Touch Panel Teaching Pendant

TB-03

ELECYLINDER Wireless Link

Instruction Manual　Seventh Edition



Confirming the Specifications	Chapter 1
Connection	Chapter 2
Operation of ELECYLINDER and ROBO PUMP	Chapter 3
Compatible with smart web units	Chapter 4
Offline Function	Chapter 5
Error Display	Chapter 6
Appendix	Chapter 7
Warranty	Chapter 8
EU Declaration of Conformity	Chapter 9



ME0376



ME0377

This instruction manual describes the contents for ELECYLINDER Wireless Link.

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

For how to use the Program (SEL system) controllers wired link, refer to the following instruction manual.
"Touch Panel Teaching Pendant TB-03 Program Controller and Wired Link Instruction Manual" (ME0377)

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

IAI Corporation

ELECYLINDER

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 ELECYLINDER Wireless Link.

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

For details on handling the program controller (RSEL, XSEL2, XSEL, MSEL, SSEL, ASEL, PSEL and TT/TTA) wired link, refer to the separate “Touch Panel Teaching Pendant TB-03 Applicable for Program Controller wired link Instruction Manual (ME0377)”.

1. Variation Applied to Axis Operation with Wireless Connection

ELECYLINDER Type	Supported from version
ELECYLINDER with Option Code -WL2	V2.30

2. Refer to the next page for the models that support ELECYLINDER.

Latest information can be checked in our homepage.
www.iai-robot.co.jp/knowledge/support/teaching_version/EC_support/TB02_03_support.pdf

3. Version upgrade

How to version upgrade, refer to [6.2 Teaching Update].

ELECYLINDER

ELECYLINDER Supporting Model List

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

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

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

ELECYLINDER

Table of Contents

Safety Guide ····· Intro-1
Handling Precautions ····· Intro-8
International Standards Compliances ····· Intro-9
Precautions for Handling Wireless Operation ····· Intro-10
Precautions for Axis Operation with Wireless Connection ····· Intro-12

1. Confirming the Specifications ····· 1-1
   - 1.1 Product Check ····· 1-1
     - 1.1.1 Component (excluding options) ····· 1-1
     - 1.1.2 Instruction manual related to this product ····· 1-2
     - 1.1.3 How to Read Model Nameplate ····· 1-3
     - 1.1.4 How to Read Model Number ····· 1-4
   - 1.2 Specifications ····· 1-5
     - 1.2.1 Basic Specification ····· 1-5
     - 1.2.2 Environmental Specifications ····· 1-6
   - 1.3 Explanation of Each Part ····· 1-7
     - 1.3.1 Front and Side Surface ····· 1-7
     - 1.3.2 Back ····· 1-8
     - 1.3.3 AC Adapter Joint ····· 1-8
   - 1.4 How to Set in/out SD Memory Card ····· 1-9
     - 1.4.1 How to Insert SD Memory Card ····· 1-9
     - 1.4.2 How to Take out SD Memory Card ····· 1-10
   - 1.5 How to Set in/out Battery Unit ····· 1-11
     - 1.5.1 How to Take Out Battery Unit ····· 1-11
     - 1.5.2 How to Attach Battery Unit ····· 1-12
     - 1.5.3 Caution When Battery Taken Off ····· 1-12
   - 1.6 External Dimensions ····· 1-13
   - 1.7 Life of Touch Panel LCD ····· 1-13
   - 1.8 Built-in Battery (Life of Battery and Replacement of Battery) ····· 1-13
   - 1.9 AC Adapter ····· 1-14
     - 1.9.1 Common Specifications for Adapter ····· 1-14
     - 1.9.2 AC adapter appearance ····· 1-14
   - 1.10 Optional Items ····· 1-16
     - 1.10.1 Grip Belt (GRP-2) ····· 1-16
     - 1.10.2 Strap (STR-1) ····· 1-16
     - 1.10.3 Spiral Cord (SIC-1) ····· 1-17
   - 1.11 Actuator Driving Unit for Teaching Pendant ····· 1-18
     - 1.11.1 Feature ····· 1-18
     - 1.11.2 How to Read Model Number ····· 1-19
     - 1.11.3 Basic Specification ····· 1-20
     - 1.11.4 Explanation of Each Part ····· 1-21
     - 1.11.5 External Dimensions ····· 1-22
     - 1.11.6 Feature of Each Part and Pin Assignment on Connector ····· 1-23
     - 1.11.7 Joining Unit ····· 1-25
   - 1.12 Maintenance Parts ····· 1-27
     - 1.12.1 Battery Unit (AB-7) (Enclosed to Main Unit) ····· 1-27
     - 1.12.2 Touch Pen (TCH-TB03) (Enclosed to Main Unit, For purpose of lost and damaged) ····· 1-27
   - 1.13 Specifications Related to Wireless ····· 1-28
     - 1.13.1 Specifications (Version, Class) ····· 1-28
     - 1.13.2 Reference for Wireless Link Reachable Distance ····· 1-28
     - 1.13.3 Directivity ····· 1-28
   - 1.14 Specifications Related to Battery Charge ····· 1-29
     - 1.14.1 Types of Charger Mode ····· 1-29
     - 1.14.2 Caution Related to Battery Charging ····· 1-29

2. Connection ····· 2-1
2.1 Wireless Link to ELECYLINDER•WLAN/Bluetooth converter ····· 2-1
2.2 To Turn Power OFF ····· 2-2
2.3 Connection of Actuator Driving Unit and ELECYLINDER ····· 2-3
2.4 Appearance of Connectivity Cables Enclosed to Actuator Driving Unit and Connectivity Specification Diagrams ····· 2-4
2.4.1 EC Power Supply Connectivity Cable: CB-ADTB-PW□□□-RB ····· 2-4
2.4.2 EC Power Supply + TB-03 Integrated Connectivity Cable: CB-ADTB-PWTB□□□ (For wired) ····· 2-4
2.5 Appearance of Actuator Driving Unit Power Supply Cables and Connectivity Specification Diagrams ····· 2-5
2.5.1 100V AC Power Supply Cable (Model: KWD-UJ-2MBS) ····· 2-5
2.5.2 200V AC Power Supply Cable (Model: CB-APMEC-PW020-TM) ····· 2-5

3. Operation of ELECYLINDER and ROBO PUMP ····· 3-1
3.1 Displayed Language Change ····· 3-1
3.2 Operating Menu ····· 3-3
3.3 Initial Screen ····· 3-5
3.4 Wireless Axis Selection Window (Change Operation Axis) ····· 3-7
3.4.1 Change Axes to Operate ····· 3-7
3.4.2 Display Wireless Axis Status ····· 3-8
3.5 Menu Selection ····· 3-17
3.6 Monitor ····· 3-20
3.6.1 Monitor Window ····· 3-21
3.6.2 Maintenance Information Window ····· 3-23
3.7 Simple Data Setting (Position Editing) ····· 3-26
3.7.1 Positioning Operation Setting ····· 3-28
3.7.2 Pressing Operation Setting ····· 3-38
3.7.3 Manual Mode ····· 3-44
3.7.4 Mounting Orientation Setting / Payload Setting ····· 3-48
3.7.5 Auto servo OFF ····· 3-50
3.8 ROBO PUMP Setting ····· 3-52
3.8.1 Operation Status ····· 3-53
3.8.2 I/O Signal ····· 3-53
3.8.3 Pressure setting ····· 3-54
3.8.4 Alarm ····· 3-55
3.8.5 Manual Mode ····· 3-55
3.8.6 Release Warning Confirmation Screen ····· 3-56
3.8.7 Deleting Data in Edit Confirmation Screen ····· 3-56
3.8.8 ROBO PUMP Advanced Settigs screen ····· 3-57
3.9 Parameter Edit ····· 3-60
3.10 Test Run ····· 3-62
3.10.1 Jog Inching Operation ····· 3-63
3.10.2 Position Movement Operation ····· 3-64
3.10.3 Direct Movement Operation ····· 3-66
3.10.4 I/O Test ····· 3-67
3.11 TP Operation Mode ····· 3-68
3.12 Alarm List ····· 3-69
3.13 Controller Reset ····· 3-70
3.13.1 ELECYLINDER Reset ····· 3-70
3.13.2 ROBO PUMP Reset ····· 3-71
3.14 Other Setting ····· 3-72
3.14.1 Parameter Initialization ····· 3-72
3.14.2 Operating Noise Adjustment (Applicable models only) ····· 3-74
3.15 Information Display ····· 3-75
3.15.1 Display Window for Each Type of Data ····· 3-75
3.15.2 Edit Axis Name ····· 3-77
3.16 Environment Setting ····· 3-79

3.17 Data Backup ····· 3-90
3.17.1 Data Backup of the Controller ····· 3-91
3.17.2 Restore to Controller ····· 3-93
3.18 Maintenance Parts List ····· 3-95
3.19 Easy Programming ····· 3-96

4. Compatible for Smart Web Units ····· 4-1
4.1 Wireless axis selection screen (WLAN/Bluetooth converter display) ····· 4-1
4.2 Restrictions During Wireless Communication ····· 4-4

5. Offline Function ····· 5-1
5.1 Position Edit (EC Only) ····· 5-1
5.2 Configuration ····· 5-3
5.3 Teaching Update ····· 5-4

6. Error Display ····· 6-1
6.1 Occurrence of Alarm ····· 6-1
6.1.1 Alarms Detected by Controller ····· 6-1
6.1.2 Messages Which Occur when Operating the Teaching Pendant ····· 6-1

7. Appendix ····· 7-1
7.1 Screenshot ····· 7-1
7.2 Teaching Update ····· 7-2
7.2.1 How to Update when Wireless Link ····· 7-2
7.2.2 How to Update when Offline ····· 7-4
7.2.3 How to and Compulsorily Update (in Common for All Models) ····· 7-5
7.2.4 Troubleshooting ····· 7-6

8. Warranty ····· 8-1
8.1 Warranty Period ····· 8-1
8.2 Scope of Warranty ····· 8-1
8.3 Honoring the Warranty ····· 8-1
8.4 Limited Liability ····· 8-1
8.5 Conditions of Conformance with Applicable Standards/Regulations, Etc., and Applications ····· 8-2
8.6 Other Items Excluded from Warranty ····· 8-2

9. EU Declaration of Conformity ····· 9-1
9.1 EU Declaration of Conformity ····· 9-1

Change History ····· Post-1

Safety Guide

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

Safety Precautions for Our Products

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

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

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

No.	Operation Description	Description
4	Installation and Start	(2) Cable Wiring ● Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. ● Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error. ● Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. ● When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction. ● Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product. ● Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire.
		(3) Grounding ● The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation. ● For the ground terminal (PE) on the AC power cable of the controller and the grounding plate in the control panel, make sure for grounding work. For security grounding, it is necessary to select an appropriate wire thickness suitable for the load. Perform wiring that satisfies the specifications (electrical equipment standards and criteria). For detail, follow the description in [an instruction manual of each controller or controller built-in actuator]. ● Conduct functional grounding on the FG terminal for a controller supplying 24V DC or a controller built-in type actuator. In order to minimize influence to mechanical operation given by electromagnetic interference (noise) to an electrical device or insulation failure, conduct grounding on a terminal or a conductor that is electrically stable. The reference impedance should be Type D (Former Class 3, ground resistance 100Ω or less).

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

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

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

Alert Indication

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

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

Handling Precautions

- In touch panel teaching pendant TB-03, the language to be displayed can be changed.
  Refer to the following for how to change it.
  - ELECYLINDER 3.1 Displayed Language Change

- Do not apply mechanical shocks on TB-03, because they may cause failure.

- If using the LCD screen for a long time, the brightness decreases. In order to extend the life of LCD, set the time setting to turn off in the environment setting to turn it off automatically, turn it off in case not used.

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

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

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

- It is recommended to have distance between TB-03 and ELECYLINDER of 5m or less with no interruption.
  The connection may get unstable even in distance of 5m or less depending on the peripheral environment of use.
  Also, be aware that, even if an axis is displayed in the wireless axis select window with distance over 5m, the connection could get unstable as the distance goes far.

- 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.

International Standards Compliances

This TB-03 comply with the following international standards:
Refer to Overseas Standard Compliance Manual (ME0287) for more detailed information.

CE Marking			UL
RoHS3 Directive	EMC Directive	Radio Equipment Directive	
○	○	○	-

If it is necessary to announce EU Declaration of Conformity with this product built in your facility, as this product itself declares the conformity to EU Directives in some specific conditions as stated below, you would be able to utilize this declaration.

EU Directives Applicable for Declaration of Conformity

EMC Directive (2014/30/EU) • • • • • • • • • • • • • • • • • • To be checked in CE marking described in model nameplate.

RoHS3 Directive (2011/65/EU + (EU)2015/863) • • • • Same as above.

RE Directive (2014/53/EU) • • • • • • • • • • • • • • • • • • To be checked in EU Declaration of Conformity.

There is EU Declaration of Conformity attached to clarify that it complies with RE Directive in [8.1 EU Declaration of Conformity].
This EU Declaration of Conformity may change without notice in case of addition of complying models and change in specifications. Consult with our sales person in charge if necessary.

Precautions for Handling Wireless Operation

- This product uses the 2.4 GHz radio band known as an ISM band. This frequency range is used by various devices such as microwave ovens and wireless LAN, so that communication may be disrupted by radio disturbance.
  Use of this device is permitted within the following countries (regions) only. Use in other countries (regions) requires certification to be obtained based on the laws and regulations of the relevant country (region).

Wireless frequency	2,400 to 2,483.5MHz
Wireless output	+5dBm

[U.S.]

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure limits. This transmitter must not be colocated or operating with any other antenna or transmitter.

[CANADA]

This device complies with Industry Canada licence-exempt RSS standards.

Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence

L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC RF Radiation Exposure Statement:

To comply with IC RF exposure requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas étre co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.

[日 本]

本製品で使用している無線モジュールは、工事設計認証を受けていますので、以下の事項を行うと法律で罰せられることがあります。

・ 無線モジュールを分解/改造すること

[EU Member States]

- For details of the applicable standards, please refer to above mentioned international standards compliances.
- Import Corporation Name : IAI Industrieroboter GmbH

* The product can be used in any country which is a member of EU.

【中国 / CHINA】

- 许可编号 : CMIIT ID = 2017DJ6592
- 申请公司名 : IAI 株式会社
- 机型名 : TB-03（主机部分“TB-03”正在接受认证。）
- 制造国 : 日本（Made in Japan）
- 进口企业名 : IAI（Shanghai）Co., Ltd.

【한국 / KOREA】

- 식별 부호 : MSIP - CRM - IAI - TB-03
- 제조사명 : 주식회사 IAI
- 모델명 : TB-03 (본체부분 "TB-03"로 인증 받고 있습니다)
- 제조국 : 일본(Made in Japan)
- 수입업자명 : IAI KOREA Corp.

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다

【ประเทศไทย / Thailand】

- ผู้ผลิต : IAI CORPORATION.
- ชื่อโมเดล : TB-03 (ได้รับใบรับรองภายใต้ชื่อ "TB-03")
- ประเทศผู้ผลิต : ญี่ปุ่น (Made in Japan)
- ผู้นำเข้า : IAI Robot (Thailand) Co., Ltd.

【México / Mexico】

- Número de Certificación : IFETEL：RCPIATB19-1957
- Nombre de la Empresa Solicitante : IAI Corporation
- Nombre del Modelo : TB-03
- País de Fabricación : Japón (Hecho en Japón)
- Nombre de la Empresa Importadora : IAI America, Inc.

Precautions for Axis Operation with Wireless Connection

This device (V2.30 or later) can operate the option model code -WL2 ELECYLINDER with wireless connection. For operation with wireless connection, secure safety by following the precautions below before use.

- The stop switch on this device will not function during wireless connection. Prepare a device / circuit to stop the operation when emergency stop is required.
- For axis operation with wireless connection, operation testing (movement to forward and backward ends, jog operation, inching operation) is possible, but the control device is not designed for purposes of automatic operation. Construct a mechanical system based on the risks of the operating environment.
- Carry out risk assessment based on the standard/spec requirements of the machinery for installation. Dangerous operation, such as that requiring an automatic stop when control signals cannot be received (including disabled communication) is not acceptable.
- Stopping axis operation by wireless network cannot be used as a safety feature as defined in EN ISO 13849-1: 2015. It is also not compliant with Safety Category B or Categories 1 to 4 stated in EN ISO 13849-1: 2015.

1. Confirming the Specifications

1.1 Product Check

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

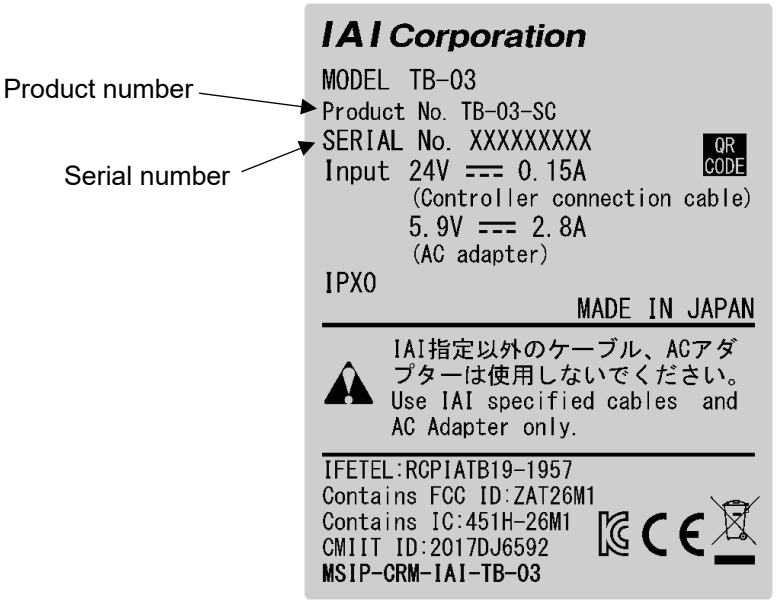
1.1.1 Component (excluding options)

No.	Product name	Product number • Photo	Number	Remarks
1	Main Body	Refer to "How to Read Model Nameplate" and "How to Read Model Number."	1	
Accessories				
2	Battery unit	AB-7 	1	
3	Touch pen	TCH-TB03	1	Provided with the teaching pendant ϕ4.5 × 100.5mm
4	AC adapter	UN318-5928 (For use in Japan, North America, Mexico and Thailand) UNZ318-5928 (For use in China) UNE318-5928 (For use in Europe) UNR318-5928 (For use in Korea)	1	Depends on model code (enclosed AC adapter type)
5	Safety guide	M0194 	1	The picture shows an image.

1.1.2 Instruction manual related to this product

No.	Name	Control number
1	Teaching Pendant Wireless Link Instruction Manual (This guide)	ME0375
2	Teaching Pendant Wired link Instruction Manual	ME0376
3	ELECYLINDER Rod Type / Table Type Instruction Manual	ME3778
4	ELECYLINDER Rod Type Dust and Drip Proof Instruction Manual	ME3779
5	ELECYLINDER Slider Type Instruction Manual	ME3793
6	ELECYLINDER Rod Type / Radial Cylinder Type Instruction Manual	ME3794
7	ELECYLINDER Belt Driven Type Instruction Manual	ME3798
8	ELECYLINDER Stopper Cylinder Instruction Manual	ME3799
9	ELECYLINDER Rotary Instruction Manual	ME3800
10	ELECYLINDER Large Slider Type Instruction Manual	ME3801
11	ELECYLINDER Creanroom Specification Instruction Manual	ME3804
12	ELECYLINDER Gripper Instruction Manual	ME3806
13	ELECYLINDER Slider Type Dust and Drip Proof Instruction Manual	ME3814
14	Ultra Mini ELECYLINDER Instruction Manual	ME3815
15	ELECYLINDER Electricity Section Instruction Manual	ME3816
16	ELECYLINDER Long Stroke Gripper Type Instruction Manual	ME3824
17	ELECYLINDER 20mm Width Slider Type / Radial Cylinder Type Instruction Manual	ME3825
18	ELECYLINDER Compact Type Instruction Manual	ME3826
19	ROBO PUMP Instruction Manual	ME3827
20	ELECYLINDER 3-finger Gripper Type Instruction Manual	ME3829
21	ELECYLINDER Vertical Compact Gripper Type / Dust Proof and Splash Proof Gripper Type Instruction Manual	ME3830
22	ELECYLINDER Wire Cylinder Rod Type Instruction Manual	ME3832
23	ELECYLINDER High Rigidity Slider Type / Crean Specification Instruction Manual	ME3833
24	ELECYLINDER Wide Slider Type / Crean Specification Instruction Manual	ME3834
25	ELECYLINDER Rod Type Double Guide Specification Instruction Manual	ME3835

1.1.3 How to Read Model Nameplate



1.1.4 How to Read Model 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 number>
TB-03 : Standard type
TB-03E : Equipped with power supply unit dedicated for ELECYLINDER

<Model code for enclosed AC 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)

* Refer to [1.11 Actuator Drive Unit for Teaching Pendant] regarding TB-03E.

TB-03 -SCN -E -ENG
Model name Enclosed items and language select

Radio Certificate certified under the model name of “TB-03”.

Set model code for main unit + AC adapter		Model code for enclosed AC adapter
For use in Japan, North America, Mexico and Thailand Type	TB-03-SCN-<Language Options>	For use in Japan, North America, Mexico and Thailand : UN318-5928
For use in China Type	TB-03-SCN-C-<Language Options>	For use in China : UNZ318-5928
For use in Europe Type	TB-03-SCN-E-<Language Options>	For use in Europe : UNE318-5928
For use in Korea	TB-03-SCN-K-<Language Options>	For use in Korea : UNR318-5928
No AC adapter enclosed type	TB-03-SCN-N-<Language Options>	No AC adapter enclosed

Option model code		Remarks
Strap	STR-1	
Spiral Cord	SIC-1	Connect the touch pen on the main unit in order to avoid loosing or dropping it
Grip Belt	GRP-2	Prepare your own and attach. Refer to [1.10.1 Grip Belt (GRP-2)]
Battery Unit for Main Unit	AB-7	

Maintenance part code		Remark
Touch Pen	TCH-TB03	ϕ4.5 × 100.5mm

1.2 Specifications

1.2.1 Basic Specification

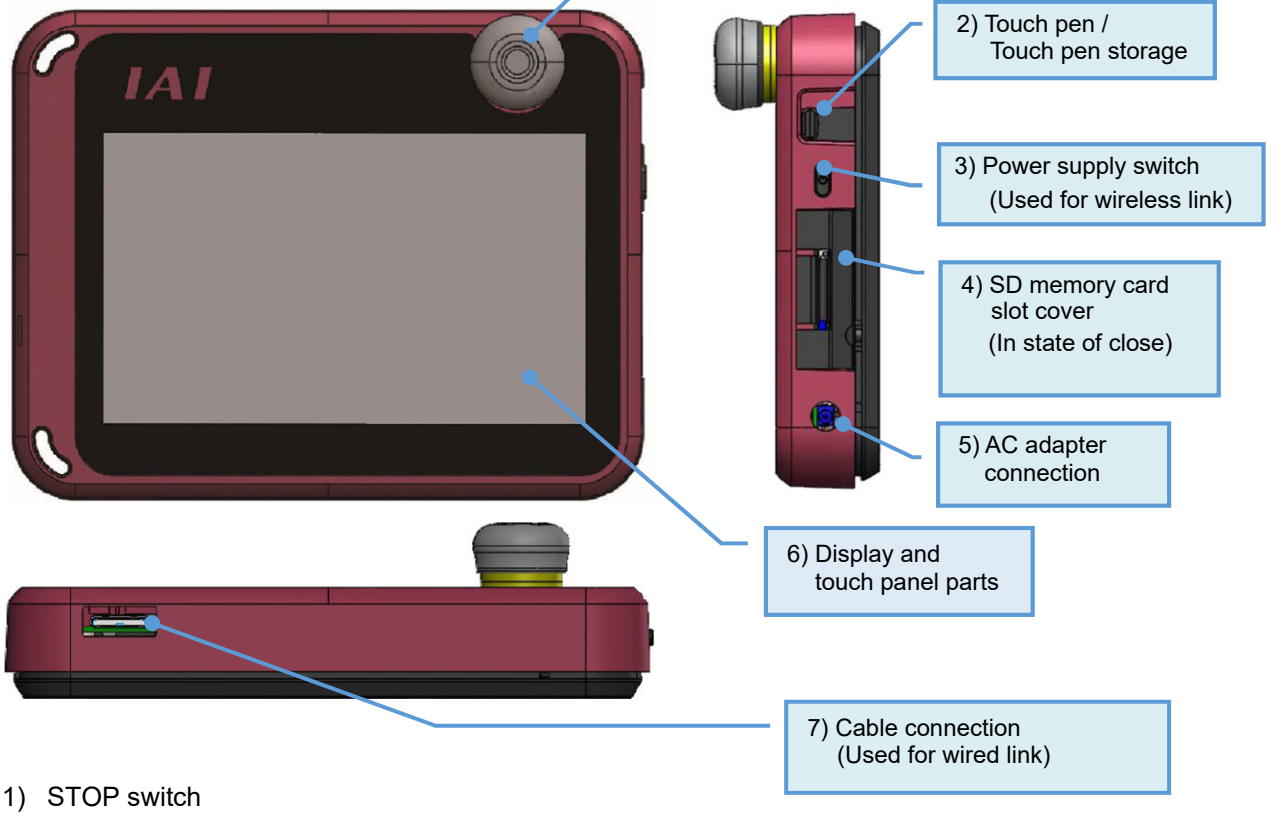
Item	Specifications
Rated voltage	5.9V DC (Supplied from adapter)
Operating voltage range	5.7 to 6.3V DC
Power consumption	16.52W or less (2.8A or less)
Insulation resistance	Between GND and FG, 500V DC, 10MΩ or more
Wireless link / Features	Bluetooth 4.2　Class 2
Battery charge system	Dedicated AC Adapter：Quick charging system with additional charging when fully charged (Wired link to EC：Slow charging with additional charging)
Duration for wireless operation	4 Hours Max.
Duration of charging	Approx. 3 Hours (AC Adapter)
Wireless operation battery	300 times of Cycle Durability
Display colors	65536 colors (16-bit colors)
Backlight method	White LED backlight
Backlight life	15,000 hours
Touch panel screen	7 inch TFT color WVGA (800 × 480)
Touch detection method	4-wire resistive type
Touch panel life	1 million times
External memory	SD/SDHC memory card interface installed (1G to 32G) (Toshiba-made recommended)
Touch pen (Accessory)	ϕ4.5 × 100.5mm
Language selection	Japanese/English/Chinese
Touch sound	ON/OFF　Volume Settable in 3 steps, S, M, and L
Data save	Applicable to have data saved to and read from external SD memory card (FAT32 Format) (Position data, parameter and alarm list)
Display adjustment	Brightness adjustable for contrast and backlight
Time setting	Clock setting available with real time clock (Backup held with CR2032 button battery)
Duration from the power being off to turned on	More than 2 seconds
Cooling method	Natural air-cooling
Size	TB-03 : 155 mm (H) × 200 mm (W) × 34 [54] mm (D) Stop switch included in [ ]
Mass	TB-03 : 670g approx. (Main Body)
SDHC™	SD memory card is a trademark of SD-3C, LLC and SDA.

1.2.2 Environmental Specifications

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

1.3 Explanation of Each Part

1.3.1 Front and Side Surface



1) STOP switch
It should be not used in wireless link.

> ⚠ *Caution : When the wireless link, operation can not be stopped with the stop switch.*

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

3) Power supply switch
Press this button in order to turn the power on and off for TB-03 main unit.
Press it and hold for 2 seconds or more to turn it off.

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

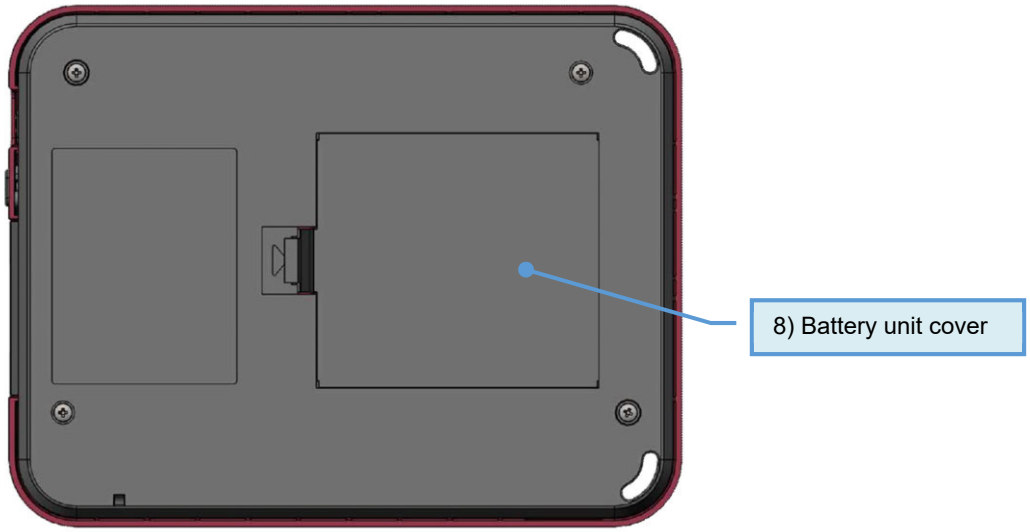
5) AC adapter connection
It is a connector to have the AC adapter joined in.

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 current value display, etc.
Touch the touch panel with a finger or touch pen (or fingers) to perform operations.

*1 In a use of the LCD display for a long term, the brightness may drop.
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)

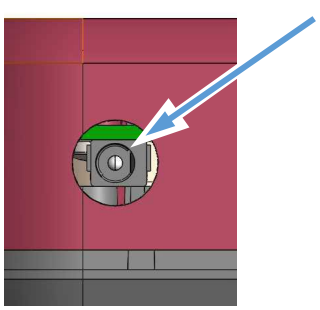
7) Cable connection
It should be not used in wireless link.

1.3.2 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 [1.5 How to Set in/out Battery Unit].

1.3.3 AC Adapter Joint

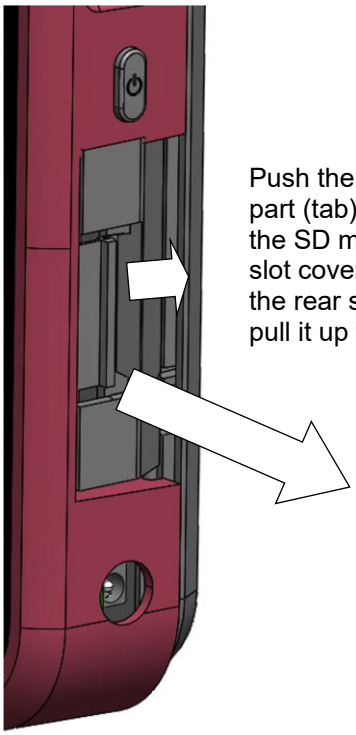


Connector name : LGP2631-0101F (SMK) : (JEITA RC-5320A Voltage Classification 2)		
Pin number	Signal name	Explanation
2	5.9V	Power supply input 5.9V
3	GND	Signal ground
4	GND	Signal ground

1.4 How to Set in/out SD Memory Card

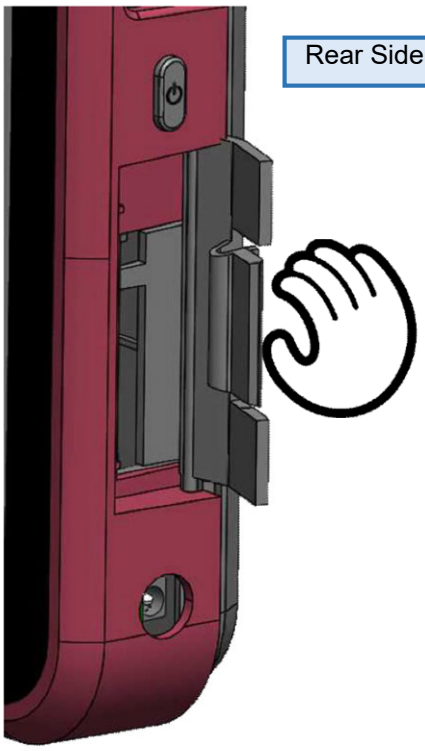
1.4.1 How to Insert SD Memory Card

1

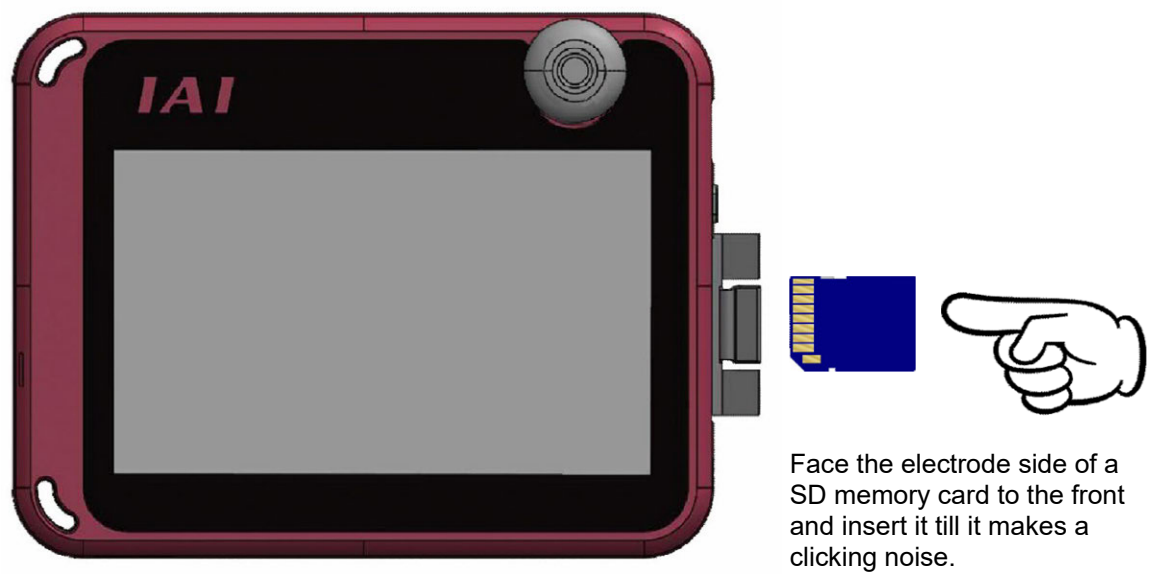


Push the extruded part (tab) slightly on the SD memory card slot cover towards the rear side and pull it up to open.

