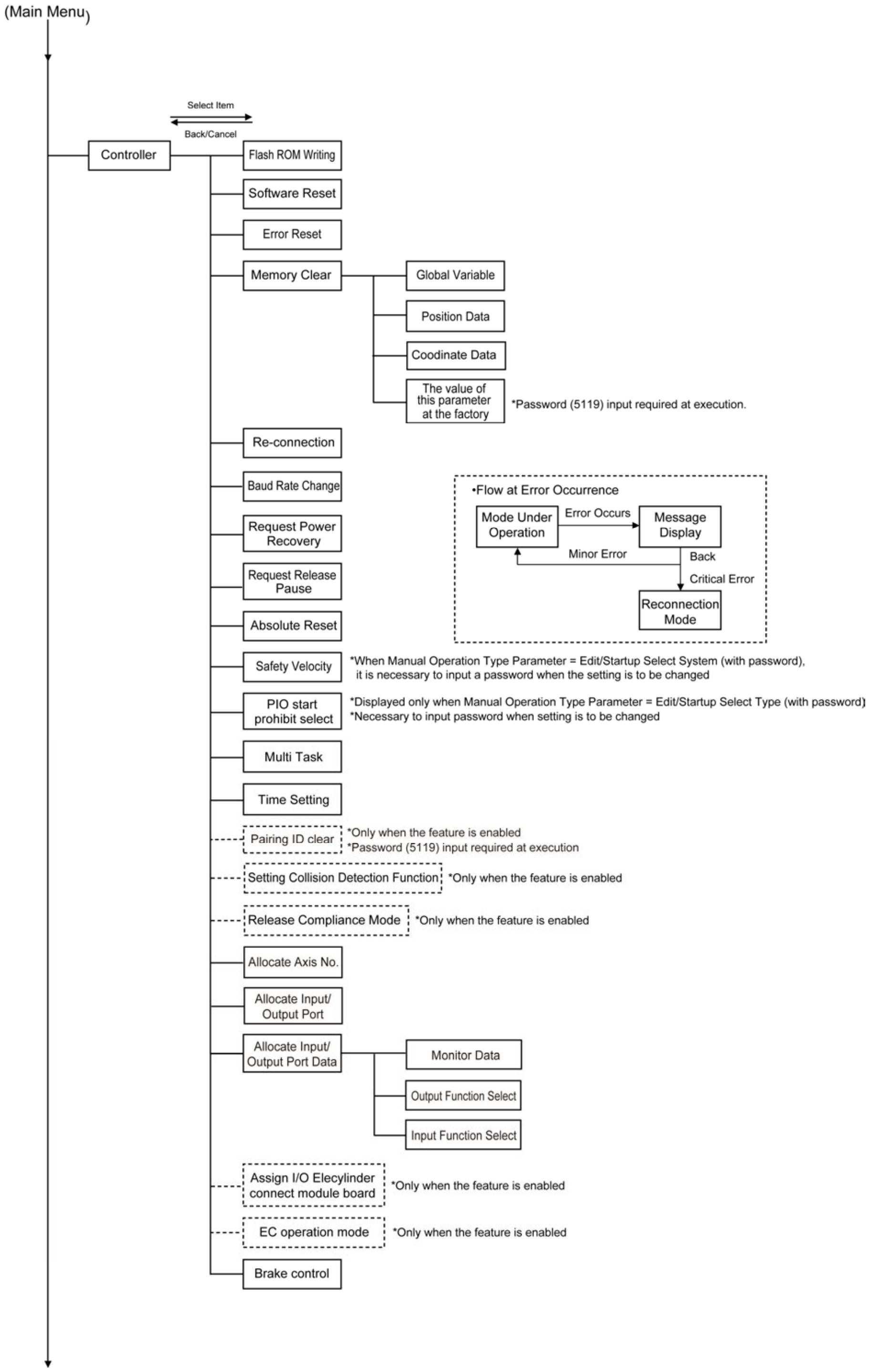
*Conduct edit after inputting step number
(Step number input is available also on PageUp/Dn)
*Data writing by "Write"



*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
Play
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
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
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
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



*Password (5119) input required at execution.

*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

*Displayed only when Manual Operation Type Parameter = Edit/Startup Select Type (with password)
*Necessary to input password when setting is to be changed

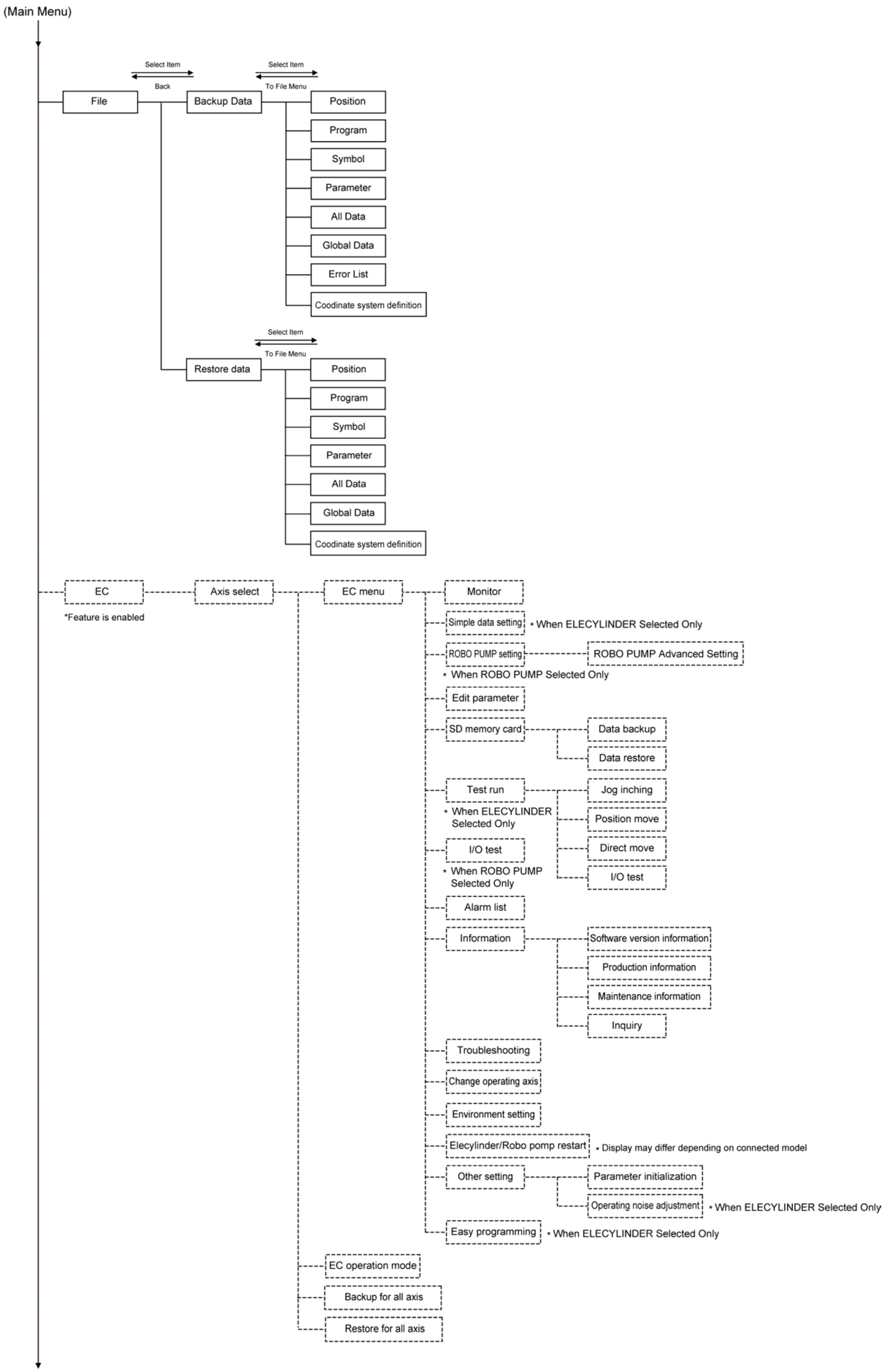
*Only when the feature is enabled
*Password (5119) input required at execution

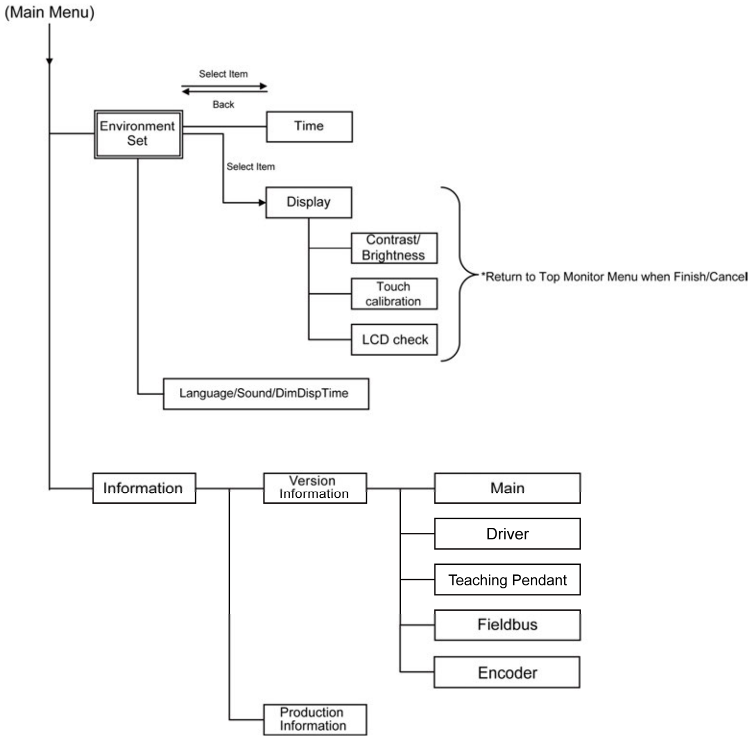
*Only when the feature is enabled

*Only when the feature is enabled

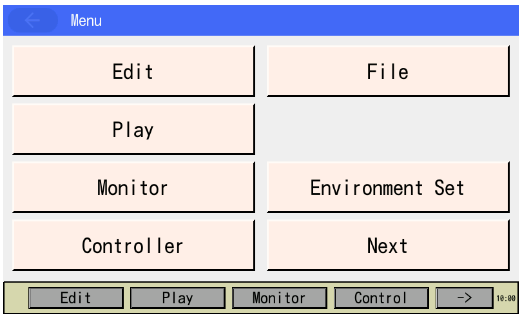
*Only when the feature is enabled

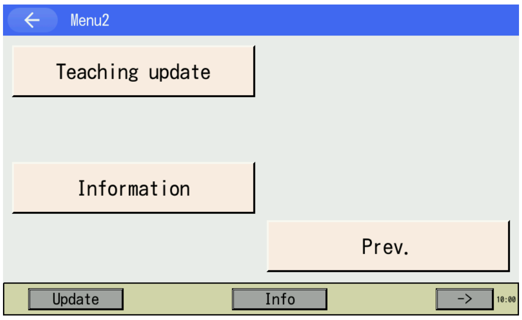
*Only when the feature is enabled


(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
Select Item
To File Menu
Restore data
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]

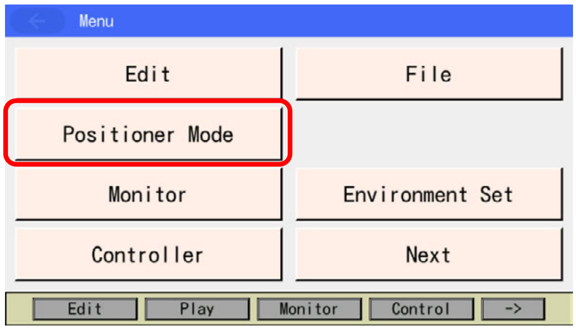
- Information : Version* and manufacturing information is displayed.
  Refer to [23. Information Display] (for applicable models only)

* The version information is to be displayed from either the monitor menu or the information menu. (It differs depending on the controller.)

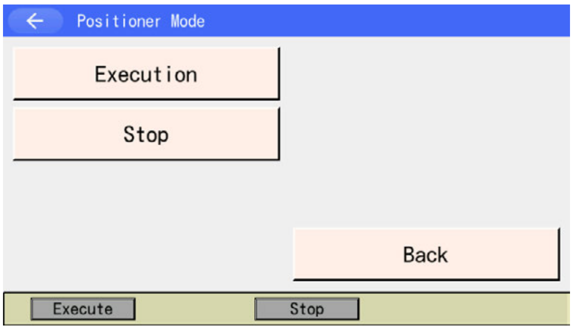
* The figures on the lower right section of the panel, show the current time (This time display is shown also on the other screens).

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.*

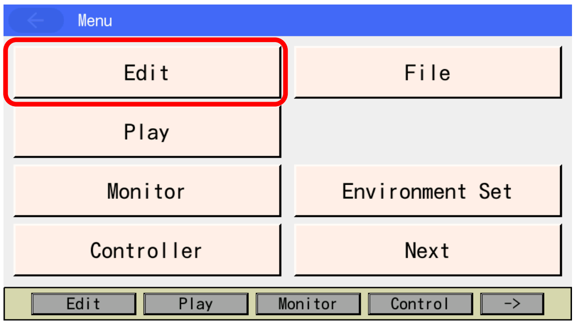
8. Position Edit

There are two ways to input the position data.

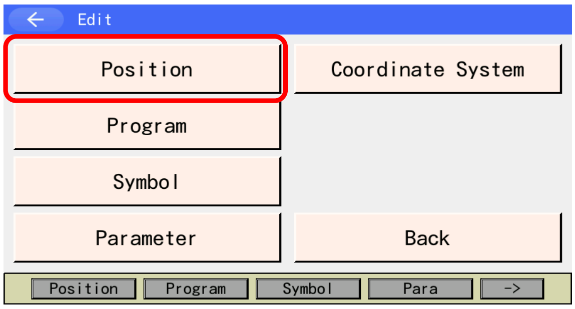
(1) Numerical input ··· It is the way to input numbers directly on the numeric keys in the touch panel in the position edit screen.

(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)

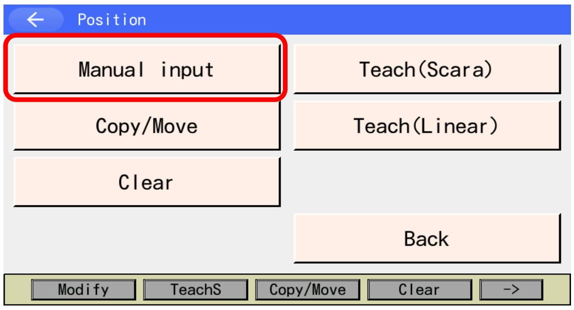


Touch Edit button in the Menu screen.



Touch Position button on the Edit screen.

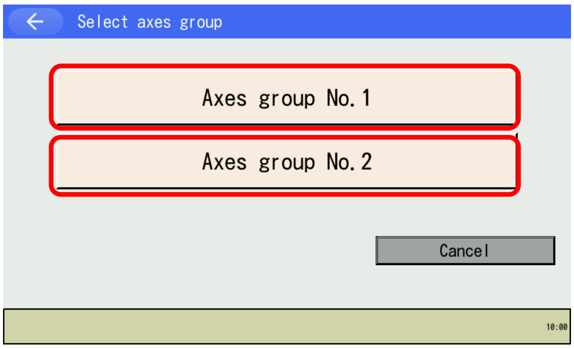
* Example shown on the left is for XSEL-KX, PX/QX, RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD and MSEL-PCX/PGX and XSEL2-TX.



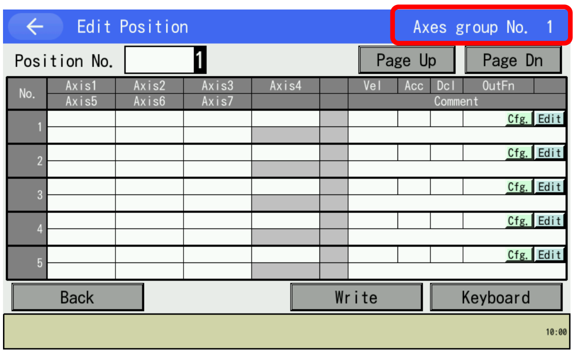
Touch Manual input button in Position menu screen.
Edit Position screen will appear.

* 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 window 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.



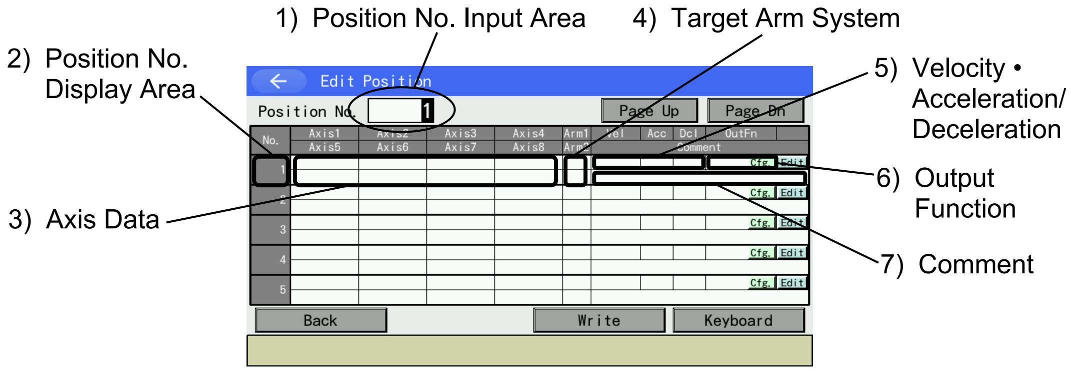
The select axes group window should appear after you touch the Manual Input button.
Touch an Axes group No. button.

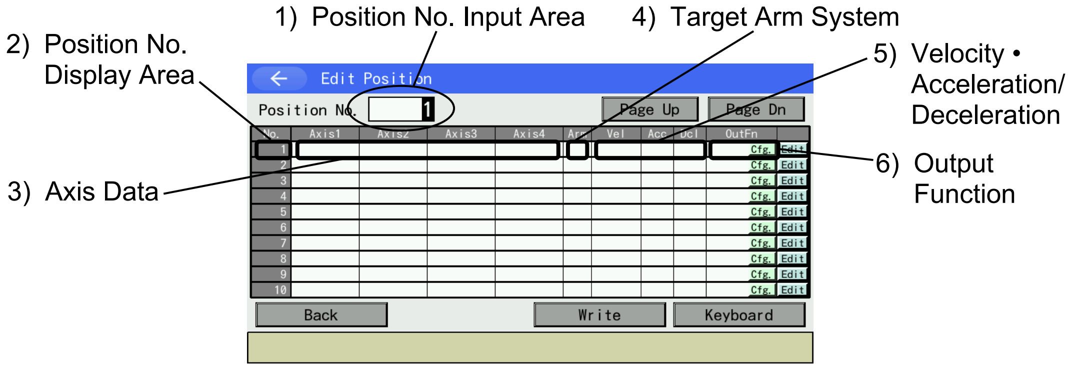


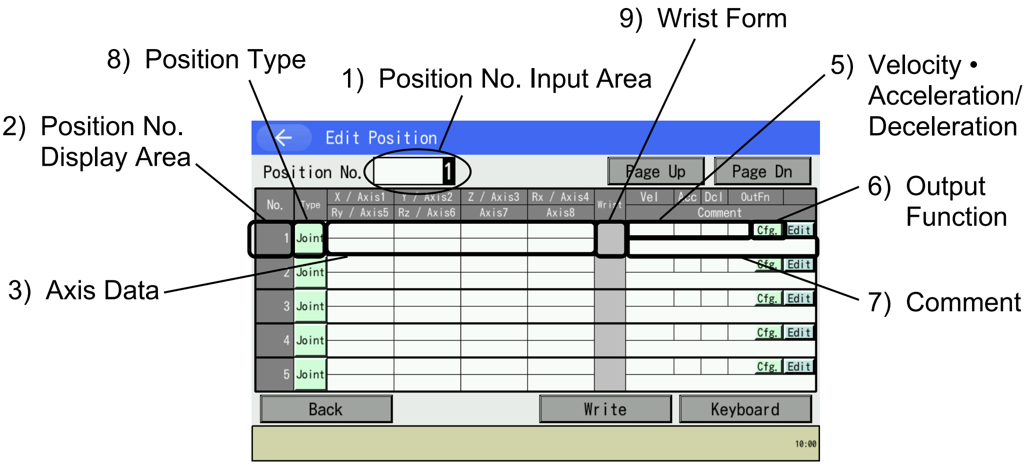
Edit Position screen will appear.

* 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-K/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-Tand for XSEL-K/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).

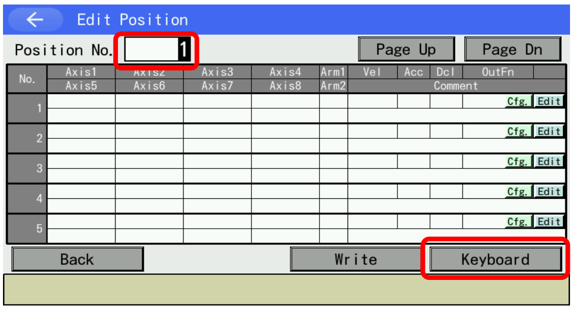
9) Wrist Form

Wrist

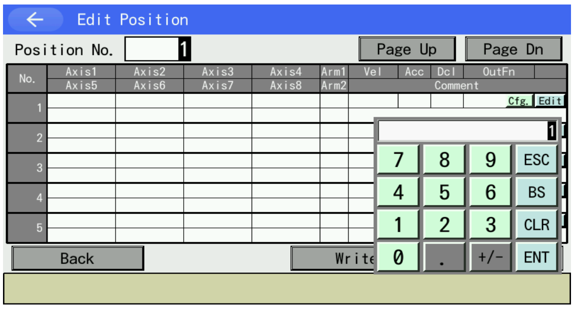
It should be displayed only when the 6-axis cartesian is activated.
Indication can be made for the wrist form (Flip/Non Flip/Not Indicated). It can be indicated only when the position type is the orthogonal coordinates.

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.)

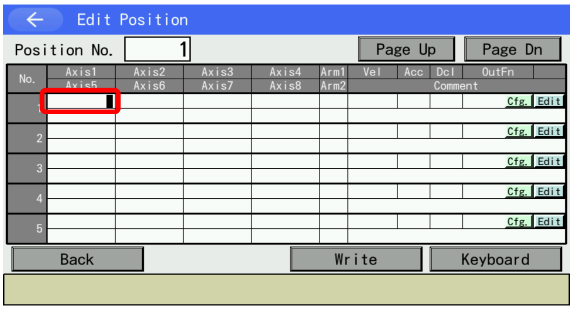


Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.

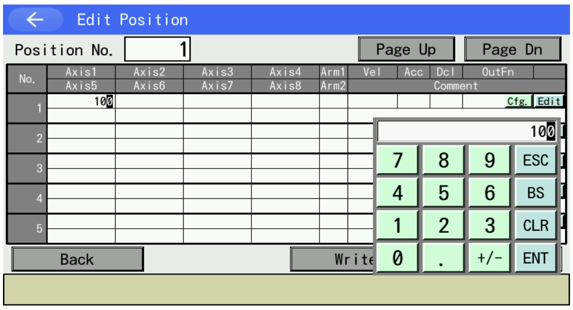


Touch the numeric part on the touch panel numeric keys to input numbers.
The contents of input will be shown in the box above the touch panel numeric keys.
When confirming the input number, touch ENT.
After touch panel numeric keys close and displayed range switches, the cursor moves to the input box 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.

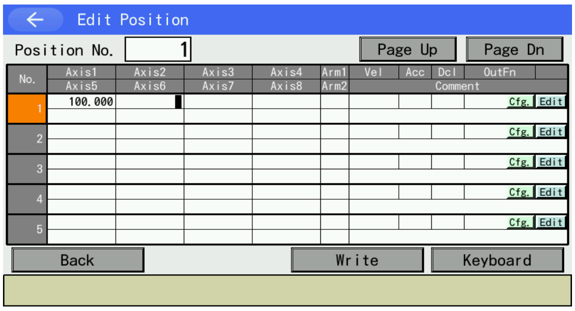
[Input of Axis Data (Axes1 to 8, X / Axis1～Rz / Axis6), Vel (Velocity), Acc (Acceleration) and Dcl (Deceleration)]
Show the cursor to the input area for the item which is desired for inputting. To show the cursor in the input area for the item which is desired for inputting is to touch in that area (white area in the background, or an area framed in red for Axis1).



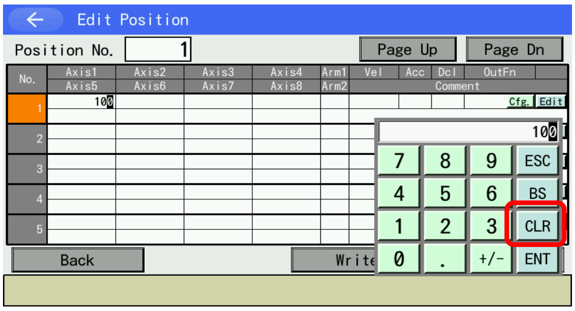
Touch the Keyboard button with the cursor being displayed to show the touch panel numeric keys in order to input numbers.



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.

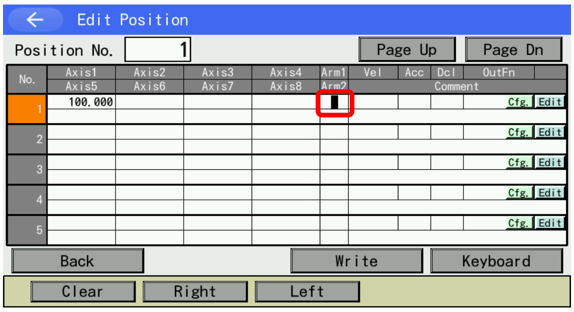


When you want to erase the data that is already input, touch CLR ENT on the touch panel numeric keys to delete what you want.

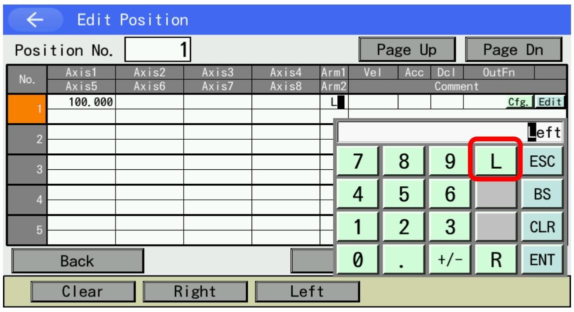
[Input of Target Arm System Data (Arm1 or Arm), (Arm2)]

* Arm1 (Arm) is a function dedicated only for XSEL-RX/SX, RXD/SXD, RAX/SAX, RAXD/SAXD or 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).



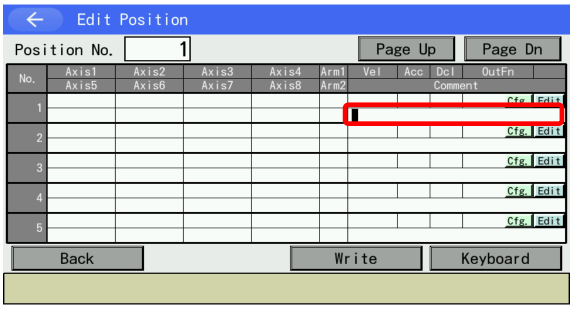
With the cursor being displayed, touch Keyboard button to show the touch panel numeric keys to input L/R.



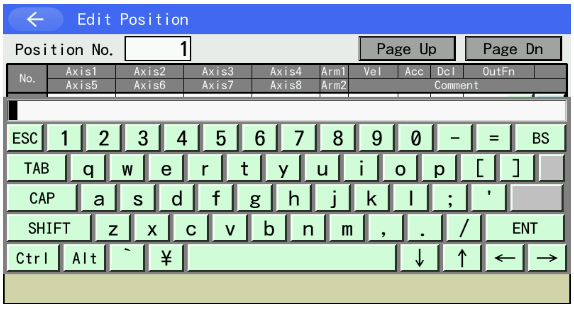
When you want to input Left (left arm), touch Keyboard button to show the touch panel numeric keys, and touch L ENT on the touch panel numeric keys.
When you want to input Right (right arm), touch R ENT, and when you delete what is input, touch CLR ENT.

[Input Comment]

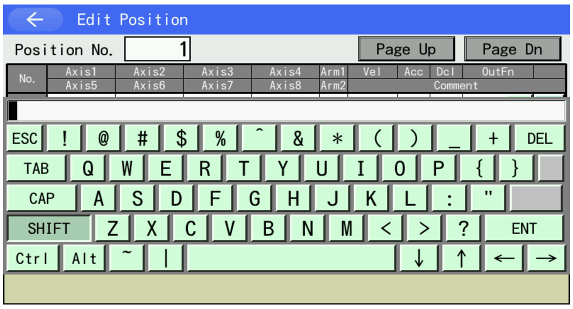
* Feature for XSEL-R/S, RX/SX, RXD/SXD, RA/SA, RAX/SAX RAXD/SAXD, RSEL and XSEL2-T/TX
Have the cursor displayed in the comment input box. To show the cursor in the box, touch the comment input area (area that the background is white, marked with red highlight).



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


Edit Position
Position No. 1
Page Up
Page Dn
No. Axis1 Axis2 Axis3 Axis4 Arm1 Vel Acc Dcl OutFn
Axis5 Axis6 Axis7 Axis8 Arm2 Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →

Initial Screen


Edit Position
Position No. 1
Page Up
Page Dn
No. Axis1 Axis2 Axis3 Axis4 Arm1 Vel Acc Dcl OutFn
Axis5 Axis6 Axis7 Axis8 Arm2 Comment
ESC ! @ # $ % ^ & * ( ) _ + DEL
TAB Q W E R T Y U I O P { }
CAP A S D F G H J K L : "
SHIFT Z X C V B N M < > ? ENT
Ctrl Alt ~ | ↓ ↑ ← →

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.

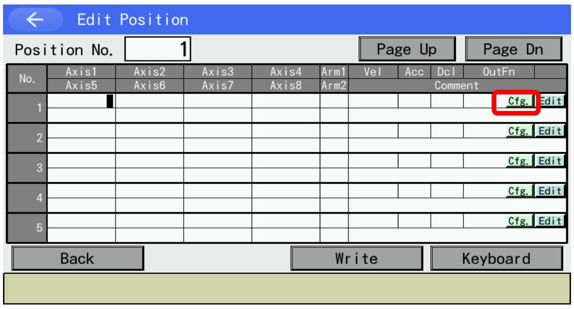
Operation of Special Function Keys out of Letters

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.

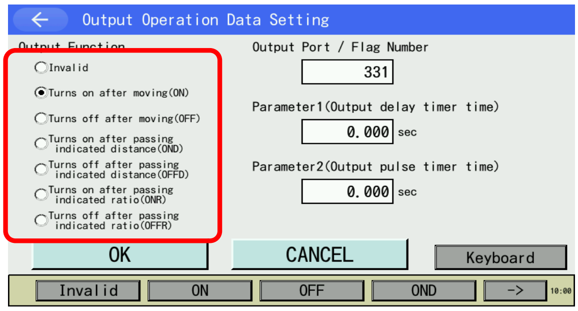
[Position Output Operation Data Input]

* Feature available only when position output operation feature is valid

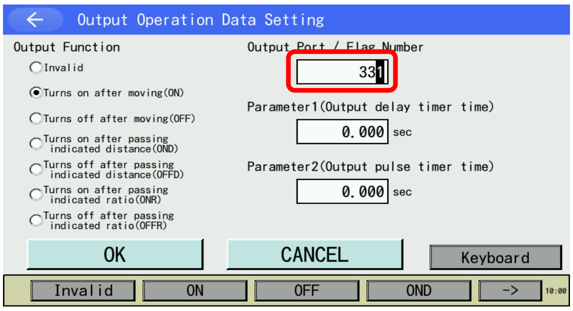
Touch the Cfg. button of the position data required to input (area marked with red highlight). The cursor will not be displayed.



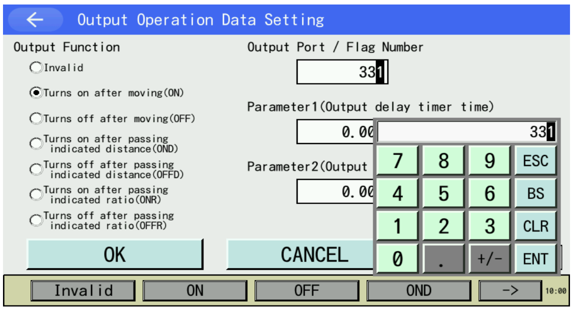
Touch the Cfg. button of the position data required to input. The screen switches to the setting window.


Output Operation Data Setting
Output Function
○Invalid
●Turns on after moving(ON)
○Turns off after moving(OFF)
○Turns on after passing indicated distance(OND)
○Turns off after passing indicated distance(OFFD)
○Turns on after passing indicated ratio(ONR)
○Turns off after passing indicated ratio(OFFR)
Output Port / Flag Number
331
Parameter1(Output delay timer time)
0.000 sec
Parameter2(Output pulse timer time)
0.000 sec
OK
CANCEL
Keyboard
Invalid
ON
OFF
OND
->

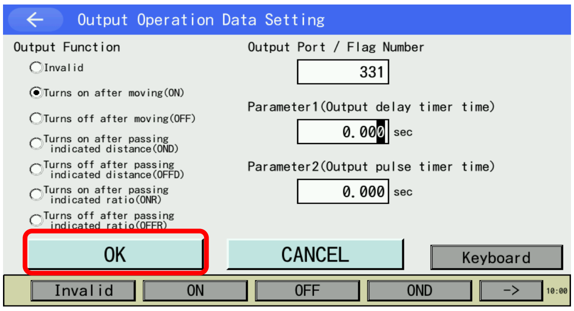
Select the output functions. Touch the radio buttons that you would like to select (figure in left, area marked with red highlight).


Output Operation Data Setting
Output Function
○Invalid
●Turns on after moving(ON)
○Turns off after moving(OFF)
○Turns on after passing indicated distance(OND)
○Turns off after passing indicated distance(OFFD)
○Turns on after passing indicated ratio(ONR)
○Turns off after passing indicated ratio(OFFR)
Output Port / Flag Number
331
Parameter1(Output delay timer time)
0.000 sec
Parameter2(Output pulse timer time)
0.000 sec
OK
CANCEL
Keyboard
Invalid
ON
OFF
OND
->

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.

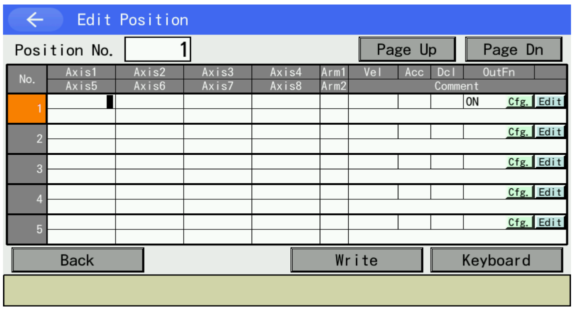

Output Operation Data Setting
Output Function
○Invalid
●Turns on after moving(ON)
○Turns off after moving(OFF)
○Turns on after passing indicated distance(OND)
○Turns off after passing indicated distance(OFFD)
○Turns on after passing indicated ratio(ONR)
○Turns off after passing indicated ratio(OFFR)
Output Port / Flag Number
331
Parameter1(Output delay timer time)
Parameter2(Output
331
7
8
9
ESC
4
5
6
BS
1
2
3
CLR
0
.
+/-
ENT
OK
CANCEL
Invalid
ON
OFF
OND
->

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.


Output Operation Data Setting
Output Function
○Invalid
●Turns on after moving(ON)
○Turns off after moving(OFF)
○Turns on after passing indicated distance(OND)
○Turns off after passing indicated distance(OFFD)
○Turns on after passing indicated ratio(ONR)
○Turns off after passing indicated ratio(OFFR)
Output Port / Flag Number
331
Parameter1(Output delay timer time)
0.000 sec
Parameter2(Output pulse timer time)
0.000 sec
OK
CANCEL
Keyboard
Invalid
ON
OFF
OND
->

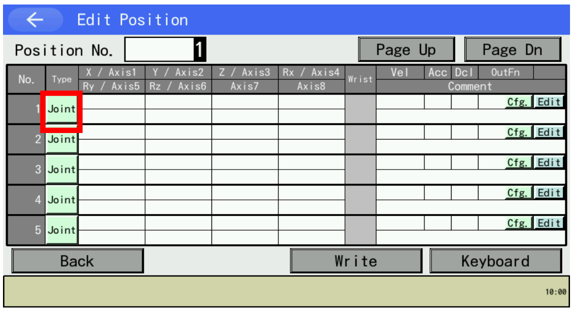
If the data is received properly, the screen goes back to the position output operation data setting window, and the cursor moves to the input area for the next item.

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.

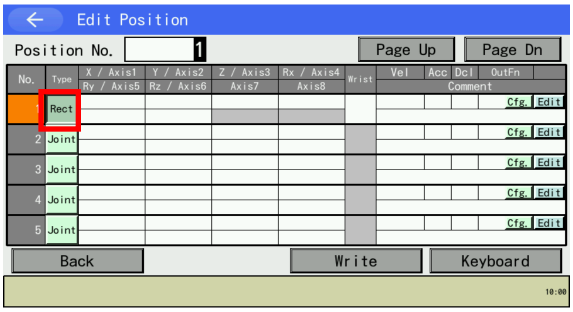


The selected output functions will be displayed in the output function column (OutFn).

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



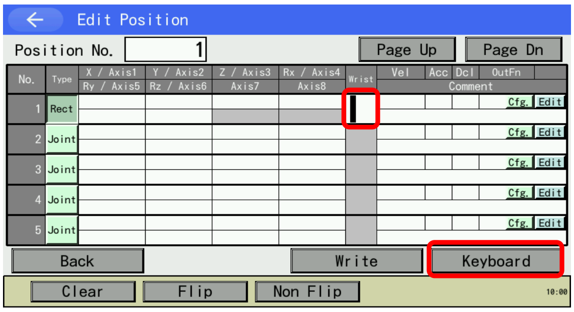
Touch a button in the position type column.



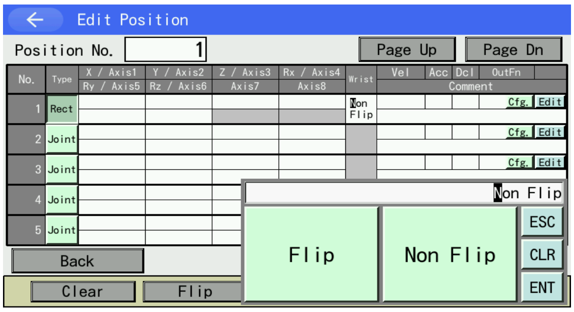
Button display in the position type column switches over.
Also, the display in the following item boxes switches along the selection of the position type.
(Available for input = Background in white / Unavailable for input = Background in grey)

* 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 coordinate

[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.



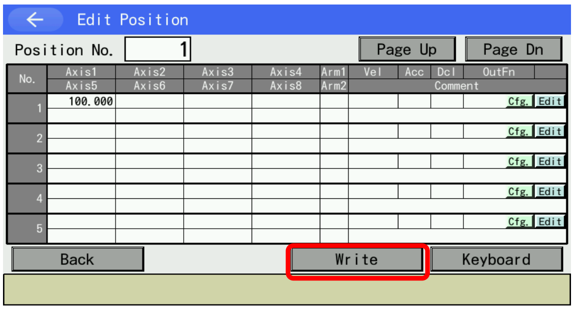
With the cursor kept showing, touch Keyboard button to show the touch panel keyboard and input Flip/Non Flip.



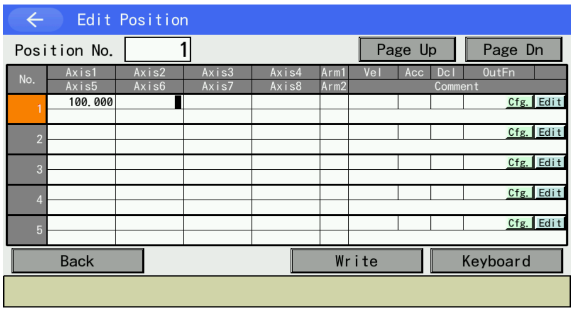
When it is required to input Flip, touch Flip and then ENT on the keyboard. When required Non Flip, touch Non Flip and then ENT.

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

[Data Transfer]



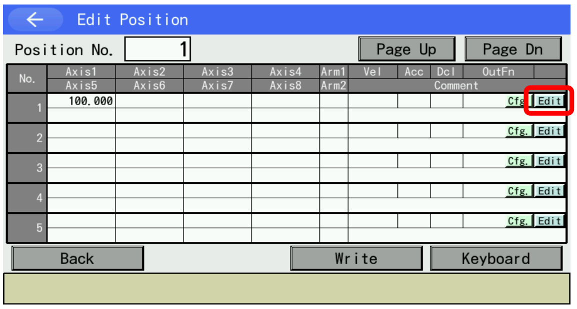
After inputting data, touch Write button on the touch panel to transfer the data to the controller.



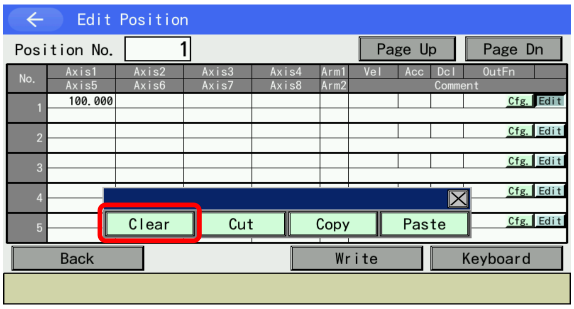
Once the transfer to the controller is complete, the background color in the position number display column will turn to the normal condition.

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)

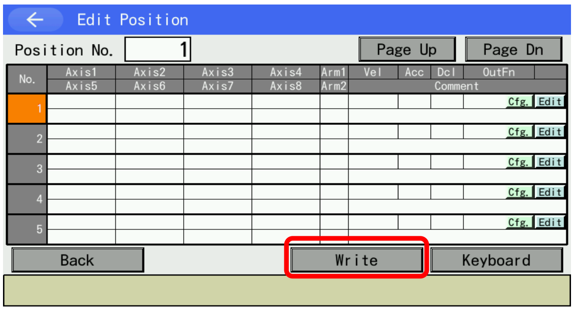
[Data Clear]



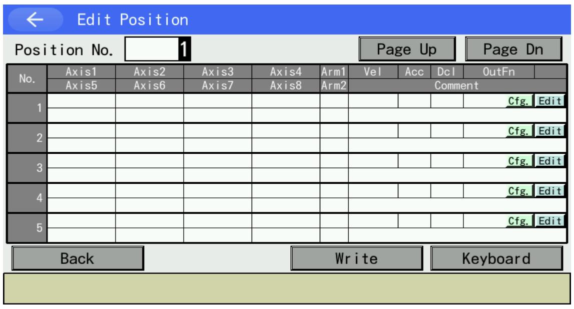
When you would like to delete the position data, touch Edit button on the position data that you would like to delete. The edit window opens.



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



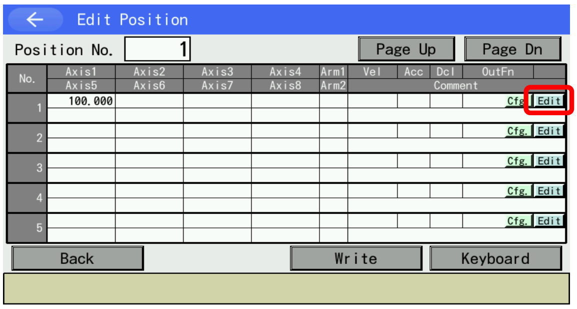
The position data was deleted, and the background color of the position number display column turns to orange, which shows that it is being edited (controller writing not yet done). Touch Write button on the touch panel to transfer the data to the controller.



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)

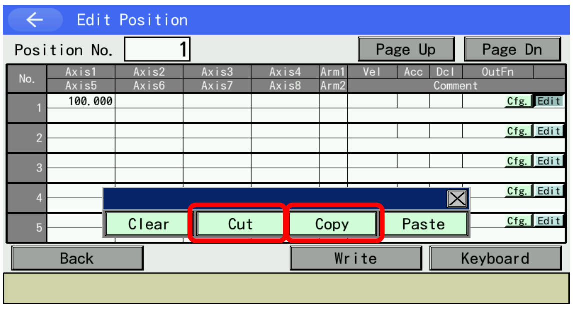
[Copy and move of data]



Position No. 1

100.000

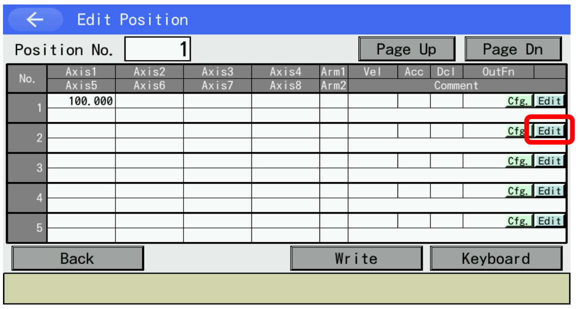
When you would like to copy (or move) the position data, touch the Edit button on the position data that you would like to copy (or move) from. The edit window opens.



Position No. 1

100.000

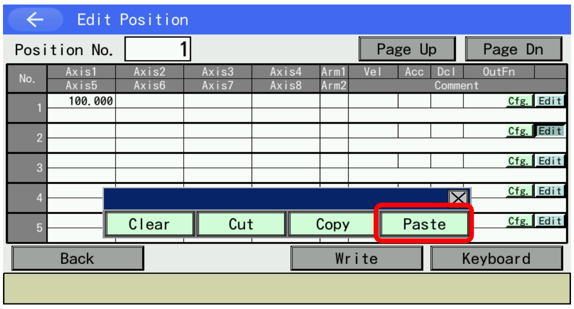
Touch the Copy button in the edit window when you would like to copy the data. Touch the Cut button in the edit window when you would like to move the data. The edit window closes.



Position No. 1

100.000

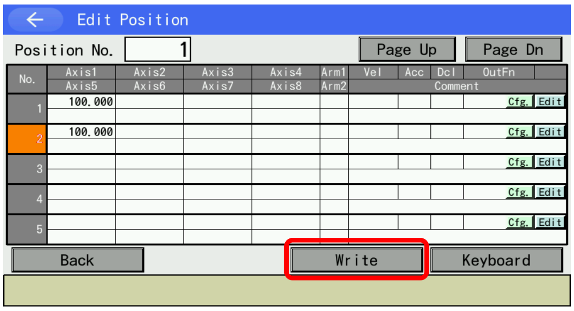
Touch the Edit button on the position data that you would like to copy (or move) the data to. The edit window opens.



Position No. 1

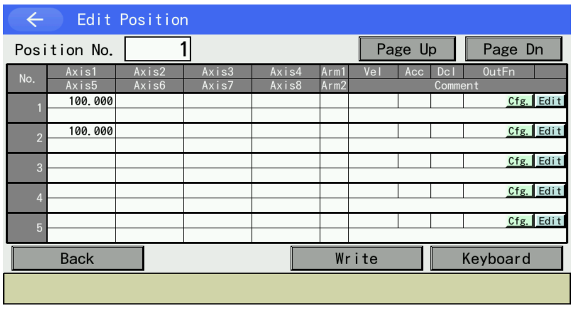
100.000

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.

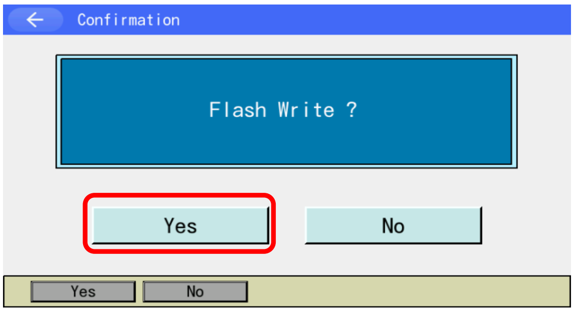


Once the transfer to the controller is complete, the background color in the position number display column will turn to the normal condition.

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)

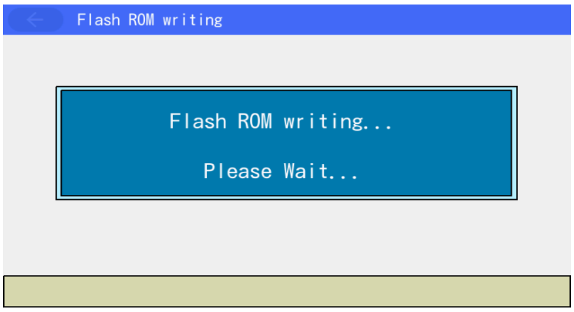
8.1.2 Flash ROM Writing

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.



Flash Write ?

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

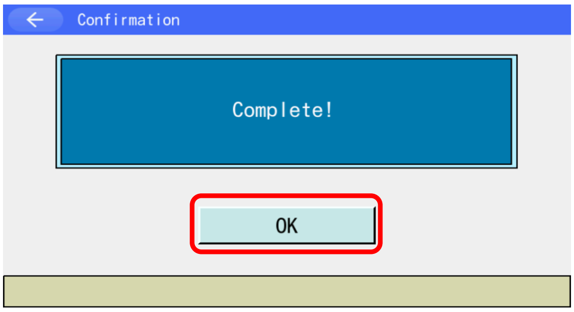


Flash ROM writing...

Please Wait...

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.



Complete!

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.

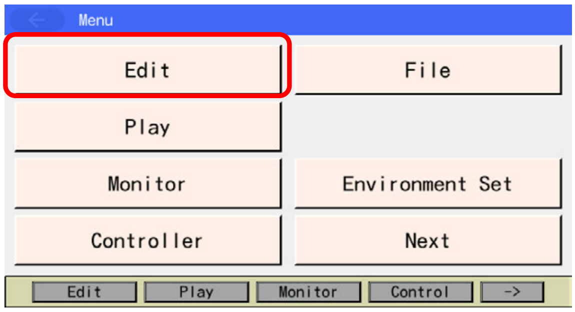
↓

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

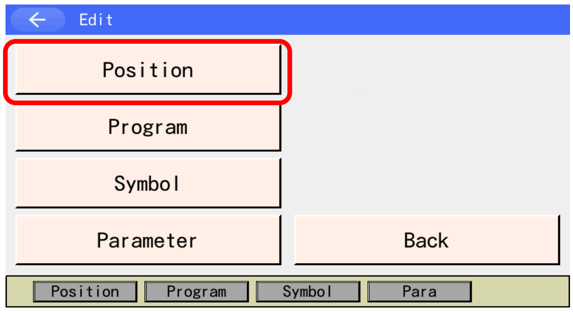
↓

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.

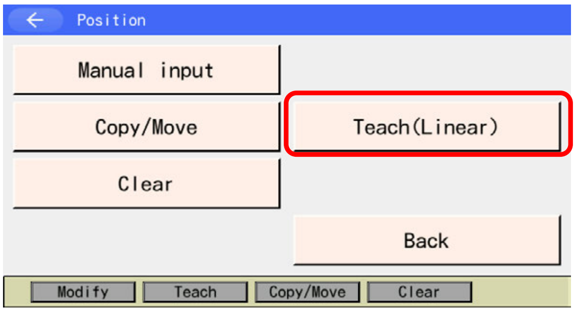


Touch Edit button in the Menu screen.

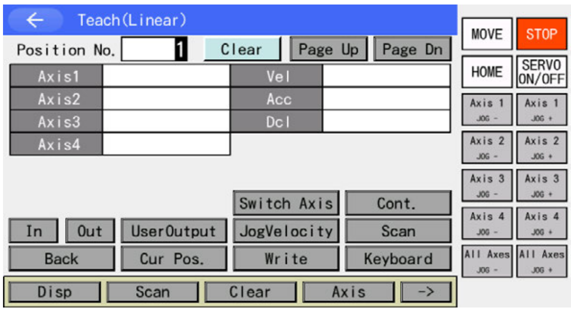


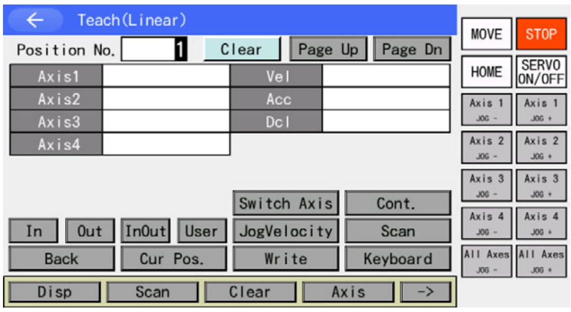
Touch Position button on the Edit screen.

* 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).



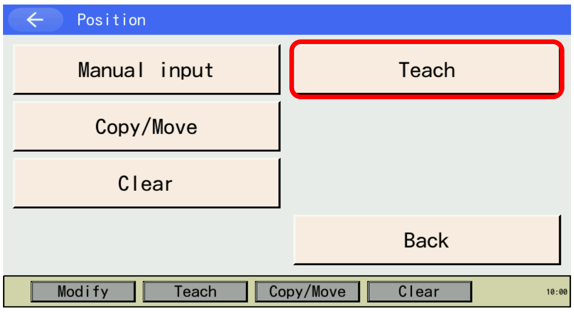
Touch Teach (Linear) button in Position menu screen.





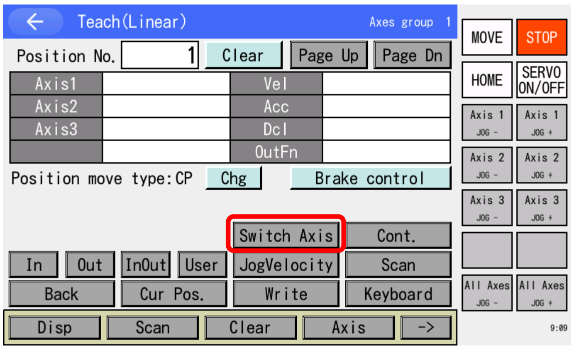
For Input and Output Ports

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



Touch Teach button in Position menu screen.

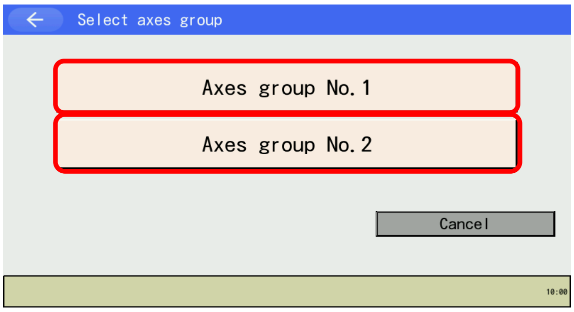
* Example in the figure on the left shows that of RSEL



Teach window appears.

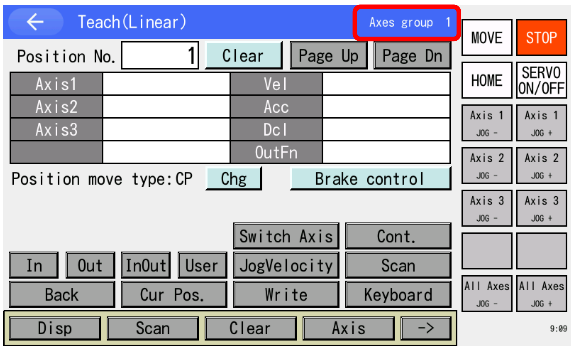
Touch the Switch Axis button to switch the screen over to the teach window that includes the axis you would require to operate.

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.



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
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

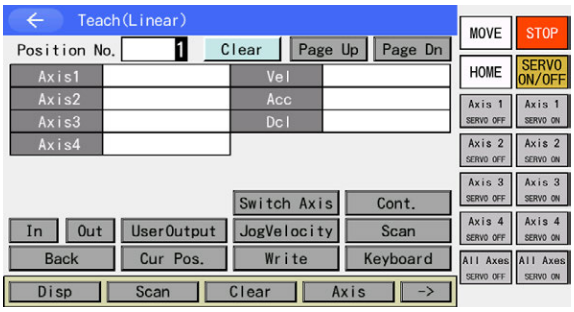
Explanation for each Touch Panel Button

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

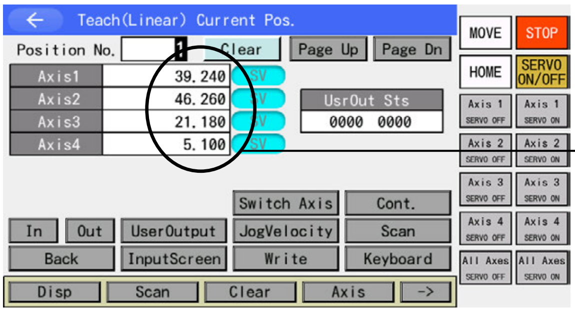
InOut	Input and output ports are monitored.
User	Turn ON/OFF the output ports (sequential 8 points at the maximum set to parameters). (It is required to preset the I/O parameters No. 74 and No. 75.)

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



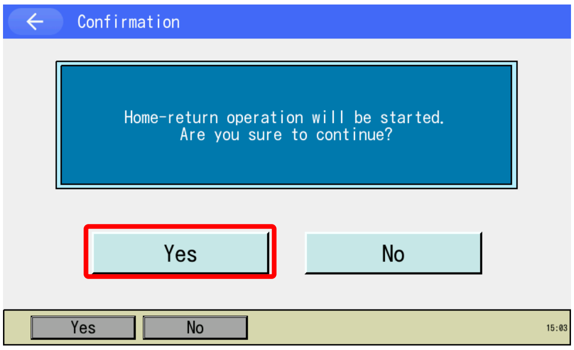
Turn the servo ON condition by touching the SERVO ON/OFF button and then the Servo all axes ON button in the Teach screen condition.
To check if servo is turned ON or OFF, touch Cur Pos. button.
After touching Home button, touch Move All Axes for all the axes, and the screen shifts to the home-return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

Current Position (Input Screen) Button



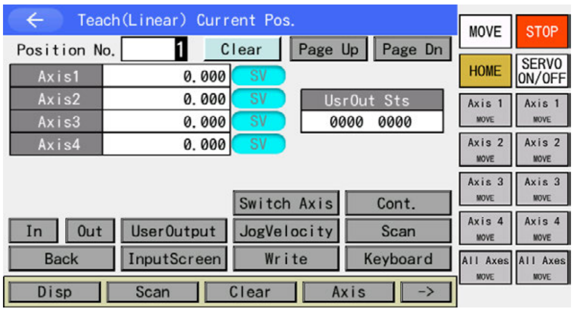
Axis1 39.240
Axis2 46.260
Axis3 21.180
Axis4 5.100
UsrOut Sts 0000 0000

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



Home-return operation will be started.
Are you sure to continue?

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.

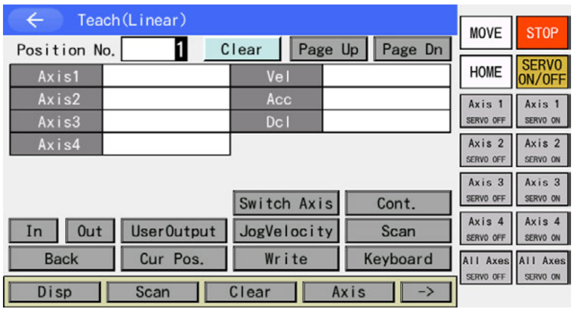


Axis1 0.000
Axis2 0.000
Axis3 0.000
Axis4 0.000
UsrOut Sts 0000 0000

After homing is complete, execute teaching.

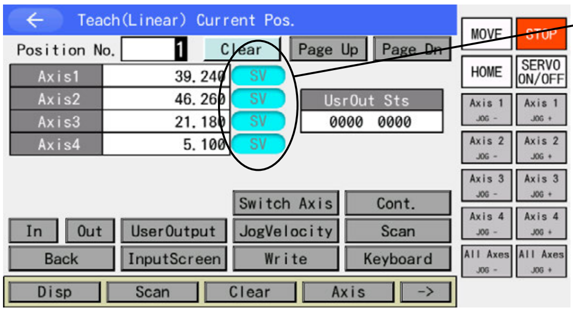
(1) Movement of an actuator

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.

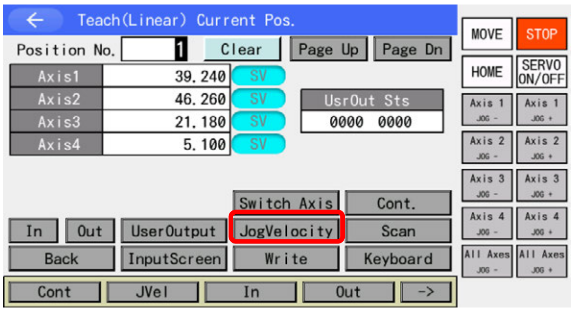
Current Position (Input Screen) Button



Axis1 39.240
Axis2 46.260
Axis3 21.180
Axis4 5.100
UsrOut Sts 0000 0000

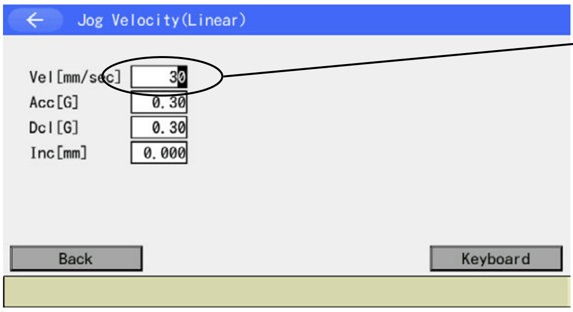
Servo Status
Light Blue: Servo ON, Black: Servo OFF

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.



Axis1 39.240
Axis2 46.260
Axis3 21.180
Axis4 5.100
UsrOut Sts 0000 0000

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

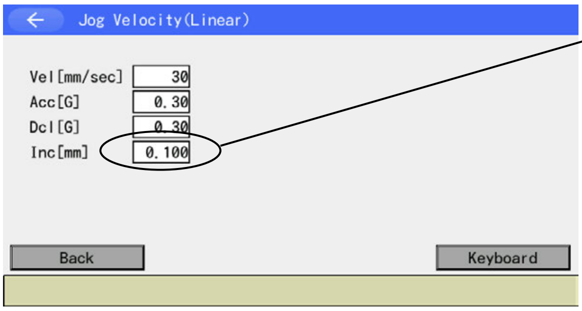


Vel[mm/sec] 30
Acc[G] 0.30
Dcl[G] 0.30
Inc[mm] 0.000

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



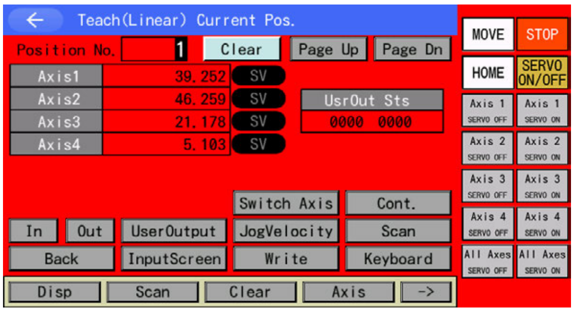
Vel[mm/sec] 30
Acc[G] 0.30
Dcl[G] 0.30
Inc[mm] 0.100

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.

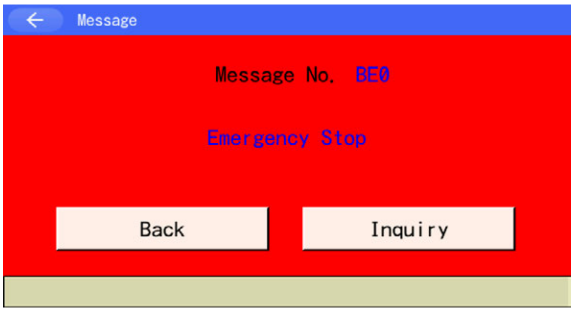
Touch the jog button once and the actuator moves for the distance of 1 inching. Touch Axis 1 JOG+ to Axis 4 JOG+ button and ALL Axes+ button to perform inching movement in the positive direction of the coordinate and Axis 1 JOG- to Axis 4JOG- button and ALL Axes- button to perform inching in the negative 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



Position No. 1
Axis1 39.252
Axis2 46.259
Axis3 21.178
Axis4 5.103
UsrOut Sts 0000 0000

Turn the servo OFF condition by touching the SERVO ON/OFF button and the Touch Servo all axes ON button to turn the servo off.
To check if servo is turned ON or OFF, touch Cur 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.)



Message No. BE0

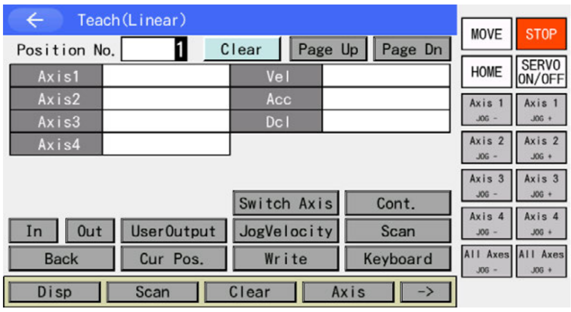
Emergency Stop

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

Touch Back button to return to Teaching screen.

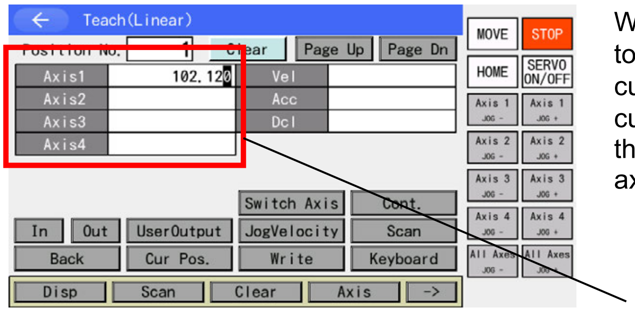
⚠ *Warning:*
Be sure to execute manual movement when the EMERGENCY STOP button is pressed.

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



Position No. 1

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.

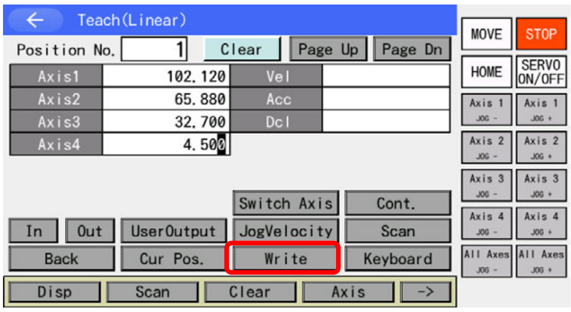


Position No. 1
Axis1 102.120

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.

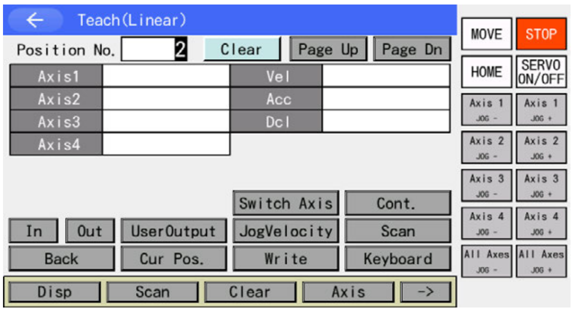
Axis boxes

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



Position No. 1
Axis1 102.120
Axis2 65.880
Axis3 32.700
Axis4 4.500

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.



Position No. 2

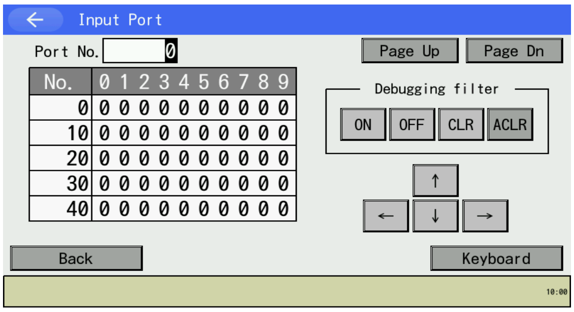
If the screen is switched with touching Page Up, Page Dn or Back button, before the data is transferred, the input data will become invalid.

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

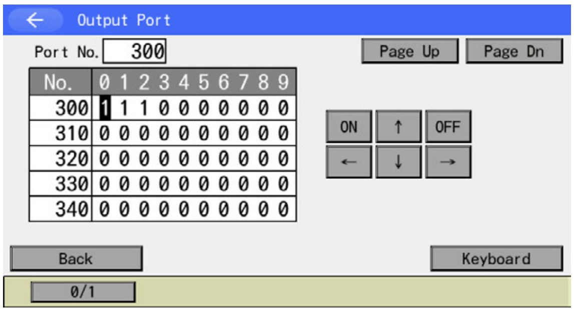


Port No. 0

No.	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0

Refer to [14.2 Input Port] for debug filters.

Output Port

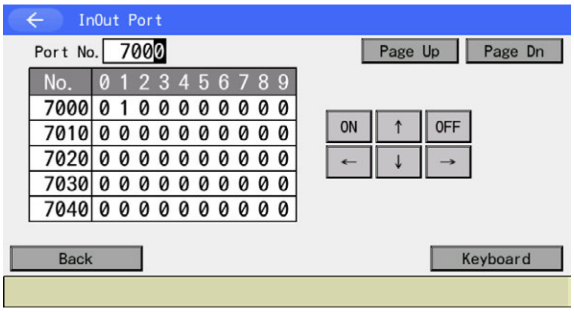


Port No. 300

No.	0	1	2	3	4	5	6	7	8	9
300	1	1	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0

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

Input/Output Port (for applicable models)



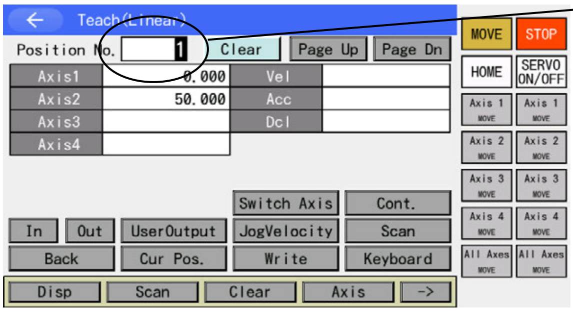
Port No. 7000

No.	0	1	2	3	4	5	6	7	8	9
7000	0	1	0	0	0	0	0	0	0	0
7010	0	0	0	0	0	0	0	0	0	0
7020	0	0	0	0	0	0	0	0	0	0
7030	0	0	0	0	0	0	0	0	0	0
7040	0	0	0	0	0	0	0	0	0	0

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.



Position No. 1

Axis1 0.000

Axis2 50.000

Axis3

Axis4

Vel

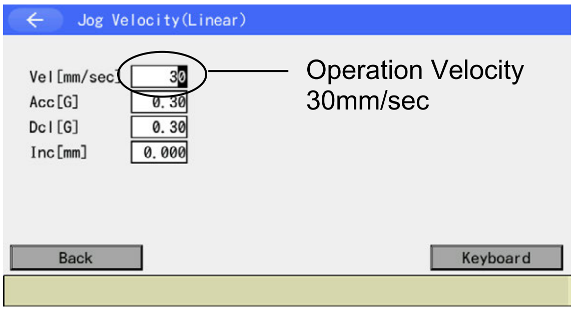
Acc

Dcl

Position No. 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 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 Axis 1 MOVE to Axis 4 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.



Vel[mm/sec] 30

Acc[G] 0.30

Dcl[G] 0.30

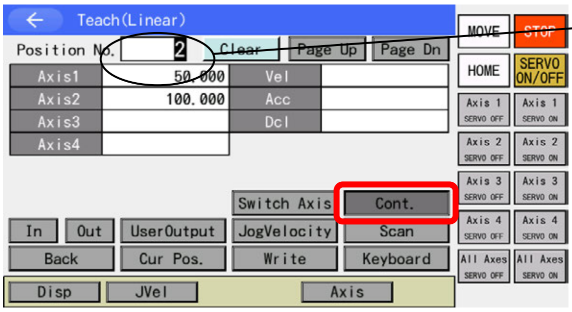
Inc[mm] 0.000

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

3) Continuous movement

Move the actuator continuously to the location of the position data transmitted to the controller.



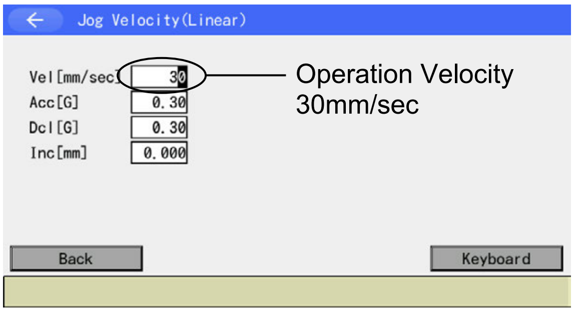
Position No. 2
Axis1 50.000
Axis2 100.000
Axis3
Axis4

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 Servo all axes ON button to turn the servo ON.
To check if servo is turned ON or OFF, touch Cur Pos. button.

Touch Cont. button.

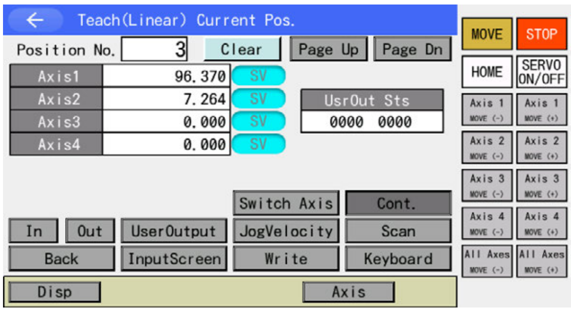
To check or change the operation velocity, touch JogVelocity button.



Vel[mm/sec] 30
Acc[G] 0.30
Dcl[G] 0.30
Inc[mm] 0.000

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

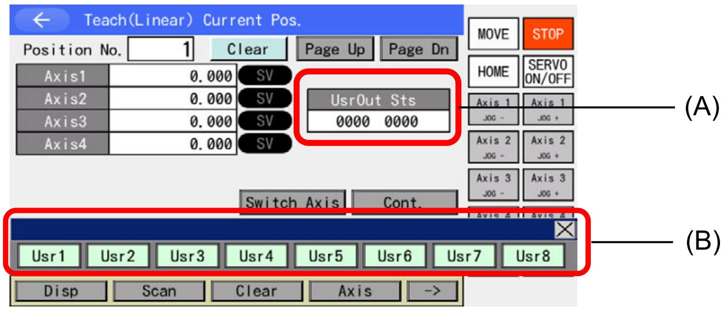


Position No. 3
Axis1 96.370
Axis2 7.264
Axis3 0.000
Axis4 0.000
UsrOut Sts 0000 0000

The actuator (in all axes) starts continuous movement by touching the MOVE button and then the All Axes MOVE (+) or All Axes MOVE (-) button, in the case of all-axis movement. Touch the Axis 1 MOVE (-) Axis 1 MOVE (+) to Axis 4 MOVE (-) Axis 4 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 MOVE (+) or All Axes MOVE (-) 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.

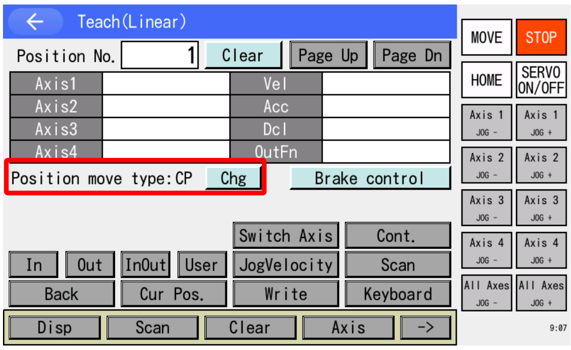
1) Setting of user-specified output port parameters
For the operation method for parameter setting, refer to [13. Parameter Edit].
The first port No. and the number of ports are set with the following parameters:

- 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

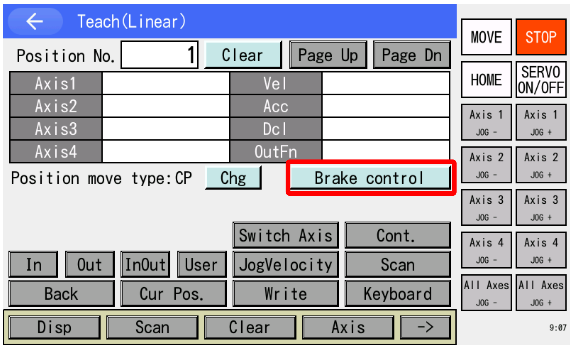
(6) Changing Position Movement Type (for applicable models only)
An operation type (CP/PTP) for position movement can be indicated.



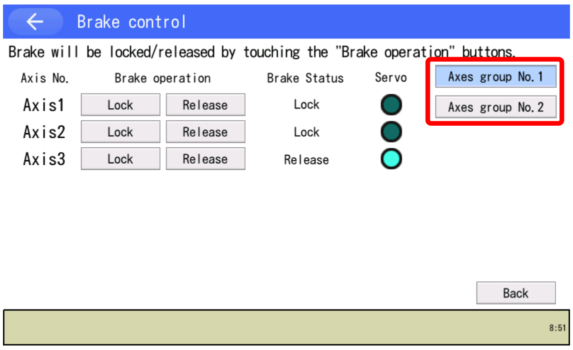
Position No. 1

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.



Position No. 1

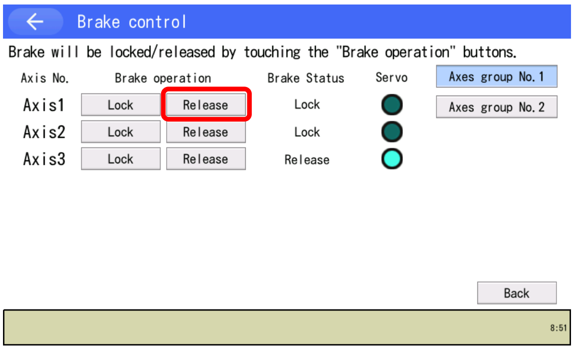


Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation		Brake Status	Servo
Axis1	Lock	Release	Lock	●
Axis2	Lock	Release	Lock	●
Axis3	Lock	Release	Release	○

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.

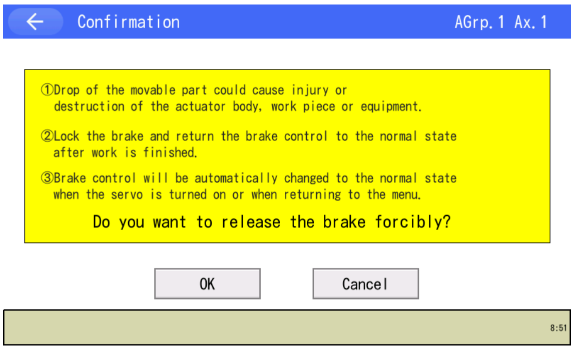
The brake operation button and the status of an effective axis should be displayed.



Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation	Brake Status	Servo
Axis1	Lock Release	Lock	●
Axis2	Lock Release	Lock	●
Axis3	Lock Release	Release	○

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



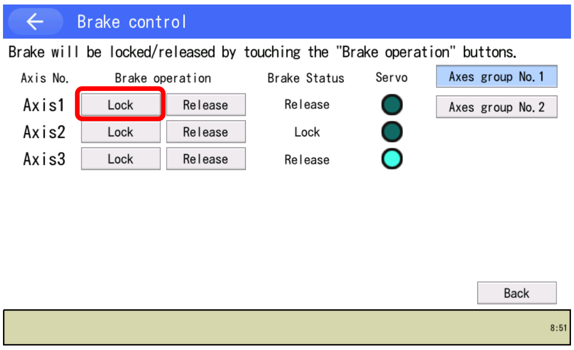
①Drop of the movable part could cause injury or destruction of the actuator body, work piece or equipment.

②Lock the brake and return the brake control to the normal state after work is finished.

③Brake control will be automatically changed to the normal state when the servo is turned on or when returning to the menu.

Do you want to release the brake forcibly?

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.



Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation	Brake Status	Servo
Axis1	Lock Release	Release	●
Axis2	Lock Release	Lock	●
Axis3	Lock Release	Release	○

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*

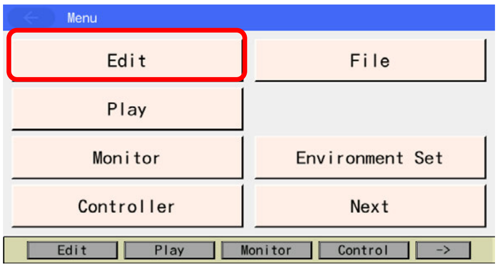
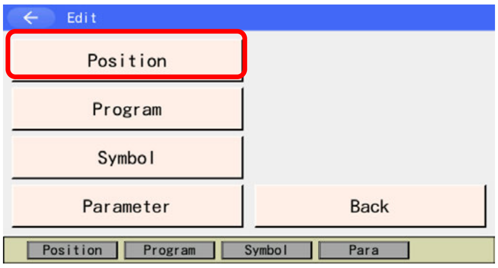
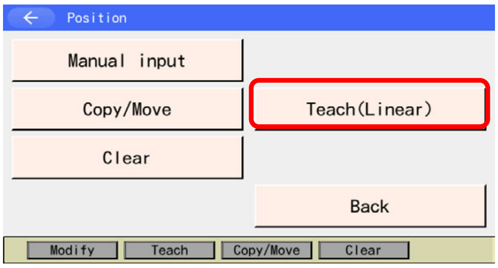
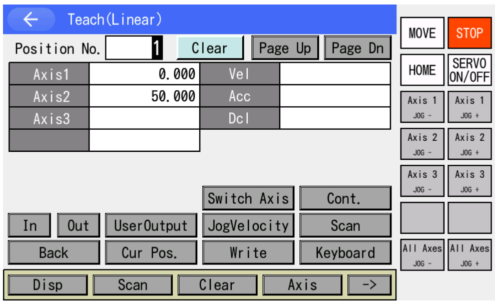
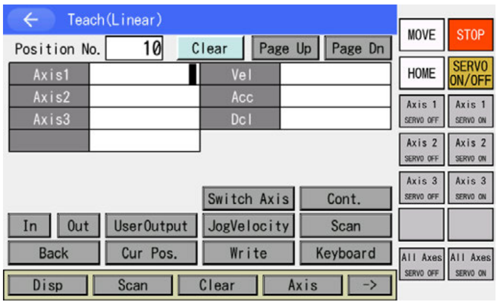
(1) The moving part may drop, which may cause injury or cause damage on the actuator main unit, workpiece or equipment. Pay special attention.

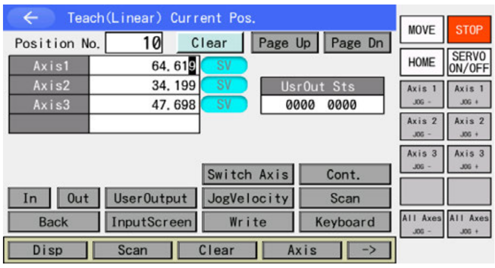
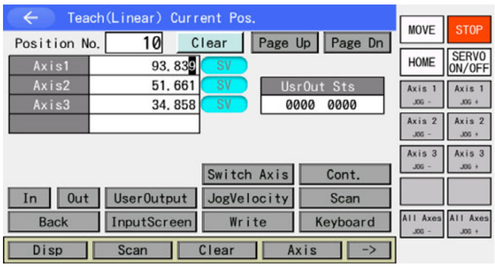
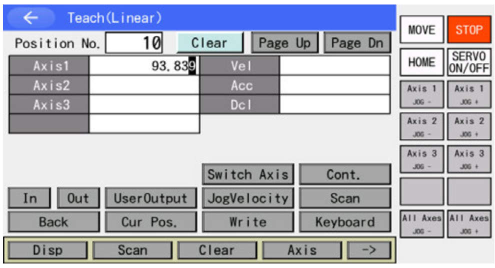
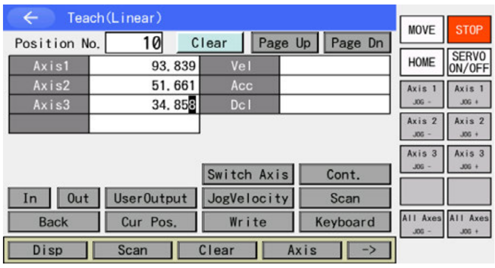
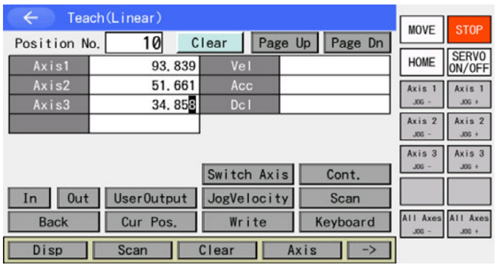
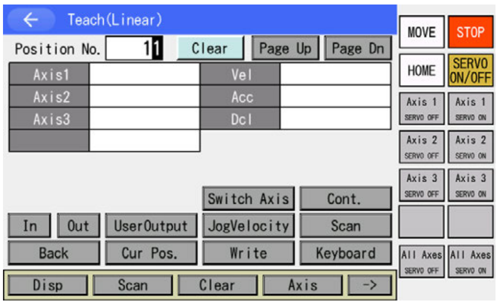
(2) Make sure to lock the brake after the work is finished to set the brake control back to the normal condition.

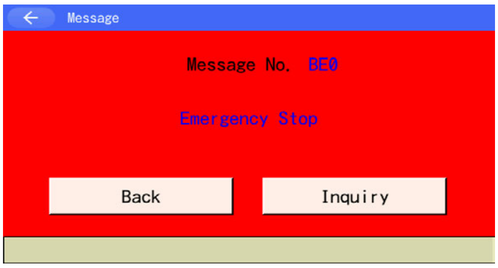
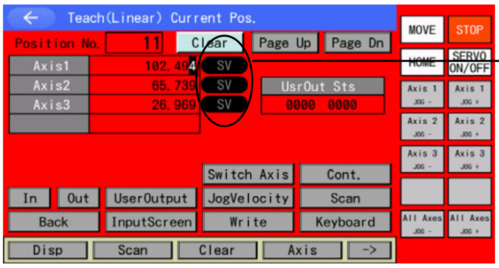
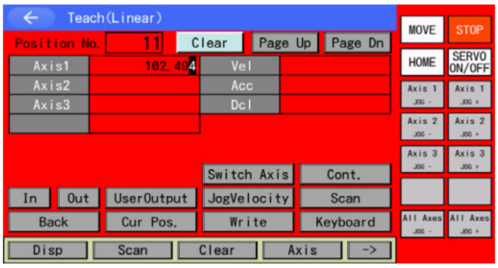
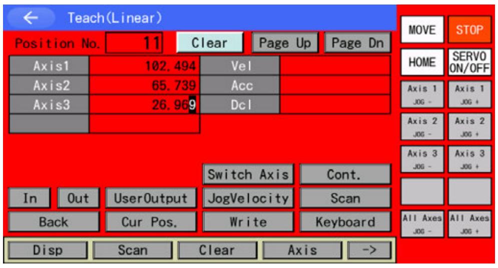
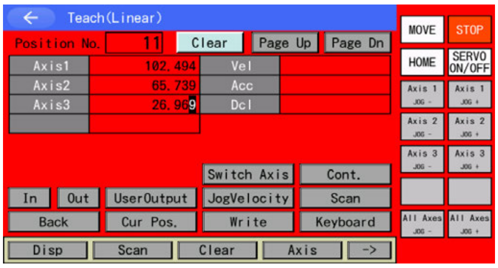
(3) When the servo is turned on and when it gets back to the menu window, the brake control should get back to the normal condition automatically.

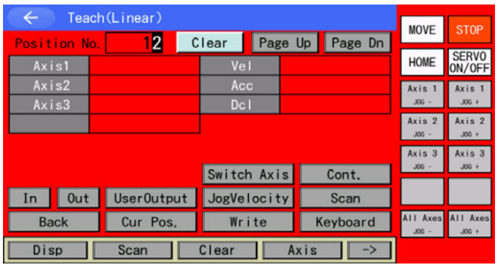
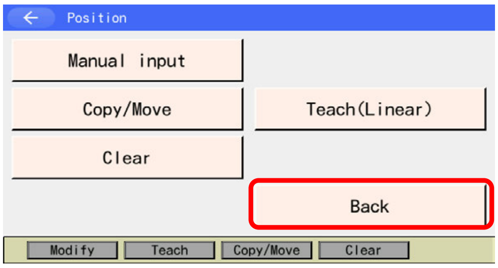
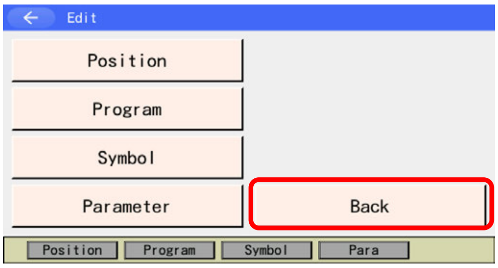
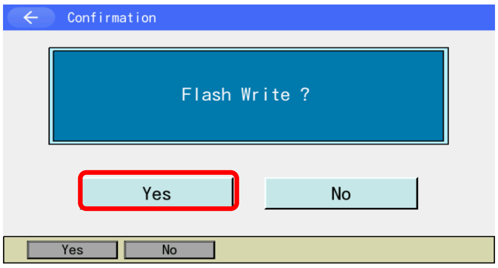
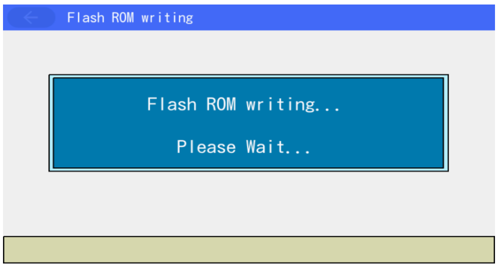
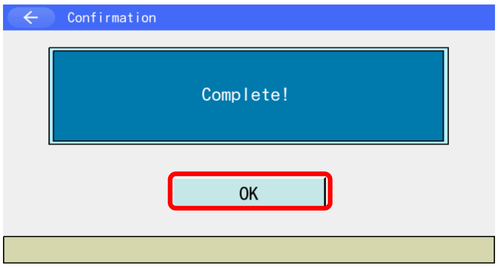
8.2.2 Example of Teaching Input

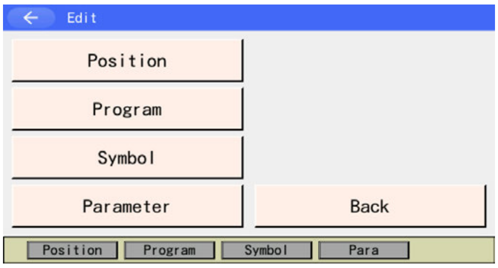
Entering the data into position No. 10 using the jog and into position No. 11 by manual movement (direct teaching) with Servo OFF status.

No.	Operation		
1	Touch Edit button.	 Menu Edit File Play Monitor Environment Set Controller Next Edit Play Monitor Control ->	
2	Touch Position button.	 Edit Position Program Symbol Parameter Back Position Program Symbol Para	
3	Touch Teach (Linear) button.	 Position Manual input Copy/Move Teach(Linear) Clear Back Modify Teach Copy/Move Clear	
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.	 Teach(Linear) Position No. 1 Clear Page Up Page Dn Axis1 0.000 Axis2 50.000 Axis3 Vel Acc Dcl Switch Axis Cont. In Out UserOutput JogVelocity Scan Back Cur Pos. Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 JOG - Axis 1 JOG + Axis 2 JOG - Axis 2 JOG + Axis 3 JOG - Axis 3 JOG + All Axes JOG - All Axes JOG +	
5	Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.	 Teach(Linear) Position No. 10 Clear Page Up Page Dn Axis1 Axis2 Axis3 Vel Acc Dcl Switch Axis Cont. In Out UserOutput JogVelocity Scan Back Cur Pos. Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 SERVO OFF Axis 1 SERVO ON Axis 2 SERVO OFF Axis 2 SERVO ON Axis 3 SERVO OFF Axis 3 SERVO ON All Axes SERVO OFF All Axes 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.	 Teach(Linear) Current Pos. Position No. 10 Axis1 64.619 Axis2 34.199 Axis3 47.698 UsrOut Sts 0000 0000	
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.	 Teach(Linear) Current Pos. Position No. 10 Axis1 93.839 Axis2 51.661 Axis3 34.858 UsrOut Sts 0000 0000	
8	Touch in the input area for Axis2 to move the cursor to the next axis and touch Scan button.	 Teach(Linear) Position No. 10 Axis1 93.839	
9	Load the data also for the 3rd axis.	 Teach(Linear) Position No. 10 Axis1 93.839 Axis2 51.661 Axis3 34.858	
10	Touch Write button to transfer the position data to the controller. The position moves to No. 11.	 Teach(Linear) Position No. 10 Axis1 93.839 Axis2 51.661 Axis3 34.858	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.	 Teach(Linear) Position No. 11	

No.	Operation		
12	Press the EMERGENCY STOP button. Touch Back button.	 Message No. BE0 Emergency Stop 	⚠ *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.	 Position No. 11 Axis1 102.494 SV Axis2 65.739 SV Axis3 26.969 SV UsrOut Sts 0000 0000 Teach(Linear) Current Pos. Clear Page Up Page Dn Switch Axis Cont. In Out UserOutput JogVelocity Scan Back InputScreen Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 Axis 2 Axis 3 All Axes	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.	 Position No. 11 Axis1 102.494 Teach(Linear) Vel Acc Dcl Clear Page Up Page Dn Switch Axis Cont. In Out UserOutput JogVelocity Scan Back Cur Pos. Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 Axis 2 Axis 3 All Axes	
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.	 Position No. 11 Axis1 102.494 Axis2 65.739 Axis3 26.969 Teach(Linear) Vel Acc Dcl Clear Page Up Page Dn Switch Axis Cont. In Out UserOutput JogVelocity Scan Back Cur Pos. Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 Axis 2 Axis 3 All Axes	
16	Touch Write button to transfer the position data to the controller. The position moves to No. 12.	 Position No. 11 Axis1 102.494 Axis2 65.739 Axis3 26.969 Teach(Linear) Vel Acc Dcl Clear Page Up Page Dn Switch Axis Cont. In Out UserOutput JogVelocity Scan Back Cur Pos. Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 Axis 2 Axis 3 All Axes	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.	 Teach(Linear) Position No. 12 Clear Page Up Page Dn Axis1 Axis2 Axis3 Vel Acc Dcl Switch Axis Cont. In Out UserOutput JogVelocity Scan Back Cur Pos. Write Keyboard Disp Scan Clear Axis -> MOVE STOP HOME SERVO ON/OFF Axis 1 JOG - Axis 1 JOG + Axis 2 JOG - Axis 2 JOG + Axis 3 JOG - Axis 3 JOG + All Axes JOG - All Axes JOG +	
18	Touch Back button.	 Position Manual input Copy/Move Teach(Linear) Clear Back Modify Teach Copy/Move Clear	The figures shown hereafter are in the condition of the emergency stop being cancelled.
19	Touch Back button.	 Edit Position Program Symbol Parameter Back Position Program Symbol Para	
20	To write the data to the flash ROM, touch Yes button. If writing is not necessary, touch No button.	 Flash Write ?	
21	While in writing process to flash ROM, the display 'Flash ROM writing...' flashes.	 Flash ROM writing... Please Wait...	***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.	 Complete!	

No.	Operation		
23		 Edit Position Program Symbol Parameter Back Position Program Symbol Para	

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).

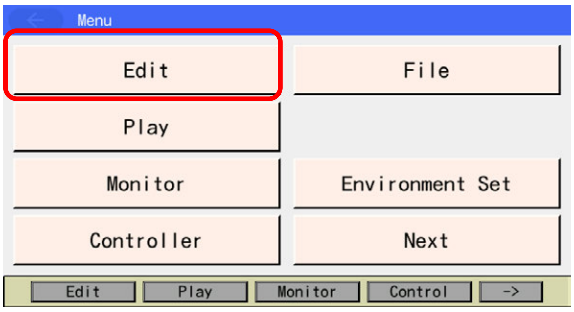
↓

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

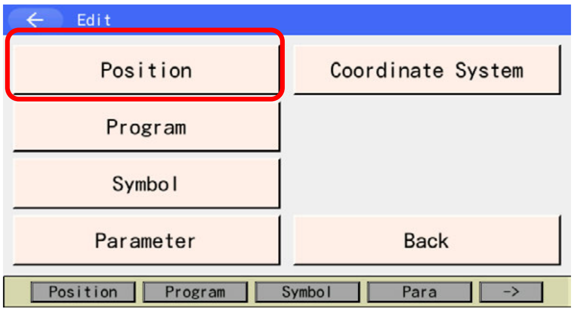
↓

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.

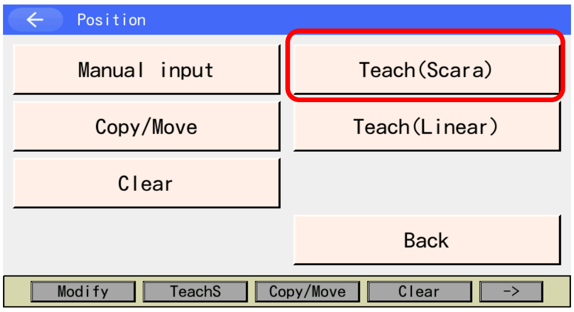


Touch Edit button in the Menu screen.



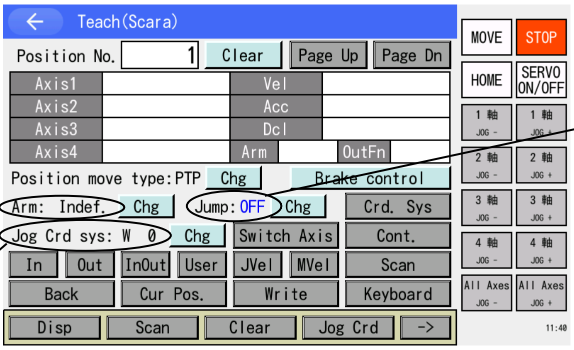
Touch Position button on the Edit screen.

- * Example shown on the left is for XSEL-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

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 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 Ouput : 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.)

Cont. : 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)

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.

8.3.2 Jog Movement Direction and Coordinate System

(1) Jog buttons and movement directions

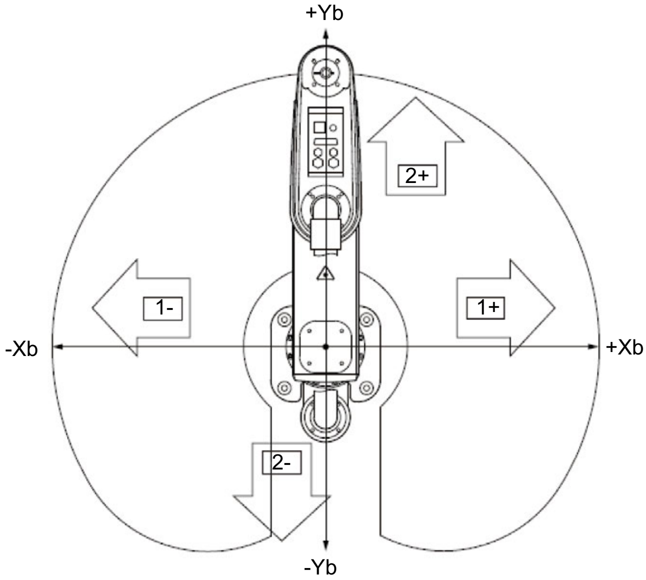
The movement direction during jog operation changes according to the coordinate system No. selected.

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

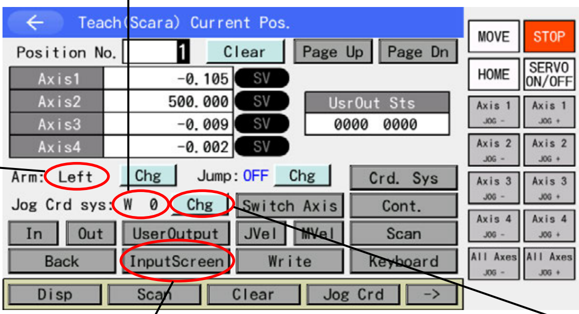
For the setting of coordinate system data, refer to [11. Coordinate System Data Edit].

1) Jog operation on base coordinate system

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



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



Position No. 1

Axis1	-0.105
Axis2	500.000
Axis3	-0.009
Axis4	-0.002

UsrOut Sts 0000 0000

Arm: Left

Jump: OFF

Jog Crd sys: W 0

Left arm system

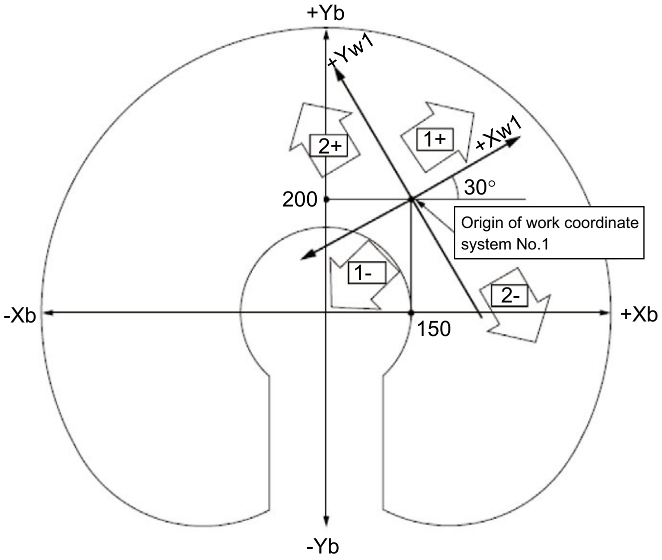
Switchover of the coordinate system for jog operation is to be conducted by touching Chg button.

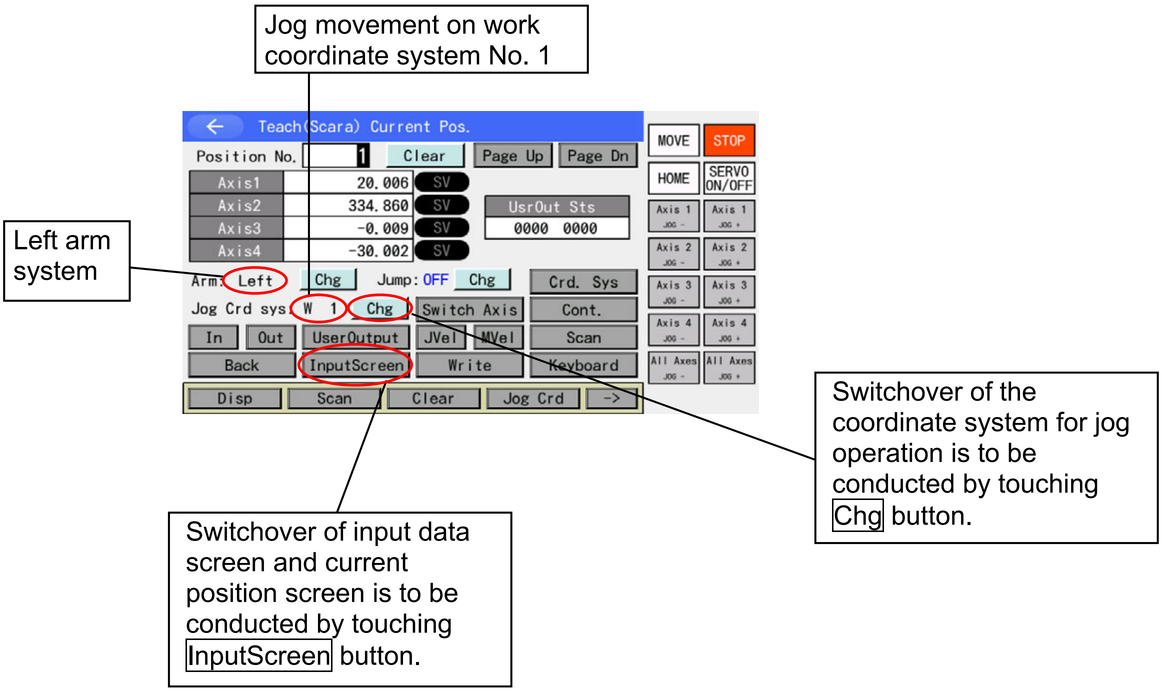
Switchover of input data screen and current position screen is to be conducted by touching InputScreen button.

2) 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.





Position No. 1
Axis1 20.006
Axis2 334.860
Axis3 -0.009
Axis4 -30.002
UsrOut Sts 0000 0000
Arm: Left
Jump: OFF
Jog Crd sys: W 1

Jog movement on work coordinate system No. 1

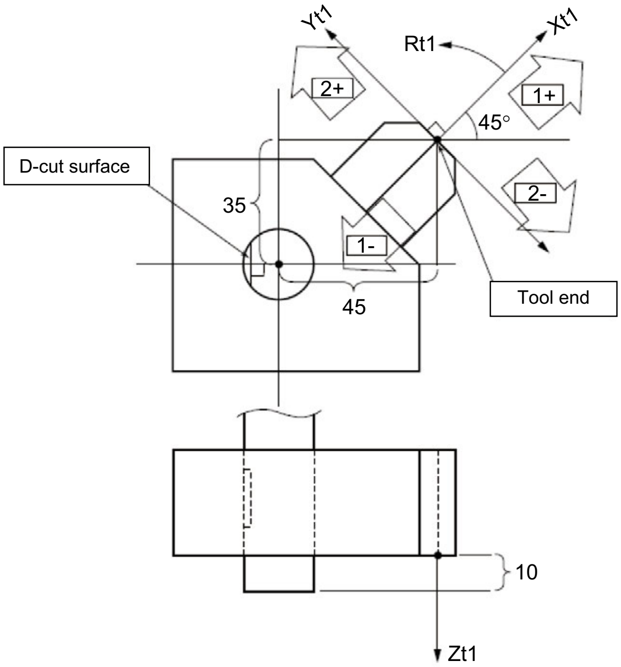
Left arm system

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.

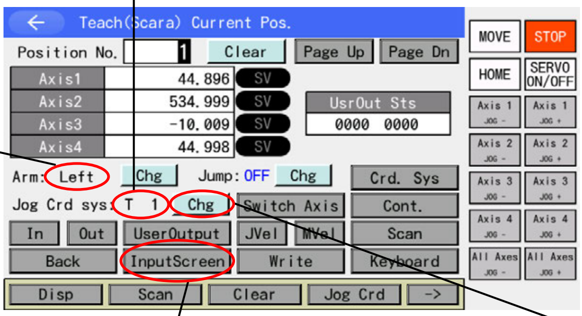
3) Jog operation on tool coordinate system

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)



Jog movement on tool coordinate system No. 1

Left arm system



Position No. 1

Axis1	44.896
Axis2	534.999
Axis3	-10.009
Axis4	44.998

UsrOut Sts 0000 0000

Arm: Left

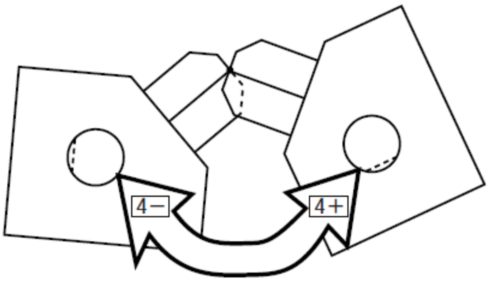
Jump: OFF

Jog Crd sys: T 1

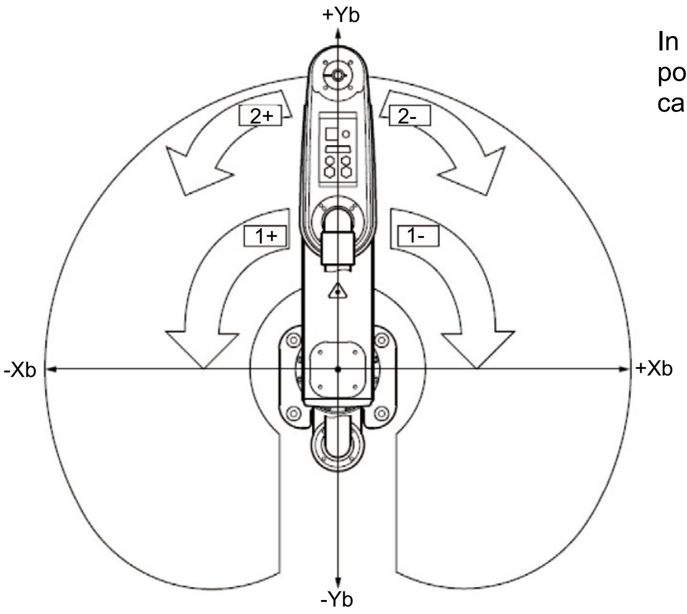
Switchover of the coordinate system for jog operation is to be conducted by touching Chg button.

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

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)

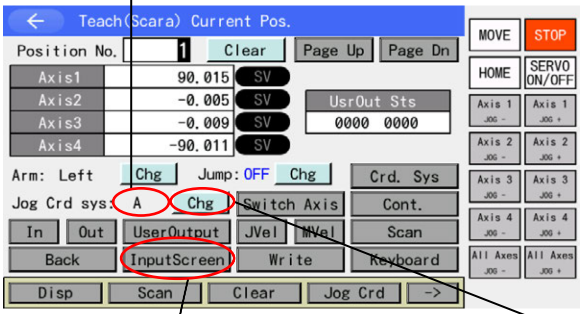


4) Jog operation on each axis system (jog operation on each arm)
Each arm, jog buttons and movement directions are as shown below.



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

Jog movement on each axis system



Position No. 1

Axis1	90.015
Axis2	-0.005
Axis3	-0.009
Axis4	-90.011

UsrOut Sts: 0000 0000

Arm: Left

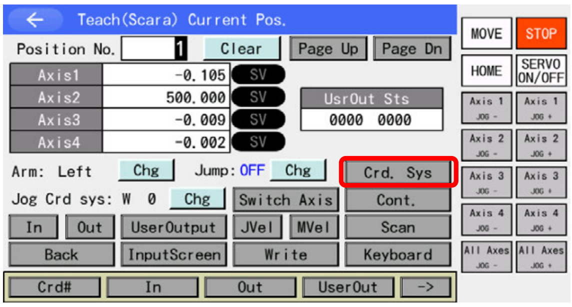
Jump: OFF

Jog Crd sys: A

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.



Position No. 1

Axis1 -0.105

Axis2 500.000

Axis3 -0.009

Axis4 -0.002

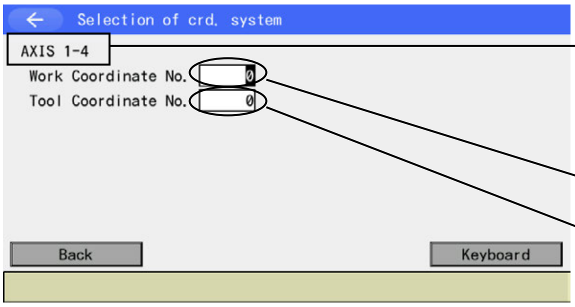
UsrOut Sts 0000 0000

Arm: Left

Jump: OFF

Jog Crd sys: W 0

Touch Crd. Sys button.



AXIS 1-4

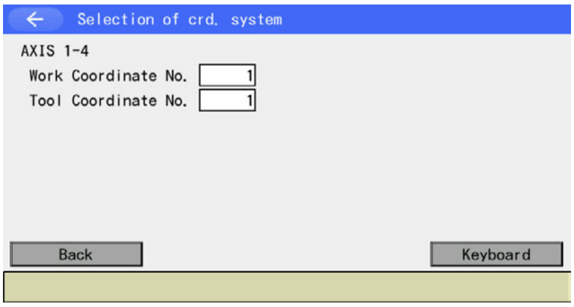
Work Coordinate No. 0

Tool Coordinate No. 0

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.

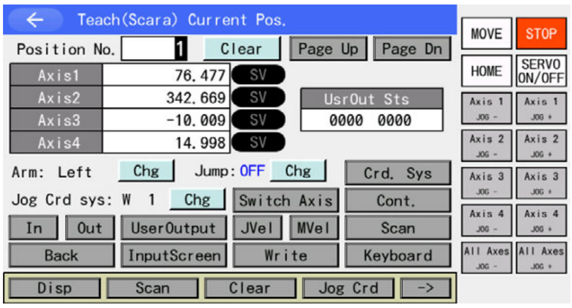


AXIS 1-4

Work Coordinate No. 1

Tool Coordinate No. 1

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.



Position No. 1

Axis1 76.477

Axis2 342.669

Axis3 -10.009

Axis4 14.998

UsrOut Sts 0000 0000

Arm: Left

Jump: OFF

Jog Crd sys: W 1

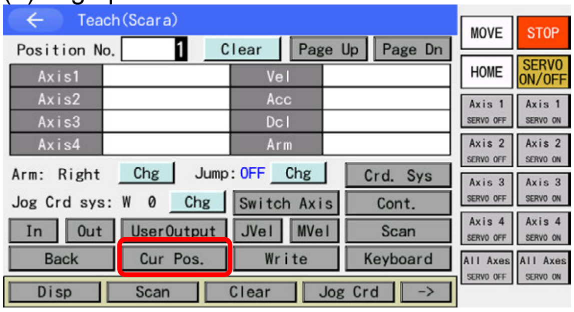
The coordinate values displayed indicate the tool tip position of the tool coordinate system No. 1 on the work coordinate system No. 1.

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.

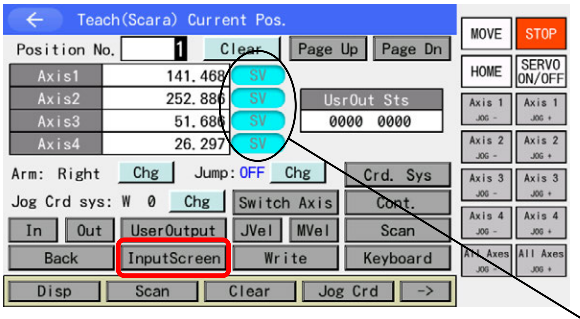
How to Open to Teaching Screen
 Go to Edit → Position → Teach (SCARA) in touch panel operation
 For XSEL-RXD/SXD/RAXD/SAXD, go to Edit → Position → Teach (Axis 1-4) or
 Teach (Axis 5-8)

(1) Jog operation



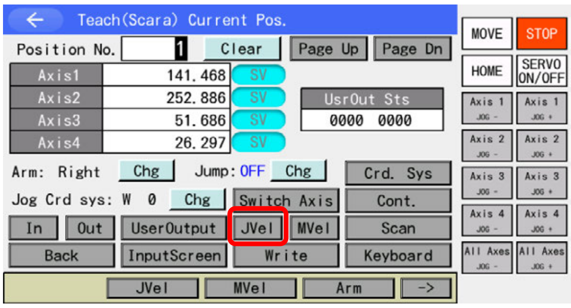
Turn the servo ON condition by touching the SERVO ON/OFF button and then the Servo all axes ON button in the Teaching screen condition.
To check if servo is turned ON or OFF, touch Cur Pos. button.

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.

Servo ON



Position No. 1

Axis1 141.468
Axis2 252.886
Axis3 51.686
Axis4 26.297

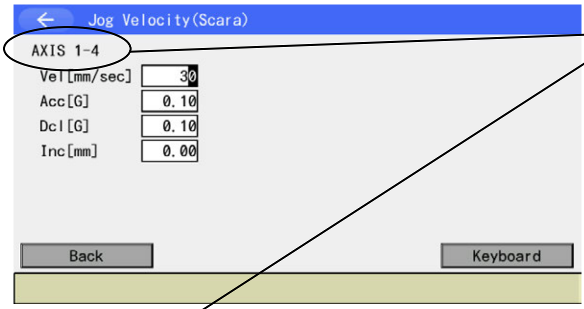
UsrOut Sts 0000 0000

Arm: Right

Jump: OFF

Jog Crd sys: W 0

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

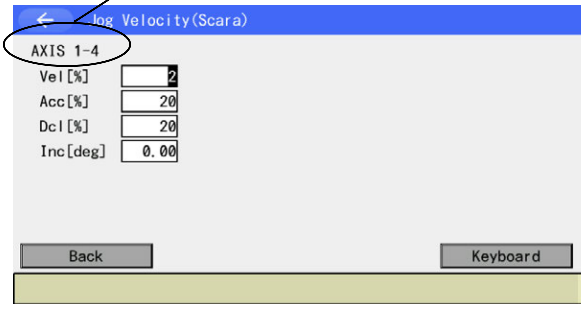


AXIS 1-4

Vel[mm/sec] 30
Acc[G] 0.10
Dcl[G] 0.10
Inc[mm] 0.00

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

Work Coordinate System,
Tool Coordinate System



AXIS 1-4

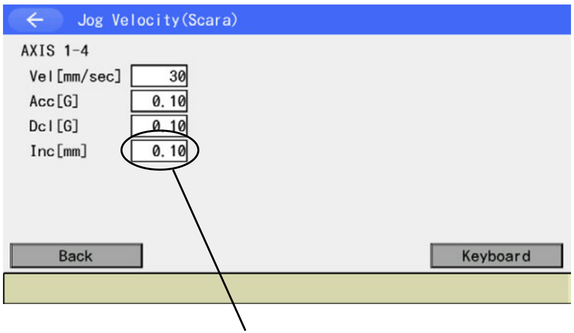
Vel[%] 2
Acc[%] 20
Dcl[%] 20
Inc[deg] 0.00

Each Axis System

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



AXIS 1-4
Vel[mm/sec] 30
Acc[G] 0.10
Dcl[G] 0.10
Inc[mm] 0.10

Inching distance: 0.1 mm

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%

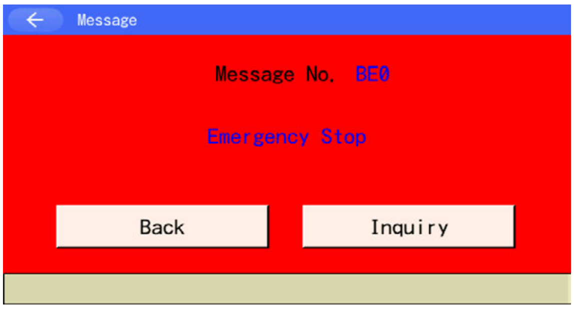
For XSEL2-TX

⦿ 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



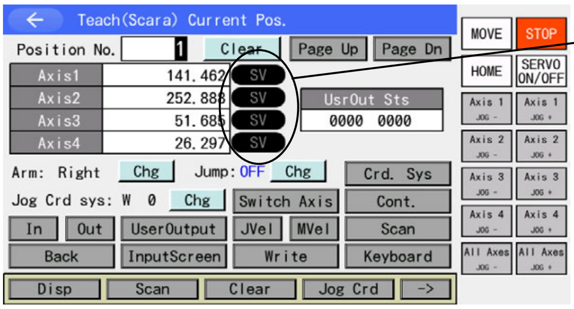
Message No. BE0

Emergency Stop

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.*



Position No. 1

Axis1	141.462	SV
Axis2	252.888	SV
Axis3	51.685	SV
Axis4	26.297	SV

UsrOut Sts 0000 0000

Arm: Right

Jump: OFF

Jog Crd sys: W 0

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

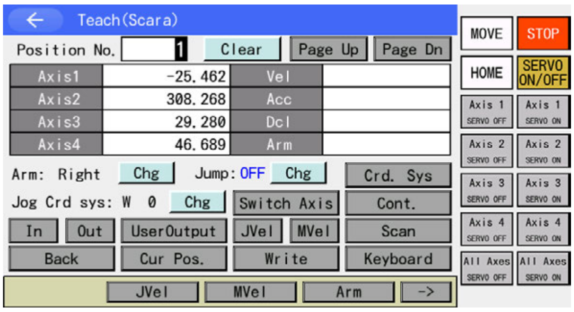
Change the current arm system over to the opposite arm system (Right arm → left arm, left arm → right arm). The 1st arm does not move and the 2nd arm moves in such a way that it becomes straightened with the 1st arm.

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)



Position No. 1

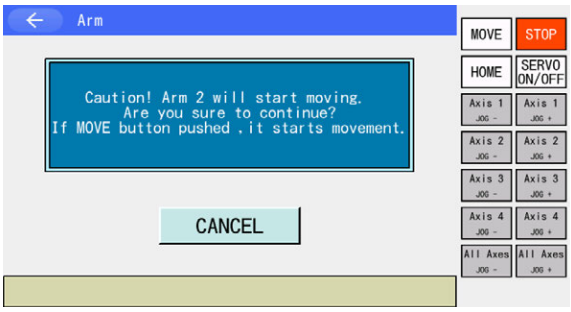
Axis1 -25.462 Vel
Axis2 308.268 Acc
Axis3 29.280 Dcl
Axis4 46.689 Arm

Arm: Right Jump: OFF

Jog Crd sys: W 0

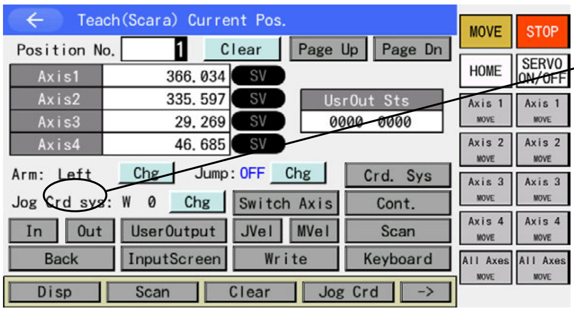
Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.

Touch Arm Chg button.



Caution! Arm 2 will start moving.
Are you sure to continue?
If MOVE button pushed . it starts movement.

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



Position No. 1

Axis1 366.034
Axis2 335.597
Axis3 29.269
Axis4 46.685

UsrOut Sts 0000 0000

Arm: Left Jump: OFF

Jog Crd sys: W 0

Current arm system display

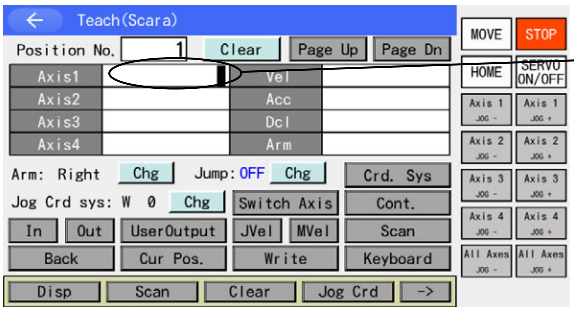
When the MOVE button is touched, the display changes over to the current position screen and the 2nd arm moves until it becomes straightened with the 1st arm.

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.

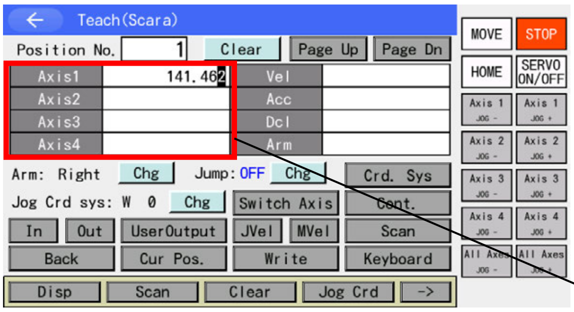
Display Change : Go to Edit → Position → Teach (SCARA) → Crd. Sys in touch panel operation
For XSEL-RXD/SXD/RAXD/SAXD, go to Edit → Position → Teach (Axis1-4) or Teach (Axis5-8) → Crd. Sys



Position No. 1
Arm: Right
Jump: OFF
Jog Crd sys: W 0

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.

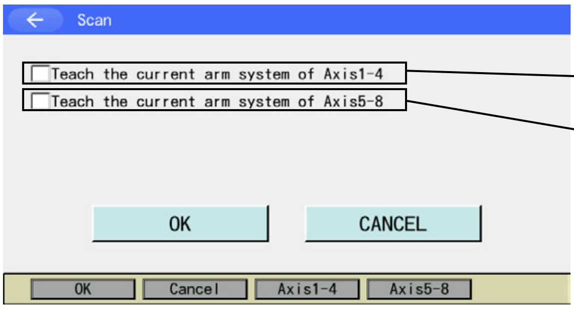


Position No. 1
Axis1 141.462
Arm: Right
Jump: OFF
Jog Crd sys: W 0

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 boxes

In the case of the XSEL-RX/SX, RXD/SXD, RAXD/SAXD or 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.



☐ Teach the current arm system of Axis1-4
☐ Teach the current arm system of Axis5-8

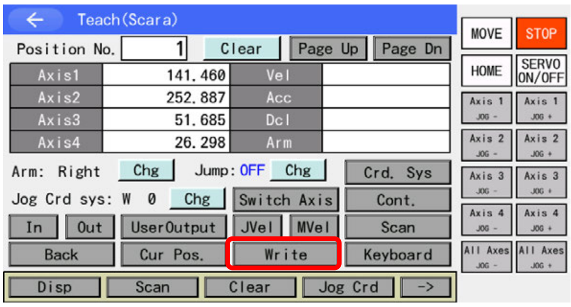
Arm System Data for Axes 1 to 4 Scanning Selection

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.



Position No. 1

Axis1	141.460
Axis2	252.887
Axis3	51.685
Axis4	26.298

Arm: Right

Jump: OFF

Jog Crd sys: W 0

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.

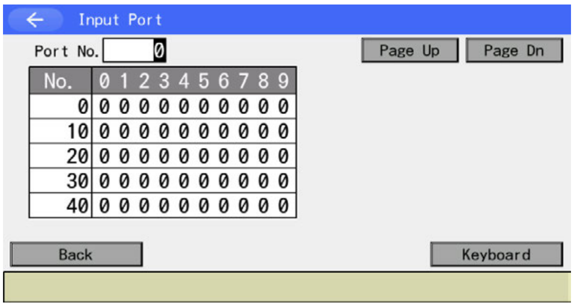
Only transferring the data to a controller by touching Write button will lose the edit data when the power gets rebooted or the software reset is conducted[*1]. Go back from the position edit screen to the flash ROM writing screen by using Back button, and have [8.1.2 Flash ROM Writing] conducted.
(*1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

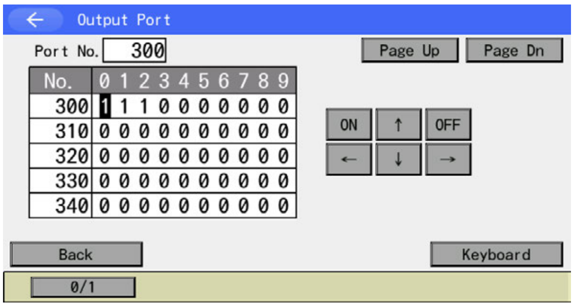


Port No. 0

No.	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0

Refer to [14.2 Input Port] for debug filters.

Output ports

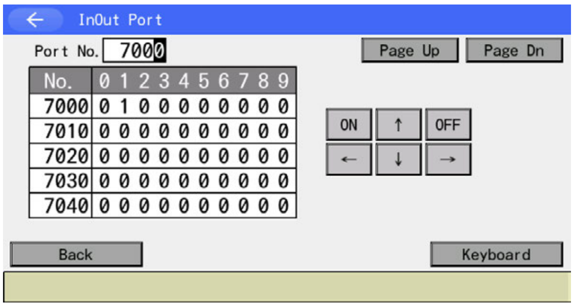


Port No. 300

No.	0	1	2	3	4	5	6	7	8	9
300	1	1	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0

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

Input/Output Port (for applicable models)



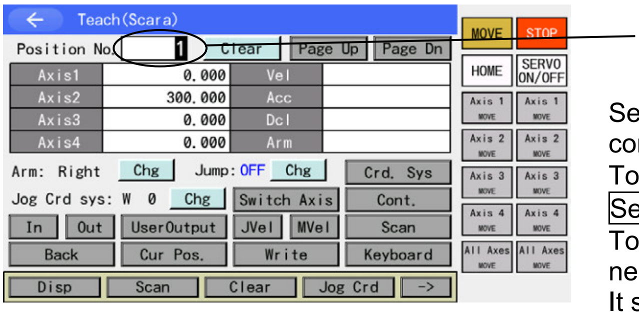
Port No. 7000

No.	0	1	2	3	4	5	6	7	8	9
7000	0	1	0	0	0	0	0	0	0	0
7010	0	0	0	0	0	0	0	0	0	0
7020	0	0	0	0	0	0	0	0	0	0
7030	0	0	0	0	0	0	0	0	0	0
7040	0	0	0	0	0	0	0	0	0	0

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 No. 1

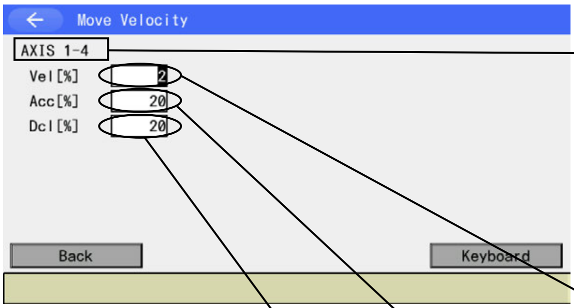
Axis1 0.000
Axis2 300.000
Axis3 0.000
Axis4 0.000

Arm: Right
Jump: OFF
Jog Crd sys: W 0

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.



AXIS 1-4
Vel[%] 2
Acc[%] 20
Dcl[%] 20

Displayed only in XSEL-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)

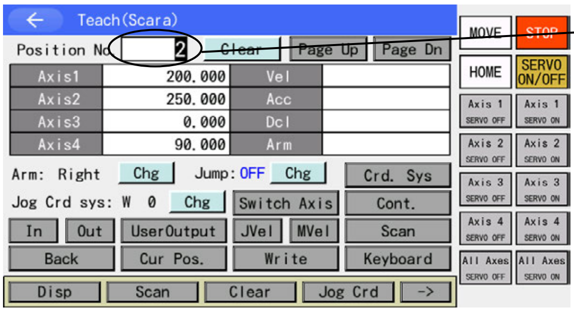
Ratio to maximum PTP acceleration (axis-specific parameter No. 134)

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. 2

Axis1 200.000

Axis2 250.000

Axis3 0.000

Axis4 90.000

Arm: Right

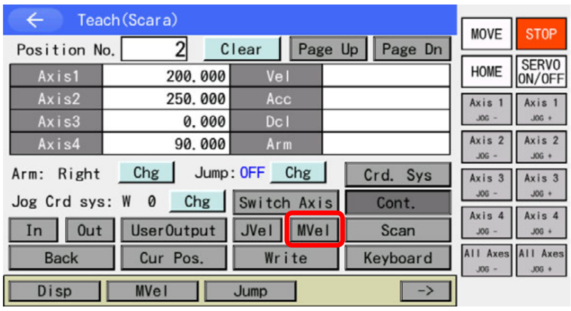
Jump: OFF

Jog Crd sys: W 0

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.



Position No. 2

Axis1 200.000

Axis2 250.000

Axis3 0.000

Axis4 90.000

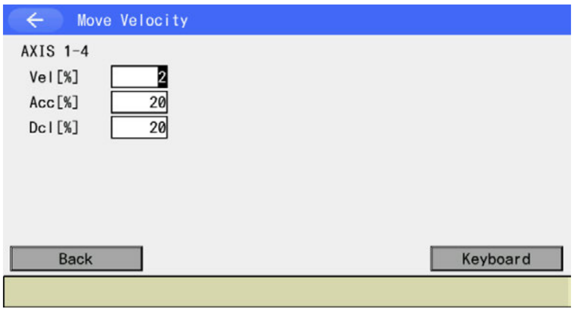
Arm: Right

Jump: OFF

Jog Crd sys: W 0

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.



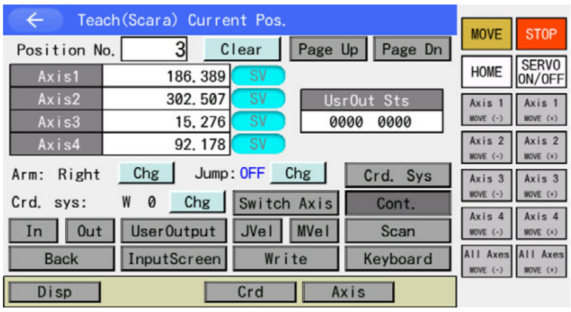
AXIS 1-4

Vel[%] 2

Acc[%] 20

Dcl[%] 20

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



Position No. 3

Axis1 186.389

Axis2 302.507

Axis3 15.276

Axis4 92.178

UsrOut Sts 0000 0000

Arm: Right

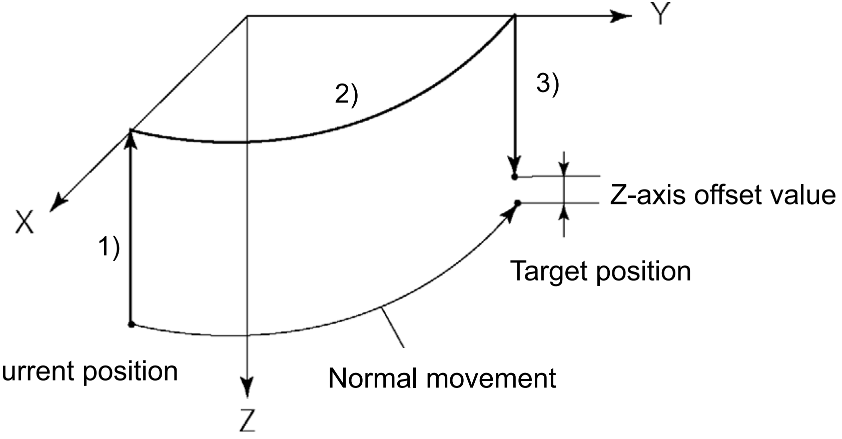
Jump: OFF

Crd. sys: W 0

Touch MOVE button, and then touch All Axes MOVE (+) or All Axes MOVE (-) to have the actuator start the continuous operation.

(10) Jump movement

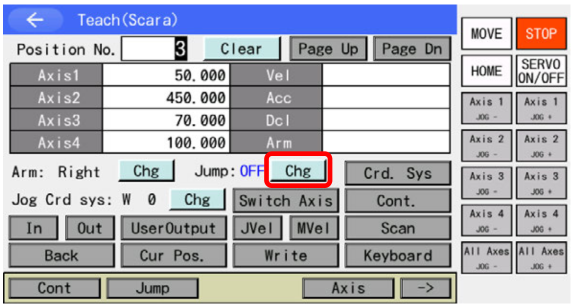
The actuator is moved to the location of the position data transferred to the controller by jump motion (arch motion). Before/after normal movement or continuous movement, the Z-axis is moved up and down.



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.



Position No. 3

Axis1 50.000

Axis2 450.000

Axis3 70.000

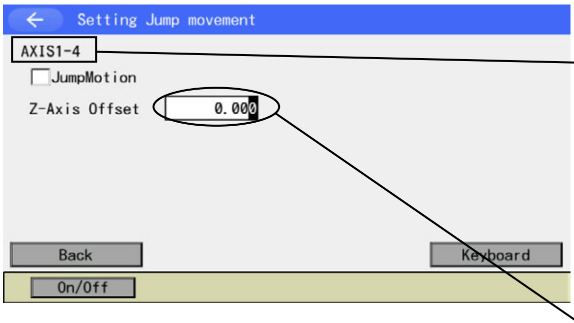
Axis4 100.000

Arm: Right

Jump: OFF

Jog Crd sys: W 0

Touch Jump Chg button.



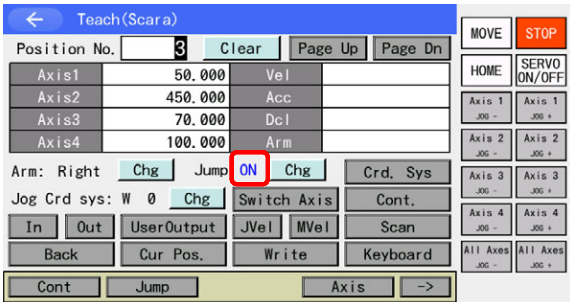
Z-Axis Offset 0.000

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.



Position No. 3

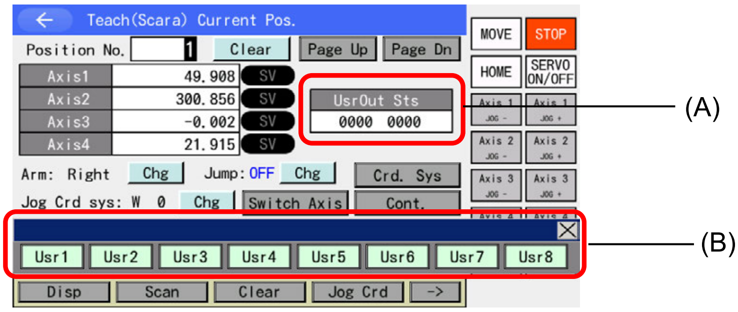
Axis1	50.000
Axis2	450.000
Axis3	70.000
Axis4	100.000

Arm: Right
Jump ON
Jog Crd sys: W 0

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.



Teach(Scara) Current Pos.
Position No. 1
Axis1 49.908
Axis2 300.856
Axis3 -0.002
Axis4 21.915
UsrOut Sts 0000 0000
Arm: Right
Jump: OFF
Jog Crd sys: W 0

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.)

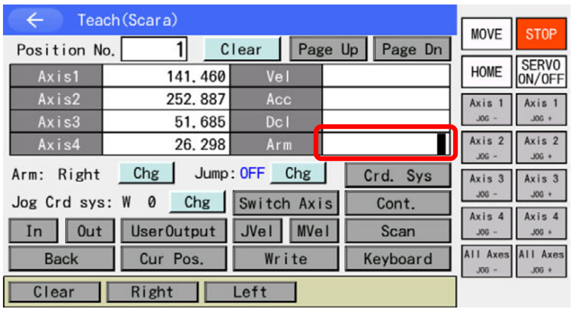
(B) User-Specified Output Port Operation Panel Window
It is a panel window to perform the operation to turn ON/OFF the user-specified output ports.
Assignment is made for the number of specified ports in the order of ‘Usr1’, ‘Usr2’, ‘Usr3’ … from the top of the user-specified output ports.
By touching 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:

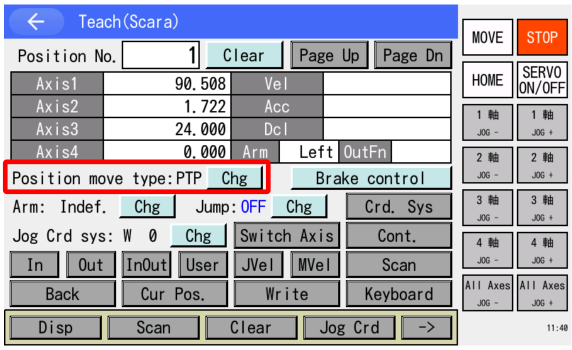
‘Usr1’ ········· Output port 308
‘Usr2’ ········· Output port 309
‘Usr3’ ········· Output port 310
‘Usr4’ ········· Output port 311
‘Usr5’ ········· Output port 312
‘Usr6’ ········· Output port 313
‘Usr7’ ········· Output port 314
‘Usr8’ ········· Output port 315

(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.


Teach(Scara)
Position No. 1
Axis1 141.460
Axis2 252.887
Axis3 51.685
Axis4 26.298
Arm: Right
Jump: OFF
Jog Crd sys: W 0

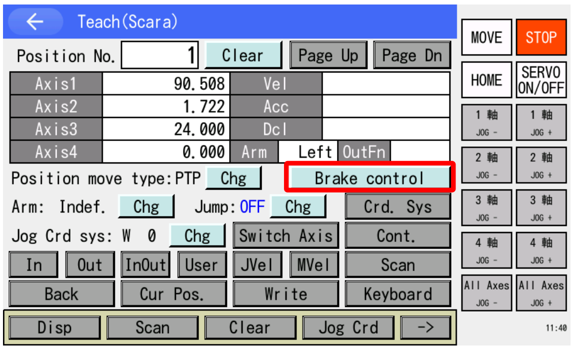
The arm system settings for Axis1 to 4 (Axis 1 to 3 for 3-axis SCARA) or Axis5 to 8 (Axis5 to 8 are for XSEL-RXD/SXD, RAXD/SAXD only) that is currently shown can be established.
Touch in Arm box to show the cursor.
Refer to [8.1.1 Input of Target Arm System Data (Arm1 or Arm), (Arm2)] for show to input.

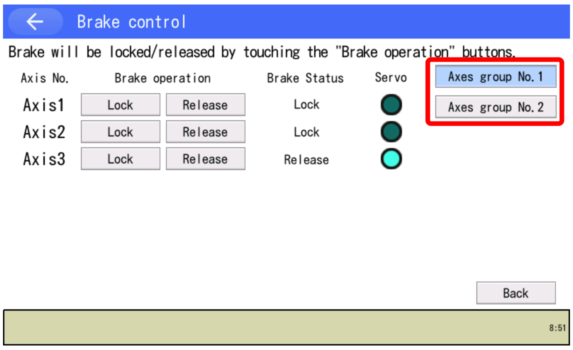
(13) Changing Position Movement Type (for applicable models only)
An operation type (CP/PTP) for position movement can be indicated.


Teach(Scara)
Position No. 1
Axis1 90.508
Axis2 1.722
Axis3 24.000
Axis4 0.000
Arm Left
Position move type: PTP
Arm: Indef.
Jump: OFF
Jog Crd sys: W 0

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.


Teach(Scara)
Position No. 1
Axis1 90.508
Axis2 1.722
Axis3 24.000
Axis4 0.000
Arm Left
Position move type: PTP
Arm: Indef.
Jump: OFF
Jog Crd sys: W 0

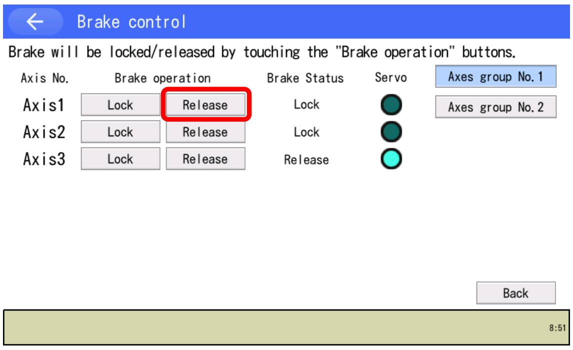


Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation	Brake Status	Servo
Axis1	Lock Release	Lock	●
Axis2	Lock Release	Lock	●
Axis3	Lock Release	Release	○

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.

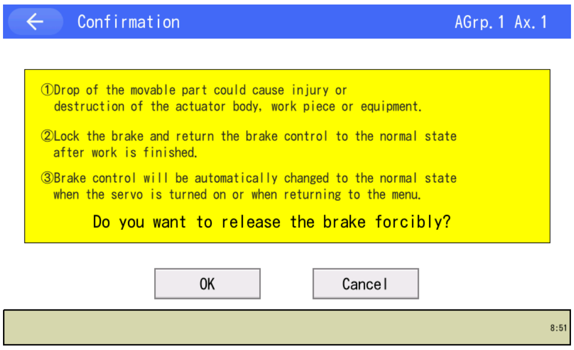
The brake operation button and the status of an effective axis should be displayed.



Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation	Brake Status	Servo
Axis1	Lock Release	Lock	●
Axis2	Lock Release	Lock	●
Axis3	Lock Release	Release	○

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



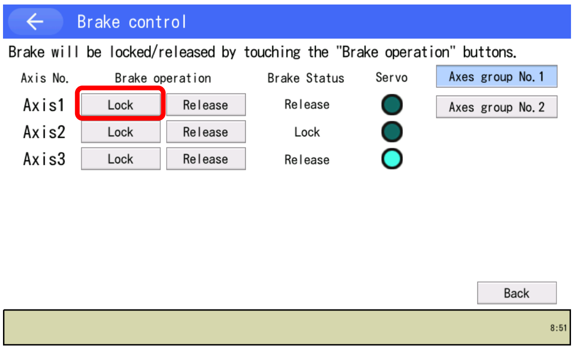
①Drop of the movable part could cause injury or destruction of the actuator body, work piece or equipment.

②Lock the brake and return the brake control to the normal state after work is finished.

③Brake control will be automatically changed to the normal state when the servo is turned on or when returning to the menu.

Do you want to release the brake forcibly?

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.



Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation	Brake Status	Servo
Axis1	Lock Release	Release	●
Axis2	Lock Release	Lock	●
Axis3	Lock Release	Release	○

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*

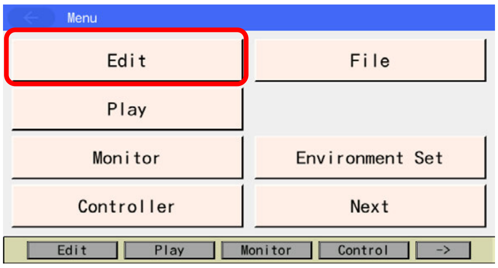
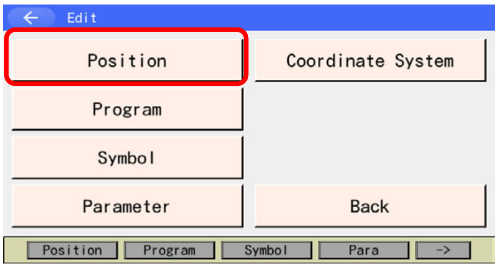
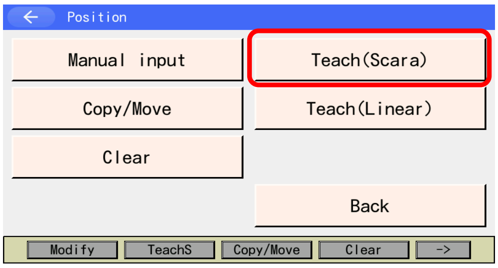
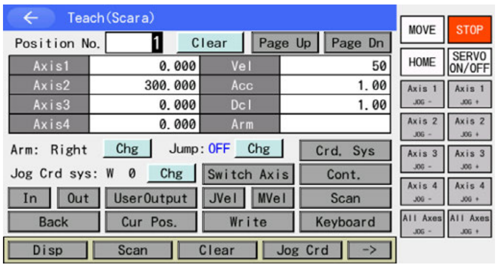
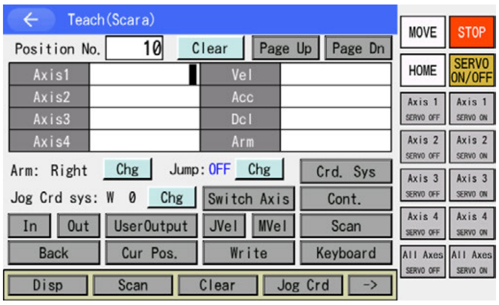
(1) The moving part may drop, which may cause injury or cause damage on the actuator main unit, workpiece or equipment. Pay special attention.

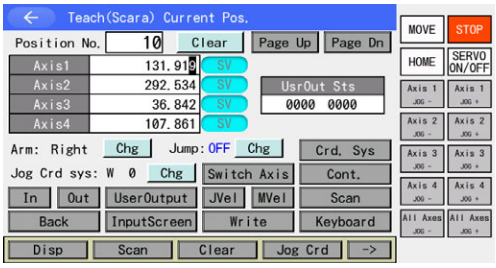
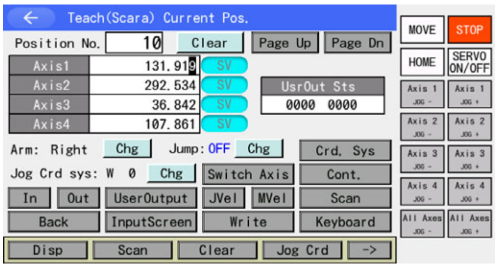
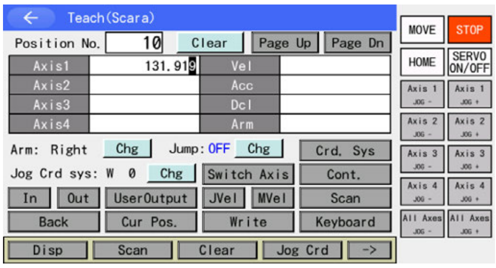
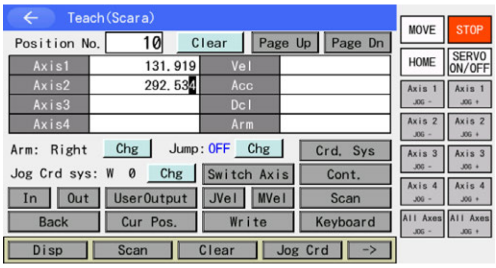
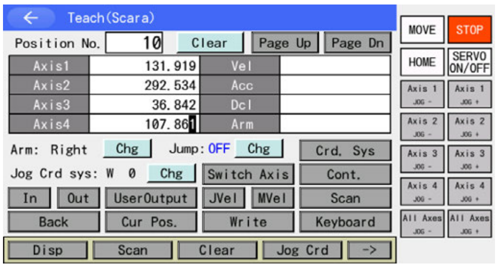
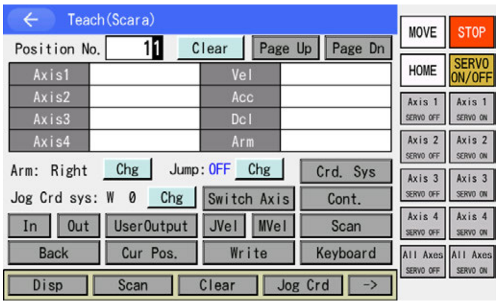
(2) Make sure to lock the brake after the work is finished to set the brake control back to the normal condition.

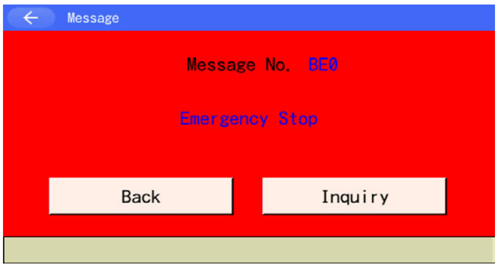
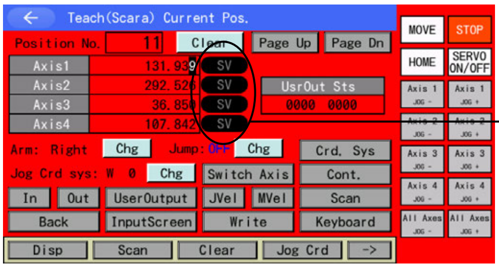
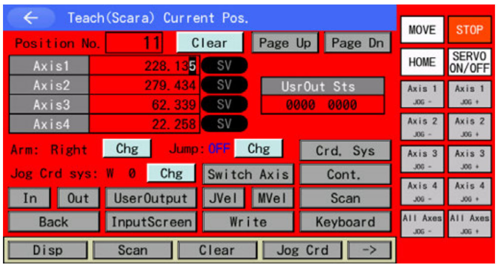
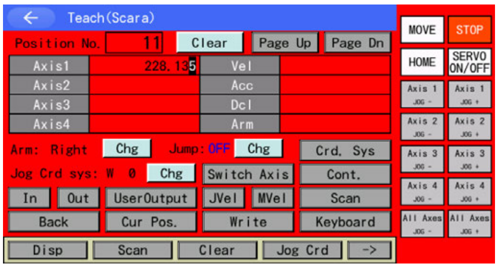
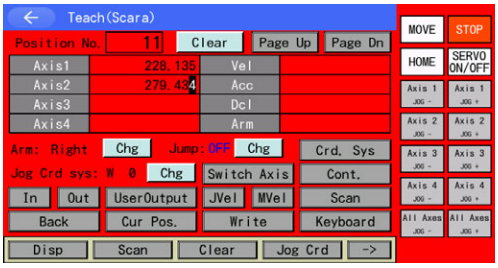
(3) When the servo is turned on and when it gets back to the menu window, the brake control should get back to the normal condition automatically.

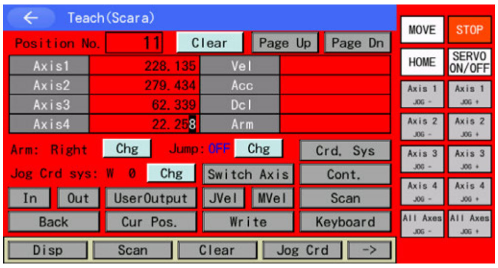
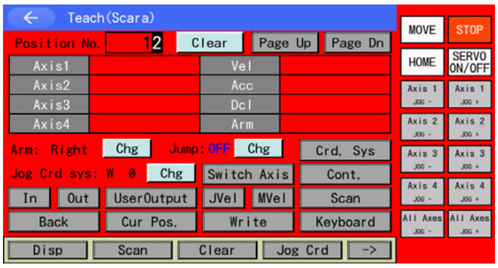
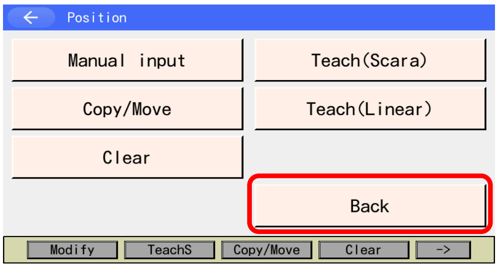
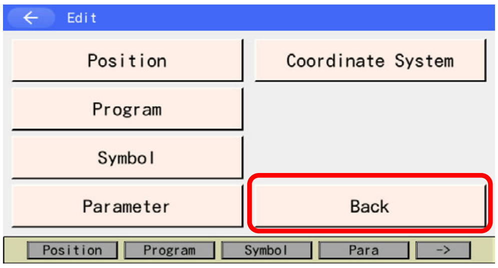
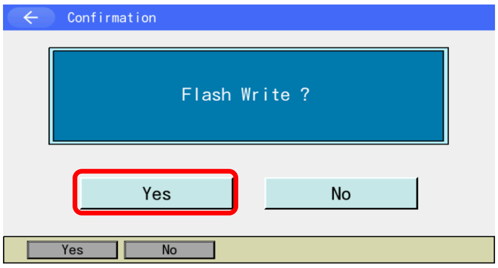
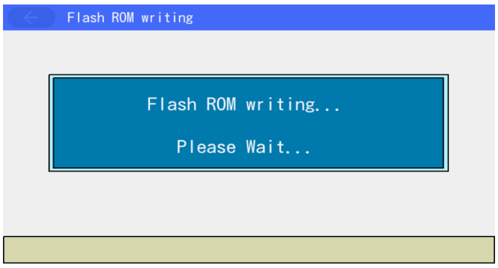
8.3.4 Example of Teaching Input

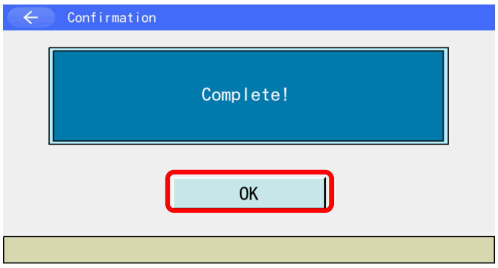
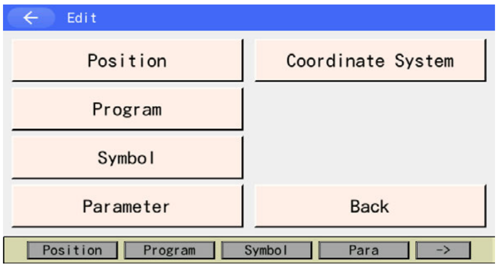
Entering the data into position No. 10 using the jog and into position No. 11 by manual movement (direct teaching) with Servo OFF status.

No.	Operation		
1	Touch Edit button.	 Menu Edit File Play Monitor Environment Set Controller Next Edit Play Monitor Control ->	
2	Touch Position button. .	 Edit Position Coordinate System Program Symbol Parameter Back Position Program Symbol Para ->	
3	Touch Teach (Scara) button.	 Position Manual input Teach(Scara) Copy/Move Teach(Linear) Clear Back Modify TeachS Copy/Move Clear ->	There is no Teach (Linear) button in XSEL-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.	Position No. 1 Axis1 0.000 Axis2 300.000 Axis3 0.000 Axis4 0.000 Vel 50 Acc 1.00 Dcl 1.00 Arm: Right Jump: OFF Jog Crd sys: W 0 Teach(Scara) Clear Page Up Page Dn Arm Chg Crd. Sys Switch Axis Cont. In Out UserOutput JVel MVel Scan Back Cur Pos. Write Keyboard Disp Scan Clear Jog Crd -> MOVE STOP HOME SERVO ON/OFF Axis 1 JOG - Axis 1 JOG + Axis 2 JOG - Axis 2 JOG + Axis 3 JOG - Axis 3 JOG + Axis 4 JOG - Axis 4 JOG + All Axes JOG - All Axes JOG +	
5	Touch SERVO ON/OFF button and then touch Servo all axes ON button to turn the servo ON.	Position No. 10 Arm: Right Jump: OFF Jog Crd sys: W 0 Teach(Scara) Clear Page Up Page Dn Axis1 Axis2 Axis3 Axis4 Vel Acc Dcl Arm Chg Crd. Sys Switch Axis Cont. In Out UserOutput JVel MVel Scan Back Cur Pos. Write Keyboard Disp Scan Clear Jog Crd -> MOVE STOP HOME SERVO ON/OFF Axis 1 SERVO OFF Axis 1 SERVO ON Axis 2 SERVO OFF Axis 2 SERVO ON Axis 3 SERVO OFF Axis 3 SERVO ON Axis 4 SERVO OFF Axis 4 SERVO ON All Axes SERVO OFF All Axes 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.	 Teach(Scara) Current Pos. Position No. 10 Axis1 131.919 Axis2 292.534 Axis3 36.842 Axis4 107.861 UsrOut Sts 0000 0000 Arm: Right Jump: OFF Jog Crd sys: W 0	
7	Touch the Scan button to load the current position of the axis No., where there is the cursor, to the input screen. Touch InputScreen button to confirm that the data has been loaded.	 Teach(Scara) Current Pos. Position No. 10 Axis1 131.919 Axis2 292.534 Axis3 36.842 Axis4 107.861 UsrOut Sts 0000 0000 Arm: Right Jump: OFF Jog Crd sys: W 0	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.	 Teach(Scara) Position No. 10 Axis1 131.919 Arm: Right Jump: OFF Jog Crd sys: W 0	
9	Also, load the data for Z-axis and R-axis in the same manner.	 Teach(Scara) Position No. 10 Axis1 131.919 Axis2 292.534 Arm: Right Jump: OFF Jog Crd sys: W 0	
10	Touch Write button to transfer the position data to the controller. The position moves to No. 11.	 Teach(Scara) Position No. 10 Axis1 131.919 Axis2 292.534 Axis3 36.842 Axis4 107.861 Arm: Right Jump: OFF Jog Crd sys: W 0	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.	 Teach(Scara) Position No. 11 Arm: Right Jump: OFF Jog Crd sys: W 0	

No.	Operation		
12	Press the EMERGENCY STOP button. Touch Back button.	 Message No. BE0 Emergency Stop 	***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.	 Position No. 11 Axis1 131.939 SV Axis2 292.526 SV Axis3 36.850 SV Axis4 107.842 SV UsrOut Sts 0000 0000 Arm: Right Jump: OFF Jog Crd sys: W 0 Teach(Scara) Current Pos. Clear Page Up Page Dn Chg Crd. Sys Switch Axis Cont. In Out UserOutput JVel MVel Scan Back InputScreen Write Keyboard Disp Jog Crd -> MOVE STOP HOME SERVO ON/OFF Axis 1 Axis 2 Axis 3 Axis 4 All Axes	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.	 Position No. 11 Axis1 228.135 SV Axis2 279.434 SV Axis3 62.339 SV Axis4 22.258 SV UsrOut Sts 0000 0000 Arm: Right Jump: OFF Jog Crd sys: W 0 Teach(Scara) Current Pos. Clear Page Up Page Dn Scan InputScreen MOVE STOP HOME SERVO ON/OFF	
15	Touch in the input area for Axis2 to move the cursor to the next axis and touch Scan button.	 Position No. 11 Axis1 228.135 Arm: Right Jump: OFF Jog Crd sys: W 0 Teach(Scara) Vel Acc Dcl Arm Scan Cur Pos. MOVE STOP HOME SERVO ON/OFF	
16	Also, load the data for Z-axis and R-axis in the same manner.	 Position No. 11 Axis1 228.135 Axis2 279.434 Arm: Right Jump: OFF Jog Crd sys: W 0 Teach(Scara) Vel Acc Dcl Arm Scan Cur Pos. MOVE STOP HOME SERVO ON/OFF	

No.	Operation		
17	Touch Write button to transfer the position data to the controller. The position moves to No. 12.	 Teach(Scara) Position No. 11 Clear Page Up Page Dn Axis1 228.135 Axis2 279.434 Axis3 62.339 Axis4 22.288 Vel Acc Dcl Arm Arm: Right Jump: OFF Crd. Sys Jog Crd sys: W 0 Switch Axis Cont. In Out UserOutput JVel MVel Scan Back Cur Pos. Write Keyboard Disp Jog Crd MOVE STOP HOME SERVO ON/OFF All Axes	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.	 Teach(Scara) Position No. 12 Clear Page Up Page Dn Back Write	
19	Touch Back button.	 Position Manual input Teach(Scara) Copy/Move Teach(Linear) Clear Back Modify TeachS Copy/Move Clear ->	The figures shown hereafter are in the condition of the emergency stop being cancelled.
20	Touch Back button.	 Edit Position Coordinate System Program Symbol Parameter Back Position Program Symbol Para ->	
21	To write the data to the flash ROM, touch Yes button. If writing is not necessary, touch No button.	Confirmation Flash Write ?	
22	While in writing process to flash ROM, the display 'Flash ROM writing…' flashes.	Flash ROM writing Flash ROM writing... Please Wait...	***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.	 Confirmation Complete! 	
24		 Edit Position Coordinate System Program Symbol Parameter Back Position Program Symbol Para ->	

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.

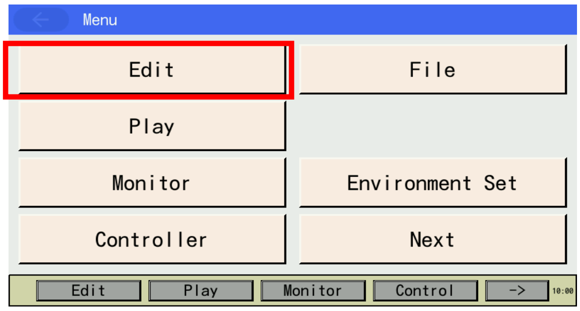
↓

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

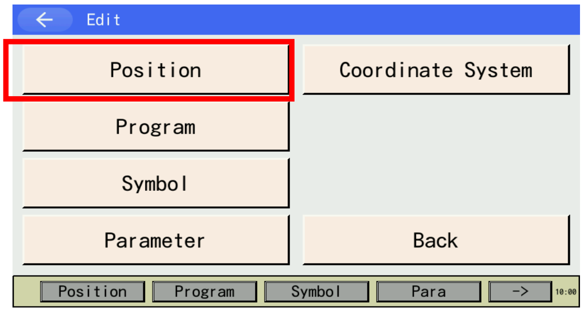
↓

3) Transmit the data to the controller.

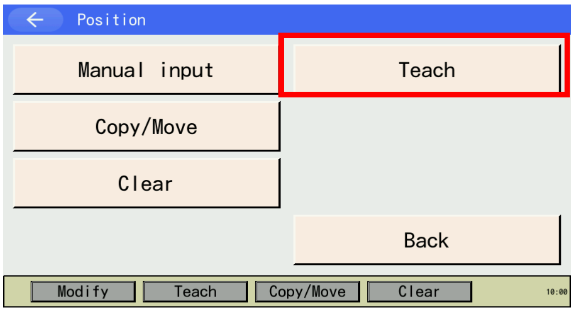
Input the position data by teaching and repeating 1) to 3).
Teaching is transacted mainly at the Teaching screen.



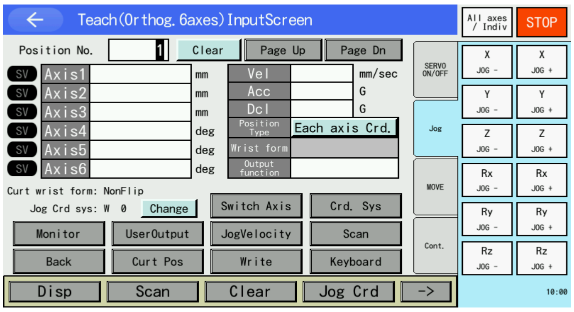
Touch Edit button in the Menu screen.



Touch Position button on the Edit screen.

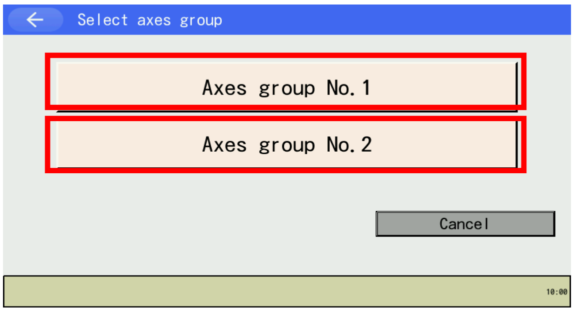


Touch Teach button in Position menu screen.

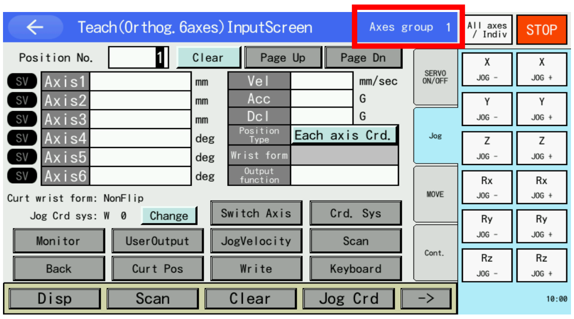


Teach window appears.

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

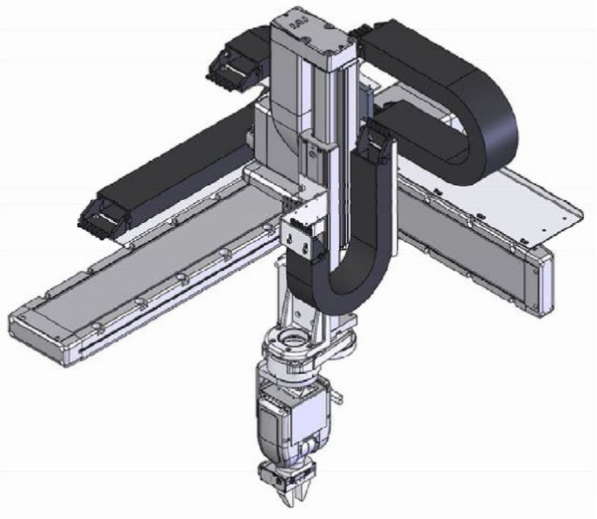
The movement direction during jog operation changes according to the coordinate system No. selected.

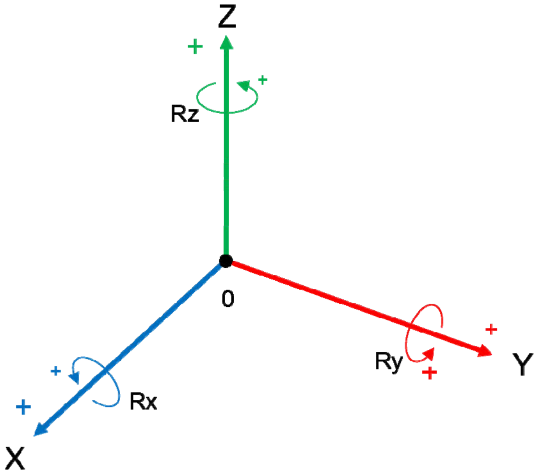
The status before shipment is the base coordinate system (work coordinate system No. 0) and tool coordinate system No. 0.

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

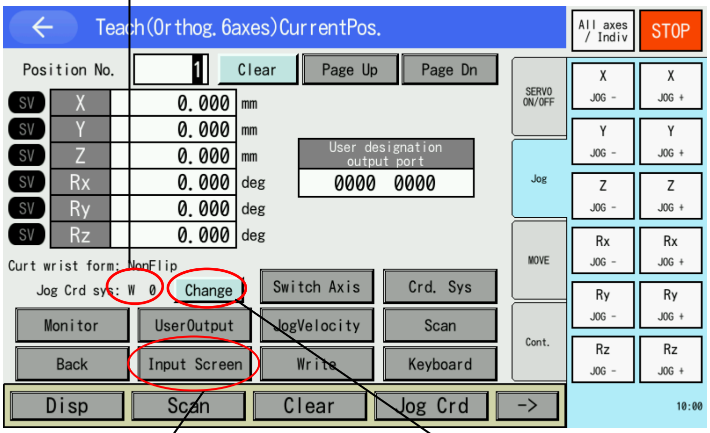
1) Jog operation on base coordinate system

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)



Teach(Orthog. 6axes)CurrentPos.

Position No. 1

SV	X	0.000	mm
SV	Y	0.000	mm
SV	Z	0.000	mm
SV	Rx	0.000	deg
SV	Ry	0.000	deg
SV	Rz	0.000	deg

User designation output port 0000 0000

Curt wrist form: NonFlip

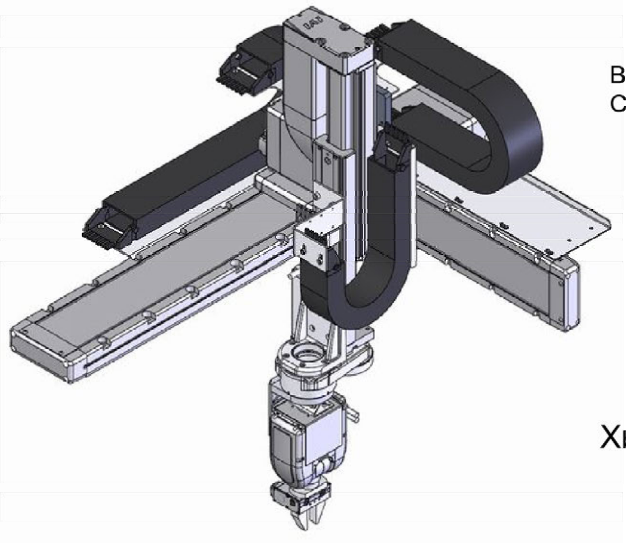
Jog Crd sys: W 0

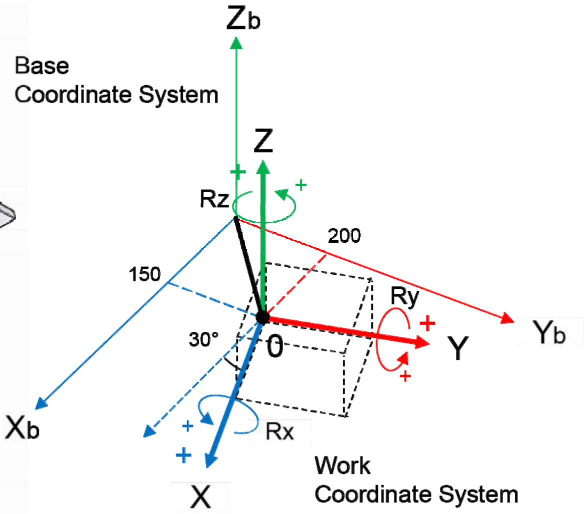
Switchover of input data screen and current position screen is to be conducted by touching Input Screen button.

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

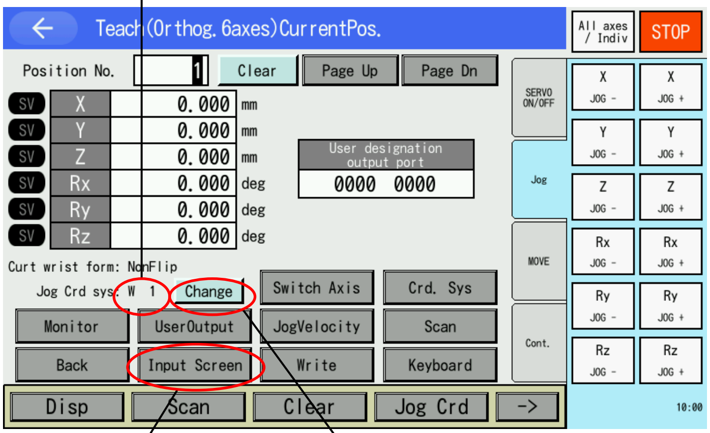
2) Jog operation on work coordinate system

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





Jog movement on work coordinate system No. 1


Teach (Orthog. 6axes) CurrentPos.

Position No. 1

SV	X	0.000	mm
SV	Y	0.000	mm
SV	Z	0.000	mm
SV	Rx	0.000	deg
SV	Ry	0.000	deg
SV	Rz	0.000	deg

User designation output port: 0000 0000

Curt wrist form: NonFlip

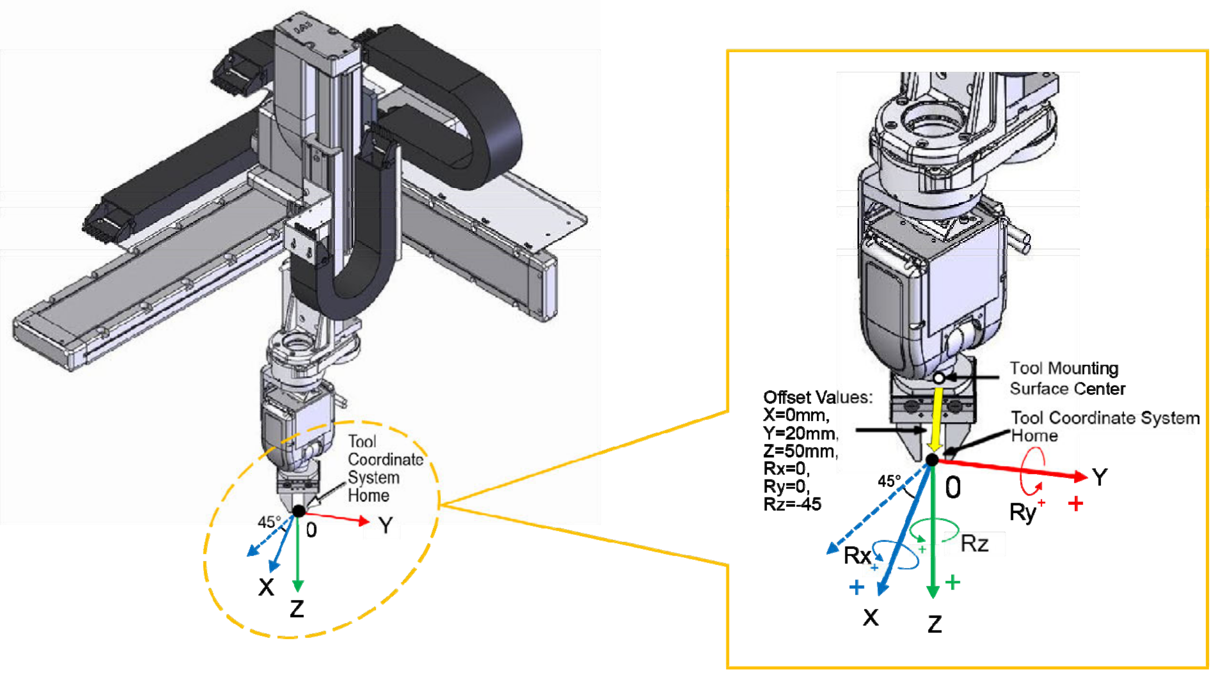
Jog Crd sys: W 1

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

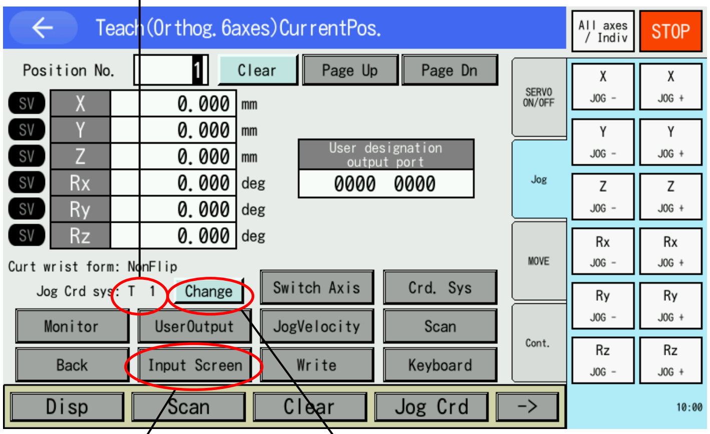
Switchover of the coordinate system for jog operation is to be conducted by touching Change button.

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



Jog movement on work coordinate system No. 1



Position No. 1

SV	X	0.000	mm
SV	Y	0.000	mm
SV	Z	0.000	mm
SV	Rx	0.000	deg
SV	Ry	0.000	deg
SV	Rz	0.000	deg

User designation output port: 0000 0000

Curt wrist form: NonFlip

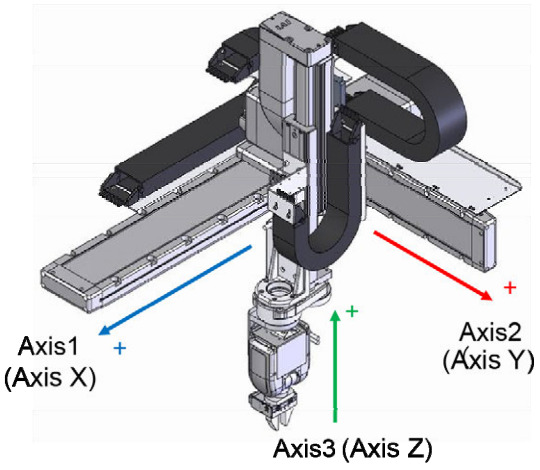
Jog Crd sys: T 1

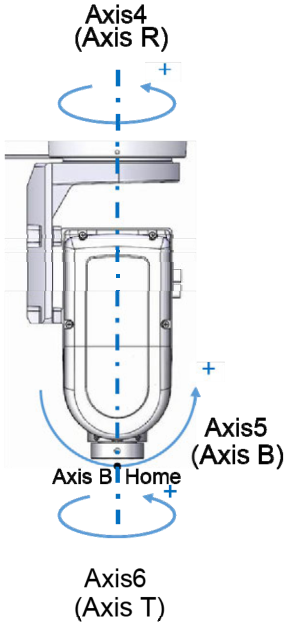
Switchover of input data screen and current position screen is to be conducted by touching Input Screen button.

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

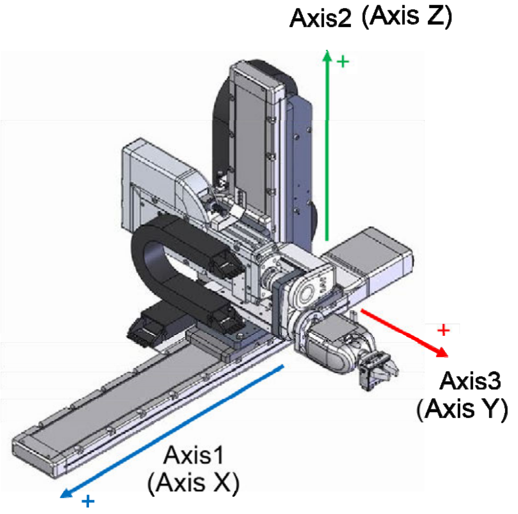
4) Jog operation on each axis system (JOG operation for each actuator)
The JOG buttons and the directions of movement in each axis should be as shown in the figure below.

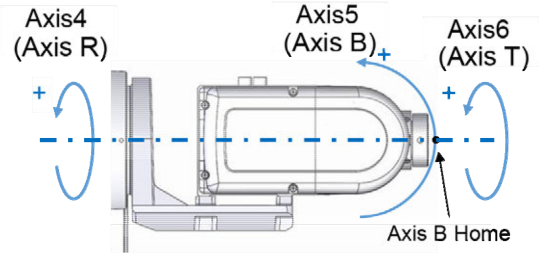
For CRS-XB□



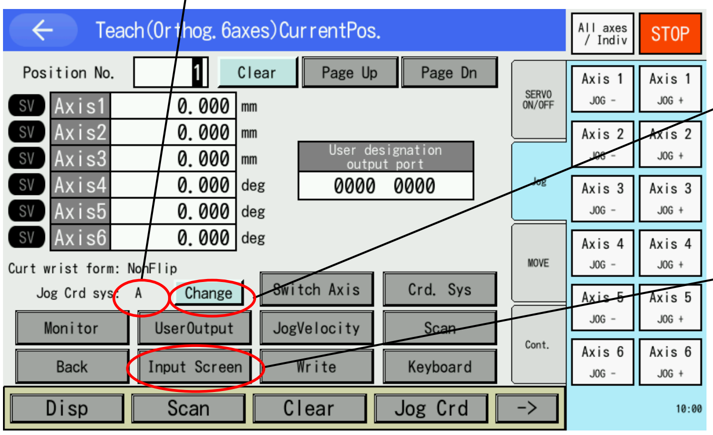


For CRS-XZ□Y





Jog movement on each axis system



Teach(Orthog. 6axes)CurrentPos.

Position No. 1

Axis1	0.000	mm
Axis2	0.000	mm
Axis3	0.000	mm
Axis4	0.000	deg
Axis5	0.000	deg
Axis6	0.000	deg

User designation output port: 0000 0000

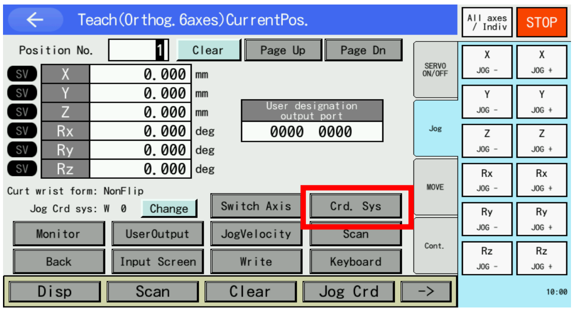
Curt wrist form: NonFlip

Jog Crd sys: A

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

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

(2) Selection of coordinate system No.



Position No. 1

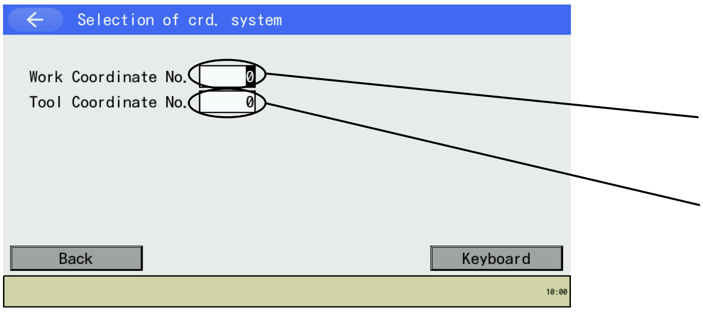
SV	X	0.000	mm
SV	Y	0.000	mm
SV	Z	0.000	mm
SV	Rx	0.000	deg
SV	Ry	0.000	deg
SV	Rz	0.000	deg

User designation output port: 0000 0000

Curt wrist form: NonFlip

Jog Crd sys: W 0

Touch Crd. Sys button.

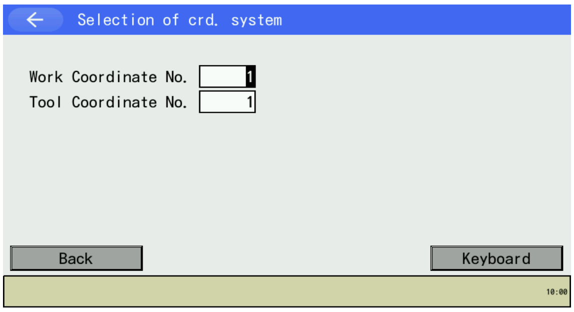


Work Coordinate No. 0

Tool Coordinate No. 0

Enter the work coordinate system No.

Enter the tool coordinate system No.

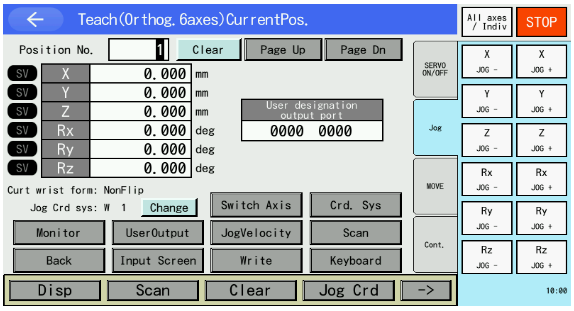


Work Coordinate No. 1

Tool Coordinate No. 1

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.



Position No. 1

SV	X	0.000	mm
SV	Y	0.000	mm
SV	Z	0.000	mm
SV	Rx	0.000	deg
SV	Ry	0.000	deg
SV	Rz	0.000	deg

User designation output port: 0000 0000

Curt wrist form: NonFlip

Jog Crd sys: W 1

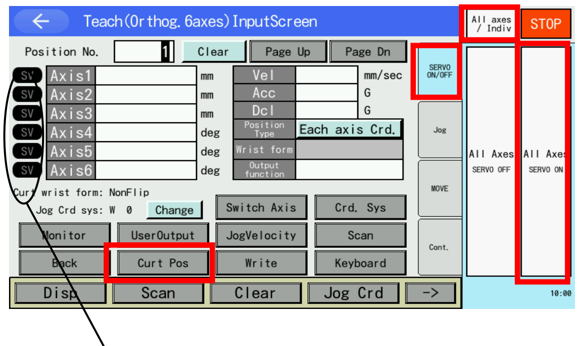
The coordinate values displayed indicate the tool tip position of the tool coordinate system No. 1 on the work coordinate system No. 1.

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



SV Marks

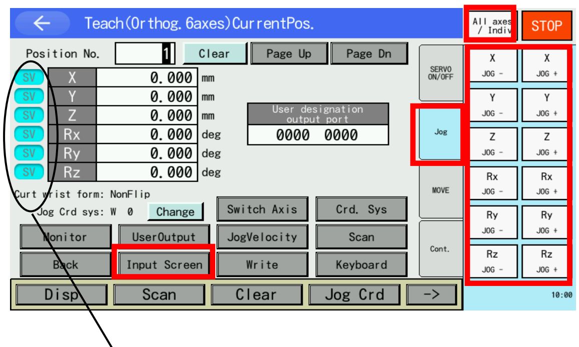
Turn the servo ON condition by touching the SERVO ON/OFF tab and then the All Axes SERVO ON button in the Teaching screen condition.

* 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)

Cur Pos. (Input Screen) button



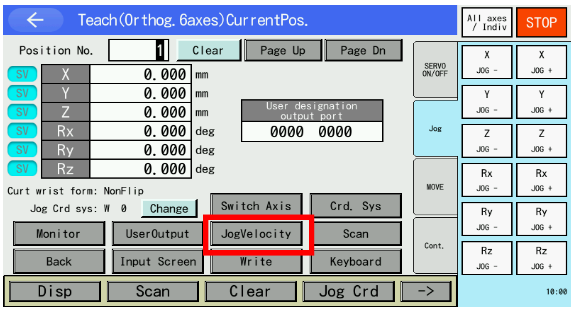
SV Marks

Before operation, check the jog operation coordinate system selected.

Select the JOG tab, and then touch the Axis 1 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.



Teach(Orthog. 6axes)CurrentPos.

Position No. 1

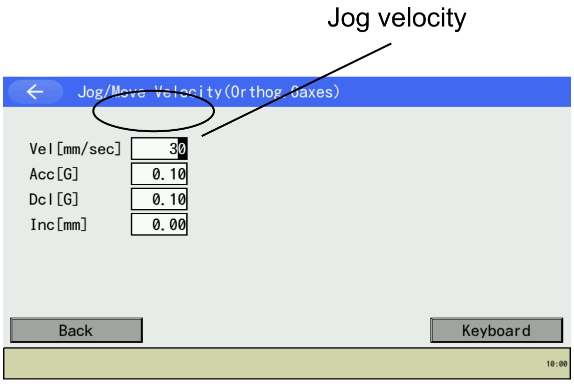
X 0.000 mm
Y 0.000 mm
Z 0.000 mm
Rx 0.000 deg
Ry 0.000 deg
Rz 0.000 deg

User designation output port 0000 0000

Curt wrist form: NonFlip

Jog Crd sys: W 0

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



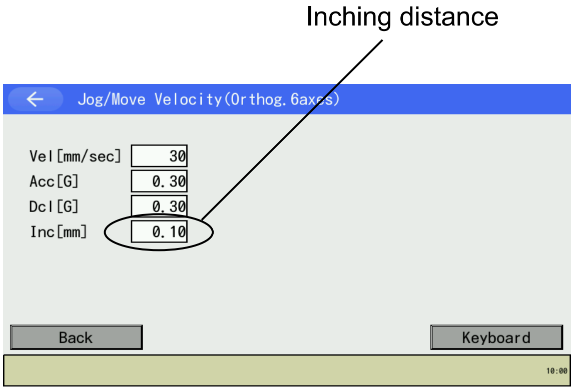
Jog velocity

Jog/Move Velocity(Orthog. 6axes)

Vel[mm/sec] 30
Acc[G] 0.10
Dcl[G] 0.10
Inc[mm] 0.00

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

Jog/Move Velocity(Orthog. 6axes)

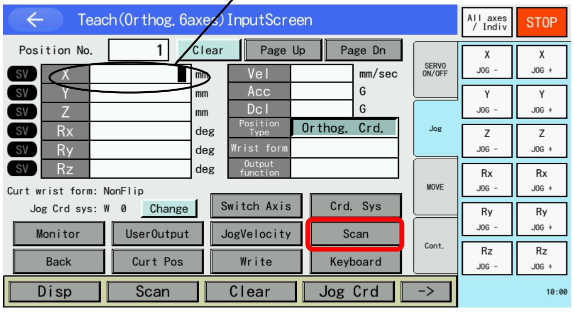
Vel[mm/sec] 30
Acc[G] 0.30
Dcl[G] 0.30
Inc[mm] 0.10

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

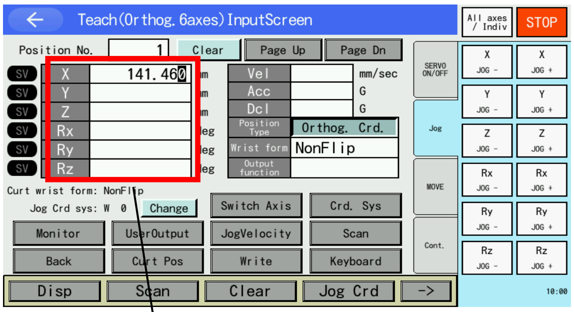
Check in advance the work coordinate system number and tool coordinate system number currently being selected.
(Window transfer: Edit → Position → Teach → Crd. Sys from touch panel)

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



Position No. 1
Position Type Orthog. Crd.
Curt wrist form: NonFlip
Jog Crd sys: W 0

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.



Position No. 1
X 141.460
Position Type Orthog. Crd.
Wrist form NonFlip
Curt wrist form: NonFlip
Jog Crd sys: W 0

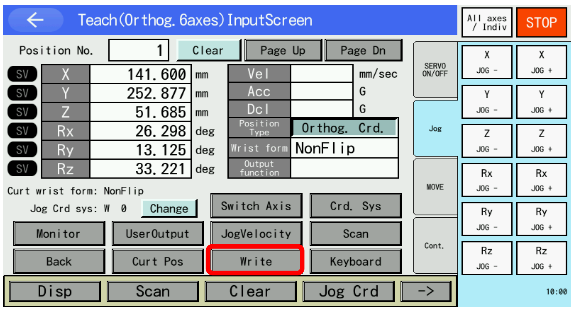
Axis boxes

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.



Position No. 1

X 141.600 mm

Y 252.877 mm

Z 51.685 mm

Rx 26.298 deg

Ry 13.125 deg

Rz 33.221 deg

Position Type: Orthog. Crd.

Wrist form: NonFlip

Curt wrist form: NonFlip

Jog Crd sys: W 0

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.

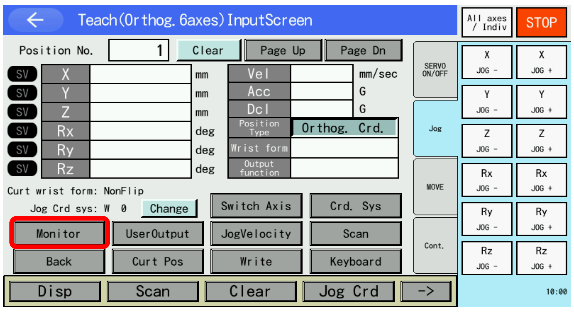
Data input will become invalid if the screen is switched by touching Page Up, Page Dn or Back button before the data is transferred.

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.



Position No. 1

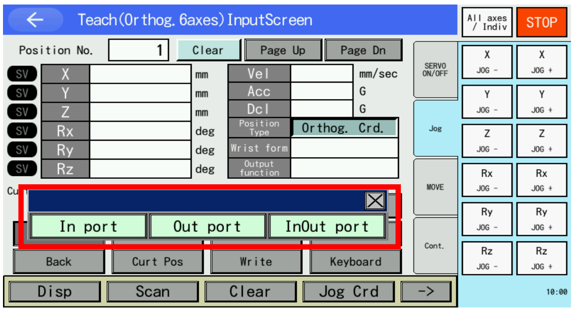
Position Type: Orthog. Crd.

Curt wrist form: NonFlip

Jog Crd sys: W 0

Touch Monitor in the teaching window.

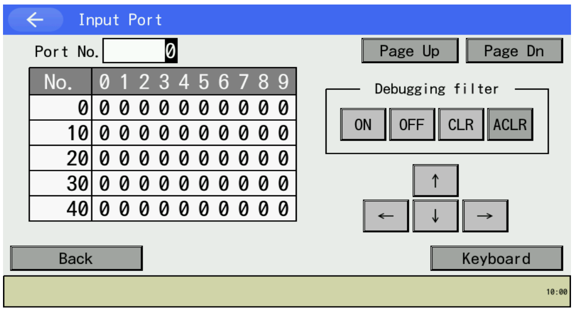
The monitor menu pop-up window will show up.



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

Touch the ☒ 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

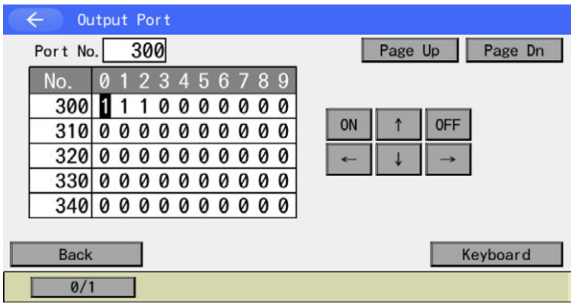


Port No. 0

No.	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0

Refer to [14.2 Input Port] for debug filters.

Output ports

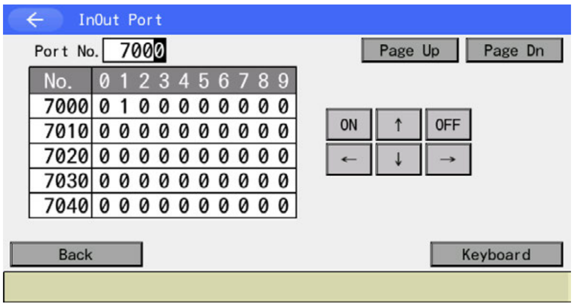


Port No. 300

No.	0	1	2	3	4	5	6	7	8	9
300	1	1	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0

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

InOut Port



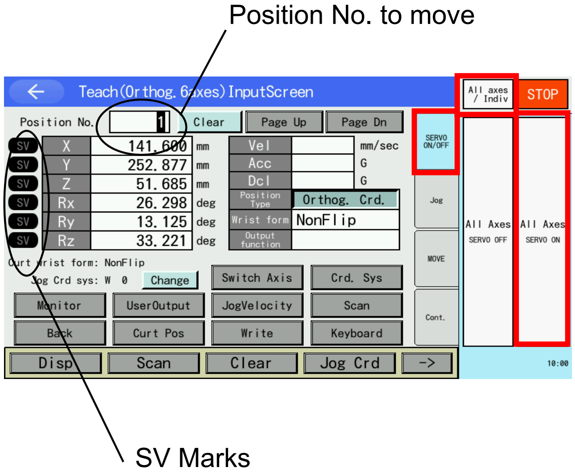
Port No. 7000

No.	0	1	2	3	4	5	6	7	8	9
7000	0	1	0	0	0	0	0	0	0	0
7010	0	0	0	0	0	0	0	0	0	0
7020	0	0	0	0	0	0	0	0	0	0
7030	0	0	0	0	0	0	0	0	0	0
7040	0	0	0	0	0	0	0	0	0	0

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)

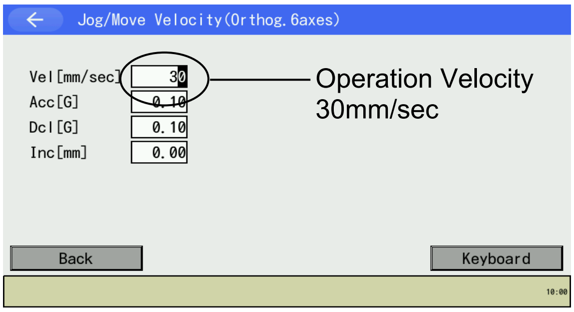


Position No. 1
X 141.600 mm
Y 252.877 mm
Z 51.685 mm
Rx 26.298 deg
Ry 13.125 deg
Rz 33.221 deg
Vel mm/sec
Acc G
Dcl G
Position Type Orthog. Crd.
Wrist form NonFlip
Curt wrist form: NonFlip
Jog Crd sys: W 0

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.

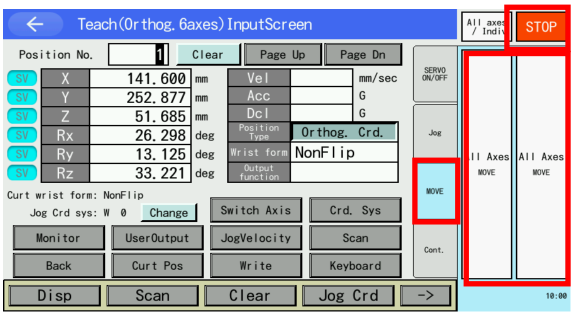
* If you cannot find the All Axes SERVO ON button, touch the All axes / Indiv button to switch the display.

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



Vel[mm/sec] 30
Acc[G] 0.10
Dcl[G] 0.10
Inc[mm] 0.00

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



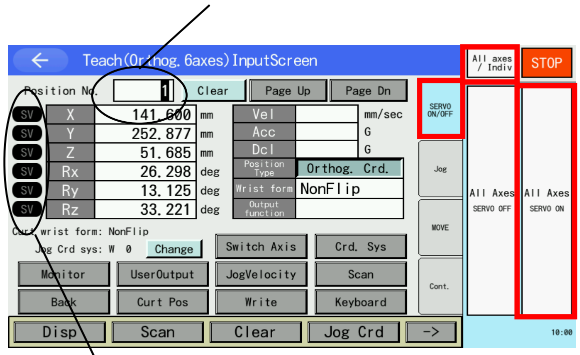
Position No. 1
X 141.600 mm
Y 252.877 mm
Z 51.685 mm
Rx 26.298 deg
Ry 13.125 deg
Rz 33.221 deg
Vel mm/sec
Acc G
Dcl G
Position Type Orthog. Crd.
Wrist form NonFlip
Curt wrist form: NonFlip
Jog Crd sys: W 0

Touch the Move tab and then touch the All Axis 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.

Position number to move in first step



Position No. 1

SV	X	141.600	mm
SV	Y	252.877	mm
SV	Z	51.685	mm
SV	Rx	26.298	deg
SV	Ry	13.125	deg
SV	Rz	33.221	deg

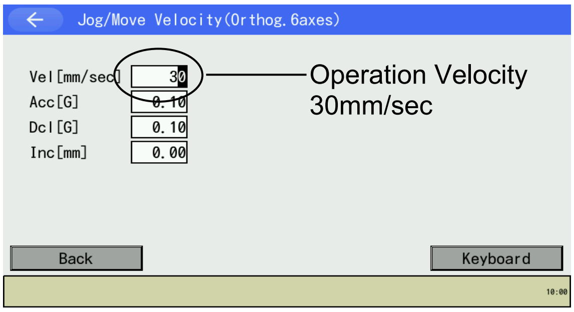
Vel mm/sec
Acc G
Dcl G
Position Type Orthog. Crd.
Wrist form NonFlip
Output function
Curt wrist form: NonFlip
Jog Crd sys: W 0

SV Marks

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.

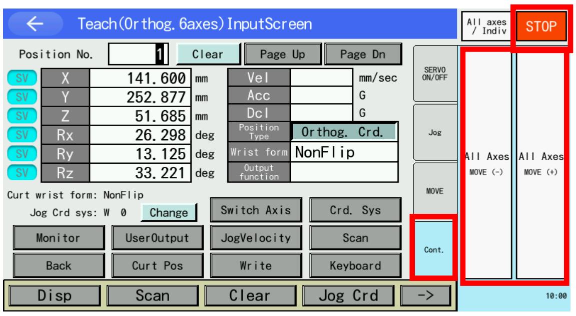
To check the movement speed or to have a change, touch the JOG Velocity button.



Vel[mm/sec] 30
Acc[G] 0.10
Dcl[G] 0.10
Inc[mm] 0.00

Operation Velocity
30mm/sec

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



Position No. 1

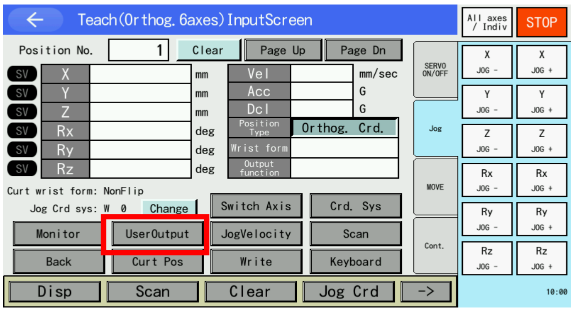
SV	X	141.600	mm
SV	Y	252.877	mm
SV	Z	51.685	mm
SV	Rx	26.298	deg
SV	Ry	13.125	deg
SV	Rz	33.221	deg

Vel mm/sec
Acc G
Dcl G
Position Type Orthog. Crd.
Wrist form NonFlip
Output function
Curt wrist form: NonFlip
Jog Crd sys: W 0

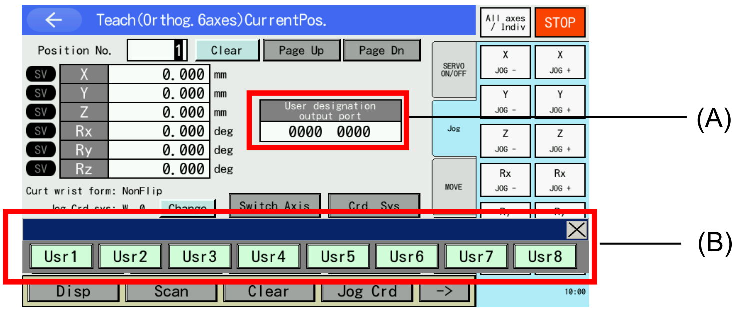
Touch the Cont. Tab and then touch the All Axis Move (+) or All Axis Move (-) button. The actuator will start making a continuous moving.
To stop the actuator on the way, touch the Stop button.

(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.

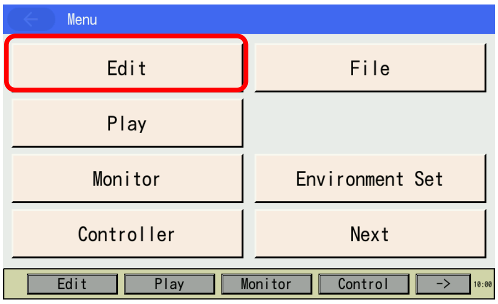
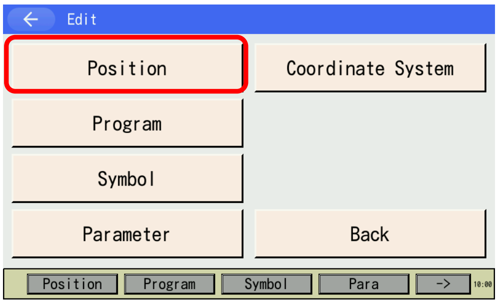
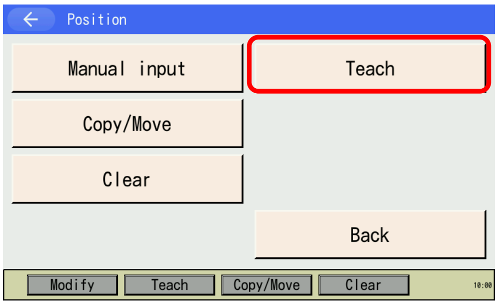
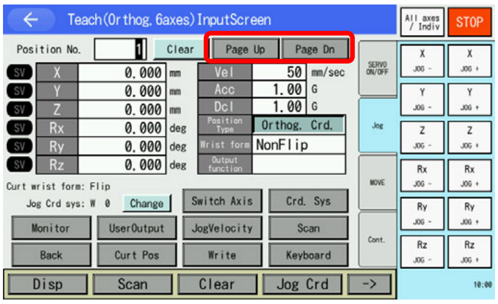
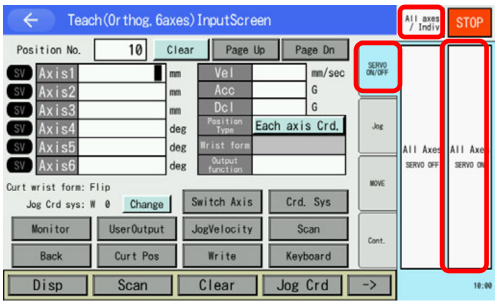
1) Setting of user-specified output port parameters
   For the operation method for parameter setting, refer to [13. Parameter Edit].
   The first port No. and the number of ports are set with the following parameters:
   - Number of ports
     I/O parameter No. 74 “QntPrtUsrOut” (Number of output ports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

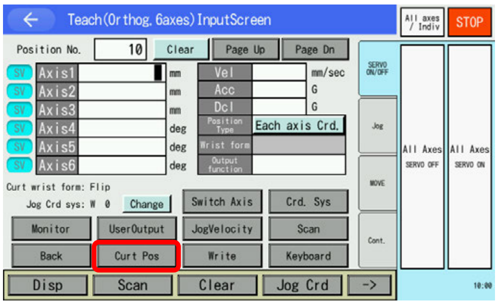
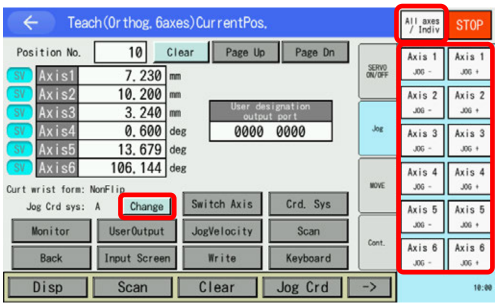
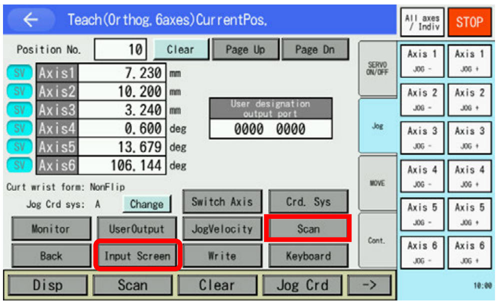
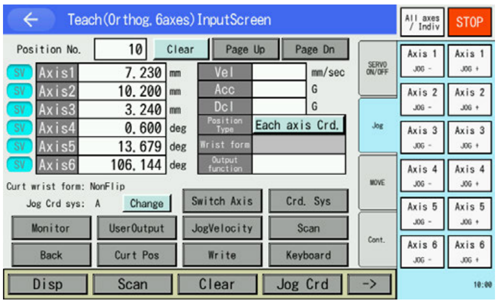
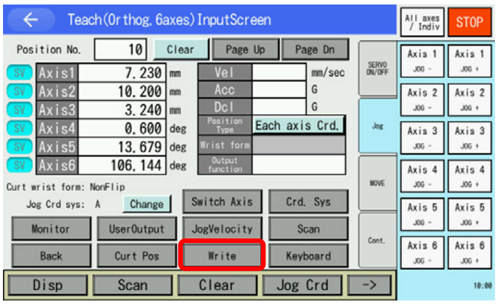
   (Setting example) When the first port No. is set to 308 and the number of ports is set to 8:

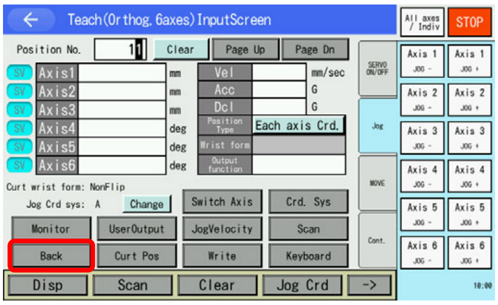
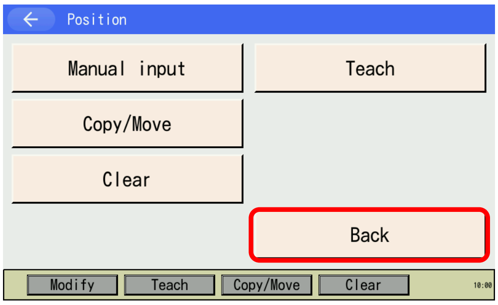
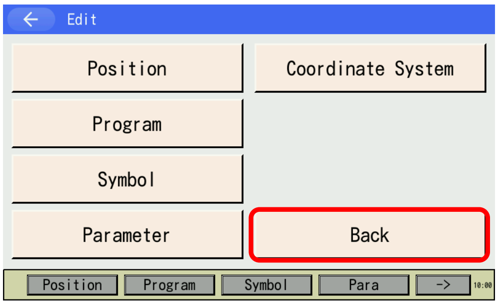
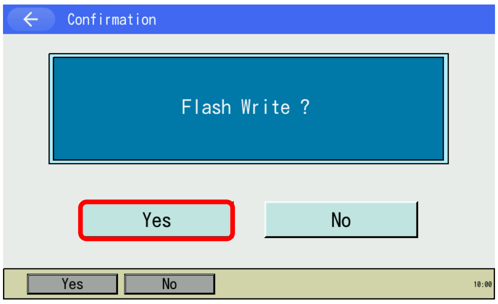
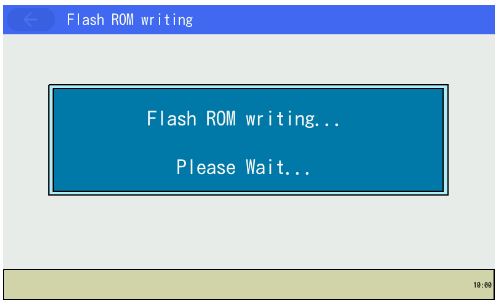
   ‘Usr1’ ········· Output port 308
   ‘Usr2’ ········· Output port 309
   ‘Usr3’ ········· Output port 310
   ‘Usr4’ ········· Output port 311
   ‘Usr5’ ········· Output port 312
   ‘Usr6’ ········· Output port 313
   ‘Usr7’ ········· Output port 314
   ‘Usr8’ ········· Output port 315

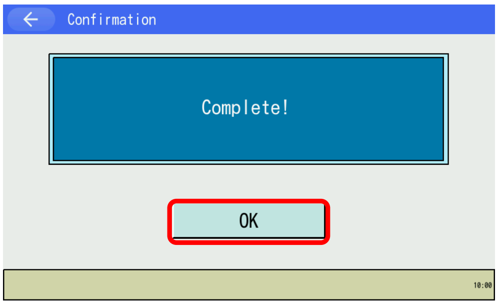
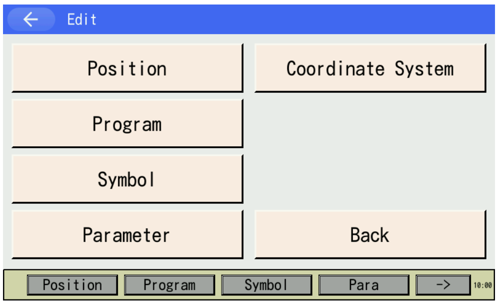
8.4.4 Example for Teaching Input

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

No.	Operation		
1	Touch Edit button.	 Menu Edit File Play Monitor Environment Set Controller Next Edit Play Monitor Control ->	
2	Touch Position button. .	 Edit Position Coordinate System Program Symbol Parameter Back Position Program Symbol Para ->	
3	Touch Teach button.	 Position Manual input Teach Copy/Move Clear Back Modify Teach Copy/Move Clear	
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.	 Teach(Orthog. 6axes) InputScreen All axes / Indiv STOP Position No. Clear Page Up Page Dn SERVO ON/OFF Jog MOVE Cont. Monitor UserOutput JogVelocity Scan Back Curt Pos Write Keyboard Disp Scan Clear Jog Crd ->	
5	Touch SERVO ON/OFF button and then touch All Axes SERVO ON button to turn the servo ON.	 Teach(Orthog. 6axes) InputScreen All axes / Indiv STOP Position No. 10 SERVO ON/OFF All Axes SERVO OFF All Axes SERVO ON Disp Scan Clear Jog Crd ->	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.

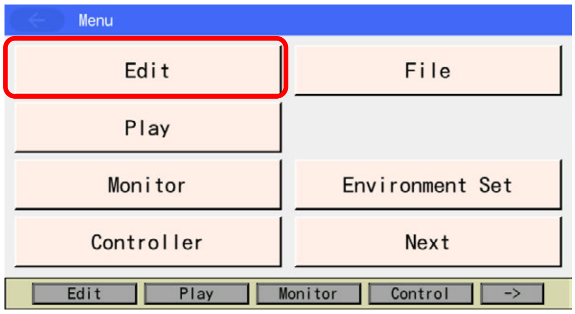
No.	Operation		
6	Touch the Curt Pos button to switch the screen to the current position display.	Teach(Orthog. 6axes) InputScreen Position No. 10 Curt wrist form: Flip Jog Crd sys: W 0	
7	Touch the Change button for the jog coordinate system to select the coordinate system to perform the jog operation. 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.	Teach(Orthog. 6axes) CurrentPos. Position No. 10 Axis1 7.230 mm Axis2 10.200 mm Axis3 3.240 mm Axis4 0.600 deg Axis5 13.679 deg Axis6 106.144 deg User designation output port 0000 0000 Curt wrist form: NonFlip Jog Crd sys: A	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.	Teach(Orthog. 6axes) CurrentPos. Position No. 10 Axis1 7.230 mm Axis2 10.200 mm Axis3 3.240 mm Axis4 0.600 deg Axis5 13.679 deg Axis6 106.144 deg User designation output port 0000 0000 Curt wrist form: NonFlip Jog Crd sys: A	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.	Teach(Orthog. 6axes) InputScreen Position No. 10 Axis1 7.230 mm Axis2 10.200 mm Axis3 3.240 mm Axis4 0.600 deg Axis5 13.679 deg Axis6 106.144 deg Position Type: Each axis Crd. Curt wrist form: NonFlip Jog Crd sys: A	*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.	Teach(Orthog. 6axes) InputScreen Position No. 10 Axis1 7.230 mm Axis2 10.200 mm Axis3 3.240 mm Axis4 0.600 deg Axis5 13.679 deg Axis6 106.144 deg Position Type: Each axis Crd. Curt wrist form: NonFlip Jog Crd sys: A	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.	 Teach(Orthog. 6axes) InputScreen STOP Position No. Clear Page Up Page Dn Axis1 Axis2 Axis3 Axis4 Axis5 Axis6 Vel Acc Dcl Each axis Crd. Curt wrist form: NonFlip Jog Crd sys: A Change Switch Axis Crd. Sys Monitor UserOutput JogVelocity Scan Back Curt Pos Write Keyboard Disp Scan Clear Jog Crd ->	
12	Touch Back button.	 Position Manual input Teach Copy/Move Clear Back Modify Teach Copy/Move Clear	
13	Touch Back button.	 Edit Position Coordinate System Program Symbol Parameter Back Position Program Symbol Para ->	
14	Write to the flash ROM. Touch the Yes button.	 Flash Write ?	
15	While in writing process to flash ROM, the display ‘Flash ROM writing...’flashes.	 Flash ROM writing... Please Wait...	***Never shut off the power to the controller during Flash ROM writing.***

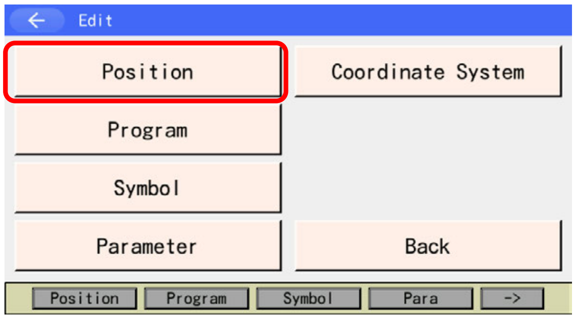
No.	Operation		
16	The flash ROM writing process is finished. Touch OK button. The screen returns to Edit menu.	 Complete! 	
17		 Edit Position Coordinate System Program Symbol Parameter Back Position Program Symbol Para -> 10:00	

8.5 Copy and Movement of Position Data

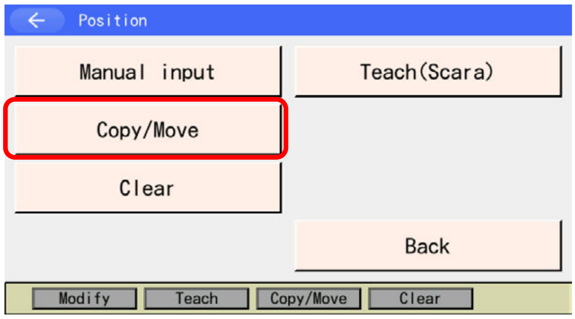
It is a way to copy or move the position data to another position number.



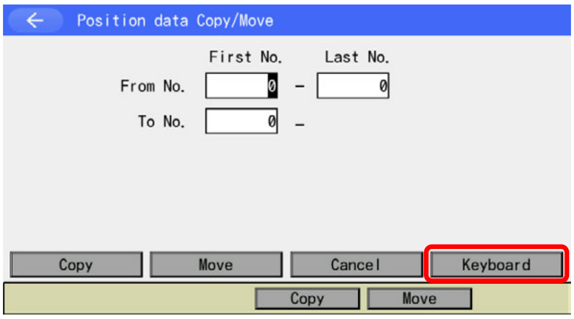
Touch Edit button in the Menu screen.



Touch Position button on the Edit screen.

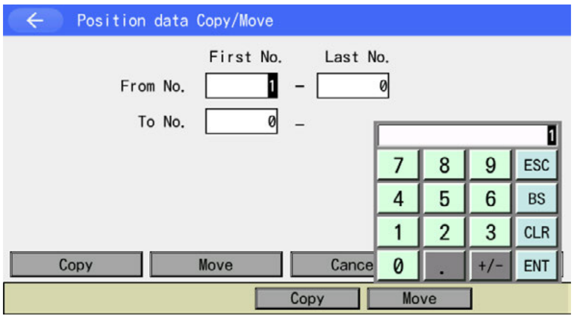


Touch Copy/Move button in Position screen.

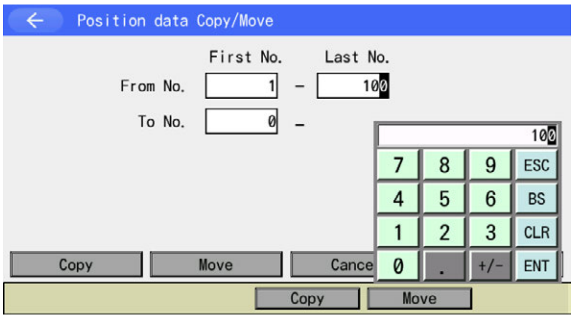


First No. Last No.
From No. 0 – 0
To No. 0 –

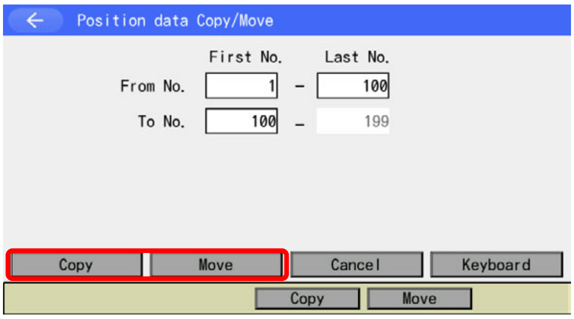
Touch Keyboard button to show the touch panel keyboard.
If the cursor is not on From No. First No., touch on From No. First No. to show the cursor.



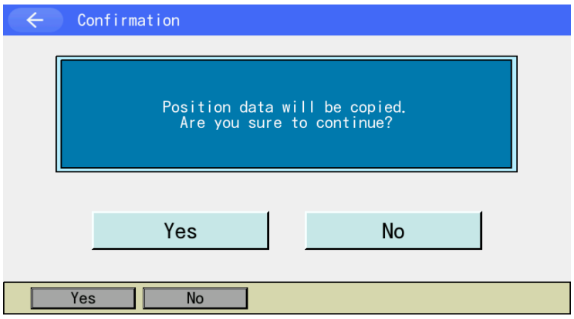
Input a value in From No. First No. and touch ENT button.
The cursor moves to From No. Last No. and touch panel keyboard closes.



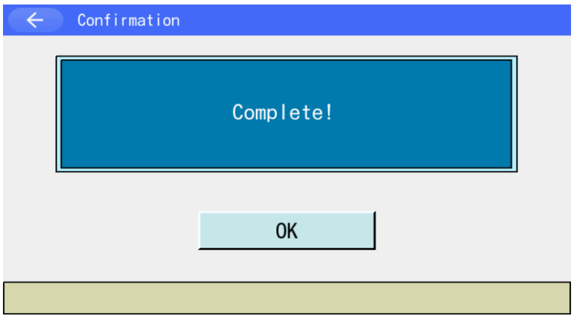
Touch Keyboard button again to show the touch panel keyboard.
Input a value in From No. Last No. and touch ENT button.



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.

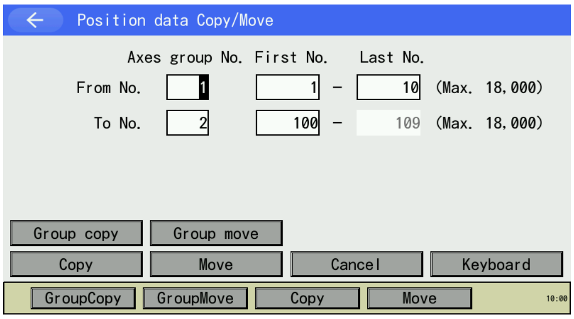

Position data will be copied.
Are you sure to continue?

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


Complete!

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.



	Axes group No.	First No.		Last No.	
From No.	1	1	–	10	(Max. 18,000)
To No.	2	100	–	109	(Max. 18,000)

Each contents and button operations are as shown below.

[From No.]

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.

[To No.]

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.

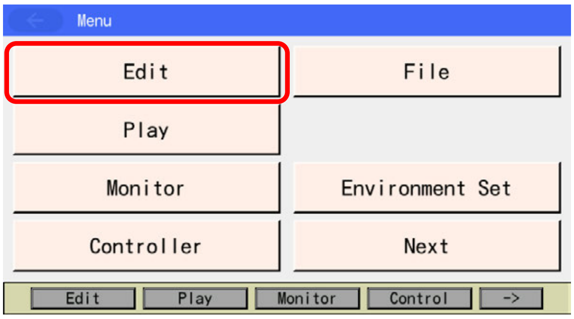
Group move : Move between axes groups is to be performed. Data in the positions from No. 1 to the maximum position number in the axes group to move from can be moved to the positions from No. 1 in the axes group to move to.
Indicate different axes group numbers for the group to move from and the group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

Cancel : The screen goes back to the position menu.

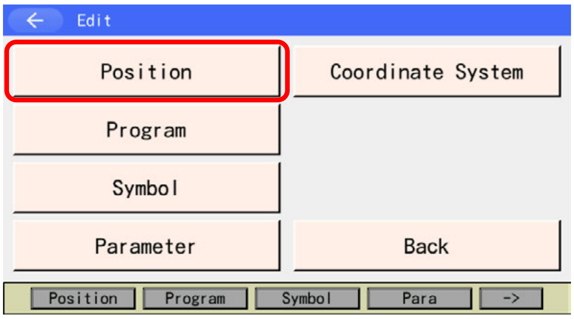
Keyboard : It should show the keyboard. Touch a box to input data to show the cursor and then touch the Keyboard button.

8.6 Deletion of Position Data

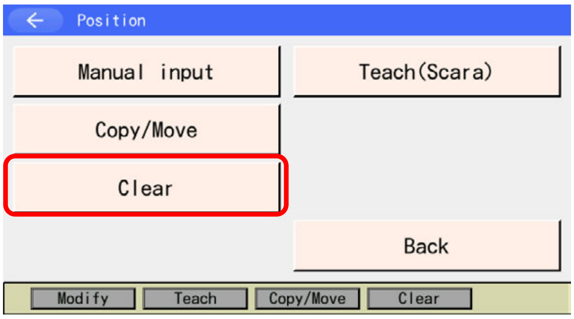
The following operating instructions are to delete the position data.



Touch Edit button in the Menu screen.

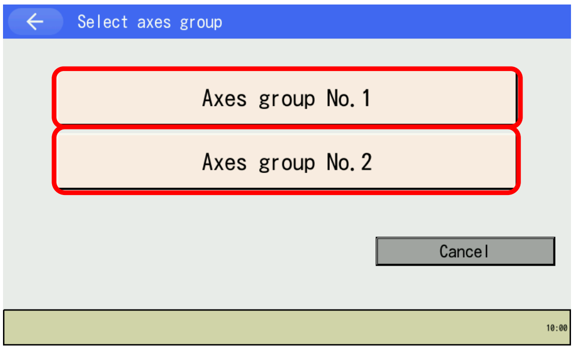


Touch Position button on the Edit screen.

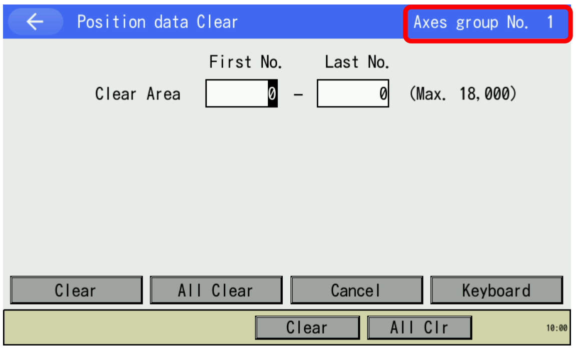


Touch Clear button on the Position screen.

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 window 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.



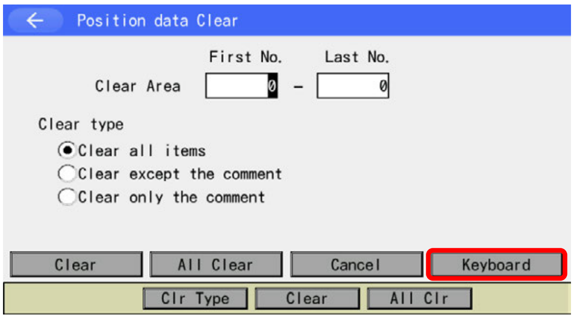
The select axes group window should appear after you touch the Manual Input button.
T ouch an Axes group No. button.



Clear Area 0 – 0 (Max. 18,000)

The position data clear window will appear.

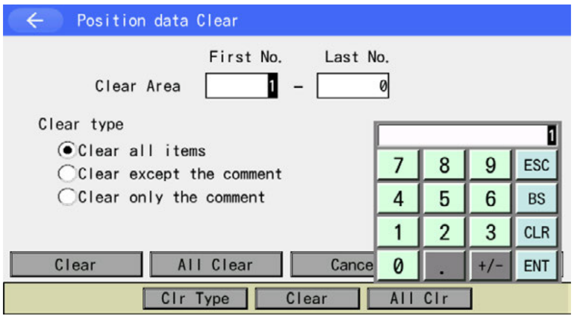
* The axes group number that was selected should be shown on the top right of the screen.



Clear Area 0 – 0

Clear type
● Clear all items
○ Clear except the comment
○ Clear only the comment

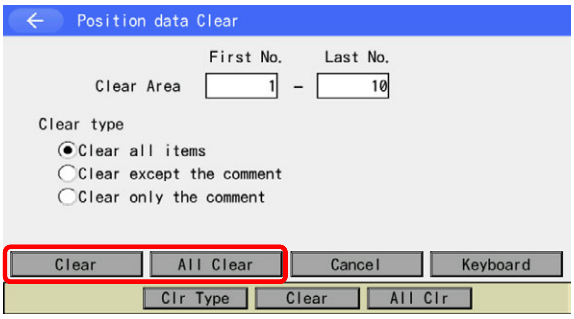
Touch Keyboard button to show the touch panel keyboard.
If the cursor is not on the top number, touch the top number to show the cursor.



Clear Area 1 – 0

Clear type
● Clear all items
○ Clear except the comment
○ Clear only the comment

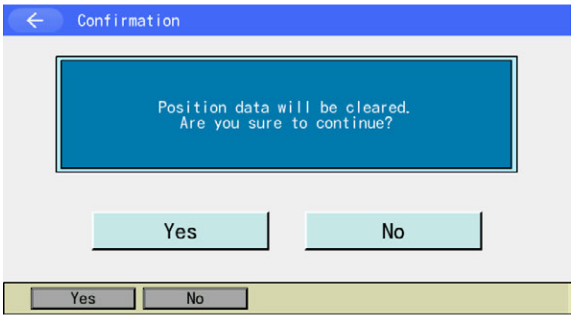
Input the First No. and touch ENT button. The cursor moves to the Last No. and the touch panel keyboard closes.



Clear Area 1 – 10

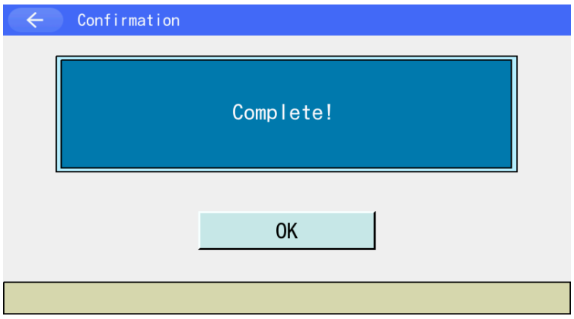
Clear type
● Clear all items
○ Clear except the comment
○ Clear only the comment

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.



Position data will be cleared.
Are you sure to continue?

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

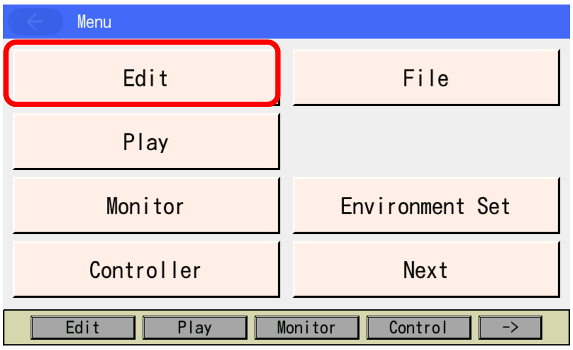
(Excluding the positioner mode of the SSEL, ASEL and PSEL controller.)

9.1 How to Input Program

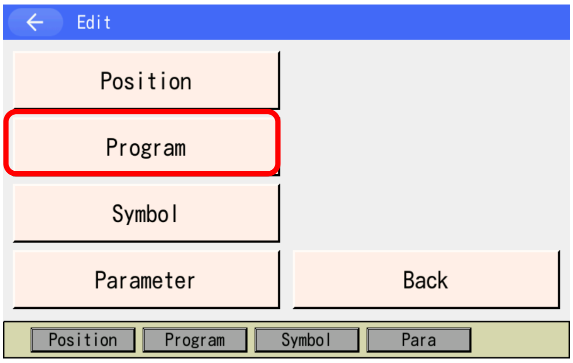
Input the program step below as an example.
Program No. 2

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		

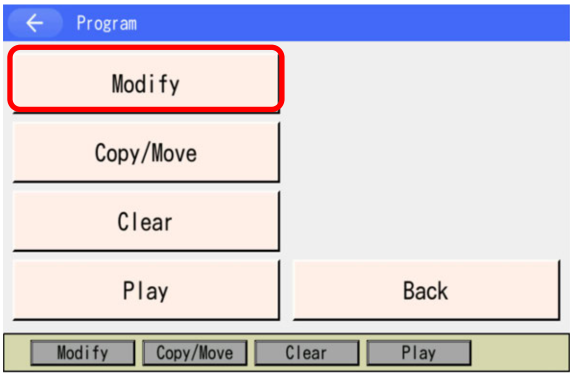
Only input conditions for Step No. 1 and all for Step No. 2 are input.



Touch Edit button in the Menu screen.

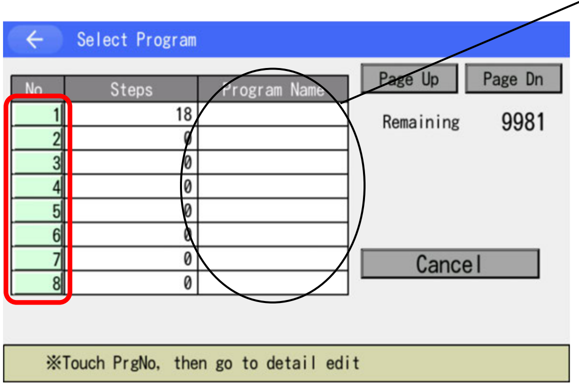


Touch Program button in the Edit screen.



Touch Modify button in the Program screen.

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



Remaining 9981

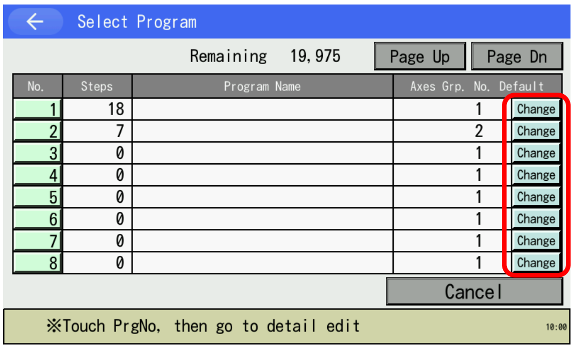
No	Steps	Program Name
1	18	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	

※Touch PrgNo, then go to detail edit

Program names created in symbol edit

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 window. 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)

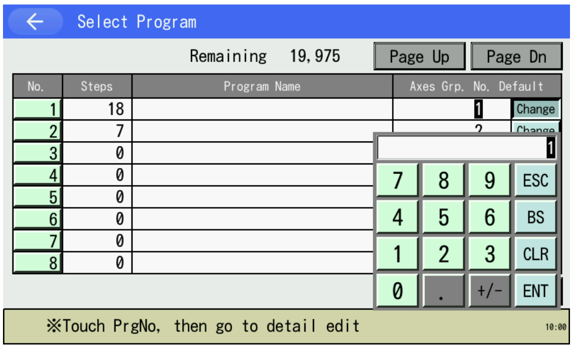


Remaining 19,975

No.	Steps	Program Name	Axes Grp. No. Default	
1	18		1	Change
2	7		2	Change
3	0		1	Change
4	0		1	Change
5	0		1	Change
6	0		1	Change
7	0		1	Change
8	0		1	Change

※Touch PrgNo, then go to detail edit

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



Remaining 19,975

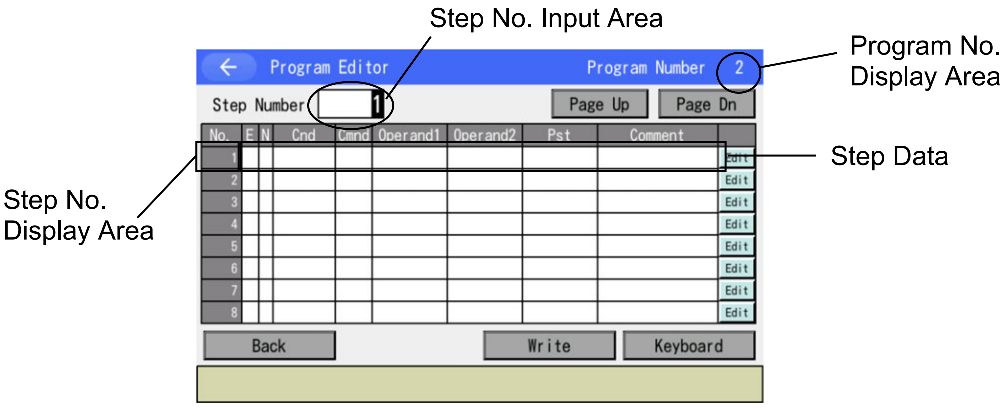
No.	Steps	Program Name	Axes Grp. No. Default	
1	18		1	Change
2	7		2	Change
3	0			
4	0			
5	0			
6	0			
7	0			
8	0			

1

※Touch PrgNo, then go to detail edit

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

After the setting is changed, follow [10.8 Flash ROM Writing] to conduct the flash ROM writing.



[Items Shown in Program Step Edit Screen]

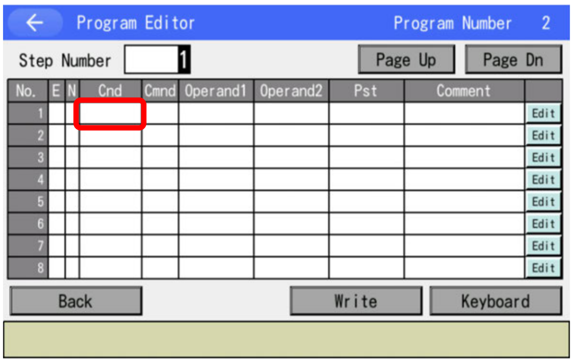
Program No. Display Area : It shows the editing program No.

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

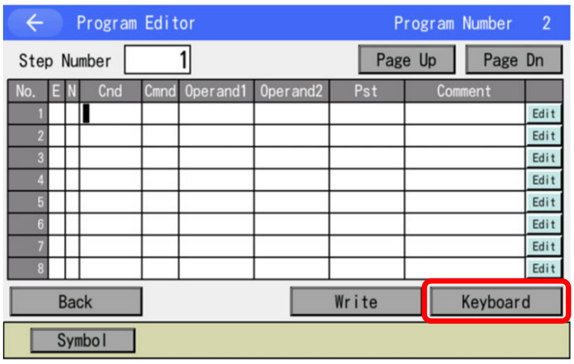
Step No. Display Area : Is to display Step No.

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.)

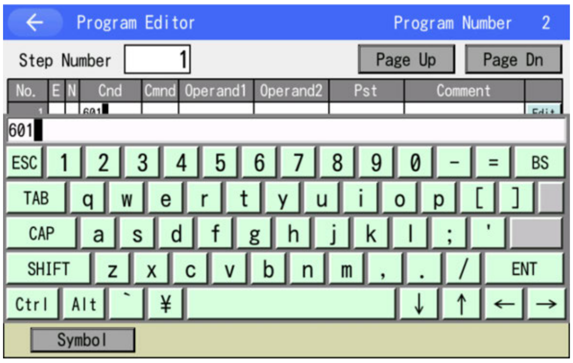


Move the cursor to No.1, Cnd area by touching.

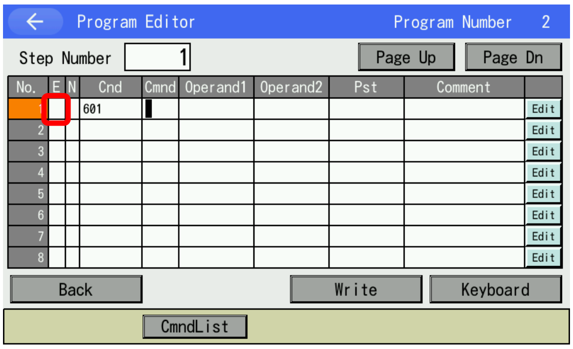


With the cursor being in Cnd input area, touch the keyboard button to show the touch panel keyboard and input 601.

Condition of Touch Panel Keyboard Displayed

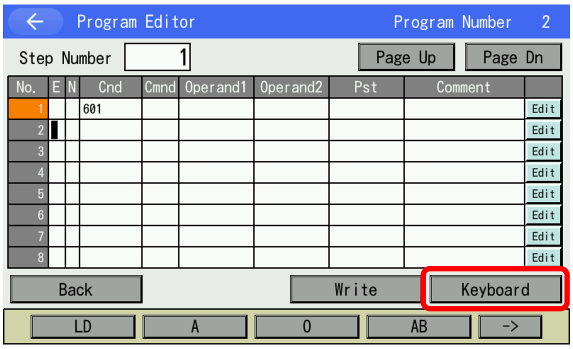

Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
601
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol

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

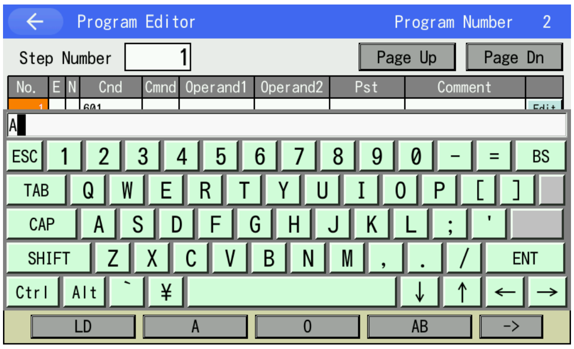


The cursor moves to Cmnd column. Also, to show that it is being edited (controller writing not yet done), the background color in the step number display box turns to orange.

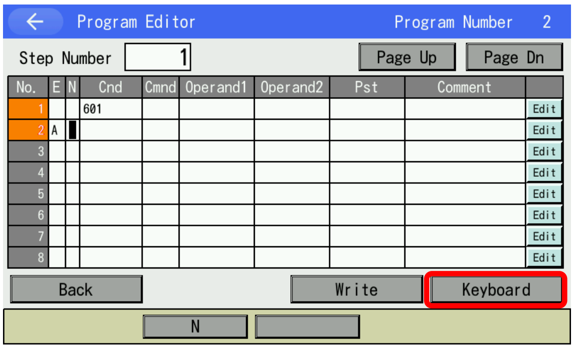
Touch No. 2, Column E to move the cursor.



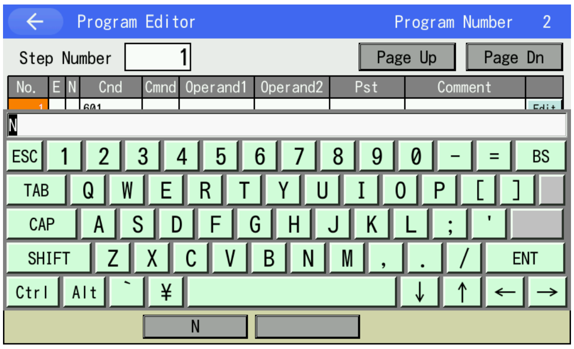
Touch the keyboard button with the cursor being displayed at E Column to show the touch panel keyboard in order to A.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
A
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB Q W E R T Y U I O P [ ]
CAP A S D F G H J K L ; '
SHIFT Z X C V B N M , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
LD
A
O
AB
->

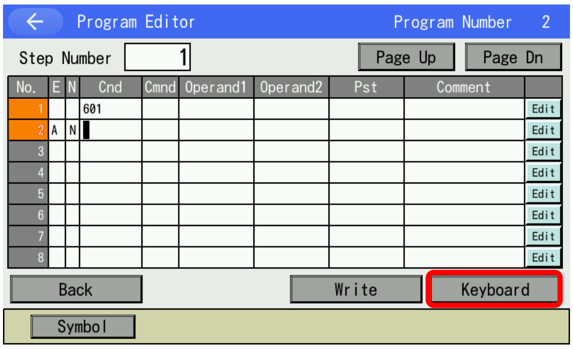
Input A and touch ENT.
The touch panel keyboard closes and A gets to be input to E Column.



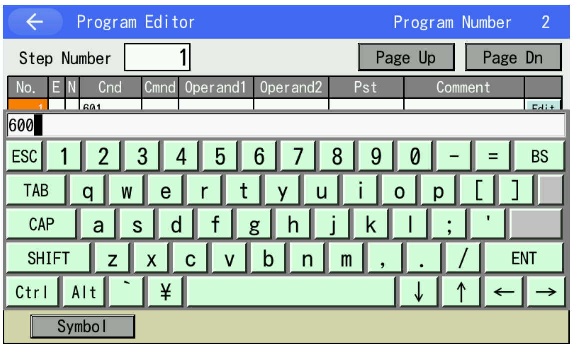
The cursor moves to N Column. Touch Keyboard button to show the touch panel keyboard, and input 'N'.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
N
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB Q W E R T Y U I O P [ ]
CAP A S D F G H J K L ; '
SHIFT Z X C V B N M , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
N

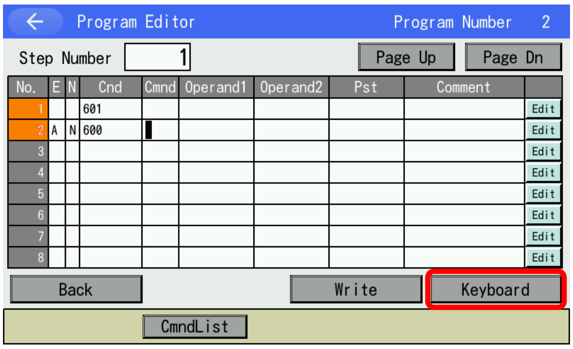
Example for input on touch panel keyboard



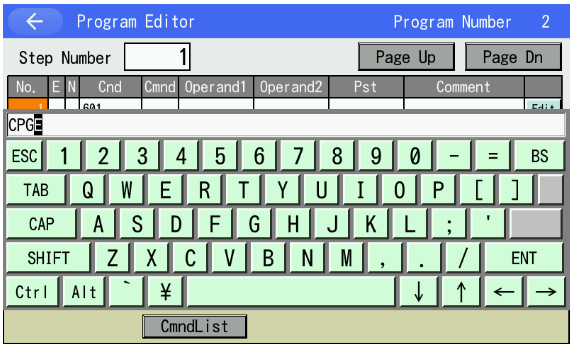
The cursor moves to the Cnd input area. Touch Keyboard button to show the touch panel keyboard, and input 600.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
600
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol

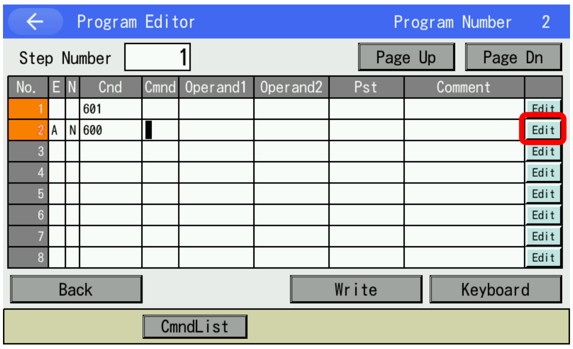
Example for input on touch panel keyboard



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


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
CPGE
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB Q W E R T Y U I O P [ ]
CAP A S D F G H J K L ; '
SHIFT Z X C V B N M , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
CmndList

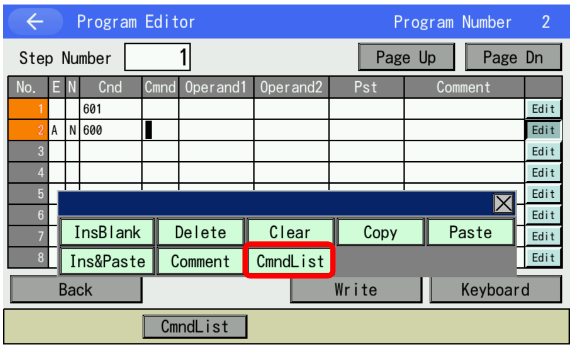
Example for input on touch panel keyboard



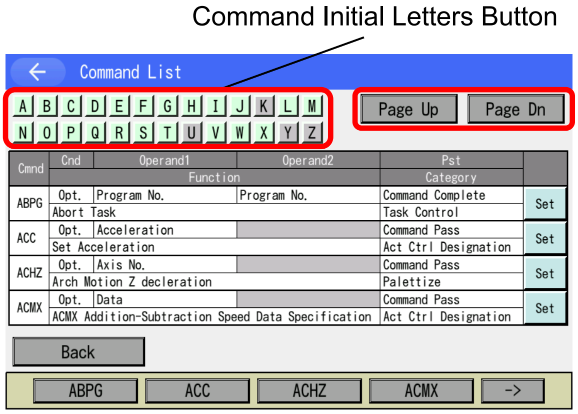
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1			601					
2	A	N	600					
3								
4								
5								
6								
7								
8								

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

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

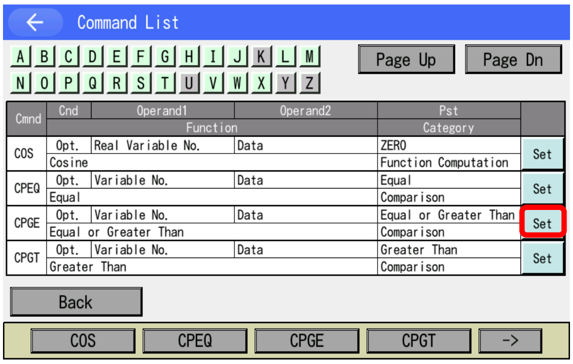


Touch ComdList button in the edit menu.


Command Initial Letters Button
Command List
A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
Page Up
Page Dn
Back
ABPG
ACC
ACHZ
ACMX
->

Cmnd	Cnd	Operand1	Operand2	Pst	
	Function			Category	
ABPG	Opt.	Program No.	Program No.	Command Complete	Set
	Abort Task			Task Control	
ACC	Opt.	Acceleration		Command Pass	Set
	Set Acceleration			Act Ctrl Designation	
ACHZ	Opt.	Axis No.		Command Pass	Set
	Arch Motion Z decleration			Palettize	
ACMX	Opt.	Data		Command Pass	Set
	ACMX Addition-Subtraction Speed Data Specification			Act Ctrl Designation	

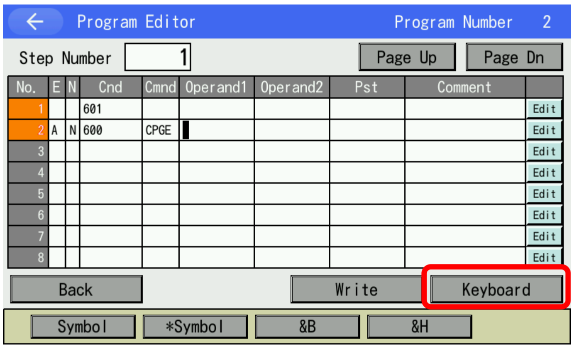
The command list window appears. Touch the command initial letters or Page Up / Page Dn buttons to switch the display in order to show the command that you would like to input.



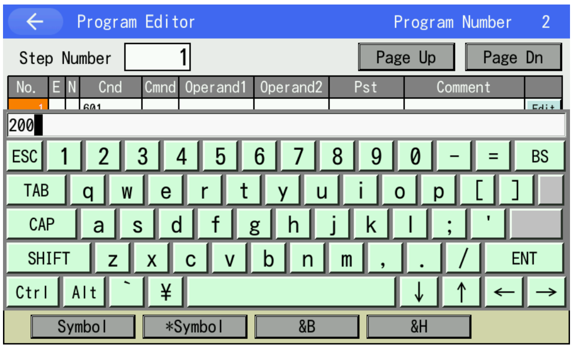
Cmnd	Cnd	Operand1	Operand2	Pst	
	Function			Category	
COS	Opt.	Real Variable No.	Data	ZERO	Set
	Cosine			Function Computation	
CPEQ	Opt.	Variable No.	Data	Equal	Set
	Equal			Comparison	
CPGE	Opt.	Variable No.	Data	Equal or Greater Than	Set
	Equal or Greater Than			Comparison	
CPGT	Opt.	Variable No.	Data	Greater Than	Set
	Greater Than			Comparison	

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

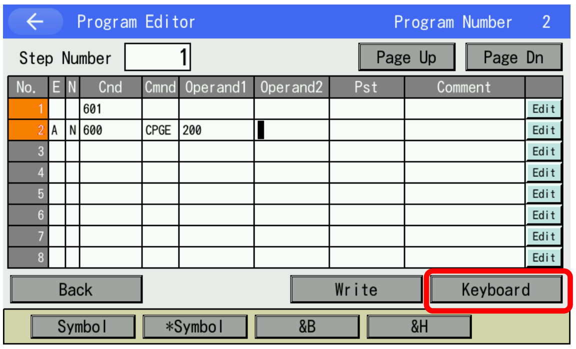
Return to the previous screen.



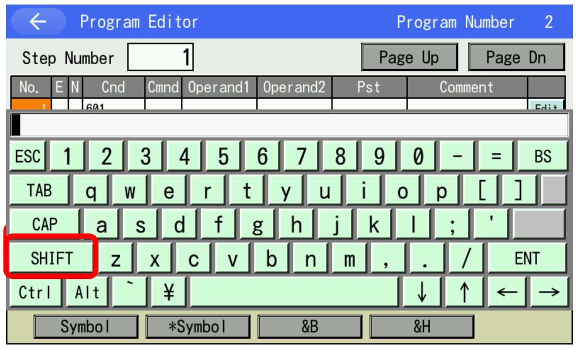
The cursor moves to the Operand1 input box.
Touch Keyboard button to show the touch panel keyboard, and input 200.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
200
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol
*Symbol
&B
&H

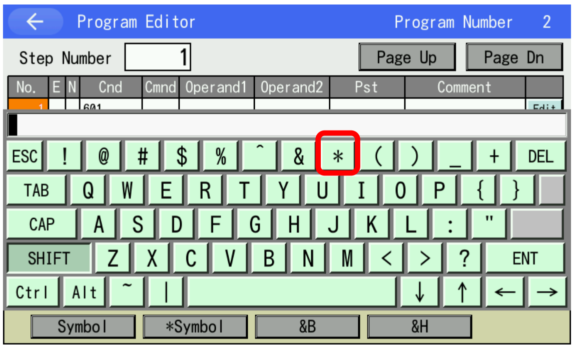
Example for input on touch panel keyboard



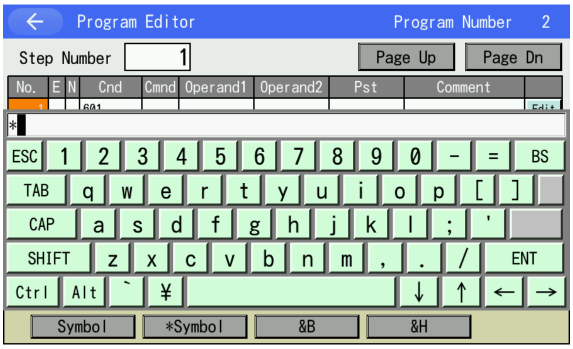
The cursor moves to the Operand2 input box.
Touch Keyboard button to show the touch panel keyboard.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol
*Symbol
&B
&H

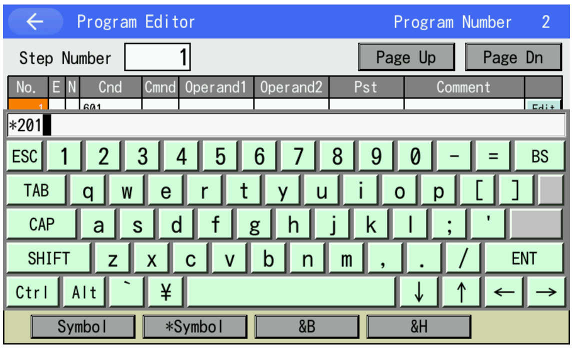
Touch SHIFT button to switch the letters displayed on the keyboard.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC ! @ # $ % ^ & * ( ) _ + DEL
TAB Q W E R T Y U I O P { }
CAP A S D F G H J K L : "
SHIFT Z X C V B N M < > ? ENT
Ctrl Alt ~ | ↓ ↑ ← →
Symbol *Symbol &B &H

Touch *.

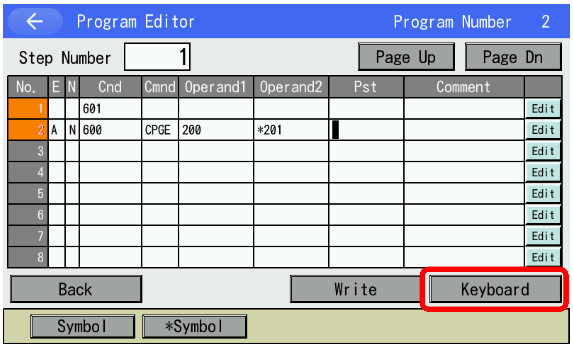

Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
*
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol *Symbol &B &H

The letters displayed on the keyboard return to normal.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol *Symbol &B &H

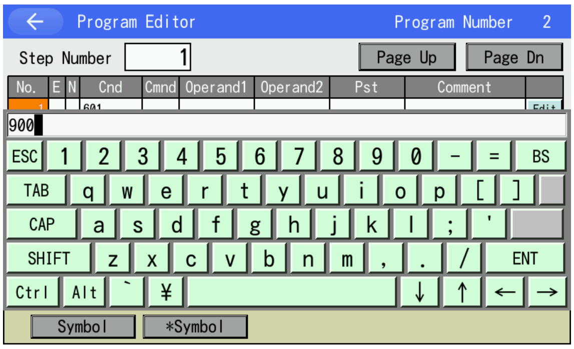
*201

Input * followed by 201, and then touch ENT.



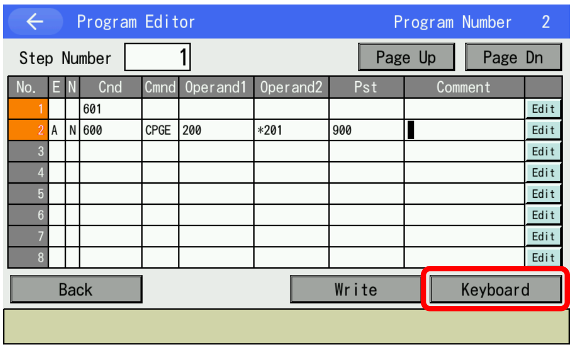
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201			Edit
3									Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol
*Symbol

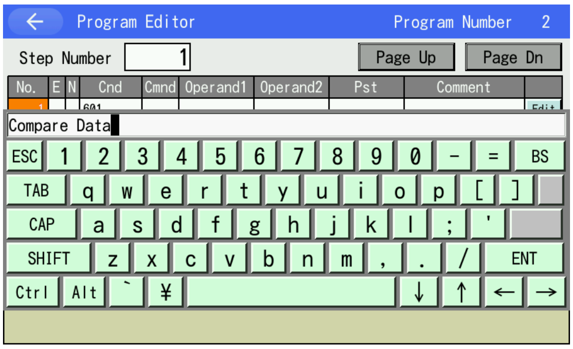
900

Example for input on touch panel keyboard



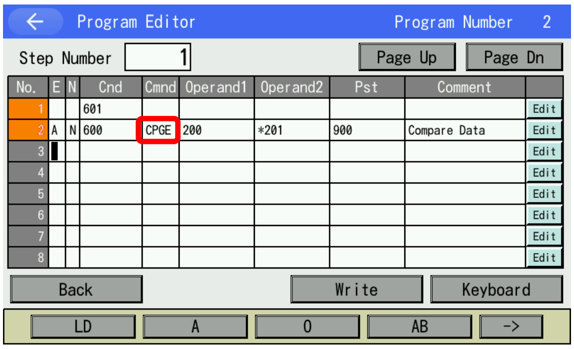
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900		Edit
3									Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

The cursor moves to the Comment input area.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →

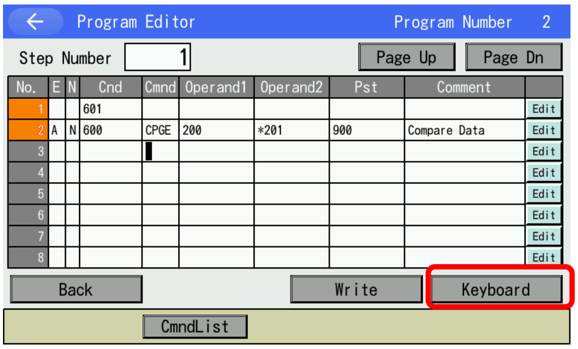
Compare Data

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.



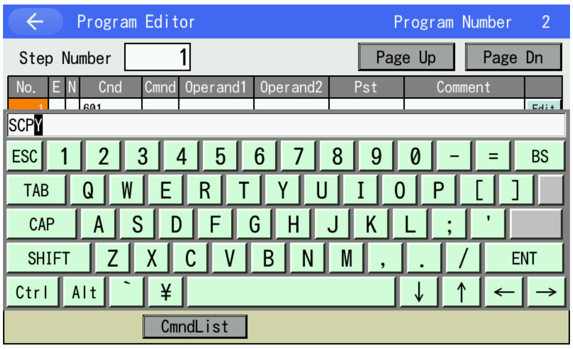
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900	Compare Data	Edit
3									Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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



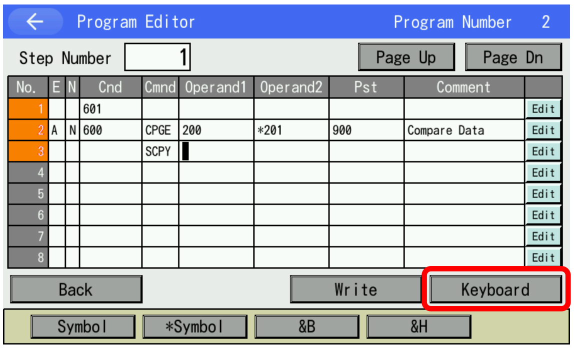
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900	Compare Data	Edit
3									Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

Touch Keyboard button to show the touch panel keyboard.


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB Q W E R T Y U I O P [ ]
CAP A S D F G H J K L ; '
SHIFT Z X C V B N M , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
CmndList

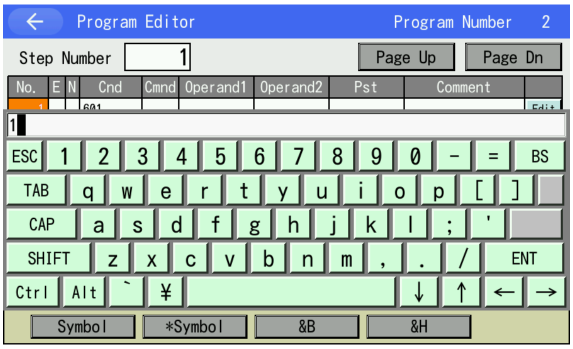
SCPY

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



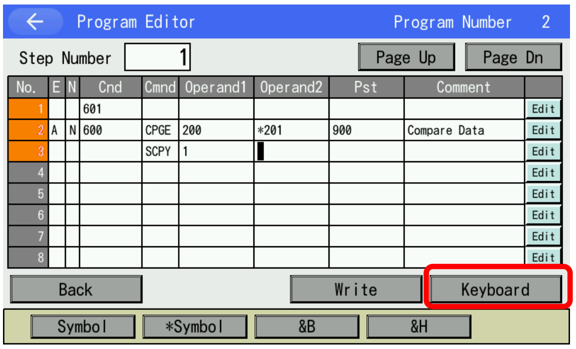
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900	Compare Data	Edit
3				SCPY					Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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


Program Editor
Program Number 2
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol
*Symbol
&B
&H

1

Example for input on touch panel keyboard

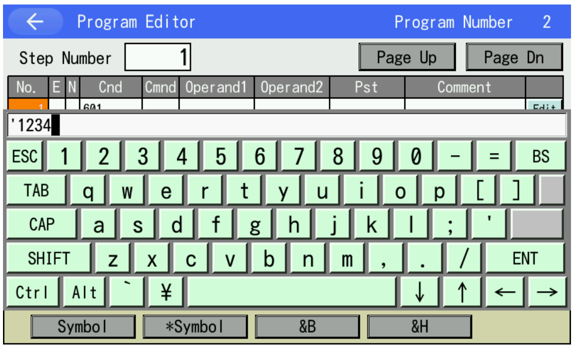


Program Number 2

Step Number 1

No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900	Compare Data	Edit
3				SCPY	1	▮			Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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

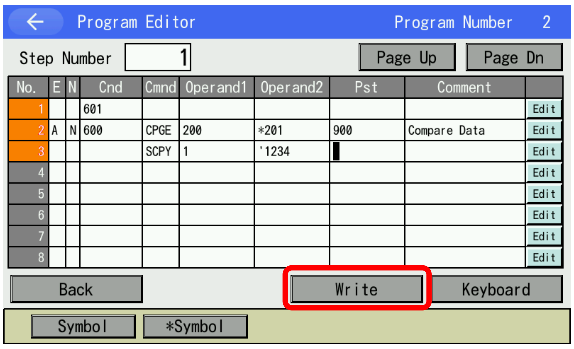

Program Editor
Page Up
Page Dn
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol
*Symbol
&B
&H

Program Number 2

Step Number 1

'1234

Input '1234 and touch ENT.



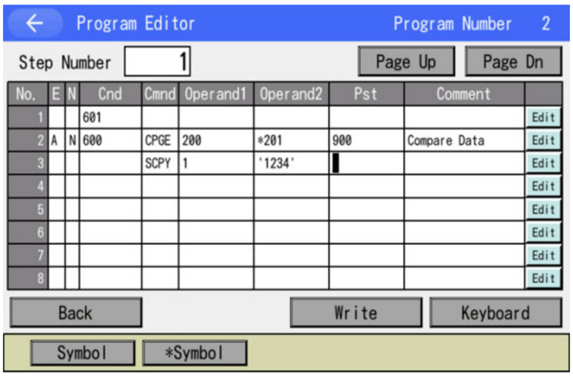
Program Number 2

Step Number 1

No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900	Compare Data	Edit
3				SCPY	1	'1234	▮		Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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.



Program Number 2

Step Number 1

No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1			601						Edit
2	A	N	600	CPGE	200	*201	900	Compare Data	Edit
3				SCPY	1	'1234'	▮		Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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.

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.

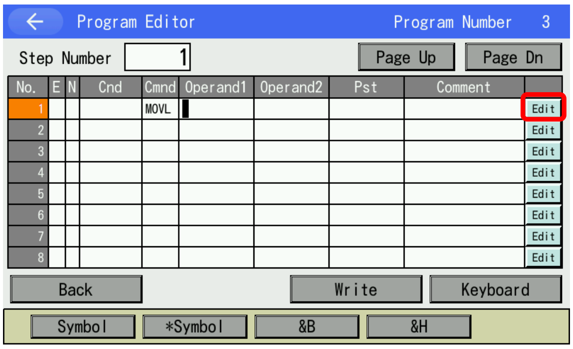
Method 2: Access the symbol edit screen to have symbol registration, and symbol input becomes available.

Example:
Input of following program steps
Program No. 3

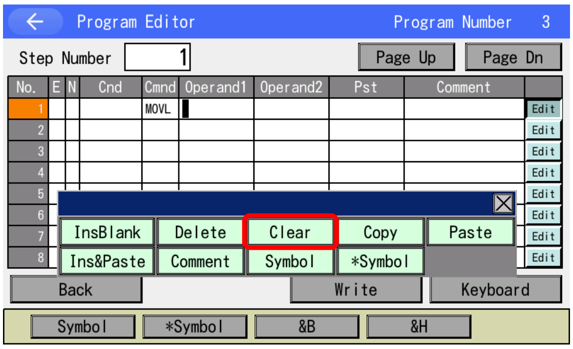
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				MOVL	TAIKIITI			

Position No. 10 is registered as 'TAIKIITI'.

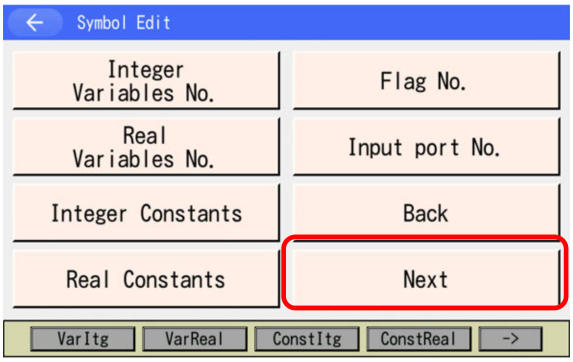
9.2.1 When Symbol Not Defined



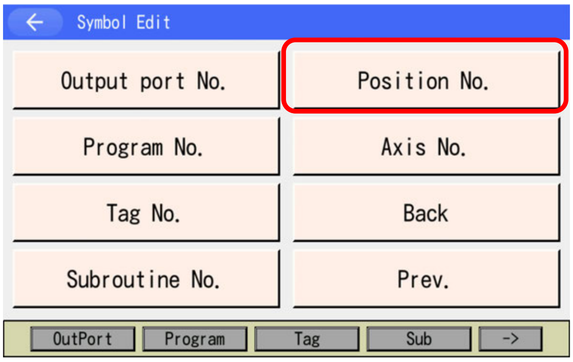
Touch Edit button area within the state of the cursor that has been located in Operand1 input box.



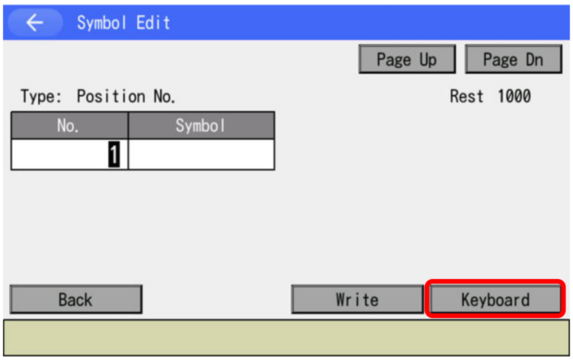
Touch Symbol button in the edit menu.



Touch Next button.



Touch Position No. button

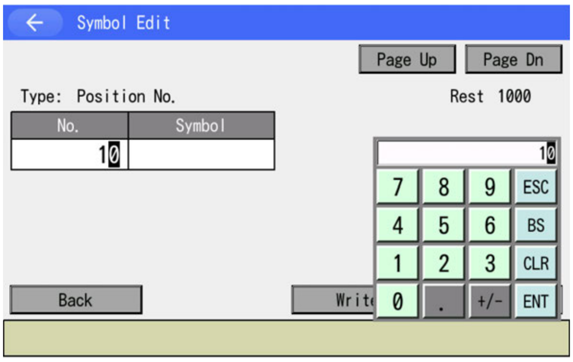


Type: Position No.

Rest 1000

No. 1

Touch Keyboard button to show the touch panel numeric keys.

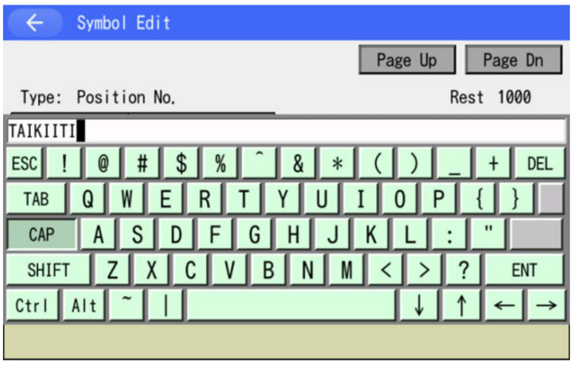


Type: Position No.

Rest 1000

No. 10

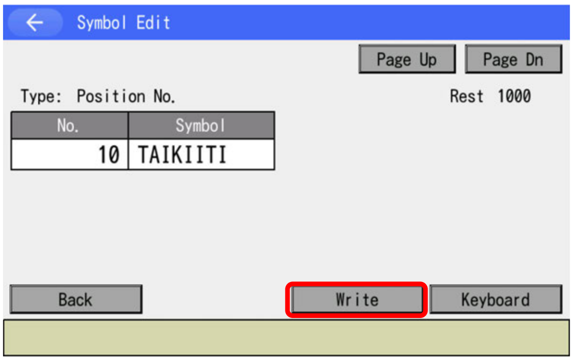
Input 10 on the touch panel numeric keys and then touch ENT. Touch panel keyboard will close.


Symbol Edit
Page Up
Page Dn
ESC ! @ # $ % ˆ & * ( ) _ + DEL
TAB Q W E R T Y U I O P { }
CAP A S D F G H J K L : "
SHIFT Z X C V B N M < > ? ENT
Ctrl Alt ˜ | ↓ ↑ ← →

Type: Position No. Rest 1000

TAIKIITI

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.)

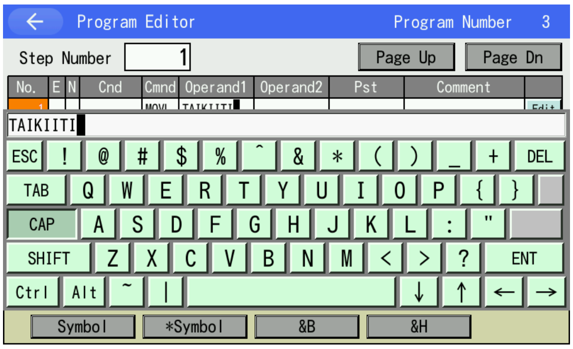


Type: Position No. Rest 1000

No.	Symbol
10	TAIKIITI

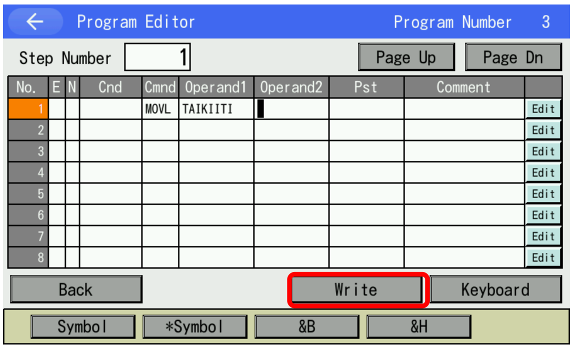
Touch Write button to transfer the symbol data to the controller. Once the transfer to the controller is complete, the display returns to the original program edit screen.

9.2.2 When There is Symbol Definition


Program Editor
Program Number 3
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC ! @ # $ % ˆ & * ( ) _ + DEL
TAB Q W E R T Y U I O P { }
CAP A S D F G H J K L : "
SHIFT Z X C V B N M < > ? ENT
Ctrl Alt ˜ | ↓ ↑ ← →
Symbol
*Symbol
&B
&H

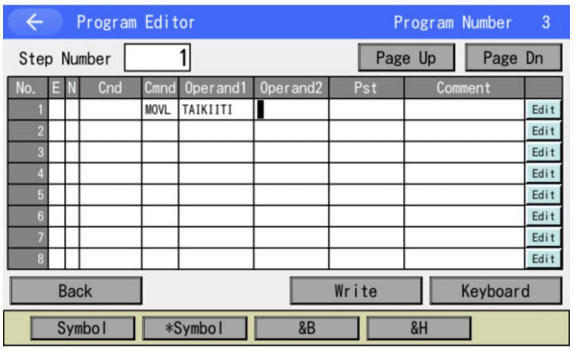
TAIKIITI

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



No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				MOVL	TAIKIITI			
2								
3								
4								
5								
6								
7								
8								

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



Program Number 3

Step Number 1

No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				MOVL	TAIKIITI				Edit
2									Edit
3									Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

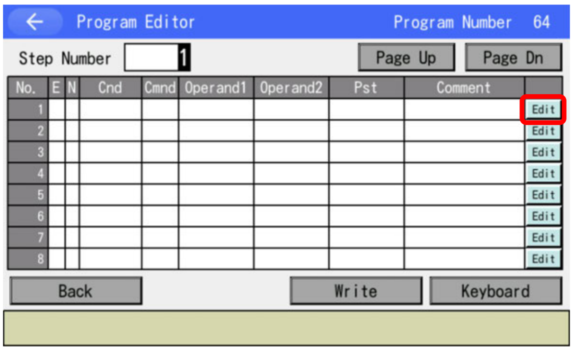
Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

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

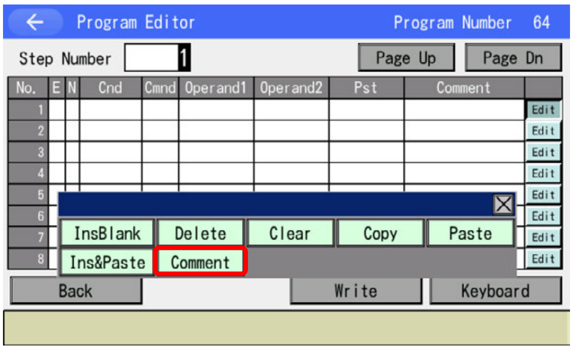
Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

9.3 Single Line Comment Input

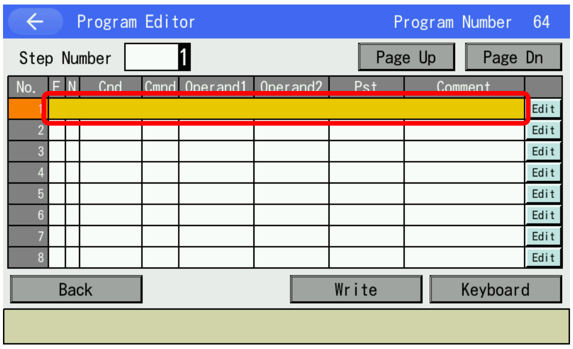
Turns a step from a program into a comment (invalid step) and you can input numbers, alphabets and signs.



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.

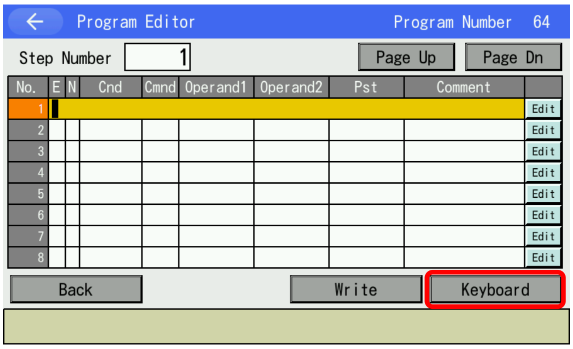


Touch Comment.

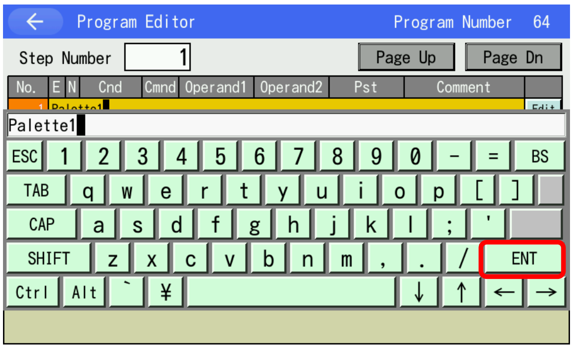


After the edit menu is closed, the display of the step data box changes.
(The background color turns into dark yellow, and the boundary for E and N columns will disappear.)

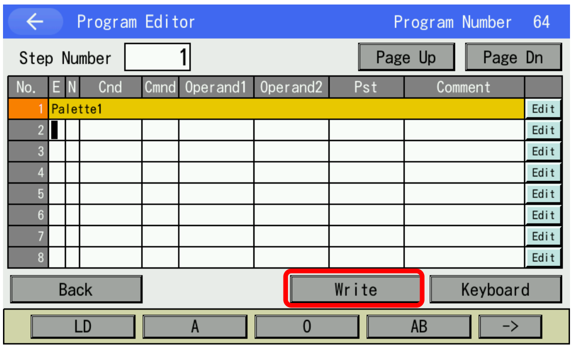
Touch in the input box.



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

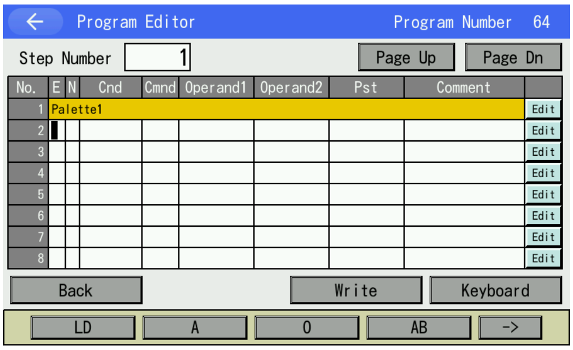

Program Editor
Program Number 64
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
Palette1
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →

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 Back 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.

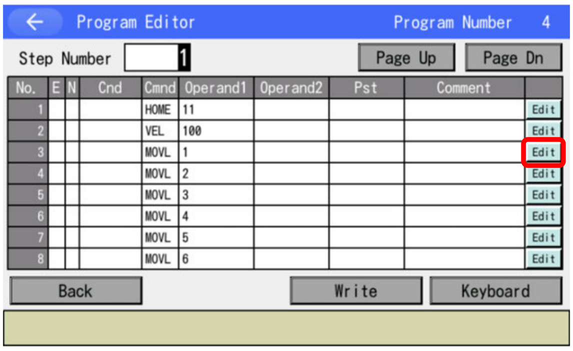
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				HOME	11			
2				VEL	100			
3				MOVL	1			
4				MOVL	2			
5				MOVL	3			
6				MOVL	4			
7				MOVL	5			
8				MOVL	6			
9				EXIT				

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)

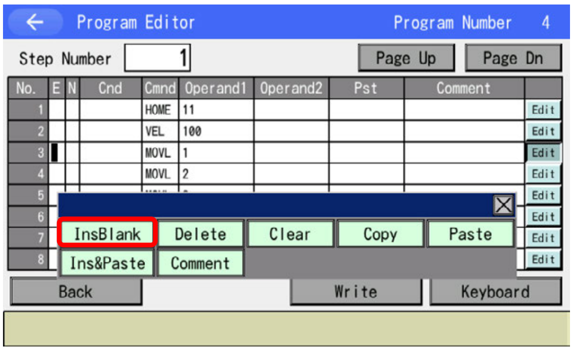
Open Program No. 4.



Step Number 1

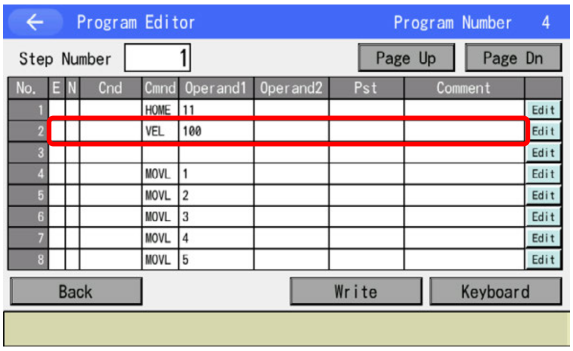
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				MOVL	1				Edit
4				MOVL	2				Edit
5				MOVL	3				Edit
6				MOVL	4				Edit
7				MOVL	5				Edit
8				MOVL	6				Edit

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



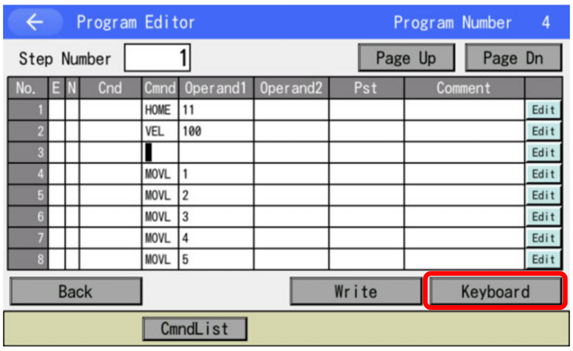
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				HOME	11			
2				VEL	100			
3				MOVL	1			
4				MOVL	2			

Touch InsBlank button in the edit menu.



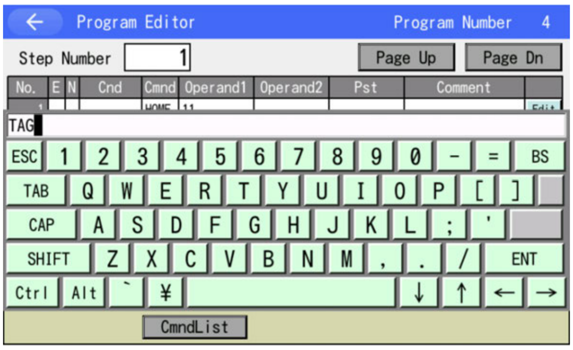
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				HOME	11			
2				VEL	100			
3								
4				MOVL	1			
5				MOVL	2			
6				MOVL	3			
7				MOVL	4			
8				MOVL	5			

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



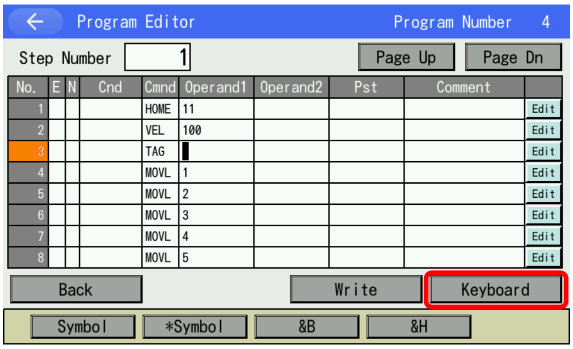
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1				HOME	11			
2				VEL	100			
3								
4				MOVL	1			
5				MOVL	2			
6				MOVL	3			
7				MOVL	4			
8				MOVL	5			

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


Program Editor
Program Number 4
Step Number 1
Page Up
Page Dn
No. E N Cnd Cmnd Operand1 Operand2 Pst Comment
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB Q W E R T Y U I O P [ ]
CAP A S D F G H J K L ; '
SHIFT Z X C V B N M , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
CmndList

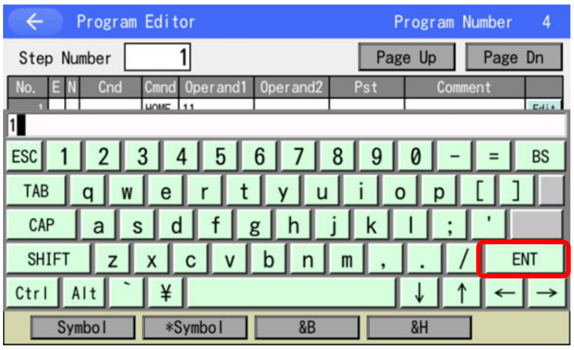
TAG

Input TAG and touch ENT.

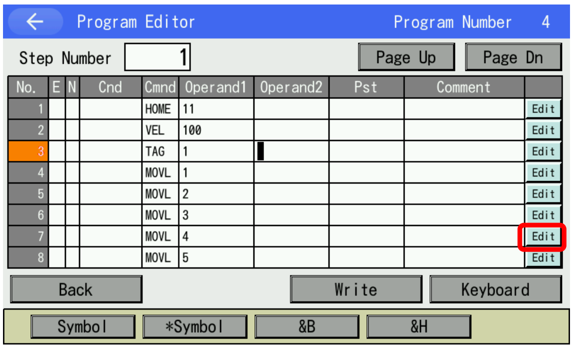


No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				TAG					Edit
4				MOVL	1				Edit
5				MOVL	2				Edit
6				MOVL	3				Edit
7				MOVL	4				Edit
8				MOVL	5				Edit

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

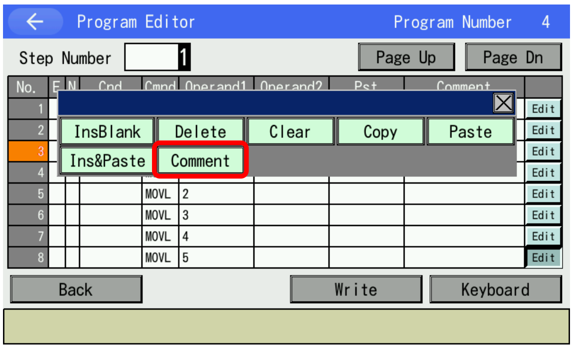

Program Editor
Program Number 4
Step Number 1
Page Up
Page Dn
1
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
Symbol
*Symbol
&B
&H

Input 1 and touch ENT.



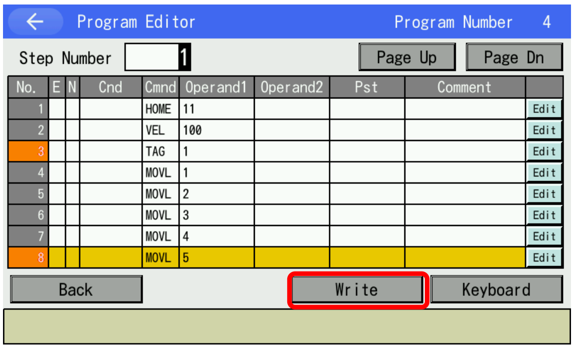
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				TAG	1				Edit
4				MOVL	1				Edit
5				MOVL	2				Edit
6				MOVL	3				Edit
7				MOVL	4				Edit
8				MOVL	5				Edit

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



No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
5				MOVL	2				Edit
6				MOVL	3				Edit
7				MOVL	4				Edit
8				MOVL	5				Edit

Touch Comment in the Edit menu.

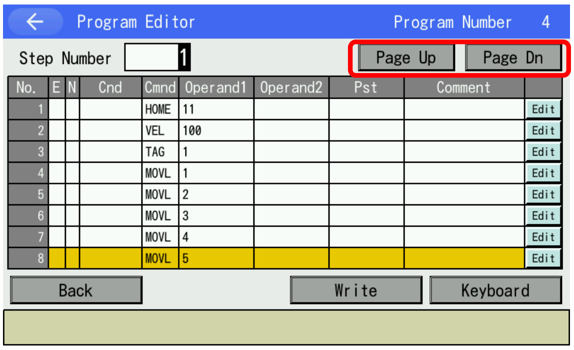


No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				TAG	1				Edit
4				MOVL	1				Edit
5				MOVL	2				Edit
6				MOVL	3				Edit
7				MOVL	4				Edit
8				MOVL	5				Edit

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 Write button to transfer the program data to the controller.

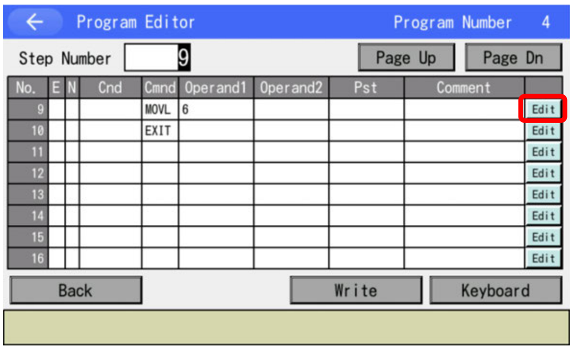
When the screen is changed with the Page Up and Page Dn buttons, and Back button before data transfer, the input data becomes invalid.



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

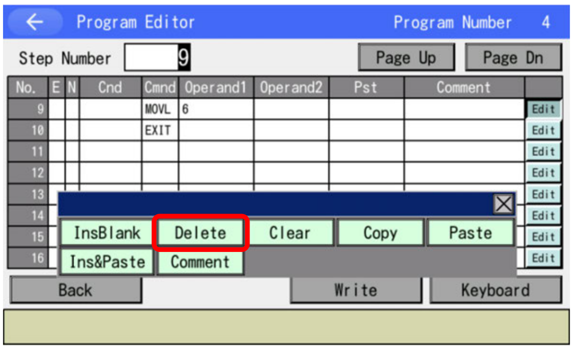
Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

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.



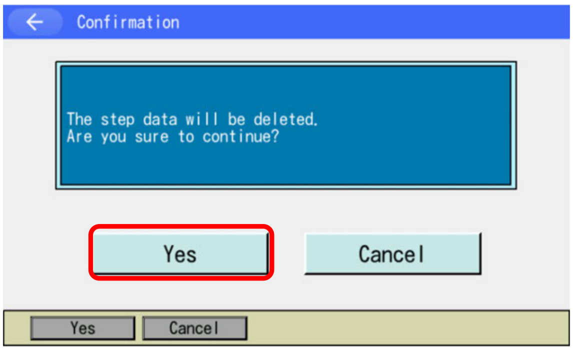
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
9				MOVL	6				Edit
10				EXIT					Edit
11									Edit
12									Edit
13									Edit
14									Edit
15									Edit
16									Edit

Touch Edit button in Step No.9.



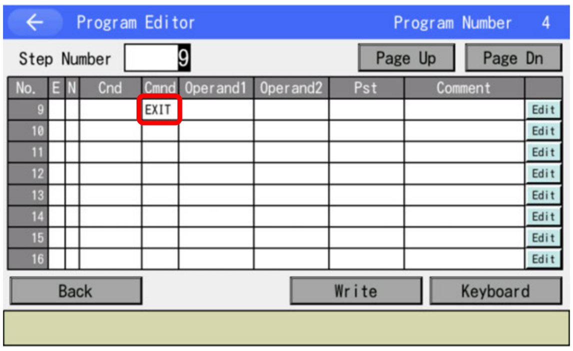
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
9				MOVL	6				Edit
10				EXIT					Edit
11									Edit
12									Edit
13									Edit
14									Edit
15									Edit
16									Edit

Touch Delete button in Edit Menu.

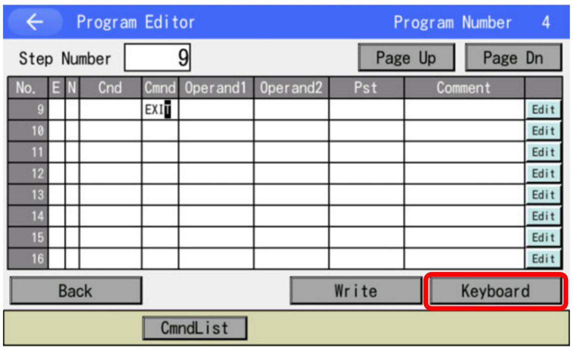


The step data will be deleted.
Are you sure to continue?

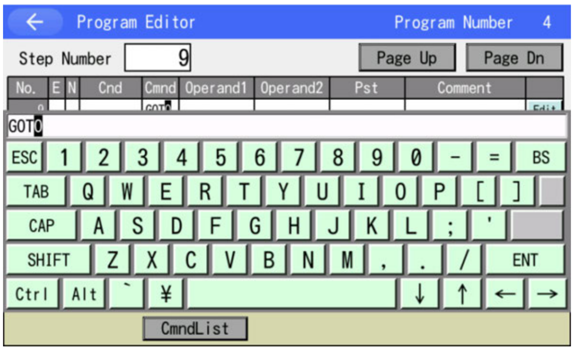
Confirmation window gets displayed. Touch the Yes button.
(If you wish to cancel the deletion, touch the Cancel button.)



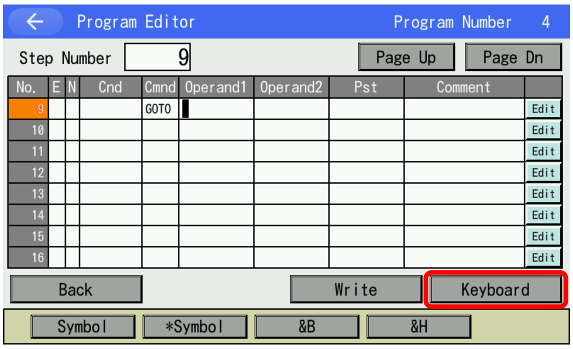
Touch No. 9, Cmnd Column to move the cursor.



Touch Keyboard button to show the touch panel keyboard.

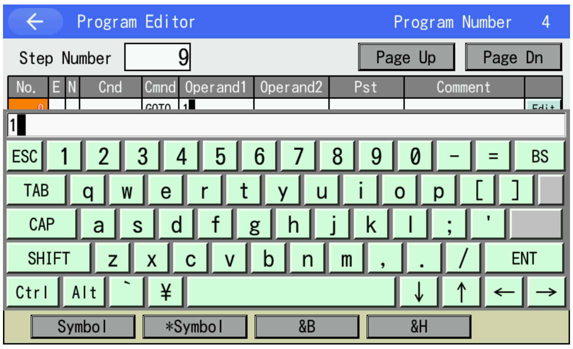


Input GOTO on the touch panel keyboard and touch ENT.

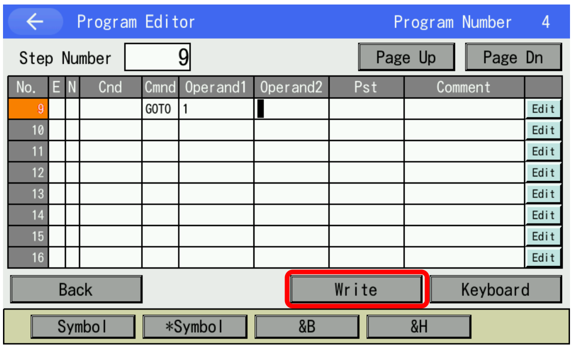


The touch panel keyboard closes and the cursor moves to Operand1 box.

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.



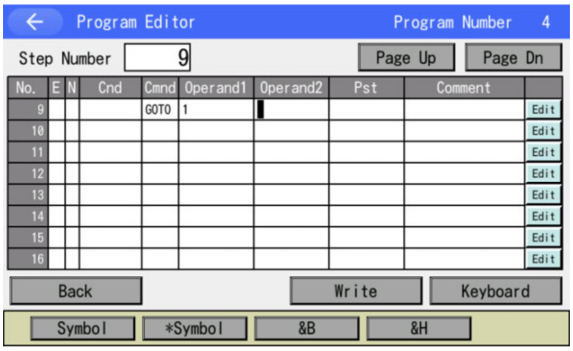
Input 1 and touch ENT.



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

Touch the 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.

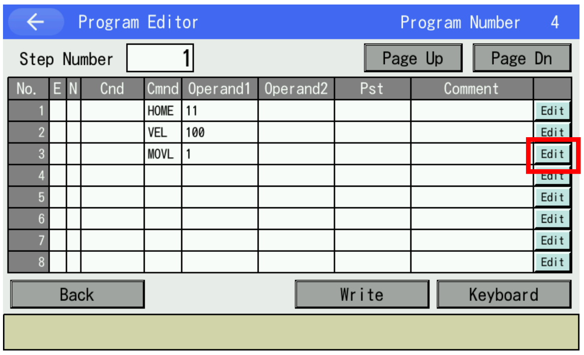
Finish the program input. Return to the flash ROM writing window by using the Back button or Cancel button.

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

9.5 Other Editing Features

Copy and Clear of the step data can be conducted.

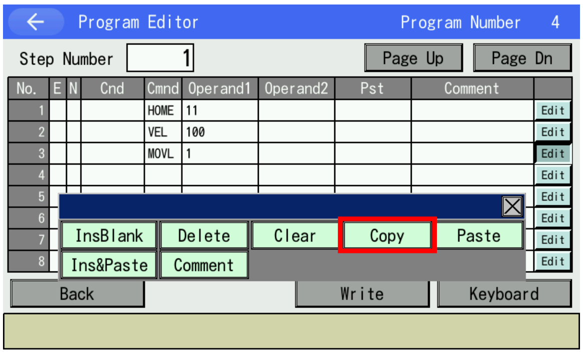
[Copy of Step Data]
For example, here explains the case to copy the step data in Step No. 3 to Step No. 4.



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

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.

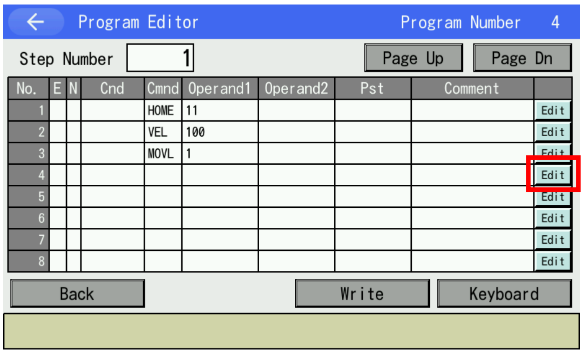
Touch Edit button in Step No.3.



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

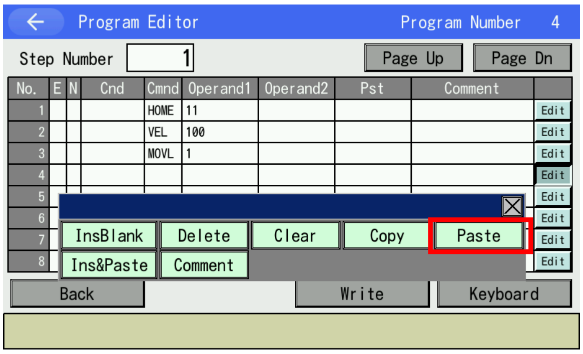
Touch Copy button in Edit Menu.

Edit menu is closed.



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

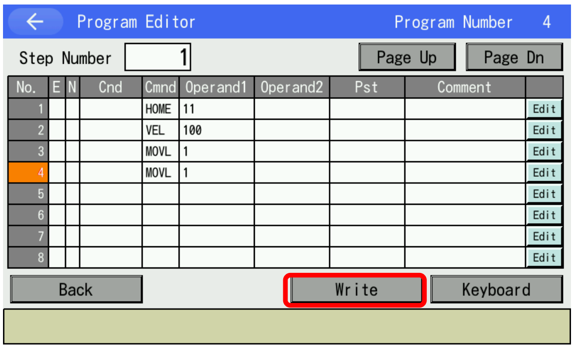
Touch Edit button in Step No.4.



No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				MOVL	1				Edit
4									Edit

Touch Paste button in Edit Menu.

Edit menu is closed.

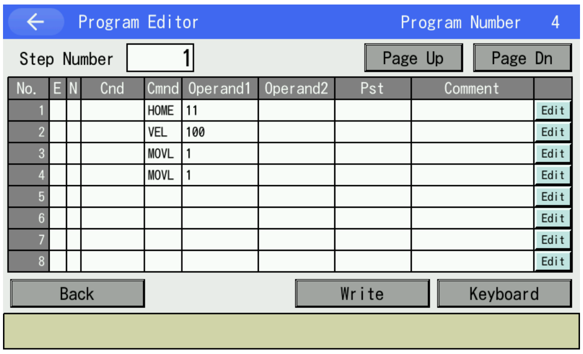


No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				MOVL	1				Edit
4				MOVL	1				Edit
5									Edit
6									Edit
7									Edit
8									Edit

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.



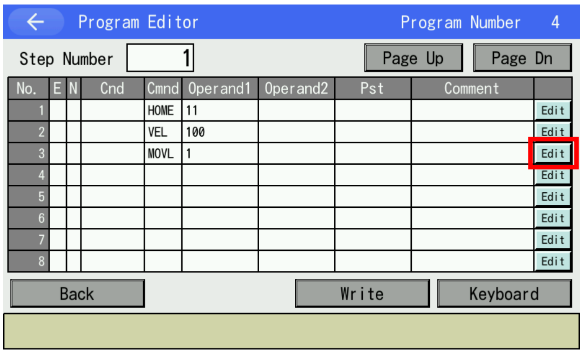
No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2				VEL	100				Edit
3				MOVL	1				Edit
4				MOVL	1				Edit
5									Edit
6									Edit
7									Edit
8									Edit

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.

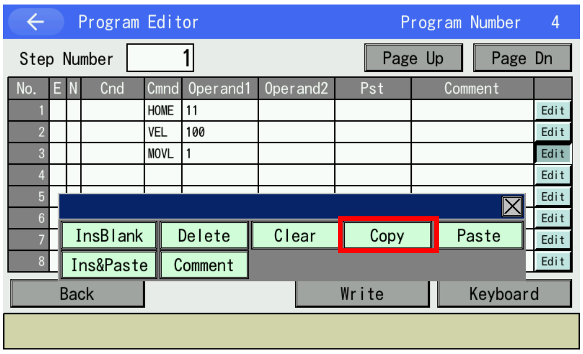
[Insertion of Step Data]
For example, here explains the case to copy the step data in Step No. 3 to Step No. 2.



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

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.

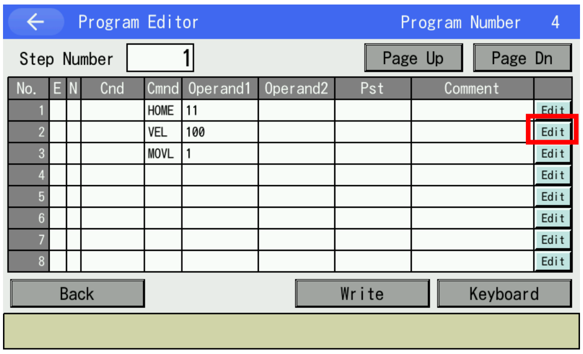
Touch Edit button in Step No.3.



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

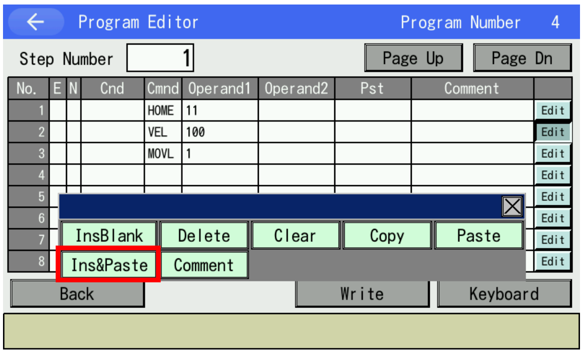
Touch Copy button in Edit Menu.

Edit menu is closed.



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

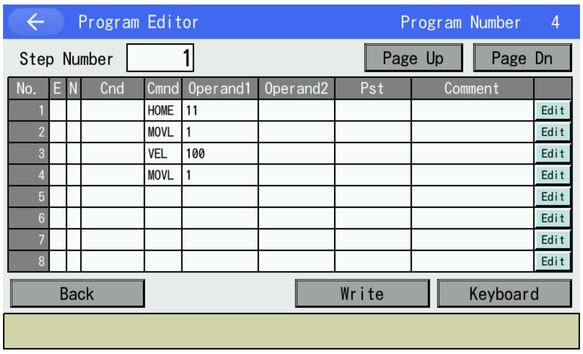
Touch Edit button in Step No.2.



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

Touch Ins&Paste button in the edit menu.

Edit menu is closed.



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

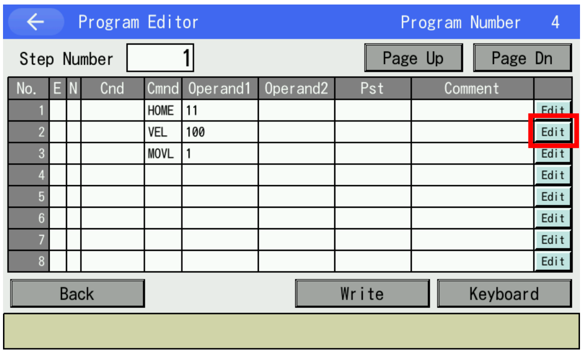
The step data copied in Step No. 2 gets inserted.

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.

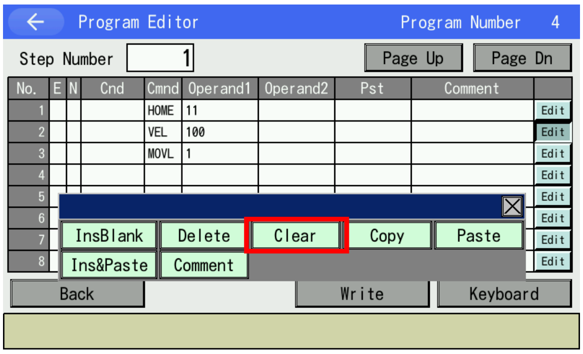
[Clear of Step Data]
For example, here explains the case to clear the step data in Step No. 2.



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

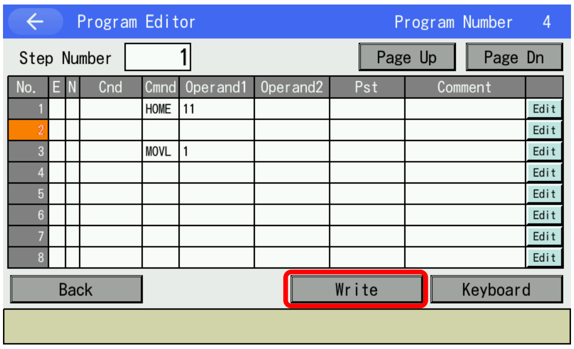
Switch the display range with Page Up / Page Dn buttons or the step number direct input in order to show the data in Step No. 2.

Touch Edit button in Step No.2.



Touch Clear button in Edit Menu.

Edit menu is closed.

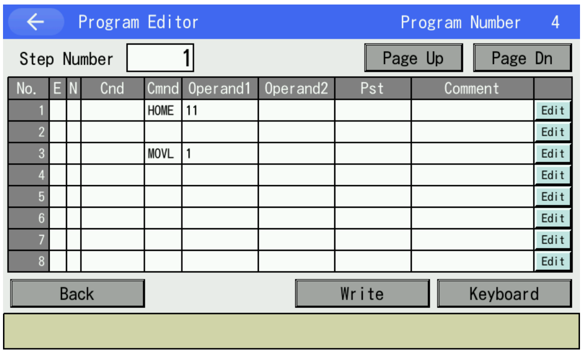


No.	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment	
1				HOME	11				Edit
2									Edit
3				MOVL	1				Edit
4									Edit
5									Edit
6									Edit
7									Edit
8									Edit

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.



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

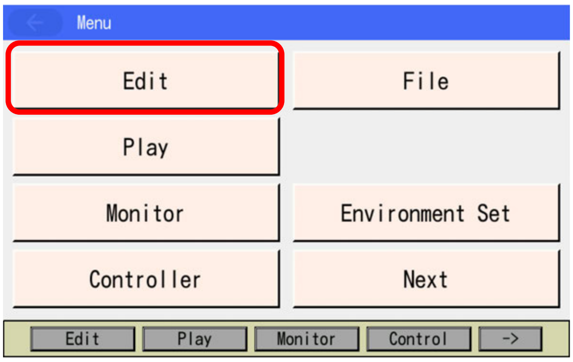
Once the transfer to the controller is complete, the background color in the step number display column will turn to the normal condition.

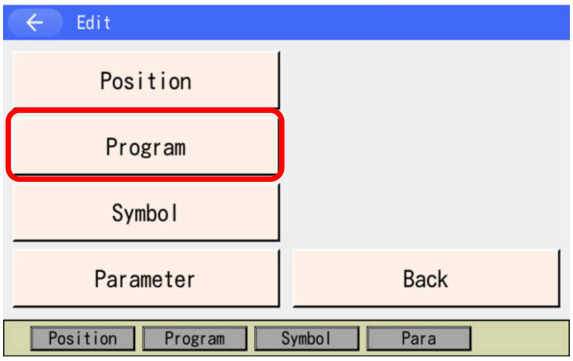
Finish the program input. Return to the flash ROM writing window by using the Back button or Cancel button.

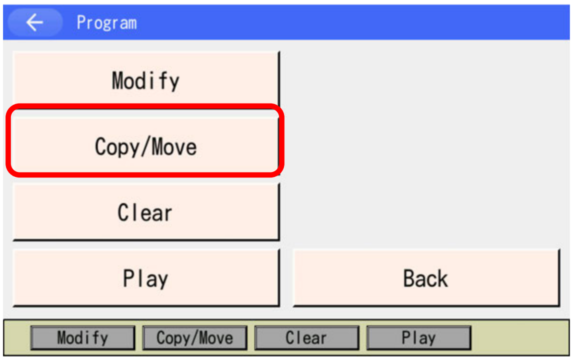
Follow [9.8 Flash ROM Writing] to conduct the flash ROM writing.

9.6 Program: Copy or Move

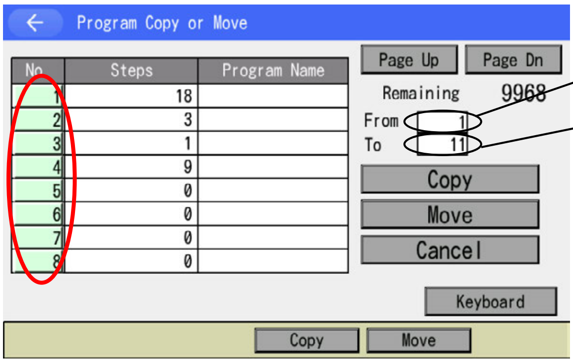
The following operating instructions are to copy or move a program to another program No.







Touch Edit → Program → Copy/Move



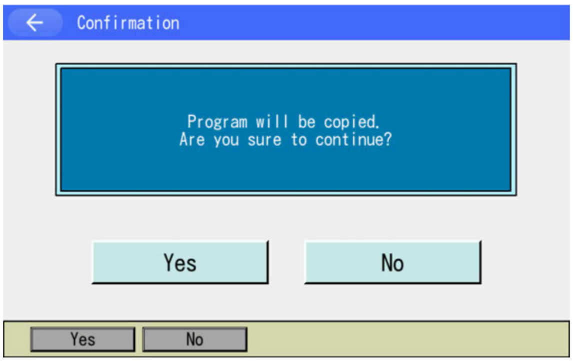
No	Steps	Program Name
1	18	
2	3	
3	1	
4	9	
5	0	
6	0	
7	0	
8	0	

Copy/Origin Program Number

Copy/Destination Program Number

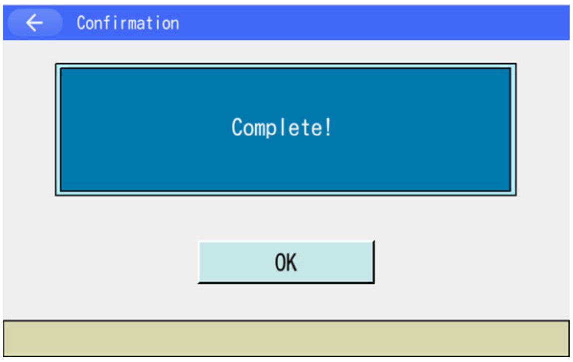
Touch Keyboard button and input the program number on the touch panel keyboard. If the cursor is in “From” or “To” box, touch the No. column in the table and the number you touched gets input in the box. The table can be changed with Page Up and Page Dn buttons.

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



Program will be copied.
Are you sure to continue?

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

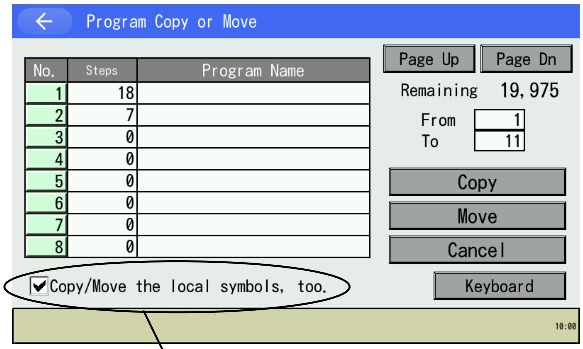


Complete!

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 window and then touch the Copy or Move button.



No.	Steps	Program Name
1	18	
2	7	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	

Remaining 19, 975

From 1

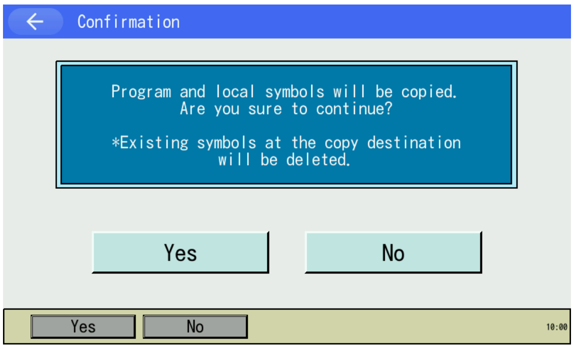
To 11

☑ Copy/Move the local symbols, too.

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.



Program and local symbols will be copied.
Are you sure to continue?

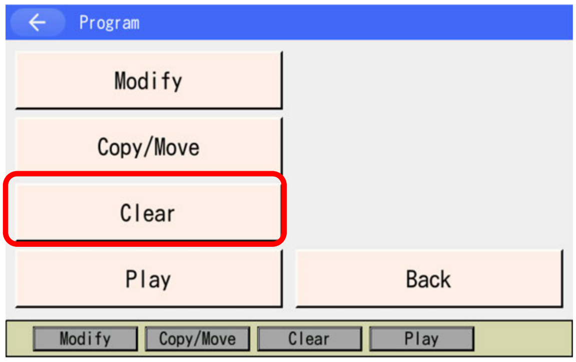
*Existing symbols at the copy destination will be deleted.

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

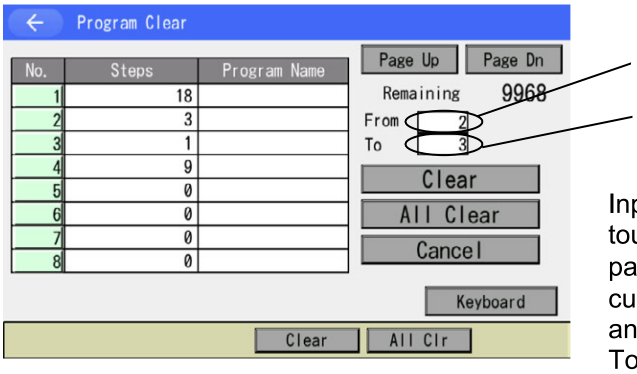
* Figure in the left shows an example for copy

* 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.



No.	Steps	Program Name
1	18	
2	3	
3	1	
4	9	
5	0	
6	0	
7	0	
8	0	

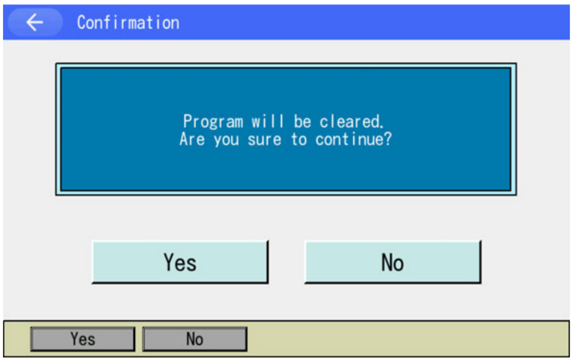
Remaining 9968
From 2
To 3

Top number to be deleted

Last number to be deleted

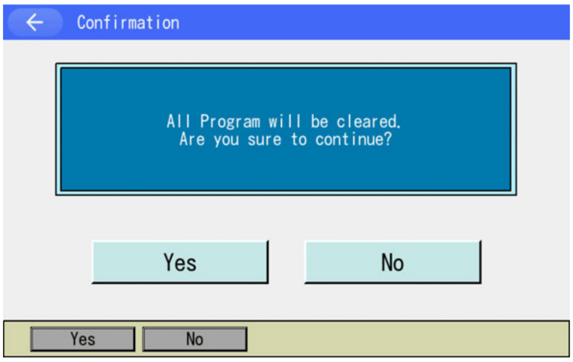
Input the program number to be deleted on the touch panel numeric keys. To show the touch panel numeric keys, touch Keyboard button. If the cursor is in From or To box, touch the No. column and the number you touched gets set in From or To input box.
When the same number is input in the top number and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

Touch Clear button, and the execution confirmation screen opens.



Program will be cleared.
Are you sure to continue?

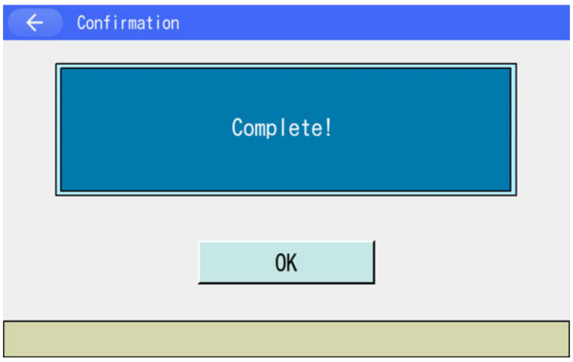
To execute, touch Yes button. To cancel, touch No button.



All Program will be cleared.
Are you sure to continue?

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.

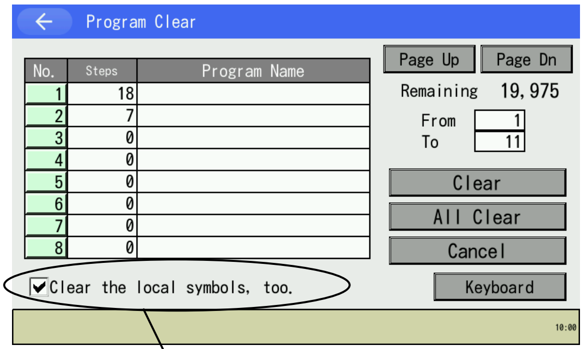


Complete!

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 window and then touch the Clear or All Clear button.



No.	Steps	Program Name
1	18	
2	7	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	

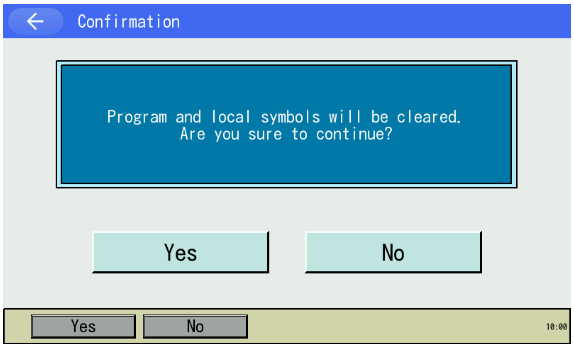
Remaining 19,975
From 1
To 11

☑ Clear the local symbols, too.

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.

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



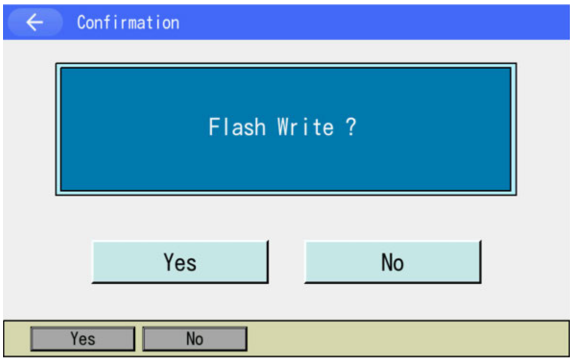
Program and local symbols will be cleared.
Are you sure to continue?

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.

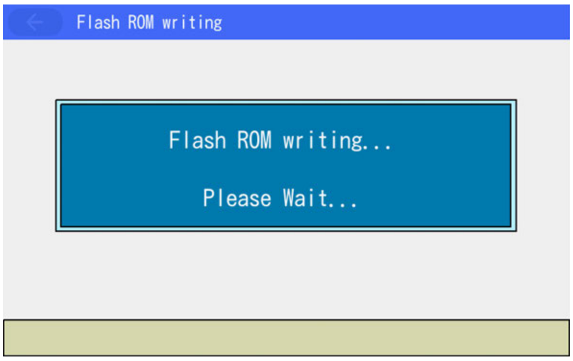
9.8 Flash ROM Writing

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.



Flash Write ?

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

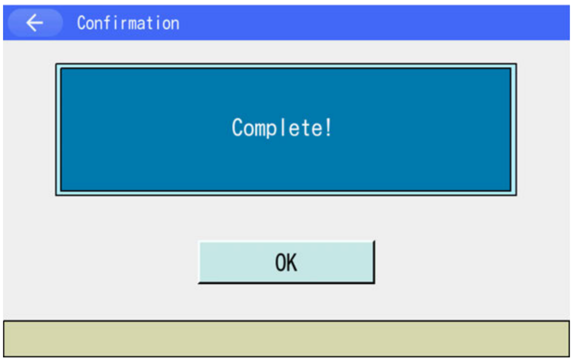


Flash ROM writing...

Please Wait...

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.



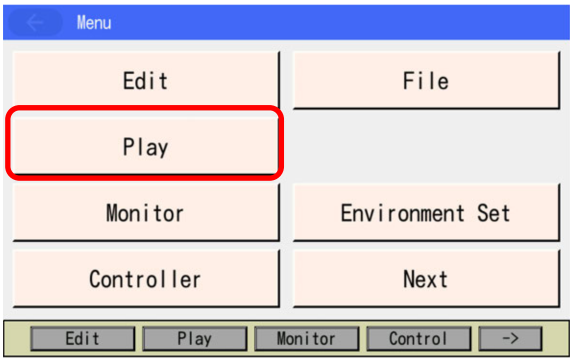
Complete!

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

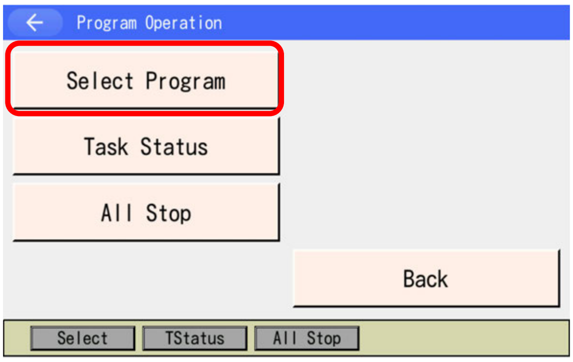
10. Program Execution

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

10.1 Operation Confirmation



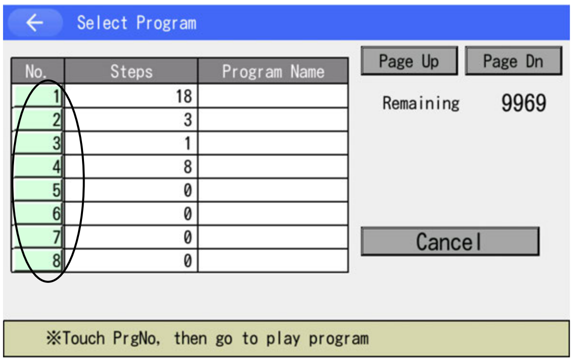
Touch Play in the main menu.
Also, in the program edit menu, there is Play button.



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.

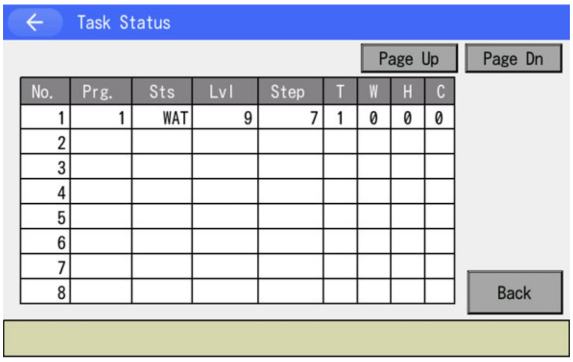


No.	Steps	Program Name
1	18	
2	3	
3	1	
4	8	
5	0	
6	0	
7	0	
8	0	

Remaining 9969

※Touch PrgNo, then go to play program

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.

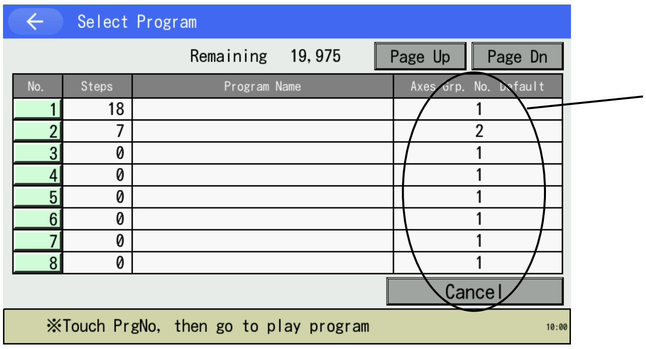


No.	Prg.	Sts	Lvl	Step	T	W	H	C
1	1	WAT	9	7	1	0	0	0
2								
3								
4								
5								
6								
7								
8								

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.

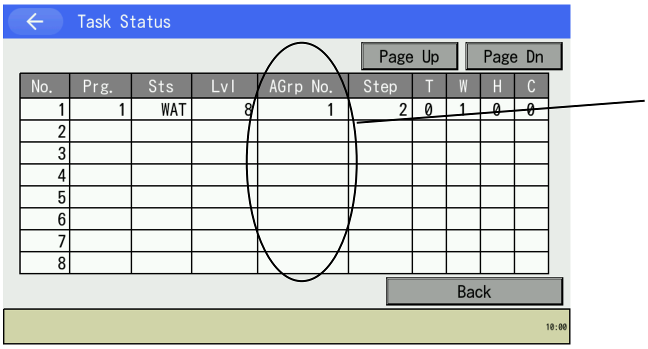
No. : Task No.
Prg. : Program No.
Sts : Task Status (Task status in OS administration inside) (For XSEL-K, the main application is applicable in Ver. 0.14 and later.)
Lvl : Task Level
Step : Step number in execution
T : In execution stop command (Stop by step operation, stop at break point and stop by 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-K, the main application is applicable in Ver. 0.26 and later.)
C : CANC input (For XSEL-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 window. Also, the axes group numbers subject to control should be displayed in the task status window.
(* Axes group numbers subject to control at the program execution start)



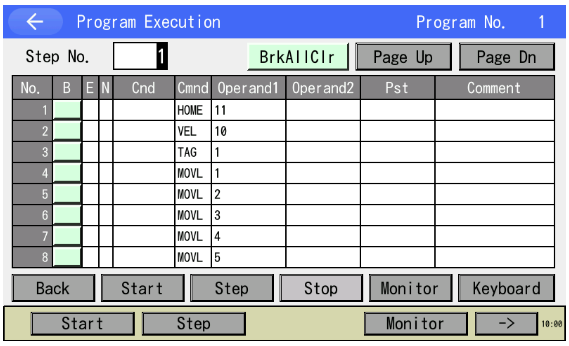
No.	Steps	Program Name	Axes Grp. No. Default
1	18		1
2	7		2
3	0		1
4	0		1
5	0		1
6	0		1
7	0		1
8	0		1

※Touch PrgNo, then go to play program



No.	Prg.	Sts	Lvl	AGrp No.	Step	T	W	H	C
1	1	WAT	8	1	2	0	1	0	0
2									
3									
4									
5									
6									
7									
8									

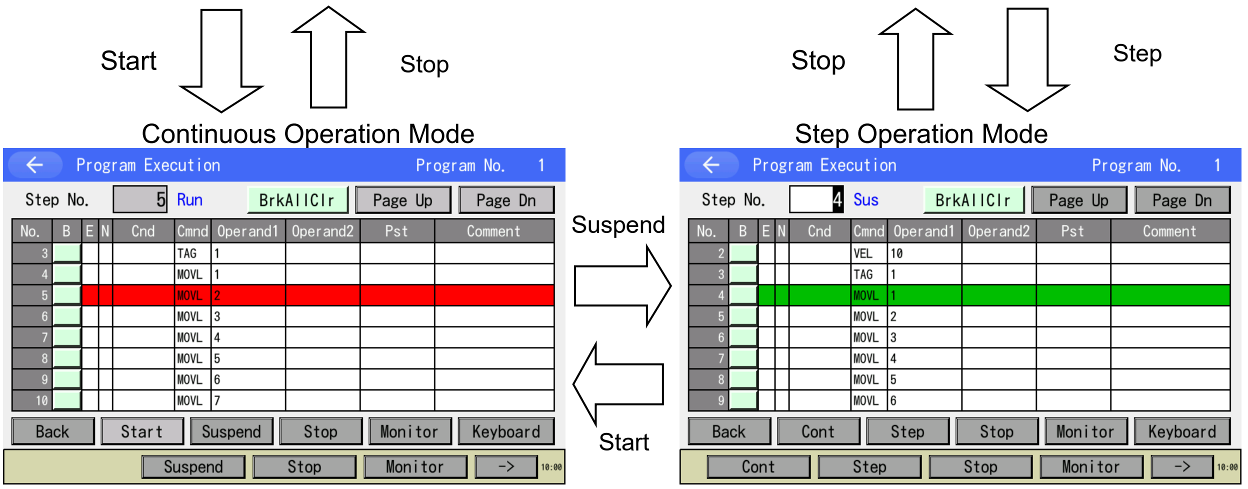
Once a program is selected in the program select screen, the display is switched to the following screen. (Figure below is the case Program No. 1 is selected.)
Select whether to operate one step by one or have the continuous operation.



No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1	🟩				HOME	11			
2	🟩				VEL	10			
3	🟩				TAG	1			
4	🟩				MOVL	1			
5	🟩				MOVL	2			
6	🟩				MOVL	3			
7	🟩				MOVL	4			
8	🟩				MOVL	5			

Touch Start button to start operation.

Touch Step button to start step operation.



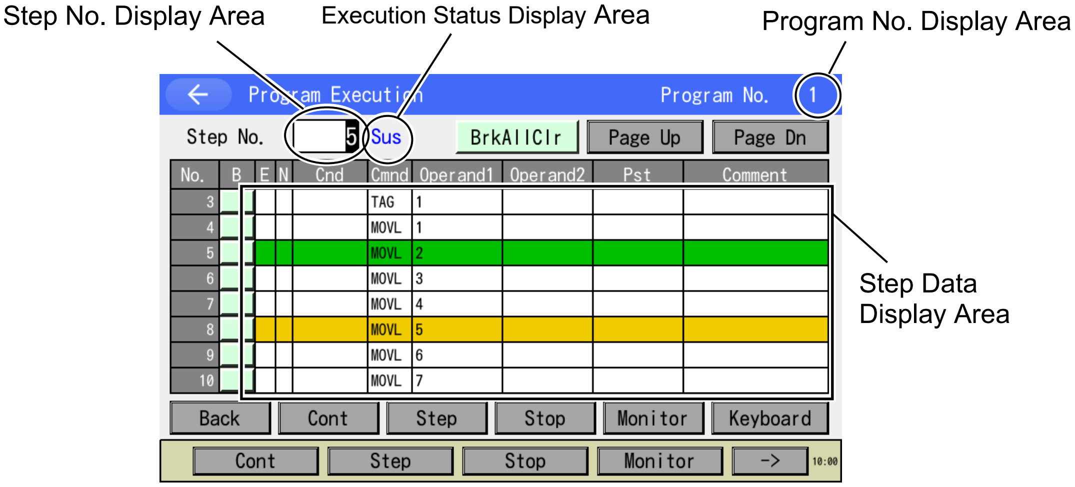
No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
3	🟩				TAG	1			
4	🟩				MOVL	1			
5	🟩	🟥	🟥	🟥	MOVL	2			
6	🟩				MOVL	3			
7	🟩				MOVL	4			
8	🟩				MOVL	5			
9	🟩				MOVL	6			
10	🟩				MOVL	7			

No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
2	🟩				VEL	10			
3	🟩				TAG	1			
4	🟩	🟩	🟩	🟩	MOVL	1			
5	🟩				MOVL	2			
6	🟩				MOVL	3			
7	🟩				MOVL	4			
8	🟩				MOVL	5			
9	🟩				MOVL	6			

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 linear 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 Velocity] for how to activate/inactivate the safety speed.



No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
3					TAG	1			
4					MOVL	1			
5					MOVL	2			
6					MOVL	3			
7					MOVL	4			
8					MOVL	5			
9					MOVL	6			
10					MOVL	7			

[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.

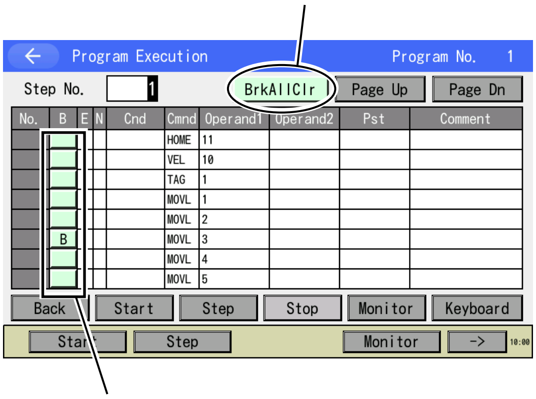
Execution Status Display Area: Execution status of the selected program is displayed.
(Blank: Operation Stop, Run: Continuous Operation, Sus: Pause)

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.

Break Points All Clear Button

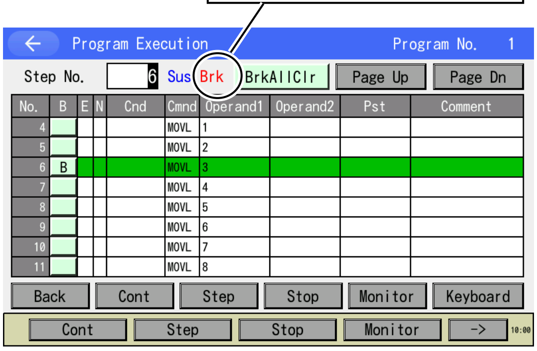


No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
					HOME	11			
					VEL	10			
					TAG	1			
					MOVL	1			
					MOVL	2			
	B				MOVL	3			
					MOVL	4			
					MOVL	5			

Set break point button
(B: Set break point, Blank: Release brake point)

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.

Showing stopped at break point.

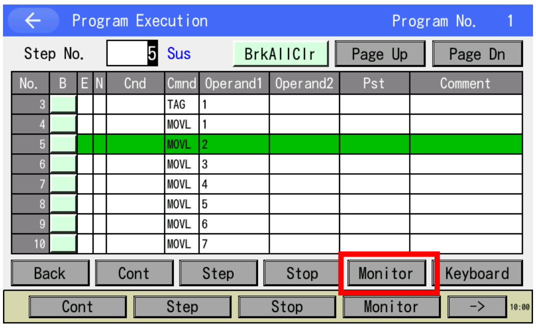


No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
4					MOVL	1			
5					MOVL	2			
6	B				MOVL	3			
7					MOVL	4			
8					MOVL	5			
9					MOVL	6			
10					MOVL	7			
11					MOVL	8			

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 Cont 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

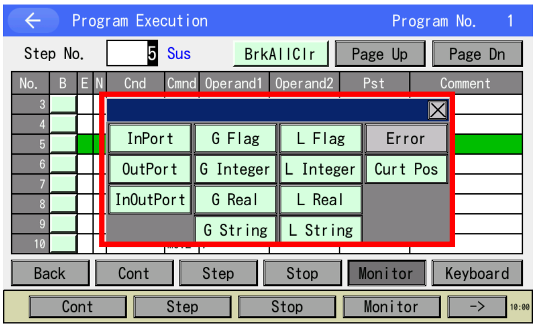
The current position of the actuator and the data in the local and global domains can be monitored during the continuous operation or step operation.



No.	B	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
3					TAG	1			
4					MOVL	1			
5					MOVL	2			
6					MOVL	3			
7					MOVL	4			
8					MOVL	5			
9					MOVL	6			
10					MOVL	7			

Touch Monitor button.

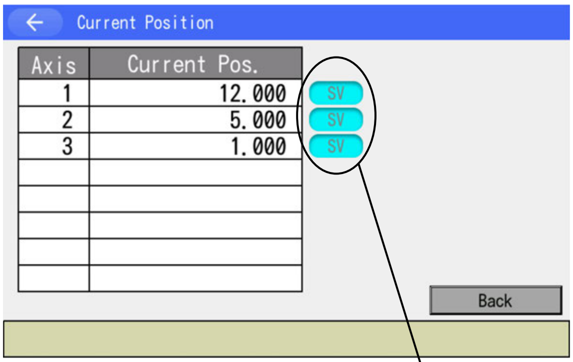
The monitor menu is opened.



Touching the button selects the monitor item.

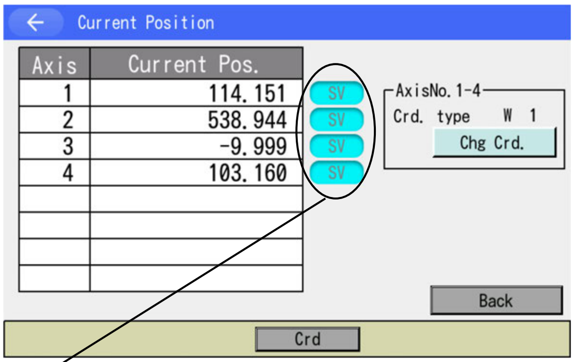
When the monitor menu screen is closed, the selected monitor screen appears.

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



Axis	Current Pos.
1	12.000
2	5.000
3	1.000

Linear Axis

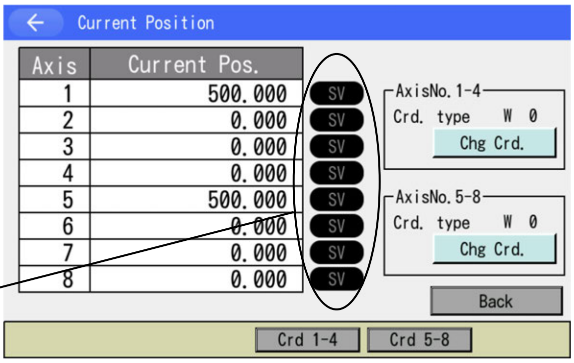


Axis	Current Pos.
1	114.151
2	538.944
3	-9.999
4	103.160

AxisNo. 1-4
Crd. type W 1

SCARA Axis

Servo ON Status



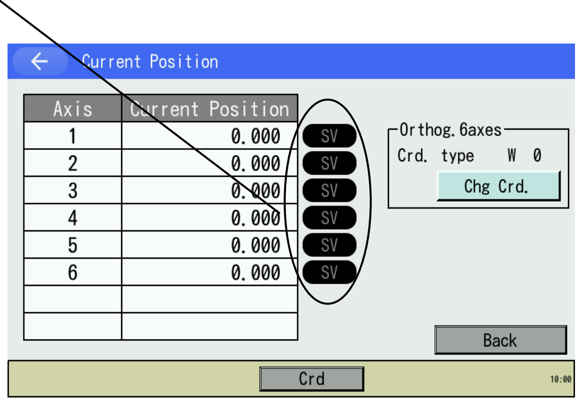
Axis	Current Pos.
1	500.000
2	0.000
3	0.000
4	0.000
5	500.000
6	0.000
7	0.000
8	0.000

AxisNo. 1-4
Crd. type W 0

AxisNo. 5-8
Crd. type W 0

Servo OFF status

For XSEL-RXD/SXD or RAXD/SAXD Controllers



Axis	Current Position
1	0.000
2	0.000
3	0.000
4	0.000
5	0.000
6	0.000

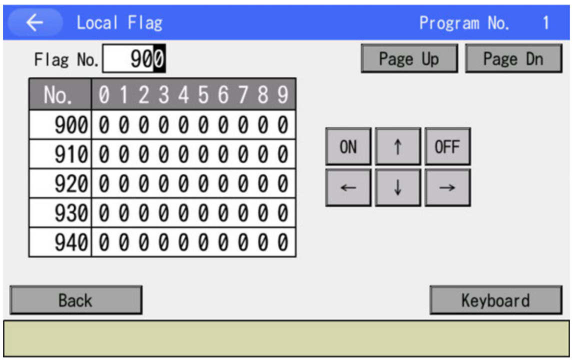
Orthog. 6axes
Crd. type W 0

When 6-axis Cartesian Activated

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

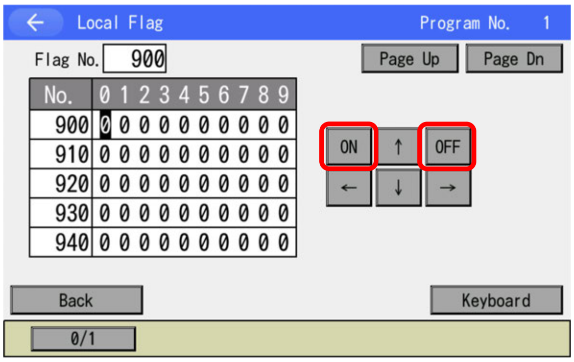
(2) Local Flag

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



Flag No. 900

No.	0	1	2	3	4	5	6	7	8	9
900	0	0	0	0	0	0	0	0	0	0
910	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0
930	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0



Flag No. 900

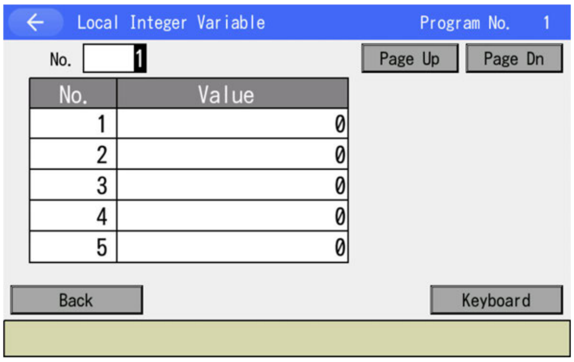
No.	0	1	2	3	4	5	6	7	8	9
900	0	0	0	0	0	0	0	0	0	0
910	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0
930	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0

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

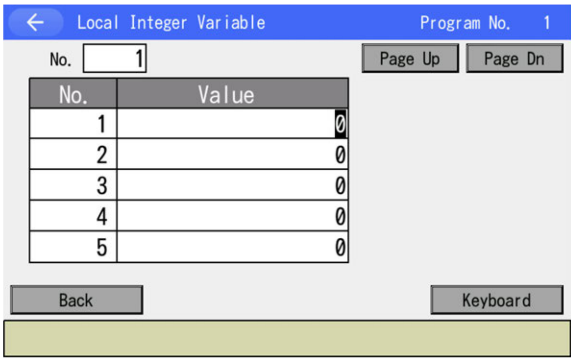
Displays the contents of the local variable. Moreover, values can be substituted for a local integer variable and a local real variable, and then the character sequence can be substituted for a local string. Touch L Integer L Real L String buttons in monitor menu.

1) Local Integer Variables



No. 1

No.	Value
1	0
2	0
3	0
4	0
5	0

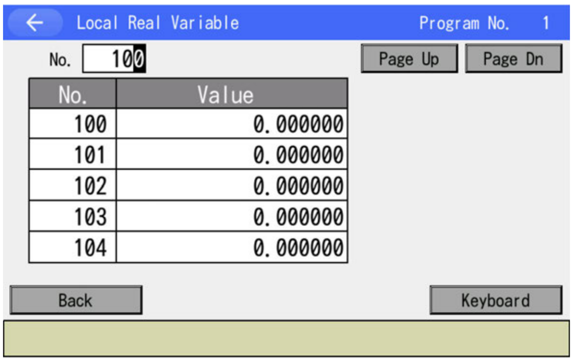


No. 1

No.	Value
1	0
2	0
3	0
4	0
5	0

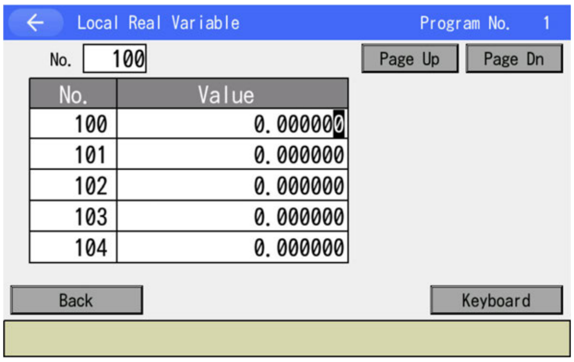
When the Local Integer Variable screen is opened, the cursor should be placed in a number box. Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the Value input box.
The data with the cursor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



No. 100

No.	Value
100	0.000000
101	0.000000
102	0.000000
103	0.000000
104	0.000000

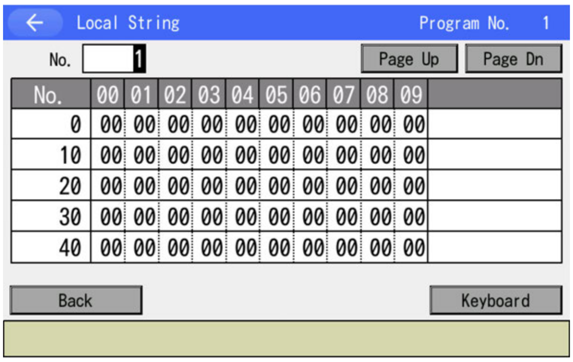


No. 100

No.	Value
100	0.000000
101	0.000000
102	0.000000
103	0.000000
104	0.000000

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.

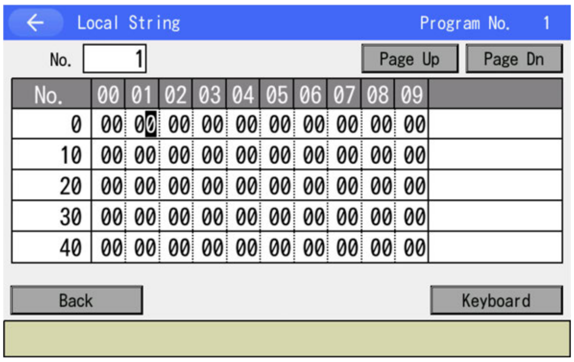
3) Local String Variables



Program No. 1

No. 1

No.	00	01	02	03	04	05	06	07	08	09	
0	00	00	00	00	00	00	00	00	00	00	
10	00	00	00	00	00	00	00	00	00	00	
20	00	00	00	00	00	00	00	00	00	00	
30	00	00	00	00	00	00	00	00	00	00	
40	00	00	00	00	00	00	00	00	00	00	

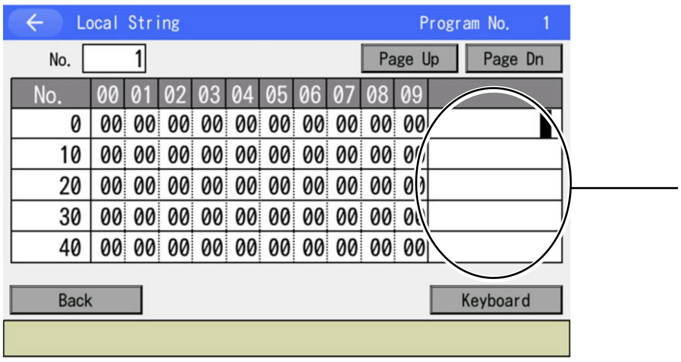


Program No. 1

No. 1

No.	00	01	02	03	04	05	06	07	08	09	
0	00	00	00	00	00	00	00	00	00	00	
10	00	00	00	00	00	00	00	00	00	00	
20	00	00	00	00	00	00	00	00	00	00	
30	00	00	00	00	00	00	00	00	00	00	
40	00	00	00	00	00	00	00	00	00	00	

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.



Program No. 1

No. 1

No.	00	01	02	03	04	05	06	07	08	09	
0	00	00	00	00	00	00	00	00	00	00	
10	00	00	00	00	00	00	00	00	00	0	
20	00	00	00	00	00	00	00	00	00	0	
30	00	00	00	00	00	00	00	00	00	0	
40	00	00	00	00	00	00	00	00	00	00	

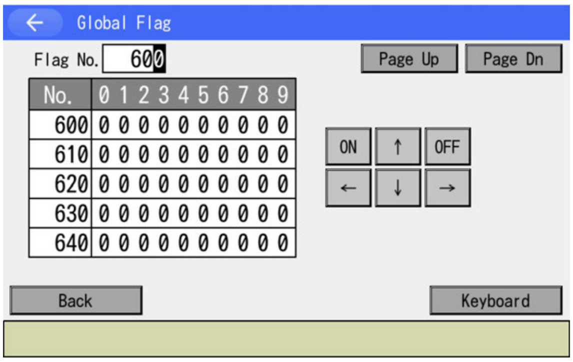
Character strings display and input box

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

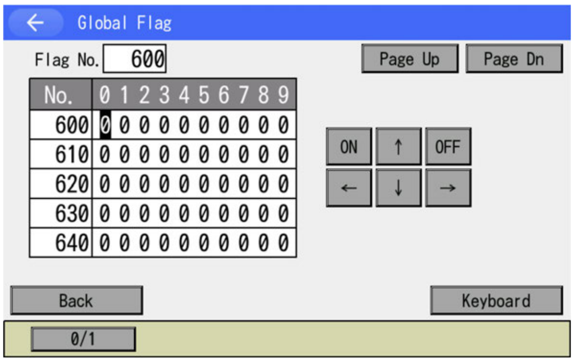
It shows the status ON/OFF of the global flags. In this screen, the global flags can be switched ON/OFF.

Touch G-Flag button in Monitor menu.



Flag No. 600

No.	0	1	2	3	4	5	6	7	8	9
600	0	0	0	0	0	0	0	0	0	0
610	0	0	0	0	0	0	0	0	0	0
620	0	0	0	0	0	0	0	0	0	0
630	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0



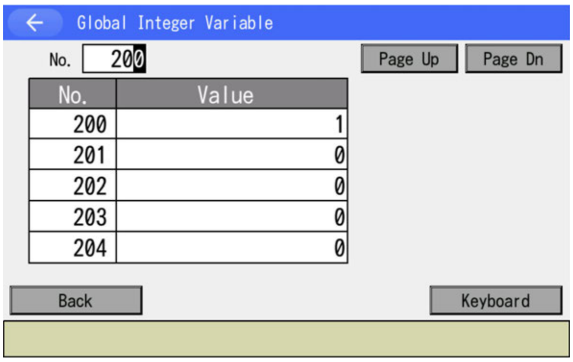
Flag No. 600

No.	0	1	2	3	4	5	6	7	8	9
600	0	0	0	0	0	0	0	0	0	0
610	0	0	0	0	0	0	0	0	0	0
620	0	0	0	0	0	0	0	0	0	0
630	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0

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

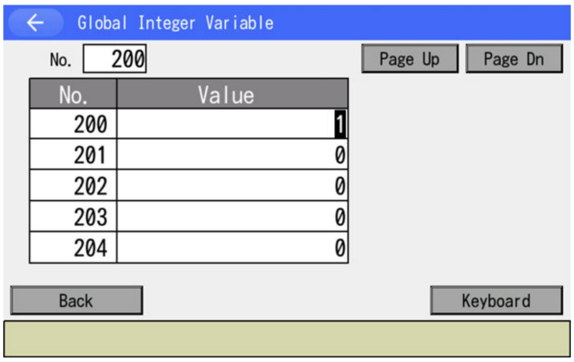
(5) Global Variables
Touch G Integer G Real G String buttons in monitor menu.

1) Global Integer variables



No. 200

No.	Value
200	1
201	0
202	0
203	0
204	0

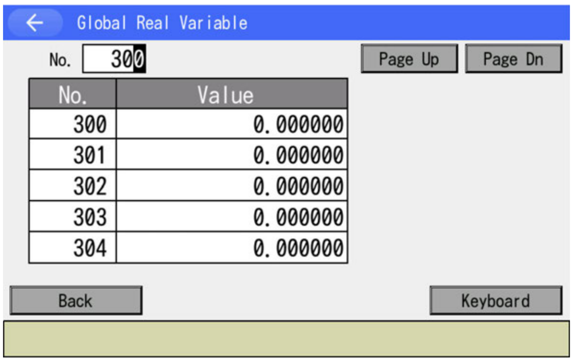


No. 200

No.	Value
200	1
201	0
202	0
203	0
204	0

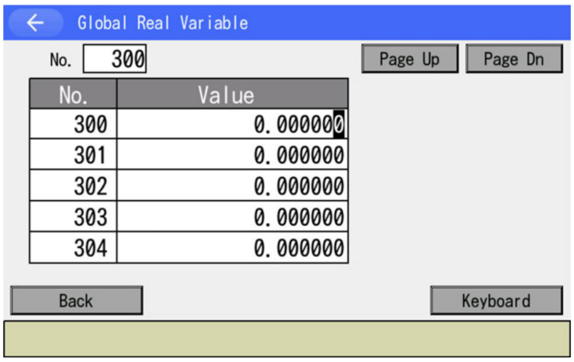
When the Global Integer Variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the Value input box.
The way to substitute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

2) Global Real Variables



No. 300

No.	Value
300	0.000000
301	0.000000
302	0.000000
303	0.000000
304	0.000000

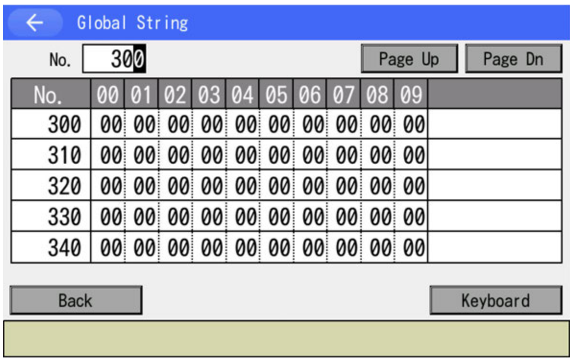


No. 300

No.	Value
300	0.000000
301	0.000000
302	0.000000
303	0.000000
304	0.000000

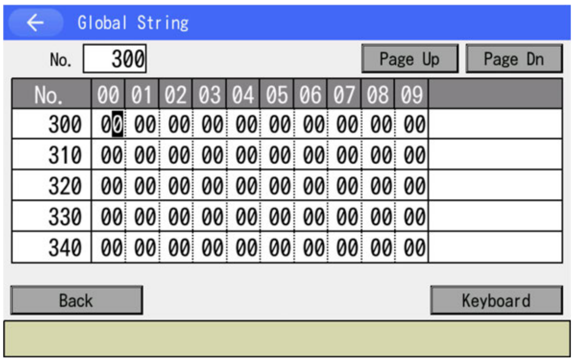
When the Global Real Variable screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the Value input box.
The way to substitute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

3) Global String Variables



No. 300

No.	00	01	02	03	04	05	06	07	08	09
300	00	00	00	00	00	00	00	00	00	00
310	00	00	00	00	00	00	00	00	00	00
320	00	00	00	00	00	00	00	00	00	00
330	00	00	00	00	00	00	00	00	00	00
340	00	00	00	00	00	00	00	00	00	00

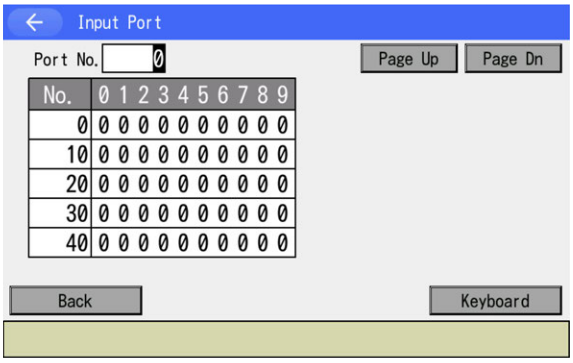


No. 300

No.	00	01	02	03	04	05	06	07	08	09
300	00	00	00	00	00	00	00	00	00	00
310	00	00	00	00	00	00	00	00	00	00
320	00	00	00	00	00	00	00	00	00	00
330	00	00	00	00	00	00	00	00	00	00
340	00	00	00	00	00	00	00	00	00	00

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.

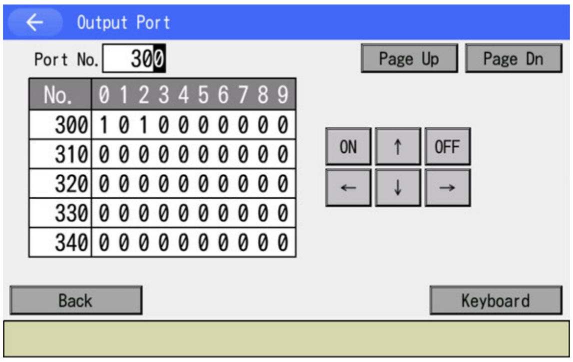


No.	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0

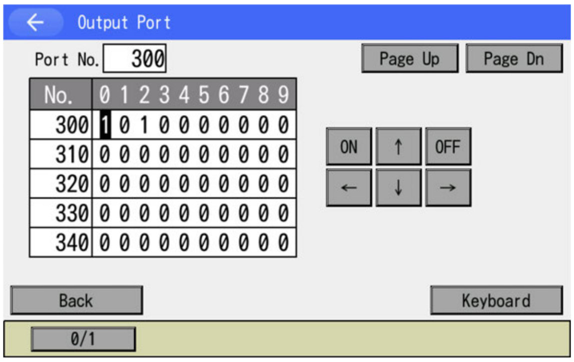
Touch Keyboard button to open the touch panel numeric keys, input a port number that you want to show, and touch ENT for confirmation.
Every touch of Page Up and Page Dn buttons scrolls up/down the displayed input port numbers by 50 items.

Refer to [14.2 Input Port] for debug filters.

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



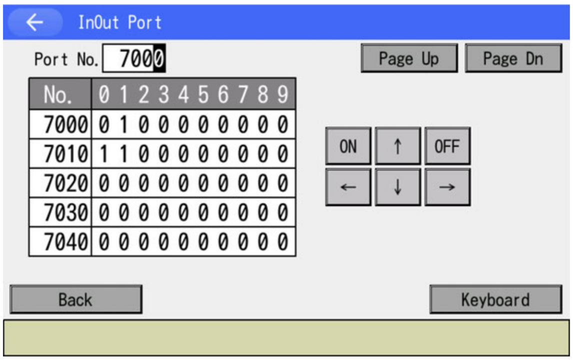
No.	0	1	2	3	4	5	6	7	8	9
300	1	0	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0



No.	0	1	2	3	4	5	6	7	8	9
300	1	0	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0

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.