2



3



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

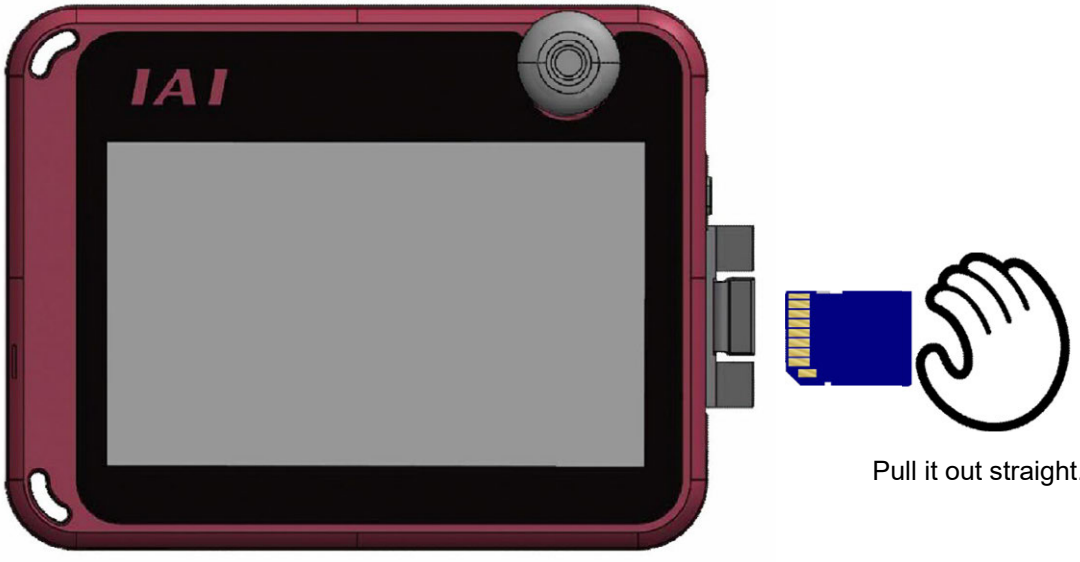
1.4.2 How to Take out SD Memory Card

1



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

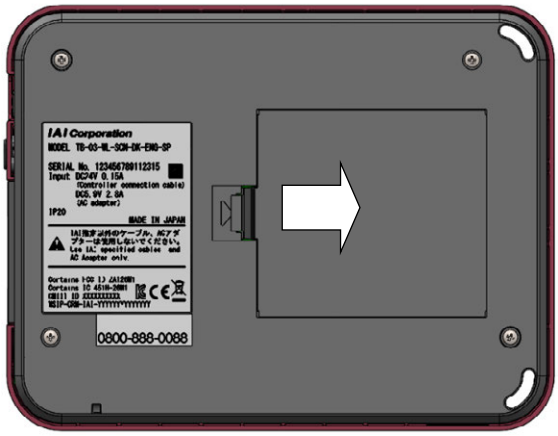
2

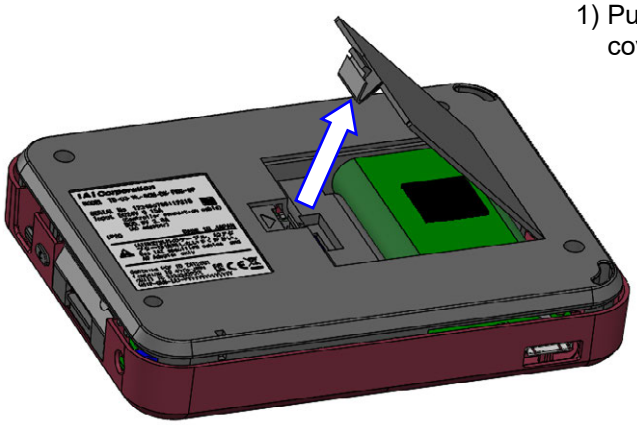


Pull it out straight.

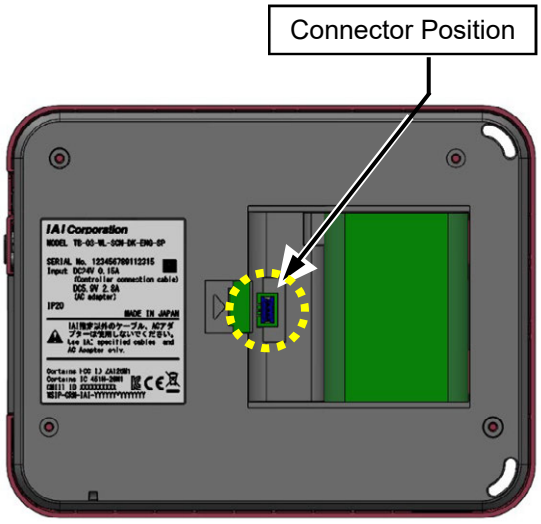
1.5 How to Set in/out Battery Unit

1.5.1 How to Take Out Battery Unit

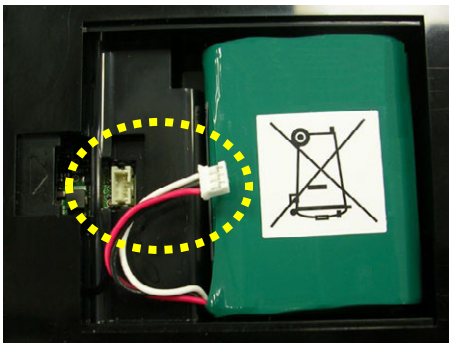




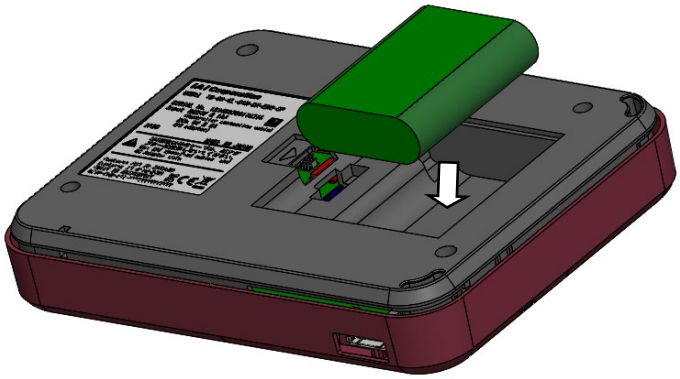
1) Push the tab towards the battery cover and the pull up batter cover.



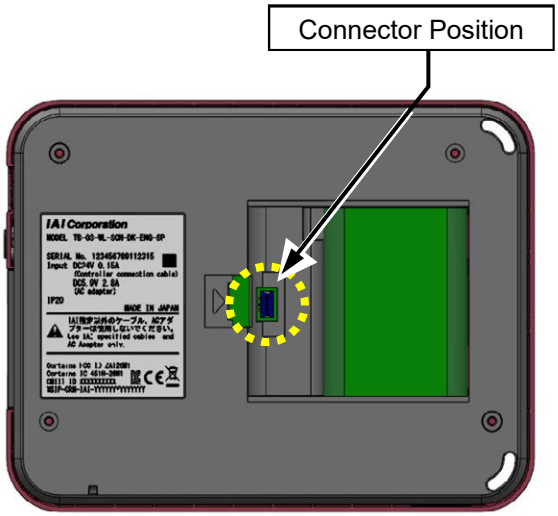
2) Pull out the connector and take out the battery unit.



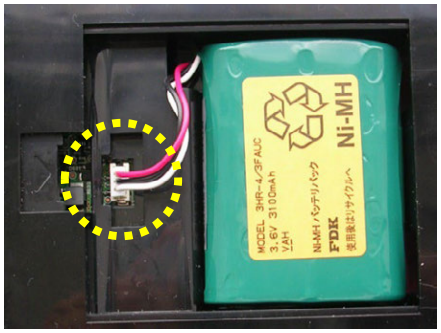
1.5.2 How to Attach Battery Unit

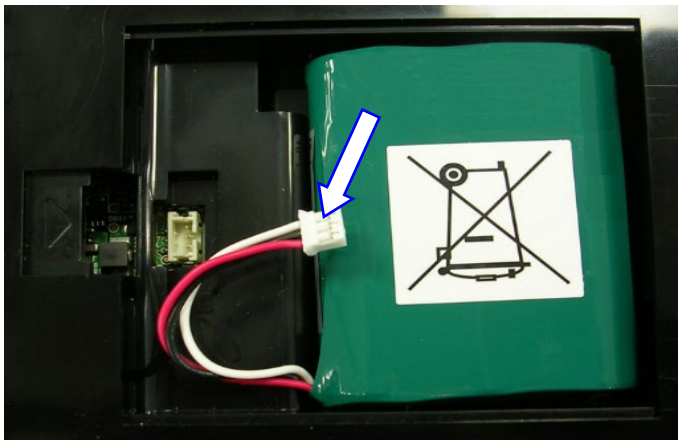


1) Set the battery unit in.



2) Join the connector.





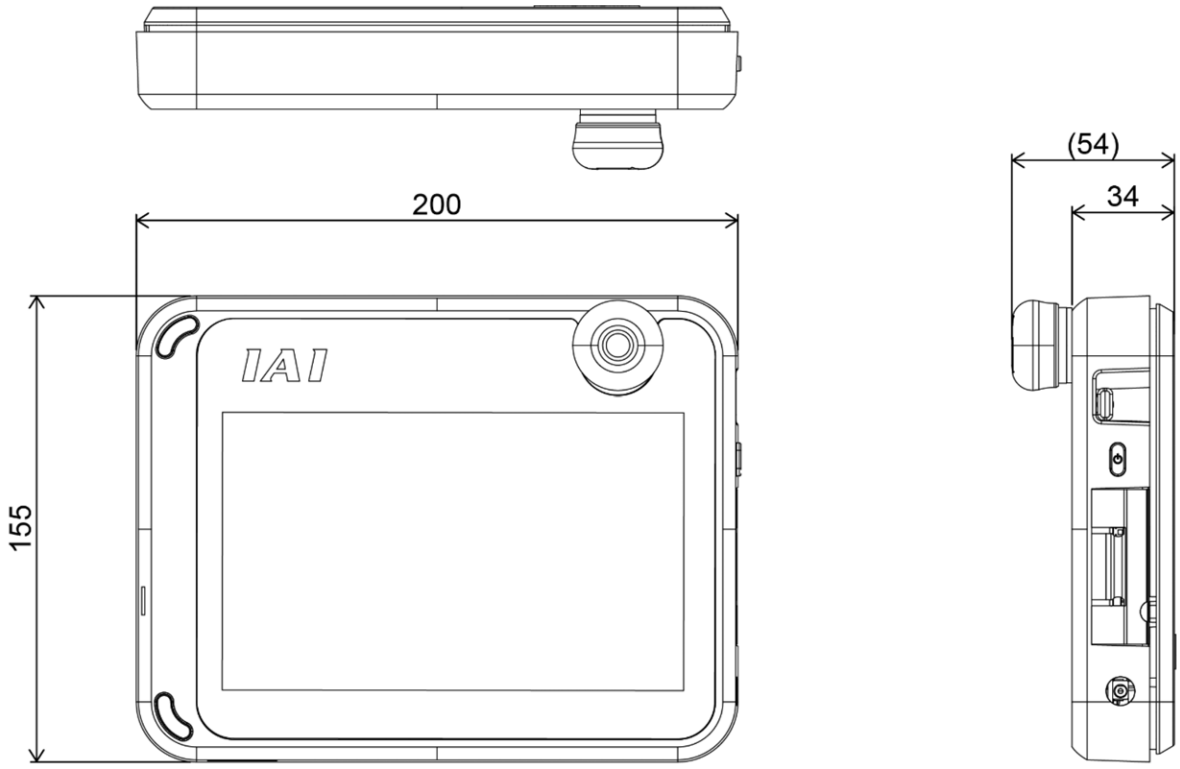
3) Attach the battery cover.

Pay attention not to get the cable pinched.

1.5.3 Caution When Battery Taken Off

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 connection with an AC adapter or a controller and supply power to TB-03 before turning it on.

1.6 External Dimensions



1.7 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)

1.8 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 "187 RTC Backup Battery Voltage Drop" once the voltage of the battery gets low. As the battery cannot be replaced at a customer's site, make a request to IAI.

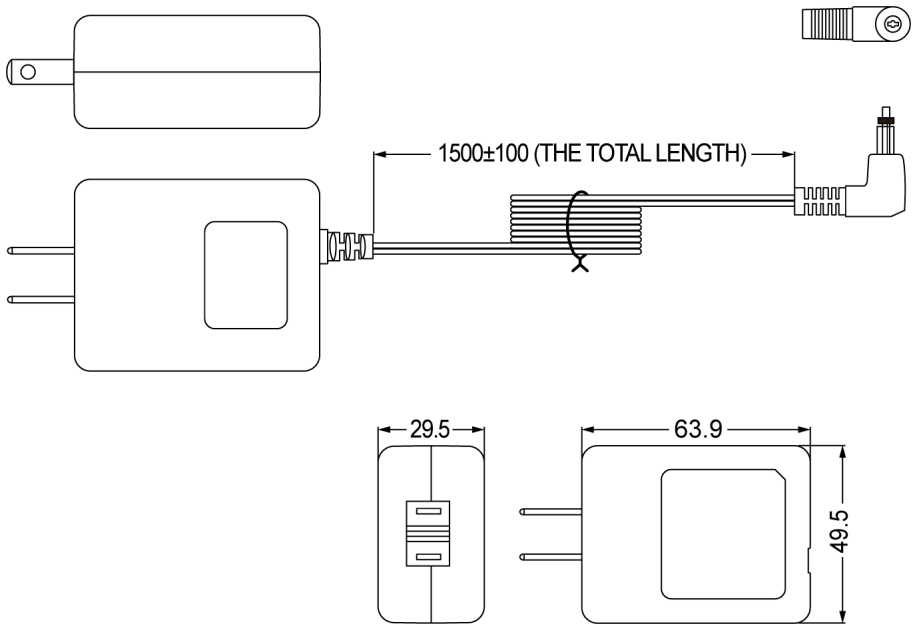
1.9 AC Adapter

1.9.1 Common Specifications for Adapter

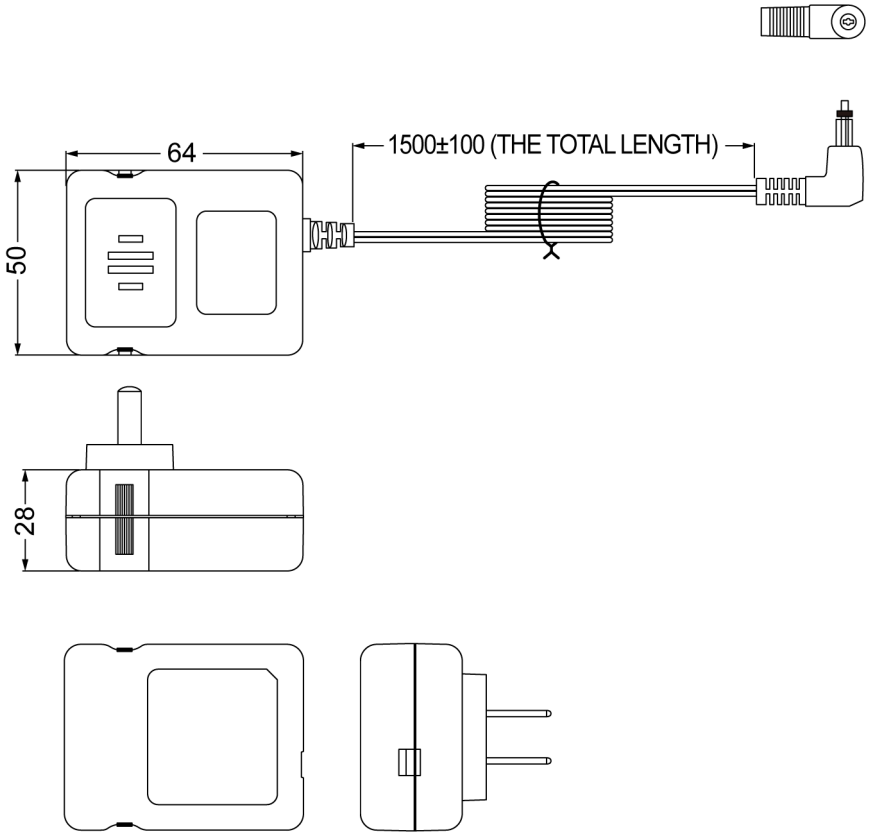
Iitem	Specifications
Power Input Voltage Range	Single-Phase 100 to 240V±10%
Power Current	0.4Amax.
Power Frequency Range	50 / 60Hz±5%
In-Rush Current	50A (at 25°C)
Output Voltage	5.9V DC (5.7 to 6.3V)
Output Current	2.8Amax.
Cable Length	1500±100mm

1.9.2 AC adapter appearance

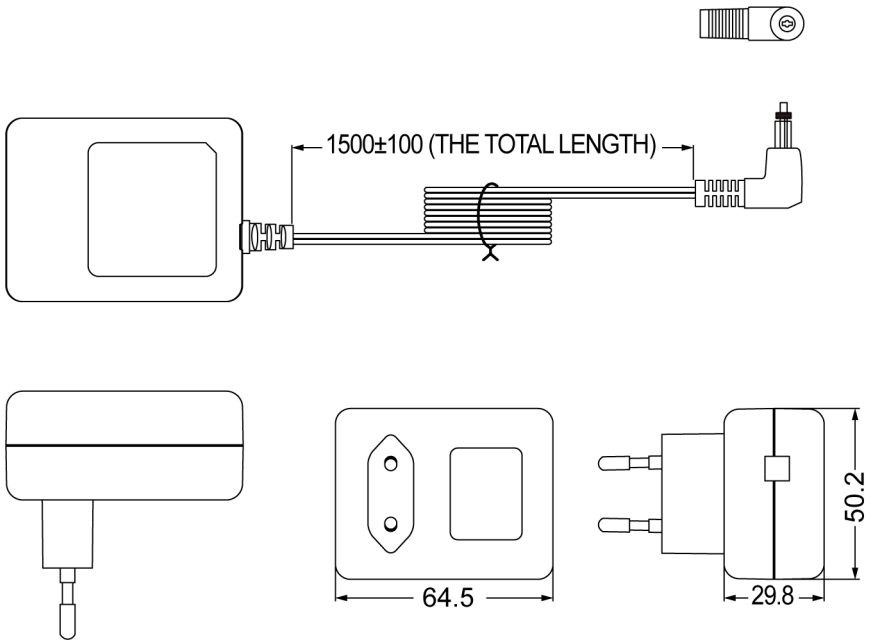
[For use in Japan, North America, Mexico and Thailand : UN318-5928]



[For use in China : UNZ318-5928]



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



1.10 Optional Items

1.10.1 Grip Belt (GRP-2)





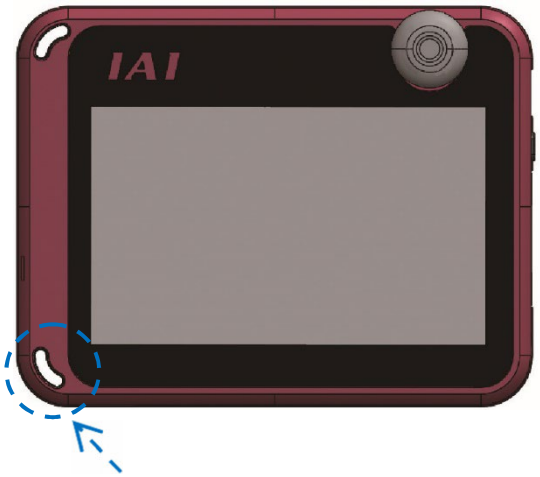


1) Put the belt through the slit on the left of the main body, and fix it on the fabric hook-and-loop fastener on the open grip.

2) Close the grip.

1.10.2 Strap (STR-1)

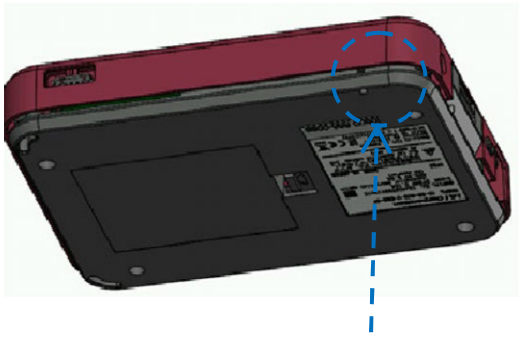




Put it through the slit on the left bottom of the main body.

1.10.3 Spiral Cord (SIC-1)





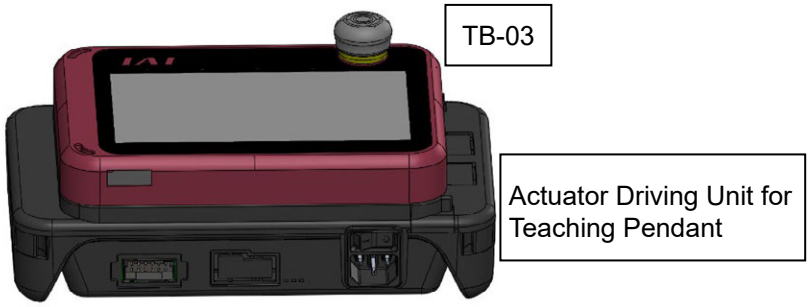
Putting it through the hole on the touch pen, and then put it through the hole allocated on the bottom the main body. (In case the spiral code would not go through the hole well, pull the cord using a tool such as tweezers.)

1.11 Actuator Driving Unit for Teaching Pendant

1.11.1 Feature

As an option for a teaching pendant, it is an "actuator driving unit" that is capable of supplying power to an actuator not completed with wiring for power supply in such cases as in installation of equipment.
It saves time to currently build up the power supply line and enables to have a quick trial run.
It is detachable to a teaching pendant, and enables to have a trial run in such cases as slider position tuning and AVD setup.

1) Unit configuration



2) Compatible actuator

The connectable actuator is ELECYLINDER (24V pulse motor type).

1.11.2 How to Read Model Number

1) Model Code for Driver Unit Individually

ADTB-EC-EC-5-1

<Power Supply Cable for Driving Unit>
0: Without cable
1: 100V AC Power Supply Cable (2m)
2: 200V AC Power Supply Cable (2m)

<Cable length>
0 : Without cable
5 : 5m (Standard)
10: 10m

<Model>
EC: ELECYLINDER

<Enclosed Cable Type>
0 : Without cable
EC (Note 1) : EC Power Supply Connectivity Cable
ECT (Note 2) : EC Power Supply + TB-03 Integrated Connectivity Cable

(Note 1) EC power supply connectivity cable (CB-ADTB-PW□□□-RB) should be enclosed.
(Note 2) EC power supply + TB-03 integrated connectivity cable (CB-ADTB-PWTB□□□) should be enclosed.

2) Model Code for TB-03 / Driving Unit in Set

TB-03E-SCN-C-1

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

<Model>
03E: Actuator Driving Unit for ELECYLINDER

<AC Adapter for Touch Panel>
Blank : 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

* An integrated connectivity cable (5m) should be enclosed in the set. Contact IAI when it is required to change the length.

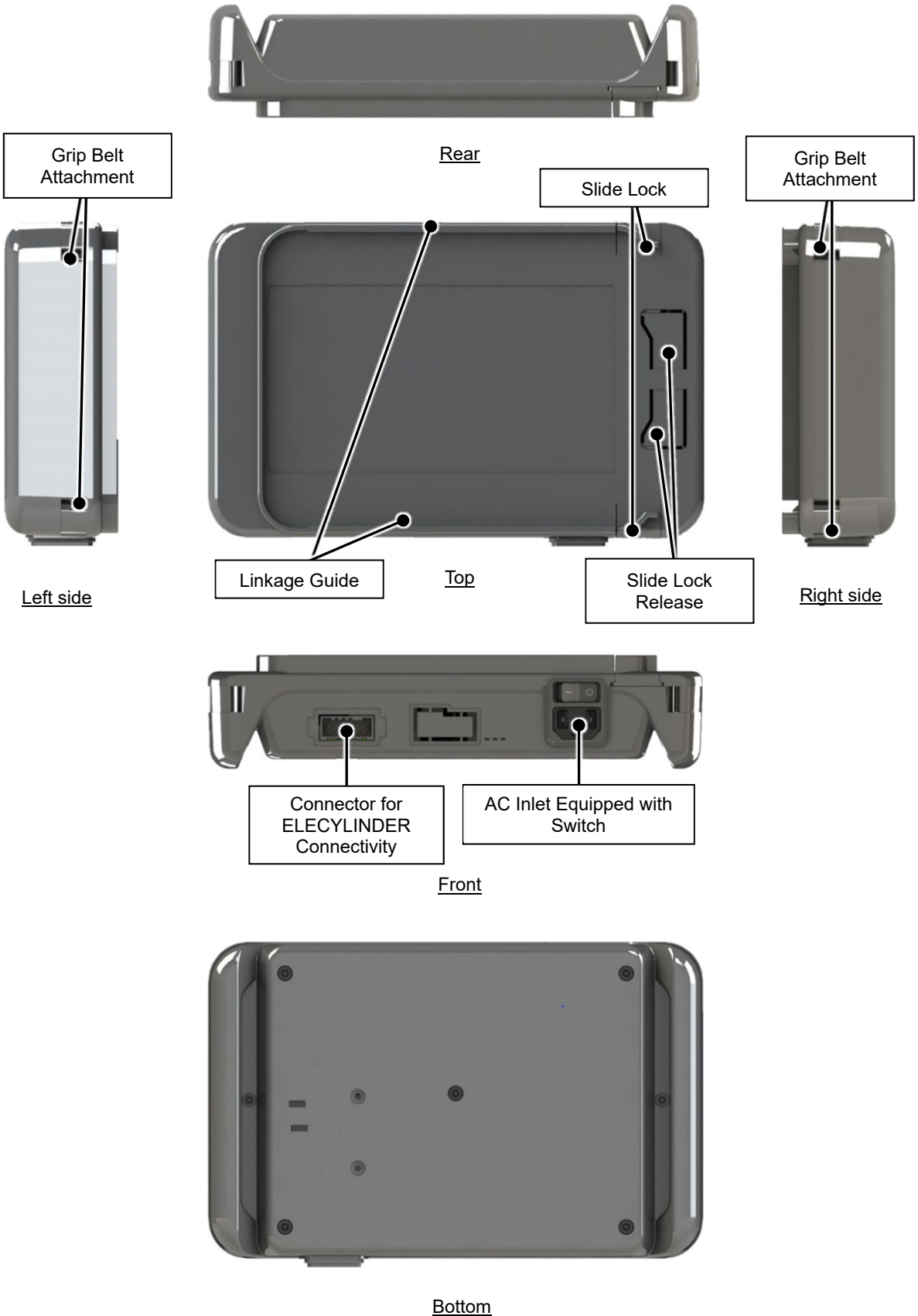
3) Model Code for Enclosed Cables Individually

- EC Power Supply Connectivity Cable : CB-ADTB-PW□□□-RB (Set the length in □□□)
- EC Power Supply + TB-03 Integrated Connectivity Cable : CB-ADTB-PWTB□□□ (Set the length in □□□)
- 100V AC Power Supply Cable : KWD-UJ-2MBS (Cable length should be 2m)
- 200V AC Power Supply Cable : CB-APMEC-PW-020-TM (Cable length should be 2m)

1.11.3 Basic Specification

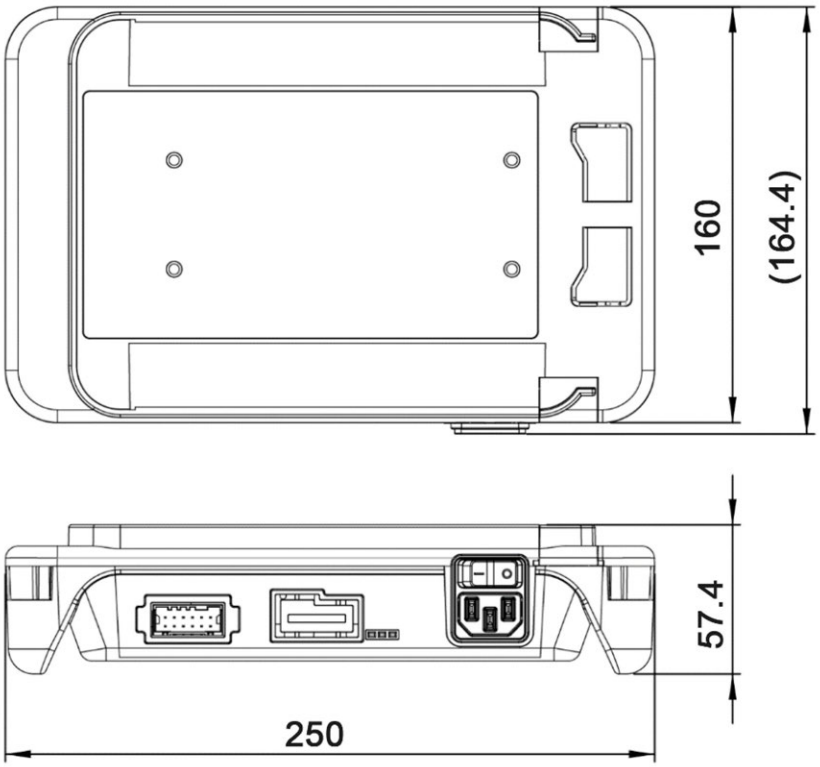
Item		Specifications
Rated Input Voltage		Single-Phase 100 to 230V AC ±10%
Input Current		1.4Atyp. (100V AC) 0.6Atyp. (230V AC)
Frequency Range		50/60Hz ±5%
Current Amperage		141VA (100V AC)
Output Current		24V DC ±10%
Load Current	Standard Dustproof and splashproof High-Stiffness	When Power Saving Setting Invalid: Rating 3.5A, Max. 4.2A When Power Saving Setting Valid: Rating 2.2A
	Slim and Small	Max. 2.0A
Output Capacity		When Power Saving Setting Invalid: Rating 84W, Max. 98.4W When Power Saving Setting Valid: Rating 52.8W
Ambient operating temperature		0 to 40°C (There should be no water condensation or freeze)
Ambient operating humidity		5%RH to 85%RH (There should be no water condensation or freeze)
Ambient storage temperature		-20 to 70°C
Ambient storage humidity		5%RH to 85%RH (There should be no water condensation or freeze)
Environment		Avoid corrosive gas and in particular avoid excessive dust
Altitude		1000 meters or less above the sea level
Vibration resistance		Frequency 10 to 57Hz / Swing width: 0.075mm Frequency 57 to 150Hz / Acceleration: 9.8m/s^2 XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
Dropped in package		From height 800mm, dropped on 1 corner + 3 edges + 6 surfaces
Overvoltage category		II
Pollution degree		2
Protection function against electric shock		II
Degree of protection		IP30
Mass		Approx. 740g
Cooling method		Natural cooling

1.11.4 Explanation of Each Part

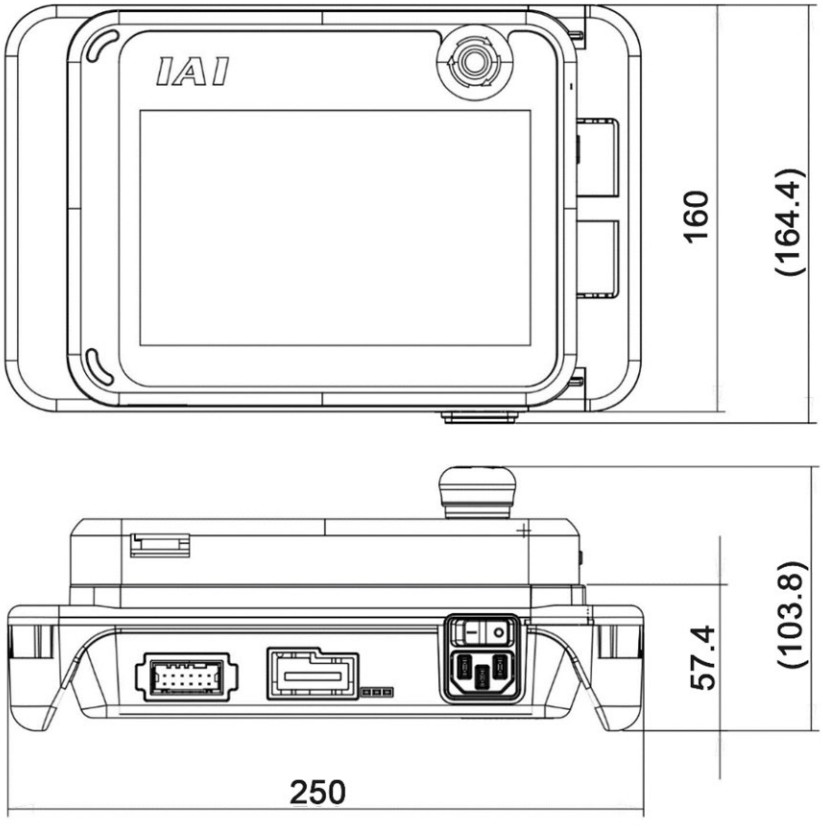


1.11.5 External Dimensions

Driving Unit Individually



Driving Unit Joined



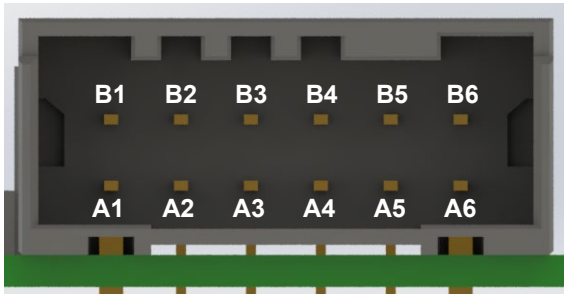
1.11.6 Feature of Each Part and Pin Assignment on Connector

1) AC Inlet Equipped with Switch



Model	DC11.0001.403	
Manufacturer	SCHURTER	
Pin No.	Signal name	Explanation
1	L	AC Input Live Terminal (Non-Grounding Side)
2	N	AC Input Neutral Terminal (Grounding Side)
3	PE	Protective Grounding Terminal (Class D Grounding)
Rated Voltage	Single-Phase 100 to 230V AC ±10%	
Input Current	1.4Atyp. (100V AC), 0.6Atyp. (230V AC)	
Connectivity Cable Specifications		
Item	Model	
100V AC Power Supply Cable	KWD-UJ-2MBS	
200V AC Power Supply Cable	CB-APMEC-PW-020-TM	

2) Connector for ELECYLINDER Connectivity

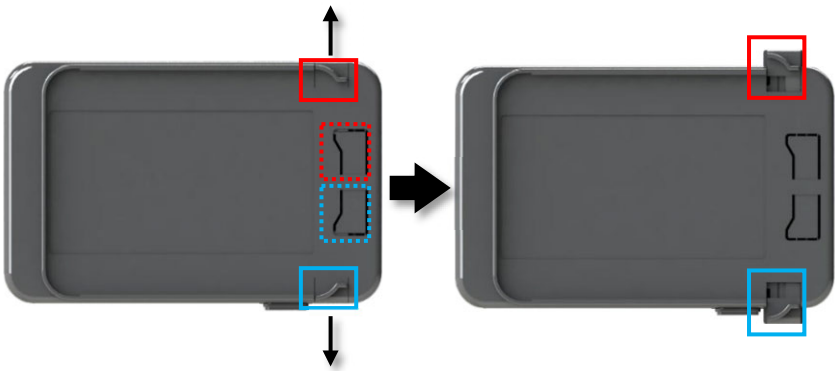


Model	1-1871935-6	
Manufacturer	TE	
Pin No.	Signal name	Explanation
A1	0V	GND
A2	24V (CP)	24V output (CP)
A3	NC	Not connected
A4	NC	Not connected
A5	NC	Not connected
A6	NC	Not connected
B1	24V (MP)	24V output (24V output (MP))
B2	NC	Not connected
B3	NC	Not connected
B4	NC	Not connected
B5	NC	Not connected
B6	NC	Not connected
Output Voltage	24V DC±10%	
Load Current	Rated 3.5A, Max. 4.2A	
Connectivity Cable Specifications		
Item	Model	
Connection Cable	EC Power Supply Connectivity Cable CB-ADTB-PW□□□-RB	
	EC Power Supply + TB-03 Integrated Connectivity Cable CB-ADTB-PWTB□□□	

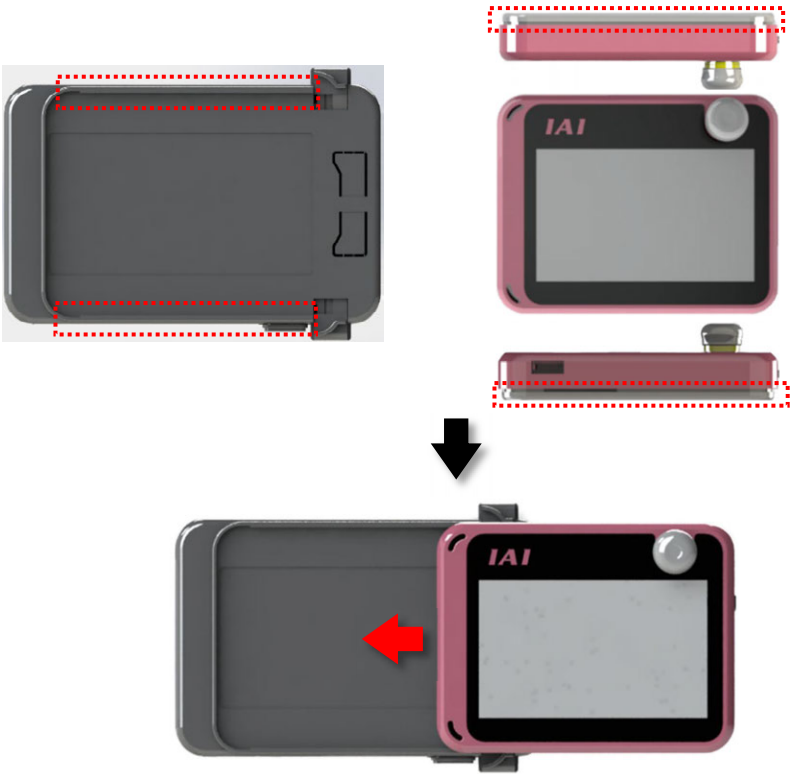
1.11.7 Joining Unit

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

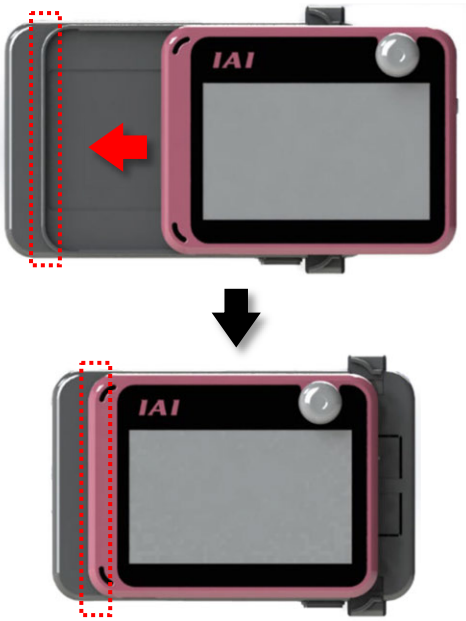
1 While pressing the slide lock release (broken line areas) on the driving unit, slide the slide locks to make them open.