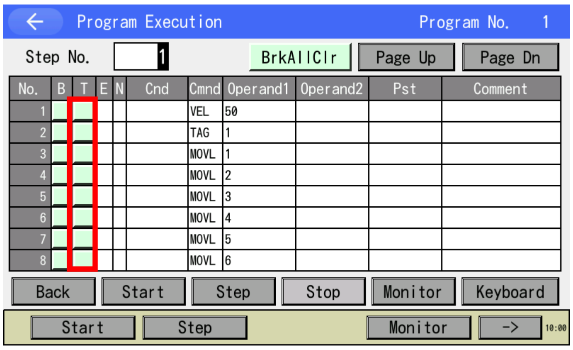


No.	0	1	2	3	4	5	6	7	8	9
7000	0	1	0	0	0	0	0	0	0	0
7010	1	1	0	0	0	0	0	0	0	0
7020	0	0	0	0	0	0	0	0	0	0
7030	0	0	0	0	0	0	0	0	0	0
7040	0	0	0	0	0	0	0	0	0	0

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.



No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3						MOVL	1			
4						MOVL	2			
5						MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

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.

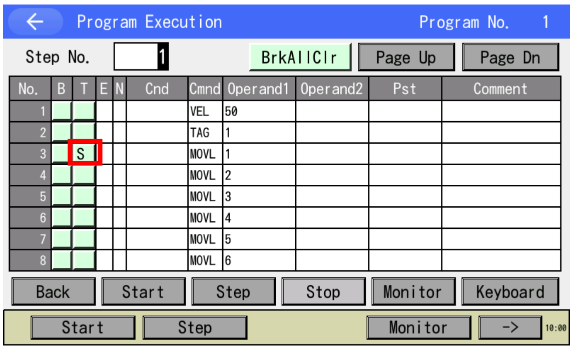
Touch T Button of the step you would like to edit setting and the display of the touched button should change.
The meanings of each type of display are as shown below.

- (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.



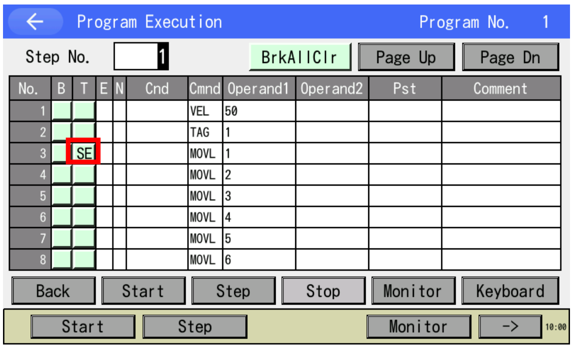
Program Execution Program No. 1

Step No. 1

No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3		S				MOVL	1			
4						MOVL	2			
5						MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

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.

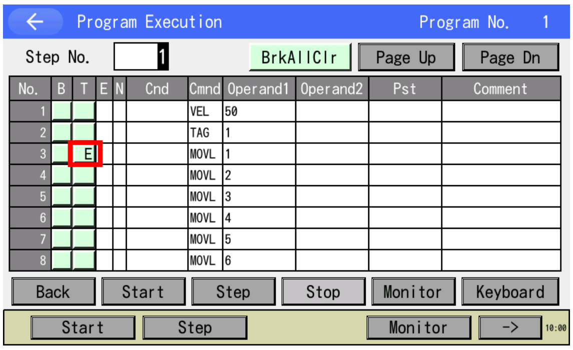


Program Execution Program No. 1

Step No. 1

No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3		SE				MOVL	1			
4						MOVL	2			
5						MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

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.

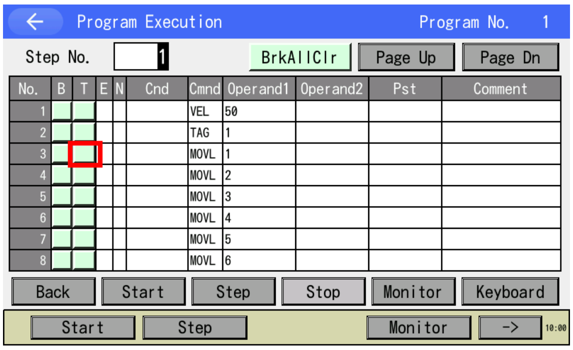


Program Execution Program No. 1

Step No. 1

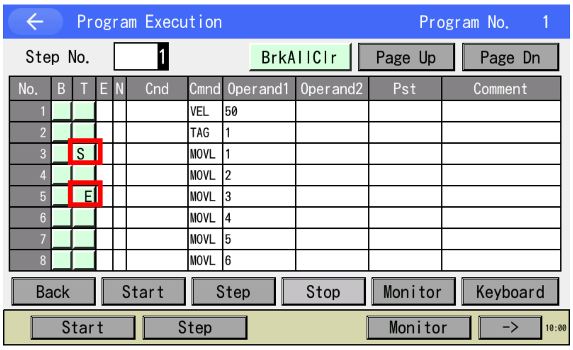
No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3		E				MOVL	1			
4						MOVL	2			
5						MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

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.



No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3						MOVL	1			
4						MOVL	2			
5						MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

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.

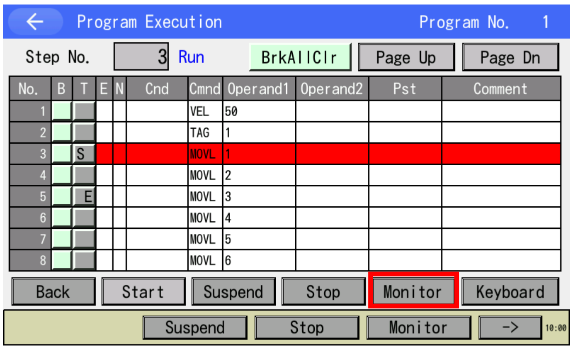


No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3		S				MOVL	1			
4						MOVL	2			
5		E				MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

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

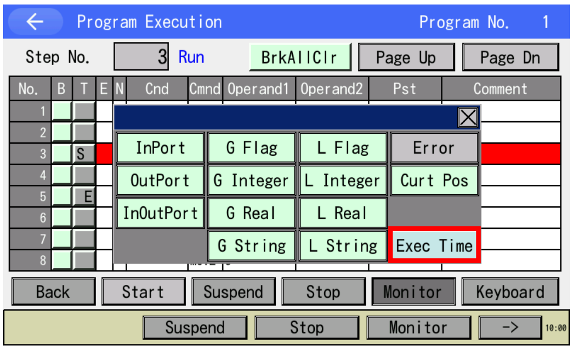
Follow the procedures below to display the result of the execution time measurement.



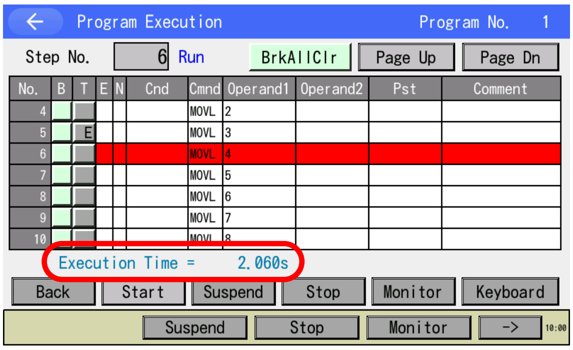
Step No. 3 Run

No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
1						VEL	50			
2						TAG	1			
3		S				MOVL	1			
4						MOVL	2			
5		E				MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			

1) Touch Monitor button.



2) Touch Exec Time button.



Step No. 6 Run

No.	B	T	E	N	Cnd	Cmnd	Operand1	Operand2	Pst	Comment
4						MOVL	2			
5		E				MOVL	3			
6						MOVL	4			
7						MOVL	5			
8						MOVL	6			
9						MOVL	7			
10						MOVL	8			

Execution Time = 2.060s

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.

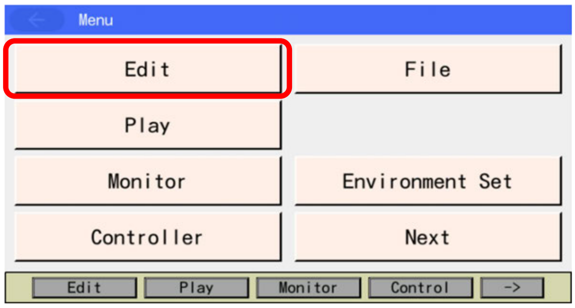
10.4.3 Cautions

- 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.

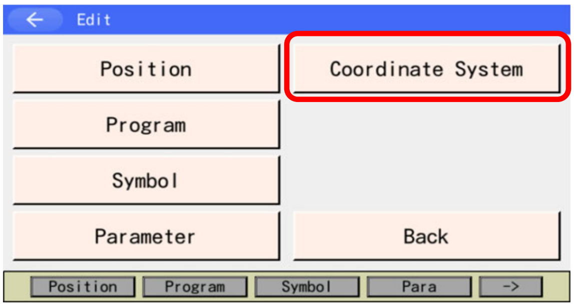
11. Coordinate System Data Editing

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

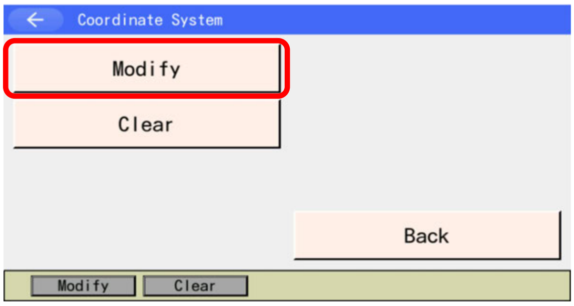
(* 1st to 3rd Axes for 3-axis SCARA Type)



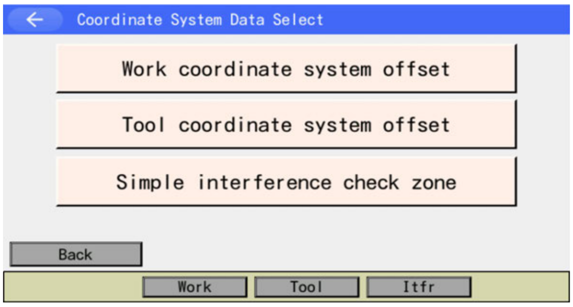
Touch Edit button.



Touch Coordinate System button.



Touch Modify button.

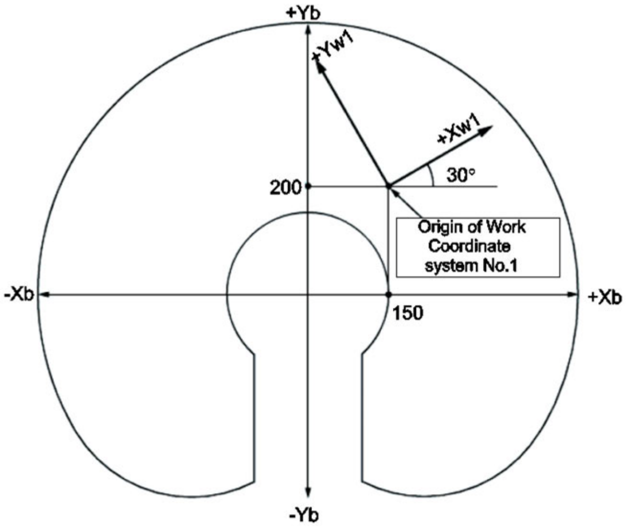

Coordinate System Data Select
Work coordinate system offset
Tool coordinate system offset
Simple interference check zone
Back
Work
Tool
Itfr

Select the coordinate system subject to editing in this screen.

11.1 Editing of Work Coordinate System Data

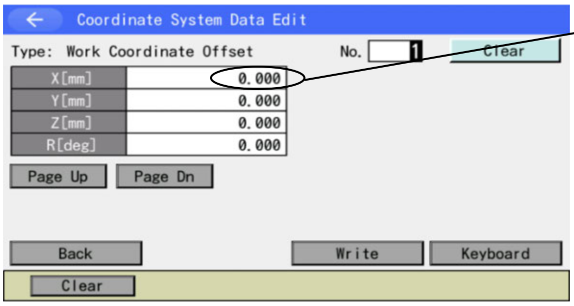
As an input example of the work coordinate system data, a coordinate system as shown below is set for the work coordinate system No. 1.

(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.



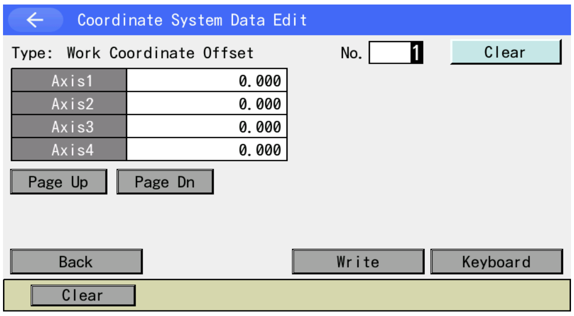
Type: Work Coordinate Offset

No. 1

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

X-axis Offset Input Box

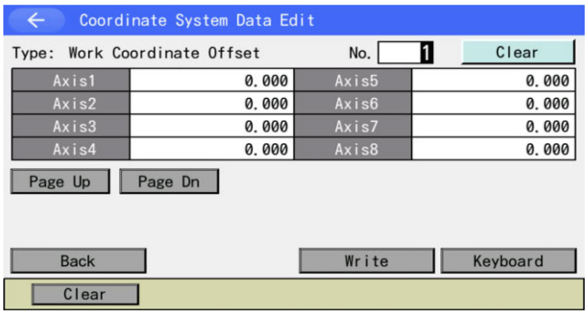
The cursor is placed at the number. To select the work coordinate system number, touch Keyboard button to show the touch panel keyboard to input, input on the hardware numeric keys, or use Page Up and Page Dn buttons.
Touch in an X-axis offset input box.



Type: Work Coordinate Offset No. 1

Axis1	0.000
Axis2	0.000
Axis3	0.000
Axis4	0.000

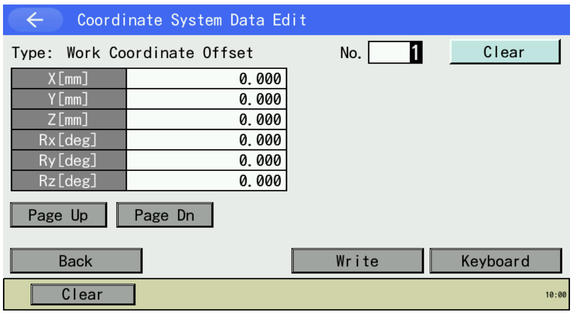
For XSEL-RX/SX, RAX/SAX, XSEL2-TX



Type: Work Coordinate Offset No. 1

Axis1	0.000	Axis5	0.000
Axis2	0.000	Axis6	0.000
Axis3	0.000	Axis7	0.000
Axis4	0.000	Axis8	0.000

For XSEL-RXD/SXD, RAXD/SAXD

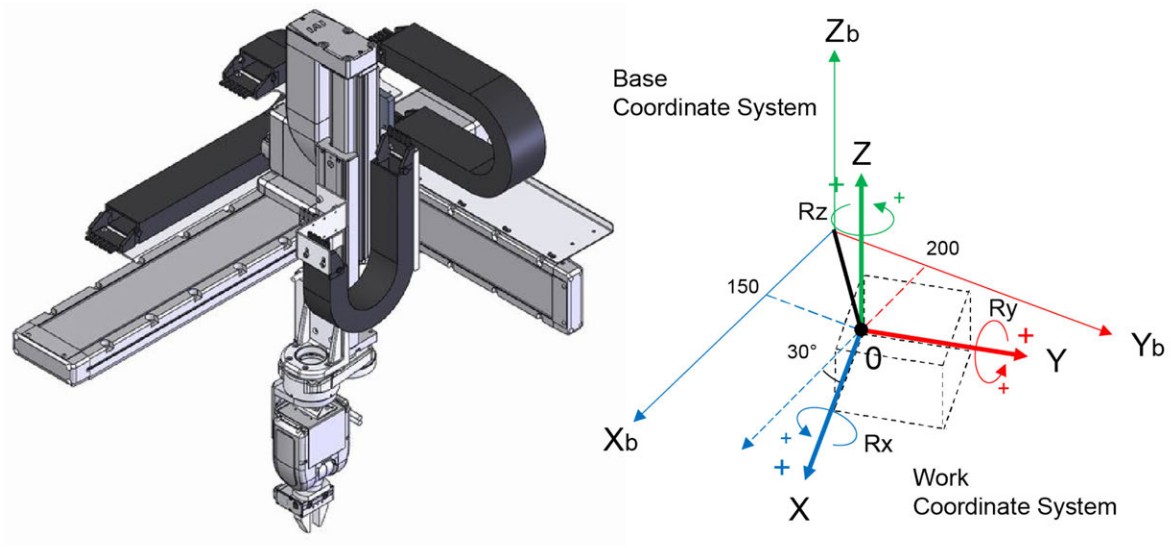


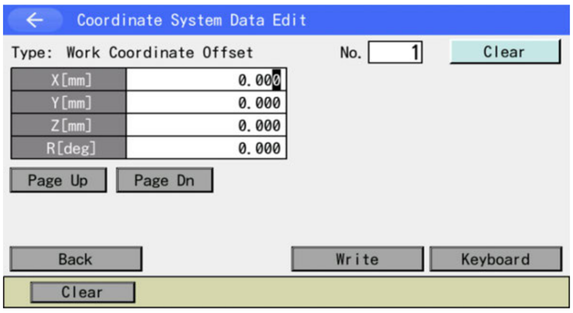
Type: Work Coordinate Offset No. 1

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
Rx[deg]	0.000
Ry[deg]	0.000
Rz[deg]	0.000

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.





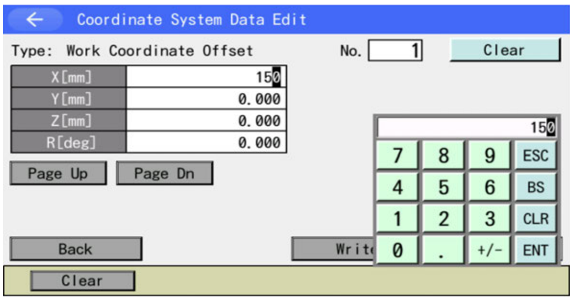
Coordinate System Data Edit

Type: Work Coordinate Offset

No. 1

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

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



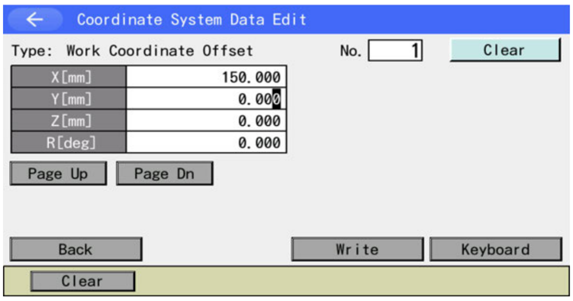
Coordinate System Data Edit

Type: Work Coordinate Offset

No. 1

X[mm]	150
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

Input 150 and touch ENT.



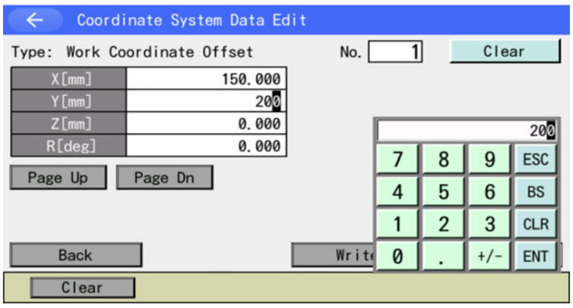
Coordinate System Data Edit

Type: Work Coordinate Offset

No. 1

X[mm]	150.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

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



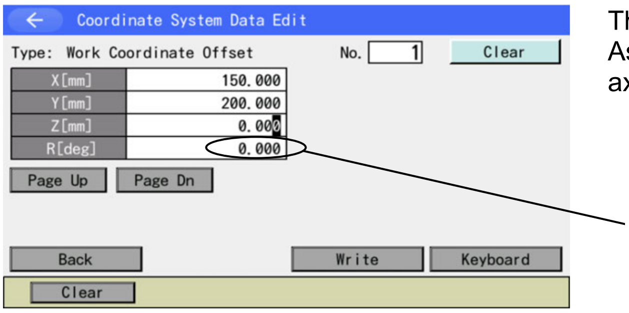
Coordinate System Data Edit

Type: Work Coordinate Offset

No. 1

X[mm]	150.000
Y[mm]	200
Z[mm]	0.000
R[deg]	0.000

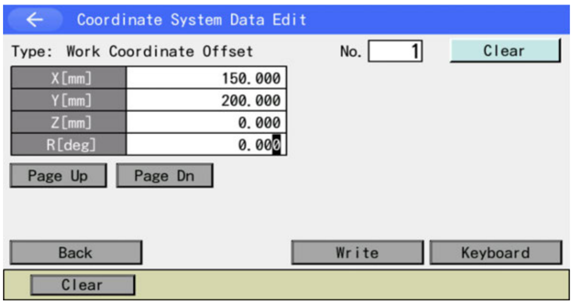
Input 200 and touch ENT.



Type: Work Coordinate Offset
No. 1

X[mm]	150.000
Y[mm]	200.000
Z[mm]	0.000
R[deg]	0.000

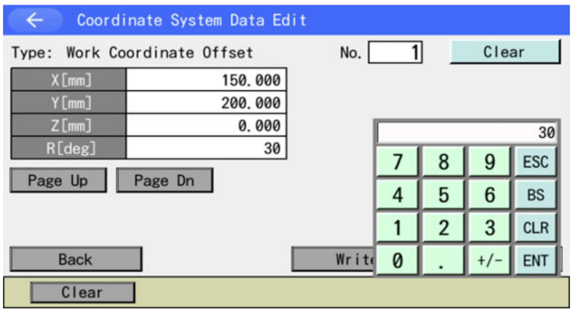
The cursor is placed on the Z-axis offset data. As the offset of Z-axis remains at 0, touch in the R-axis offset input box.



Type: Work Coordinate Offset
No. 1

X[mm]	150.000
Y[mm]	200.000
Z[mm]	0.000
R[deg]	0.000

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

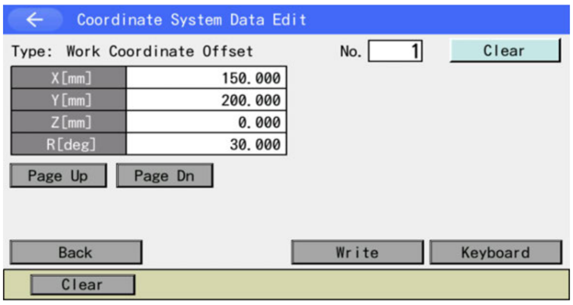


Type: Work Coordinate Offset
No. 1

X[mm]	150.000
Y[mm]	200.000
Z[mm]	0.000
R[deg]	30

30

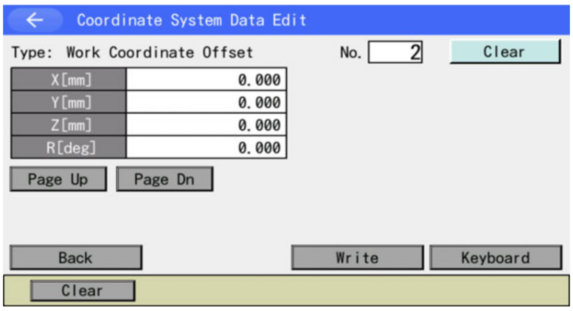
Input 30 and touch ENT.



Type: Work Coordinate Offset
No. 1

X[mm]	150.000
Y[mm]	200.000
Z[mm]	0.000
R[deg]	30.000

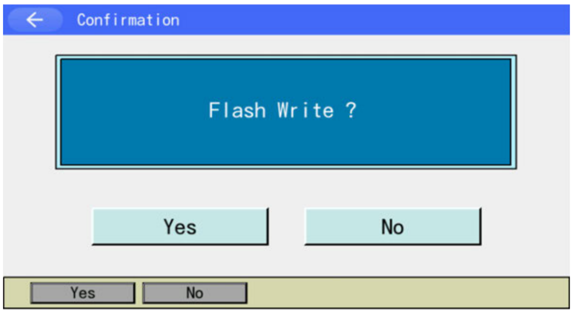
Touch Write button to transfer the data to the controller. The position moves to Work Coordinate Offset No. 2.



Type: Work Coordinate Offset No. 2

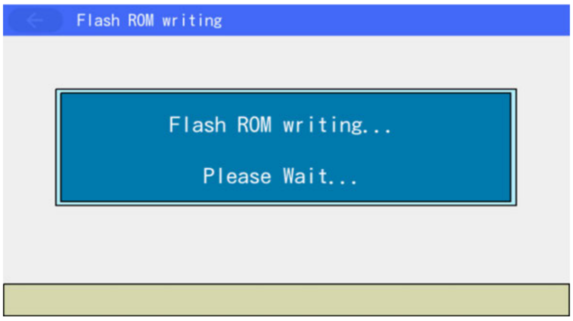
X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

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



Flash Write ?

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

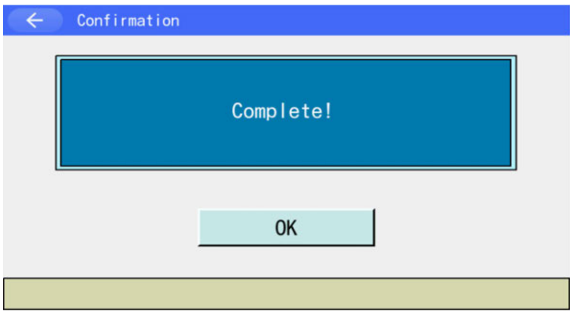


Flash ROM writing...

Please Wait...

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

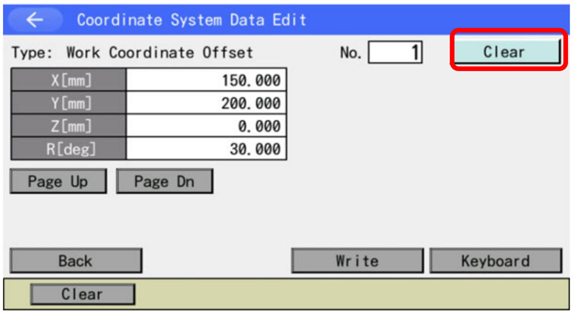
Never turn off the power to the Controller at this time.



Complete!

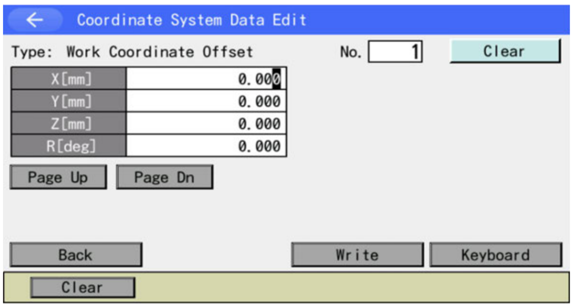
Flash ROM writing is completed.
Touch OK button to return to the edit menu screen.

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)

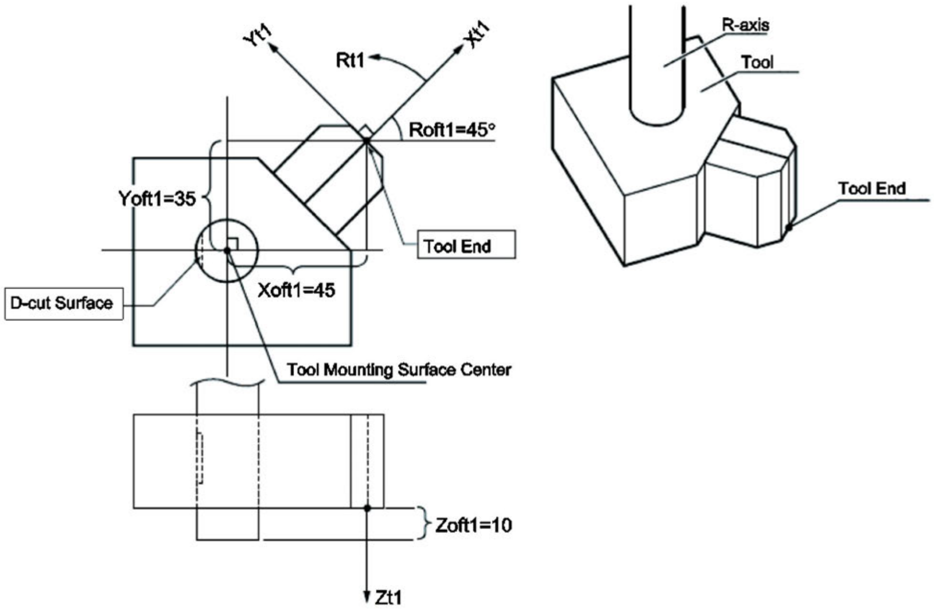
To transfer the data to the controller, touch Write button.



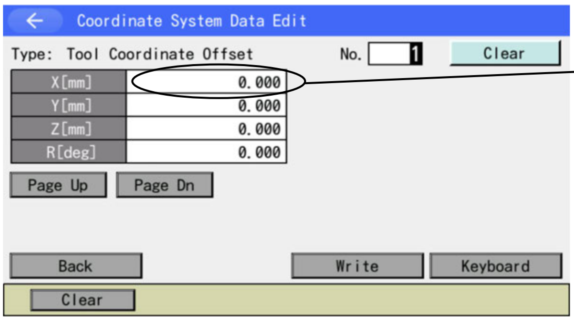
Example of Screen after Touching Clear Button

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)



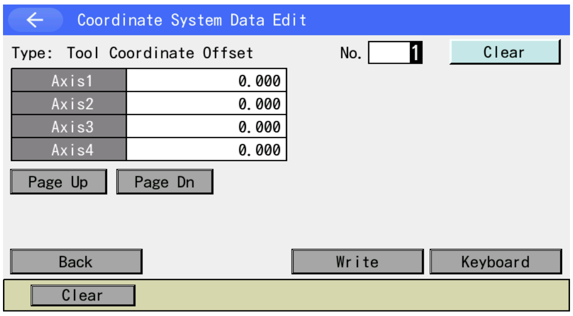
Coordinate System Data Edit

Type: Tool Coordinate Offset No. 1

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

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.

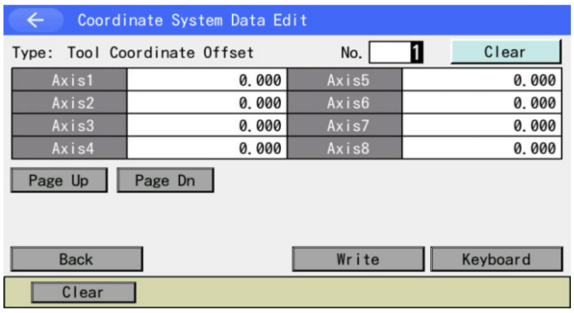


Coordinate System Data Edit

Type: Tool Coordinate Offset No. 1

Axis1	0.000
Axis2	0.000
Axis3	0.000
Axis4	0.000

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

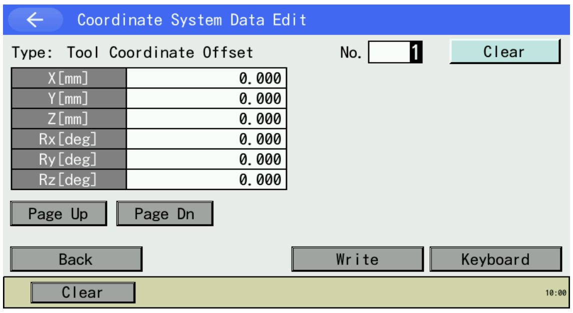


Coordinate System Data Edit

Type: Tool Coordinate Offset No. 1

Axis1	0.000	Axis5	0.000
Axis2	0.000	Axis6	0.000
Axis3	0.000	Axis7	0.000
Axis4	0.000	Axis8	0.000

For XSEL-RXD/SXD, RAXD/SAXD



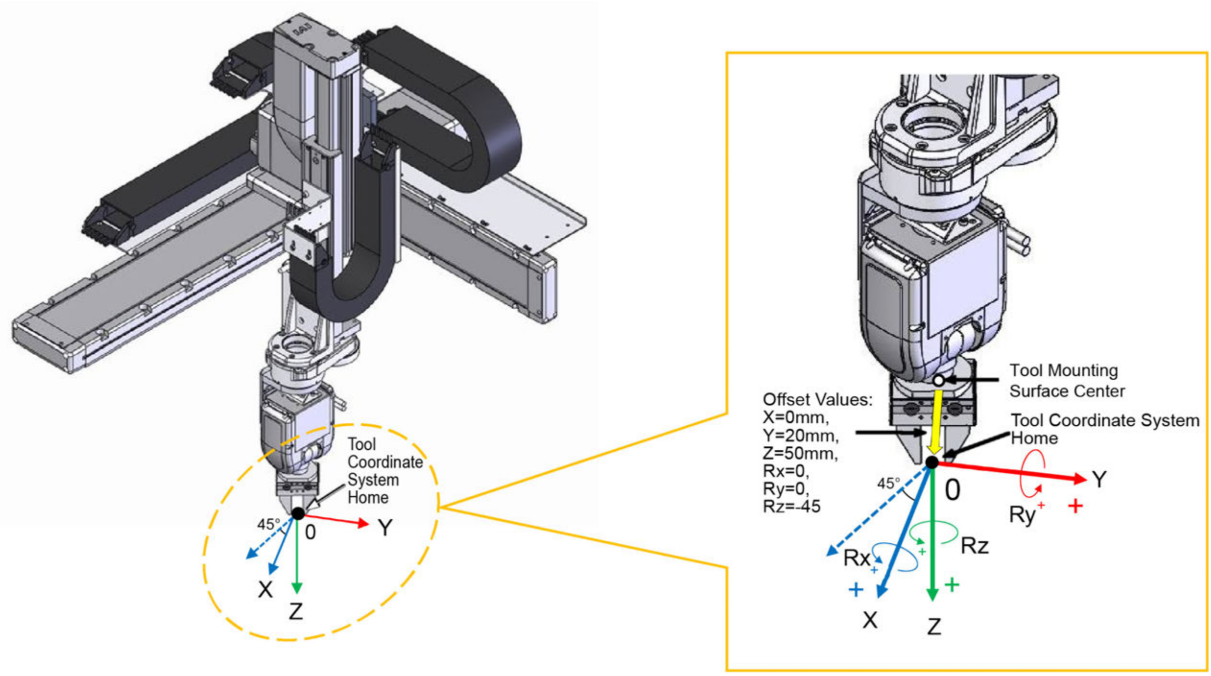
Coordinate System Data Edit

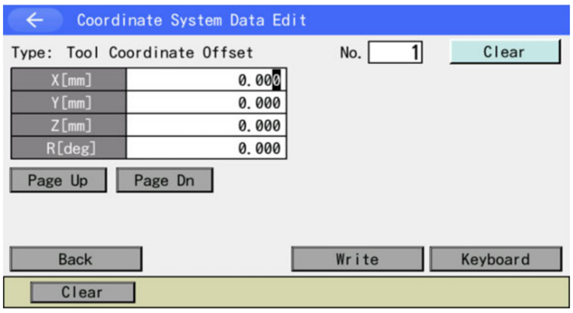
Type: Tool Coordinate Offset No. 1

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
Rx[deg]	0.000
Ry[deg]	0.000
Rz[deg]	0.000

For 6-Axis Cartesian

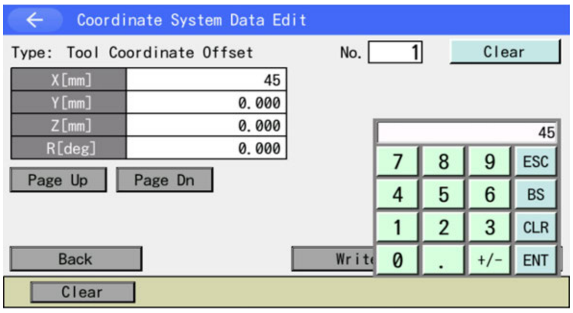
Tool Coordinate System in 6-Axis Cartesian Robot
When offset at Xoft1 = 0, oft1 = 20, Zoft1 = 50, Rxoft1 = 0, Ryoft1 = 0 and Rzoft1 = -45.





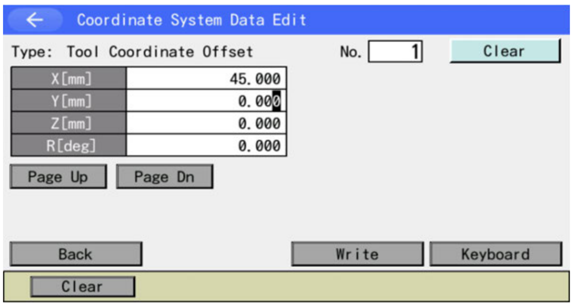
Type: Tool Coordinate Offset
No. 1
X[mm] 0.000
Y[mm] 0.000
Z[mm] 0.000
R[deg] 0.000

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



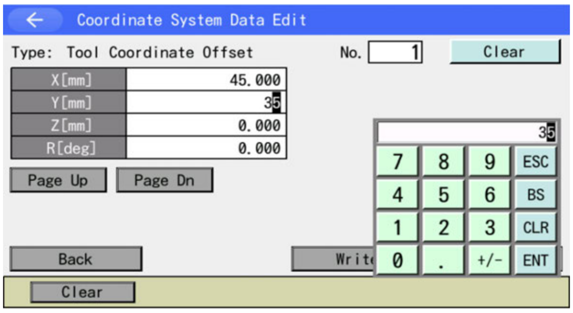
Type: Tool Coordinate Offset
No. 1
X[mm] 45
Y[mm] 0.000
Z[mm] 0.000
R[deg] 0.000
45

Input 45 and touch ENT.



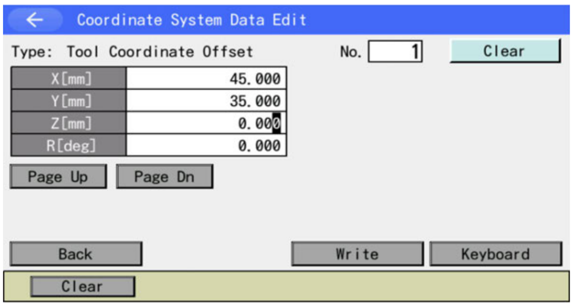
Type: Tool Coordinate Offset
No. 1
X[mm] 45.000
Y[mm] 0.000
Z[mm] 0.000
R[deg] 0.000

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



Type: Tool Coordinate Offset
No. 1
X[mm] 45.000
Y[mm] 35
Z[mm] 0.000
R[deg] 0.000
35

Input 35 and touch ENT.

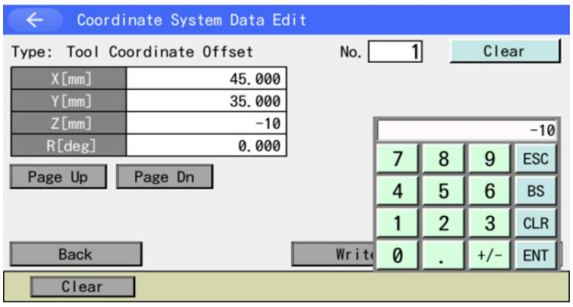


Coordinate System Data Edit

Type: Tool Coordinate Offset   No. 1

X[mm] 45.000
Y[mm] 35.000
Z[mm] 0.000
R[deg] 0.000

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



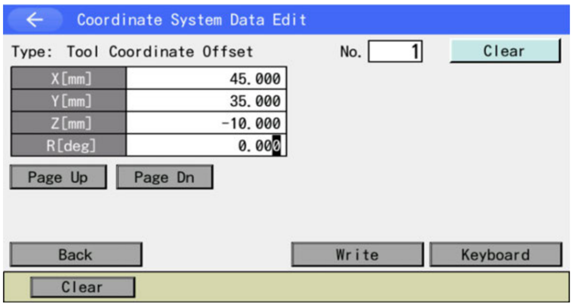
Coordinate System Data Edit

Type: Tool Coordinate Offset   No. 1

X[mm] 45.000
Y[mm] 35.000
Z[mm] -10
R[deg] 0.000

-10

Input -10 and touch ENT.

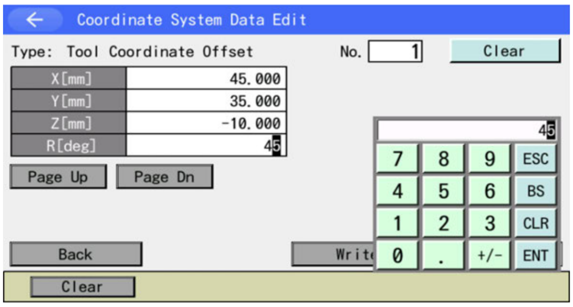


Coordinate System Data Edit

Type: Tool Coordinate Offset   No. 1

X[mm] 45.000
Y[mm] 35.000
Z[mm] -10.000
R[deg] 0.000

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



Coordinate System Data Edit

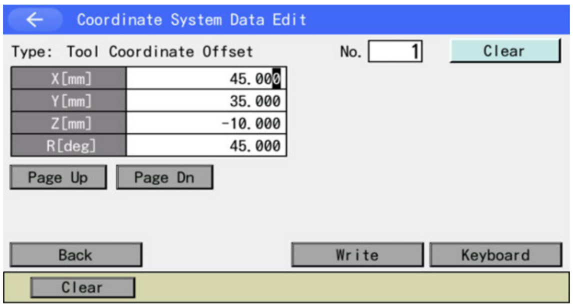
Type: Tool Coordinate Offset   No. 1

X[mm] 45.000
Y[mm] 35.000
Z[mm] -10.000
R[deg] 45

45

Input 45 and touch ENT.

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

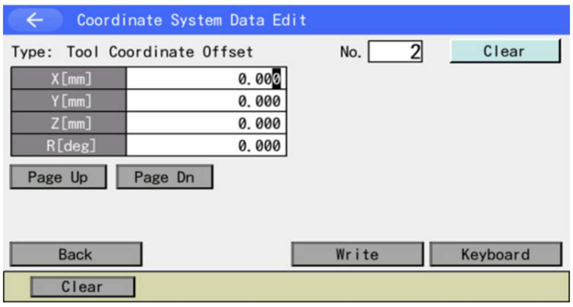


Coordinate System Data Edit

Type: Tool Coordinate Offset No. 1

X[mm]	45.000
Y[mm]	35.000
Z[mm]	-10.000
R[deg]	45.000

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

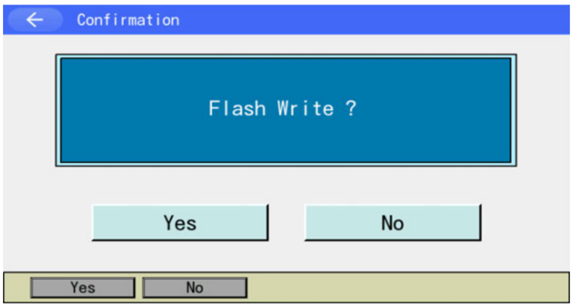


Coordinate System Data Edit

Type: Tool Coordinate Offset No. 2

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

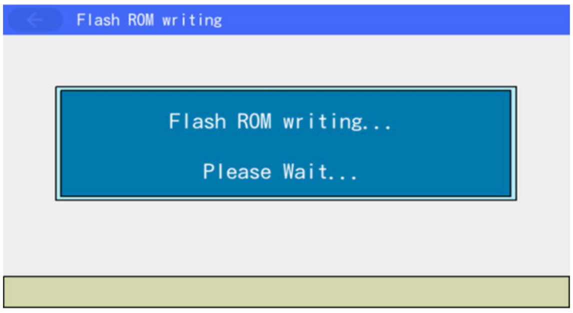
Touch Back button or Cancel button to go to the Flash ROM writing screen.



Confirmation

Flash Write ?

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



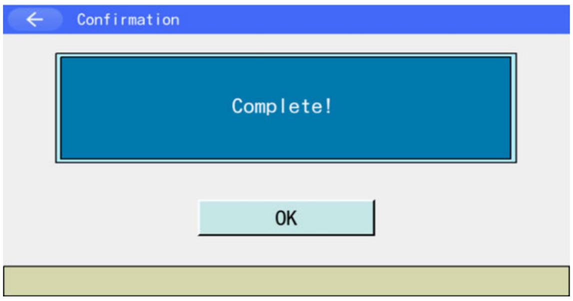
Flash ROM writing

Flash ROM writing...

Please Wait...

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

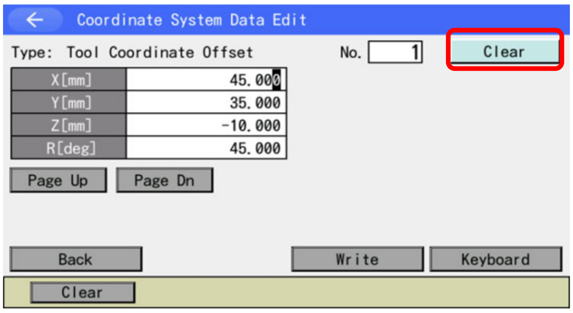
Never turn off the power to the Controller at this time.



Complete!

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

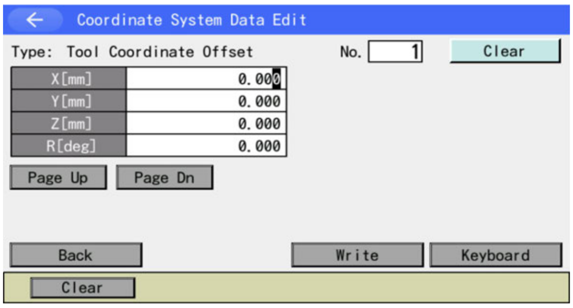


Type: Tool Coordinate Offset No. 1

X[mm]	45.000
Y[mm]	35.000
Z[mm]	-10.000
R[deg]	45.000

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.



Type: Tool Coordinate Offset No. 1

X[mm]	0.000
Y[mm]	0.000
Z[mm]	0.000
R[deg]	0.000

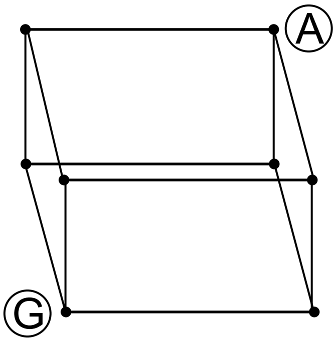
Example of Screen after Touching Clear Button

11.3 Editing of Simple Interference Check Zone

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

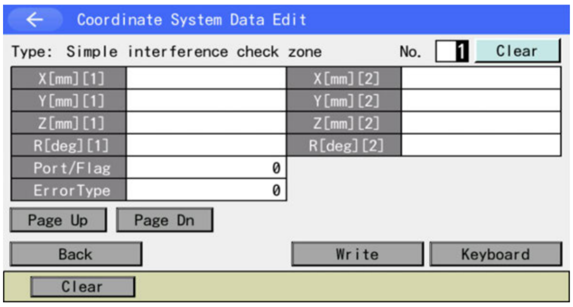
- 2-point position data to define the zone. (Input the values of the base coordinate system.)
- Output port No. or global flag No. for output during zone invasion.
- Error type at zone invasion time. (0: No error-handling,
  1: Message level error,
  2: Motion reset level error.)

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 A: Xb = 475, Yb = -50, Zb = 150, Rb = 0
Base coordinate values of G: Xb = 400, Yb = 50, Zb = 200, Rb = 180
Output port for output during zone invasion: No. 311
Error type at zone invasion time: 1.

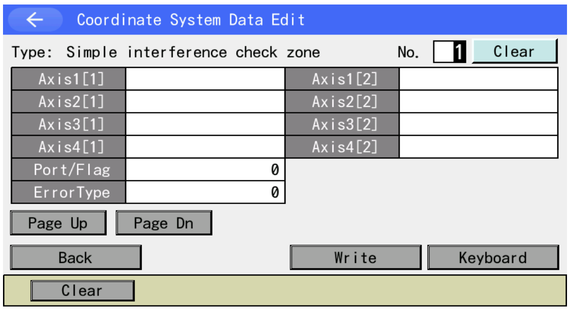
* In 3-axis SCARA type, the setting of Rb does not have a meaning. (It gets out of account on controller side.)
* The domain definition should be done only in X, Y and Z for the 6-axis cartesian.



Type: Simple interference check zone No. 1

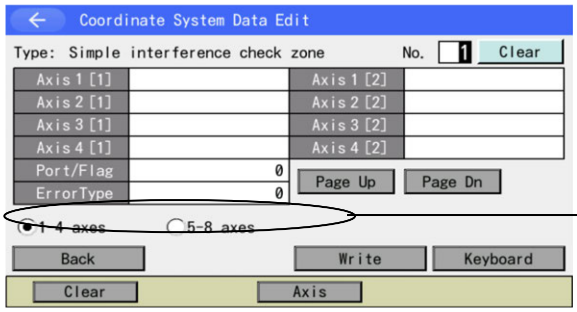
Port/Flag	0
ErrorType	0

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.



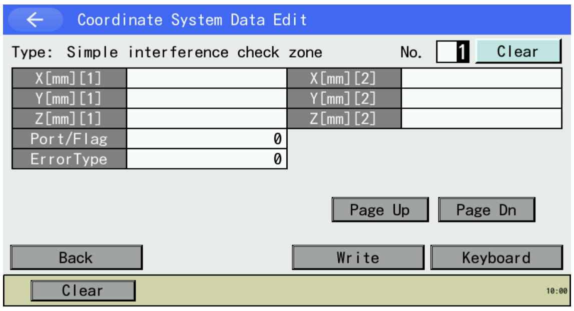
For XSEL-RX/SX, RAX/SAX, XSEL2-TX

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

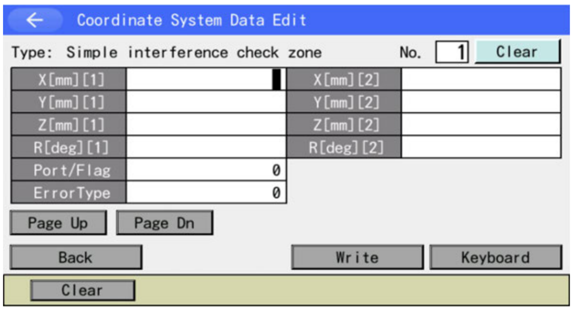


Axis Switchover

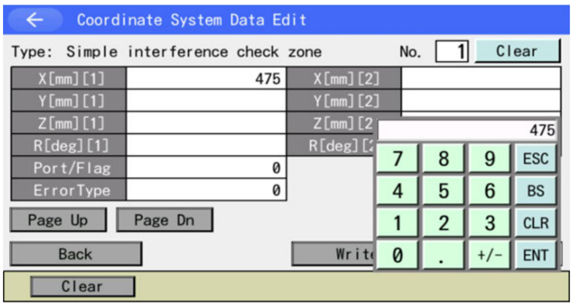
For XSEL-RXD/SXD, RAXD/SAXD



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.



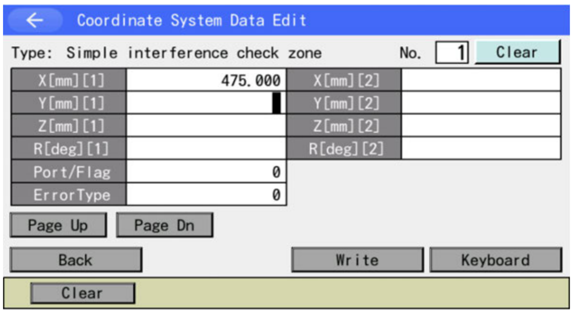
Coordinate System Data Edit

Type: Simple interference check zone No. 1

X[mm][1]	475	X[mm][2]	
Y[mm][1]		Y[mm][2]	
Z[mm][1]		Z[mm][2]	
R[deg][1]		R[deg][2]	
Port/Flag	0		
ErrorType	0		

475

Input 475 and touch ENT.

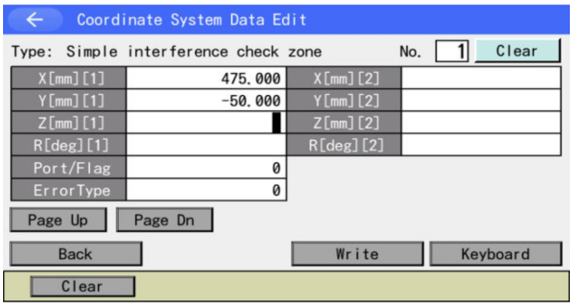


Coordinate System Data Edit

Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	
Y[mm][1]		Y[mm][2]	
Z[mm][1]		Z[mm][2]	
R[deg][1]		R[deg][2]	
Port/Flag	0		
ErrorType	0		

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

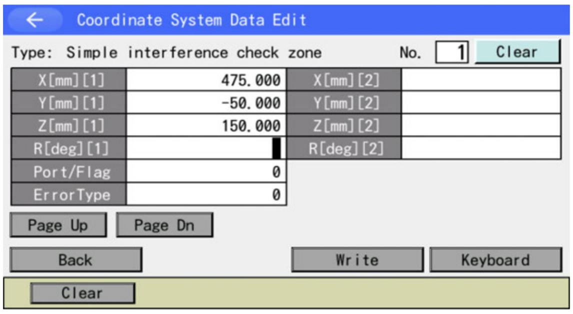


Coordinate System Data Edit

Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	
Y[mm][1]	-50.000	Y[mm][2]	
Z[mm][1]		Z[mm][2]	
R[deg][1]		R[deg][2]	
Port/Flag	0		
ErrorType	0		

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

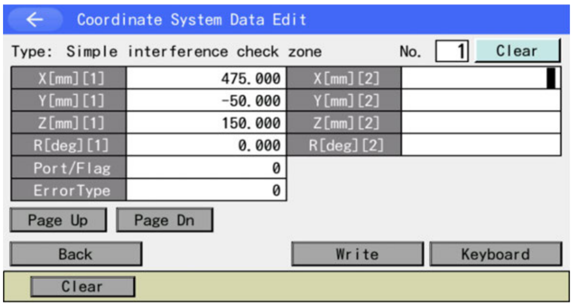


Coordinate System Data Edit

Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	
Y[mm][1]	-50.000	Y[mm][2]	
Z[mm][1]	150.000	Z[mm][2]	
R[deg][1]		R[deg][2]	
Port/Flag	0		
ErrorType	0		

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

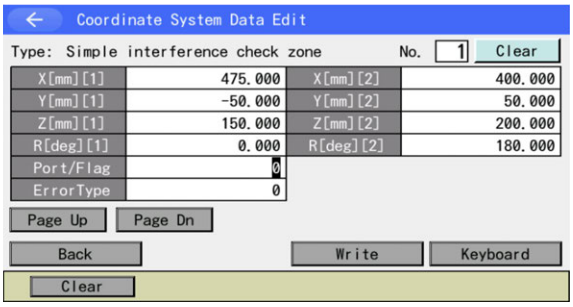


Coordinate System Data Edit

Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	
Y[mm][1]	-50.000	Y[mm][2]	
Z[mm][1]	150.000	Z[mm][2]	
R[deg][1]	0.000	R[deg][2]	
Port/Flag	0		
ErrorType	0		

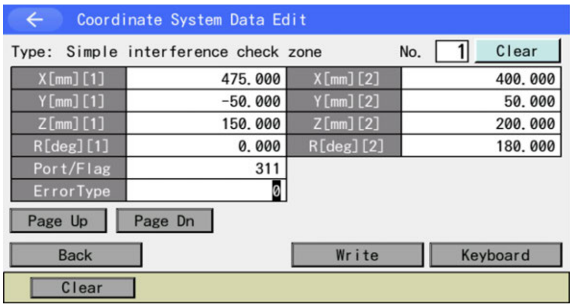
The cursor moves to the other X-axis data.
Enter the base coordinate values of G in the same way as A.



Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	400.000
Y[mm][1]	-50.000	Y[mm][2]	50.000
Z[mm][1]	150.000	Z[mm][2]	200.000
R[deg][1]	0.000	R[deg][2]	180.000
Port/Flag	0		
ErrorType	0		

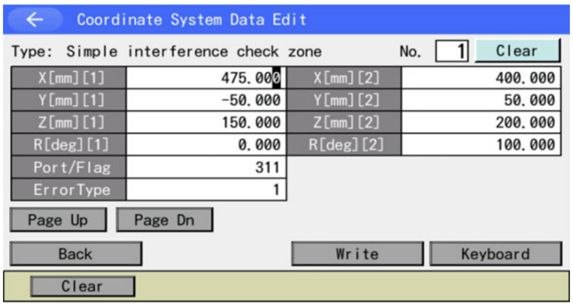
Once the input of coordinate data is finished (the input for R-axis is confirmed), the cursor moves to the input port/flag input box.



Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	400.000
Y[mm][1]	-50.000	Y[mm][2]	50.000
Z[mm][1]	150.000	Z[mm][2]	200.000
R[deg][1]	0.000	R[deg][2]	180.000
Port/Flag	311		
ErrorType	0		

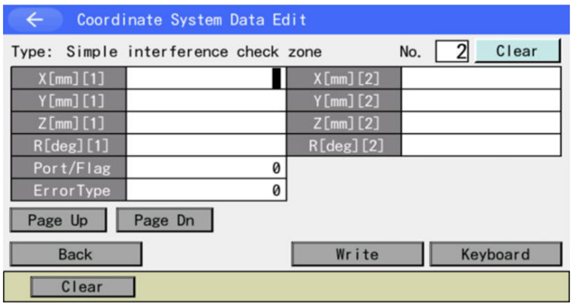
Touch Keyboard button to show the touch panel keyboard to input 311 and touch ENT.
The cursor moves to the Error Type input area.



Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	400.000
Y[mm][1]	-50.000	Y[mm][2]	50.000
Z[mm][1]	150.000	Z[mm][2]	200.000
R[deg][1]	0.000	R[deg][2]	100.000
Port/Flag	311		
ErrorType	1		

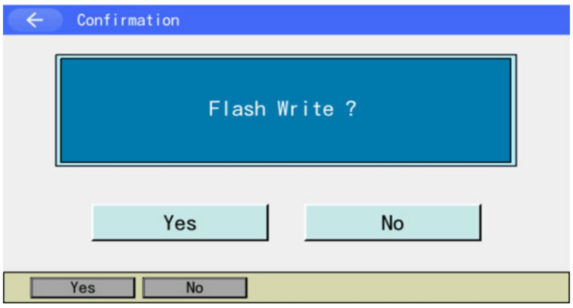
Touch Keyboard button to show the touch panel keyboard to input 1 and touch ENT.
Touch Write button to transfer the data.



Type: Simple interference check zone No. 2

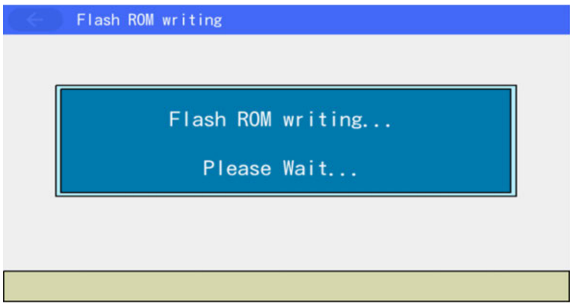
X[mm][1]		X[mm][2]	
Y[mm][1]		Y[mm][2]	
Z[mm][1]		Z[mm][2]	
R[deg][1]		R[deg][2]	
Port/Flag	0		
ErrorType	0		

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, the “9F1” error occurs if the output port error (“312” Error in RSEL and XSEL2-TX) or error type is specified.
Touch Back button to go to Flash ROM writing screen.



Flash Write ?

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



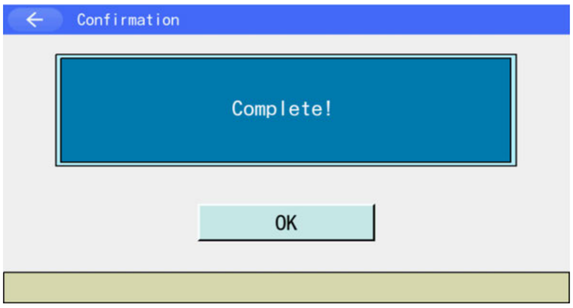
Flash ROM writing

Flash ROM writing...

Please Wait...

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.

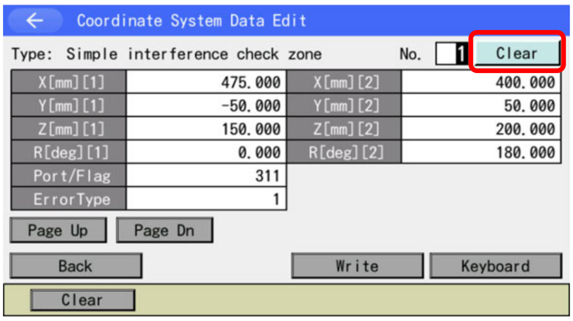


Confirmation

Complete!

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



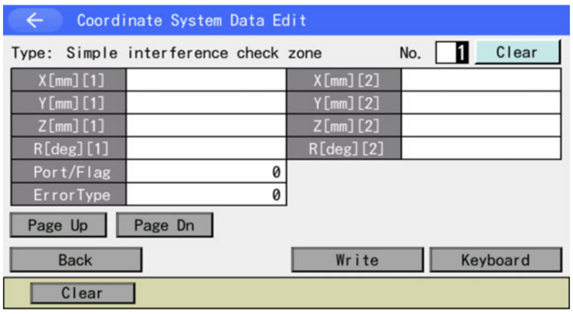
Coordinate System Data Edit

Type: Simple interference check zone No. 1

X[mm][1]	475.000	X[mm][2]	400.000
Y[mm][1]	-50.000	Y[mm][2]	50.000
Z[mm][1]	150.000	Z[mm][2]	200.000
R[deg][1]	0.000	R[deg][2]	180.000
Port/Flag	311		
ErrorType	1		

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.



Coordinate System Data Edit

Type: Simple interference check zone No. 1

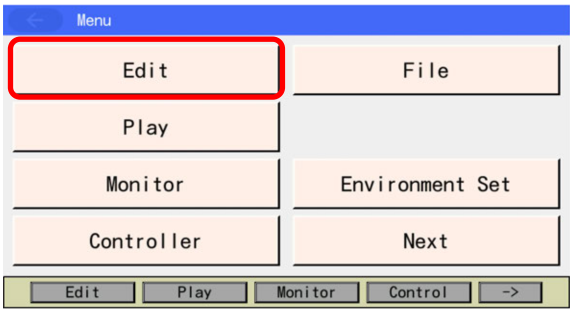
X[mm][1]		X[mm][2]	
Y[mm][1]		Y[mm][2]	
Z[mm][1]		Z[mm][2]	
R[deg][1]		R[deg][2]	
Port/Flag	0		
ErrorType	0		

Screen after Touching Clear Button

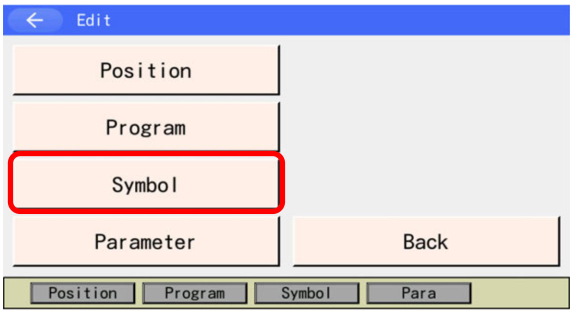
12. Symbol Edit

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

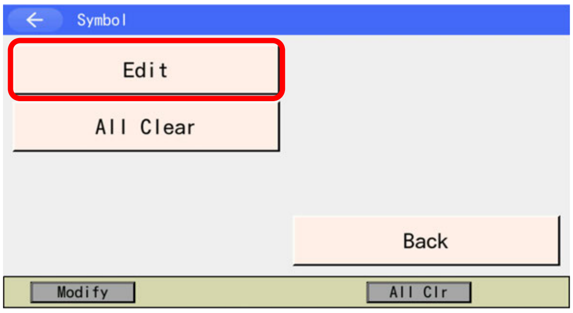
Symbol (Names) can be applied to variables, ports, flags, position, etc.



Touch Edit button in the menu screen.



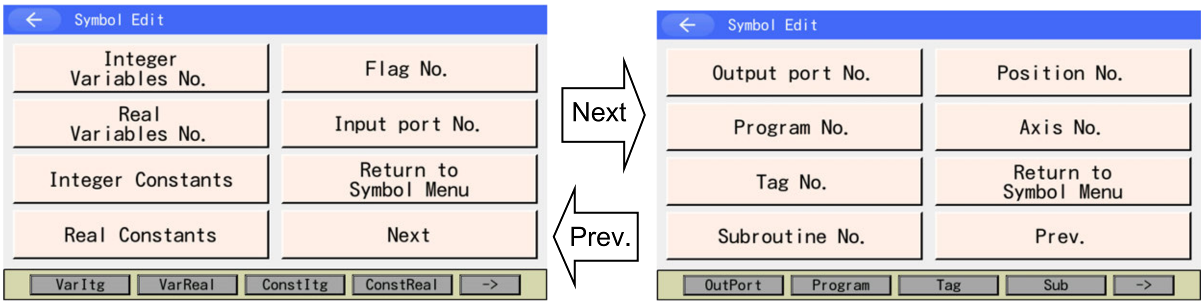
Touch Symbol button in the edit screen.



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.

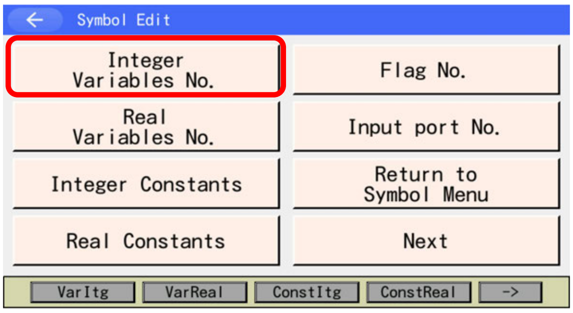
(2) Articles for Symbol Descriptions
1) The top letter[*1] needs to be an alphabet or underscore.
2) The second letter and after[*1] should be ASCII Code 0x21 to 0x7e.
3) The maximum number of letters[*2] should be 9 single-byte characters. (String literal should be 8 single-byte characters letters at 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).

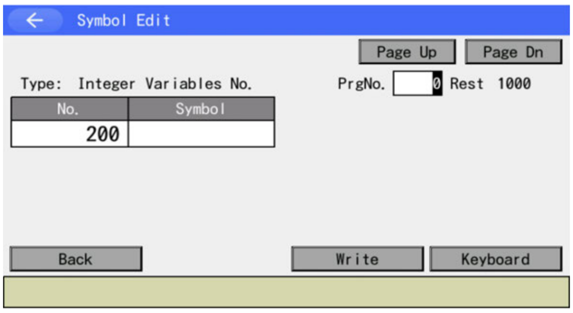
*2 RSEL and XSEL2-T/TX are available for use of up to 40 single-byte characters (39 single-byte characters max. for string literal).

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.

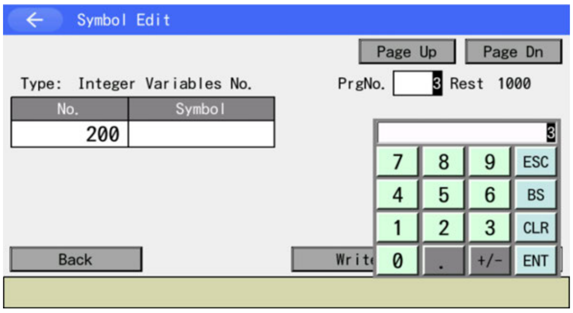


Type: Integer Variables No.

PrgNo. 0 Rest 1000

200

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.



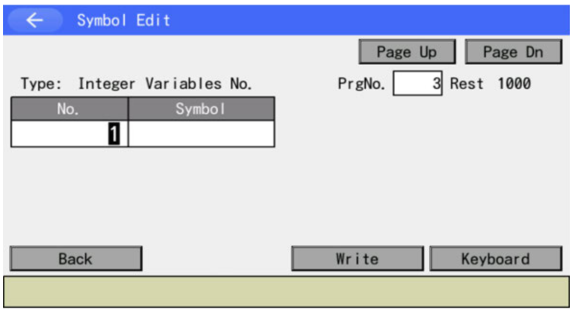
Type: Integer Variables No.

PrgNo. 3 Rest 1000

200

3

Input 3 and touch ENT.

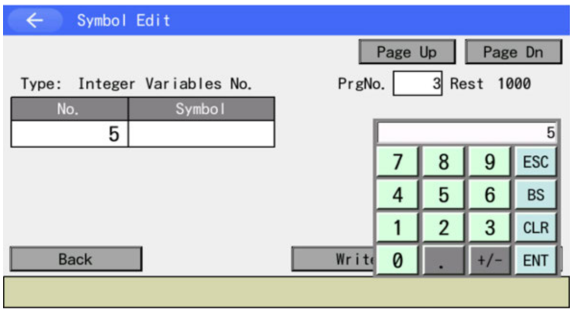


Type: Integer Variables No.

PrgNo. 3 Rest 1000

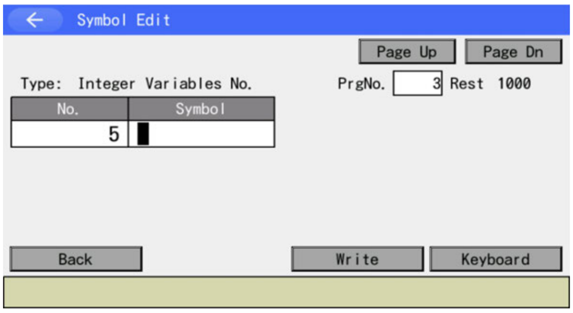
1

The cursor moves to the number box.
Touch Keyboard button to show the touch panel numeric keys.



Type: Integer Variables No.
PrgNo. 3 Rest 1000
No. 5 Symbol

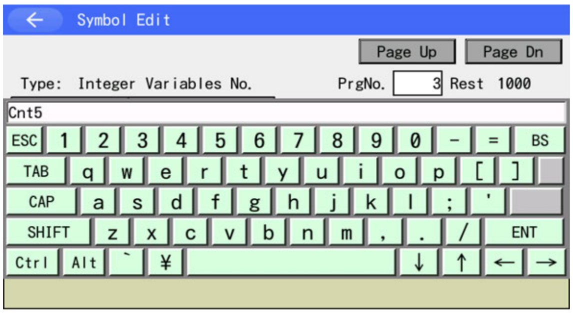
Input 5 and touch ENT.



Type: Integer Variables No.
PrgNo. 3 Rest 1000
No. 5 Symbol

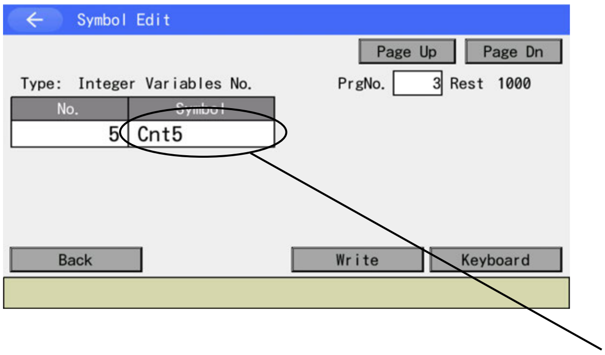
The cursor moves to the Symbol box.

Touch Keyboard button to show the touch panel numeric keys.


Symbol Edit
Page Up
Page Dn
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →

Type: Integer Variables No.
PrgNo. 3 Rest 1000
Cnt5

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.

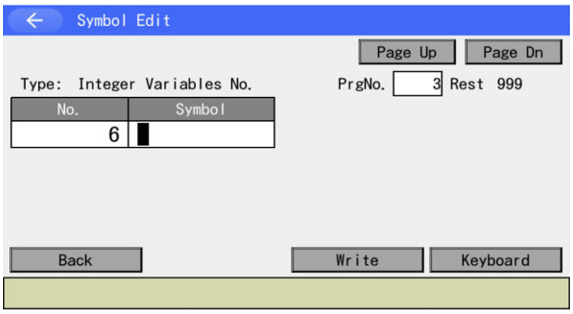


Type: Integer Variables No.
PrgNo. 3 Rest 1000
No. 5 Symbol Cnt5

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

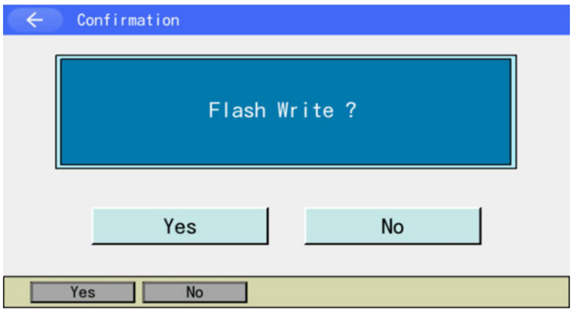


Type: Integer Variables No.

PrgNo. 3 Rest 999

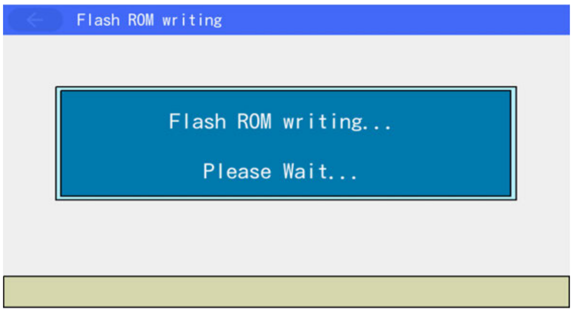
No.	Symbol
6	

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



Flash Write ?

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

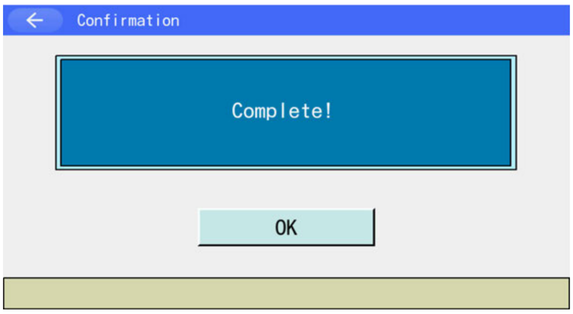


Flash ROM writing...

Please Wait...

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.



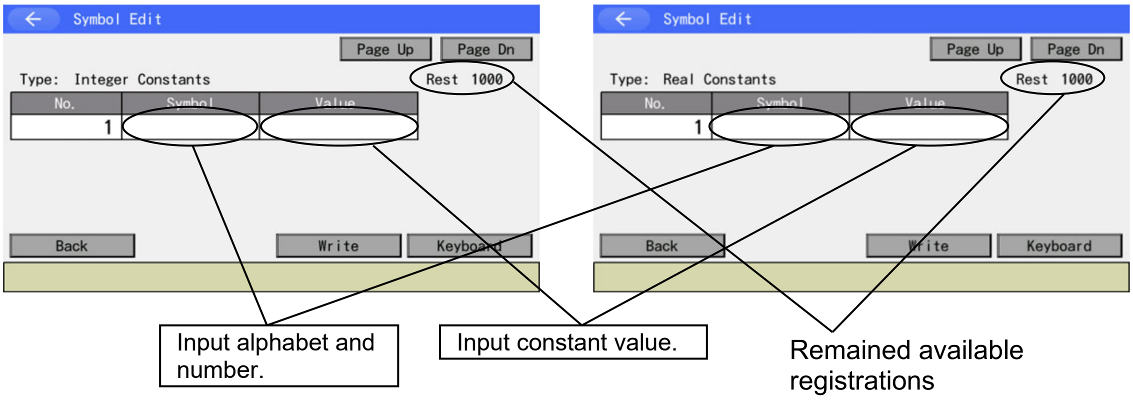
Complete!

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" (A44C 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

Type: Integer Constants

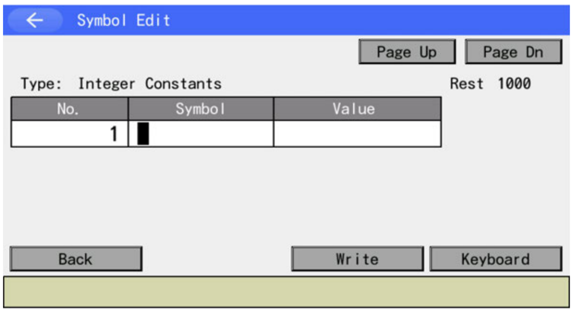
Rest 1000

Real Type Constant Number Symbol Edit Screen

Type: Real Constants

Rest 1000

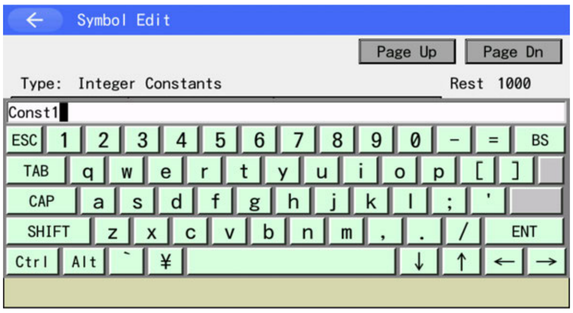
Example for input of integer constants:
Define 1000 to the symbol name ‘Const1’ using the touch panel keyboard.



Type: Integer Constants

Rest 1000

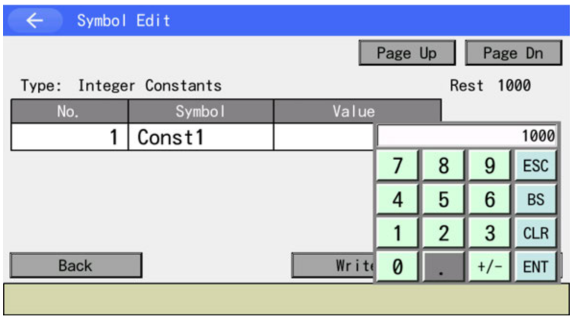
Touch in the symbol input box to move the cursor there.
Touch Keyboard button to show the touch panel keyboard.


Symbol Edit
Page Up
Page Dn
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →

Type: Integer Constants Rest 1000

Const1

Input Const1 and touch ENT.
Input SHIFT C o n s t 1 .
The cursor moves to the Value input box.



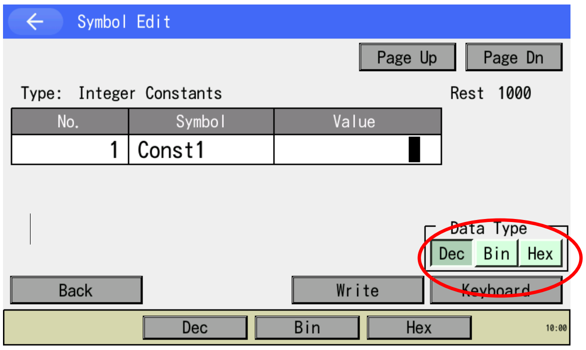
Type: Integer Constants Rest 1000

No.	Symbol	Value
1	Const1	1000

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.

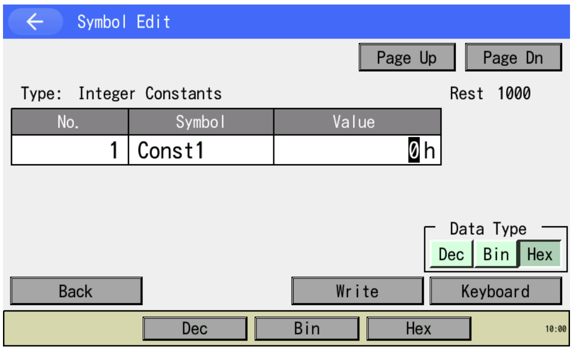


Type: Integer Constants Rest 1000

No.	Symbol	Value
1	Const1	

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.



Type: Integer Constants Rest 1000

No.	Symbol	Value
1	Const1	0h

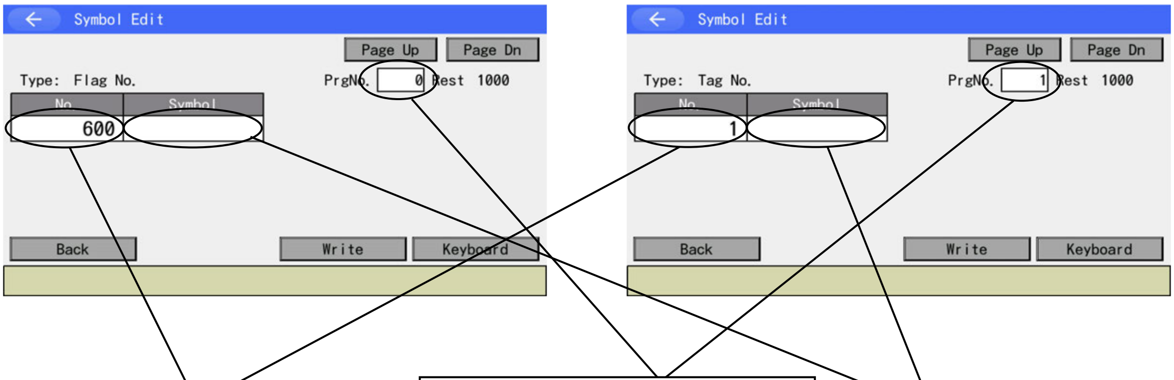
The display in the defined value box is changed based on the data type. (The left figure shows the case when the hexadecimal digit (Hex) has been selected). The fundamental number is shown after the defined value (for binary: b, for hexadecimal: h, for decimal: (blank)).

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

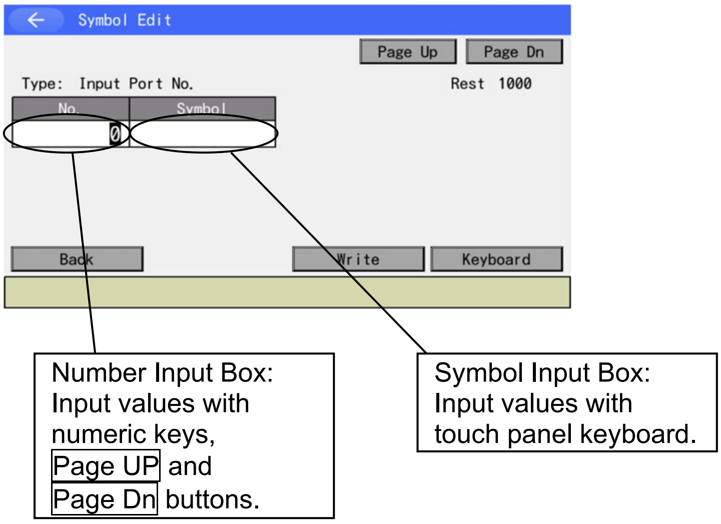


Number Input Box:
Input values with numeric keys, Page UP and Page Dn buttons.

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.



Type: Input Port No.

Rest 1000

No. 0

Number Input Box:
Input values with
numeric keys,
Page UP and
Page Dn buttons.

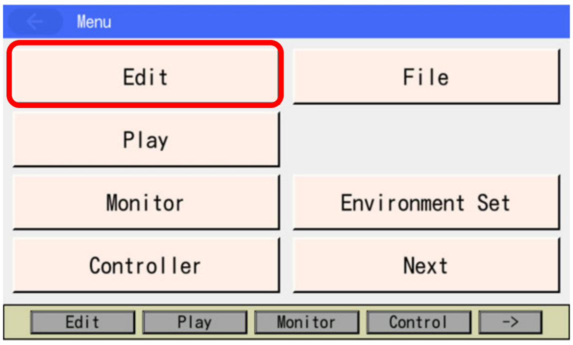
Symbol Input Box:
Input values with
touch panel keyboard.

13. Parameter Edit

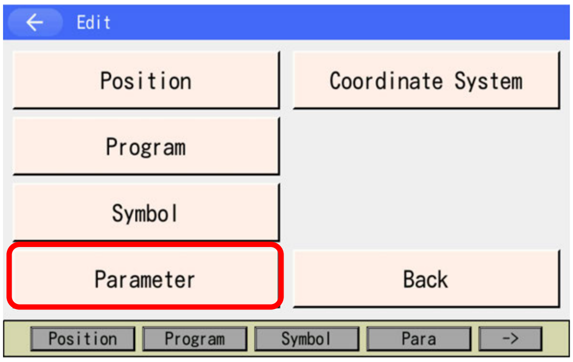
You can change the parameters corresponding to your system.
When you change the parameters by yourself, please note the parameter contents.

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.

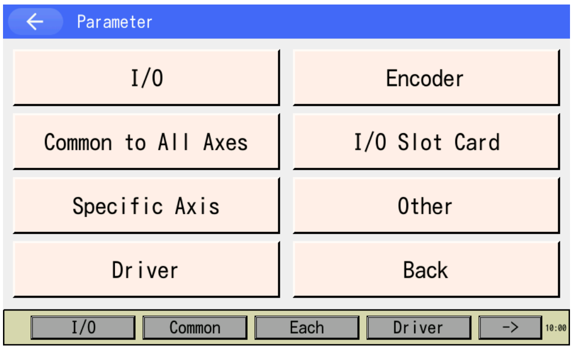


Touch Edit button in the Menu screen.



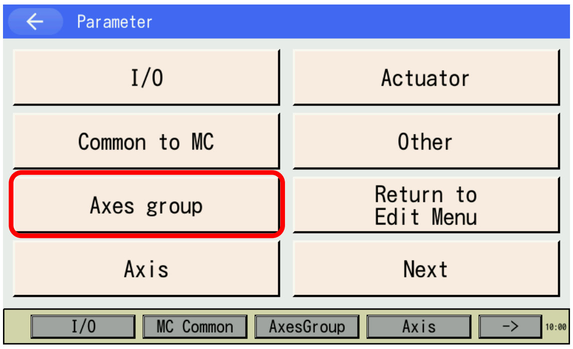
Touch Parameter button in the Edit screen.

13.1 Parameter Edit Items



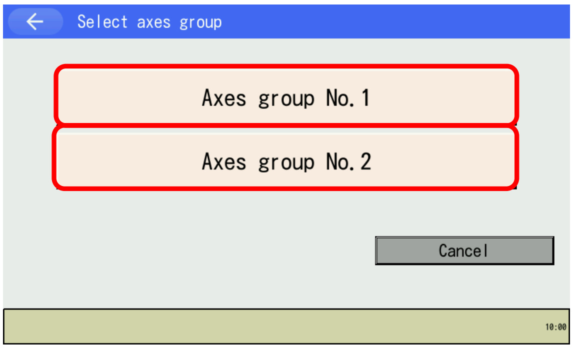
In some controllers, "I/O Slot Card" changes to names of "I/O System Device". Also, the contents to be displayed differ depending on the controllers.

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)

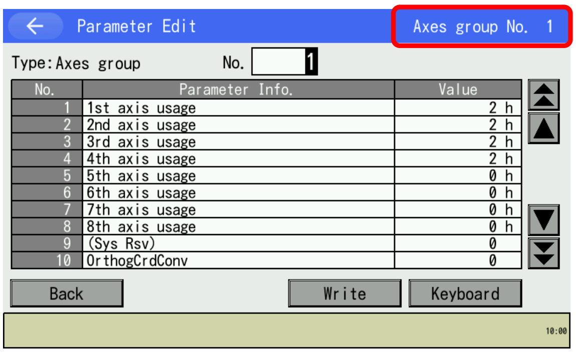


Touch the Axes group button when required to display or edit the axes group parameters.

* 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.

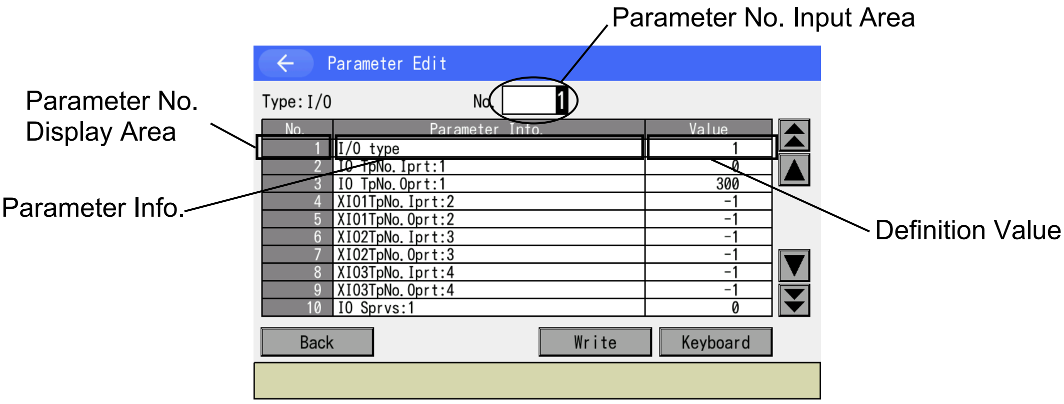


Type: Axes group   No. 1

No.	Parameter Info.	Value
1	1st axis usage	2 h
2	2nd axis usage	2 h
3	3rd axis usage	2 h
4	4th axis usage	2 h
5	5th axis usage	0 h
6	6th axis usage	0 h
7	7th axis usage	0 h
8	8th axis usage	0 h
9	(Sys Rsv)	0
10	OrthogCrdConv	0

The parameter edit window should appear.

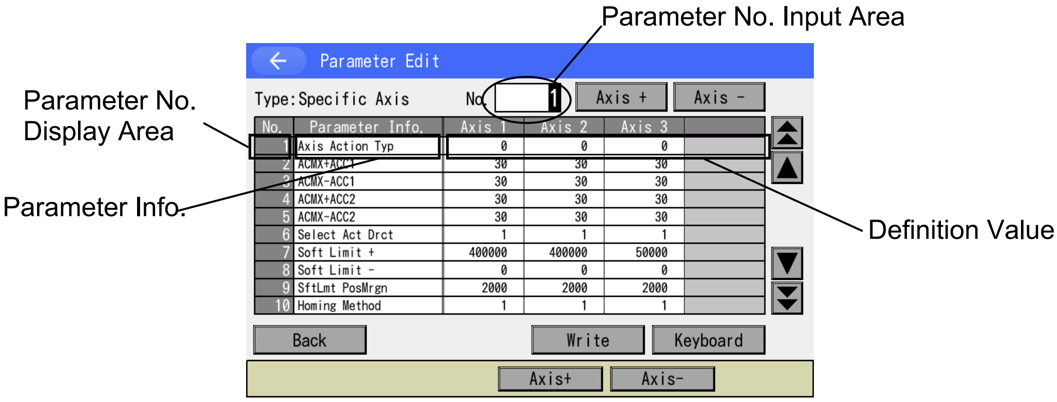
* The axes group number that was selected should be shown on the top right of the screen.



Type: I/O   No. 1

No.	Parameter Info.	Value
1	I/O type	1
2	IO TpNo. Iprt:1	0
3	IO TpNo. Oprt:1	300
4	XIO1TpNo. Iprt:2	-1
5	XIO1TpNo. Oprt:2	-1
6	XIO2TpNo. Iprt:3	-1
7	XIO2TpNo. Oprt:3	-1
8	XIO3TpNo. Iprt:4	-1
9	XIO3TpNo. Oprt:4	-1
10	IO Sprvs:1	0

For Device Independent Parameters (figure shows example of I/O parameter)



Type: Specific Axis   No. 1

No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	400000	400000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

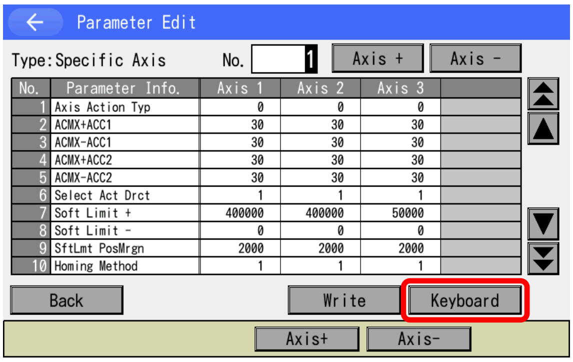
For Device Dependent Parameters (figure shows example of each axis parameter)

[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.

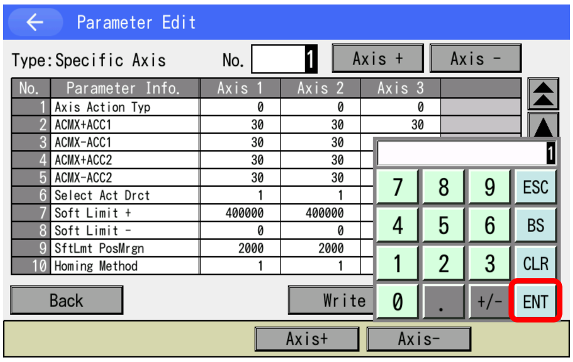


Type:Specific Axis

No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	400000	400000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

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.

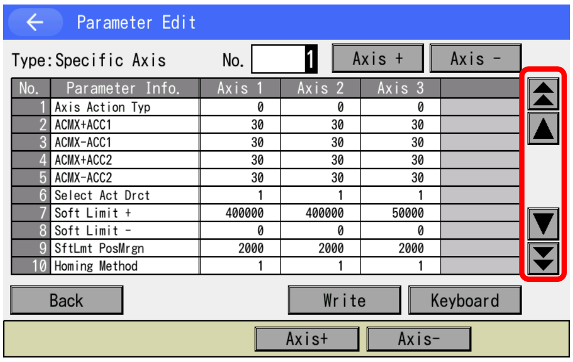


Type:Specific Axis

No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	
4	ACMX+ACC2	30	30	
5	ACMX-ACC2	30	30	
6	Select Act Drct	1	1	
7	Soft Limit +	400000	400000	
8	Soft Limit -	0	0	
9	SftLmt PosMrgn	2000	2000	
10	Homing Method	1	1	

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.

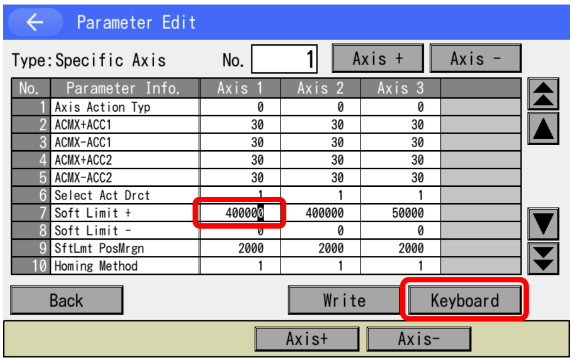


Type:Specific Axis

No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	400000	400000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

Switching displayed range can also be conducted with ⏫ ⏬ ▲ ▼ buttons.

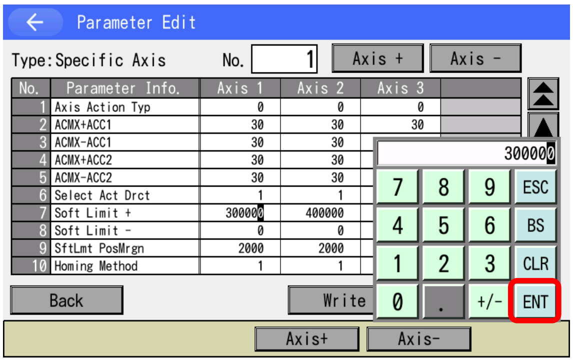
Touch ⏫ ⏬ ▲ ▼ buttons so the parameter number that you would like to edit can be displayed.



No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	400000	400000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

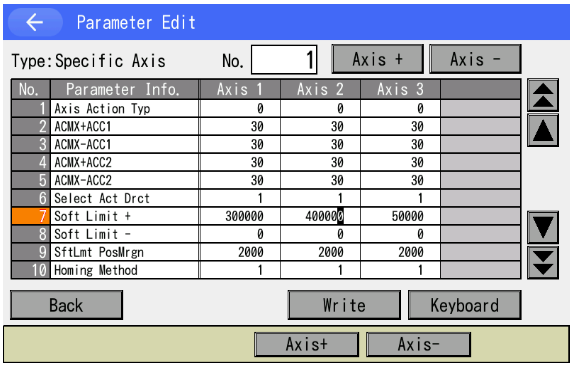
Touch the place you would like to edit (1st axis in No. 7) in order to move the cursor.

Touch the keyboard button after the cursor has been moved to show the touch panel numeric keys.



No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	
4	ACMX+ACC2	30	30	
5	ACMX-ACC2	30	30	
6	Select Act Drct	1	1	
7	Soft Limit +	300000	400000	
8	Soft Limit -	0	0	
9	SftLmt PosMrgn	2000	2000	
10	Homing Method	1	1	

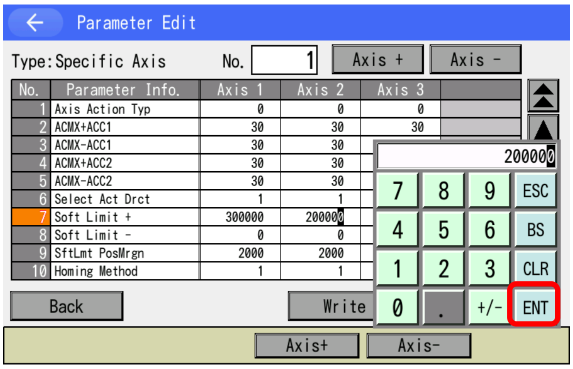
Input 300000 on the touch panel numeric keys and touch ENT. [Unit: 0.001mm]



No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	300000	400000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

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.

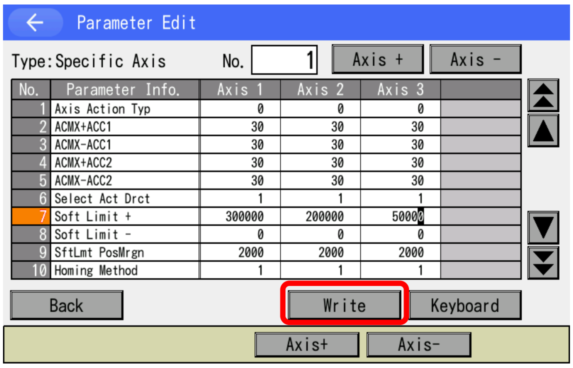
If you would like to input again, touch the keyboard button after touching the input column to move the cursor there.



No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	
4	ACMX+ACC2	30	30	
5	ACMX-ACC2	30	30	
6	Select Act Drct	1	1	
7	Soft Limit +	300000	200000	
8	Soft Limit -	0	0	
9	SftLmt PosMrgn	2000	2000	
10	Homing Method	1	1	

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.

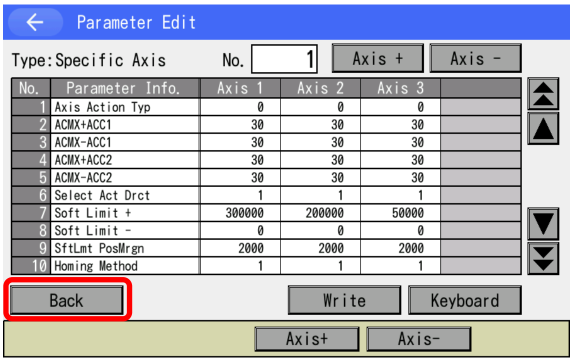


Type:Specific Axis No. 1

No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	300000	200000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

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.

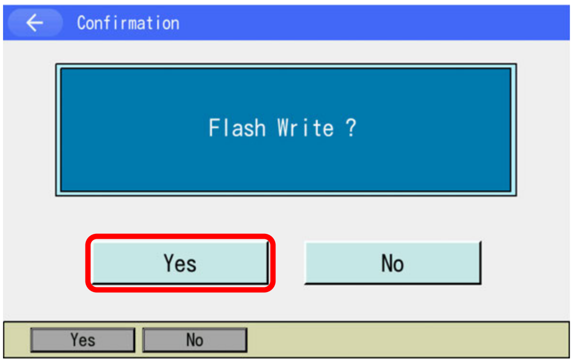


Type:Specific Axis No. 1

No.	Parameter Info.	Axis 1	Axis 2	Axis 3
1	Axis Action Typ	0	0	0
2	ACMX+ACC1	30	30	30
3	ACMX-ACC1	30	30	30
4	ACMX+ACC2	30	30	30
5	ACMX-ACC2	30	30	30
6	Select Act Drct	1	1	1
7	Soft Limit +	300000	200000	50000
8	Soft Limit -	0	0	0
9	SftLmt PosMrgn	2000	2000	2000
10	Homing Method	1	1	1

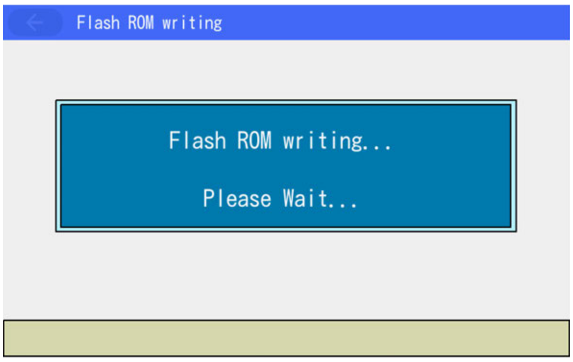
Once the transfer to the controller is complete, the background color in the parameter number display column will turn to the normal condition.

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.



Flash Write ?

Conduct the flash ROM writing.
Touch the Yes button.

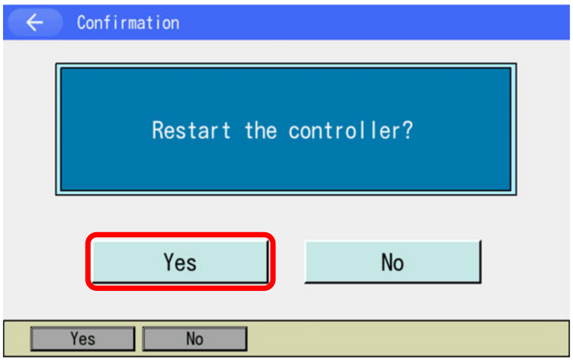


Flash ROM writing...

Please Wait...

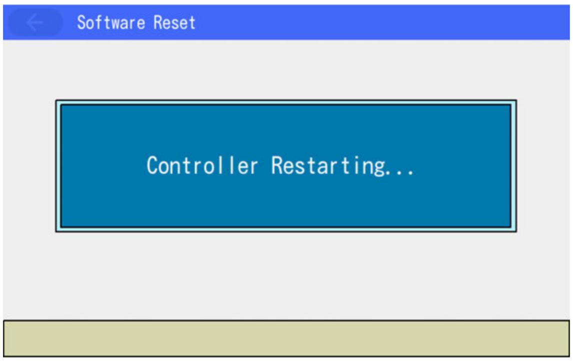
While in writing process to flash ROM, the screen shown in the left will be displayed.

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



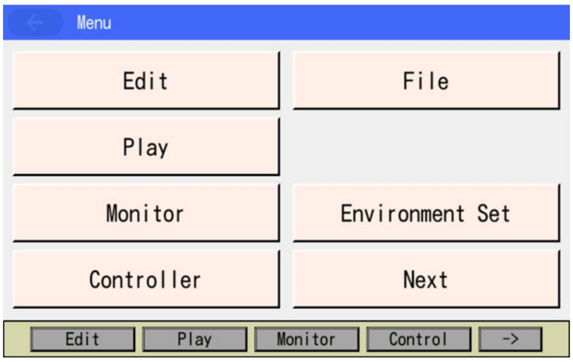
Restart the controller?

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.



Controller Restarting...

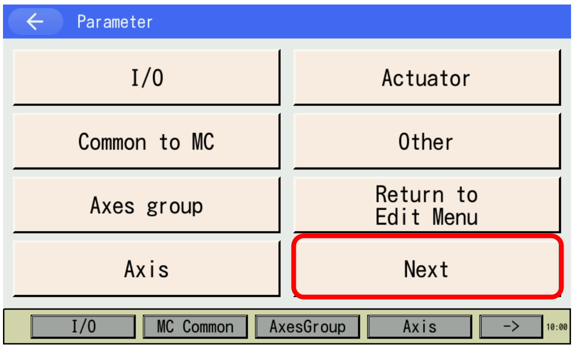
The screen shown on the left is displayed during the software reset.



Once the software reset is complete, the display returns to the main menu screen.

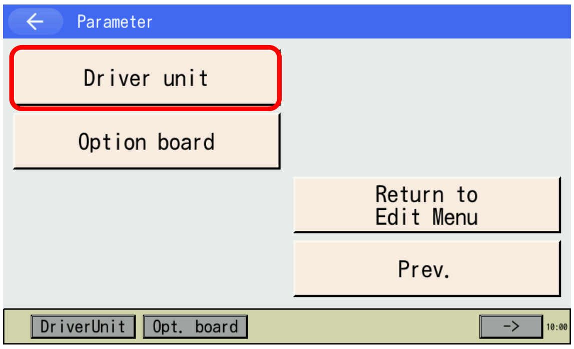
13.3 Input Example: Edit Driver Unit Parameters

Edit Driver Unit Parameter No. 3 Soft Limit Positive Side.

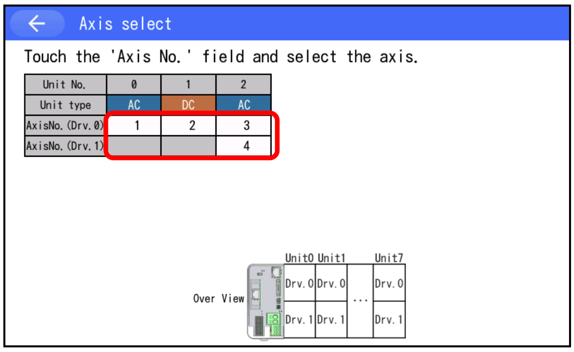


Touch the Next button.

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



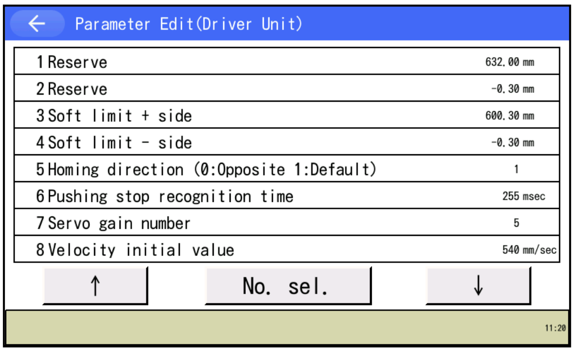
Touch the Driver Unit button.



Touch the 'Axis No.' field and select the axis.

Unit No.	0	1	2
Unit type	AC	DC	AC
AxisNo. (Drv. 0)	1	2	3
AxisNo. (Drv. 1)			4

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.



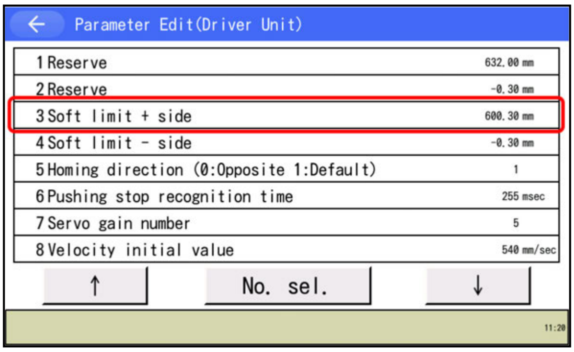
Parameter Edit(Driver Unit)

1	Reserve	632.00 mm
2	Reserve	-0.30 mm
3	Soft limit + side	600.30 mm
4	Soft limit - side	-0.30 mm
5	Homing direction (0:Opposite 1:Default)	1
6	Pushing stop recognition time	255 msec
7	Servo gain number	5
8	Velocity initial value	540 mm/sec

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.

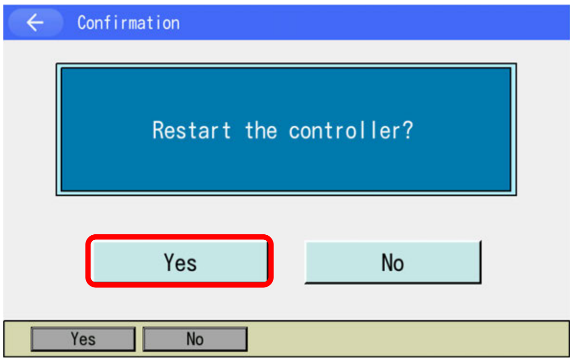


Parameter Edit(Driver Unit)

1	Reserve	632.00 mm
2	Reserve	-0.30 mm
3	Soft limit + side	600.30 mm
4	Soft limit - side	-0.30 mm
5	Homing direction (0:Opposite 1:Default)	1
6	Pushing stop recognition time	255 msec
7	Servo gain number	5
8	Velocity initial value	540 mm/sec

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.



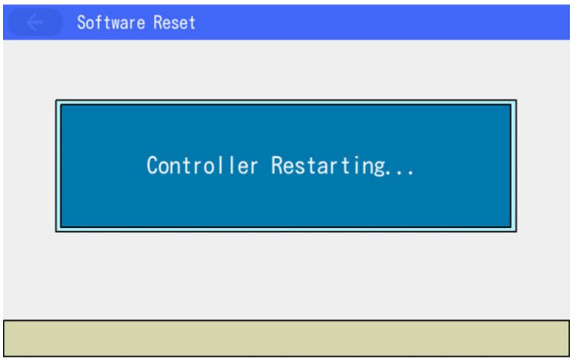
Confirmation

Restart the controller?

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.

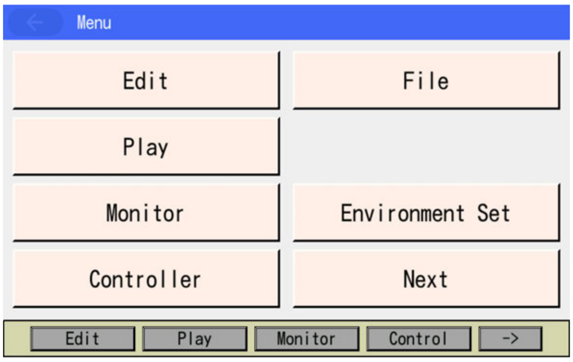
If you touch the No button, the controller will not be rebooted and the screen will go back to the parameter edit window without any change reflected to the parameters. In order to reflect the parameters to the controller, have the controller rebooted.

⚠ *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.



Controller Restarting...

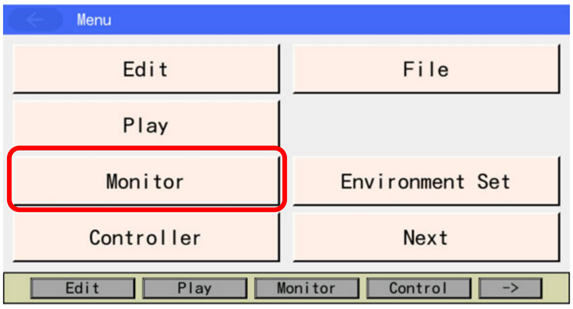
The screen shown on the left is displayed during the software reset.



Once the software reset is complete, the display returns to the main menu screen.

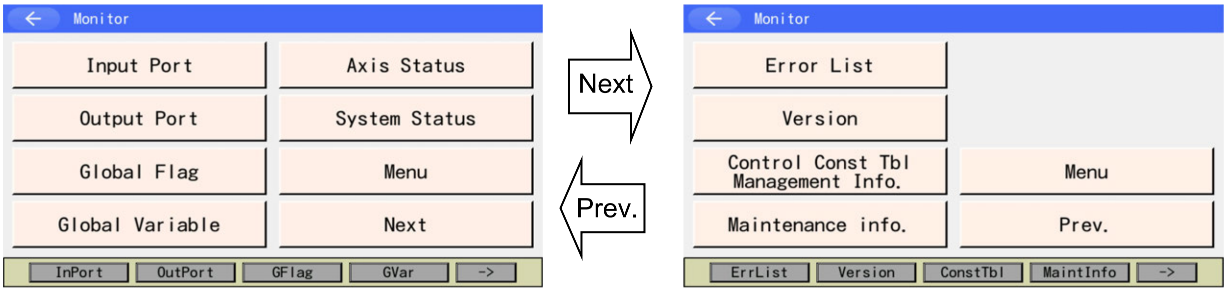
14. Monitor

Monitor each status, global variable, port status, etc.



Touch Monitor button in the menu screen.

14.1 Monitor Items

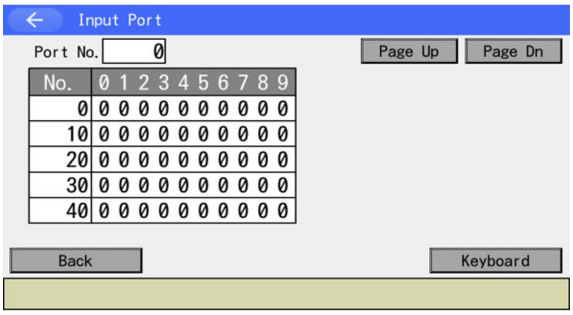


* The types and the positions of the buttons shown on the screen differ depending on the model types.

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 setting should be displayed (for applicable models only).
Refer to [15.19.1 Monitor Data Output Setting] for how to set it up.

14.2 Input Port



Port No. 0

No.	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0

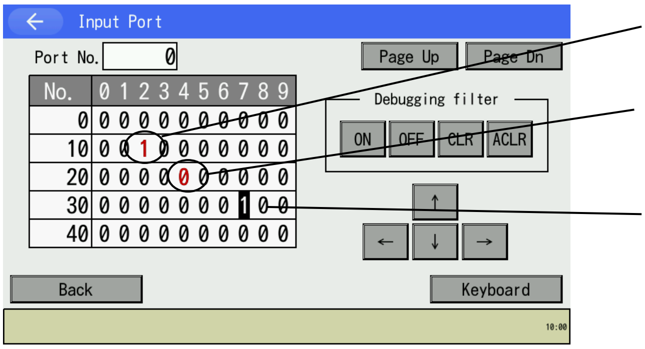
1: ON, 0: OFF
Input the port number that you want to show in the port number input box by using the touch panel numeric keys, and then touch ENT.
Every touch of Page Up and Page Dn buttons scrolls up/down the input port numbers by 50 items.

In the input port monitor window, 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.)



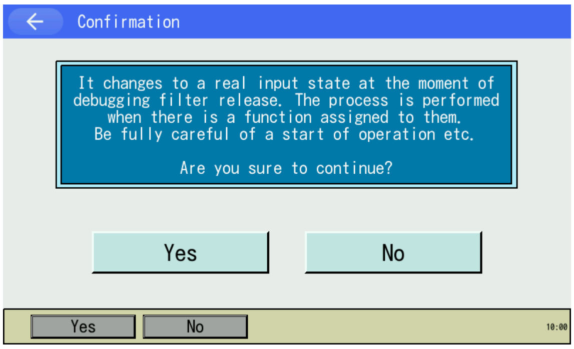
No.	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
10	0	0	1	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	1	0	0
40	0	0	0	0	0	0	0	0	0	0

Port with ON Filter Set

Port with OFF Filter Set

Cursor to Select Port Number (Port No. 37 is selected in this figure)

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.



It changes to a real input state at the moment of debugging filter release. The process is performed when there is a function assigned to them.
Be fully careful of a start of operation etc.

Are you sure to continue?

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

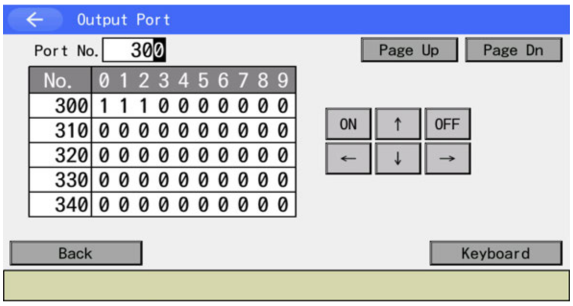
Actual Input Status Filter Type	ON	OFF
ON		OFF → ON
OFF	ON → OFF	

* 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.

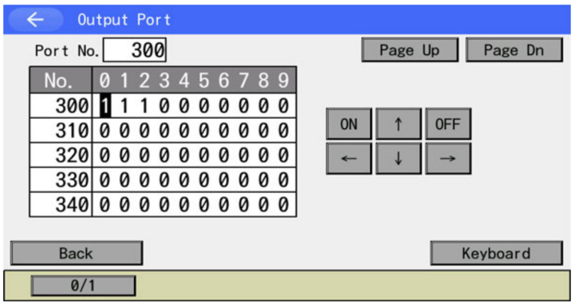
- Feature assigned to input port such as program startup and all activated axes home-return operation
- SEL program that branches off with input conditions
- SEL program that uses commands to monitor status of input port (WTON, WTOF, IN, INB, HOLD, CANC, JBWF, JBWN, JFWF, JFWN, etc.)
- Other processes executed with input port status being monitored

14.3 Output Port



Port No. 300

No.	0	1	2	3	4	5	6	7	8	9
300	1	1	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0



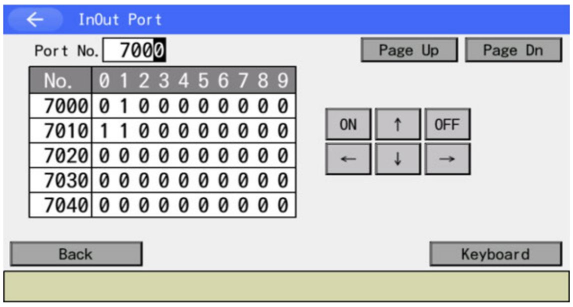
Port No. 300

No.	0	1	2	3	4	5	6	7	8	9
300	1	1	1	0	0	0	0	0	0	0
310	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0
330	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0

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.

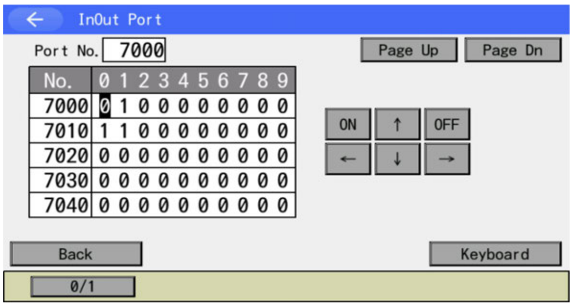
14.4 Input/Output Port

(for applicable models only)



Port No. 7000

No.	0	1	2	3	4	5	6	7	8	9
7000	0	1	0	0	0	0	0	0	0	0
7010	1	1	0	0	0	0	0	0	0	0
7020	0	0	0	0	0	0	0	0	0	0
7030	0	0	0	0	0	0	0	0	0	0
7040	0	0	0	0	0	0	0	0	0	0



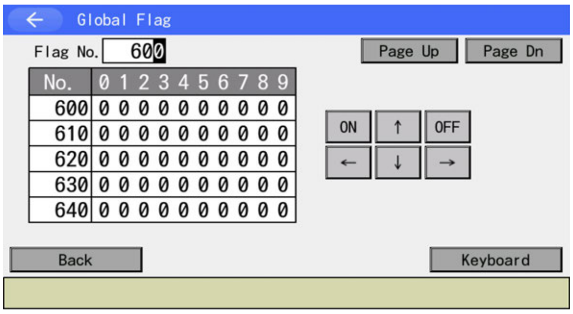
Port No. 7000

No.	0	1	2	3	4	5	6	7	8	9
7000	0	1	0	0	0	0	0	0	0	0
7010	1	1	0	0	0	0	0	0	0	0
7020	0	0	0	0	0	0	0	0	0	0
7030	0	0	0	0	0	0	0	0	0	0
7040	0	0	0	0	0	0	0	0	0	0

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].

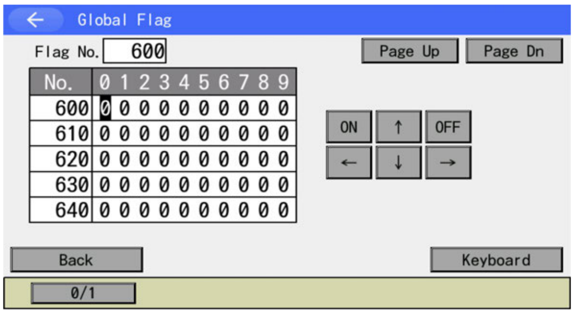
14.5 Global Flag

Displays the ON/OFF status of global flag. Also, it can switch the ON/OFF status of the global flags.
1: ON, 0: OFF



Flag No. 600

No.	0	1	2	3	4	5	6	7	8	9
600	0	0	0	0	0	0	0	0	0	0
610	0	0	0	0	0	0	0	0	0	0
620	0	0	0	0	0	0	0	0	0	0
630	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0



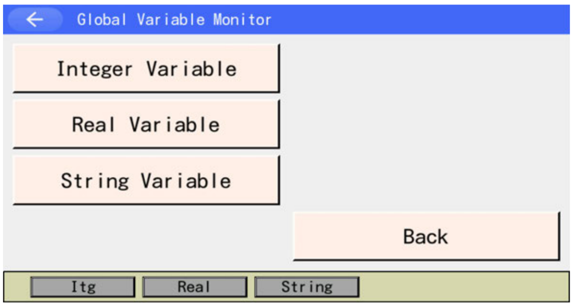
Flag No. 600

No.	0	1	2	3	4	5	6	7	8	9
600	0	0	0	0	0	0	0	0	0	0
610	0	0	0	0	0	0	0	0	0	0
620	0	0	0	0	0	0	0	0	0	0
630	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0

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.

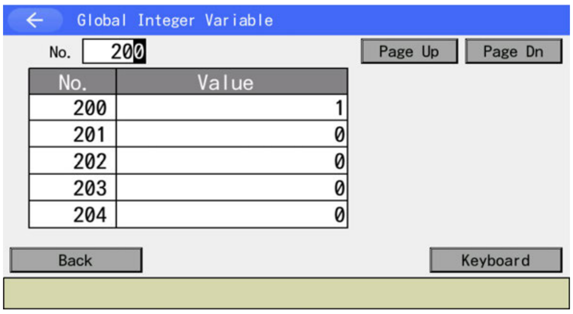
14.6 Global Variable

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.



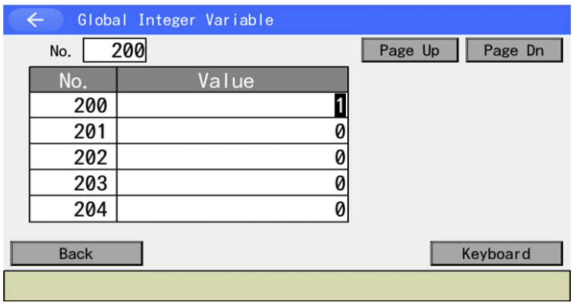
There are three types of global variables.
Touch each button to show each monitor screen.

1) Global Integer variables



No. 200

No.	Value
200	1
201	0
202	0
203	0
204	0

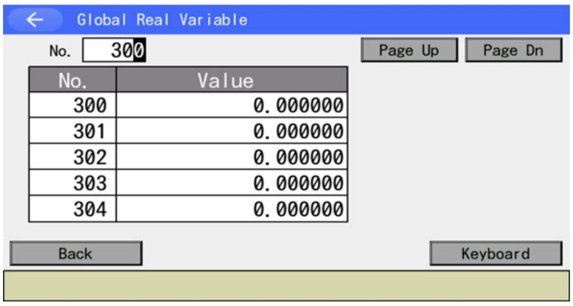


No. 200

No.	Value
200	1
201	0
202	0
203	0
204	0

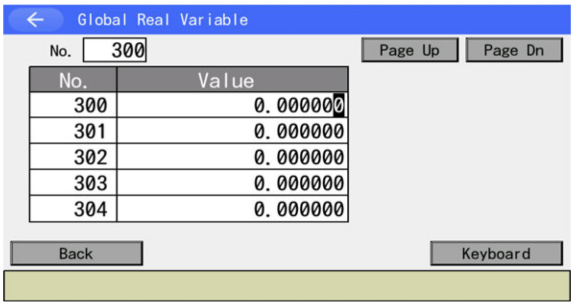
When the global Integer variables screen is opened, the cursor should be placed in a number box.
Make the number to be monitored shown by using Page Up and Page Dn buttons.
Inputting a number on the touch panel numeric keys is also available. The cursor moves to the data box.
The data with the cursor 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



No. 300

No.	Value
300	0.000000
301	0.000000
302	0.000000
303	0.000000
304	0.000000

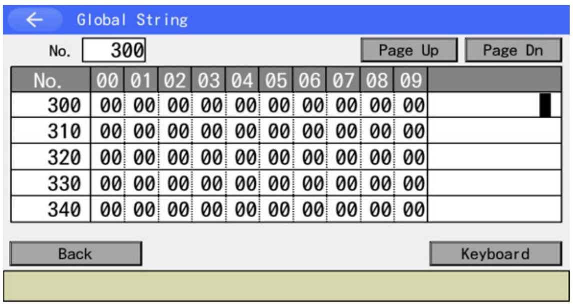


No. 300

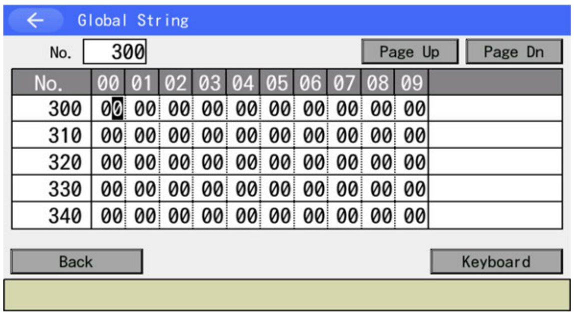
No.	Value
300	0.000000
301	0.000000
302	0.000000
303	0.000000
304	0.000000

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

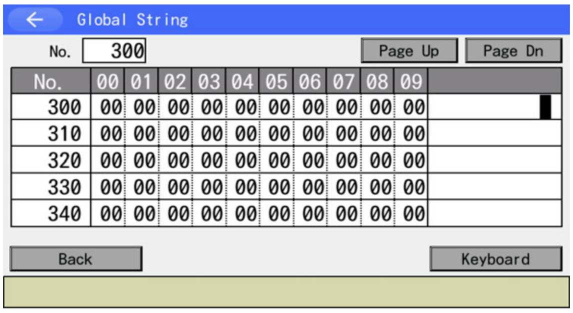


No.	00	01	02	03	04	05	06	07	08	09	
300	00	00	00	00	00	00	00	00	00	00	█
310	00	00	00	00	00	00	00	00	00	00	
320	00	00	00	00	00	00	00	00	00	00	
330	00	00	00	00	00	00	00	00	00	00	
340	00	00	00	00	00	00	00	00	00	00	



No.	00	01	02	03	04	05	06	07	08	09	
300	00	00	00	00	00	00	00	00	00	00	
310	00	00	00	00	00	00	00	00	00	00	
320	00	00	00	00	00	00	00	00	00	00	
330	00	00	00	00	00	00	00	00	00	00	
340	00	00	00	00	00	00	00	00	00	00	

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.



No.	00	01	02	03	04	05	06	07	08	09	
300	00	00	00	00	00	00	00	00	00	00	█
310	00	00	00	00	00	00	00	00	00	00	
320	00	00	00	00	00	00	00	00	00	00	
330	00	00	00	00	00	00	00	00	00	00	
340	00	00	00	00	00	00	00	00	00	00	

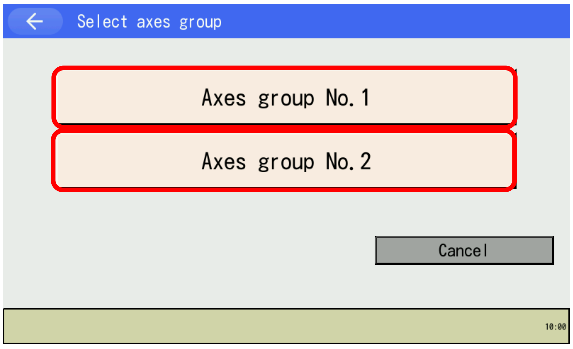
Touch in a character strings display and input box to show the cursor in it, and input of character strings is available.
Touch Keyboard button to show the touch panel keyboard to input.
In order to move the cursor among the character string displays, input columns and data columns, touch a place where 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

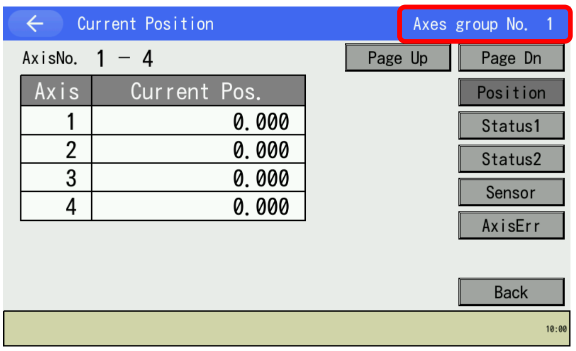
Displays the current position of each axis, servo status, sensor status, etc.
The status items may vary depending on the model.
Select the item to be displayed on the monitor using the buttons on the right side of the monitor screen.

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 window 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.



Axis	Current Pos.
1	0.000
2	0.000
3	0.000
4	0.000

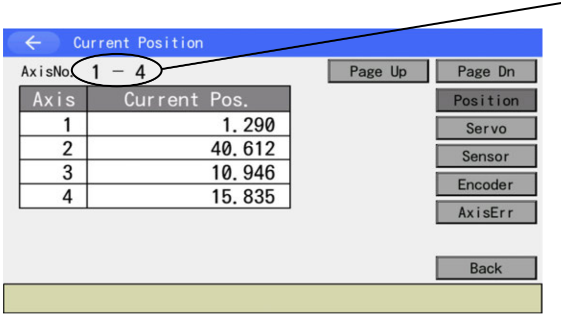
The axis status current position window opens.

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

(1) Current position

Axis Number in Display No.

Switch over axis

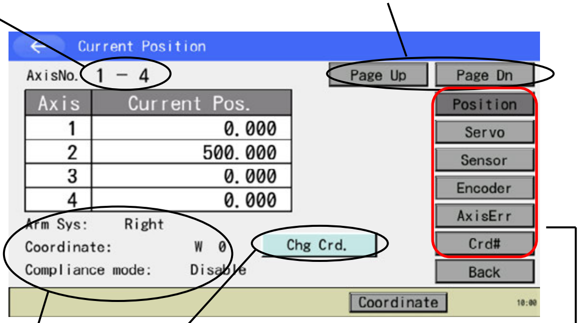


Current Position

AxisNo. 1 − 4

Axis	Current Pos.
1	1.290
2	40.612
3	10.946
4	15.835

Linear Axis



Current Position

AxisNo. 1 − 4

Axis	Current Pos.
1	0.000
2	500.000
3	0.000
4	0.000

Arm Sys: Right

Coordinate: W 0

Compliance mode: Disable

SCARA Axis

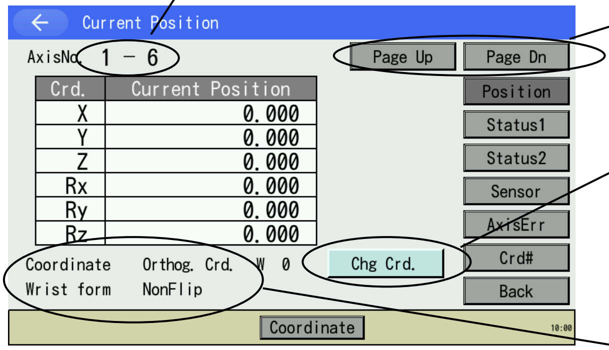
Display currently shown is switched between Coordinate System of Work Piece in Select (W) and Each Axis System (A).

This area displays the condition of the current arm system, position type and compliance mode.

Touch these buttons and each relative item is displayed.

Axis Numbers in Display

To switch over axes



Current Position

AxisNo. 1 − 6

Crd.	Current Position
X	0.000
Y	0.000
Z	0.000
Rx	0.000
Ry	0.000
Rz	0.000

Coordinate Orthog. Crd. W 0

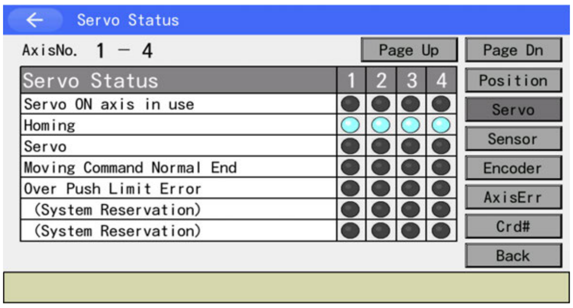
Wrist form NonFlip

6-axis Cartesian

Selected work coordinate system (W) and each axis system (A) are switched over in current position display.

Current position type and wrist form are displayed.

(2) Servo status



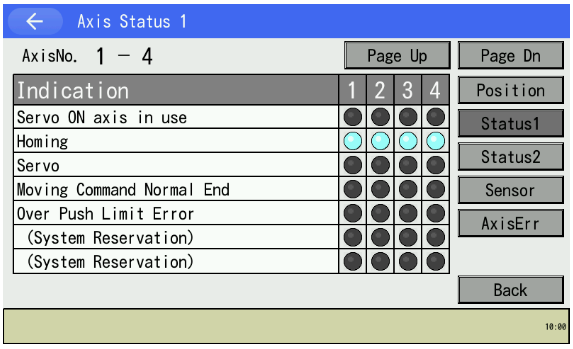
AxisNo. 1 – 4

Servo Status	1	2	3	4
Servo ON axis in use	●	●	●	●
Homing	○	○	○	○
Servo	●	●	●	●
Moving Command Normal End	●	●	●	●
Over Push Limit Error	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●

It is available to switch the axis number with Page Up and Page Dn buttons.

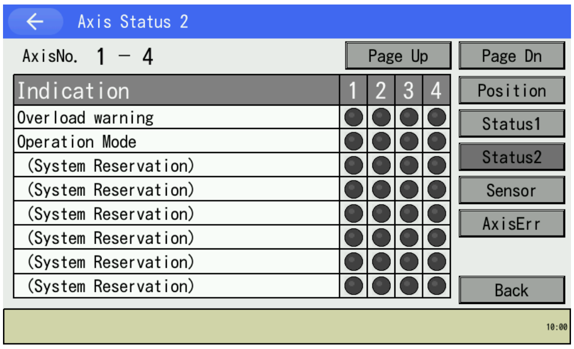
The status of ON/OFF is displayed with ○ (ON) and ● (OFF).

Display should be either Status 1 or Status 2 depending on models



AxisNo. 1 – 4

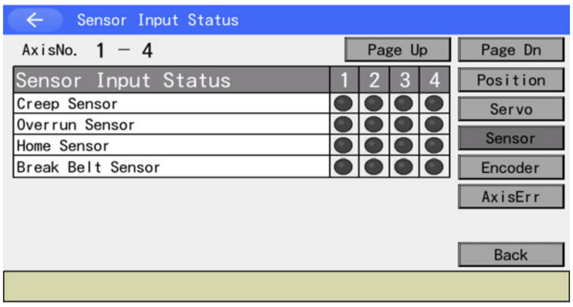
Indication	1	2	3	4
Servo ON axis in use	●	●	●	●
Homing	○	○	○	○
Servo	●	●	●	●
Moving Command Normal End	●	●	●	●
Over Push Limit Error	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●



AxisNo. 1 – 4

Indication	1	2	3	4
Overload warning	●	●	●	●
Operation Mode	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●

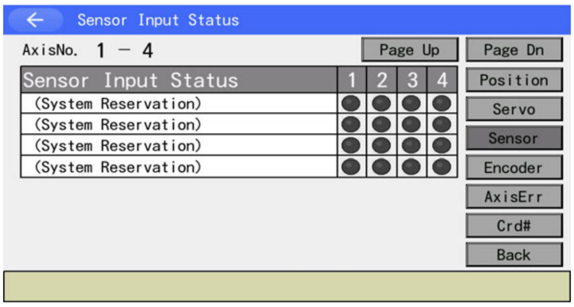
(3) Sensor Input Status



AxisNo. 1 – 4

Sensor Input Status	1	2	3	4
Creep Sensor	●	●	●	●
Overrun Sensor	●	●	●	●
Home Sensor	●	●	●	●
Break Belt Sensor	●	●	●	●

Orthogonal axis

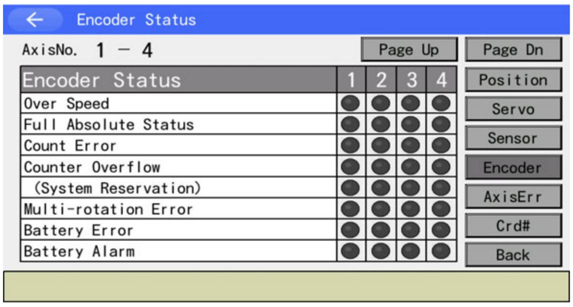


AxisNo. 1 – 4

Sensor Input Status	1	2	3	4
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●
(System Reservation)	●	●	●	●

SCARA Axis

(4) Encoder Status (for applicable models only)

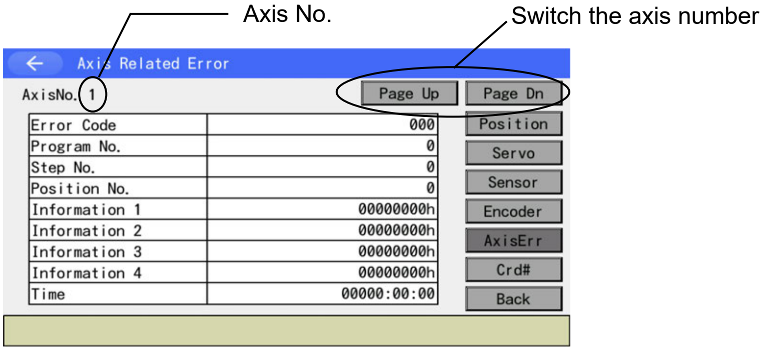


AxisNo. 1 – 4

Encoder Status	1	2	3	4
Over Speed	●	●	●	●
Full Absolute Status	●	●	●	●
Count Error	●	●	●	●
Counter Overflow	●	●	●	●
(System Reservation)	●	●	●	●
Multi-rotation Error	●	●	●	●
Battery Error	●	●	●	●
Battery Alarm	●	●	●	●

* The items displayed on each status screen differ depending on the models.

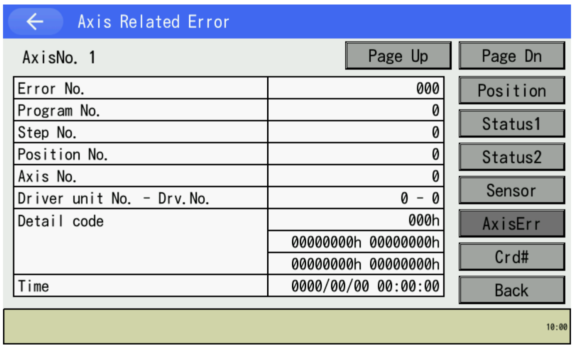
(5) Axis Related Error



AxisNo. 1

Error Code	000
Program No.	0
Step No.	0
Position No.	0
Information 1	00000000h
Information 2	00000000h
Information 3	00000000h
Information 4	00000000h
Time	00000:00:00

The contents of display differ depending on models.



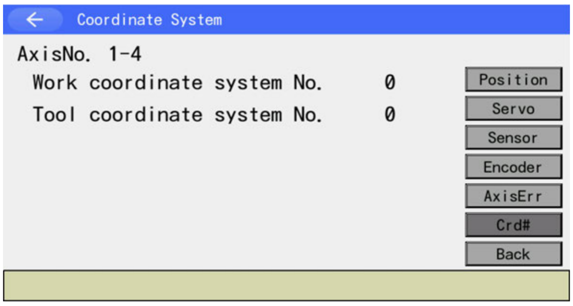
AxisNo. 1

Error No.	000
Program No.	0
Step No.	0
Position No.	0
Axis No.	0
Driver unit No. - Drv.No.	0 - 0
Detail code	000h 00000000h 00000000h 00000000h 00000000h
Time	0000/00/00 00:00:00

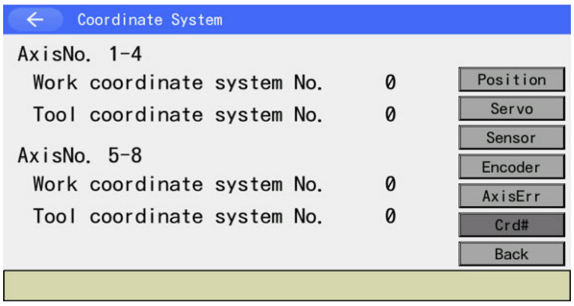
For RSEL

(6) Selected Coordinate System (Valid only for applicable models and when the feature is activated)

The coordinate system number currently selected in displayed.



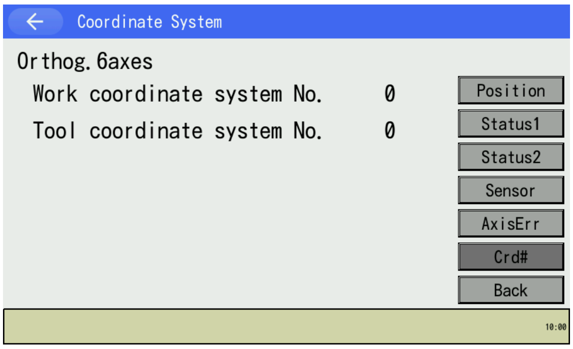
AxisNo. 1-4
Work coordinate system No. 0
Tool coordinate system No. 0



AxisNo. 1-4
Work coordinate system No. 0
Tool coordinate system No. 0
AxisNo. 5-8
Work coordinate system No. 0
Tool coordinate system No. 0

XSEL-X/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



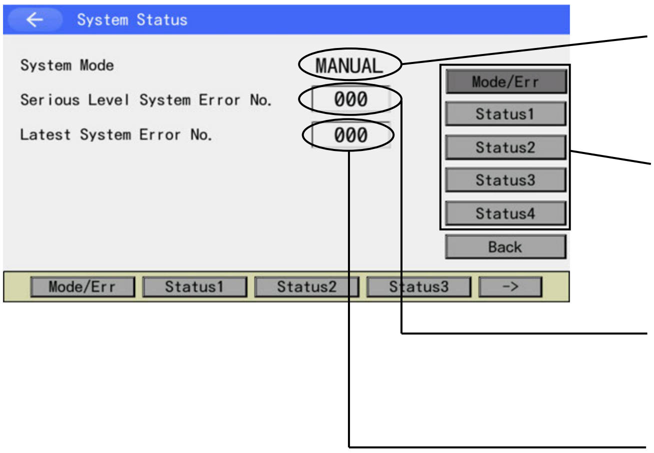
Orthog.6axes
Work coordinate system No. 0
Tool coordinate system No. 0

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



System Status

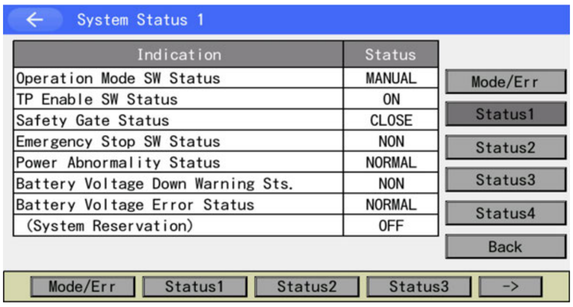
System Mode: MANUAL
Serious Level System Error No.: 000
Latest System Error No.: 000

Show the current mode "MANUAL", "AUTO"

Touch these buttons and each status screen is displayed.

The highest level of error is displayed in those currently being generated.

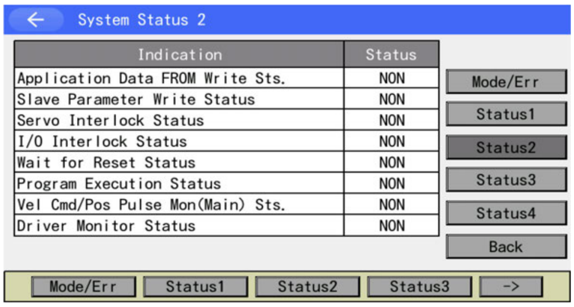
The newest error is displayed in those currently being generated.



System Status 1

Indication	Status
Operation Mode SW Status	MANUAL
TP Enable SW Status	ON
Safety Gate Status	CLOSE
Emergency Stop SW Status	NON
Power Abnormality Status	NORMAL
Battery Voltage Down Warning Sts.	NON
Battery Voltage Error Status	NORMAL
(System Reservation)	OFF

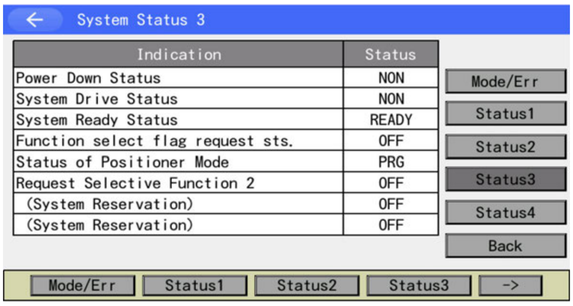
System Status (1)



System Status 2

Indication	Status
Application Data FROM Write Sts.	NON
Slave Parameter Write Status	NON
Servo Interlock Status	NON
I/O Interlock Status	NON
Wait for Reset Status	NON
Program Execution Status	NON
Vel Cmd/Pos Pulse Mon(Main) Sts.	NON
Driver Monitor Status	NON

System Status (2)



System Status 3

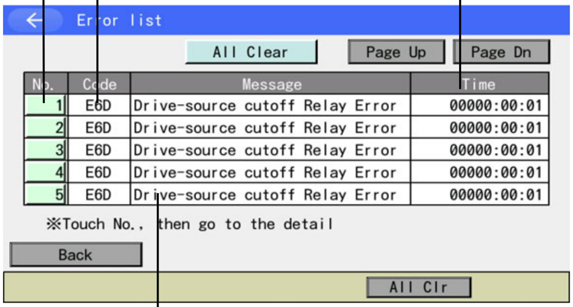
Indication	Status
Power Down Status	NON
System Drive Status	NON
System Ready Status	READY
Function select flag request sts.	OFF
Status of Positioner Mode	PRG
Request Selective Function 2	OFF
(System Reservation)	OFF
(System Reservation)	OFF

System Status (3)

14.9 Error List

14.9.1 Error List

Select Error List in the monitor items.



The younger the number is, the newer the error.

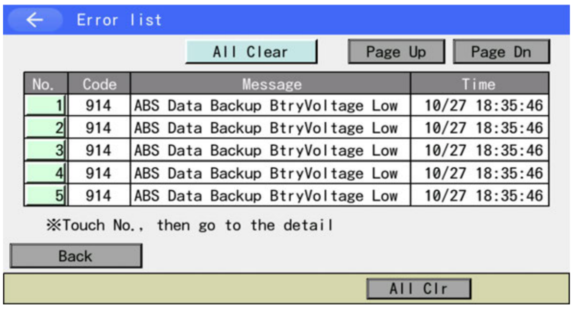
Error Code

Generated Time shows the time after the power started to be supplied to the controller or after the software reset.

Error Message

No.	Code	Message	Time
1	E6D	Drive-source cutoff Relay Error	00000:00:01
2	E6D	Drive-source cutoff Relay Error	00000:00:01
3	E6D	Drive-source cutoff Relay Error	00000:00:01
4	E6D	Drive-source cutoff Relay Error	00000:00:01
5	E6D	Drive-source cutoff Relay Error	00000:00:01

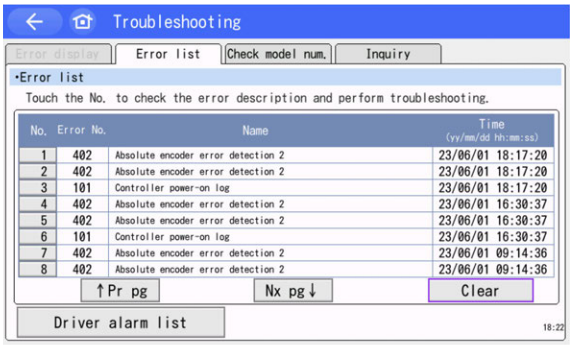
※Touch No., then go to the detail



No.	Code	Message	Time
1	914	ABS Data Backup BtryVoltage Low	10/27 18:35:46
2	914	ABS Data Backup BtryVoltage Low	10/27 18:35:46
3	914	ABS Data Backup BtryVoltage Low	10/27 18:35:46
4	914	ABS Data Backup BtryVoltage Low	10/27 18:35:46
5	914	ABS Data Backup BtryVoltage Low	10/27 18:35:46

※Touch No., then go to the detail

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.



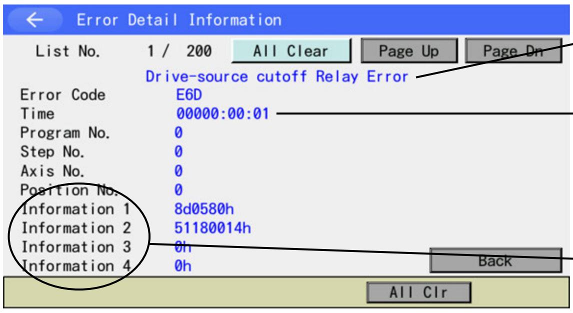
•Error list

Touch the No. to check the error description and perform troubleshooting.

No.	Error No.	Name	Time (yy/mm/dd hh:mm:ss)
1	402	Absolute encoder error detection 2	23/06/01 18:17:20
2	402	Absolute encoder error detection 2	23/06/01 18:17:20
3	101	Controller power-on log	23/06/01 18:17:20
4	402	Absolute encoder error detection 2	23/06/01 16:30:37
5	402	Absolute encoder error detection 2	23/06/01 16:30:37
6	101	Controller power-on log	23/06/01 16:30:37
7	402	Absolute encoder error detection 2	23/06/01 09:14:36
8	402	Absolute encoder error detection 2	23/06/01 09:14:36

For RSEL and XSEL2-T/TX, the window shown in the figure on the left should be displayed.

(1) Error Detail Information



List No. 1 / 200

Drive-source cutoff Relay Error

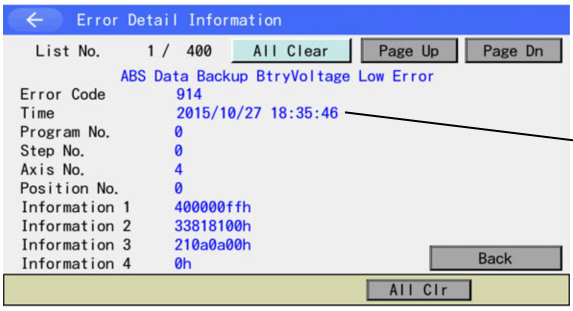
Error Code E6D
Time 00000:00:01
Program No. 0
Step No. 0
Axis No. 0
Position No. 0
Information 1 8d0580h
Information 2 51180014h
Information 3 0h
Information 4 0h

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.



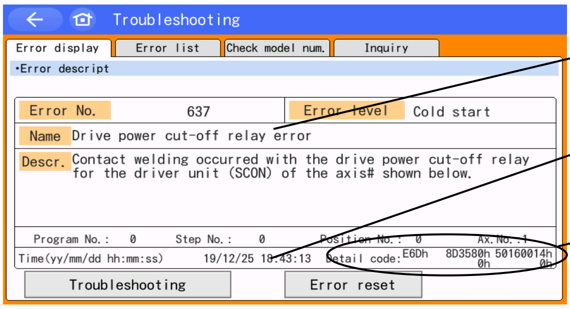
List No. 1 / 400

ABS Data Backup BtryVoltage Low Error

Error Code 914
Time 2015/10/27 18:35:46
Program No. 0
Step No. 0
Axis No. 4
Position No. 0
Information 1 400000ffh
Information 2 33818100h
Information 3 210a0a00h
Information 4 0h

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 descript

Error No. 637
Error level Cold start
Name Drive power cut-off relay error
Descr. Contact welding occurred with the drive power cut-off relay for the driver unit (SCON) of the axis# shown below.

Program No.: 0 Step No.: 0 Position No.: 0 Ax.No.: 1
Time(yy/mm/dd hh:mm:ss) 19/12/25 18:43:13 Detail code: E6Dh 8D3580h 50160014h 0h 0h

For RSEL, XSEL2-T/TX

Error Message

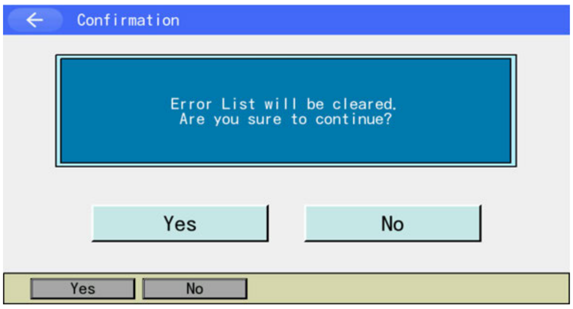
Time passed after controller power turned on or software reset conducted

Detail Code is the information for IAI use in order to analyze a cause of error.
(Contents should differ depending on the error number.)

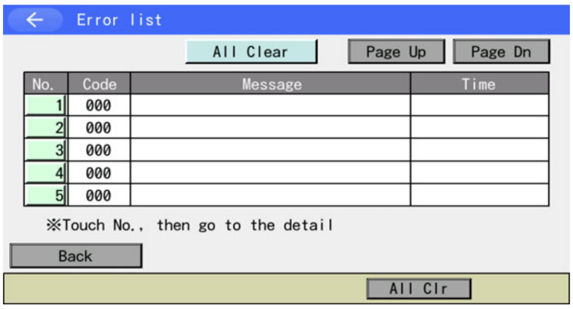
Touch the 🏠 button and the screen goes back to the main menu.
Touch the ← button and the screen goes back to the error list display window.

(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.



Error List will be cleared.
Are you sure to continue?



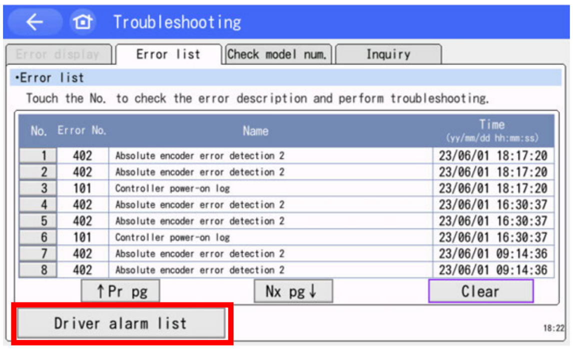
No.	Code	Message	Time
1	000		
2	000		
3	000		
4	000		
5	000		

※Touch No., then go to the detail

Image after Completing to Clear

14.9.2 Driver Alarm List (for applicable models only)

(1) Display of Driver Alarm List



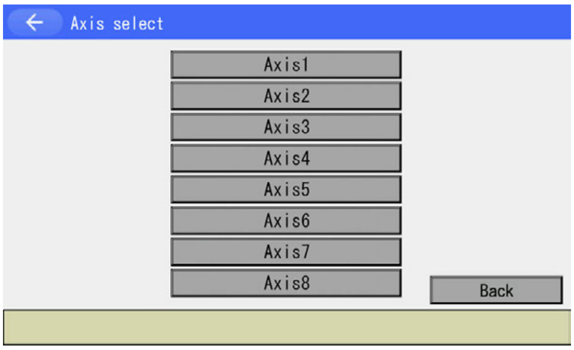
•Error list

Touch the No. to check the error description and perform troubleshooting.

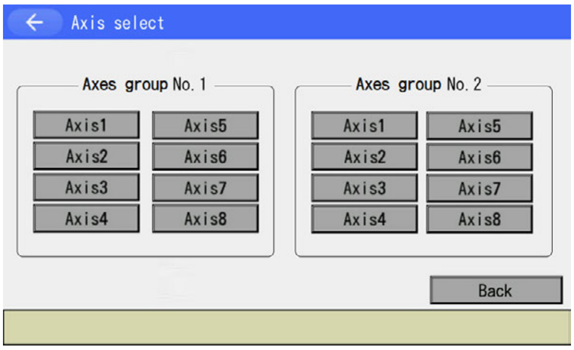
No.	Error No.	Name	Time (yy/mm/dd hh:mm:ss)
1	402	Absolute encoder error detection 2	23/06/01 18:17:20
2	402	Absolute encoder error detection 2	23/06/01 18:17:20
3	101	Controller power-on log	23/06/01 18:17:20
4	402	Absolute encoder error detection 2	23/06/01 16:30:37
5	402	Absolute encoder error detection 2	23/06/01 16:30:37
6	101	Controller power-on log	23/06/01 16:30:37
7	402	Absolute encoder error detection 2	23/06/01 09:14:36
8	402	Absolute encoder error detection 2	23/06/01 09:14:36

Touch Driver alarm list button in the error list screen.

Select an axis to be displayed in the list in the axis select screen.

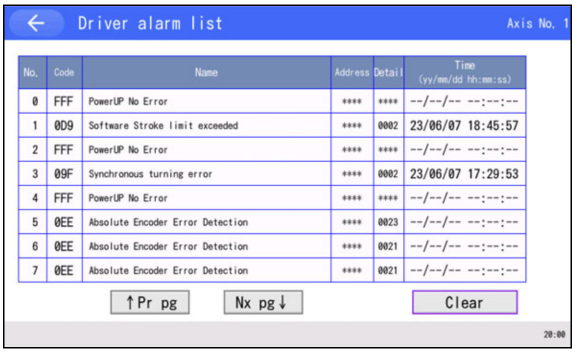


When Axes Group Disabled



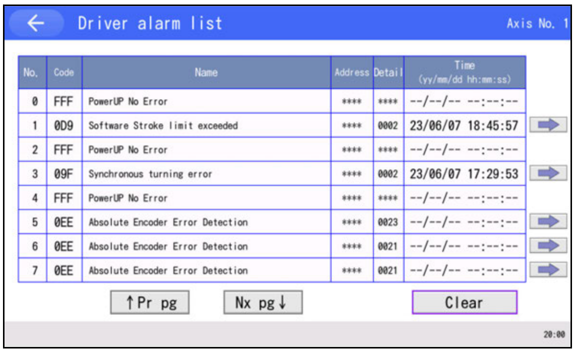
When Axes Group Enabled

The driver alarm list of the axis selected in the axis select screen should be displayed.



No.	Code	Name	Address	Detail	Time (yy/mm/dd hh:mm:ss)
0	FFF	PowerUP No Error	****	****	--/--/-- --:--:--
1	0D9	Software Stroke limit exceeded	****	0002	23/06/07 18:45:57
2	FFF	PowerUP No Error	****	****	--/--/-- --:--:--
3	09F	Synchronous turning error	****	0002	23/06/07 17:29:53
4	FFF	PowerUP No Error	****	****	--/--/-- --:--:--
5	0EE	Absolute Encoder Error Detection	****	0023	--/--/-- --:--:--
6	0EE	Absolute Encoder Error Detection	****	0021	--/--/-- --:--:--
7	0EE	Absolute Encoder Error Detection	****	0021	--/--/-- --:--:--

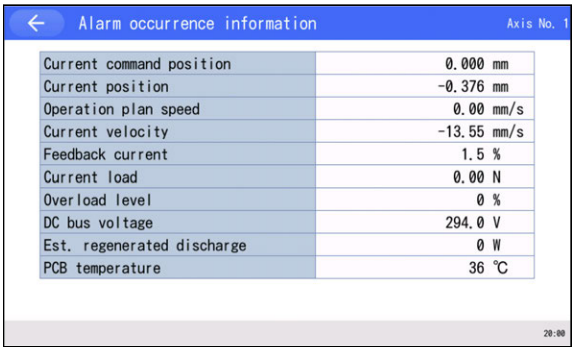
When Not Applicable for
Alarm Generation Information



No.	Code	Name	Address	Detail	Time (yy/mm/dd hh:mm:ss)	
0	FFF	PowerUP No Error	****	****	--/--/-- --:--:--	
1	0D9	Software Stroke limit exceeded	****	0002	23/06/07 18:45:57	➡
2	FFF	PowerUP No Error	****	****	--/--/-- --:--:--	
3	09F	Synchronous turning error	****	0002	23/06/07 17:29:53	➡
4	FFF	PowerUP No Error	****	****	--/--/-- --:--:--	
5	0EE	Absolute Encoder Error Detection	****	0023	--/--/-- --:--:--	➡
6	0EE	Absolute Encoder Error Detection	****	0021	--/--/-- --:--:--	➡
7	0EE	Absolute Encoder Error Detection	****	0021	--/--/-- --:--:--	➡

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.

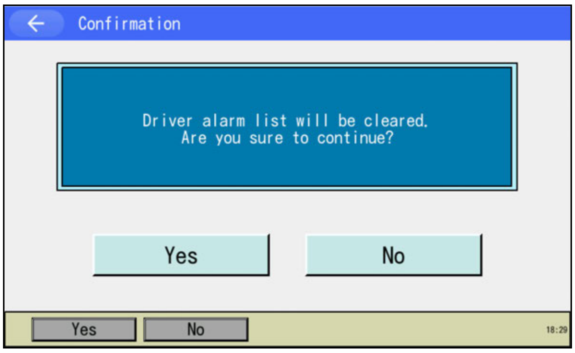


Current command position	0.000 mm
Current position	-0.376 mm
Operation plan speed	0.00 mm/s
Current velocity	-13.55 mm/s
Feedback current	1.5 %
Current load	0.00 N
Overload level	0 %
DC bus voltage	294.0 V
Est. regenerated discharge	0 W
PCB temperature	36 ℃

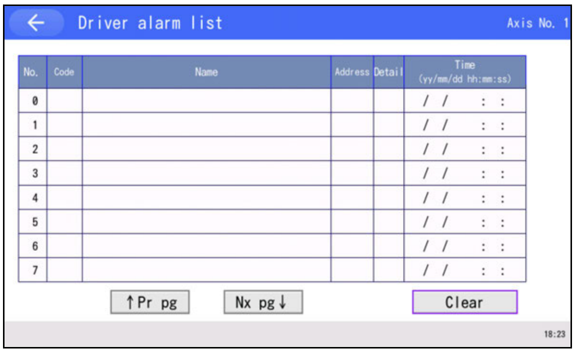
The information at the moment of a controller alarm being generated should be shown.

(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.



Driver alarm list will be cleared.
Are you sure to continue?



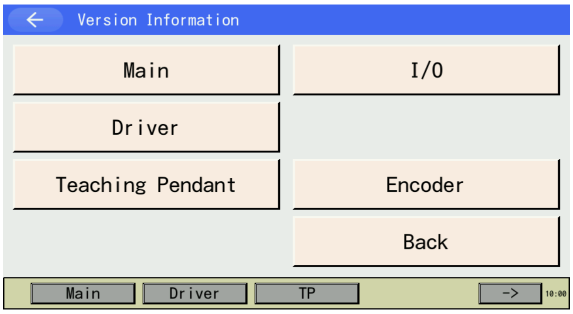
No.	Code	Name	Address	Detail	Time (yy/mm/dd hh:mm:ss)
0					/ / : :
1					/ / : :
2					/ / : :
3					/ / : :
4					/ / : :
5					/ / : :
6					/ / : :
7					/ / : :

Image after Completing to Clear

14.10 Version Information

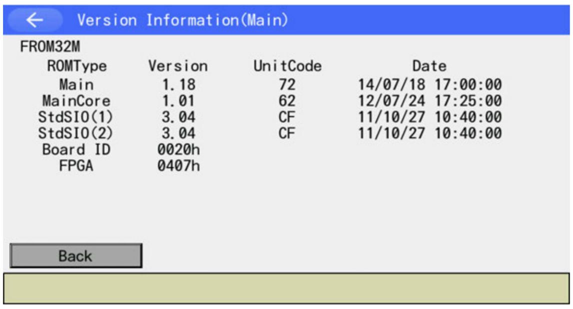
Displays version information.

- * 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.

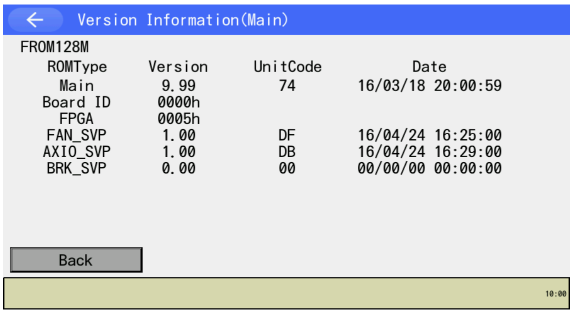
(1) Main



```
Version Information(Main)
FROM32M
  ROMType      Version     UnitCode          Date
    Main         1.18         72       14/07/18 17:00:00
  MainCore       1.01         62       12/07/24 17:25:00
 StdSIO(1)       3.04         CF       11/10/27 10:40:00
 StdSIO(2)       3.04         CF       11/10/27 10:40:00
  Board ID      0020h
    FPGA        0407h
```

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

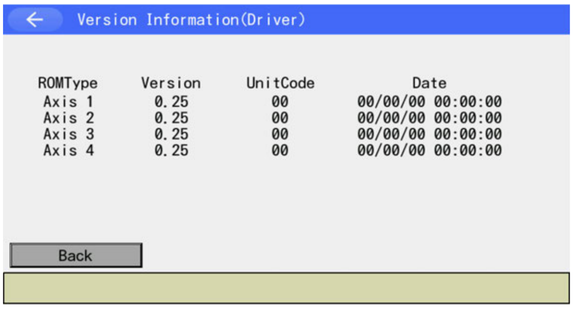
*1: 'Nouse' is shown in channel's set as "Not to Use" in I/O Parameter No. 201 and 213.



```
Version Information(Main)
FROM128M
  ROMType      Version     UnitCode          Date
    Main         9.99         74       16/03/18 20:00:59
  Board ID      0000h
    FPGA        0005h
  FAN_SVP        1.00         DF       16/04/24 16:25:00
  AXIO_SVP       1.00         DB       16/04/24 16:29:00
  BRK_SVP        0.00         00       00/00/00 00:00:00
```

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

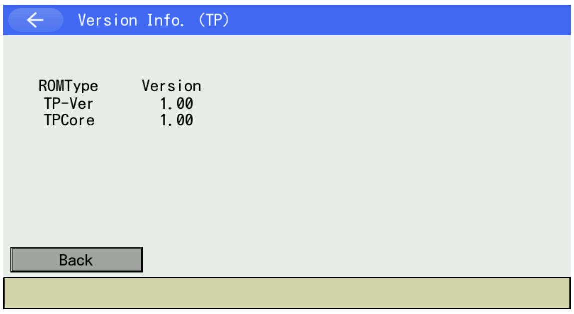
(2) Driver



ROMType	Version	UnitCode	Date
Axis 1	0.25	00	00/00/00 00:00:00
Axis 2	0.25	00	00/00/00 00:00:00
Axis 3	0.25	00	00/00/00 00:00:00
Axis 4	0.25	00	00/00/00 00:00:00

The driver CPU version is displayed.

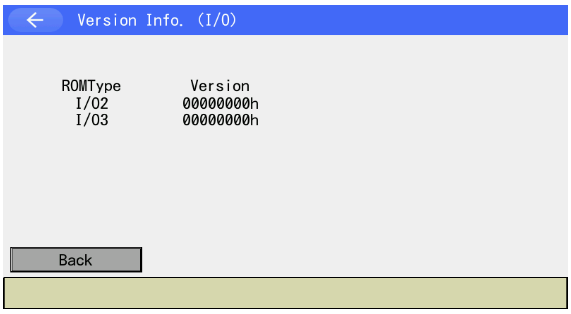
(3) Teaching Pendant



ROMType	Version
TP-Ver	1.00
TPCore	1.00

The version of this product is shown.
TP-Ver : Application version
TPCore: Core version

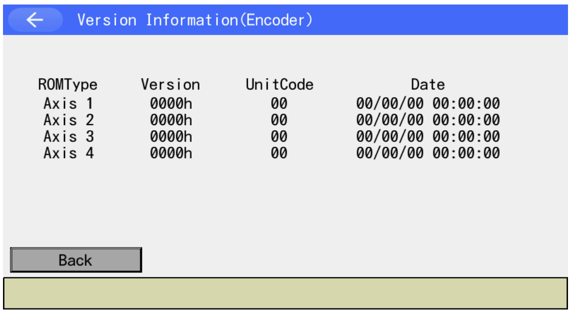
(4) I/O



ROMType	Version
I/02	00000000h
I/03	00000000h

Version of extension I/O module is displayed

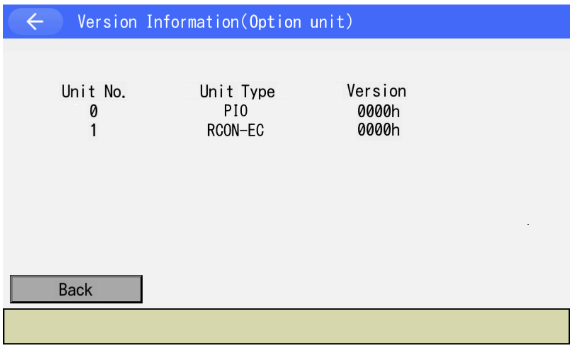
(5) Encoder



ROMType	Version	UnitCode	Date
Axis 1	0000h	00	00/00/00 00:00:00
Axis 2	0000h	00	00/00/00 00:00:00
Axis 3	0000h	00	00/00/00 00:00:00
Axis 4	0000h	00	00/00/00 00:00:00

Version of encoder CPU is displayed

(6) Option Unit

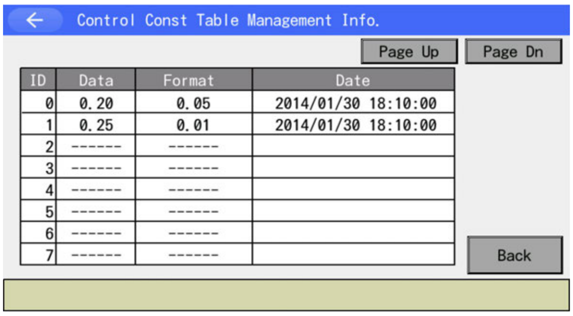


Unit No.	Unit Type	Version
0	PIO	0000h
1	RCON-EC	0000h

Version of option unit is displayed.

14.11 Control Constant Table Management Information

(for applicable models only)



ID	Data	Format	Date
0	0.20	0.05	2014/01/30 18:10:00
1	0.25	0.01	2014/01/30 18:10:00
2	------	------	
3	------	------	
4	------	------	
5	------	------	
6	------	------	
7	------	------	

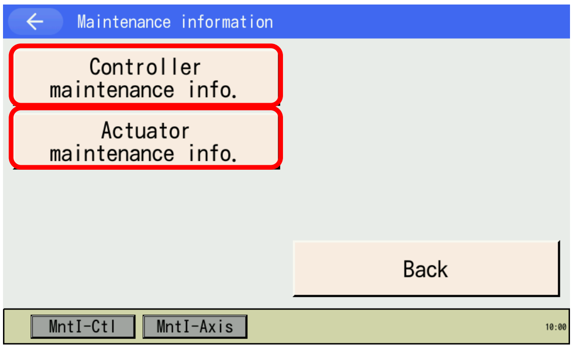
It is available to check the version of the control constant table for the encoder and monitor.

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).

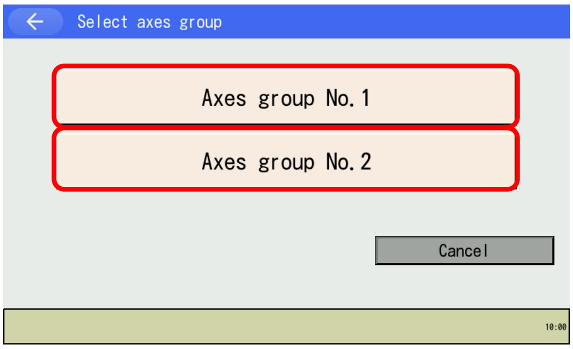
When the controller related maintenance information is supported, touch the Maintenance Information button and the maintenance information menu should appear. Touch the Controller maintenance info. button to open the maintenance information (controller) window and the Actuator maintenance info. button to open the maintenance information (actuator) window.



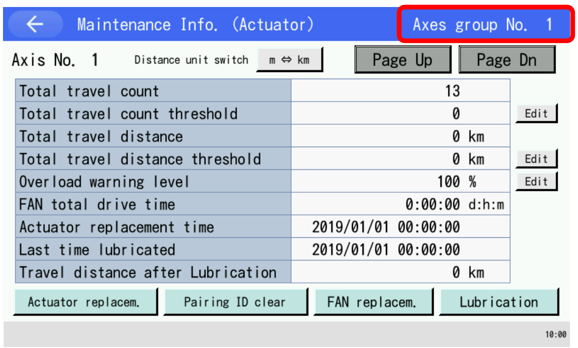
When the controller related maintenance information is supported, touch the Maintenance Information button and the maintenance information menu should appear.

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 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 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.



Axis No. 1

Total travel count	13
Total travel count threshold	0
Total travel distance	0 km
Total travel distance threshold	0 km
Overload warning level	100 %
FAN total drive time	0:00:00 d:h:m
Actuator replacement time	2019/01/01 00:00:00
Last time lubricated	2019/01/01 00:00:00
Travel distance after Lubrication	0 km

The maintenance information (actuator) window opens.

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

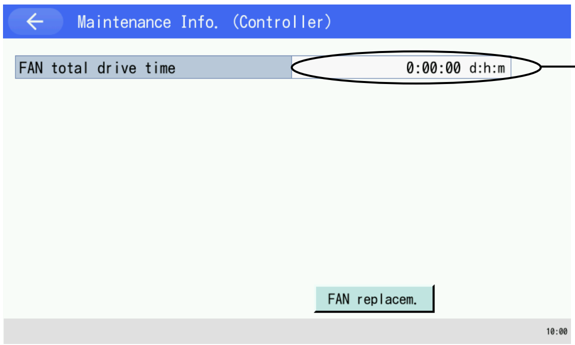
14.12.1 Maintenance Information Window

One of the following maintenance information windows should be shown in response to the controller type.

14.12.1.1 Maintenance Information (Controller) Window

This window will show up when you touch the Controller maintenance info. button in the maintenance information menu.

[Displayed Items in Maintenance Information (Controller) Window]



Maintenance Info. (Controller)

FAN total drive time 0:00:00 d:h:m

1) FAN total drive time

1) FAN total drive time
   The fan total drive time (day : hour : minute) of the controller should be displayed.

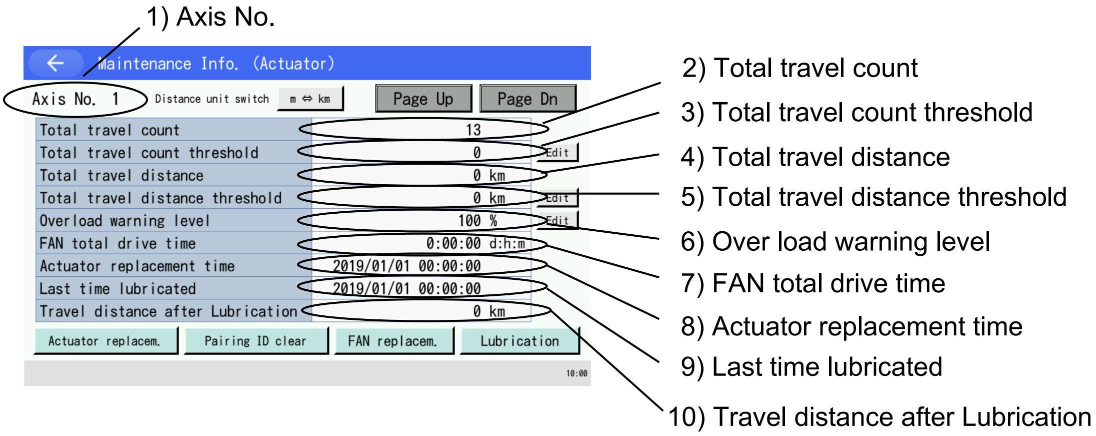
   Touch the FAN replacem button and the fan total drive time can be initialized (zero-cleared). Refer to [14.12.4 Fan Replacement] for detail.

   Touch the ← button on the top left and the screen goes back to the previous.

14.12.1.2 Maintenance Information (Actuator) Window

This window 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) Window]



Axis No. 1

Total travel count	13
Total travel count threshold	0
Total travel distance	0 km
Total travel distance threshold	0 km
Overload warning level	100 %
FAN total drive time	0:00:00 d:h:m
Actuator replacement time	2019/01/01 00:00:00
Last time lubricated	2019/01/01 00:00:00
Travel distance after Lubrication	0 km

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.

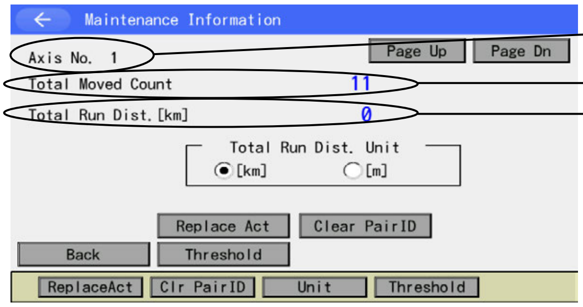
(Note) The items and buttons to be displayed should differ depending on the controller type and supported features.

*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 Window

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]



Axis No. 1

Total Moved Count 11

Total Run Dist. [km] 0

● [km] ○ [m]

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.

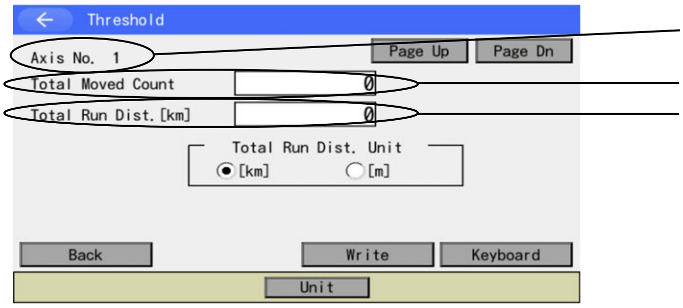
   By touching Clear PairID button, the paired I.D. can be cleared.
   For details, refer to [14.12.3 Pairing ID Clear].

   By touching each button in the total operation distance display unit box, the unit of the total operation distance display can be switched over.

   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.

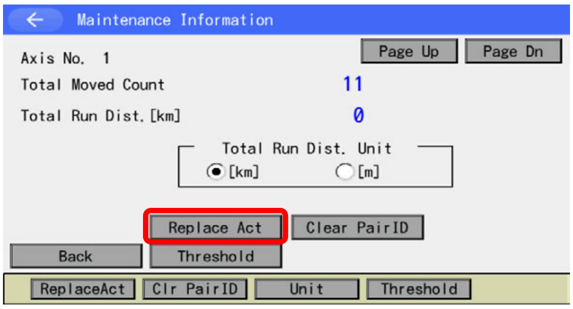
> ⚠ *Caution: In the case that the Axis No. or Maintenance Information screen is changed without importing the data, the input data is erased.*

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

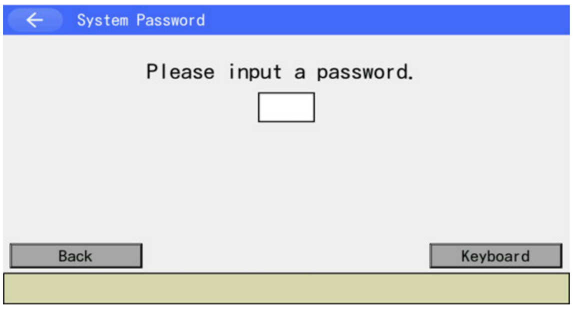
When the actuator is replaced, the total operation times and total operation distance can be initialized (cleared). In [14.12.1.2 Maintenance Information (Actuator) Window], actuator replaced time also gets updated.



Axis No. 1
Total Moved Count 11
Total Run Dist. [km] 0
Total Run Dist. Unit ● [km] ○ [m]

Touch Replace Act button.

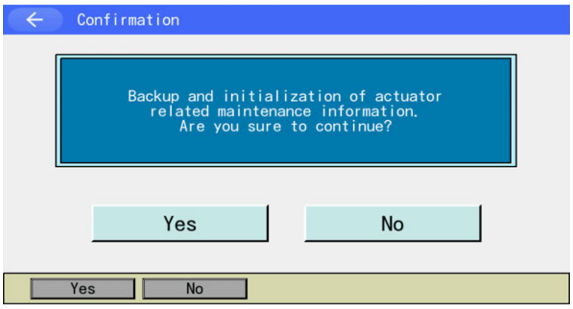
* The figure on the left shows a case of [14.12.1.3 Maintenance Information Window] as an example.



Please input a password.

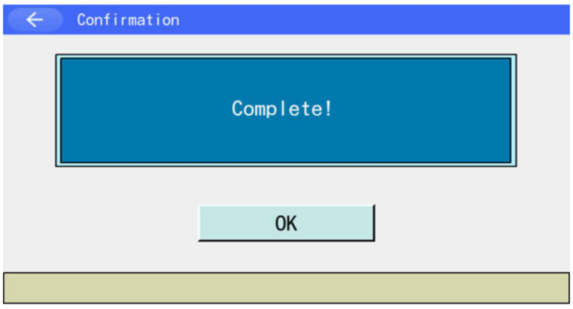
The password input window appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information window.