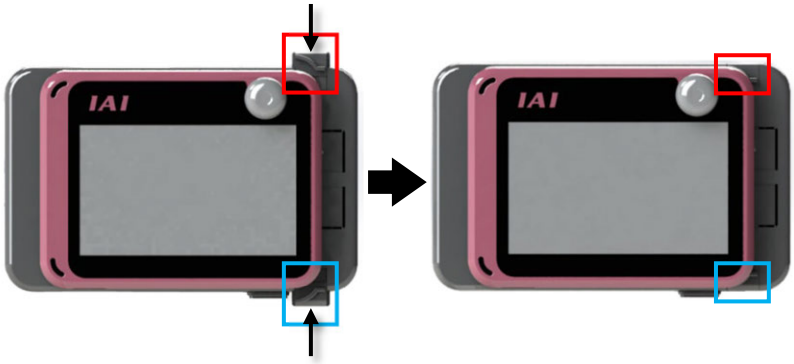
2 Insert the slots (broken line areas in the figure) on a teaching pendant to the linkage guides on the actuator driving unit from the right side.



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



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

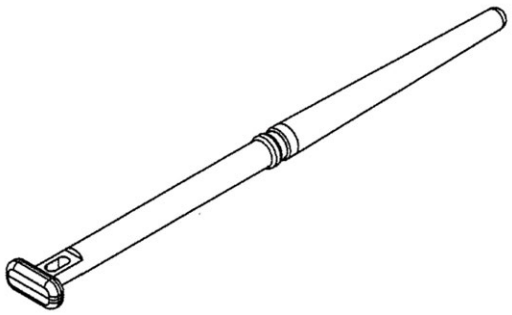


1.12 Maintenance Parts

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



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



1.13 Specifications Related to Wireless

1.13.1 Specifications (Version, Class)

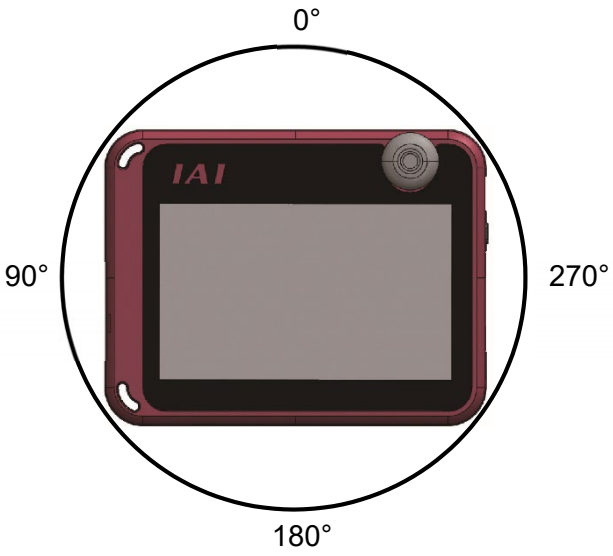
Bluetooth 4.2 Class 2

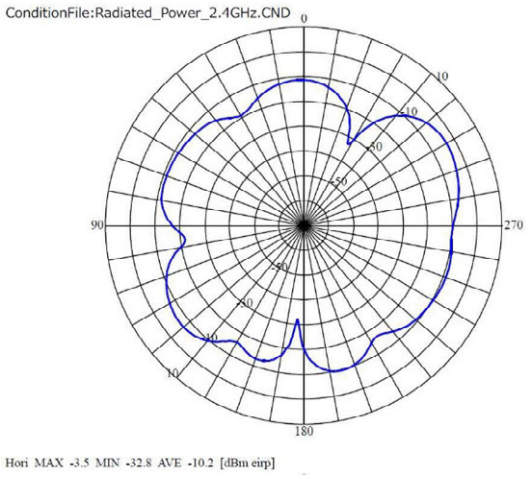
1.13.2 Reference for Wireless Link Reachable Distance

It is recommended to have distance between TB-03 and ELECYLINDER•WLAN/Bluetooth converter of 5m or less with no interruption.
The connection may get unstable even in distance of 5m or less depending on the peripheral environment of use.
Also, be aware that, even if an axis is displayed in the wireless axis select window with distance over 5m, the connection could get unstable as the distance goes far.

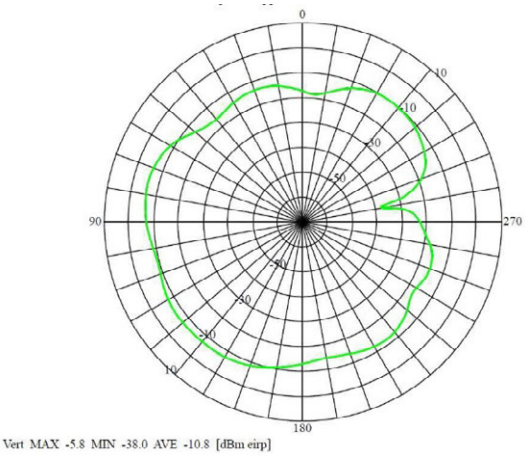
1.13.3 Directivity

Shown below is the result of directivity measurement in the measurement distance of 3m.





Horizontally Polarized Wave



Vertically Polarized Wave

1.14 Specifications Related to Battery Charge

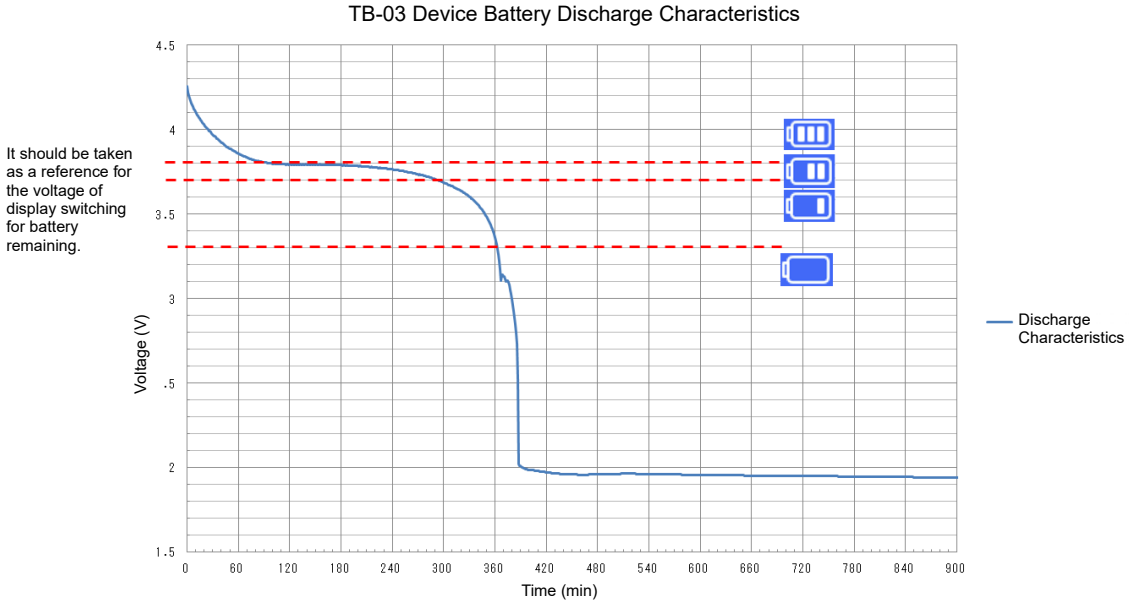
1.14.1 Types of Charger Mode

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.

1.14.2 Caution Related to Battery Charging

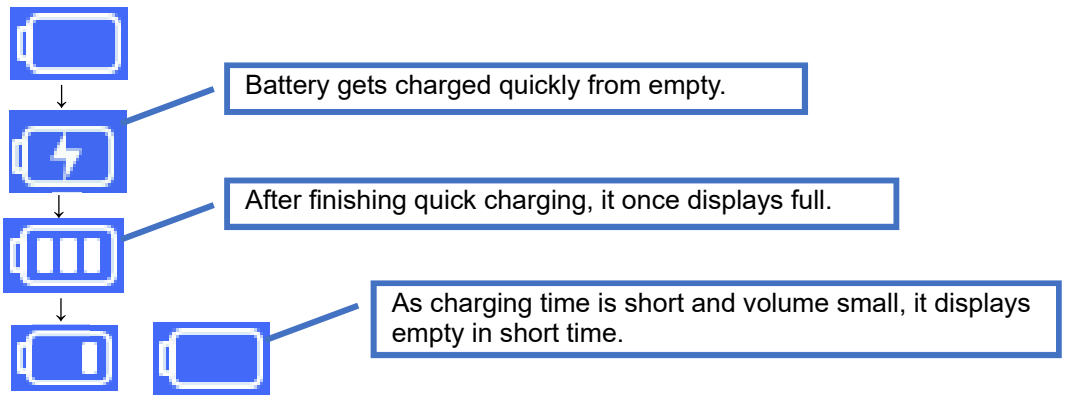
1.14.2.1 Display of Battery Remained

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)



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)



2. Connection

2.1 Wireless Link to ELECYLINDER•WLAN/Bluetooth converter

Turn the ELECYLINDER•WLAN/Bluetooth converter power on, and then turn on the power of the TB-03.
It is recommended to have distance between TB-03 and ELECYLINDER•WLAN/Bluetooth converter of 5m or less with no interruption.
[Refer to 1.13.2 Reference for Wireless Link Reachable Distance]

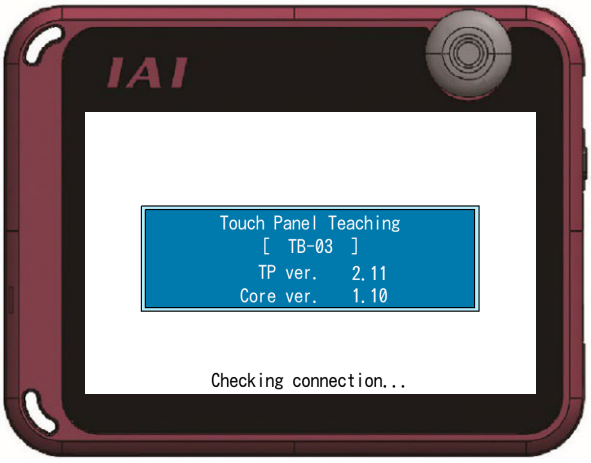
1





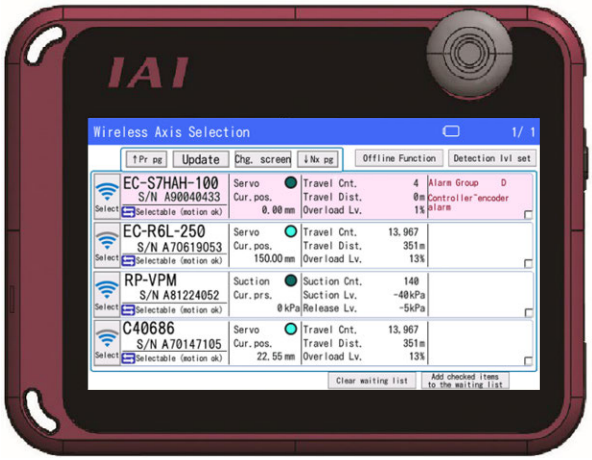
Press the power switch to turn the power on.

2



Initial display window starts up.

3

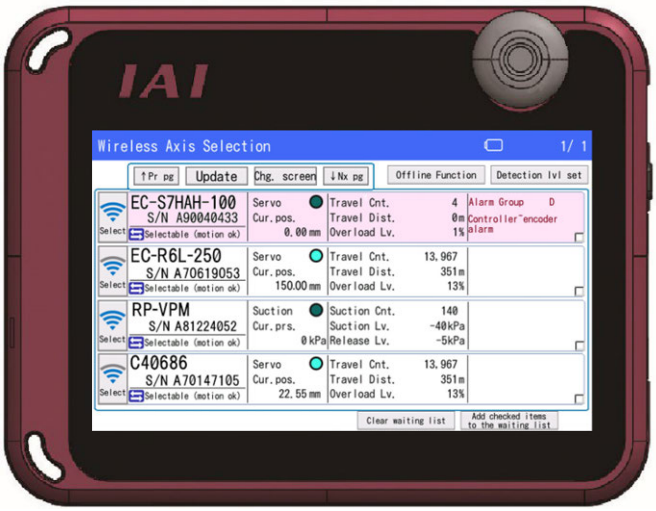


Wireless axis selection window appears.
It may take time to show the display depending on the reception of the signal.

Displays on actuators turn on from those with reception stronger to weaker when there are several units linked.

2.2 To Turn Power OFF

1





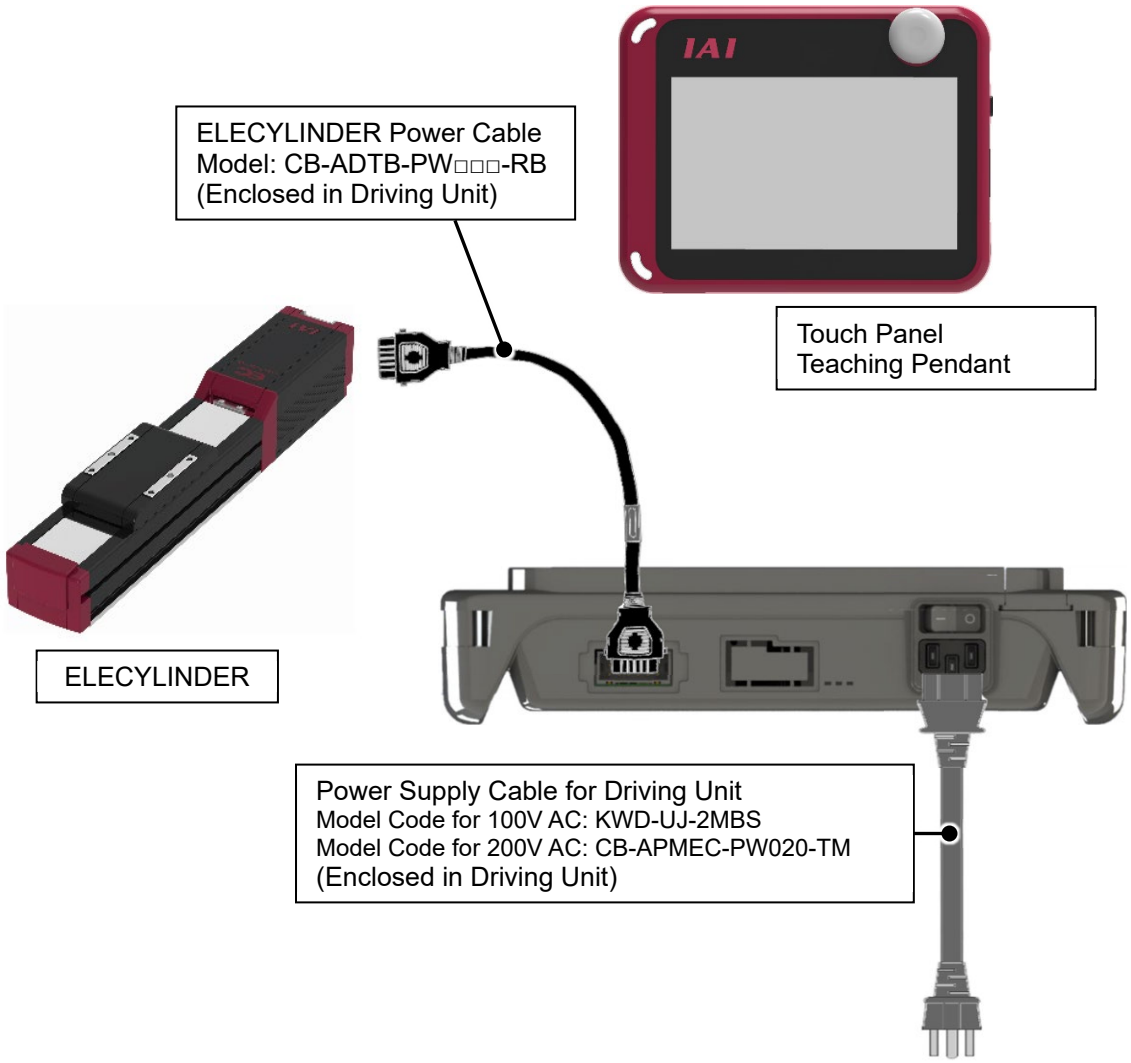
Press and hold the power switch for two seconds or longer to turn the power on.

2



2.3 Connection of Actuator Driving Unit and ELECYLINDER

Turn the controller power OFF before connecting or disconnecting the teaching pendan.

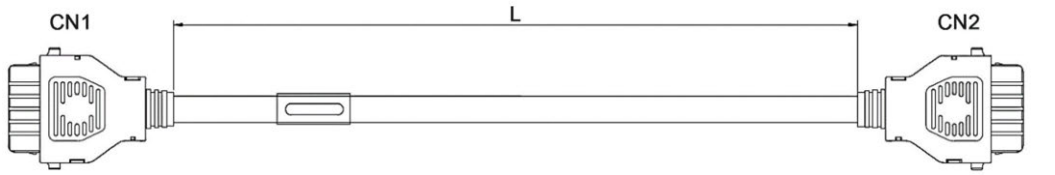


⚠ *Caution*:
- *Connecting or disconnecting the unit while the controller power is ON could result in faults.*
- *Confirm the connector engagement section and connect/disconnect while taking care not to apply excessive force. If the connector does not fit in smoothly, do not push it in with force. Failure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

* When purchasing a driving unit individually, selection can be made from EC power supply + TB-03 combination cable (CB-ADTB-PWTB□□□) and EC power supply connection cable (CB-ADTP-PW050-RB) for an ELECYLINDER connection cable.

2.4 Appearance of Connectivity Cables Enclosed to Actuator Driving Unit and Connectivity Specification Diagrams

2.4.1 EC Power Supply Connectivity Cable: CB-ADTB-PW□□□-RB



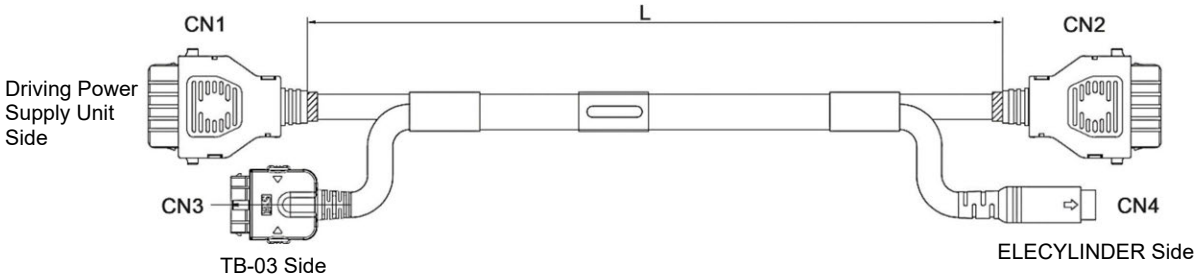
CN1

Color	Signal Name	Pin No.
BK (AWG18)	0V	A1
RD (AWG18)	24V (MP)	B1
LB (AWG22)	24V (CP)	A2
	IN0	B3
	IN1	B4
	IN2	B5
	(Reservation)	B6
	OUT0	A3
	OUT1	A4
	OUT2	A5
	(Reservation)	A6
	BKRLS	B2

CN2

Pin No.	Signal Name	Color
A1	0V	BK (AWG18)
B1	24V (MP)	RD (AWG18)
A2	24V (CP)	LB (AWG22)
B3	IN0	
B4	IN1	
B5	IN2	
B6	(Reservation)	
A3	OUT0	
A4	OUT1	
A5	OUT2	
A6	(Reservation)	
B2	BKRLS	

2.4.2 EC Power Supply + TB-03 Integrated Connectivity Cable: CB-ADTB-PWTB□□□ (For wired)



CN1

Color	Signal Name	Pin No.
BK (AWG18)	0V	A1
RD (AWG18)	24V (MP)	B1
LB (AWG22)	24V (CP)	A2
	IN0	B3
	IN2	B5

CN2

Pin No.	Signal Name	Color
A1	0V	BK (AWG18)
B1	24V (MP)	RD (AWG18)
A2	24V (CP)	LB (AWG22)
B3	IN0	
B5	IN2	

CN3

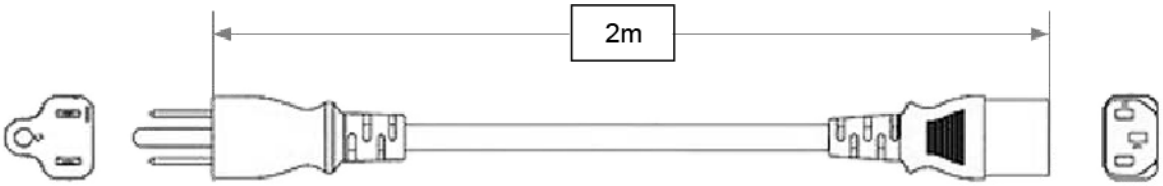
Color	Dot mark/Color		Signal Name	No.
YW	■	BK	EMG1+	1
YW	■	RD	EMG1-	2
-	-	-	EMG2+	3
-	-	-	EMG2-	4
LGY	■	BK	ENB1+	5
LGY	■	RD	ENB1-	6
-	-	-	ENB2+	7
-	-	-	ENB2-	8
-	-	-	N.C	9
-	-	-	N.C	10
WT	■	BK	GND	11
-	-	-	TXD	12
-	-	-	RXD	13
-	-	-	6.5V	14
OR	■	RD	SRD+	15
OR	■	BK	SRD-	16
PK	■	RD	T5V	17
WT	■	RD	T24V	18
-	-	-	GND	19
UL1571 Applicable Wire			GND	20
-	-	-	N.C	21
-	-	-	N.C	22
-	-	-	N.C	23
-	-	-	FG	24
Shield to be clamped to hood on ST connector				

CN4

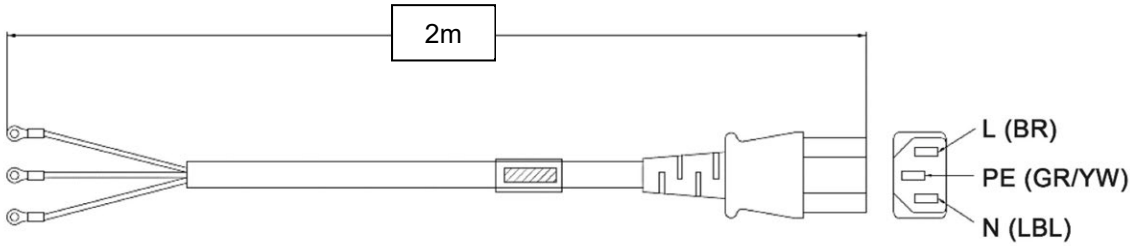
No.	Signal Name	Color	Dot mark/Color	
1	SGA	OR	■	RD
2	SGB	OR	■	BK
3	T5V	UL1571 Applicable Wire		
4	ENB	LGY	■	BK
6	T24V	WT	■	RD
8	EMGB	YW	■	RD
5	EMGA	YW	■	BK
7	GND	WT	■	BK
Shell	GND	-	-	-

2.5 Appearance of Actuator Driving Unit Power Supply Cables and Connectivity Specification Diagrams

2.5.1 100V AC Power Supply Cable (Model: KWD-UJ-2MBS)



2.5.2 200V AC Power Supply Cable (Model: CB-APMEC-PW020-TM)



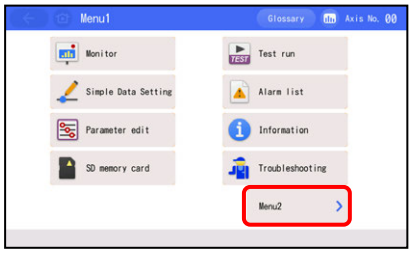
3. Operation of ELECYLINDER and ROBO PUMP

3.1 Displayed Language Change

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

● Display change from English to Japanese

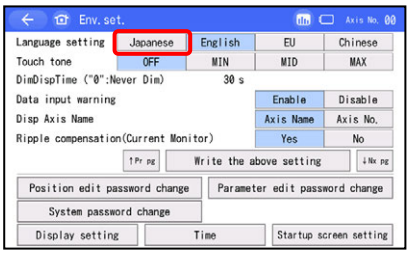
(1) Touch [Menu2] in Menu1.



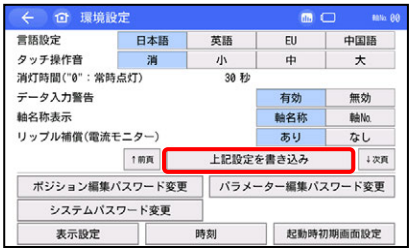
(2) Touch [Env. set.] in Menu2.



(3) Touch [Japanese].



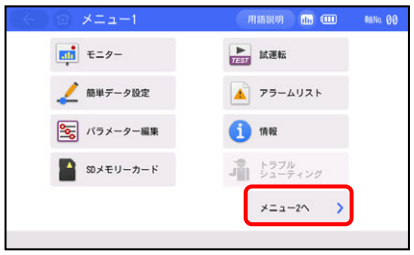
(4) Touch [上記設定を書き込み].



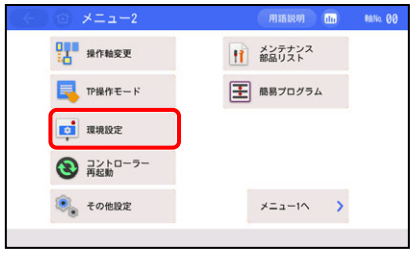
(Note) Skipping to another window without touching [上記設定を書き込み] will allow language to go back to that before changed.

● Display change from Japanese to English

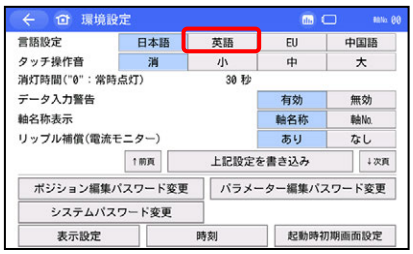
(1) Touch [メニュー2 へ] in メニュー1.



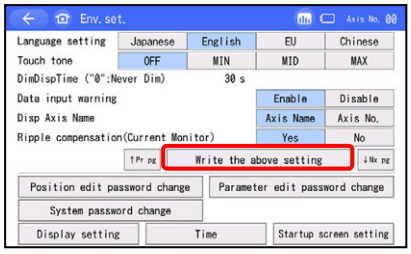
(2) Touch [環境設定] in メニュー2.



(3) Touch [英語].



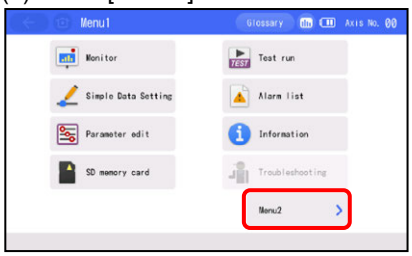
(4) Touch [Write the above setting].



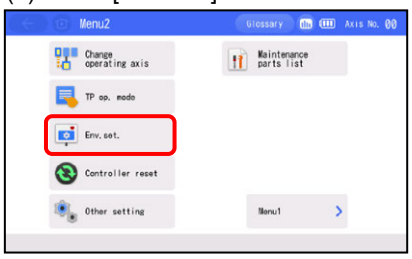
(Note) Skipping to another window without touching [Write the above setting] will allow language to go back to that before changed.

● Display change from English to Chinese

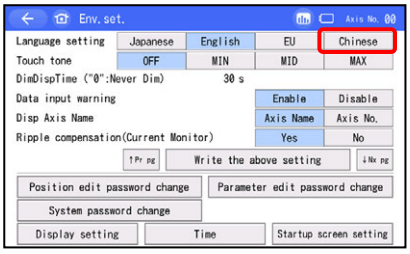
(1) Touch [Menu2] in Menu1.



(2) Touch [Env. set.] in Menu2.



(3) Touch [Chinese].



(4) Touch [写入上述设定].



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

● Display change from Chinese to English

(1) Touch [菜单 2] in 菜单 1.



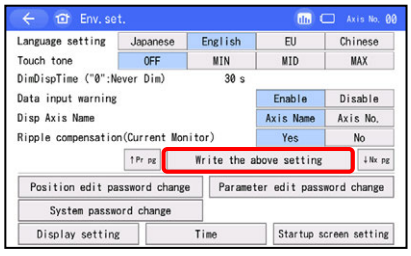
(2) Touch [环境设定] in 菜单 2.



(3) Touch [英语].



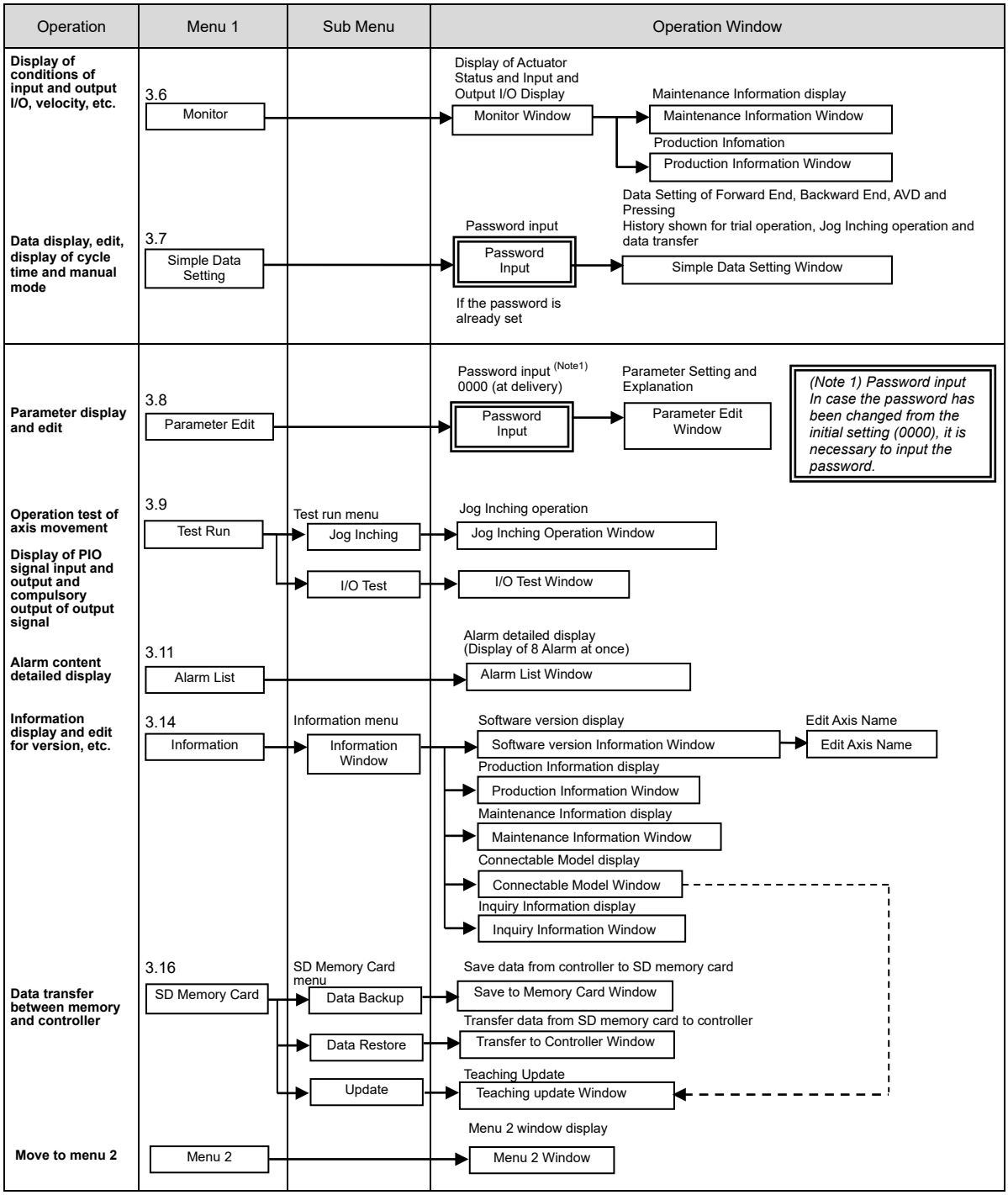
(4) Touch [Write the above setting].