Backup and initialization of actuator related maintenance information. Are you sure to continue?

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.



Complete!

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 ID clear feature is activated, the pairing ID clear execution confirmation window appears continually.
Refer to [14.12.3 Pairing ID Clear] to conduct the pairing ID clear if necessary.

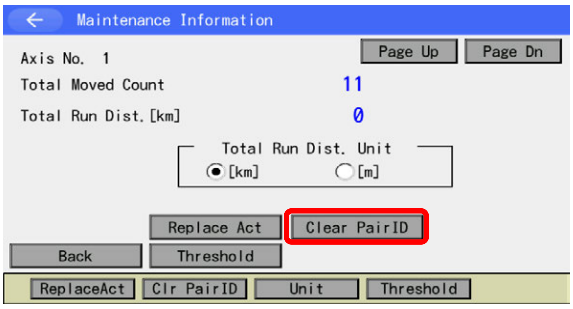
In any cases other than above, back to maintenance information screen (or to the maintenance information (actuator) window).

14.12.3 Pairing ID Clear

The controller possesses a feature to output an absolute error when it checks the encoder ID 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 ID (pairing ID).

This feature is available only when the battery-less absolute encoder is connected and the pairing ID clear feature is activated.

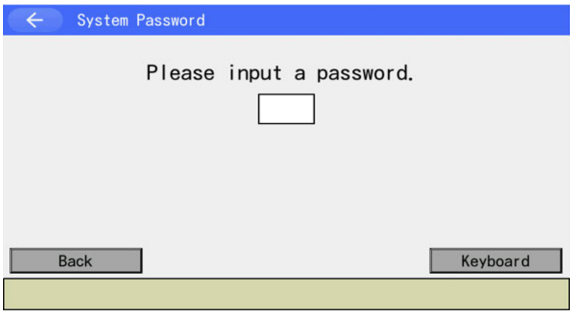
* This feature is the same as the pairing ID clear feature in the controller menu.



Axis No. 1
Total Moved Count 11
Total Run Dist. [km] 0
Total Run Dist. Unit ● [km] ○ [m]

Touch Clear PairID button.

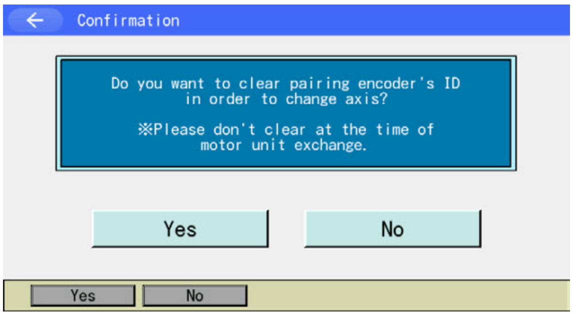
* The figure on the left shows a case of [14.12.1.3 Maintenance Information Window] as an example.



Please input a password.

The password input window appears. Input 5119 on the keyboard.

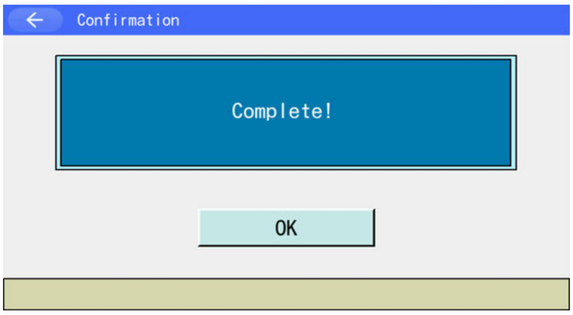
* Once the password is input, it is effective until getting out of the maintenance information window.



Do you want to clear pairing encoder's ID in order to change axis?

※Please don't clear at the time of motor unit exchange.

Touch Yes button when the paired ID is to be cleared.
Touch No button when the paired ID is not to be cleared.



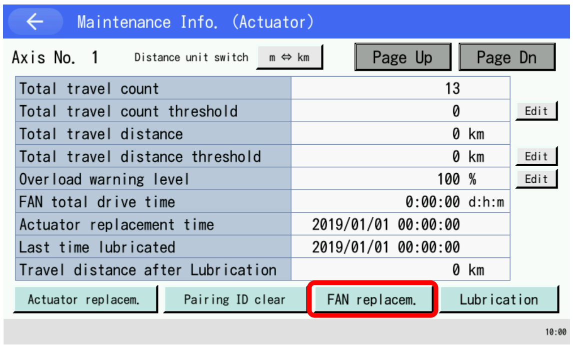
Complete!

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.

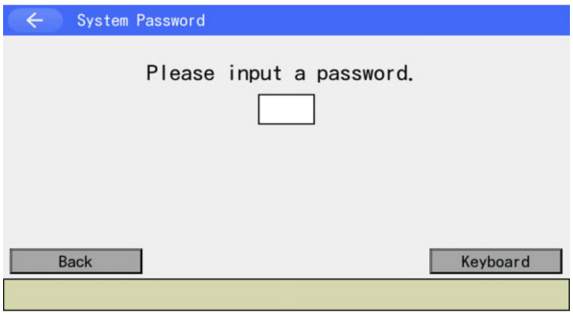


Axis No. 1

Total travel count	13	
Total travel count threshold	0	Edit
Total travel distance	0 km	
Total travel distance threshold	0 km	Edit
Overload warning level	100 %	Edit
FAN total drive time	0:00:00 d:h:m	
Actuator replacement time	2019/01/01 00:00:00	
Last time lubricated	2019/01/01 00:00:00	
Travel distance after Lubrication	0 km	

Touch the FAN replacem. button.

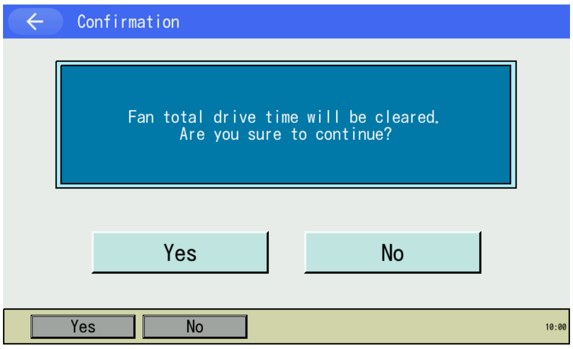
* The figure on the left shows a case of [14.12.1.2 Maintenance Information (Actuator) Window] as an example.



Please input a password.

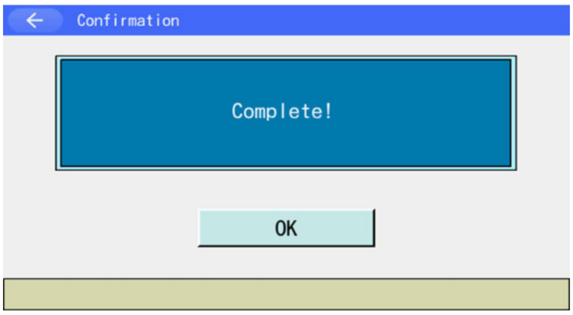
The password input window appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information window.



Fan total drive time will be cleared.
Are you sure to continue?

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.



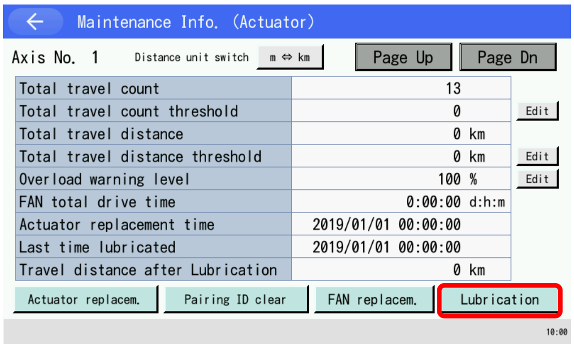
Complete!

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

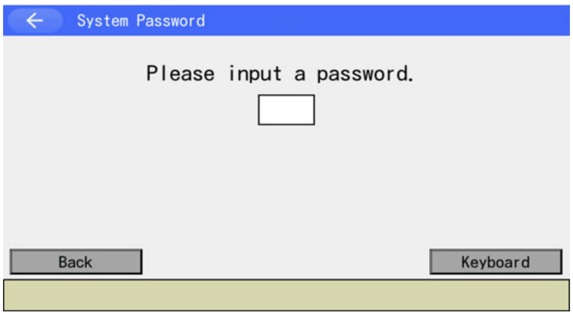
After grease supply, update can be held on the maintenance information regarding grease supply (update of grease supplied time and initializing of drive distance after grease supply).

This feature is valid only when the controller and actuators are applicable for the information management feature.



Total travel count	13
Total travel count threshold	0
Total travel distance	0 km
Total travel distance threshold	0 km
Overload warning level	100 %
FAN total drive time	0:00:00 d:h:m
Actuator replacement time	2019/01/01 00:00:00
Last time lubricated	2019/01/01 00:00:00
Travel distance after Lubrication	0 km

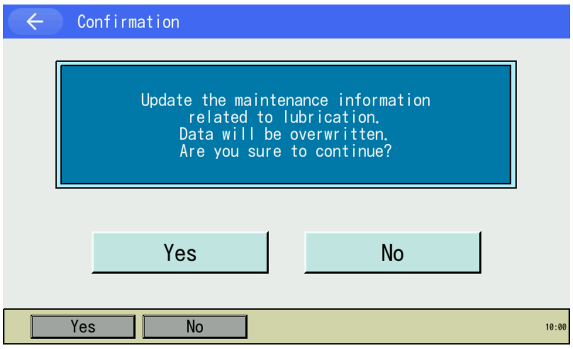
Touch the Lubrication button.



Please input a password.

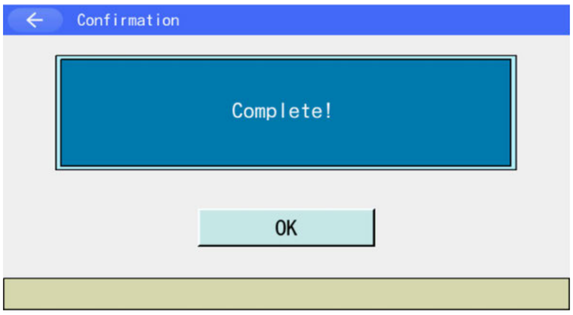
The password input window appears. Input 5119 on the keyboard.

* Once the password is input, it is effective until getting out of the maintenance information window.



Update the maintenance information
related to lubrication.
Data will be overwritten.
Are you sure to continue?

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.



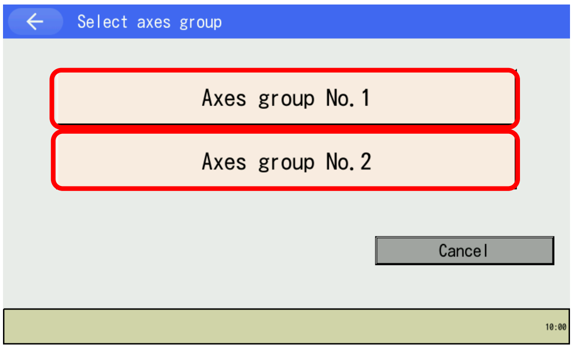
Complete!

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.

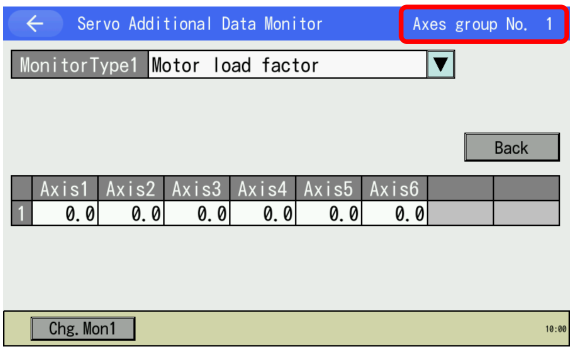
14.13 Servo Additional Data Monitor
(for applicable models only)

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 window 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.



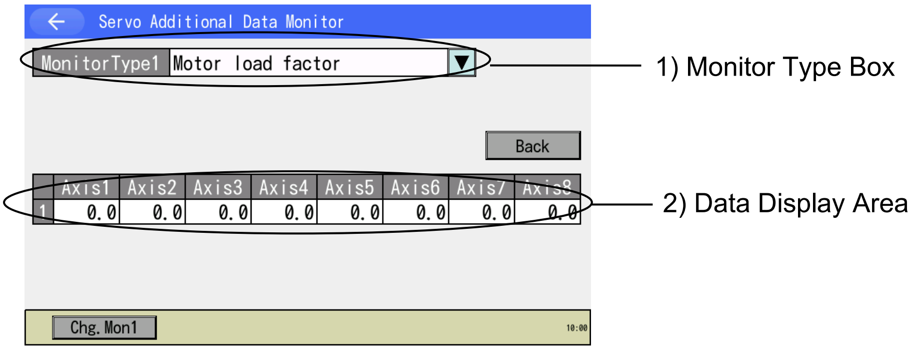
MonitorType1 Motor load factor

	Axis1	Axis2	Axis3	Axis4	Axis5	Axis6		
1	0.0	0.0	0.0	0.0	0.0	0.0		

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 Window]



MonitorType1: Motor load factor

	Axis1	Axis2	Axis3	Axis4	Axis5	Axis6	Axis7	Axis8
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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.

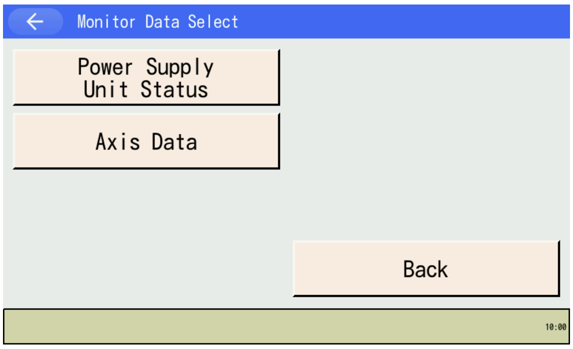
   Four types of data can be monitored at the same time at the maximum. (Display will be adjusted automatically for the number of items to monitor.)

   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 window should be displayed.
(Refer to [15.19.1 Monitor Data Output Setting] for how to set it up.)



When both of the power supply unit status and axis status are set was the monitor items, touch the monitor data button and the select monitor data window should open.

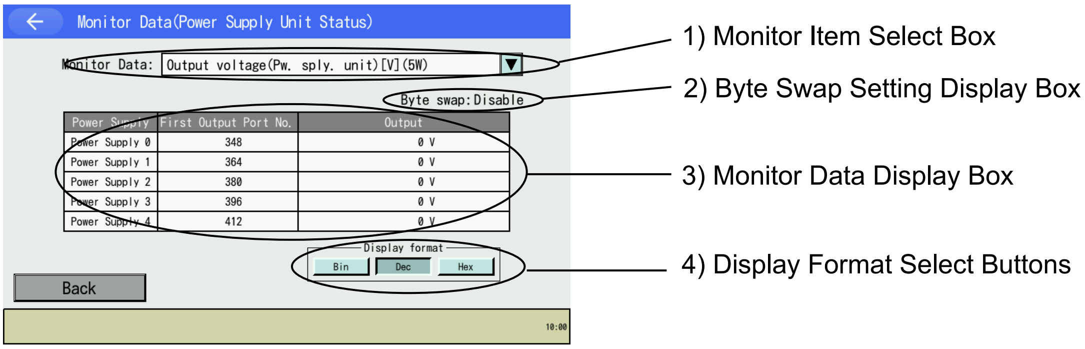
Touch the power supply unit status button to open the monitor data (power supply unit status) window or touch the axis status button to open the monitor data (axis status).

* When there is only one of the power supply unit status and the axis status is set as the monitor item, the screen will directly go to the applicable window.

14.14.1 Monitor Data (Power Supply Unit Status) Window

This shows the monitor values in the power supply unit status. This window 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) Window]



Monitor Data(Power Supply Unit Status)

Monitor Data: Output voltage(Pw. sply. unit)[V](5W)

Byte swap:Disable

Power Supply	First Output Port No.	Output
Power Supply 0	348	0 V
Power Supply 1	364	0 V
Power Supply 2	380	0 V
Power Supply 3	396	0 V
Power Supply 4	412	0 V

Display format
Bin
Dec
Hex
Back
10:00
1) Monitor Item Select Box
2) Byte Swap Setting Display Box
3) Monitor Data Display Box
4) Display Format Select Buttons

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 window 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 window 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). Ignore the data in places with no power supply unit connected.

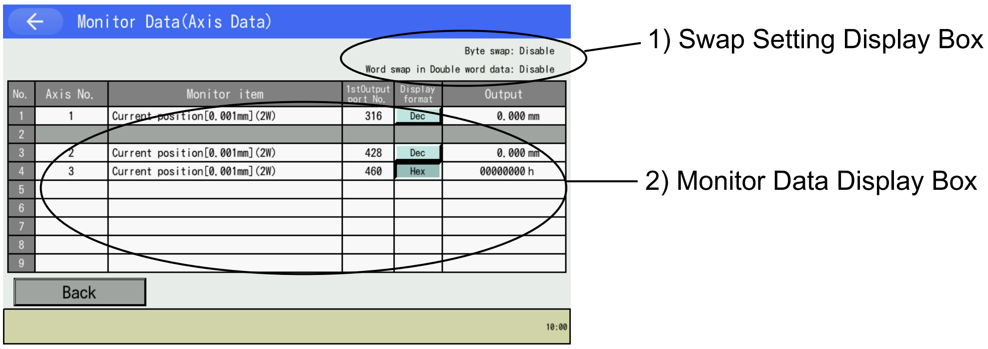
4) Display Format Select Buttons
The format to display output in Monitor Data Display Box should be shown and selected. The display should be switched to the display format of a button that you touched.
Binary System : The outputs (monitor values) are shown in decimal numbers. It shows the display in 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) Window

This shows the monitor values in the axis status. This window is available to go only when the axis status is set as a monitor item.

[Displayed Items in Monitor Data (Axis Status) Window]



Monitor Data(Axis Data)

Byte swap: Disable

Word swap in Double word data: Disable

No.	Axis No.	Monitor item	1stOutput port No.	Display format	Output
1	1	Current position[0.001mm](2W)	316	Dec	0.000 mm
2					
3	2	Current position[0.001mm](2W)	428	Dec	0.000 mm
4	3	Current position[0.001mm](2W)	460	Hex	00000000 h
5					
6					
7					
8					
9					

1) Swap Setting Display Box

2) Monitor Data Display Box

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 window 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 window 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.

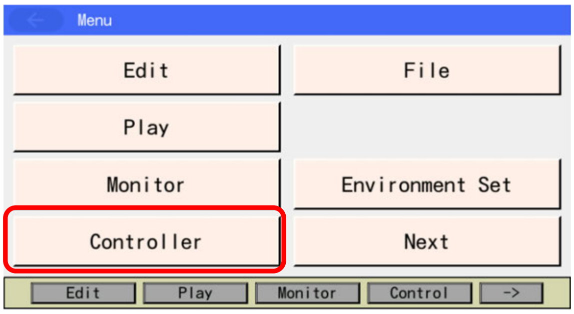
When the display format is in the decimal system, it shows the display in real numbers or integral numbers followed by a unit. When the display format is in the hexadecimal system, it shows the display in hexadecimal numbers followed by ‘h’ as a representative of hexadecimal system.

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) window.

Touch the Back button and the screen goes back to the previous.

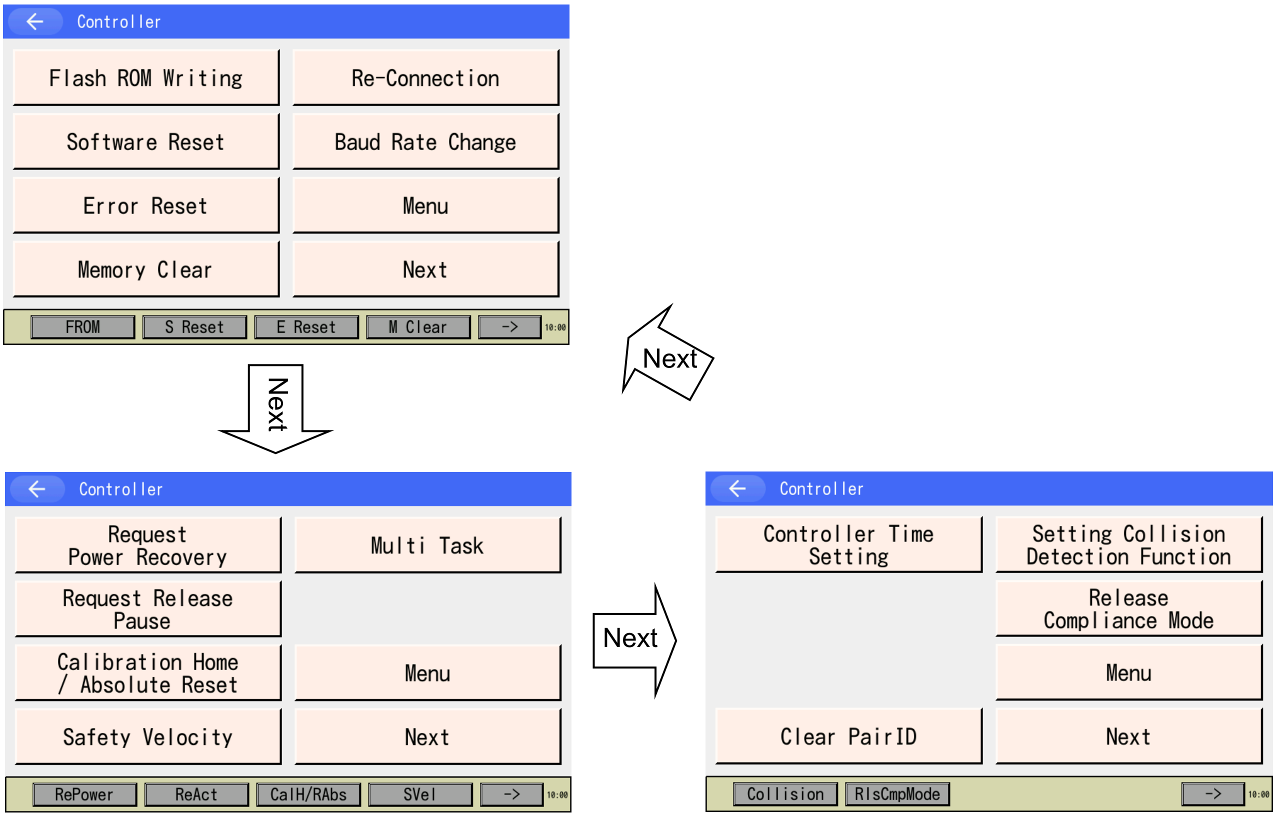
15. Controller

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

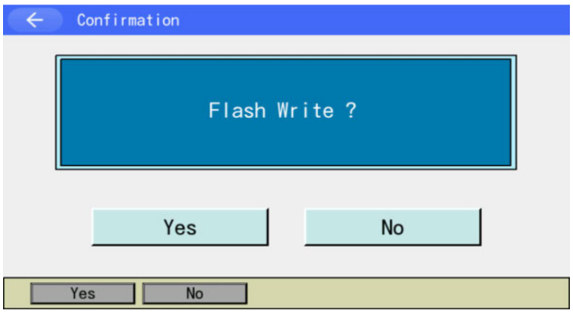


* The types and the positions of the buttons shown on the screen differ depending on the model types.

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)

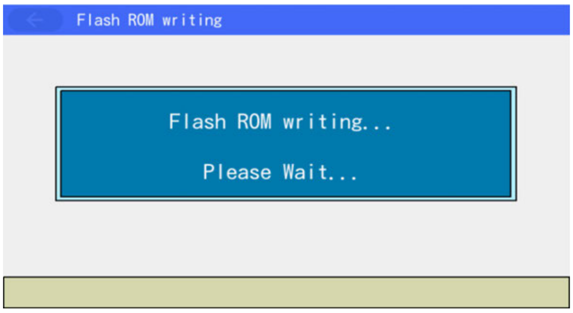
15.2 Flash ROM Writing

After clearing the data from Flash ROM, write data which is saved in controller memory to Flash ROM.



Flash Write ?

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

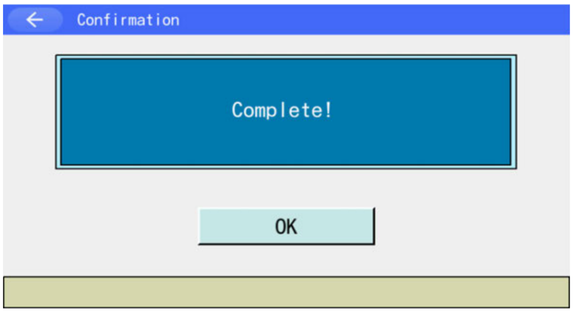


Flash ROM writing...

Please Wait...

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.

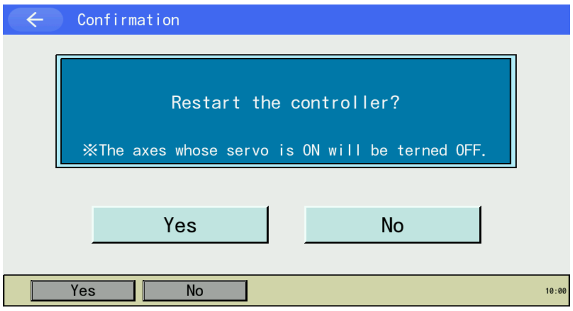


Complete!

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

15.3 Software Reset

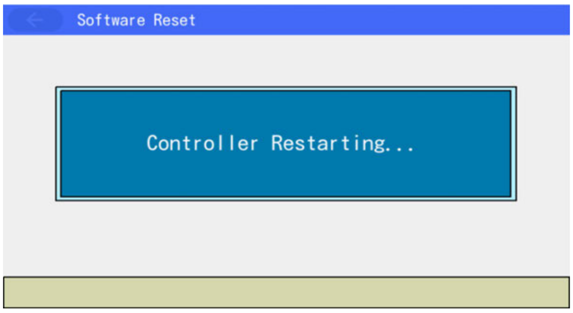
Executes software reset of the controller. The data which is not written to Flash ROM will be cleared.



Restart the controller?

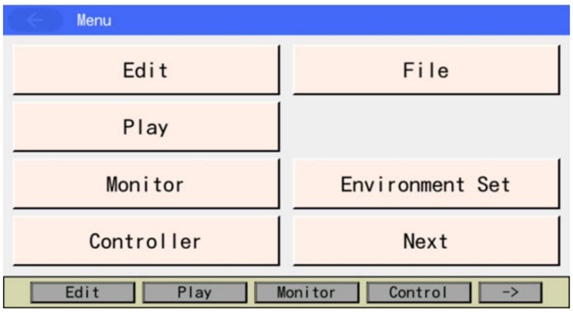
※The axes whose servo is ON will be terned OFF.

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.



Controller Restarting...

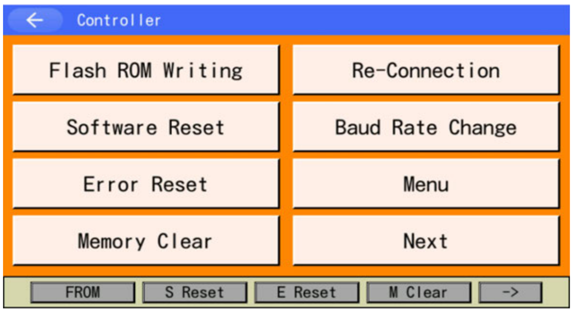
The screen shown on the left is displayed during the software reset.



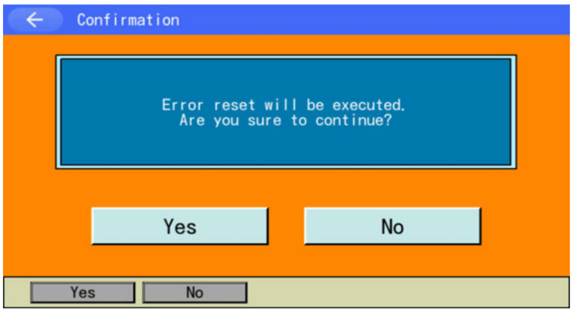
Once the software reset is complete, the display returns to the main menu screen.

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.

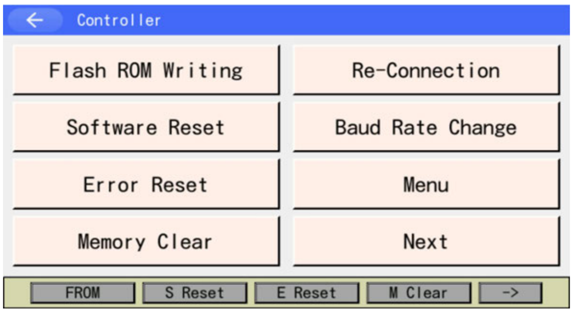


The background color is orange when an error is being generated.
Touch Error Reset button.



Error reset will be executed.
Are you sure to continue?

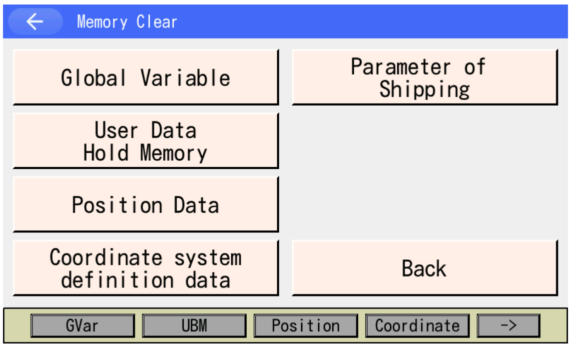
Touch Yes button when you want to have an error reset.
When the error reset is not necessary, touch No button.



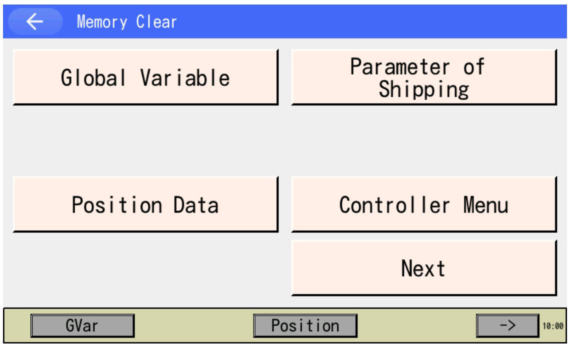
As shown in the figure on the left, if the cause of an error is already removed, the background color is changed from orange to white which shows in normal condition.

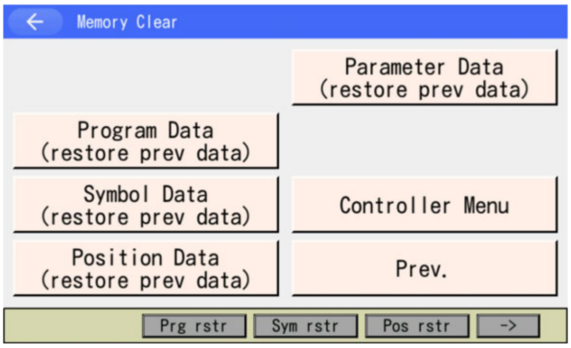
15.5 Memory Clear

15.5.1 Memory Initialization Items



Example for Memory Initializing Menu Screen (XSEL-RXD/SXD)




Memory Clear
Parameter Data (restore prev data)
Program Data (restore prev data)
Symbol Data (restore prev data)
Controller Menu
Position Data (restore prev data)
Prev.
Prg rstr
Sym rstr
Pos rstr
->

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)

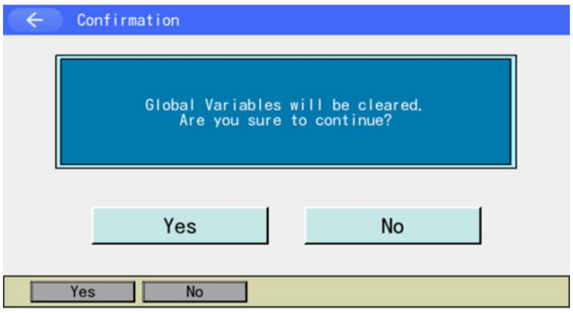
Symbol Data (restore prev data) : Recover the flash ROM writing data for the symbol data to the writing data of one generation before. (TTA and MSEL-PCX/PGX/PC/PG/PCF/PGF only)

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)

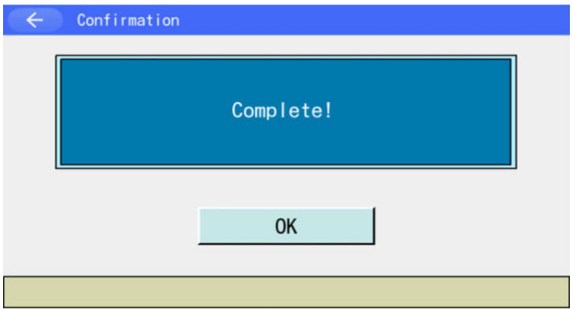
15.5.2 Global Variable

Conducts Zero-Clear (initialization) to global variables



Global Variables will be cleared.
Are you sure to continue?

Touch Yes button when you want to initialize the global variables.
When the initialization of the global variables is not necessary, touch No button.



Complete!

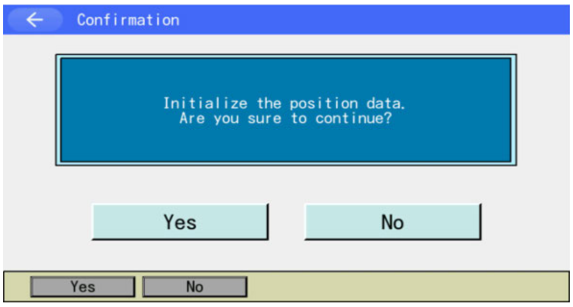
If the initialization of the global variables is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

15.5.3 User Data Hold Memory

Refer to [17.3 User Data Hold Memory Initialization].

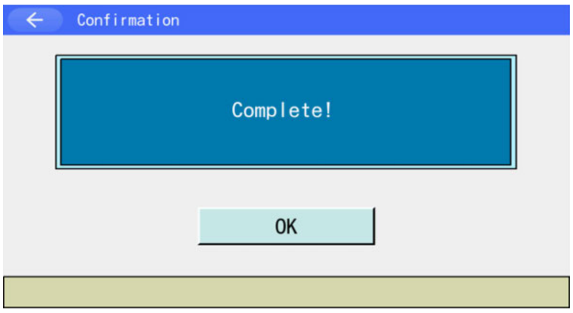
15.5.4 Position Data (XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/RAXD/SAXD, TTA , MSEL-PC/PG/PCF/PGF/PCX/PGX, RSEL and XSEL2-T/TX Only)

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.



Initialize the position data.
Are you sure to continue?

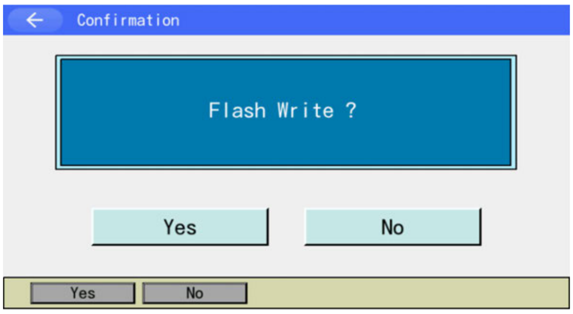
Touch Yes button when you want to initialize the position data.
When the initialization of the position data is not necessary, touch No button.



Complete!

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.

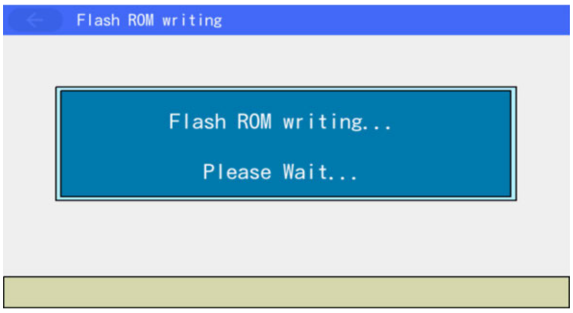
Touch Back button to return to Flash ROM writing screen.



Confirmation

Flash Write ?

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



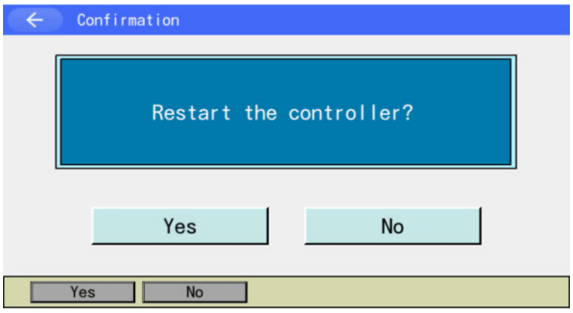
Flash ROM writing

Flash ROM writing...

Please Wait...

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

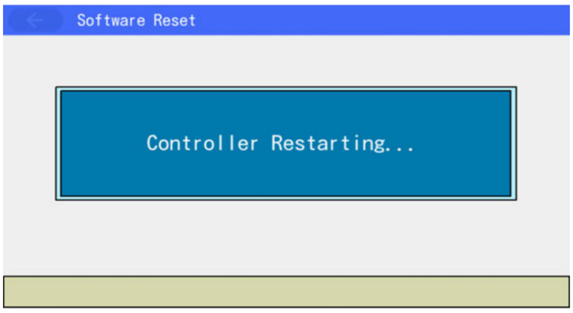
Never turn off the power to the Controller at this time.



Confirmation

Restart the controller?

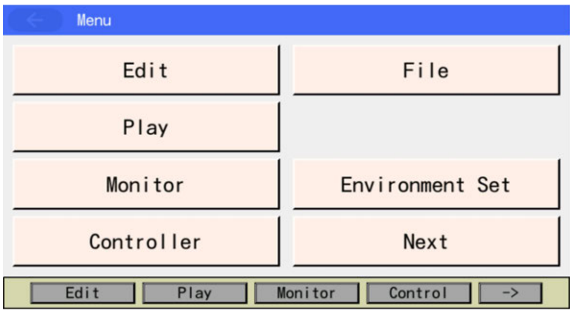
After flash ROM writing is complete, the display changes to the software reset screen.
Touch Yes button.



Software Reset

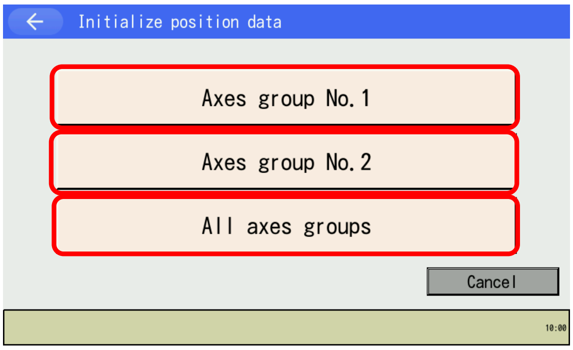
Controller Restarting...

The screen shown on the left is displayed during the software reset.



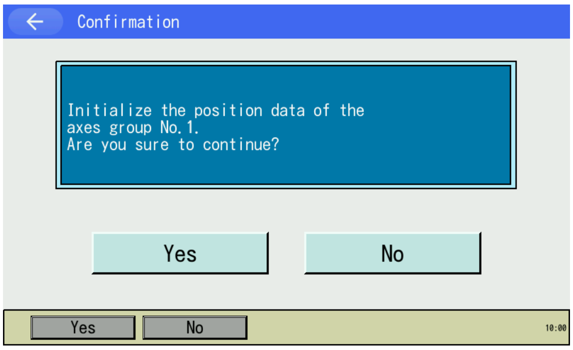
Once the software reset is complete, the display returns to the main menu screen.

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 window 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.



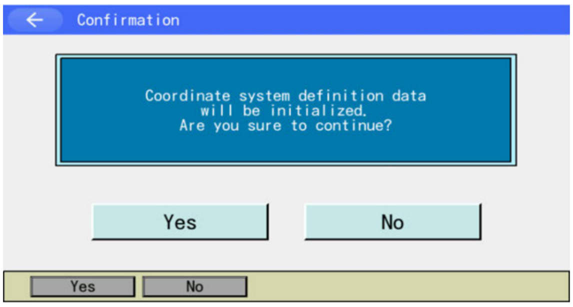
Initialize the position data of the
axes group No. 1.
Are you sure to continue?

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

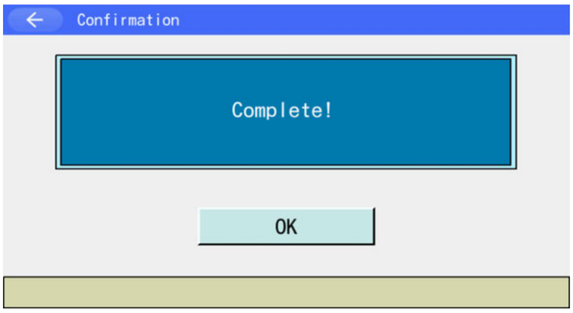
15.5.5 Coordinate System Data (XSEL-RX/SX/RXD/SXD/RAX/SAX/RAXD/SAXD, MSEL-PCX/PG, RSEL and XSEL2-TX Only)

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.



Coordinate system definition data
will be initialized.
Are you sure to continue?

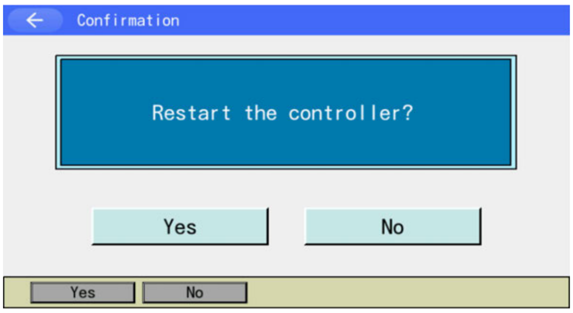
Touch Yes button when you want to initialize the coordinate system data.
When the initialization of the coordinate system data is not necessary, touch No button.



Complete!

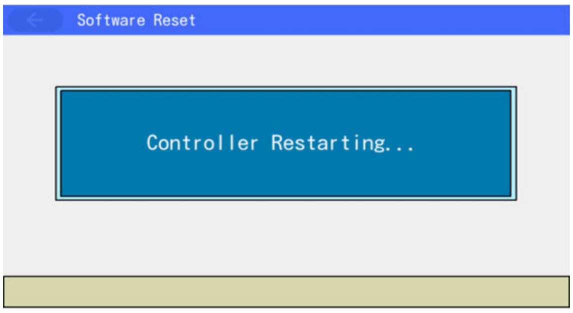
If the initialization of the coordinate system data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

Touch Back button to return to the controller reset screen.

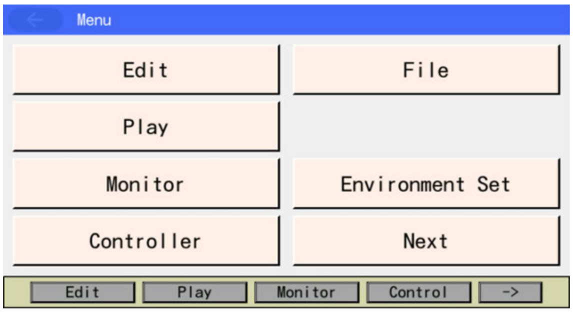


Restart the controller?

Touch Yes button.



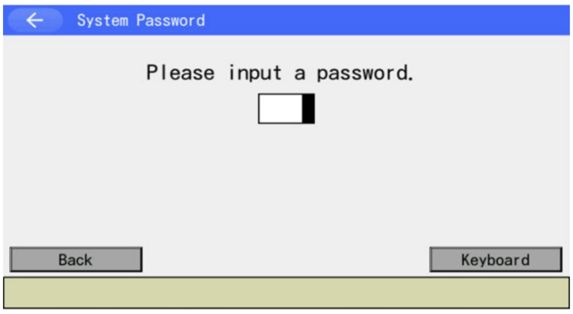
The screen shown on the left is displayed during the software reset.



Once the software reset is complete, the display returns to the main menu screen.

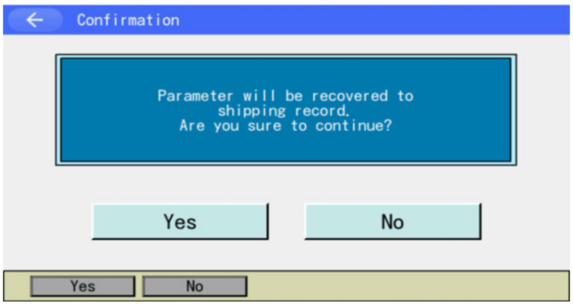
15.5.6 The Value of This Parameter at the Factory (SSEL, ASEL, PSEL, XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/ RAXD/SAXD, TTA AC Servo Type / High-Resolution Type and MSEL High-Resolution Type, RSEL and XSEL2-T/TX)

Set the parameters back to the condition of delivery from the production plant.



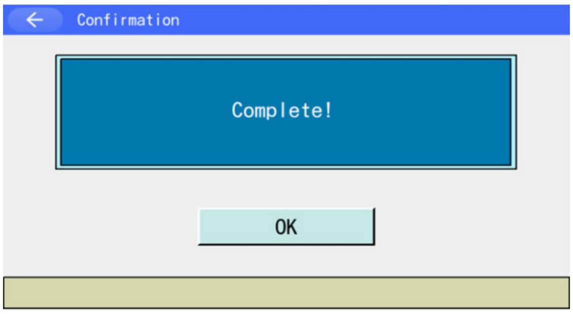
Please input a password.

The password input window appears.
Input 5119 on the keyboard.



Parameter will be recovered to shipping record.
Are you sure to continue?

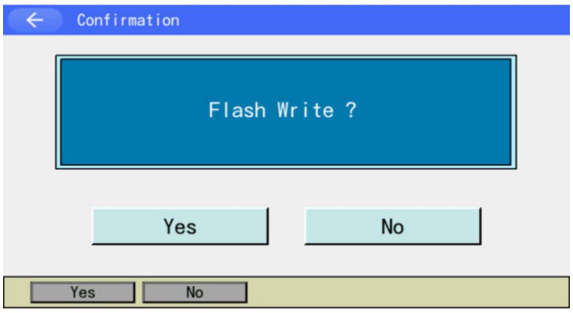
To set the parameters back to the condition of delivery from the production plant, touch Yes button.
If not to set the parameters back to the condition of delivery from the production plant, touch No button.



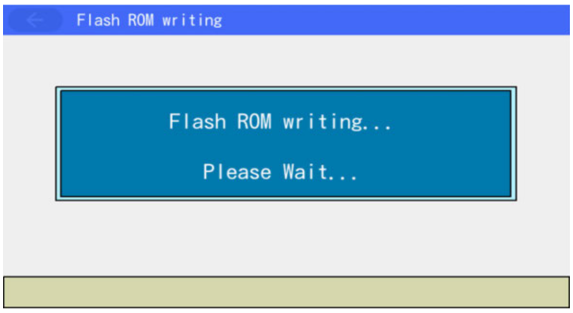
Complete!

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 Back button.

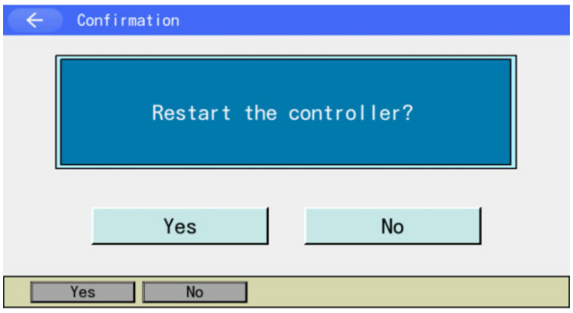


To write the data to the flash ROM, touch Yes button.
If writing is not necessary, touch No button.

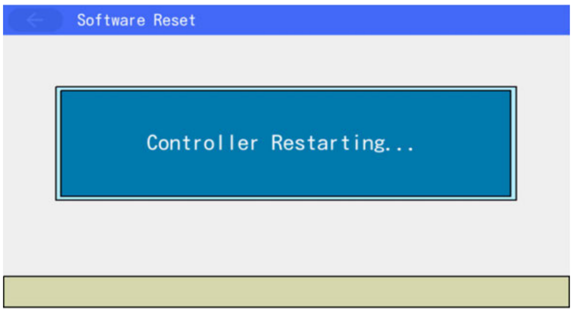


While in writing process to flash ROM, the screen shown in the left will be displayed.

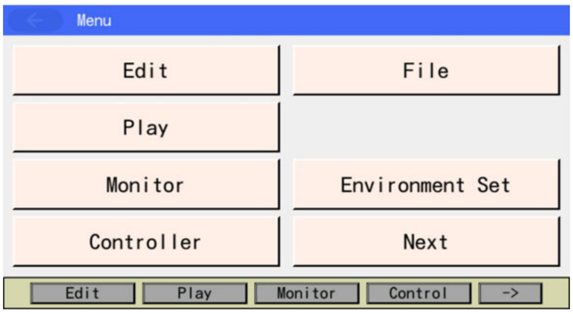
Never turn off the power to the Controller at this time.



After flash ROM writing is complete, the display changes to the software reset screen.
Touch Yes button.



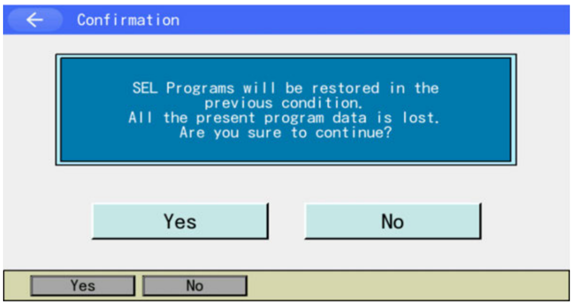
The screen shown on the left is displayed during the software reset.



Once the software reset is complete, the display returns to the main menu screen.

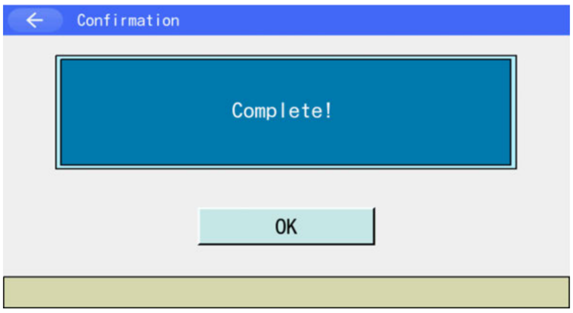
15.5.7 Program Data (Restore Prev Data)

The flash ROM writing data in the program data is recovered to the writing data of one generation before.



SEL Programs will be restored in the previous condition.
All the present program data is lost.
Are you sure to continue?

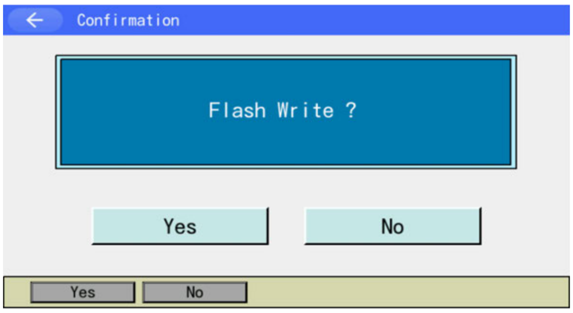
Touch Yes button when you want to set the program data one generation before.
When it is not necessary to set the program data one generation before, touch No button.



Complete!

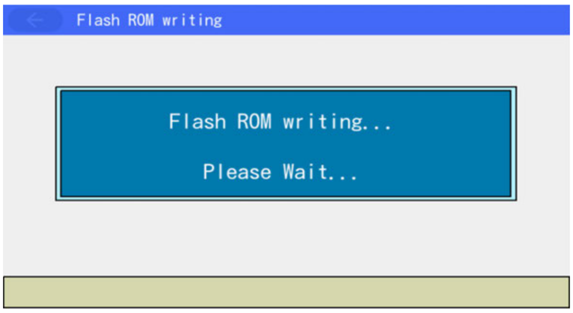
If the recovery of the program data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

Touch Back button to return to Flash ROM writing screen.



Flash Write ?

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

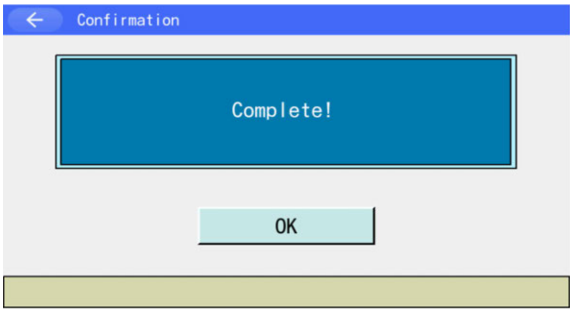

Flash ROM writing

Flash ROM writing...

Please Wait...

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.

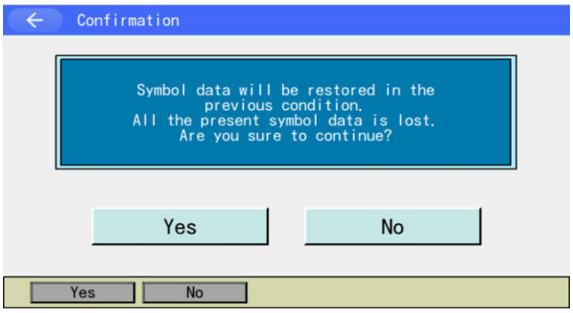

Confirmation

Complete!

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

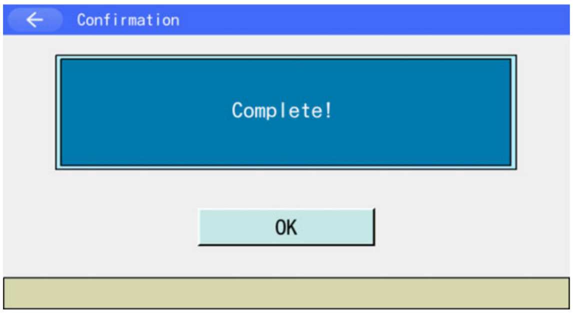
15.5.8 Symbol Data (Restore Prev Data)

The flash ROM writing data in the symbol data is recovered to the writing data of one generation before.



Symbol data will be restored in the previous condition.
All the present symbol data is lost.
Are you sure to continue?

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.



Complete!

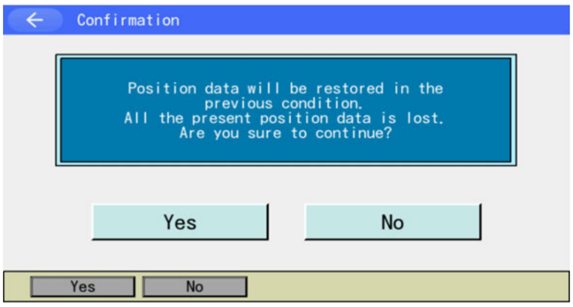
If the recovery of the symbol data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

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 (Restore Prev Data)].

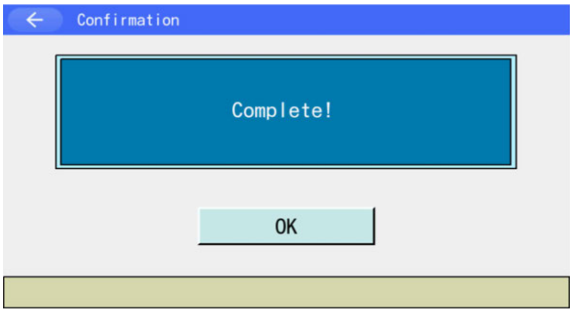
15.5.9 Position Data (Restore Prev Data)

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.



Position data will be restored in the previous condition.
All the present position data is lost.
Are you sure to continue?

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.



Complete!

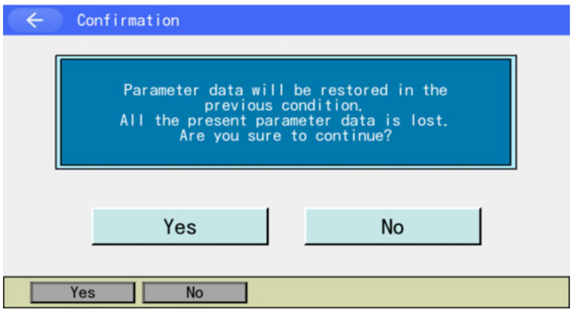
If the recovery of the position data is finished, the display changes to the screen shown on the left.
Touch OK button to return to Memory Initialization Menu screen.

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 (Restore Prev Data)].

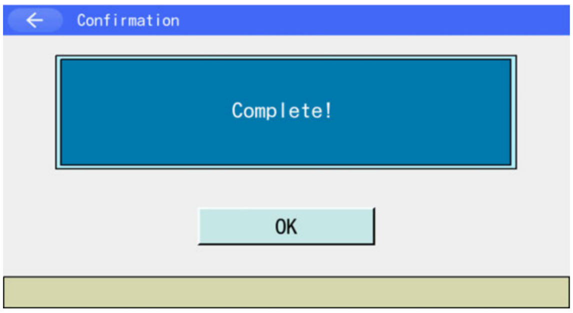
15.5.10 Parameter Data (Restore Prev Data)

The flash ROM writing data in the Parameter data is recovered to the writing data of one generation before.



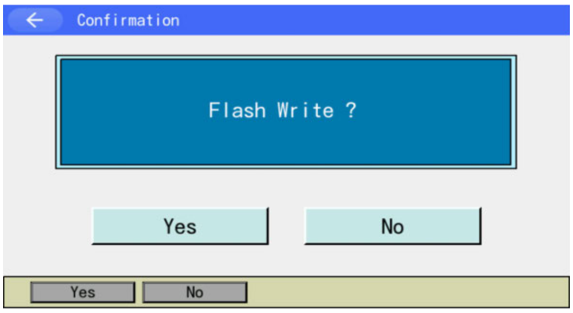
Parameter data will be restored in the previous condition.
All the present parameter data is lost.
Are you sure to continue?

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.



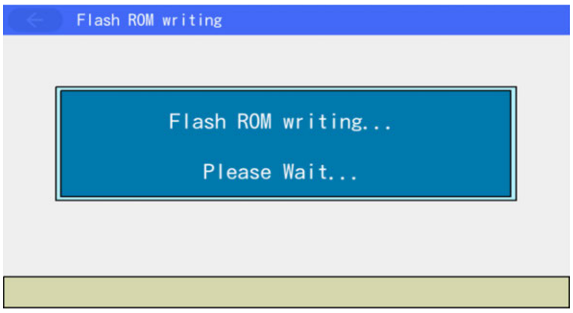
Complete!

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.



Flash Write ?

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

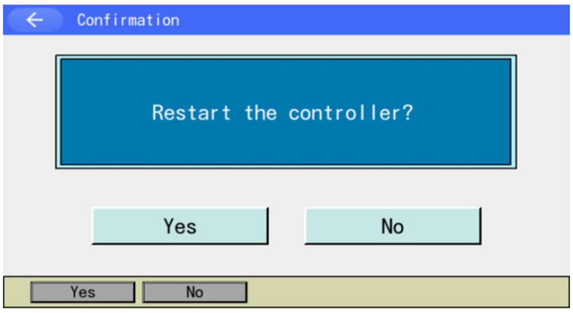


Flash ROM writing...

Please Wait...

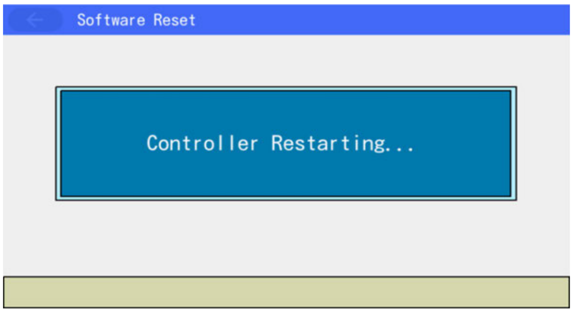
While in writing process to flash ROM, the screen shown in the left will be displayed.

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



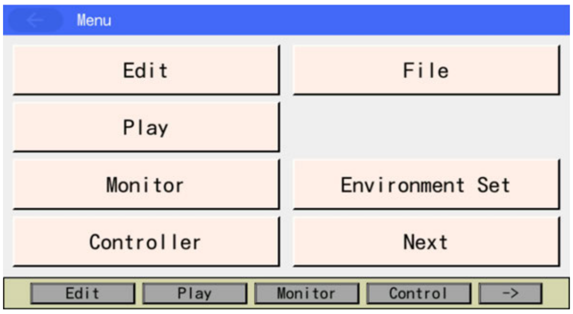
Restart the controller?

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.



Controller Restarting...

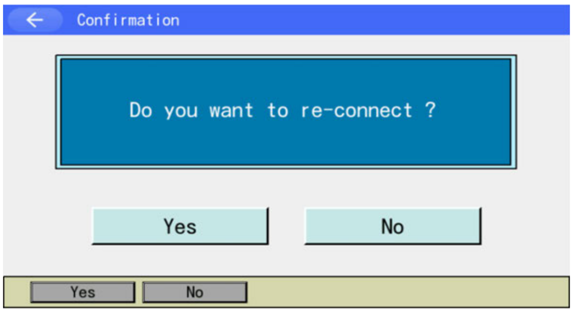
The screen shown on the left is displayed during the software reset.



Once the software reset is complete, the display returns to the main menu screen.

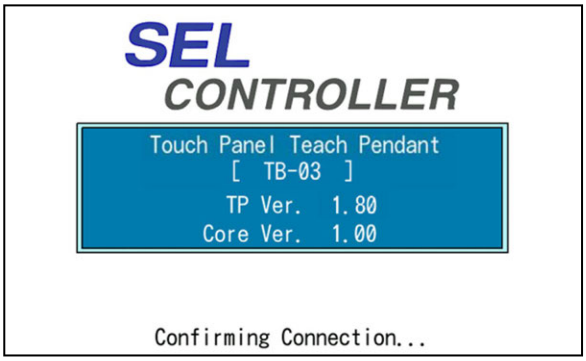
15.6 Re-Connection

Re-connect to the controller.



Do you want to re-connect ?

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.



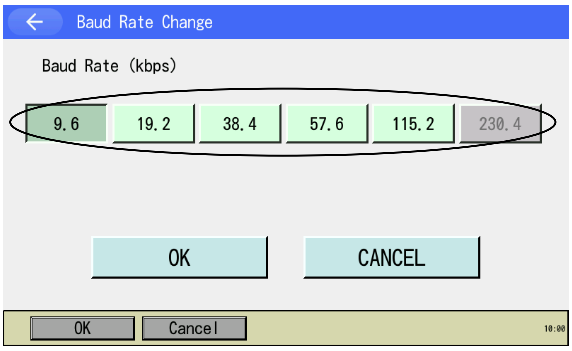
Touch Panel Teach Pendant
[TB-03]
TP Ver. 1.80
Core Ver. 1.00

Confirming Connection...

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

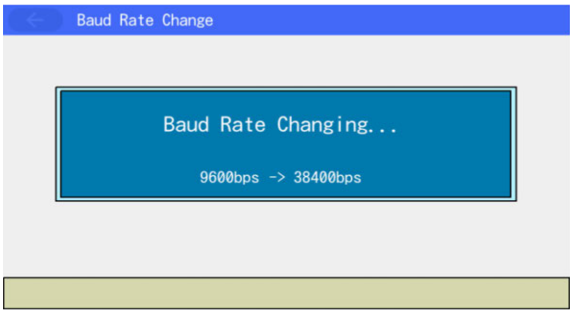
Changes the communication baud rate between the controller and the teaching pendant.



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.



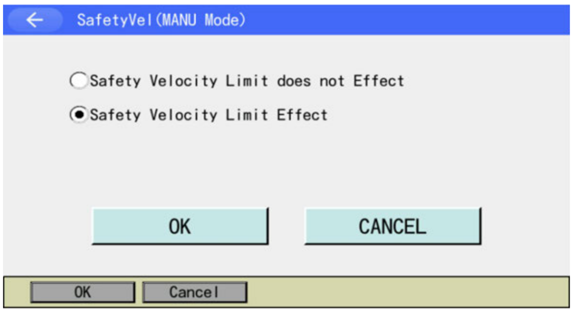
Baud Rate Changing...

9600bps -> 38400bps

"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.



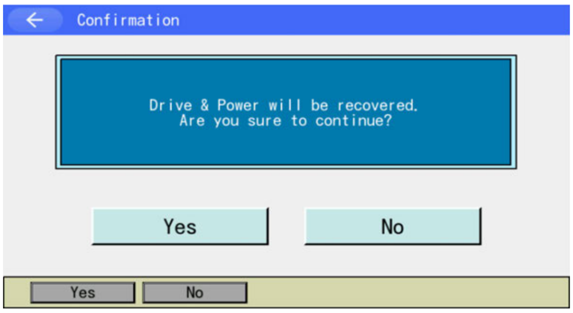
○Safety Velocity Limit does not Effect
●Safety Velocity Limit Effect

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 linear 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 Request Power Recovery

Requests to recover driver power to the controller.
Refer to [15.12 Driver Power Recovery Request and Action Pause Release Request].

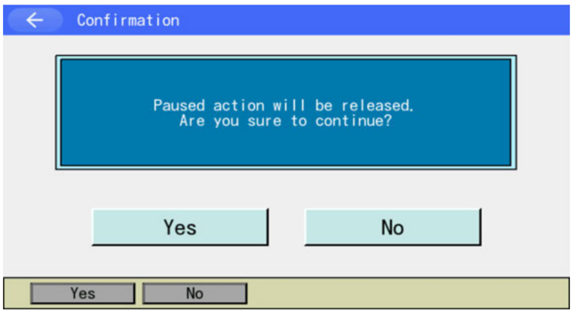


Drive & Power will be recovered.
Are you sure to continue?

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 Request Release Pause

Requests to release action pause to the controller.
Refer to [15.12 Driver Power Recovery Request and Action Pause Release Request].



Paused action will be released.
Are you sure to continue?

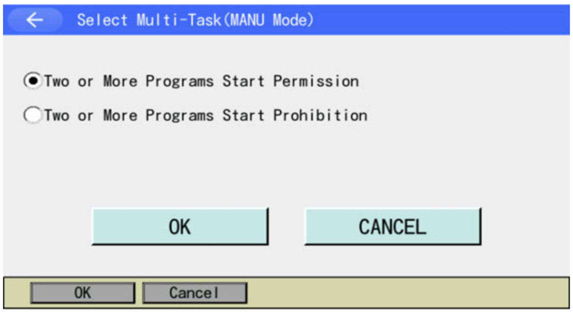
To demand the cancellation of the operation pause, touch Yes button. The display returns to the previous screen.
When it is not necessary to demand the cancellation of the operation pause, touch No button. The display returns to the previous screen.

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)

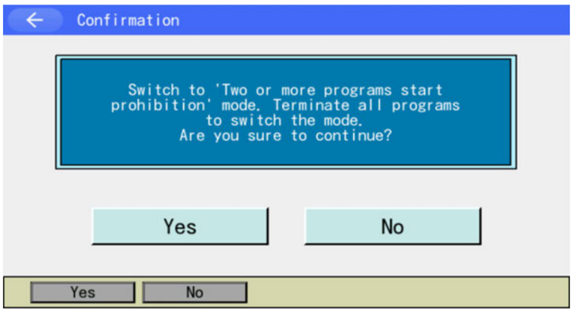


● Two or More Programs Start Permission
○ Two or More Programs Start Prohibition

Two or More Programs Start Permission
Simultaneous operation of multiple programs is allowed.

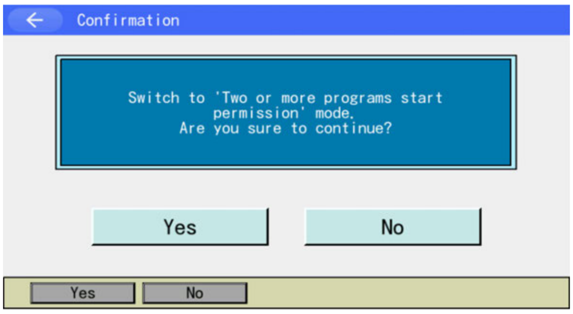
Two or More Programs Start Prohibition
Simultaneous operation of multiple programs is forbidden.

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.



Switch to 'Two or more programs start prohibition' mode. Terminate all programs to switch the mode.
Are you sure to continue?

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.



Switch to 'Two or more programs start permission' mode.
Are you sure to continue?

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. 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) 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. 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 (enable SW recovery type = action continuation recovery [during automatic operation only]), stop according to 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.

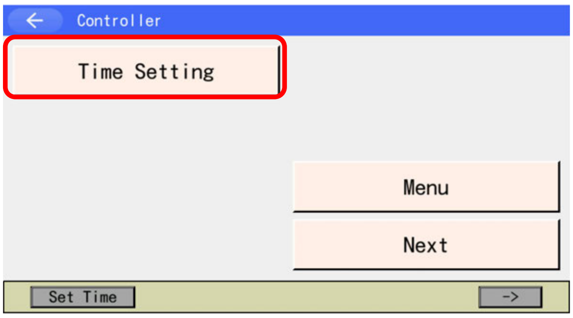
* If case (1) 1) and (2) 1) occur at the same time, you need to first execute Driver Power Recovery Request. After completing it, execute the Action Pause Release Request.

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 :

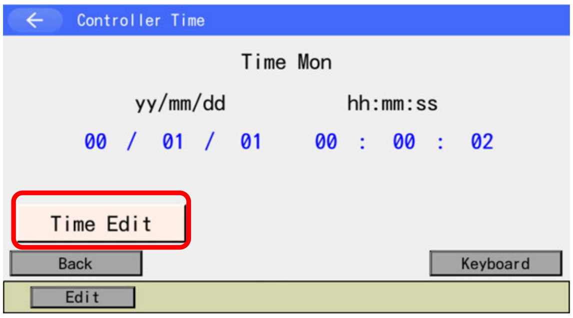
- XSEL-R/S, RX/SX, RXD/SXD (MAIN Application from Version 0.01)
- XSEL-RA/SA, RAX/SAX, RAXD/SAXD (MAIN Application from Version 0.01)
- TTA (MAIN Application from Version 0.01)
- MSEL-PCX/PGX/PC/PG/PCF/PGF (MAIN Application from Version 0.01)
- RSEL (MAIN Application from Version 0.01)
- XSEL2-T/TX (MAIN 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.

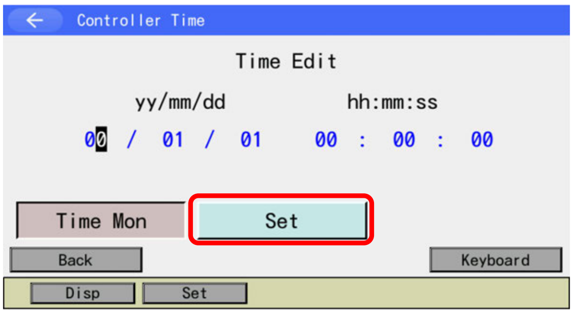


yy/mm/dd hh:mm:ss
00 / 01 / 01 00 : 00 : 02

Controller clock is displayed.

Touch Time Edit button to move to the edit screen.

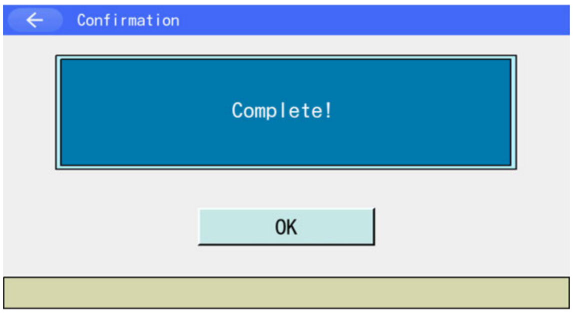
Touch Time Edit button.



yy/mm/dd hh:mm:ss
00 / 01 / 01 00 : 00 : 00

The controller clock can be edited.

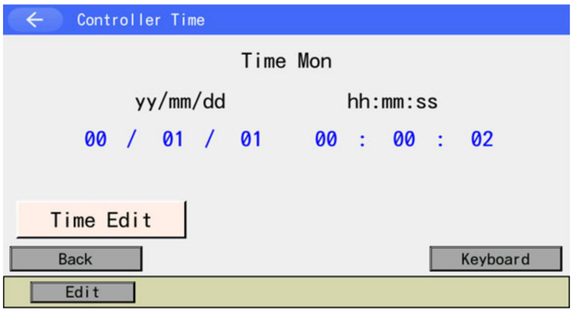
1. Input the time on Keyboard.
2. Touch Set button.



Complete!

The display turns to the confirmation screen when the controller clock setting is finished.

Touch OK button to return to the clock display screen.



Time Mon

yy/mm/dd hh:mm:ss

00 / 01 / 01 00 : 00 : 02

The display returns to this screen.

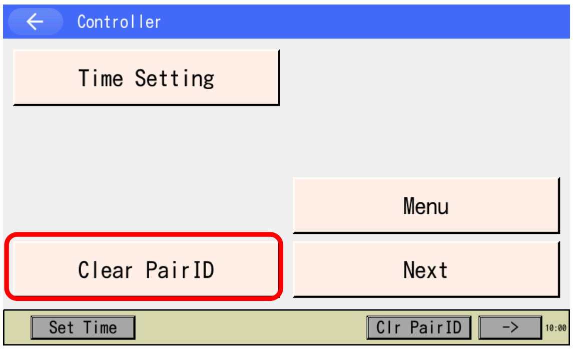
Touch Back button to return to Controller Menu screen.

15.14 Clear PairID

The controller possesses a feature to output an absolute error when it checks the encoder ID 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 ID (pairing ID).

This feature is available only when the battery-less absolute encoder is connected and the pairing ID clear feature is activated.

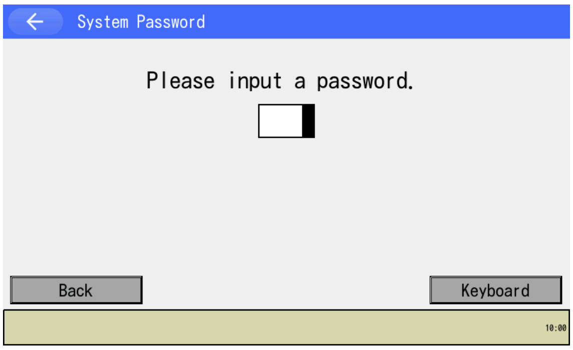
* This feature is the same as the pairing ID clear feature in the maintenance information.



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.

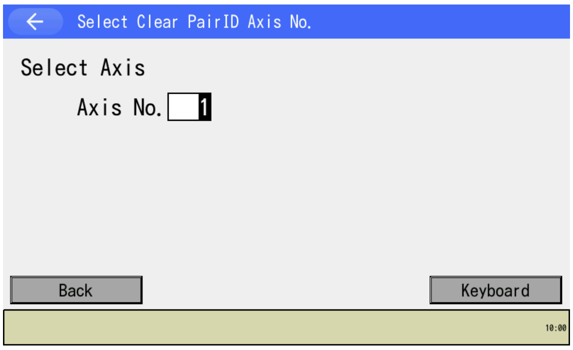
* The button will not be shown when the pairing ID clear feature is not activated.



Please input a password.

The password input window appears.
Input 5119 on the software numeric keys.

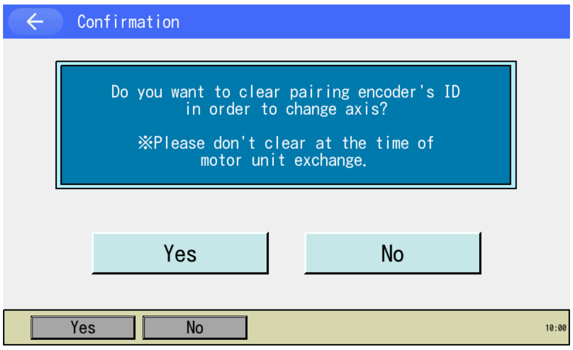
* Password will be kept valid once it has been set up until the connection gets established again or the power gets rebooted.



Select Axis

Axis No. 1

Input the axis number that you would like to have pairing ID clear conducted in Axis No. box using the software numeric keys.

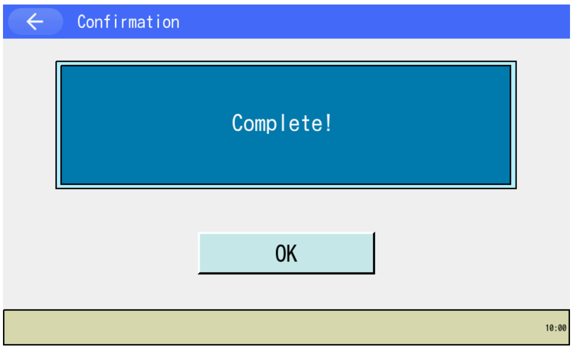


Confirmation

Do you want to clear pairing encoder's ID in order to change axis?

※Please don't clear at the time of motor unit exchange.

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.

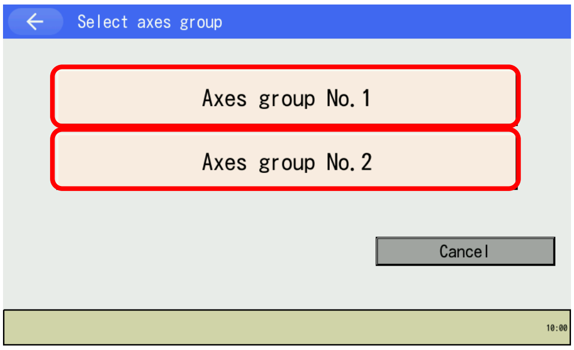


Confirmation

Complete!

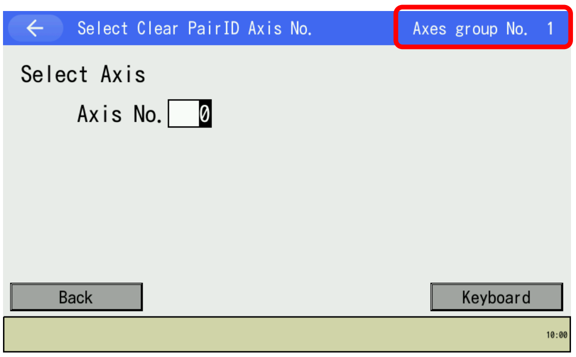
Once the process is completed, the screen changes to the figure shown in the left. Touch OK button to go back to axis number select screen.

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 window 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.



Select axes group

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



Select Clear PairID Axis No.

Axes group No. 1

Select Axis

Axis No. 0

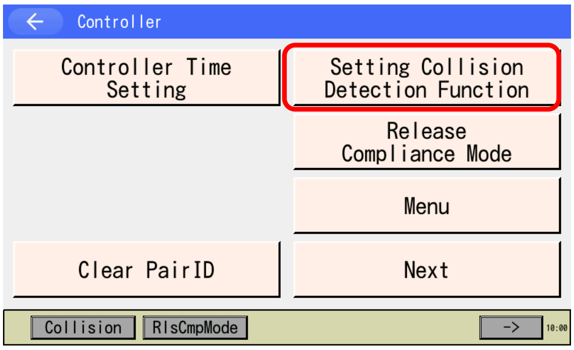
Select Clear Pair ID Axis No. window appears.

* 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.

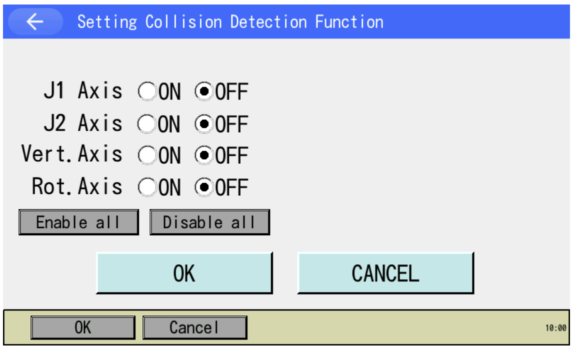
This feature is valid only when the controller and robot support the collision detection function and also the collision detection function is enabled.



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.

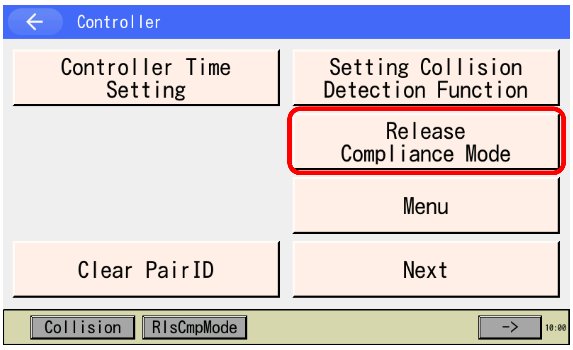
* Touch Enable all / Disable all buttons and radio button select can be switched over in SCARA unit.

* 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.

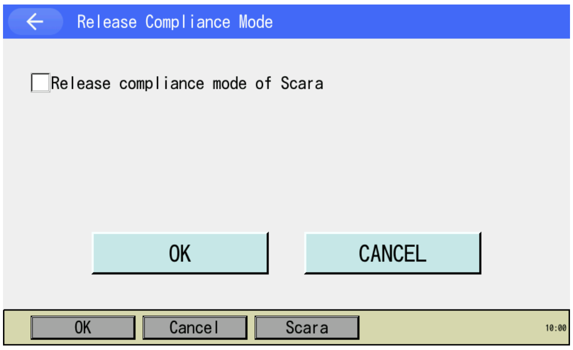
This feature is valid only when the controller and robot support the compliance control feature and also the compliance control function is enabled.



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.



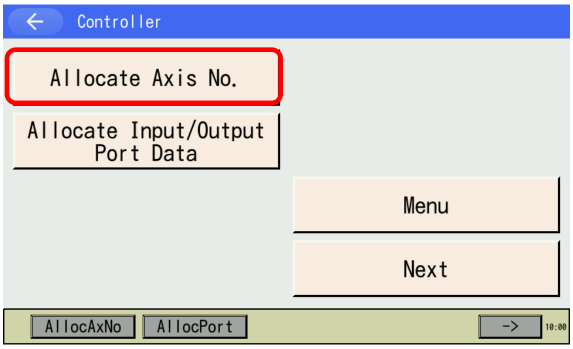
☐Release compliance mode of Scara

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

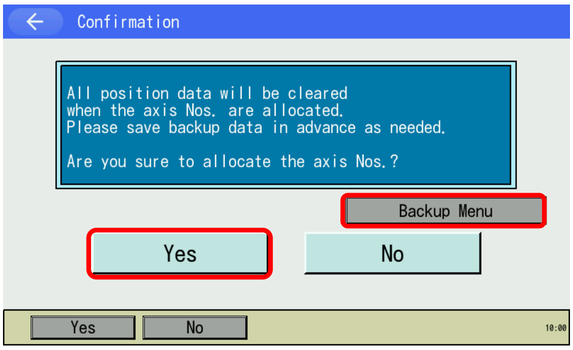
It is necessary to have an assignment of the axis numbers after a change to the unit construction for RSEL and XSEL2-T/TX. Assign the axis numbers using this feature.



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.



All position data will be cleared
when the axis Nos. are allocated.
Please save backup data in advance as needed.

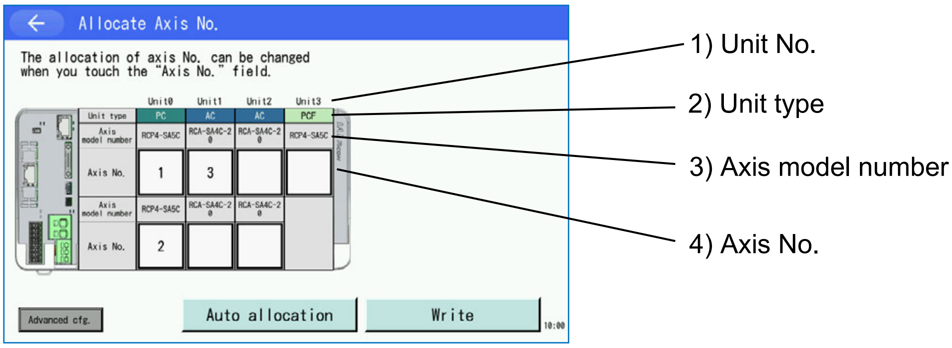
Are you sure to allocate the axis Nos.?

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.

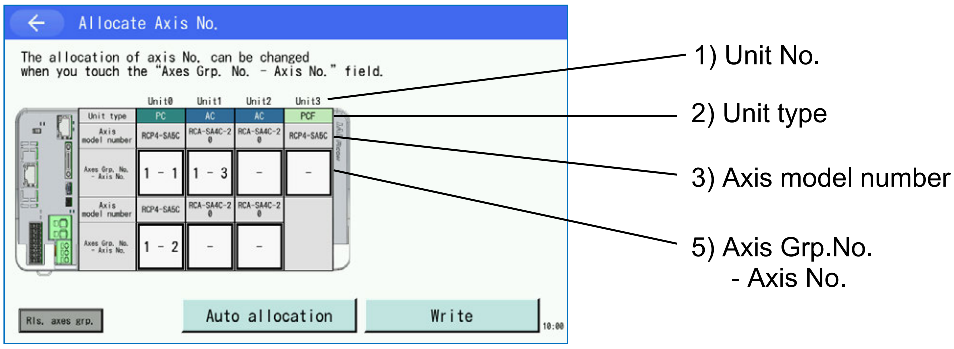
Once the axis number assignment is carried out, the current position data will be all cleared.

[Displayed Items in Allocate Axis No. Window (RSEL)]



The allocation of axis No. can be changed when you touch the "Axis No." field.

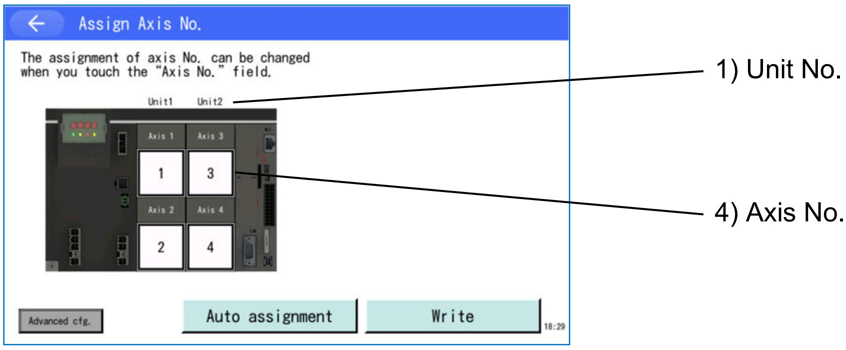
	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axis No.	1	3		
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axis No.	2			



The allocation of axis No. can be changed when you touch the "Axes Grp. No. - Axis No." field.

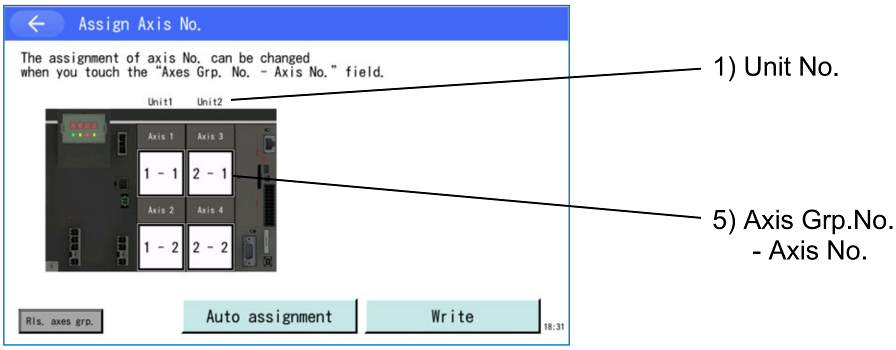
	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axes Grp. No. - Axis No.	1 - 1	1 - 3	-	-
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axes Grp. No. - Axis No.	1 - 2	-	-	

[Displayed Items in Allocate Axis No. Window (XSEL2-T/TX)]



The assignment of axis No. can be changed when you touch the "Axis No." field.

Unit1	Unit2
Axis 1	Axis 3
1	3
Axis 2	Axis 4
2	4



The assignment of axis No. can be changed when you touch the "Axes Grp. No. - Axis No." field.

Unit1	Unit2
Axis 1	Axis 3
1 - 1	2 - 1
Axis 2	Axis 4
1 - 2	2 - 2

* 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.

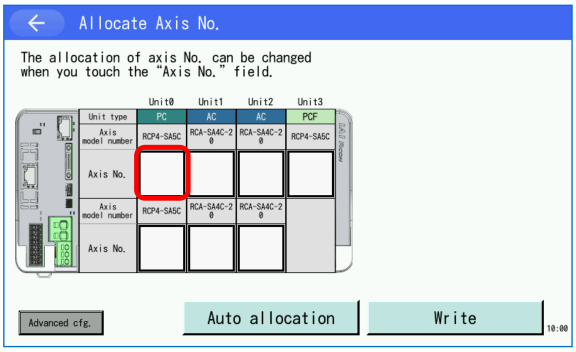
5) Axes Group Number - Axis Number Input Box
   In the figure shows the position of the connectors to connect actuators.
   The one on the top is for the 1st axis and bottom for the 2nd axis.
   Input the axes group number - axis number to assign to an actuator.
   The axis group number setting range 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

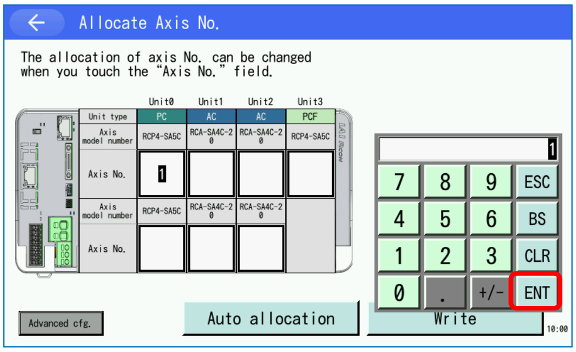
[Assignment Change by Direct Input of Axis Number]

When it is preferred to indicate an axis number to assign to an actuator expressly, follow the procedures below to assign an axis number.


Allocate Axis No.

The allocation of axis No. can be changed when you touch the "Axis No." field.

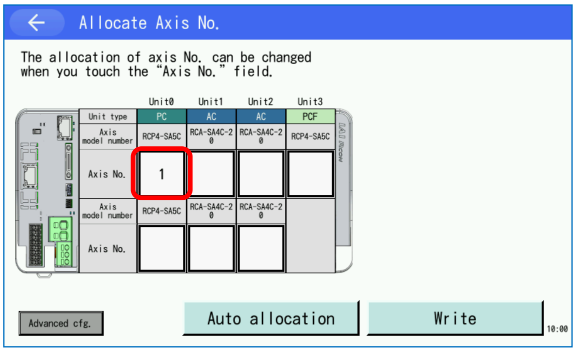
Touch in an input box for an axis number that you require to have an assignment change. A keyboard appears.


Allocate Axis No.

The allocation of axis No. can be changed when you touch the "Axis No." field.

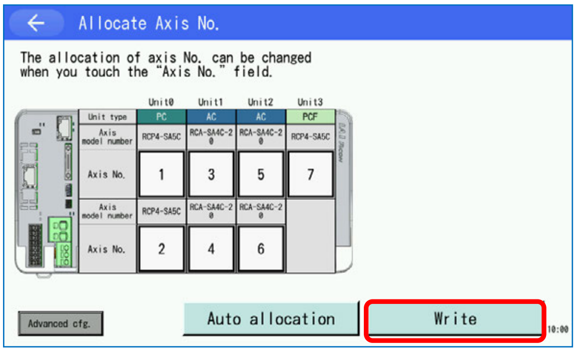
Input an axis number and touch the ENT button. The keyboard closes.

If it is required to cancel the assignment, touch CLR and ENT.


Allocate Axis No.

The allocation of axis No. can be changed when you touch the "Axis No." field.

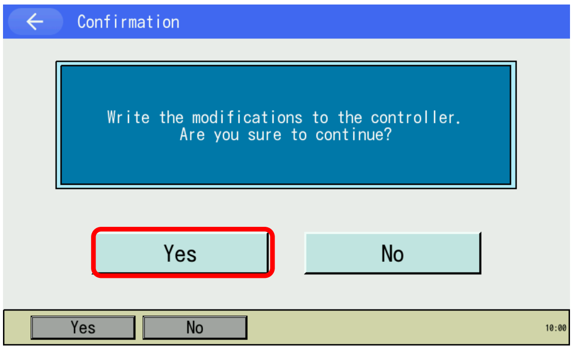
The value you input shows up in the axis number input box.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axis No.	1	3	5	7
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axis No.	2	4	6	

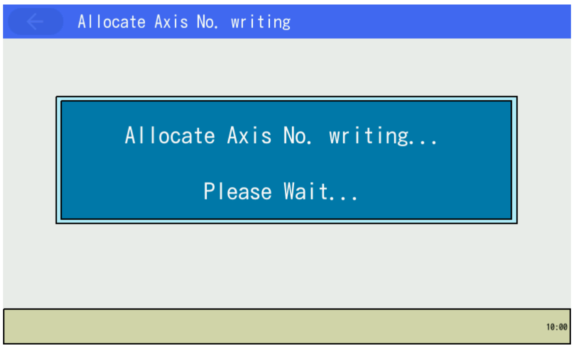
Have an input to all the points that you require to make assignment changes, and then touch the Write button. A confirmation window shows up.



Write the modifications to the controller.
Are you sure to continue?

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.

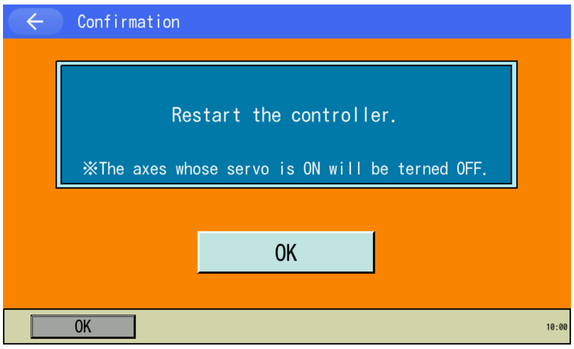


Allocate Axis No. writing...

Please Wait...

While in the process of axis number assignment writing, "Allocate Axis No. Writing..." flashes.

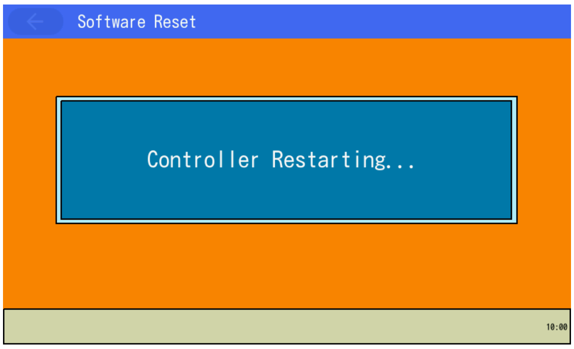
Never turn off the power to the Controller at this time.



Restart the controller.

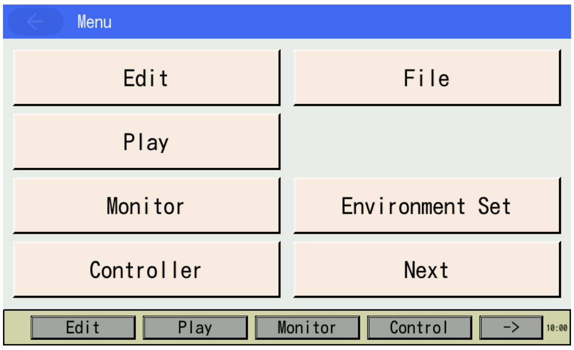
※The axes whose servo is ON will be terned OFF.

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.



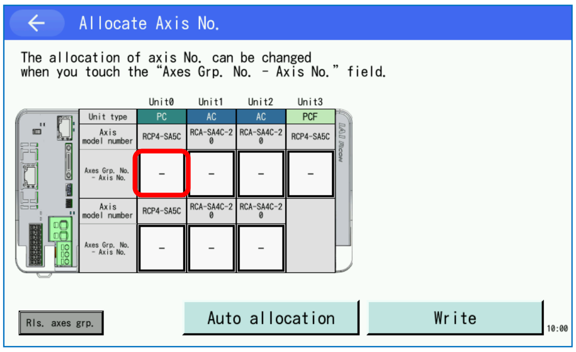
Controller Restarting...

While in the process of controller reboot, “Controller Restarting...” flashes.



Once the reboot is complete, the main menu will appear.

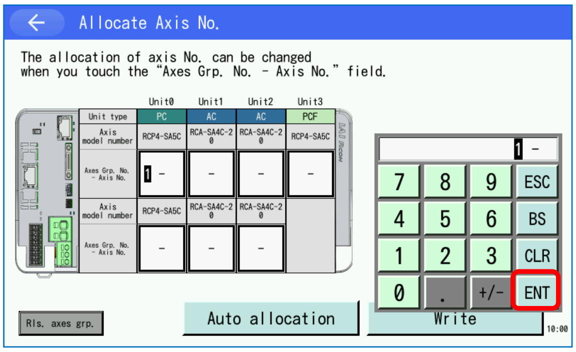
When the axis number assignment mode is the advanced setting (axis number assignment with using axes groups), it is necessary to input an axes group number and axis number in a row in the axis number input.
(Refer to [15.17.2 Axis Number Assignment Mode Switchover] for how to switch over the axis number assignment mode.)



The allocation of axis No. can be changed when you touch the “Axes Grp. No. - Axis No.” field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axes Grp. No. - Axis No.	-	-	-	-
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axes Grp. No. - Axis No.	-	-	-	

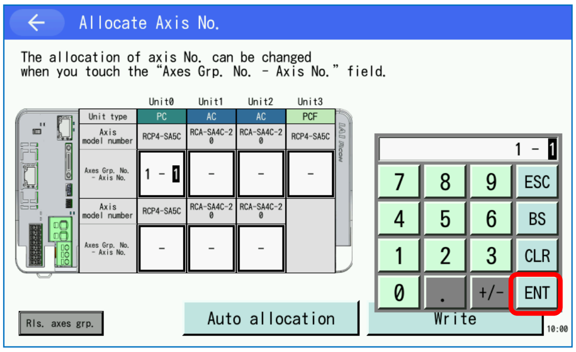
Touch an input box for Axes Grp. No. - Axis No. that you require to have an assignment change. A keyboard appears.



The allocation of axis No. can be changed when you touch the "Axes Grp. No. - Axis No." field.

Input an axes group number and touch the ENT button.
The cursor moves to the axis number input position.

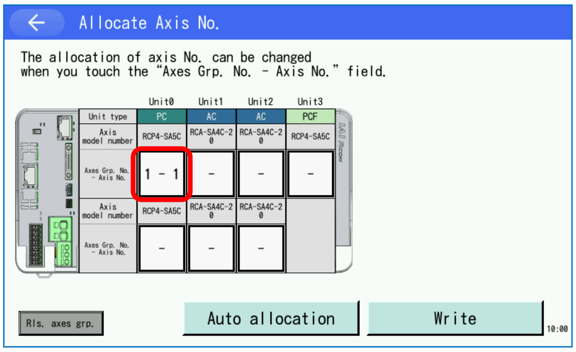
If it is required to cancel the assignment, touch CLR and ENT.



The allocation of axis No. can be changed when you touch the "Axes Grp. No. - Axis No." field.

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.



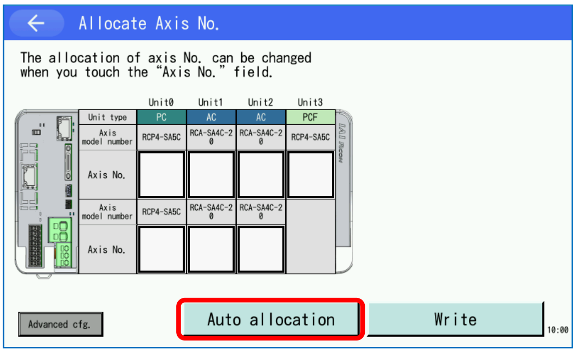
The allocation of axis No. can be changed when you touch the "Axes Grp. No. - Axis No." field.

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]

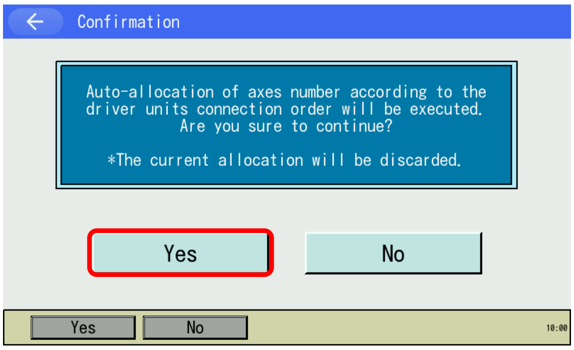
If you require to have an automatic input of an axis number to be assigned to an actuator, follow the procedures below to assign axis numbers.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-2 0	RCA-SA4C-2 0	RCP4-SA5C
Axis No.				
Axis model number	RCP4-SA5C	RCA-SA4C-2 0	RCA-SA4C-2 0	
Axis No.				

Touch the Auto allocation button. A confirmation window shows up.



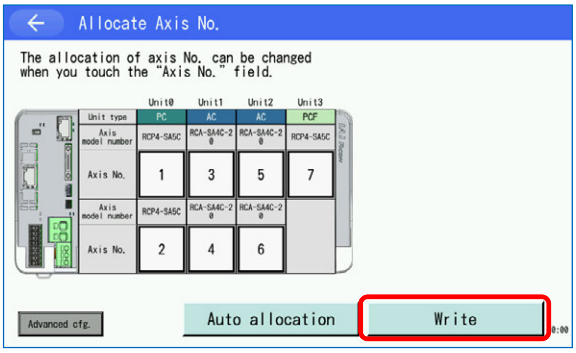
Auto-allocation of axes number according to the driver units connection order will be executed.
Are you sure to continue?

*The current allocation will be discarded.

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.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-2 0	RCA-SA4C-2 0	RCP4-SA5C
Axis No.	1	3	5	7
Axis model number	RCP4-SA5C	RCA-SA4C-2 0	RCA-SA4C-2 0	
Axis No.	2	4	6	

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.

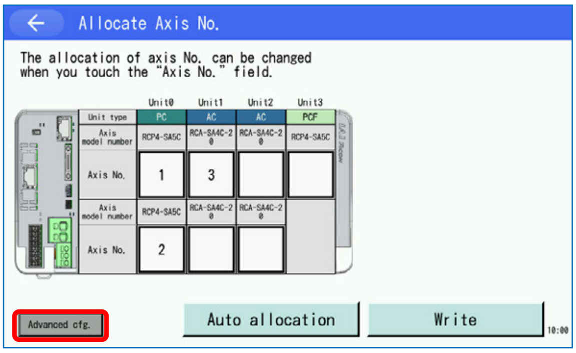
- Limit to the input values of axis numbers for combined axes (Refer to [15.17.3 Axis Number Assignment for Combined Axes])
- Exclusion of combination axes that are short of constructed axe

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”

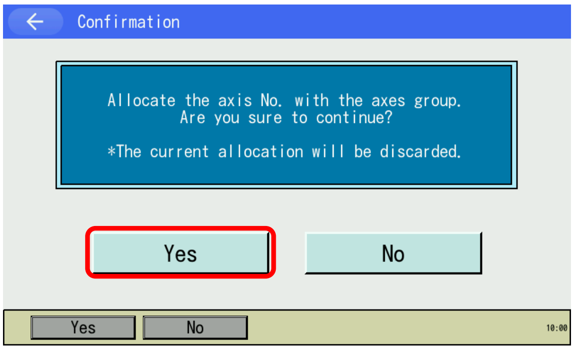


Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axis No.” field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axis No.	1	3		
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axis No.	2			

If the axis number assignment mode is in the normal setting, touch the Advanced cfg. button. A confirmation window shows up.



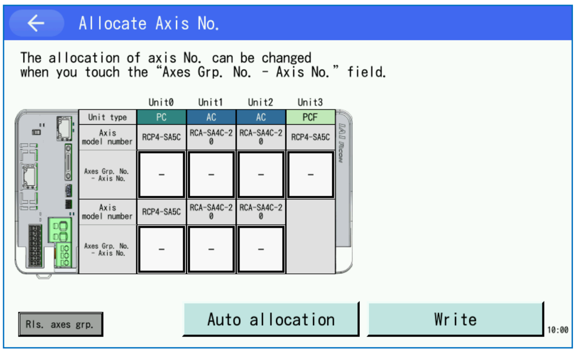
Confirmation

Allocate the axis No. with the axes group.
Are you sure to continue?

*The current allocation will be discarded.

Touch the Yes button.

Touch the Yes button and the current assignment information will be discarded.



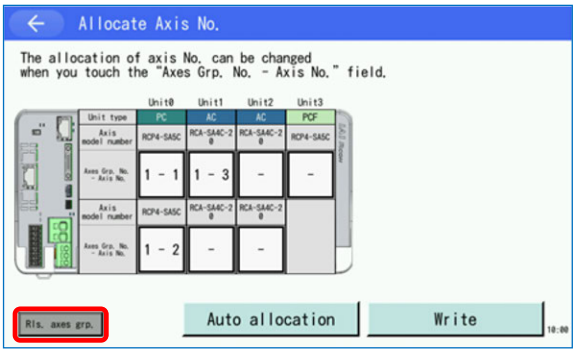
Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axes Grp. No. - Axis No.” field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axes Grp. No. - Axis No.	-	-	-	-
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axes Grp. No. - Axis No.	-	-	-	

The axis number assignment mode switches over to the advanced setting (axis number assignment with using axes groups)

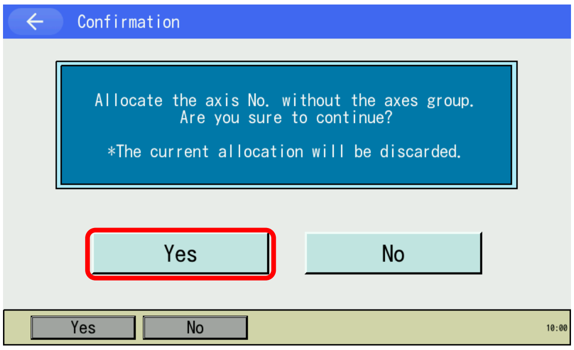
In order to switch the axis number assignment mode back to the normal setting from the advanced setting, follow the procedures below.



The allocation of axis No. can be changed when you touch the "Axes Grp. No. - Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axes Grp. No. - Axis No.	1 - 1	1 - 3	-	-
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axes Grp. No. - Axis No.	1 - 2	-	-	

Touch the Rls. axes grp. button. A confirmation window shows up.

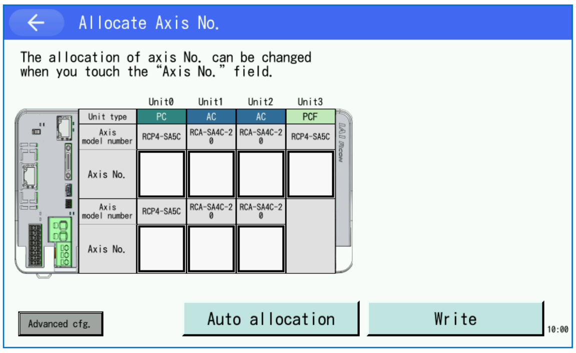


Allocate the axis No. without the axes group.
Are you sure to continue?

*The current allocation will be discarded.

Touch the Yes button.

Touch the Yes button and the current assignment information will be discarded.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	AC	AC	PCF
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	RCP4-SA5C
Axis No.				
Axis model number	RCP4-SA5C	RCA-SA4C-20	RCA-SA4C-20	
Axis No.				

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

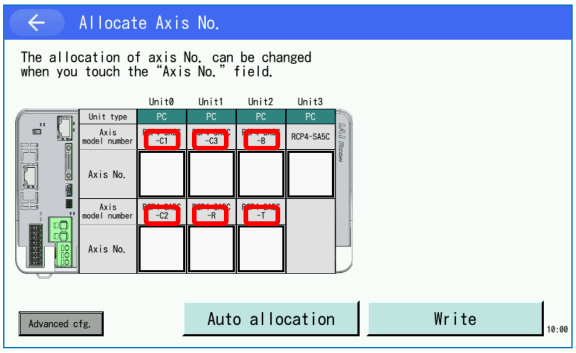
For RSEL, there is a limit to the assigned axis numbers for the combined axes such as Orthogonal 6-axis and wrist units. Make sure to consider the limit of the axis number input when inputting an axis number.
(Automatic assignment of axis numbers considering the limit should be performed when the automatic 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.

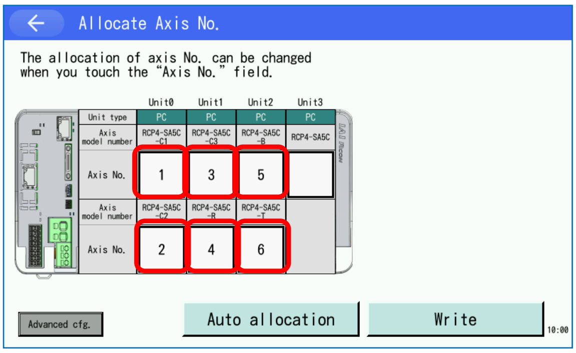
* It is necessary to have C1-axis, C2-axis, C3-axis, R-axis, B-axis and T-axis existed.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	-C1	-C3	-B	RCP4-SA5C
Axis No.				
Axis model number	-C2	-R	-T	
Axis No.				

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.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	RCP4-SA5C -C1	RCP4-SA5C -C3	RCP4-SA5C -B	RCP4-SA5C
Axis No.	1	3	5	
Axis model number	RCP4-SA5C -C2	RCP4-SA5C -R	RCP4-SA5C -T	
Axis No.	2	4	6	

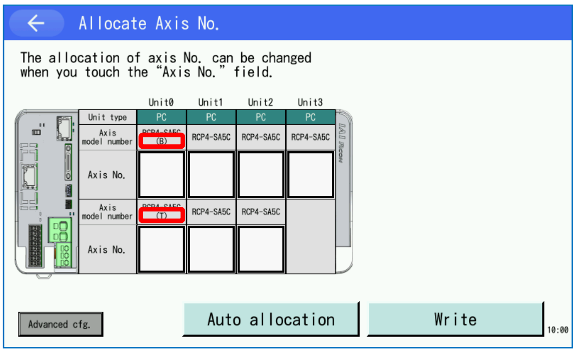
Assign C1 = 1, C2 = 2, C3 = 3, R = 4, B = 5, T = 6.

* 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.

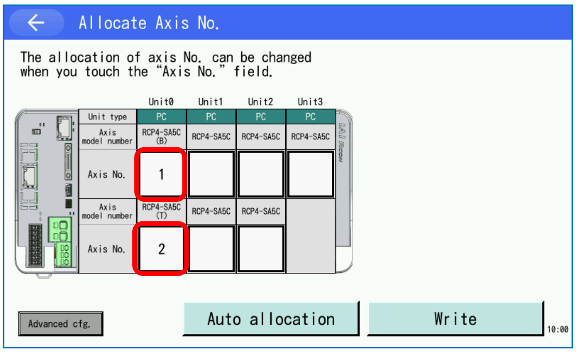


Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axis No.” field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	RCP4-SA5C (B)	RCP4-SA5C	RCP4-SA5C	RCP4-SA5C
Axis No.				
Axis model number	RCP4-SA5C (T)	RCP4-SA5C	RCP4-SA5C	
Axis No.				

For the driver unit of the wrist unit, the constructing axes information ((B) and (T)) should be displayed after the axis model code.



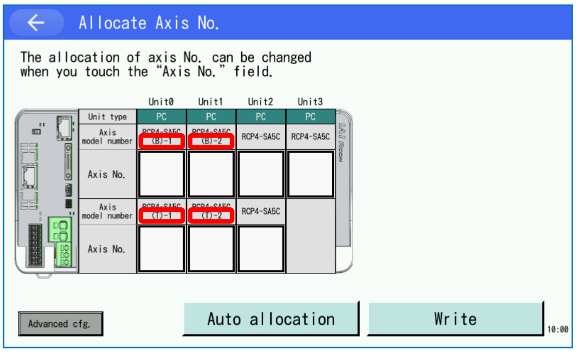
Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axis No.” field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	RCP4-SA5C (B)	RCP4-SA5C	RCP4-SA5C	RCP4-SA5C
Axis No.	1			
Axis model number	RCP4-SA5C (T)	RCP4-SA5C	RCP4-SA5C	
Axis No.	2			

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.



Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axis No.” field.

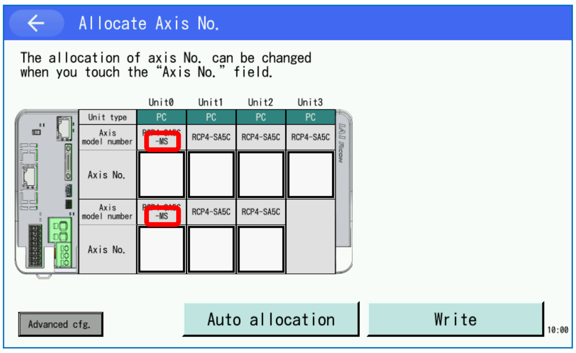
	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	RCP4-SA5C (B)-1	RCP4-SA5C (B)-2	RCP4-SA5C	RCP4-SA5C
Axis No.				
Axis model number	RCP4-SA5C (T)-1	RCP4-SA5C (T)-2	RCP4-SA5C	
Axis No.				

* 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

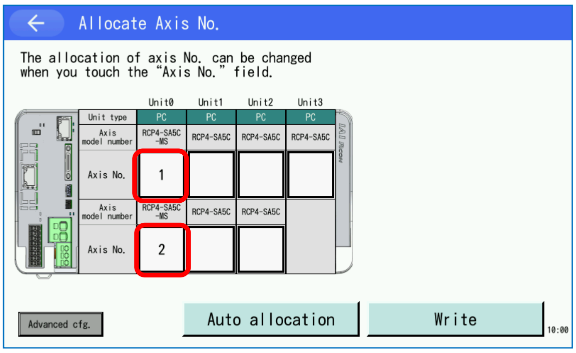
Axis number assignment for the multi-slider should be performed following the procedures below.

* It is necessary to have axes for all multi-slider units existed.


Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axis No.” field.

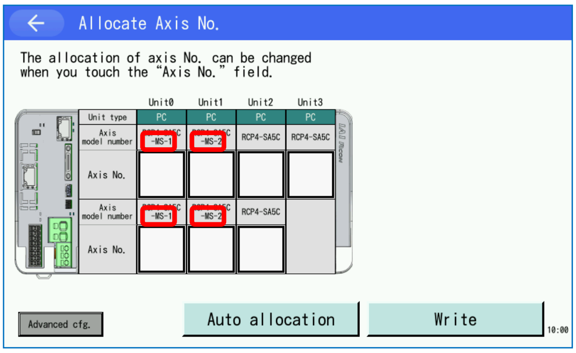
For the driver unit of the multi-slider, the constructing axes information (MS) should be displayed after the axis model code.


Allocate Axis No.

The allocation of axis No. can be changed when you touch the “Axis No.” field.

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.)


Allocate Axis No.

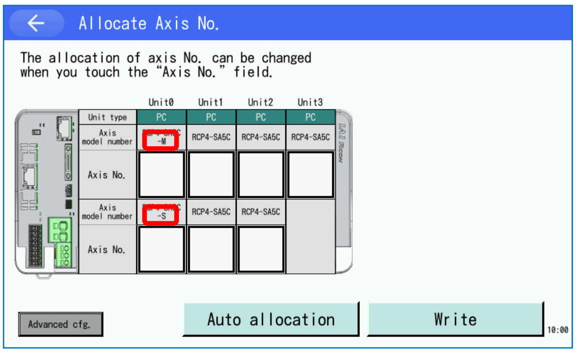
The allocation of axis No. can be changed when you touch the “Axis No.” field.

* 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.



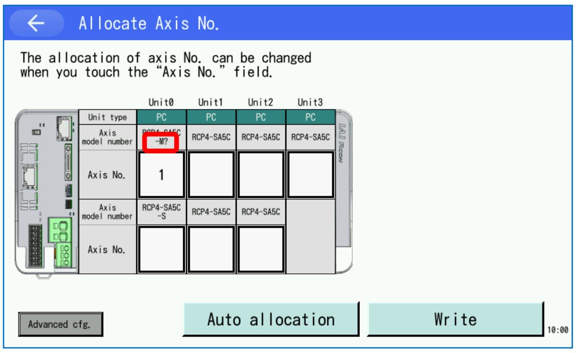
Allocate Axis No.

The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	-M	RCP4-SA5C	RCP4-SA5C	RCP4-SA5C
Axis No.				
Axis model number	-S	RCP4-SA5C	RCP4-SA5C	
Axis No.				

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.



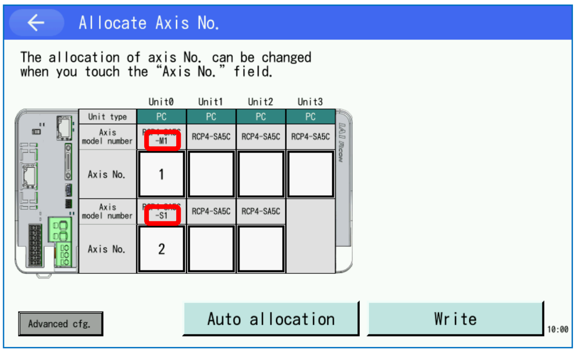
Allocate Axis No.

The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	-M?	RCP4-SA5C	RCP4-SA5C	RCP4-SA5C
Axis No.	1			
Axis model number	RCP4-SA5C -S	RCP4-SA5C	RCP4-SA5C	
Axis No.				

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.



Allocate Axis No.

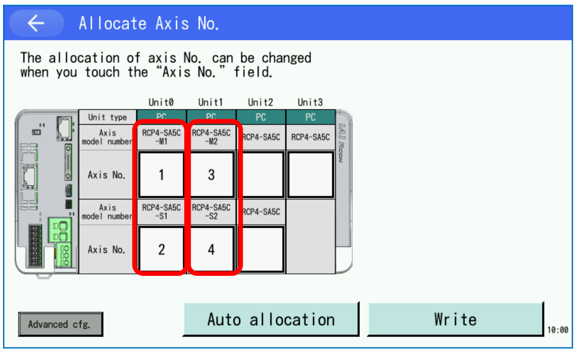
The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	-M1	RCP4-SA5C	RCP4-SA5C	RCP4-SA5C
Axis No.	1			
Axis model number	-S1	RCP4-SA5C	RCP4-SA5C	
Axis No.	2			

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.



The allocation of axis No. can be changed when you touch the "Axis No." field.

	Unit0	Unit1	Unit2	Unit3
Unit type	PC	PC	PC	PC
Axis model number	RCP4-SA5C-M1	RCP4-SA5C-M2	RCP4-SA5C	RCP4-SA5C
Axis No.	1	3		
Axis model number	RCP4-SA5C-S1	RCP4-SA5C-S2	RCP4-SA5C	
Axis No.	2	4		

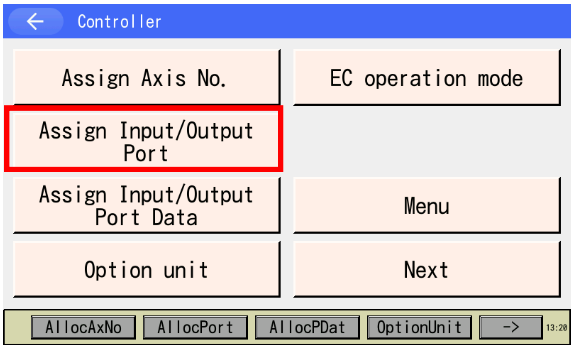
* Shown in the figure on the left is a condition that two combinations of synchronized axes are established.
(It is the combination that the same identification number is constructed)

* 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.

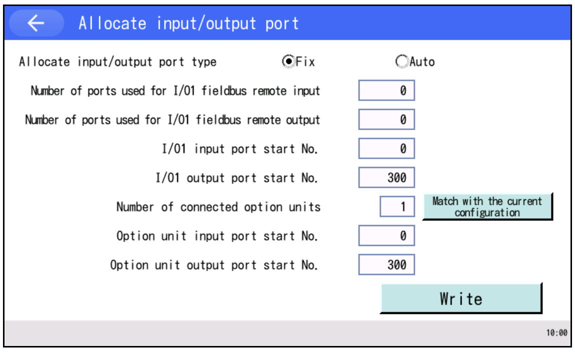


Touch the Assign Input/Output Port button in the controller menu window to show the input and output port assignment window.

* 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.

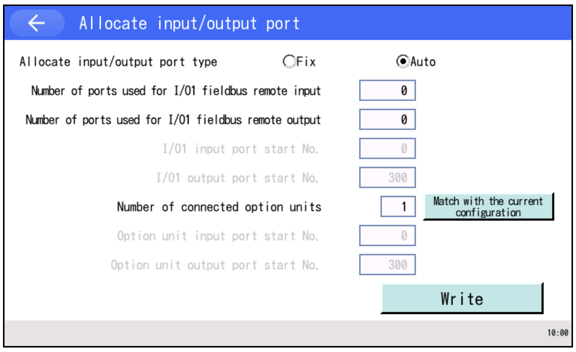
The contents to be displayed should differ depending on connected controllers.

[Displayed Window for RSEL]


Allocate input/output port
Match with the current configuration
Write
10:00

Allocate input/output port type ● Fix ○ Auto
Number of ports used for I/01 fieldbus remote input 0
Number of ports used for I/01 fieldbus remote output 0
I/01 input port start No. 0
I/01 output port start No. 300
Number of connected option units 1
Option unit input port start No. 0
Option unit output port start No. 300

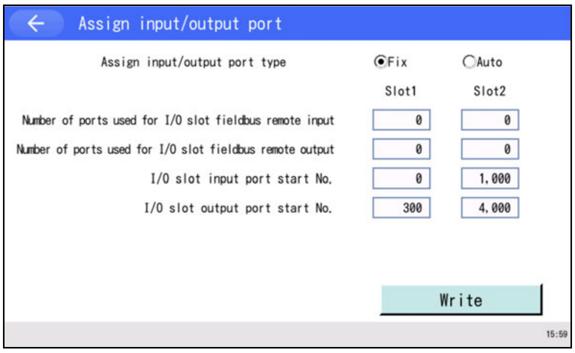
Allocate input/output port type:
Fixed


Allocate input/output port
Match with the current configuration
Write
10:00

Allocate input/output port type ○ Fix ● Auto
Number of ports used for I/01 fieldbus remote input 0
Number of ports used for I/01 fieldbus remote output 0
I/01 input port start No. 0
I/01 output port start No. 300
Number of connected option units 1
Option unit input port start No. 0
Option unit output port start No. 300

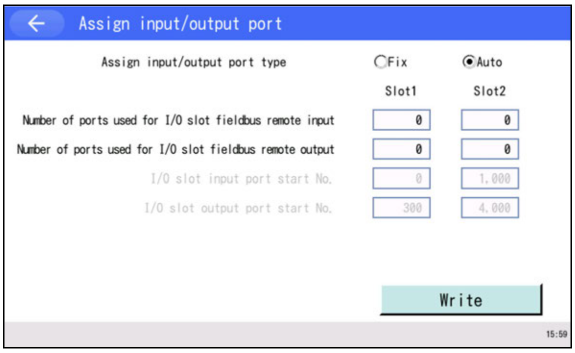
Allocate input/output port type:
Automatic

[Displayed Window for XSEL2-T/TX]



Assign input/output port type	● Fix	○ Auto
	Slot1	Slot2
Number of ports used for I/0 slot fieldbus remote input	0	0
Number of ports used for I/0 slot fieldbus remote output	0	0
I/0 slot input port start No.	0	1,000
I/0 slot output port start No.	300	4,000

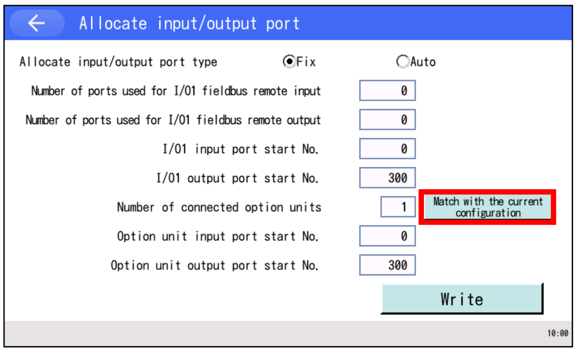
Assign input/output port type:
Fixed



Assign input/output port type	○ Fix	● Auto
	Slot1	Slot2
Number of ports used for I/0 slot fieldbus remote input	0	0
Number of ports used for I/0 slot fieldbus remote output	0	0
I/0 slot input port start No.	0	1,000
I/0 slot output port start No.	300	4,000

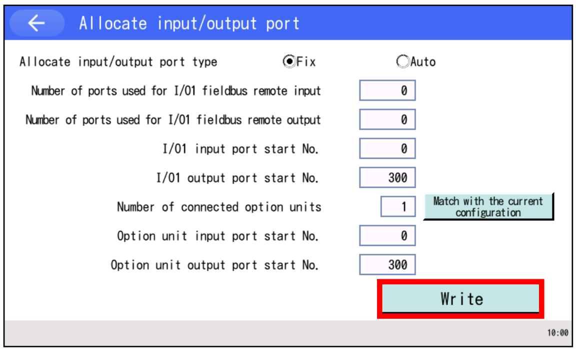
Assign input/output port type:
Automatic

- 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".


Allocate input/output port
Match with the current configuration
Write
10:00

Allocate input/output port type ● Fix ○ Auto
Number of ports used for I/O1 fieldbus remote input 0
Number of ports used for I/O1 fieldbus remote output 0
I/O1 input port start No. 0
I/O1 output port start No. 300
Number of connected option units 1
Option unit input port start No. 0
Option unit output port start No. 300

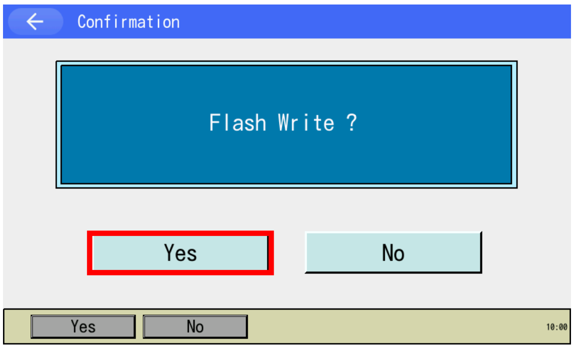
For the number of connected option units, touch the Match with the current configuration button and the number of unit currently connected should automatically get input.


Allocate input/output port
Match with the current configuration
Write
10:00

Allocate input/output port type ● Fix ○ Auto
Number of ports used for I/O1 fieldbus remote input 0
Number of ports used for I/O1 fieldbus remote output 0
I/O1 input port start No. 0
I/O1 output port start No. 300
Number of connected option units 1
Option unit input port start No. 0
Option unit output port start No. 300

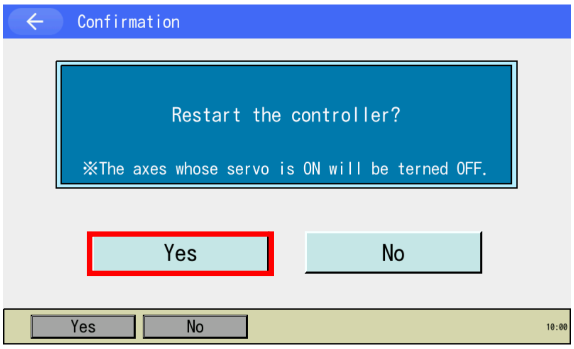
Touch the Write button after all the settings inputs are done, and the data should get transferred to the controller.

Return to the flash ROM writing window by using such as the ← button.



Flash Write ?

Touch Yes button to start flash ROM writing.



Restart the controller?

※The axes whose servo is ON will be terned OFF.

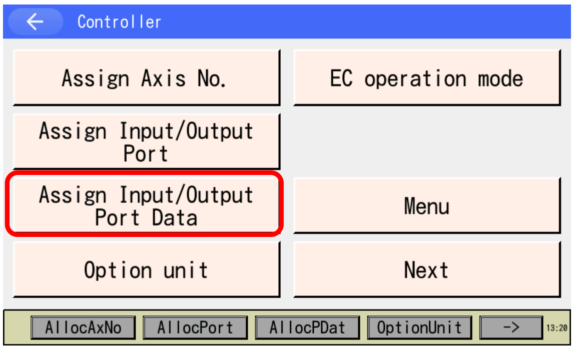
After finishing the flash ROM writing, the screen should switch to the controller rebooting confirmation window.
Touch the Yes button in order to activate the changed settings to allow the reboot.

Any axis with the servo being on should get the servo turned off.

15.19 Input/Output Port Data Assignment

(for applicable models only)

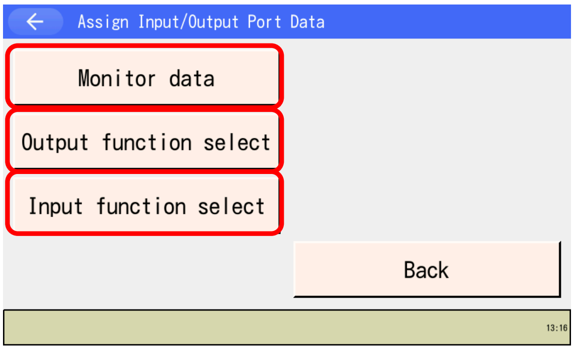
Conduct the feature assignment and port assignment for monitor data output, output feature select and input feature select.



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.

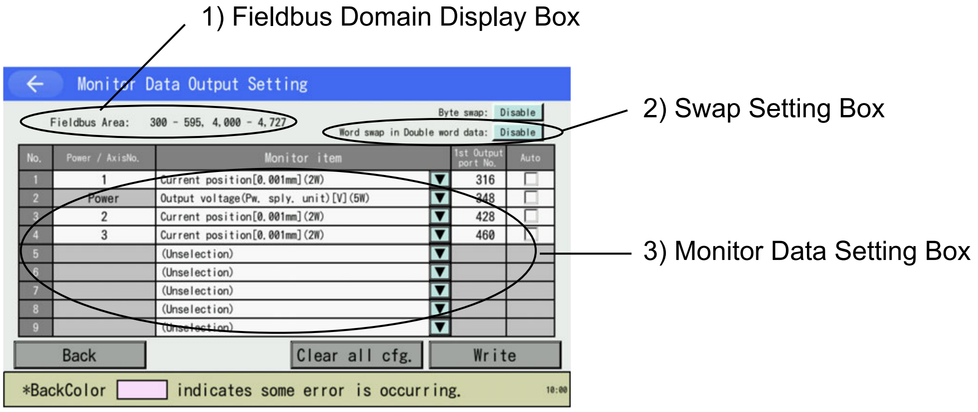


Touch a button that you require to activate.

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 window. (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 Window]



1) Fieldbus Domain Display Box

2) Swap Setting Box

3) Monitor Data Setting Box

Monitor Data Output Setting

Fieldbus Area: 300 - 595, 4,000 - 4,727

Byte swap: Disable

Word swap in Double word data: Disable

No.	Power / AxisNo.	Monitor item	1st Output port No.	Auto
1	1	Current position[0.001mm](2W) ▼	316	☐
2	Power	Output voltage(Pw. sply. unit)[V](5W) ▼	348	☐
3	2	Current position[0.001mm](2W) ▼	428	☐
4	3	Current position[0.001mm](2W) ▼	460	☐
5		(Unselection) ▼		
6		(Unselection) ▼		
7		(Unselection) ▼		
8		(Unselection) ▼		
9		(Unselection) ▼		

*BackColor 🟪 indicates some error is occurring.

1) Fieldbus Domain 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 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)

Power / EC / AxisNo. : 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”, 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 feature (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 axis status monitor items appear when axis numbers are assigned with the axis number assignment feature.

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 feature.
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.

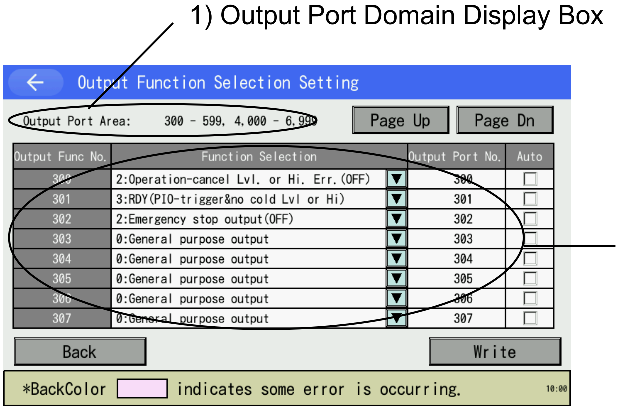
After setting input is complete, touch the Write button to transfer the settings to the controller. Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write 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 Feature Select Setting

Select a feature to be assigned to the output port. Also, set an output port number to assign the feature.

[Displayed Items in Output Feature Select Setting Window]


1) Output Port Domain Display Box

2) Output Feature Select Setting Box

Output Function Selection Setting

Output Port Area: 300 - 599, 4,000 - 6,999

Output Func No.	Function Selection	Output Port No.	Auto
300	2:Operation-cancel Lvl. or Hi. Err.(OFF) ▼	300	☐
301	3:RDY(PIO-trigger&no cold Lvl or Hi) ▼	301	☐
302	2:Emergency stop output(OFF) ▼	302	☐
303	0:General purpose output ▼	303	☐
304	0:General purpose output ▼	304	☐
305	0:General purpose output ▼	305	☐
306	0:General purpose output ▼	306	☐
307	0:General purpose output ▼	307	☐

*BackColor 🟪 indicates some error is occurring.

1) Output Port Domain Display Box
   This shows the range of output ports. The output port number to assign a feature should be selected in this range.

2) Output Feature Select Setting Box
   Select/set the feature to be assigned to the output port.

   Output Func No. : Output feature number is shown. (300 to 315, 300 (Area 2) to 315 (Area 2))

   Function Selection : Select/set the feature to be assigned to the output port.
   Touch the ▼ button and the features available for setting are shown in a list. Touch the feature that you require to assign to select it.
   The features available for setting may differ depending on output feature numbers.

   Output Port No. : Set an output port number to assign a feature. Make sure not to have the output port numbers duplicated with another output feature number or an output in use for another feature.
   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 feature 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 the 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 feature number one before is in error or feature assignment not being done, the search should be conducted from the port number next to a port number in use for the output feature number another one before. In case there is no valid output feature 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 feature numbers will switch.

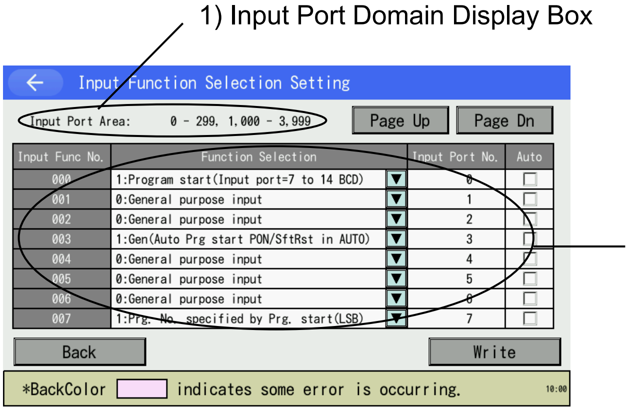
After setting input is complete, touch the Write button to transfer the settings to the controller. Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

Touch the Back button and the screen goes back to the previous.

15.19.3 Input Feature Select Setting

Select a feature to be assigned to the input port. Also, set an input port number to assign the feature.

[Displayed Items in Input Feature Select Setting Window]


1) Input Port Domain Display Box

2) Input Feature Select Setting Box

Input Port Area: 0 - 299, 1,000 - 3,999

Input Func No.	Function Selection	Input Port No.	Auto
000	1:Program start(Input port=7 to 14 BCD) ▼	0	☐
001	0:General purpose input ▼	1	☐
002	0:General purpose input ▼	2	☐
003	1:Gen(Auto Prg start PON/SftRst in AUTO) ▼	3	☐
004	0:General purpose input ▼	4	☐
005	0:General purpose input ▼	5	☐
006	0:General purpose input ▼	6	☐
007	1:Prg. No. specified by Prg. start(LSB) ▼	7	☐

*BackColor ▨ indicates some error is occurring.

1) Input Port Domain Display Box
This shows the range of input ports. The input port number to assign a feature should be selected in this range.

2) Input Feature Select Setting Box
Input feature number is shown. (000 to 015)

Input Func No. : Input feature number is shown. (000 to 015)

Function Selection : Select/set the feature to be assigned to the input port.
Touch the ▼ button and the features available for setting are shown in a list. Touch the feature that you require to assign to select it.
The features available for setting may differ depending on input feature numbers.

Input Port No. : Set an input port number to assign a feature. Make sure not to have the input port numbers duplicated with another input feature number or an input in use for another feature.
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 feature 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 the 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 feature number one before is in error or feature assignment not being done, the search should be conducted from the port number next to a port number in use for the output feature number another one before. In case there is no valid output feature 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 feature numbers will switch.

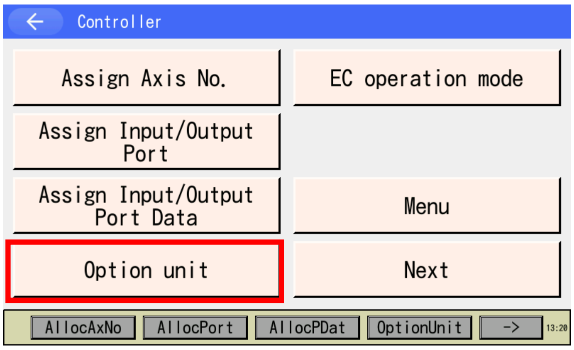
After setting input is complete, touch the Write button to transfer the settings to the controller. Once the writing is started, when going back to the menu window with the Back button, a confirmation of flash ROM writing and software reset should come up. In order to reflect the written data, write to the flash ROM and conduct the software reset.

Touch the Back button and the screen goes back to the previous.

15.20 Option Unit Setting

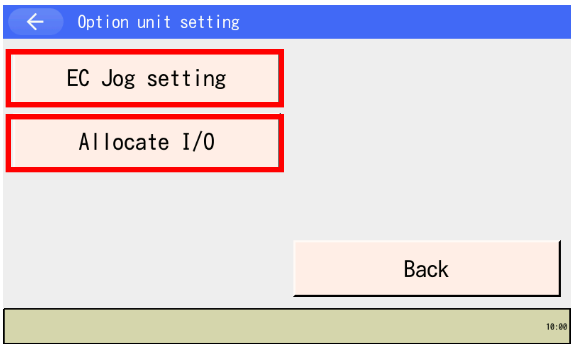
(only for applicable models and the feature is enabled)

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.

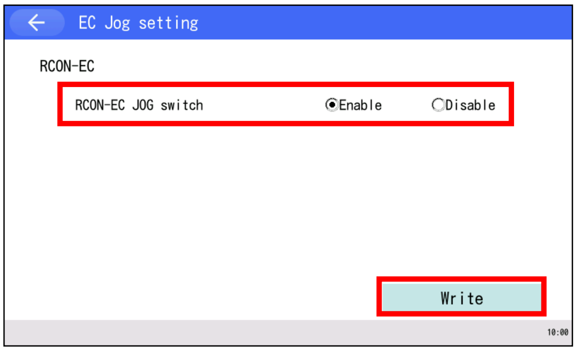


If RCON-EC is connected, the option unit setting menu window should be displayed.
Touch a button of the feature that you would establish the settings.

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.



RCON-EC

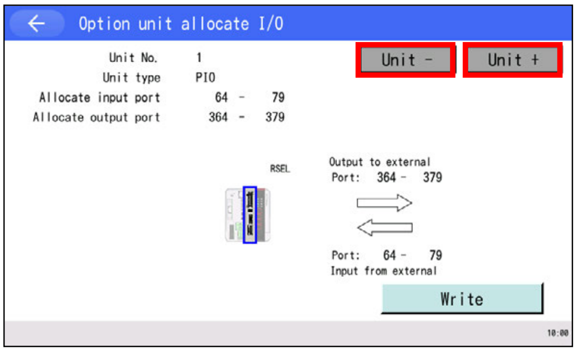
RCON-EC JOG switch ● Enable ○ Disable

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.

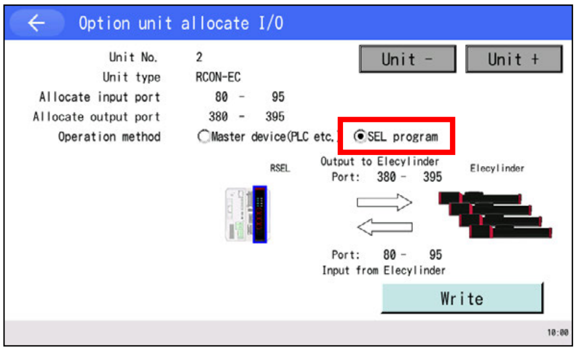
15.20.2 Option Unit Allocate I/O

Display and setting of the option unit I/O assignment should be conducted.



Unit No. 1
Unit type PIO
Allocate input port 64 - 79
Allocate output port 364 - 379

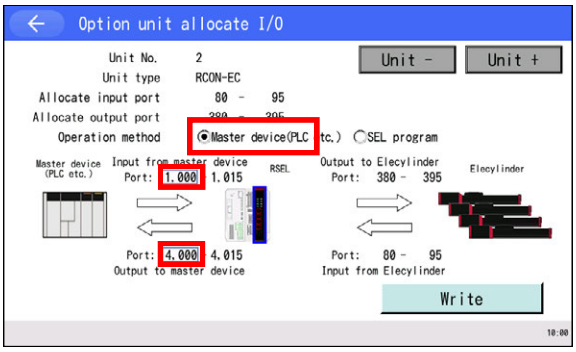
Touch either the Unit + or Unit - button and the unit number should change.



Unit No. 2
Unit type RCON-EC
Allocate input port 80 - 95
Allocate output port 380 - 395
Operation method ○Master device(PLC etc.) ●SEL program

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.

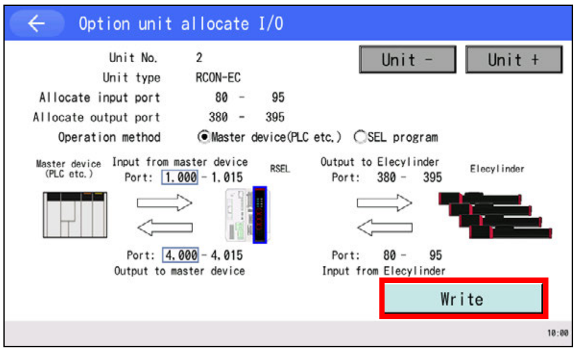
If it is set in the SEL program, the input and output port assignment with ELECYLINDER should be displayed.



Unit No. 2
Unit type RCON-EC
Allocate input port 80 - 95
Allocate output port 380 - 395
Operation method ●Master device(PLC etc.) ○SEL program
Port: 1.000 1.015
Port: 4.000 4.015

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.



Unit No. 2
Unit type RCON-EC
Allocate input port 80 - 95
Allocate output port 380 - 395
Operation method ●Master device(PLC etc.) ○SEL program
Port: 1.000 - 1.015
Port: 4.000 - 4.015

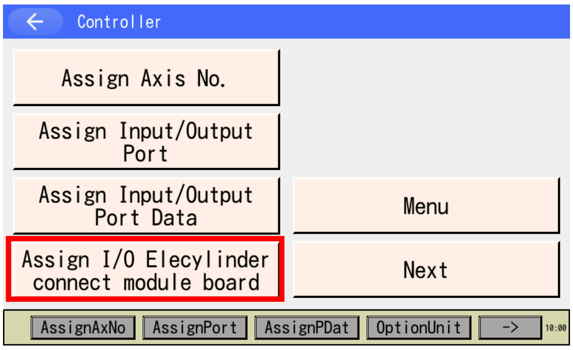
Touch the Write button to transfer the contents of the setting to the controller.

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 ELECYLINDER Connection Module Board I/O Assignment

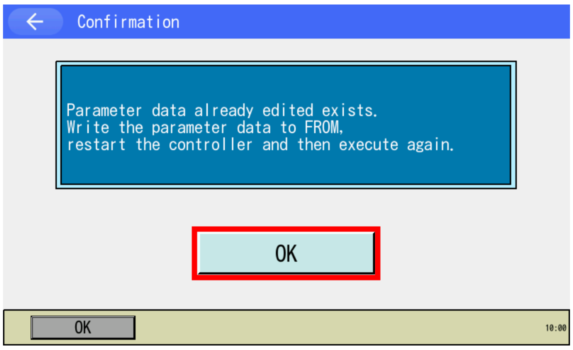
(for applicable models only)

I/O assignment and setting of the ELECYLINDER connection module board should be performed in this feature.



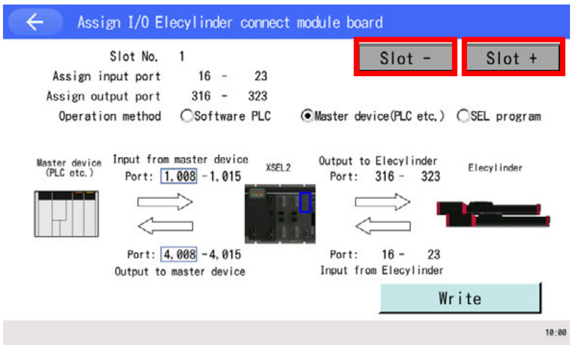
Touch the Assign I/O Elecylinder connect module board button in the controller menu window.

- * 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.



Parameter data already edited exists.
Write the parameter data to FROM,
restart the controller and then execute again.

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.



Slot No. 1
Assign input port 16 - 23
Assign output port 316 - 323
Operation method ○Software PLC ●Master device(PLC etc.) ○SEL program

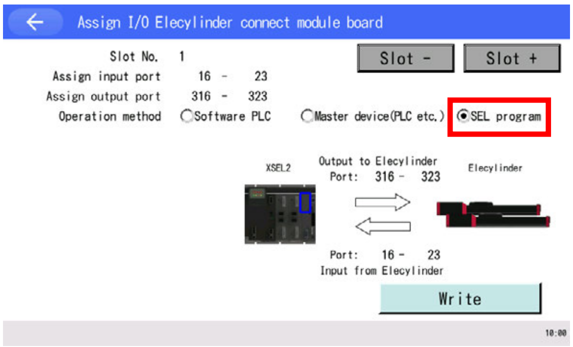
Input from master device
Port: 1,008 -1,015

Output to Elecylinder
Port: 316 - 323

Port: 4,008 -4,015
Output to master device

Port: 16 - 23
Input from Elecylinder

Touch the Slot + or Slot - button, and the slot number should change.

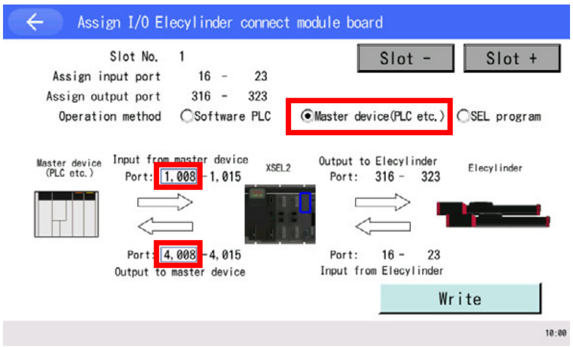

Assign I/O Elecylinder connect module board

Slot No. 1
Assign input port 16 - 23
Assign output port 316 - 323
Operation method ○Software PLC ○Master device(PLC etc.) ●SEL program

Output to Elecylinder Port: 316 - 323
Port: 16 - 23 Input from Elecylinder

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.

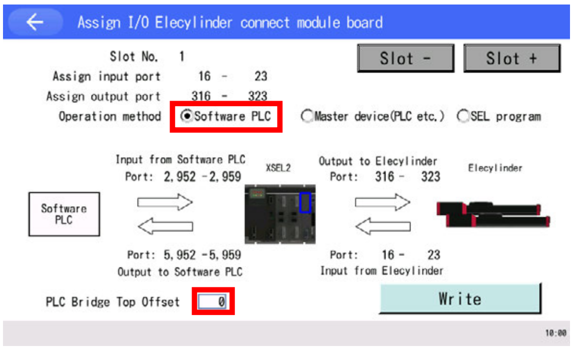

Assign I/O Elecylinder connect module board

Slot No. 1
Assign input port 16 - 23
Assign output port 316 - 323
Operation method ○Software PLC ●Master device(PLC etc.) ○SEL program

Input from master device Port: 1,008 - 1,015
Port: 4,008 - 4,015 Output to master device
Output to Elecylinder Port: 316 - 323
Port: 16 - 23 Input from Elecylinder

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.

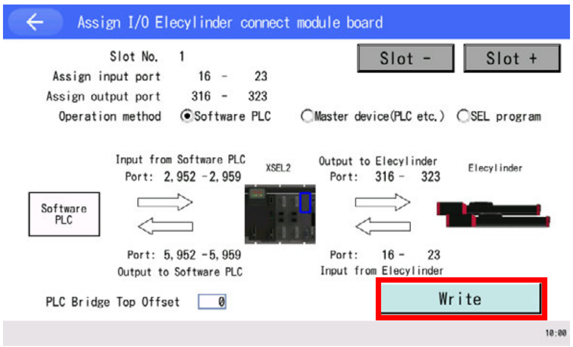

Assign I/O Elecylinder connect module board

Slot No. 1
Assign input port 16 - 23
Assign output port 316 - 323
Operation method ●Software PLC ○Master device(PLC etc.) ○SEL program

Input from Software PLC Port: 2,952 - 2,959
Port: 5,952 - 5,959 Output to Software PLC
Output to Elecylinder Port: 316 - 323
Port: 16 - 23 Input from Elecylinder
PLC Bridge Top Offset 0

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.


Assign I/O Elecylinder connect module board

Slot No. 1
Assign input port 16 - 23
Assign output port 316 - 323
Operation method ●Software PLC ○Master device(PLC etc.) ○SEL program

Input from Software PLC Port: 2,952 - 2,959
Port: 5,952 - 5,959 Output to Software PLC
Output to Elecylinder Port: 316 - 323
Port: 16 - 23 Input from Elecylinder
PLC Bridge Top Offset 0

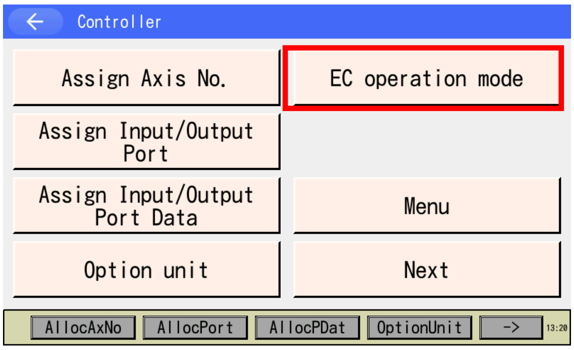
Touch the Write button to transfer the settings to the controller.

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)

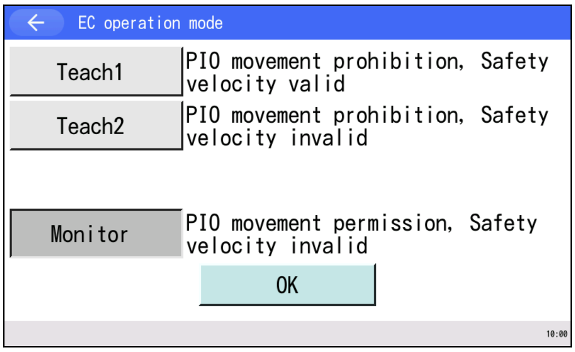
The ELECYLINDER operation mode setting in the manual mode (MANU) should be established.



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.


EC operation mode
Teach1
PIO movement prohibition, Safety velocity valid
Teach2
PIO movement prohibition, Safety velocity invalid
Monitor
PIO movement permission, Safety velocity invalid
OK
10:00

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.

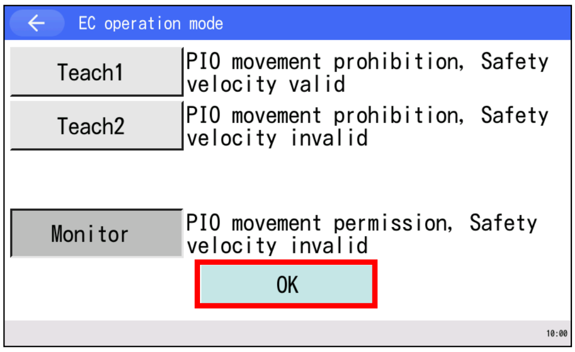
  Safety velocity invalid : Operation in the velocity set in the simple data setting window (higher than the safety velocity) becomes available.

- 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.

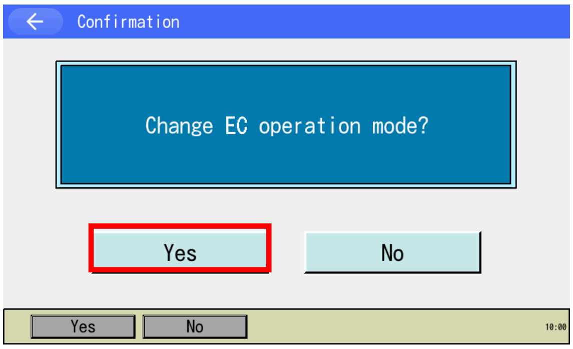


Teach1: PIO movement prohibition, Safety velocity valid

Teach2: PIO movement prohibition, Safety velocity invalid

Monitor: PIO movement permission, Safety velocity invalid

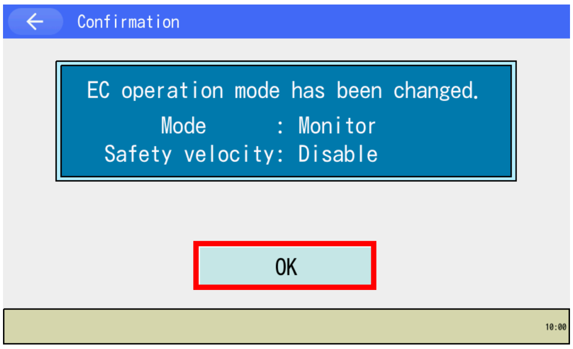
Touch a button of a mode to be selected and touch the OK button.



Change EC operation mode?

Touch Yes button in the confirmation window.

Touch the No button and the screen returns to the EC operation mode change window.



EC operation mode has been changed.
Mode : Monitor
Safety velocity: Disable

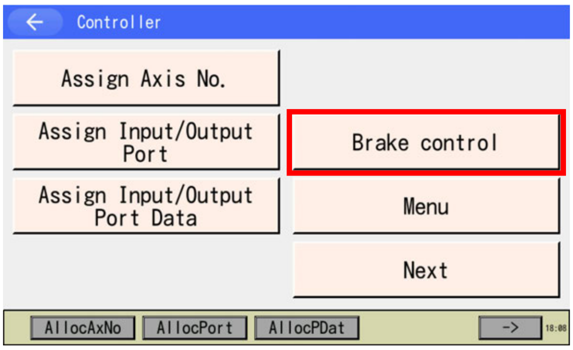
Once the change is complete, the confirmation window should show up.

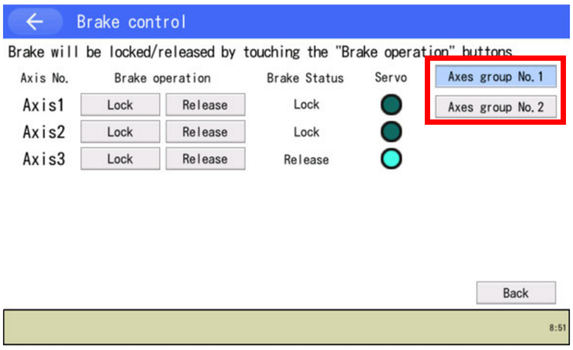
Touch the OK button and the screen returns to the controller menu.

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.



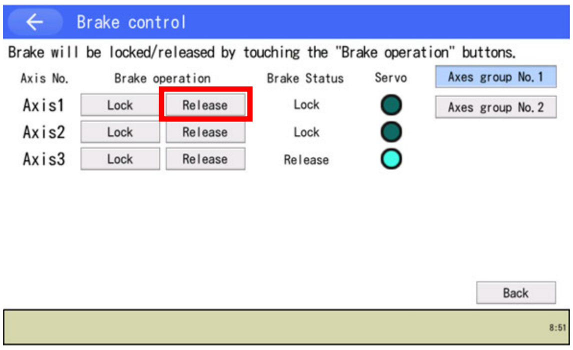


Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation		Brake Status	Servo
Axis1	Lock	Release	Lock	●
Axis2	Lock	Release	Lock	●
Axis3	Lock	Release	Release	○

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.

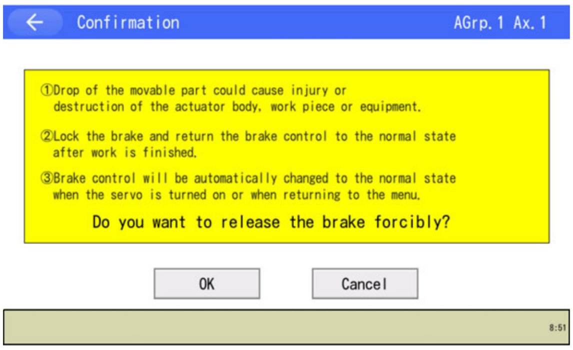
The brake operation button and the status of an effective axis should be displayed.



Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation		Brake Status	Servo
Axis1	Lock	Release	Lock	●
Axis2	Lock	Release	Lock	●
Axis3	Lock	Release	Release	○

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



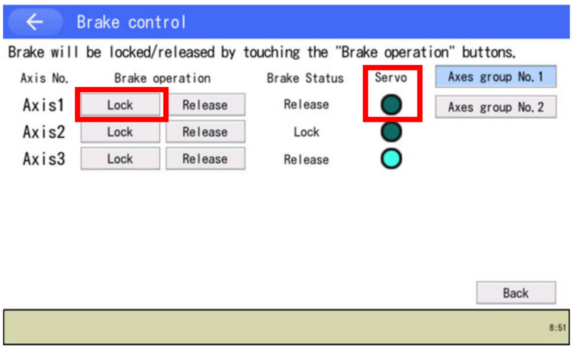
①Drop of the movable part could cause injury or destruction of the actuator body, work piece or equipment.

②Lock the brake and return the brake control to the normal state after work is finished.

③Brake control will be automatically changed to the normal state when the servo is turned on or when returning to the menu.

Do you want to release the brake forcibly?

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.



Brake will be locked/released by touching the "Brake operation" buttons.

Axis No.	Brake operation		Brake Status	Servo
Axis1	Lock	Release	Release	●
Axis2	Lock	Release	Lock	●
Axis3	Lock	Release	Release	○

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.

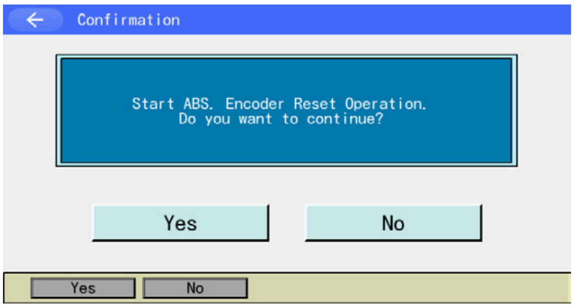
(3) When the servo is turned on and when it gets back to the menu window, the brake control should get back to the normal condition automatically.

16. Absolute Reset

16.1 Absolute Reset of the Orthogonal Axis Axes of XSEL-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

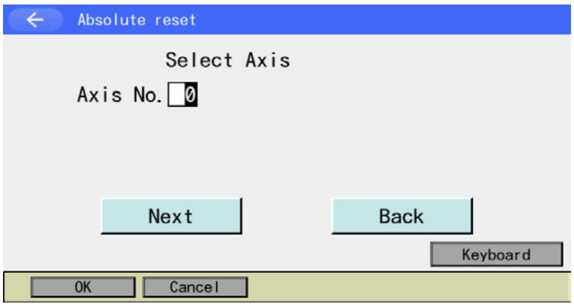
When the controller is applicable to the “battery-less absolute reset”, the procedure is different. In such case, perform the absolute reset operation following the [16.8.1 How to Conduct Absolute Reset for Battery-less Absolute Type].

Select Absolute Reset from Controller Menu.



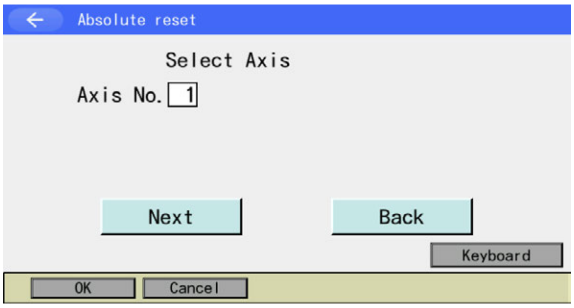
Start ABS. Encoder Reset Operation.
Do you want to continue?

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.



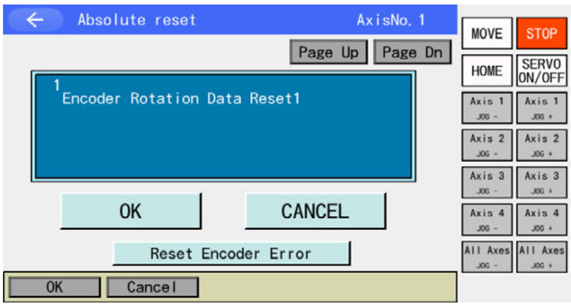
Select Axis
Axis No. 0

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.



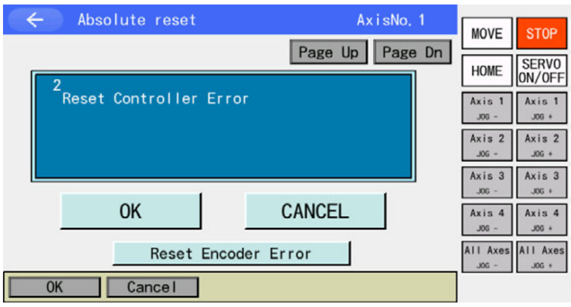
Select Axis
Axis No. 1

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.



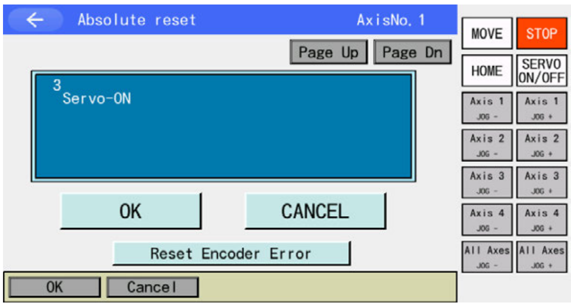
1
Encoder Rotation Data Reset1

1) Encoder Rotation Data Reset 1
Touch OK button.



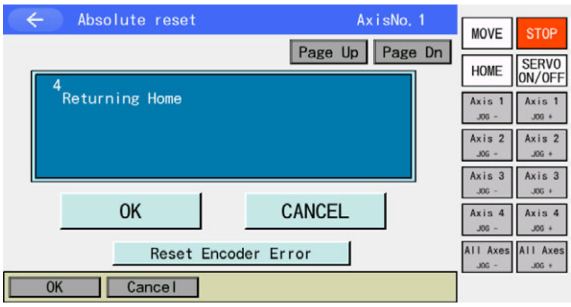
2
Reset Controller Error

2) Reset Controller Error
Touch OK button.



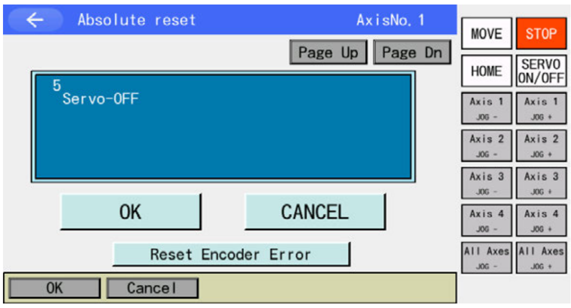
3
Servo-ON

3) Servo-ON
Touch OK button.



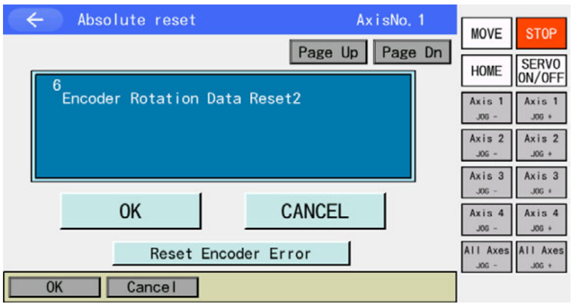
4
Returning Home

4) Returning Home
Touch OK button.



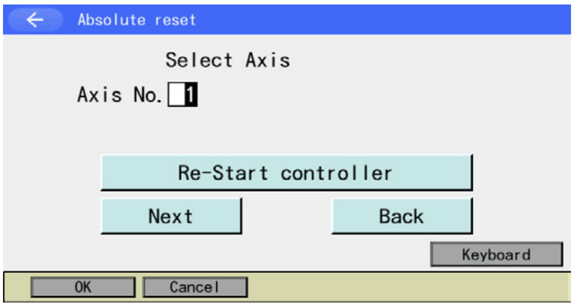
5
Servo-OFF

5) Servo-OFF
Touch OK button.



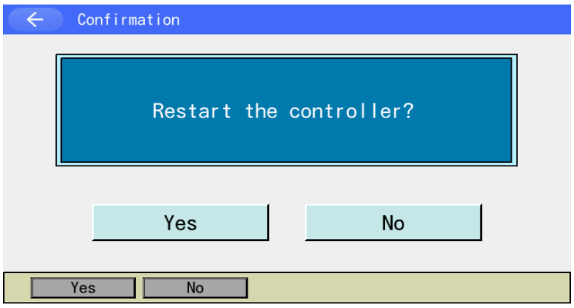
6
Encoder Rotation Data Reset2

6) Encoder Rotation Data Reset 2
Touch OK button.



Select Axis
Axis No. 1

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?

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

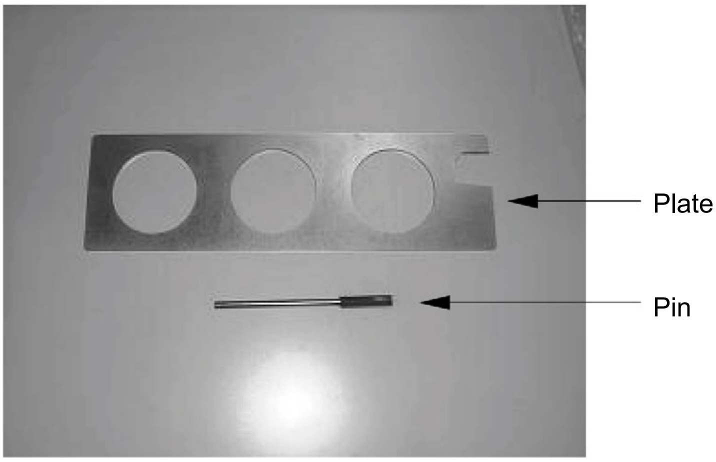
16.2.1 XSEL-KX/RXD/SXD or 1st to 4th Axes of XSEL-PX/QX/RX/SX

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 SCARA 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.)

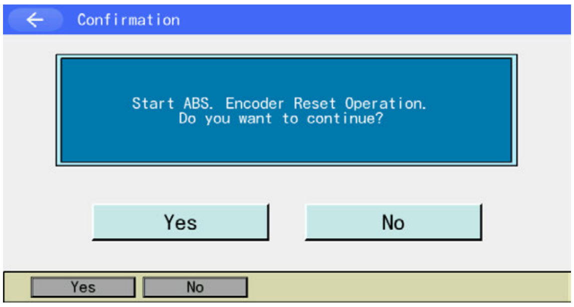


Example of Absolute Reset Adjustment Jig (Type JG-1)

⚠ *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.*

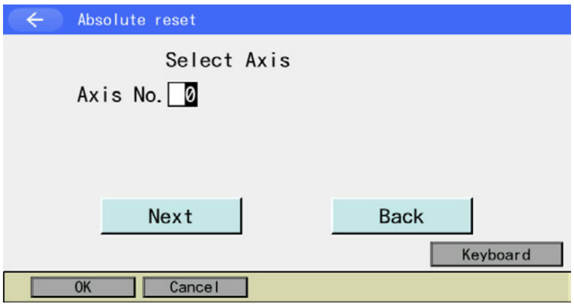
There are three types of absolute reset, Arm1, Arm2 and Z-axis + R-axis.

(1) Absolute Reset on Arm1 and Arm2
Select Absolute Reset from Controller Menu.



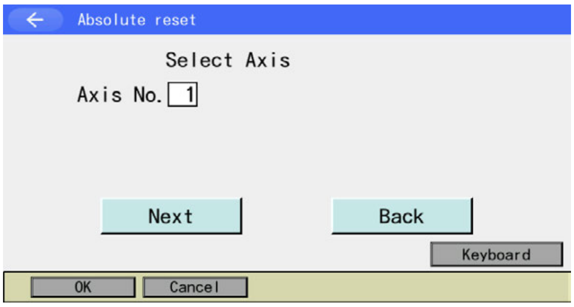
Start ABS. Encoder Reset Operation.
Do you want to continue?

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.



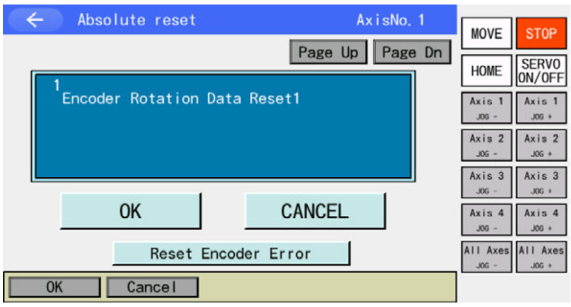
Select Axis
Axis No. 0

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.



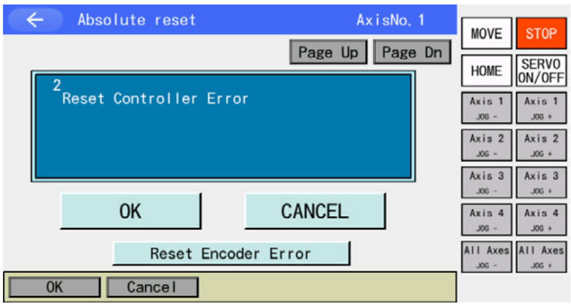
Select Axis
Axis No. 1

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.



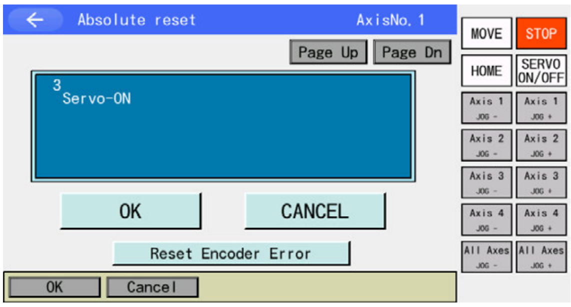
1
Encoder Rotation Data Reset1

1) Encoder Rotation Data Reset 1
Touch OK button.



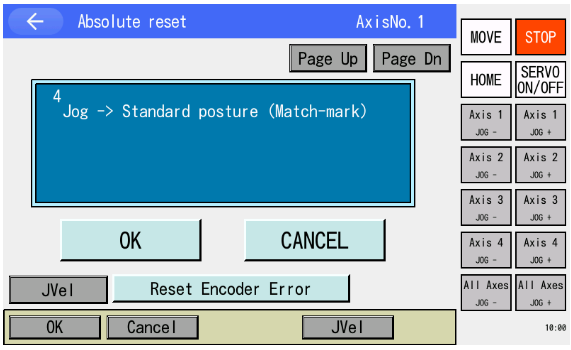
2
Reset Controller Error

2) Reset Controller Error
Touch OK button.



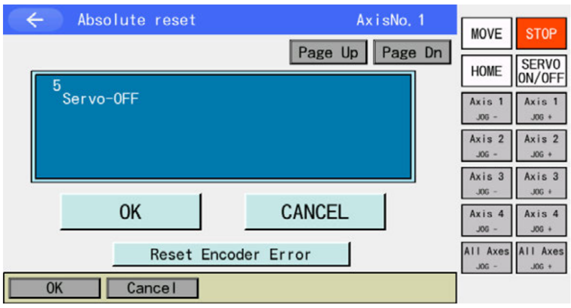
3
Servo-ON

3) Servo-ON
Touch OK button.



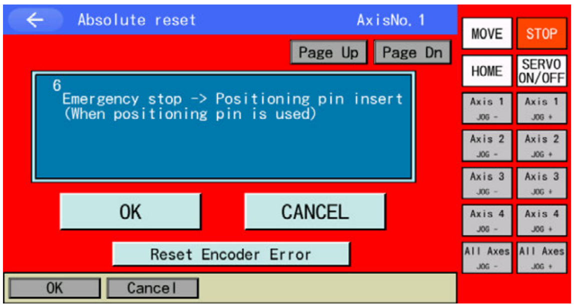
4
Jog -> Standard posture (Match-mark)

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.



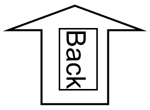
5
Servo-OFF

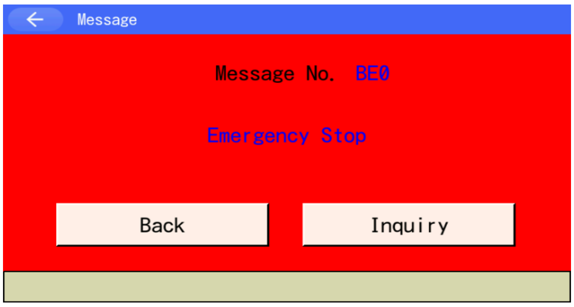
5) Servo-OFF
Touch OK button.



6
Emergency stop -> Positioning pin insert
(When positioning pin is used)

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.





Message No. BE0

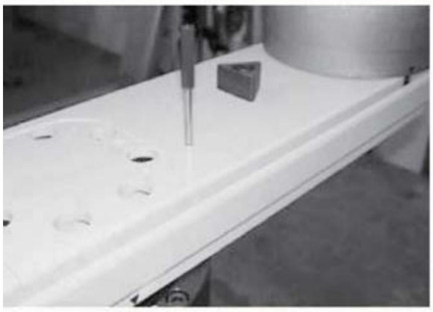
Emergency Stop

Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.

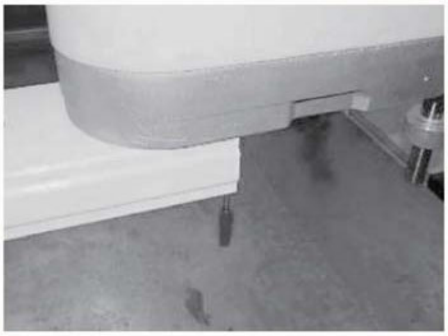
Check that the EMERGENCY STOP button has been pressed.

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.

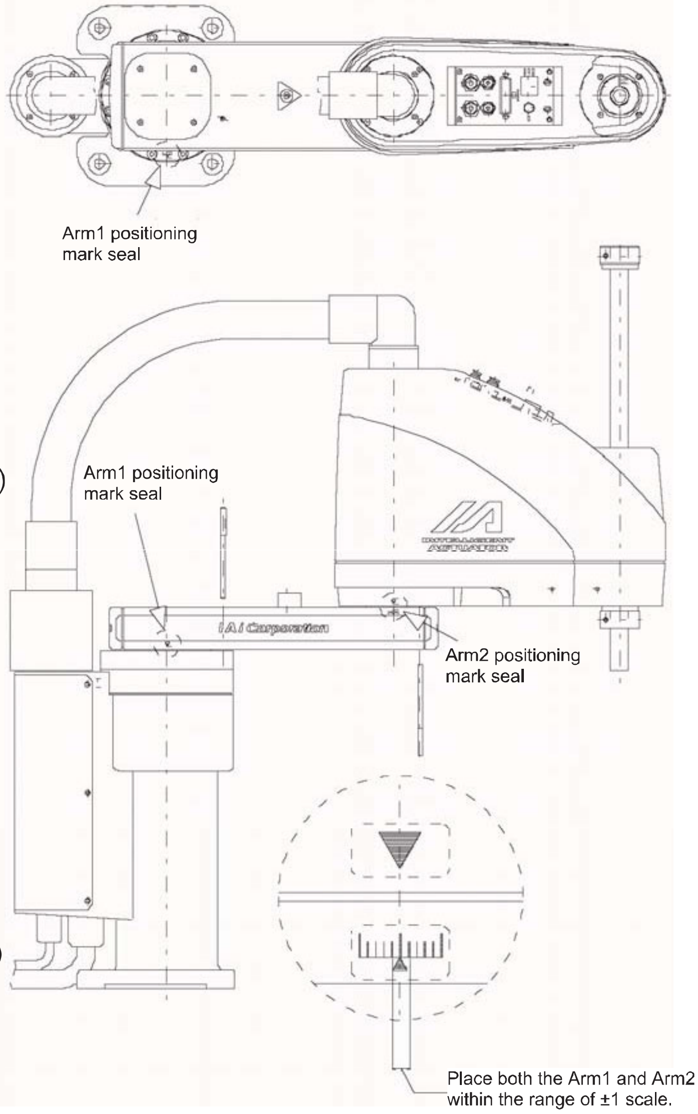
- After checking that the EMERGENCY STOP button has been pressed, set the jig.
- Decide the basic position referring to the positioning mark seal and set the jig.
- Only the Arm1 is covered with a lid with setscrews. Remove them and set the jig.
- An absolute reset on the arm with the adjusting jig is 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)

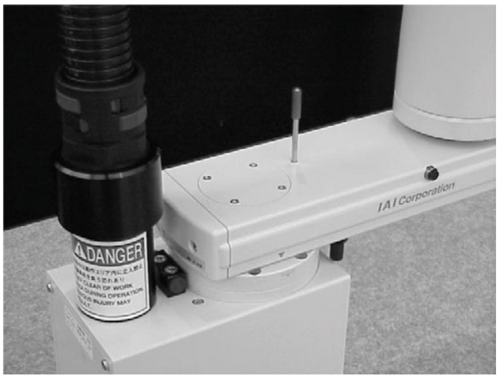


Arm2
(Arm length 500/600, arm length 700/800)

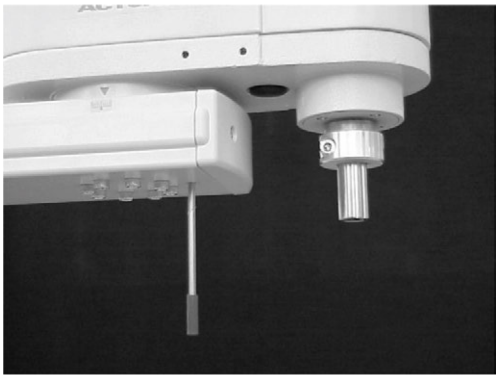

Arm1 positioning mark seal
INTELLIGENT ACTUATOR
Arm1 positioning mark seal
I A I Corporation
Arm2 positioning mark seal
Place both the Arm1 and Arm2 within the range of ±1 scale.

Arm length 500/600/700/800 Reference Position

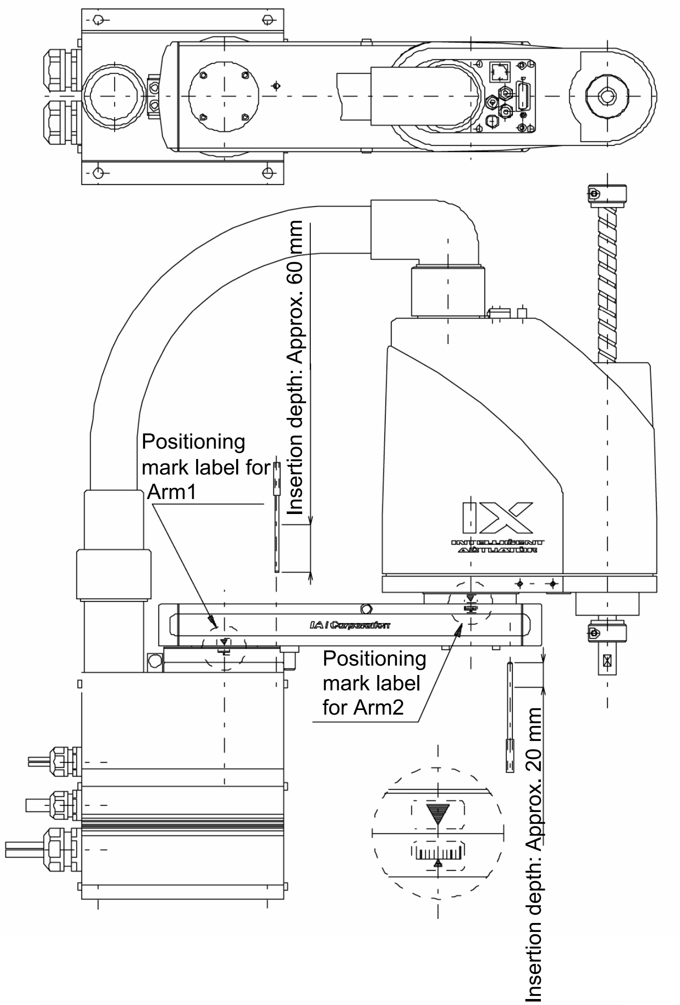
⚠ *Warning: Be sure to press the EMERGENCY STOP switch before setting an adjusting jig. Failure to do so may cause a robot malfunction, which may lead to a serious accident resulting in injury or death.*



Arm1
(Arm length 250/300/350)

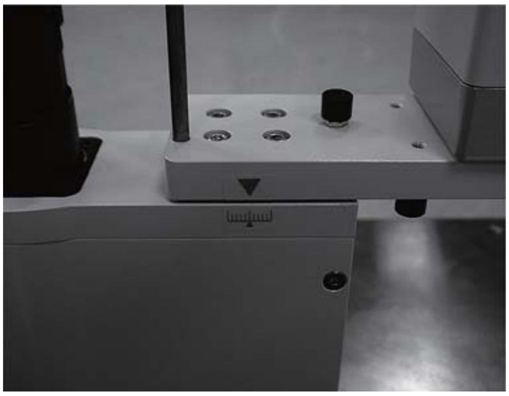


Arm2
(Arm length 250/300/350)

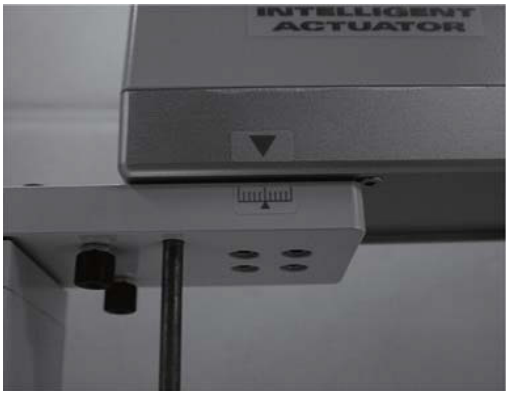

Insertion depth: Approx. 60 mm
Positioning mark label for Arm1
Positioning mark label for Arm2
Insertion depth: Approx. 20 mm

Arm length 250/300/350 Reference Position

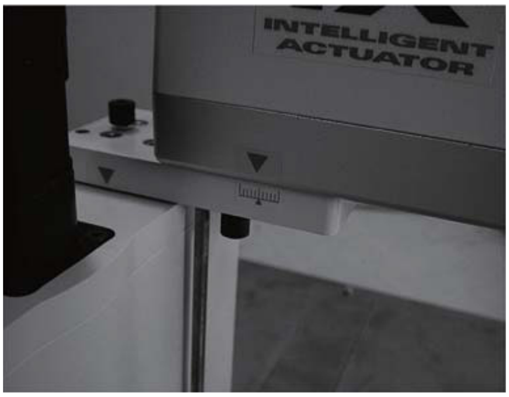
(Note) *When performing an absolute reset for Arm1 of IX-NNN2515, rotate Arm2 slightly then set with an adjustment jig (pin) to set it.*



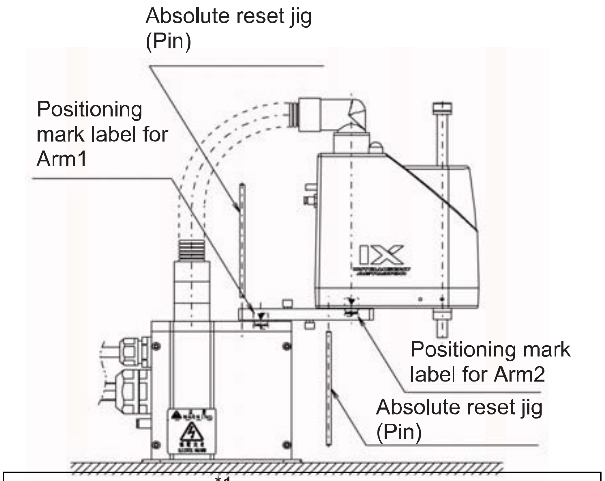
Arm1 (Arm length 120/150/180)



Arm2 (Arm length 150/180)

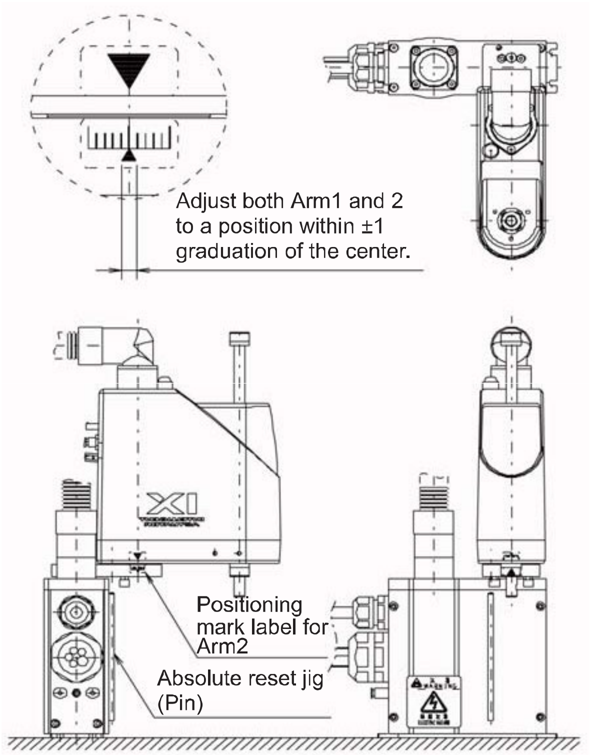


Arm2 (Arm length 120)



Arm length 120*1/150/180 Reference Position

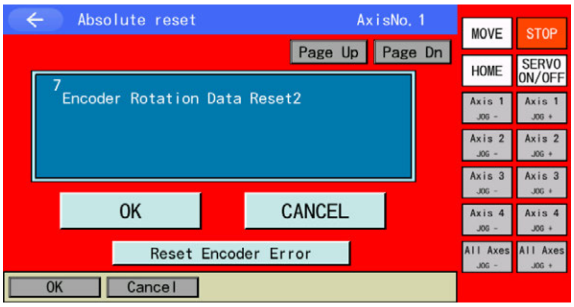
*1: When an absolute reset is performed for Arm1 (arm length: 120)



Arm length 120*2 Reference Position

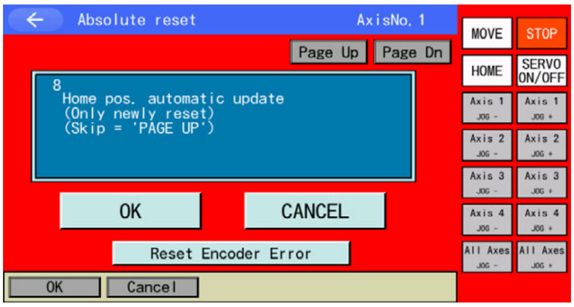
*2: When an absolute reset is performed for Arm2 (arm length: 120)

⚠ *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 Reset2

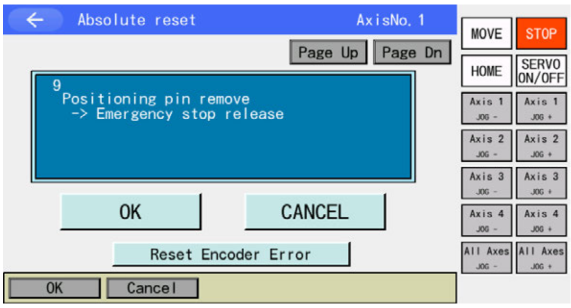
7) Encoder Rotation Data Reset 2
Touch OK button.



8
Home pos. automatic update
(Only newly reset)
(Skip = 'PAGE UP')

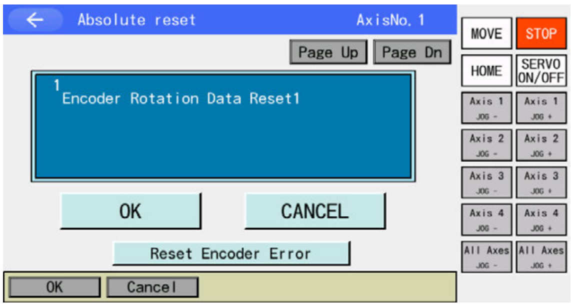
8) Home pos. automatic update
Touch Page Up button. Make sure not to touch OK button

- 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.)



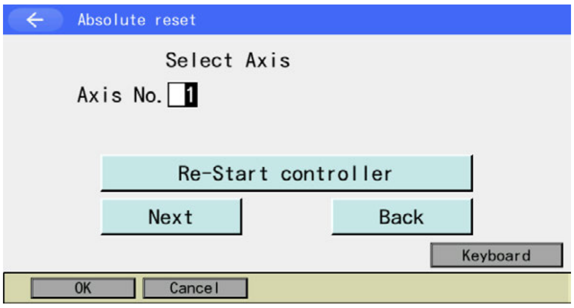
9
Positioning pin remove
-> Emergency stop release

9) Detach adjusting tool and Emergency stop release
Detach the adjusting tool if it has been set on.
Release the EMERGENCY STOP button before touching OK button.



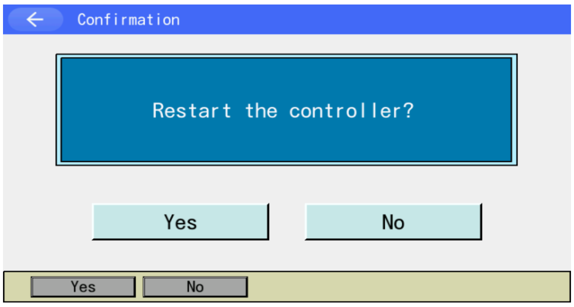
1 Encoder Rotation Data Reset1

The display returns to the first screen.
Touch CANCEL button.



Select Axis
Axis No. 1

Touch Re-Start controller button.

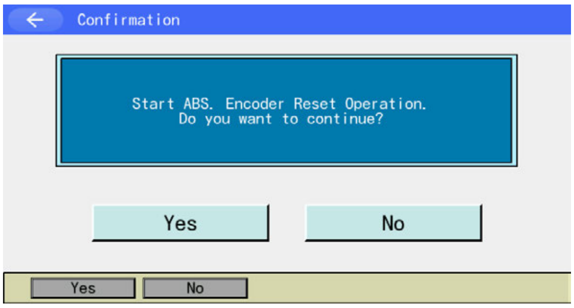


Restart the controller?

Restart the controller.
Touch Yes button.
The display returns to the main menu when the reboot is finished.

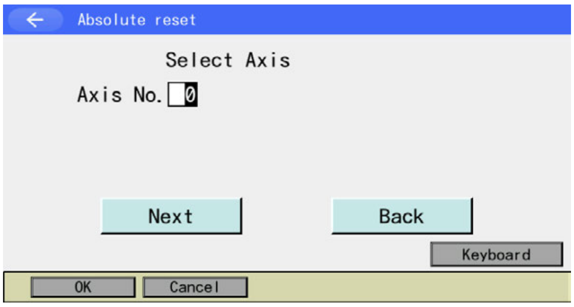
⚠ *Caution: Be careful not to perform reset using an incorrect sequence, since it may cause the arm position to become offset.*
Execute "home preset value auto refresh" only when any mechanical change such as arm change has been made. (Joint part only)

(2) Absolute reset on Z-axis + R-axis
Select Absolute Reset from Controller Menu.



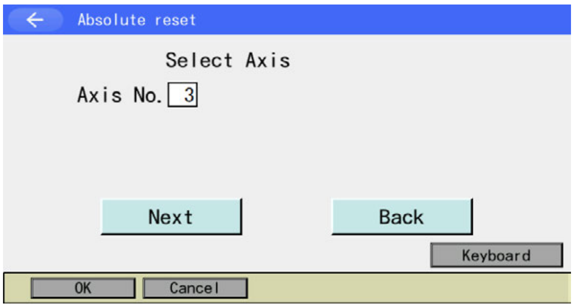
Start ABS. Encoder Reset Operation.
Do you want to continue?

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.



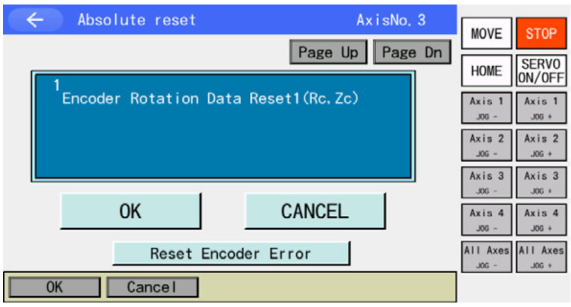
Axis No. 0

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.



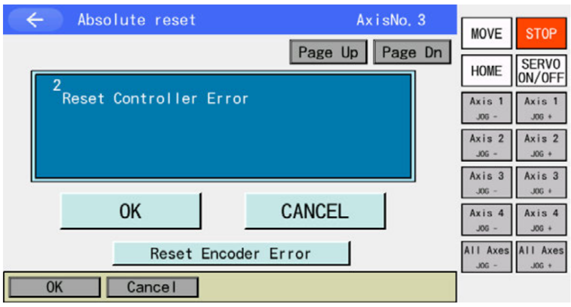
Axis No. 3

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.



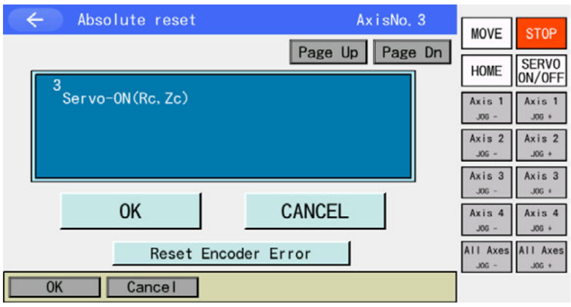
1
Encoder Rotation Data Reset1(Rc.Zc)

1) Encoder Rotation Data Reset 1
Touch OK button.



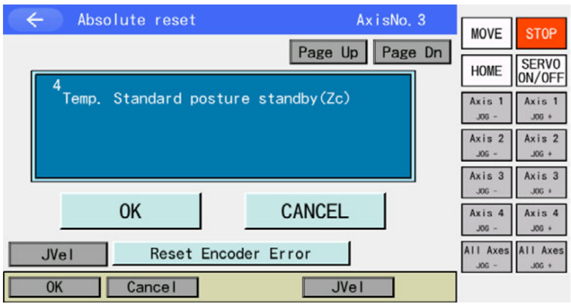
2
Reset Controller Error

2) Reset Controller Error
Touch OK button.



3
Servo-ON(Rc.Zc)

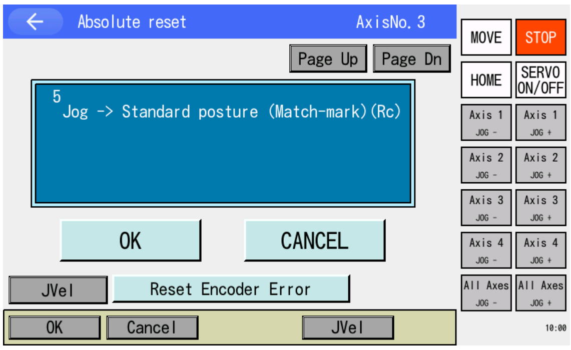
3) Servo-ON
Touch OK button.



4 Temp. Standard posture standby(Zc)

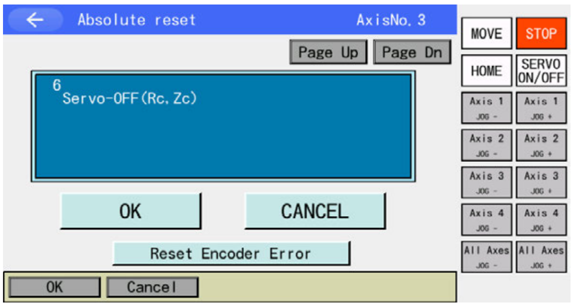
4) Temp. standard posture standby
Touch OK button.

> ⚠ *Caution:*
> *The Z-axis returns to the home position.*



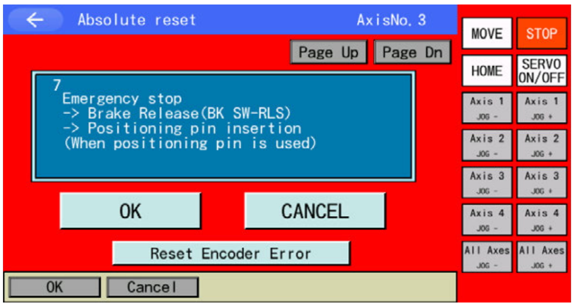
5 Jog -> Standard posture (Match-mark)(Rc)

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.



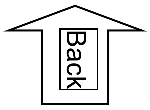
6 Servo-OFF(Rc, Zc)

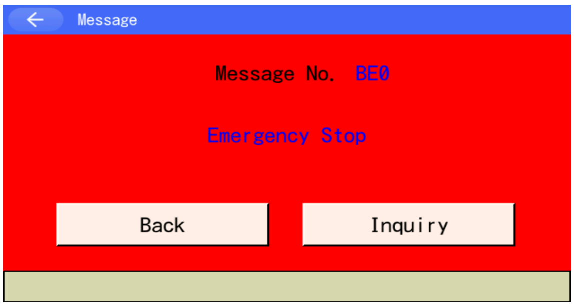
6) Servo-OFF
Touch OK button.



7
Emergency stop
-> Brake Release(BK SW-RLS)
-> Positioning pin insertion
(When positioning pin is used)

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.





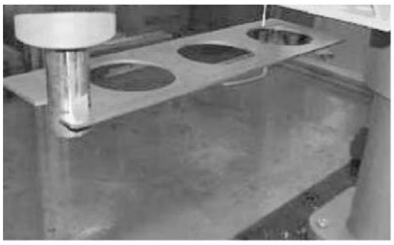
Message No. BE0

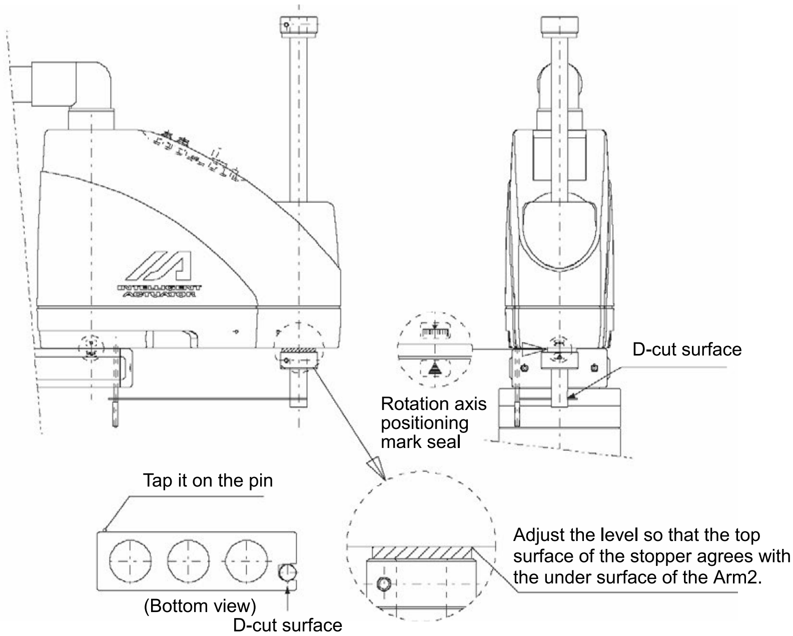
Emergency Stop

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.

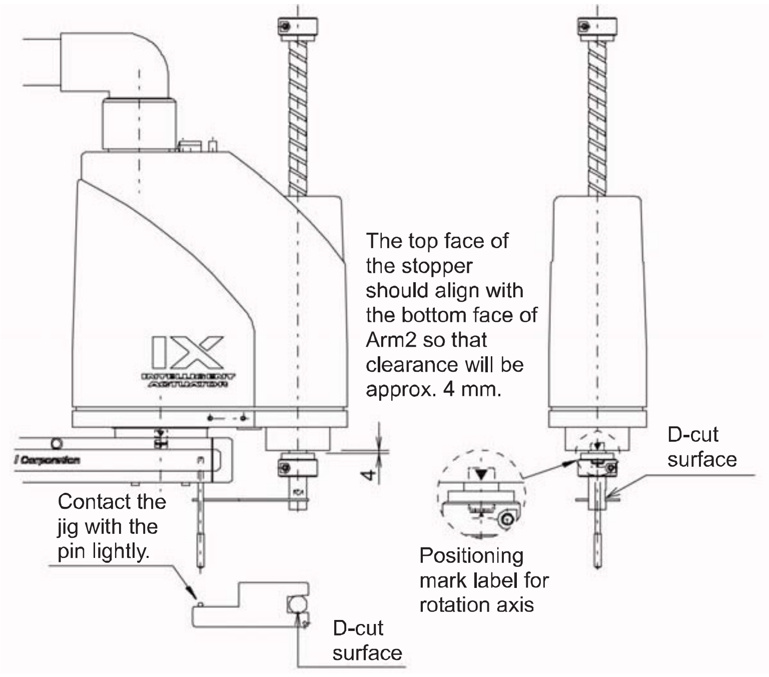
- After checking that the EMERGENCY STOP switch has been pressed, set the jig.
- Set the jig by referring to the positioning mark.
- Adjust the level so that the top surface of the stopper approximately agrees with the under surface of the Arm2.



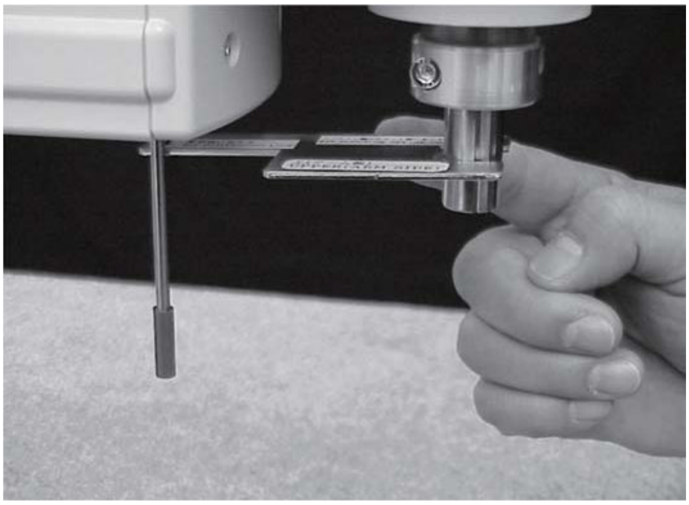

D-cut surface
Rotation axis positioning mark seal
Tap it on the pin
Adjust the level so that the top surface of the stopper agrees with the under surface of the Arm2.
(Bottom view)
D-cut surface

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.

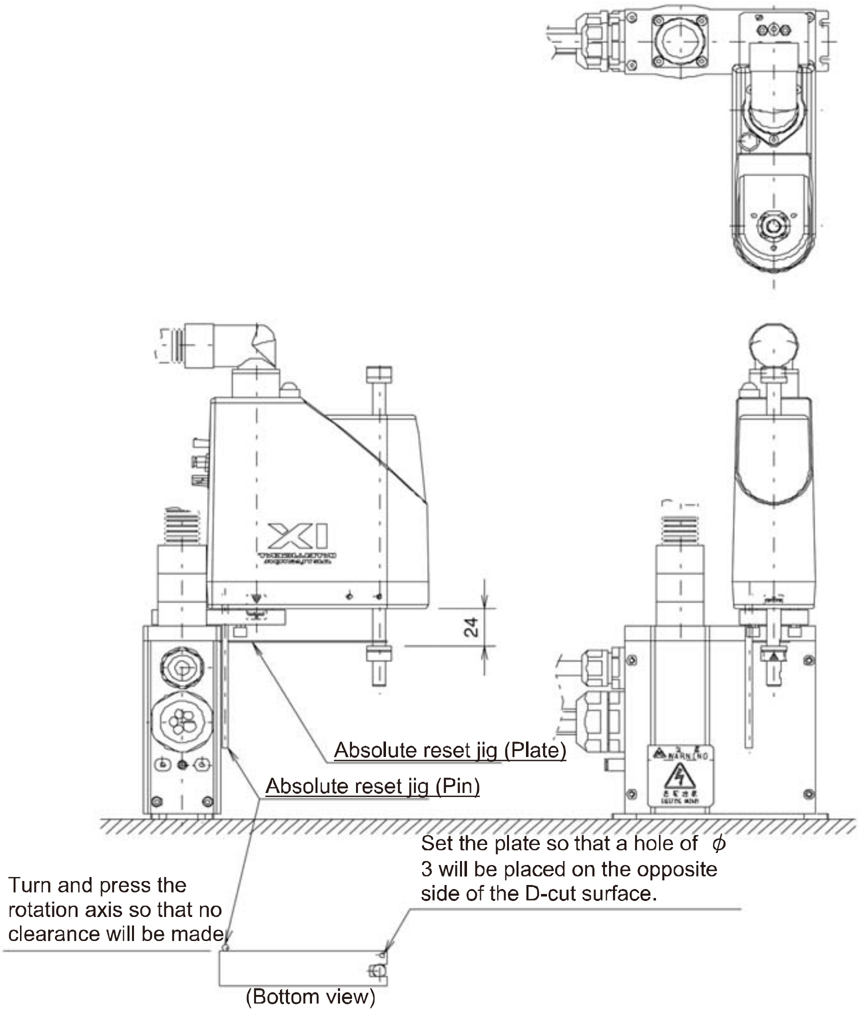

The top face of the stopper should align with the bottom face of Arm2 so that clearance will be approx. 4 mm.
4
D-cut surface
Contact the jig with the pin lightly.
Positioning mark label for rotation axis
D-cut surface

(Bottom view)



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.*



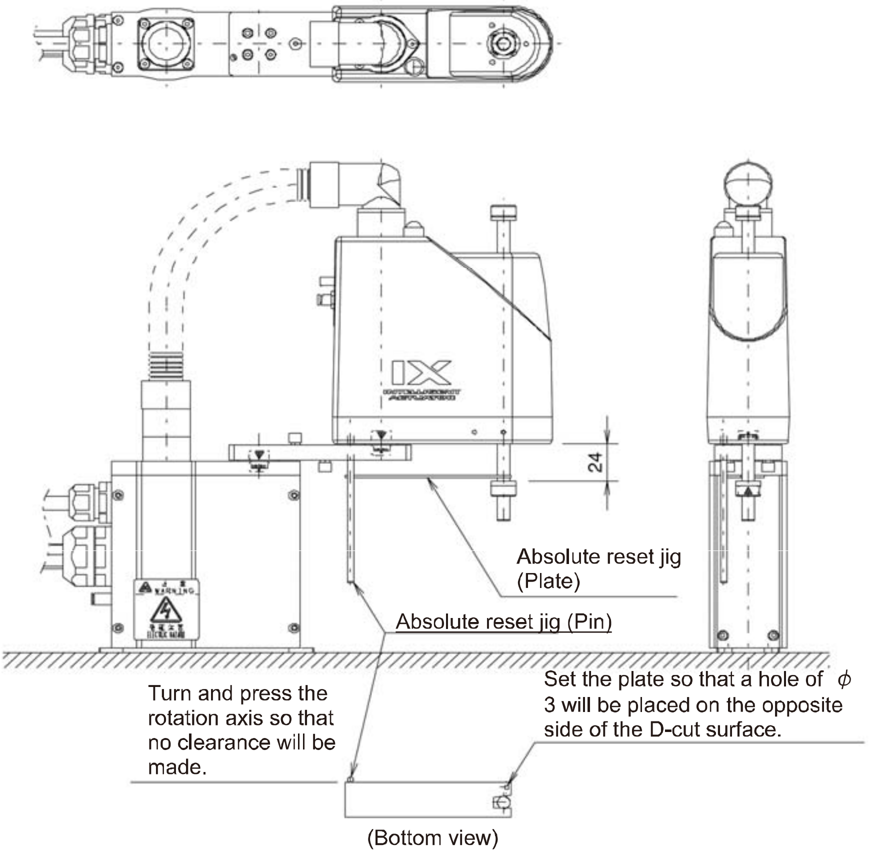
Absolute reset jig (Plate)

Absolute reset jig (Pin)

Set the plate so that a hole of ϕ 3 will be placed on the opposite side of the D-cut surface.

Turn and press the rotation axis so that no clearance will be made.

Arm length 120 Reference Position



Absolute reset jig (Plate)

Absolute reset jig (Pin)

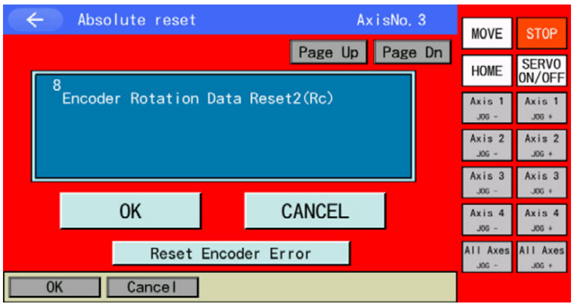
Turn and press the rotation axis so that no clearance will be made.

Set the plate so that a hole of ϕ 3 will be placed on the opposite side of the D-cut surface.

(Bottom view)

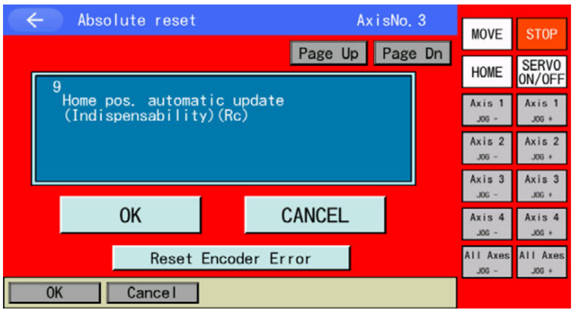
Arm length 150/180 Reference Position

⚠ *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.*


Absolute reset AxisNo. 3

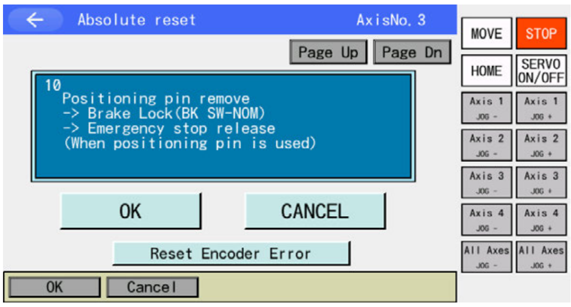
8
Encoder Rotation Data Reset2(Rc)

8) Encoder Rotation Data Reset 2
Touch OK button.


Absolute reset AxisNo. 3

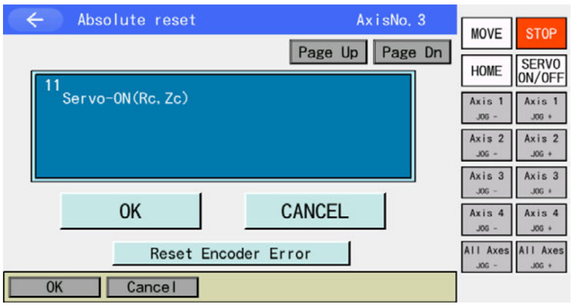
9
Home pos. automatic update
(Indispensability)(Rc)

9) Home pos. automatic update
Touch OK button.


Absolute reset AxisNo. 3

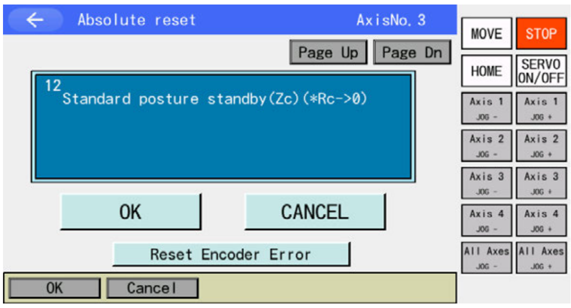
10
Positioning pin remove
-> Brake Lock(BK SW-NOM)
-> Emergency stop release
(When positioning pin is used)

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.


Absolute reset AxisNo. 3

11
Servo-ON(Rc, Zc)

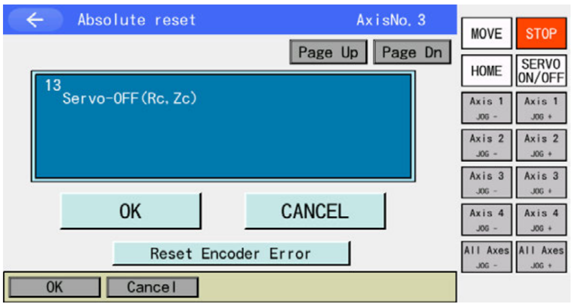
11) Servo-ON
Touch OK button.



12
Standard posture standby(Zc)(*Rc->0)

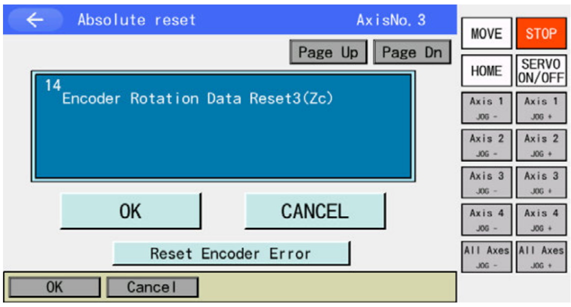
12) Standard posture standby
Touch OK button.

⚠ *Caution:*
The Z-axis returns to the home position.



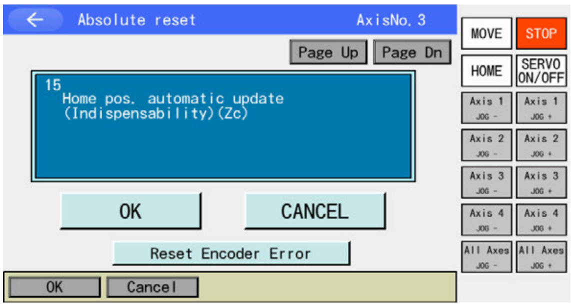
13
Servo-OFF(Rc.Zc)

13) Servo-OFF
Touch OK button.



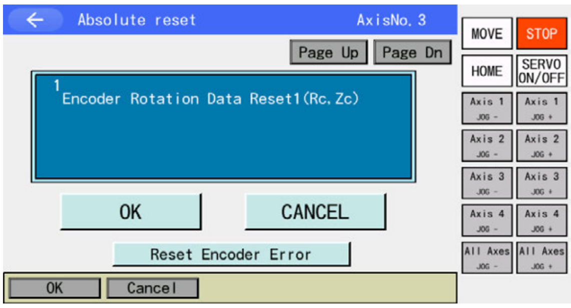
14
Encoder Rotation Data Reset3(Zc)

14) Encoder Rotation Data Reset 3
Touch OK button.



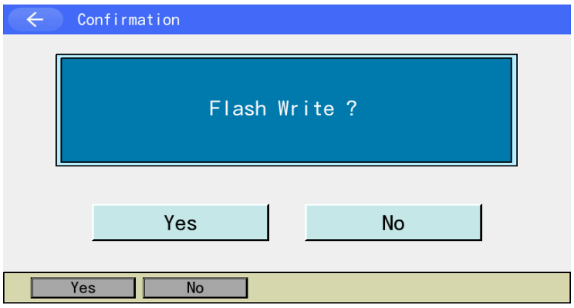
15
Home pos. automatic update
(Indispensability)(Zc)

15) Home pos. automatic update
Touch OK button.



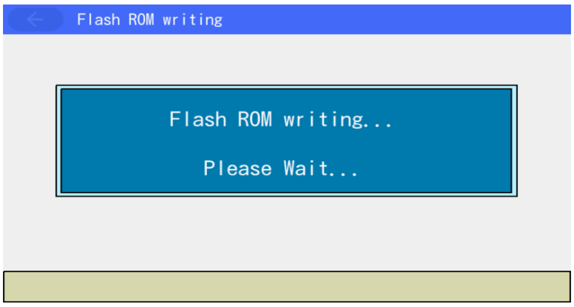
1 Encoder Rotation Data Reset1(Rc,Zc)

The display returns to the first screen.
Touch CANCEL button.
The display returns to the previous screen.



Flash Write ?

Do not fail to conduct Flash ROM Writing → Software Reset after the home preset automatic updating.

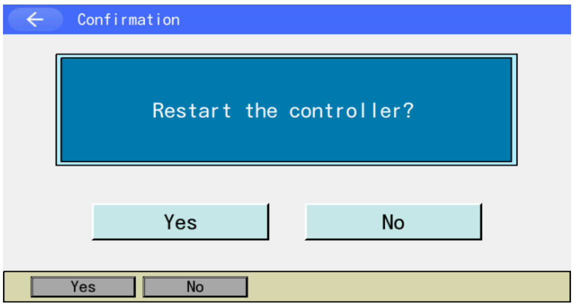


Flash ROM writing...

Please Wait...

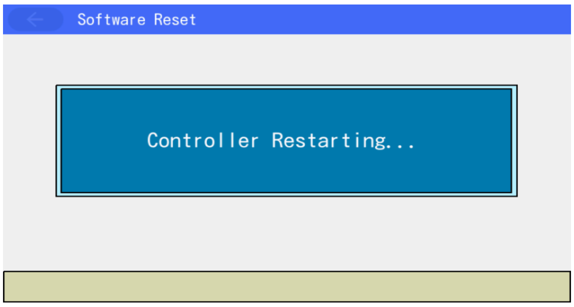
While in writing process to flash ROM, the screen shown in the left will be displayed.

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



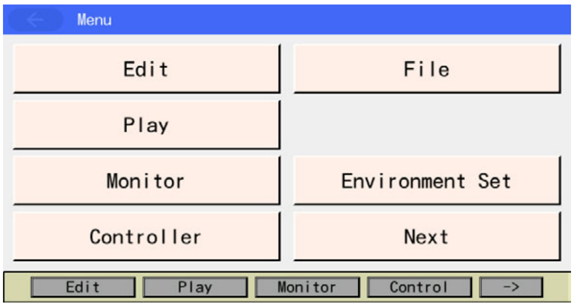
Restart the controller?

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.



Controller Restarting...

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.



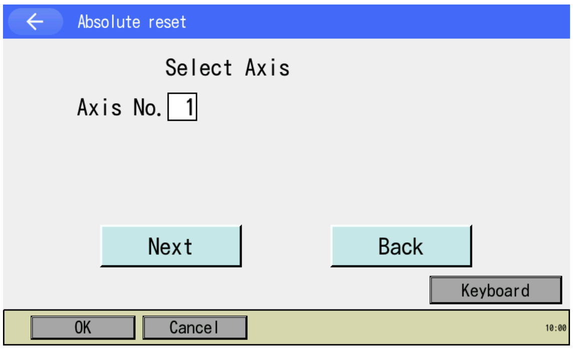
16.2.2 How to Conduct Absolute Reset for Battery-less Absolute SCARA Type

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

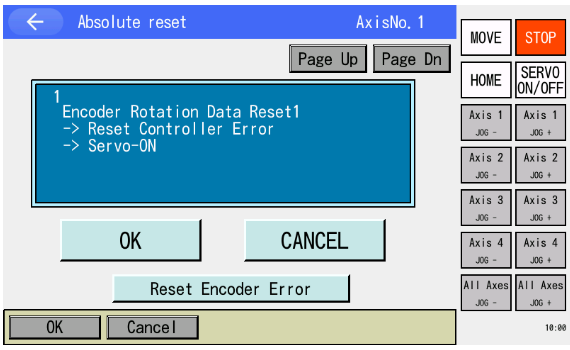
(1) Absolute Reset on Arm1 and Arm2



Select Axis
Axis No. 1

1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.

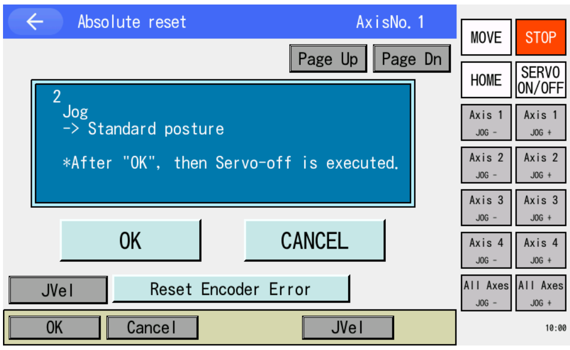
* Input 1or 5 when you conduct the absolute reset on Arm1 and 2 or 6 when on Arm2.



1
Encoder Rotation Data Reset1
-> Reset Controller Error
-> Servo-ON

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.



2
Jog
-> Standard posture

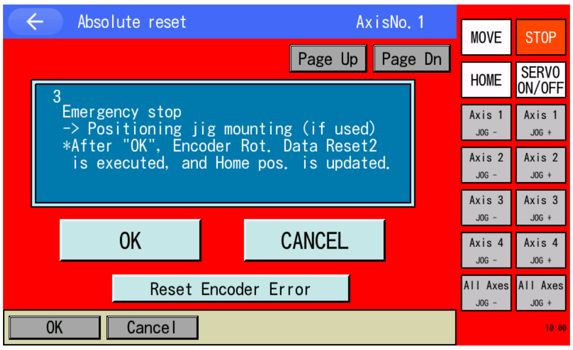
*After "OK", then Servo-off is executed.

3) Jog Movement
Move the actuator with jog to a point near the standard posture (refer to the 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.

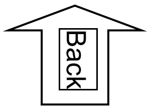
(i) For Battery-less Absolute Encoder

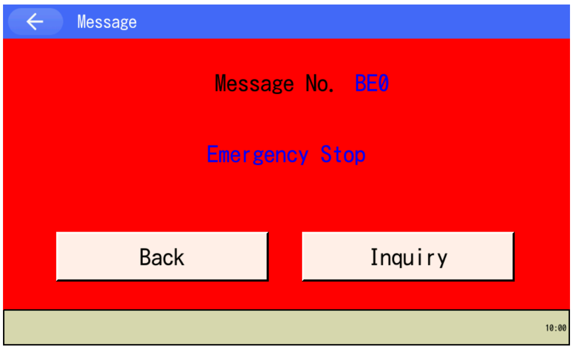


3
Emergency stop
-> Positioning jig mounting (if used)
*After "OK", Encoder Rot. Data Reset2
is executed, and Home pos. is updated.

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.

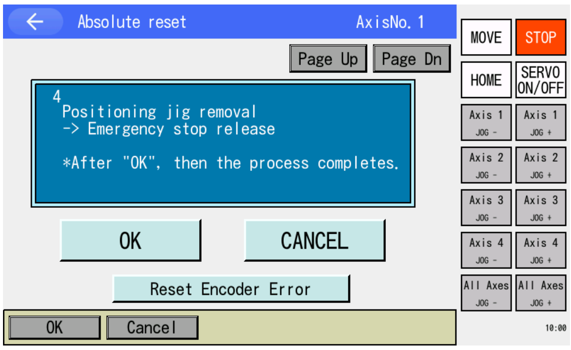




Message No. BE0

Emergency Stop

Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.

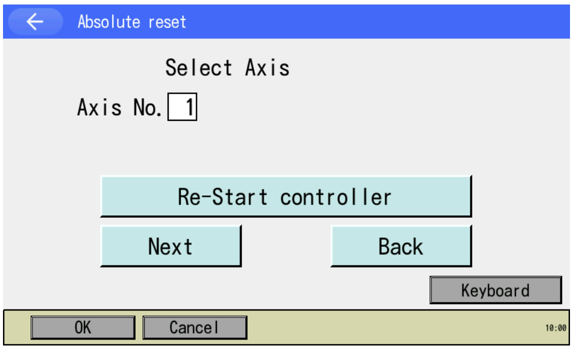


4
Positioning jig removal
-> Emergency stop release

*After "OK", then the process completes.

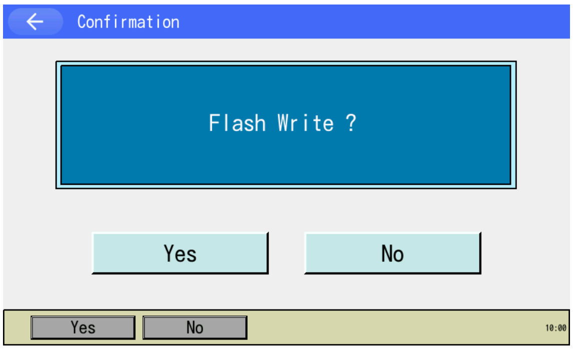
5) Positioning jig removal and Emergency stop release
Detach the positioning tool.
Release the EMERGENCY STOP button before touching OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



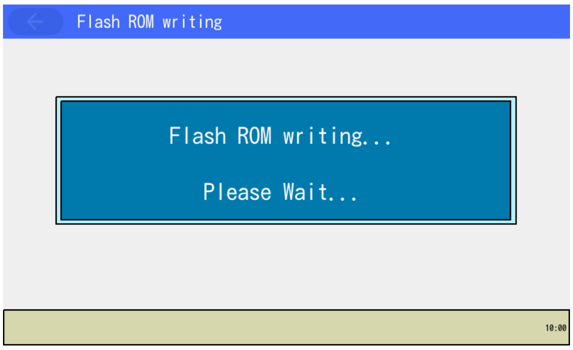
Select Axis
Axis No. 1

6) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.


Confirmation

Flash Write ?

7) Touch Yes button to start flash ROM writing.

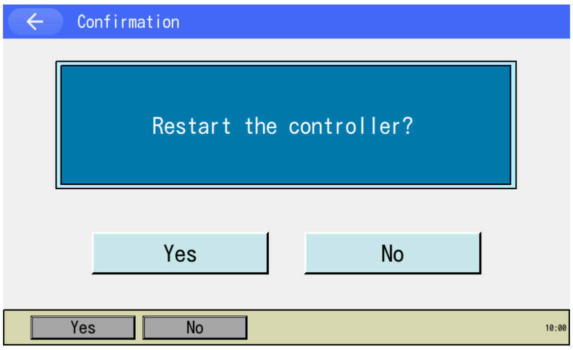

Flash ROM writing

Flash ROM writing...

Please Wait...

8) While in writing process to flash ROM, the screen.

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

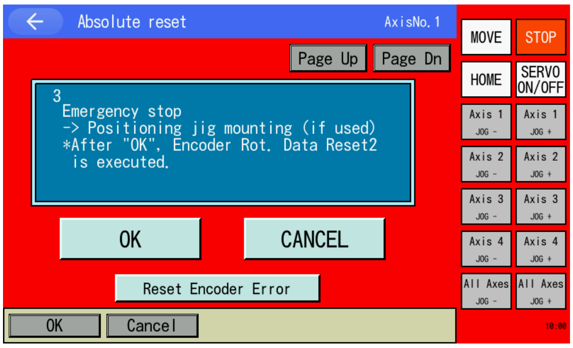

Confirmation

Restart the controller?

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.

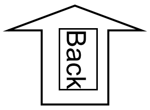
(i) For Battery-less Absolute Encoder excluded

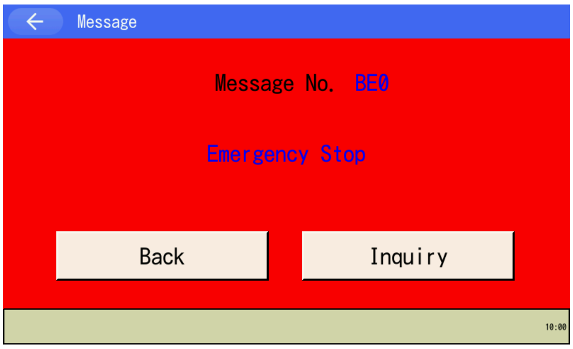


3
Emergency stop
-> Positioning jig mounting (if used)
*After "OK", Encoder Rot. Data Reset2
is executed.

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.

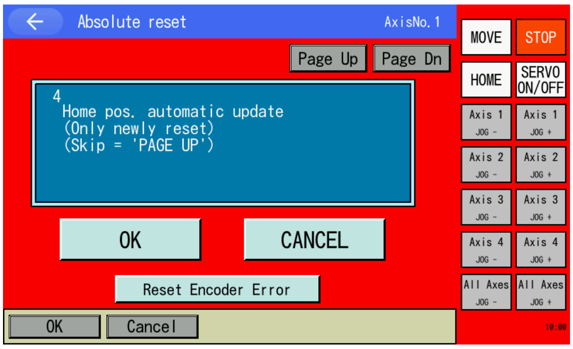




Message No. BE0

Emergency Stop

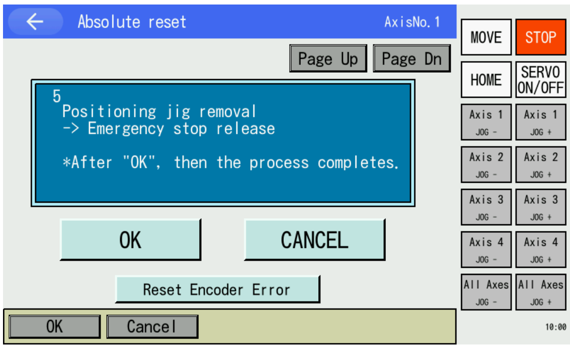
Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.



4
Home pos. automatic update
(Only newly reset)
(Skip = 'PAGE UP')

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.)

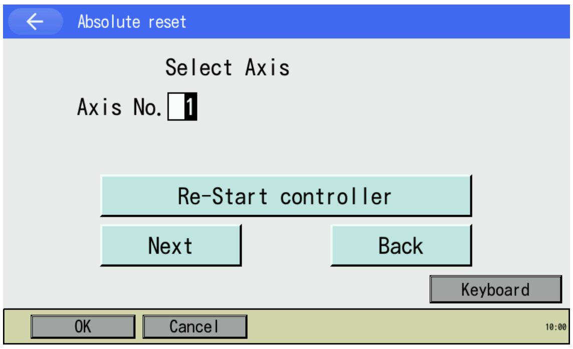

Absolute reset AxisNo. 1

5
Positioning jig removal
-> Emergency stop release

*After "OK", then the process completes.

6) Positioning jig removal and Emergency stop release
Detach the positioning tool.
Release the EMERGENCY STOP button before touching OK button.

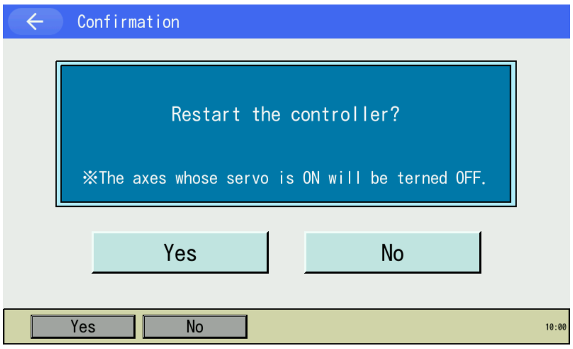
* After confirming OK, the screen automatically returns to the axis select screen.


Absolute reset

Select Axis

Axis No. 1

Touch Re-Start controller button.


Confirmation

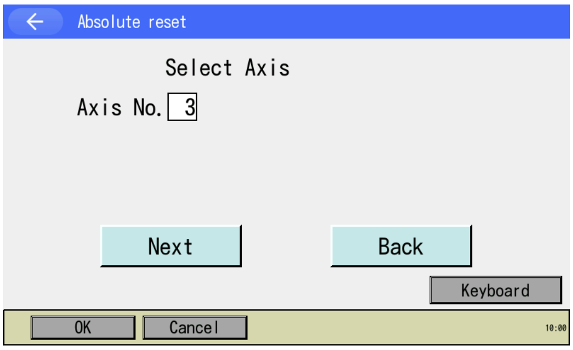
Restart the controller?

※The axes whose servo is ON will be terned OFF.

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



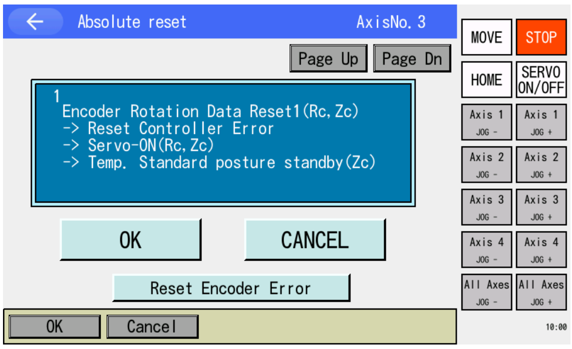
Absolute reset

Select Axis

Axis No. 3

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).



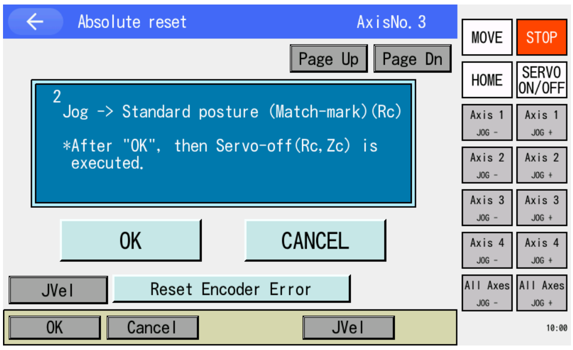
Absolute reset AxisNo. 3

1
Encoder Rotation Data Reset1(Rc, Zc)
-> Reset Controller Error
-> Servo-ON(Rc, Zc)
-> Temp. Standard posture standby(Zc)

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.



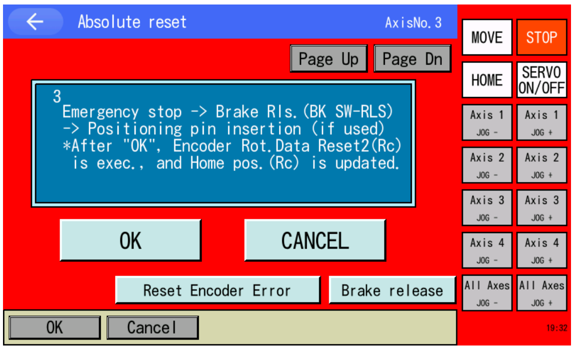
Absolute reset AxisNo. 3

2
Jog -> Standard posture (Match-mark)(Rc)

*After "OK", then Servo-off(Rc, Zc) is executed.

3) Jog Movement
Move the R-axis with the jog button to a place around the standard posture (refer to the figures for standard posture in [16.2 (2)]), and touch OK button.

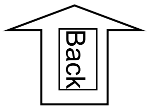
* After touching OK, the servo will get automatically turned OFF (Rc, Zc).

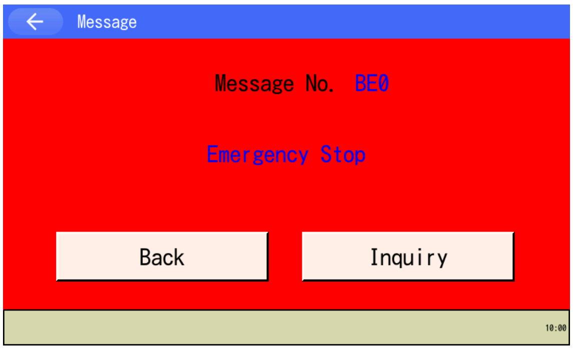


```
3
Emergency stop -> Brake Rls.(BK SW-RLS)
-> Positioning pin insertion (if used)
*After "OK", Encoder Rot.Data Reset2(Rc)
 is exec., and Home pos.(Rc) is updated.
```

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).

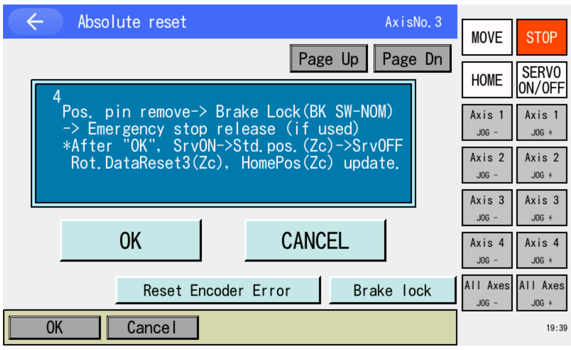




Message No. BE0

Emergency Stop

Inputting emergency stop displays the screen at the left.
Touch Back button, and the screen goes back to the previous.

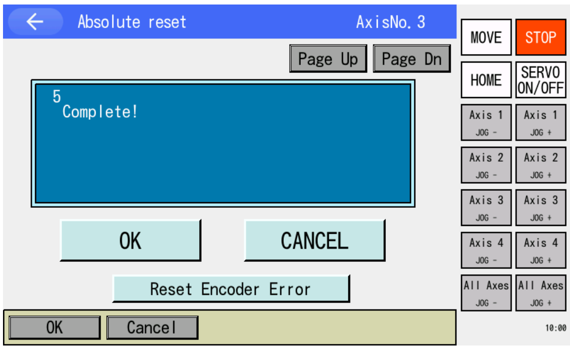


```
4
Pos. pin remove-> Brake Lock(BK SW-NOM)
-> Emergency stop release (if used)
*After "OK", SrvON->Std.pos.(Zc)->SrvOFF
 Rot.DataReset3(Zc), HomePos(Zc) update.
```

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).

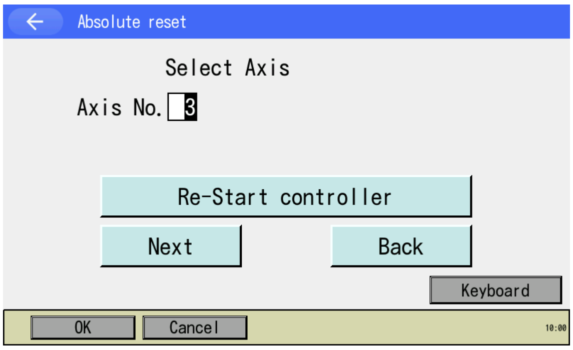
⚠ *Caution:*
The Z-axis returns to the home position.



5
Complete!

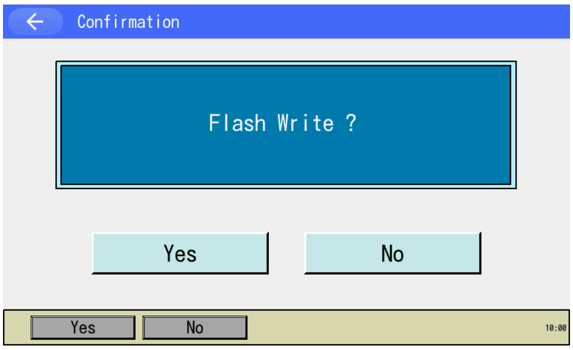
6) Complete!
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



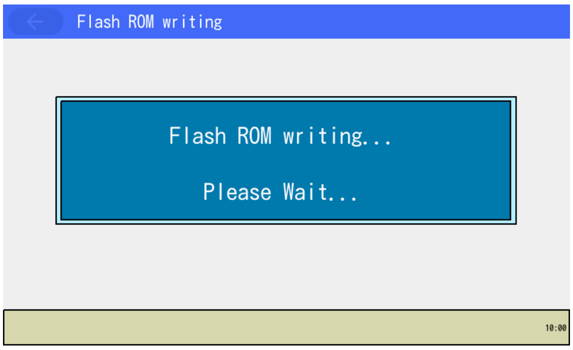
Select Axis
Axis No. 3

7) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.



Flash Write ?

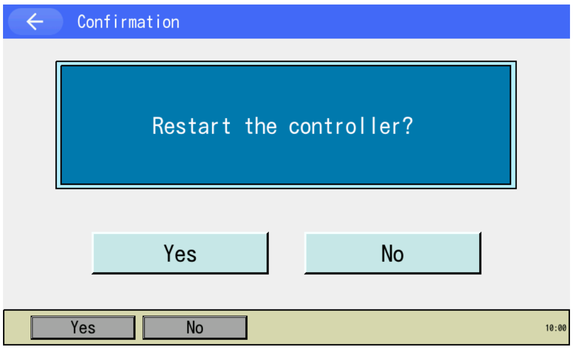
8) Touch Yes button to start flash ROM writing.



Flash ROM writing...
Please Wait...

9) While in writing process to flash ROM, the screen.

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

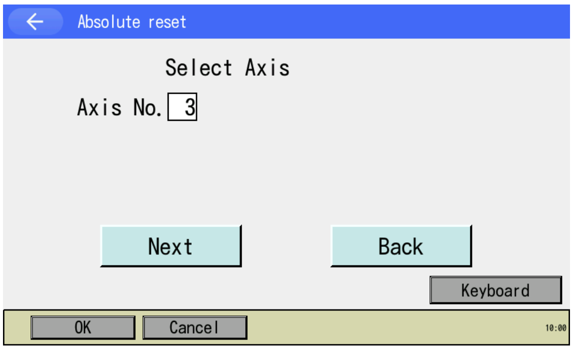


Restart the controller?

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.

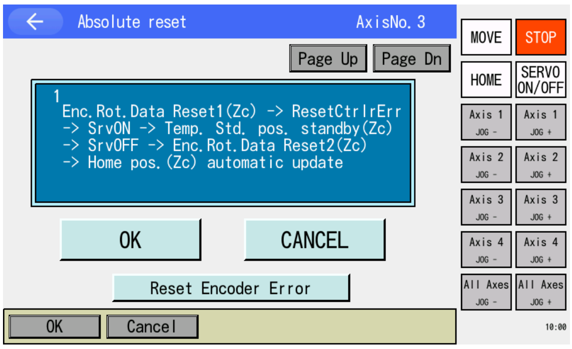
(3) Absolute reset on Z-axis   * For 3-Axis SCARA



Axis No. 3

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).

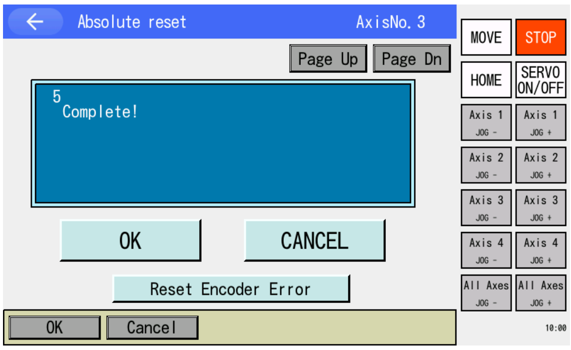


```
1
Enc.Rot.Data Reset1(Zc) -> ResetCtrlErr
-> SrvON -> Temp. Std. pos. standby(Zc)
-> SrvOFF -> Enc.Rot.Data Reset2(Zc)
-> Home pos.(Zc) automatic update
```

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.

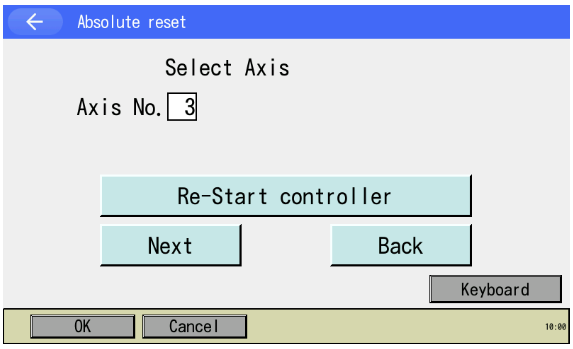
> ⚠ *Caution:*
> *The Z-axis returns to the home position.*



```
5
Complete!
```

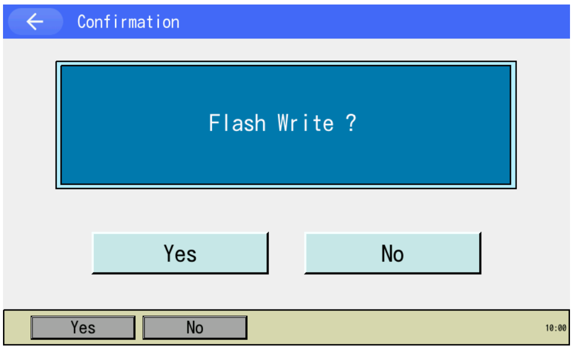
3) Complete!
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



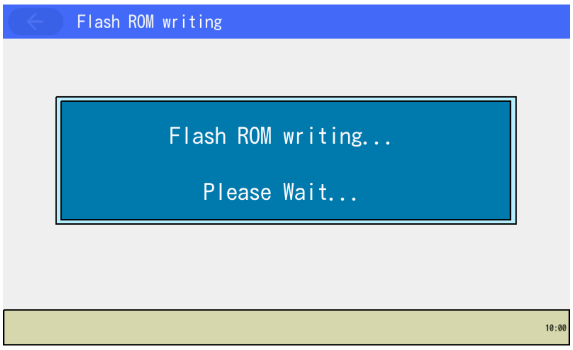
Axis No. 3

4) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.



Flash Write ?

5) Touch Yes button to start flash ROM writing.

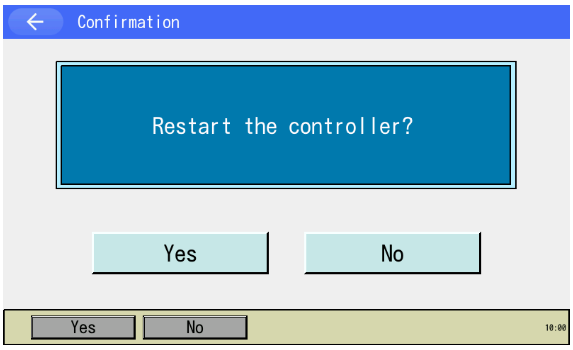


Flash ROM writing...

Please Wait...

6) While in writing process to flash ROM, the left screen.

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



Restart the controller?

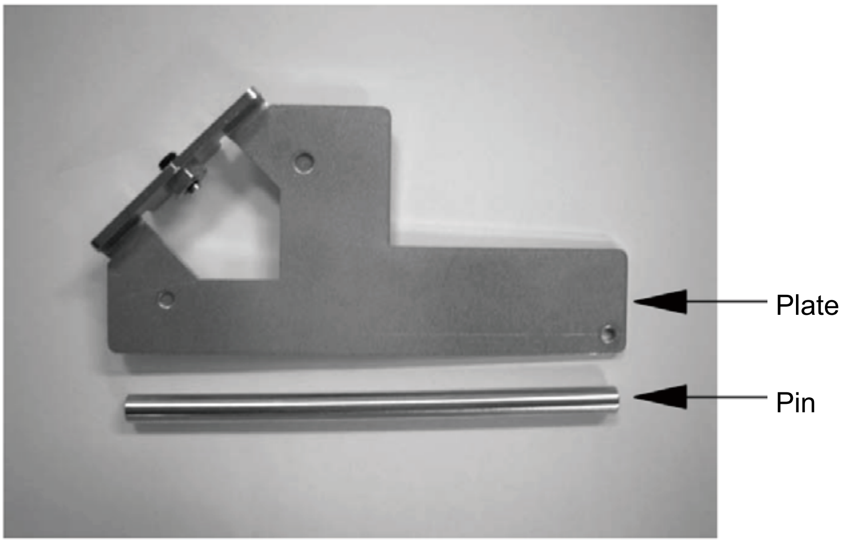
7) Once the flash ROM writing is finished, the screen changes to the screen for software reset.
To activate the parameters that you had changed, it is necessary to have a software reset.
Touch Yes button.

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)



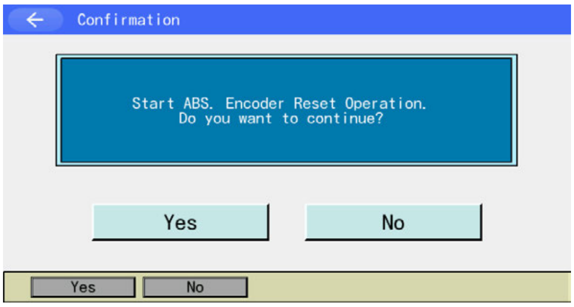
Connect the cables for the robot, controller and teaching pendant to enable operation from the teaching pendant.
Before proceeding, be sure to confirm that the EMG switch operates properly.

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

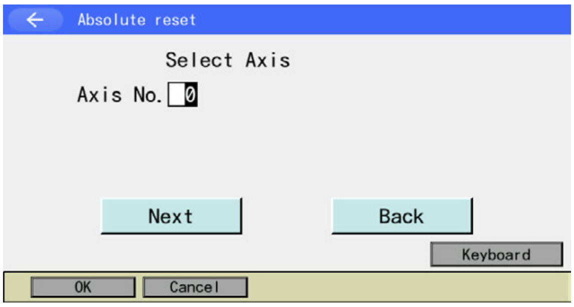
For absolute reset for the ZR unit, a series of operations of the vertical axis and rotation axis is performed. Because there is an item for operating the robot in the adjustment procedure, perform the adjustment in the condition where the actuator is available by setting the appropriate moving range of the actuator and arranging it so there are no obstacles etc. for the actuator.

Select Absolute Reset from Controller Menu.



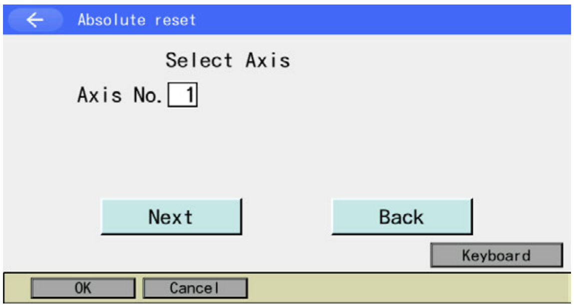
Start ABS. Encoder Reset Operation.
Do you want to continue?

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.



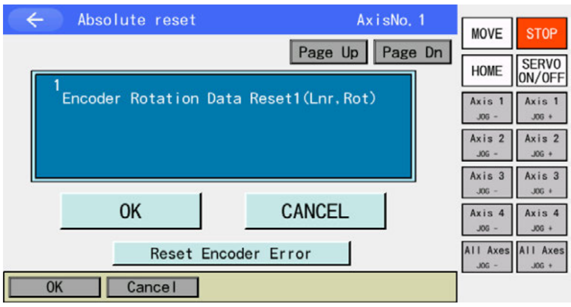
Axis No. 0

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.



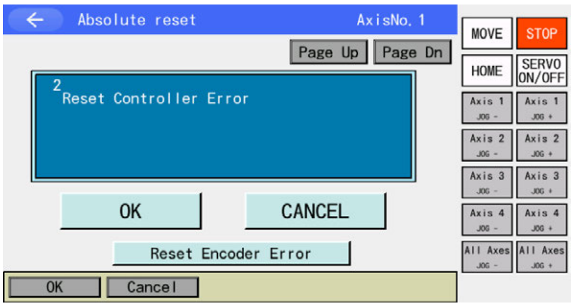
Axis No. 1

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.


Absolute reset AxisNo. 1

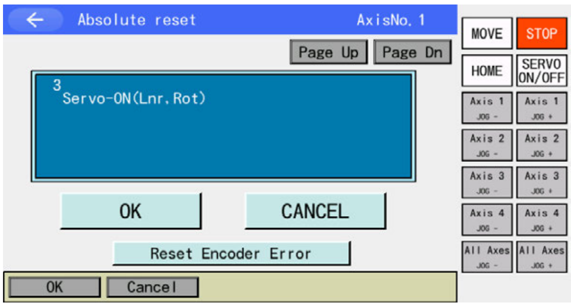
1
Encoder Rotation Data Reset1(Lnr.Rot)

1) Encoder Rotation Data Reset 1
Touch OK button.


Absolute reset AxisNo. 1

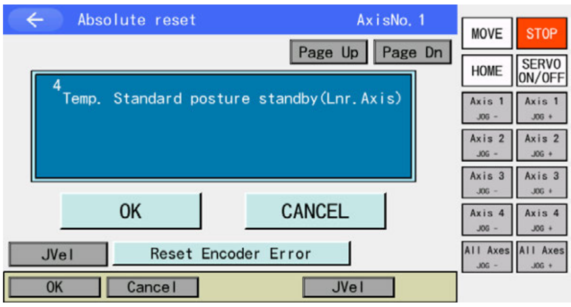
2
Reset Controller Error

2) Reset Controller Error
Touch OK button.


Absolute reset AxisNo. 1

3
Servo-ON(Lnr.Rot)

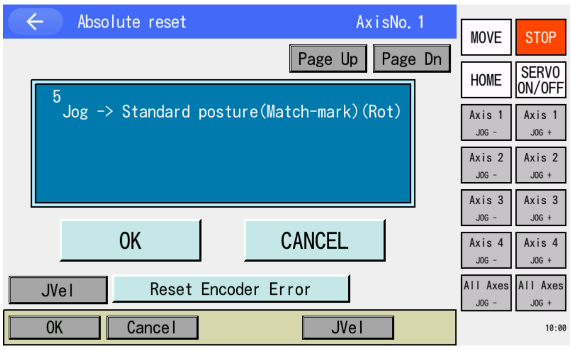
3) Servo-ON
Touch OK button.


Absolute reset AxisNo. 1

4
Temp. Standard posture standby(Lnr.Axis)

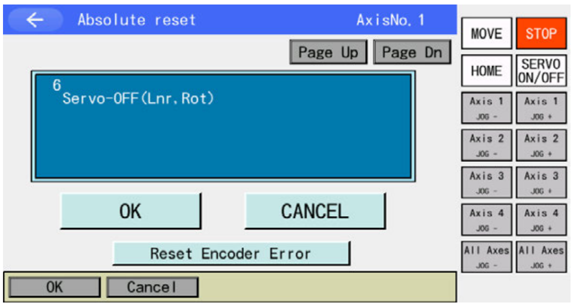
4) Temp. Standard posture standby
Touch OK button.

⚠ *Caution:*
The vertical axis returns to the home position.



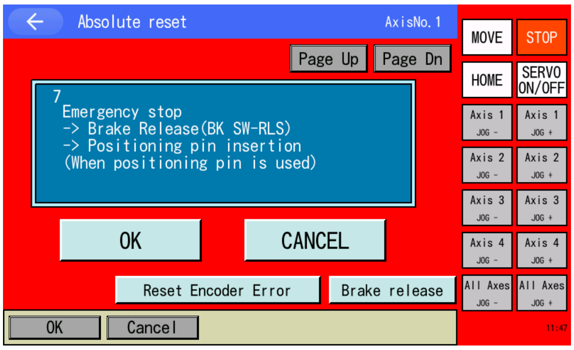
5
Jog -> Standard posture(Match-mark)(Rot)

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.



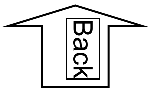
6
Servo-OFF(Lnr.Rot)

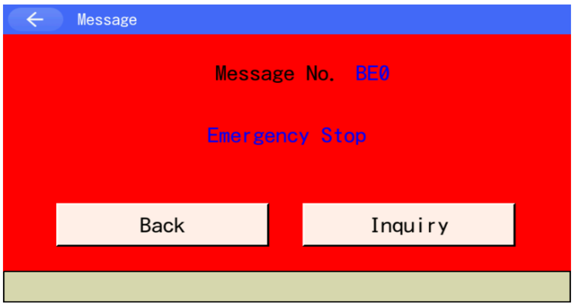
6) Servo-OFF
Touch OK button.



7
Emergency stop
-> Brake Release(BK SW-RLS)
-> Positioning pin insertion
(When positioning pin is used)

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.



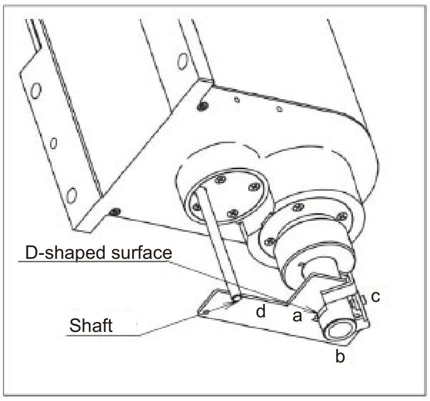


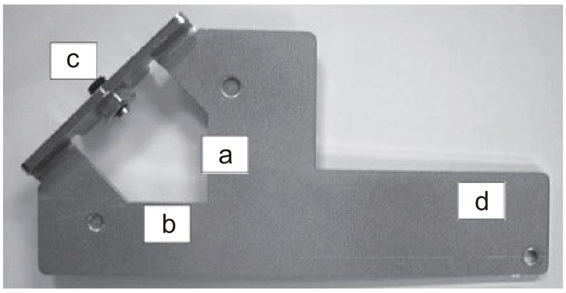
Message No. BE0

Emergency Stop

Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

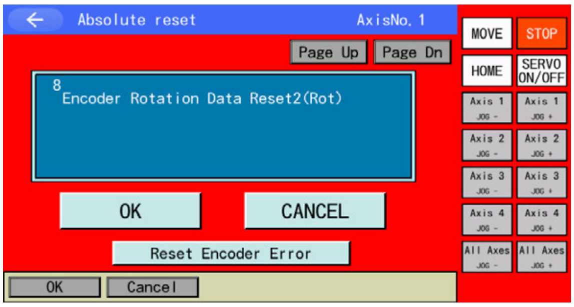
Jig Attachment Procedure





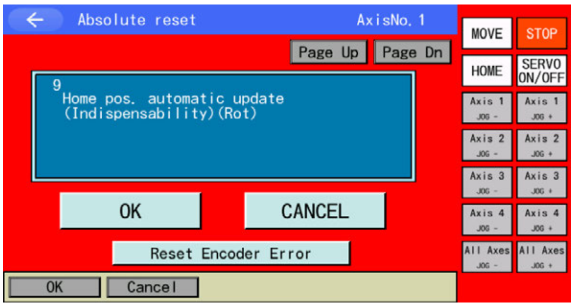
1) Insert the ball screw spline shaft into the jig hole from the lower side.
2) Put the D-cut surface of the ball screw spline shaft onto the surface “a”.
3) Put the ball screw spline shaft side surface onto the surface “b”.
4) Fasten the screw “c” and fix the jig onto the ball screw spline shaft.
   - * 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.*



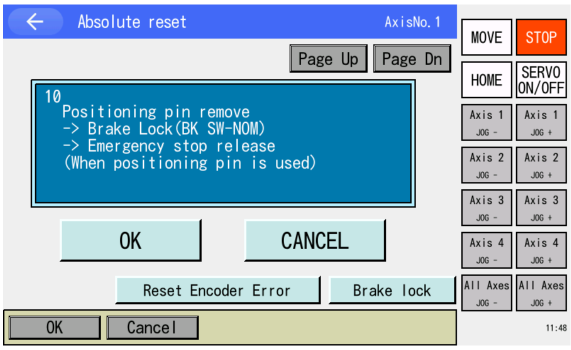
8
Encoder Rotation Data Reset2(Rot)

8) Encoder Rotation Data Reset 2
Touch OK button.



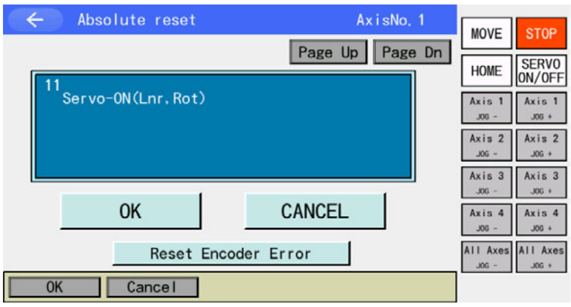
9
Home pos. automatic update
(Indispensability)(Rot)

9) Home pos. automatic update
Touch OK button.



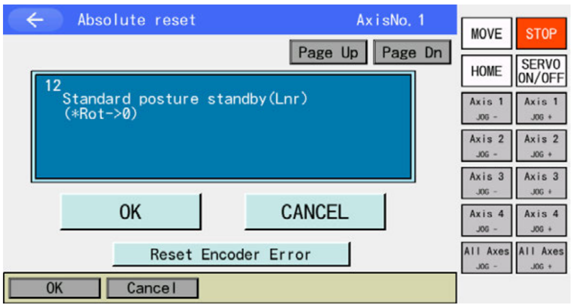
10
Positioning pin remove
-> Brake Lock(BK SW-NOM)
-> Emergency stop release
(When positioning pin is used)

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(Lnr.Rot)

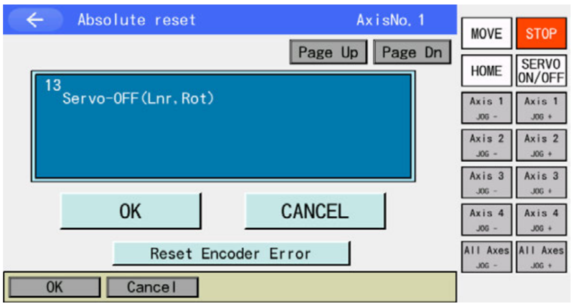
11) Servo-ON
Touch OK button.



12
Standard posture standby(Lnr)
(*Rot->0)

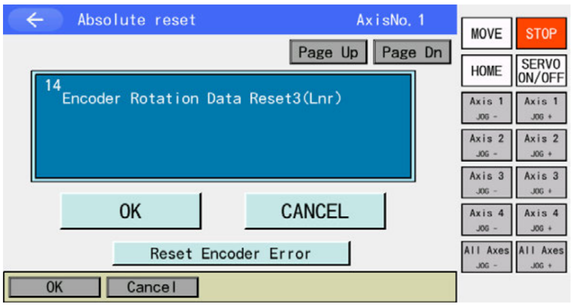
12) Standard posture standby
Touch OK button.

> ⚠ *Caution:*
> *The vertical axis returns to the home position.*



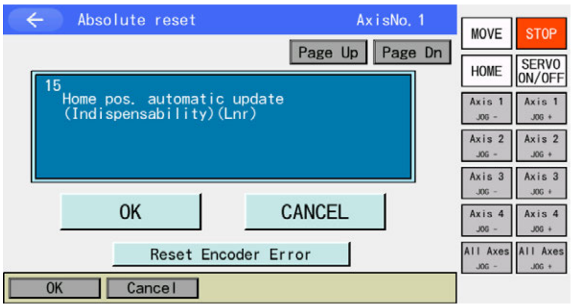
13
Servo-OFF(Lnr,Rot)

13) Servo-OFF
Touch OK button.



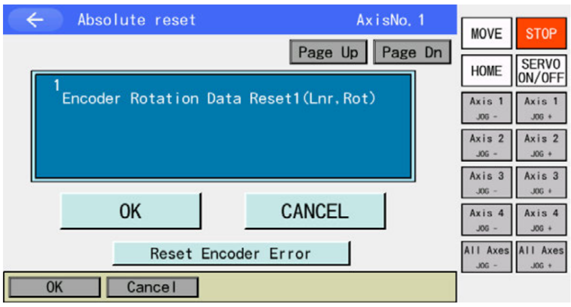
14
Encoder Rotation Data Reset3(Lnr)

14) Encoder Rotation Data Reset 3
Touch OK button.



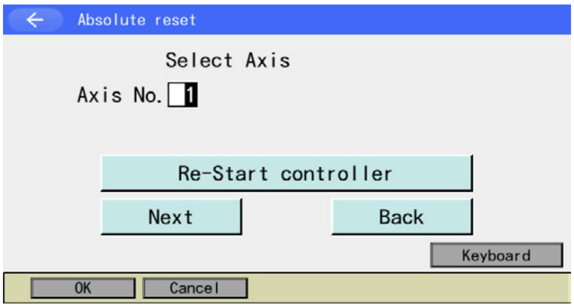
15
Home pos. automatic update
(Indispensability)(Lnr)

15) Home pos. automatic update
Touch OK button.



1 Encoder Rotation Data Reset1(Lnr.Rot)

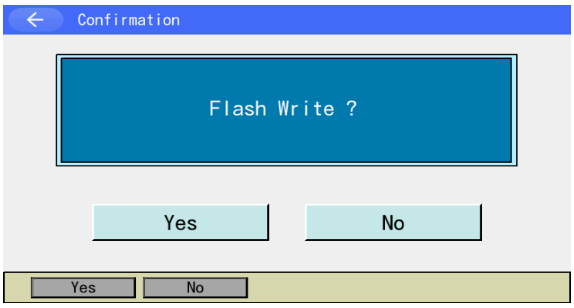
Touch CANCEL button.



Select Axis

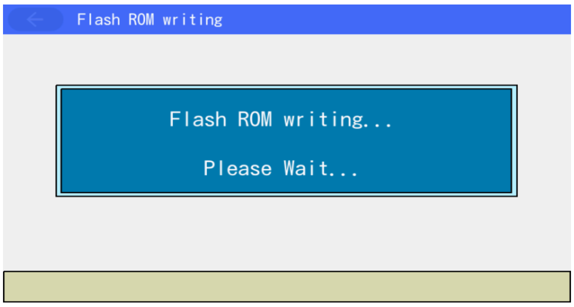
Axis No. 1

Touch Re-Start controller button.



Flash Write ?

Do not fail to conduct Flash ROM Writing → Software Reset after the home preset automatic updating.

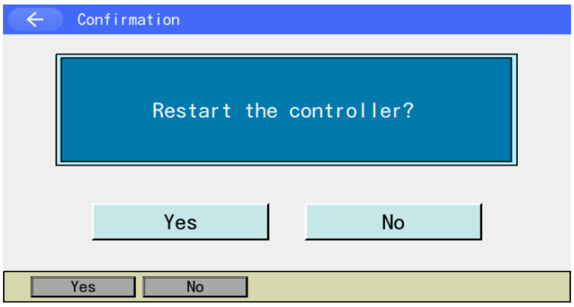


Flash ROM writing...

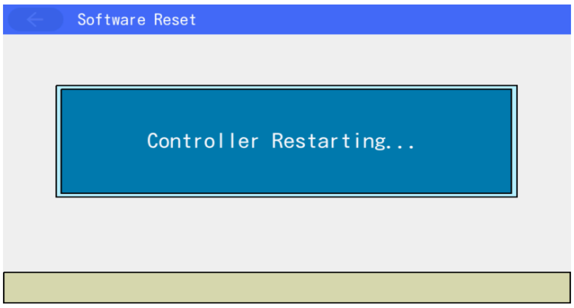
Please Wait...

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

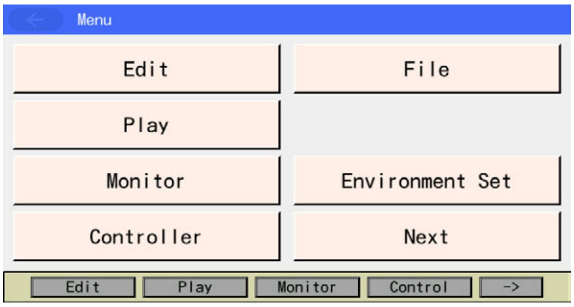
Never turn off the power to the Controller at this time.



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.

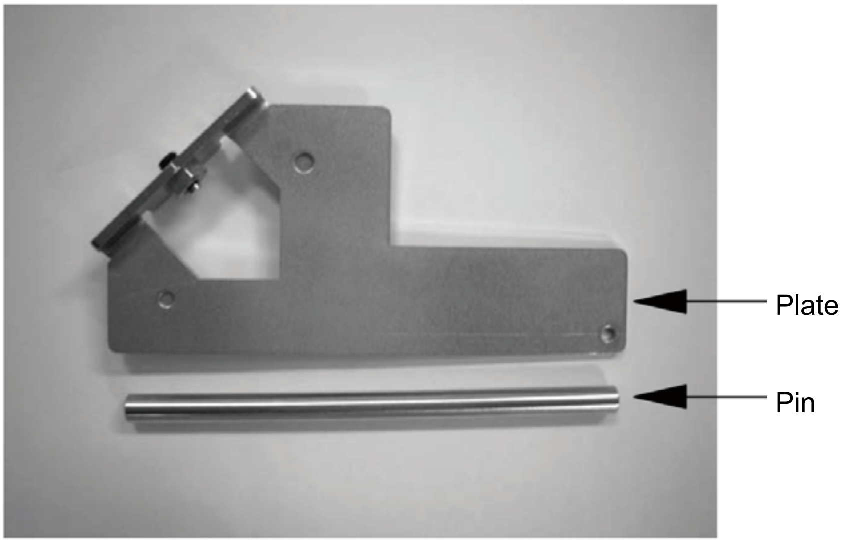


16.4 Perform Ball Screw Spline Shaft Adjusting on ZR Unit (Incremental Type)

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)



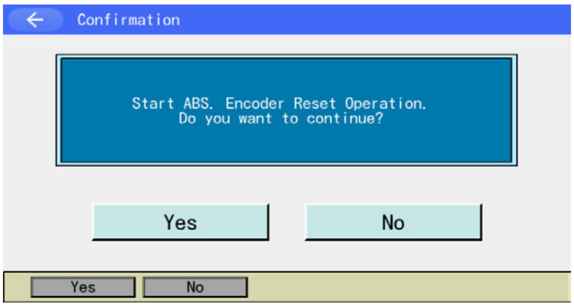
Connect the cables for the robot, controller and teaching pendant to enable operation from the teaching pendant.
Before proceeding, be sure to confirm that the EMG switch operates properly.

⚠ *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

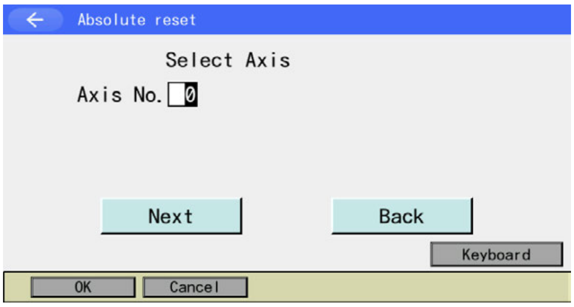
For ball screw spline shaft adjusting for the ZR unit, a series of operations of the vertical axis and rotation axis is performed. Because there is an item for operating the robot in the adjustment procedure, perform the adjustment in the condition where the actuator is available by setting the appropriate moving range of the actuator and arranging it so there are no obstacles etc. for the actuator.

Select Absolute Reset from Controller Menu.



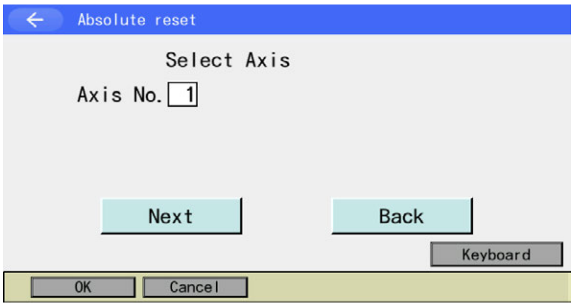
Start ABS. Encoder Reset Operation.
Do you want to continue?

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.



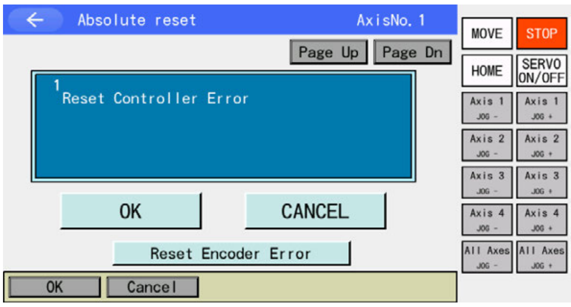
Axis No. 0

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.



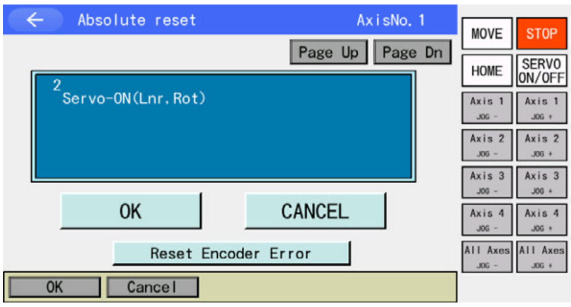
Axis No. 1

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.


Absolute reset AxisNo. 1

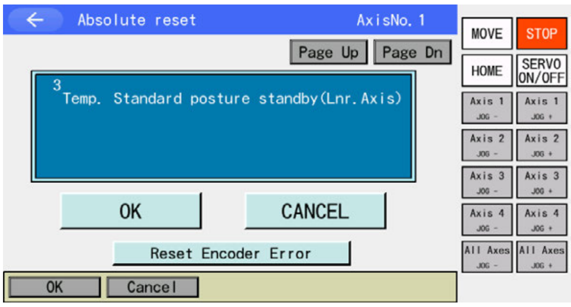
1 Reset Controller Error

1) Reset Controller Error
Touch OK button.


Absolute reset AxisNo. 1

2 Servo-ON(Lnr.Rot)

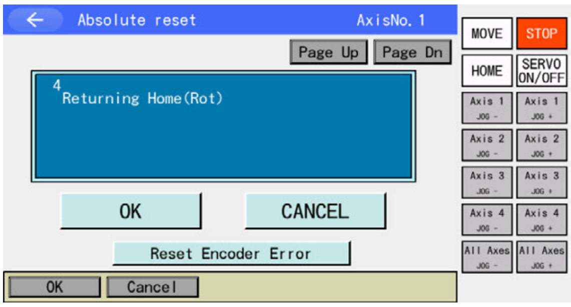
2) Servo-ON
Touch OK button.


Absolute reset AxisNo. 1

3 Temp. Standard posture standby(Lnr.Axis)

3) Temp. Standard posture standby
Touch OK button.

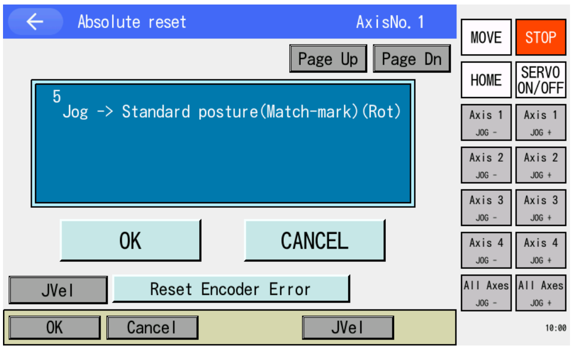
⚠ *Caution:*
The vertical axis returns to the home position.


Absolute reset AxisNo. 1

4 Returning Home(Rot)

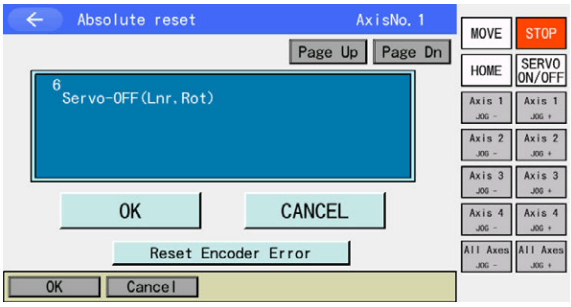
4) Returning Home
Touch OK button.

⚠ *Caution:*
The rotation axis returns to the home position.


Absolute reset AxisNo. 1

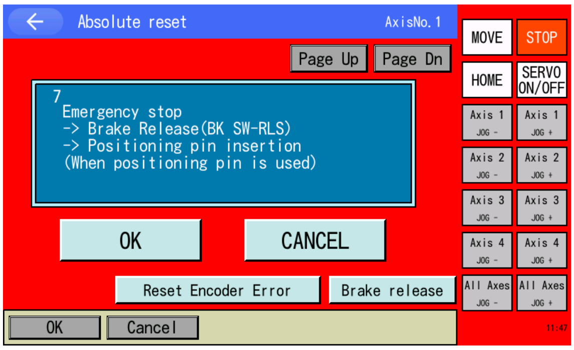
5
Jog -> Standard posture(Match-mark)(Rot)

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.


Absolute reset AxisNo. 1

6
Servo-OFF(Lnr.Rot)

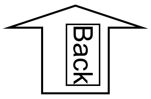
6) Servo-OFF
Touch OK button.

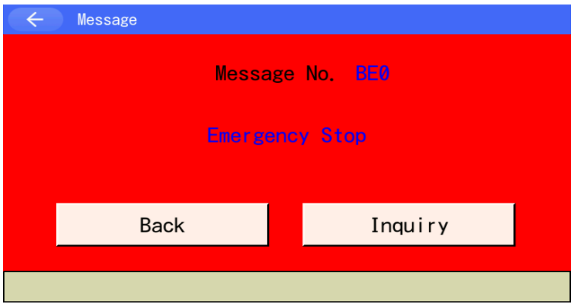

Absolute reset AxisNo. 1

7
Emergency stop
-> Brake Release(BK SW-RLS)
-> Positioning pin insertion
(When positioning pin is used)

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.



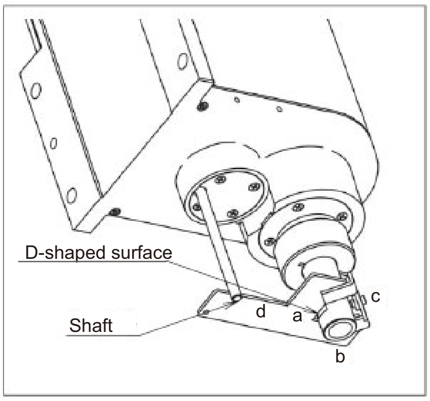

Message

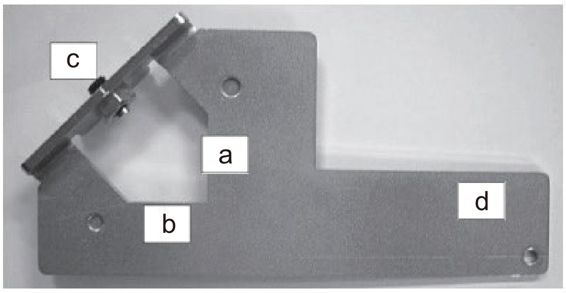
Message No. BE0

Emergency Stop

Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

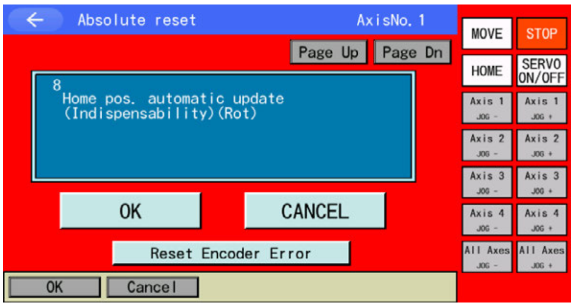
Jig Attachment Procedure





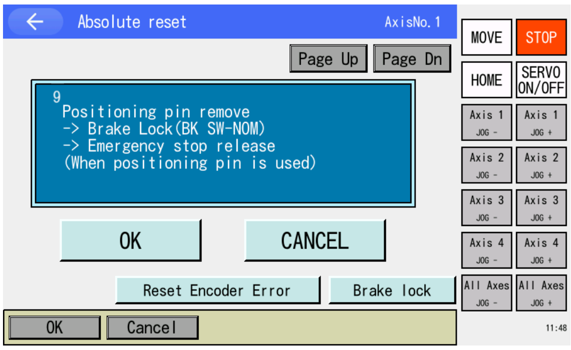
1) Insert the ball screw spline shaft into the jig hole from the lower side.
2) Put the D-cut surface of the ball screw spline shaft onto the surface “a”.
3) Put the ball screw spline shaft side surface onto the surface “b”.
4) Fasten the screw “c” and fix the jig onto the ball screw spline shaft.
   * 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.*



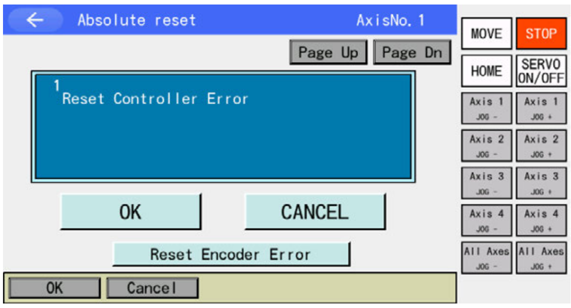
8
Home pos. automatic update
(Indispensability)(Rot)

8) Home pos. automatic update
Touch OK button.



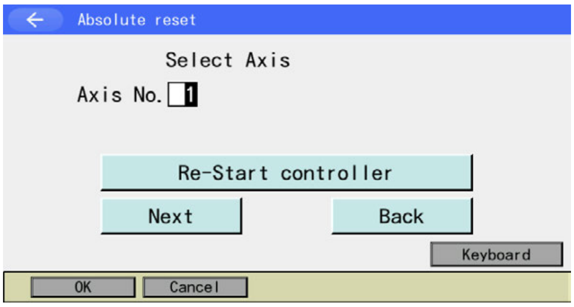
9
Positioning pin remove
-> Brake Lock(BK SW-NOM)
-> Emergency stop release
(When positioning pin is used)

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.

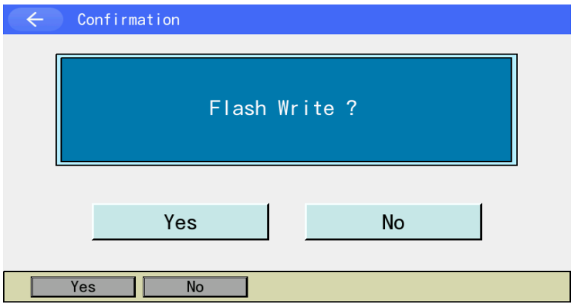


1
Reset Controller Error

Touch CANCEL button.

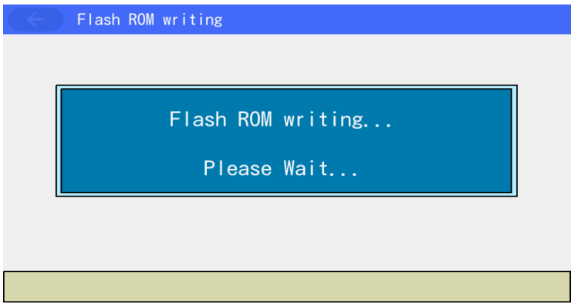


Select Axis
Axis No. 1


Confirmation

Flash Write ?

Do not fail to conduct Flash ROM Writing → Software Reset after the home preset automatic updating.

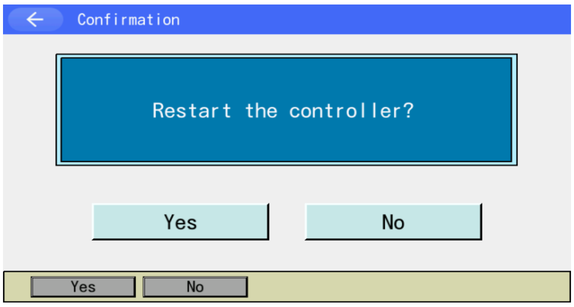

Flash ROM writing

Flash ROM writing...

Please Wait...

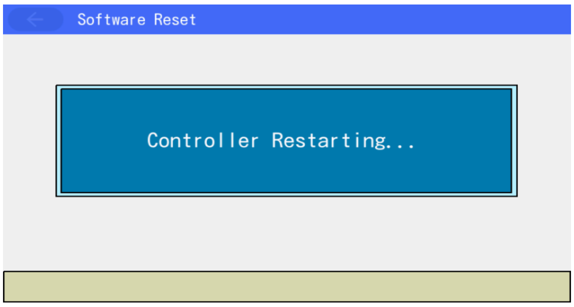
While in writing process to flash ROM, the screen shown in the left will be displayed.

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


Confirmation

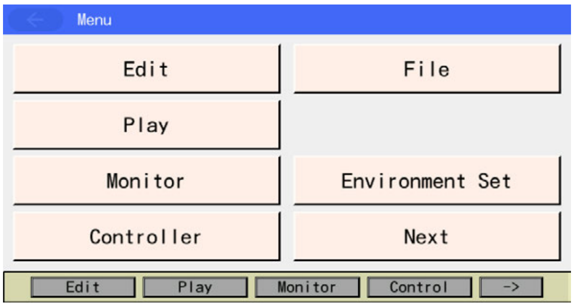
Restart the controller?

After flash ROM writing is complete, the display changes to the software reset screen.
Reset software.
Touch Yes button.


Software Reset

Controller Restarting...

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 Linear 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.

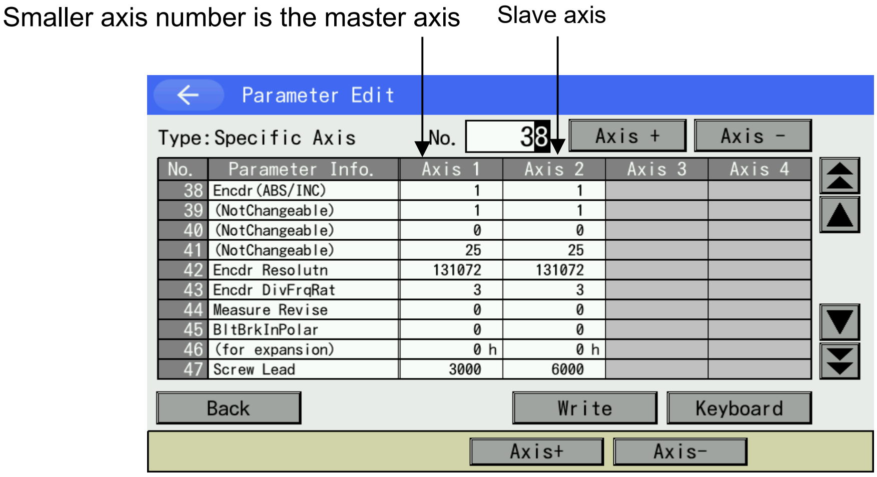
16.5.1 Synchro Axes

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

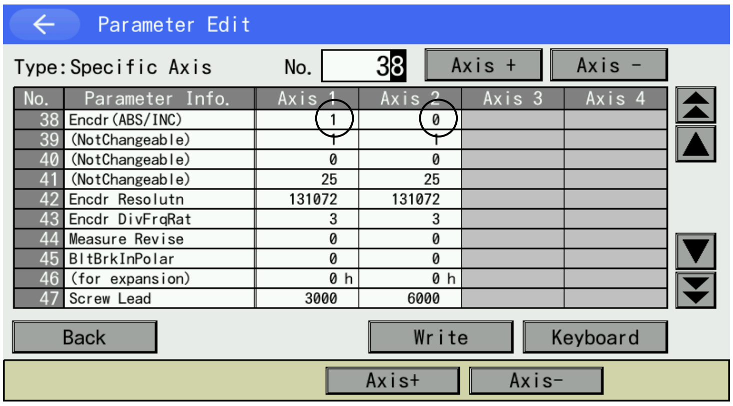

Smaller axis number is the master axis
Slave axis

Type:Specific Axis No. 38

No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
38	Encdr(ABS/INC)	1	1		
39	(NotChangeable)	1	1		
40	(NotChangeable)	0	0		
41	(NotChangeable)	25	25		
42	Encdr Resolutn	131072	131072		
43	Encdr DivFrqRat	3	3		
44	Measure Revise	0	0		
45	BltBrkInPolar	0	0		
46	(for expansion)	0 h	0 h		
47	Screw Lead	3000	6000		

⚠ *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:



Type:Specific Axis No. 38

No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
38	Encdr(ABS/INC)	1	0		
39	(NotChangeable)	1	1		
40	(NotChangeable)	0	0		
41	(NotChangeable)	25	25		
42	Encdr Resolutn	131072	131072		
43	Encdr DivFrqRat	3	3		
44	Measure Revise	0	0		
45	BltBrkInPolar	0	0		
46	(for expansion)	0 h	0 h		
47	Screw Lead	3000	6000		

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

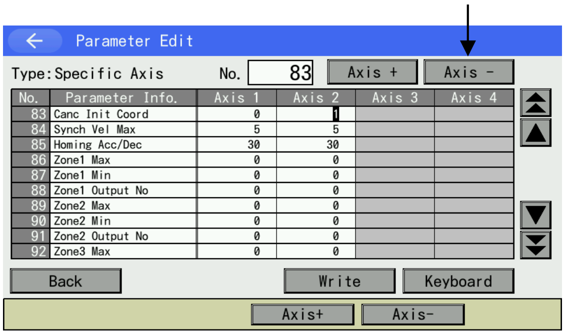
In the case of “Specific-axis parameter No. 38 encoder ABS/INC type”: master axis = 1 and slave axis = 1:

> 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

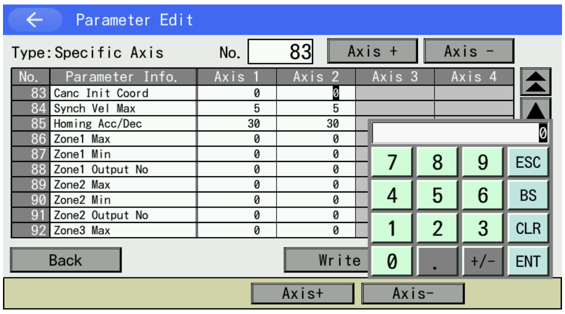
Slave axis



Type:Specific Axis No. 83 Axis + Axis -

No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
83	Canc Init Coord	0	1		
84	Synch Vel Max	5	5		
85	Homing Acc/Dec	30	30		
86	Zone1 Max	0	0		
87	Zone1 Min	0	0		
88	Zone1 Output No	0	0		
89	Zone2 Max	0	0		
90	Zone2 Min	0	0		
91	Zone2 Output No	0	0		
92	Zone3 Max	0	0		

(2) Input 0 for the “Specific-axis parameter No. 83 ABS synchro slave axis coordinate initialization cancel” for the slave axis.

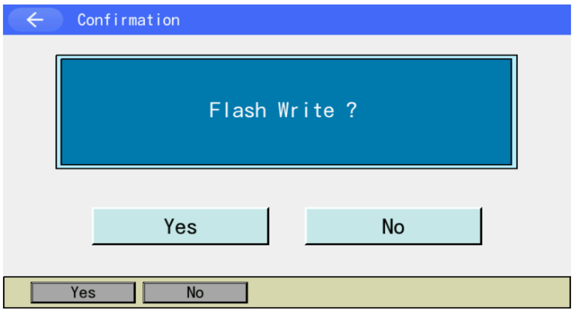


Type:Specific Axis No. 83 Axis + Axis -

No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
83	Canc Init Coord	0	0		
84	Synch Vel Max	5	5		
85	Homing Acc/Dec	30	30		
86	Zone1 Max	0	0		
87	Zone1 Min	0	0		
88	Zone1 Output No	0	0		
89	Zone2 Max	0	0		
90	Zone2 Min	0	0		
91	Zone2 Output No	0	0		
92	Zone3 Max	0	0		

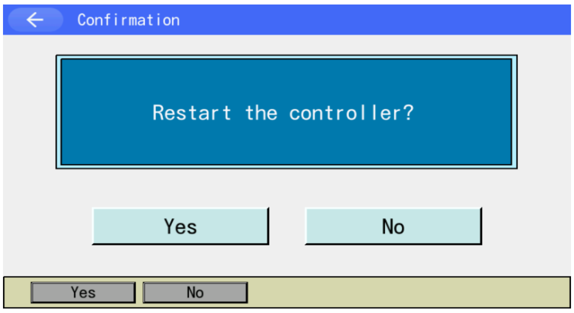
Input 0 on the touch panel numeric keys, and then touch ENT to confirm the input.
Once it is confirmed, the background color of the number display column turns to orange, which shows that it is being edited (controller writing not yet done), and the cursor moves to the next input column.
Touch Write button to transfer the data to the controller.

Touch Back button several times to go to Flash ROM writing screen.



Flash Write ?

Write the data to Flash ROM.
Touch Yes button.



Restart the controller?

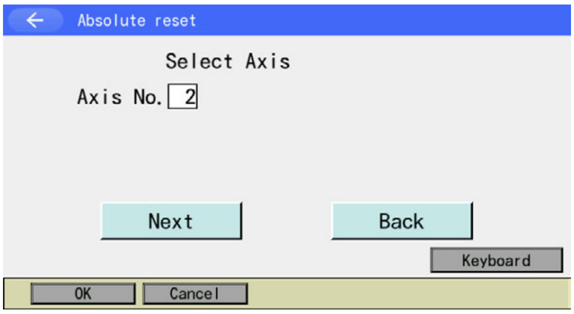
Conduct the reboot (software reset) on the controller.
Touch Yes button.

(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.

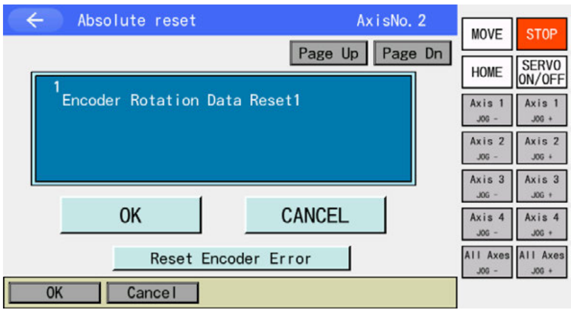
1) Execute the "Encoder Rotation Data Reset 1" for the slave axis.



Select Axis

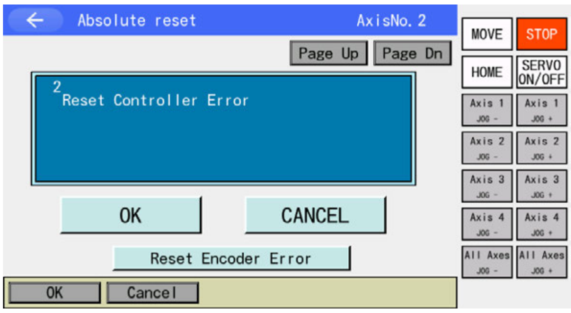
Axis No. 2

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.



1 Encoder Rotation Data Reset1

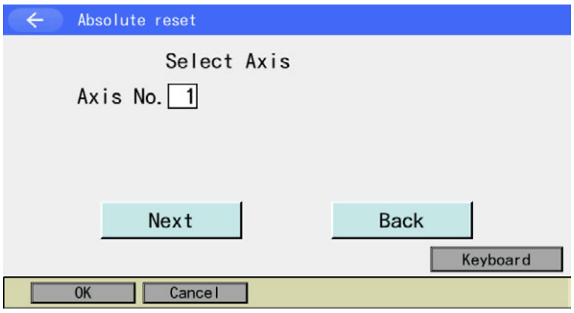
Touch OK button.



2 Reset Controller Error

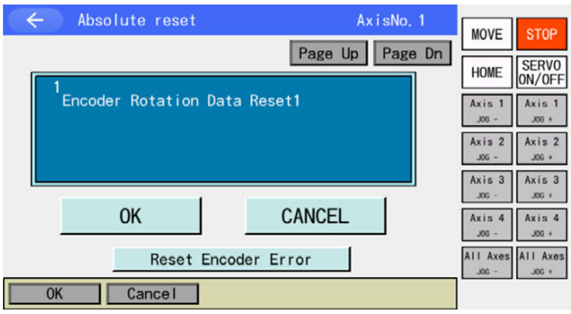
Touch CANCEL button. Make sure not to touch OK button.
Get out of Absolute Reset Mode now.

2) Execute an absolute reset for the master axis according to the screen steps.



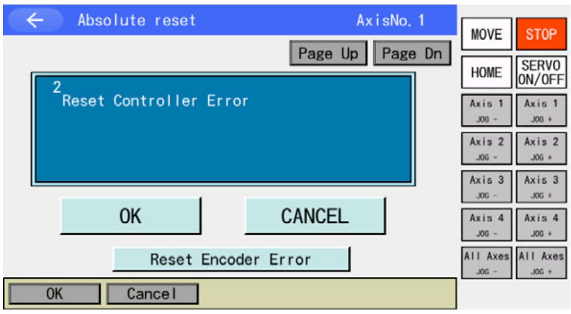
Axis No. 1

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.



1 Encoder Rotation Data Reset1

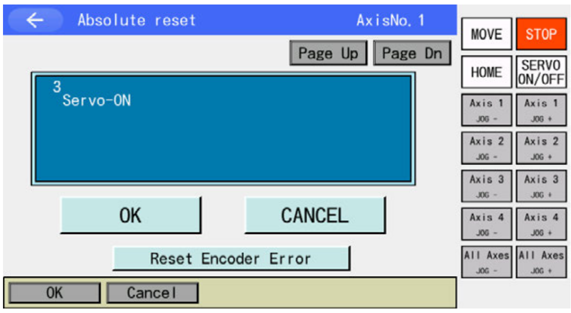
Touch OK button.



Absolute reset AxisNo. 1

2 Reset Controller Error

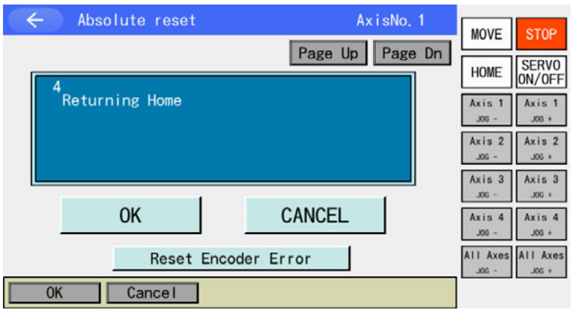
Touch OK button.



Absolute reset AxisNo. 1

3 Servo-ON

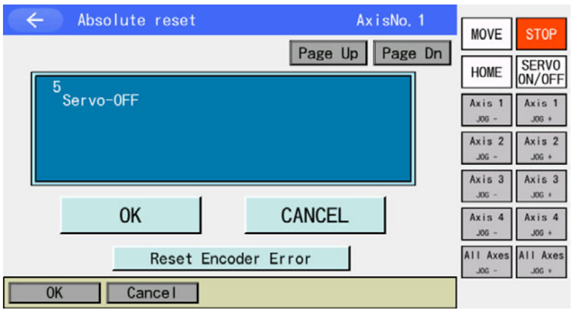
Touch OK button.



Absolute reset AxisNo. 1

4 Returning Home

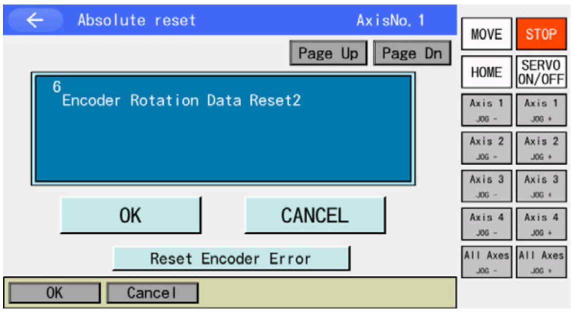
Returning Home
Touch OK button.



Absolute reset AxisNo. 1

5 Servo-OFF

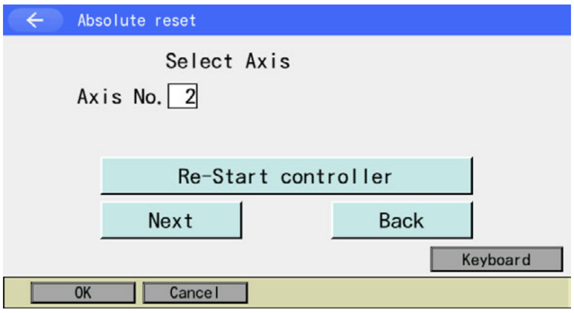
Servo-OFF
Touch Page Up button to forward the screen.
Make sure not to touch OK button.


Absolute reset AxisNo. 1

6
Encoder Rotation Data Reset2

Touch OK button.

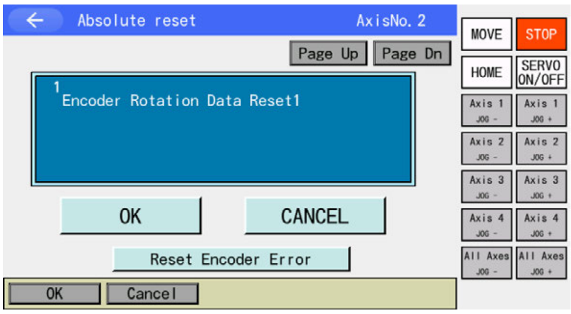
3) Execute the "Encoder Rotation Data Reset 1" for the slave axis again


Absolute reset

Select Axis

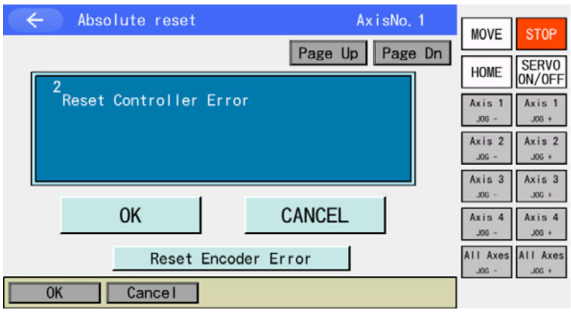
Axis No. 2

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.


Absolute reset AxisNo. 2

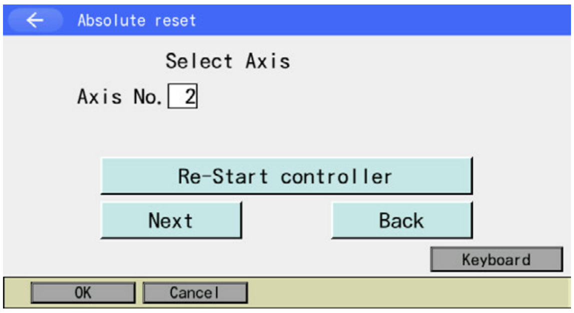
1
Encoder Rotation Data Reset1

Touch OK button.

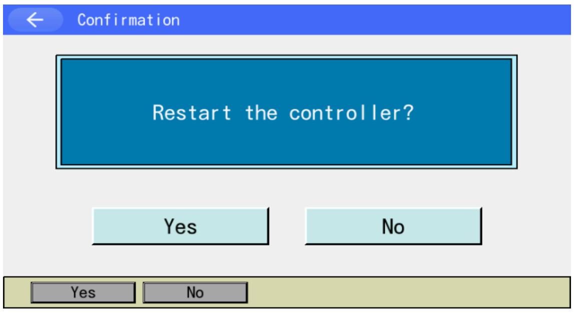

Absolute reset AxisNo. 1

2
Reset Controller Error

Touch CANCEL button. Make sure not to touch OK button.
Get out of Absolute Reset Mode.



Touch Re-Start controller button.

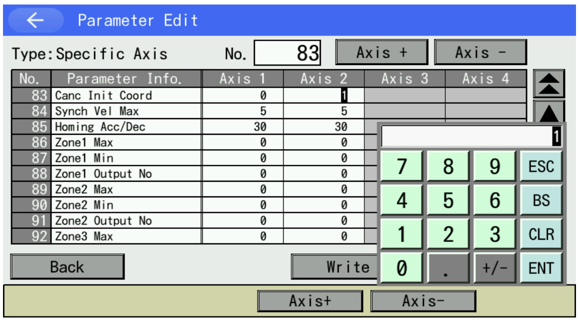


Restart the controller?

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

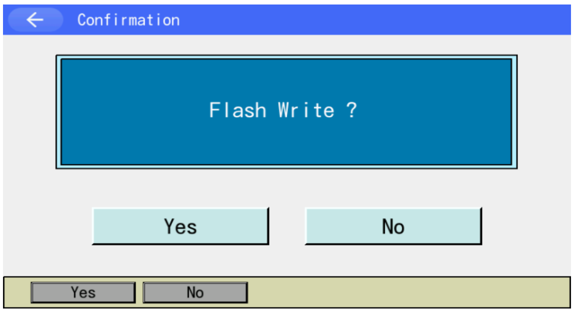


Type:Specific Axis No. 83

No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
83	Canc Init Coord	0	1		
84	Synch Vel Max	5	5		
85	Homing Acc/Dec	30	30		
86	Zone1 Max	0	0		
87	Zone1 Min	0	0		
88	Zone1 Output No	0	0		
89	Zone2 Max	0	0		
90	Zone2 Min	0	0		
91	Zone2 Output No	0	0		
92	Zone3 Max	0	0		

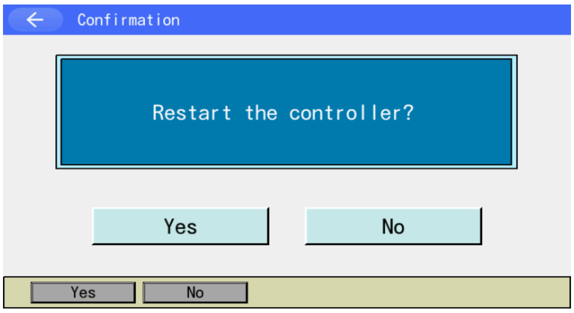
Input 1 on the touch panel numeric keys, and then touch ENT to confirm the input. Once it is confirmed, the background color of the number display column turns to orange, which shows that it is being edited (controller writing not yet done), and the cursor moves to the next input column.

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.



Flash Write ?

Write the data to Flash ROM.
Touch Yes button.



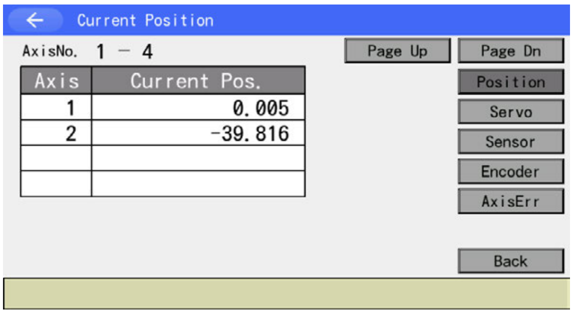
Restart the controller?

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.



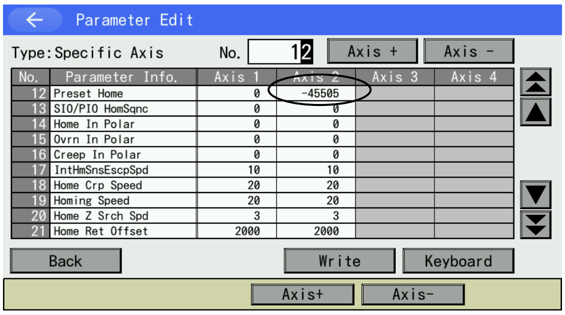
Current Position

AxisNo. 1 – 4

Axis	Current Pos.
1	0.005
2	-39.816

* 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)



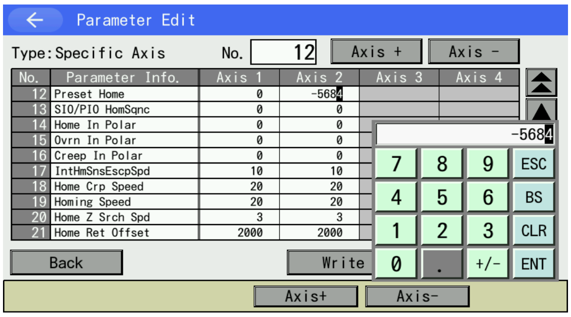
Parameter Edit

Type:Specific Axis No. 12

No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
12	Preset Home	0	-45505		
13	SIO/PIO HomSqnc	0	0		
14	Home In Polar	0	0		
15	Ovrn In Polar	0	0		
16	Creep In Polar	0	0		
17	IntHmSnsEscpSpd	10	10		
18	Home Crp Speed	20	20		
19	Homing Speed	20	20		
20	Home Z Srch Spd	3	3		
21	Home Ret Offset	2000	2000		

In this example: -45505 + ((0.005 - (-39.816)) × 1000) = -5684

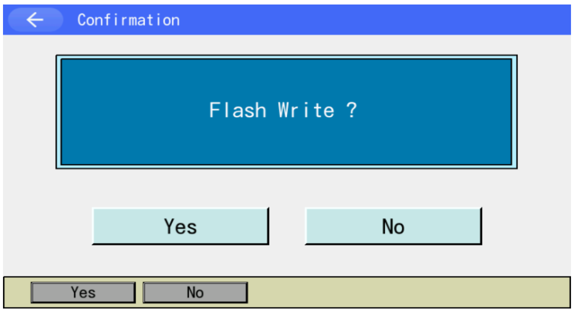
3) Input the calculation result in 2) above to the “Specific-axis parameter No. 12 preset home value” for the slave axis.



Type:Specific Axis No. 12

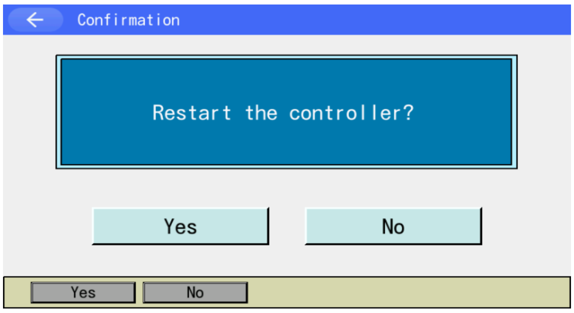
No.	Parameter Info.	Axis 1	Axis 2	Axis 3	Axis 4
12	Preset Home	0	-5684		
13	SIO/PIO HomSqnc	0	0		
14	Home In Polar	0	0		
15	Ovrn In Polar	0	0		
16	Creep In Polar	0	0		
17	IntHmSnsEscpSpd	10	10		
18	Home Crp Speed	20	20		
19	Homing Speed	20	20		
20	Home Z Srch Spd	3	3		
21	Home Ret Offset	2000	2000		

After touching ENT, touch Write button to transfer the data to the controller.
Use Back button to go to Flash ROM writing screen.



Flash Write ?

Write the data to Flash ROM .
Touch Yes button.

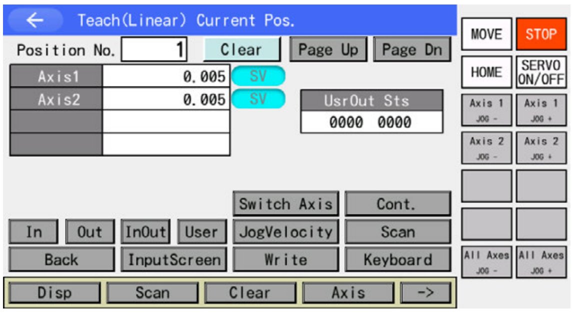


Restart the controller?

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)



Position No. 1
Axis1 0.005
Axis2 0.005
UsrOut Sts 0000 0000

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 “Pressing Absolute Reset” conducted in case the absolute data is lost in Ultra Large SCARA Robot IX-NNN10040/IX-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]

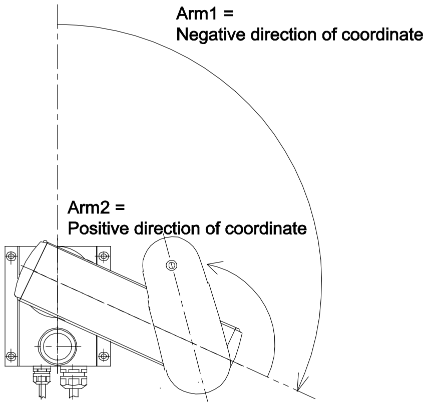
⚠ *Caution: “Stopper pressing position acquirement” may not be available in the situation that the absolute reset is required. Have it done while the normal operation can be performed.*

[Initial posture]

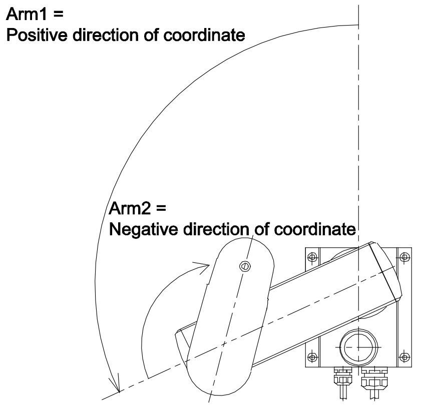
◎ Arm1, Arm2

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.



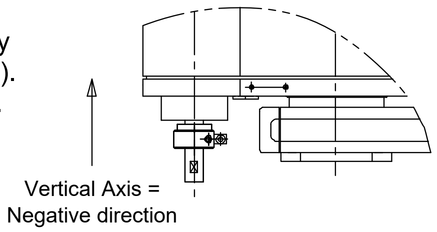
Initial posture of right arm system (At the delivery)
Arm1 = Negative direction of coordinate
Arm2 = Positive direction of coordinate



Initial posture of left arm system
Arm1 = Positive direction of coordinate
Arm2 = Negative direction of coordinate

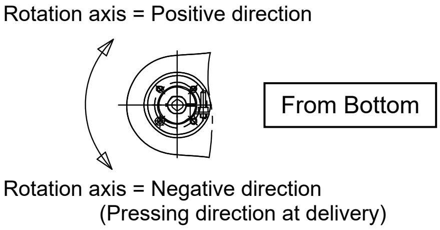
◎ Vertical Axis

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

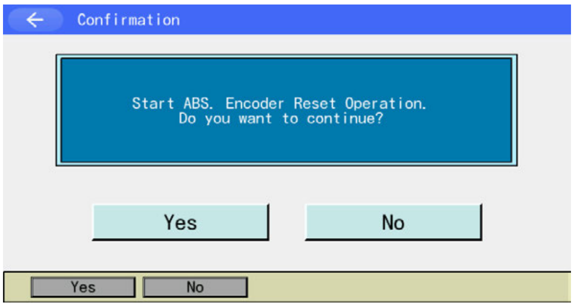
There is no indication in specific for the position of the initial posture of the rotation axis.
It can be set at any position.


Rotation axis = Positive direction
From Bottom
Rotation axis = Negative direction
(Pressing direction at delivery)

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.)

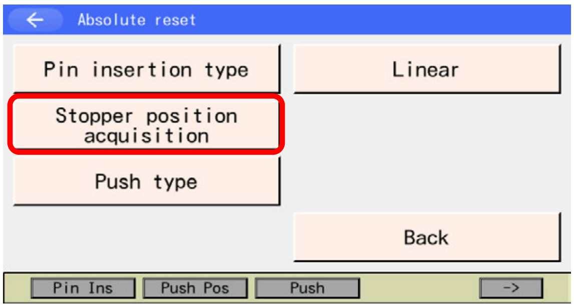
1) Select Absolute Reset from Controller Menu.



Start ABS. Encoder Reset Operation.
Do you want to continue?

2) To have an absolute reset, touch Yes button.

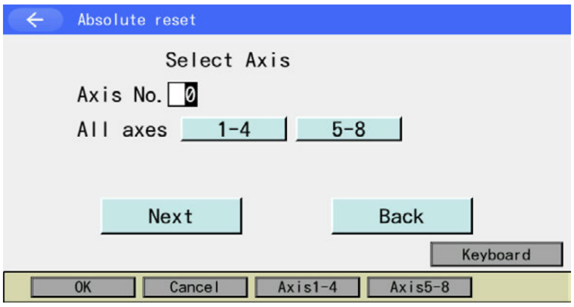
When not to have an absolute reset, touch No button. The display returns to the previous screen.



3) Touch Stopper position acquisition button.

* Linear button should be shown only when there is a linear axis.

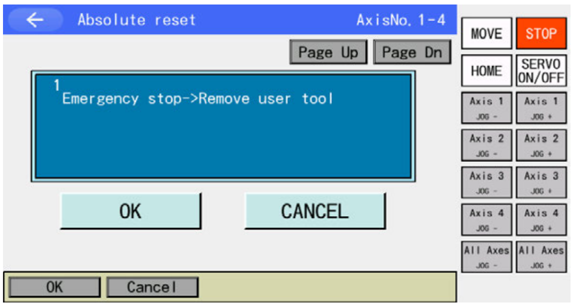
16.6.1.1 Procedures for All Axes in Batch



1) Either touch 1-4 or 5-8 button, and touch Next button.

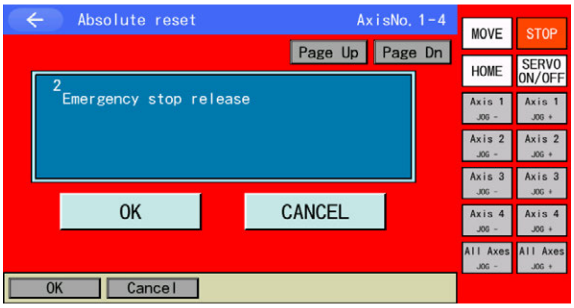
* There is 5-8 button equipped in XSEL-RXD/SXD/RAXD/SAXD only.

* It should be from 1-3 button for 3-axis SCARA

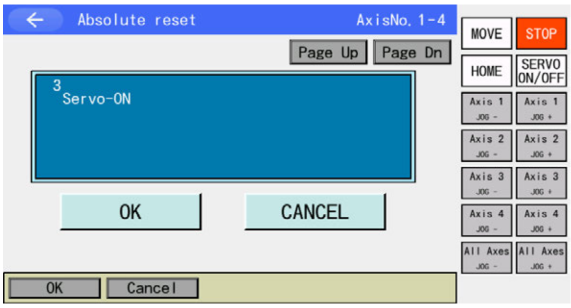

1 Emergency stop->Remove user tool

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.

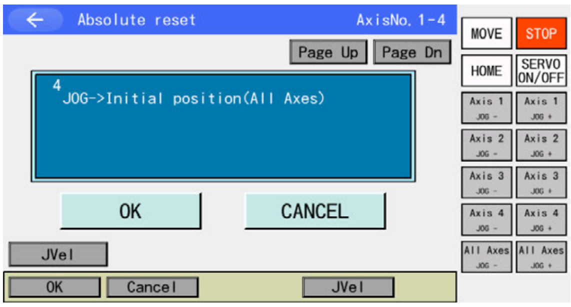

2 Emergency stop release

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.


3 Servo-ON

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. How to Perform Pressing Absolute Reset on IX-1000/1200].)

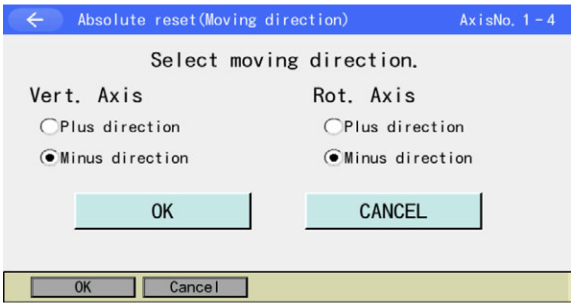
1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.



4
JOG->Initial position(All Axes)

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.



Select moving direction.

Vert. Axis
○Plus direction
●Minus direction

Rot. Axis
○Plus direction
●Minus direction

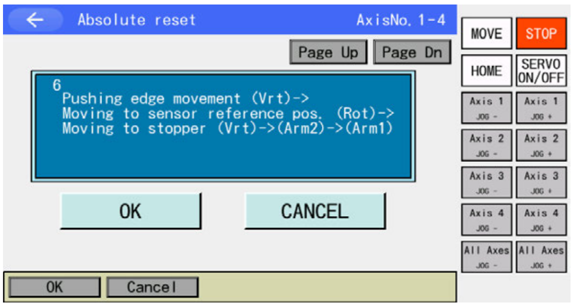
6) Selection for Moving Direction of Vertical Axis and Rotation Axis

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.

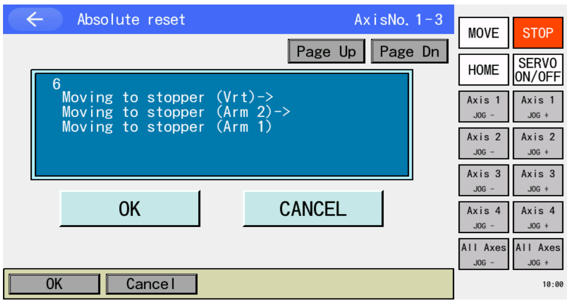


6
Pushing edge movement (Vrt)->
Moving to sensor reference pos. (Rot)->
Moving to stopper (Vrt)->(Arm2)->(Arm1)

7) Acquirement of Stopper Pressing Position / Sensor Datum Position for All Axes

Touch OK button.

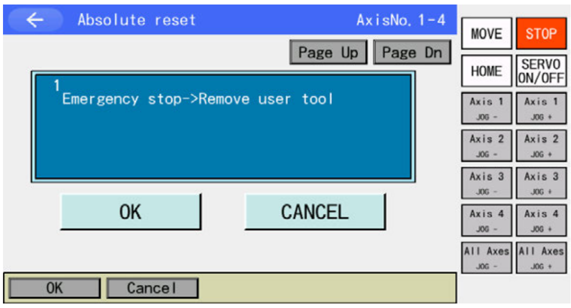
The axes shift in the order of vertical pressing position movement, rotation axis sensor datum position movement, vertical axis stopper pressing movement, Arm2 stopper pressing movement and Arm1 stopper pressing movement to acquire the pressing position.



6
Moving to stopper (Vrt)->
Moving to stopper (Arm 2)->
Moving to stopper (Arm 1)

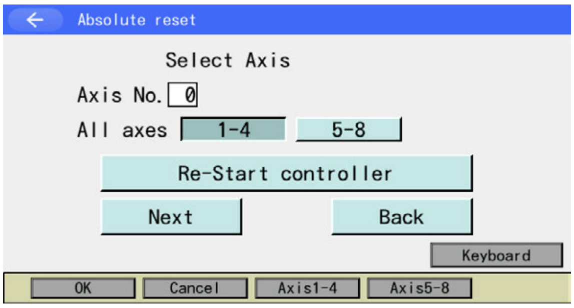
* The figure shown on the left should be shown for 3-axis SCARA.
Touch the OK button.

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.



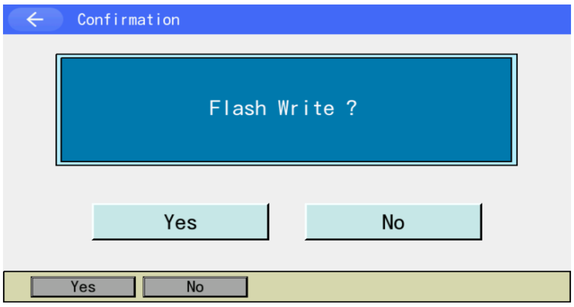
1 Emergency stop->Remove user tool

8) The screen goes back to the first screen once the process is complete.
Touch CANCEL button.



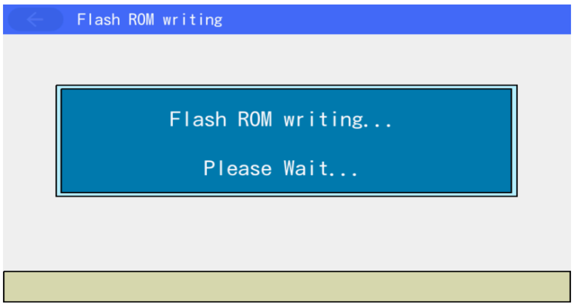
9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

10) Touch Yes button to start flash ROM writing.

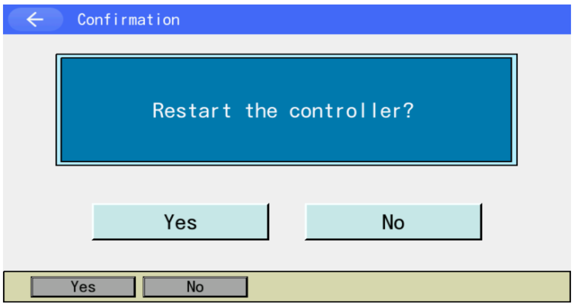


Flash ROM writing...

Please Wait...

11) While in writing process to flash ROM, the screen.

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



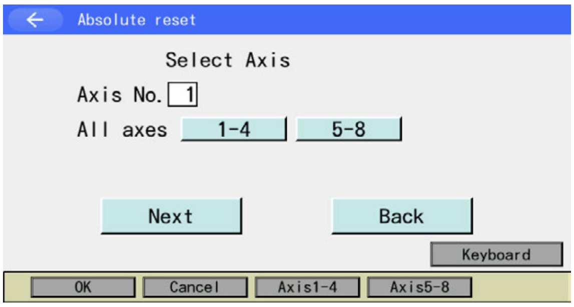
Restart the controller?

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

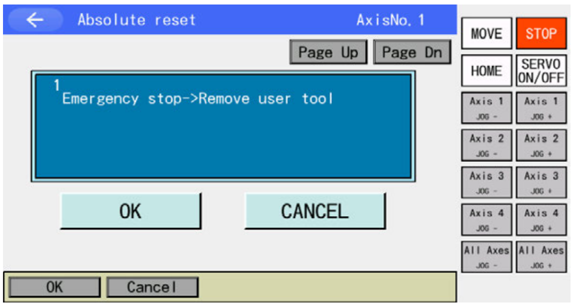

Absolute reset

Select Axis

Axis No. 1

1) Input either 1 or 2 (5 or 6) in Axis No. box with using the software numeric keys, and then touch Next button.

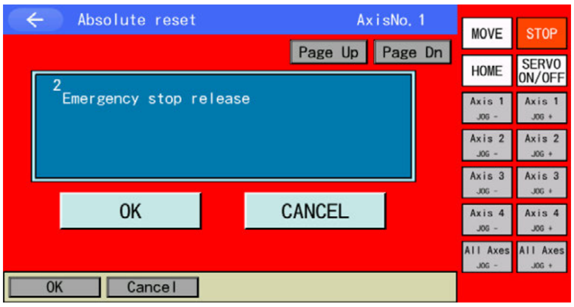
Shown in the figure on the left is the condition that Arm1 on the 1st SCARA in XSEL-RXD/SXD is selected.


Absolute reset AxisNo. 1

1 Emergency stop->Remove user tool

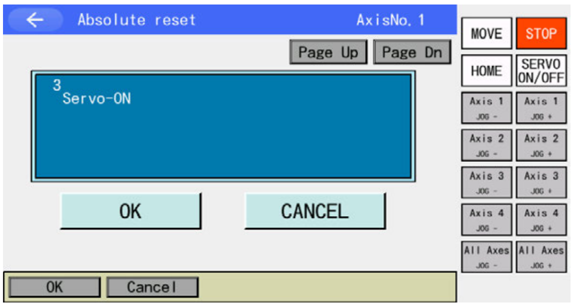
2) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.


Absolute reset AxisNo. 1

2 Emergency stop release

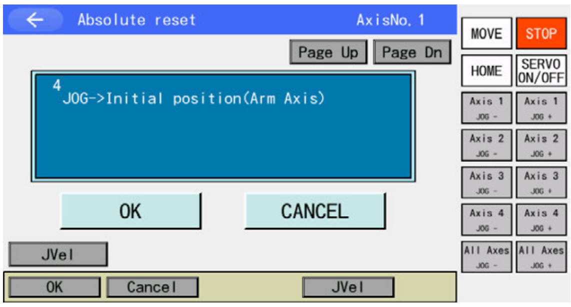
3) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop.
(The screen for emergency stop is shown in the figure on the left.)
Touch OK button.


Absolute reset AxisNo. 1

3
Servo-ON

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. How to Perform Pressing Absolute Reset on IX-1000/1200].)

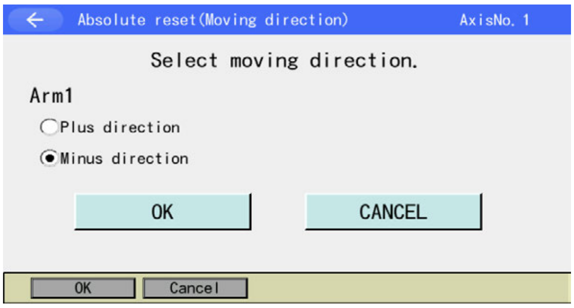
1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.


Absolute reset AxisNo. 1

4
JOG->Initial position(Arm Axis)

5) Moving to Initial Posture

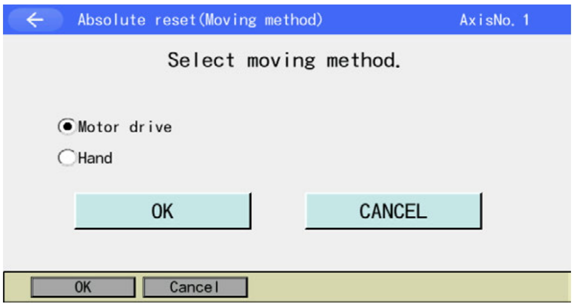
1. If using JOG operation to align to initial posture
   To avoid interference, use JOG operation to align Arm1 (2) to the initial posture.
   Touch OK button.
2. If aligning to initial posture manually
   Turn ON the emergency stop. Align Arm1 (2) to the initial posture manually. Turn OFF the emergency stop.
   Touch OK button.


Absolute reset(Moving direction) AxisNo. 1

Select moving direction.

Arm1
○ Plus direction
● Minus direction

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.



Absolute reset(Moving method) AxisNo. 1

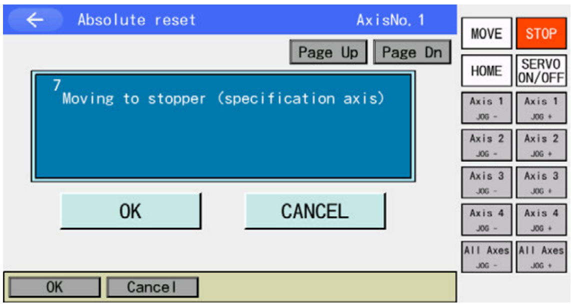
Select moving method.

● Motor drive
○ Hand

7) Selection for Moving Direction of Arm1 (2)

1. <u>If conducting with motor drive</u>
   Touch the radio button for motor drive.
   Touch OK button.
2. <u>If conducting manually</u>
   Touch the radio button for manual (hand) .
   Touch OK button.

Note: Touch CANCEL button to finish the absolute reset.

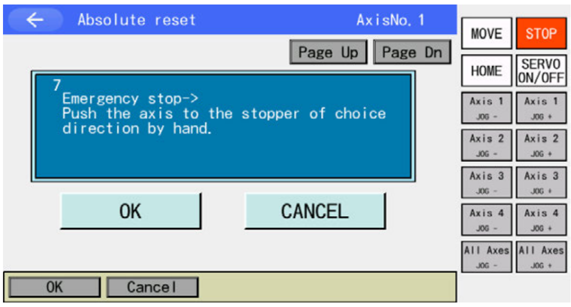


Absolute reset AxisNo. 1

7
Moving to stopper (specification axis)

8) Moving to stopper of Arm1 (2) (in motor drive)
Touch OK button.

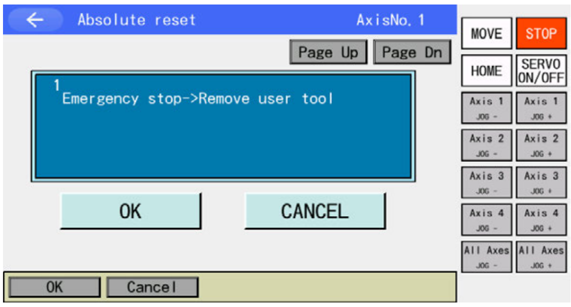
Arm1 or 2 moves for stopper pressing to acquire the pressing position.



Absolute reset AxisNo. 1

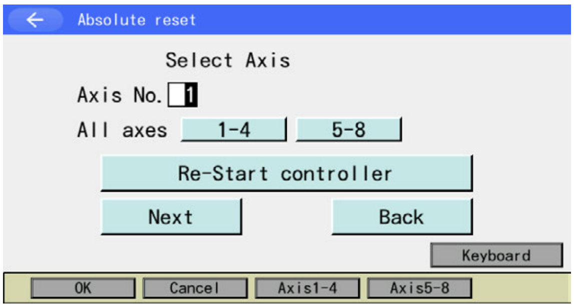
7
Emergency stop->
Push the axis to the stopper of choice direction by hand.

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.



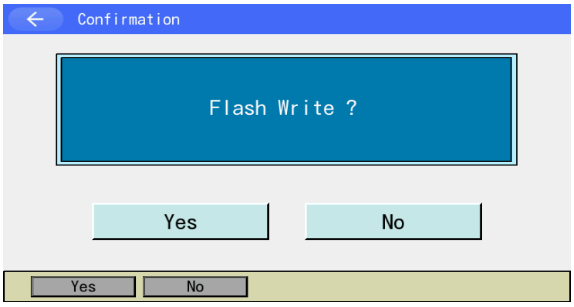
1 Emergency stop->Remove user tool

10) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.



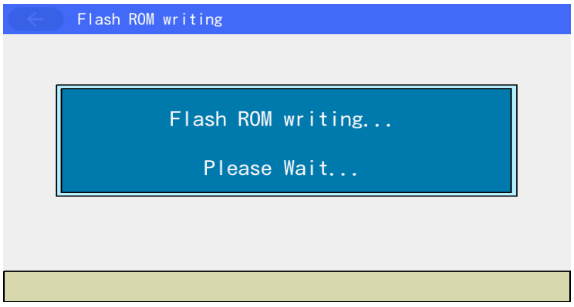
11) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

12) Touch Yes button to start flash ROM writing.

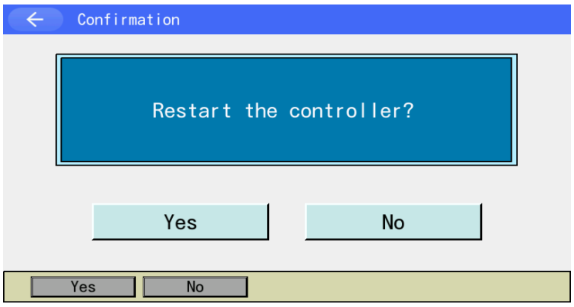

Flash ROM writing

Flash ROM writing...

Please Wait...

13) While in writing process to flash ROM, the screen.

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

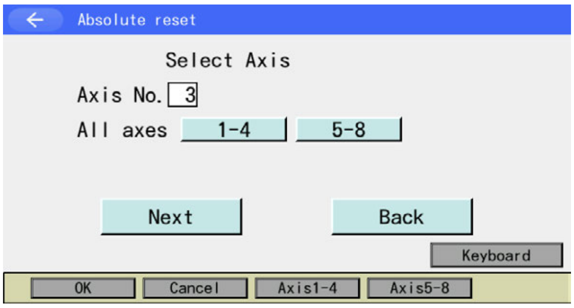

Confirmation

Restart the controller?

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.

16.6.1.2 (2) Vertical Axis + Rotation Axis * For 4-Axis SCARA

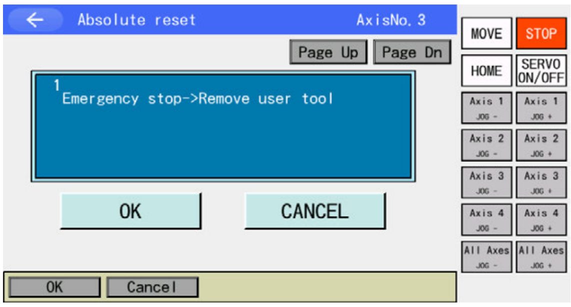

Absolute reset

Select Axis

Axis No. 3

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.

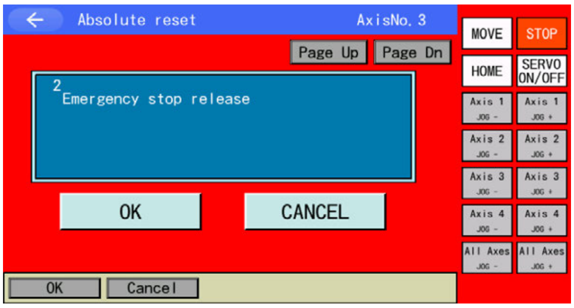
Shown in the figure on the left is the condition that vertical axis + rotation axis on the 1st SCARA in XSEL-RXD/SXD are selected.


Absolute reset AxisNo. 3

1 Emergency stop->Remove user tool

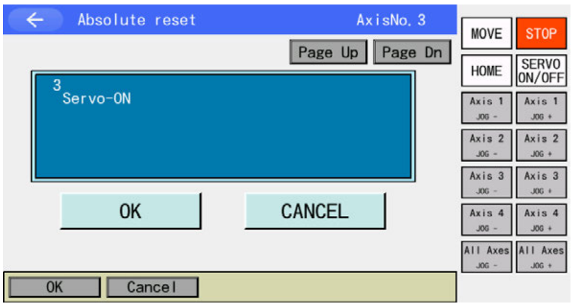
2) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.


Absolute reset AxisNo. 3

2 Emergency stop release

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.

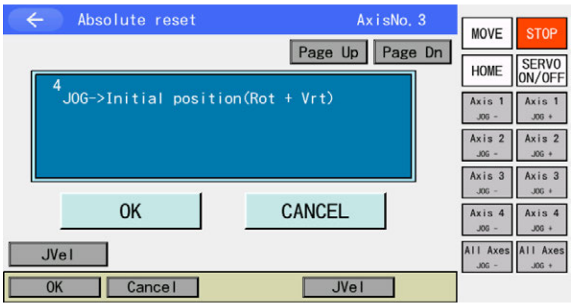

Absolute reset AxisNo. 3

3 Servo-ON

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. How to Perform Pressing Absolute Reset on IX-1000/1200].)

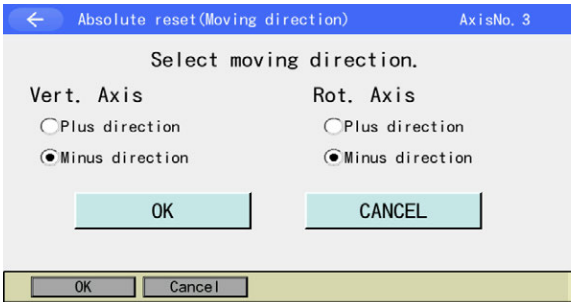
1. If using JOG operation to align to initial posture
   Touch OK button to turn the servo ON.
2. If aligning to initial posture manually
   Touch Page Up button.

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.



4
JOG->Initial position(Rot + Vrt)

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.



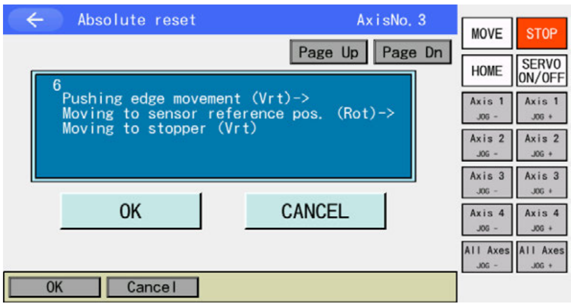
Select moving direction.

Vert. Axis
○Plus direction
●Minus direction

Rot. Axis
○Plus direction
●Minus direction

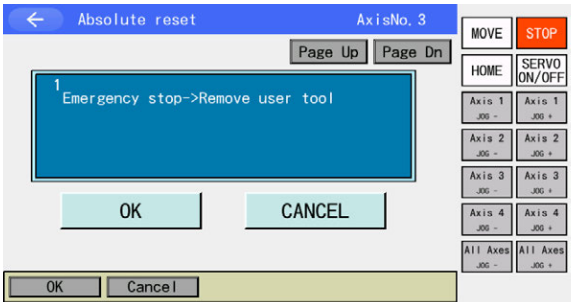
7) Acquirement of Stopper Pressing Position / Sensor Datum Position
   Touch OK button.

   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.

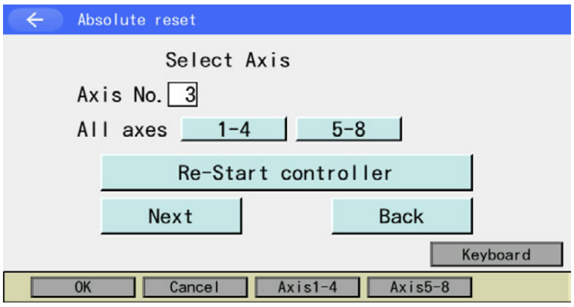


6
Pushing edge movement (Vrt)->
Moving to sensor reference pos. (Rot)->
Moving to stopper (Vrt)

8) The screen goes back to the initial screen once it is finished.
   Touch CANCEL button.

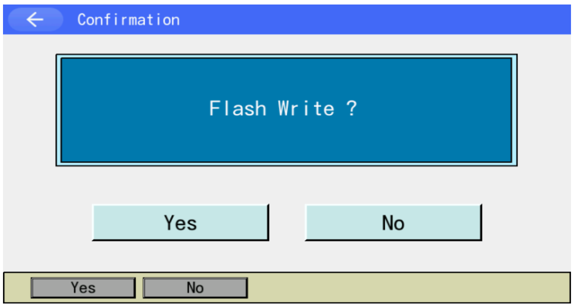


1
Emergency stop->Remove user tool



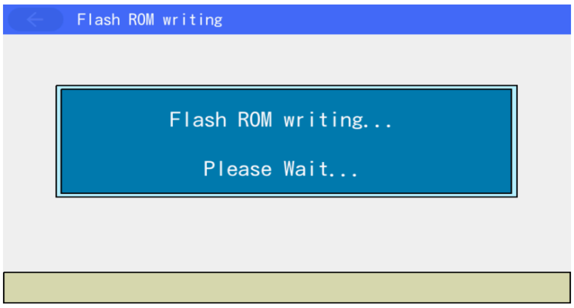
9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

10) Touch Yes button to start flash ROM writing.

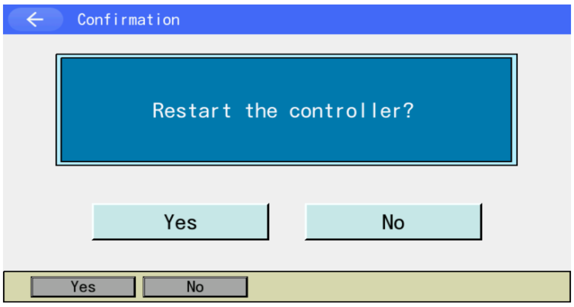


Flash ROM writing...

Please Wait...

11) While in writing process to flash ROM, the screen.

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

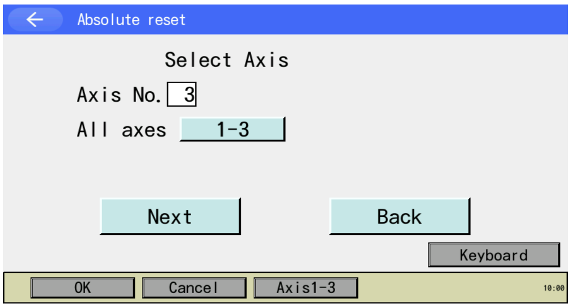


Restart the controller?

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


Absolute reset

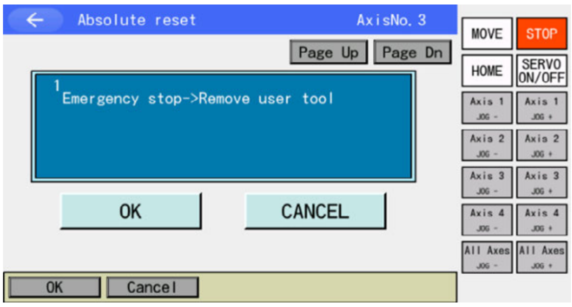
Select Axis

Axis No. 3

All axes 1-3

1) Input 3 in “Axis No.” box with using the software numeric keys, and then touch the Next button.

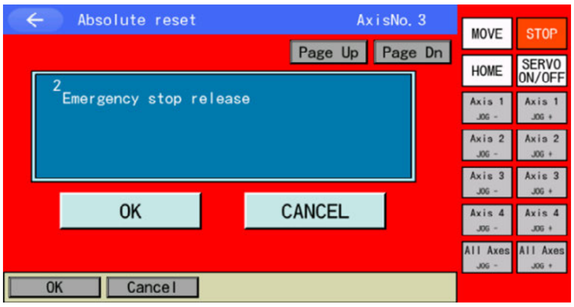
The figure on the left shows the condition that the vertical axis has been selected in XSEL-RAX/SAX or XSEL2-TX (3-axis SCARA).


Absolute reset AxisNo. 3

1 Emergency stop->Remove user tool

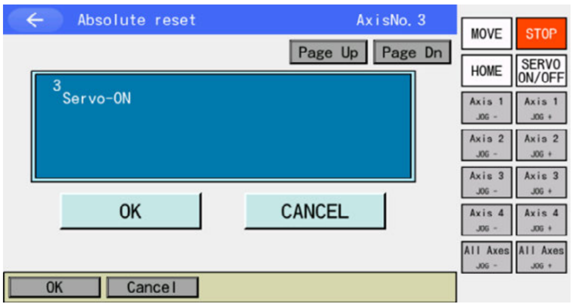
2) Remove user tool
In case there is a concern of interference during operation, remove the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.


Absolute reset AxisNo. 3

2 Emergency stop release

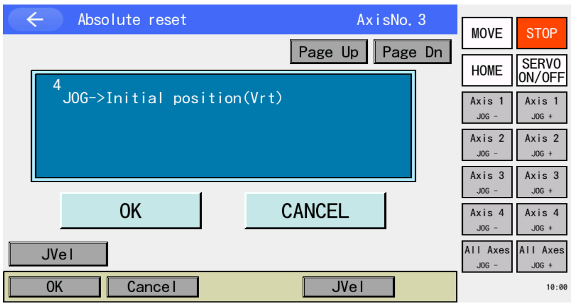
3) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.


Absolute reset AxisNo. 3

3 Servo-ON

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.

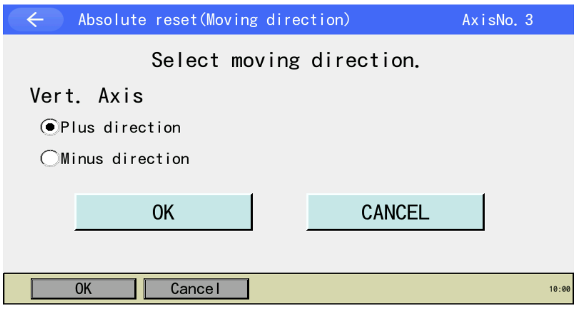


Absolute reset AxisNo. 3

4
JOG->Initial position(Vrt)

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.



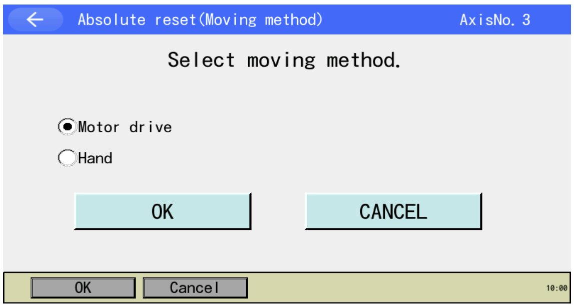
Absolute reset(Moving direction) AxisNo. 3

Select moving direction.

Vert. Axis

● Plus direction
○ Minus direction

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.



Absolute reset(Moving method) AxisNo. 3

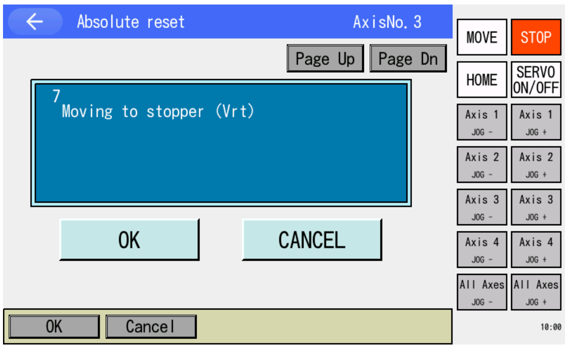
Select moving method.

● Motor drive
○ Hand

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.

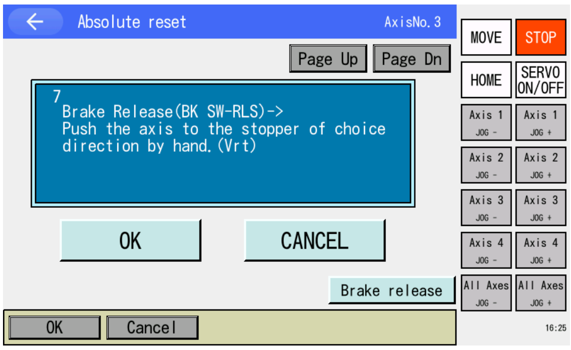
Caution : Touch Cancel and the whole process of absolute reset will be closed.



7
Moving to stopper (Vrt)

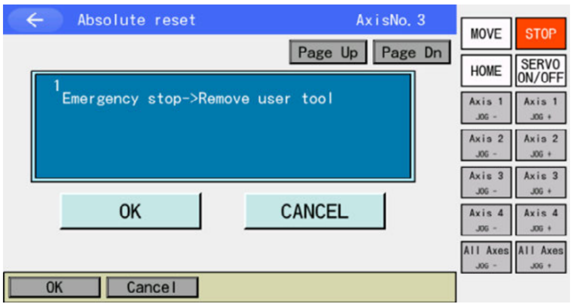
8) Stopper Pressing Movement of Vertical Axis (in Motor Drive)
Touch OK button.

The vertical axis moves in the stopper pressing movement and acquire the pressing position.



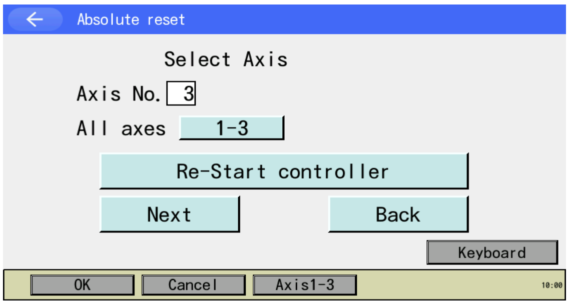
7
Brake Release(BK SW-RLS)->
Push the axis to the stopper of choice direction by hand.(Vrt)

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.



1
Emergency stop->Remove user tool

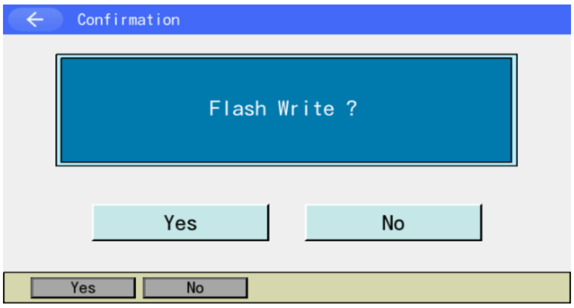
10) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.



Select Axis
Axis No. 3
All axes 1-3

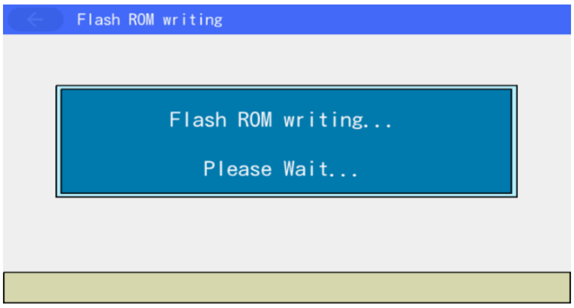
11) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears



Flash Write ?

12) Touch Yes button to start flash ROM writing.

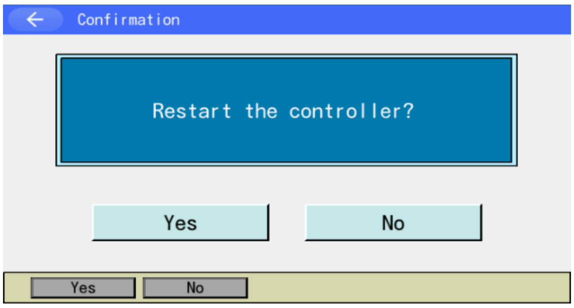


Flash ROM writing...

Please Wait...

13) While in writing process to flash ROM, the screen.

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



Restart the controller?

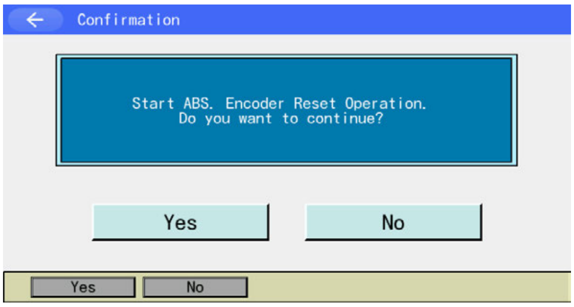
14) Once the flash ROM writing is finished, the screen changes to the screen for software reset.
Touch Yes button to reflect the pressing position.

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.)

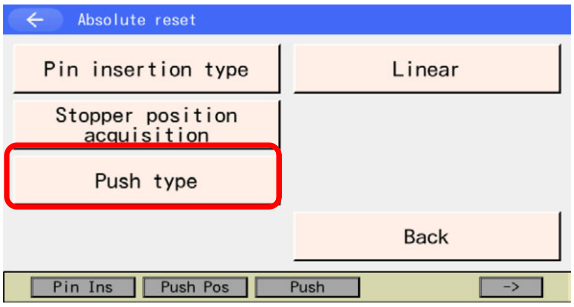
1) Select Absolute Reset from Controller Menu.



Start ABS. Encoder Reset Operation.
Do you want to continue?

2) Touch Yes button to conduct the absolute reset.

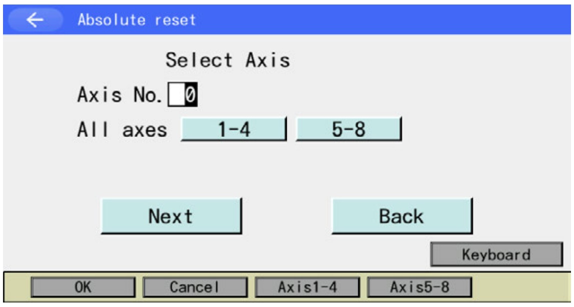
If the absolute reset is not required, touch No button.
The screen goes back to the previous screen.



3) Touch Push type button.

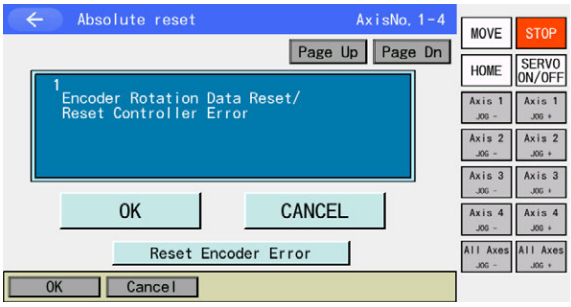
* Linear button should be shown only when there is a linear axis.

16.6.2.1 Procedures for All Axes in Batch



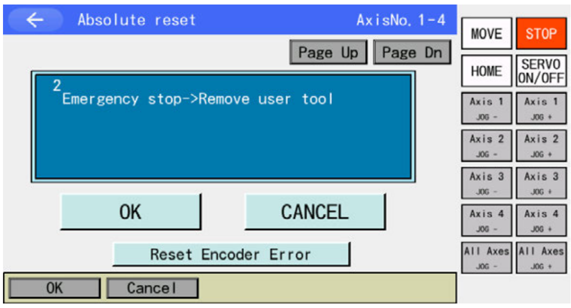
1) Touch 1-4 or 5-8 button, and touch Next button.

* There is 5-8 button equipped in XSEL-RXD/SXD/RAXD/SAXD only.
* It should be from 1-3 button for 3-axis SCARA.



1
Encoder Rotation Data Reset/
Reset Controller Error

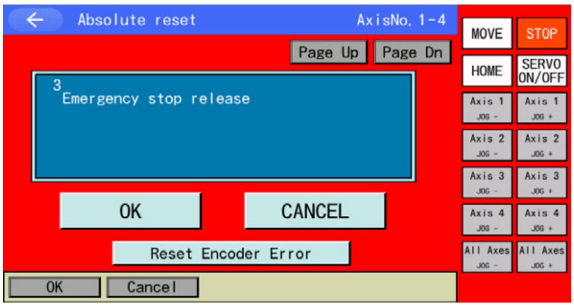
2) Encoder Rotation Data Reset / Reset Controller Error
Touch OK button.



2
Emergency stop->Remove user tool

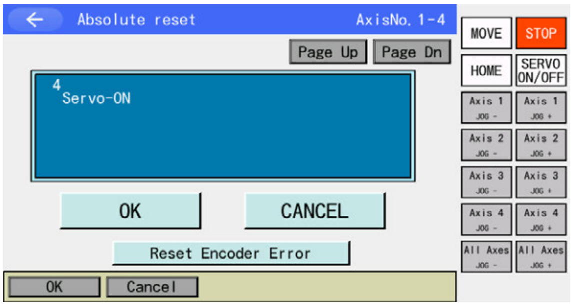
3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.



3
Emergency stop release

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.



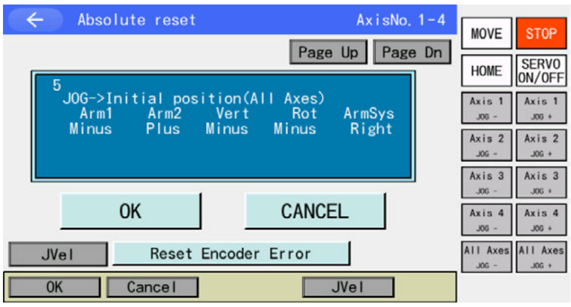
4
Servo-ON

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. How to Perform Pressing Absolute Reset on IX-1000/1200)

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

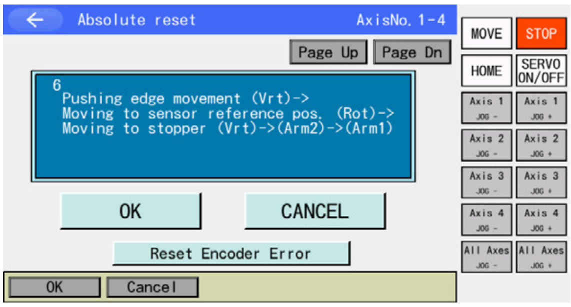


5
JOG->Initial position(All Axes)
Arm1 Arm2 Vert Rot ArmSys
Minus Plus Minus Minus Right

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.

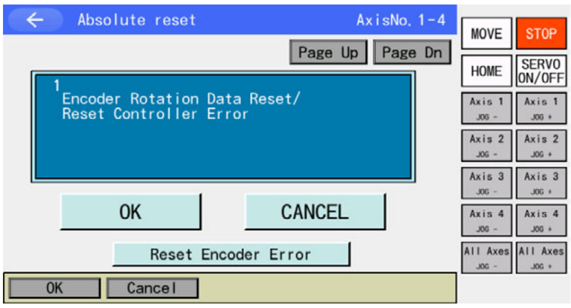
* With the operation in Step 7), each axis moves to the direction shown in this screen.



6
Pushing edge movement (Vrt)->
Moving to sensor reference pos. (Rot)->
Moving to stopper (Vrt)->(Arm2)->(Arm1)

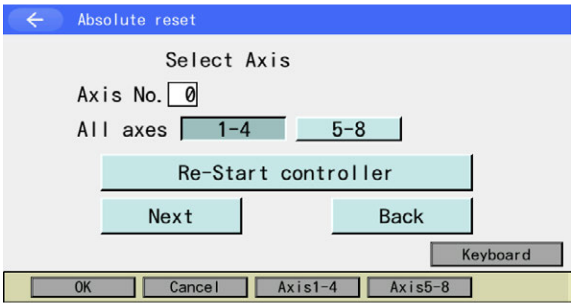
7) Stopper Pressing Absolute Reset on All Axes
Touch OK button.

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.



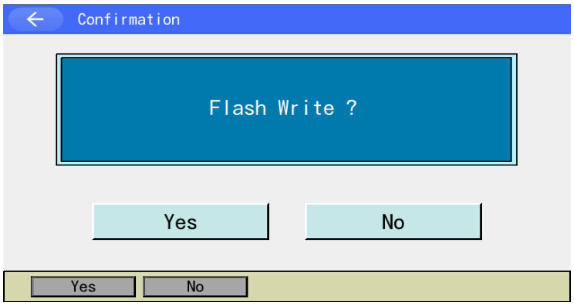
1
Encoder Rotation Data Reset/
Reset Controller Error

8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.



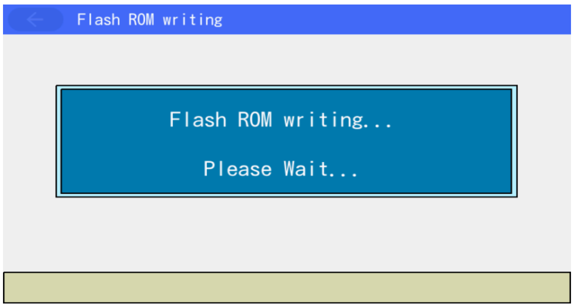
9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

10) Touch Yes button to start flash ROM writing.

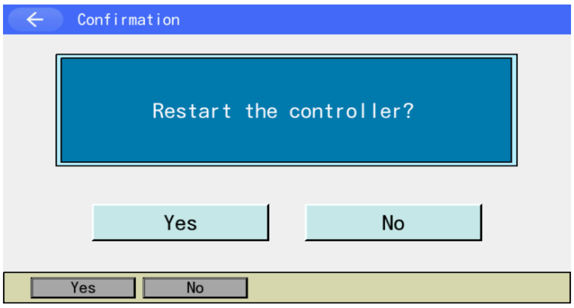


Flash ROM writing...