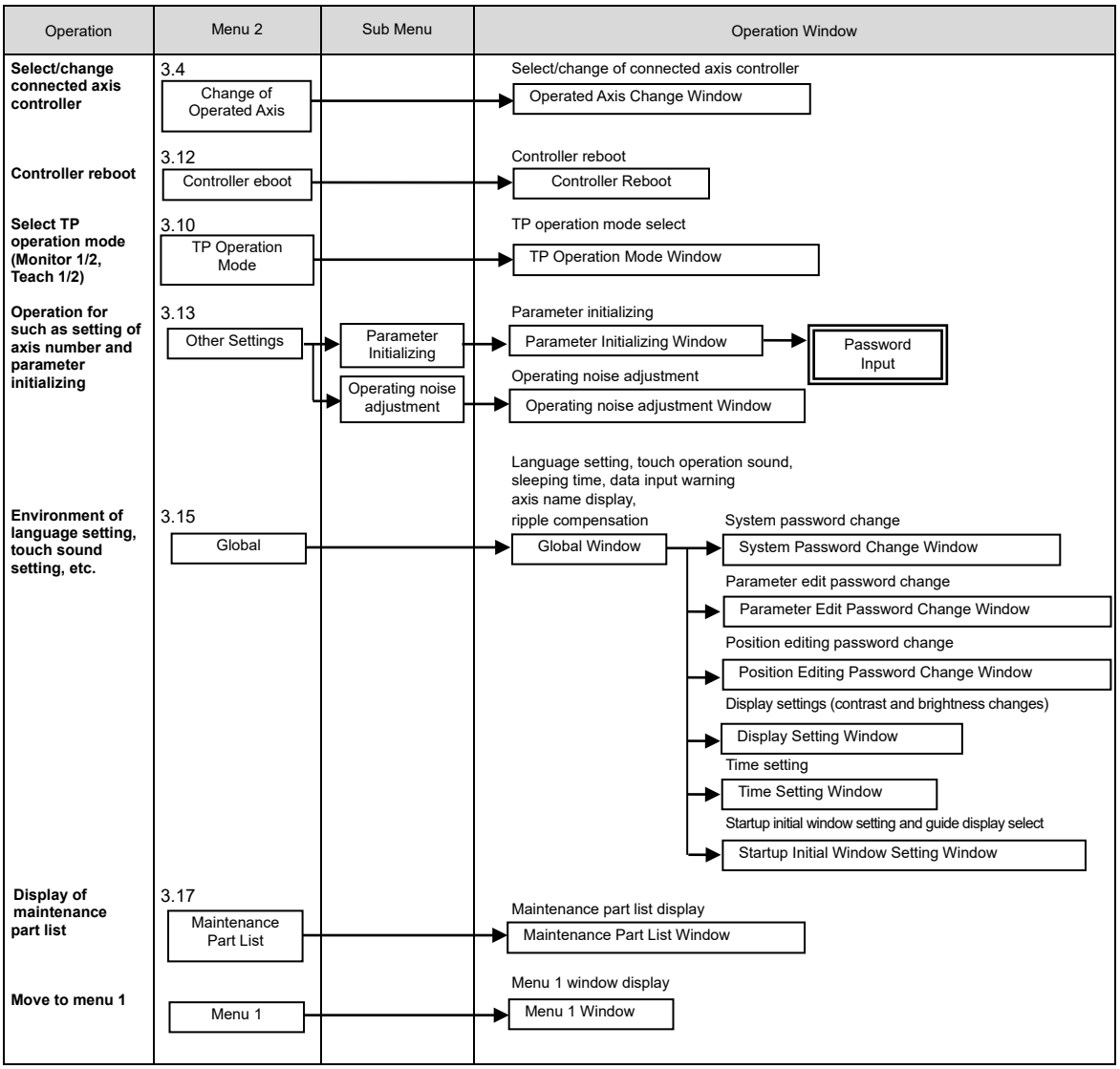


(Note) Skipping to another window without touching [Write the above setting] will allow language to go back to that before changed.

3.2 Operating Menu

Operating menu when the TB-03 is connected to ELECYLINDER is shown.




Operation
Menu 2
Sub Menu
Operation Window
Select/change connected axis controller
3.4
Change of Operated Axis
Operated Axis Change Window
Controller reboot
3.12
Controller eboot
Controller Reboot
Select TP operation mode (Monitor 1/2, Teach 1/2)
TP operation mode select
3.10
TP Operation Mode
TP Operation Mode Window
Operation for such as setting of axis number and parameter initializing
3.13
Other Settings
Parameter Initializing
Parameter initializing
Parameter Initializing Window
Password Input
Operating noise adjustment
Operating noise adjustment
Operating noise adjustment Window
Language setting, touch operation sound, sleeping time, data input warning axis name display, ripple compensation
Environment of language setting, touch sound setting, etc.
3.15
Global
Global Window
System password change
System Password Change Window
Parameter edit password change
Parameter Edit Password Change Window
Position editing password change
Position Editing Password Change Window
Display settings (contrast and brightness changes)
Display Setting Window
Time setting
Time Setting Window
Startup initial window setting and guide display select
Startup Initial Window Setting Window
Display of maintenance part list
3.17
Maintenance Part List
Maintenance part list display
Maintenance Part List Window
Move to menu 1
Menu 1
Menu 1 window display
Menu 1 Window

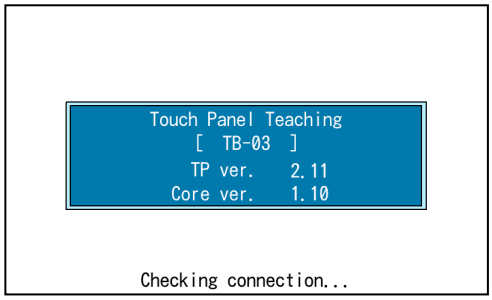
3.3 Initial Screen

Turn the power on, select wireless axis to operate and start the operation.

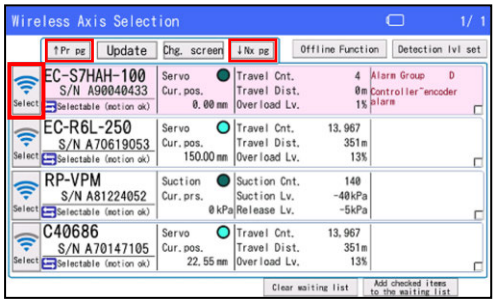
IAI logo will be displayed in the screen for a few seconds.



Versions of the teaching and core will be displayed.



Wireless Axis Select window will show up.



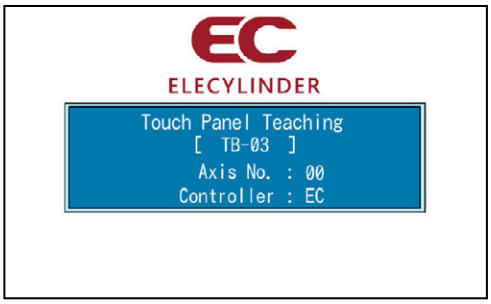
Select the axes to operate in this teaching pendant.

For the 4-axis display specification, axes for 4 units at the maximum should be displayed in one screen. (Up to 4 screens 16 units)
In case more than four units are connected and the axis you would like to operate is not displayed, touch [↑ Pr pg] / [↓ Nx pg] to show the axis you would like to operate.

For the 16-axis display specification, axes for 16 units at the maximum should be displayed in one screen.

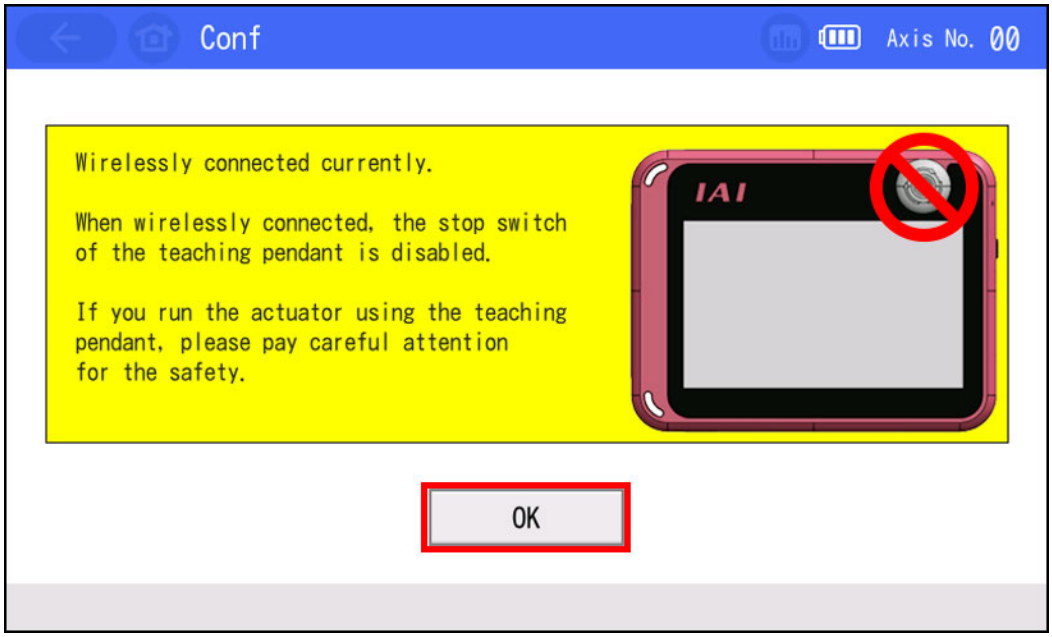
[Refer to 3.4 Wireless Axis Select Screen (Change Operation Axis)]
Refer to [3.8 ROBO PUMP Setting] for details of ROBO Pump display.

When you select the axis to operate, the number of axis to be operated and the type of controller will be displayed.

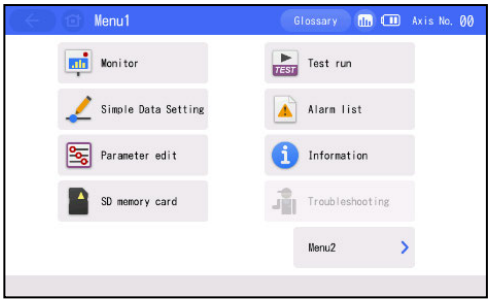


(EC: ELECYLINDER)

If the wireless axis operation setting of the teaching pendant is enabled and an axis that can be operated via a wireless connection is selected, this confirmation window will be displayed. Confirm what is written and touch [OK].



⚠ *Caution: Before starting axis operation, make sure that you check the contents described in the Intro-12 page "Precautions for Axis Operation with Wireless Connection" and follow it to secure the safety.*



The Menu 1 screen appears.

It is available to show a screen other than Menu 1 Screen.
[Refer to 3.16 Environment Setting "Startup screen setting"]

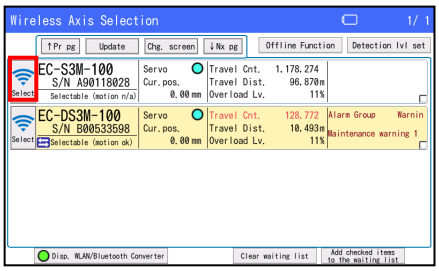
3.4 Wireless Axis Selection Window (Change Operation Axis)

It is a window to select wireless axis to operate.
It is also available to monitor the status of the connected axes. [Refer to 3.4.2 Display Wireless Axis Status]

This window should appear after the power gets turned on or if you touch [Change Operating Axis] in Menu 2 window or touch the Change Axes to Operate button [Refer to 3.5 Menu Selection] on the right top of the window.

3.4.1 Change Axes to Operate

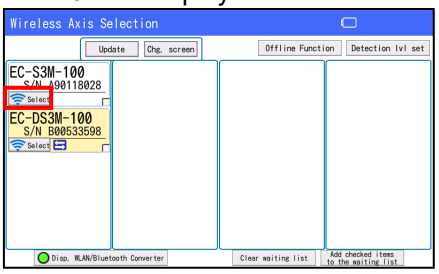
For 4-axis display



Display the axis to operate in the teaching pendant, and touch the wireless ico Select on the left to select it.

Four units at maximum can be shown in one screen. (Up to 4 screens 16 units)
In case more than four units are connected and the axis you would like to operate is not displayed, touch [↑ Pr pg] / [↓ Nx pg] to show the axis you would like to operate.

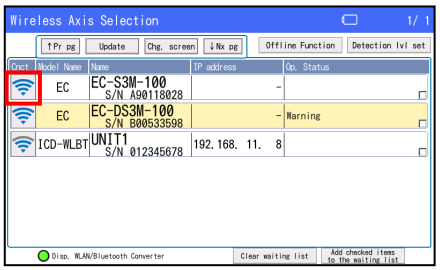
For 16-axis display



Display the axis to operate in the teaching pendant, and touch the wireless icon Select on the left bottom to select it.

16 units at maximum can be shown in one screen. (Up to one screen 16 units)

For WLAN/Bluetooth converter display

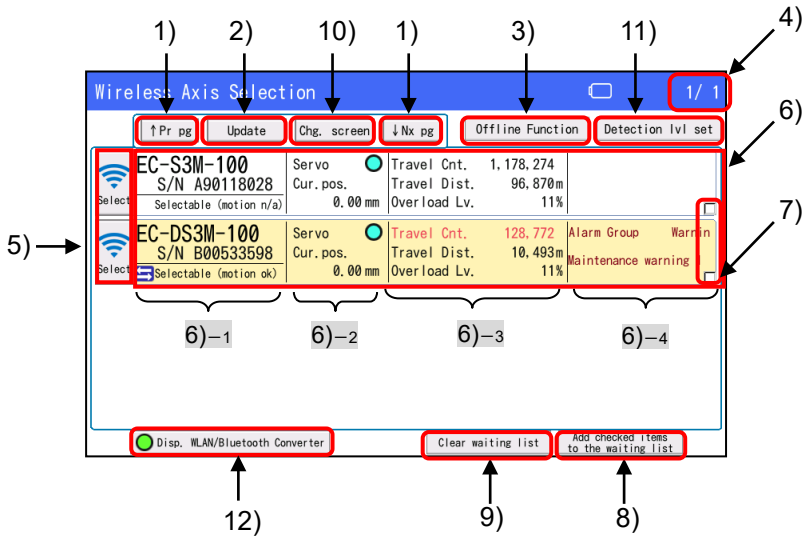


Display the axis to operate in the teaching pendant, and touch the wireless icon on the left bottom to select it.

6 units at maximum can be shown in one screen. (Up to 3 screens 16 units)
In case more than 6 units are connected and the axis you would like to operate is not displayed, touch [↑ Pr pg] / [↓ Nx pg] to show the axis you would like to operate.

3.4.2 Display Wireless Axis Status

For 4-axis display



1) [↑ Pr pg] and [↓ Nt pg] Buttons

You can change pages with these buttons. Four pages (16 units) should be able to show at maximum.

2) [Update] Button

Display in the window gets erased once and wireless axis data get gathered and displayed again.

3) [Offline Function] Button

The display goes to the screen to edit positions (only for EC), to set up environment for main unit and to update the teaching tools which are available offline (with no wireless operation).

4) Page Number

Current page number and total number of pages should be shown.

5) Wireless Icon (Wireless Link Button)

It is an icon to show the status of signal reception.
Status of signal reception should be expressed in five patterns, which are 4 levels + no reception of signal.

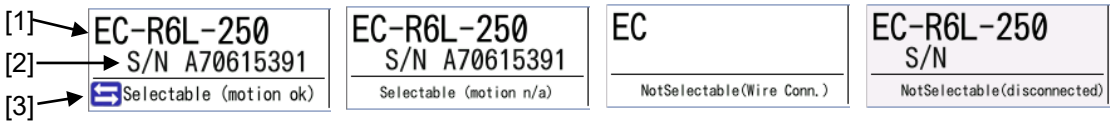
Press and hold this icon to move to a process to establish connection to the applicable axis.
It should become unavailable to use when the connection is wired, when an axis is in wireless connection with another teaching tool, or when an axis is disconnected.



6) Data Display Area

Data for wireless axis should be displayed. Order of display should follow the strength of signal reception.

6)-1 Display Area 1



[1] Axis Name

Here, displays the “axis name” registered to ELECYLINDER.
The model code of ELECYLINDER (Series name - Type / Lead Length - Stroke: eg. EC-R6L-250) is registered in the initial setting.
“Axis name” is available to change. [Refer to 3.15.2 Axis Name Edit]

[2] S/N (serial number)

Here, displays the “serial number” of ELECYLINDER.

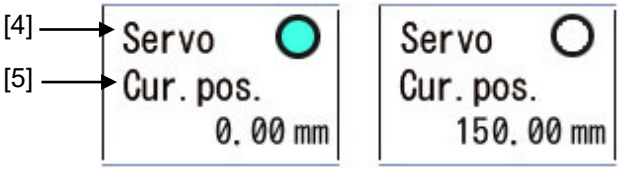
[3] Link Status

Here, displays the status of ELECYLINDER connection. The status of link should be shown in either of four types below.
Wireless axis operation icon should be displayed when operation with wireless connection is available.

Display	Status
Selectable (motion ok)	It is a condition wireless link is available to select (Axis available for operation with wireless connection: WL2)
Selectable (motion n/a)	It is a condition wireless link is available to select (Axis not available for operation with wireless connection: WL)
Not Selectable (Wire Conn.)	It is a condition that wired link is established with another teaching tool
Not Selectable (disconnected)	It is a condition that data was received once, but it is lost

(Note) An axis in condition of “Not Selectable (disconnected)” cannot be linked wirelessly for such reasons as the power to ELECYLINDER gets shut off on the way and likes, but it remains displayed until [Update] button gets pressed.

6)-2 Display Area 2



[4] Servo-on Display

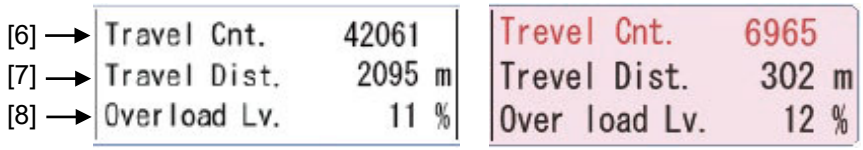
The status of the servo should be displayed in two patterns.
Servo is on when this is on ●, and it is off when off ○.
The adsorption status should be displayed for ROBO PUMP. It should show adsorption complete when it is illuminated ●, and adsorption not complete when it is off ○.

[5] Current Position Display

Here, displays the current position.
It should show the current pressure (current pressure at vacuum pump part) for ROBO PUMP.

6)-3 Display Area 3

The items in this display area should be displayed only in wireless link.



[6] Travel Cnt.
Here, displays “total number of drive” in the maintenance information. [Refer to 3.6.2 Maintenance Information Window]
of any item exceeded the threshold for warning, it should be shown here in red.
It should show the adsorption count (“Total Adsorption Count” in the maintenance information) for ROBO PUMP.

[7] Travel Dist.
Here, displays “total distance of drive” in the maintenance information. [Refer to 3.6.2 Maintenance Information Window]
In case of any item exceeded the threshold for warning, it should be shown here in red.
It should show the adsorption confirmation level (upper value of pressure to complete adsorption) for ROBO PUMP.

[8] Over load Lv.
Here, displays “overload level” in the driver monitor information. [Refer to 3.6.1 Monitor Window]
In case of any item exceeded the threshold for warning, it should be shown here in red. [Refer to 3.6.2 Maintenance Information Window]
It should show the desorption confirmation level (lower value of pressure to complete desorption) for ROBO PUMP.

6)-4 Display Area 4



[9] Alarm Display
There should be nothing to be displayed here if there is no alarm or warning being occurred at the moment.
“Alarm Group” and “Alarm Group Name” should be displayed when an alarm or warning is being occurred.
The data display of an axis with an alarm or warning being occurred will be displayed with red if the background color is an alarm, and yellow if it is a warning.

Data Availability ○ : Data Available × : Data Unavailable

No.	Display Content	Normal Condition		Wireless Link Unavailable (Wire-Linked) Condition	Disconnected Condition
		Alarm Not Generated	Alarm Generated		
1	Axis Name	○	○	Displayed as “EC”	×
2	S/N (serial number)	○	○	×	×
3	Link Status	○	○	○	×
4	Servo-on Display	○	○	○	×
5	Current Position Display	○	○	○	×
6	Travel Cnt.	○	○	×	×
7	Travel Dist.	○	○	×	×
8	Over load Lv.	○	○	×	×
9	Alarm Display	-	○	○	×

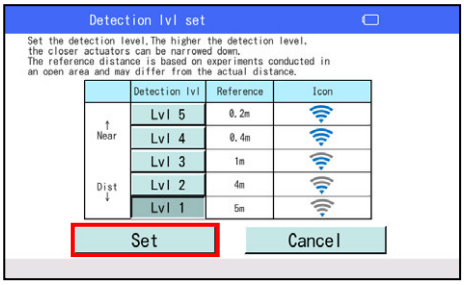
7) Checkbox for Standby Axis List Registration
Select axes that you would like to register in the standby axis list.
While a checkmark is put, touch the 8) [Add checked items to the waiting list] button, and it can be registered in the standby axis list.
An axis registered in the standby axis list will not be displayed in the wireless axis select window even if the [Update] button is touched.

8) [Add checked items to the waiting list] Button
Register the axes selected in the 7) checkbox for standby axis list registration to the standby axis list, delete the display once, and collect the information of wireless axes to display it again.
Axes selected in the checkbox will not be displayed.

9) [Clear waiting list] Button
After deleting the standby axis list registered before, erase the display once, and collect the information of wireless axes to display it again.
Axes not displayed before can be displayed.

10) [Chg. screen] Button
The display switches to the wireless axis select window in the 16-axis display specification.

11) [Detection lvl set] Button
The level for what range of axes to be collected can be adjusted.



The level that can be detected in the wireless axis select window should be set up.

Set up the detection level referring to such as the reference distance and displayed icons, and touch the [Set] button.
The higher the detection level is set, the closer actuators can be detected.

For instance, if it is set to Lv. 5, only actuators in the range of approximately 0.2m around TB-03 can be detected and shown in the wireless axis select window.

Levels and reference distance are just reference. It may differ from the actual operation. Adjust it for the used environment.

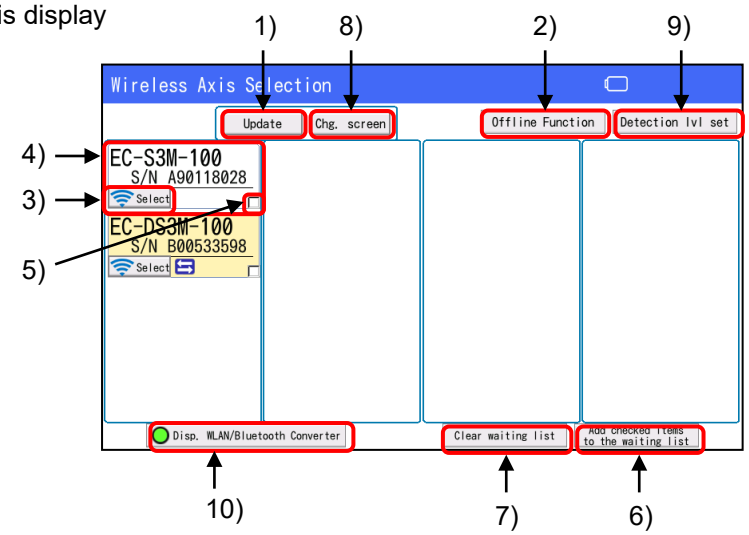
12) [WLAN/Bluetooth converter display] Button



When a WLAN/Bluetooth converter is detected, the indicator lamp turns on and a button for switching to the Wireless Axis Selection screen for the WLAN/Bluetooth Converter Display Specification is displayed. Once detected, the lamp remains lit and the button also remains displayed.

⚠ *Caution: The WLAN/Bluetooth converter is not displayed in the 4-axis display specification. A maximum of 16 devices, including axes and WLAN/Bluetooth converters, can be detected. Therefore, fewer than 16 axes may be displayed on this screen. If the desired axis is not displayed, touch [Refresh].*

For 16-axis display



* Refer to [3.8 ROBO PUMP Setting] for details of ROBO Pump display.

1) [Update] Button

Display in the window gets erased once and wireless axis data get gathered and displayed again.

2) [Offline Function] Button

The display goes to the screen to edit positions (only for EC), to set up environment for main unit and to update the teaching tools which are available offline (with no wireless operation).

3) Wireless Icon (Wireless Link Button)

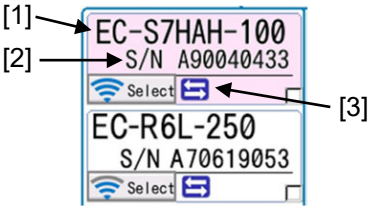
It is an icon to show the status of signal reception.
Status of signal reception should be expressed in five patterns, which are 4 levels + no reception of signal.



Press and hold this icon to move to a process to establish connection to the applicable axis.
It should become unavailable to use when the connection is wired, when an axis is in wireless connection with another teaching tool, or when an axis is disconnected.

4) Data Display Area

Data for wireless axis should be displayed. Order of display should follow the strength of signal reception.



[1] Axis Name

Here, displays the “axis name” registered to ELECYLINDER.
The model code of ELECYLINDER (Series name - Type / Lead Length - Stroke: eg. EC-R6L-250) is registered in the initial setting.
“Axis name” is available to change. [Refer to 3.15.2 Axis Name Edit]

[2] S/N (serial number)

Here, displays the “serial number” of ELECYLINDER.

[3] Link Status

It shows availability of wireless axis condition. The status of link should be shown in either of two types below.
Wireless axis operation icon should be displayed when operation with wireless connection is available.

Display	Status
	It is a condition wireless link is available to select (Axis available for operation with wireless connection: WL2)*
Blank	Others

* For ROBO PUMP, those in WL Option should be indicated.

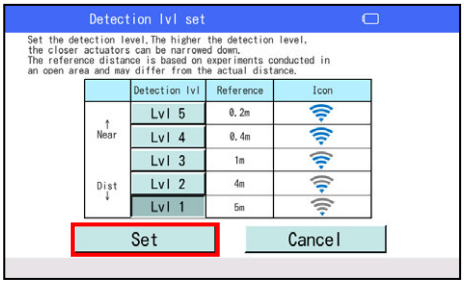
5) Checkbox for Standby Axis List Registration
Select axes that you would like to register in the standby axis list.
While a checkmark is put, touch the 6) [Add checked items to the waiting list] button, and it can be registered in the standby axis list.
An axis registered in the standby axis list will not be displayed in the wireless axis select window even if the [Update] button is touched.

6) [Add checked items to the waiting list] Button
Register the axes selected in the 5) checkbox for standby axis list registration to the standby axis list, delete the display once, and collect the information of wireless axes to display it again.
Axes selected in the checkbox will not be displayed.

7) [Clear waiting list] Button
After deleting the standby axis list registered before, erase the display once, and collect the information of wireless axes to display it again.
Axes not displayed before can be displayed.

8) [Chg. screen] Button
The display switches to the wireless axis select window in the WLAN/Bluetooth converter display specification.

9) [Detection lvl set] Button
The level for what range of axes to be collected can be adjusted.



The level that can be detected in the wireless axis select window should be set up.

Set up the detection level referring to such as the reference distance and displayed icons, and touch the [Set] button.
The higher the detection level is set, the closer actuators can be detected.

For instance, if it is set to Lv. 5, only actuators in the range of approximately 0.2m around TB-03 can be detected and shown in the wireless axis select window.

Levels and reference distance are just reference. It may differ from the actual operation. Adjust it for the used environment.

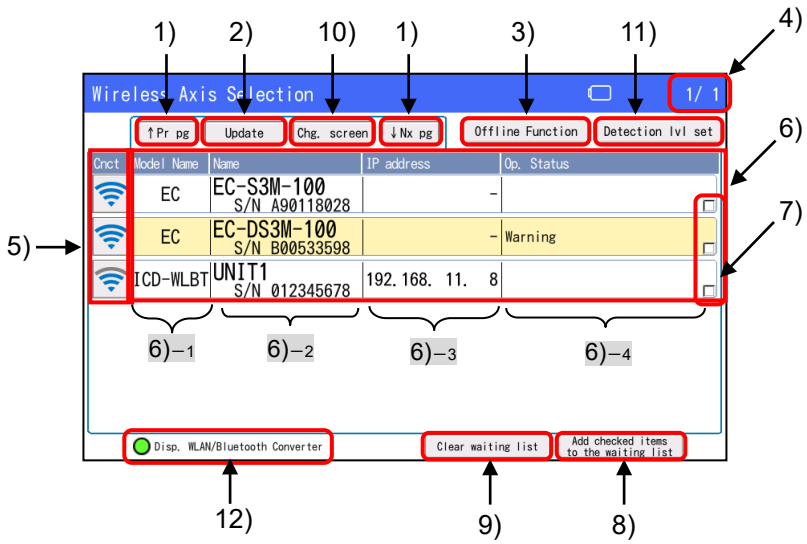
10) [WLAN/Bluetooth converter display] Button



When a WLAN/Bluetooth converter is detected, the indicator lamp turns on and a button for switching to the Wireless Axis Selection screen for the WLAN/Bluetooth Converter Display Specification is displayed. Once detected, the lamp remains lit and the button also remains displayed.

⚠ *Caution: The WLAN/Bluetooth converter is not displayed in the 16-axis display specification. A maximum of 16 devices, including axes and WLAN/Bluetooth converters, can be detected. Therefore, fewer than 16 axes may be displayed on this screen. If the desired axis is not displayed, touch [Refresh].*

For WLAN/Bluetooth converter display



1) [↑ Pr pg] and [↓ Nt pg] Buttons

You can change pages with these buttons. Four pages (16 units) should be able to show at maximum.

2) [Update] Button

Display in the window gets erased once and wireless axis data get gathered and displayed again.

3) [Offline Function] Button

The display goes to the screen to edit positions (only for EC), to set up environment for main unit and to update the teaching tools which are available offline (with no wireless operation).

4) Page Number

Current page number and total number of pages should be shown.

5) Wireless Icon (Wireless Link Button)

It is an icon to show the status of signal reception.
Status of signal reception should be expressed in five patterns, which are 4 levels + no reception of signal.



Press and hold this icon to move to a process to establish connection to the applicable axis.
It should become unavailable to use when the connection is wired, when an axis is in wireless connection with another teaching tool, or when an axis is disconnected.

6) Data Display Area

Data for wireless axis should be displayed. Order of display should follow the strength of signal reception.

6)-1 Model Names

It displays one of "EC", "CCM", "RP", or "ICD-WLBT" (WLAN/Bluetooth converter).

6)-2 Name

It shows model names. If not configured, this field is left blank.
The serial number is also displayed on the lower line.

6)-3 IP address

For WLAN/Bluetooth converters only, the IP address is displayed.
For all other models, "-" is displayed.

6)-4 Operating status

Operating status should be displayed.

Normal Display
When information is obtained in the normal status, Normal is displayed.

Alarm Display
When an alarm or warning occurs, the presence of an alarm or warning is indicated.
For devices with an active alarm, the background color of the data display area turns red.
For devices with an active warning, the background color of the data display area turns yellow.

Unsupported / Disconnected Display
For unsupported devices or when communication is disconnected, the background color turns gray.

Display Content	Alarm and warning not generated	Alarm generated	Warning generated	Wired connection	Disconnecting
Connection button	○	○	○	×	×
Model Names	○	○	○	○	×
Name	○	○	○	×	×
S/N	○	○	○	×	×
IP address	○	○	○	○	×
Operating status	○	○	○	○	○

7) Checkbox for Standby Axis List Registration
Select axes that you would like to register in the standby axis list.
While a checkmark is put, touch the 8) [Add checked items to the waiting list] button, and it can be registered in the standby axis list.
An axis registered in the standby axis list will not be displayed in the wireless axis select window even if the [Update] button is touched.

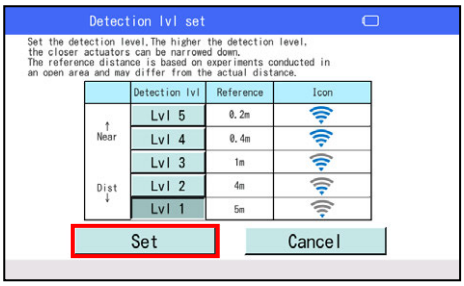
8) [Add checked items to the waiting list] Button
Register the axes selected in the 7) checkbox for standby axis list registration to the standby axis list, delete the display once, and collect the information of wireless axes to display it again.
Axes selected in the checkbox will not be displayed.

9) [Clear waiting list] Button
After deleting the standby axis list registered before, erase the display once, and collect the information of wireless axes to display it again.
Axes not displayed before can be displayed.

10) [Chg. screen] Button
The display switches to the wireless axis select window in the 4-axis display specification.

11) [Detection lvl set] Button

The level for what range of axes to be collected can be adjusted.



The level that can be detected in the wireless axis select window should be set up.

Set up the detection level referring to such as the reference distance and displayed icons, and touch the [Set] button.
The higher the detection level is set, the closer actuators can be detected.

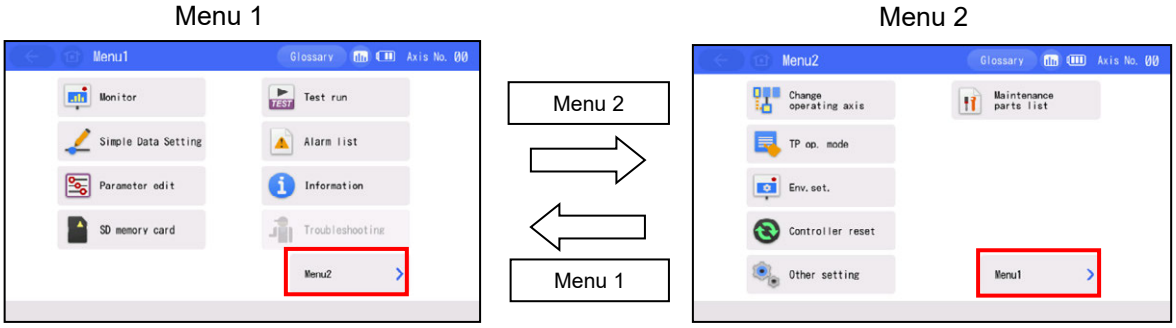
For instance, if it is set to Lv. 5, only actuators in the range of approximately 0.2m around TB-03 can be detected and shown in the wireless axis select window.

Levels and reference distance are just reference. It may differ from the actual operation. Adjust it for the used environment.

12) WLAN/Bluetooth converter display area

The indicator lamp lights up to indicate that a WLAN/Bluetooth converter has been detected. Once detected, the lamp remains lit.

3.5 Menu Selection



Two menu selection screens, Menu 1 and Menu 2, are available.
Touching [Menu2] on the Menu 1 screen changes the display to the Menu 2 screen.
Touching [Menu1] on the Menu 2 screen changes the display to the Menu 1 screen.



1)		Return Button	: Returns to Previous Screen
2)		Home Button	: Returns to Menu 1 Screen
3)		Glossary Button	: Shows the Explanation Screen for Special Terms
4)		Monitor Button	: Opens the Monitor Screen
5)		Battery Display	: It displays the condition and remaining of battery. [1.14.2.1 Display of Battery Remained]
6)		Change operating axis Button	: Shows Select Wireless Axis Screen. (It should not function in the simple data setting / test run screen)

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


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


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


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


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

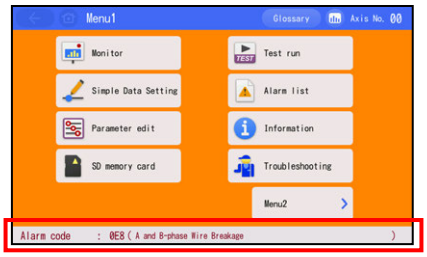
In this manual, some figures may not show the battery display. Although, the battery condition and remaining should be displayed in all the windows in the TB-03 in the actual use.

[Menu 1 list]

- Monitor — Displays the actuator status, I/O signal status, maintenance information and manufacturing information. [Refer to 3.6 Monitor]
- Simple Data Setting — Conduct settings of position, velocity acceleration/deceleration to operate the actuator. The wireless axis operation setting of the teaching pendant is enabled and axes available for operation with wireless connection should be also available for trial operation. [Refer to 3.7 Simple Data Setting (Position Editing)]
- Parameter edit — Conduct settings such as to adjust operation range or home position, or to change the direction of home-return operation. [Refer to 3.9 Parameter Edit]
- SD memory card — Perform readout of position data and parameters, file saving and storage of the alarm list. Teaching update also can be conducted in this menu. [Refer to 3.17 Data Backup]
- Test run — Conduct a test run for Jog operation, inching operation and I/O. [Refer to 3.10 Test Run]
- Alarm list — Shows a list of alarms and the time when they occurred. [Refer to 3.12 Alarm List]
- Information — Shows the software version, manufacturing information, maintenance information and models available for connection. [Refer to 3.15 Information Display]
- Troubleshooting — Shows the contents of an alarm and the countermeasure when an alarm has been generated.

[Menu 2 list]

- Change operation axis — Select an axis to operate. [Refer to 3.4 Wireless Axis Selection Window (Change Operation Axis)]
- TP op. mode — Switch over between forbidden and permitted for PIO operation and between invalid and valid for the safety velocity. [Refer to 3.11 TP Operation Mode]
- Env. set. — Conduct settings for display language, touch sound, turn-off time, data input warning, axis name display, ripple compensation, wireless standby axis list automatic reading, password, display, clock and initial window setting at startup. [Refer to 3.16 Environment Setting]
- Controller reset — Restart the controller. [Refer to 3.13 Controller Reset]
- Other setting — Conduct parameter initialization and Operating noise adjustment. [Refer to 3.14 Other Setting]
- Maintenance parts list — Displays information of maintenance parts. [Refer to 3.18 Maintenance Parts List]
- Easy programming — It is a window that enables setting of movement between positions, timer and repeated operation by indicating number, and to have continuous operation manually. This function can be used only when the wireless axis operation setting of the teaching pendant is enabled and the teaching pendant is connected to an axis that can be operated via a wireless connection. [Refer to 3.19 Easy Programming]

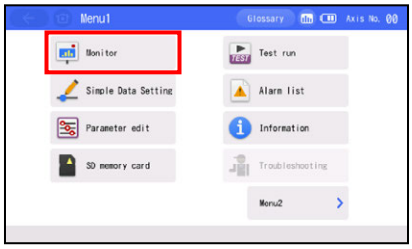


When an alarm generates, the corresponding alarm code and alarm name will appear at the bottom of the screen and the background color will change to orange.

Touch the gray area which shows the alarm information, and the display changes to the contents of the alarm.

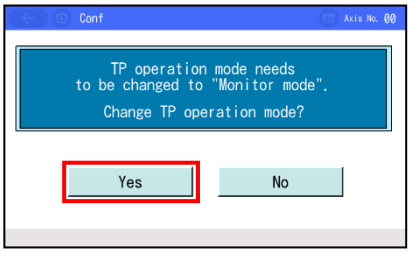
3.6 Monitor

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



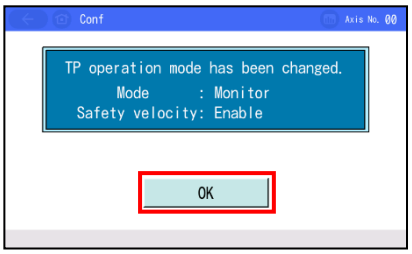
Touch [Monitor] on the Menu 1 screen.

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



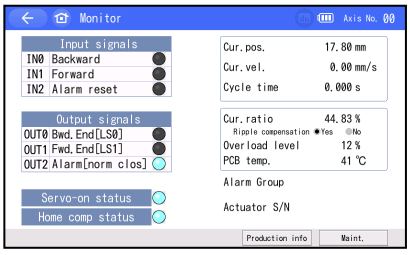
Touch [Yes] to change to Monitor Mode 1 or 2.
If not, touch [No].

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



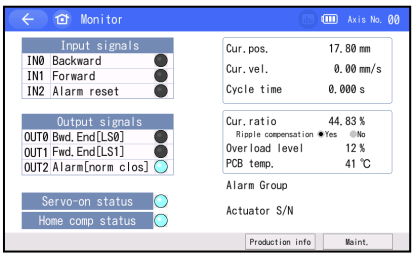
Touch [OK].

The monitor screen appears.

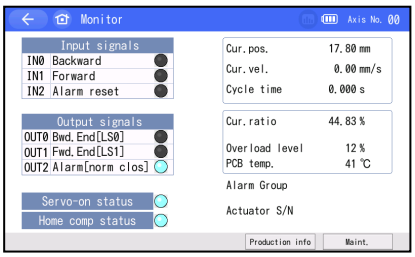


3.6.1 Monitor Window

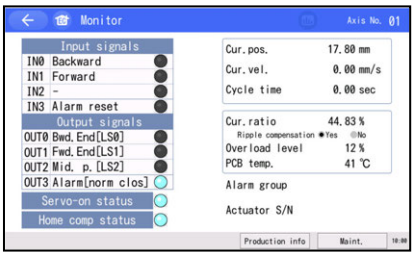
(Applicable for Ripple Compensation)



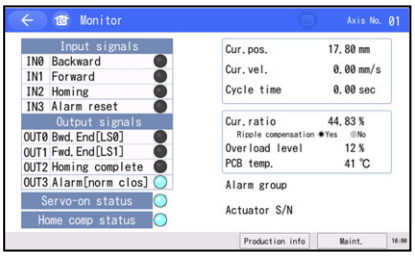
(Not Applicable for Ripple Compensation)



(3-position setting)



(Double (Multi-I/O enabled) when Solenoid Valve Type (operation mode) is selected)



Touch [Production info] and the production information screen will be displayed. [Refer to 3.15 Information Display]
Touch [Maint.] and the maintenance information screen will be displayed. [Refer to 3.6.2 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.
- Cur. pos. — The current position is shown.
- Cur. vel. — The current speed is shown.
- Cycle time — It shows the cycle time of when operation is made in the velocity and acceleration/deceleration set in the simple data setup window.
- Cur. ratio — The value of electrical current is shown as a percentage of the rated current.

  Ripple compensation (Note 1) — It can be chosen with the radio button whether to display the current/current ratio with ripple compensation or without ripple compensation.
  • Yes : Shown in command current (Note 2)
  • No : Shown in output current (Note 3)
- Overload level — The overload level is shown in the rate that the motor raising temperature assumed to generate the overload alarm set as 100%.
- PCB temp. — Temperature of the control PC board in the actuator is shown.
- Alarm Group — The applicable alarm group is shown.
- Actuator S/N — Shows the manufacturing number of the actuator.

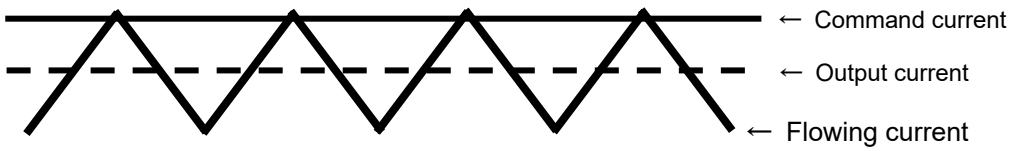
Note 1 Versions Applicable for Ripple Compensation

Tool/Actuator	Applicable Versions
Teaching Pendant TB-03	V2.40 and later
ELECYLINDER	V0006 and later

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

Note 2 The command current should compensate for the amount of current ripple considering transistor switching.

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



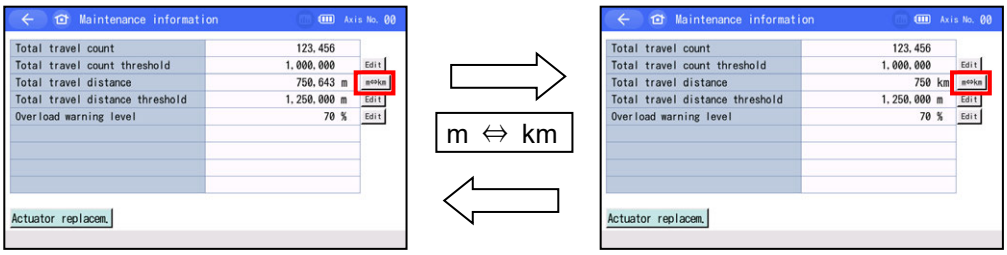
3.6.2 Maintenance Information Window

(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. (Excluding Rotary type and ROBO PUMP)

(Display in m for distance) (Display in km for distance)

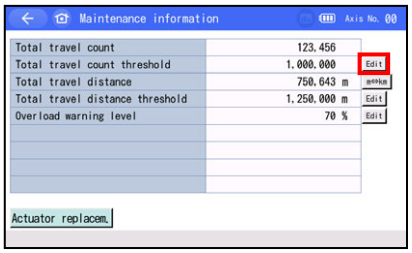


[Contents of Display]

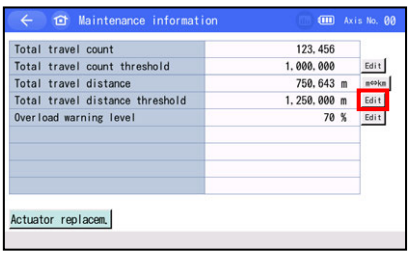
- Total travel count The cumulative total number of actuator movements is shown.
- Total travel distance The cumulative total distance travelled by the actuator is shown.
  (Rotary type: travel count for round trip between 0 and 180deg (To be figured out from total drive distance))
  (ROBO PUMP: Total adsorption count, total motor revolution time)

[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)
  (ROBO PUMP: Total adsorption count, total motor revolution time setting)

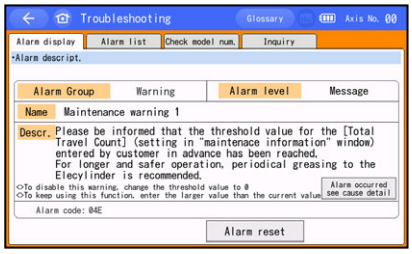


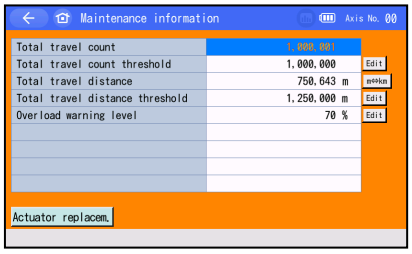
Touch [Edit] on the right of Total travel count threshold to change the setting for the total travel count threshold.



Touch [Edit] on the right of Total travel distance threshold to change the setting for the total travel distance threshold.

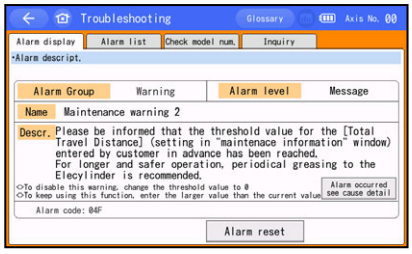
When Total Travel Count has Exceeded Total Travel Count Threshold

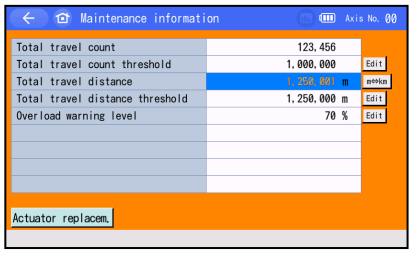




You will be notified in Maintenance warning 1 window.
The number in total travel count blinks in maintenance information window.

When Total Travel Distance has Exceeded Total Travel Distance Threshold





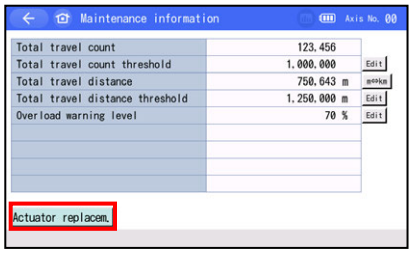
You will be notified in Maintenance warning 2 window.
The number in total travel distance blinks in maintenance information window.

● / ● flash in turn



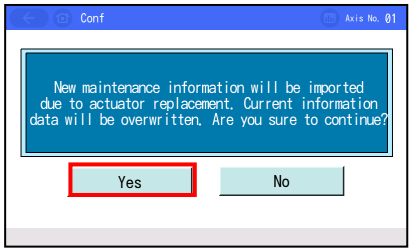
LED lamps on ELECYLINDER flash red and green in turn in all of Maintenance Warning 1, 2 and 3.

[Resetting Total travel count and Total travel distance]



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

Input “5119” and touch [ENT].



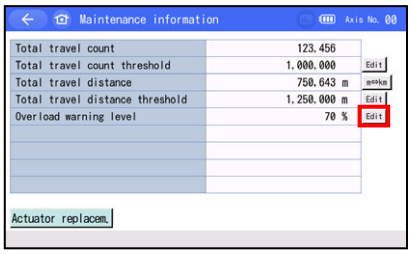
The actuator replacement confirmation screen appears.

Touch [Yes].

The Total travel count and Total travel distance are reset to 0.

(2) Over Load Warning

With the motor rising temperature estimated to generate an overload alarm set as 100%, an overload warning can get output when the temperature has exceeded the rate of the motor temperature set in this window.

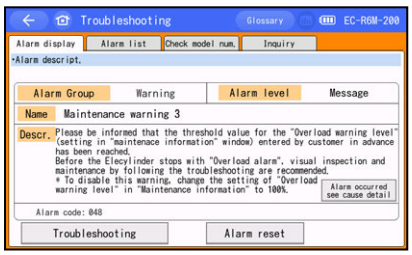


Touch [Edit] on the right of Over load warning level to change the setting for the over load warning level.

[Items of Setting]

- Over load warning level Set the level to generate the over load warning alarm. Set to 100, and a warning should be generated.

When Over load Level has Exceeded Setting Rate

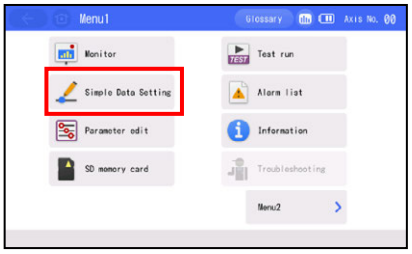


You will be notified as an overload warning in Maintenance warning 3 screen.

LED lamps on ELECYLINDER flash red and green in turn.

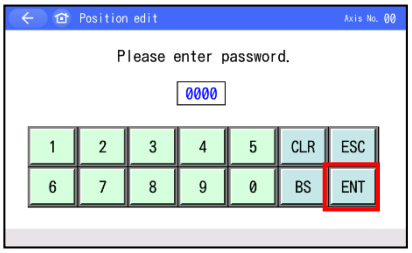
3.7 Simple Data Setting (Position Editing)

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.
The wireless axis operation setting for the teaching pendant is enabled and axes available for operation with wireless connection should be available for JOG and inching operations. [Refer to 3.7.3 Manual Mode]



Touch [Simple Data Setting] on the Menu 1 screen.

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



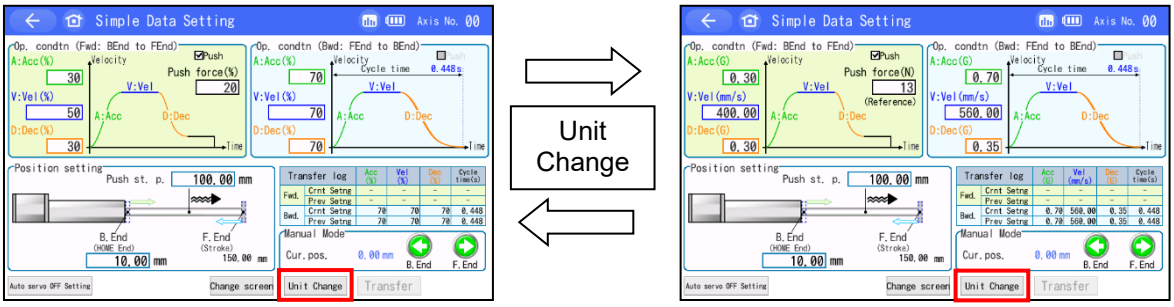
Enter the position edit password.
Touch [ENT].

> The default position edit password is “0000”.
> For how to change the position edit password, refer to 3.16, “Environment Setting [Position edit password change]”.

The simple data setting screen appears.

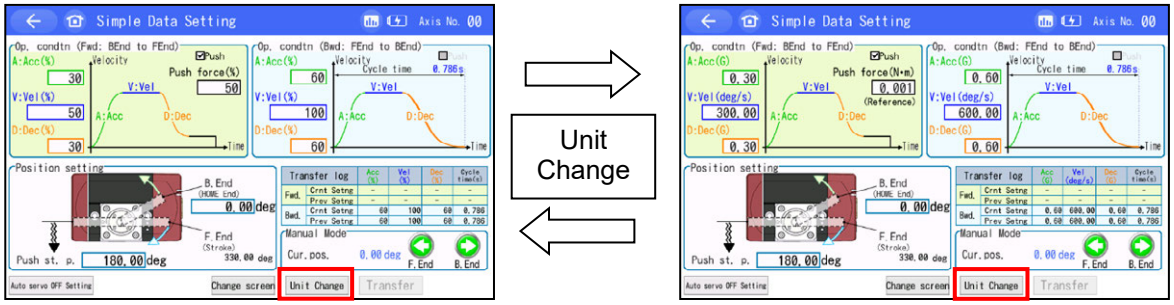
■ Unit Change
[Unit Change] switches the unit between % and mm/s for velocity, % and G for acceleration / deceleration and % and N for pressing force (Rotary type excluded).

Rod type: Simple data setting screen for pressing operation (2-position setting)

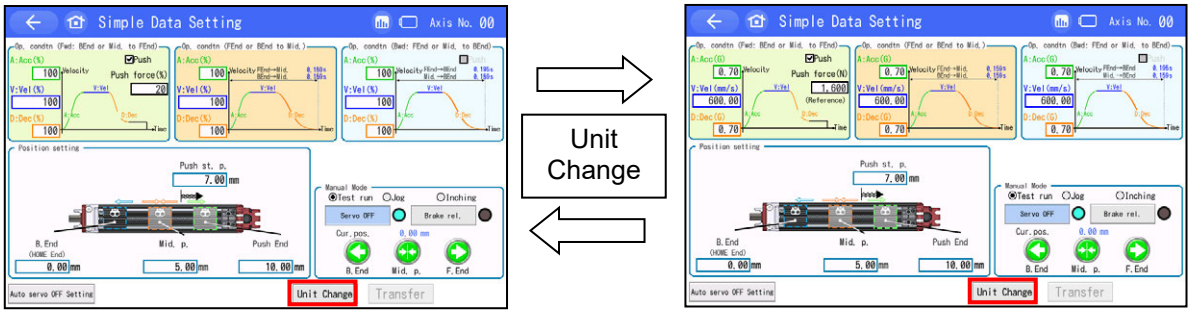


[Unit Change] switches the unit between % and deg/s for velocity, % and G for acceleration / deceleration and % and N•m for pressing force (Rotary type).

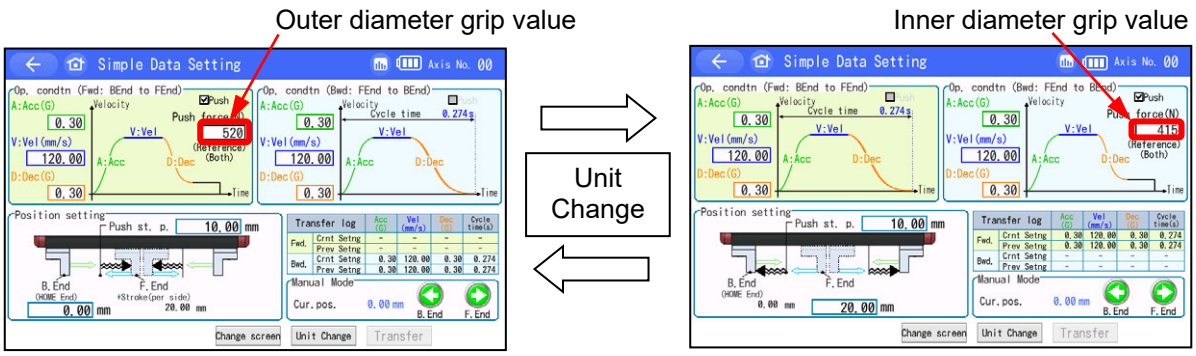
Rotary type: Simple data setting screen for pressing operation (2-position setting)



Wire Cylinder: Simple data setting screen for positioning operation (3-position setting)



3-finger gripper type: Simple data setting screen for pressing operation (2-position setting)



Caution: The 3-finger gripper is different in the grip force for outer diameter grip and inner diameter grip.
In a versions earlier than V5.00, when the display unit for the three-finger gripper (EC-GRTR14) is in [N], it should show the grip force for outer grip even if it is inner grip.

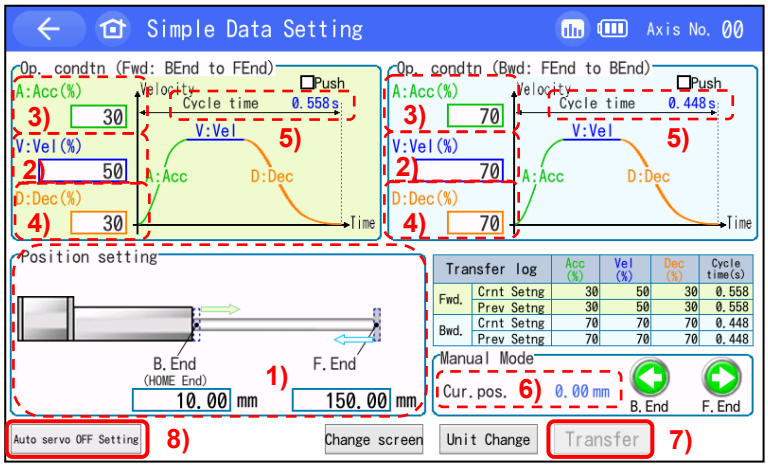


Therefore, when using the 3-finger gripper (EC-GRTR14) in versions earlier than V5.00 with gripping at the inner diameter, use the displayed unit in [%], not in [N], for grip force (pressing force).

- *To set up the grip force for the inner diameter grip, refer to the graph shown in [Relation Between Grip Force and Current Limit] in 3-finger gripper Instruction Manual (ME3829) to set it up in [%].*

3.7.1 Positioning Operation Setting

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Rotary and Wire Cylinder excluded)



(Note) It is a display when WL2 is indicated.

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 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [mm/s] = Lead Length [mm] / 800 / 0.001 [s]
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation. Set a number from 1% to 100%. Also, the unit can be switched to G by pressing [Unit Change]. Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop. Set a number from 1% to 100%. Also, the unit can be switched to G by pressing [Unit Change]. Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

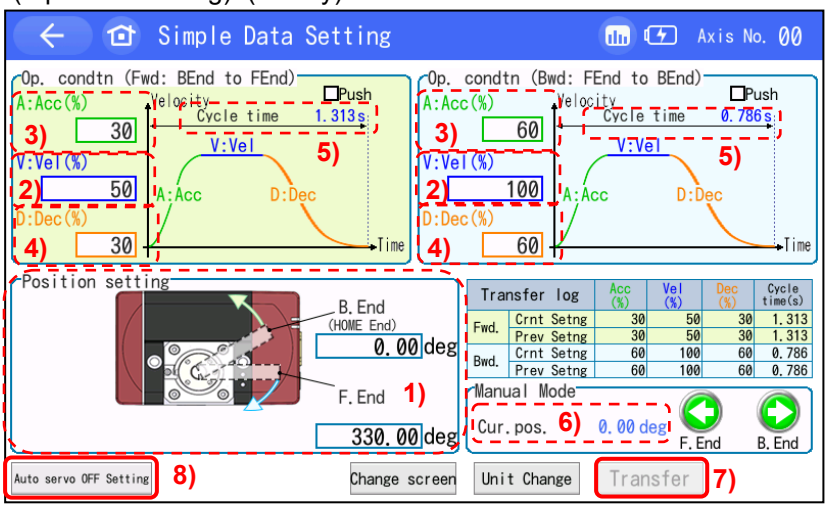
6) Cur. pos. [mm] : Displays the current position.

7) [Transfer] button : Once the data setting is complete, press [Transfer] to transfer the data to the controller.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time. [Refer to 3.7.5 Auto servo OFF]

> ⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
> *Also, without transferring, operation by the manual operation switch will not be available.*
> *Refer to [3.7.3 Manual Mode] for manual operation.*

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Rotary)



1) Position setting [deg] : Input the positions of the backward end and forward end. Positioning coordinate value. Enter is as the distance from the home position.
The unit is deg and input can be made down to two decimal places.

2) Vel [% or deg/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to deg/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.

Note 1 The minimum velocity is as shown below.
Min. Velocity: 20deg/s

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

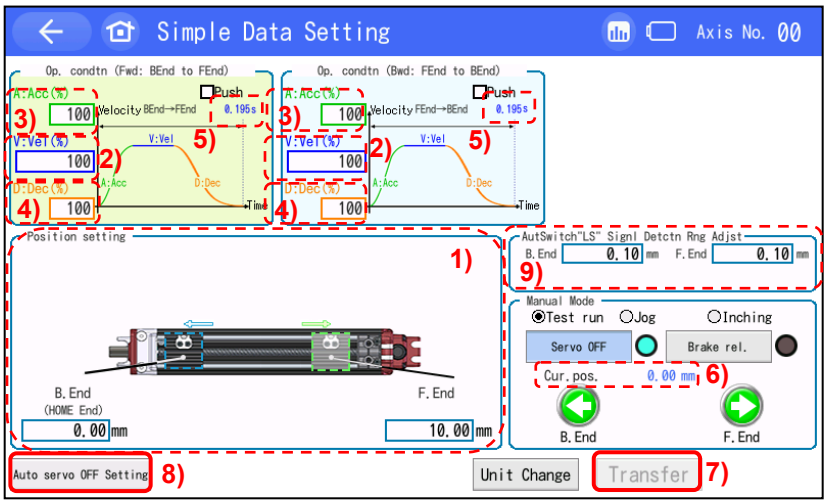
6) Cur. pos. [mm] : Displays the current position.

7) [Transfer] button : Once the data setting is complete, press [Transfer] to transfer the data to the controller.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
[Refer to 3.7.5 Auto servo OFF]

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
Refer to [3.7.3 Manual Mode] for manual operation.

Shown below is the content of setting for the position data for the positioning operation (2-position setting). (Wire Cylinder)



1) Position setting [mm] : Input the positions of the backward end and forward end.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to mm/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.

Note 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [mm/s [deg/s]] = Lead Length [mm] / Encoder Pulse Number [pulse] / 0.001 [s]
(Number of 24V pulse motor type encoder pulse: 800)
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

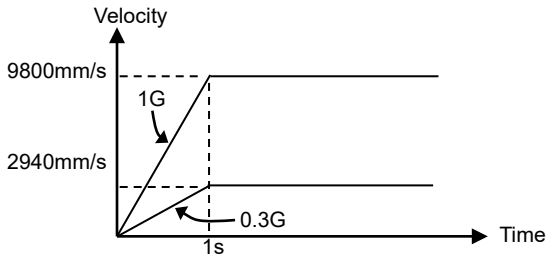
7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) Auto servo OFF Setting : Setting the Auto servo OFF delay time.
[Refer to 3.7.5 Auto servo OFF]

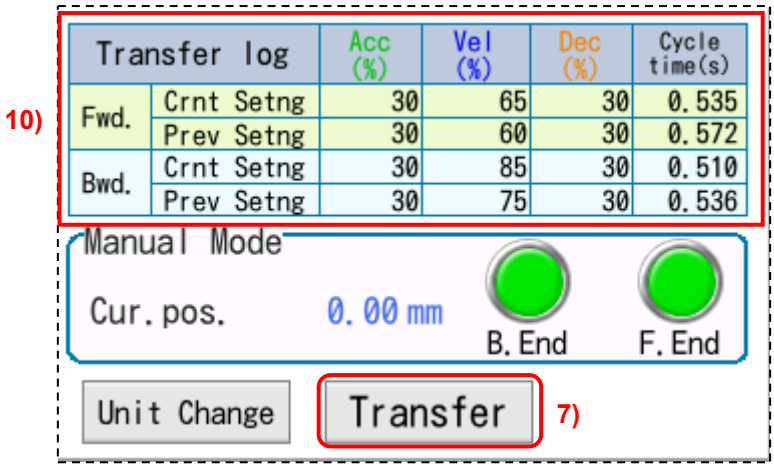
9) Auto Switch “LS” Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch “LS” signal.
Input the backward end and forward end.
The unit is mm and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
Refer to [3.7.3 Manual Mode] for manual operation.

(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 2940mm/s (9800mm/s × 0.3) per second.



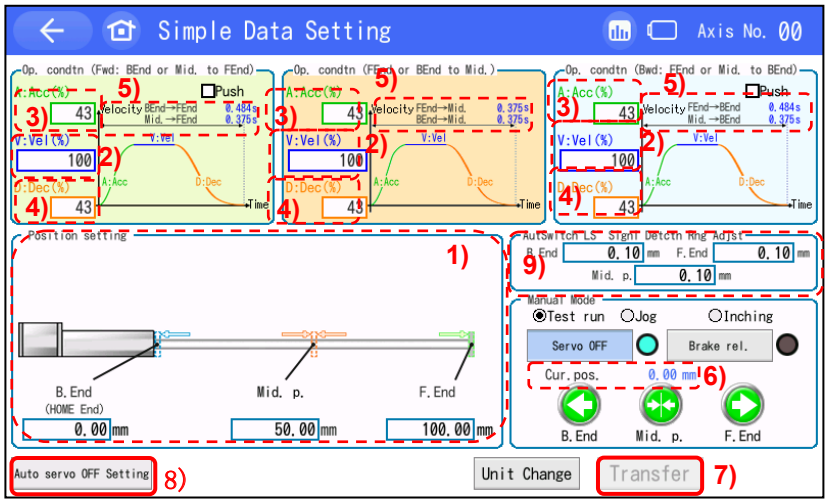
⚠ *Caution: If the actuator or work part receives impact or generates vibration, lower the acceleration/deceleration. If the system is used continuously with the actuator or work part receiving impact or generating vibration, the life of the actuator may be significantly reduced.*



10) Transfer log

Once the data of the velocity and acceleration/deceleration for the way forth and the way back is transferred by pressing [Transfer], the old setting parameters will be shown in the previous setting area and the new parameters in the current setting area, and the cycle time calculated from these parameters will be displayed.
However, it cannot be checked for the wire cylinder and the MF specification.

Shown below is the content of setting for the position data for the positioning operation (3-position setting). (Rotary and Wire Cylinder excluded)



1) Position setting [mm] : Input the positions of the backward end, forward end and middle point.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to mm/s by pressing [Unit Change].
Input can be made down to the two decimal places for mm/s.

Note 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [mm/s [deg/s]] = Lead Length [mm] / 800 / 0.001 [s]
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

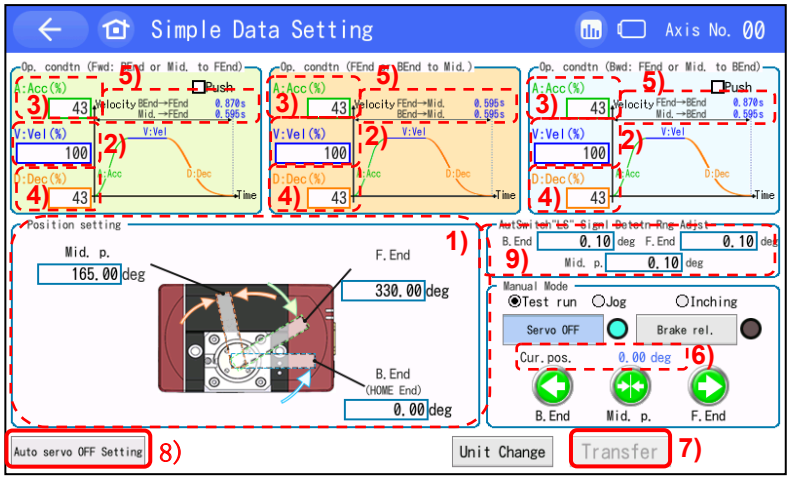
7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time.
Refer to [3.7.5 Auto servo OFF]

9) Auto Switch “LS” Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch “LS” signal.
Input the backward end, forward end and middle point.
The unit is mm and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
Also, without transferring, operation by the manual operation switch will not be available.
Refer to [3.7.3 Manual Mode] for manual operation.

Shown below is the content of setting for the position data for the positioning operation (3-position setting). (Rotary)



1) Position setting [deg] : Input the positions of the backward end, forward end and middle point.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is deg and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to deg/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.

Note 1 The minimum velocity is as shown below.
Min. Velocity [20 deg/s]

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

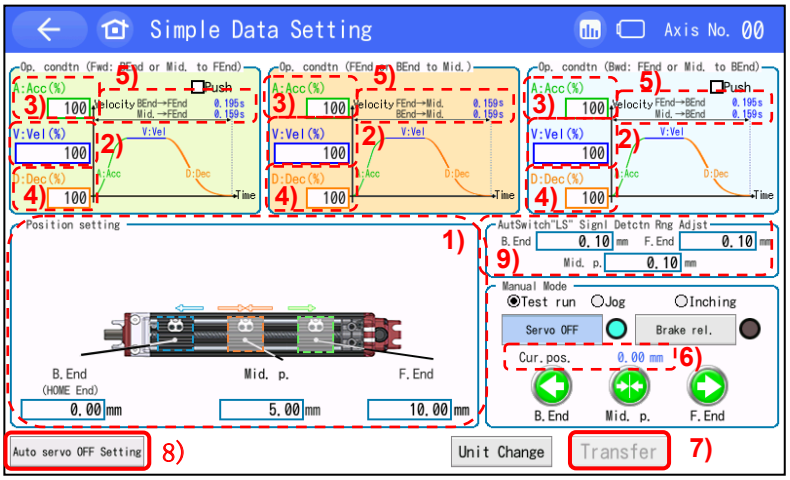
7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time.
Refer to [3.7.5 Auto servo OFF]

9) Auto Switch “LS” Signal Detection Range Adjustment [deg] : Sets the detection range of the auto switch “LS” signal.
Input the backward end, forward end and middle point.
The unit is deg and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

> ⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
> *Also, without transferring, operation by the manual operation switch will not be available.*
> *Refer to [3.7.3 Manual Mode] for manual operation.*

Shown below is the content of setting for the position data for the positioning operation (3-position setting). (Wire Cylinder)



1) Position setting [mm] : Input the positions of the backward end, forward end and middle point.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel [% or mm/s] : Set the velocity of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to mm/s by pressing [Unit Change].
Input can be made down to the two decimal places for deg/s.