Please Wait...

11) While in writing process to flash ROM, the screen.

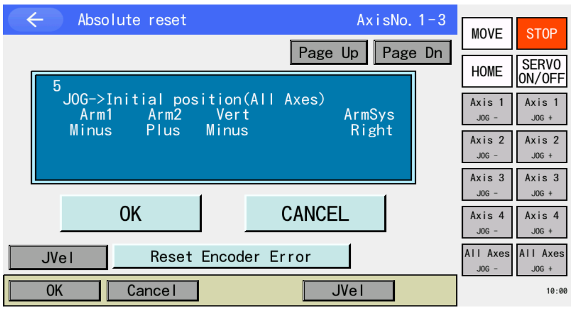
Never turn off the power to the Controller at this time.



Restart the controller?

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

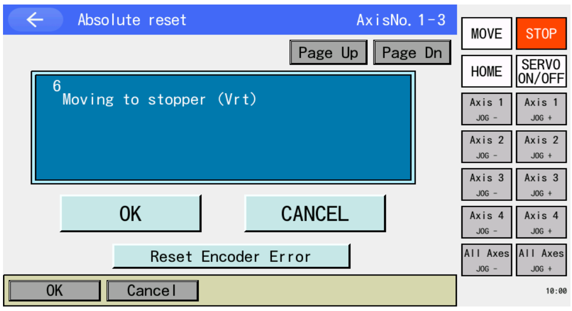


```
5
 JOG->Initial position(All Axes)
   Arm1     Arm2     Vert              ArmSys
  Minus     Plus    Minus               Right
```

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.

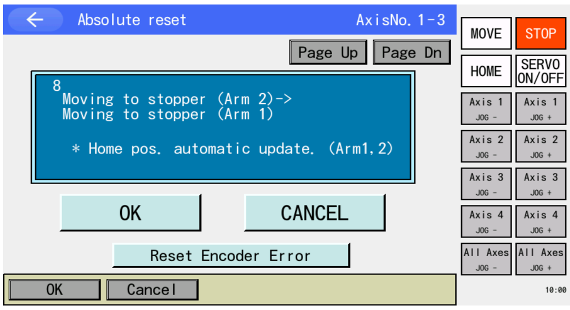
* With the operation in Step 7), each axis moves to the direction shown in this screen.



6
Moving to stopper (Vrt)

7) Vertical Stopper Pressing Style Absolute Reset
Touch OK button.

Conduct the vertical axis stopper pressing movement.

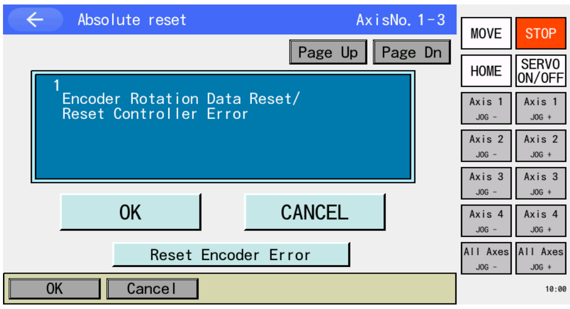


8
Moving to stopper (Arm 2)->
Moving to stopper (Arm 1)

＊Home pos. automatic update. (Arm1, 2)

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.



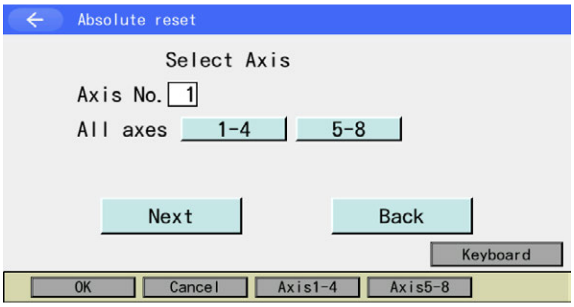
1
Encoder Rotation Data Reset/
Reset Controller Error

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

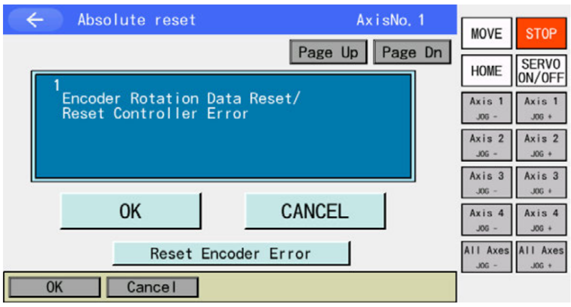
16.6.2.2 (1) Arm1 and Arm2



Axis No. 1

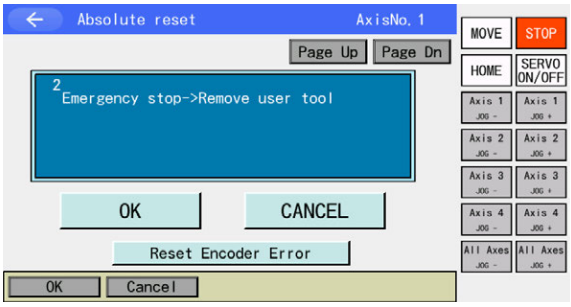
1) Input either 1 or 2 (5 or 6) in Axis No. box with using the software numeric keys, and then touch Next button.

Shown in the figure on the left is the condition that Arm1 on the 1st SCARA in XSEL-RXD/SXD is selected.



1
Encoder Rotation Data Reset/
Reset Controller Error

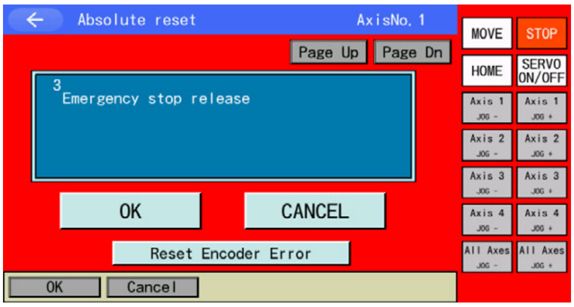
2) Encoder Rotation Data Reset / Reset Controller Error
Touch OK button.



2
Emergency stop->Remove user tool

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.

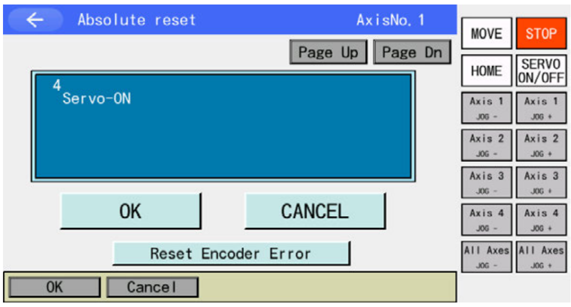
To cancel the process, touch CANCEL button.



Absolute reset AxisNo. 1

3 Emergency stop release

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.

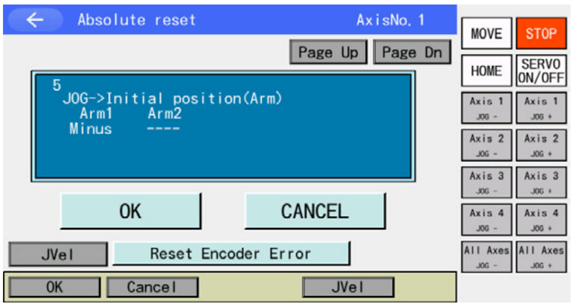


Absolute reset AxisNo. 1

4 Servo-ON

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. How to Perform Pressing Absolute Reset on IX-1000/1200].)

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.



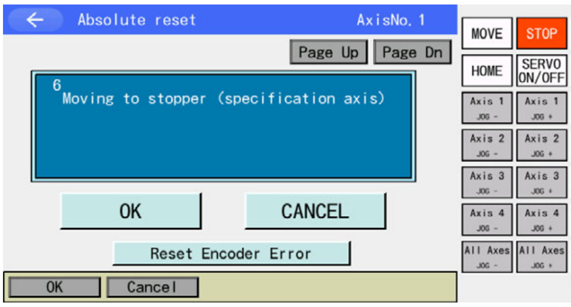
Absolute reset AxisNo. 1

5 JOG->Initial position(Arm)
Arm1 Arm2
Minus ----

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.

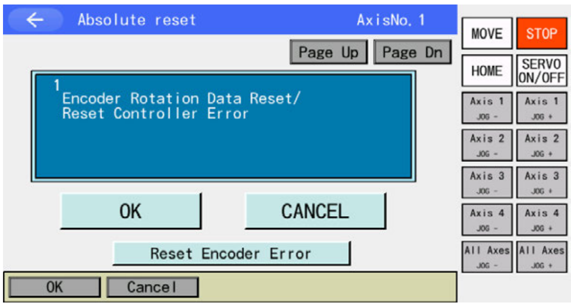
* With the operation in Step 7), the axis moves to the direction shown in this screen.



6
Moving to stopper (specification axis)

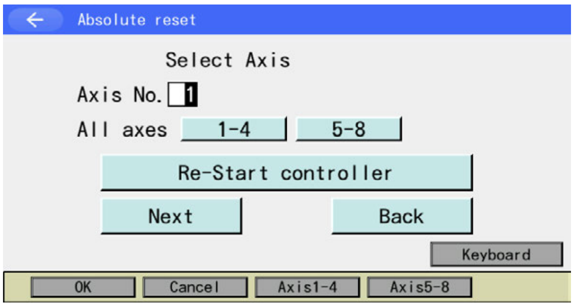
7) Stopper Pressing Absolute Reset on Indicated Axis
Touch OK button.

Arm1 (2) moves for stopper pressing.



1
Encoder Rotation Data Reset/
Reset Controller Error

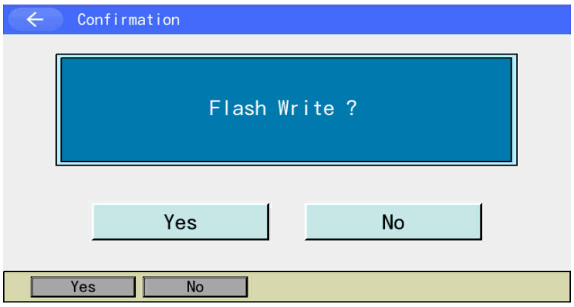
8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.



Axis No. 1

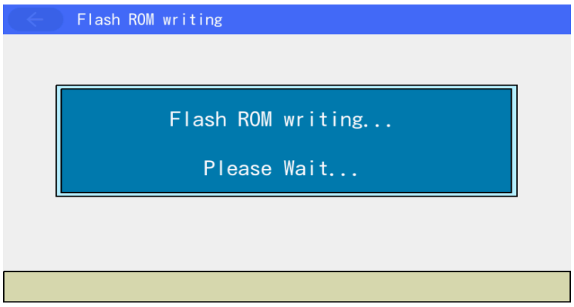
9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

10) Touch Yes button to start flash ROM writing.



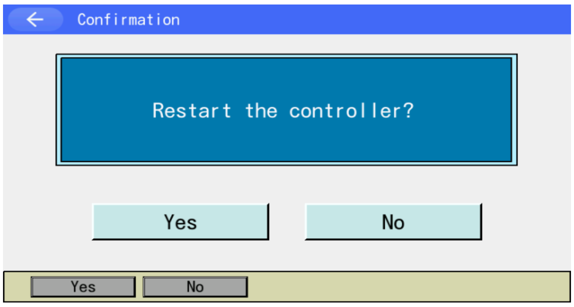
Flash ROM writing

Flash ROM writing...

Please Wait...

11) While in writing process to flash ROM, the screen.

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

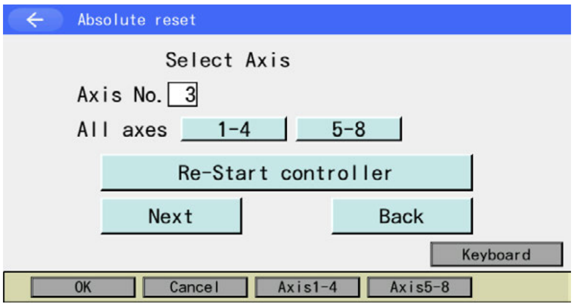


Confirmation

Restart the controller?

12) Once the flash ROM writing is finished, the screen changes to the screen for software reset. Touch Yes button.

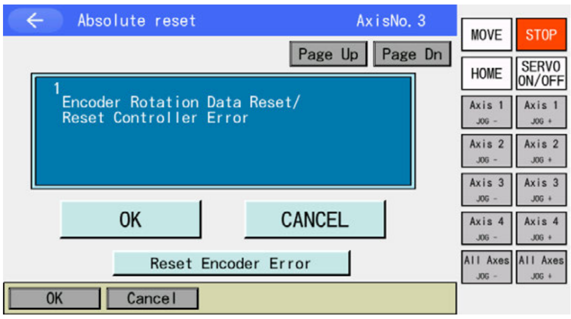
16.6.2.2 (2) Vertical Axis + Rotation Axis * For 4-Axis SCARA



Axis No. 3

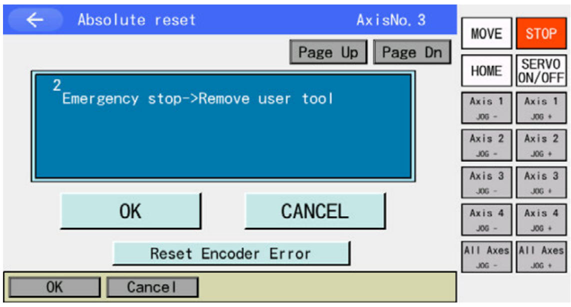
1) Input either 3 or 7 (7 for XSEL-RXD/SXD/RAXD/SAXD only) in Axis No. box with using the software numeric keys, and then touch Next button.

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.



1 Encoder Rotation Data Reset/ Reset Controller Error

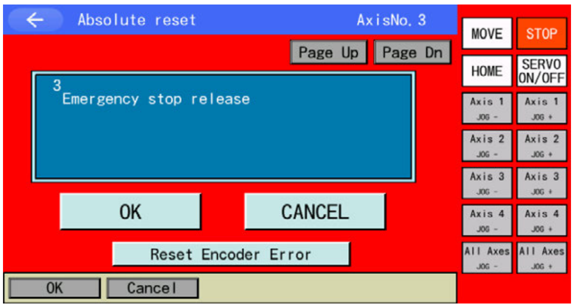
2) Encoder Rotation Data Reset / Reset Controller Error
Touch OK button.



2 Emergency stop->Remove user tool

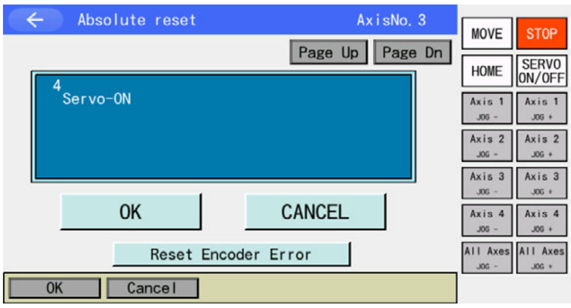
3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.



3 Emergency stop release

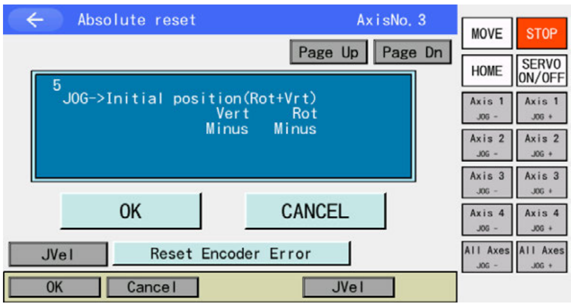
4) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



4
Servo-ON

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. How to Perform Pressing Absolute Reset on IX-1000/1200].)

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.

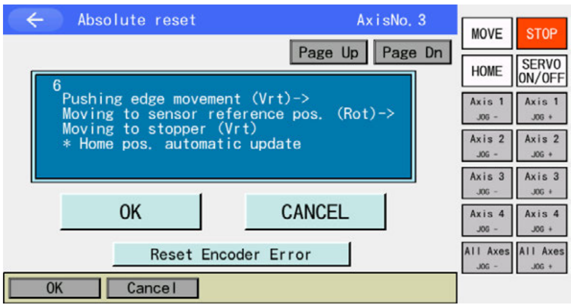


5
JOG->Initial position(Rot+Vrt)
Vert Rot
Minus Minus

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.

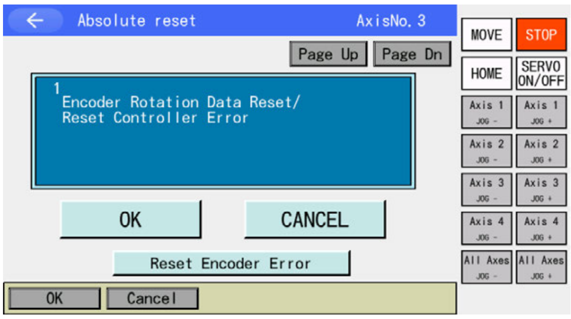
* With the operation in Step 7), the axis moves to the direction shown in this screen.



6
Pushing edge movement (Vrt)->
Moving to sensor reference pos. (Rot)->
Moving to stopper (Vrt)
* Home pos. automatic update

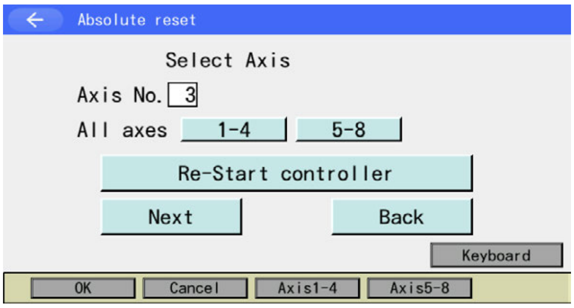
7) Stopper Pressing Absolute Reset on Vertical and Rotation Axes
Touch OK button.

The axes shift in the order of vertical axis pressing end movement, rotation axis sensor datum position movement and vertical axis stopper pressing movement.



1
Encoder Rotation Data Reset/
Reset Controller Error

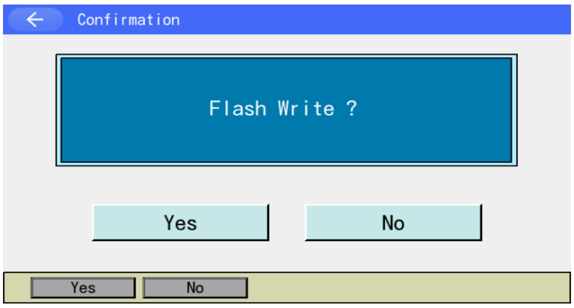
8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.



Axis No. 3

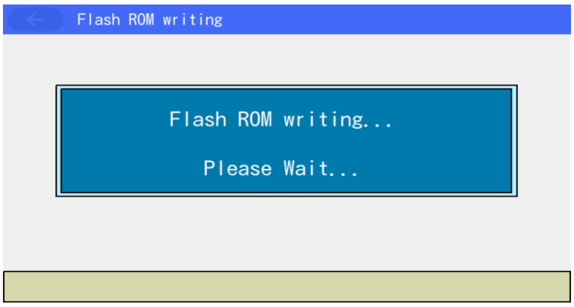
9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

10) Touch Yes button to start flash ROM writing.

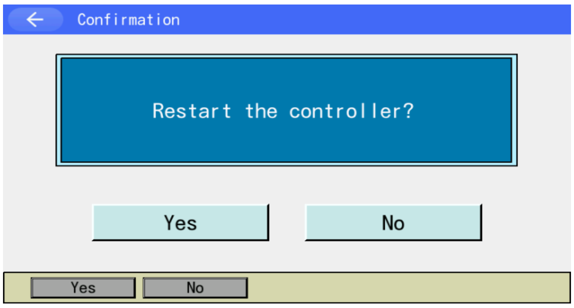


Flash ROM writing...

Please Wait...

11) While in writing process to flash ROM, the screen.

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

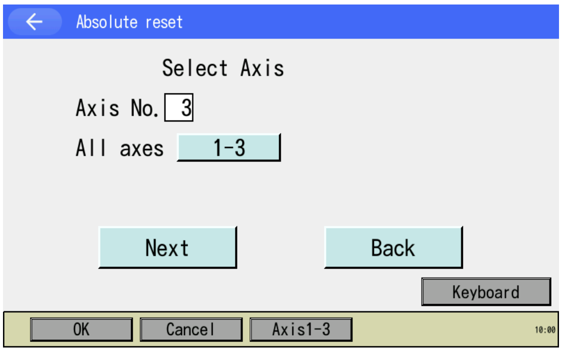


Confirmation

Restart the controller?

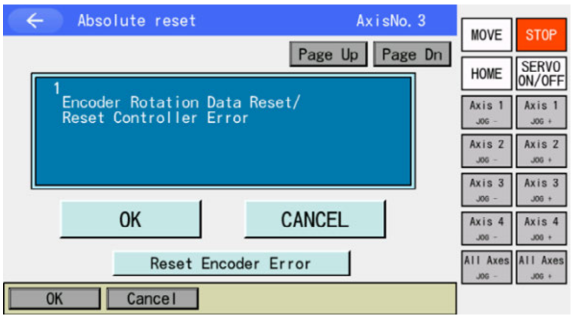
12) Once the flash ROM writing is finished, the screen changes to the screen for software reset.
Touch Yes button.

16.6.2.2 (3) Vertical Axis   * For 3-Axis SCARA



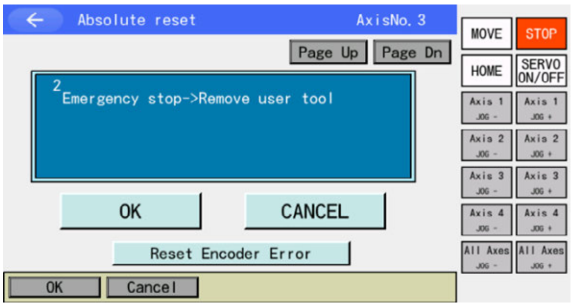
1) Input 3 in “Axis No.” box with using the software numeric keys, and then touch the Next button.

The figure on the left shows the condition that the vertical axis has been selected in 3-axis SCARA.



1 Encoder Rotation Data Reset/ Reset Controller Error

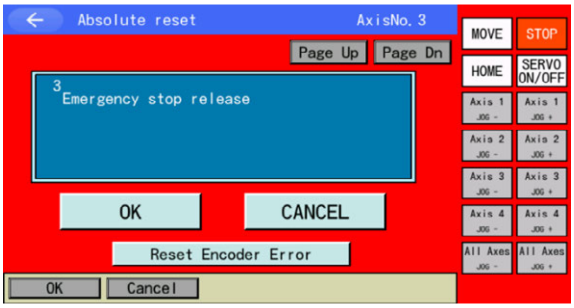
2) Encoder Multi-Rotation Data Reset / Controller Error Reset
Touch OK button.



2 Emergency stop->Remove user tool

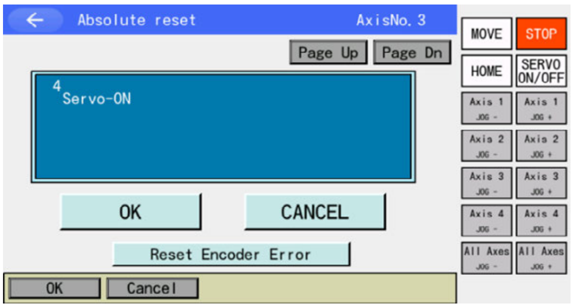
3) Remove user tool
In case there is a concern of interference during operation, detach the user tool in the emergency stop condition.
After detaching, touch OK button.

To cancel the process, touch CANCEL button.



3 Emergency stop release

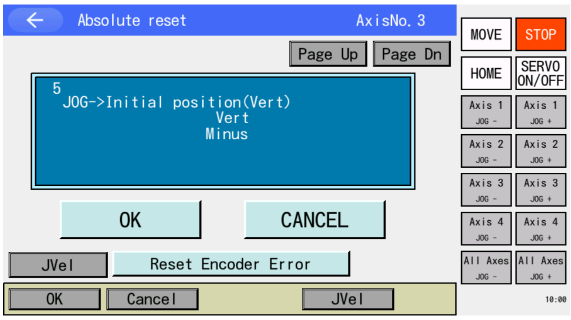
4) Emergency stop release
If the emergency stop is conducted in the previous section, cancel the emergency stop. (The screen for emergency stop is shown in the figure on the left.)
Touch OK button.



4
Servo-ON

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.

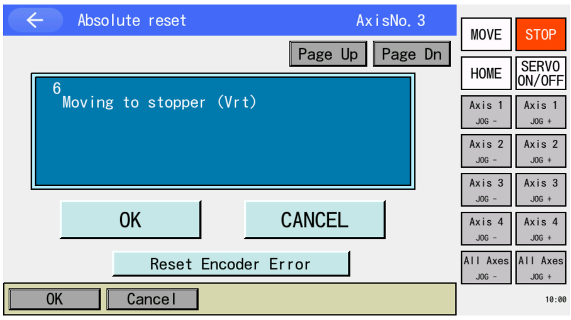


5
JOG->Initial position(Vert)
Vert
Minus

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.

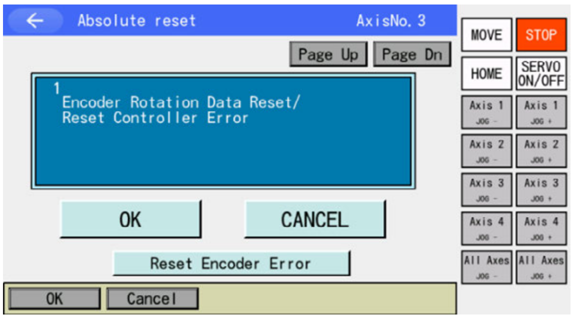
* With the operation in Step (7), the axis should move in the direction shown in this window.



6
Moving to stopper (Vrt)

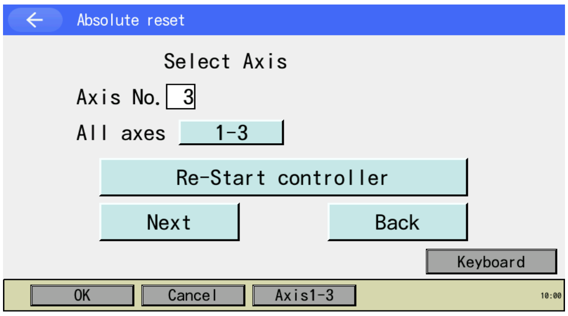
7) Vertical Axis Stopper Pressing Style Absolute Reset
Touch OK button.

The vertical axis performs the stopper pressing movement.



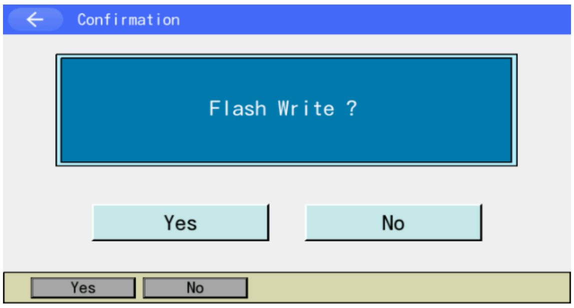
1
Encoder Rotation Data Reset/
Reset Controller Error

8) The screen goes back to the initial screen once it is finished.
Touch CANCEL button.



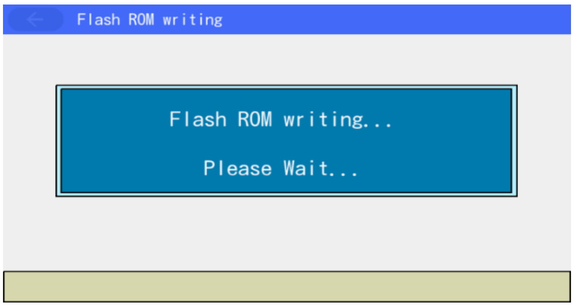
9) Touch Re-Start controller button.

A confirmation screen for the flash ROM writing appears.



Flash Write ?

10) Touch Yes button to start flash ROM writing.

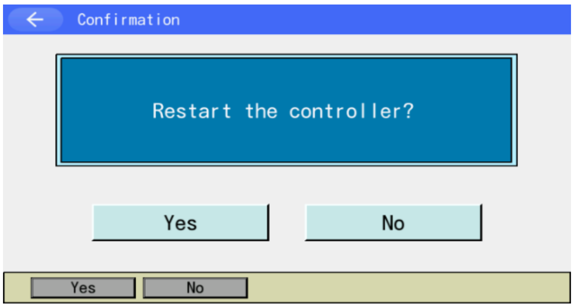


Flash ROM writing...

Please Wait...

11) While in writing process to flash ROM, the screen.

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

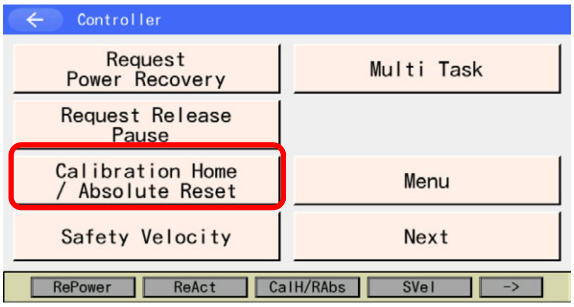

Confirmation

Restart the controller?

12) Once the flash ROM writing is finished, the screen changes to the screen for software reset.
Touch Yes button.

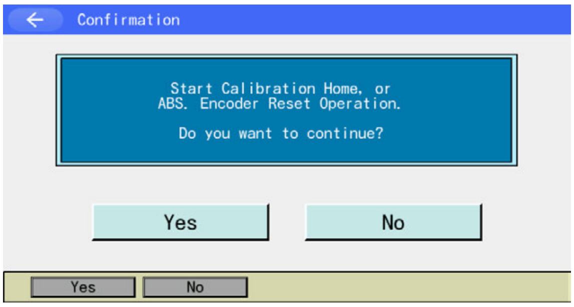
16.7 Home Adjustment / Absolute Reset on MSEL-PC/PG/PCF/PGF/PCX/PGX, PSEL

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.



Start Calibration Home, or
ABS. Encoder Reset Operation.

Do you want to continue?

2) Touch Yes button to conduct calibration home / absolute reset.
If the absolute reset is not required, touch No button. The screen goes back to the previous screen.

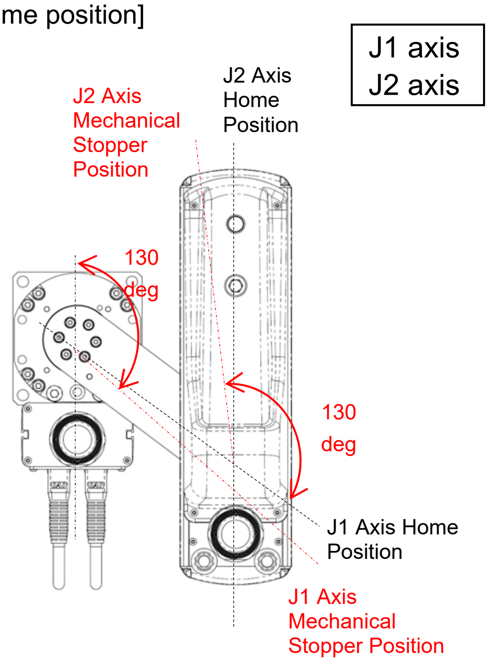
It is available to perform operation on SCARA Robot without having anything special as an absolute reset has already been conducted before delivered out from our factory. It is necessary to have an absolute reset when an absolute error generates or the robot is dismantled for such a reason as motor replacement work.

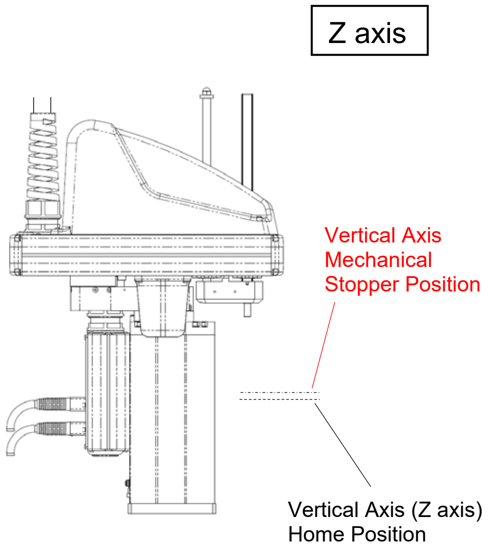
> ⚠ *Caution: In case of not having the absolute reset conducted, it may cause malfunction of the robot or a critical operational error.*

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]


J1 axis
J2 axis
J2 Axis Mechanical Stopper Position
J2 Axis Home Position
130 deg
130 deg
J1 Axis Home Position
J1 Axis Mechanical Stopper Position

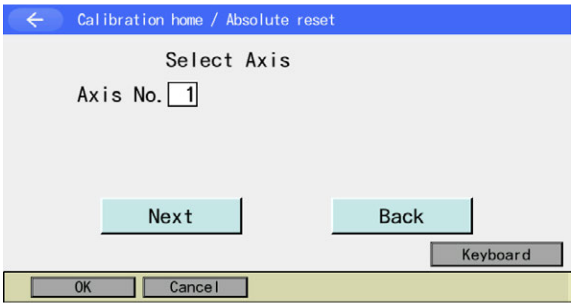

Z axis
Vertical Axis Mechanical Stopper Position
Vertical Axis (Z axis) Home Position

> ⚠ *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 Calibration Home / 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.

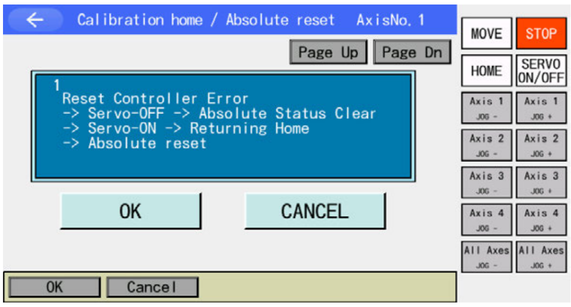


Select Axis

Axis No. 1

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)

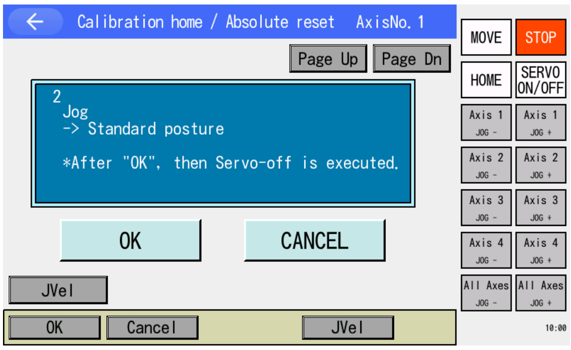


```
1
Reset Controller Error
-> Servo-OFF -> Absolute Status Clear
-> Servo-ON -> Returning Home
-> Absolute reset
```

2) Home-Return Operation and Absolute Reset
Touch OK button.

* After touching 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 How to Home Adjustment / Absolute Reset on MSEL-PCX/PGX/PC/PG/PCF/PGF and PSEL]. 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.*



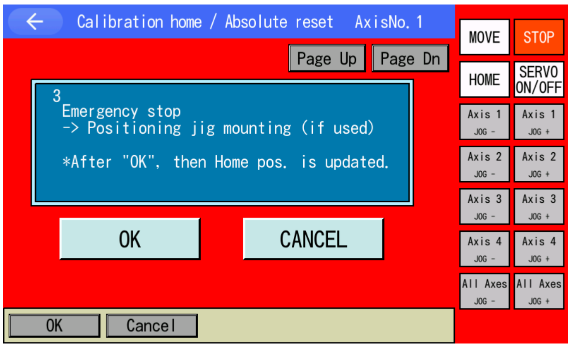
Calibration home / Absolute reset AxisNo. 1

2
Jog
-> Standard posture

*After "OK", then Servo-off is executed.

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 touching OK, the indicated axis turns off automatically.

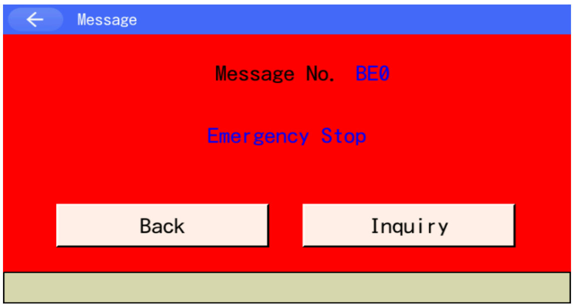


Calibration home / Absolute reset AxisNo. 1

3
Emergency stop
-> Positioning jig mounting (if used)

*After "OK", then Home pos. is updated.

4) Emergency stop
Press the EMERGENCY STOP button.

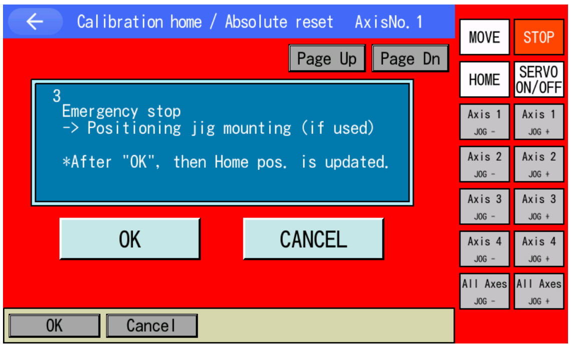


Message

Message No. BE0

Emergency Stop

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.



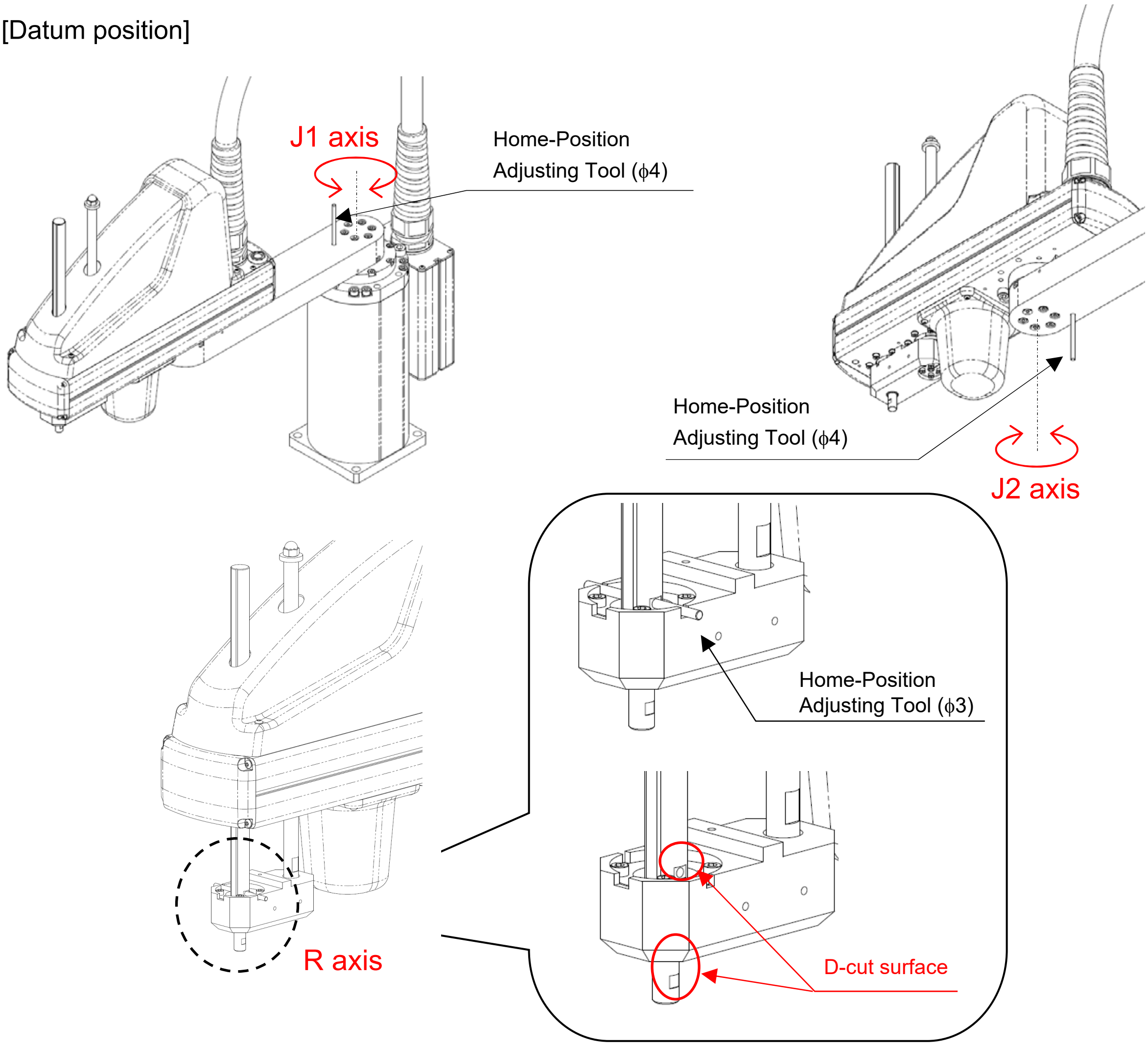
```
3
 Emergency stop
 -> Positioning jig mounting (if used)

 *After "OK", then Home pos. is updated.
```

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.

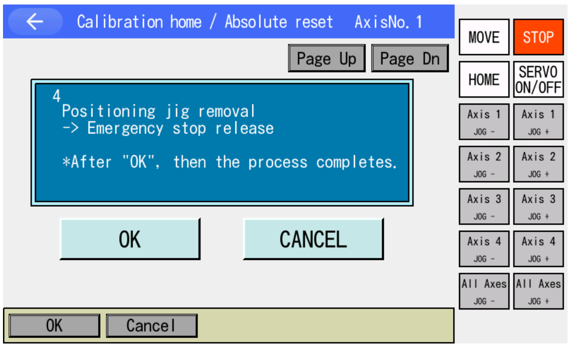
* After touching OK, home preset gets automatically updated.

[Datum position]



J1 axis
Home-Position Adjusting Tool (ϕ4)
Home-Position Adjusting Tool (ϕ4)
J2 axis
Home-Position Adjusting Tool (ϕ3)
R axis
D-cut surface

Caution: Pay attention not to get the cables and pipes on the tool twisted.

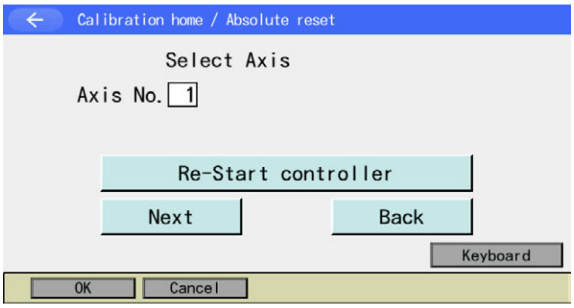

Calibration home / Absolute reset AxisNo. 1

4
Positioning jig removal
-> Emergency stop release

*After "OK", then the process completes.

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 touching OK, the screen automatically returns to the axis select screen.

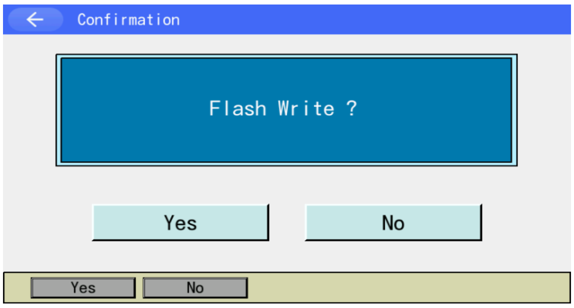

Calibration home / Absolute reset

Select Axis

Axis No. 1

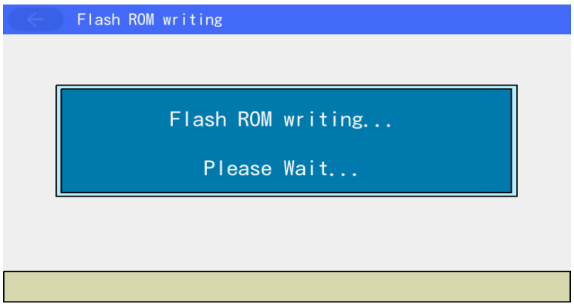
8) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

(Reference) Flash ROM writing can be conducted at once after absolute reset completes on each axis.


Confirmation

Flash Write ?

9) Make sure to conduct flash ROM writing and then software reset as the parameters are updated.

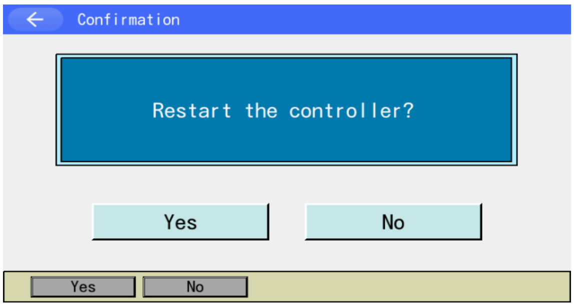

Flash ROM writing

Flash ROM writing...

Please Wait...

10) While in writing process to flash ROM, the screen.

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



Confirmation

Restart the controller?

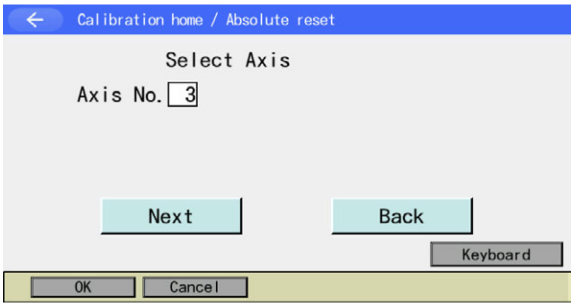
11) After flash ROM writing is complete, the display changes to the Software Reset screen.
To activate the parameters that you had changed, it is necessary to have a software reset. Touch Yes button.

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.

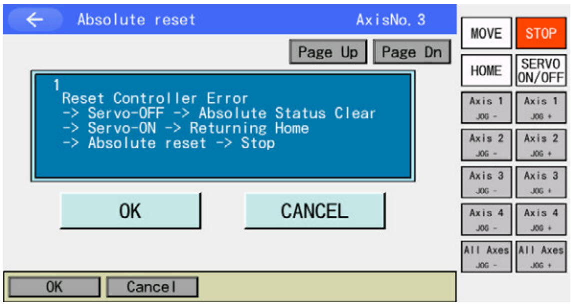


Select Axis

Axis No. 3

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 to 4
PSEL : 1 to 2

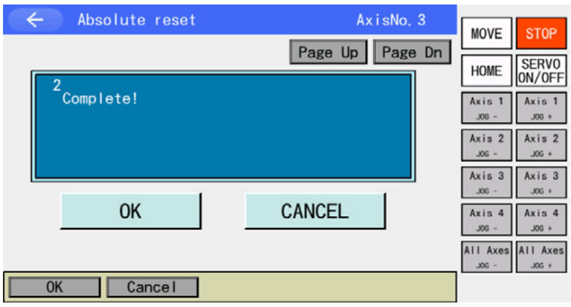


1
Reset Controller Error
-> Servo-OFF -> Absolute Status Clear
-> Servo-ON -> Returning Home
-> Absolute reset -> Stop

2) Home-Return Operation and Absolute Reset
Touch OK button.

* After touching OK, the process is carried out from the controller error reset to the stop in order.

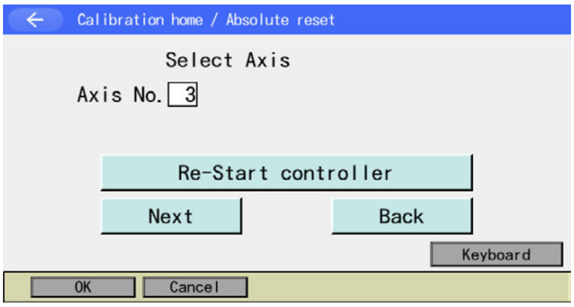
⚠ *Caution: Home-return operation starts as soon as touching OK button. The standard home position is the posture described in the beginning of [16.7 How to Home Adjustment / Absolute Reset on MSEL-PCX/PGX/PC/PG/PCF/PGF and PSEL]. In case there is any interference to peripheral equipment during the home-return 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.*



2
Complete!

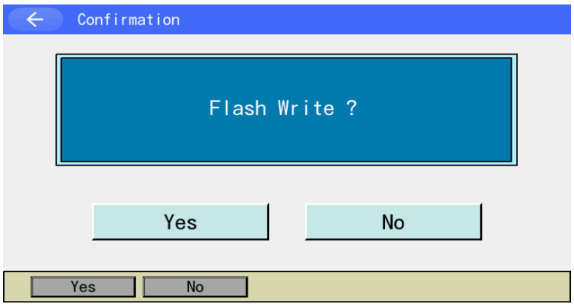
3) Complete!
Touch OK button.

* After touching OK, the screen automatically returns to the axis select screen.



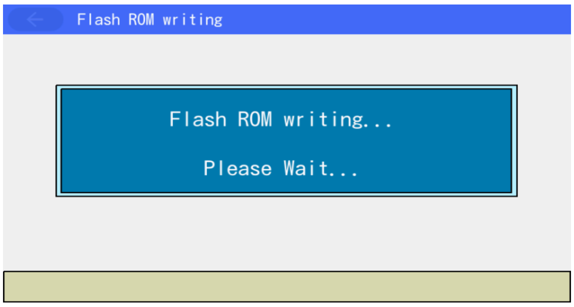
4) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.

(Reference) Flash ROM writing can be conducted at once after absolute reset completes on each axis.



Flash Write ?

5) Make sure to conduct flash ROM writing and then software reset as the parameters are updated.

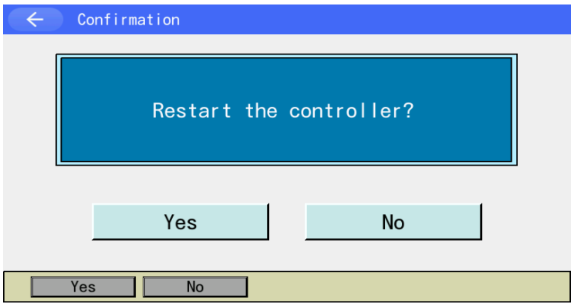


Flash ROM writing...

Please Wait...

6) While in writing process to flash ROM, the screen.

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



Restart the controller?

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 $\boxed{\text{Yes}}$ button.

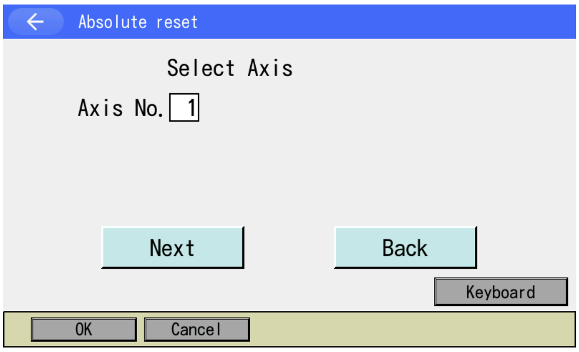
Once the software reset is complete, the screen automatically returns to the main menu screen.

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

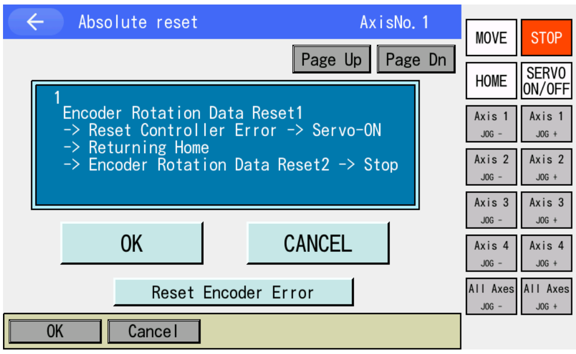
Absolute Reset on Cartesian Axes:
Absolute reset should be performed in the following procedures for AC servo motor type TTA, XSEL-P/Q (V1.52 and later), XSEL-R/S/RA/SA, XSEL2-T, 5th to 8th Axes of XSEL-RX/SX (V1.23 and later), 5th to 8th Axes of XSEL-RAX/SAX (4th to 8th Axes if 3-axis SCARA), SSEL (V0.57 and later) and 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).



Select Axis

Axis No. 1

1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.

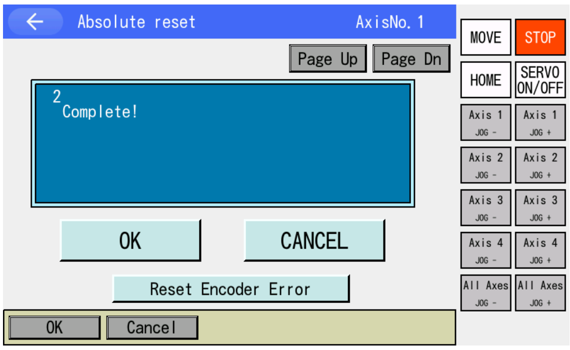


1
Encoder Rotation Data Reset1
-> Reset Controller Error -> Servo-ON
-> Returning Home
-> Encoder Rotation Data Reset2 -> Stop

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.

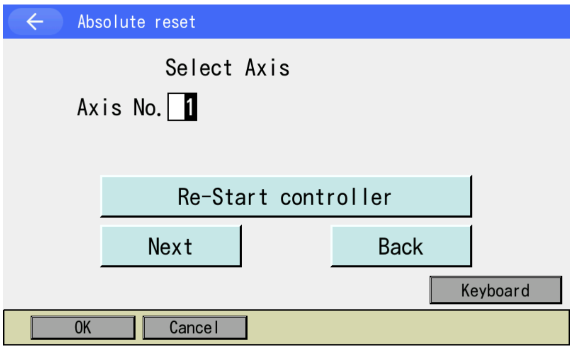
⚠ *Caution:* The indicated axis conducts the home-return operation.



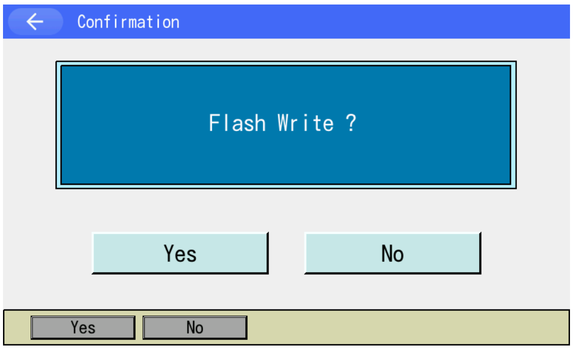
2
Complete!

3) Complete screen
Touch OK button.

* After touching OK, the screen automatically goes back to the axis select screen.

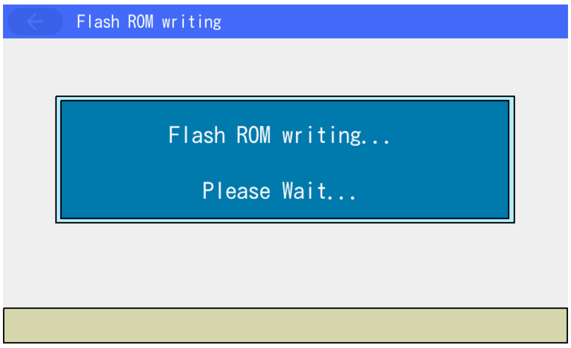


4) Touch Re-Start Controller button.
Flash ROM writing confirmation screen opens.



Flash Write ?

5) Touch Yes button.

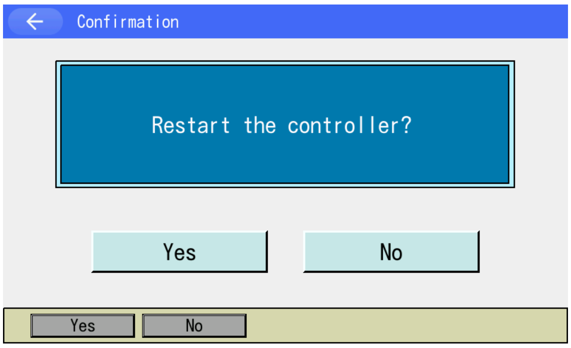


Flash ROM writing...

Please Wait...

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.



Restart the controller?

7) After flash ROM writing is complete, the display changes to the Software Reset screen.

Touch Yes button.

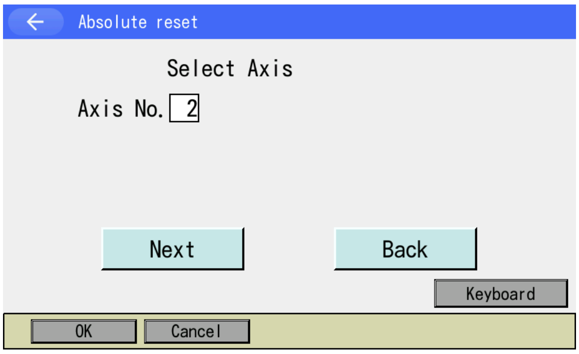
Once software reset is finished, the screen automatically goes back to the main menu screen.

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].

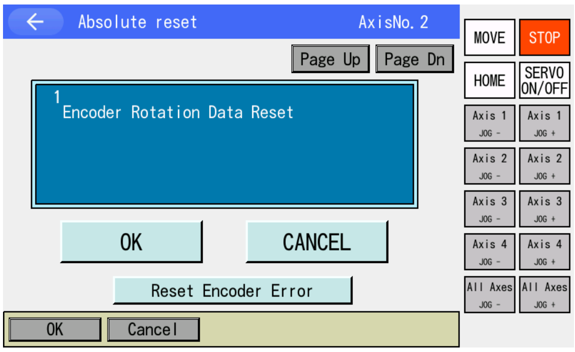
1) Conduct the absolute reset on the slave axes.



Select Axis

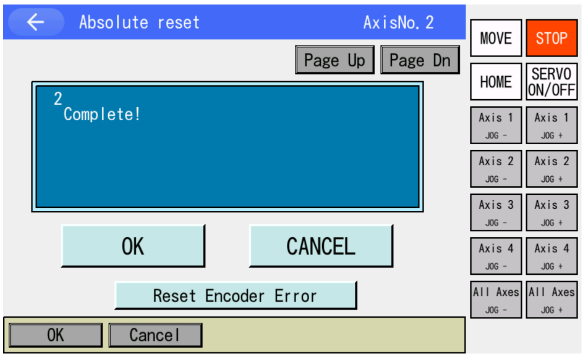
Axis No. 2

Input the axis number of the slave axis using the touch panel numeric keys, and then touch Next button.



1
Encoder Rotation Data Reset

Touch OK button.

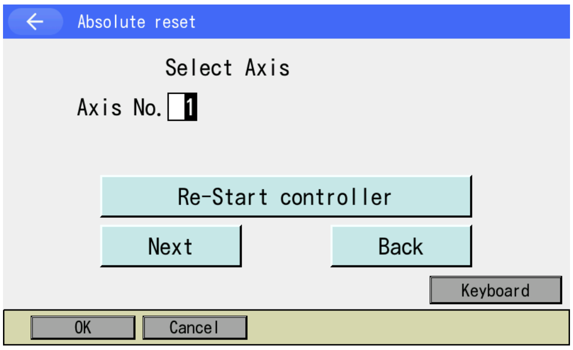


2
Complete!

Touch OK button.

* After touching OK, the screen automatically goes back to the axis select screen.

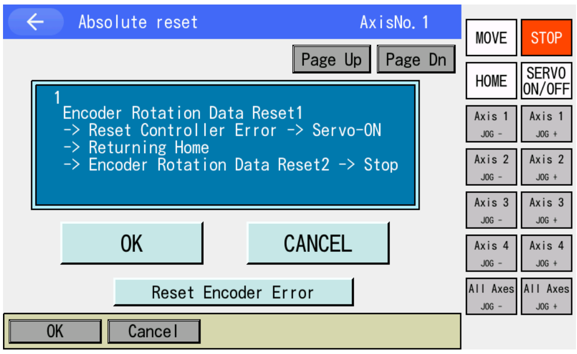
2) Conduct the absolute reset on the master axis.



Select Axis

Axis No. 1

Input the axis number of the master axis using the touch panel numeric keys, and then touch Next button.

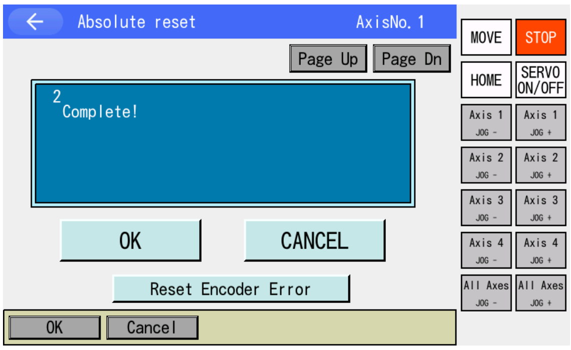


```
1
Encoder Rotation Data Reset1
-> Reset Controller Error -> Servo-ON
-> Returning Home
-> Encoder Rotation Data Reset2 -> Stop
```

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.

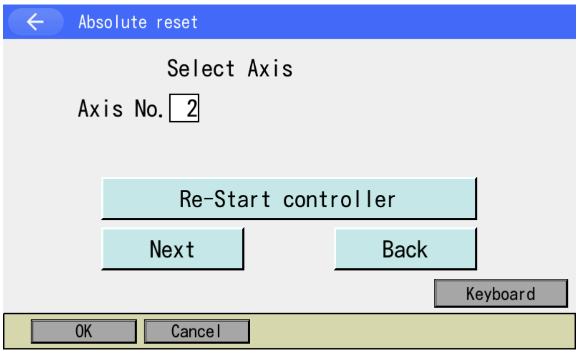


```
2
Complete!
```

Touch OK button.

* After touching OK, the screen automatically goes back to the axis select screen.

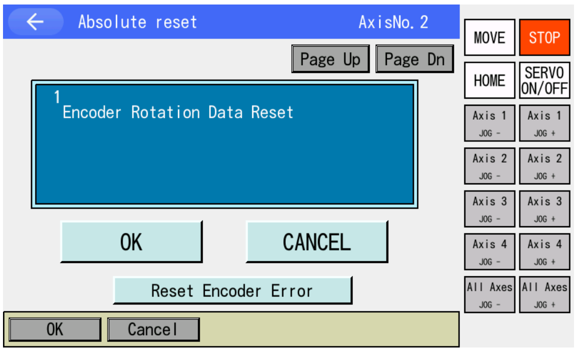
3) Conduct the absolute reset on the slave axes again.



Select Axis

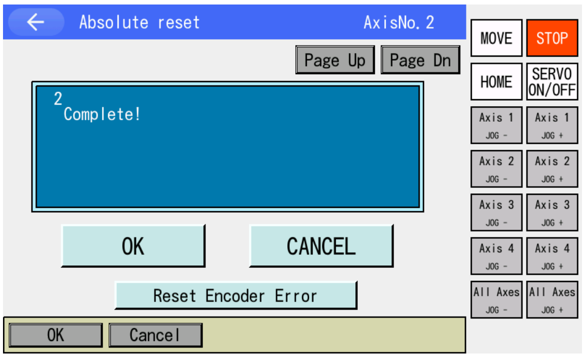
Axis No. 2

Input the axis number of the slave axis using the touch panel numeric keys, and then touch Next button.



1
Encoder Rotation Data Reset

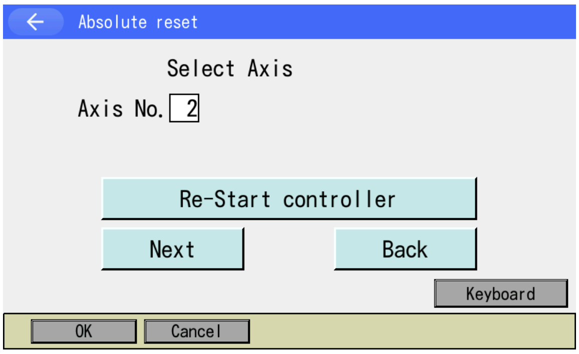
Touch OK button.



2
Complete!

Touch OK button.

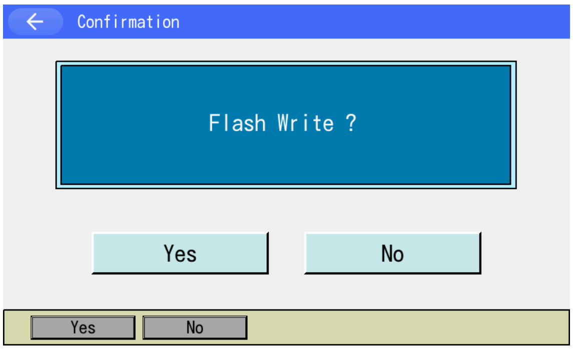
* After touching OK, the screen automatically goes back to the axis select screen.



Select Axis

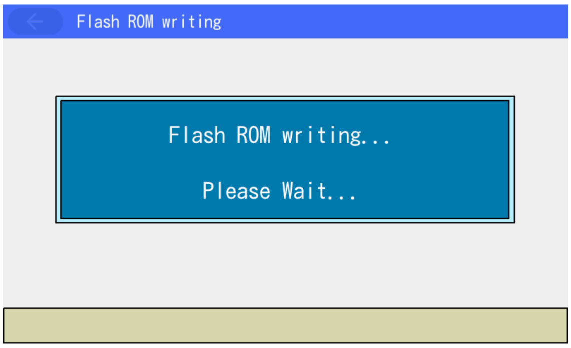
Axis No. 2

Touch Re-Start Controller button.
Flash ROM writing confirmation screen opens.



Flash Write ?

Touch Yes button.

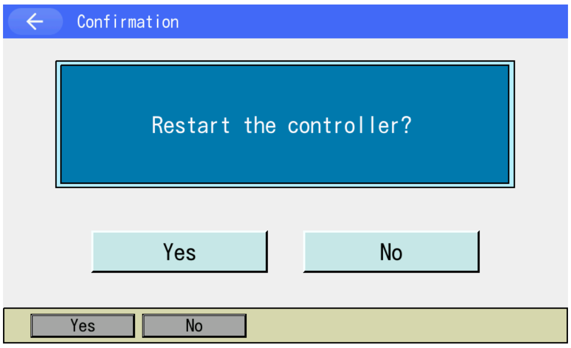


Flash ROM writing...

Please Wait...

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.



Restart the controller?

After flash ROM writing is complete, the display changes to the Software Reset screen.

Touch Yes button.

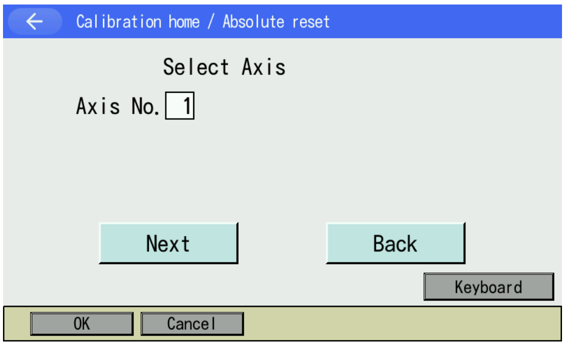
Once software reset is finished, the screen automatically goes back to the main menu screen.

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.

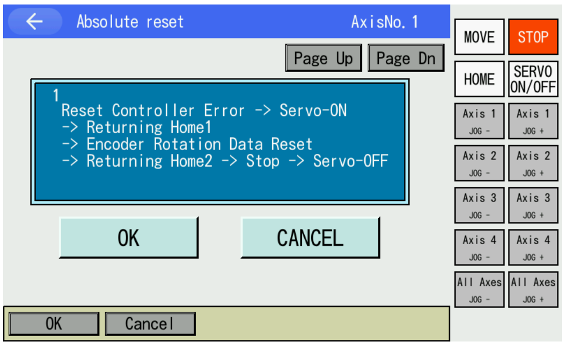


Calibration home / Absolute reset

Select Axis

Axis No. 1

1) Input the axis number to the axis number box using the touch panel numeric keys, and then touch Next button.



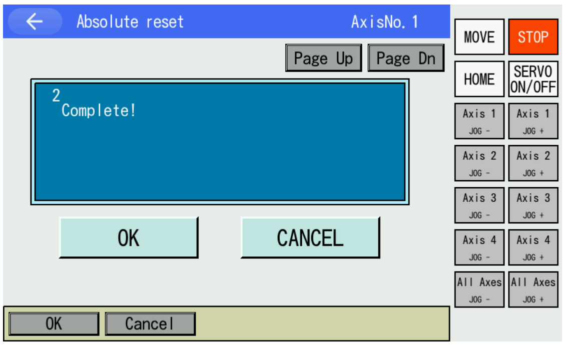
Absolute reset AxisNo. 1

```
1
Reset Controller Error -> Servo-ON
-> Returning Home1
-> Encoder Rotation Data Reset
-> Returning Home2 -> Stop -> Servo-OFF
```

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.*

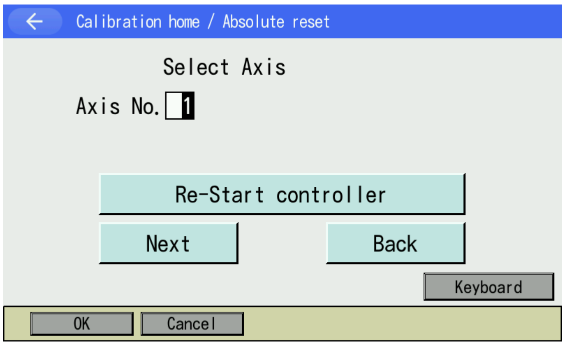


Absolute reset AxisNo. 1

```
2
Complete!
```

3) Complete!
Touch OK button.

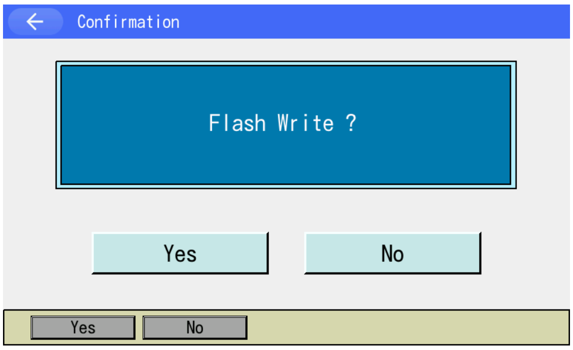
* After touching OK, the screen automatically goes back to the axis select screen.


Calibration home / Absolute reset

Select Axis

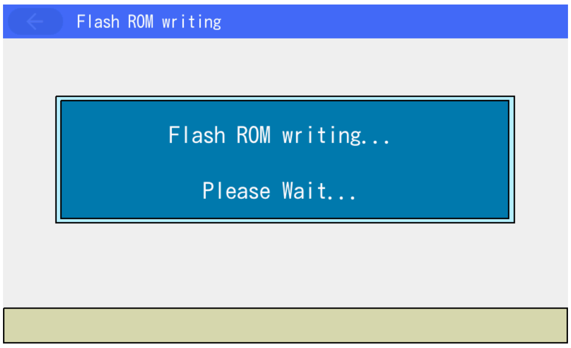
Axis No. 1

4) Touch Re-Start Controller button.
Flash ROM writing confirmation screen opens.


Confirmation

Flash Write ?

5) Touch Yes button.

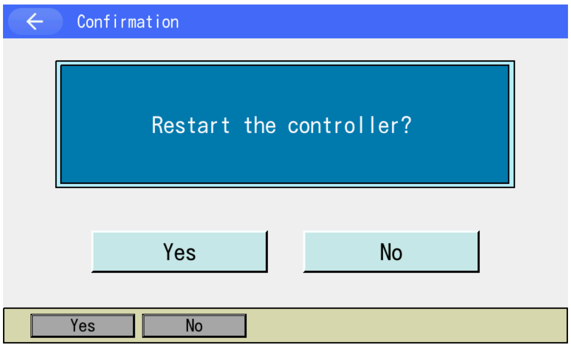

Flash ROM writing

Flash ROM writing...

Please Wait...

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.


Confirmation

Restart the controller?

7) After flash ROM writing is complete, the display changes to the Software Reset screen.

Touch Yes button.

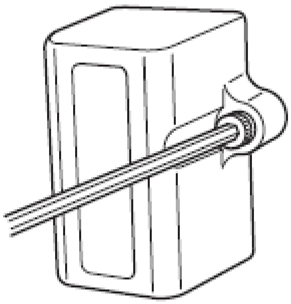
Once software reset is finished, the screen automatically goes back to the main menu screen.

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

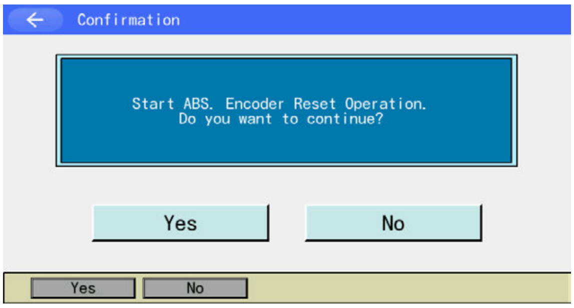
The encoder error reset / software reset should be conducted when replacing a battery for occurrence of No. A03 "Absolute Data Backup Battery Voltage Drop Warning" (No. 247 for XSEL2-T/TX) or error not occurred. Homing in the absolute reset procedures does not have to be attempted again.
Keep the controller's 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.



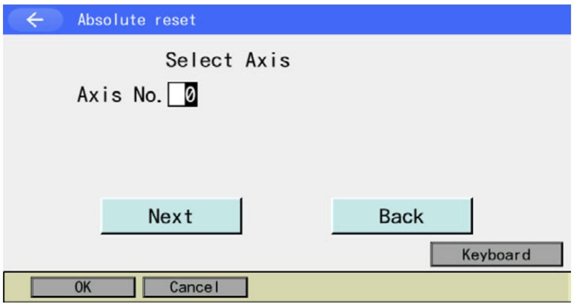
For XSEL-K Controllers, detach the screw holding the battery unit on the front panel as shown in the figure on the left with using a hex wrench.
Pull the battery unit towards you.
Replace it with a new one.
For battery replacement work for models other than XSEL-K Controllers, refer to [Instruction Manual for Each Controller].

Select Absolute Reset from Controller Menu.

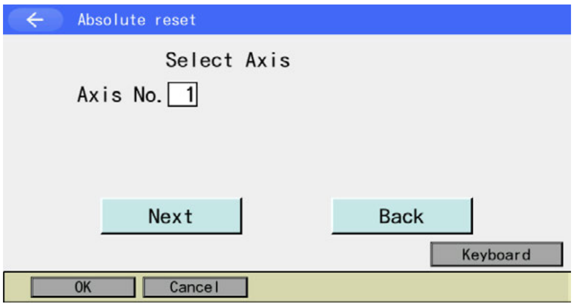


Start ABS. Encoder Reset Operation.
Do you want to continue?

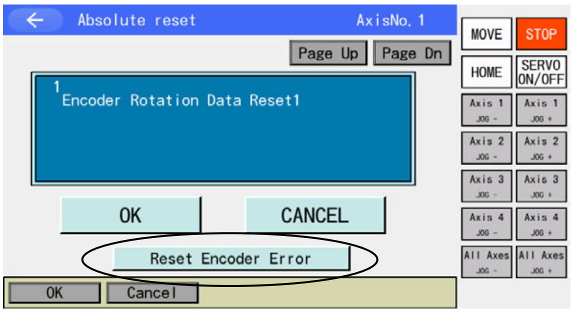
3) To have an encoder error reset, touch Yes button.
   When not to have an encoder error reset, touch No button. The display returns to the previous screen.



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.

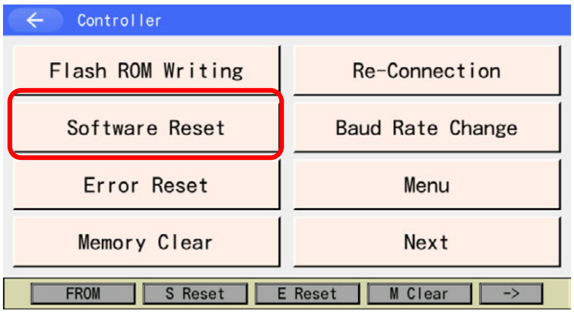


5) Once the input is confirmed, the cursor disappears. If you want to redo the input, touch the axis number input box.
If you want to continue encoder error reset, touch Next button.
When you cancel encoder error reset, touch Back button.



1
Encoder Rotation Data Reset1

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

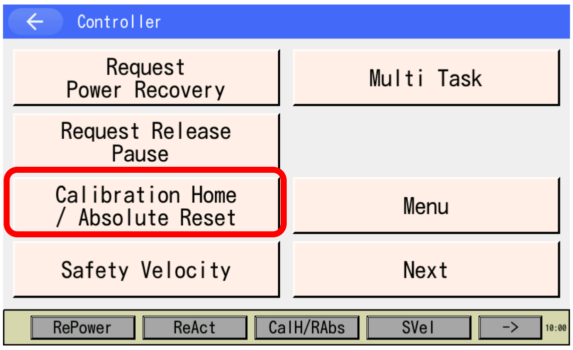
[Necessary Items for Absolute Reset]

Model Number : For S Type JG-WUS
For M Type JG-WUM

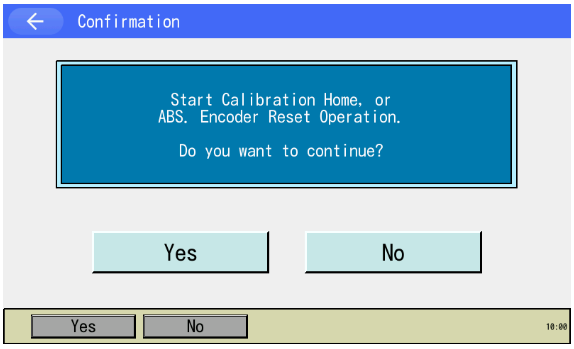
(Note) The model numbers stated above are those that an absolute reset tool, screws and pins come in a set.

- Absolute Reset Tool (in common for S Type and M Type)
- Bolt Size S : Hexagonal Socket Head Bolt, M6 × 6, 1 piece
  Size M : Hexagonal Socket Head Bolt, M6 × 10, 1 piece
- Pin Size S : ϕ4 B Type Parallel Pin, Length 40, 1 piece
  ϕ3 B Type Parallel Pin, Length 40, 2 pieces
  Size M : ϕ4 B Type Parallel Pin, Length 40, 3 pieces

(2) How to Absolute Reset



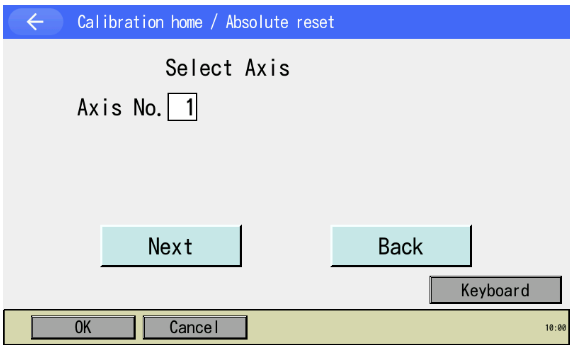
1) Select Calibration Home / Absolute Reset from Controller Menu.



Start Calibration Home, or
ABS. Encoder Reset Operation.

Do you want to continue?

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.

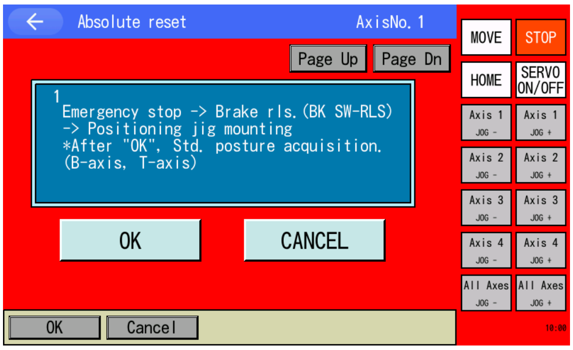


Calibration home / Absolute reset

Select Axis

Axis No. 1

3) Input a number in Axis No. box with using the software numeric keys, and then touch Next button.



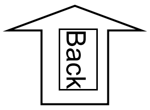
Absolute reset AxisNo. 1

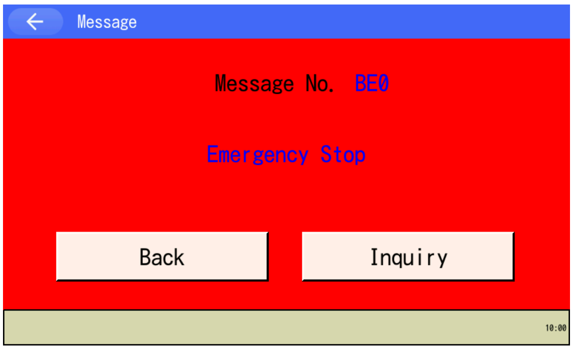
1
Emergency stop -> Brake rls. (BK SW-RLS)
-> Positioning jig mounting
*After "OK", Std. posture acquisition.
(B-axis, T-axis)

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.





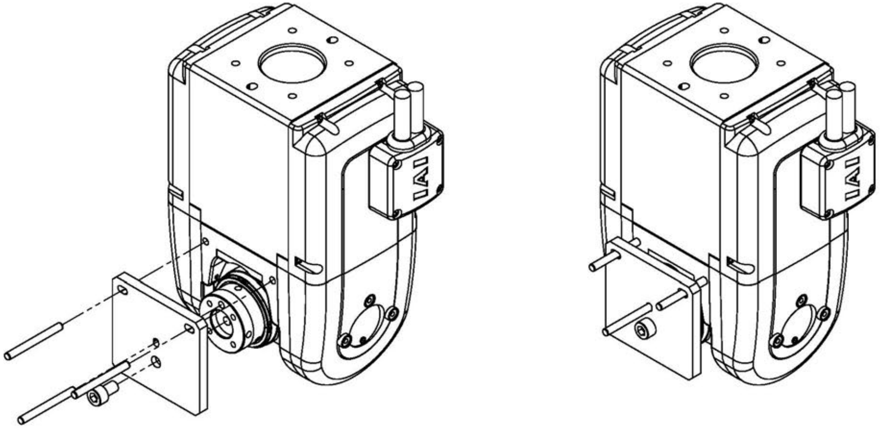
Message

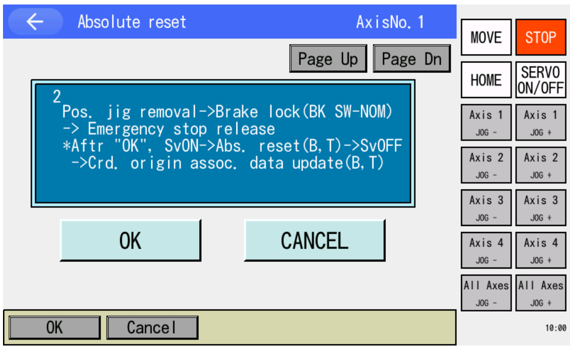
Message No. BE0

Emergency Stop

Inputting emergency stop displays the screen at the left.
Touch Back button to go back to the previous screen.

[Standard posture]

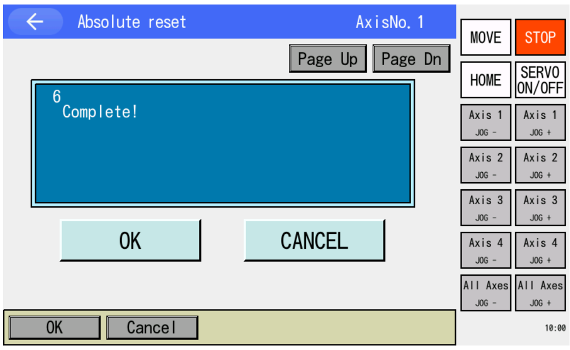




```
2
Pos. jig removal->Brake lock(BK SW-NOM)
-> Emergency stop release
*Aftr "OK", SvON->Abs. reset(B,T)->SvOFF
 ->Crd. origin assoc. data update(B,T)
```

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.

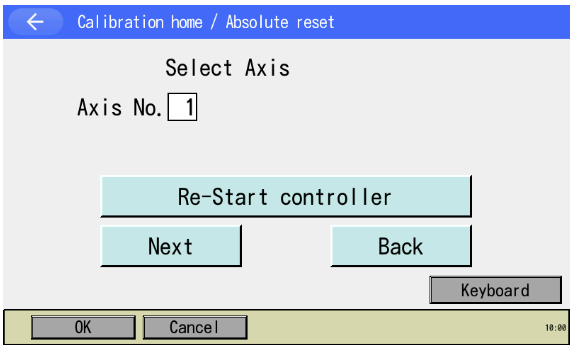
* After touching OK, the process is carried out from the Servo-ON to the coordinate origin association data update (B, T) in order.



```
6
Complete!
```

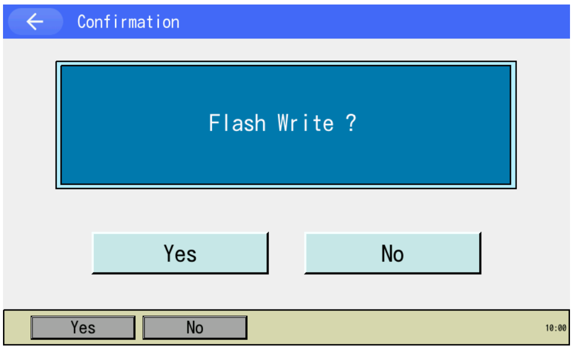
6) Complete!
Touch OK button.

* After touching OK, the screen automatically returns to the axis select screen.



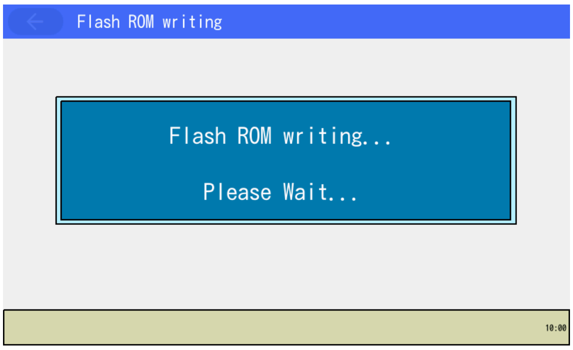
Axis No. 1

7) Touch Re-Start controller button.
A confirmation screen for the flash ROM writing appears.



Flash Write ?

8) Make sure to conduct flash ROM writing and then software reset as the parameters are updated.

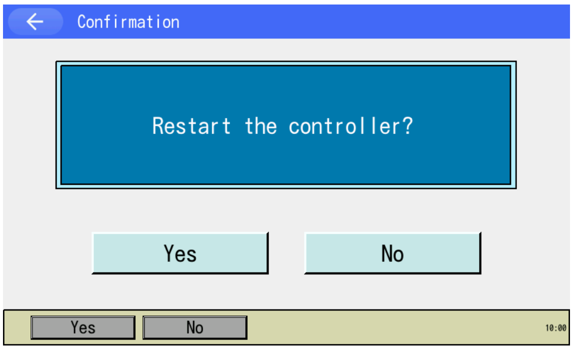


Flash ROM writing...

Please Wait...

9) While in writing process to flash ROM, the screen.

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



Restart the controller?

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

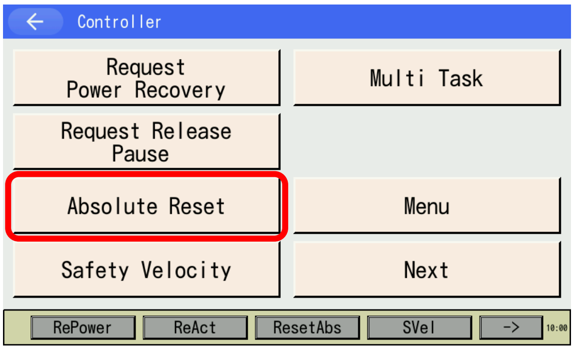
[Necessary Items for Absolute Reset]

Model Number : For S Type JG-WUS
For M Type JG-WUM

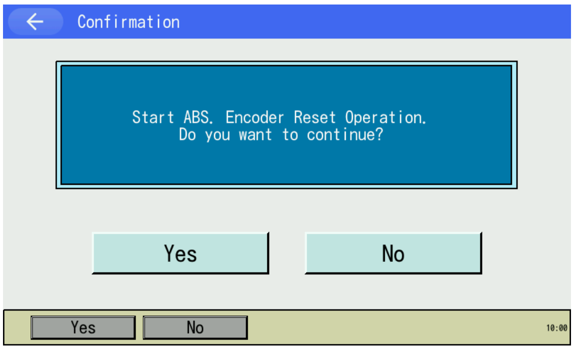
(Note) The model numbers stated above are those that an absolute reset tool, screws and pins come in a set.

- 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 pieces
  Size M : ϕ4 B Type Parallel Pin, Length 40, 3 pieces

(2) How to Absolute Reset



1) Select Absolute Reset from Controller Menu.

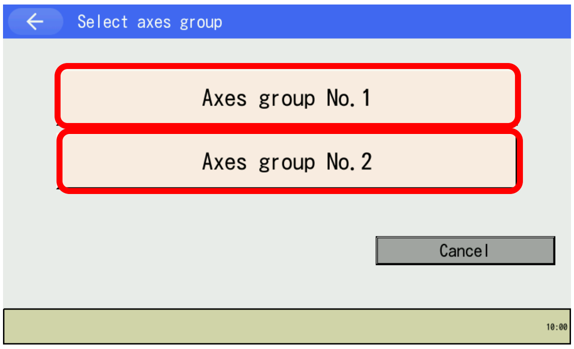


Start ABS. Encoder Reset Operation.
Do you want to continue?

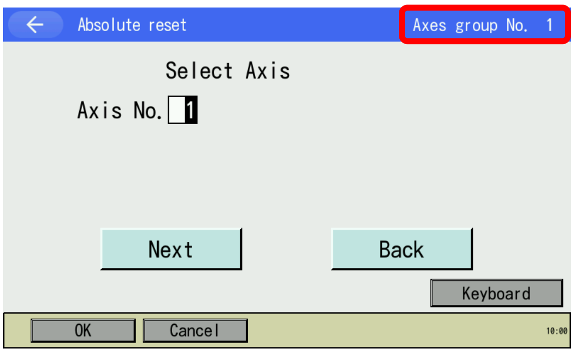
2) Touch Yes button to conduct absolute reset.

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.

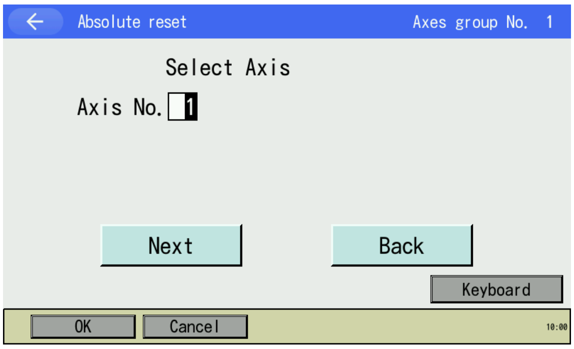
Refer to each chapter below for details.

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]

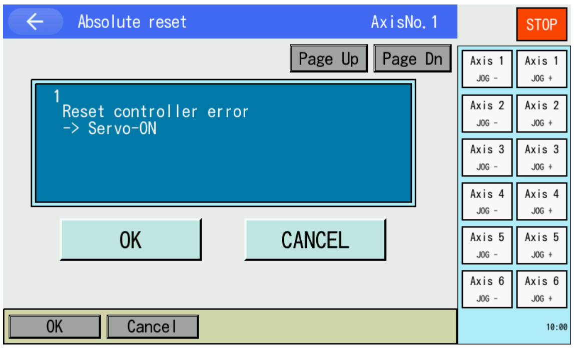
16.12.1 X-, Y- and Z-Axes of 6-axis Cartesian

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.

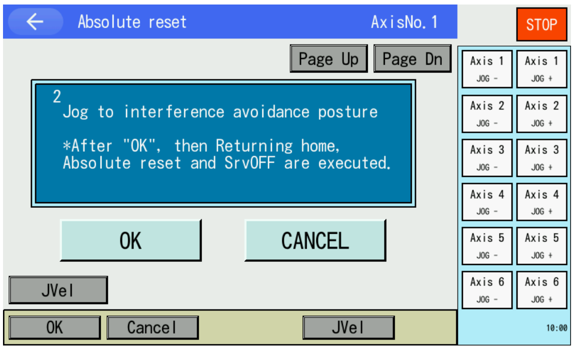


1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.



1
Reset controller error
-> Servo-ON

2) Reset controller error → Servo-on shows up. Touch the OK button.



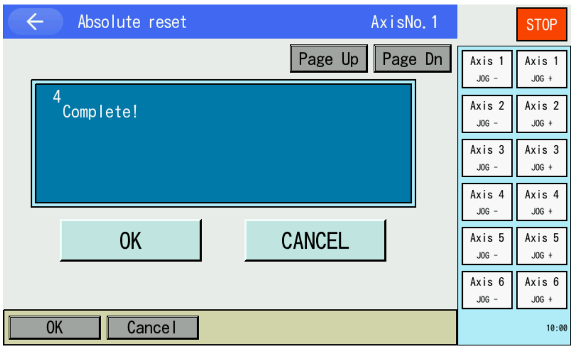
2
Jog to interference avoidance posture

*After "OK", then Returning home,
Absolute reset and SrvOFF are executed.

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.

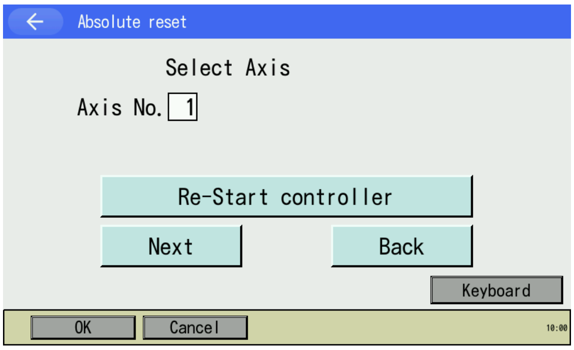
⚠ *Caution:*
The indicated axis conducts the home-return operation.



4
Complete!

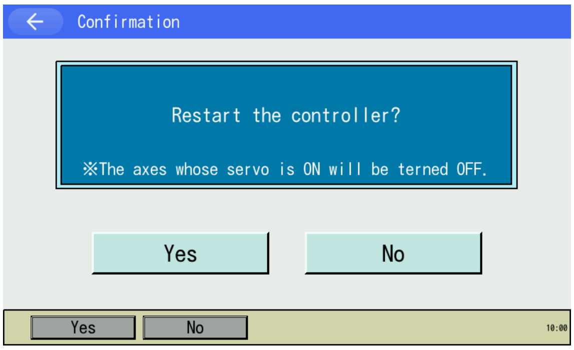
4) Complete!
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



Select Axis
Axis No. 1

5) Touch Re-Start controller button.
Touch the re-start controller button.



Restart the controller?

※The axes whose servo is ON will be terned OFF.

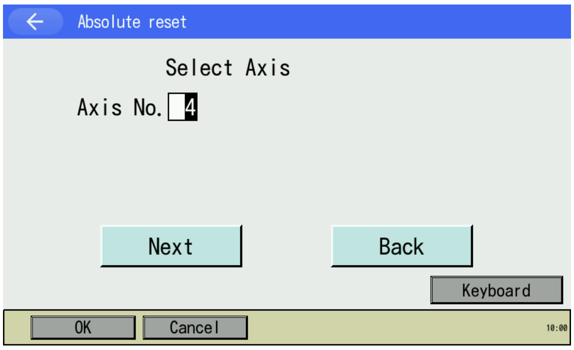
6) Conduct the software reset.
Touch the Yes button.

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

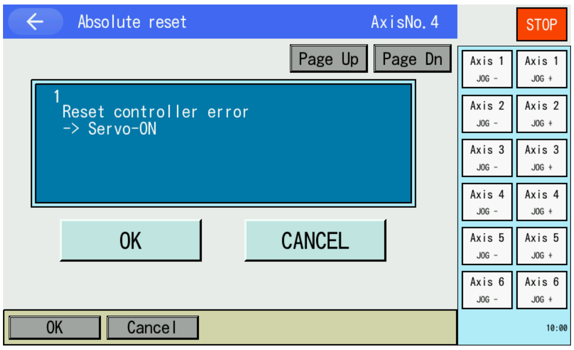
For R-axis of the 6-axis cartesian, conduct the absolute reset in the procedures below.



Select Axis

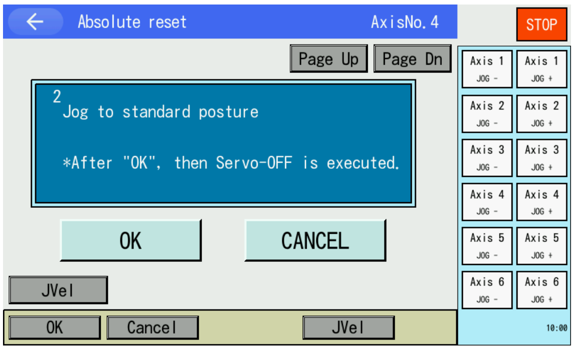
Axis No. 4

1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.



1
Reset controller error
-> Servo-ON

2) Reset controller error → Servo-on shows up.
Touch OK button.



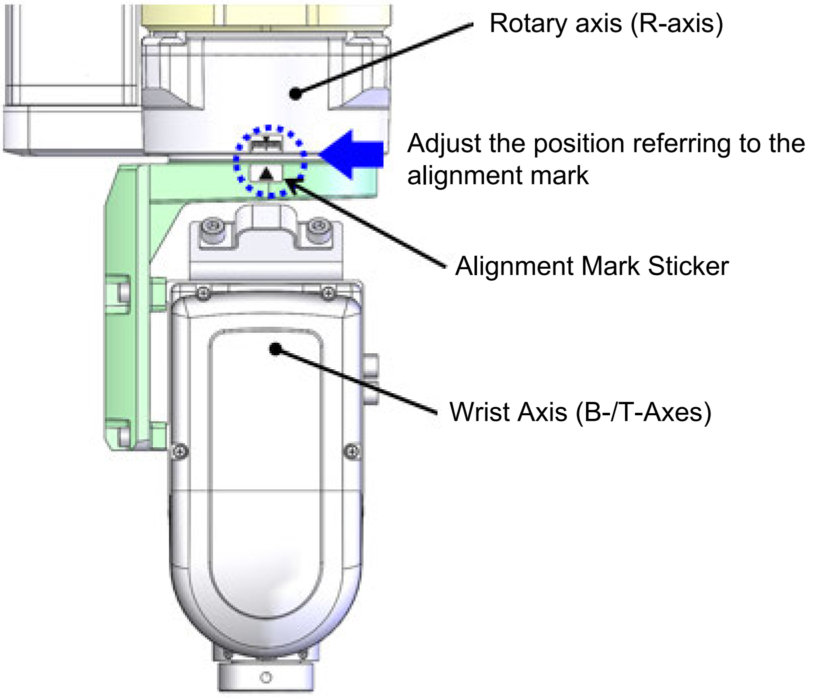
2
Jog to standard posture

*After "OK", then Servo-OFF is executed.

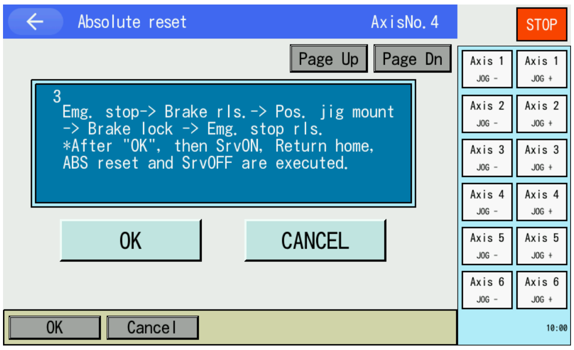
3) Jog to standard posture
Move the indicated axis with the jog operation to the posture vicinity.
Touch the OK button after finished.

* After touching OK, the indicated axis should automatically turn the servo off.

[Standard Posture]

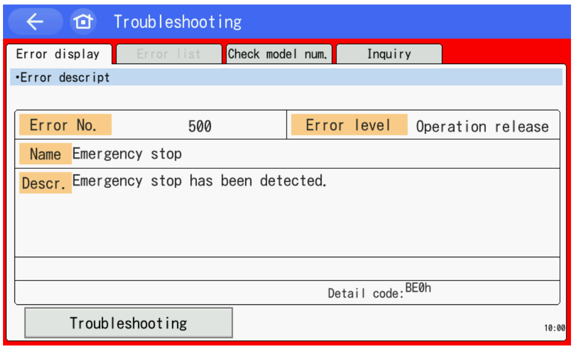


Home position



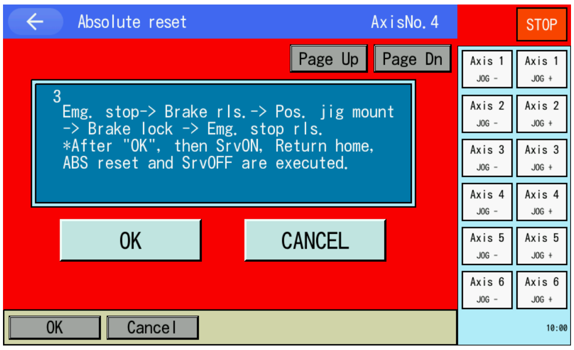
3
Emg. stop-> Brake rls.-> Pos. jig mount
-> Brake lock -> Emg. stop rls.
*After "OK", then SrvON. Return home,
ABS reset and SrvOFF are executed.

4) Emergency STOP
Press the Emergency STOP button.



Error No. 500
Error level Operation release
Name Emergency stop
Descr. Emergency stop has been detected.
Detail code: BE0h

5) Inputting emergency stop displays the screen at the left.
Touch ← button to go back to the previous screen.



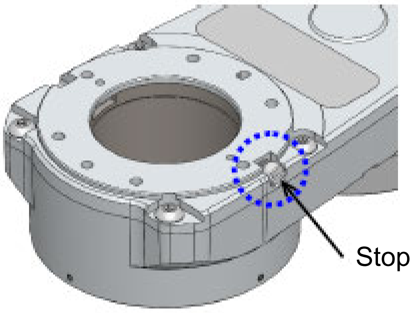
3
Emg. stop-> Brake rls.-> Pos. jig mount
-> Brake lock -> Emg. stop rls.
*After "OK", then SrvON, Return home,
ABS reset and SrvOFF are executed.

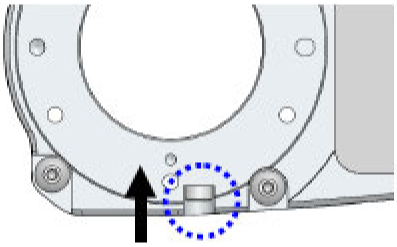
6) Put on positioning tool
Put the positioning tool on after the brake release. After putting it on, lock the brake and then cancel the emergency stop button.
Touch OK button.

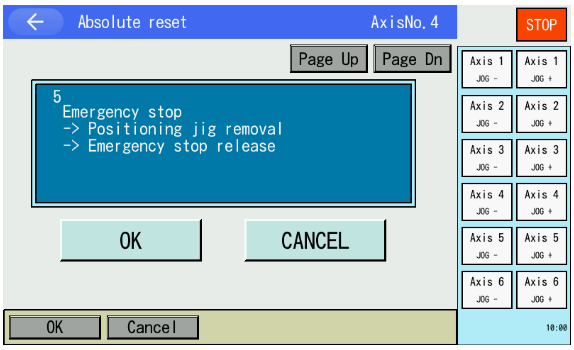
* After touching OK, process from turning the servo on to servo off should take place in the order.

> ⚠ *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.

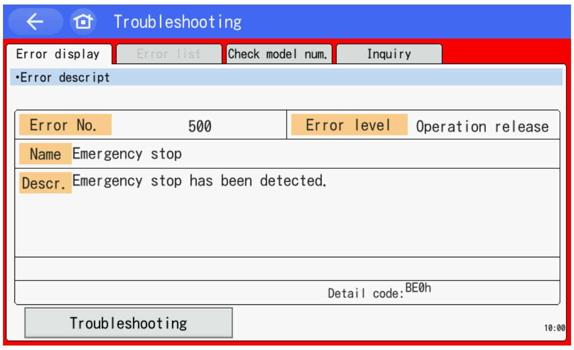






5
Emergency stop
-> Positioning jig removal
-> Emergency stop release

7) Emergency STOP
Press the Emergency STOP button.



•Error descript

Error No. 500

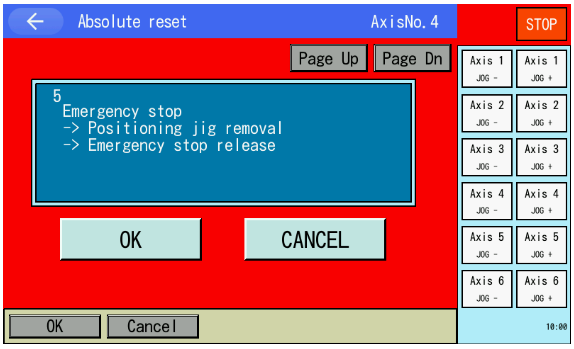
Error level Operation release

Name Emergency stop

Descr. Emergency stop has been detected.

Detail code: BE0h

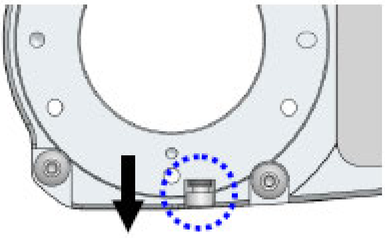
8) Inputting emergency stop displays the screen at the left.
Touch ← button to go back to the previous screen.



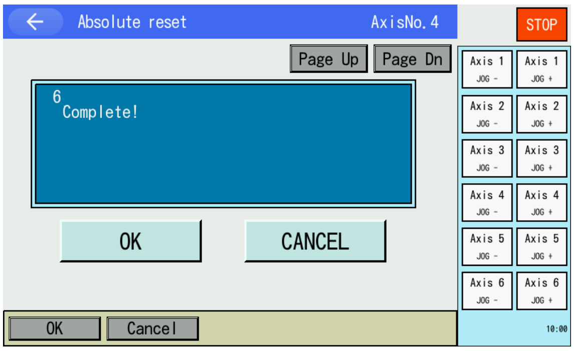
5
Emergency stop
-> Positioning jig removal
-> Emergency stop release

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.



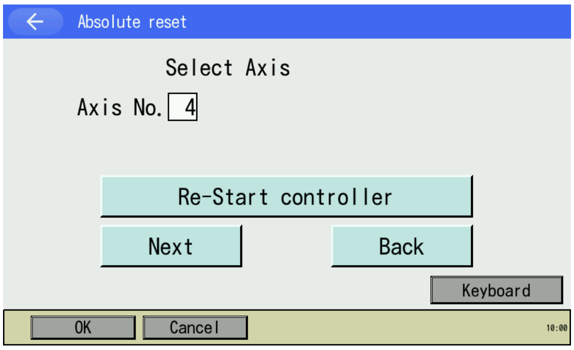
Set back to previous position



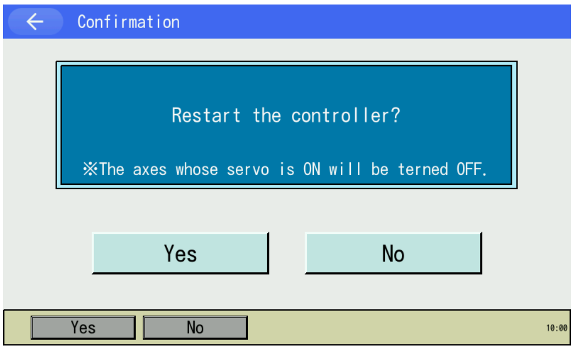
6
Complete!

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.



Restart the controller?

※The axes whose servo is ON will be terned OFF.

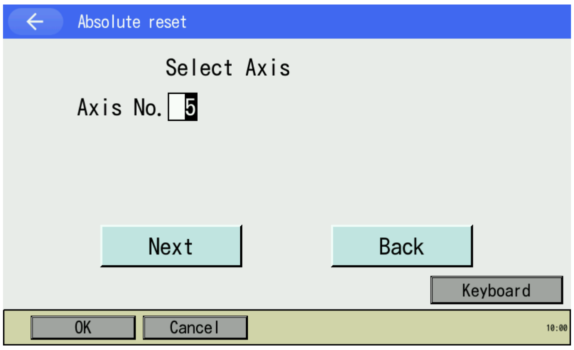
12) Conduct the software reset.
Touch Yes button.

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

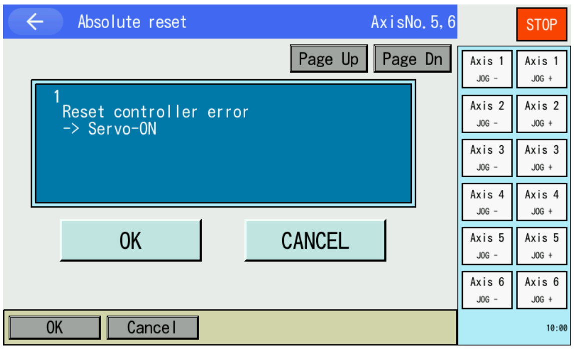
For B- and T-axes of the 6-axis cartesian, conduct the absolute reset in the procedures below.



Select Axis

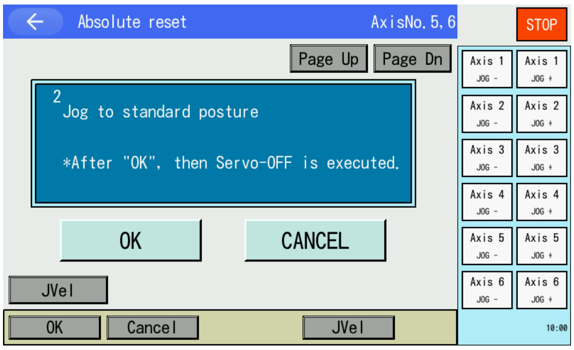
Axis No. 5

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)



1
Reset controller error
-> Servo-ON

2) Reset controller error → Servo-on shows up.
Touch OK button.



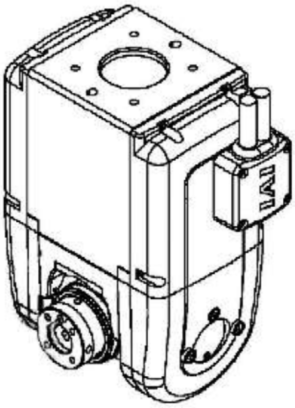
2
Jog to standard posture

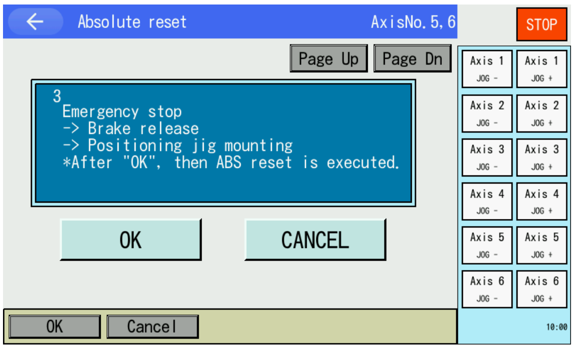
*After "OK", then Servo-OFF is executed.

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.

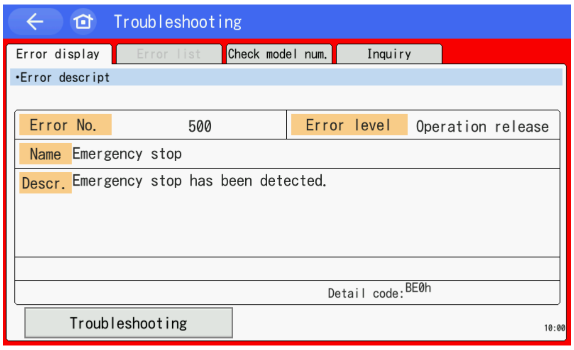
[Standard Posture]





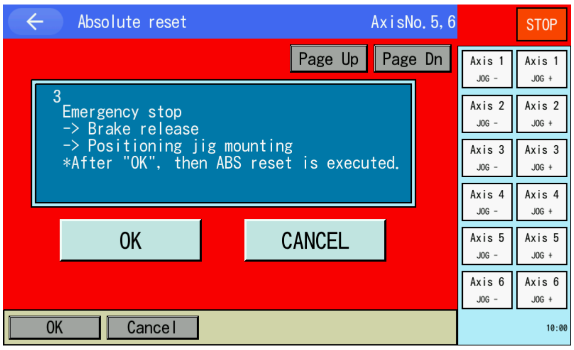
```
3
Emergency stop
-> Brake release
-> Positioning jig mounting
*After "OK", then ABS reset is executed.
```

4) Press the Emergency STOP button.



Error No. 500
Error level Operation release
Name Emergency stop
Descr. Emergency stop has been detected.
Detail code: BE0h

5) The display turns to the window shown on the left.
Touch ← button to go back to the previous screen.

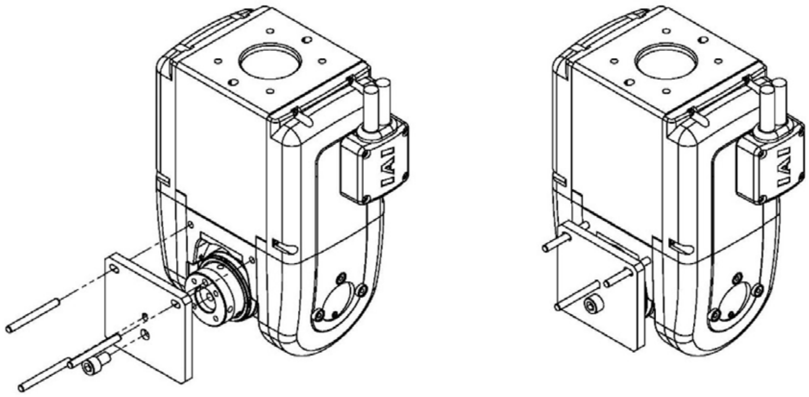


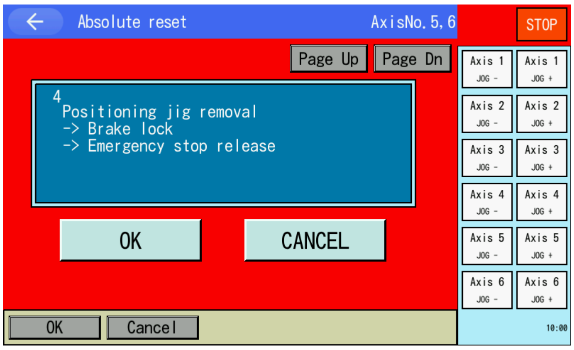
```
3
Emergency stop
-> Brake release
-> Positioning jig mounting
*After "OK", then ABS reset is executed.
```

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.

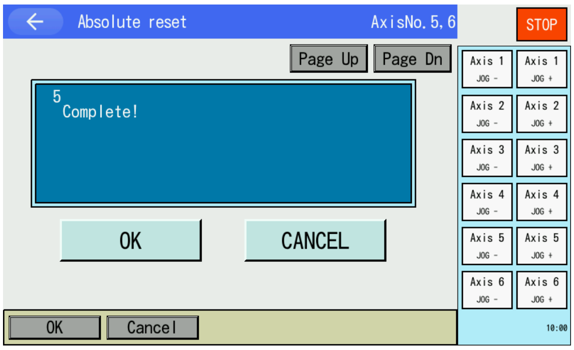
[To put on positioning tool]





4
Positioning jig removal
-> Brake lock
-> Emergency stop release

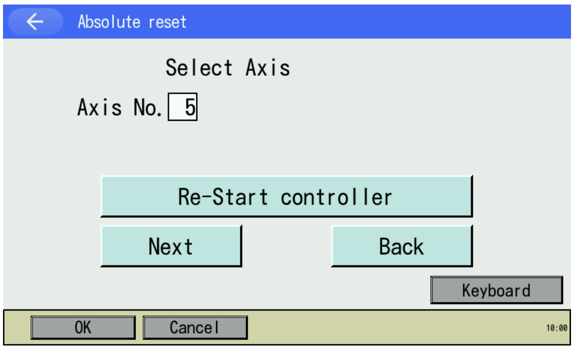
7) Take the positioning tool off. After taking it off, lock the brake and then cancel the emergency stop button.
Touch OK button.



5
Complete!

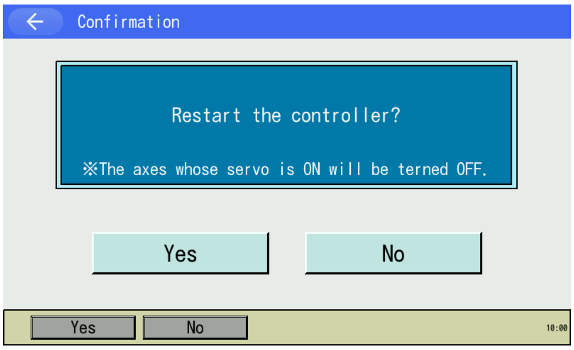
8) Complete! Should come out.
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



Select Axis
Axis No. 5

9) Touch Re-Start controller button.
The display turns to the software reset window.



Restart the controller?

※The axes whose servo is ON will be terned OFF.

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

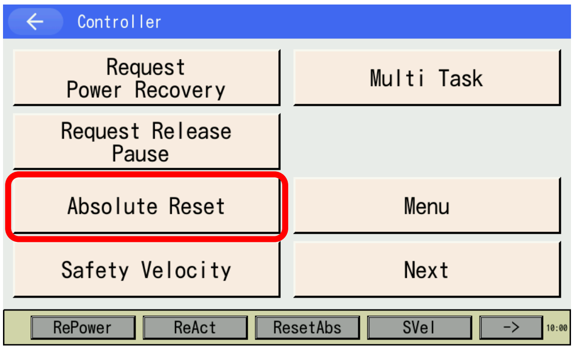
[Necessary Items for Absolute Reset]

Model Number : For S Type JG-WUS
For M Type JG-WUM

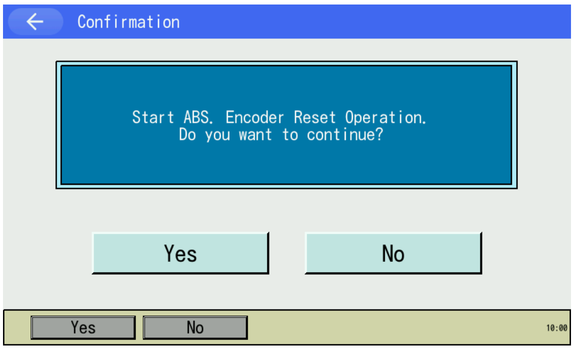
(Note) The model numbers stated above are those that an absolute reset tool, screws and pins come in a set.

- 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 pieces
  Size M : ϕ4 B Type Parallel Pin, Length 40, 3 pieces

(2) How to Absolute Reset



1) Select Absolute Reset from Controller Menu.

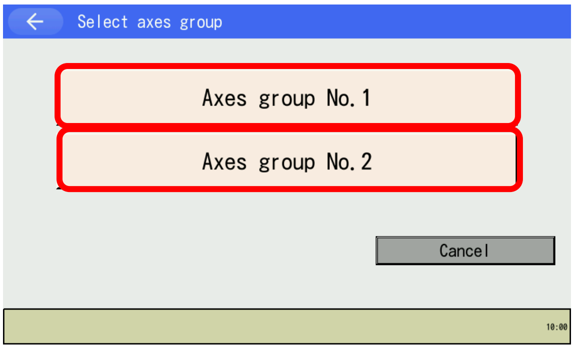


Start ABS. Encoder Reset Operation.
Do you want to continue?

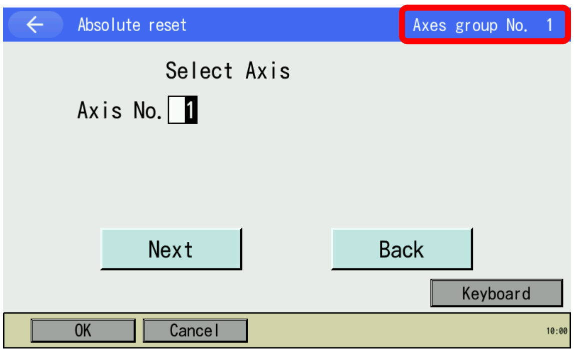
2) Touch Yes button to conduct absolute reset.

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 group 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.



Axis No. 1

The axis number input window should open.

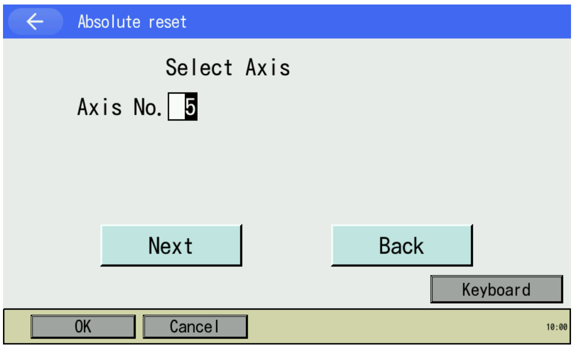
* The axes group number that was selected should be shown on the top right of the screen.

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.

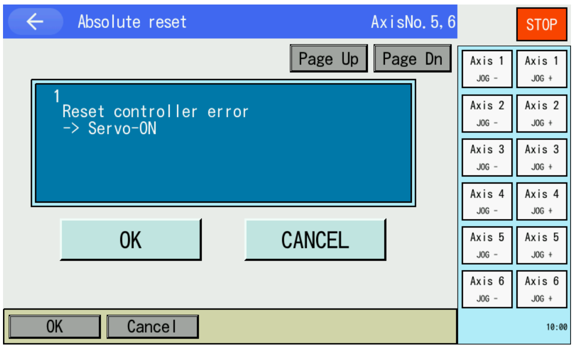


Absolute reset

Select Axis

Axis No. 5

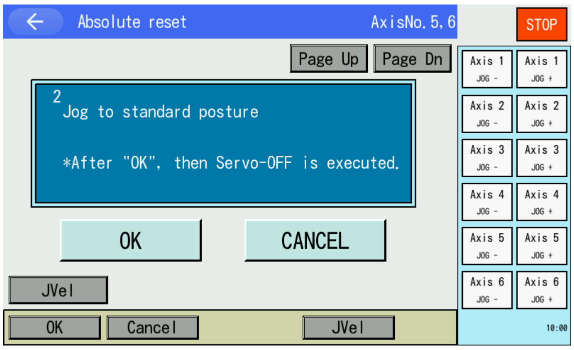
1) Using the touch panel numeric keys, input an axis number in the axis number box, and touch the Next button.
(Input an axis number of the B-axis)



Absolute reset AxisNo.5,6

1
Reset controller error
-> Servo-ON

2) Reset controller error → Servo-on shows up.
Touch OK button.



Absolute reset AxisNo.5,6

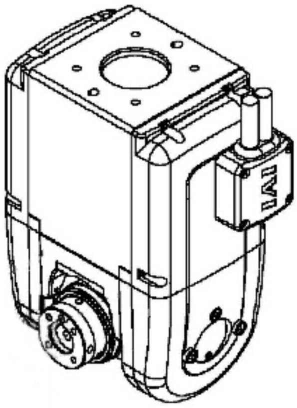
2
Jog to standard posture

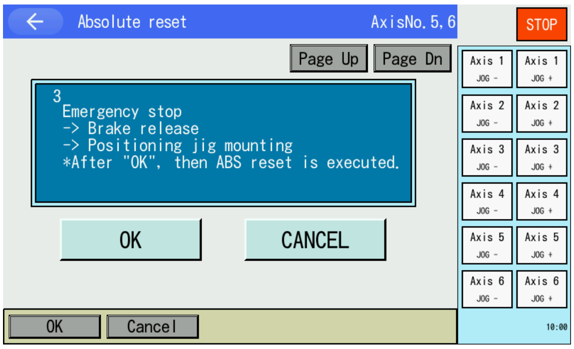
*After "OK", then Servo-OFF is executed.

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.

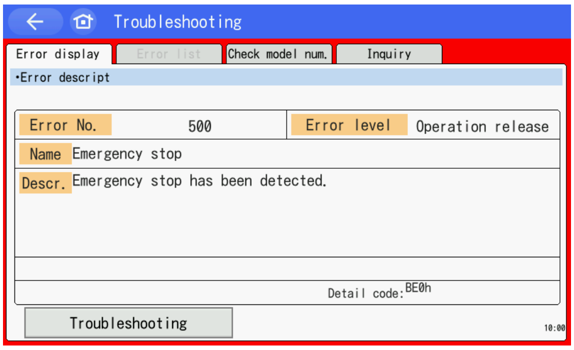
[Standard Posture]





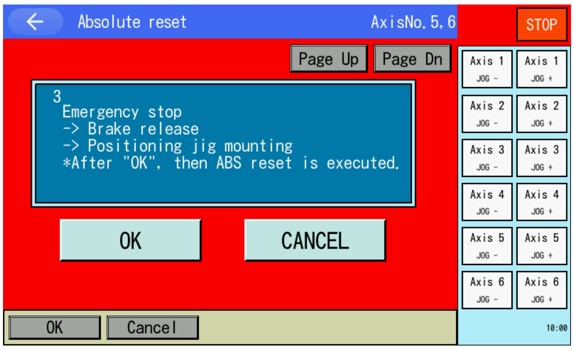
3
Emergency stop
-> Brake release
-> Positioning jig mounting
*After "OK", then ABS reset is executed.

4) Press the Emergency STOP button.



Error No. 500
Error level Operation release
Name Emergency stop
Descr. Emergency stop has been detected.
Detail code: BE0h

5) The display turns to the window shown on the left.
Touch ← button to go back to the previous screen.

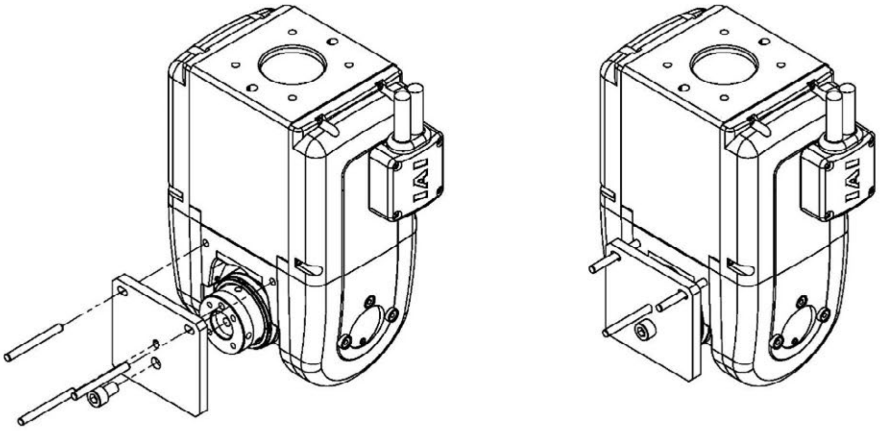


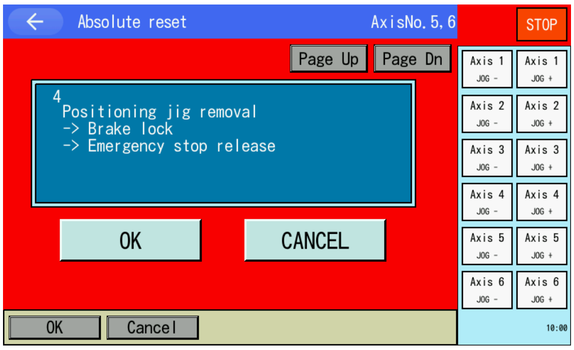
3
Emergency stop
-> Brake release
-> Positioning jig mounting
*After "OK", then ABS reset is executed.

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.

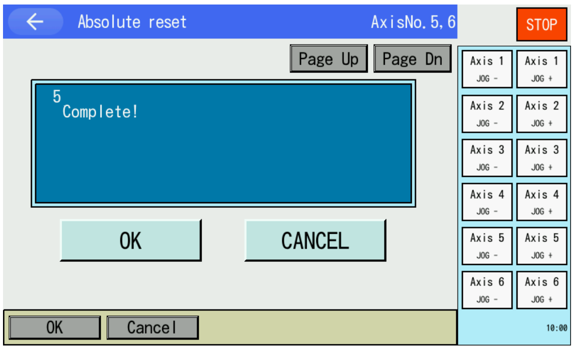
[To put on positioning tool]





4
Positioning jig removal
-> Brake lock
-> Emergency stop release

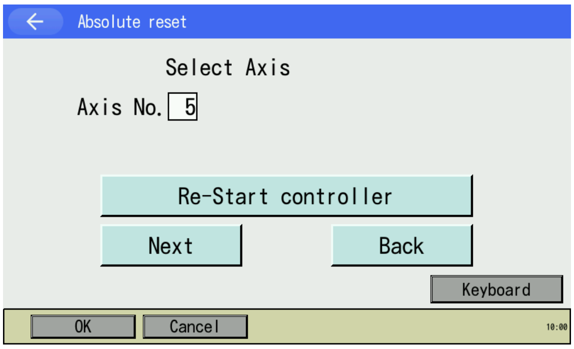
7) Take the positioning tool off. After taking it off, lock the brake and then cancel the emergency stop button.
Touch OK button.



5
Complete!

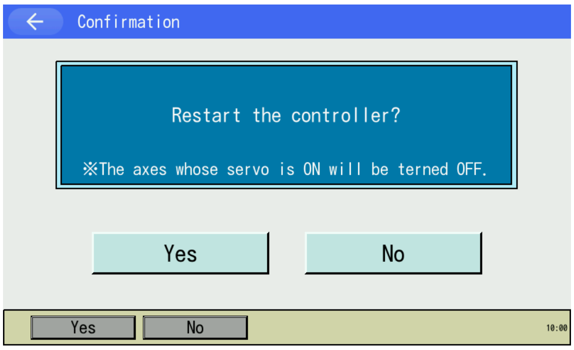
8) Complete! Should come out.
Touch OK button.

* After confirming OK, the screen automatically returns to the axis select screen.



Select Axis
Axis No. 5

9) Touch Re-Start controller button.
The display turns to the software reset window.



Restart the controller?

※The axes whose servo is ON will be terned OFF.

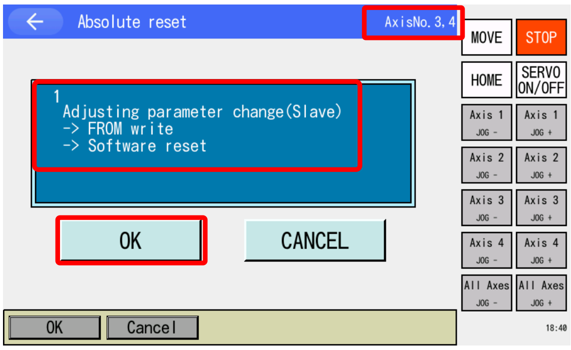
10) Conduct the software reset.
Touch Yes button.

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.

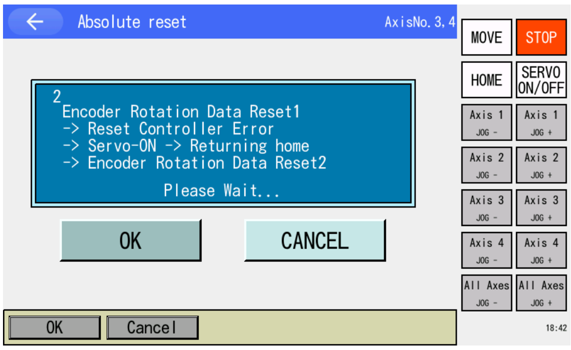
(1) Select the master axis or slave axis in the Select Axis Number window, and the screen shifts to the synchronizing axis absolute reset window.



1
Adjusting parameter change(Slave)
-> FROM write
-> Software reset

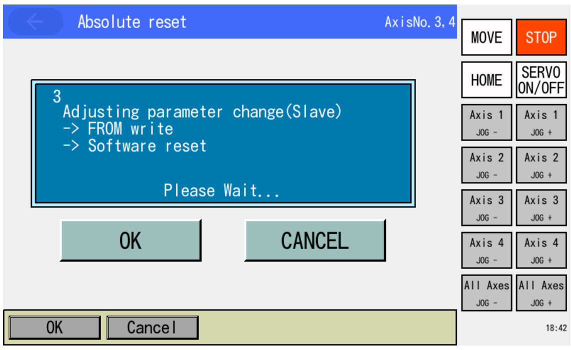
The synchronizing axis absolute reset window should show both of the master axis number and slave axis number as shown in the figure on the left.
Also, it shows "Adjusting parameter change (Slave)..." In the message box.
Touch the OK button and the displayed content should automatically be executed.
The screen should shift to the next window once all the procedures are completed.

> ⚠ *Caution:*
> *The indicated axis conducts the home-return operation.*



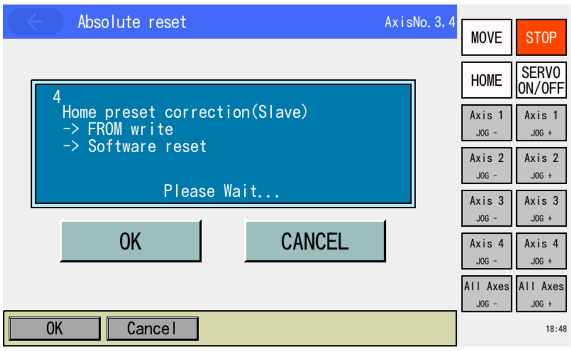
2
Encoder Rotation Data Reset1
-> Reset Controller Error
-> Servo-ON -> Returning home
-> Encoder Rotation Data Reset2
Please Wait...

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.



3
Adjusting parameter change(Slave)
-> FROM write
-> Software reset
Please Wait...

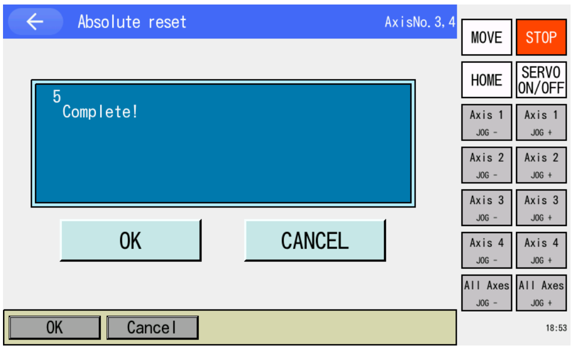
The content in the message box should be executed in the window shown in the figure on the left.
The screen should shift to the next window once all the procedures are completed.



4
Home preset correction(Slave)
-> FROM write
-> Software reset

Please Wait...

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.



5
Complete!

"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

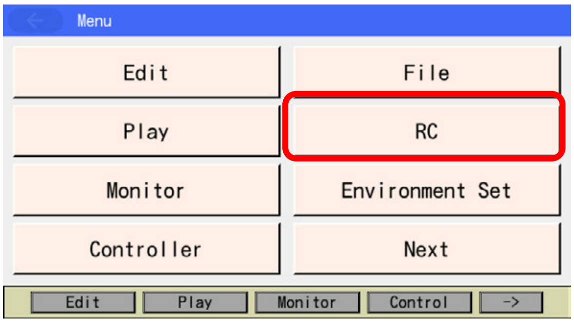
In the case of the XSEL-P/Q/PX/QX, XSEL-R/S/RX/SX/RXD/SXD controllers with the RC gateway function, the following operations are available.

- Editing of the RC Position Data in XSEL
- RC-axis Monitoring

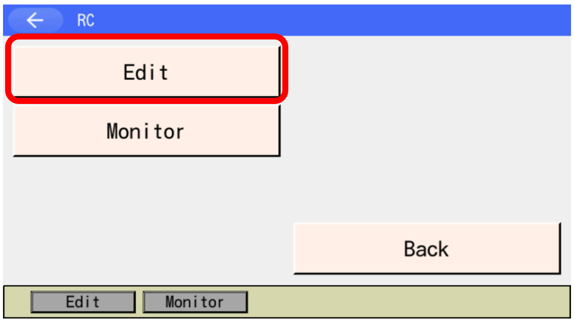
17.1 Editing of the RC Position Data in XSEL

17.1.1 RC Position Data Creation

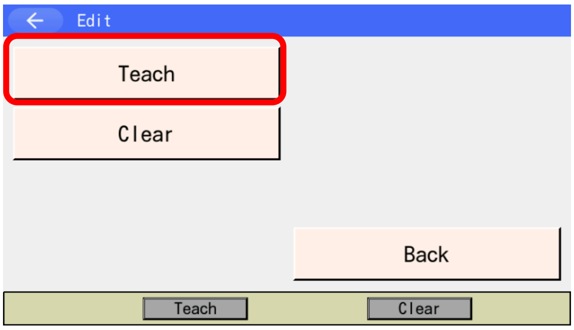
The RC position data to be set in the XSEL controller is edited.



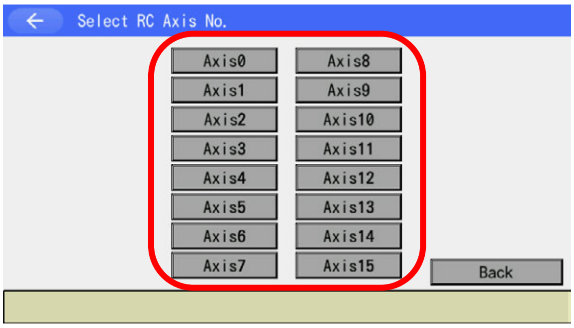
Touch RC button in the menu screen.



Touch Edit button in the RC menu screen.

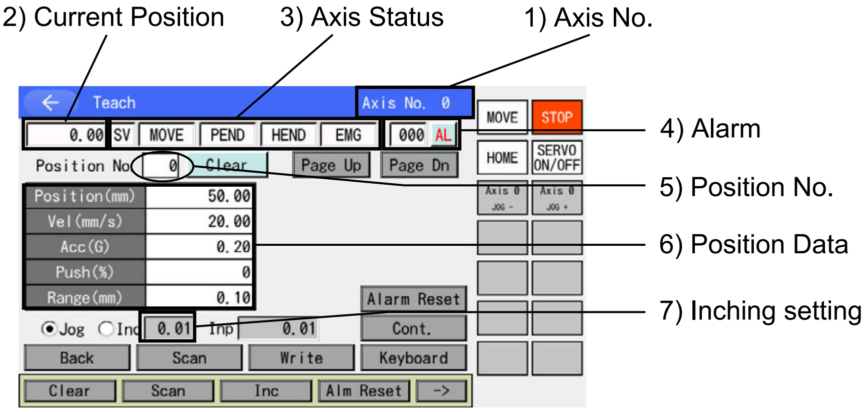


Touch Teach button in the RC edit menu screen.



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.

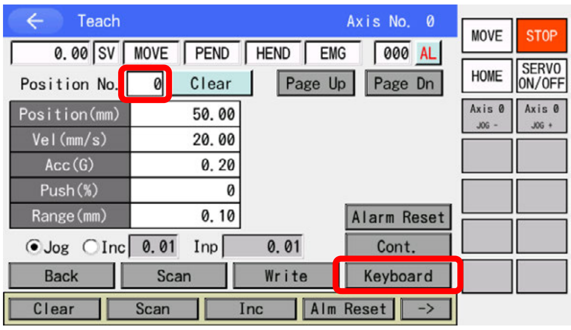
> ⚠ *Caution: At the time when this function is executed, the position data is cleared.*
> *Please take care.*

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.)

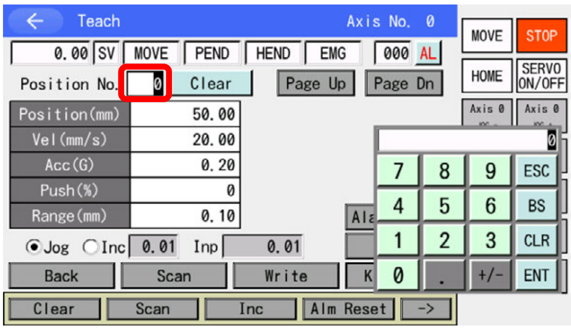
⚠ *Caution: The position data starts from No. 0 unlike XSEL.*



Position No. 0

Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10
Inc 0.01 Inp 0.01

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



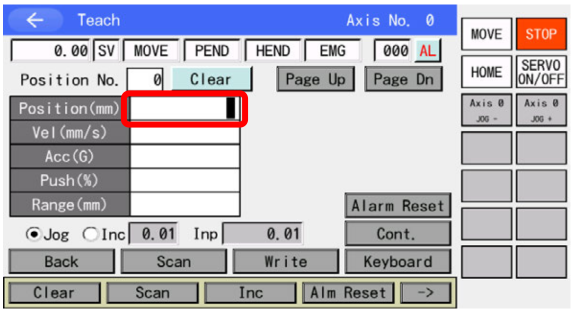
Position No. 0

Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10
Inc 0.01 Inp 0.01

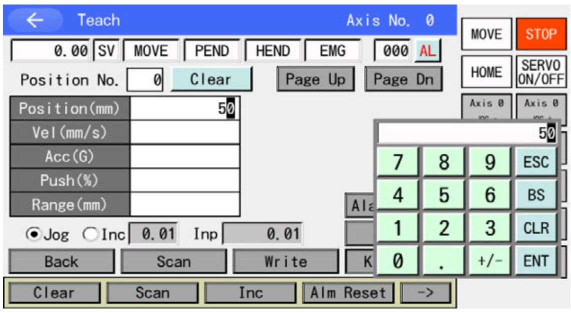
Touch the numerical part when it is desired to input number on the touch panel numeric keys when inputting the position number.
The contents of input will be shown in the box above the touch panel numeric keys.
When confirming the input number, touch ENT.
The touch panel numeric keys close and the data 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.

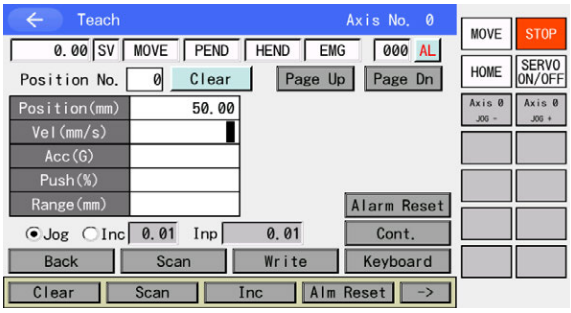
Next, show the cursor to the input part in the item you want to make an input.
To show the cursor, touch on the input part (the white area in the background, or area in the red frame for target position [mm]) in the item you want to make an input.



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.

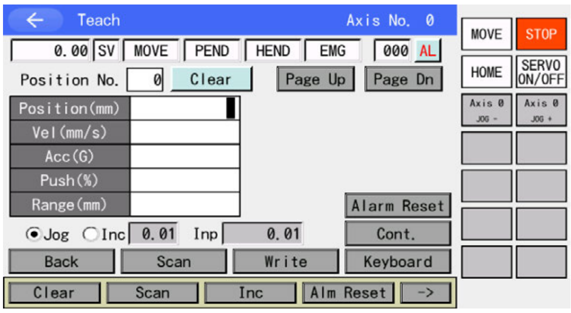


If you want to input 50 to Position [mm], touch Keyboard button to show the touch panel numeric keys, and touch 5 0 ENT on the touch panel numeric keys.



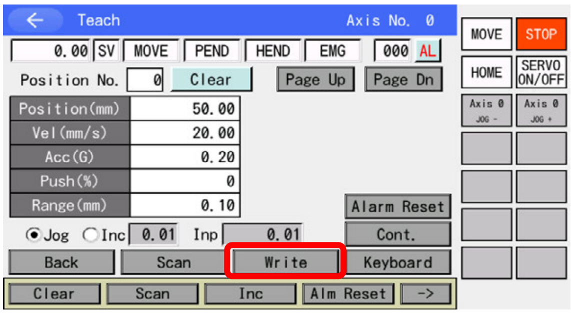
If the input is accepted, the cursor moves to the input box for Vel (mm/s).
Then, input values for Vel (mm/s), Acc (G), Push (%) and Range (mm).

⚠ *Caution: In the TB-03, 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]



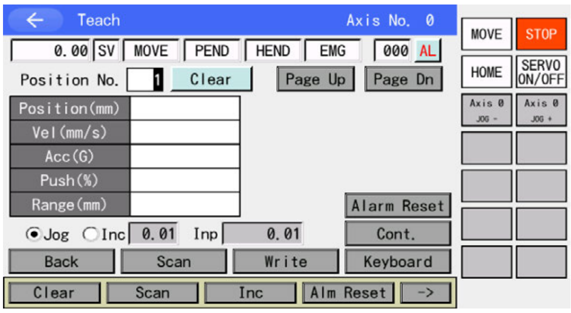
Position No. 0 Clear Page Up Page Dn

Position(mm)	50.00
Vel(mm/s)	20.00
Acc(G)	0.20
Push(%)	0
Range(mm)	0.10

● Jog ○ Inc 0.01 Inp 0.01

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.

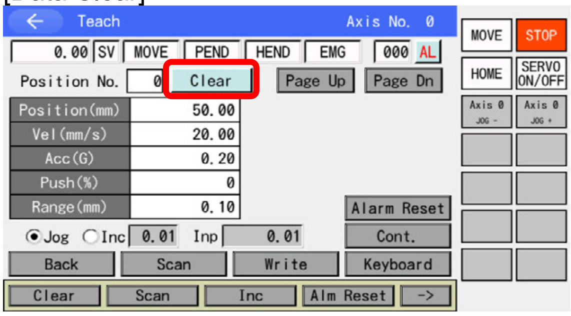


Position No. 1 Clear Page Up Page Dn

● Jog ○ Inc 0.01 Inp 0.01

Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

[Data Clear]

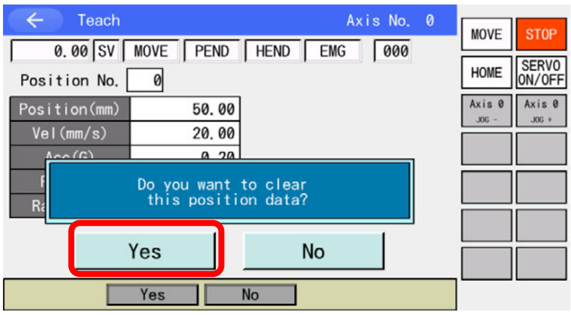


Position No. 0 Clear Page Up Page Dn

Position(mm)	50.00
Vel(mm/s)	20.00
Acc(G)	0.20
Push(%)	0
Range(mm)	0.10

● Jog ○ Inc 0.01 Inp 0.01

When you want to delete the data in the position number being displayed, touch Clear button in the touch panel.



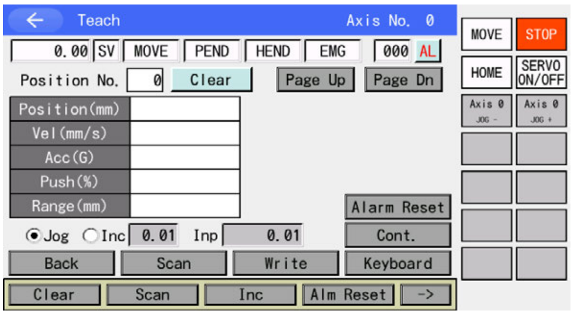
Position No. 0

Position(mm) 50.00

Vel(mm/s) 20.00

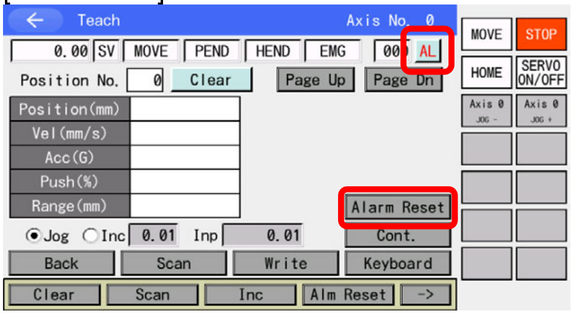
Do you want to clear this position data?

Touch Yes button on the touch panel and the data gets transferred to the controller.

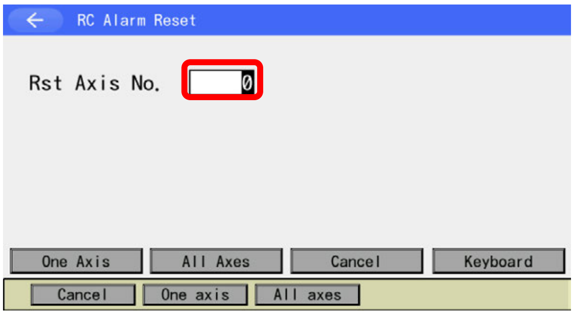


Once the clear is succeeded, the data in the same position number (after cleared) is displayed.

[Alarm Reset]

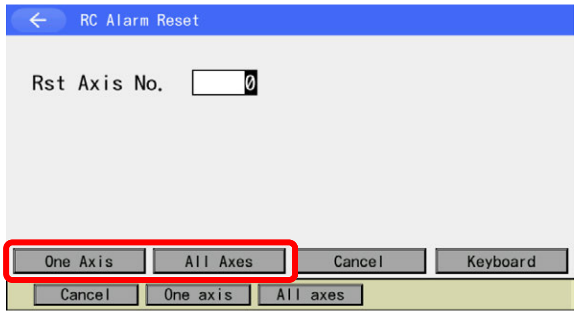


If you want to have an alarm reset on the RC axis in edit, touch AL button.
When you want to have an alarm reset on the RC axes you want to choose, touch Alarm Reset button.



Rst Axis No. 0

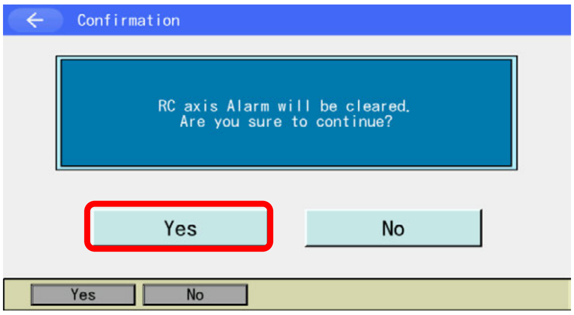
When you want to have an alarm reset only on the indicated axis, set the axis number.
With the cursor shown in the appropriate area, touch Keyboard button to make the touch panel numeric keys appear on the screen to input a number



RC Alarm Reset

Rst Axis No. 0

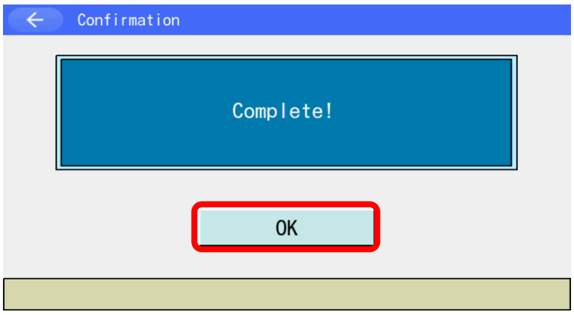
When you want to have an alarm reset only on the indicated axis, touch One Axis button.
When you want to have an alarm reset on all the RC axes, touch All Axes button.



Confirmation

RC axis Alarm will be cleared.
Are you sure to continue?

Touch Yes button.
Touch No button, to return to the RC alarm reset screen.



Confirmation

Complete!

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.

↓

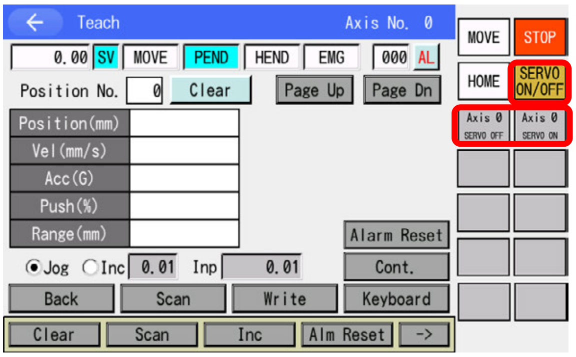
2) Take the data of the current position of the RC actuator into the teaching screen.

↓

3) Transmit the data to the controller.

(1) Servo ON/OFF Operation

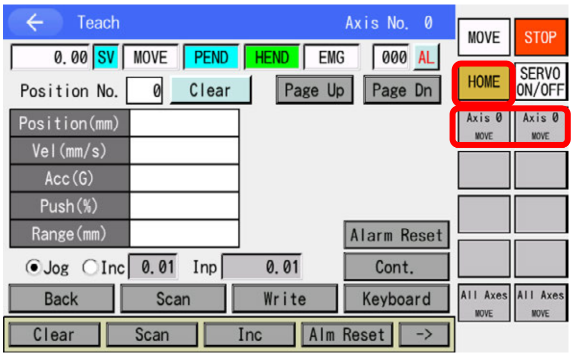
Using this operation, the RC actuator servo-motor is turned ON/OFF.
This operation is available only in the single axis.



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 Axis 0 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

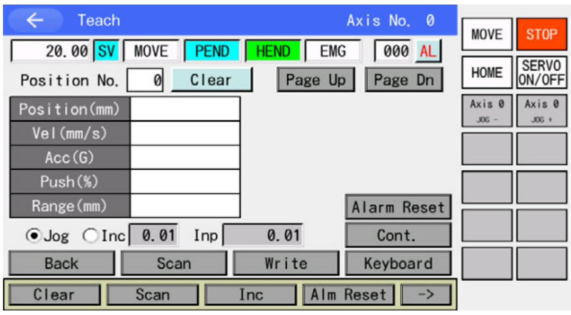
In the case of the incremental encoder applicable RC actuator, it is required to perform the home return operation after the power is turned on, or after the software reset and before the teaching operation.
This operation is available only in the single axis.



Turn the servo-motor ON.
Press HOME button.
After the background color of HOME button has changed, touch the Axis 0 SERVO OFF button to conduct home-return operation.
The axis status display “HEND” turns on when the home-return operation is finished.

(3) Actuator Movement

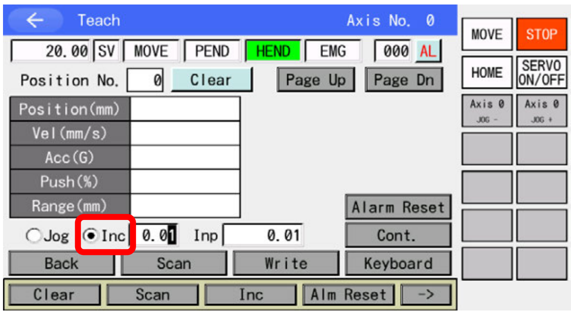
1) Jog operation
Perform the jog operation of the RC actuator.
This operation is available only in the single axis.



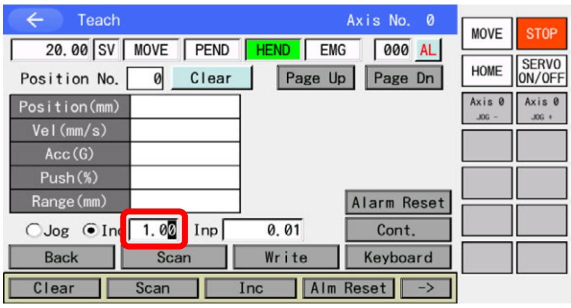
Turn the servo-motor ON.

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).

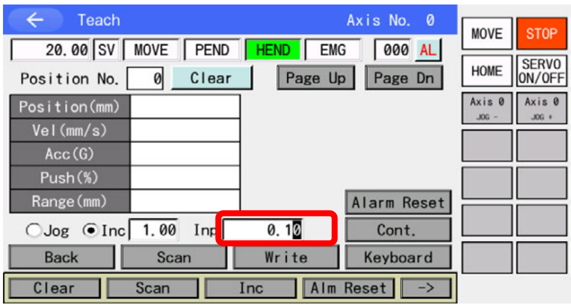
2) Inching operation
Perform the RC actuator inching operation.
This operation is available only in the single axis.



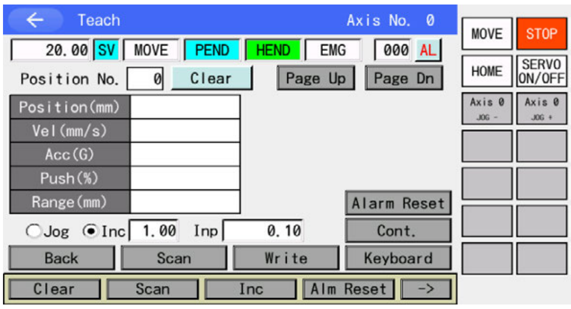
Touch Inc button directly to make Inc button selected.



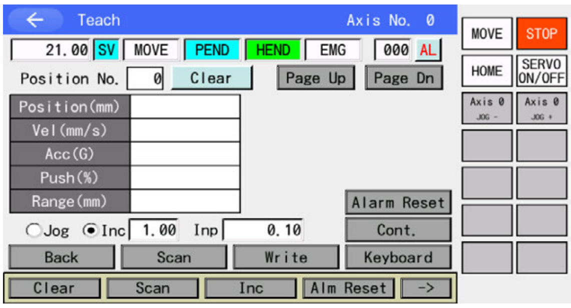
Set the inching distance (travel distance for each touching of the JOG button).
Show the cursor to the input part beside "Inc" and touch Keyboard button to open the touch panel numeric keys to input a value and touch ENT.
The numerical value input range is from 0.00 to 1.00 (Unit: mm).



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).

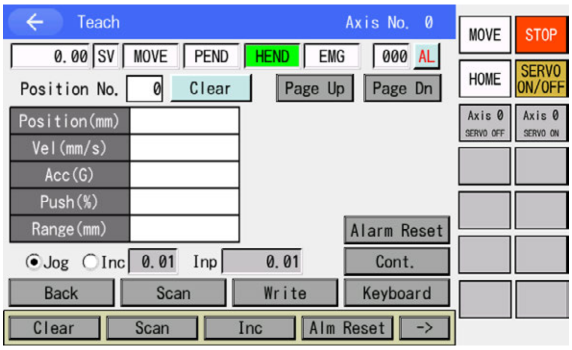


Turn the servo-motor ON.
The condition of servo-on/off can be checked on the axis status display “SV”, which turns on when the servo is on and turns off when the servo is off.

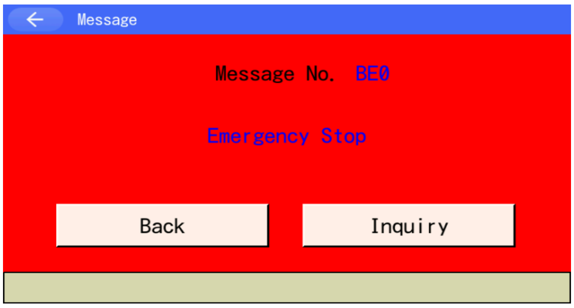


Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
(“+” means the movement to the plus direction on the coordinates and “-“means the movement to the minus direction on the coordinates).

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.



Message No. BE0

Emergency Stop

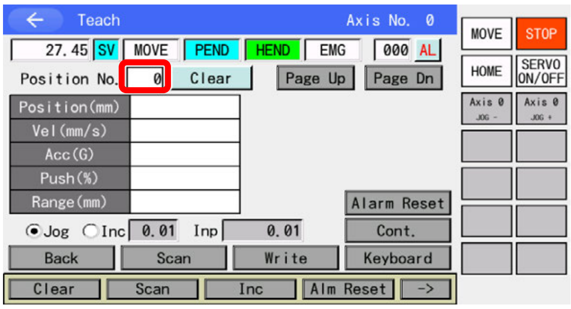
Pressing the EMERGENCY STOP button switches the display to the emergency stop screen.

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

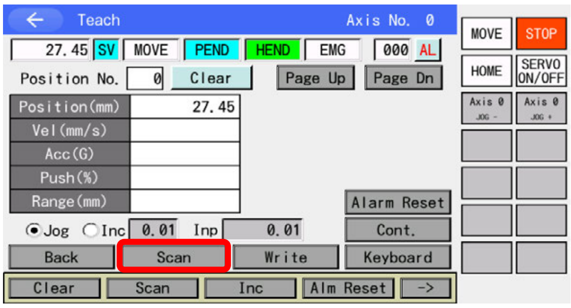
The chosen RC actuator position is taken in the teaching window as the position data.



Position No. 0

Position(mm)

Set the position number from which the current position is to be loaded.



Position No. 0

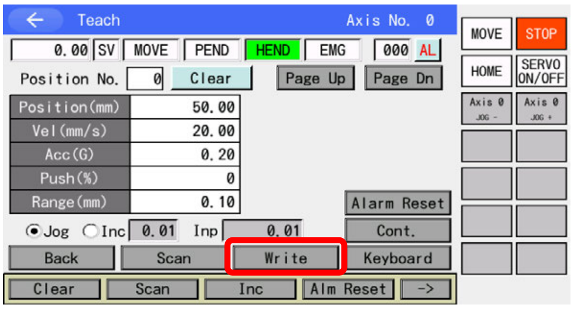
Position(mm) 27.45

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



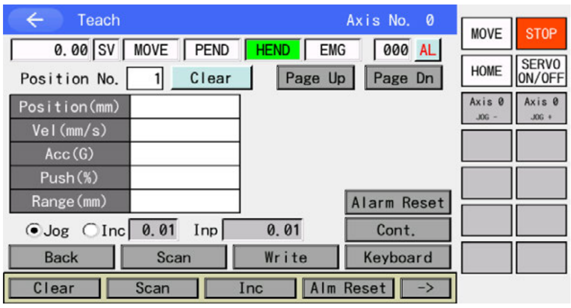
0.00

Position No. 0

Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10

● Jog ○ Inc 0.01 Inp 0.01

After data input is complete, touch Write button on the touch panel keys to transfer the data to the controller.



0.00

Position No. 1

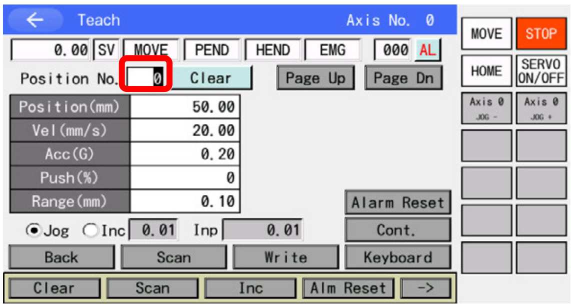
Position(mm)
Vel(mm/s)
Acc(G)
Push(%)
Range(mm)

● Jog ○ Inc 0.01 Inp 0.01

Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

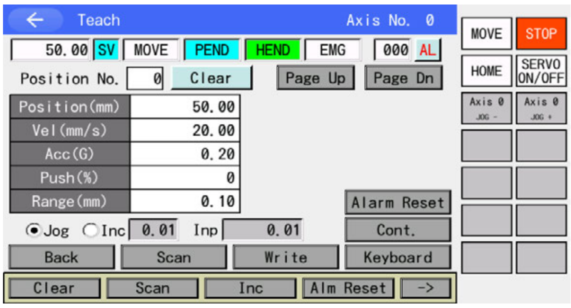
(6) Position Check
When the RC actuator is moved to the place corresponding to the taught position data, the position check can be performed.

1) Movement
Move the RC actuator to the position corresponding to the position data transferred to the controller.



0.00
000
Position No. 0
Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10
● Jog ○ Inc 0.01 Inp 0.01

Set the position number you want to move to.

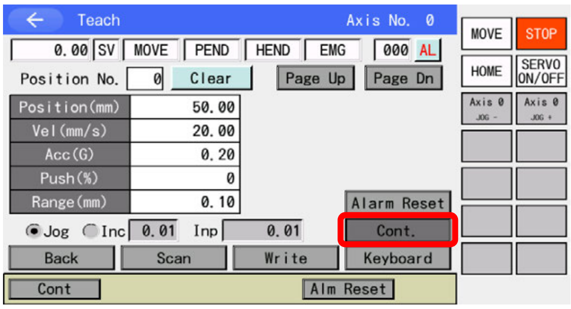


50.00
000
Position No. 0
Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10
● Jog ○ Inc 0.01 Inp 0.01

Turn the servo-motor ON.
Perform the home return operation.

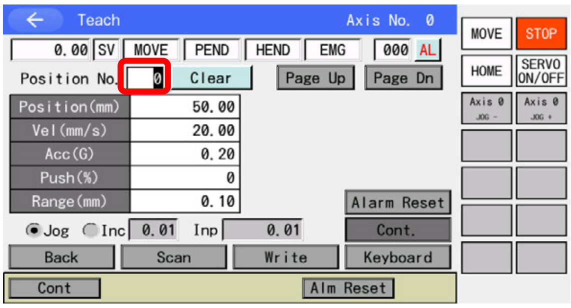
Touch the MOVE button.
Touch the Axis 0 MOVE (-) button after the background color in the MOVE button has changed, and the axis starts moving.
When it is stopped on the way, touch the STOP button.

2) Continuous Movement
The RC actuator automatically follows the position corresponding to the position data transferred to the controller.



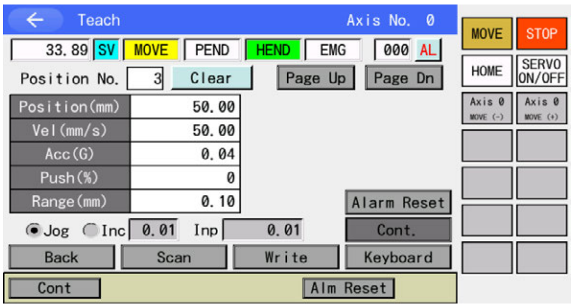
0.00
000
Position No. 0
Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10
● Jog ○ Inc 0.01 Inp 0.01

Touch Cont. button to switch to the continuous operation mode.



0.00
000
Position No. 0
Position(mm) 50.00
Vel(mm/s) 20.00
Acc(G) 0.20
Push(%) 0
Range(mm) 0.10
● Jog ○ Inc 0.01 Inp 0.01

Set the position number you want to move to first.



33.89
000
Position No. 3
Position(mm) 50.00
Vel(mm/s) 50.00
Acc(G) 0.04
Push(%) 0
Range(mm) 0.10
● Jog ○ Inc 0.01 Inp 0.01

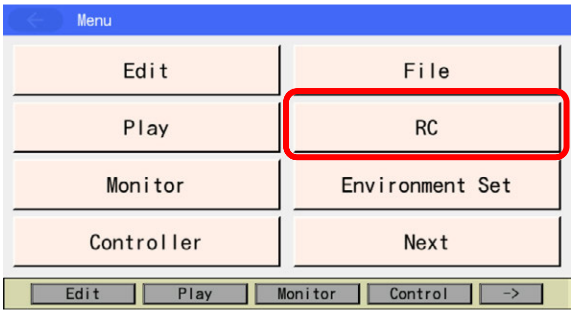
Turn the servo-motor ON.
Perform the home return operation.

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.

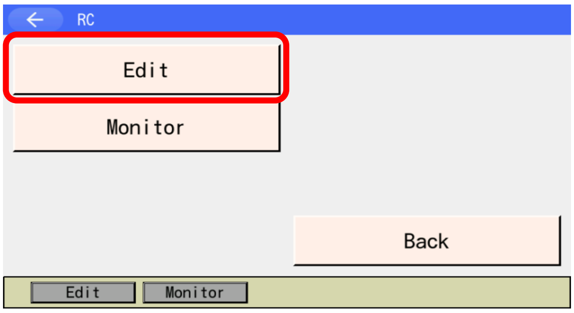
⚠ Caution: *Be careful as it may take a few seconds before start moving after touching the Axis 0 MOVE (+) or Axis 0 MOVE (-) button. (The time interval for movement start varies depending on the number of registered position data items).*

17.1.3 RC Position Data Deletion

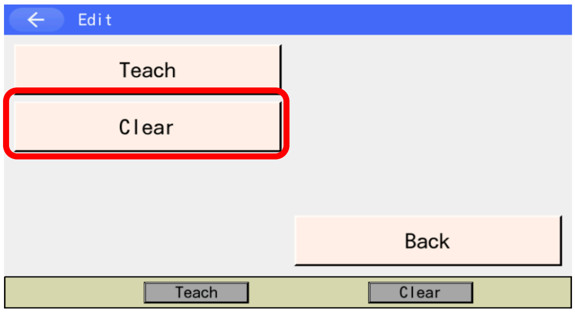
Position Data with the selected Axis No. and Position No., is deleted.



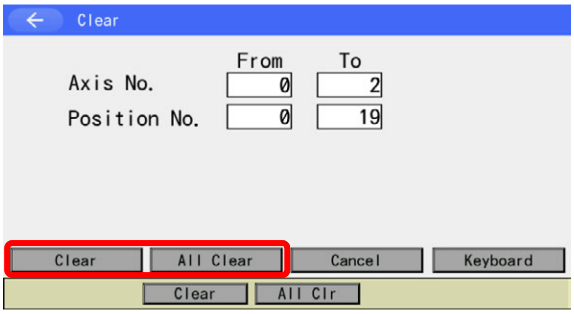
Touch RC button in the menu screen.



Touch Edit button.

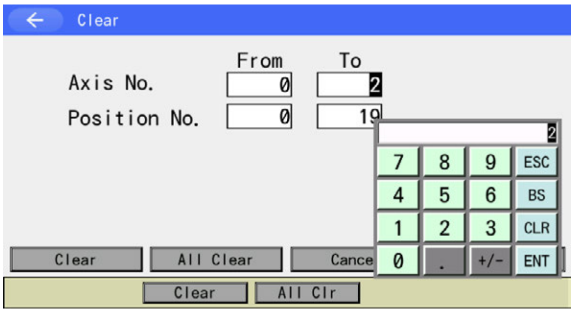


Touch Clear button.



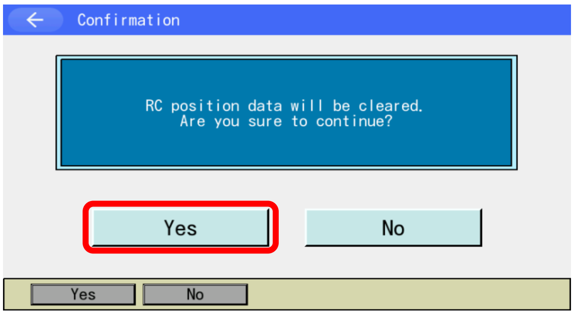
Axis No. From 0 To 2
Position No. From 0 To 19

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.



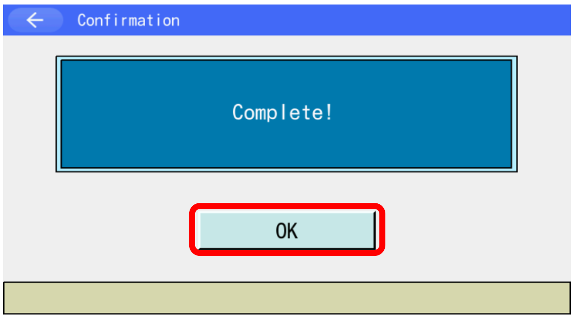
Axis No. From 0 To 2
Position No. From 0 To 19

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.



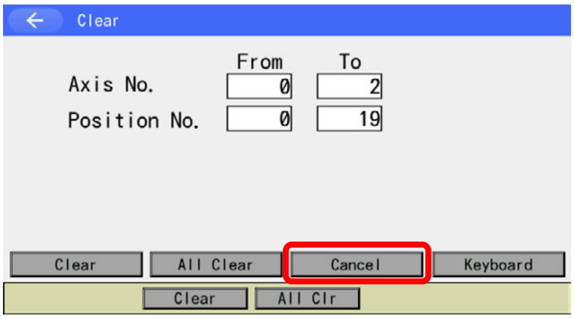
RC position data will be cleared.
Are you sure to continue?

Touch Yes button.
Touch No button, to return to the RC position clear screen.



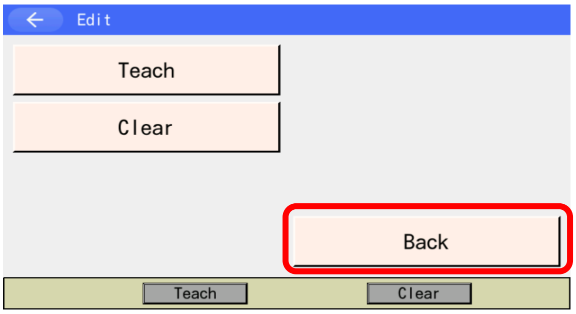
Complete!

The display shows this screen when the position clear is finished.
Touch OK button, to return to the RC position clear screen.

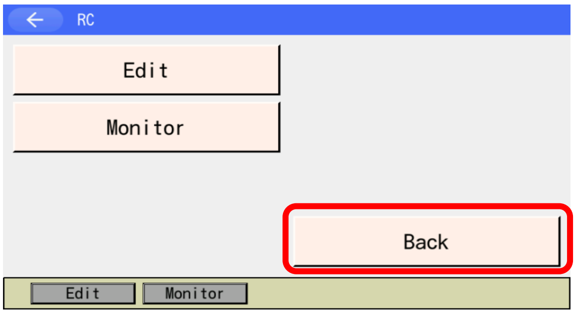


	From	To
Axis No.	0	2
Position No.	0	19

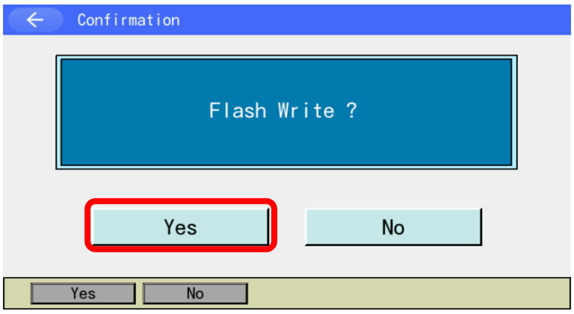
Touch Cancel button.



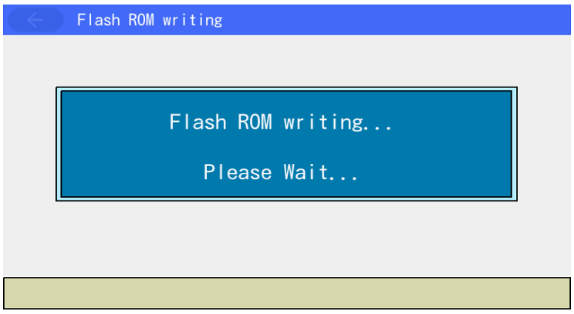
Touch Back button.



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.

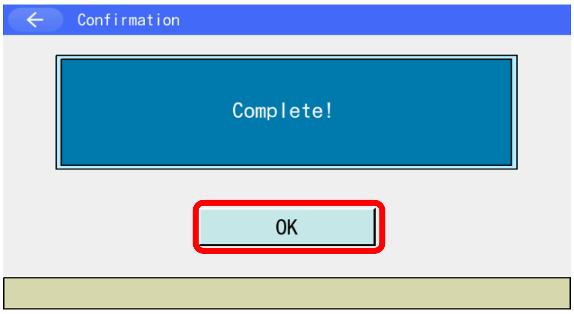


Flash ROM writing...

Please Wait...

"Flash ROM writing..." flashes during the flash ROM writing.

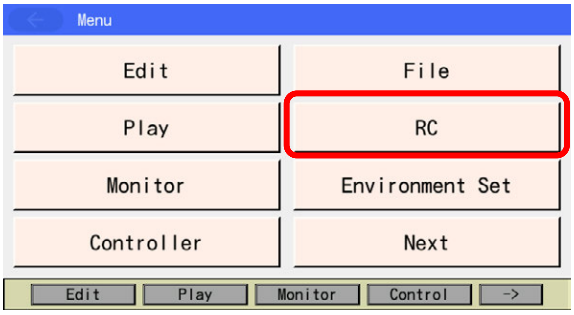
Never turn off the power to the Controller at this time.



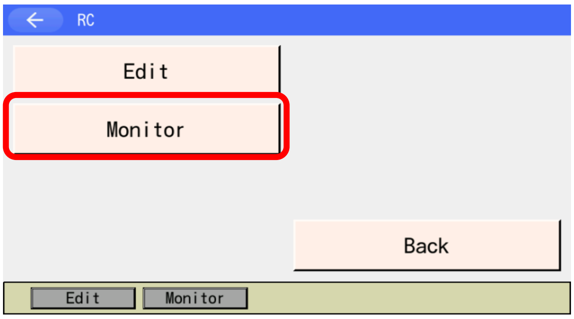
The display shows this screen when the flash ROM writing is finished.
Touch OK button, to return to the RC menu screen.

17.2 RC Actuator Monitoring

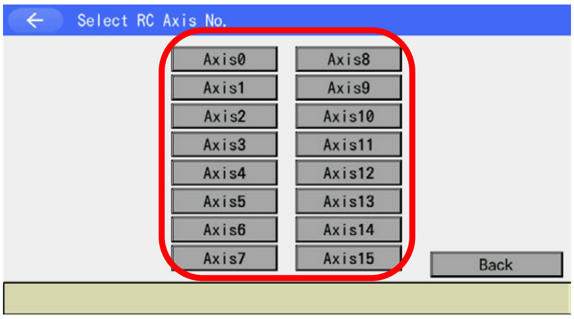
The RC actuator’s status, current position and alarm code are displayed.



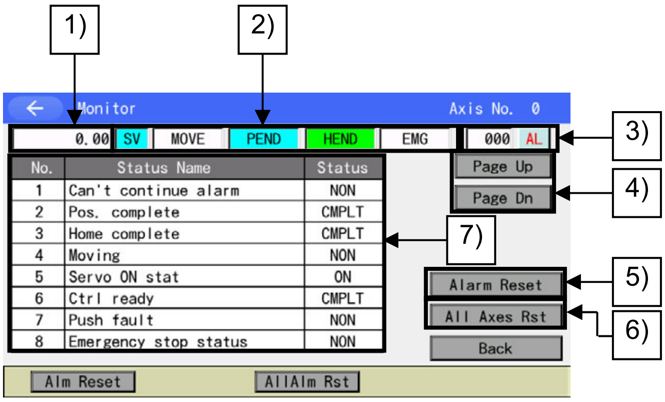
Touch RC button in the menu screen.



Touch Monitor button.



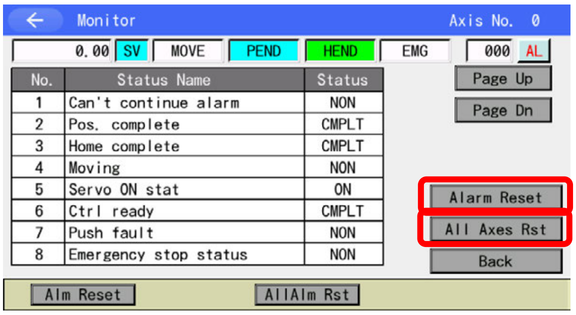
Select the RC axis number to monitor by touching the appropriate button.
The display returns to the RC menu screen if you touch Back button.



No.	Status Name	Status
1	Can't continue alarm	NON
2	Pos. complete	CMPLT
3	Home complete	CMPLT
4	Moving	NON
5	Servo ON stat	ON
6	Ctrl ready	CMPLT
7	Push fault	NON
8	Emergency stop status	NON

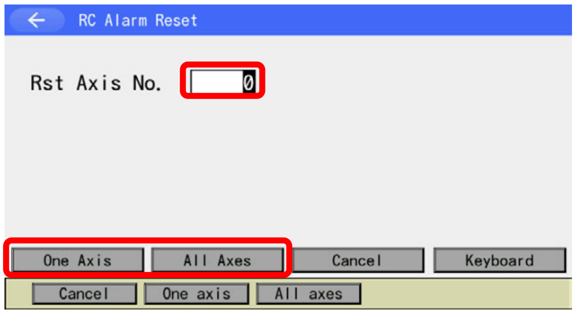
1) The current position [mm] is displayed.
2) The status of the actuator is displayed.
   SV : Turns on when the servo is on
   MOVE : Turns on during operation
   PEND : Turns on when positioning is finished
   HEND : Turns on when home-return operation is finished
   EMG : Turns on during emergency 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]

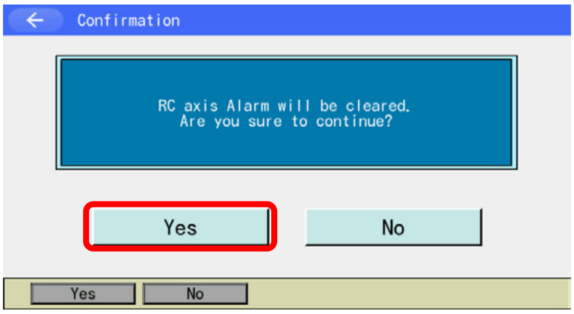


No.	Status Name	Status
1	Can't continue alarm	NON
2	Pos. complete	CMPLT
3	Home complete	CMPLT
4	Moving	NON
5	Servo ON stat	ON
6	Ctrl ready	CMPLT
7	Push fault	NON
8	Emergency stop status	NON

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.