Note 1 Figure out the minimum velocity by using the formula below.
Min. Velocity [mm/s [deg/s]] = Lead Length [mm] / 800 / 0.001 [s]
(Number of 200V servo motor type encoder pulse: 16384)

3) Acc [% or G] : Set the acceleration at the start of operation.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

4) Dec [% or G] : Set the deceleration at stop.
Set a number from 0% to 100%.
Also, the unit can be switched to G by pressing [Unit Change].
Input can be made down to the two decimal places for G.

5) Cycle time [s] : The cycle time calculated from the acceleration, velocity and deceleration set is shown.

6) Cur. pos. [mm] : Displays the current position.

7) [Transfer] button : Once the data setting is complete, touch [Transfer] to transfer the data to the controller.

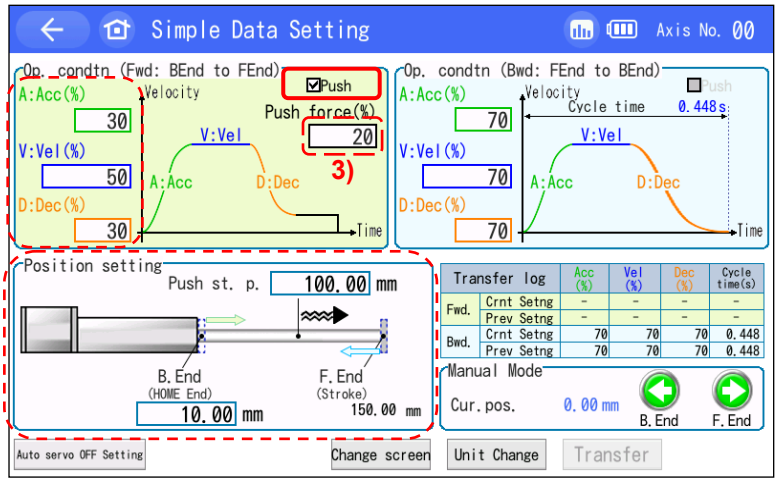
8) [Auto servo OFF Setting] : Setting the Auto servo OFF delay time.
Refer to [3.7.5 Auto servo OFF]

9) Auto Switch “LS” Signal Detection Range Adjustment [mm] : Sets the detection range of the auto switch “LS” signal.
Input the backward end, forward end and middle point.
The unit is mm and input can be made down to two decimal places.
Depending on the specifications of the EC, this item may not be displayed.

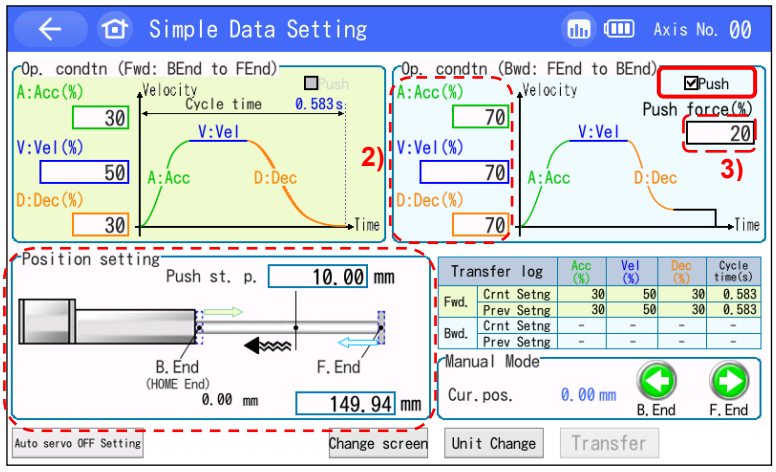
> ⚠ *Caution: If moving to another window without transferring data, all the data settings will go back to those before.*
> *Also, without transferring, operation by the manual operation switch will not be available.*
> *Refer to [3.7.3 Manual Mode] for manual operation.*

3.7.2 Pressing Operation Setting

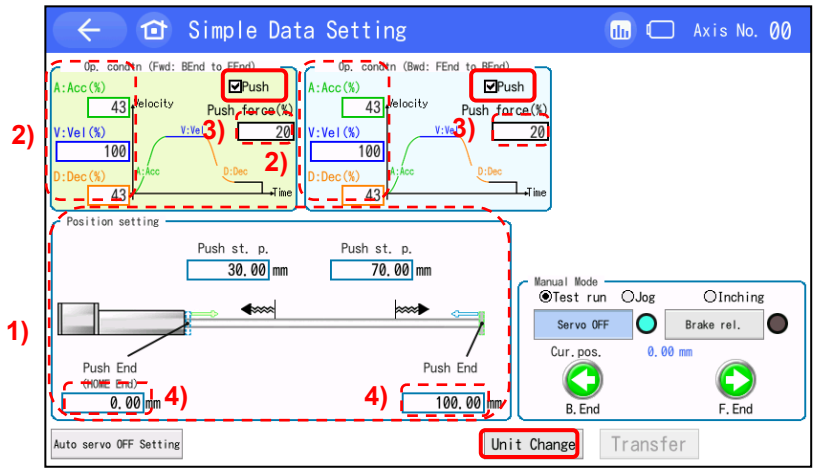
Shown below is the content of setting for the position data for the pressing operation.
(Rotary and Wire Cylinder excluded)
Touch the checkbox □ at Pressing to add a checkmark ✓, and the screen goes to the setting window for the pressing operation.
The number of points that can be configured for pressing operation differs depending on the EC specifications. For details, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)]
(Models for which the [□ Pressing] option is not displayed cannot perform pressing operation.)



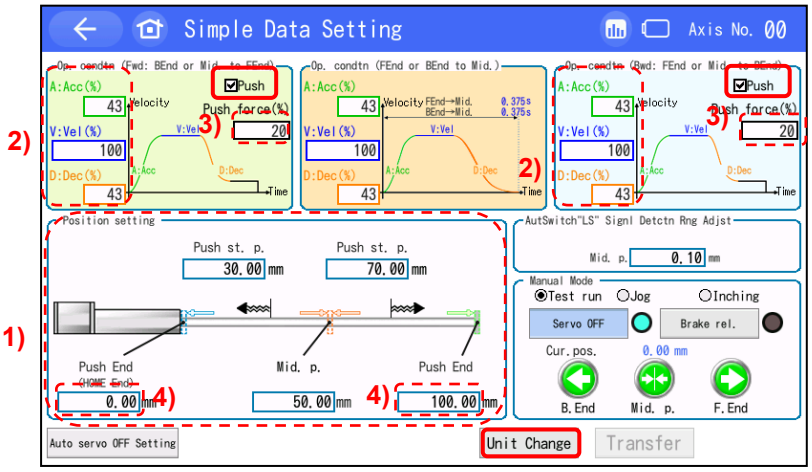
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (2-position setting)



2-end Pressing
(3-position setting)

(Note) It is a display when WL2 is indicated.

1) Position setting [mm] : Setting can be made for the start position of movement (backward end, forward end or middle point) and the start position of pressing operation. Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

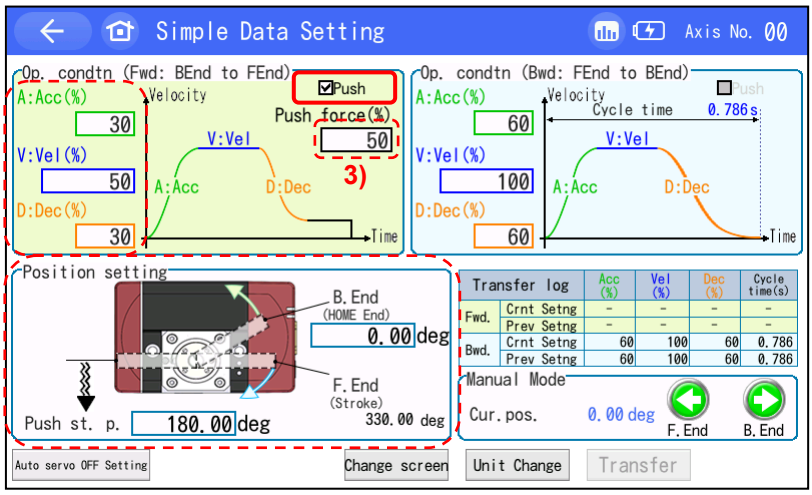
2) Vel, Acc, Dec : Setting can be made for the velocity, accelerationand deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation.
The way to conduct settings is the same as that for positioning operation.

3) Push force [% or N] : Set a push force (limit current value) in %.
The unit can be switched to N by pressing [Unit Change].
The pressing velocity should be 20mm/s.
If the velocity is set to 20mm/s or less, pressing operation will be performed in the setting velocity.

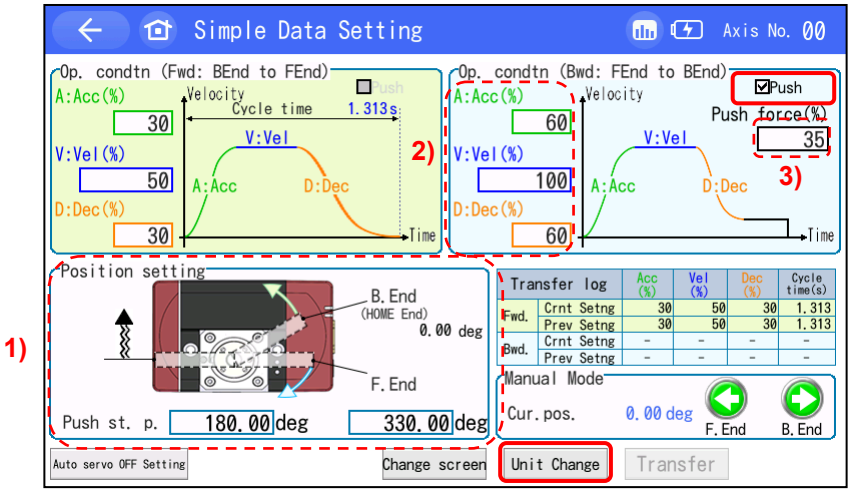
4) Push End [mm] : Set up the position to detect the pressing operation is missed. Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

Transfer log : The transfer log will not be displayed in pressing operation.
The transfer operation and manual operation is the same as the positioning operation. Refer to [3.7.1 Positoning Operation]

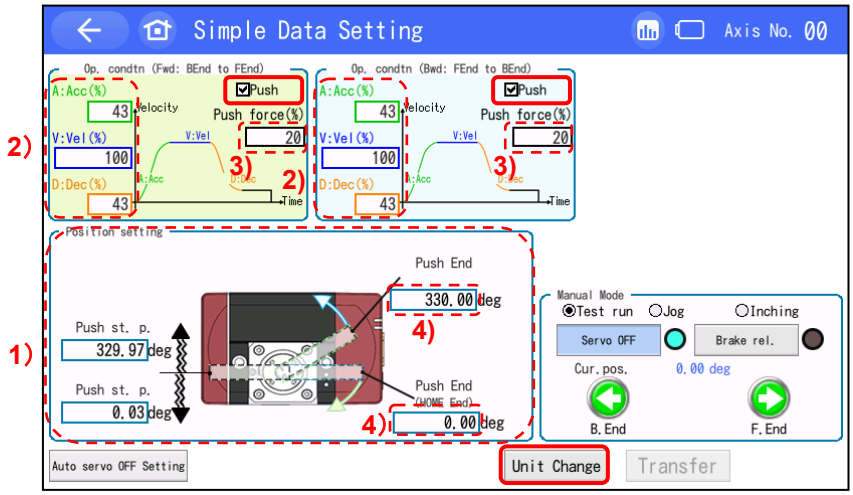
Shown below is the content of setting for the position data for the pressing operation. (Rotary)
Touch the checkbox □ at Pressing to add a checkmark ✓, and the screen goes to the setting window for the pressing operation.
The number of points that can be configured for pressing operation differs depending on the EC specifications. For details, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)]



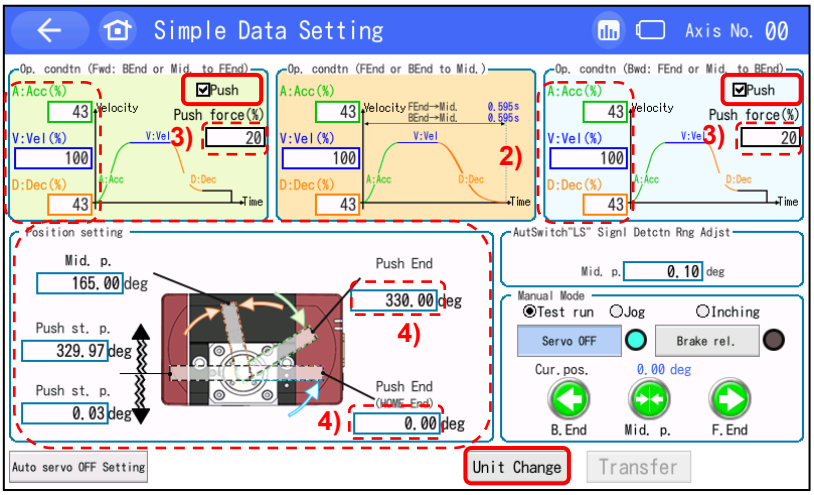
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (2-position setting)



2-end Pressing
(3-position setting)

(Note) It is a display when WL2 is indicated.

1) Position setting [deg] : Setting can be made for the start position of movement (backward end, forward end or middle point) and the start position of pressing operation. Positioning coordinate value. Enter is as the distance from the home position.
The unit is deg and input can be made down to two decimal places.

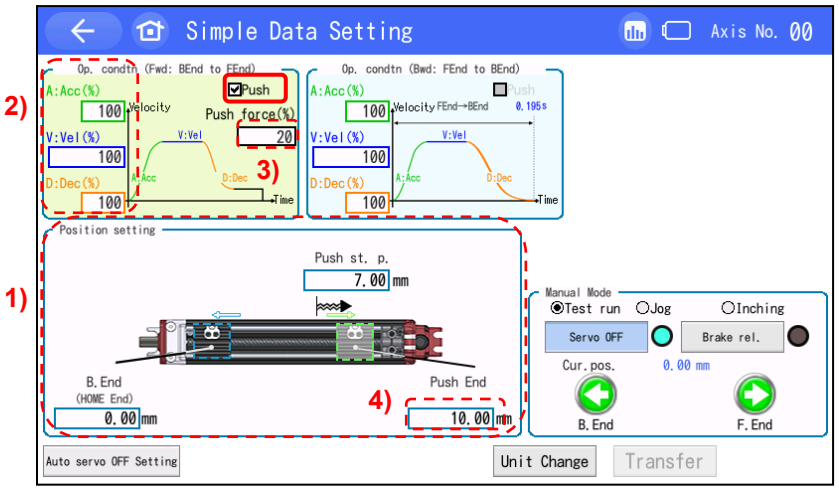
2) Vel, Acc, Dec : Setting can be made for the velocity, acceleration and deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation.
The way to conduct settings is the same as that for positioning operation.

3) Push force [% or N•m] : Set a pressing torque (limit current value) in %.
The unit can be switched to N•m by pressing [Unit Change].
The pressing velocity should be 20deg/s.
If the velocity is set to 20deg/s or less, pressing operation will be performed in the setting velocity.

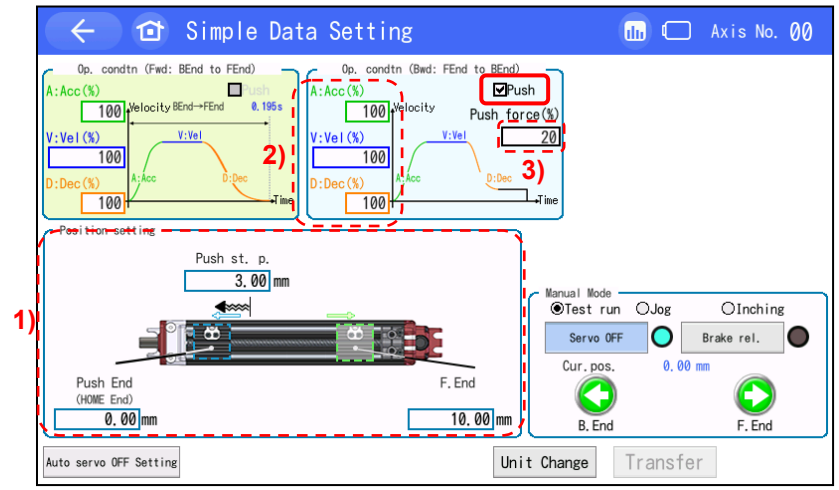
4) Push End [deg] : Set up the position to detect the pressing operation is missed.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is deg and input can be made down to two decimal places.

Transfer log : The transfer log will not be displayed in pressing operation.
The transfer operation and manual operation is the same as the positioning operation. Refer to [3.7.1 Positoning Operation]

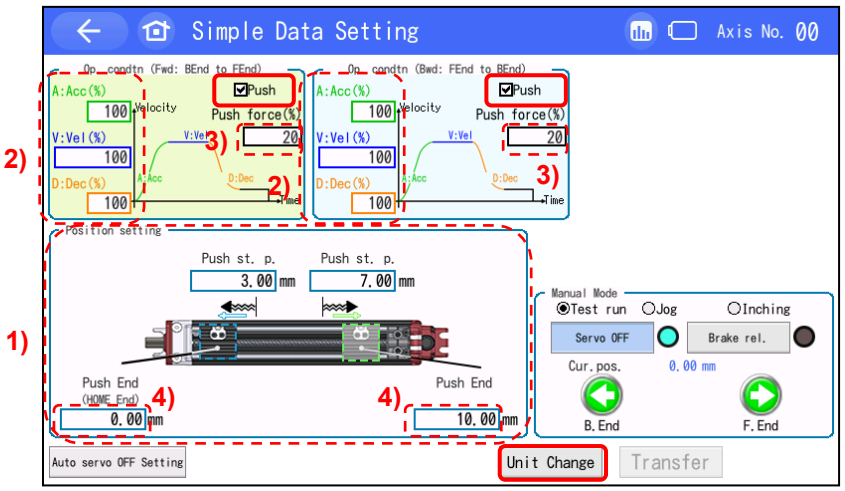
Shown below is the content of setting for the position data for the pressing operation.
(Wire Cylinder)
Touch the checkbox □ at Pressing to add a checkmark ✓, and the screen goes to the setting window for the pressing operation.
The number of points that can be configured for pressing operation differs depending on the EC specifications. For details, refer to [ELECYLINDER Electricity Section Instruction Manual (ME3816)]



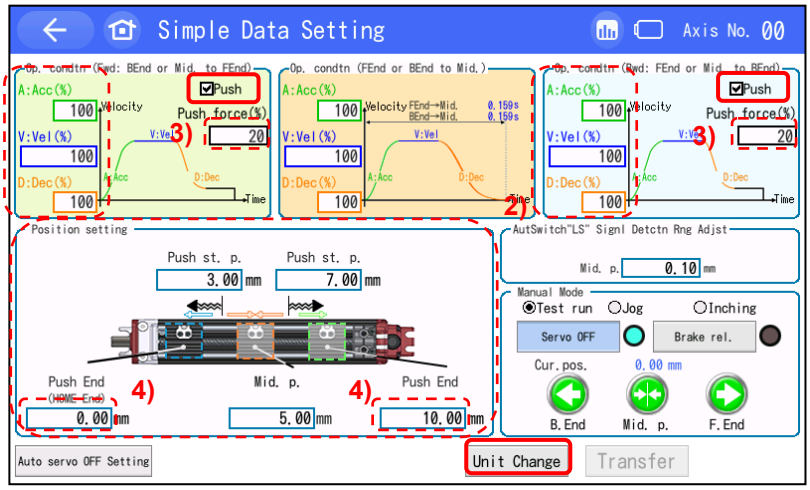
Pressing operation of Fwd (BEnd to FEnd)



Pressing operation of Bwd (FEnd to BEnd)



2-end Pressing (2-position setting)



2-end Pressing
(3-position setting)

(Note) It is a display when WL2 is indicated.

1) Position setting [mm] : Setting can be made for the start position of movement (backward end, forward end or middle point) and the start position of pressing operation. Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

2) Vel, Acc, Dec : Setting can be made for the velocity, acceleration and deceleration for movement from the start position of the movement (backward end, forward end or middle point) to the start position of pressing operation.
The way to conduct settings is the same as that for positioning operation.

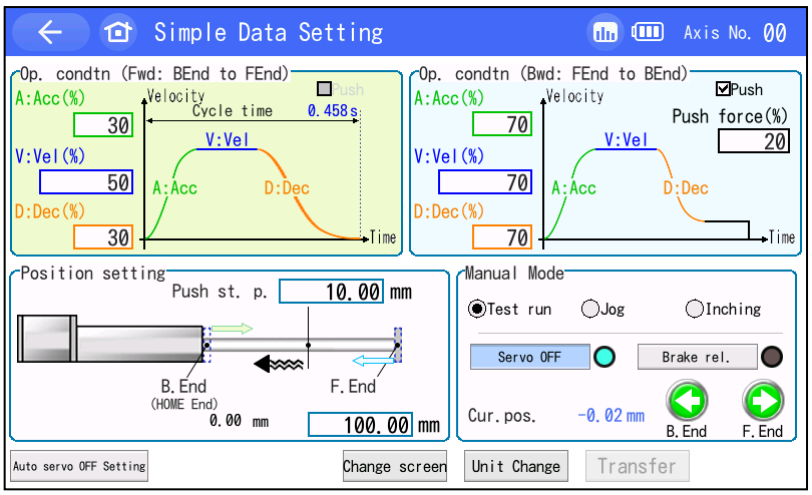
3) Push force [% or N] : Set a push force (limit current value) in %.
The unit can be switched to N by pressing [Unit Change].
The pressing velocity should be 20mm/s.
If the velocity is set to 20mm/s or less, pressing operation will be performed in the setting velocity.

4) Push End [mm] : Set up the position to detect the pressing operation is missed.
Positioning coordinate value. Enter is as the distance from the home position.
The unit is mm and input can be made down to two decimal places.

Transfer log : The transfer log will not be displayed in pressing operation.
The transfer operation and manual operation is the same as the positioning operation. Refer to [3.7.1 Positoning Operation]

3.7.3 Manual Mode

In the combination of TB-03 with the wireless axis operation setting enabled (V5.30 and later) and option code -WL2, trial operation (moving to forward end and backward end and JOG and inching operations) of axis is available in wireless condition.



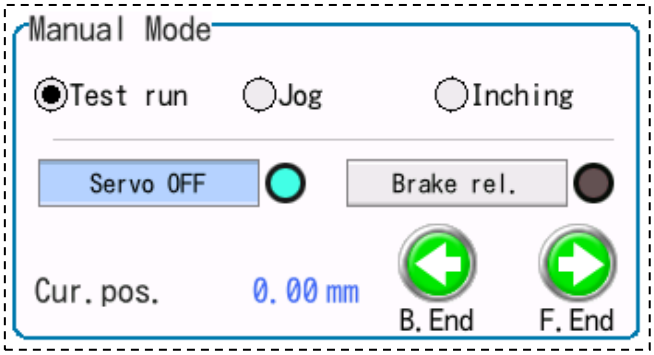
> *Caution: Before starting axis operation, make sure that you check the contents described in the 11 page "Precautions for Axis Operation with Wireless Connection" and follow it to secure the safety.*

Once the simple data setup window is shown, the manual operation box should show up in the right bottom of the screen.
Selection can be made with ○ (radio buttons) from Trial Run, Jog and Inching.

(1) Test Run

Select Test run in radio buttons (○).

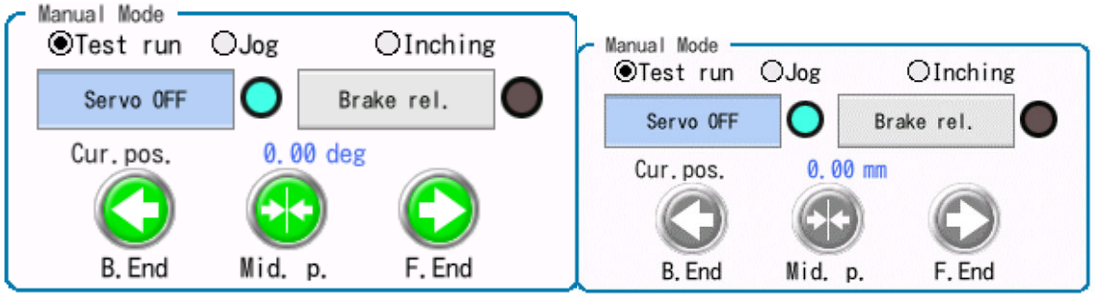
2-position setting





Set values not transferred

3-position setting



It should be switched over between power on and off by touching [Servo OFF] or [Servo ON].
It should be switched over between brake compulsory release on and off by touching [Brake rel.].

An actuator should move to the backward end if you touch [B. End].
Make operation using velocity and acceleration/deceleration in the operation conditions (Way back: from F. End to B. End).

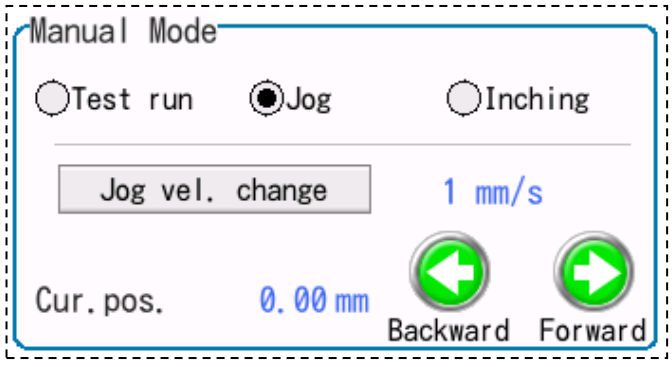
An actuator should move to the forward end if you touch [F. End].
Make operation using velocity and acceleration/deceleration in the operation conditions (Way forward: from B. End to F. End).

An actuator should move to the forward end if you touch [Mid. P.].
Make operation using velocity and acceleration/deceleration in the operation conditions (From F. End / B. End to Mid. P).

Both forward and backward operations (including movement to intermediate point) should activate while the button is touched and held. Release the button and the operation should stop.
[B. End] and [F. End], [Mid. P] are ready for operation when they are shown in green. If they are not green, the set values are not transferred. Transfer the set value data to a controller in advance by pressing [Transfer] button.

(2) JOG

Select JOG in radio buttons (○).



An actuator keeps moving backward while touching [Backward].
Regardless of the backward end setting, the actuator should move backwards till the home position.

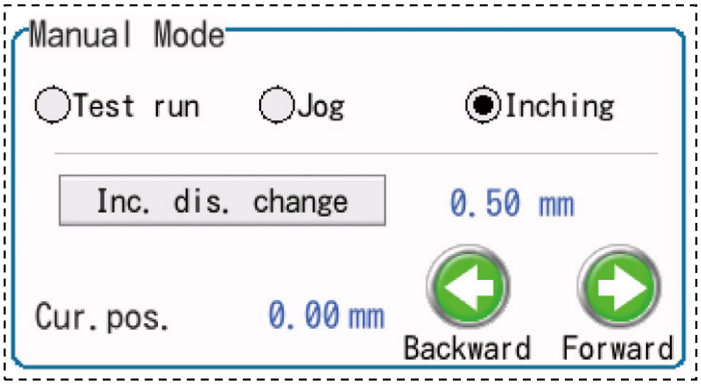
An actuator keeps moving forward while touching [Forward].
Regardless of the forward end setting, the actuator should move forwards till the stroke end.

Touch [Jog vel. change] and the velocity to move backward/forward should change in the order below.

1 mm/s (deg/s) → 10 mm/s (deg/s) → 30 mm/s (deg/s) → 50 mm/s (deg/s) → 100 mm/s (deg/s)

(3) Inching

Select Inching in radio buttons (○).



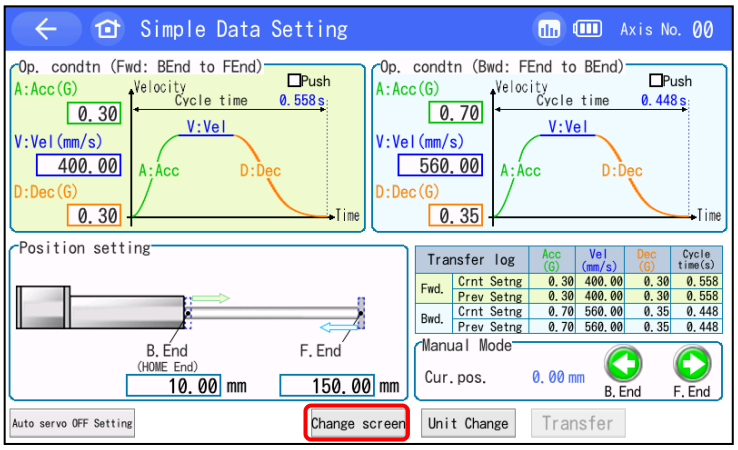
Touch [Backward] and an actuator should move backward in a certain distance.
Regardless of the backward end setting, the actuator should move backwards till the home position.

Touch [Forward] and an actuator should move forward in a certain distance.
Regardless of the forward end setting, the actuator should move forwards till the stroke end.
In the inching operation, keep touching it and it should turn to the jog operation in 1mm/s after one seconds. It should increase speed every one second after that.

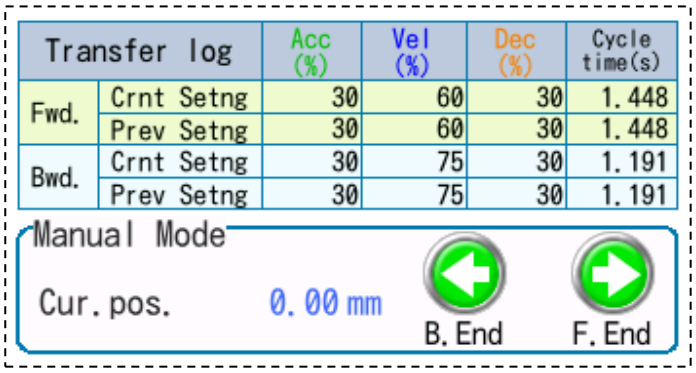
Touch [Inc. dis. change] and the distance to move in one touch should change in the order below.

0.01 mm (deg) → 0.10 mm (deg) → 0.50 mm (deg) → 1.00 mm (deg) → 5.00 mm (deg)

(4) Transfer log display (Not displayed in Wire Cylinder or 3-position setting)



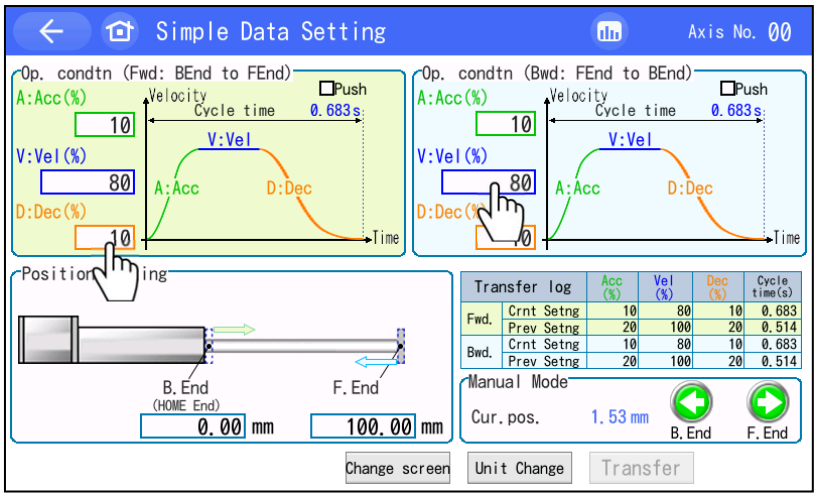
Touch [Change screen] and the screen should be switched over between the manual operation display and data transfer history display.
Switchover is available in any condition of Test run, Jog and Inching.



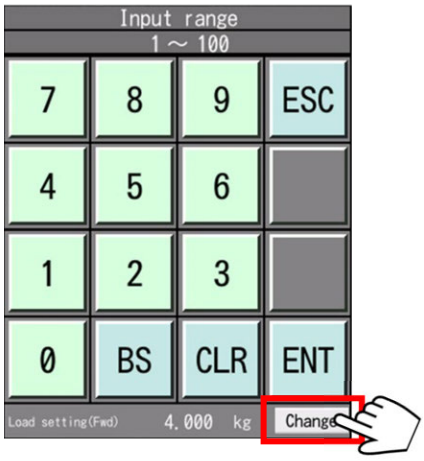
In the data transfer history display, the manual operation buttons work as [B. End] and [F. End] buttons for Test Run.
Once you switch the screen back to the manual operation display, the setting should go back to the test run.

3.7.4 Mounting Orientation Setting / Payload Setting

By setting “Payload (kg/kg•m^2)” and “Mounting orientation” on the way back and forth in advance, the acceleration and deceleration you can choose can be determined.
* It should not be available for setting in the 3-position setting.



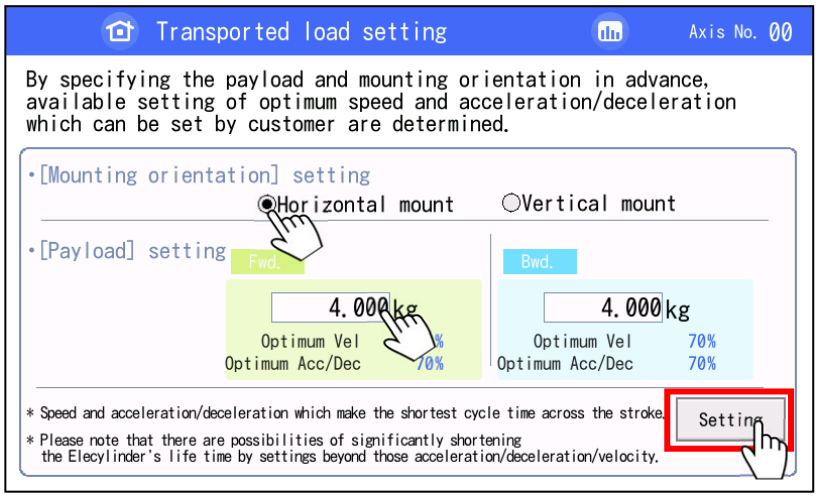
Touch either acceleration, velocity or deceleration.



The numeric key pad should open.

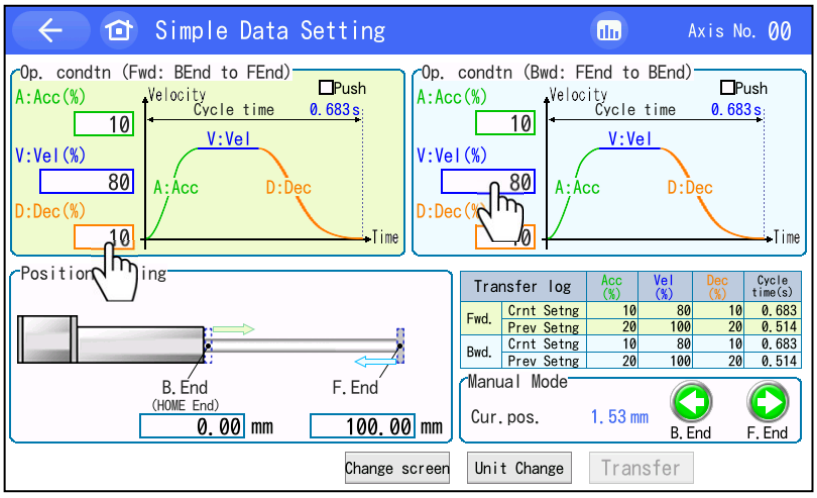
Touch [Change] on the right bottom.

The models not applicable for the payload setting (refer to next page) should not have [Change] displayed.



Select "Mounting orientation", input "Payload" and then touch [Setting].

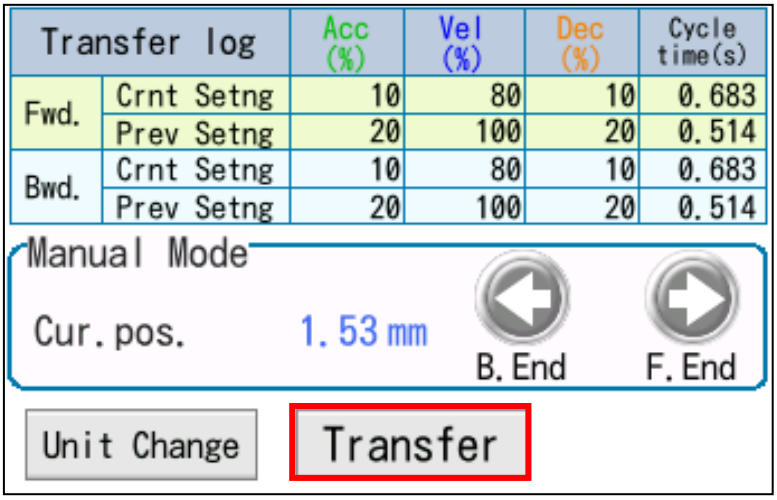
The unit is "kg•m^2" for rotary type



Touch an operational condition to be set or adjusted.



Input a value in the numeric keys and touch [ENT].



Touch [Transfer].

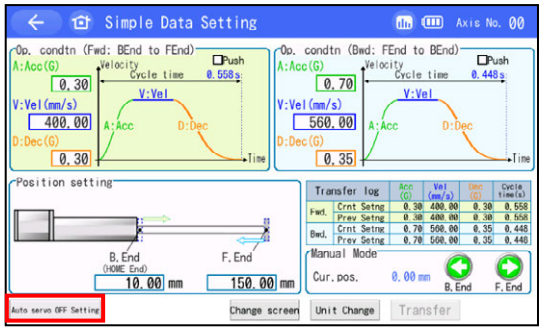
The values should get written to the controller, [B. End] and [F. End] should turn into green and "Transfer liog" should be updated.

Payload Setting Not Applicable Model

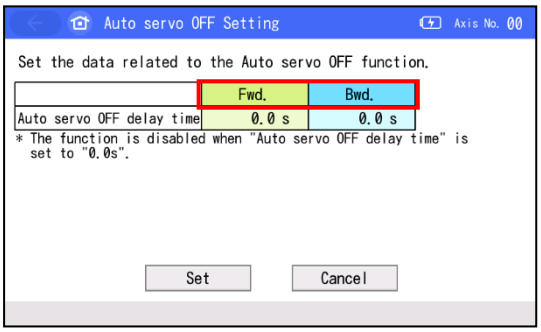
- Ultra Mini ELECYLINDER : EC-SL3□/GDS3L/GDB3□/T3□
- Gripper Type : EC-GRB□/GRBP□(W)/GRC□/GRST□/GRTR□
- Stopper Cylinder ECO Type : EC-ST15M
- Wire Cylinder : EC-WER1/WEGR2

3.7.5 Auto servo OFF

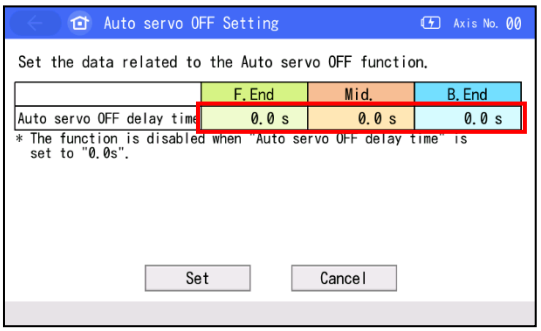
When the automatic servo-of is set, the servo should turn off when the automatic servo off latency has passed after the operation completed. The automatic servo-off latency can be set to each of back and forth ways.



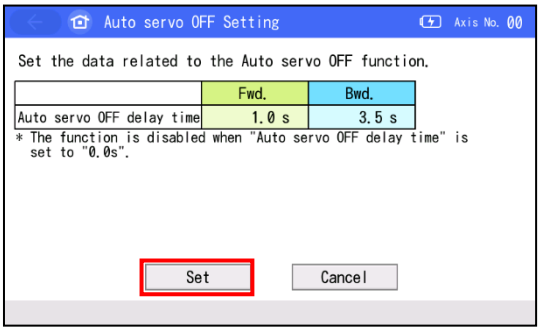
Touch [Auto servo OFF Setting] and the automatic servo-off setup window should appear.



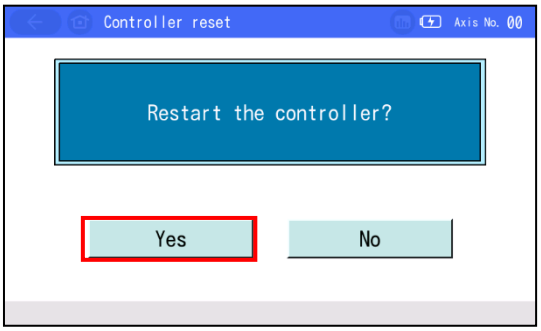
Set the automatic servo-off latency to back and forth ways.
* Set it to "0.0s", and the feature should be inactivated.



In the 3-position setting, setup for the middle point comes available.



Touch [Set] after input.



Touch [Yes].

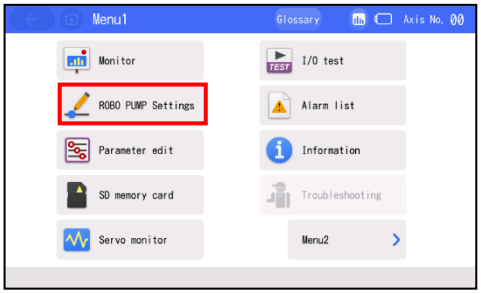
Reboot the controller and the automatic servo-off setup is complete.

The applicable version of ELECYLINDER

Models	Version
24V system ELECYLINDER	V000D or later
200V system ELECYLINDER	V0005 or later
Ultra Mini ELECYLINDER	V0002 or later
Thin Type ELECYLINDER 2-Size ELECYLINDER	V0001 or later
Microcylinder	V0001 or later

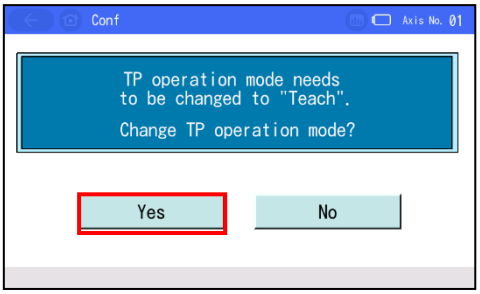
3.8 ROBO PUMP Setting

When ROBO PUMP is connected and ROBO PUMP is selected in the Select Axis screen, the [ROBO PUMP Settings] button should be shown in the Menu 1 screen. Touch it and the screen should shift to the ROBO PUMP Setting screen.
In the ROBO PUMP setting screen, settings for suction of ROBO PUMP, release, display of status monitor, pressure setting and detail settings are available.



Touch [ROBO PUMP settings] on the Menu 1 screen.

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

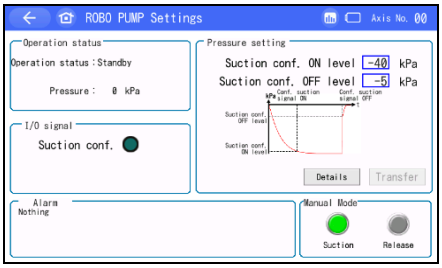
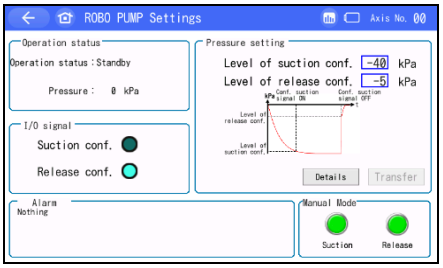
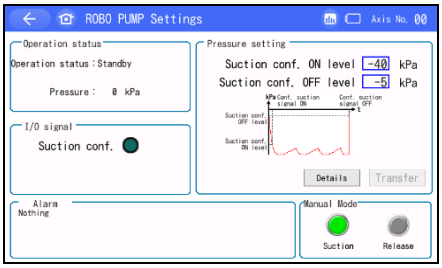
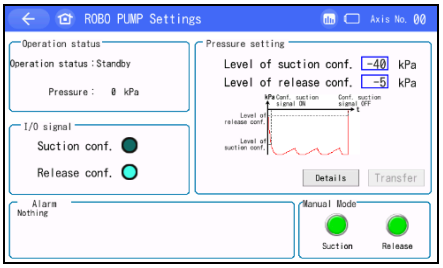


Touch [Yes] to change to Teach Mode 1 or 2.

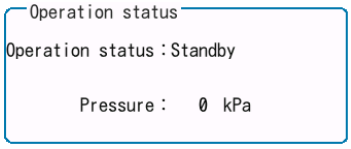
If not, touch [No].

(Note) The safety speed does not change.

ROBO PUMP Settings screen appears.
The contents of pressure setting may differ depending on the PIO patterns and enable or disable of the Energy-saving mode.

	If the PIO pattern is 0 or 1	If the PIO pattern is 2
Energy-saving mode Disabled		
Energy-saving mode Enabled		

3.8.1 Operation Status



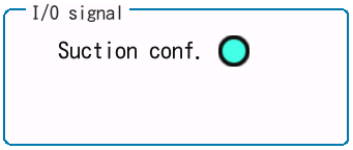
Shown below is the displayed Items.

[Displayed Items]
- Operation status : The operation status of the ROBO POMP is shown.
- Pressure [kPa] : Pressure at the vacuum pump part should be displayed.

3.8.2 I/O Signal

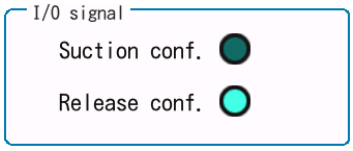
Shown below is the displayed Items.

If the PIO pattern is 0 or 1.



[Displayed Items]
- Suction conf. : It should turn on when suction is complete.
  : It should be off when suction is not complete.

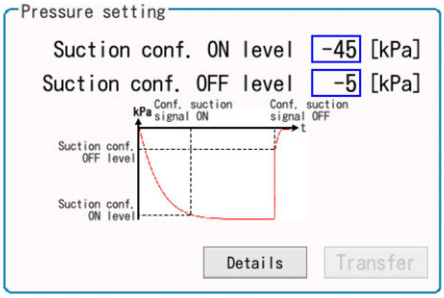
If the PIO pattern is 2.



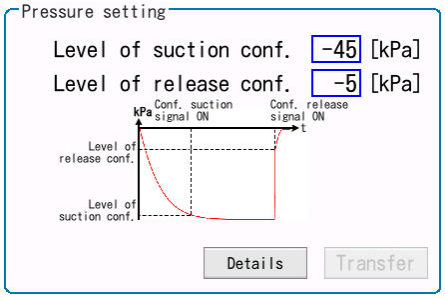
[Displayed Items]
- Suction conf. : It should turn on when suction is complete.
- Release conf. : It should turn on when release is complete.

3.8.3 Pressure setting

If the PIO pattern is 0 or 1.



If the PIO pattern is 2.



The display details, process when each button is touched are as shown below.

[Display Details When PIO Pattern is 0 or 1]

- Suction conf. ON level [kPa] : The upper limit of pressure to terminate suction should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Suction conf. OFF level [kPa] : The upper limit of pressure to terminate release should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Pressure setting graph : The relation between the suction confirmation ON and OFF levels and the pressure should be shown.

[Display Details When PIO Pattern is 2]

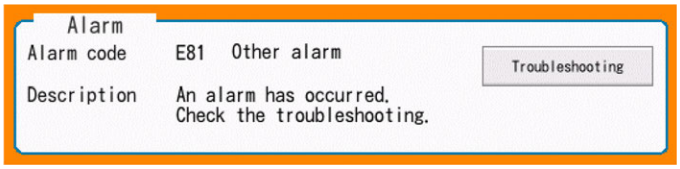
- Level of suction conf. [kPa] : The upper limit of pressure to terminate suction should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Level of release conf. [kPa] : The upper limit of pressure to terminate release should be set up. The unit is [kPa] and integers in negative can also be input. Settings cannot be changed during suction or release in the monitoring mode.
- Pressure setting graph : The relation between the suction confirmation and release confirmation levels and the pressure should be shown.

[Button]

- [Details] button : ROBO PUMP Details screen should be displayed Refer to [3.8.8.1 ROBO PUMP Advanced Settigs 1 screen (Energy-saving mode), 3.8.8.2 ROBO PUMP Advanced Settigs 2 screen (Level setting)].
- [Transfer] button : The changed setting should be sent to ROBO PUMP.

* The [Transfer] button should be inactivated when there is no change to the settings in the monitoring mode and teaching mode or during operation of suction or release.

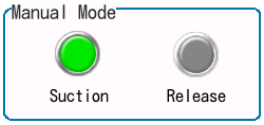
3.8.4 Alarm



The display details, process when each button is touched are as shown below.

- Alarm code : An occurred alarm code should be displayed.
  "None" should be shown when there is no alarm occurred.
- Content : An occurred alarm code should be displayed.
- [Troubleshooting] button : The screen moves to the troubleshooting window.

3.8.5 Manual Mode



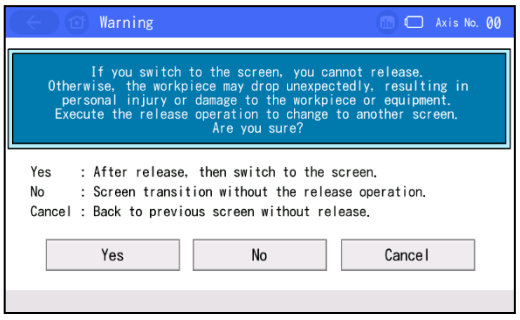
The process when each button is touched is as follows.

- [Suction] button : Touch it and the suction operation should start.
  When it is in standby and data is not yet sent, it should be valid.
- [Release] button : Touch it and the release operation should start.
  When PIO Pattern = 0 or 2, it should be valid during release or in standby.
  When PIO Pattern = 1, it should be valid only during suction.

* The [Suction] and [Release] buttons should be inactivated in the monitoring mode and when there is changed data before transferred.

3.8.6 Release Warning Confirmation Screen

When it is attempted to move to the Menu 1 window or Select Axis window during suction, the release warning confirmation window should open.

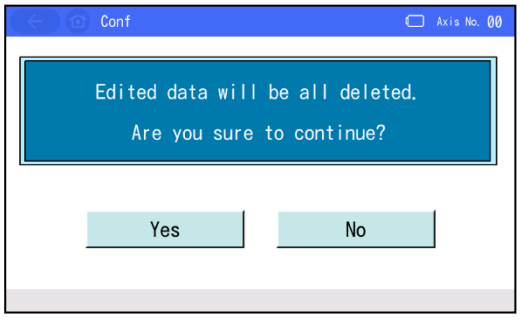


The process when each button is touched is as follows.

- [Yes] button : The screen should go to the Menu 1 window or Select Axis screen after the release process is completed.
- [No] button : The release process should not be performed before the screen goes to the Menu 1 screen or Select Axis screen.
- [Cnacel] button : The release process should not be performed, and the screen should go back to the ROBO PUMP Settings (ROBO PUMP Advanced Settings) screen.

3.8.7 Deleting Data in Edit Confirmation Screen

When data has been edited, but the [Transfer] was not touched and attempted to go to the Menu 1 screen or Select Axis screen, the Deleting Data in Edit Confirmation screen should come out.

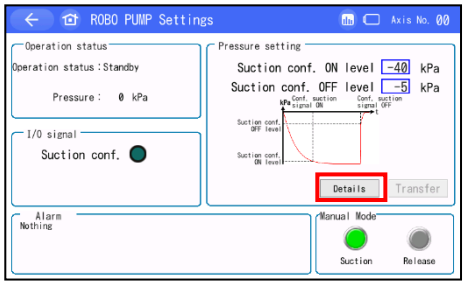


The process when each button is touched is as follows.

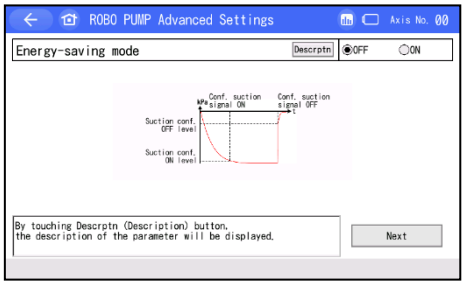
- [Yes] button : The data should be deleted and the screen goes to the Menu 1 screen or Select Axis screen.
- [No] button : The data should not be deleted, and the screen goes back to the ROBO PUMP Settings (ROBO PUMP Advanced Settings) screen.

3.8.8 ROBO PUMP Advanced Settigs screen

By touching the [Details] in the ROBO PUMP Settings screen, the screen goes to ROBO PUMP Advanced Settings Screen 1.
In ROBO PUMP Advanced Settings Screen 1, the Energy-saving mode enable/disable can be switched over.



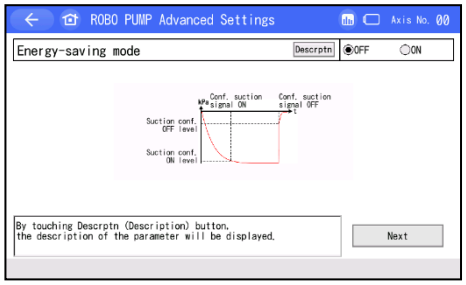
Touch [Detais] on the ROBO PUMP Settings screen.



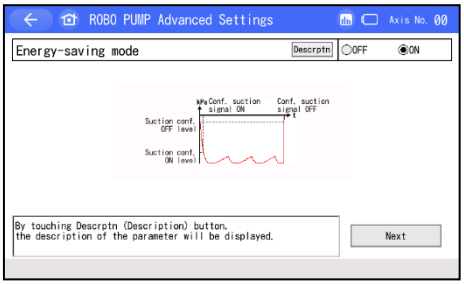
The ROBO PUMP Advanced Settigs screen will be displayed.

3.8.8.1 ROBO PUMP Advanced Settigs 1 screen (Energy-saving mode)

Energy-saving mode: Disabled



Energy-saving mode: Enabled

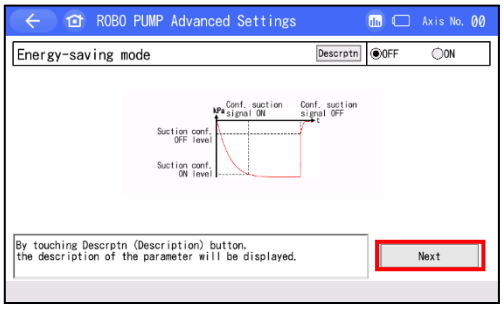


The display, setting details and process when each button is touched are as shown below.

- [Descrptn] button : Touch it and an explanation of the Energy-saving mode should be shown at the bottom of the window.
- [OFF], [ON] radio button : Setting for disable and enable of the Energy-saving mode can be conducted.
  Touch ○ (radio button) at the item that you would like to set up or text string.
  ○ (radio button) of the selected item should turn into black.
- Pressure setting graph : It should display the relation between the suction confirmation ON/OFF level and pressure when the PIO pattern is 0 or 1, and relation between suction confirmation and release confirmation levels and pressure when the PIO pattern is 2.
- Energy-saving mode : Touch the [Descrptn], and an explanation of the Energy-saving mode should be shown.
- [Next] button : ROBO PUMP Advanced Settigs screen 2 (Level setting) should be displayed.

3.8.8.2 ROBO PUMP Advanced Settigs 2 screen (Level setting)

By touching the [Next] in ROBO PUMP Advanced Settings Screen 1, the screen goes to ROBO PUMP Advanced Settings Screen 2.
In ROBO PUMP Advanced Settings Screen 2, setting of suction confirmation ON level, suction confirmation OFF, suction confirmation and release confirmation level can be conducted.
The suction confirmation ON level, suction confirmation OFF, suction confirmation and release confirmation level are to be determined by the setting of the PIO patterns.
Also, when the Energy-saving mode is enabled, the setting of the suction stop level can be established.

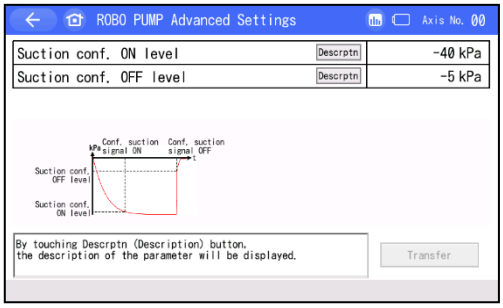


Touch [Next] on the ROBO PUMP Settings screen 1.

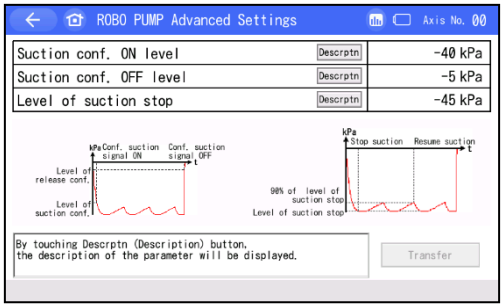
The ROBO PUMP Settings screen 2 will be displayed.
The display details, process when each button is touched are as shown below.

[Display Details When PIO Pattern is 0 or 1]

Energy-saving mode: Disabled



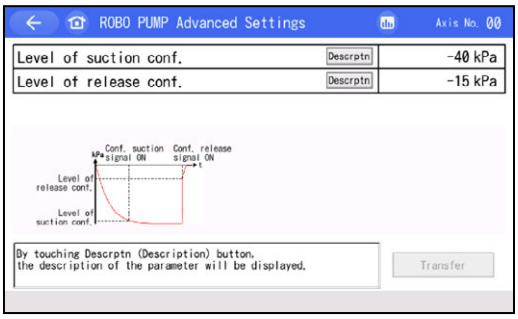
Energy-saving mode: Enabled



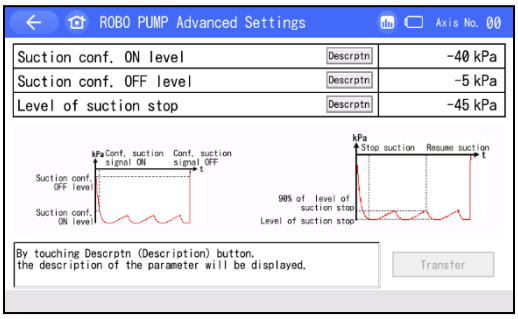
- Suction conf. ON level : The pressure to turn the suction confirmation signal ON is set up.
  A negative integer can be input.
  The suction confirmation signal should turn ON when the pressure gets below the set value.
- Suction conf.OFF level : The pressure to turn the suction confirmation signal OFF is set up.
  A negative integer can be input.
  The suction confirmation signal should turn OFF when the pressure gets above the set value.
- Level of suction stop : Pressure to stop suction operation when the Energy-saving mode is activated should be set.
  A negative integer can be input.
  Once the pressure reaches the value set in this parameter, the suction action stops, and the suction action resumes when the pressure goes above 90% of the set value.

[Display Details When PIO Pattern is 2]

Energy-saving mode: Disabled



Energy-saving mode: Enabled



- Level of suction conf. : The pressure to turn the suction confirmation signal ON is set up.
  A negative integer can be input.
  The suction confirmation signal should turn ON when the pressure gets below the set value.
- Level of release conf. : The pressure to turn the release confirmation signal ON is set up.
  A negative integer can be input.
  The release confirmation signal should turn ON when the pressure gets above the set value.
  The release confirmation signal should turn ON when the pressure gets above the set value.
  It should turn OFF when the suction signal turns on.
- Level of suction stop : Pressure to stop suction operation when the Energy-saving mode is activated should be set.
  A negative integer can be input.
  Once the pressure reaches the value set in this parameter, the suction action stops, and the suction action resumes when the pressure goes above 90% of the set value.

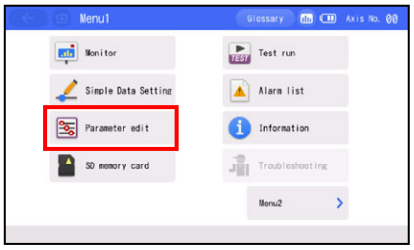
ROBO PUMP advanced setting screen 2 process when each button is touched are as shown below.

- [Descrptn] button : Touch the Descrptn button, and an explanation of the level setting should be shown at the bottom of the screen.
- Parameter : Touch the [Descrptn], and an explanation of the parameter should be shown.
- [Transfer] button : The changed setting should be sent to ROBO PUMP.

* The [Transfer] button should be inactivated when there is no change to the settings in the monitoring mode and teaching mode or during operation of suction or release.

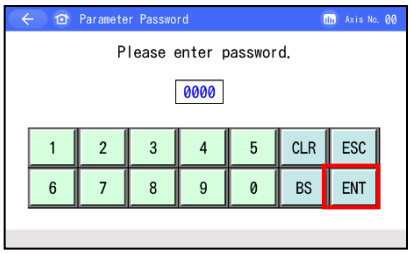
3.9 Parameter Edit

Parameters are displayed and edited.



Touch [Parameter edit] on the Menu 1 screen.

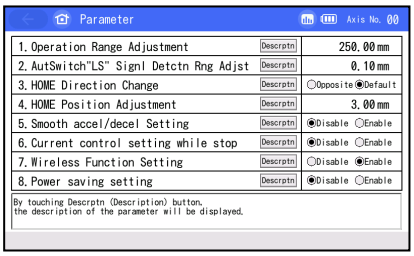
If a system password is not “0000,” the password entry screen appears.



Input the parameter edit password.
Touch [ENT].

> The parameter edit password at delivery is set to “0000”. For how to change the parameter edit password, refer to 3.16 Environment Setting [Parameter edit password change].

A parameter table is displayed.

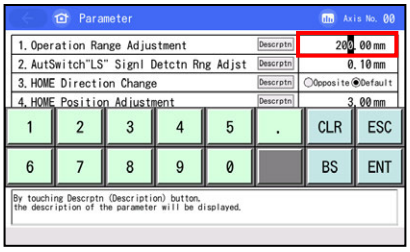


The displayed items may differ depending on models.

(1) Basic operation

There are three kinds, items to input the setting values, items to select by touching ○ (radio button) and items to select from the drop-down list.

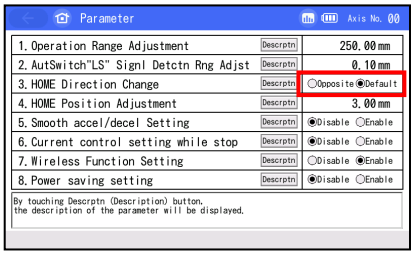
Item to input a setting value



Touch the item that you would like to make a setting, and the setting parameter starts flashing and numeric keys will show up.
Touch numbers on the numeric keys to input and touch [ENT].

When the process needs to be cancelled after the numeric keys appear, touch [ESC].

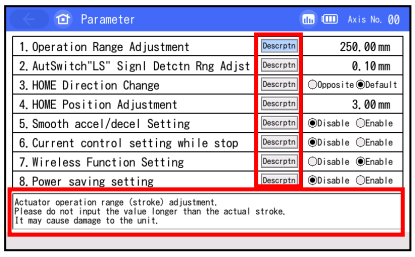
Item to touch ○ (radio button) to select



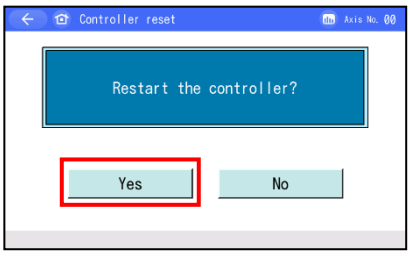
Touch ○ (radio button) of the item or the text itself that you would like to select.

A black dot will be marked in ○ (radio button) that you selected.

Descriptions



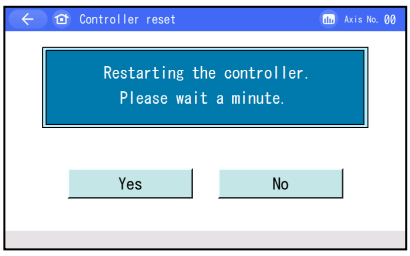
Touch [Descrptn] button and the descriptions of the setting items will be shown in the bottom of the screen.



Touch Home Button once all the settings are completed. A confirmation screen asking “Restart the controller?” will come up. Touch [Yes] if you have made a change.

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

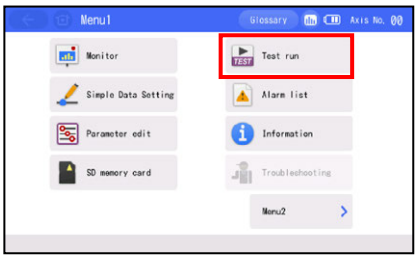
⚠ *Caution: If the controller is not restarted, the parameter that has been rewritten does not translate to the intended action.*
The parameter will become effective once the controller is restarted or power is reconnected.



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

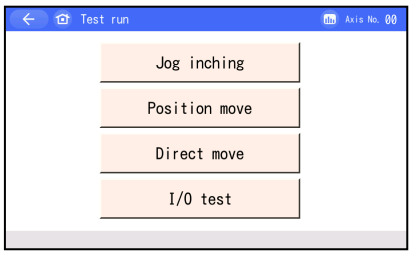
3.10 Test Run

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



Touch [Test run] on the Menu 1 screen.

Test run menu screen is displayed.



* [Jog inching], [Position move], [Direct move] button should appear only when the wireless axis operation setting of the teaching pendant is enabled and an axis available for operation with wireless link is connected.

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

(1) Jog inching

Perform jog/inching operation.
Refer to [3.10.1 Jog Inching Operation] for details about how to operate.

(2) Position move
Movement to the forward end or backward end or continuous movement should be performed.

- Move
  Movement should be made from the current position to either of the forward end or the backward end which has been indicated. (One time of movement only)
- Countinuous
  Movement should be made repeatedly between the forward end and the backward end.

Refer to [3.10.2 Position Movement Operation] for details about how to operate.

(3) Direct move
Input the target position and the speed on the numeric keys to perform movement.

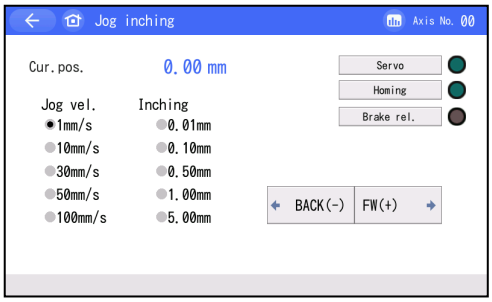
Refer to [3.10.3 Direct Movement Operation] for details about how to operate.

(4) I/O test
Monitoring of the input and output signals and compulsory output of the output signal can be conducted.

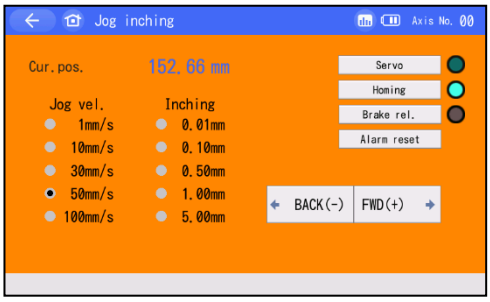
Refer to [3.10.4 I/O Test] for details about how to operate.

3.10.1 Jog Inching Operation

JOG and inching operations should be available only when the wireless axis operation setting of the teaching pendant is enabled and an axis available for operation with wireless link is connected.



Jog/Inching Screen



When Alarm Generated

[Operation on the Jog inching screen]

- Jog vel. / Inching : Select either of 1, 10, 30, 50 or 100mm/s of JOG speed or 0.01, 0.10, 0.50, 1.00, 5.00mm of inching distance, and JOG operation with the selected speed or inching operation with the selected distance can be conducted. The circle (radio button) on the selected one will be marked with a black dot.

- [Servo] : It shows the status of the servo whether it is ON or OFF for the axis. When the servo is ON, display of ○ is activated and it is inactivated when the servo is OFF.

- [Homing] : 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.

- [Brake rel.] : For an actuator equipped with a brake, touch [Brake rel.] and the brake gets compulsorily released and the circle turns on. Touch [Brake rel.] again and the brake works and the circle turns off.

- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.

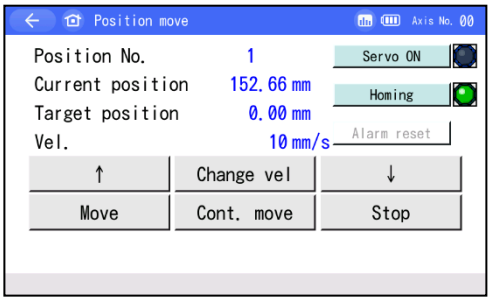
- [BACK (-)], [FW (+)] : When JOG operation is selected, while touching them, the axis moves in the set speed. When inching operation is selected, every time touching them, the axis moves for the set distance. [BACK (-)] performs JOG operation in negative direction. [FW (+)] performs JOG operation in positive direction.

  In inching operation, touch and hold them for two seconds, and JOG operation will be performed in 1mm/sec. The speed increases in every 1 second afterwards.

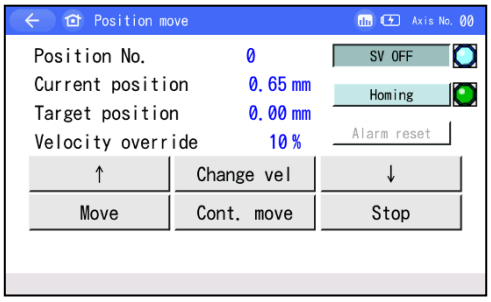
> ⚠ *Caution: An axis could drop if the brake compulsory release is performed while the servo is off when the axis is installed in the vertical orientation.*

3.10.2 Position Movement Operation

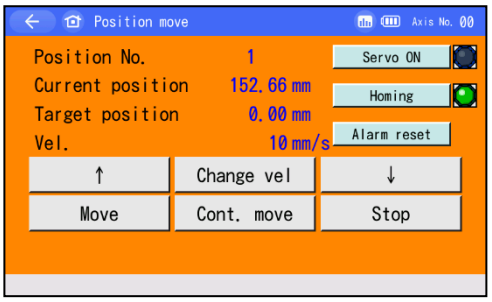
Move to a position or continuously to multiple positions registered in the position table.
The items to be displayed should differ depending on valid/invalid of the safety velocity.
[Refere to 3.11 TP Operation Mode]



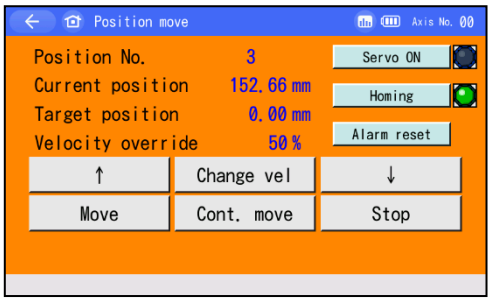
When Safety Velocity is Valid



When Safety Velocity is Invalid



When Alarm Generated
with Safety Velocity Activated



When Alarm Generated
with Safety Velocity Inactivated

[Operation on the position movement screen]

- Position No. : “1” should be shown when the forward end is selected and “0” when the backward end is selected.
- Current position : Displays the current position.
- Target position : Displays the target position set in the selected position number.