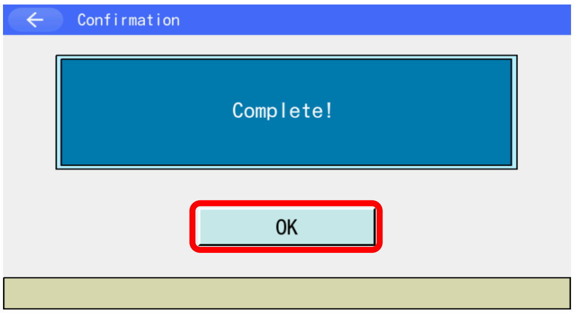


RC alarm reset screen is displayed if Alarm Reset button is touched in RC Monitor screen.
Select the axis number you want to have an alarm reset, and touch One Axis button.
Touch All Axes button, and an alarm reset is held on all the RC axes.



RC axis Alarm will be cleared.
Are you sure to continue?

Touch Yes button.
Touch No button, to return to the RC monitor screen.



Complete!

The display shows this screen when the alarm reset is finished.
Touch OK button, to return to the RC monitor screen.

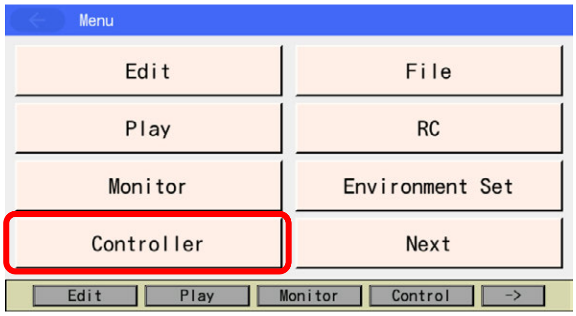
17.3 User Data Hold Memory Initialization

17.3.1 Description

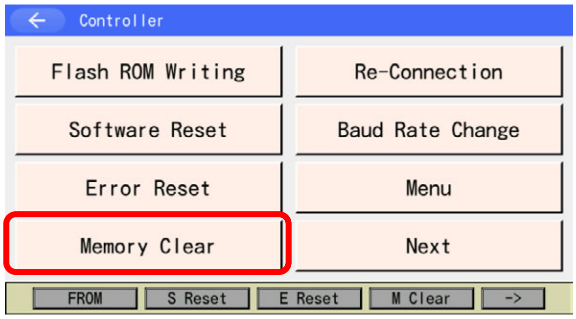
(6A1) "UBM Data Construction Change Error" will be generated if changes are made in I/O Parameter No. 502 "RC Gateway Position Data Definition Max. Axis Number" and 503 "RC Gateway Position Data Definition Position Data Points", and software reset is held after the flash ROM writing.
When the error occurs, 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-03.

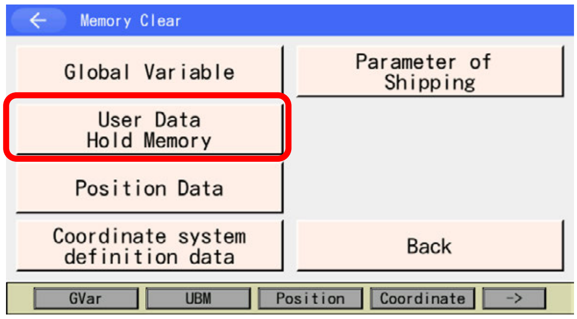
17.3.2 Operation Procedure



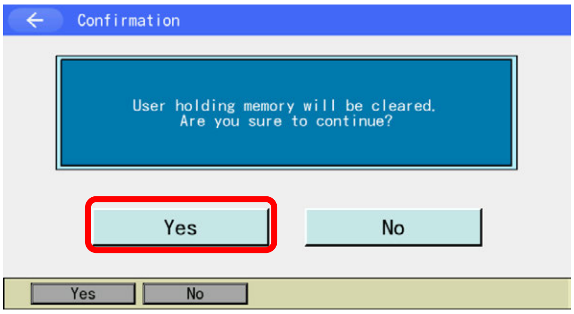
Touch Controller button.



Touch Memory Clear button.

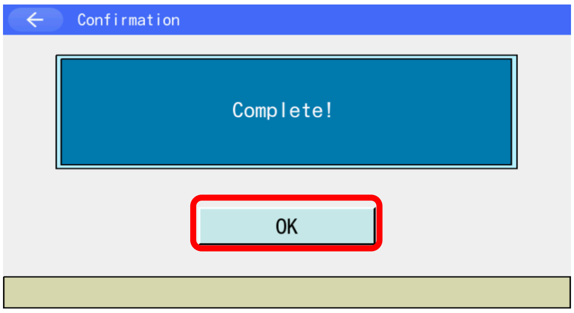


Touch User Data Hold Memory button.



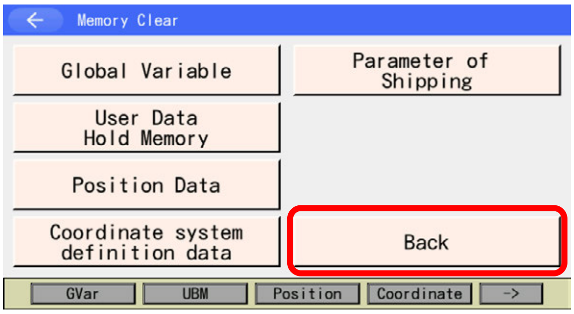
User holding memory will be cleared.
Are you sure to continue?

Touch Yes button.
Touch No button, to return to the memory initialization menu screen.

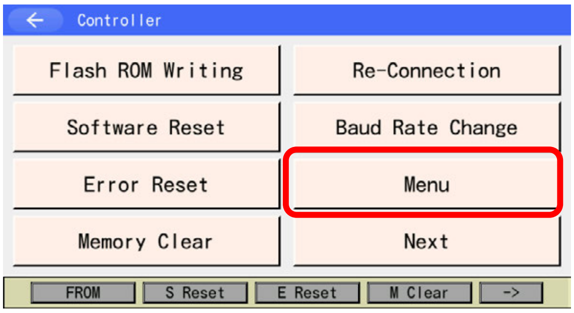


Complete!

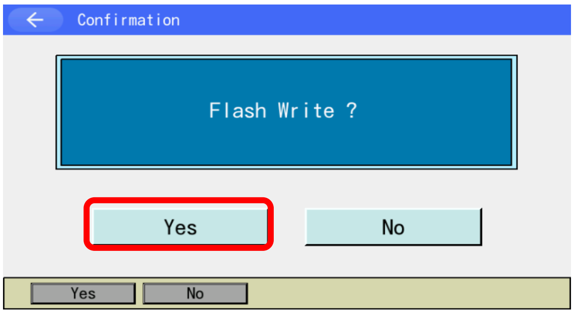
The display shows this screen when the initializing in the user data retaining memory is finished.
Touch OK button, to return to the memory initialization menu screen.



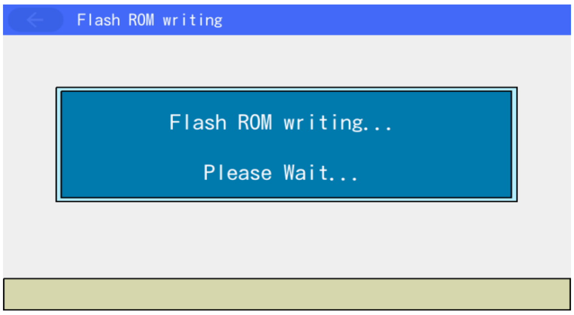
Touch Back button.



Touch Menu button.

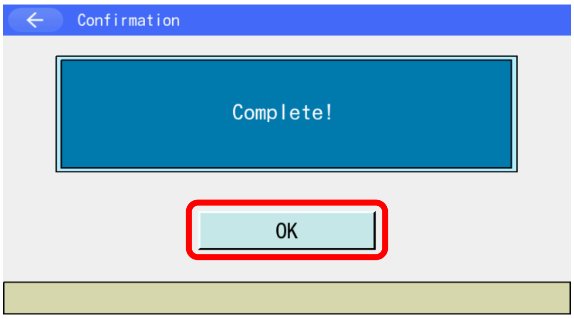


To write the data to the flash ROM, touch Yes button.
When it is not necessary to write the data to the flash ROM, touch No button.



"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

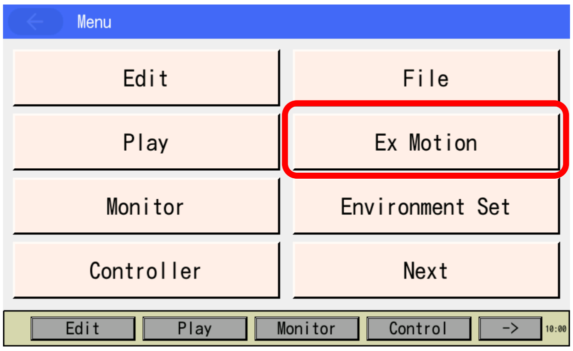
In the case of the XSEL-RA/SA/RAX/SAX/RAXD/SAXD controllers, the following operations are available.

- Extended Motion Control Position Data Editing
- Extended Motion Control Axis Monitoring

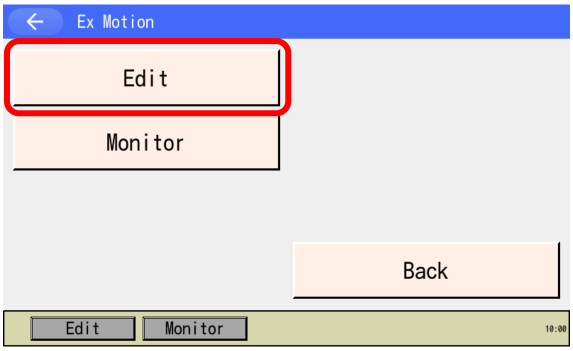
18.1 Extended Motion Control Position Data Editing

18.1.1 Extended Motion Control Position Data Creation

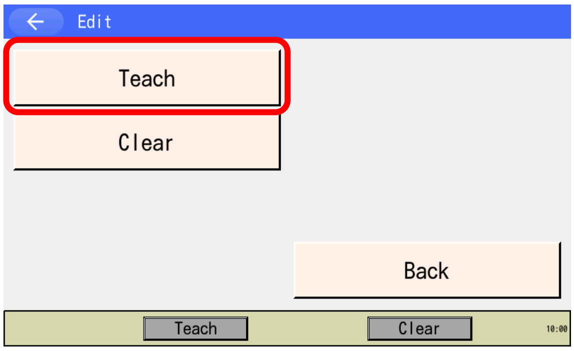
The extended motion control position data is to be edited.



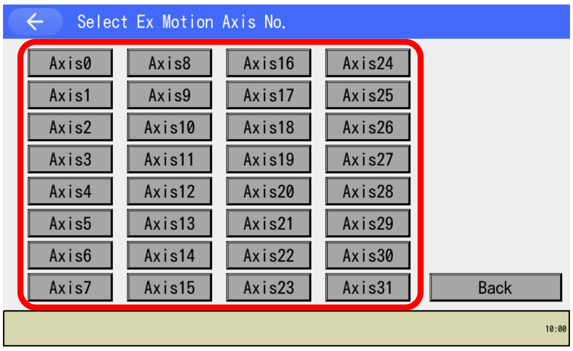
Touch Ex Motion button in the menu screen.



Touch Edit button in the Ex Motion menu screen.

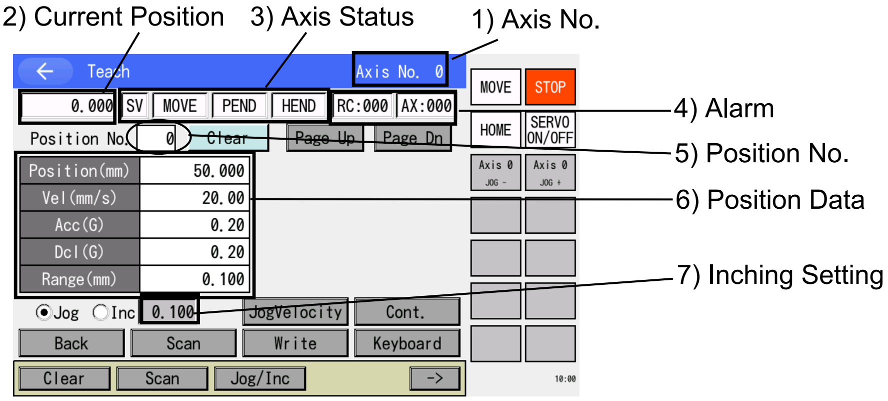


Touch Teach button in the Ex Motion Edit menu screen.



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
   <u>Position (mm)</u>
   The target position for the actuator to be moved is indicated.
   <u>Vel (mm/s)</u>
   The velocity of the actuator in operation is indicated.
   <u>Acc (G)</u>
   The acceleration of the actuator in operation is indicated.
   <u>Dcl (G)</u>
   The deceleration of the actuator in operation is indicated.
   <u>Range (mm)</u>
   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.

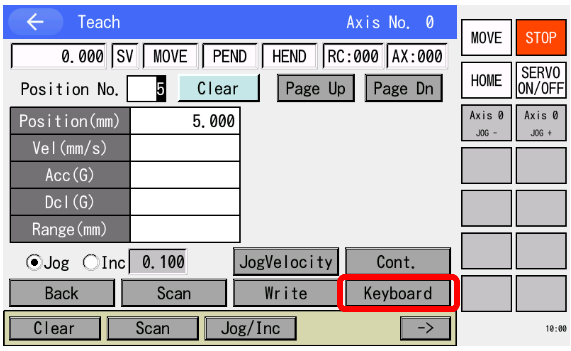
> ⚠ *Caution: At the time when this function is executed, the position data is cleared. Please take care.*

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.

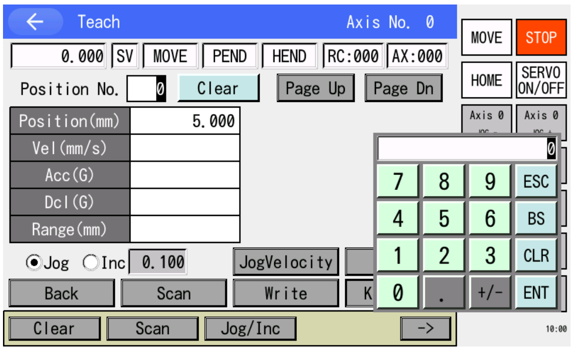
[Addition and Change of Position Data]

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.*



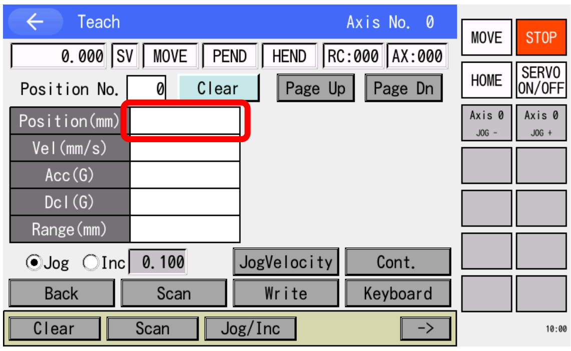
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.



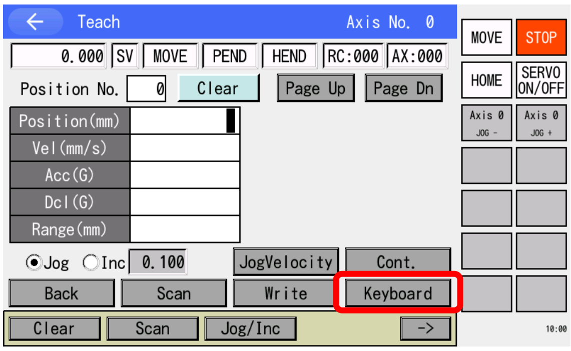
Touch the numerical part when it is desired to input number on the touch panel numeric keys when inputting the position number.
The contents of input will be shown in the box above the touch panel numeric keys.
When confirming the input number, touch ENT.
The touch panel numeric keys close and the data 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.

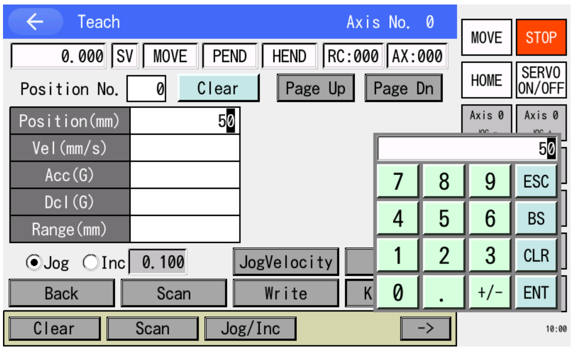
Next, show the cursor to the input part in the item you want to make an input.
To show the cursor, touch on the input part in the item you want to make an input.



When the target position (mm) is to be input, touch the section inside the red frame.

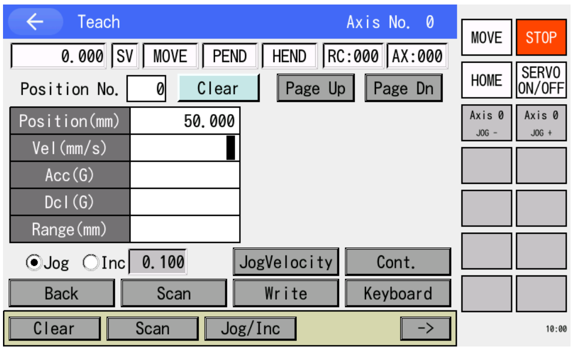


With the cursor shown in the appropriate area, touch Keyboard button to make the touch panel numeric keys appear on the screen to input a number.



Position(mm) 50

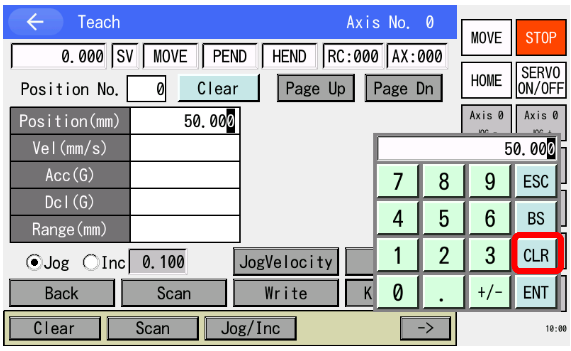
If you want to input 50 to Position (mm), touch Keyboard button to show the touch panel numeric keys, and touch 5 0 ENT on the touch panel numeric keys.



Position(mm) 50.000

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).

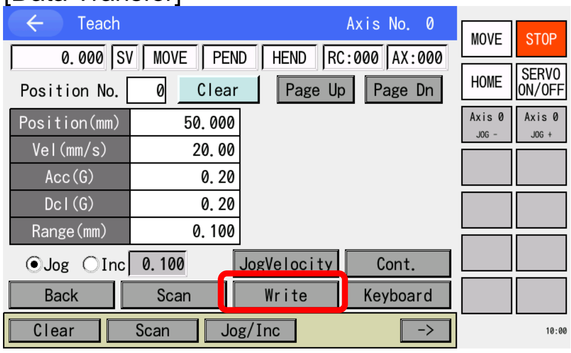
⚠ *Caution: In the TB-03, the input range check is not performed. Confirm the specifications for the axis to be used, input the data.*



Position(mm) 50.000

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.

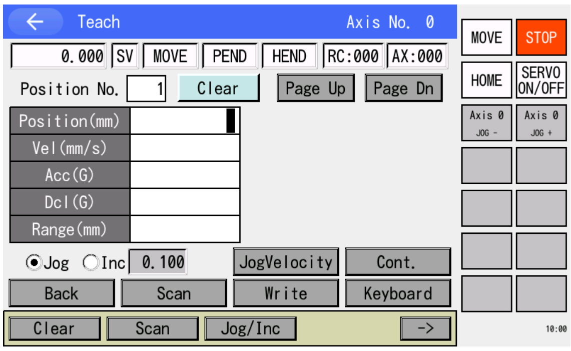
[Data Transfer]



Position No. 0
Position(mm) 50.000
Vel(mm/s) 20.00
Acc(G) 0.20
Dcl(G) 0.20
Range(mm) 0.100
● Jog ○ Inc 0.100

After data input is complete, touch Write button on the touch pane to transfer the data to the controller.

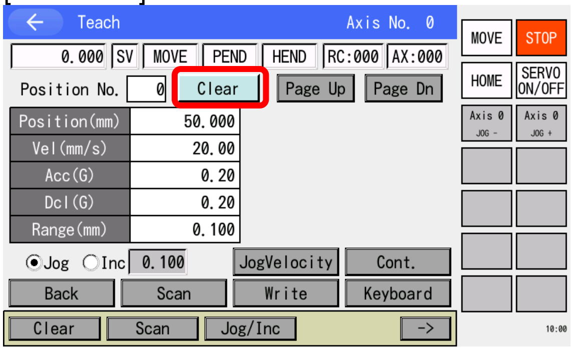
Caution: The input data would not be written to the controller unless the operation above is conducted. When the position No. is changed without performing the above operation, the input data is cleared.



Position No. 1
Position(mm)
Vel(mm/s)
Acc(G)
Dcl(G)
Range(mm)
● Jog ○ Inc 0.100

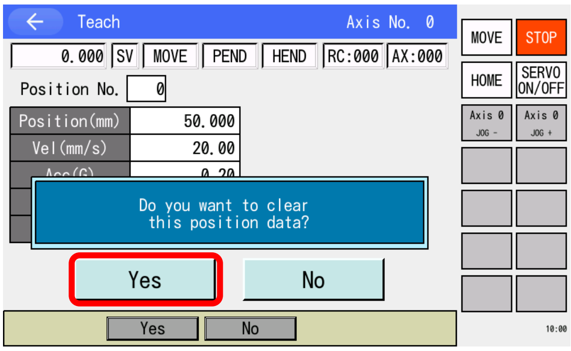
Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

[Data Clear]



Position No. 0
Position(mm) 50.000
Vel(mm/s) 20.00
Acc(G) 0.20
Dcl(G) 0.20
Range(mm) 0.100
● Jog ○ Inc 0.100

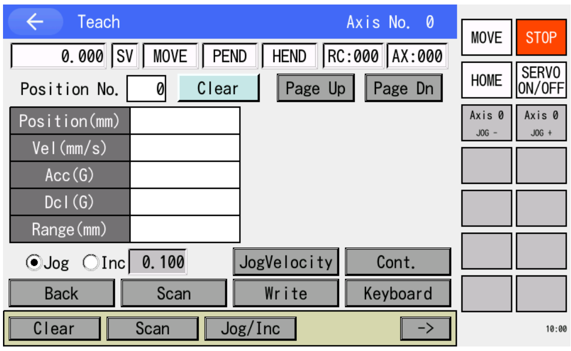
When you want to delete the data in the position number being displayed, touch Clear button in the touch panel.



Position No. 0
Position(mm) 50.000
Vel(mm/s) 20.00
Acc(G) 0.20

Do you want to clear this position data?

Touch Yes button on the touch panel and the data gets transferred to the controller.



0.000

Position No. 0

● Jog ○ Inc 0.100

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.

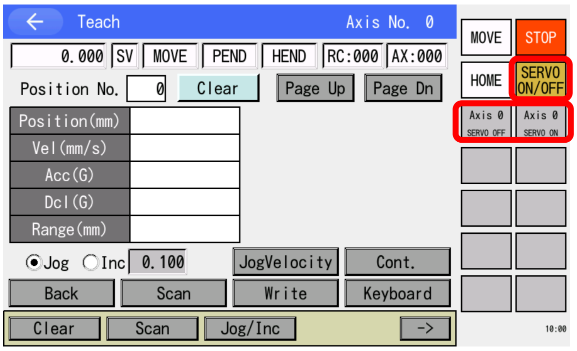
↓

2) Take the data of the current position of the extended motion control axis into the teaching screen.

↓

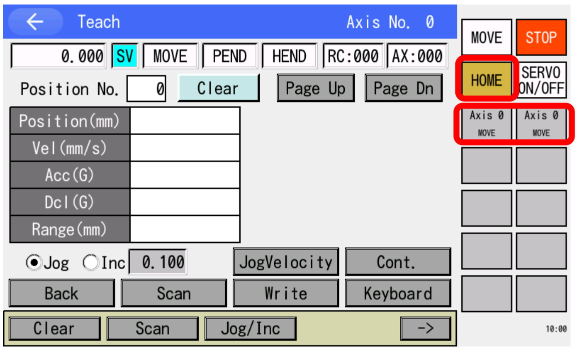
3) Transmit the data to the controller.

(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 Axis 0 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 Axis 0 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.

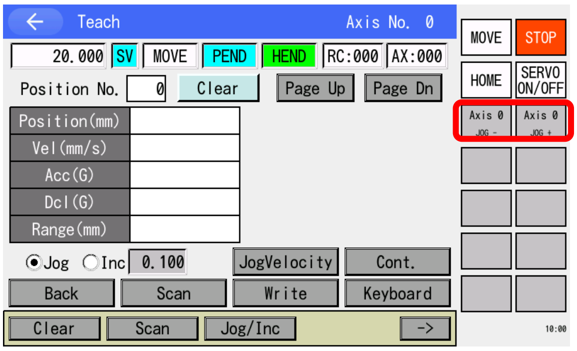
(2) Home Return Operation
In the case of the incremental encoder type extended motion control axis, after the power is turned ON or software is reset, home return operation is required before the teaching operation.
This operation is available only in the single axis.



Turn the servo-motor ON.
Touch HOME button.
After the background color of HOME button has changed, touch the Axis 0 MOVE button to conduct home-return operation.
The axis status display “HEND” turns on when the home-return operation is finished.

(3) Actuator Movement

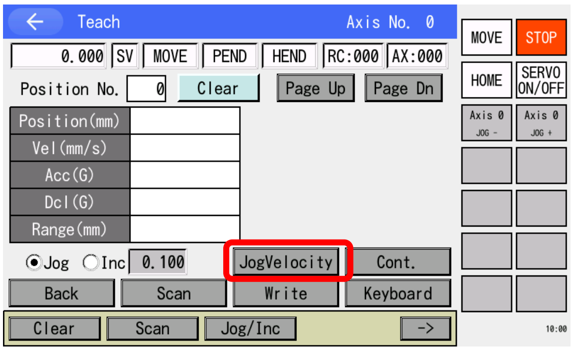
1) Jogging Operation
Perform the jog feeding operation for the extended motion control axis.
This operation is available only in the single axis.



20.000 | RC:000 | AX:000
Position No. 0
● Jog ○ Inc 0.100

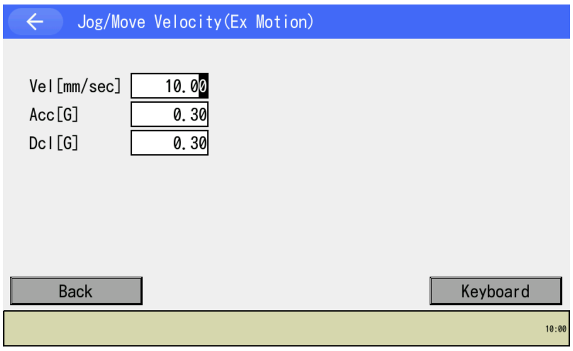
Turn the servo-motor ON.
Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
("+" means the movement to the plus direction on the coordinates and "-" means the movement to the minus direction on the coordinates).

The actuator movement speed, etc., at the time of jog feeding, can be changed using the JogVelocity button.



0.000 | RC:000 | AX:000
Position No. 0
● Jog ○ Inc 0.100

Touch JogVelocity button

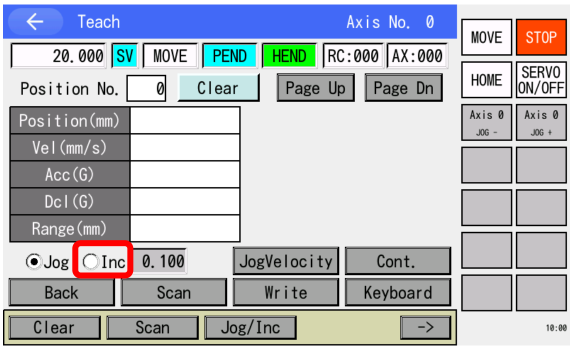


Vel[mm/sec] 10.00
Acc[G] 0.30
Dcl[G] 0.30

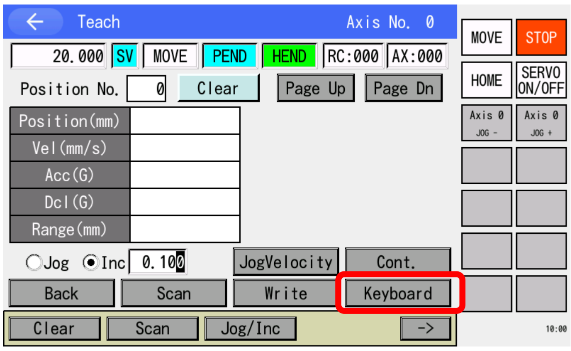
Input the parameters for the Vel (Velocity), Acc (Acceleration) and Dcl (Deceleration) at the time of jog feeding, using the touch panel ten-key pad.
The touch panel ten-key pad is opened by means of touching the Keyboard button.
Touch the Back button to return to the extended motion teaching screen and perform the jog feeding operation.

2) Inching Operation

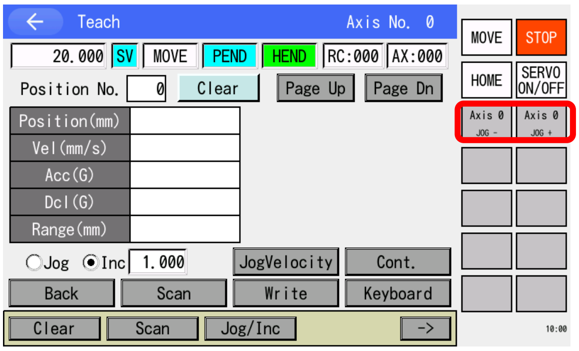
Perform the inching operation for the extended motion control axis.
This operation is available only in the single axis.



Touch Inc button directly to make Inc button selected.

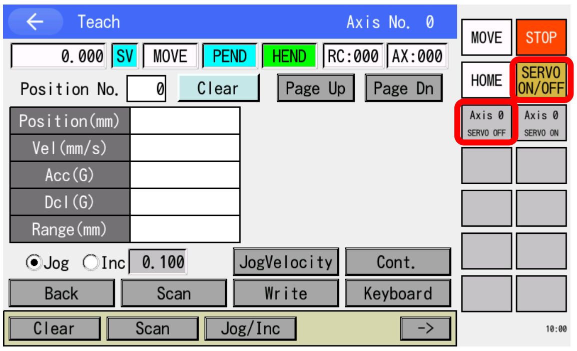


Set the inching distance (travel distance for each touching of the JOG button).
Show the cursor to the input part beside "Inc" and touch Keyboard button to open the touch panel numeric keys to input a value and touch ENT.
The numerical value input range is from 0.00 to 1.00 (Unit: mm).

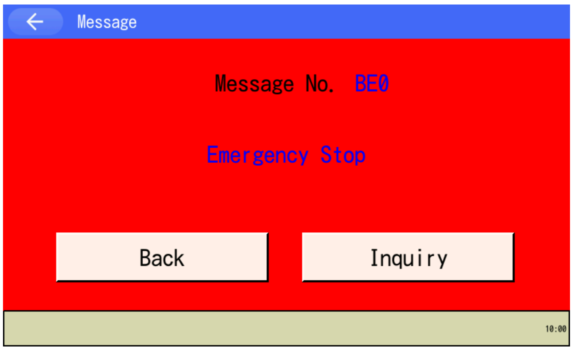


Turn the servo-motor ON.
Touch Axis 0 JOG + or Axis 0 JOG - button to move the actuator to the specific position.
("+" means the movement to the plus direction on the coordinates and "-"means the movement to the minus direction on the coordinates).

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 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.

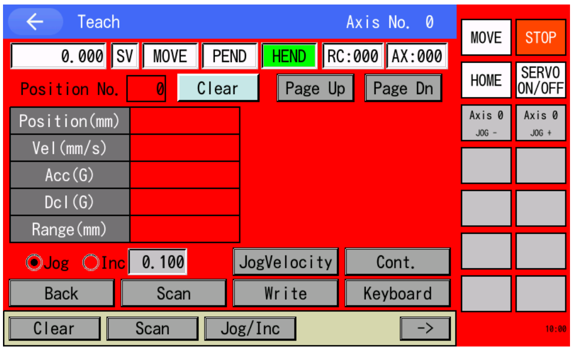


Message No. BE0

Emergency Stop

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

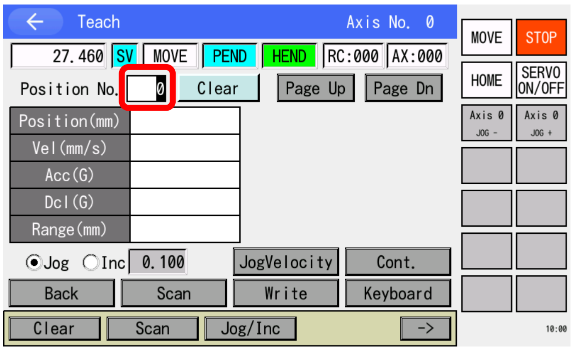
Touch Back button to return to Teaching screen.



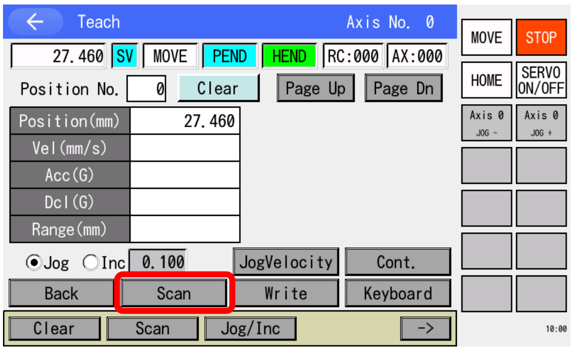
Move the actuator manually to an appropriate position.

⚠ *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.



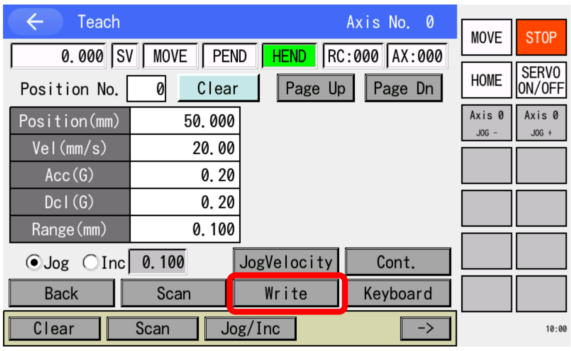
Set the position No. for the import destination.



Touch Scan button to load the current position to the target position from with the data is loaded.

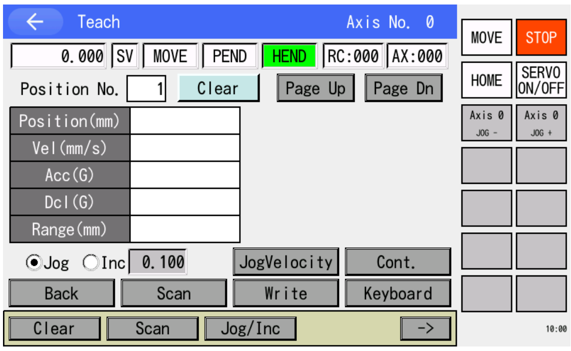
⚠ *Caution:*
- *In order to capture the current position data in the target position data section, the home return operation has to be completed.*
  Execute it after it is confirmed that "HEND" in the axis status display is turned on.
  If it is executed before the home return operation, the [(9E2) Not 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



0.000
Position No. 0
Position(mm) 50.000
Vel(mm/s) 20.00
Acc(G) 0.20
Dcl(G) 0.20
Range(mm) 0.100
● Jog ○ Inc 0.100

After data input is complete, touch Write button on the touch panel keys to transfer the data to the controller.



0.000
Position No. 1
● Jog ○ Inc 0.100

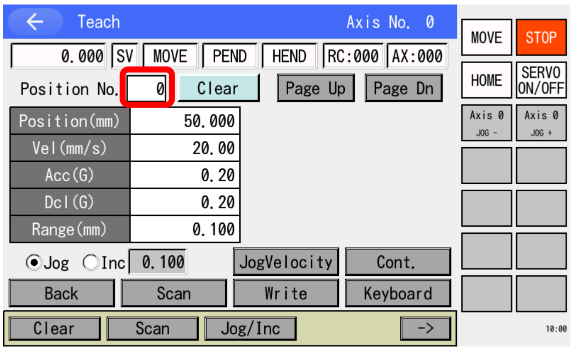
Once the transfer to the controller is complete, the position number gets incremented and the next data input screen is shown.

(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.

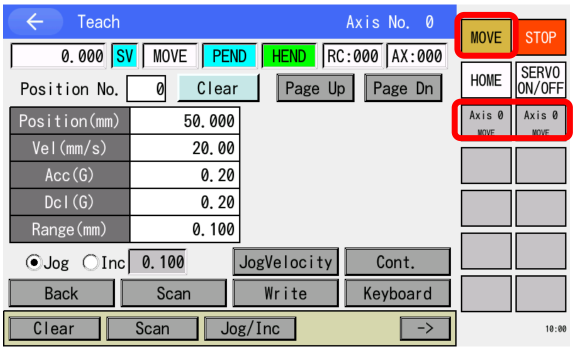
1) Movement

Move the extended motion control axis to the position corresponding to the position data transferred to the controller.



Position(mm)	50.000
Vel(mm/s)	20.00
Acc(G)	0.20
Dcl(G)	0.20
Range(mm)	0.100

Set the position number you want to move to.



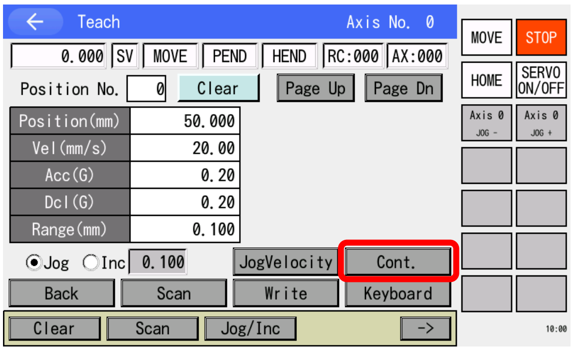
Position(mm)	50.000
Vel(mm/s)	20.00
Acc(G)	0.20
Dcl(G)	0.20
Range(mm)	0.100

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.



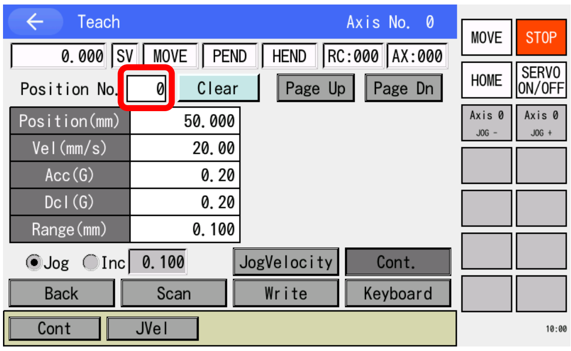
0.000

Position No. 0

Position(mm)	50.000
Vel(mm/s)	20.00
Acc(G)	0.20
Dcl(G)	0.20
Range(mm)	0.100

● Jog ○ Inc 0.100

Touch Cont. button to switch to the continuous operation mode.



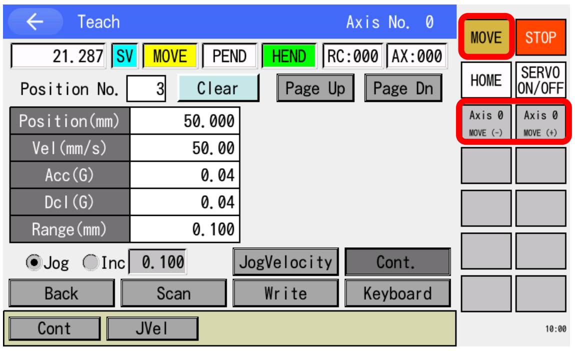
0.000

Position No. 0

Position(mm)	50.000
Vel(mm/s)	20.00
Acc(G)	0.20
Dcl(G)	0.20
Range(mm)	0.100

● Jog ○ Inc 0.100

Set the position number you want to move to first.



21.287

Position No. 3

Position(mm)	50.000
Vel(mm/s)	50.00
Acc(G)	0.04
Dcl(G)	0.04
Range(mm)	0.100

● Jog ○ Inc 0.100

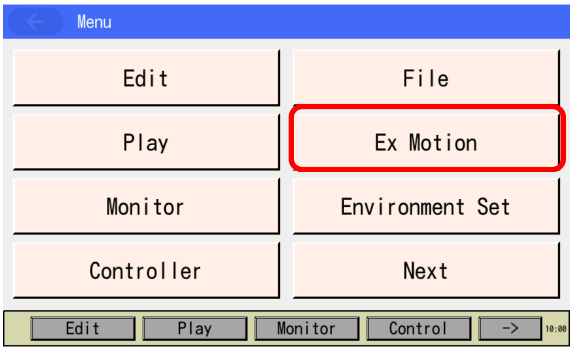
Touch MOVE button.
Perform the home return operation.

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)

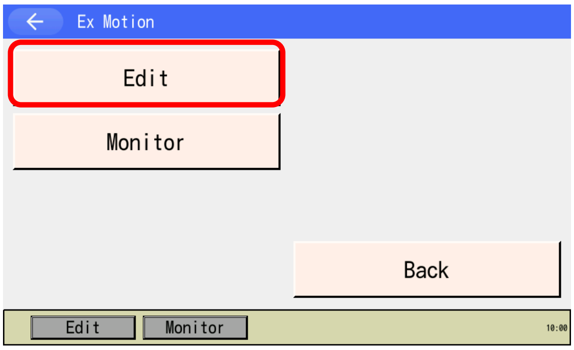
⚠ Caution: *Be careful as it may take a few seconds before start moving after touching the Axis 0 MOVE (+) or Axis 0 MOVE (-) button. (The time interval for movement start varies depending on the number of registered position data items).*

18.1.3 Extended Motion Control Axis Position Data Deletion

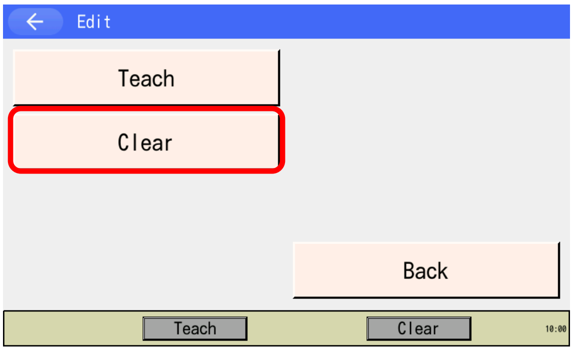
Delete the position data within the designated range.



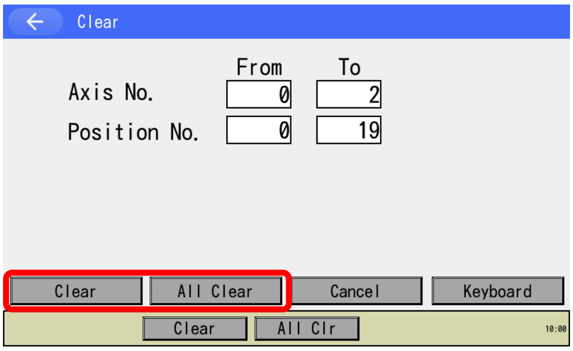
Touch Ex Motion button in the menu screen.



Touch Edit button.



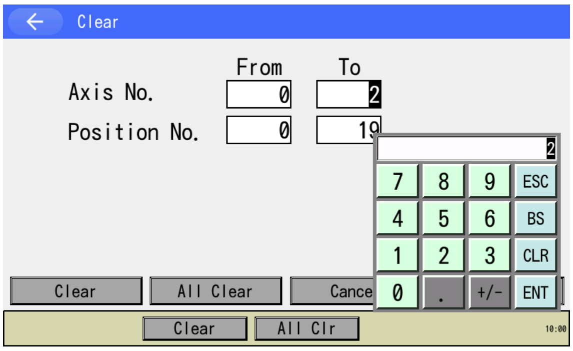
Touch Clear button.



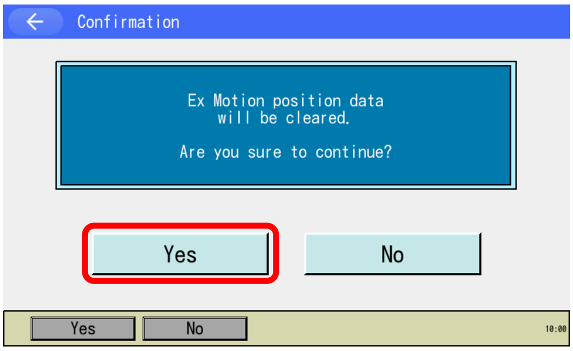
	From	To
Axis No.	0	2
Position No.	0	19

Clear | All Clear

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.



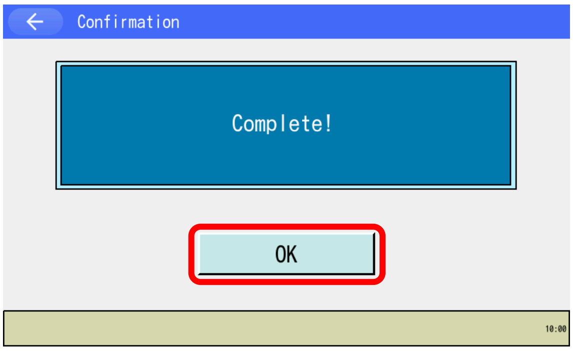
If you touch in the input area on "Axis No." or "Position No.", the cursor will be shown on the touched item.
Input the position number by displaying the numeric keys on the touch panel by touching Keyboard button.
Touch on the numeric part if you want to input on the touch panel numeric keys. The contents 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.



Ex Motion position data
will be cleared.

Are you sure to continue?

Touch Yes button.
When the No button is touched, the Extended Motion Control Position Data Clear Screen is returned.

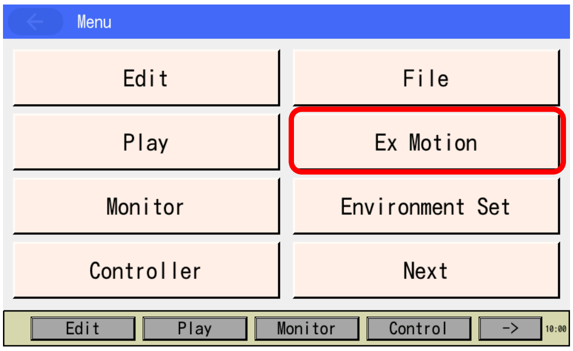


Complete!

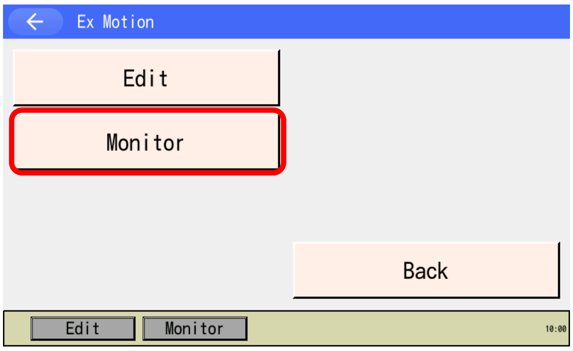
The display shows this screen when the position clear is finished.
When the OK button is touched, the Extended Motion Control Position Data Clear Screen is returned.

18.2 Extended Motion Control Axis Monitoring

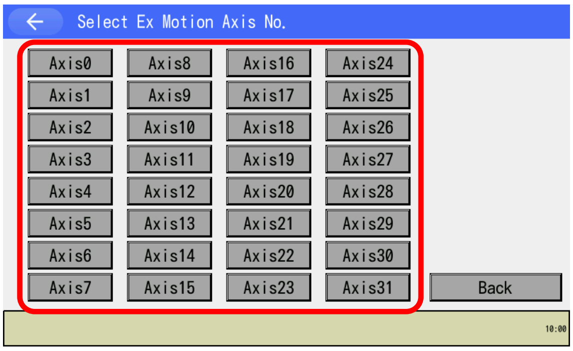
The extended motion control axis's status, current position and alarm code are displayed.



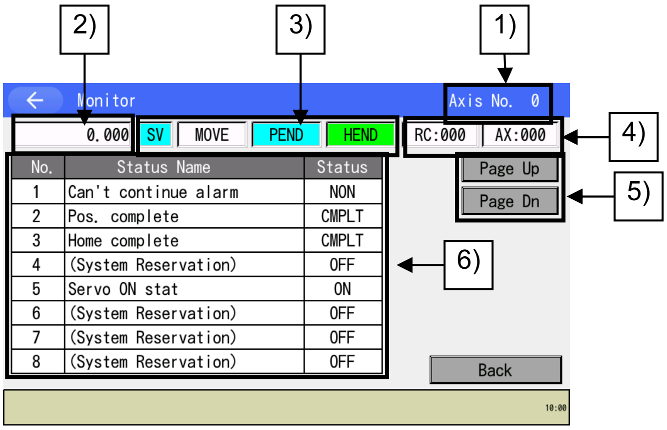
Touch Ex Motion button in the menu screen.



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.



No.	Status Name	Status
1	Can't continue alarm	NON
2	Pos. complete	CMPLT
3	Home complete	CMPLT
4	(System Reservation)	OFF
5	Servo ON stat	ON
6	(System Reservation)	OFF
7	(System Reservation)	OFF
8	(System Reservation)	OFF

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.

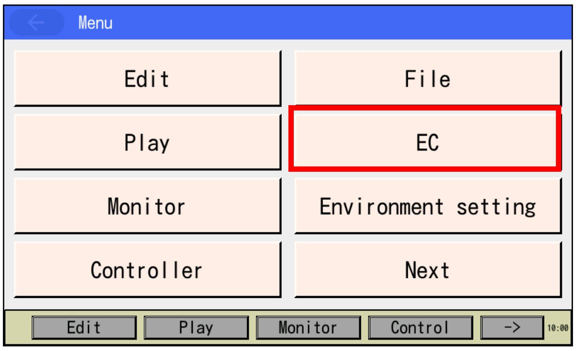
⚠ *Caution:* When *the user data hold memory is initialized, all the extended motion control axis position data items are cleared.*
Backup the extended motion control axis position data items using the personal computer (PC) application software for XSEL or TB-03.

18.3.2 Operation Procedure

For the operation procedure, refer to [17.3.2 Operation Procedure].

19. ELECYLINDER, ROBO PUMP Operation Function

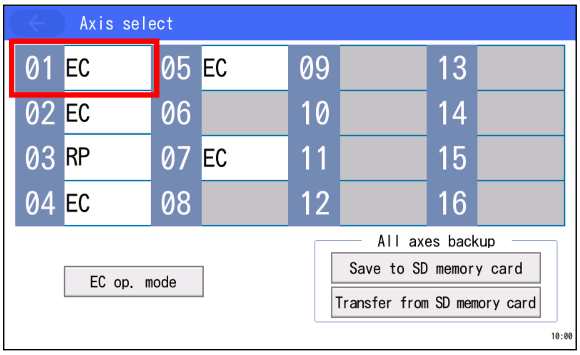
When the EC Interface (RCON-EC or ELECYLINDER connection module board) (hereinafter described as “EC Interface”) is connected to the RSEL or XSEL2-T/TX controller, it should be available to indicate an axis on ELECYLINDER or ROBO PUMP and to operate, show data, change settings and so on.
The EC button should not be shown if EC Interface is not activated.



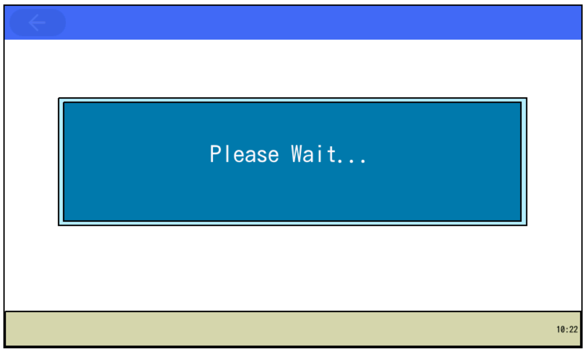
Touch the EC button in the main menu window and the screen goes to the axis select window.

19.1 Changing Operating Axis

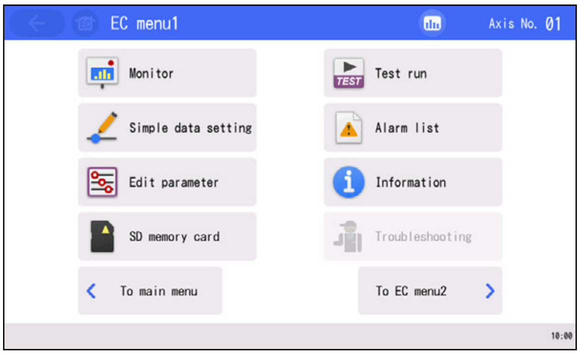
The axis select window should appear by touching the EC button in the main menu window or touching the Change operating axis button in EC menu 2 window.



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.)



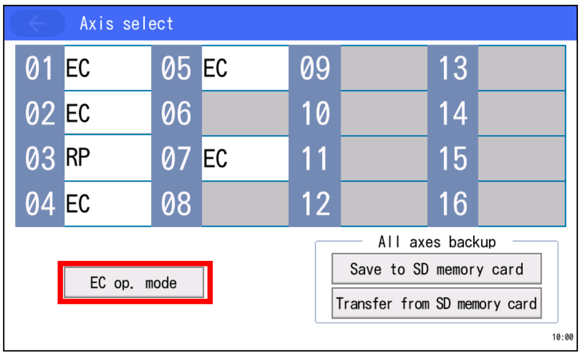
Acquirement of data for the selected ELECYLINDER or ROBO PUMP should start.



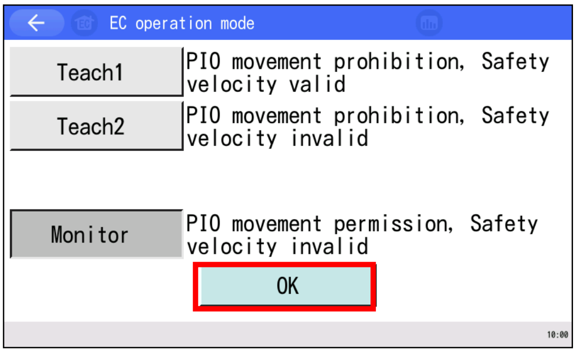
Once the data acquiring process for the ELECYLINDER or ROBO PUMP is complete, EC menu 1 window should show up.

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.


EC operation mode
Teach1
PIO movement prohibition, Safety velocity valid
Teach2
PIO movement prohibition, Safety velocity invalid
Monitor
PIO movement permission, Safety velocity invalid
OK
10:00

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.

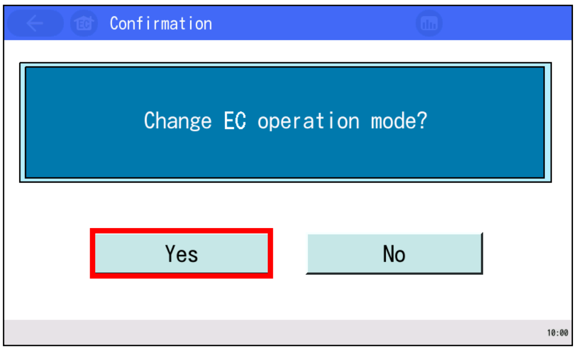
(Note) As there is no safety velocity equipped in ROBO PUMP, the safety velocity should not activate.

- 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.

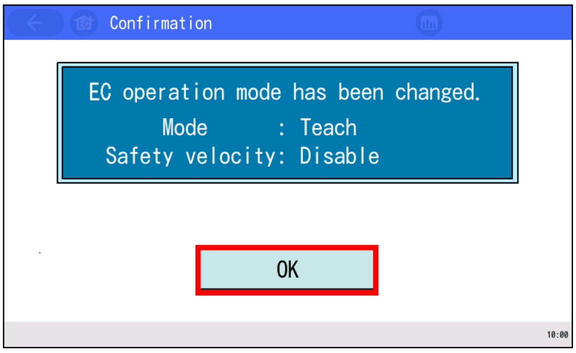
- Monitor (PIO movement permission / Safety velocity invalid)

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.



Change EC operation mode?

Touch Yes button in the confirmation window.

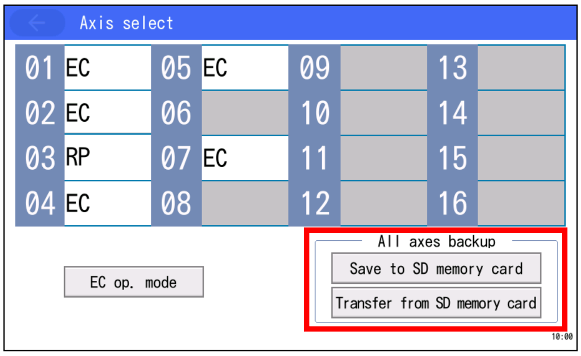


EC operation mode has been changed.
Mode : Teach
Safety velocity: Disable

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.*

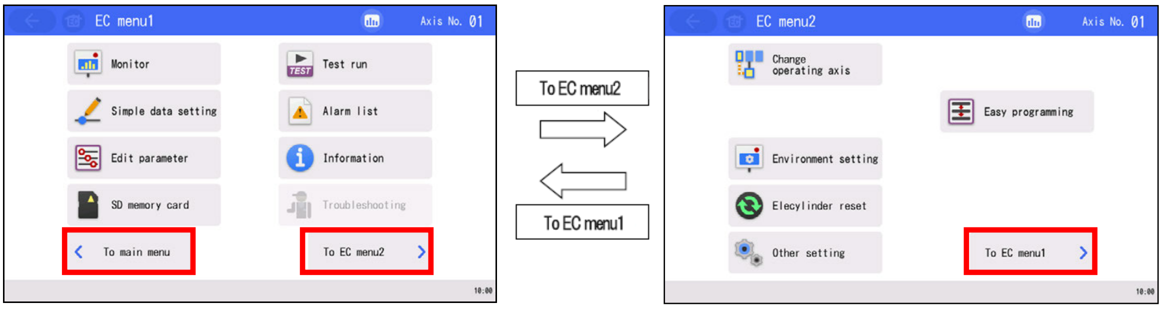
19.1.2 Backup for All Axis



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].)

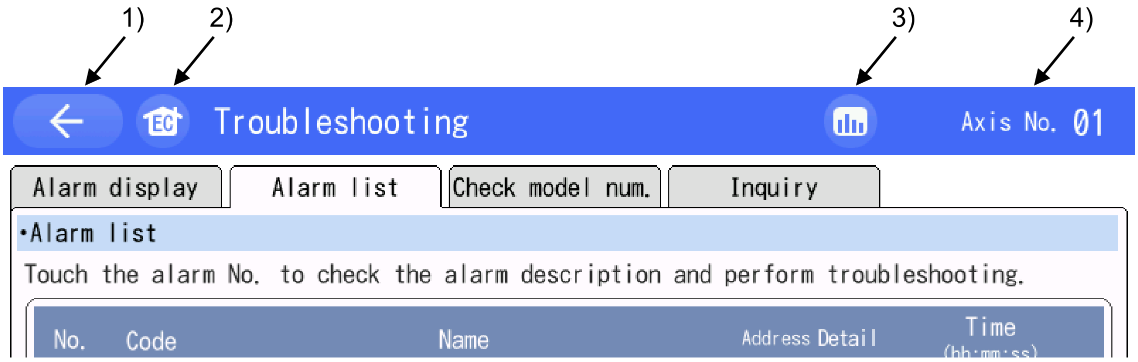
[EC menu 1]

• 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]



Touch the alarm No. to check the alarm description and perform troubleshooting.

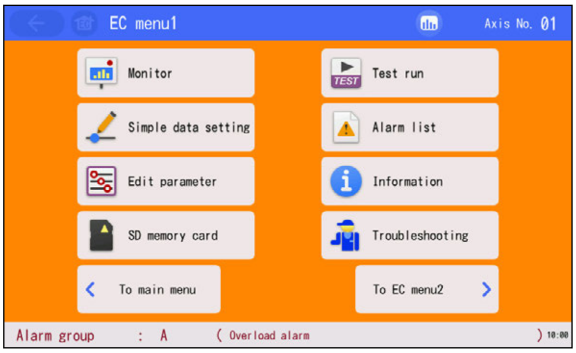
1) ← Return Button : Returns to Previous window

2) EC 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]

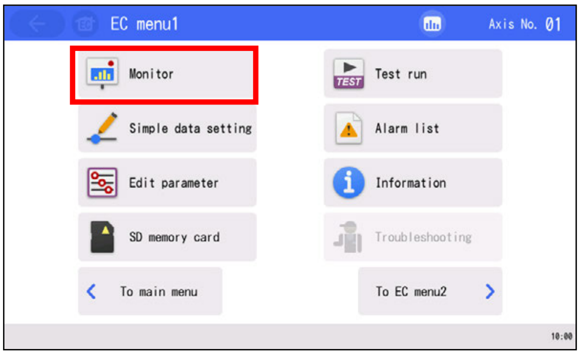


Alarm group : A (Overload alarm) 10:00

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.

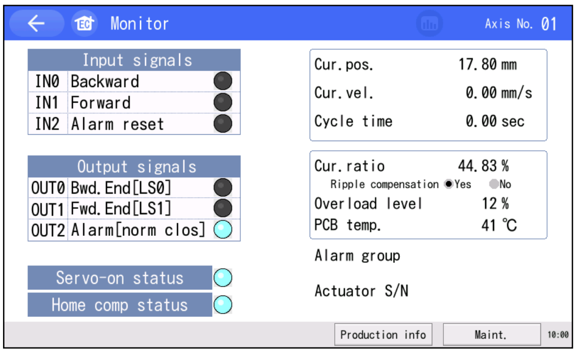
19.3 Monitor

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



Input signals		
IN0	Backward	●
IN1	Forward	●
IN2	Alarm reset	●

Output signals		
OUT0	Bwd. End[LS0]	●
OUT1	Fwd. End[LS1]	●
OUT2	Alarm[norm clos]	○

Servo-on status ○
Home comp status ○

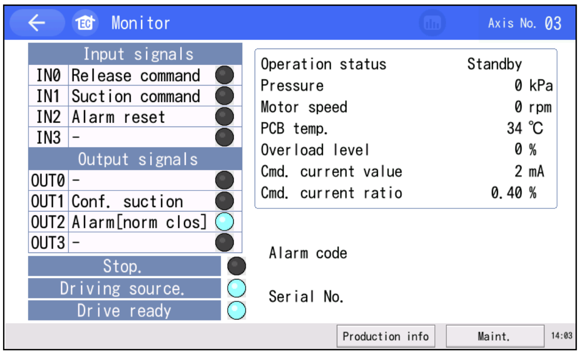
Cur. pos. 17.80 mm
Cur. vel. 0.00 mm/s
Cycle time 0.00 sec

Cur. ratio 44.83 %
Ripple compensation ● Yes ○ No
Overload level 12 %
PCB temp. 41 ℃

Alarm group

Actuator S/N

Monitoring Window for ELECYLINDER
Refer to [19.3.1 Monitor Window (ELECYLINDER)]



Input signals		
IN0	Release command	●
IN1	Suction command	●
IN2	Alarm reset	●
IN3	-	●

Output signals		
OUT0	-	●
OUT1	Conf. suction	●
OUT2	Alarm[norm clos]	○
OUT3	-	●

Stop. ●
Driving source. ○
Drive ready ○

Operation status Standby
Pressure 0 kPa
Motor speed 0 rpm
PCB temp. 34 ℃
Overload level 0 %
Cmd. current value 2 mA
Cmd. current ratio 0.40 %

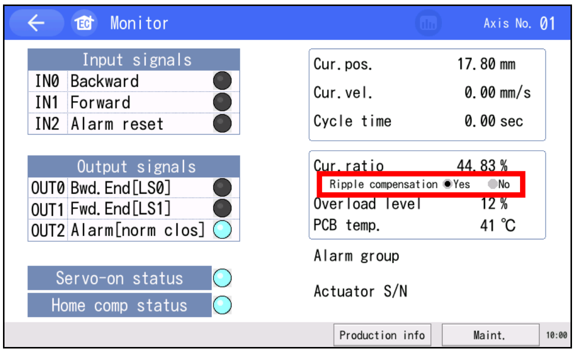
Alarm code

Serial No.

Monitoring Window for ROBO PUMP
Refer to [19.3.2 Monitor Window (ELECYLINDER)]

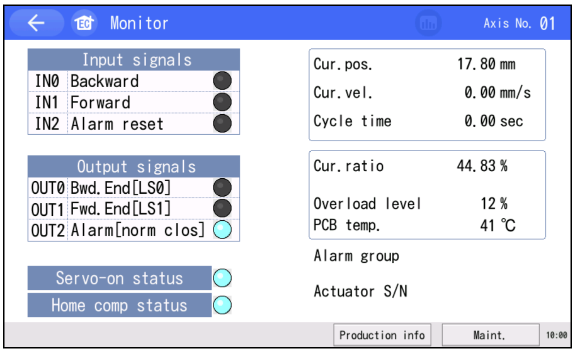
19.3.1 Monitor Window (ELECYLINDER)

(Applicable for Ripple Compensation)



Cur. pos. 17. 80 mm
Cur. vel. 0. 00 mm/s
Cycle time 0. 00 sec
Cur. ratio 44. 83 %
Ripple compensation ● Yes ○ No
Overload level 12 %
PCB temp. 41 ℃

(Not Applicable for Ripple Compensation)



Cur. pos. 17. 80 mm
Cur. vel. 0. 00 mm/s
Cycle time 0. 00 sec
Cur. ratio 44. 83 %
Overload level 12 %
PCB temp. 41 ℃

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)]

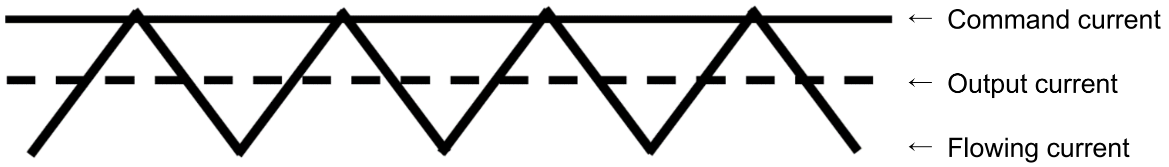
[Displayed Items]

• 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. ON is lit. OFF is unlit.
• 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.

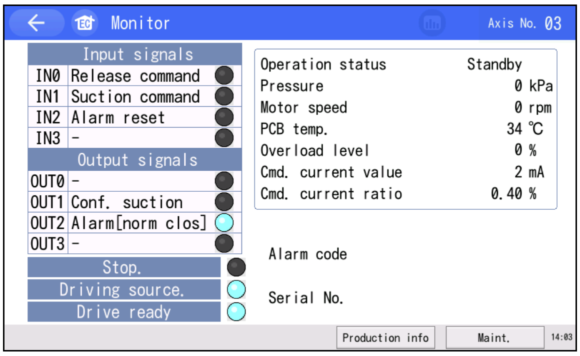
Note 1 *The selection of the ripple compensation should only be displayed in ELECYLINDER with its version V0006 or later. For those models with no selections, calculations should be performed in command current (Note 2).*

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)



Operation status Standby
Pressure 0 kPa
Motor speed 0 rpm
PCB temp. 34 ℃
Overload level 0 %
Cmd. current value 2 mA
Cmd. current ratio 0.40 %
Alarm code
Serial No.

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

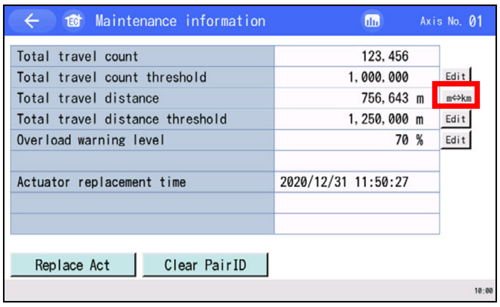
19.3.3.1 Maintenance Information Window (ELECYLINDER)

[1] Total travel count and total travel distance

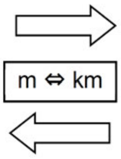
A warning should get output when the total travel count or total travel distance has exceeded each setting.

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)

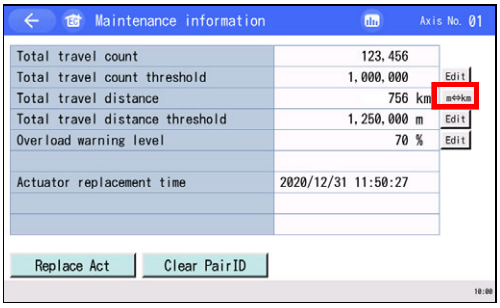
(Display in m for distance)



Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	756,643 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27



(Display in km for distance)



Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	756 km
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

[Contents of Display]

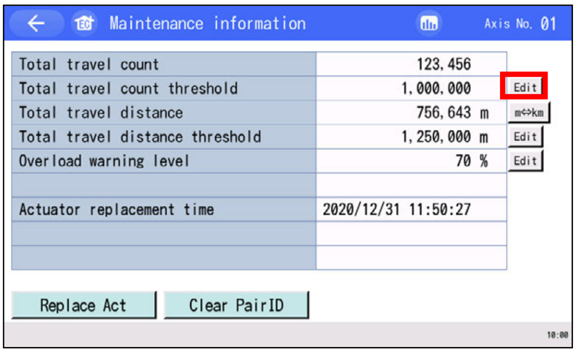
• Total travel count	The cumulative total number of actuator movements is shown.
• Total travel distance	The cumulative total distance travelled by the actuator is shown.

(Rotary type: Travel count for round trip between 0 and 180deg
(To be figured out from total drive distance))

[Items of Setting]

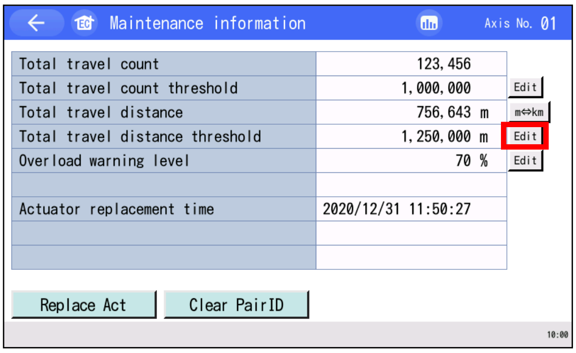
• Total travel count threshold	Set the total travel count to output a warning.
• Total travel distance threshold	Set the total travel distance to output a warning.

(Rotary type: setting of travel count for round trip between 0 and 180deg)



Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	756,643 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

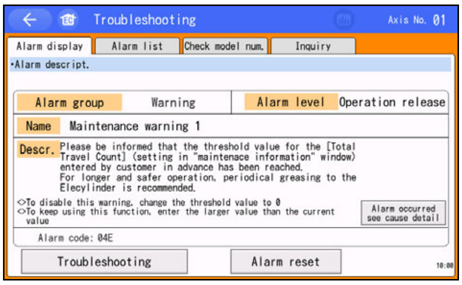
Touch Edit button on the right of Total travel count threshold to change the setting for the total travel count threshold.



Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	756,643 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

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


Troubleshooting Axis No. 01

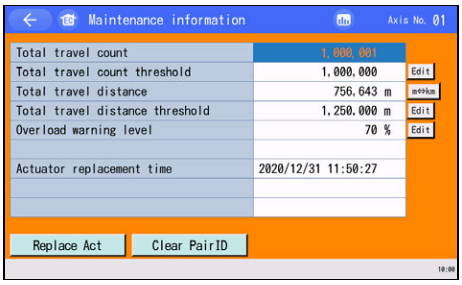
•Alarm descript.

Alarm group	Warning	Alarm level	Operation release
Name	Maintenance warning 1		

Descr. Please be informed that the threshold value for the [Total Travel Count] (setting in "maintenace information" window) entered by customer in advance has been reached.
For longer and safer operation, periodical greasing to the Elecylinder is recommended.

◇To disable this warning, change the threshold value to 0
◇To keep using this function, enter the larger value than the current value

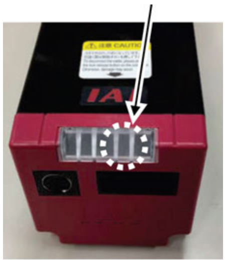
Alarm code: 04E


Maintenance information Axis No. 01

Total travel count	1,000,001
Total travel count threshold	1,000,000
Total travel distance	756,643 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

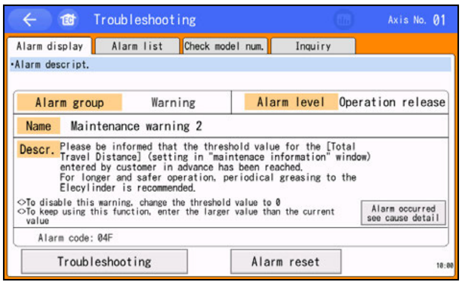
You will be notified in Maintenance warning 1 window.
The number in total travel count blinks in maintenance information window.

●/● 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


Troubleshooting Axis No. 01

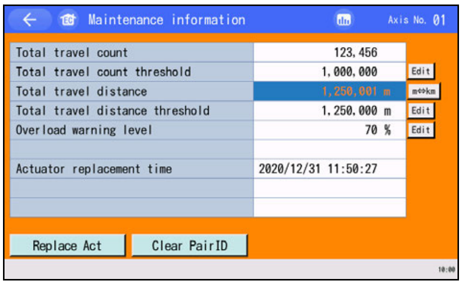
•Alarm descript.

Alarm group	Warning	Alarm level	Operation release
Name	Maintenance warning 2		

Descr. Please be informed that the threshold value for the [Total Travel Distance] (setting in "maintenace information" window) entered by customer in advance has been reached.
For longer and safer operation, periodical greasing to the Elecylinder is recommended.

◇To disable this warning, change the threshold value to 0
◇To keep using this function, enter the larger value than the current value

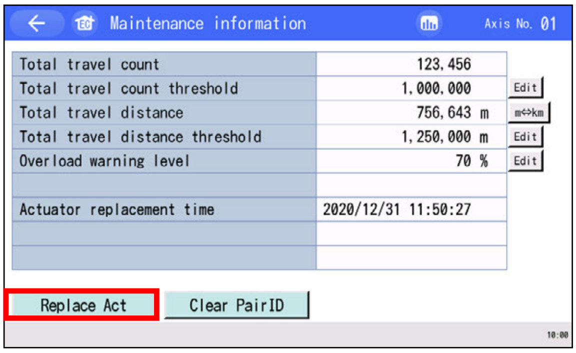
Alarm code: 04F


Maintenance information Axis No. 01

Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	1,250,001 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

You will be notified in Maintenance warning 2 window.
The number in total travel distance blinks in maintenance information window.

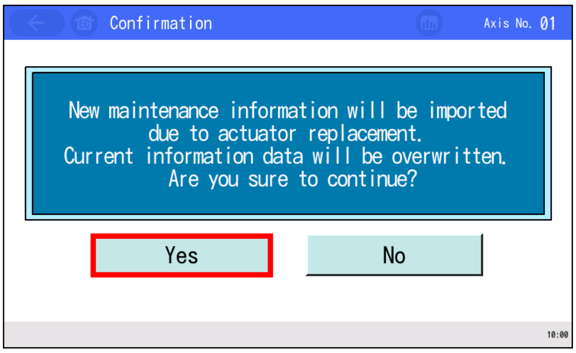
[Resetting Total travel count and Total travel distance]


Maintenance information Axis No. 01

Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	756,643 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

Touch Replace Act button to display the password entry window.

Input '5119' and touch ENT button.

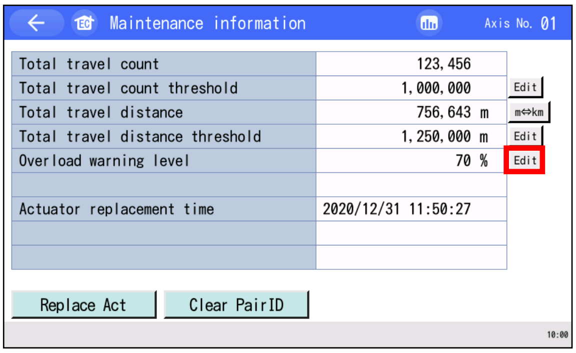

Confirmation Axis No. 01

New maintenance information will be imported due to actuator replacement.
Current information data will be overwritten.
Are you sure to continue?

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.



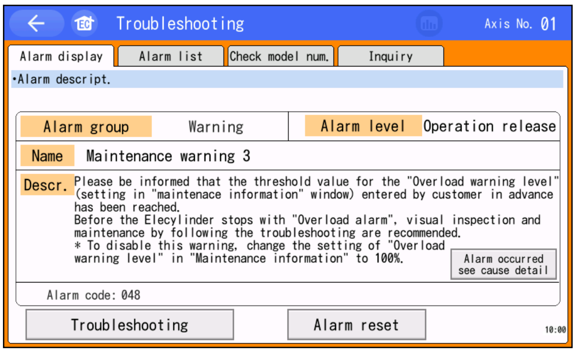
Total travel count	123,456
Total travel count threshold	1,000,000
Total travel distance	756,643 m
Total travel distance threshold	1,250,000 m
Overload warning level	70 %
Actuator replacement time	2020/12/31 11:50:27

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



•Alarm descript.

Alarm group: Warning

Alarm level: Operation release

Name: Maintenance warning 3

Descr. Please be informed that the threshold value for the "Overload warning level" (setting in "maintenace information" window) entered by customer in advance has been reached.
Before the Elecylinder stops with "Overload alarm", visual inspection and maintenance by following the troubleshooting are recommended.
＊ To disable this warning, change the setting of "Overload warning level" in "Maintenance information" to 100%.

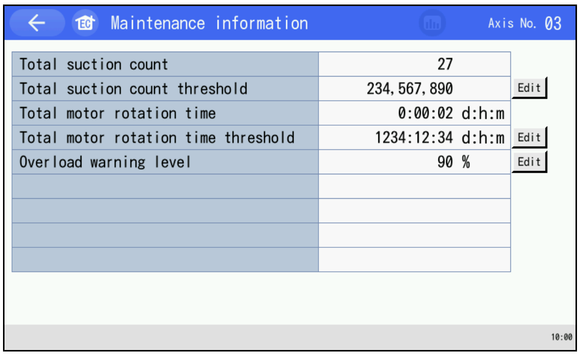
Alarm code: 048

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.



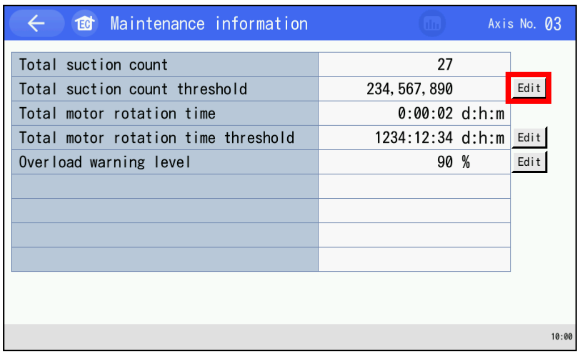
Total suction count	27	
Total suction count threshold	234,567,890	Edit
Total motor rotation time	0:00:02 d:h:m	
Total motor rotation time threshold	1234:12:34 d:h:m	Edit
Overload warning level	90 %	Edit

[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.

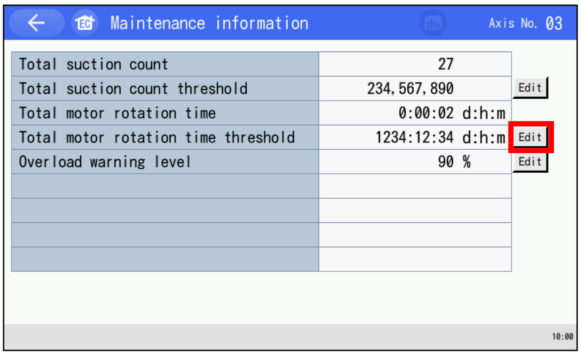
[Items of Setting]

• 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.



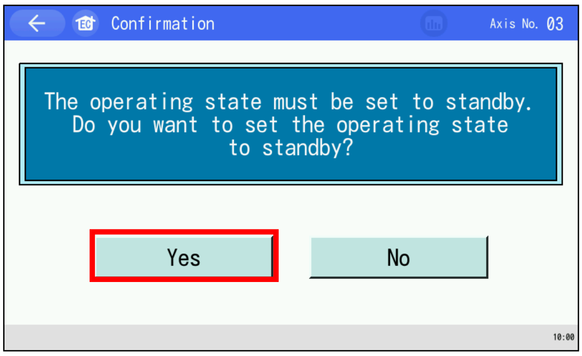
Total suction count	27	
Total suction count threshold	234,567,890	Edit
Total motor rotation time	0:00:02 d:h:m	
Total motor rotation time threshold	1234:12:34 d:h:m	Edit
Overload warning level	90 %	Edit

Touch Edit button on the right of total suction count threshold to change the setting for the total suction count threshold.



Total suction count	27	
Total suction count threshold	234,567,890	Edit
Total motor rotation time	0:00:02 d:h:m	
Total motor rotation time threshold	1234:12:34 d:h:m	Edit
Overload warning level	90 %	Edit

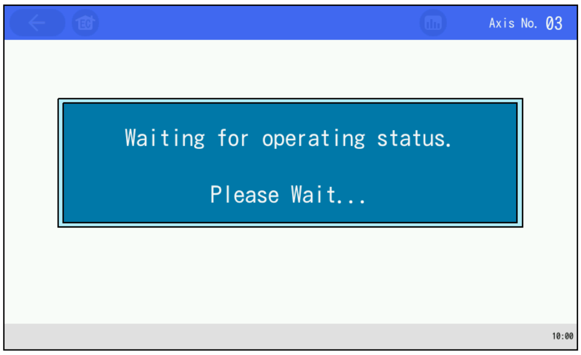
Touch Edit button on the right of total motor rotation time threshold to change the setting for the total motor rotation time threshold.



The operating state must be set to standby.
Do you want to set the operating state to standby?

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.

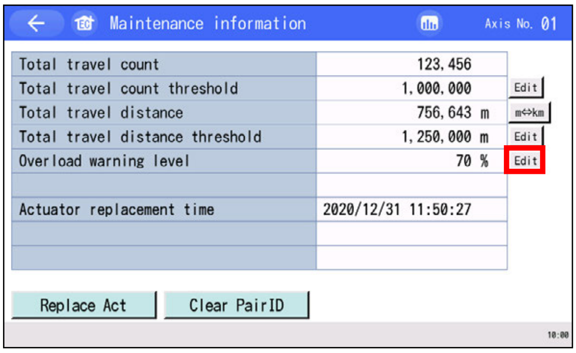


Waiting for operating status.

Please 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.



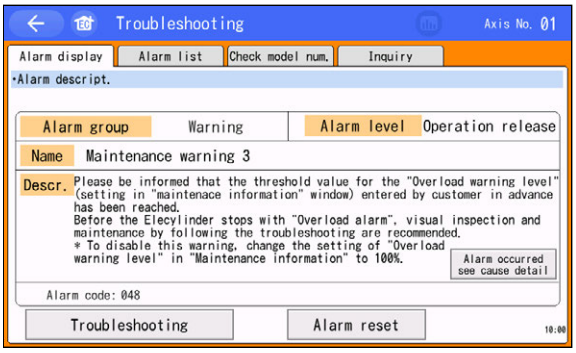
Total travel count	123,456	
Total travel count threshold	1,000,000	Edit
Total travel distance	756,643 m	m⇔km
Total travel distance threshold	1,250,000 m	Edit
Overload warning level	70 %	Edit
Actuator replacement time	2020/12/31 11:50:27	

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



•Alarm descript.

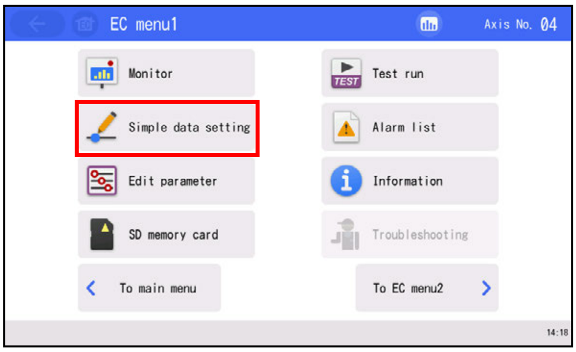
Alarm group: Warning
Alarm level: Operation release
Name: Maintenance warning 3
Descr.: Please be informed that the threshold value for the "Overload warning level" (setting in "maintenace information" window) entered by customer in advance has been reached.
Before the Elecylinder stops with "Overload alarm", visual inspection and maintenance by following the troubleshooting are recommended.
* To disable this warning, change the setting of "Overload warning level" in "Maintenance information" to 100%.

Alarm code: 048

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)

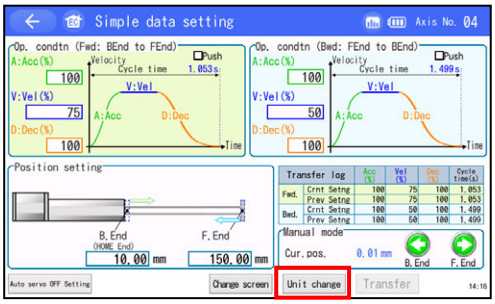
Setting and editing of data related to operation such as forward end, backward end, velocity (V), acceleration (A), deceleration (D) and pressing setting can be performed. Also, JOG operation can be performed.

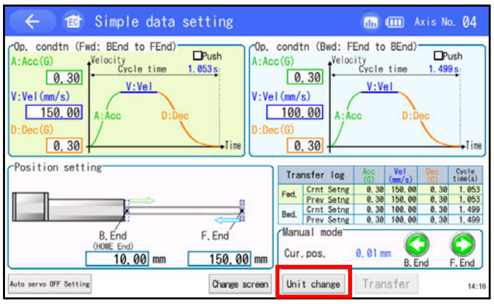


Touch [Simple data setting] on the Menu 1 screen.

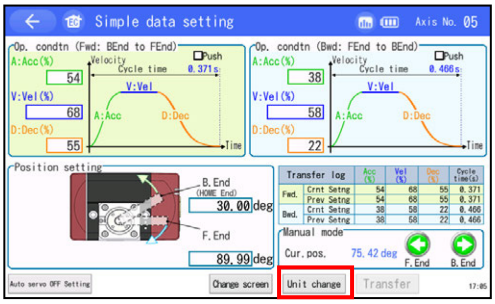
The simple data setting window appears.
Unit change button switches the unit between % and mm/s [deg/s] for velocity, % and G for acceleration / deceleration and % and N [N·m] for pressing force.

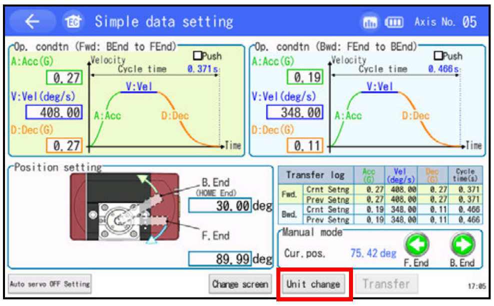
Simple Data Setting window (Positioning Operation) Refer to [19.4.1 Positioning Operation]



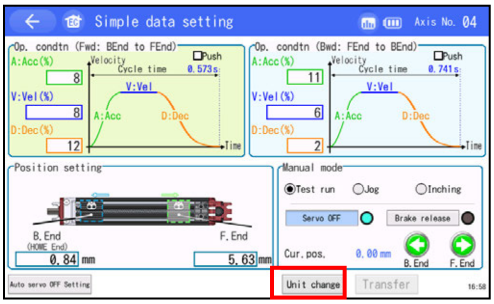


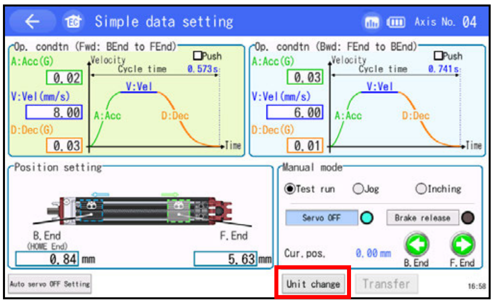
Unit Change





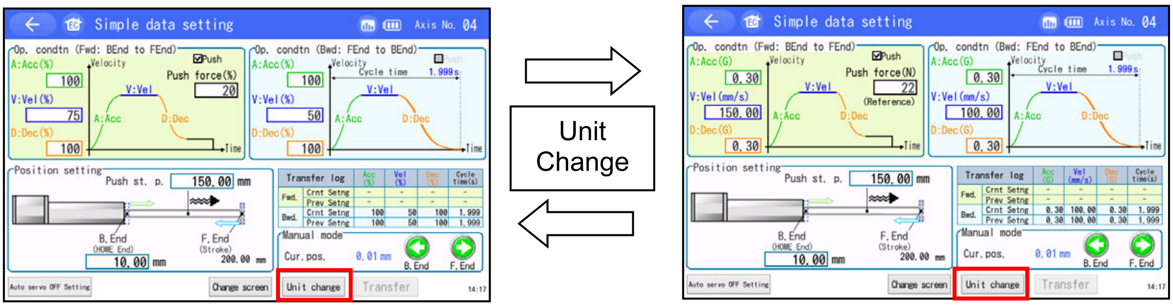
Unit Change





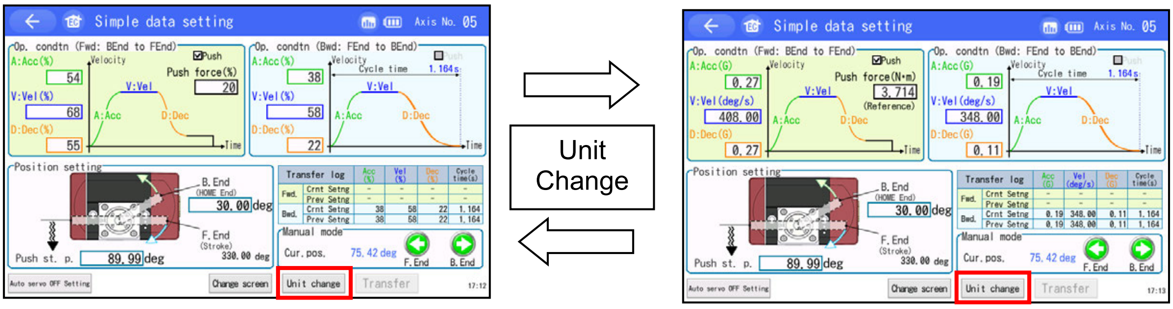
Unit Change

Simple Data Setting window (Pressing Operation) Refer to [19.4.2 Pressing Operation]



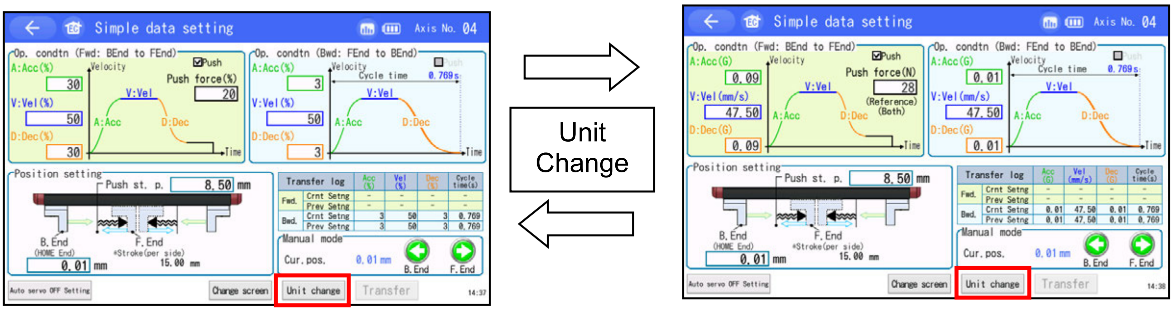
Axis No. 04 — Fwd: A:Acc(%) 100, V:Vel(%) 75, D:Dec(%) 100, ☑Push, Push force(%) 20; Bwd: A:Acc(%) 100, V:Vel(%) 50, D:Dec(%) 100, Cycle time 1.999s; Push st. p. 150.00 mm; B.End (HOME End) 10.00 mm; F.End (Stroke) 200.00 mm; Bwd. Crnt Setng 100 50 100 1.999, Prev Setng 100 50 100 1.999; Cur. pos. 0.01 mm

Axis No. 04 — Fwd: A:Acc(G) 0.30, V:Vel(mm/s) 150.00, D:Dec(G) 0.30, ☑Push, Push force(N) 22 (Reference); Bwd: A:Acc(G) 0.30, V:Vel(mm/s) 100.00, D:Dec(G) 0.30, Cycle time 1.999s; Push st. p. 150.00 mm; B.End (HOME End) 10.00 mm; F.End (Stroke) 200.00 mm; Bwd. Crnt Setng 0.30 100.00 0.30 1.999, Prev Setng 0.30 100.00 0.30 1.999; Cur. pos. 0.01 mm



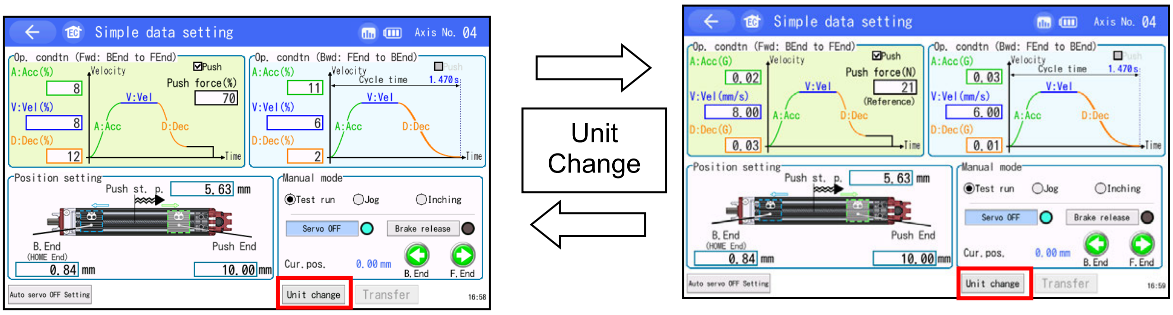
Axis No. 05 — Fwd: A:Acc(%) 54, V:Vel(%) 68, D:Dec(%) 55, ☑Push, Push force(%) 20; Bwd: A:Acc(%) 38, V:Vel(%) 58, D:Dec(%) 22, Cycle time 1.164s; B.End (HOME End) 30.00 deg; F.End (Stroke) 330.00 deg; Push st. p. 89.99 deg; Bwd. Crnt Setng 38 58 22 1.164, Prev Setng 38 58 22 1.164; Cur. pos. 75.42 deg

Axis No. 05 — Fwd: A:Acc(G) 0.27, V:Vel(deg/s) 408.00, D:Dec(G) 0.27, ☑Push, Push force(N•m) 3.714 (Reference); Bwd: A:Acc(G) 0.19, V:Vel(deg/s) 348.00, D:Dec(G) 0.11, Cycle time 1.164s; B.End (HOME End) 30.00 deg; F.End (Stroke) 330.00 deg; Push st. p. 89.99 deg; Bwd. Crnt Setng 0.19 348.00 0.11 1.164, Prev Setng 0.19 348.00 0.11 1.164; Cur. pos. 75.42 deg



Axis No. 04 — Fwd: A:Acc(%) 30, V:Vel(%) 50, D:Dec(%) 30, ☑Push, Push force(%) 20; Bwd: A:Acc(%) 3, V:Vel(%) 50, D:Dec(%) 3, Cycle time 0.769s; Push st. p. 8.50 mm; B.End (HOME End) 0.01 mm; F.End *Stroke (per side) 15.00 mm; Bwd. Crnt Setng 3 50 3 0.769, Prev Setng 3 50 3 0.769; Cur. pos. 0.01 mm

Axis No. 04 — Fwd: A:Acc(G) 0.09, V:Vel(mm/s) 47.50, D:Dec(G) 0.09, ☑Push, Push force(N) 28 (Reference) (Both); Bwd: A:Acc(G) 0.01, V:Vel(mm/s) 47.50, D:Dec(G) 0.01, Cycle time 0.769s; Push st. p. 8.50 mm; B.End (HOME End) 0.01 mm; F.End *Stroke (per side) 15.00 mm; Bwd. Crnt Setng 0.01 47.50 0.01 0.769, Prev Setng 0.01 47.50 0.01 0.769; Cur. pos. 0.01 mm



Axis No. 04 — Fwd: A:Acc(%) 8, V:Vel(%) 8, D:Dec(%) 12, ☑Push, Push force(%) 70; Bwd: A:Acc(%) 11, V:Vel(%) 6, D:Dec(%) 2, Cycle time 1.470s; Push st. p. 5.63 mm; B.End (HOME End) 0.84 mm; Push End 10.00 mm; Manual mode ● Test run ○ Jog ○ Inching; Cur. pos. 0.00 mm

Axis No. 04 — Fwd: A:Acc(G) 0.02, V:Vel(mm/s) 8.00, D:Dec(G) 0.03, ☑Push, Push force(N) 21 (Reference); Bwd: A:Acc(G) 0.03, V:Vel(mm/s) 6.00, D:Dec(G) 0.01, Cycle time 1.470s; Push st. p. 5.63 mm; B.End (HOME End) 0.84 mm; Push End 10.00 mm; Manual mode ● Test run ○ Jog ○ Inching; Cur. pos. 0.00 mm

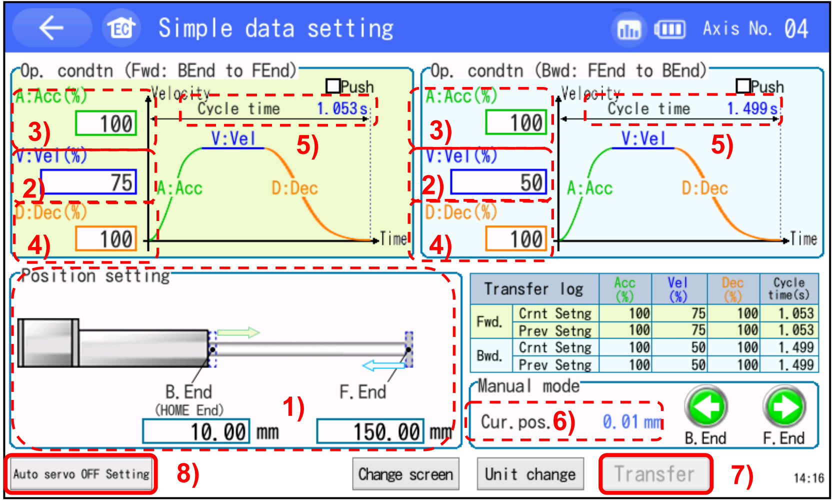
⚠ *Caution: When using the 3-finger gripper (EC-GRTR14) with gripping at the inner diameter, use the displayed unit in [%], not in [N], for grip force (pressing force).*

The 3-finger gripper is different in the grip force for outer diameter grip and inner diameter grip.

- *The displayed unit [N] should display the grip force for the outer diameter grip even in use with the inner diameter grip.*
- *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. (Rotary and Wire Cylinder excluded)



A:Acc(%) 100
V:Vel(%) 75
D:Dec(%) 100

A:Acc(%) 100
V:Vel(%) 50
D:Dec(%) 100

B. End 10.00 mm
F. End 150.00 mm

Cur. pos. 0.01 mm

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	100	75	100	1.053
	Prev Setng	100	75	100	1.053
Bwd.	Crnt Setng	100	50	100	1.499
	Prev Setng	100	50	100	1.499

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.

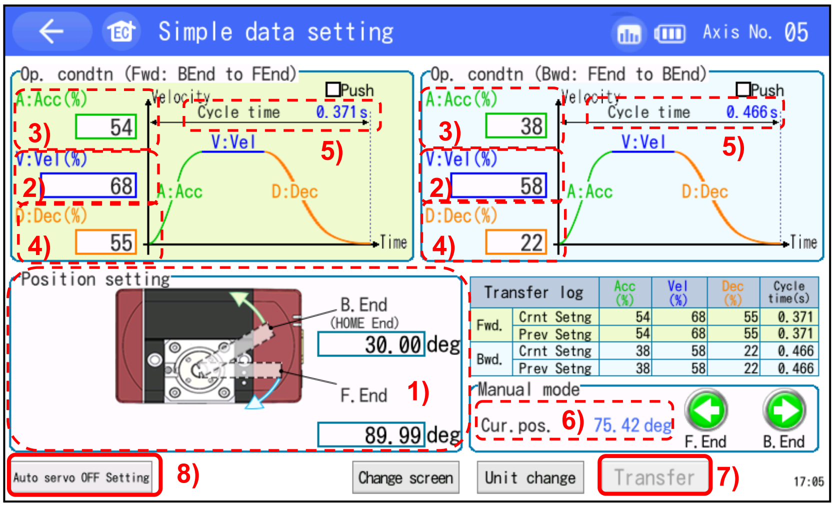
6) Cur. pos. [mm] : Displays the current position.

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 switch will not be available.*

Shown below is the content of setting for the position data for the positioning operation. (Rotary)



Op. condtn (Fwd: BEnd to FEnd)
A:Acc(%) 54
V:Vel(%) 68
D:Dec(%) 55
Cycle time 0.371s

Op. condtn (Bwd: FEnd to BEnd)
A:Acc(%) 38
V:Vel(%) 58
D:Dec(%) 22
Cycle time 0.466s

Position setting
B. End (HOME End) 30.00 deg
F. End 89.99 deg

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	54	68	55	0.371
	Prev Setng	54	68	55	0.371
Bwd.	Crnt Setng	38	58	22	0.466
	Prev Setng	38	58	22	0.466

Cur. pos. 75.42 deg

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.

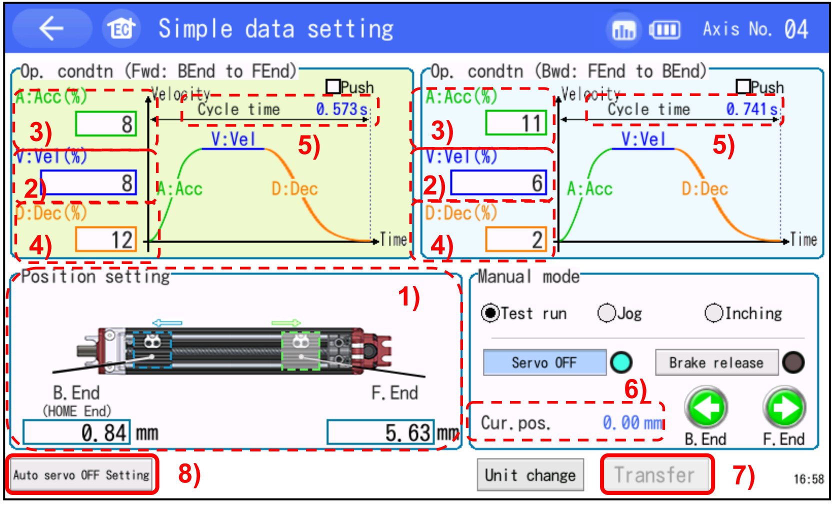
6) Cur. pos. [mm] : Displays the current position.

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 switch will not be available.

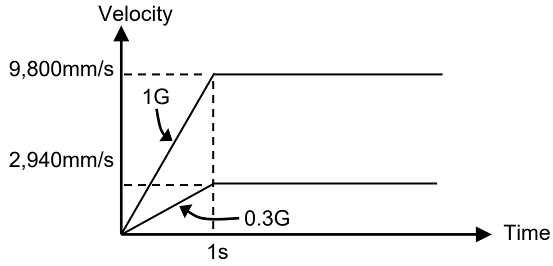
Shown below is the content of setting for the position data for the positioning operation. (Wire Cylinder)



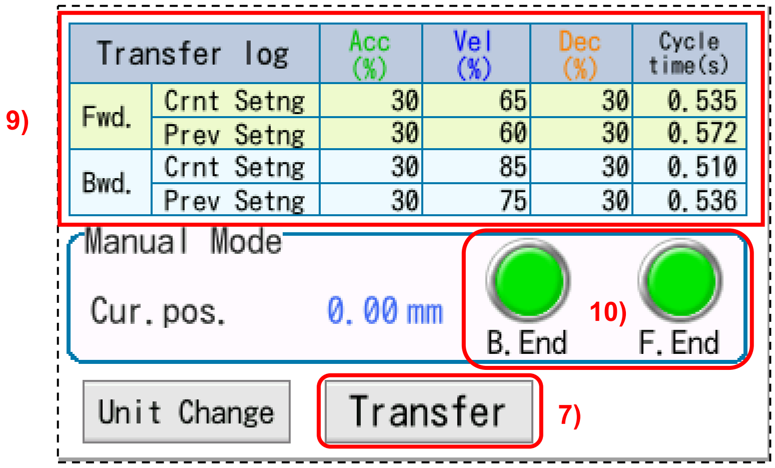
1) Position setting [mm]	: Input the positions of the backward end and forward end. Positioning coordinate value. Enter is as the distance from the home position. The unit is mm and input can be made down to two decimal places.
2) Vel [% or mm/s]	: Set the velocity of operation. Set a number from 1 to 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]

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.

(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.*



Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	30	65	30	0.535
	Prev Setng	30	60	30	0.572
Bwd.	Crnt Setng	30	85	30	0.510
	Prev Setng	30	75	30	0.536

Manual Mode

Cur. pos. 0.00 mm

9) 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.

10) Manual Mode

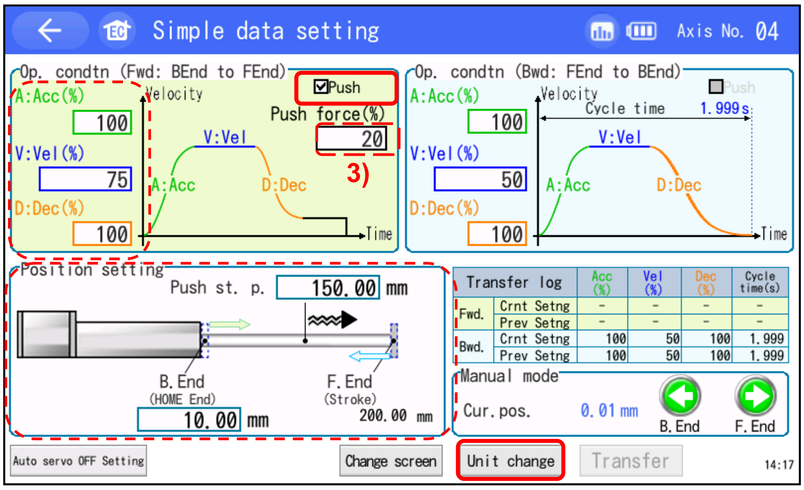
At B.End or F.End in the manual operation area, and the actuator can be moved forward or backward. (JOG Operation)

Operation is available when B.End and F.End are activated in green. If they are not activated in green, the setting values are not transferred. Transfer the parameters to the ELECYLINDER by pressing Transfer, first.

(When the home-return operation is incomplete, the button actuates as the home-return button, not forward end and backward end button. Touch it and the home-return operation should be performed.)

19.4.2 Pressing Operation

Shown below is the content of setting for the position data for the pressing operation.
(Rotary and Wire Cylinder excluded)
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)

Simple data setting Axis No. 04

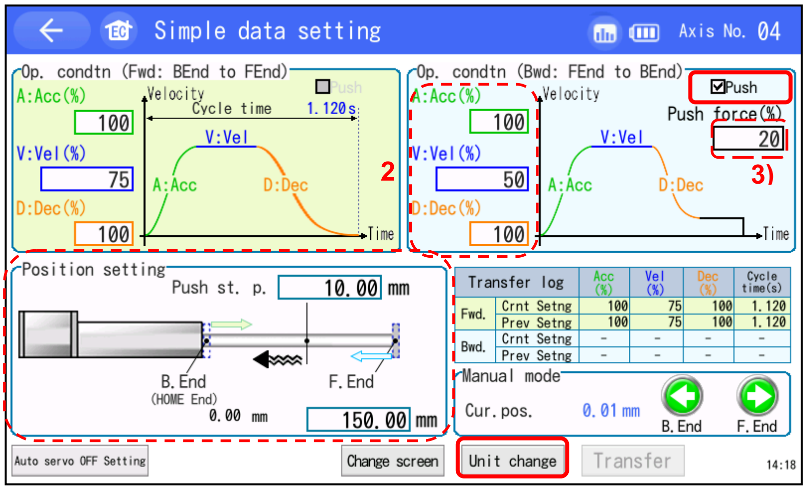
Op. condtn (Fwd: BEnd to FEnd) ☑Push
A:Acc(%) 100
V:Vel(%) 75
D:Dec(%) 100
Push force(%) 20

Op. condtn (Bwd: FEnd to BEnd) ☐Push
Cycle time 1.999s
A:Acc(%) 100
V:Vel(%) 50
D:Dec(%) 100

Position setting
Push st. p. 150.00 mm
B.End (HOME End) 10.00 mm
F.End (Stroke) 200.00 mm

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	-	-	-	-
	Prev Setng	-	-	-	-
Bwd.	Crnt Setng	100	50	100	1.999
	Prev Setng	100	50	100	1.999

Manual mode
Cur. pos. 0.01 mm



Pressing operation of Bwd
(FEnd to BEnd)

Simple data setting Axis No. 04

Op. condtn (Fwd: BEnd to FEnd) ☐Push
Cycle time 1.120s
A:Acc(%) 100
V:Vel(%) 75
D:Dec(%) 100

Op. condtn (Bwd: FEnd to BEnd) ☑Push
A:Acc(%) 100
V:Vel(%) 50
D:Dec(%) 100
Push force(%) 20

Position setting
Push st. p. 10.00 mm
B.End (HOME End) 0.00 mm
F.End 150.00 mm

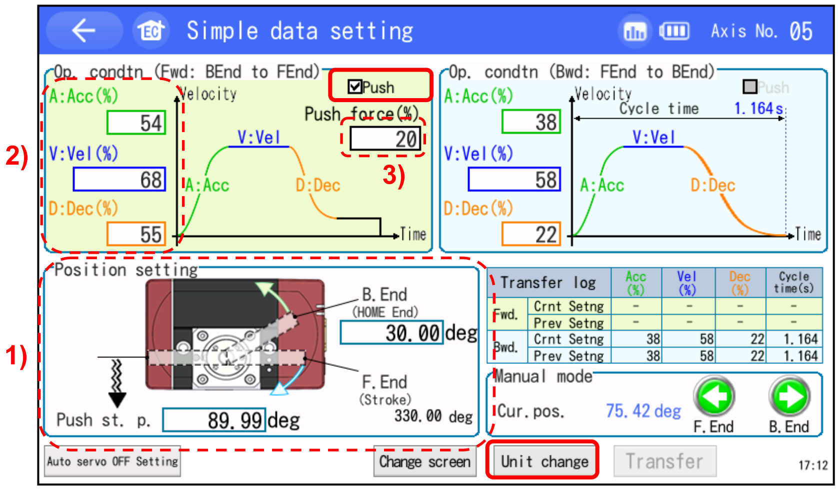
Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	100	75	100	1.120
	Prev Setng	100	75	100	1.120
Bwd.	Crnt Setng	-	-	-	-
	Prev Setng	-	-	-	-

Manual mode
Cur. pos. 0.01 mm

1) Position setting [mm]	: Setting can be made for the start position of movement (backward end or forward end) 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 or forward end) 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 pressing torque (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.
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.



Op. condtn (Fwd: BEnd to FEnd)
A:Acc(%) 54
V:Vel(%) 68
D:Dec(%) 55
☑Push
Push force(%) 20

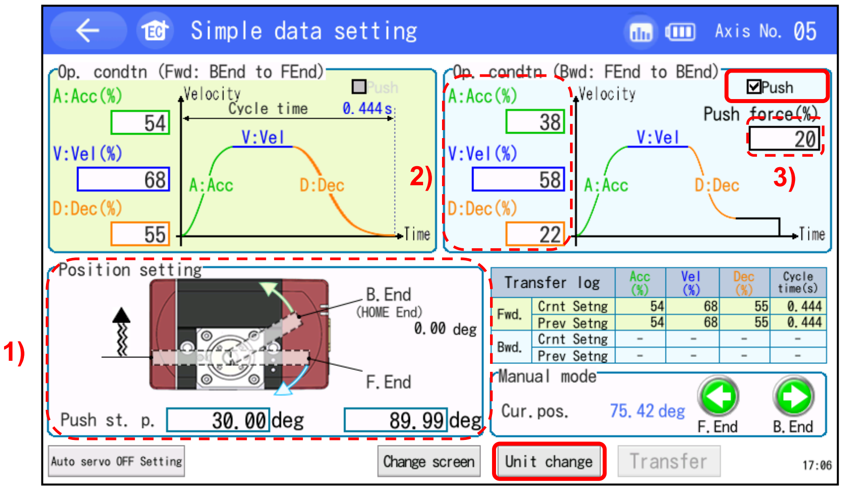
Op. condtn (Bwd: FEnd to BEnd)
A:Acc(%) 38
V:Vel(%) 58
D:Dec(%) 22
☐Push
Cycle time 1.164s

Position setting
B. End (HOME End) 30.00 deg
F. End (Stroke) 330.00 deg
Push st. p. 89.99 deg

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	–	–	–	–
	Prev Setng	–	–	–	–
Bwd.	Crnt Setng	38	58	22	1.164
	Prev Setng	38	58	22	1.164

Manual mode
Cur. pos. 75.42 deg

Pressing operation of Fwd
(BEnd to FEnd)



Op. condtn (Fwd: BEnd to FEnd)
A:Acc(%) 54
V:Vel(%) 68
D:Dec(%) 55
☐Push
Cycle time 0.444s

Op. condtn (Bwd: FEnd to BEnd)
A:Acc(%) 38
V:Vel(%) 58
D:Dec(%) 22
☑Push
Push force(%) 20

Position setting
B. End (HOME End) 0.00 deg
F. End 89.99 deg
Push st. p. 30.00 deg

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	54	68	55	0.444
	Prev Setng	54	68	55	0.444
Bwd.	Crnt Setng	–	–	–	–
	Prev Setng	–	–	–	–

Manual mode
Cur. pos. 75.42 deg

Pressing operation of Bwd
(FEnd to BEnd)

1) Position setting [deg] : Setting can be made for the start position of movement (backward end or forward end) 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.

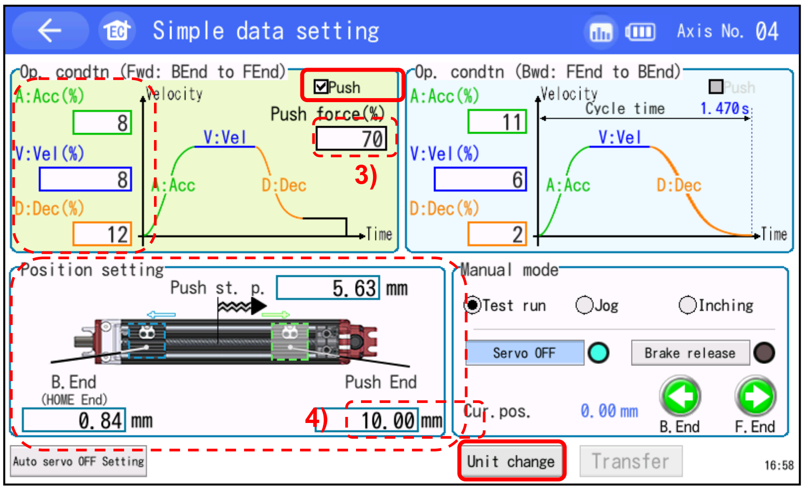
2) Vel and Acc/Dec : Setting can be made for the velocity, acceleration and deceleration for movement from the start position of the movement (backward end or forward end) to the start position of pressing operation.
The way to conduct settings is the same as that for positioning operation.

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.

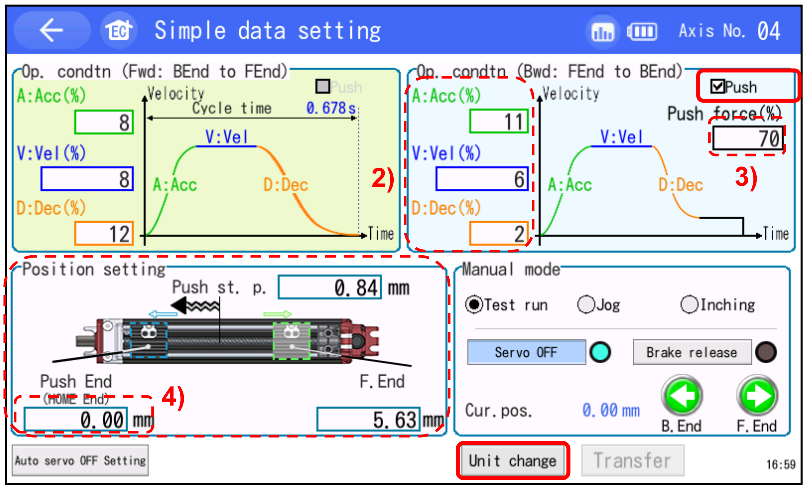
Transfer log : The transfer log will not be displayed in pressing operation.

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.


Simple data setting
Axis No. 04
Op. condtn (Fwd: BEnd to FEnd)
☑Push
A:Acc(%) 8
V:Vel(%) 8
D:Dec(%) 12
Push force(%) 70
Op. condtn (Bwd: FEnd to BEnd)
☐Push
A:Acc(%) 11
V:Vel(%) 6
D:Dec(%) 2
Cycle time 1.470s
Position setting
Push st. p. 5.63 mm
B.End (HOME End) 0.84 mm
Push End 10.00 mm
Manual mode
● Test run ○ Jog ○ Inching
Cur.pos. 0.00 mm

Pressing operation of Fwd
(BEnd to FEnd)

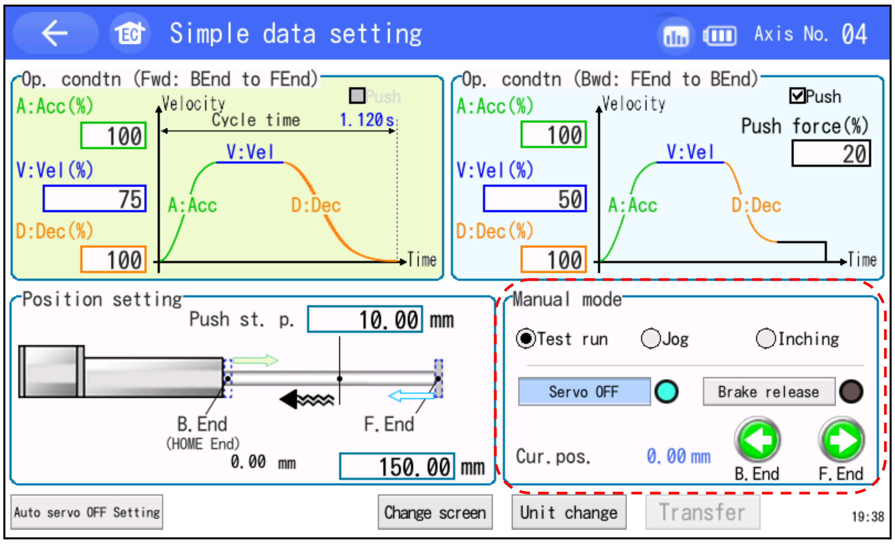

Simple data setting
Axis No. 04
Op. condtn (Fwd: BEnd to FEnd)
☐Push
A:Acc(%) 8
V:Vel(%) 8
D:Dec(%) 12
Cycle time 0.678s
Op. condtn (Bwd: FEnd to BEnd)
☑Push
A:Acc(%) 11
V:Vel(%) 6
D:Dec(%) 2
Push force(%) 70
Position setting
Push st. p. 0.84 mm
Push End (HOME End) 0.00 mm
F.End 5.63 mm
Manual mode
● Test run ○ Jog ○ Inching
Cur.pos. 0.00 mm

Pressing operation of Bwd
(FEnd to BEnd)

1) Position setting [mm]	: Setting can be made for the start position of movement (backward end or forward end) 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 or forward end) 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 pressing torque (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]

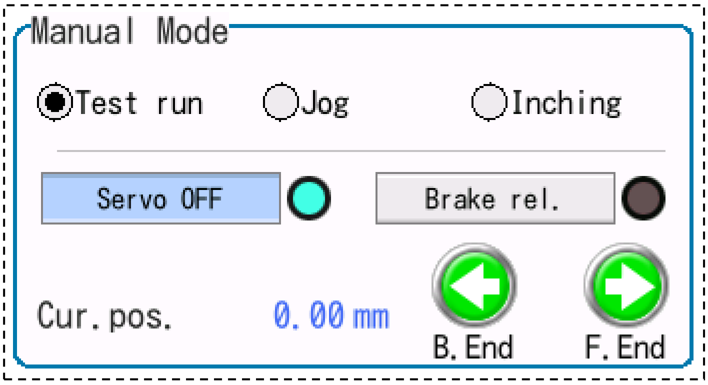
19.4.3 Manual Mode

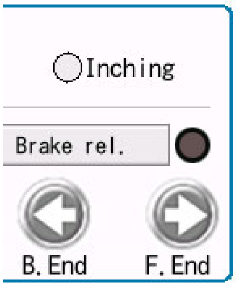


Once the simple data setup window is shown, the manual operation box should show up in the right bottom of the screen.
Selection can be made with ○ (radio buttons) from Trial Run, Jog and Inching.

(1) Test Run

Select Test run in radio buttons (○).





Set values not transferred

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.

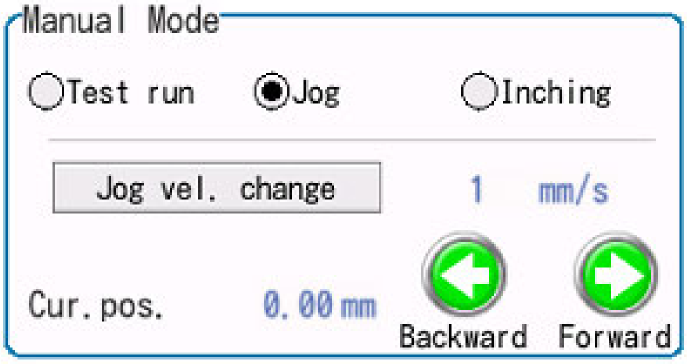
The actuator moves to the backward end at B. End.
Make operation using velocity and acceleration/deceleration in the operation conditions (Way back: from F. End to B. End).

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).

Both forward and backward operations should activate while the button is touched and held.
Release the button and the operation should stop.
B. End and F. End are ready for operation when they are shown in green. If they are not green, the set values are not transferred. Transfer the set value data to a ELECYLINDER in advance by pressing Transfer button.

(2) JOG

Select JOG in radio buttons (○).



Manual Mode

○Test run ●Jog ○Inching

Jog vel. change 1 mm/s

Cur. pos. 0.00 mm

Backward Forward

An actuator keeps moving backward while touching Backward button.
Regardless of the backward end setting, the actuator should move backwards till the home position.

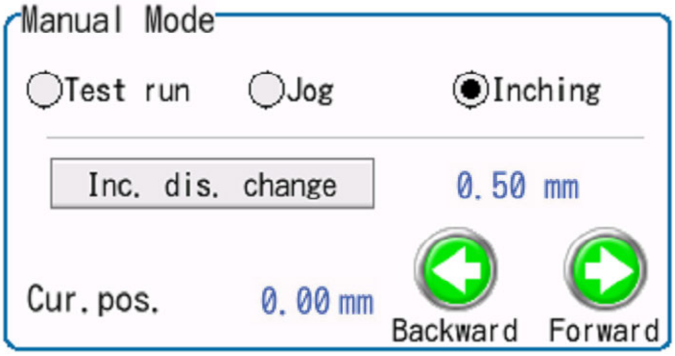
An actuator keeps moving forward while touching Forward button.
Regardless of the forward end setting, the actuator should move forwards till the stroke end.

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 (○).



Manual Mode

○Test run ○Jog ●Inching

Inc. dis. change 0.50 mm

Cur. pos. 0.00 mm

Backward Forward

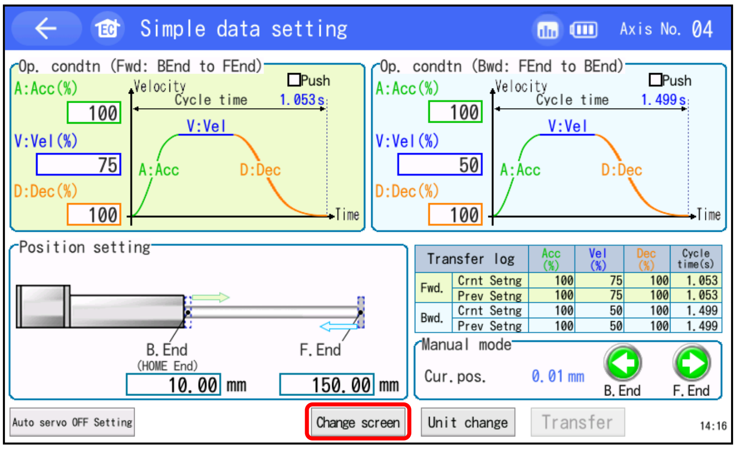
Touch Backward button and an actuator should move backward in a certain distance.
Regardless of the backward end setting, the actuator should move backwards till the home position.

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.

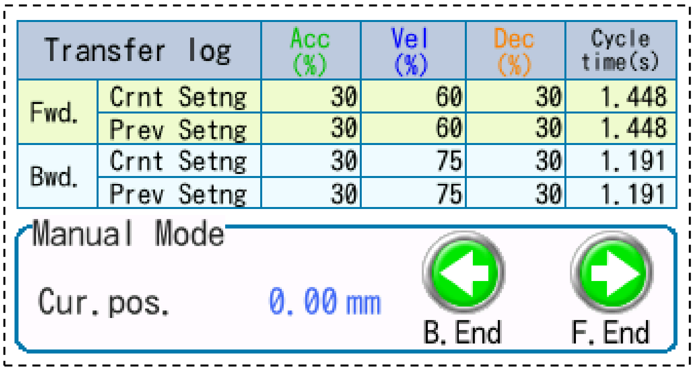
0.01 mm [deg] → 0.10 mm [deg] → 0.50 mm [deg] → 1.00 mm [deg] → 5.00 mm [deg]

(4) Transfer log display (Not displayed for wire cylinder)



Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	100	75	100	1.053
	Prev Setng	100	75	100	1.053
Bwd.	Crnt Setng	100	50	100	1.499
	Prev Setng	100	50	100	1.499

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.

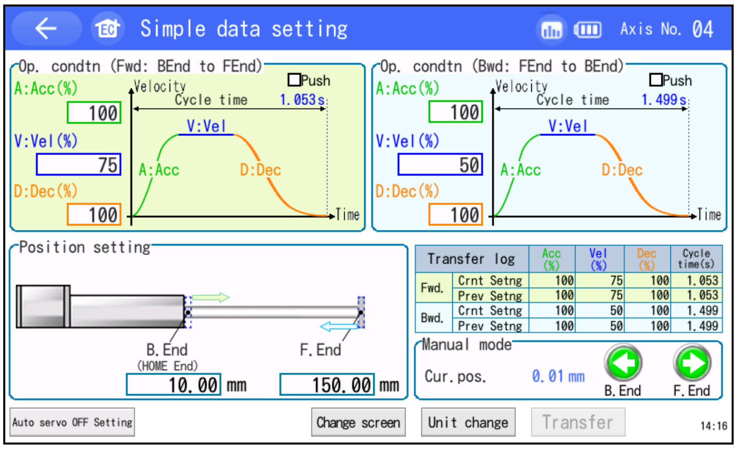


Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	30	60	30	1.448
	Prev Setng	30	60	30	1.448
Bwd.	Crnt Setng	30	75	30	1.191
	Prev Setng	30	75	30	1.191

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.



Op. condtn (Fwd: BEnd to FEnd)
A:Acc(%) 100
V:Vel(%) 75
D:Dec(%) 100
Cycle time 1.053 s

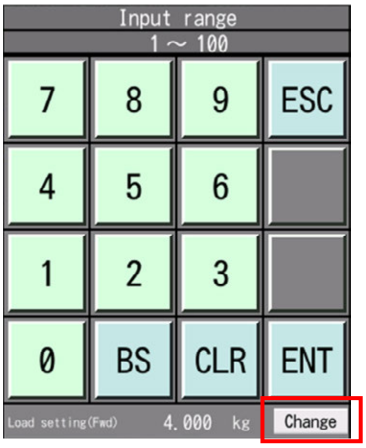
Op. condtn (Bwd: FEnd to BEnd)
A:Acc(%) 100
V:Vel(%) 50
D:Dec(%) 100
Cycle time 1.499 s

B. End 10.00 mm
F. End 150.00 mm

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	100	75	100	1.053
	Prev Setng	100	75	100	1.053
Bwd.	Crnt Setng	100	50	100	1.499
	Prev Setng	100	50	100	1.499

Cur. pos. 0.01 mm

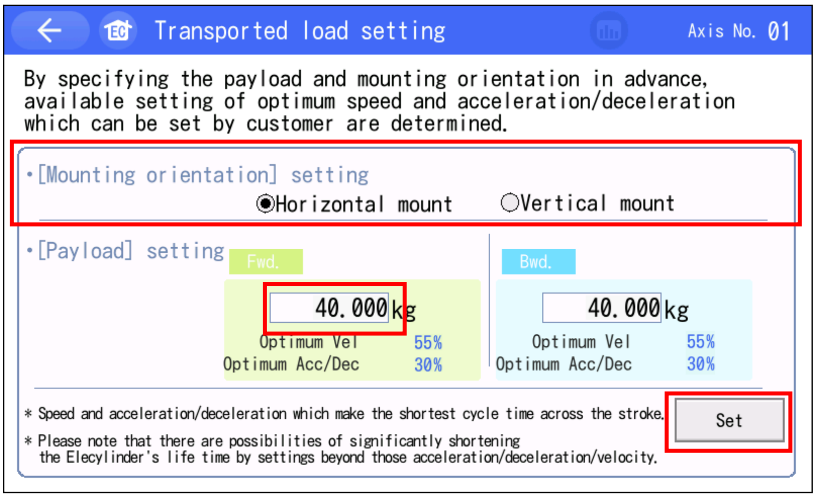
Touch either acceleration, velocity or deceleration.



Load setting(Fwd) 4.000 kg

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.



By specifying the payload and mounting orientation in advance, available setting of optimum speed and acceleration/deceleration which can be set by customer are determined.

・[Mounting orientation] setting
● Horizontal mount ○ Vertical mount

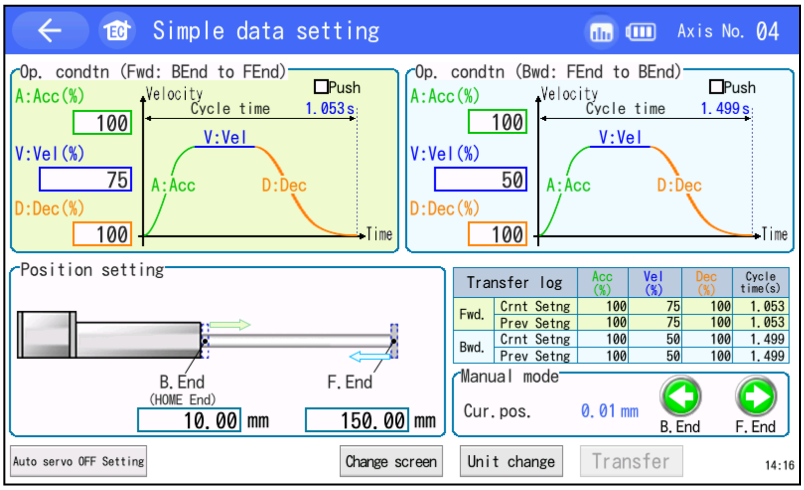
・[Payload] setting

	Fwd.	Bwd.
	40.000 kg	40.000 kg
Optimum Vel	55%	55%
Optimum Acc/Dec	30%	30%

＊ Speed and acceleration/deceleration which make the shortest cycle time across the stroke.
＊ Please note that there are possibilities of significantly shortening the Elecylinder's life time by settings beyond those acceleration/deceleration/velocity.

Select "Mounting orientation", input "Payload" and then touch Set.

The unit is "kg-m^2" for rotary type



Op. condtn (Fwd: BEnd to FEnd) ☐Push

A:Acc(%) 100
V:Vel(%) 75
D:Dec(%) 100
Cycle time 1.053s

Op. condtn (Bwd: FEnd to BEnd) ☐Push

A:Acc(%) 100
V:Vel(%) 50
D:Dec(%) 100
Cycle time 1.499s

Position setting

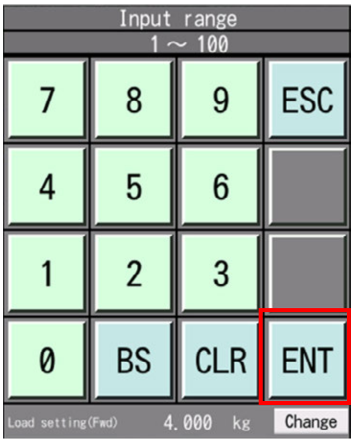
B. End (HOME End) 10.00 mm
F. End 150.00 mm

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	100	75	100	1.053
	Prev Setng	100	75	100	1.053
Bwd.	Crnt Setng	100	50	100	1.499
	Prev Setng	100	50	100	1.499

Manual mode

Cur. pos. 0.01 mm

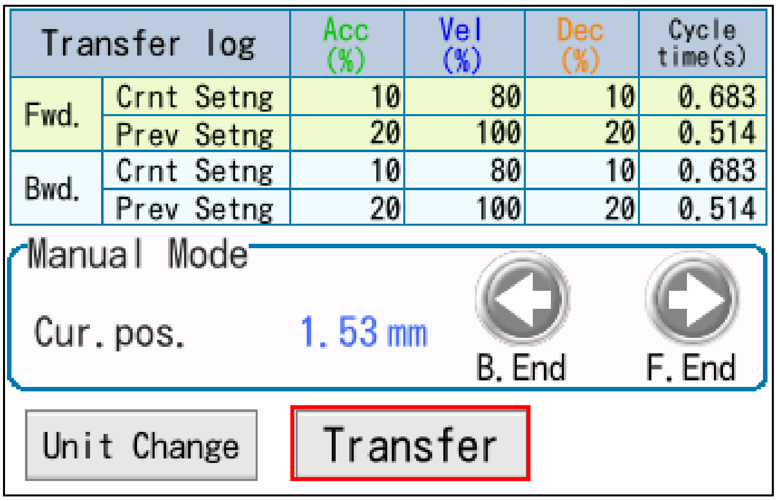
Touch an operational condition to be set or adjusted.



Input range
1 ～ 100

Load setting(Fwd) 4.000 kg

Input a value in the numeric keys and touch ENT.



Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	10	80	10	0.683
	Prev Setng	20	100	20	0.514
Bwd.	Crnt Setng	10	80	10	0.683
	Prev Setng	20	100	20	0.514

Manual Mode

Cur. pos. 1.53 mm

Touch Transfer.

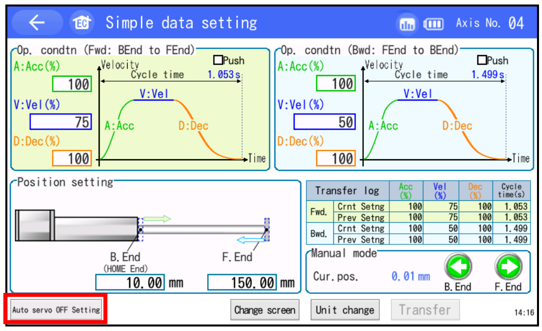
The values should get written to the controller, B. End and F. End should turn into green and "Transfer liog" should be updated.

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)

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.


Simple data setting   Axis No. 04

Op. condtn (Fwd: BEnd to FEnd)
A:Acc(%) 100
V:Vel(%) 75
D:Dec(%) 100
☐Push
Cycle time 1.053s

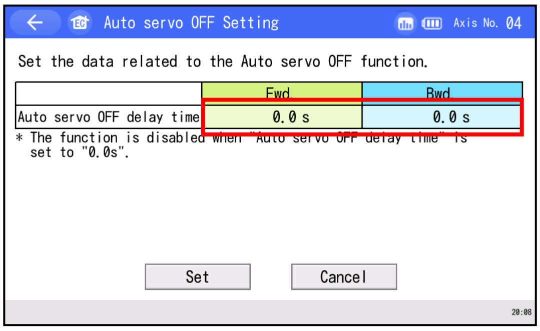
Op. condtn (Bwd: FEnd to BEnd)
A:Acc(%) 100
V:Vel(%) 50
D:Dec(%) 100
☐Push
Cycle time 1.499s

Position setting
B.End (HOME End) 10.00 mm
F.End 150.00 mm

Transfer log		Acc (%)	Vel (%)	Dec (%)	Cycle time(s)
Fwd.	Crnt Setng	100	75	100	1.053
	Prev Setng	100	75	100	1.053
Bwd.	Crnt Setng	100	50	100	1.499
	Prev Setng	100	50	100	1.499

Manual mode
Cur. pos. 0.01 mm

Touch Auto servo OFF Setting and the automatic servo-off setup window should appear.


Auto servo OFF Setting   Axis No. 04

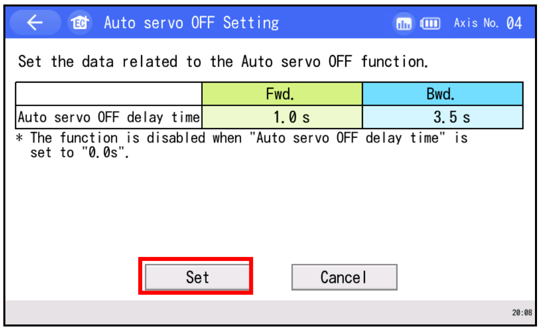
Set the data related to the Auto servo OFF function.

	Fwd	Bwd
Auto servo OFF delay time	0.0 s	0.0 s

* The function is disabled when "Auto servo OFF delay time" is set to "0.0s".

Set the automatic servo-off latency to back and forth ways.

* Set it to "0.0s", and the feature should be inactivated.

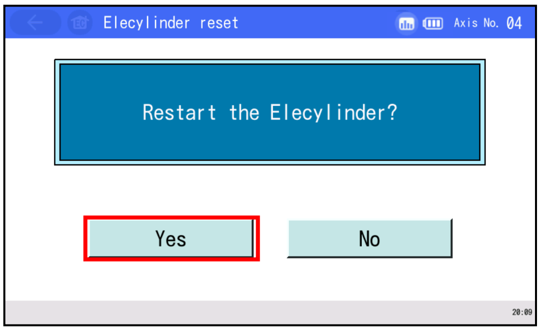

Auto servo OFF Setting   Axis No. 04

Set the data related to the Auto servo OFF function.

	Fwd.	Bwd.
Auto servo OFF delay time	1.0 s	3.5 s

* The function is disabled when "Auto servo OFF delay time" is set to "0.0s".

Touch Set after input.


Elecylinder reset   Axis No. 04

Restart the Elecylinder?

Touch Yes.

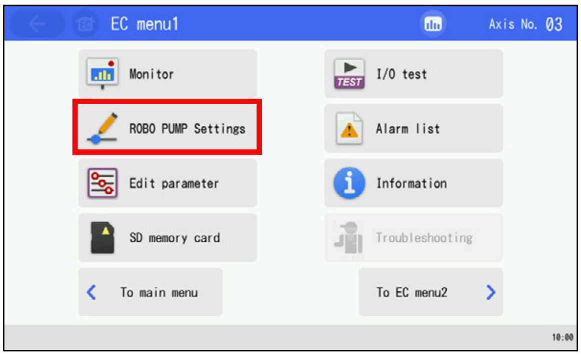
Reboot the controller and the automatic servo-off setup is complete.

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

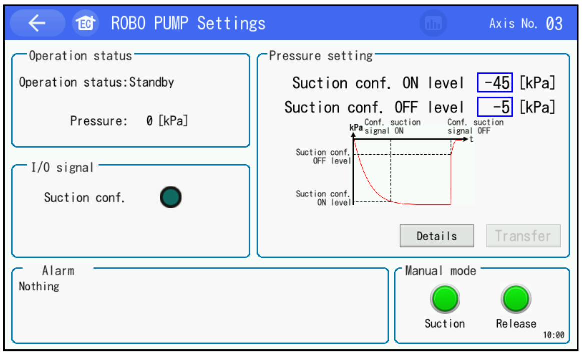
19.5 ROBO PUMP Setting

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.



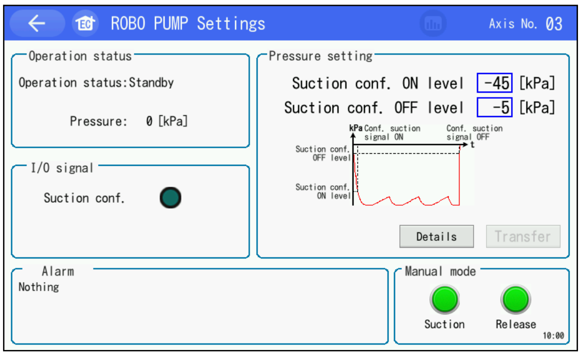
Touch [ROBO PUMP Settings] button on the EC Menu 1 window.

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.



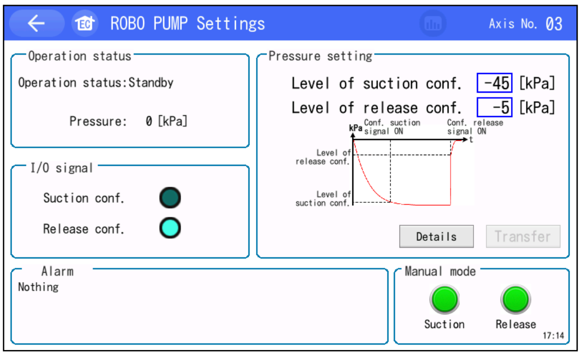
Operation status:Standby
Pressure: 0 [kPa]
Suction conf. ON level -45 [kPa]
Suction conf. OFF level -5 [kPa]
Nothing

When PIO pattern is 0 or 1, and energy-saving mode is disabled



Operation status:Standby
Pressure: 0 [kPa]
Suction conf. ON level -45 [kPa]
Suction conf. OFF level -5 [kPa]
Nothing

When PIO pattern is 0 or 1, and energy-saving mode is enabled



ROBO PUMP Settings Axis No. 03

Operation status:Standby

Pressure: 0 [kPa]

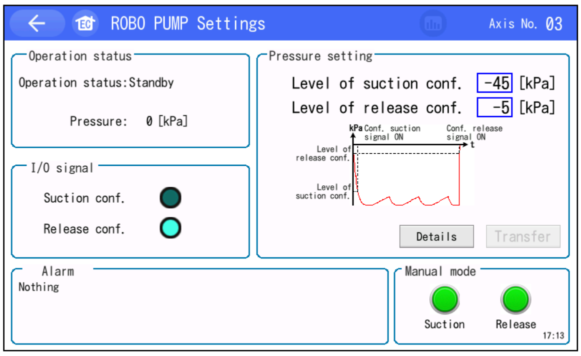
Level of suction conf. -45 [kPa]

Level of release conf. -5 [kPa]

Alarm

Nothing

When PIO pattern is 2, and energy-saving mode is disabled



ROBO PUMP Settings Axis No. 03

Operation status:Standby

Pressure: 0 [kPa]

Level of suction conf. -45 [kPa]

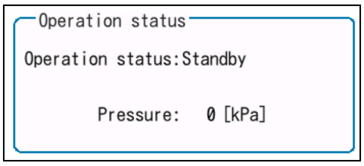
Level of release conf. -5 [kPa]

Alarm

Nothing

When PIO pattern is 2, and energy-saving mode is enabled

19.5.1 Operation Status



Operation status

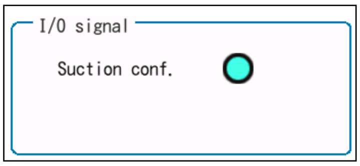
Operation status:Standby

Pressure: 0 [kPa]

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



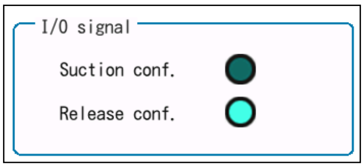
I/O signal

Suction conf. ●

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.



I/O signal

Suction conf. ●

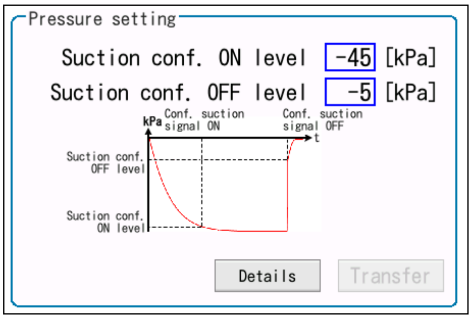
Release conf. ●

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


Pressure setting

Suction conf. ON level -45 [kPa]

Suction conf. OFF level -5 [kPa]

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.

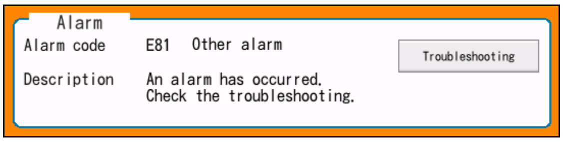
4) Release conf. level [kPa] : The lower limit of pressure to terminate release should be set up.
The unit is [kPa] and integers in negative can also be input.
Settings cannot be changed during suction or release in the monitoring mode.

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



Alarm code E81 Other alarm

Description An alarm has occurred.
Check the troubleshooting.

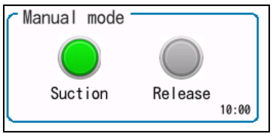
The display and process when each button is touched are as shown below.

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



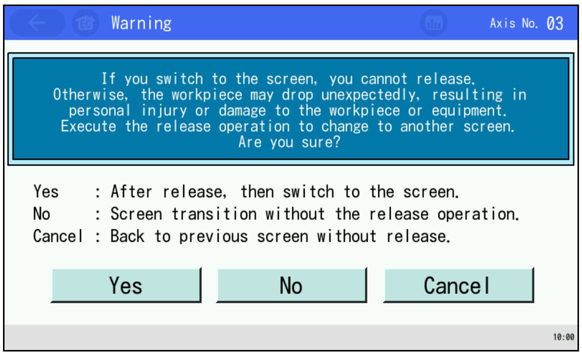
The process when each button is touched are as shown below.

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.



If you switch to the screen, you cannot release.
Otherwise, the workpiece may drop unexpectedly, resulting in personal injury or damage to the workpiece or equipment.
Execute the release operation to change to another screen.
Are you sure?

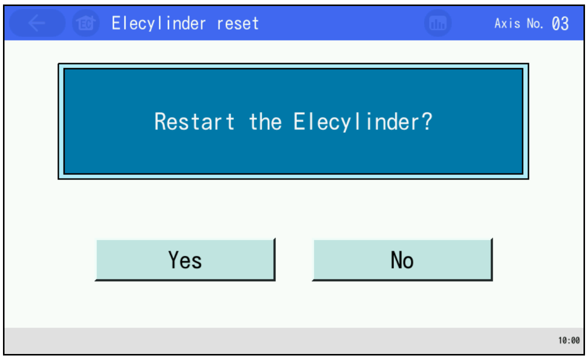
Yes : After release, then switch to the screen.
No : Screen transition without the release operation.
Cancel : Back to previous screen without release.

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.



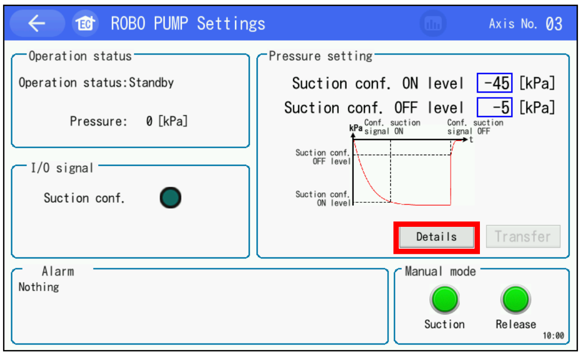
Restart the Elecylinder?

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.



Operation status:Standby

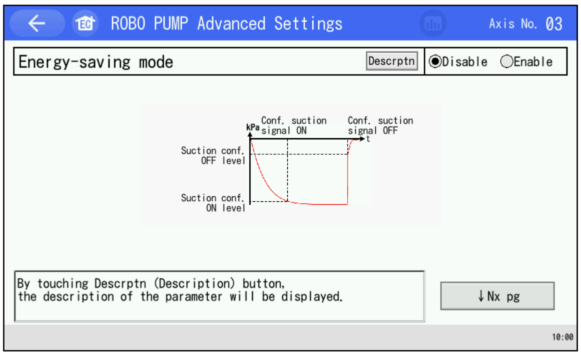
Pressure: 0 [kPa]

Suction conf. ON level -45 [kPa]

Suction conf. OFF level -5 [kPa]

Alarm: Nothing

Touch the Details button in the ROBO PUMP Settings window.

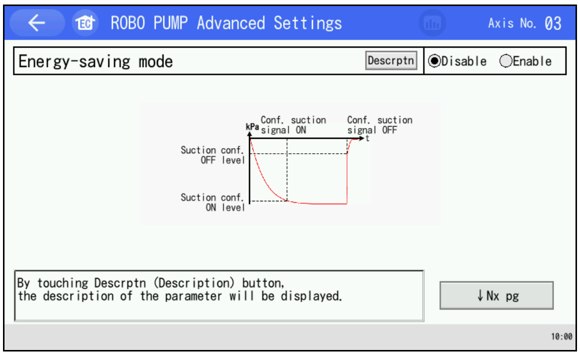


Energy-saving mode ● Disable ○ Enable

By touching Descrptn (Description) button, the description of the parameter will be displayed.

The ROBO PUMP Advanced Settings window 1 should be displayed.

19.5.8.1 ROBO PUMP Advanced Settings 1 Window (Energy-saving mode)



Energy-saving mode ● Disable ○ Enable

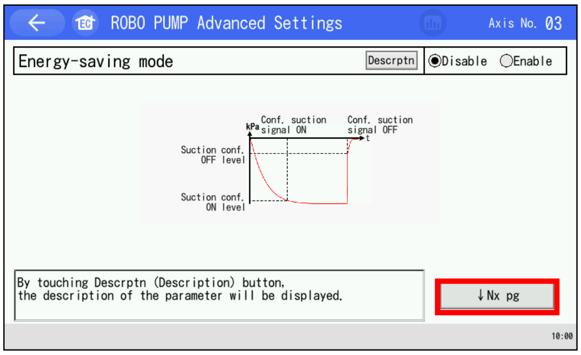
By touching Descrptn (Description) button,
the description of the parameter will be displayed.

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.



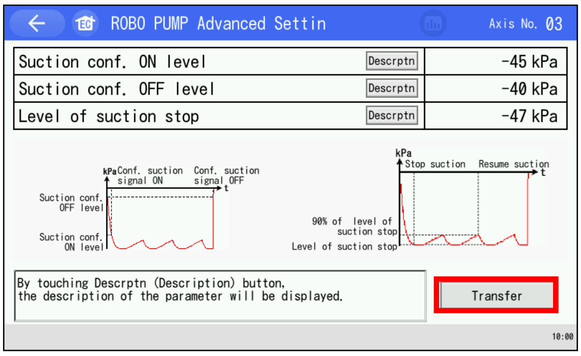
ROBO PUMP Advanced Settings Axis No. 03

Energy-saving mode Descrptn ●Disable ○Enable

By touching Descrptn (Description) button, the description of the parameter will be displayed.

Touch the ↓ Nx pg button in the ROBO PUMP Advanced Settings window 1.

ROBO PUMP Advanced Settings Window 2 should be displayed.

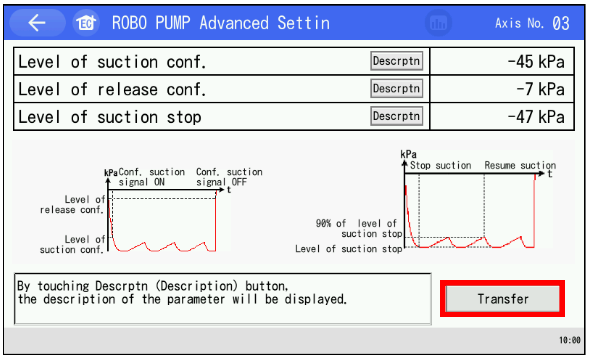


ROBO PUMP Advanced Settin Axis No. 03

Suction conf. ON level	Descrptn	-45 kPa
Suction conf. OFF level	Descrptn	-40 kPa
Level of suction stop	Descrptn	-47 kPa

By touching Descrptn (Description) button, the description of the parameter will be displayed.

When PIO pattern is 0 or 1



ROBO PUMP Advanced Settin Axis No. 03

Level of suction conf.	Descrptn	-45 kPa
Level of release conf.	Descrptn	-7 kPa
Level of suction stop	Descrptn	-47 kPa

By touching Descrptn (Description) button, the description of the parameter will be displayed.

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.

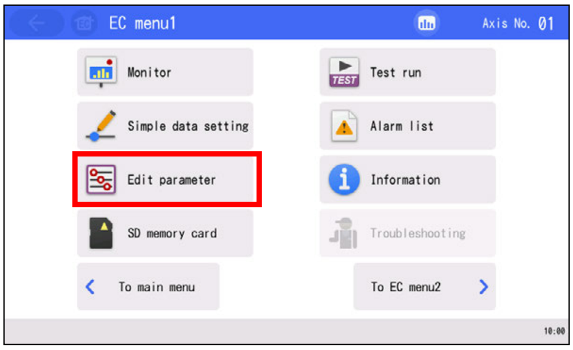
6) Descrptn button : Touch it and an explanation for the level setting should be shown at the bottom of the window.

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.

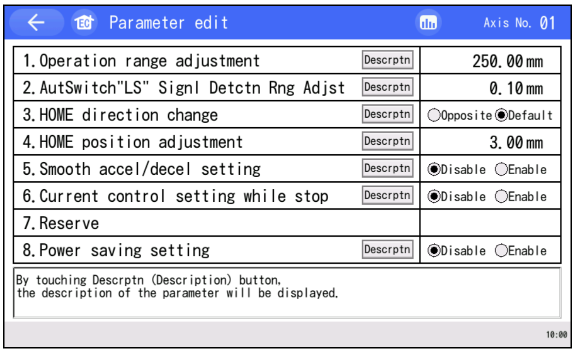
19.6 Edit Parameter

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.)

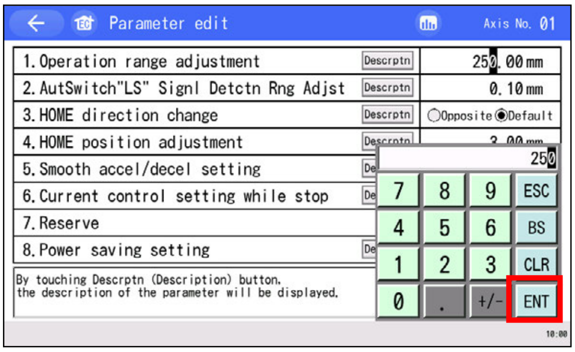


1. Operation range adjustment	Descrptn	250.00 mm
2. AutSwitch"LS" Signl Detctn Rng Adjst	Descrptn	0.10 mm
3. HOME direction change	Descrptn	○Opposite ●Default
4. HOME position adjustment	Descrptn	3.00 mm
5. Smooth accel/decel setting	Descrptn	●Disable ○Enable
6. Current control setting while stop	Descrptn	●Disable ○Enable
7. Reserve		
8. Power saving setting	Descrptn	●Disable ○Enable

By touching Descrptn (Description) button,
the description of the parameter will be displayed.

Next page shows the basic operation in the edit parameter window.

(1) Item to input a setting value



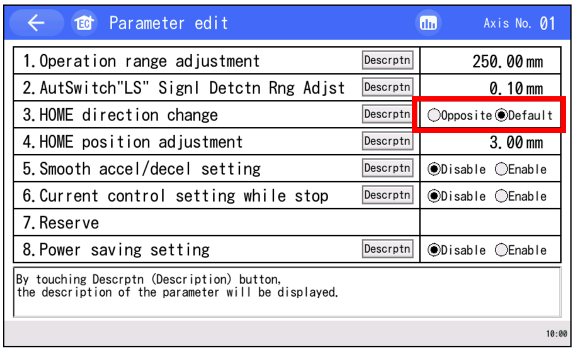
Parameter edit   Axis No. 01

1. Operation range adjustment	Descrptn	250.00mm
2. AutSwitch"LS" Signl Detctn Rng Adjst	Descrptn	0.10mm
3. HOME direction change	Descrptn	○Opposite ●Default
4. HOME position adjustment	Descrptn	
5. Smooth accel/decel setting	De	
6. Current control setting while stop	De	
7. Reserve		
8. Power saving setting	De	

By touching Descrptn (Description) button, the description of the parameter will be displayed.

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) Item to tach ○ (radio button) to select



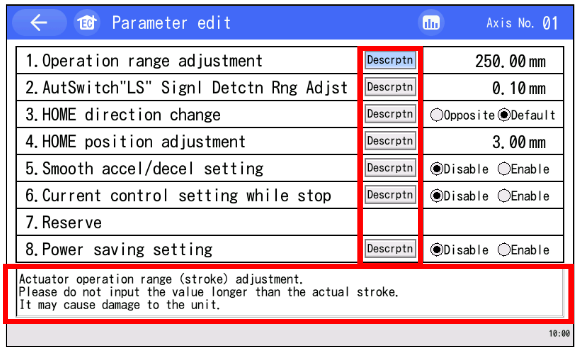
Parameter edit   Axis No. 01

1. Operation range adjustment	Descrptn	250.00mm
2. AutSwitch"LS" Signl Detctn Rng Adjst	Descrptn	0.10mm
3. HOME direction change	Descrptn	○Opposite ●Default
4. HOME position adjustment	Descrptn	3.00mm
5. Smooth accel/decel setting	Descrptn	●Disable ○Enable
6. Current control setting while stop	Descrptn	●Disable ○Enable
7. Reserve		
8. Power saving setting	Descrptn	●Disable ○Enable

By touching Descrptn (Description) button, the description of the parameter will be displayed.

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) Descriptions



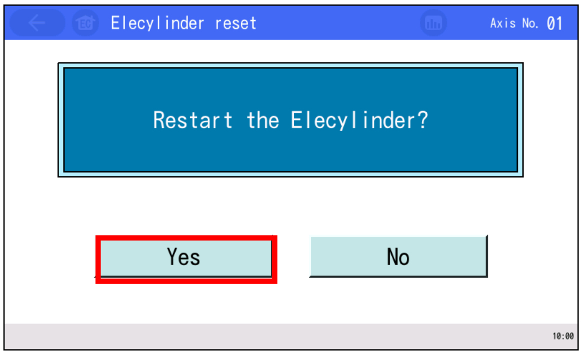
Parameter edit   Axis No. 01

1. Operation range adjustment	Descrptn	250.00mm
2. AutSwitch"LS" Signl Detctn Rng Adjst	Descrptn	0.10mm
3. HOME direction change	Descrptn	○Opposite ●Default
4. HOME position adjustment	Descrptn	3.00mm
5. Smooth accel/decel setting	Descrptn	●Disable ○Enable
6. Current control setting while stop	Descrptn	●Disable ○Enable
7. Reserve		
8. Power saving setting	Descrptn	●Disable ○Enable

Actuator operation range (stroke) adjustment.
Please do not input the value longer than the actual stroke.
It may cause damage to the unit.

Touch Descrptn button and the descriptions of the setting items will be shown in the bottom of the screen.

(4) Reflecting Parameters

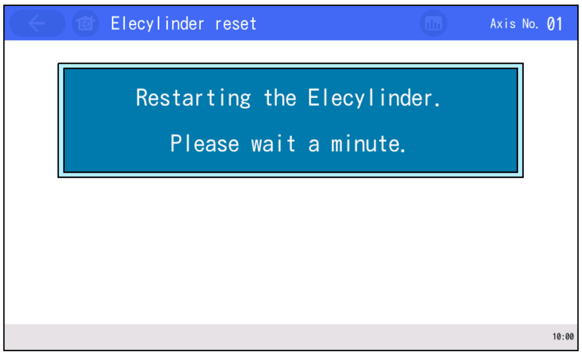


Restart the Elecylinder?

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.

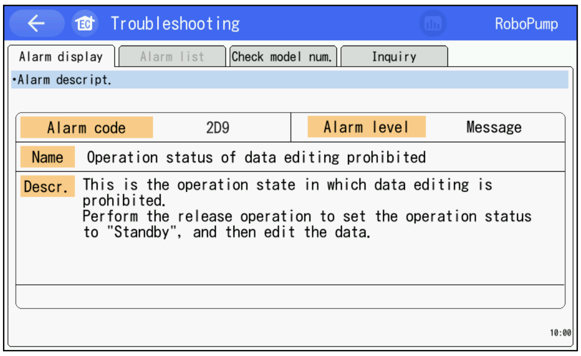
⚠ Caution: *If ELECYLINDER or ROBO PUMP is not restarted, the parameter that has been rewritten does not translate to the intended action.*
The parameter will become effective once ELECYLINDER or ROBO PUMP is restarted or after power is reconnected.



Restarting the Elecylinder.
Please wait a minute.

ELECYLINDER or ROBO PUMP is restarted, after which the parameter you have set will be reflected.

(5) Data Edit Prohibited Operation Status



・Alarm descript.

Alarm code	2D9	Alarm level	Message

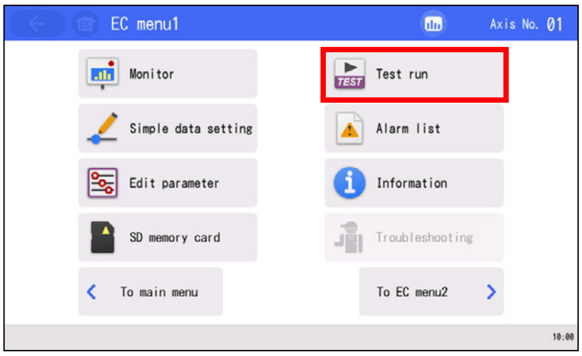
Name: Operation status of data editing prohibited

Descr.: This is the operation state in which data editing is prohibited.
Perform the release operation to set the operation status to "Standby", and then edit the data.

When it is attempted to change any settings during ROBO PUMP suction or release, the data edit prohibited operation status window should open.
The parameter will not be reflected.

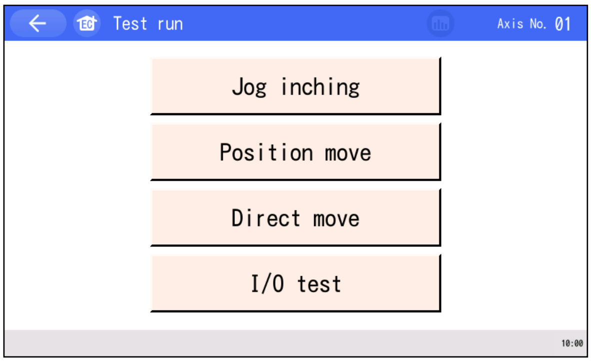
19.7 Test Run

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
Movement to the forward end or backward end or continuous movement should be performed.
- Move
  Movement should be made from the current position to either of the forward end or the backward end which has been indicated. (One time of movement only)
- Continuous
  Movement should be made repeatedly between the forward end and the backward end.

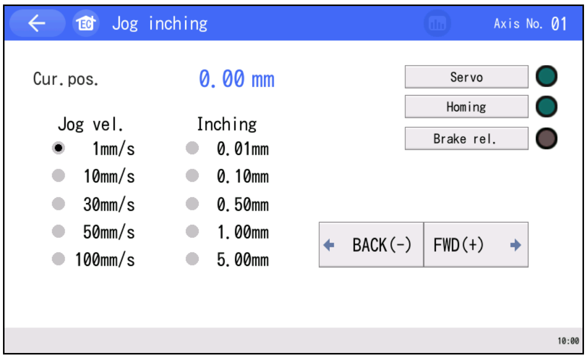
Refer to [19.7.2 Position Movement Operation] for details about how to operate.

(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.



Cur. pos. 0.00 mm

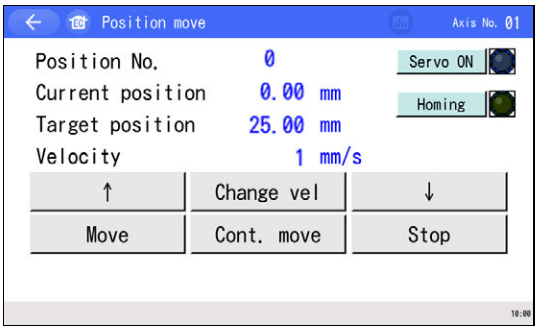
Jog vel.	Inching
● 1mm/s	○ 0.01mm
○ 10mm/s	○ 0.10mm
○ 30mm/s	○ 0.50mm
○ 50mm/s	○ 1.00mm
○ 100mm/s	○ 5.00mm

• 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)

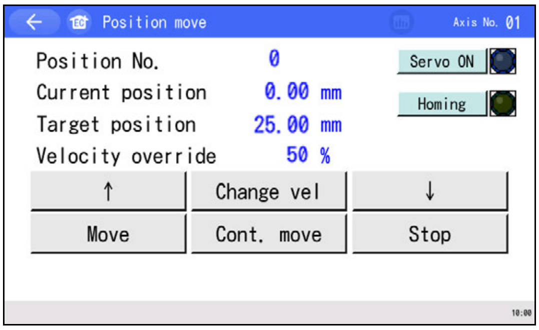
Move to a position or continuously to multiple positions registered in the position table.
The items to be displayed should differ depending on valid/invalid of the safety velocity.
Refer to [19.1.1 EC Operation Mode]



Position move Axis No. 01

Position No. 0
Current position 0.00 mm
Target position 25.00 mm
Velocity 1 mm/s

When Safety Velocity is Valid



Position move Axis No. 01

Position No. 0
Current position 0.00 mm
Target position 25.00 mm
Velocity override 50 %

When Safety Velocity is Invalid

- Position No. : "1" should be shown when the forward end is selected and "0" when the backward end is selected.
- Current position : Displays the current position.
- Target position : Displays the target position set in the selected position number.

When Safety Velocity is Valid;

- 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) for the movement target.

When Safety Velocity is Valid;

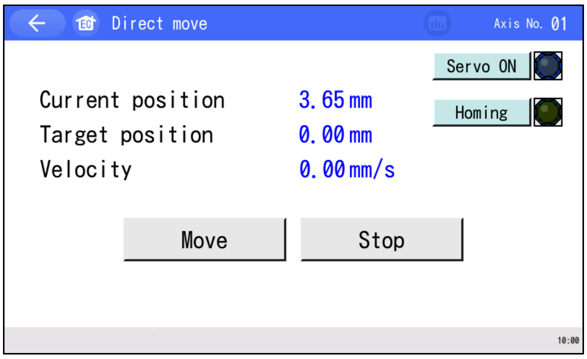
- Change vel button : Speed can be changed in order of 1mm/s, 10mm/s, 30mm/s, 50mm/s and 100mm/s every time touching Change vel button.

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 and backward end till touching Stop button.
- Stop button : Touching Stop button stops the axis.

19.7.3 Direct Movement Operation (for applicable models only)

A position is specified directly to move the axis.

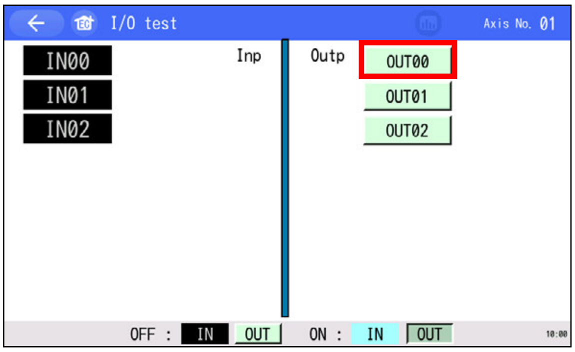


Current position 3.65 mm
Target position 0.00 mm
Velocity 0.00 mm/s

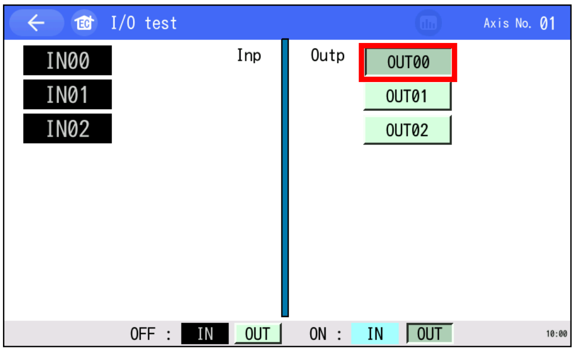
•	Current position	: Displays the current position.
•	Target position	: Touching "Target position" displays the numeric keypad. Enter a desired target position and then touch ENT button.
•	Velocity	: Touching "Velocity" displays the numeric keypad. Enter a desired speed and then touch ENT button.
•	Servo 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 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.



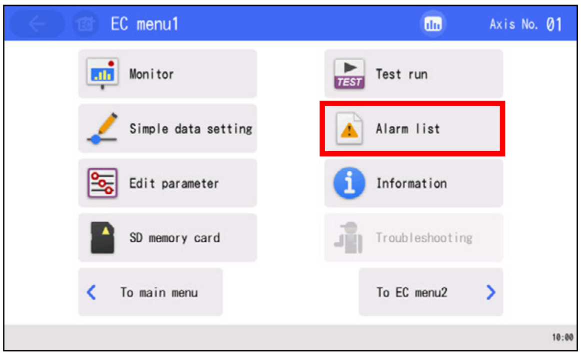
If it is necessary to turn on OUT00 which is currently off, touch OUT00 button.



OUT00 turns on.
Touch OUT00 button again and it turns off.

19.8 Alarm List

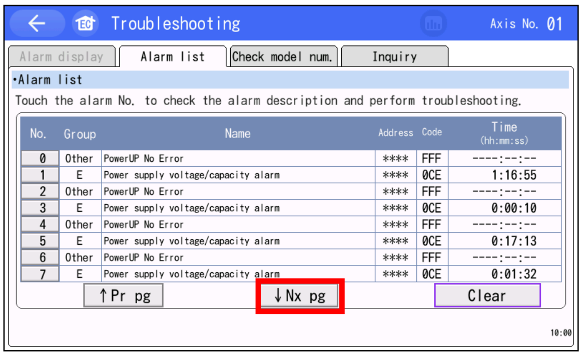
A list of alarms that may generate after ELECYLINDER or ROBO PUMP power is turned on is shown. The displayed items should differ for ELECYLINDER and ROBO PUMP.



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".

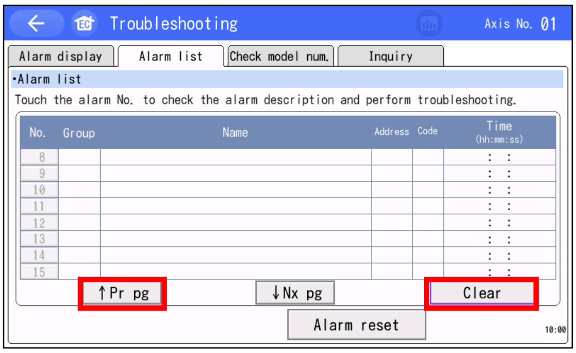


•Alarm list

Touch the alarm No. to check the alarm description and perform troubleshooting.

No.	Group	Name	Address	Code	Time (hh:mm:ss)
0	Other	PowerUP No Error	****	FFF	----:--:--
1	E	Power supply voltage/capacity alarm	****	0CE	1:16:55
2	Other	PowerUP No Error	****	FFF	----:--:--
3	E	Power supply voltage/capacity alarm	****	0CE	0:00:10
4	Other	PowerUP No Error	****	FFF	----:--:--
5	E	Power supply voltage/capacity alarm	****	0CE	0:17:13
6	Other	PowerUP No Error	****	FFF	----:--:--
7	E	Power supply voltage/capacity alarm	****	0CE	0:01:32

Touching ↓ Nx pg button displays the list of the next window.



•Alarm list

Touch the alarm No. to check the alarm description and perform troubleshooting.

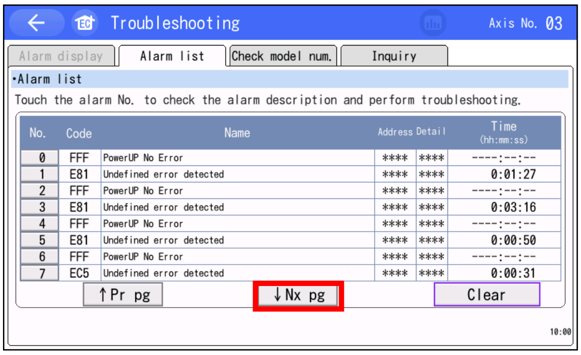
No.	Group	Name	Address	Code	Time (hh:mm:ss)
8					: :
9					: :
10					: :
11					: :
12					: :
13					: :
14					: :
15					: :

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, 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".

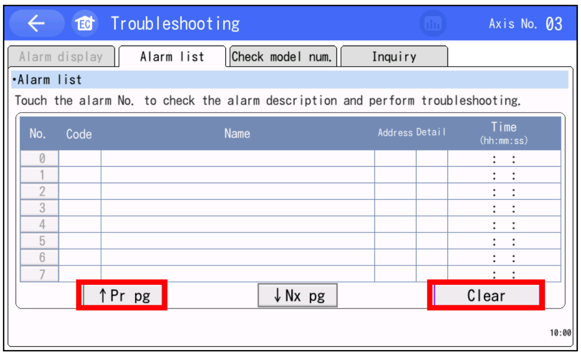


•Alarm list

Touch the alarm No. to check the alarm description and perform troubleshooting.

No.	Code	Name	Address	Detail	Time (hh:mm:ss)
0	FFF	PowerUP No Error	****	****	----:--:--
1	E81	Undefined error detected	****	****	0:01:27
2	FFF	PowerUP No Error	****	****	----:--:--
3	E81	Undefined error detected	****	****	0:03:16
4	FFF	PowerUP No Error	****	****	----:--:--
5	E81	Undefined error detected	****	****	0:00:50
6	FFF	PowerUP No Error	****	****	----:--:--
7	EC5	Undefined error detected	****	****	0:00:31

Touching ↓ Nx pg button displays the list of the next window.



•Alarm list

Touch the alarm No. to check the alarm description and perform troubleshooting.

No.	Code	Name	Address	Detail	Time (hh:mm:ss)
0					: :
1					: :
2					: :
3					: :
4					: :
5					: :
6					: :
7					: :

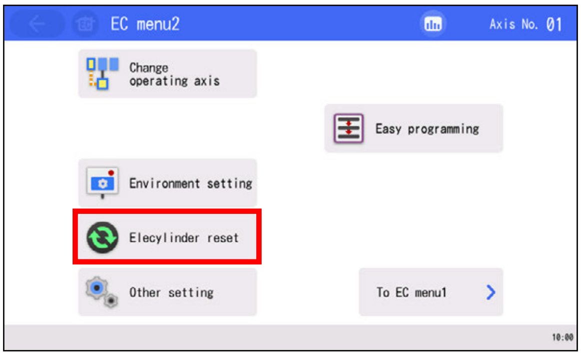
Touching ↑ Pr pg button displays the list of the previous window.

Touching Clear button clears all alarm details.

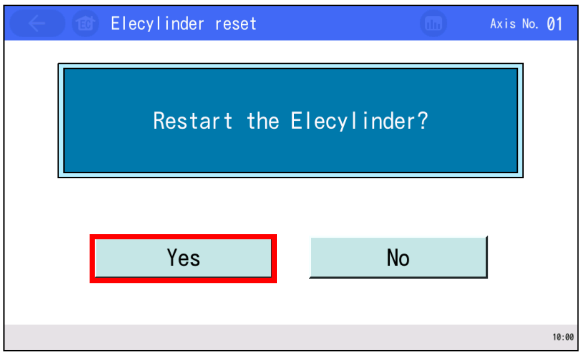
19.9 ELECYLINDER, ROBO PUMP Reset

ELECYLINDER or ROBO PUMP is restarted.

19.9.1 ELECYLINDER Reset



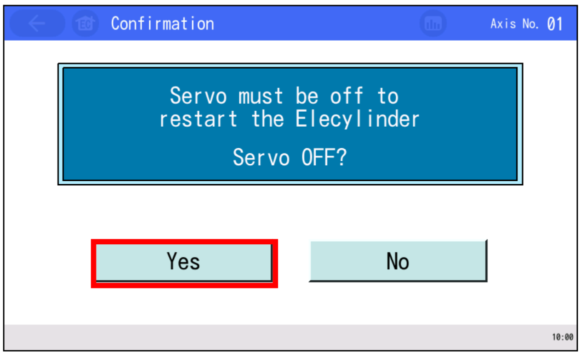
Touch Elecylinder reset button on the EC menu 2 window.



Restart the Elecylinder?

Touch Yes button.

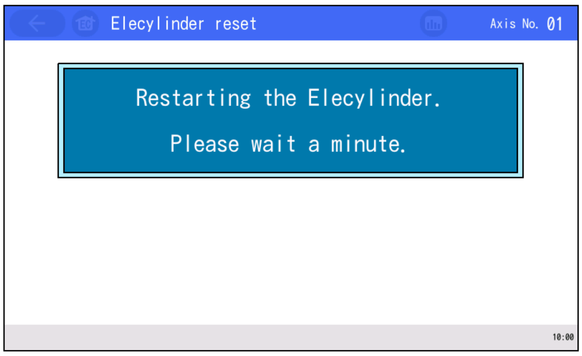
Touch No button to return to the EC menu 2 window without restarting.



Servo must be off to restart the Elecylinder
Servo OFF?

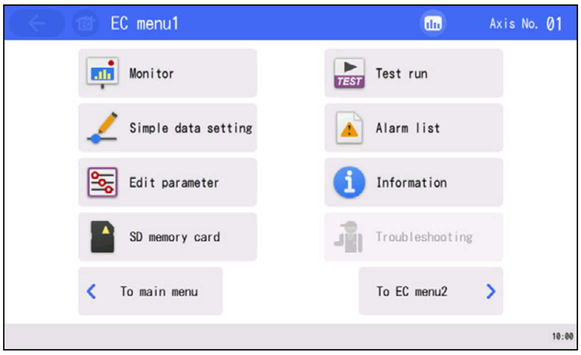
This window appears if the servo is ON.
Touch Yes button.

Touch No button to return to the EC menu 2 window without restarting.



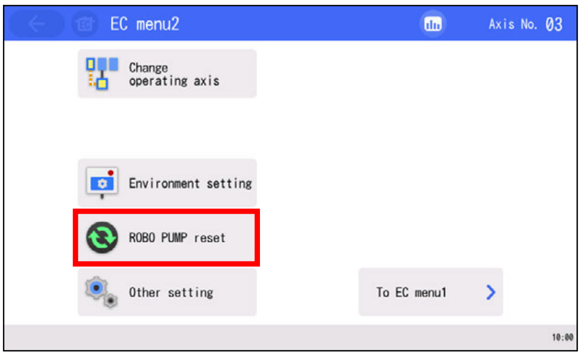
Restarting the Elecylinder.
Please wait a minute.

ELECYLINDER is restarted.

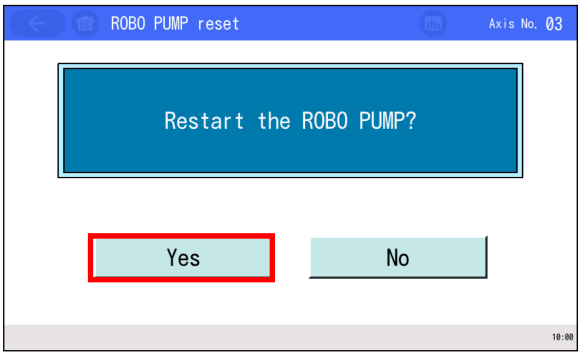


Returns to the EC menu 1 window.

19.9.2 ROBO PUMP Reset



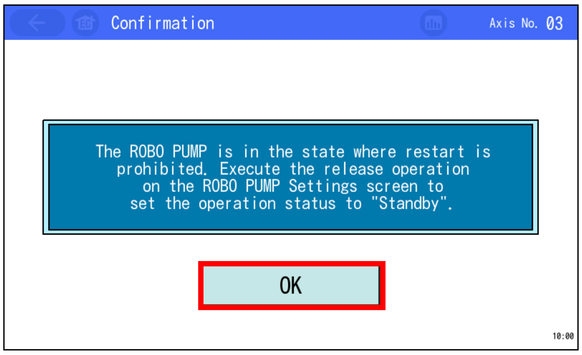
Touch ROBO PUMP reset button on the EC menu 2 window.



Restart the ROBO PUMP?

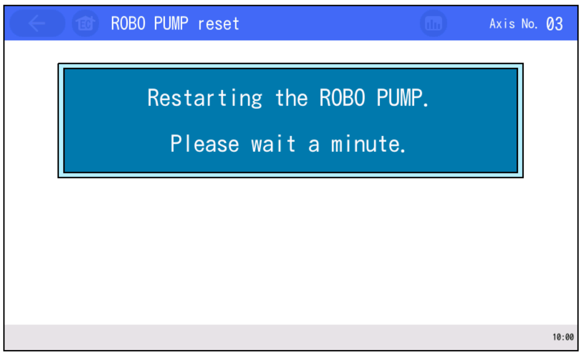
Touch Yes button.

Touch No button to return to the EC menu 2 window without restarting.



The ROBO PUMP is in the state where restart is prohibited. Execute the release operation on the ROBO PUMP Settings screen to set the operation status to "Standby".

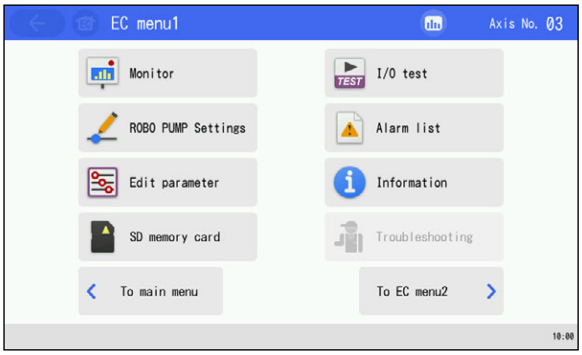
The reboot prohibited window should show up when reboot is conducted while ROBO PUMP is in suction or release.
Touch the OK button, and the screen goes to EC Menu 2 Window.



Restarting the ROBO PUMP.

Please wait a minute.

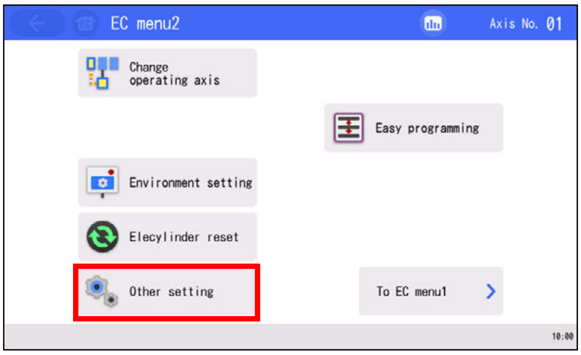
ROBO PUMP should get rebooted.



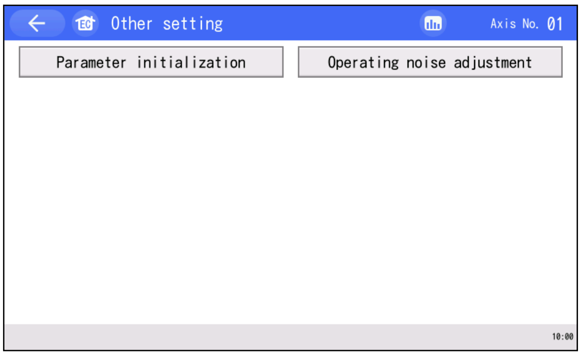
Returns to the EC menu 1 window.

19.10 Other Setting

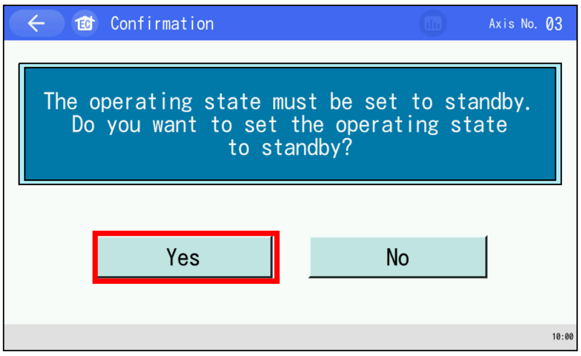
Parameter initialization and operation sound tuning should be conducted.
The displayed items may differ depending on models.



Touch Other setting button in EC menu 2 window.



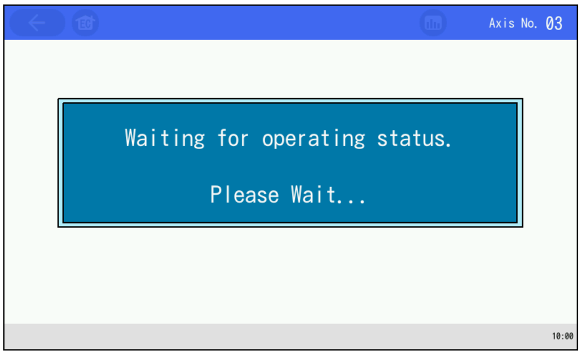
Other setting window opens.
For ROBO PUMP, the Parameter initialization button should be displayed.
Select one from Parameter initialization and Operating noise adjustment that you would like to carry on and touch the button.



The operating state must be set to standby.
Do you want to set the operating state to standby?

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.



Waiting for operating status.

Please Wait...

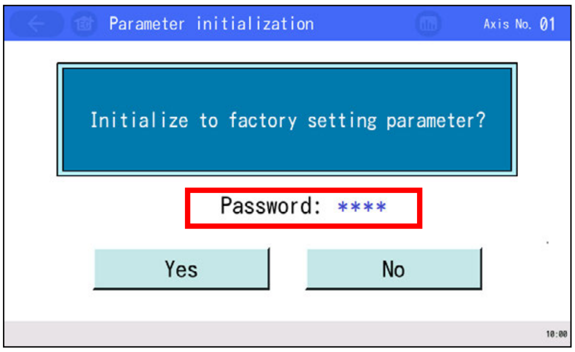
Make ROBO PUMP wait.
After it is completed, the screen goes to the Initialize Parameter window.

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.*

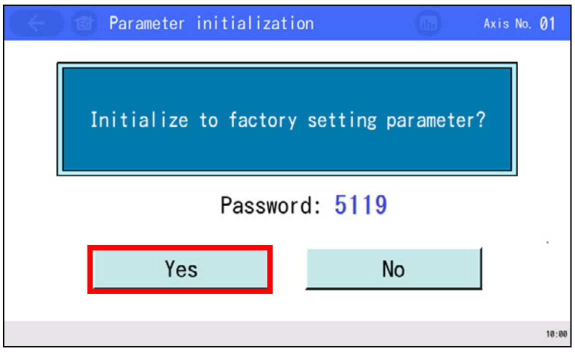
Touch Parameter initialization button in Other setting window to display Parameter initialization window.



Initialize to factory setting parameter?

Password: ****

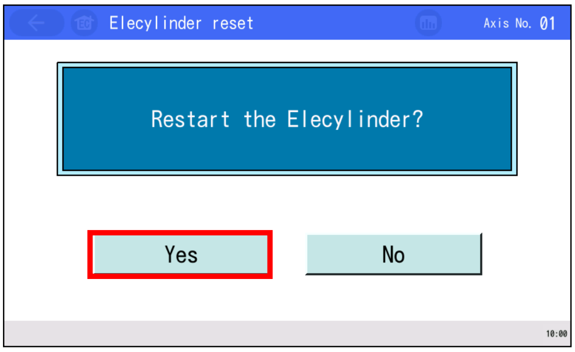
Touching "Password" displays the numerical keypad.
Input '5119' and touch ENT button.



Initialize to factory setting parameter?

Password: 5119

Touch Yes button, and the confirmation window for ELECYLINDER or ROBO PUMP reboot appears.



Restart the Elecylinder?

Touch Yes button.

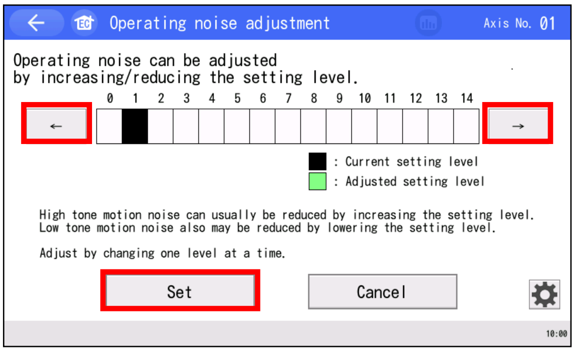
Touch No button, will not be rebooted and the screen returns to the previous.

> ⚠ *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



Operating noise can be adjusted
by increasing/reducing the setting level.

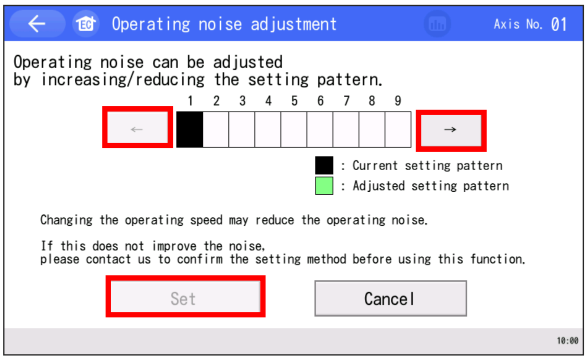
■ : Current setting level
🟩 : Adjusted setting level

High tone motion noise can usually be reduced by increasing the setting level.
Low tone motion noise also may be reduced by lowering the setting level.

Adjust by changing one level at a time.

Touch ← and → buttons on the right and left of the levels to adjust the level one by one to perform tuning.
617
Once the tuning is finished, touch Set button.

- When Models that Support Pattern Setting



Operating noise can be adjusted
by increasing/reducing the setting pattern.

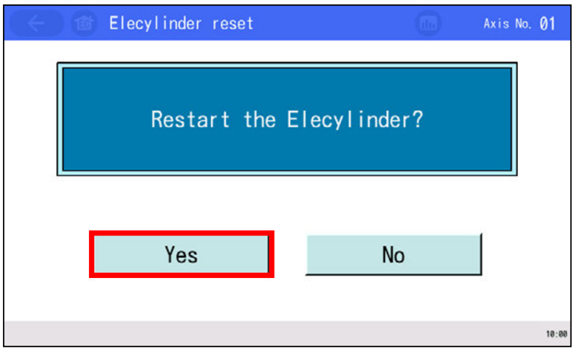
■ : Current setting pattern
🟩 : Adjusted setting pattern

Changing the operating speed may reduce the operating noise.

If this does not improve the noise,
please contact us to confirm the setting method before using this function.

Touch ← and → buttons on the right and left of the patterns to adjust the level one by one to perform tuning.

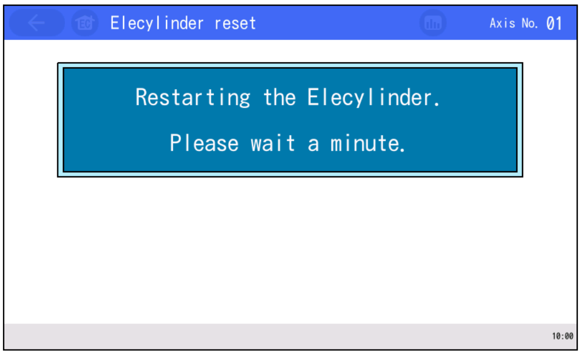
Once the tuning is finished, touch Set button.



Restart the Elecylinder?

Touch Yes button.

Touch No button and a reboot of ELECYLINDER would not be performed and the screen goes back to the previous window.



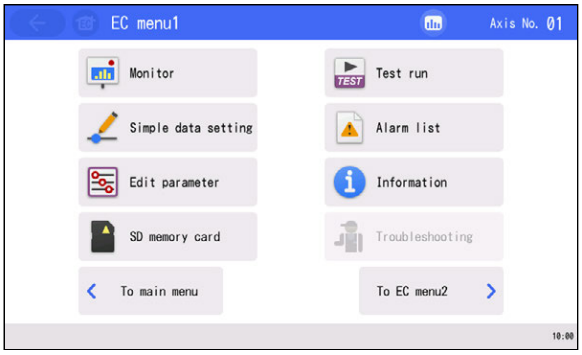
Elecylinder reset

Axis No. 01

Restarting the Elecylinder.
Please wait a minute.

10:00

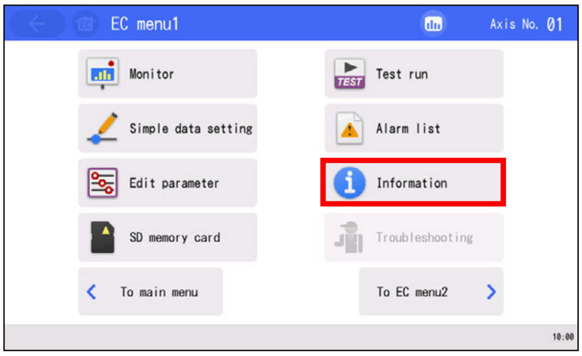
ELECYLINDER should be rebooted.



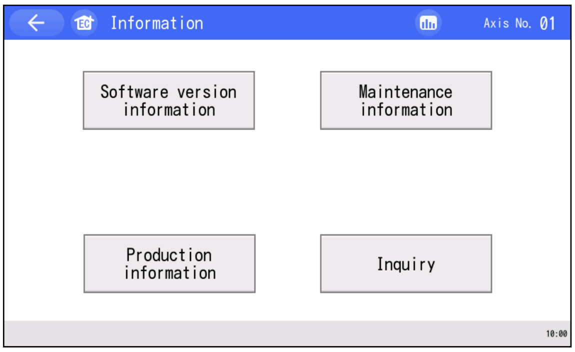
The screen goes back to EC menu 1 window.

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.

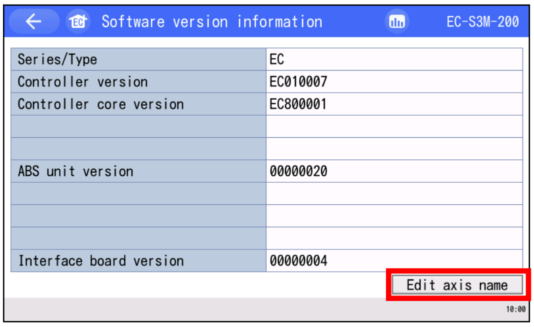
Touch a button of the feature that you would like to display such as Software version information.

19.11.1 Information Display Windows

19.11.1.1 Software Version Information

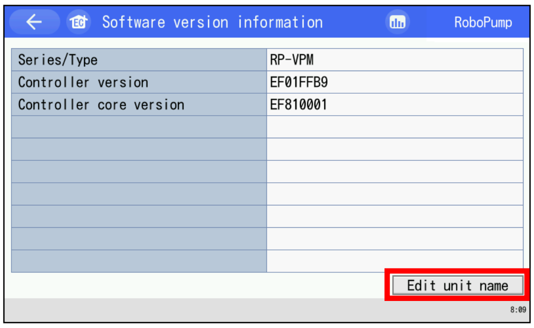
Touch Software version information button in Information menu window.
Software version information window opens.

ELECYLINDER window



Series/Type	EC
Controller version	EC010007
Controller core version	EC800001
ABS unit version	00000020
Interface board version	00000004

ROBO PUMP window

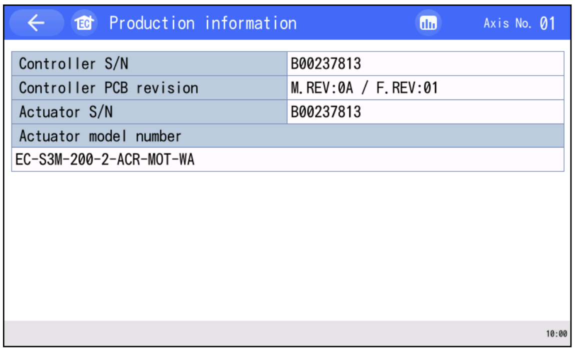


Series/Type	RP-VPM
Controller version	EF01FFB9
Controller core version	EF810001

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.

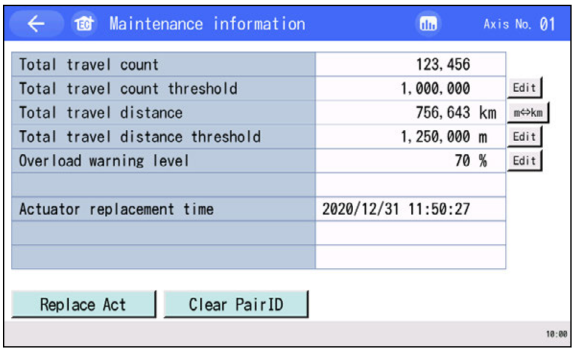


Controller S/N	B00237813
Controller PCB revision	M.REV:0A / F.REV:01
Actuator S/N	B00237813
Actuator model number	
EC-S3M-200-2-ACR-MOT-WA	

Production information window opens.

19.11.1.3 Maintenance Information

Touch Maintenance information button in Information menu window.

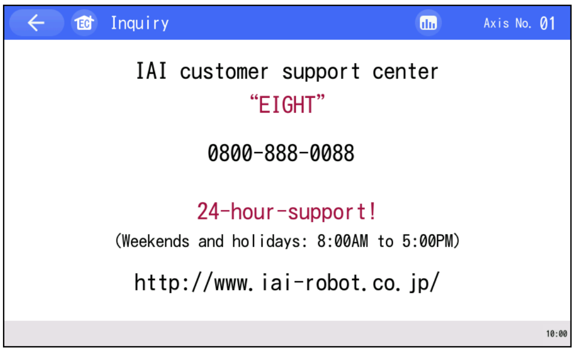


Total travel count	123,456	
Total travel count threshold	1,000,000	Edit
Total travel distance	756,643 km	m⇔km
Total travel distance threshold	1,250,000 m	Edit
Overload warning level	70 %	Edit
Actuator replacement time	2020/12/31 11:50:27	

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.



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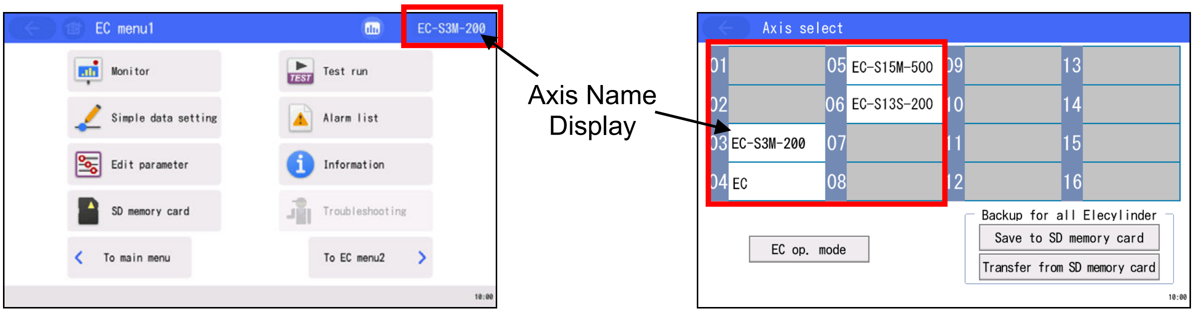
http://www.iai-robot.co.jp/

Inquiry window opens.

19.11.2 Editing Axis Name and Unit Name

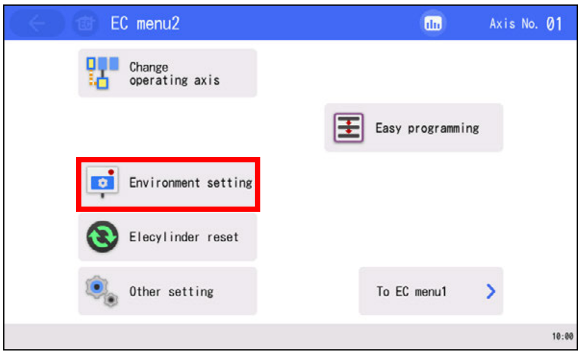
A name can be set on an axis. To show the axis name, select Axis Name at the axis name display section in the environment setting window.
Refer to [19.12 Environment Setting [Axis Name Display]]

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.

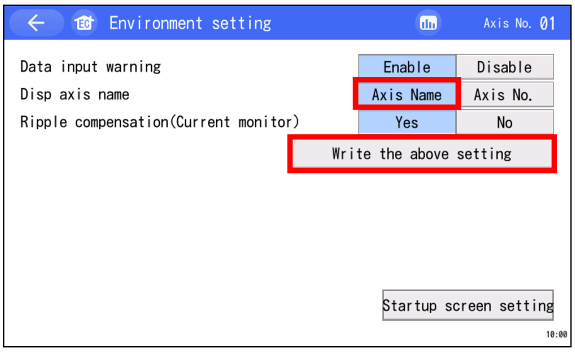


(Note) *The characters available to set in TB-03 are the half-size font characters and symbols. Use the PC software for input with full size characters.*

[Axis Name Edit Operation]

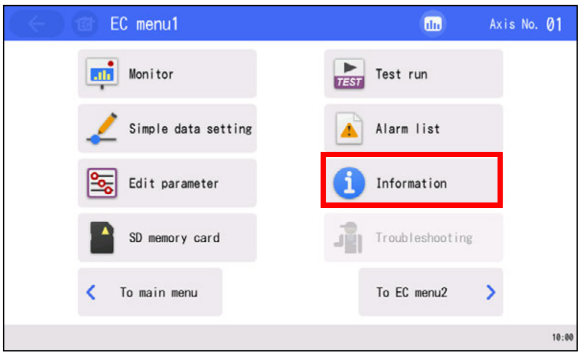


Touch Environment setting button on the EC menu 2 window.

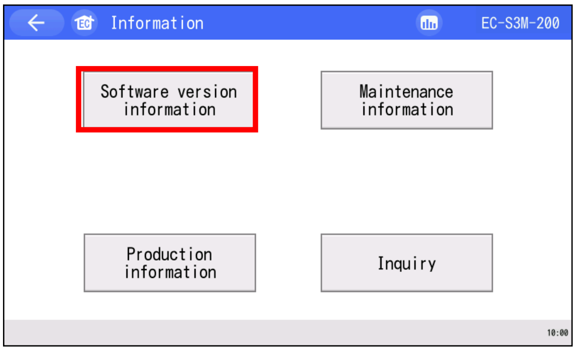


Data input warning Enable Disable
Disp axis name Axis Name Axis No.
Ripple compensation(Current monitor) Yes No

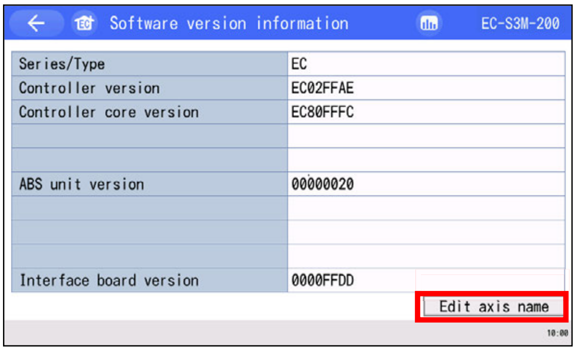
Touch the Axis Name button to switch the setting to the axis name, and then touch the Write the above setting button.
The setting will not be changed when you move to another screen without touching it.



Touch Information button on the EC menu 1 window.

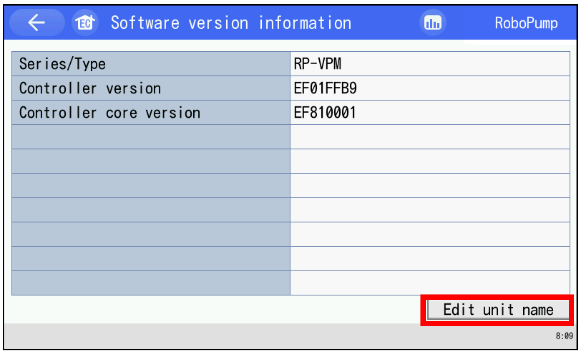


Information window opens.
Touch Software version information button.



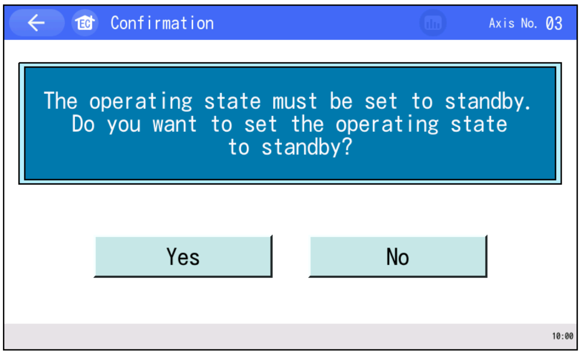
Series/Type	EC
Controller version	EC02FFAE
Controller core version	EC80FFFC
ABS unit version	00000020
Interface board version	0000FFDD

For ELECYLINDER, touch Edit axis name button.



Series/Type	RP-VPM
Controller version	EF01FFB9
Controller core version	EF810001

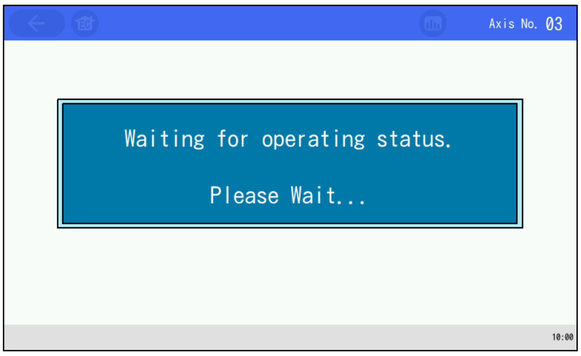
For ROBO PUMP, touch Edit unit name button.



The operating state must be set to standby.
Do you want to set the operating state to standby?

Touch the Edit Unit Name button during suction or release of ROBO PUMP, and the standby confirmation window should open.
Touch Yes button.

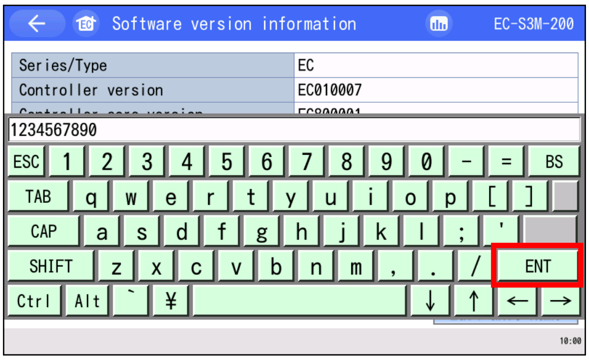
Touch the No button, and the screen goes to the software version information window without bringing ROBO PUMP to standby.



Waiting for operating status.

Please Wait...

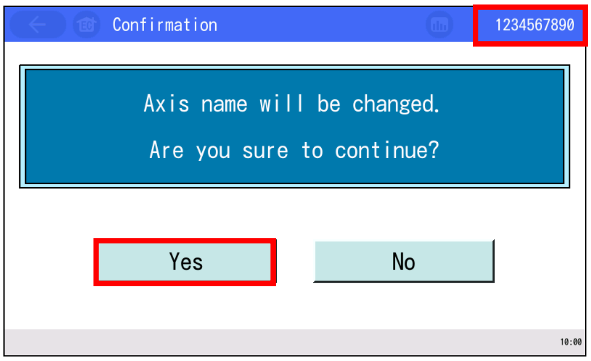
Make ROBO PUMP wait.


Software version information
EC-S3M-200
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
10:00

Series/Type	EC
Controller version	EC010007

1234567890

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.



Axis name will be changed.

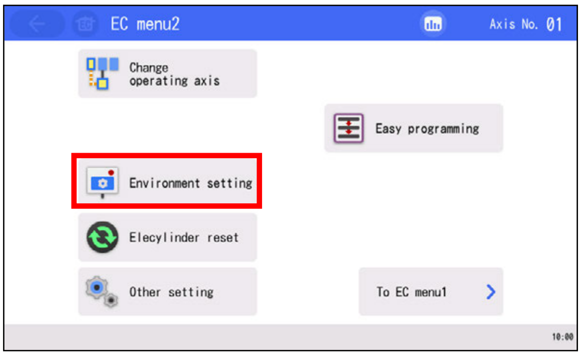
Are you sure to continue?

Displayed in the top right is the name of the axis. (Tentative setting condition)
Touch Yes button to confirm the setting.

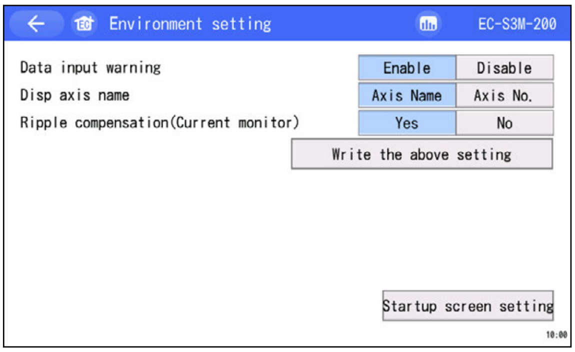
Touch the No button and the setting goes back to the one changed.

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 22].



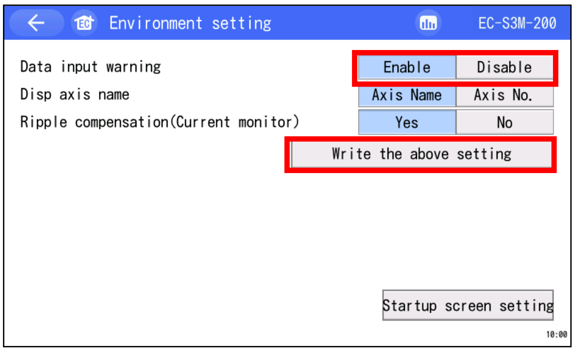
Touch Environment setting button on the EC menu 2 window.



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.

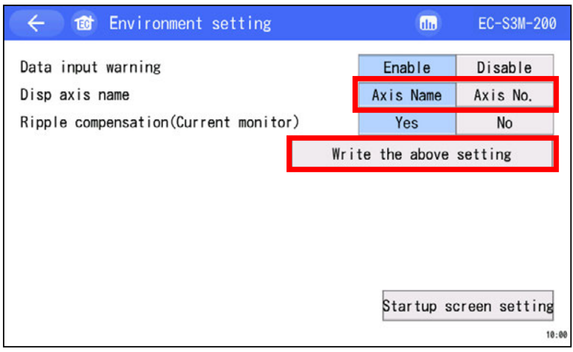


Touch Enable button to give the warning.
Touch Disable button not to give the warning.

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.



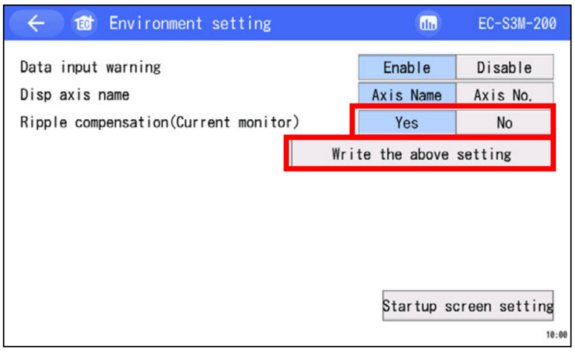
Touch Axis Name button and the name will be shown.
Touch Axis No. button and the number will be shown.

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.

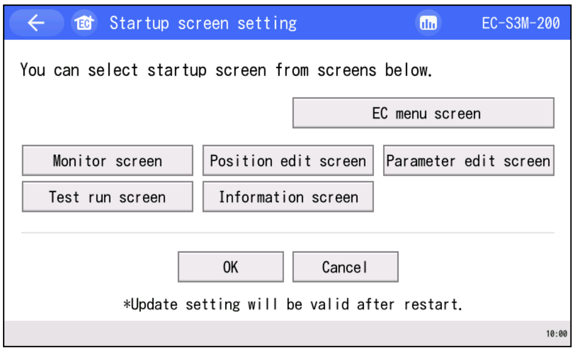


Touch Yes button and the setting should be established "with ripple compensation".
Touch No button and the setting should be established "without ripple compensation".

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.



You can select startup screen from screens below.

*Update setting will be valid after restart.

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)
- Parameters : prec(EC24V), prec2(EC200V), prrpv(RP)
- Alarm list : csv(EC24V, EC200V, RP)
- All data : bkec(EC24V), bkec2(EC200V), 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.

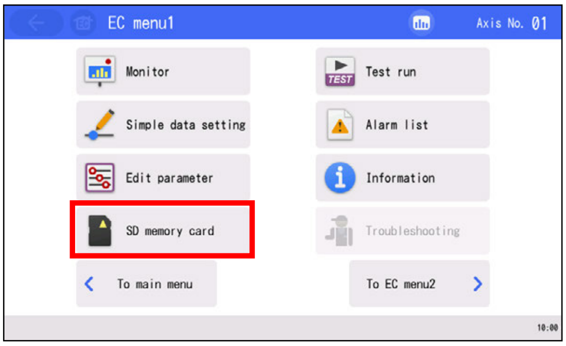
(Note) Files with Chinese names are not supported.

(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]

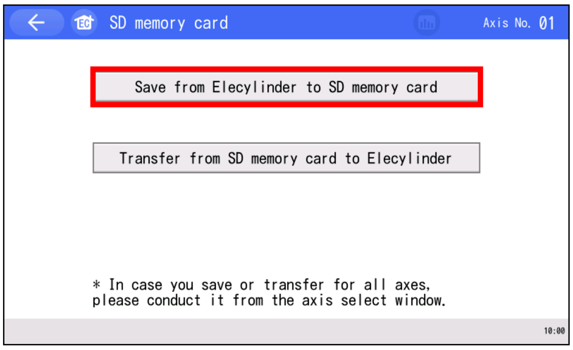
⚠ *Caution: For a Secure Digital memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, use FAT32 Format for the file system.*

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.

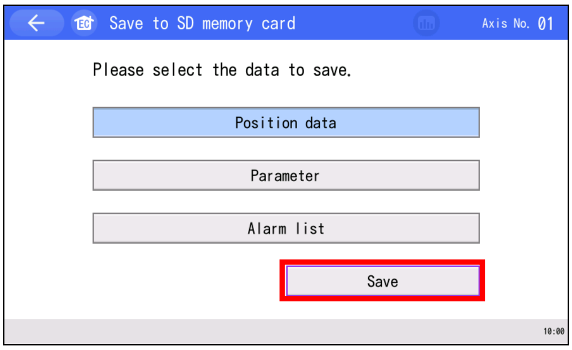


Touch SD memory card button in EC menu 1 window.


SD memory card
Axis No. 01
Save from Elecylinder to SD memory card
Transfer from SD memory card to Elecylinder
10:00

＊ In case you save or transfer for all axes, please conduct it from the axis select window.

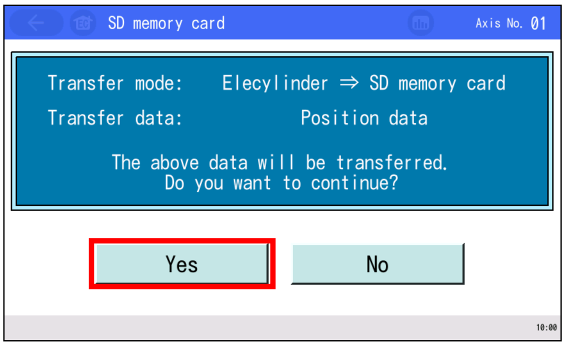
SD memory card window opens.
Touch Save from Elecylinder to SD memory card
or
Save from ROBO PUMP to SD memory card button.



Please select the data to save.

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.

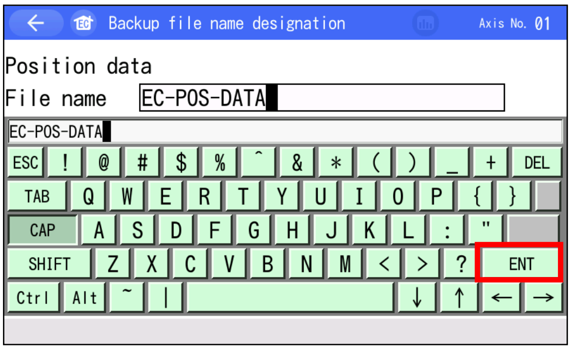


Transfer mode: Elecylinder ⇒ SD memory card
Transfer data: Position data

The above data will be transferred.
Do you want to continue?

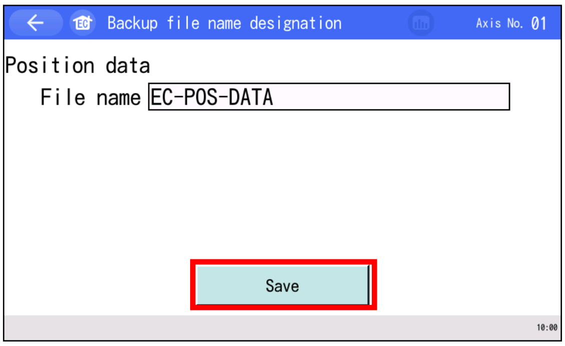
Touch Yes button.

Touch No button, and the screen returns to the previous window.


Backup file name designation
Axis No. 01
ESC ! @ # $ % ^ & * ( ) _ + DEL
TAB Q W E R T Y U I O P { }
CAP A S D F G H J K L : "
SHIFT Z X C V B N M < > ? ENT
Ctrl Alt ~ | ↓ ↑ ← →

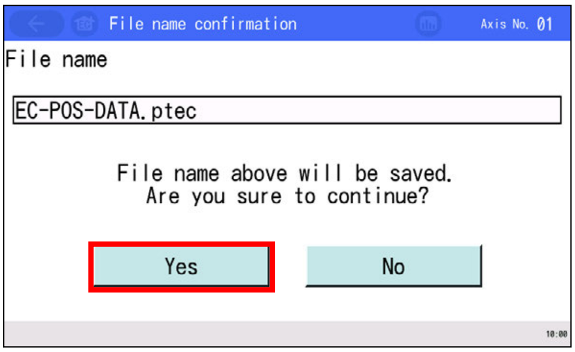
Position data
File name EC-POS-DATA

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.



Position data
File name EC-POS-DATA

Touch Save button.

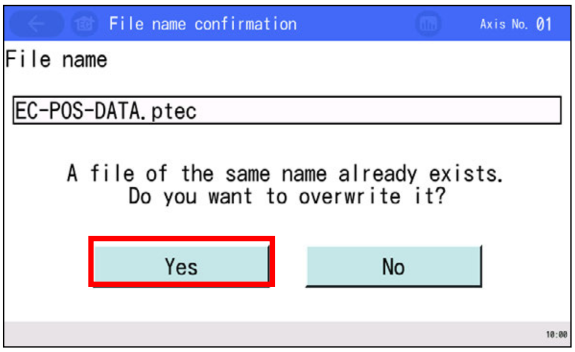


File name
EC-POS-DATA.ptec

File name above will be saved.
Are you sure to continue?

Touch Yes button in the file name confirmation window.

Touch the No button and the screen returns to the indicate backup file name window.



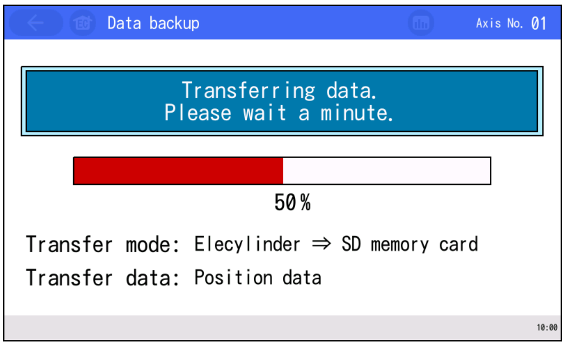
File name

EC-POS-DATA.ptec

A file of the same name already exists.
Do you want to overwrite it?

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.



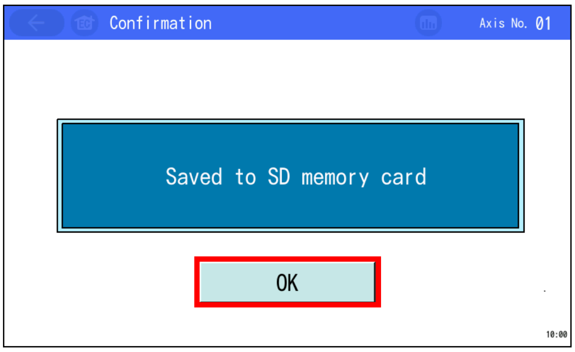
Transferring data.
Please wait a minute.

50%

Transfer mode: Elecylinder ⇒ SD memory card

Transfer data: Position data

Data transfer window will be shown.



Saved to SD memory card

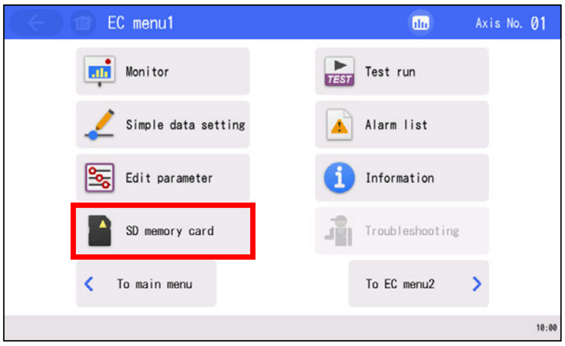
A message to tell the data transfer is complete pops up and the backup process is finished.

Touch OK button, and the screen returns to Save to SD memory card window.

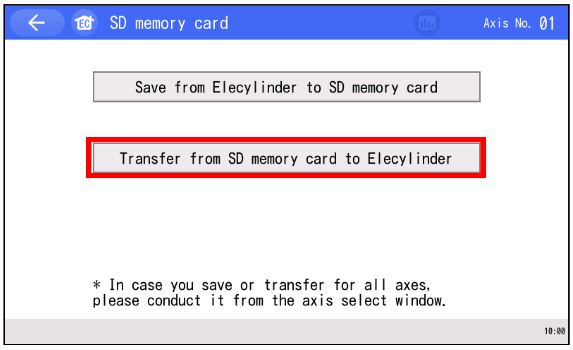
19.13.2 Restoring Individual Data

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

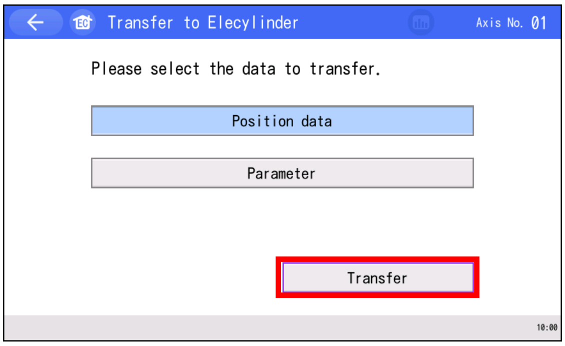


Touch SD memory card button in EC menu 1 window.


SD memory card
Axis No. 01
Save from Elecylinder to SD memory card
Transfer from SD memory card to Elecylinder
10:00

＊ In case you save or transfer for all axes, please conduct it from the axis select window.

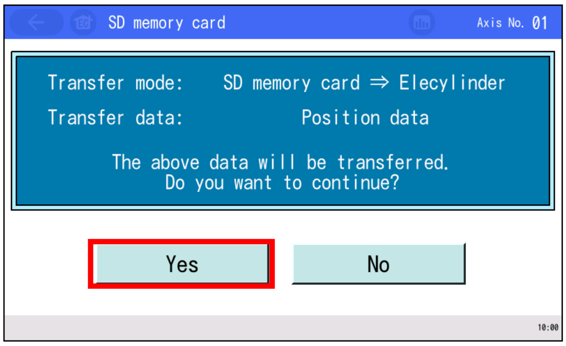
SD memory card window opens. Touch Transfer from SD memory card to Elecylinder button. (Valid only when EC operation mode is teaching mode)



Please select the data to transfer.

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.

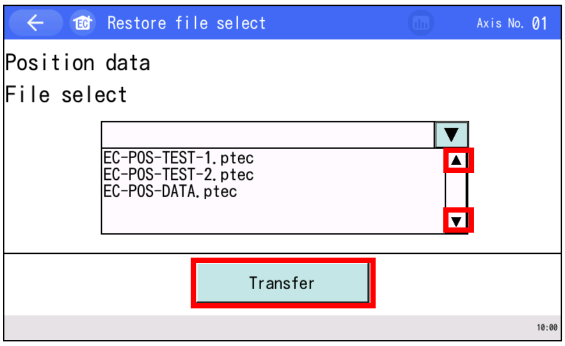


Transfer mode: SD memory card ⇒ Elecylinder
Transfer data: Position data

The above data will be transferred.
Do you want to continue?

Touch Yes button.

Touch the No button and the screen returns to the previous window.

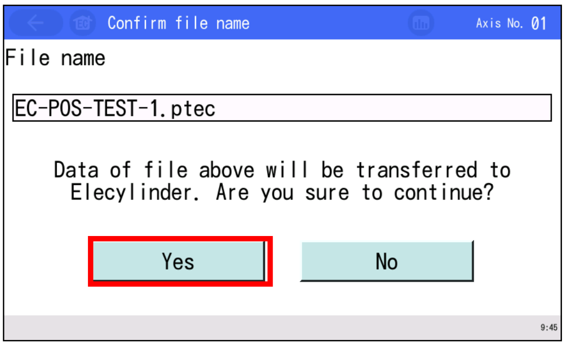


Position data
File select

EC-POS-TEST-1.ptec
EC-POS-TEST-2.ptec
EC-POS-DATA.ptec

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 or ROBO PUMP.

Touch Transfer button.

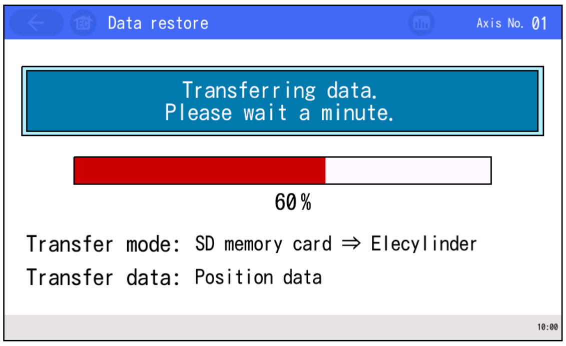


File name
EC-POS-TEST-1.ptec

Data of file above will be transferred to Elecylinder. Are you sure to continue?

Touch Yes button.

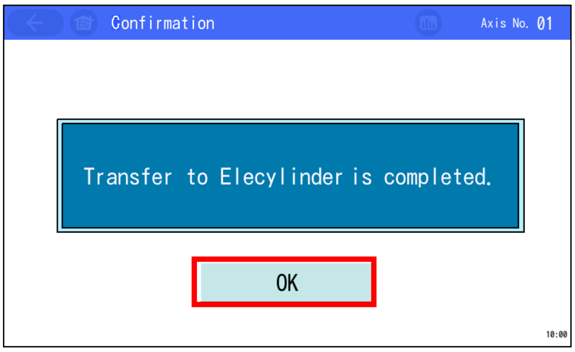
If No button is touched, the screen goes back to the previous one for the restore file select.



Transferring data.
Please wait a minute.

Transfer mode: SD memory card ⇒ Elecylinder
Transfer data: Position data

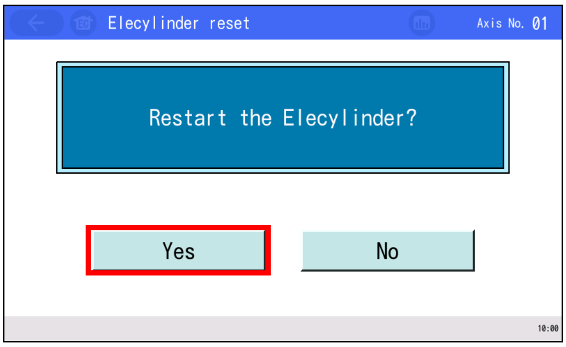
Data transfer window will be shown.



Transfer to Elecylinder is completed.

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

Touch OK button.

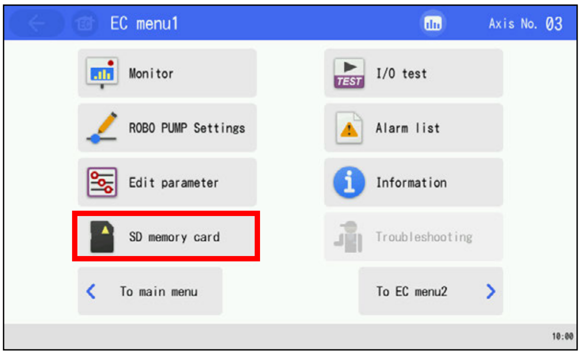


Restart the Elecylinder?

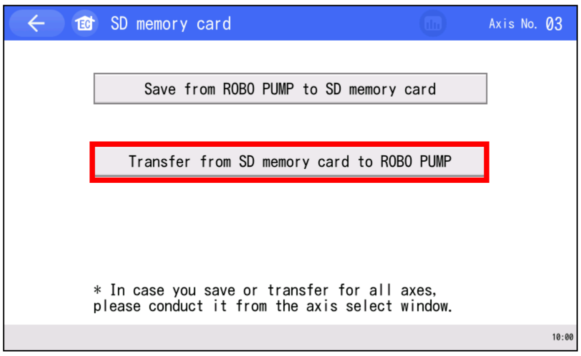
Touch Yes button to execute reboot.

(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

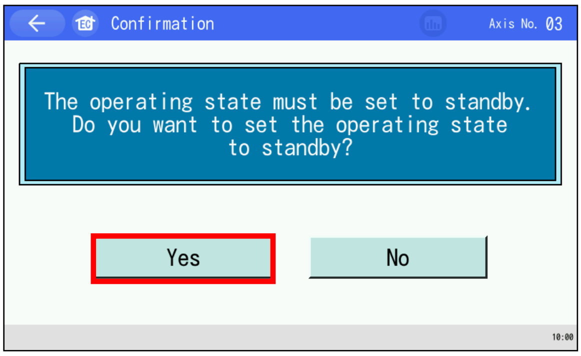


Touch SD memory card button in EC menu 1 window.


SD memory card
Axis No. 03
Save from ROBO PUMP to SD memory card
Transfer from SD memory card to ROBO PUMP
10:00

＊ In case you save or transfer for all axes, please conduct it from the axis select window.

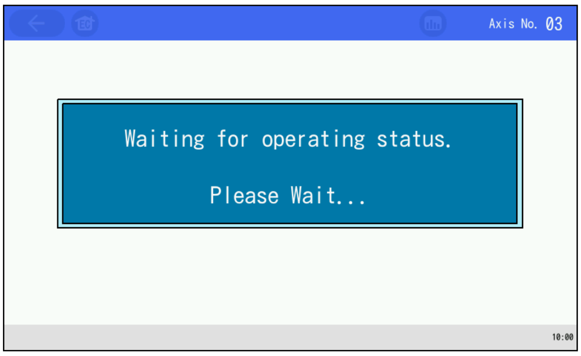
SD memory card window opens. Touch Transfer from SD memory card to ROBO PUMP button. (Valid only when EC operation mode is teaching mode)



The operating state must be set to standby.
Do you want to set the operating state to standby?

Touch the SD memory card button during suction or release of ROBO PUMP, and the standby confirmation window should open.
Touch Yes button.

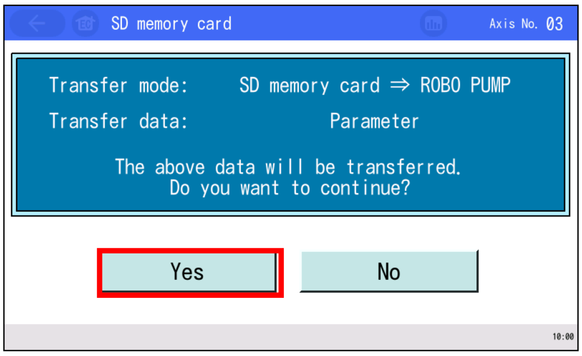
Touch the No button, and the screen goes back to the Secure Digital Memory Card window without making ROBO PUMP wait.



Waiting for operating status.

Please Wait...

Make ROBO PUMP wait.



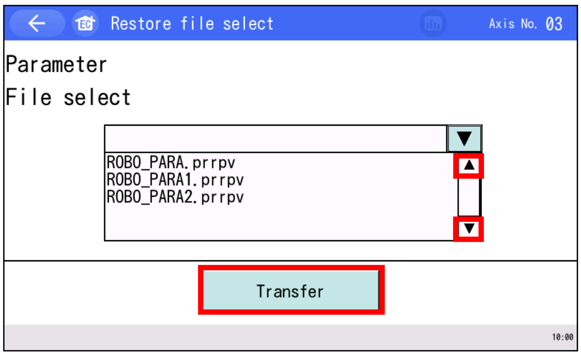
Transfer mode: SD memory card ⇒ ROBO PUMP

Transfer data: Parameter

The above data will be transferred.
Do you want to continue?

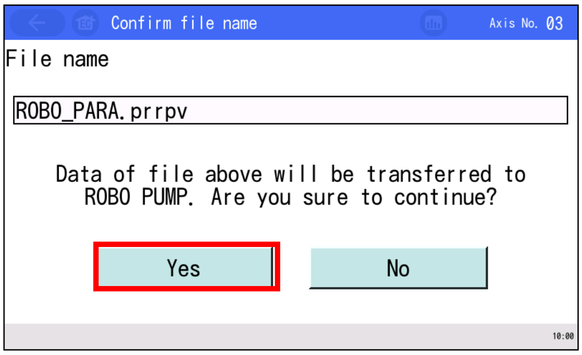
Touch Yes button.

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.



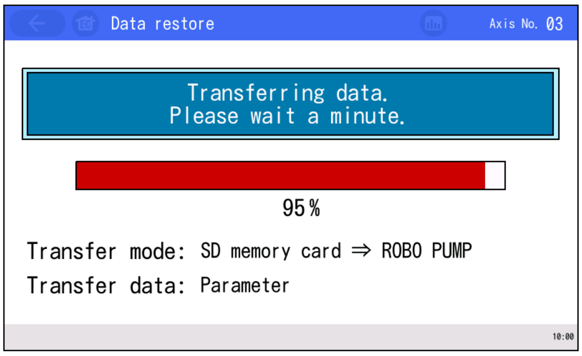
File name

ROBO_PARA.prrpv

Data of file above will be transferred to
ROBO PUMP. Are you sure to continue?

Touch Yes button.

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

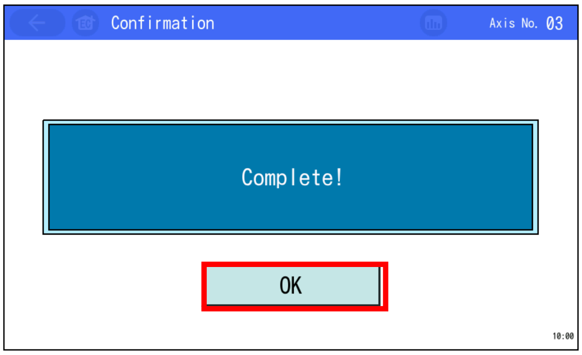


Transferring data.
Please wait a minute.

Transfer mode: SD memory card ⇒ ROBO PUMP

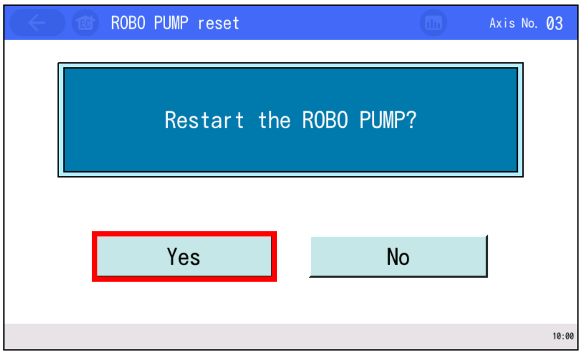
Transfer data: Parameter

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.

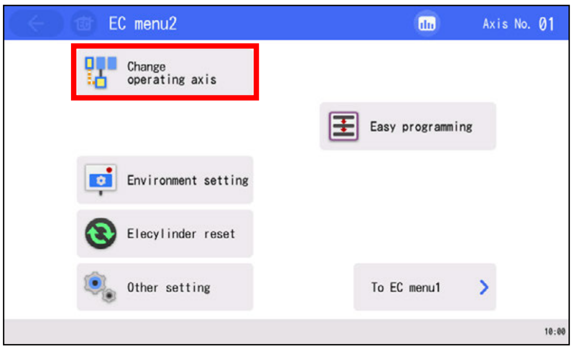


Touch Yes button to execute reboot.

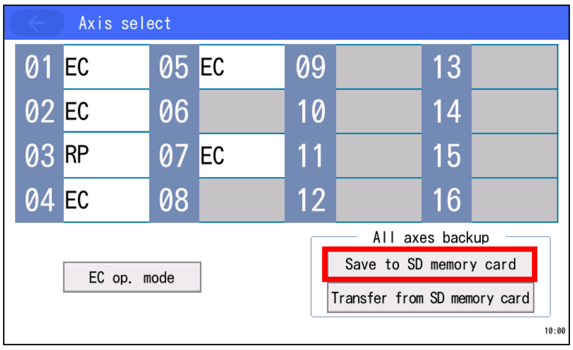
(Note) Reboot screen will not appear if there is no difference between the data in ROBO PUMP and the data that was read out.

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.

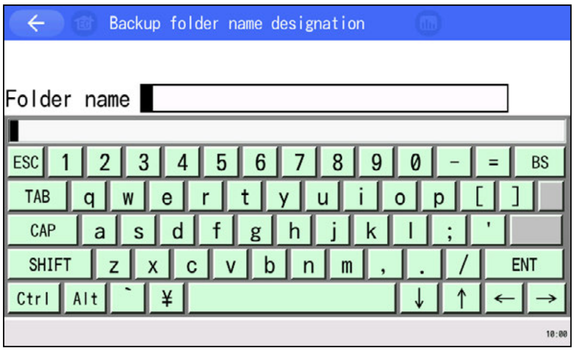


Touch Change operating axis button in EC menu 2 window.

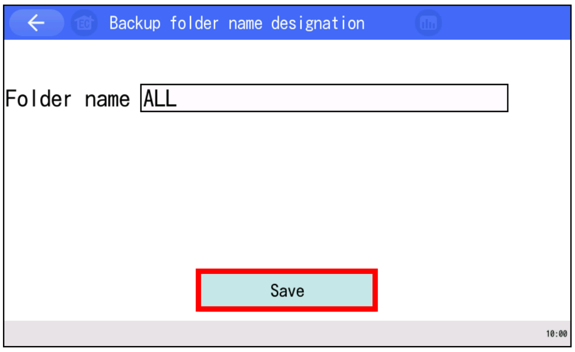


01	EC	05	EC	09		13	
02	EC	06		10		14	
03	RP	07	EC	11		15	
04	EC	08		12		16	

Axis select window opens.
Touch Save to SD memory card button.

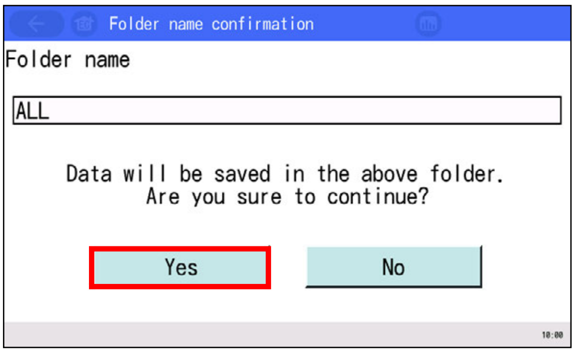

Backup folder name designation
Folder name
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
10:00

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.



Folder name ALL

Touch Save button.



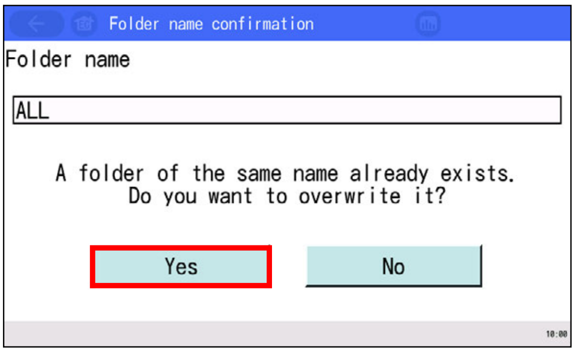
Folder name

ALL

Data will be saved in the above folder.
Are you sure to continue?

Touch Yes button.

Touch the No button and the screen returns to the indicate backup folder name window.



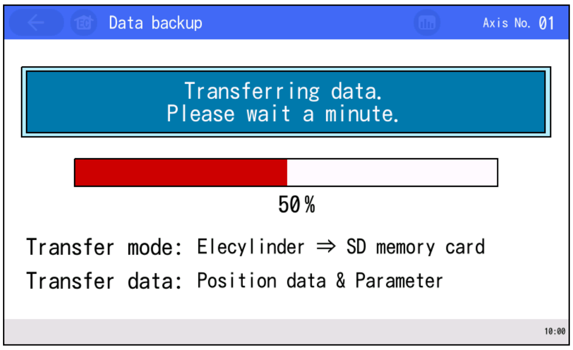
Folder name

ALL

A folder of the same name already exists.
Do you want to overwrite it?

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.



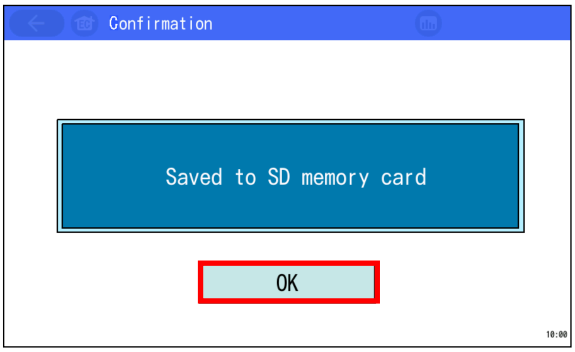
Transferring data.
Please wait a minute.

50％

Transfer mode: Elecylinder ⇒ SD memory card

Transfer data: Position data & Parameter

Data transfer window will be shown.



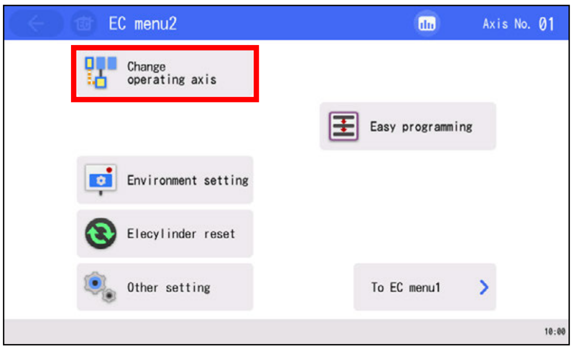
Saved to SD memory card

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

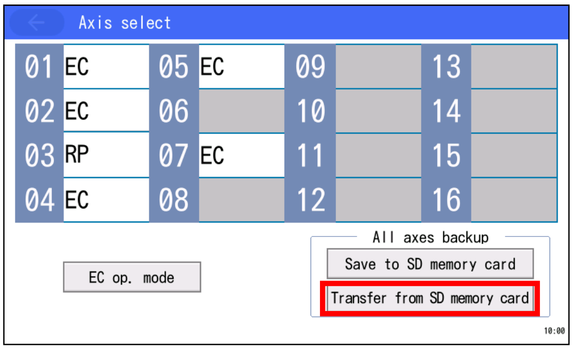
Touch OK button, and the screen returns to axis select window.

19.13.4 Restoring of All at Once for All Axes Data

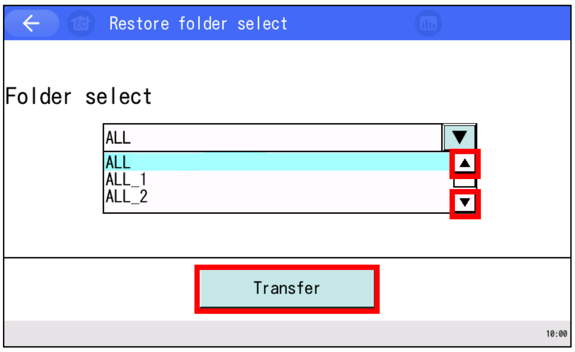
Restoring should be made by transferring ELECYLINDER or ROBO PUMP data for all axes from a Secure Digital memory card.



Touch Change operating axis button in EC menu 2 window.

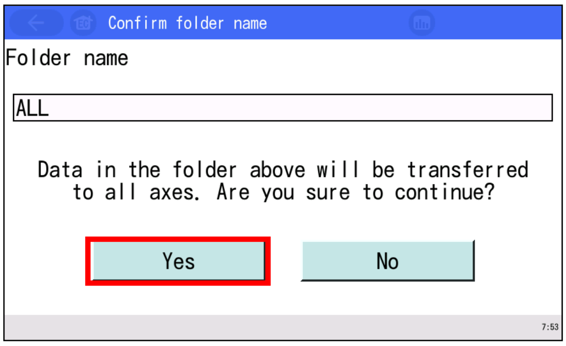


Axis select window opens.
Touch Transfer from SD memory card button.
(Valid only when EC operation mode is teaching mode)



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.



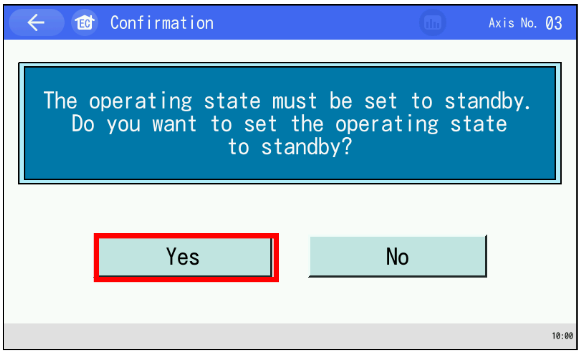
Folder name

ALL

Data in the folder above will be transferred to all axes. Are you sure to continue?

Touch Yes button.

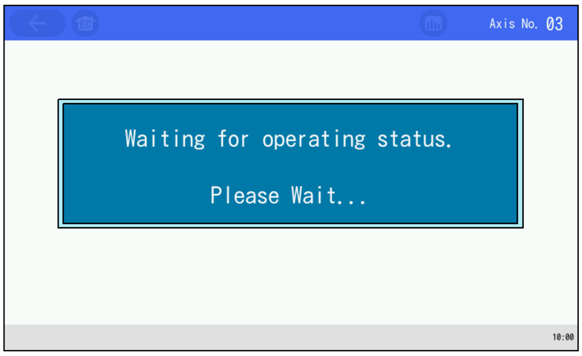
If No button is touched, the screen goes back to the previous for the restore file select.



The operating state must be set to standby.
Do you want to set the operating state to standby?

Touch the [Yes] button during suction or release of ROBO PUMP, and the standby confirmation window should appear.
Touch Yes button.

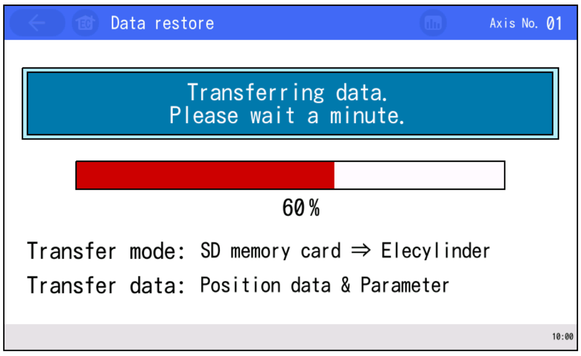
Touch the No button, and the screen goes back to the previous without making ROBO PUMP wait.



Waiting for operating status.

Please Wait...

Make ROBO PUMP wait.

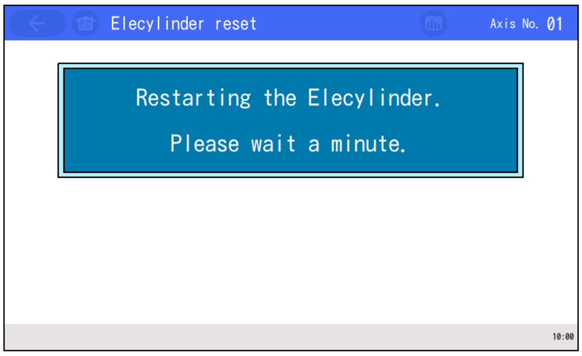


Transferring data.
Please wait a minute.

Transfer mode: SD memory card ⇒ Elecylinder

Transfer data: Position data & Parameter

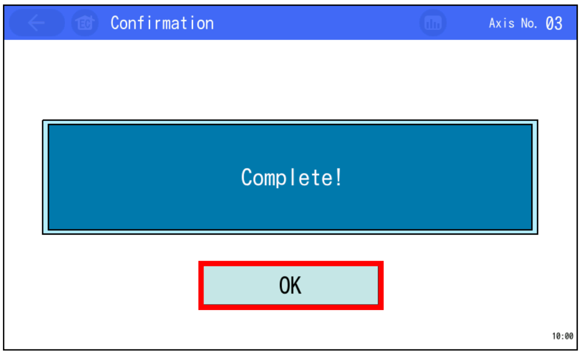
Data transfer screen will be shown.



Restarting the Elecylinder.

Please wait a minute.

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.

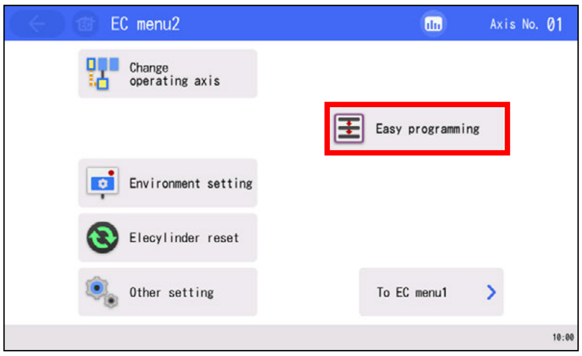
Touch OK button, and the screen returns to axis select window.

19.14 Easy Programming

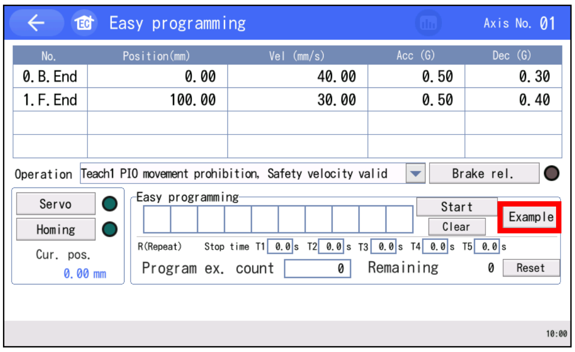
In the easy programming, pause duration can be set between sets of operations and continuous operation can be performed by indicating the number of repeating times.

[How to Establish Setting]

Set the position number (0: backward end, 1: forward end) 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.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation Teach1 PIO movement prohibition, Safety velocity valid

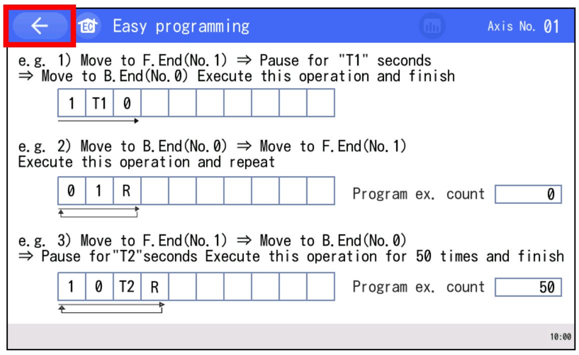
Cur. pos. 0.00 mm

Easy programming

R(Repeat) Stop time T1 0.0 s T2 0.0 s T3 0.0 s T4 0.0 s T5 0.0 s

Program ex. count 0 Remaining 0

Easy programming window opens.
Touch Example button and examples for how to construct a program are displayed.



e.g. 1) Move to F.End(No.1) ⇒ Pause for "T1" seconds
⇒ Move to B.End(No.0) Execute this operation and finish

| 1 | T1 | 0 |

e.g. 2) Move to B.End(No.0) ⇒ Move to F.End(No.1)
Execute this operation and repeat

| 0 | 1 | R |

Program ex. count 0

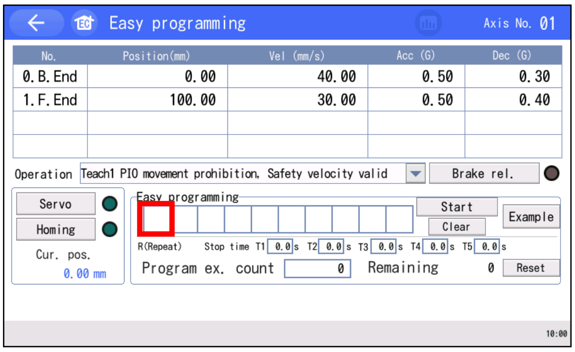
e.g. 3) Move to F.End(No.1) ⇒ Move to B.End(No.0)
⇒ Pause for"T2"seconds Execute this operation for 50 times and finish

| 1 | 0 | T2 | R |

Program ex. count 50

Touch ← to return to the previous window.
Take this as a reference when constructing an Easy programming.

[Driving Easy Programming]



Easy programming   Axis No. 01

No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

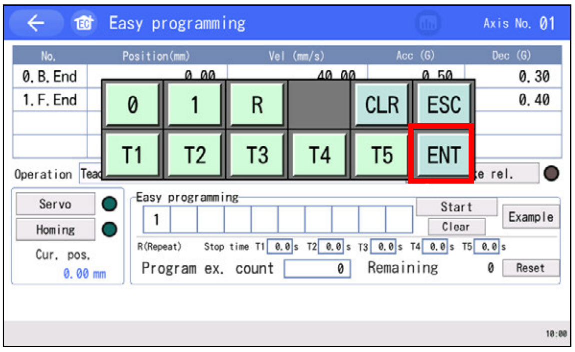
Operation: Teach1 PIO movement prohibition, Safety velocity valid

Cur. pos. 0.00 mm

Stop time T1 0.0 s T2 0.0 s T3 0.0 s T4 0.0 s T5 0.0 s

Program ex. count 0   Remaining 0

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



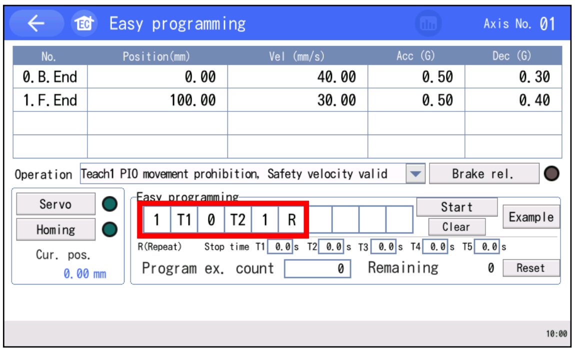
Easy programming   Axis No. 01

Easy programming: 1

Stop time T1 0.0 s T2 0.0 s T3 0.0 s T4 0.0 s T5 0.0 s

Program ex. count 0   Remaining 0

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



Easy programming   Axis No. 01

No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation: Teach1 PIO movement prohibition, Safety velocity valid

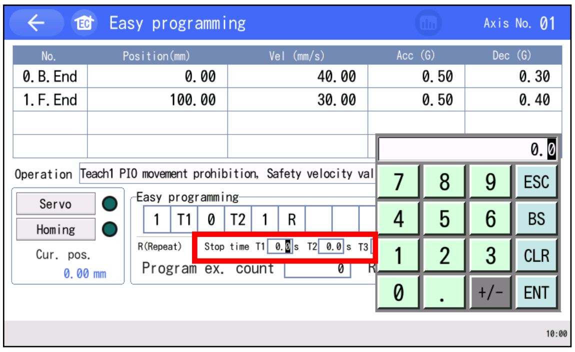
Cur. pos. 0.00 mm

Easy programming: 1 T1 0 T2 1 R

Stop time T1 0.0 s T2 0.0 s T3 0.0 s T4 0.0 s T5 0.0 s

Program ex. count 0   Remaining 0

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



Easy programming   Axis No. 01

No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation: Teach1 PIO movement prohibition, Safety velocity val

Cur. pos. 0.00 mm

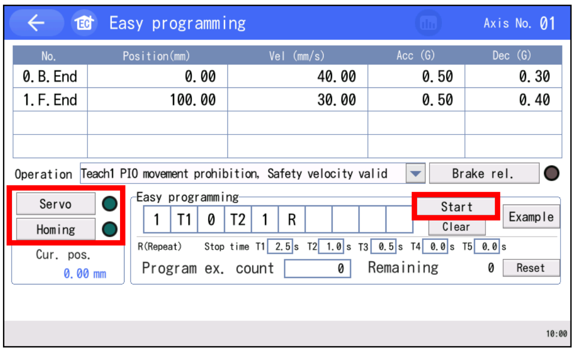
Easy programming: 1 T1 0 T2 1 R

Stop time T1 0.0 s T2 0.0 s T3

Program ex. count 0

0.0

Use a timer (T1 to T5) if you would like to set a stop time. Touch a timer and input in the numeric keys.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation Teach1 PIO movement prohibition, Safety velocity valid

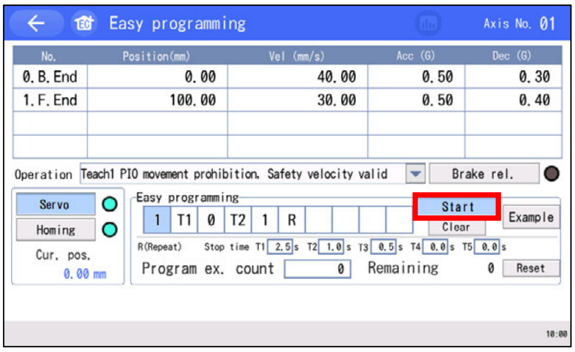
Easy programming: 1 T1 0 T2 1 R

R(Repeat) Stop time T1 2.5 s T2 1.0 s T3 0.5 s T4 0.0 s T5 0.0 s

Program ex. count 0 Remaining 0

Cur. pos. 0.00 mm

Have the servo ON and the home-return conducted, and then touch Start button to start the operation.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation Teach1 PIO movement prohibition, Safety velocity valid

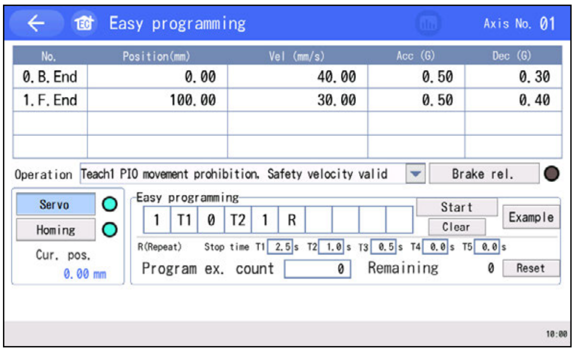
Easy programming: 1 T1 0 T2 1 R

R(Repeat) Stop time T1 2.5 s T2 1.0 s T3 0.5 s T4 0.0 s T5 0.0 s

Program ex. count 0 Remaining 0

Cur. pos. 0.00 mm

During the operation, the Start button and the step number in execution turn to blue.
To stop operation, touch the Start button again.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation Teach1 PIO movement prohibition, Safety velocity valid

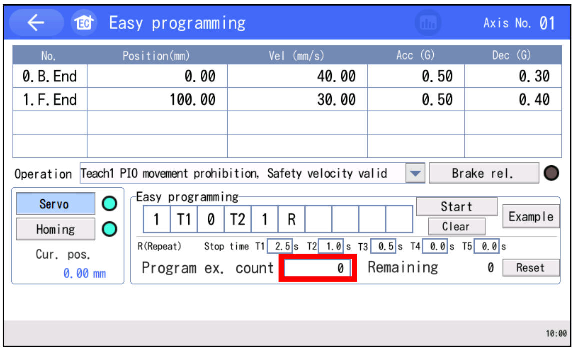
Easy programming: 1 T1 0 T2 1 R

R(Repeat) Stop time T1 2.5 s T2 1.0 s T3 0.5 s T4 0.0 s T5 0.0 s

Program ex. count 0 Remaining 0

Cur. pos. 0.00 mm

Operation stops.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation Teach1 PIO movement prohibition, Safety velocity valid

Easy programming: 1 T1 0 T2 1 R

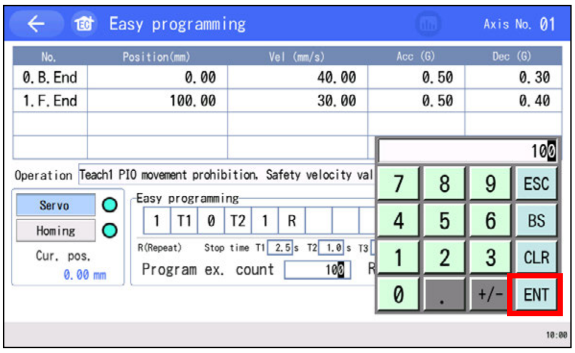
R(Repeat) Stop time T1 2.5 s T2 1.0 s T3 0.5 s T4 0.0 s T5 0.0 s

Program ex. count 0 Remaining 0

Cur. pos. 0.00 mm

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.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

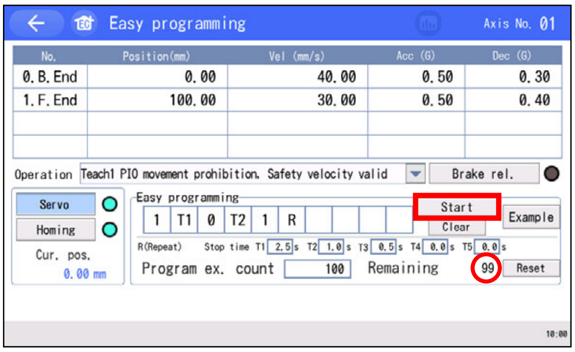
Operation Teach1 PIO movement prohibition. Safety velocity val

Easy programming 1 T1 0 T2 1 R

R(Repeat) Stop time T1 2.5 s T2 1.0 s T3

Program ex. count 100

Touch the Start button to start operation.
The repeating remaining count should be displayed and will count down as 100 → 99 → 98 → · · · · .



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

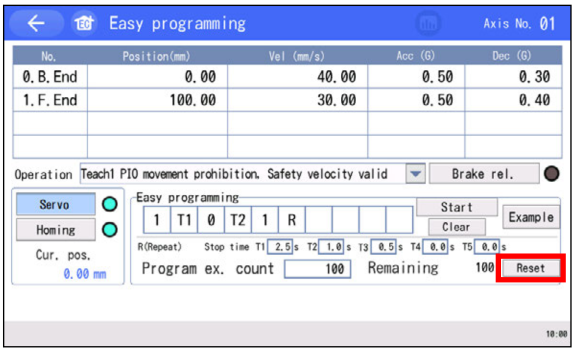
Operation Teach1 PIO movement prohibition. Safety velocity valid

Easy programming 1 T1 0 T2 1 R

R(Repeat) Stop time T1 2.5 s T2 1.0 s T3 0.5 s T4 0.0 s T5 0.0 s

Program ex. count 100 Remaining 99

Touch the Reset button and the remaining count should return to the program execution count.



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

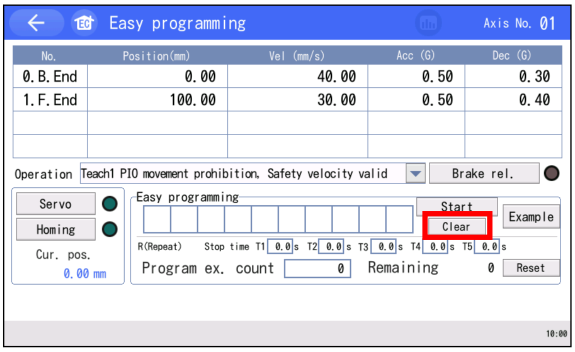
Operation Teach1 PIO movement prohibition. Safety velocity valid

Easy programming 1 T1 0 T2 1 R

R(Repeat) Stop time T1 2.5 s T2 1.0 s T3 0.5 s T4 0.0 s T5 0.0 s

Program ex. count 100 Remaining 100

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



No.	Position(mm)	Vel (mm/s)	Acc (G)	Dec (G)
0.B.End	0.00	40.00	0.50	0.30
1.F.End	100.00	30.00	0.50	0.40

Operation Teach1 PIO movement prohibition. Safety velocity valid

R(Repeat) Stop time T1 0.0 s T2 0.0 s T3 0.0 s T4 0.0 s T5 0.0 s

Program ex. count 0 Remaining 0

(Note) An Easy programming cannot be saved.

20. Data Backup

Data is transferred between the SD Memory Card in the 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
- Extended Motion Position
- Driver unit parameter

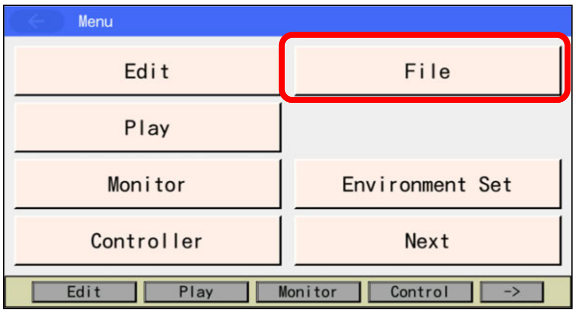
[Compatibility of Stored Data]
- The extensions of the data to be stored in a SD Memory Card are the same as those handled in the PC software for XSEL, thus there is compatibility.
  The extension of the position data for XSEL-K for example is ".xpt".
  (Refer to [List of Supported Models] in PC Software 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.

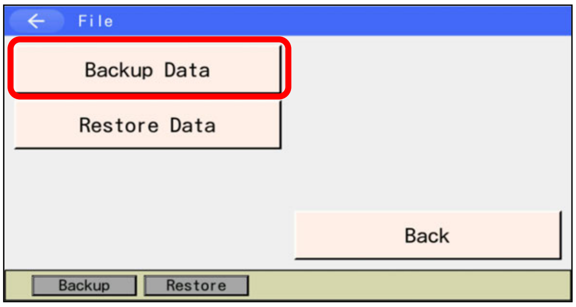
Data Type	Directory
Position	\TB_SEL\Position\File Name
Program (individual)	\TB_SEL\Program\File Name
Program (total)	\TB_SEL\ProgramAll\File Name
Symbol	\TB_SEL\Symbol\File Name
Parameter	\TB_SEL\Parameter\File Name
All data backup	\TB_SEL\Backup\File Name
Global data	\TB_SEL\Global\File Name
Error 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

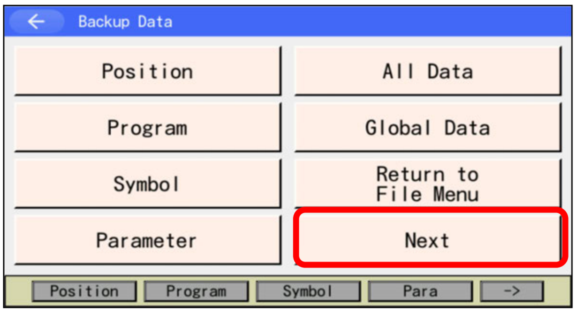
The data in the controller is transferred to the SD Memory Card for backup.



Touch File button in the menu screen.



Touch Backup Data button in the file menu screen.



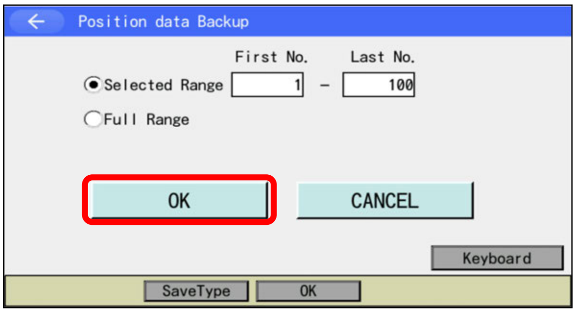
Select the data type that you want to store by touching the appropriate button.
Touch Next button and the data types displayed in the screen will be switched.

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

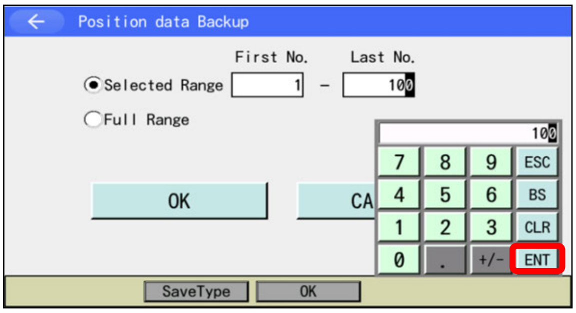


● Selected Range 1 – 100
○ Full Range

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".

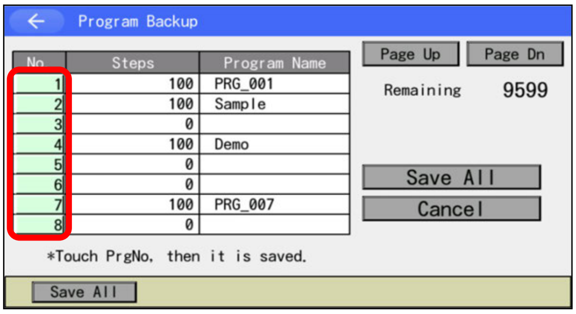


● Selected Range 1 – 100
○ Full Range

100

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



No	Steps	Program Name
1	100	PRG_001
2	100	Sample
3	0	
4	100	Demo
5	0	
6	0	
7	100	PRG_007
8	0	

Remaining 9599

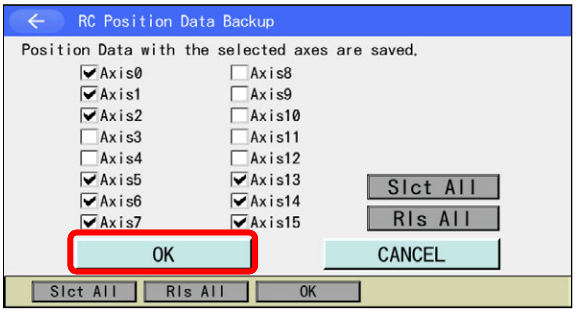
*Touch PrgNo, then it is saved.

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



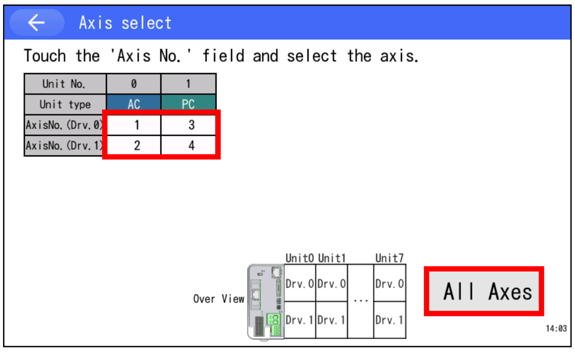
Position Data with the selected axes are saved.

☑ Axis0
☑ Axis1
☑ Axis2
☐ Axis3
☐ Axis4
☑ Axis5
☑ Axis6
☑ Axis7
☐ Axis8
☐ Axis9
☐ Axis10
☐ Axis11
☐ Axis12
☑ Axis13
☑ Axis14
☑ Axis15

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



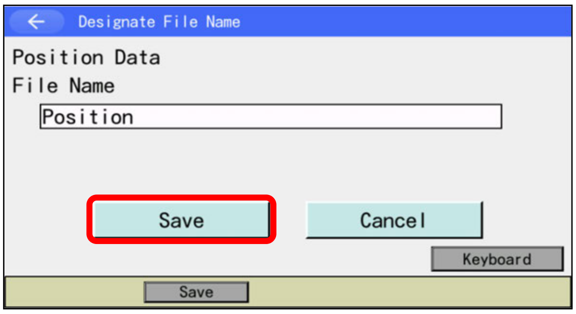
Touch the 'Axis No.' field and select the axis.

Unit No.	0	1
Unit type	AC	PC
AxisNo.(Drv.0)	1	3
AxisNo.(Drv.1)	2	4

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.)

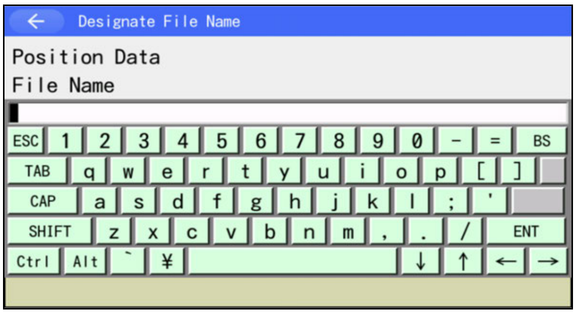


Position Data
File Name
Position

Input the stored file name, and touch Save button. Touch Cancel button, and the display returns to the previous screen.

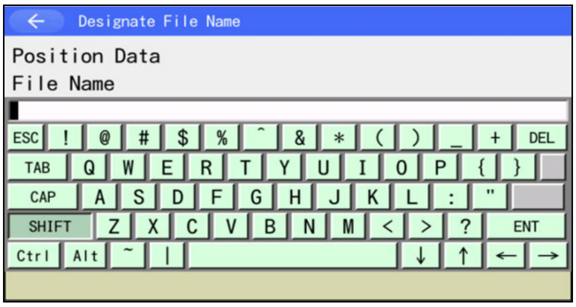
* The number of letters available to input in the stored file name is 31 at maximum with half-size font characters.

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.


Designate File Name
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →

Position Data
File Name

Initial Screen


Designate File Name
ESC ! @ # $ % ^ & * ( ) _ + DEL
TAB Q W E R T Y U I O P { }
CAP A S D F G H J K L : "
SHIFT Z X C V B N M < > ? ENT
Ctrl Alt ~ | ↓ ↑ ← →

Position Data
File Name

SHIFT key being touched

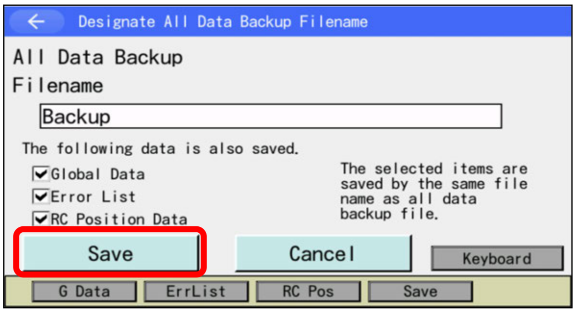
Use the keyboard shown in the figures above to input the file name. When you want to input a capital letter, either touch SHIFT key or touch CAP key to show the capital letters. (Figure on top right) SHIFT key gets released every time after a letter is input while CAP key is remained on until it is touched 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.



Designate All Data Backup Filename

All Data Backup
Filename

Backup

The following data is also saved.

☑Global Data
☑Error List
☑RC Position Data

The selected items are saved by the same file name as all data backup file.

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).

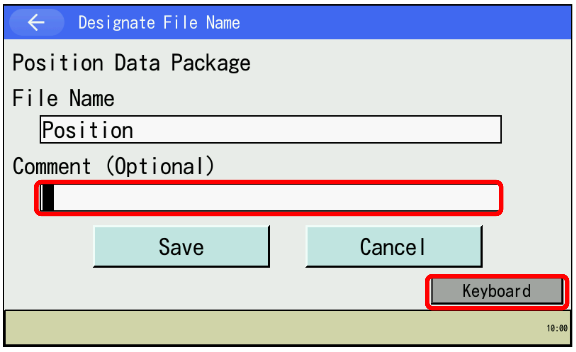
* The items of RC-axis Position Data and Extended Motion Position Data are displayed only when these functions have become available.
* The file names for the data stored at the same time are the same as that for the backup file for all the data. (Only the extensions differ.)
For instance, if the backup 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.



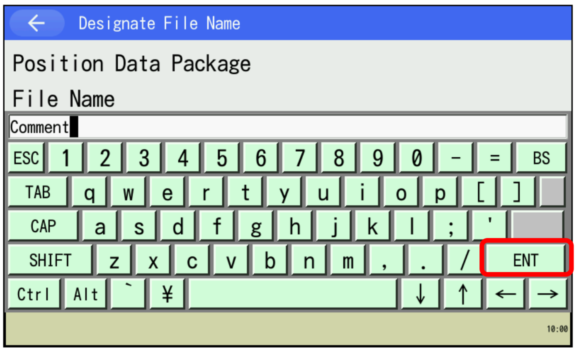
Position Data Package

File Name: Position

Comment (Optional)

Touch in the file comment input box to show the cursor, and then touch the Keyboard button.

A touch panel keyboard appears.


Designate File Name
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
10:00

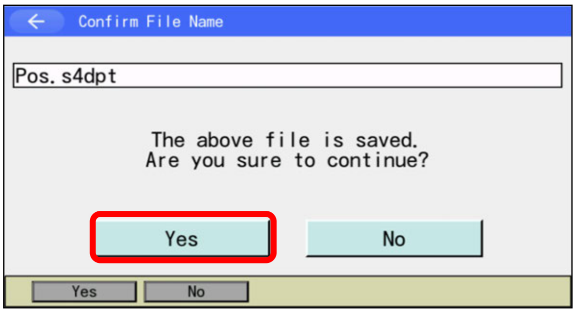
Position Data Package

File Name

Comment

Input some character string, and touch the ENT button.

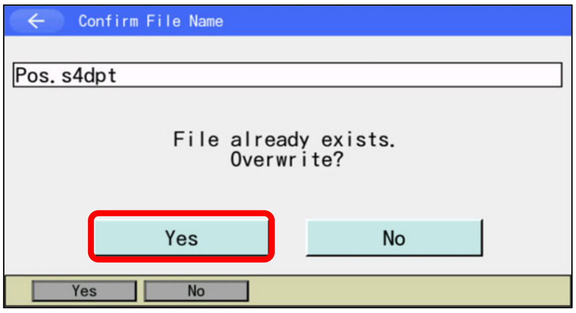
* The number of characters available for input in the file comment input box is up to 40 half-width characters.



Pos. s4dpt

The above file is saved.
Are you sure to continue?

Check the storage file name, and touch Yes button. Touch No button, to return to the backup file name indication screen.

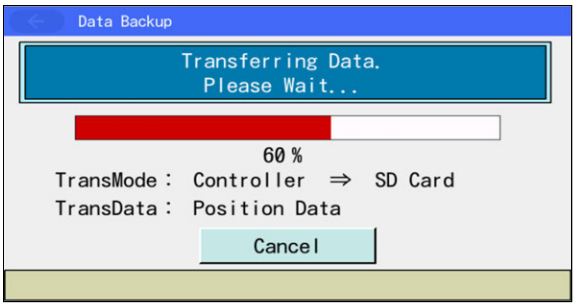


Pos. s4dpt

File already exists.
Overwrite?

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.



Transferring Data.
Please Wait...

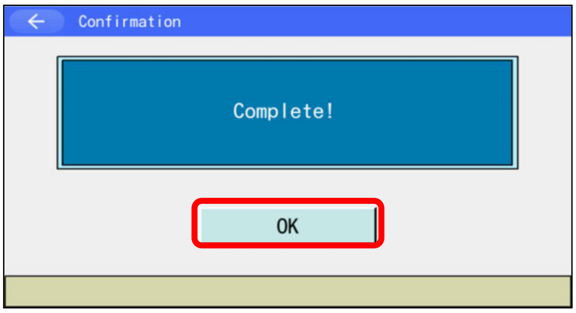
60 %

TransMode : Controller ⇒ SD Card
TransData : Position Data

Data transfer screen will be shown.

Touch Cancel button to cancel to save the file.

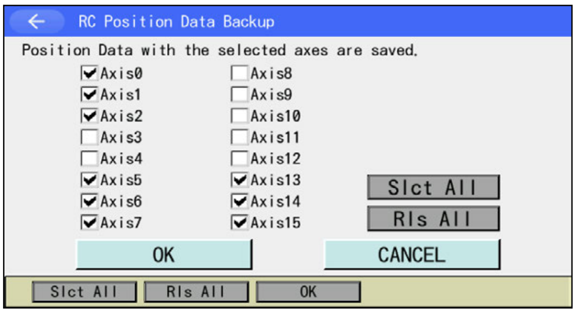
⚠ *Caution: In case the file storage process is cancelled, there is no guarantee of the saved data contents.*



Complete!

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.

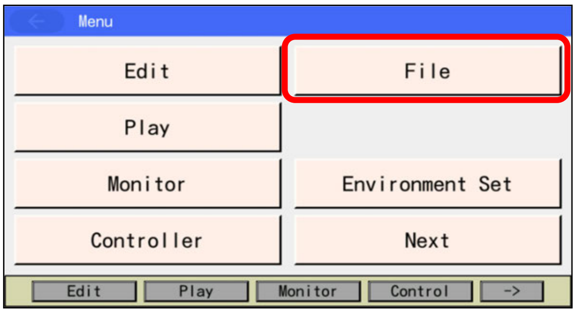


Position Data with the selected axes are saved.

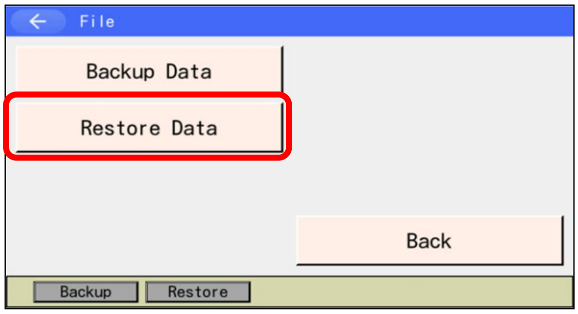
☑Axis0 ☐Axis8
☑Axis1 ☐Axis9
☑Axis2 ☐Axis10
☐Axis3 ☐Axis11
☐Axis4 ☐Axis12
☑Axis5 ☑Axis13
☑Axis6 ☑Axis14
☑Axis7 ☑Axis15

20.2 Restore to Controller

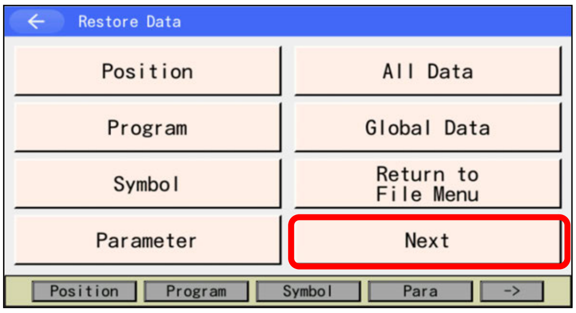
Data in the SD Memory Card is transferred to the controller.



Touch File button in the menu screen.

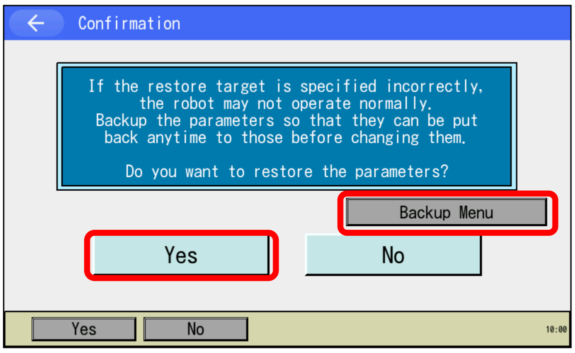


Touch Restore Data button in the file menu screen.



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.

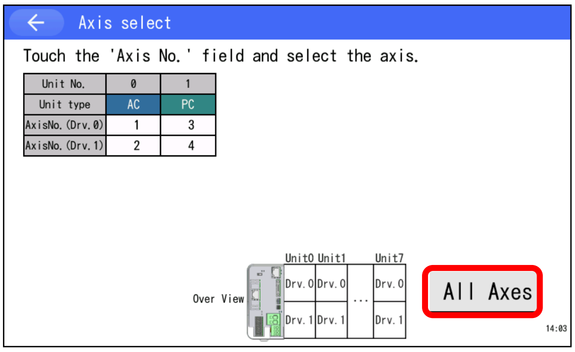
When the driver unit parameter (for applicable models only) is selected as the data type, the screen goes to the following window.



If the restore target is specified incorrectly, the robot may not operate normally.
Backup the parameters so that they can be put back anytime to those before changing them.

Do you want to restore the parameters?

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.

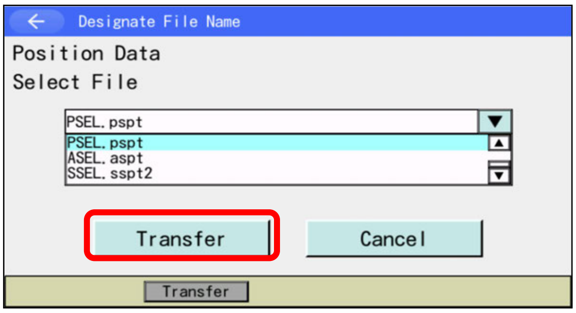


Touch the 'Axis No.' field and select the axis.

Unit No.	0	1
Unit type	AC	PC
AxisNo.(Drv.0)	1	3
AxisNo.(Drv.1)	2	4

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.



Designate File Name

Position Data

Select File

PSEL.pspt

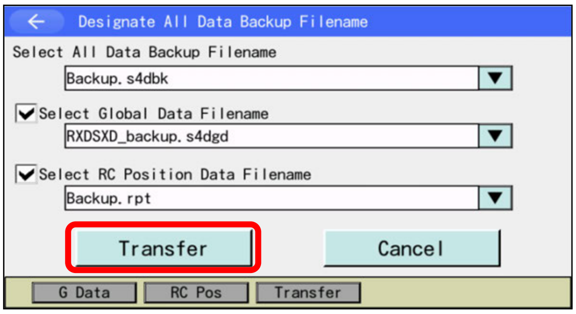
PSEL.pspt
ASEL.aspt
SSEL.sspt2

Touch ▲ and ▼ to select a file to transfer to the controller from the file list in a SD 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.



Designate All Data Backup Filename

Select All Data Backup Filename
Backup.s4dbk

☑ Select Global Data Filename
RXDSXD_backup.s4dgd

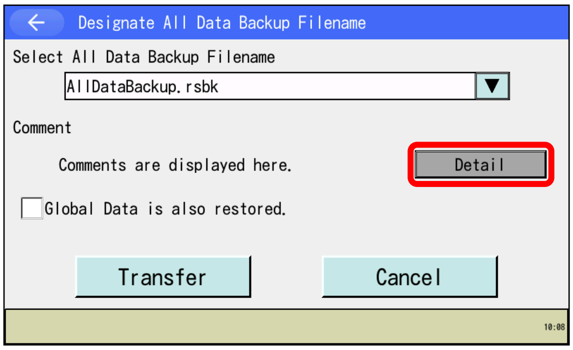
☑ Select RC Position Data Filename
Backup.rpt

Touch ▲ and ▼ to select a file to transfer to the controller from the file list in a SD 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.



Designate All Data Backup Filename

Select All Data Backup Filename

AllDataBackup.rsbk

Comment

Comments are displayed here.

☐ Global Data is also restored.

The window shown in the figure on the left should be displayed for RSEL and XSEL2-T/TX.

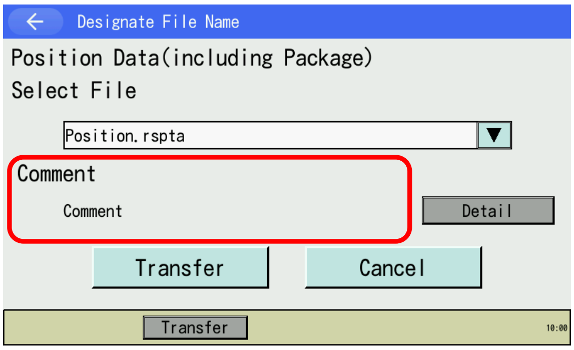
For RSEL and XSEL2-T/TX, when transferring all the data backup files, it is available to transfer the global data at the same time.
In order to transfer the global dat, touch the checkbox to put a checkmark.

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.



Position Data(including Package)

Select File

Position.rspta

Comment

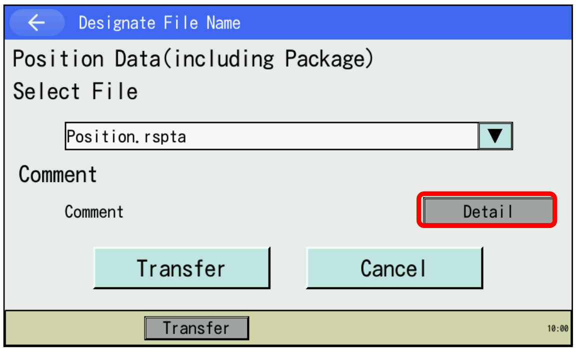
Comment

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.



Position Data(including Package)

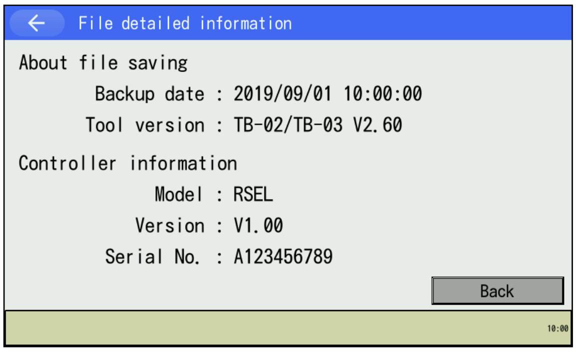
Select File

Position.rspta

Comment

Comment

Select a backup file to transfer to the controller in the select file box and touch the Detail button.



About file saving

Backup date : 2019/09/01 10:00:00

Tool version : TB-02/TB-03 V2.60

Controller information

Model : RSEL

Version : V1.00

Serial No. : A123456789

The tool information and controller information in the backup file are shown.

Contents of display are as shown below:

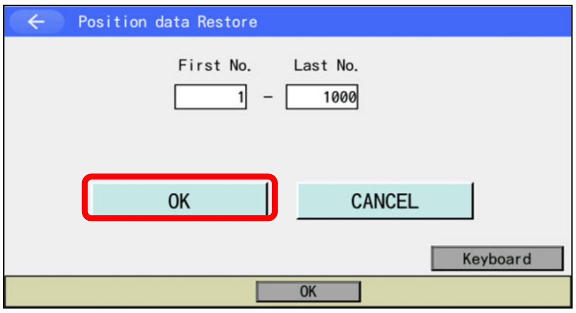
About file saving
Backup data : The day and time of backup is shown.
Tool version : A tool used for the backup and the version of the tool are shown.
Controller information
Model : Model name of a controller that the backup was conducted is shown.
Version : The application part version of a controller 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.

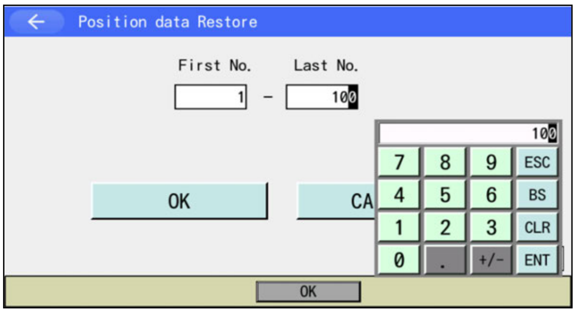
Touch the Back button and the screen goes back to the designate file name window.

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



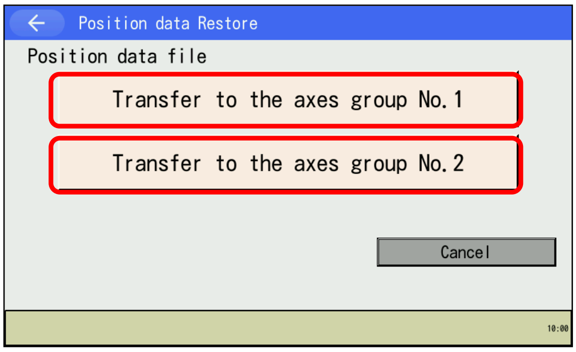
Input the position number range for the transfer to the controller and touch OK button.
If you touch CANCEL button, the display returns to the restore file name indication screen.



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)

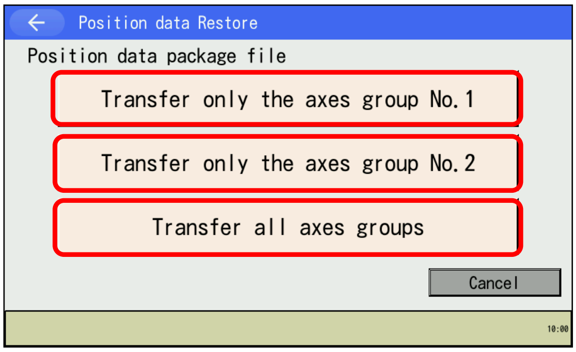
1) When restoring a backup file with axes group inactivated or backup file saved in the axis number assignment feature non-applicable controller to a controller with axes group activated


Position data Restore
Position data file
Transfer to the axes group No.1
Transfer to the axes group No.2
Cancel
10:00

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.

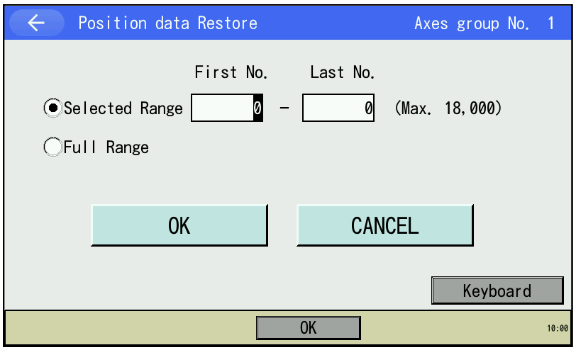

Position data Restore
Position data package file
Transfer only the axes group No.1
Transfer only the axes group No.2
Transfer all axes groups
Cancel
10:00

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.)



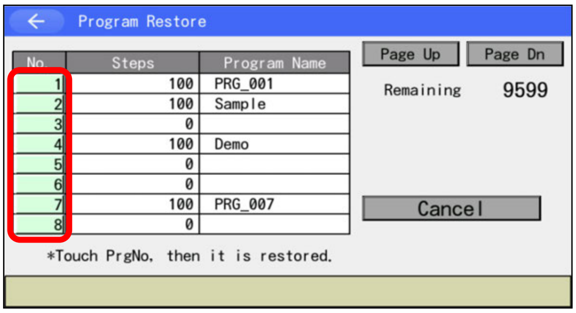
	First No.		Last No.	
● Selected Range	0	–	0	(Max. 18,000)
○ Full Range				

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)



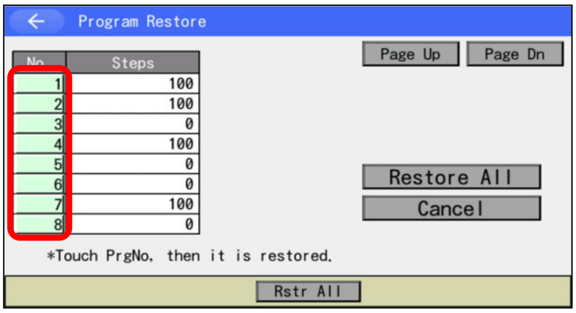
No	Steps	Program Name
1	100	PRG_001
2	100	Sample
3	0	
4	100	Demo
5	0	
6	0	
7	100	PRG_007
8	0	

Remaining 9599

*Touch PrgNo, then it is restored.

Touch the transferred program number.
If you touch Cancel button, the display returns to the restore file name indication screen.

(iii) Program (total)



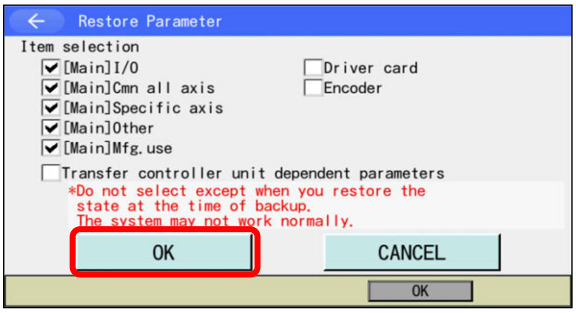
No	Steps
1	100
2	100
3	0
4	100
5	0
6	0
7	100
8	0

*Touch PrgNo, then it is restored.

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



Item selection

☑ [Main]I/O
☑ [Main]Cmn all axis
☑ [Main]Specific axis
☑ [Main]Other
☑ [Main]Mfg. use
☐ Driver card
☐ Encoder

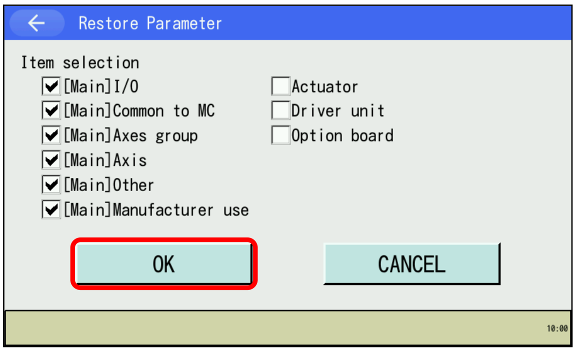
☐ Transfer controller unit dependent parameters

*Do not select except when you restore the state at the time of backup.
The system may not work normally.

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.

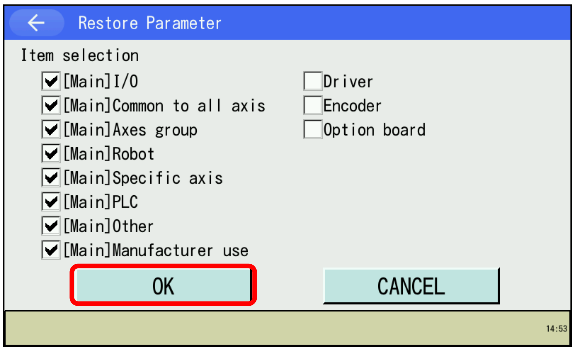


Item selection

☑ [Main]I/O
☑ [Main]Common to MC
☑ [Main]Axes group
☑ [Main]Axis
☑ [Main]Other
☑ [Main]Manufacturer use
☐ Actuator
☐ Driver unit
☐ Option board

For RSEL

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.

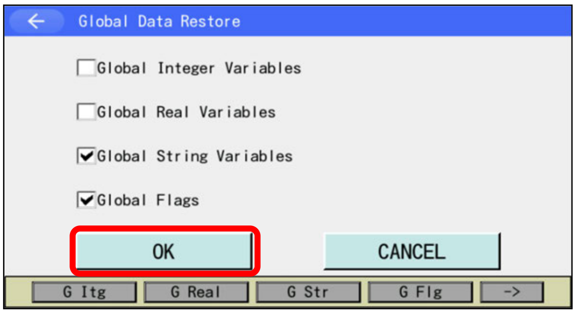


Item selection

☑ [Main]I/O
☑ [Main]Common to all axis
☑ [Main]Axes group
☑ [Main]Robot
☑ [Main]Specific axis
☑ [Main]PLC
☑ [Main]Other
☑ [Main]Manufacturer use
☐ Driver
☐ Encoder
☐ Option board

For XSEL2-T/TX

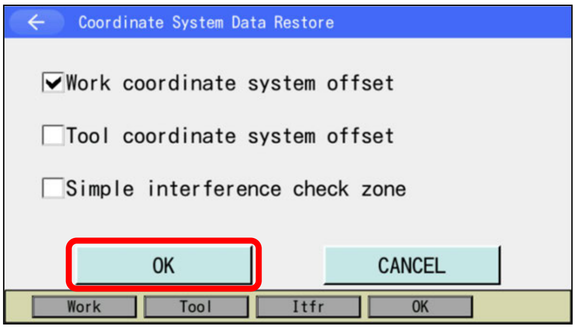
(v) Global data



☐ Global Integer Variables
☐ Global Real Variables
☑ Global String Variables
☑ Global Flags

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.

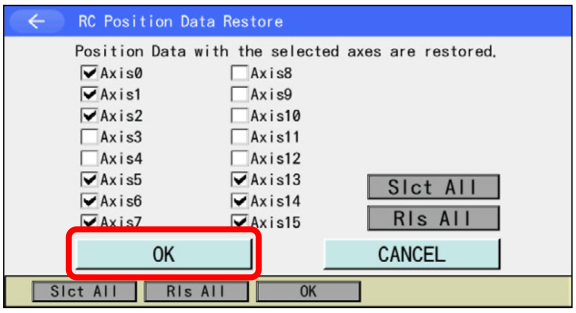
(vi) Coordinate system definition data



☑ Work coordinate system offset
☐ Tool coordinate system offset
☐ Simple interference check zone

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



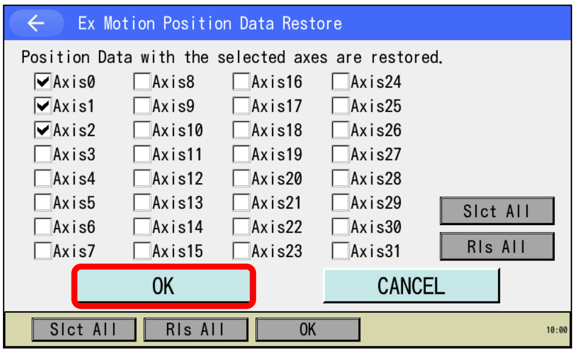
Position Data with the selected axes are restored.

☑ Axis0 ☐ Axis8
☑ Axis1 ☐ Axis9
☑ Axis2 ☐ Axis10
☐ Axis3 ☐ Axis11
☐ Axis4 ☐ Axis12
☑ Axis5 ☑ Axis13
☑ Axis6 ☑ Axis14
☑ Axis7 ☑ Axis15

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

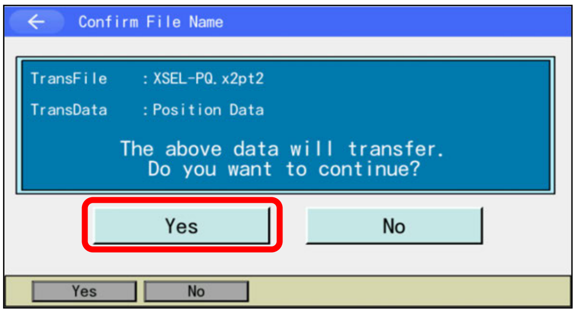


Position Data with the selected axes are restored.

☑Axis0 ☑Axis1 ☑Axis2 ☐Axis3 ☐Axis4 ☐Axis5 ☐Axis6 ☐Axis7
☐Axis8 ☐Axis9 ☐Axis10 ☐Axis11 ☐Axis12 ☐Axis13 ☐Axis14 ☐Axis15
☐Axis16 ☐Axis17 ☐Axis18 ☐Axis19 ☐Axis20 ☐Axis21 ☐Axis22 ☐Axis23
☐Axis24 ☐Axis25 ☐Axis26 ☐Axis27 ☐Axis28 ☐Axis29 ☐Axis30 ☐Axis31

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.

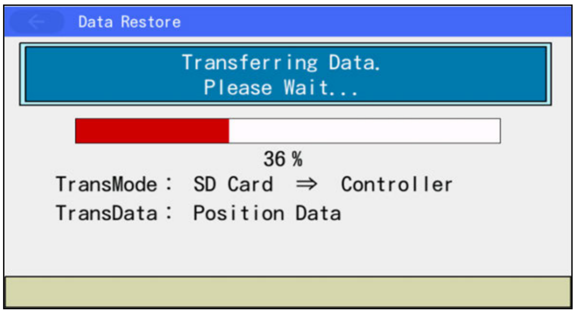
Touch Slct All button, and all the activated axes can be selected.
Touch Rls All button, and all the activated axes can be released from selected status.



TransFile : XSEL-PQ.x2pt2
TransData : Position Data

The above data will transfer.
Do you want to continue?

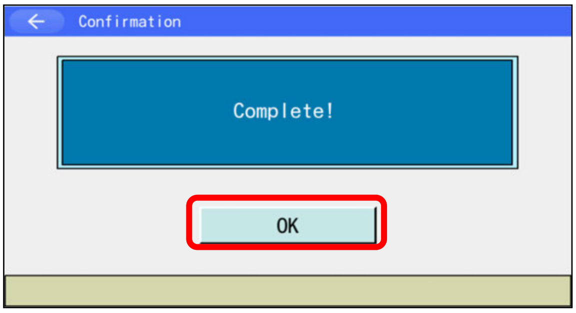
Check the contents of transfer, and touch Yes button.
If you touch No button, the display goes back to the previous screen.



Transferring Data.
Please Wait...

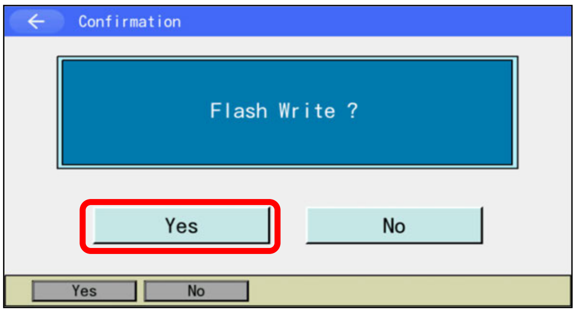
36 %
TransMode : SD Card ⇒ Controller
TransData : Position Data

Data transfer screen will be shown.



Complete!

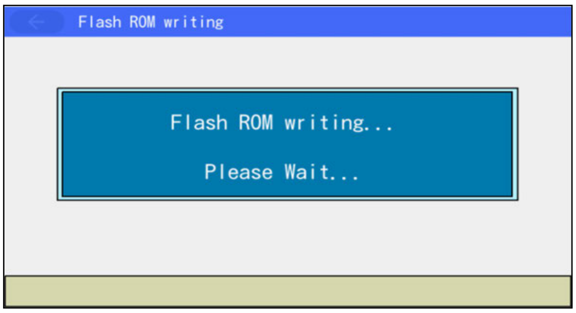
The display shows this screen when in the data transfer is finished.
If you touch OK button, the display returns to the restore menu screen.


Confirmation

Flash Write ?

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).

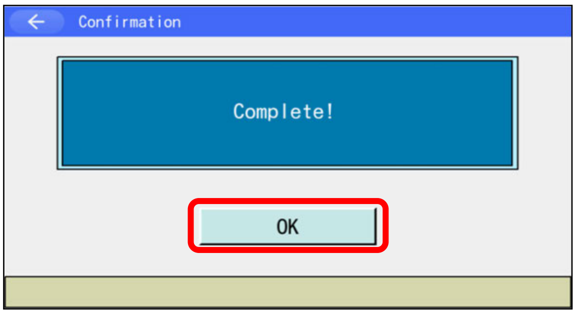

Flash ROM writing

Flash ROM writing...

Please Wait...

"Flash ROM writing..." flashes during the flash ROM writing.

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

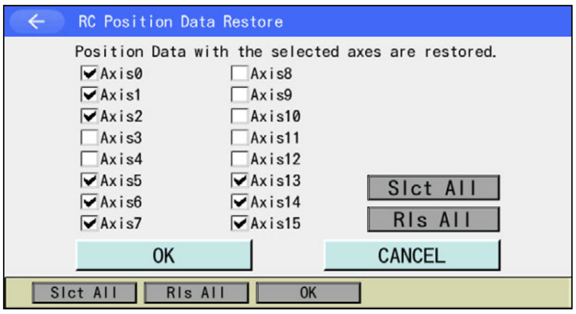

Confirmation

Complete!

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

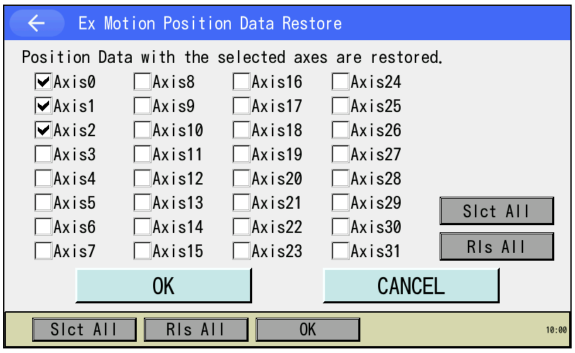


RC Position Data Restore

Position Data with the selected axes are restored.

☑ Axis0 ☐ Axis8
☑ Axis1 ☐ Axis9
☑ Axis2 ☐ Axis10
☐ Axis3 ☐ Axis11
☐ Axis4 ☐ Axis12
☑ Axis5 ☑ Axis13
☑ Axis6 ☑ Axis14
☑ Axis7 ☑ Axis15

In the case that the extended motion position data file is transferred at the same time:



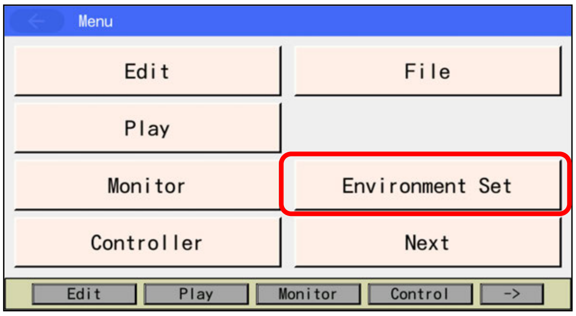
Ex Motion Position Data Restore

Position Data with the selected axes are restored.

☑ Axis0 ☐ Axis8 ☐ Axis16 ☐ Axis24
☑ Axis1 ☐ Axis9 ☐ Axis17 ☐ Axis25
☑ Axis2 ☐ Axis10 ☐ Axis18 ☐ Axis26
☐ Axis3 ☐ Axis11 ☐ Axis19 ☐ Axis27
☐ Axis4 ☐ Axis12 ☐ Axis20 ☐ Axis28
☐ Axis5 ☐ Axis13 ☐ Axis21 ☐ Axis29
☐ Axis6 ☐ Axis14 ☐ Axis22 ☐ Axis30
☐ Axis7 ☐ Axis15 ☐ Axis23 ☐ Axis31

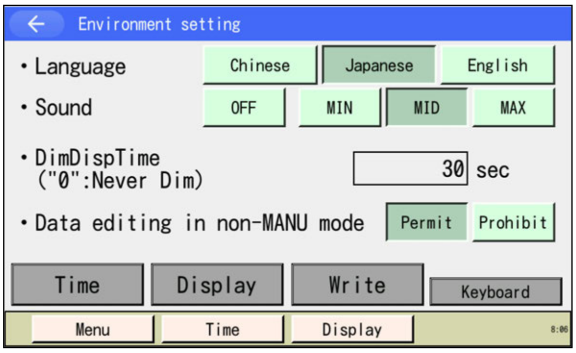
21. Environment Setting

Settings are established for the language, touch operation sound, sleep timer, clock and display.

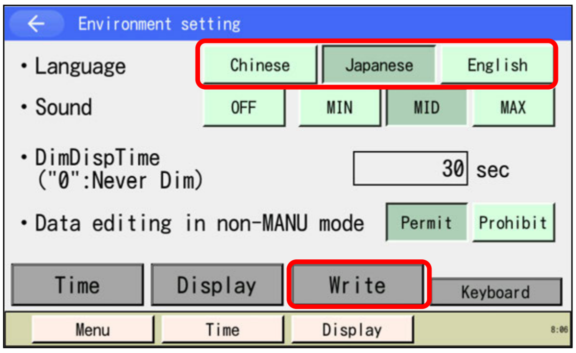


Touch Environment Set button in the menu screen.

The environment setting screen appears.

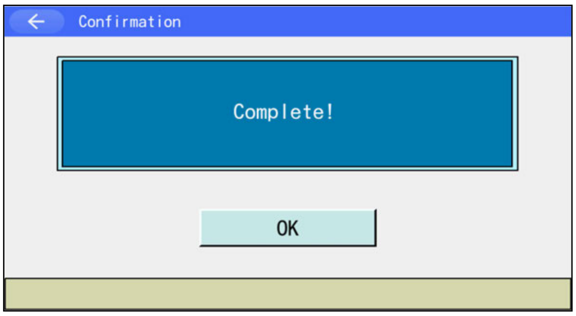


[Language]
Language can be selected and changed.



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.

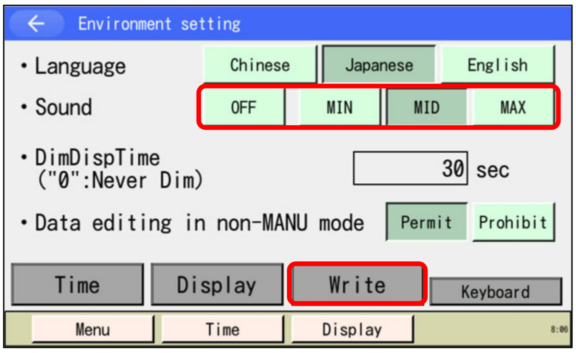


Complete!

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!".

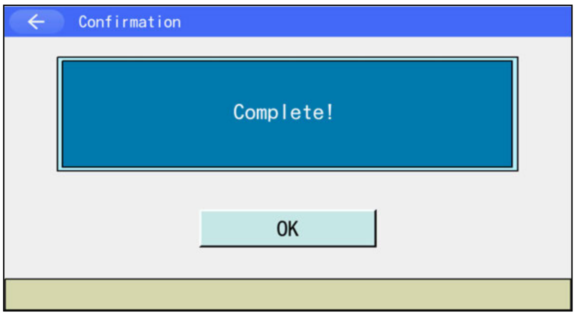
[Touch Operation Sound Setting]
Setting can be established whether to output the touch sound or not.



• Language
• Sound
• DimDispTime ("0":Never Dim) 30 sec
• Data editing in non-MANU mode

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.

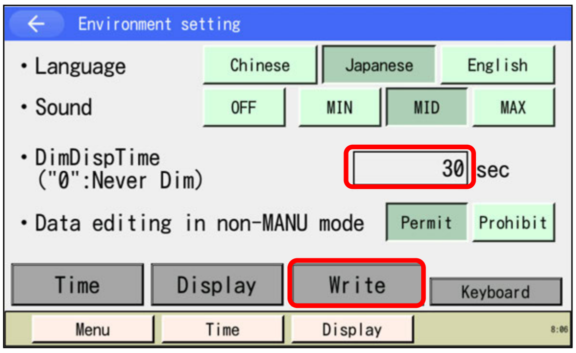


Complete!

When the writing process is finished, the confirmation screen opens.

Touch OK button to return to the environment setting screen.

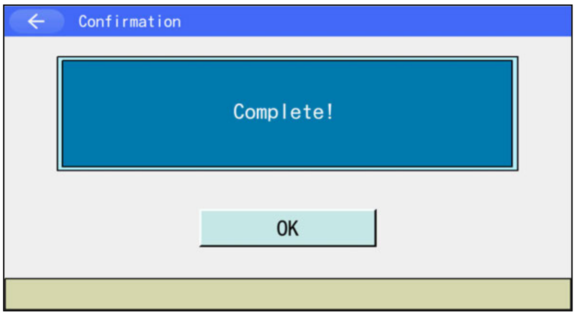
[Sleep Timer]
Timer setting can be established for the screen to go to the sleep mode when no operation is held.



DimDispTime ("0":Never Dim) 30 sec

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.

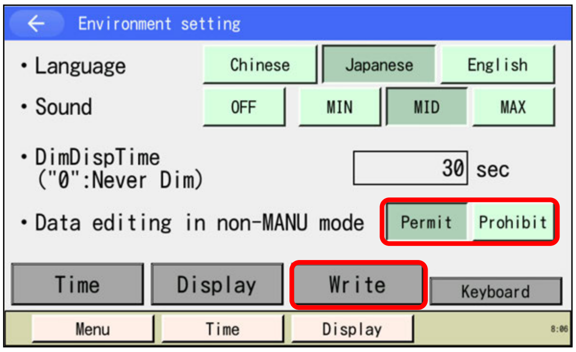


Complete!

When the writing process is finished, the confirmation screen opens.

Touch OK button to return to the environment setting screen.

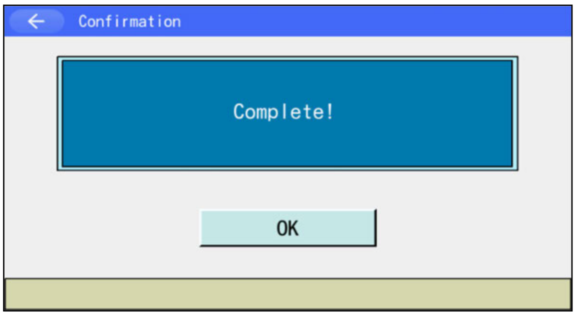
[Data Edit in Non-Manual Mode]
Permission and prohibition of data edit in AUTO Mode can be set.



DimDispTime ("0":Never Dim) 30 sec

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.

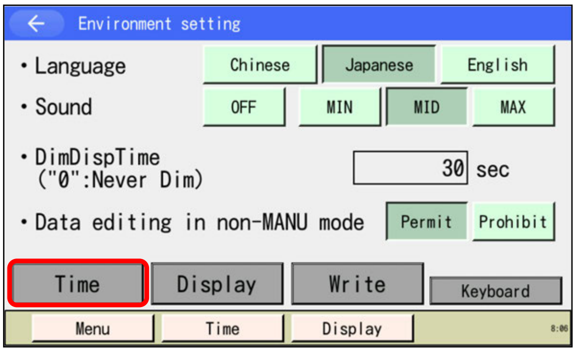


Complete!

When the writing process is finished, the confirmation screen opens.

Touch OK button to return to the environment setting screen.

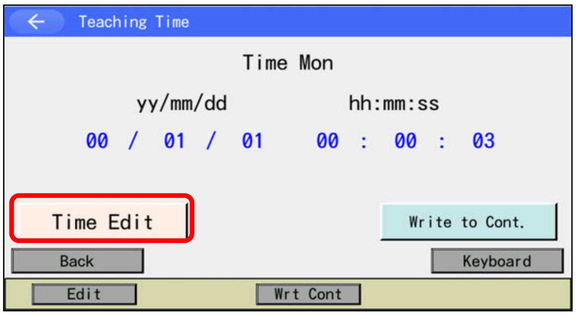
[Time Setting]
Clock setting can be established on TB-03. It is also available to set the TB-03 clock to the controller clock when a model that supports the controller clock is connected.



- Language
- Sound
- DimDispTime ("0":Never Dim) 30 sec
- Data editing in non-MANU mode

Touch Time button.

Touch Time button.



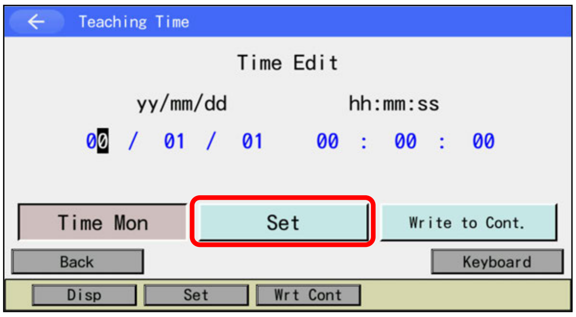
Time Mon

yy/mm/dd hh:mm:ss
00 / 01 / 01 00 : 00 : 03

TB-03 clock is displayed.

Touch Time Edit button, and the display proceeds to the edit screen.

Touch Time Edit button.

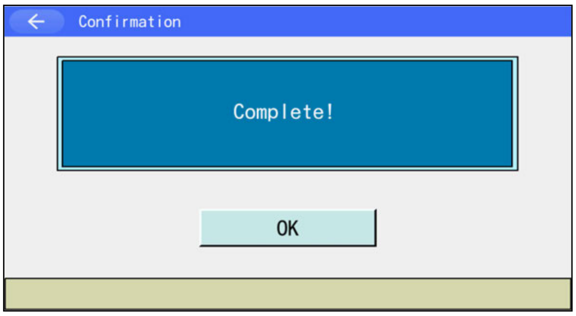


Time Edit

yy/mm/dd hh:mm:ss
00 / 01 / 01 00 : 00 : 00

TB-03 clock can be changed.

1. Input the time on Keyboard.
2. Touch Set button.

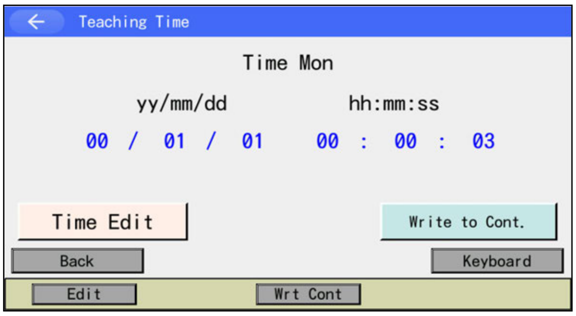


Confirmation

Complete!

When the TB-03 clock edit is finished, the confirmation screen opens.

Touch OK button to return to the clock display screen.



Teaching Time

Time Mon

yy/mm/dd hh:mm:ss

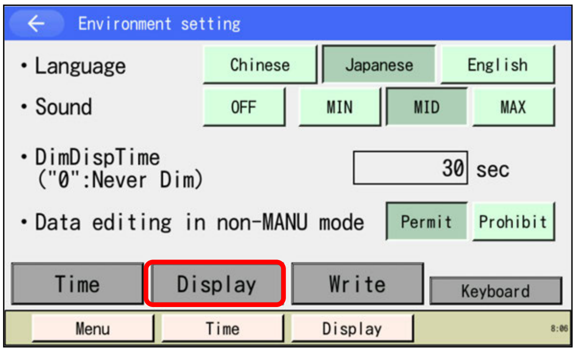
00 / 01 / 01 00 : 00 : 03

The display returns to this screen.

Touch Back button to return to the environment setting screen.

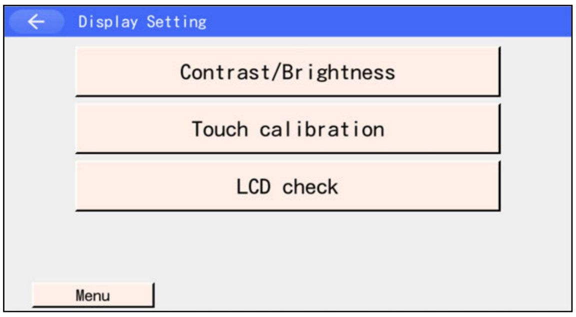
It is available to set the TB-03 clock to the controller clock if you touch Write to Cont. button either in the clock display screen or the clock edit screen.
(Write to Cont. appears only when a model that supports the controller clock is connected.)

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



Touch Display button.

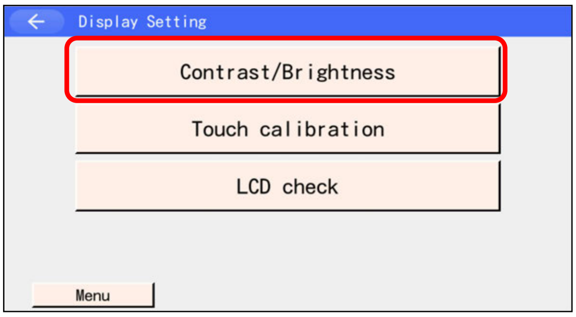
Display Setting menu screen is displayed.



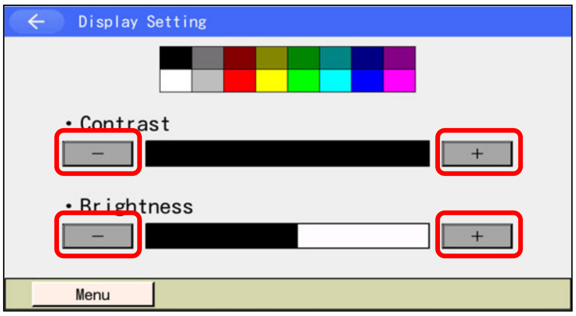
Select Display Setting menu.

Touch Menu button to return to the menu screen.

Change the Contrast/Brightness



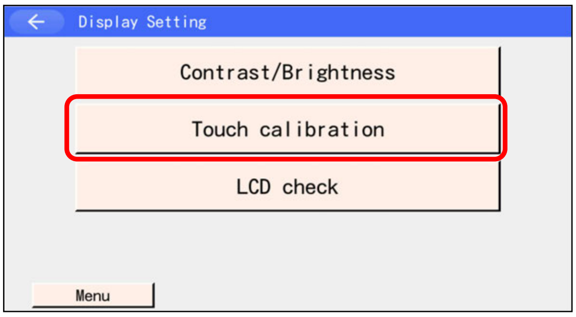
Touch Contrast/Brightness button.



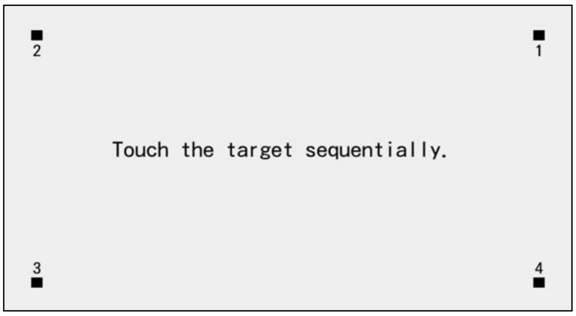
Touch - and + under Contrast to adjust the contrast of the screen.
Touch - and + under Brightness to adjust the brightness of the screen.

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.

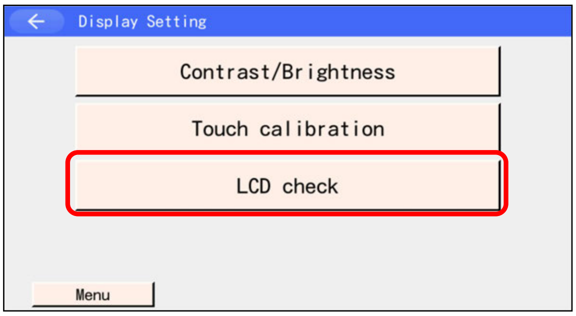


Touch the target sequentially.

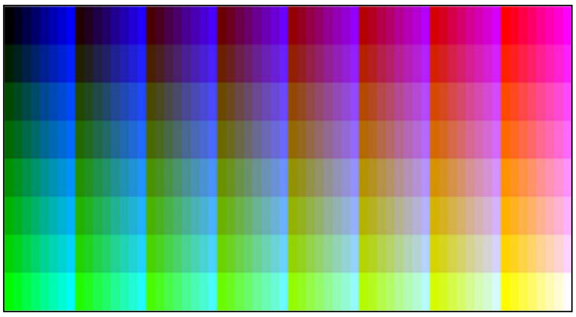
Touch ■ in the order of 1, 2, 3 and 4.

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.

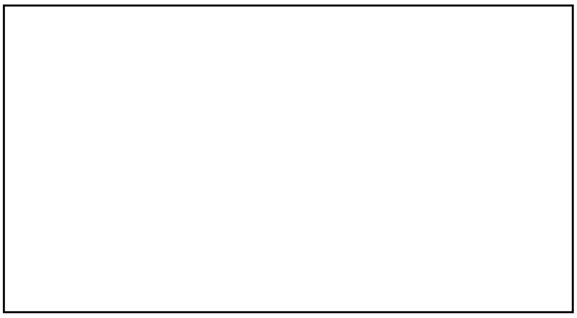


Touch LCD check button.



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.

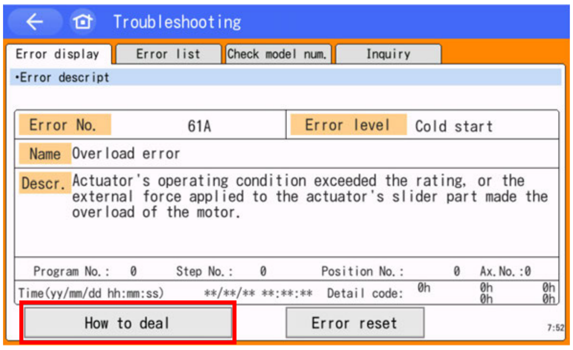
22. Error Display

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]



•Error descript

Error No. 61A Error level Cold start

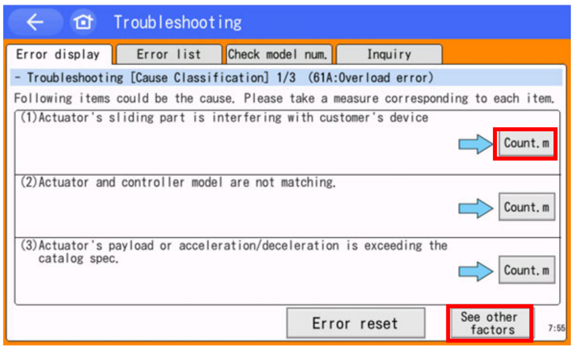
Name Overload error

Descr. Actuator's operating condition exceeded the rating, or the external force applied to the actuator's slider part made the overload of the motor.

Program No.: 0 Step No.: 0 Position No.: 0 Ax.No.:0

Time(yy/mm/dd hh:mm:ss) **/**/** **:**:** Detail code: 0h 0h 0h 0h 0h

Touch How to deal button.



- Troubleshooting [Cause Classification] 1/3 (61A:Overload error)

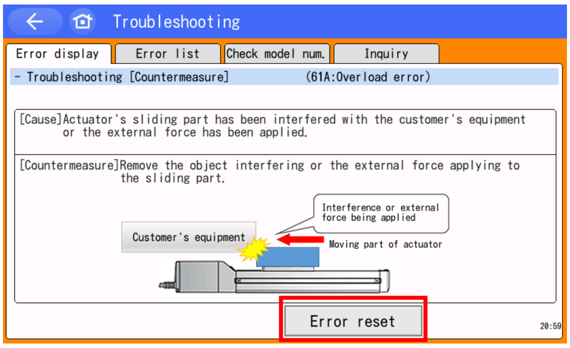
Following items could be the cause. Please take a measure corresponding to each item.

(1)Actuator's sliding part is interfering with customer's device

(2)Actuator and controller model are not matching.

(3)Actuator's payload or acceleration/deceleration is exceeding the catalog spec.

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.



- Troubleshooting [Countermeasure] (61A:Overload error)

[Cause]Actuator's sliding part has been interfered with the customer's equipment or the external force has been applied.

[Countermeasure]Remove the object interfering or the external force applying to the sliding part.

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.

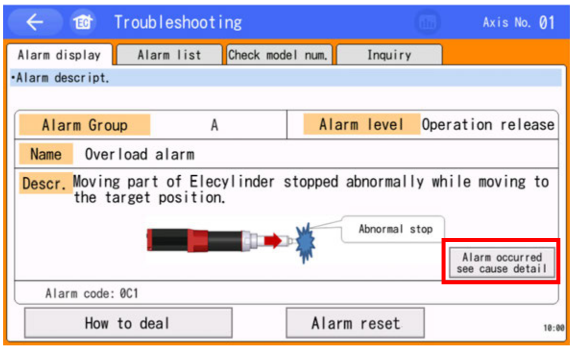
Error No.	Error message
300	SEL Command Language Input Error
301	Operand Input Incomplete Error
302	Operand Input Prohibited Error
303	Operand Data Error
304	Operand Undefined Symbol Use Error
305	Operand Symbol Type Error
306	Program in Process Edit Prohibited Error
307	Symbol Error
308	Input Condition Undefined Symbol Use Error
309	Symbol Use Count Excess Error
30A	Secure Digital Memory Card Error (TP)
30B	Internal Process Error
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

Error No.	Error message
321	Input below Min. Velocity Warning
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]

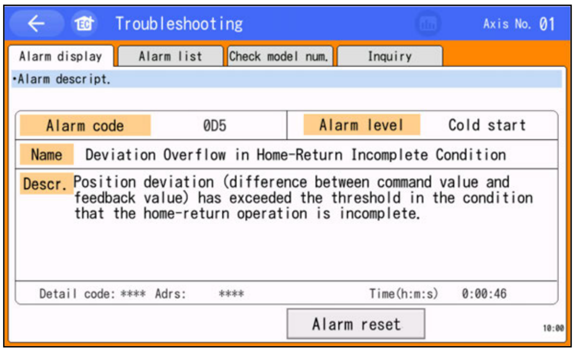


•Alarm descript.

Alarm Group A
Alarm level Operation release
Name Overload alarm
Descr. Moving part of Elecylinder stopped abnormally while moving to the target position.

Alarm code: 0C1

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.



•Alarm descript.

Alarm code 0D5
Alarm level Cold start
Name Deviation Overflow in Home-Return Incomplete Condition
Descr. Position deviation (difference between command value and feedback value) has exceeded the threshold in the condition that the home-return operation is incomplete.

Detail code: **** Adrs: **** Time(h:m:s) 0:00:46

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)

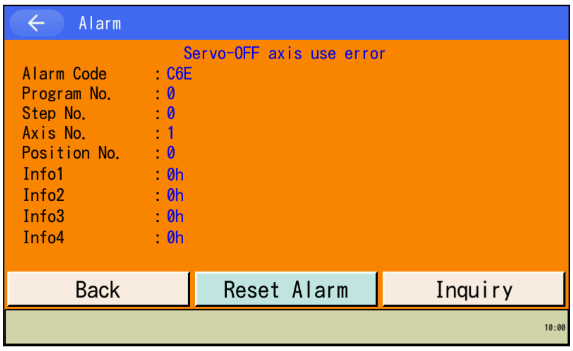
Shown below is a list of the alarm codes related to a teaching pendant. For the alarm codes related to ELECYLINDER, refer to [Instruction Manual of ELECYLINDER].

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

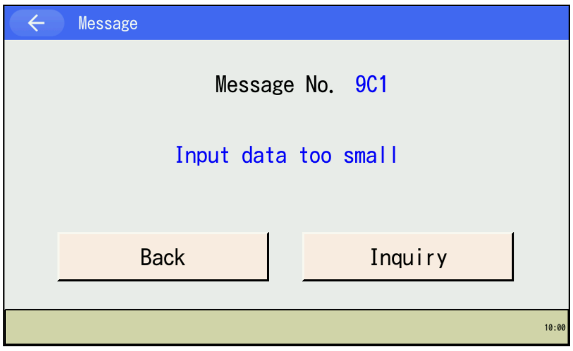
22.2.1 Display at Occurrence

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.



Servo-OFF axis use error

Alarm Code : C6E
Program No. : 0
Step No. : 0
Axis No. : 1
Position No. : 0
Info1 : 0h
Info2 : 0h
Info3 : 0h
Info4 : 0h



Message No. 9C1

Input data too small

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.

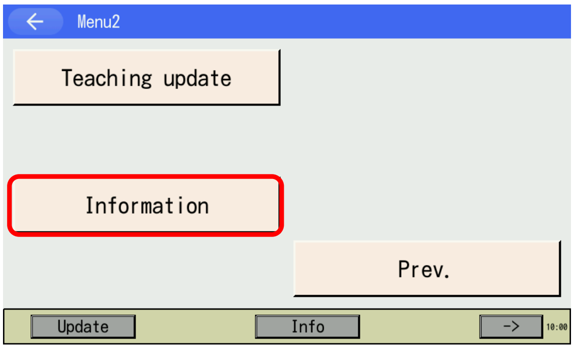
Error No.	Error name	Description, action, etc.
9E0	Servo OFF while in Action	It is forbidden to make an operation or continuous operation when the home-return operation is incomplete. Turn on the servo first.
9E1	Not yet Homed MOVE	It is forbidden to have teaching when the home-return operation is incomplete. 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.

Error No.	Error name	Description, action, etc.
AD0	File Open Error	It is a SD memory card error. The file cannot be opened.
AD1	Failed in Writing File	It is a SD memory card error. The file cannot be written in.
AD2	Failed in Reading File	It is a SD memory card error. The file cannot be read out.
AD3	File Close Error	It is a SD 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	SD memory card Open Error	SD memory card was not identified.
ADA	Battery Not Connected	There is no battery detected or connected. Connect a battery. In case this occurs even after a battery gets connected, contact IAI.
ADB	Battery Failure	The battery is not available for charging in quick charging (with AC adapter connected). Replace the battery. In case this occurs even after a battery gets replaced, contact IAI.
DE0	Receive Data Invalid	The received data has an error. Please reconnect. When it is not eliminated even through re-connection, contact IAI.
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.)

Error No.	Error name	Description, action, etc.
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.

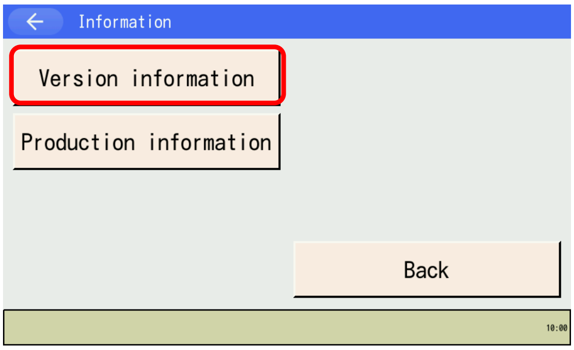


Touch the Information button in the main menu window.

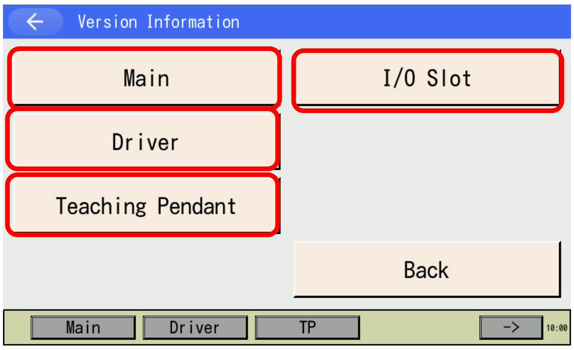
23.1 Version Information

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.

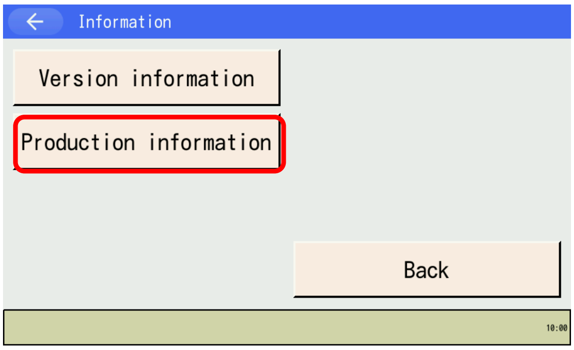
Refer to [14.10 Version Information] for the contents of display in each window.

23. Information Display

23.2 Production Information

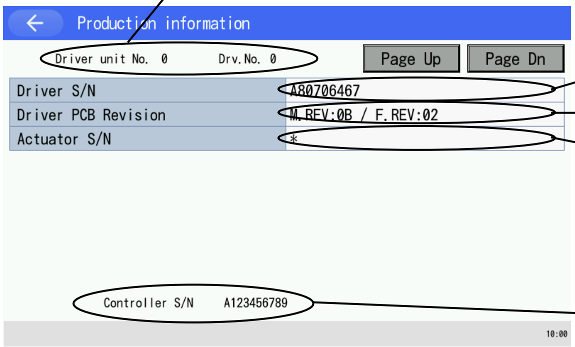
(for applicable models only)

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]



Driver unit No. 0 Drv.No. 0

Driver S/N A80706467

Driver PCB Revision M.REV:0B / F.REV:02

Actuator S/N *

Controller S/N A123456789

1) Display Box for Driver Unit Number and Drv. No.

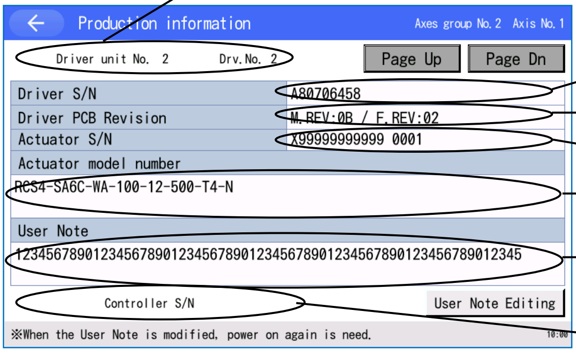
2) Driver S/N

3) Driver PCB revision

4) Actuator S/N

7) Controller S/N

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 XSEL2/2X, Bit 0-3 in All Axes Common Parameter No. 118 Actuator Identification Feature Setting also needs to be set to 1: Feature Enabled.



Driver unit No. 2 Drv.No. 2

Driver S/N A80706458

Driver PCB Revision M.REV:0B / F.REV:02

Actuator S/N X99999999999 0001

Actuator model number
RCS4-SA6C-WA-100-12-500-T4-N

User Note
12345678901234567890123456789012345678901234567890123456789012345

Controller S/N

※When the User Note is modified, power on again is need.

1) Display Box for Driver Unit Number and Drv. No.

2) Driver S/N

3) Driver PCB revision

4) Actuator S/N

5) Actuator model number

6) User Note

7) Controller S/N

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.

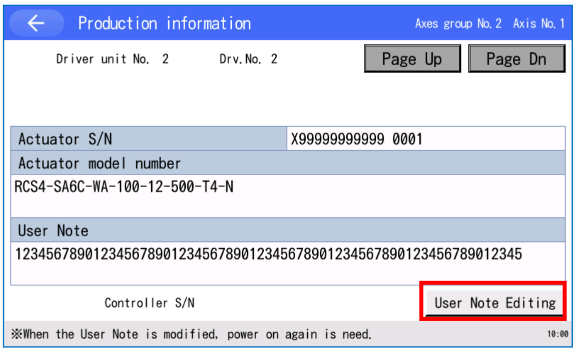
5) Actuator model number
   The model code of the actuator saved in the encoder should be shown.

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. touch the ENT button to edit the user note.

In TB-03, 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.



Driver unit No. 2 Drv.No. 2

Actuator S/N X999999999999 0001

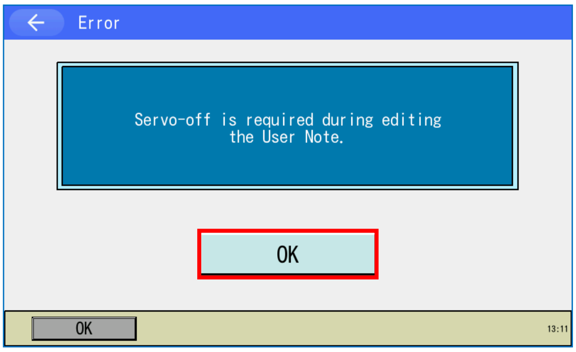
Actuator model number
RCS4-SA6C-WA-100-12-500-T4-N

User Note
12345678901234567890123456789012345678901234567890123456789012345

Controller S/N

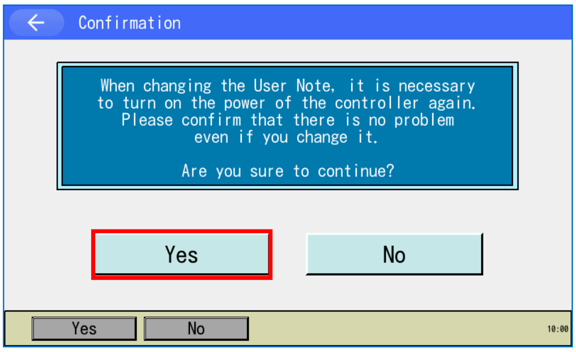
※When the User Note is modified, power on again is need. 10:00

Touch the User Note Editing button.



Servo-off is required during editing the User Note.

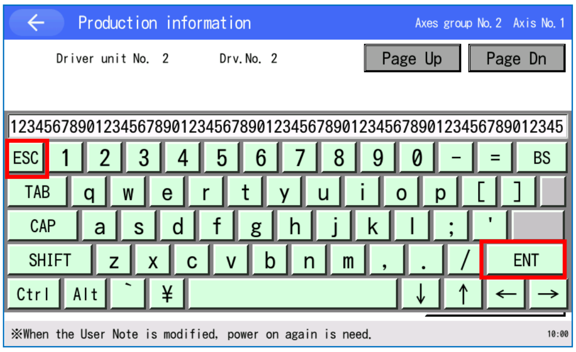
When the servo of a selected axis is on, a warning should be shown and it should be terminated as an error.
Touch the OK button, and the screen goes to production information window.



When changing the User Note, it is necessary to turn on the power of the controller again. Please confirm that there is no problem even if you change it.

Are you sure to continue?

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.


Production information
Axes group No.2 Axis No.1
Page Up
Page Dn
ESC 1 2 3 4 5 6 7 8 9 0 - = BS
TAB q w e r t y u i o p [ ]
CAP a s d f g h j k l ; '
SHIFT z x c v b n m , . / ENT
Ctrl Alt ` ¥ ↓ ↑ ← →
10:00

Driver unit No. 2 Drv.No. 2

12345678901234567890123456789012345678901234567890123456789012345

※When the User Note is modified, power on again is need.

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.

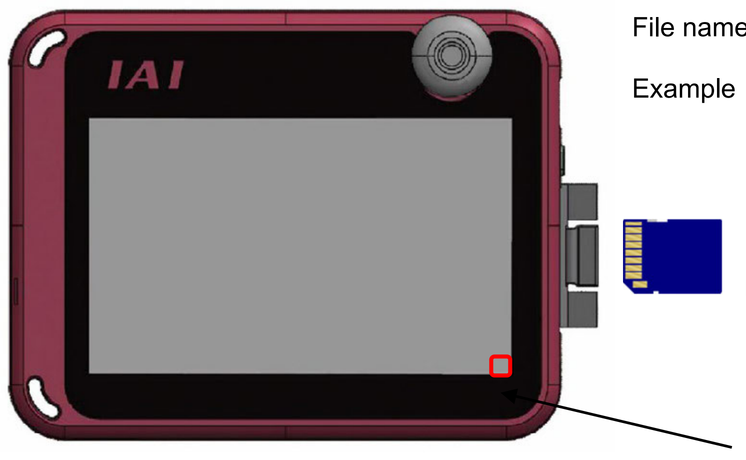
Touch the Page Up or Page Dn button and the window switches over between the driver unit number and Drv. No..

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.



File name : IMG_YYMMDDHHMMSS.bmp

Example : When the save processing starts at 12:34:56 on Aug. 9, 2017, the file name is "IMG_170809123456.bmp (751KB)".

Insert SD memory card beforehand.

Press this portion longer than usual.

Domain to Save Data (cannot be changed)
The domain that the screenshot data is saved is the folder stated below in a SD memory card.
\TB_SEL\ScreenShot\

[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.
3. Some screens may not be able to take screenshots.

⚠ *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-03 can be updated using a SD memory card.
Also, in case the menu window of TB-03 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-03 only.
It should not update the softwares of each controller or ELECYLINDER.

Regardless of condition of connection, this update updates all the TB-03 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

The same updating file as TB-02 should be used for TB-03.

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.

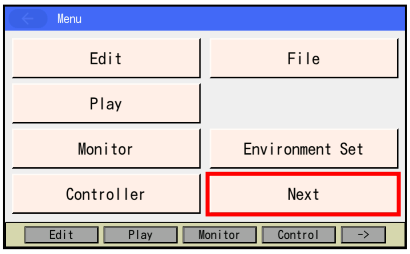
Preparation 4 Take the SD memory card cover is open, and insert a SD memory card while the power to TB-03 is off. Refer to [2.4 How to Set in/out SD Memory Card.]

Preparation 5 Supply power to the controller to which TB-03 is connected and start up TB-03.

24.2.1 How to Update when SEL controller Connected

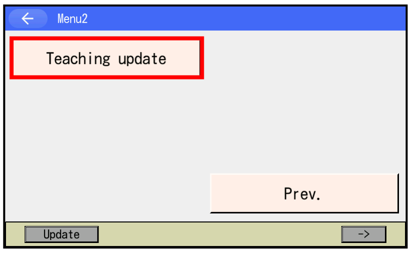
(Note) *Refer to [24.2.2 How to Update when Alarm Code DEE Displayed] if Alarm Code DEE gets shown after the power is turned on.*

[Step 1] Perform from Preparation 1 to Preparation 5 in [24.2 ◆Preparation].



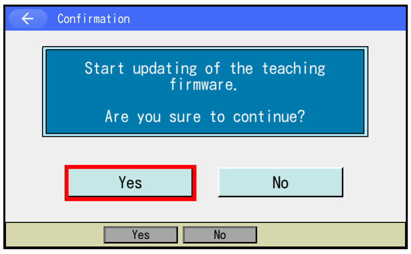
[Step 2]

Touch Next button in the menu window.



[Step 3]

Touch Teaching update button.



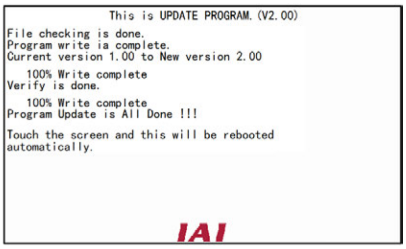
Start updating of the teaching firmware.

Are you sure to continue?

[Step 4]

A confirmation window for update appears.

Touch Yes button.



```
This is UPDATE PROGRAM.(V2.00)
File checking is done.
Program write ia complete.
Current version 1.00 to New version 2.00
   100% Write complete
Verify is done.
   100% Write complete
Program Update is All Done !!!
Touch the screen and this will be rebooted
automatically.
```

[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-03 will start up in the new version.

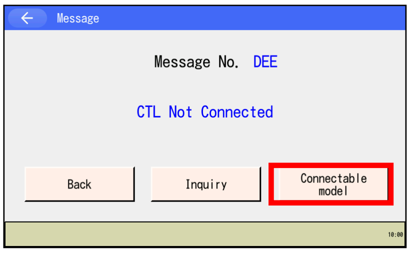
In case there is nothing shown on the screen even after more than one minute has passed after starting update, refer to how to recover in [24.2.4 Troubleshooting] No. 5 to perform the compulsory update.

⚠ *Caution: Do not attempt to turn off the power to TB-03 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].

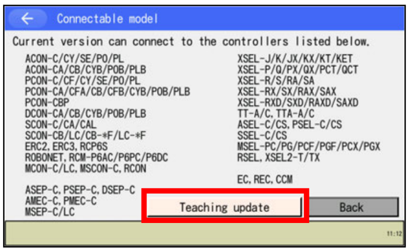


Message No. DEE

CTL Not Connected

[Step 2]

Touch Connectable model button.

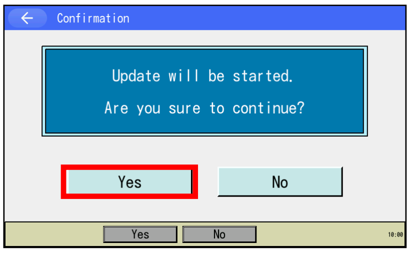


Current version can connect to the controllers listed below.

```
ACON-C/CY/SE/PO/PL                    XSEL-J/K/JX/KX/KT/KET
ACON-CA/CB/CYB/POB/PLB                XSEL-P/Q/PX/QX/PCT/QCT
PCON-C/CF/CY/SE/PO/PL                 XSEL-R/S/RA/SA
PCON-CA/CFA/CB/CFB/CYB/POB/PLB        XSEL-RX/SX/RAX/SAX
PCON-CBP                              XSEL-RXD/SXD/RAXD/SAXD
DCON-CA/CB/CYB/POB/PLB                TT-A/C, TTA-A/C
SCON-C/CA/CAL                         ASEL-C/CS, PSEL-C/CS
SCON-CB/LC/CB-*F/LC-*F                SSEL-C/CS
ERC2, ERC3, RCP6S                     MSEL-PC/PG/PCF/PGF/PCX/PGX
ROBONET, RCM-P6AC/P6PC/P6DC           RSEL, XSEL2-T/TX
MCON-C/LC, MSCON-C, RCON
                                      EC, REC, CCM
ASEP-C, PSEP-C, DSEP-C
AMEC-C, PMEC-C
MSEP-C/LC
```

[Step 3]

Touch Teaching update button.

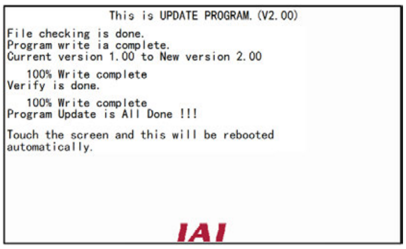


Update will be started.
Are you sure to continue?

[Step 4]

A confirmation window for update appears.

Touch Yes button.



```
This is UPDATE PROGRAM. (V2.00)
File checking is done.
Program write ia complete.
Current version 1.00 to New version 2.00
   100% Write complete
Verify is done.
   100% Write complete
Program Update is All Done !!!
Touch the screen and this will be rebooted
automatically.
```

[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-03 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-03 while in updating.*

24.2.3 How to Compulsorily Update

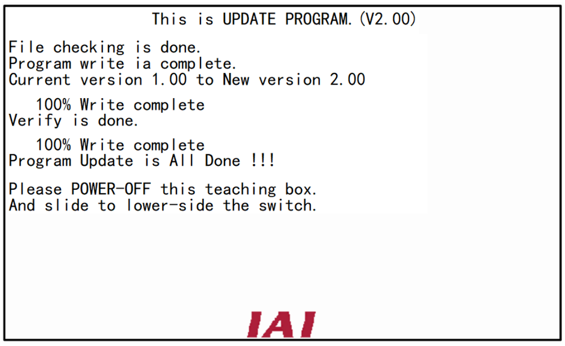
Follow the procedures below to update again in case the menu window of TB-03 would not be displayed due to a failure in updating for reasons such as the power got shut during updating process.

[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-03.
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.

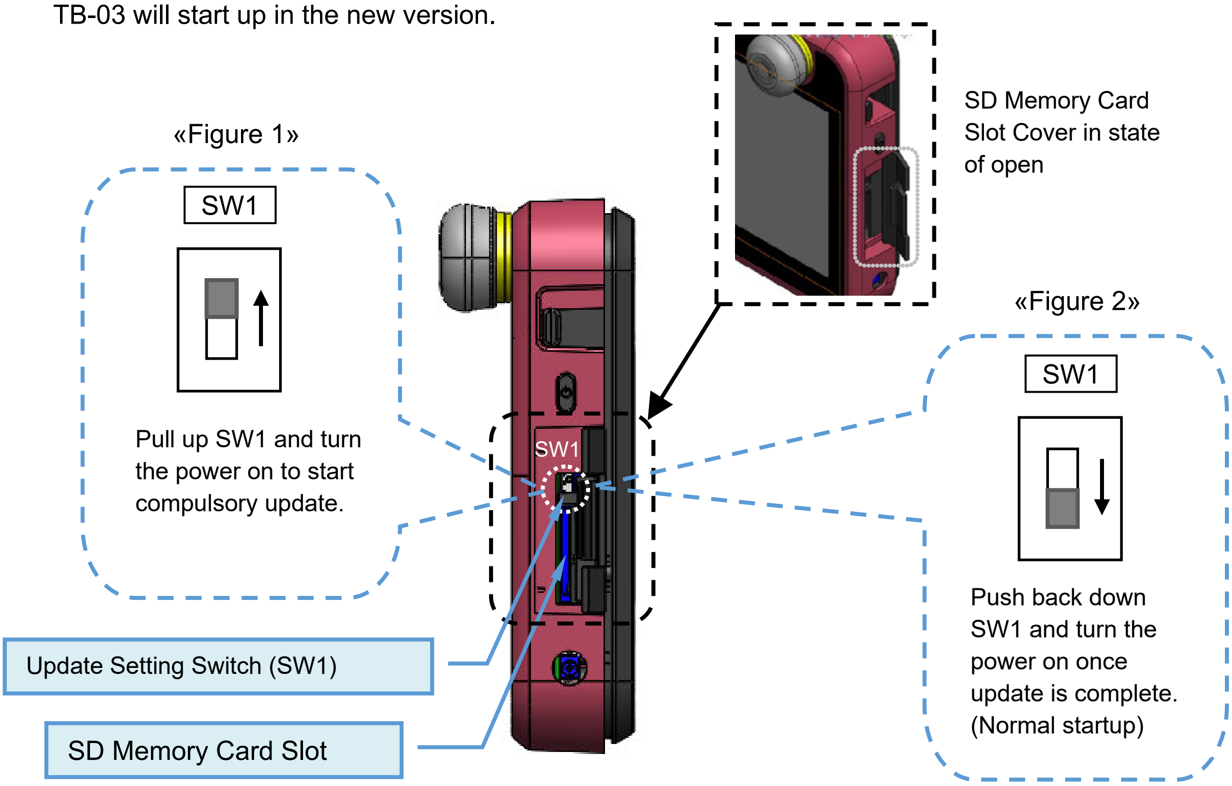


```
                This is UPDATE PROGRAM. (V2.00)
File checking is done.
Program write ia complete.
Current version 1.00 to New version 2.00
   100% Write complete
Verify is done.
   100% Write complete
Program Update is All Done !!!
Please POWER-OFF this teaching box.
And slide to lower-side the switch.
```

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»

TB-03 will start up in the new version.



SD Memory Card Slot Cover in state of open
«Figure 1»
SW1
Pull up SW1 and turn the power on to start compulsory update.
SW1
«Figure 2»
SW1
Push back down SW1 and turn the power on once update is complete. (Normal startup)
Update Setting Switch (SW1)
SD Memory Card Slot

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
September 2017	First Edition
November 2017	Edition 1B • Product Check: Model code corrected in Program Controller Cable • 2.12 Specifications Related to Battery Charge: Descriptions revised • 3.12 Data Setter Connection Procedure: Description related to BE1 Alarm display deleted • Correction made to screenshots unmatched to what should be actually displayed
February 2018	Second Edition • XSEL-RAX/SAX IXA Applicable Support (Applied to 3-axis SCARA, Applied to SCARA axis battery-less absolute) • Applicable for collision detection function • Applicable for compliance control function • Correction made
November 2018	Edition 2B • Data Setter changed to (Touch Panel) Teaching Pendant • 3.1 to 3.11 Note added for cable minimum bending radius • 3.11 Connection cable wiring diagram deleted
March 2020	Third Edition • Applicable for RSEL Controller • Change made associated with acquirement of Mexico Certification for RF and Wireless Products
July 2020	Fourth Edition • Applicable for 6-axis Cartesian Robot • Applicable for Wrist Unit
August 2021	Fifth 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 5.7 RSEL Controller the replaced • Descriptions added for the maximum setting in 8.3.3 (1) Jog Operation, (2) Inching Operation and (8) Movement • 14.9.2 Driver Alarm List added • 14.10 Version Information (6) Optional unit added

Revision Date	Revision Description
(August 2021)	• 15.1 Controller Items "I/O port allocation", "Option unit", and "EC operation mode" added. • 15.18 Input/Output Port Assignment added. • 15.19 Input/Output Port Data Assignment Item number, figure and part of text changed. • 15.20 Optional Unit Setting added. • 15.21 EC Operation Mode added. • Chapter 19 ELECYLINDER Operation Function • Chapter 20 Data Backup "driver unit parameters" backup and restore added • 22.1 RSEL System Explanation during screen display for ELECYLINDER operation added • Terms integrated, correction made
June 2022	Edition 5B • Supported models for ELECYLINDER added • Correction due to the abolition of DVD • 2.8 Description revised regarding built-in battery • 19.4.4 Descriptions added for Payload Setting Not Applicable Model • 19.9.2 The when of the Models that Support Pattern Setting to the Operation Noise Tuning added
August 2021	Edition 5C • Support Models added
July 2023	Edition 5D • Models change and added for ELECYLINDER supported • 2.5.2 [Caution] added • 14.9 Description revised of the error list • 19.4 Change made to Simple Data Setting content • 19.4.5Auto servo OFF added • 22.1.1 Changed some screen images and contents • 22.1.3 Changed screen image • 24.2.2, 24.2.3 Changed update time Black and white display change of the update start screen image
August 2023	Edition 5E • Move Product Check to chapter 2 • 2.1.2 Added ELECYLINDER instruction manual • 19.4 Unification of contents of simple data setting, correction of typos.
June 2024	Edition 5F • 19.4 Note added related to grip force of ELECYLINDER 3-finger gripper • 24.2 Teaching Update change made to contents (24.2.3 How to Compulsorily Update, 24.2.4 Troubleshooting added) • Correction made

Revision Date	Revision Description
July 2024	Sixth Edition • Applied to ROBO PUMP Standard Type (RP-VPM)
September 2024	Seventh Edition ● Applicable for XSEL2 Controller
March 2025	Eighth Edition ● 16.2.2 Absolute Reset Procedures description changed to order by type ● 19.4 Simple Data Setting (Position Editing) screen image changed ● 19.4.1, 19.4.2 Wire Cylinder setting added

Manual No.: ME0377-8A (March 2025)

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