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

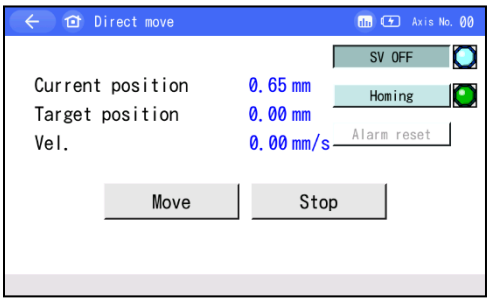
When Safety Velocity is Invalid;
- Velocity override : Displays the selected speed override [%].
- [Servo ON] : It shows the status of the servo whether it is ON or OFF for the axis. When the servo is ON, display of ○ is activated and it is inactivated when the servo is OFF.
- [Homing] : Touch [Homing] and the home-return operation should get executed after a confirmation window for execution is displayed. ○ display should get illuminated when the home-return operation is completed and ○ display should turn off when the home-return operation is incomplete.
- [Alarm reset] : After removing a cause of an error, touch [Alarm reset] to cancel the alarm.

- [↑], [↓] : Touch [↑] or [↓] to select a position number (1: forward end, 0: backward end) for the movement target.
- [Change vel] : When Safety Velocity is Valid
  Speed can be changed in order of 1mm/s, 10mm/s, 30mm/s, 50mm/s and 100mm/s every time touching [Change vel].

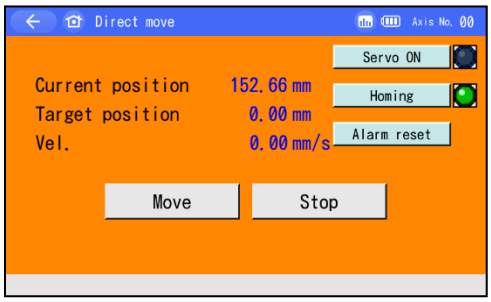
  : When Safety Velocity is Invalid
  Speed override can be changed in order of 10%, 50% and 100% every time touching [Change vel].
- [Move] : Touching [Move] moves the axis to the target position.
- [Cont. move] : Touch [Cont. Move] and the axis performs continuous operation between the forward end and backward end till touching [Stop].
- [Stop] : Touching [Stop] stops the axis.

3.10.3 Direct Movement Operation

A position is specified directly to move the axis.



Direct Movement Screen



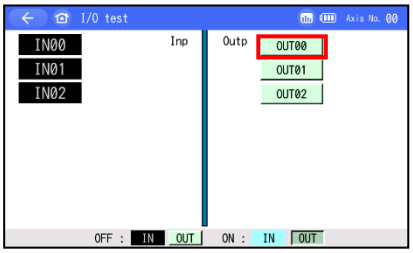
When Alarm Generated

[Operation on the direct movement screen]

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

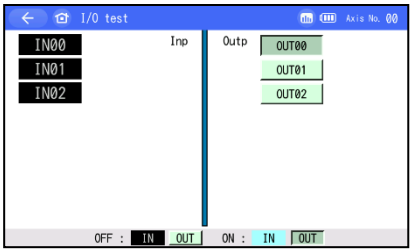
3.10.4 I/O Test

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.



If it is necessary to turn on OUT00 which is currently off, touch [OUT00].

OUT00 turns on.



Touch [OUT00] again and it turns off.

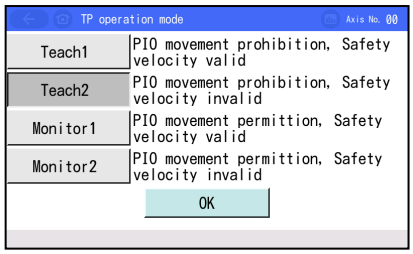
3.11 TP Operation Mode

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



Touch [TP op. mode] on the Menu 2 screen.

The TP operation mode screen appears.



Select and touch [Teach1] or other desired mode.

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

- Teach1 (PIO movement prohibition / Safety velocity valid)
  PIO movement prohibition : Write items or parameters in the simple data setup window to the controller, and indications in the actuator operation system can be made.
  Safety velocity valid : It is not for use in wireless link.

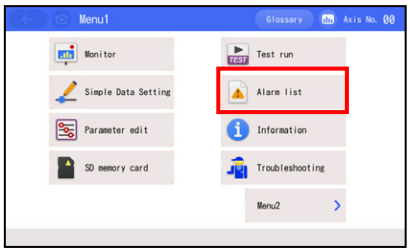
- Teach2 (PIO movement prohibition / Safety velocity invalid)
  PIO movement prohibition : Write items or parameters in the simple data setup window to the controller, and indications in the actuator operation system can be made.
  Safety velocity invalid : It is not for use in wireless link.

- Monitor1 (PIO movement permittion / Safety velocity valid)
  PIO movement permittion : Monitoring is only available. Writing of contents and parameters in the simple data setting screen to the controller or command to the actuator operation system are not available. Operation commands (jog, home return, etc.) cannot be issued from the teaching tool.
  Safety velocity valid : The maximum velocity should be the safety velocity (100m/s) regardless of the velocity command from the PLC.

- Monitor2 (PIO movement permittion / Safety velocity invalid)
  PIO movement permittion : Monitoring is only available. Writing of contents and parameters in the simple data setting screen to the controller or command to the actuator operation system are not available. Operation commands (jog, home return, etc.) cannot be issued from the teaching tool.
  Safety velocity invalid : You can move the actuator at the velocity (higher than the safety velocity) according to the command from the PLC.

3.12 Alarm List

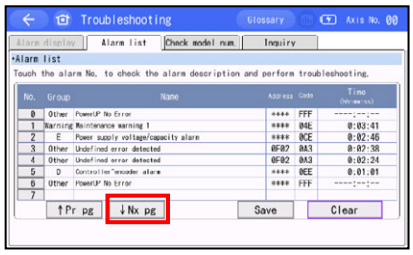
A list of alarms that may generate after the controller power is turned on is shown.



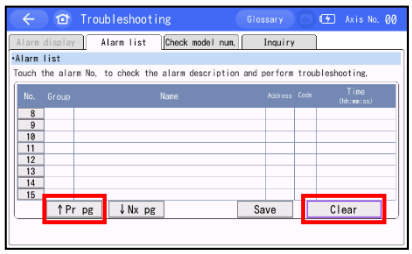
Touch [Alarm list] on the Menu 1 screen.

The controller's alarm list appears.

Alarm list will be displayed.
- ELECYLINDER display items : No., Group, Name, Address, Code, Time (hh:mm:ss)
- ROBOPUMP display items : No., Code, Name, Address, Detail, Time (hh:mm:ss)



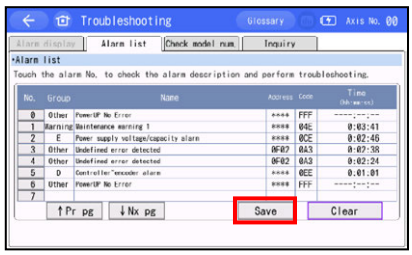
Touching [↓ Nx pg] displays the list of the next screen.



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

Touching [Clear] clears all alarm details.

The time of occurrence of each alarm is indicated by an elapsed time from this "FFF PowerUP No Error".



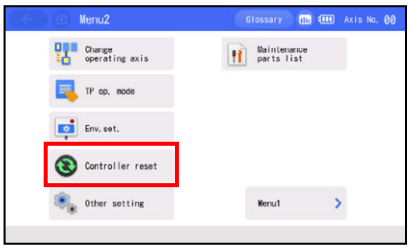
Touch [Save] and the screen goes to the screen to save to a Secure Digital memory card.

Refer to [3.17 Data Backup] for how to operate to save data to a Secure Digital memory card.

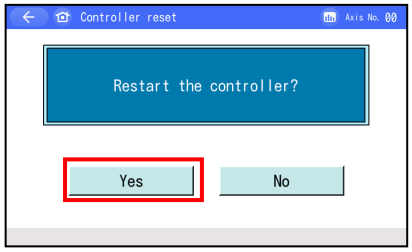
3.13 Controller Reset

The controller is restarted.

3.13.1 ELECYLINDER Reset

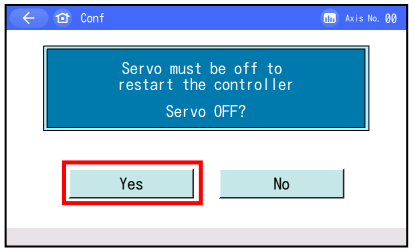


Touch [Controller reset] on the Menu 2 screen.



Touch [Yes].

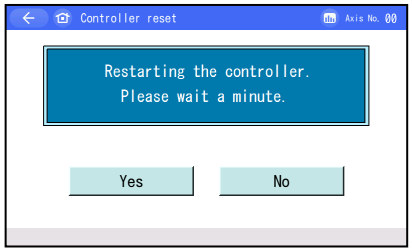
Touch [No] to return to the Menu 2 screen without restarting the controller.



This screen appears if the servo is on.

Touch [Yes].

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

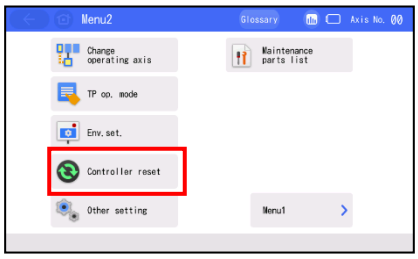


The controller is restarted.

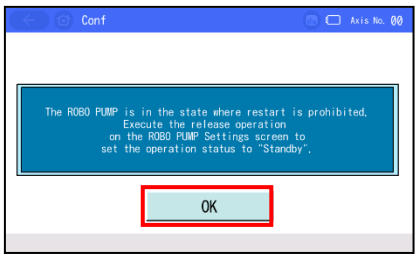


Returns to Menu 1 screen.

3.13.2 ROBO PUMP Reset

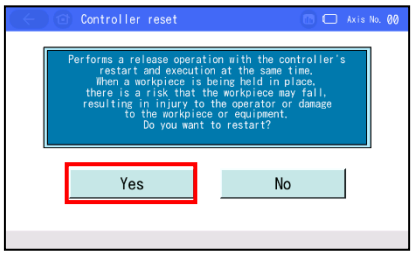


Touch [Controller reset] on the Menu 2 screen.



Touch it while in suction, and the window to show reboot prohibited should be displayed.

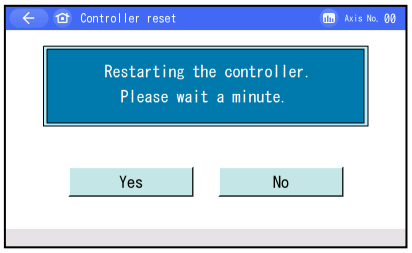
Touch [OK] to return to the Menu 2 screen to have it desorbed, and touch [Controller Reboot again].



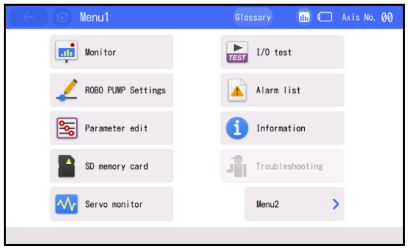
In order to have a release operation at the same time as execution of reboot, a message to pull attention should be displayed.

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

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



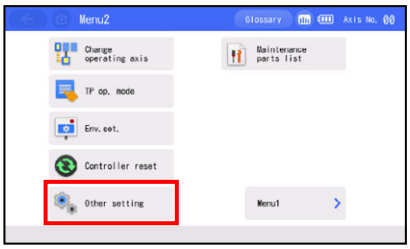
The controller is restarted.



Returns to Menu 1 screen.

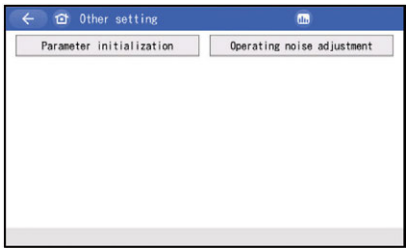
3.14 Other Setting

Parameter initialization and operating noise adjustment should be conducted.



Touch [Other setting] in Menu 2 screen.

For ROBO PUMP, have it conducted while it is desorbed.



Other setting screen opens.

Select one from [Parameter initialization], [Operating noise adjustment] that you would like to carry on and touch the button.

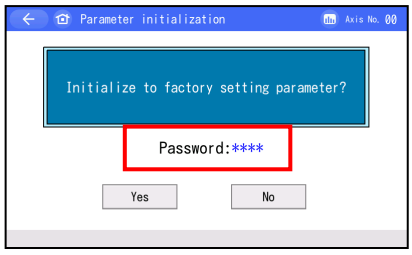
There is no feature to adjust the operational sounds for ROBO PUMP.

3.14.1 Parameter Initialization

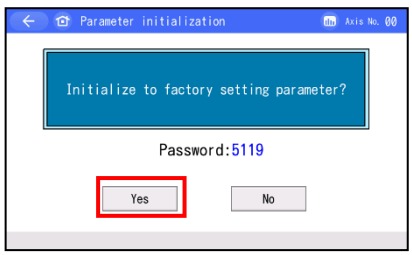
The parameters are reset to their factory default settings (initialized).

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

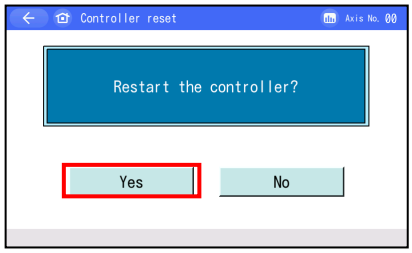
Touch [Parameter initialization] in Other setting screen to display Parameter initialization screen.



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



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



Touch [Yes].

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

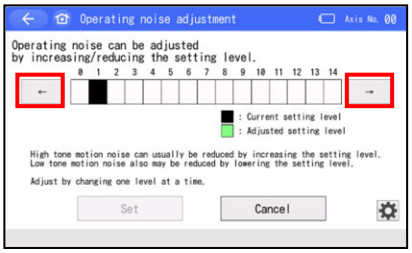
> ⚠ *Caution: If the controller is not restarted, the parameters that have been rewritten to their factory settings do not translate to the factory-set operations.*
> *The factory settings will become effective once the controller is restarted or power is reconnected.*

3.14.2 Operating Noise Adjustment (Applicable models only)

The operation noise can be tuned.
By having it tuned, possibility of an operation noise error could be reduced.

Touch the [Operating noise adjustment] in the Other Setting window to display the Operating noise adjustment screen.

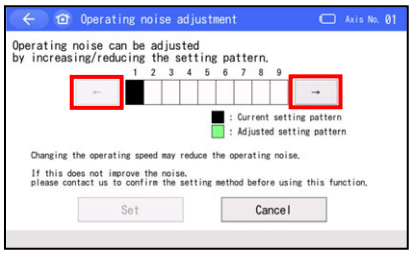
- For models that support level setting



Touch [←] and [→] on the right and left of the levels to adjust the level one by one to perform tuning.

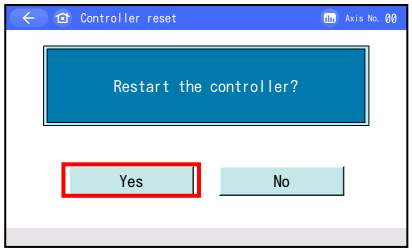
Once the tuning is finished, touch [Set].

- For models that support pattern setting



Touch [←] and [→] on the right and left of the pattern to adjust the pattern one by one to perform tuning.

Once the tuning is finished, touch [Set].



Touch [Yes].

Touch [No] and a restart of the controller would not be performed and the screen goes back to the previous screen.

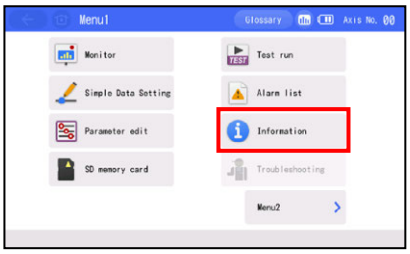


The controller is restarted.

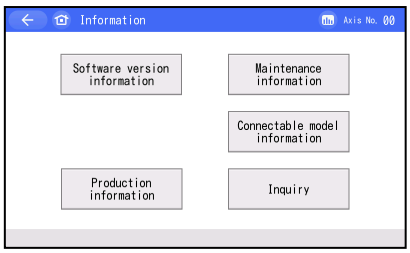
Returns to Menu 1 screen.

3.15 Information Display

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



Touch [Information] on the Menu 1 screen.



The information screen appears.

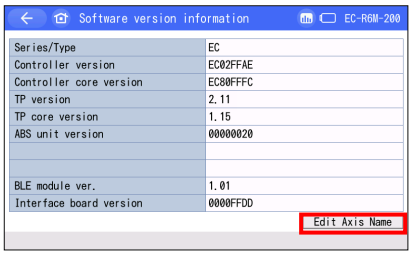
Touch a button of the feature that you would like to display such as [Software version information].

3.15.1 Display Window for Each Type of Data

3.15.1.1 Software version information

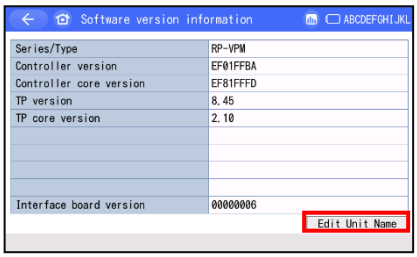
Touch [Software version information] in Information screen.

Software version information screen opens.



ELECYLINDER software version information screen

Touch [Edit Axis Name] and the name of axes can be edited. Refer to [3.15.2 Edit Axis Name] for how to edit an axis name.

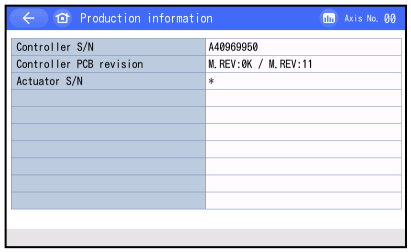


ROBOPUMP software version information screen

Touch [Edit Unit Name] and the name of unit can be edited. Refer to [3.15.2 Axis Name Edit] for how to edit a unit name.

3.15.1.2 Production information

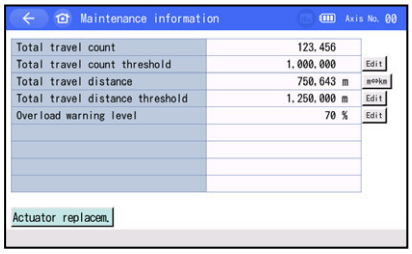
Touch [Production information] button in Information screen.



Production information screen opens.

3.15.1.3 Maintenance information

Touch [Maintenance information] in Information screen.

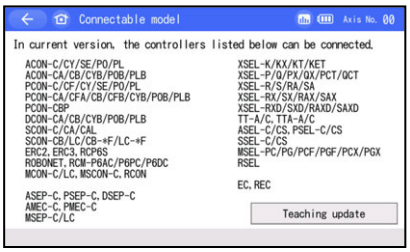


Maintenance information screen opens.

Refer to [3.6.2 Maintenance Information Screen] for how to operate displayed button.

3.15.1.4 Connectable model

Touch [Connectable model information] in Information screen.



Connectable model screen opens.

(Note) In this display, controllers applicable for wired link should also be shown.
(Note) The images in this instruction manual may differ from the latest display.

Refer to [6.4 Teaching Update] for how to update teaching.

3.15.1.5 Inquiry

Touch [Inquiry] in Information screen.

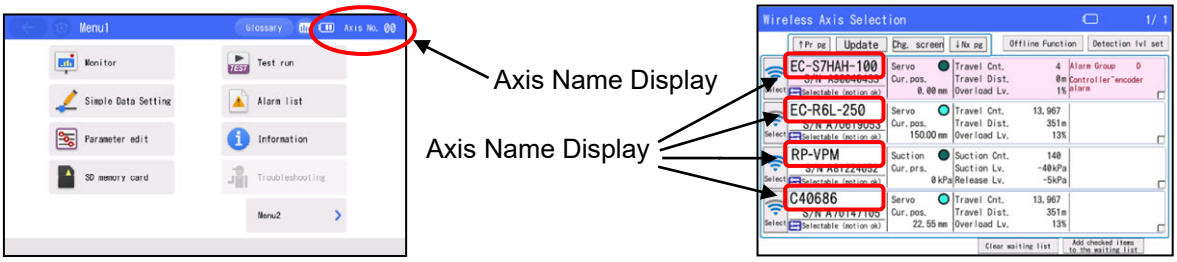


Inquiry screen opens.

3.15.2 Edit Axis Name

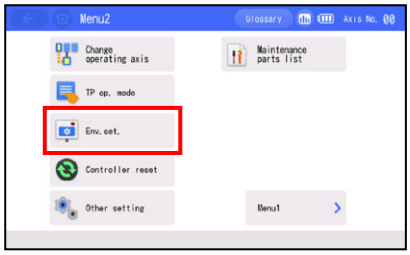
A name can be set on an axis of the ELECYLINDER and a unit of the ROBO PUMP. To show the axis name, select Axis Name at the axis name display section in the environment setting screen.

The set name should be displayed on the right top of each window and the Select Axis screen. Display on the right top corner in each window should show the “Axis No. 00” even if Axis Name Display is selected if an axis name has not been set.



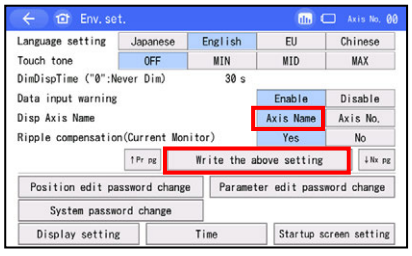
(Note) The available characters for setting in TB-03 are capitalized font English characters (from A to Z) and numbers (from 0 to 9).
For full-size font characters character input, please use PC software.

[Axis Name Edit Operation]



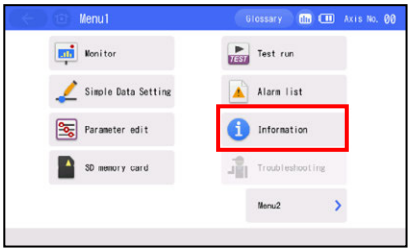
Touch [Env. set.] on the Menu 2 screen.

For ROBO PUMP, have it conducted while it is desorbed.

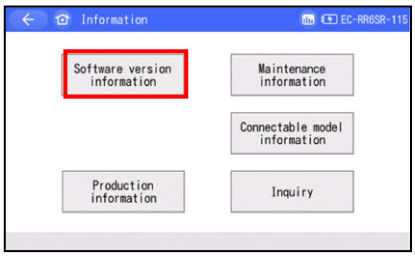


Set to “Axis Name” for the axis name display.

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

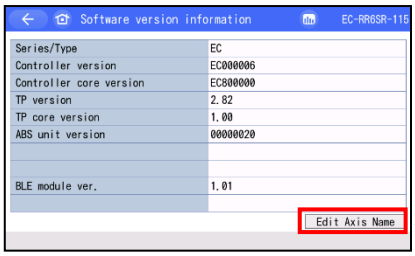


Touch [Information] on the Menu 1 screen.



Information screen opens.

Touch [Software version information].

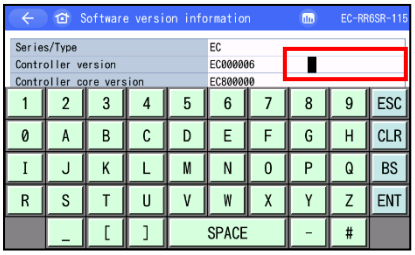


The Software version information screen will be displayed.

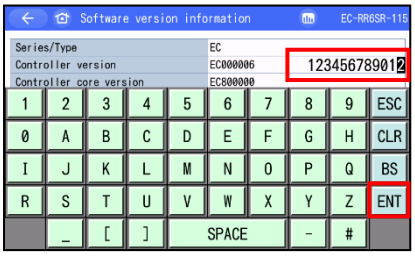
Touch [Edit Axis Name] in the case of ELECYLINDER.



Touch [Edit Unit Name] in the case of ROBO PUMP.

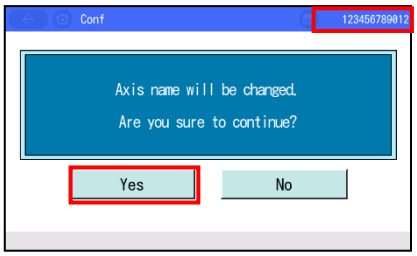


On the right of the Controller version display is the input area. Character select buttons are shown in the half bottom of the screen.



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

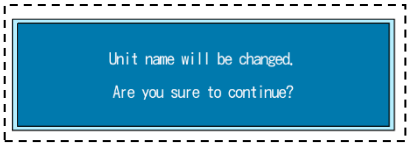
Touch [ENT] with nothing input, and it is defined as no setting. With no setting, an axis number will be shown.



The change confirmation screen will appear, with the axis name input shown in the right top.

This status is still a temporary setting.
Touch [Yes] to confirm the setting.

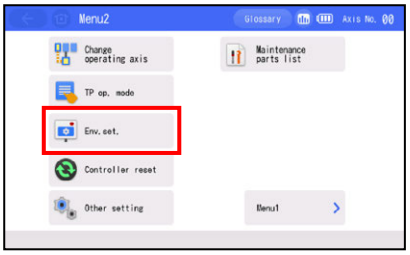
Touch [No] and the condition goes back to before setting.



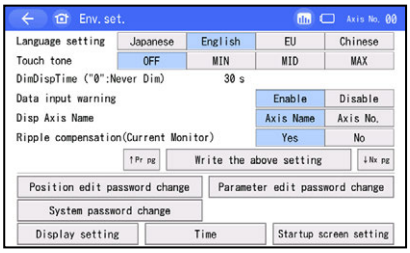
(Display of change confirmation window in ROBO PUMP)

3.16 Environment Setting

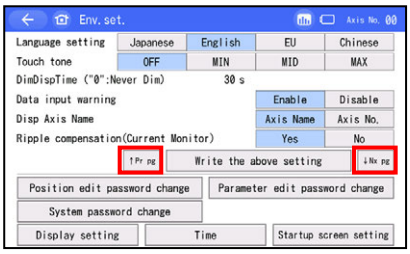
You can change the language setting, touch tone setting, dim display time setting, data input warning setting, axis name display setting, ripple compensation, wireless standby axis list automatic reading, wireless axis operation setting, position editing password change / Prs Program edit password change, parameter edit password change, system password change, display setting, time setting and Startup screen setting.



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

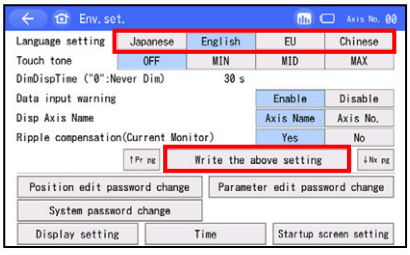


The environment setting screen appears.



Touch [↑ Pr pg] or [□ Nx pg], the second page of the Environment Setup window should be displayed.

[Language setting]
Select a language to show from Japanese/English/EU/Chinese.

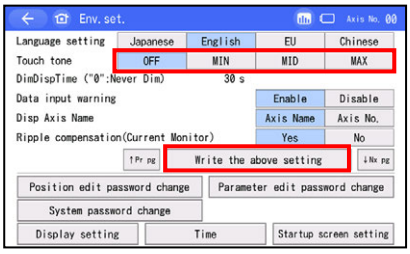


Touch a language (such as [Japanese]) to show.

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

For the operation procedures in detail to change the language, refer to [3.1 Display Language Change].

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

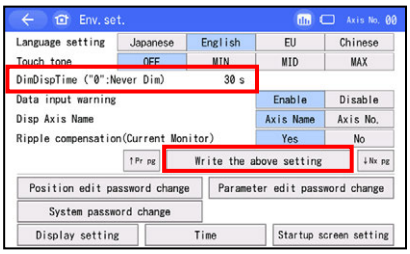


Touch [OFF]. A touch tone is not output.

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

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

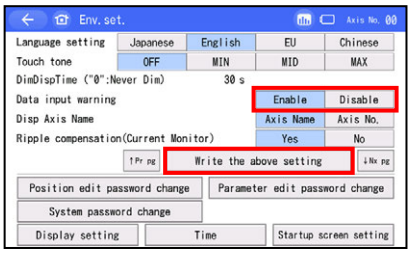
[DimDispTime]
Set the dim display time when not being operated.
Zero seconds mean the display is on all the time.



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

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

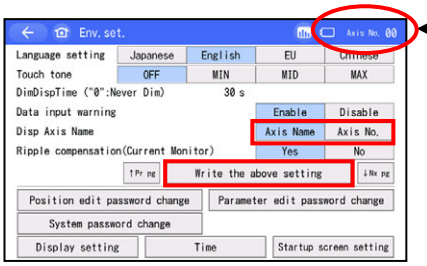
[Data input warning]
The warning can be output when a value less than the minimum speed and a value exceeding the rated acceleration/deceleration speed are entered in the position data. Note that the value is entered even if the warning occurs. Always use within the specification of the actuator.



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

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

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



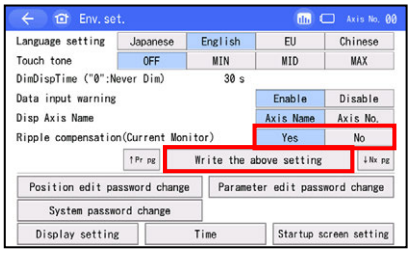
← Axis Name Display

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

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

The axis name can be set in Software version information screen. [Refer to 3.15.2 Axis Name Edit]

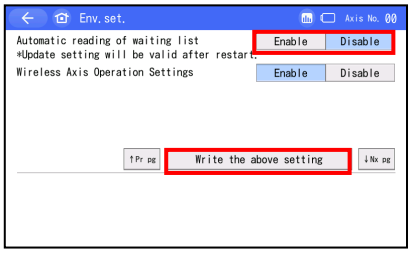
[Ripple Compensation]
Setting should be established to select whether to have ripple compensation or not to have it in the monitor screen as the initial setting.



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

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

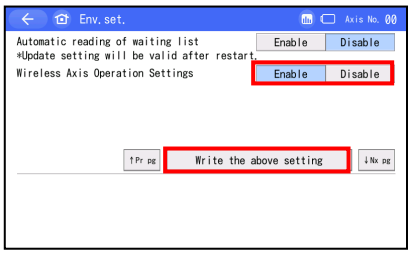
[Wireless Standby Axis List Automatic Reading]
Save the standby axis list registered in the wireless axis select window to a Secure Digital memory card, and it can be automatically read in at the startup.
Refer to [3.4.2 Display Wireless Axis Status].



Touch [Enable], and the standby axis list should be read in automatically from the Secure Digital memory card.
Touch [Disable], and the standby axis list should not be read in automatically from the Secure Digital memory card.

Select either Enable or Disable, and then touch [Write the above setting]. The setting will not be changed when you move to another screen without touching it. Also, the wireless standby axis list automatic reading feature setting should get enabled at the next launch.

[Wireless Axis Operation setting]
Enable or disable Wireless Axis Operation can be selected.



Touch [Enable] to allow axis operation during wireless communication.
Touch [Disable] to prevent axis operation during wireless communication.

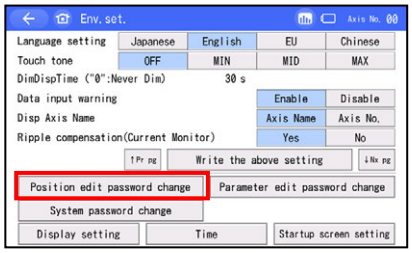
Select either Enable or Disable, and then touch [Write the above setting]. The setting will not be changed when you move to another screen without touching it.

Depending on the specifications of the EC or ROBO PUMP, axis operation may not be available even if the wireless axis operation setting is changed. The wireless axis operation setting takes effect only for WL2-specification ECs, WL-specification ROBO PUMP, or devices connected via an R-Unit.

Connected Devices	Wireless axis operation setting for the teaching pendant	Test run
EC via R-Unit (*)	Enable	available
	Disable	unavailable
EC (WL specification)	Enable	unavailable
	Disable	unavailable
EC (WL2 specification) ROBO PUMP (WL specification)	Enable	available
	Disable	unavailable

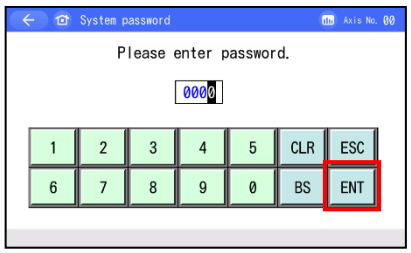
* WL and WL2 setting specifications do not affect.

[Position Edit Password Chenge]
Change the position edit password.



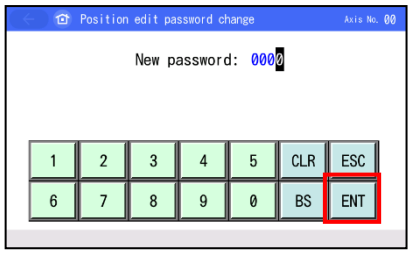
Touch [Position edit password change].

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



Input a system password.
Touch [ENT].

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

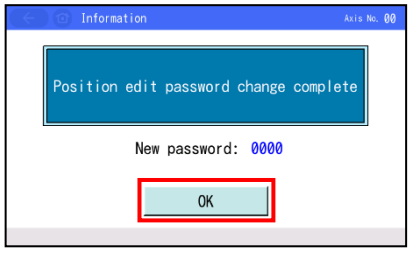


Enter the new position edit password to change to.
If the position edit password is not set, enter “0000”.

Touch [ENT].



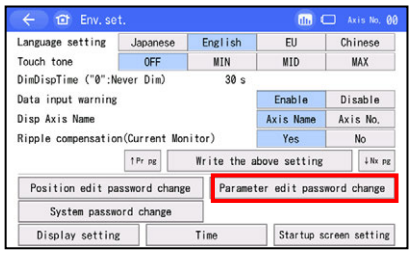
Touch [Change].



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

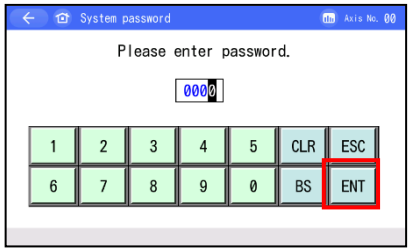
Touch [OK].

[Parameter Edit Passward Change]
Change the parameter edit password.



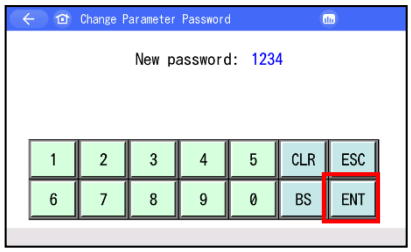
Touch [Parameter edit password change].

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



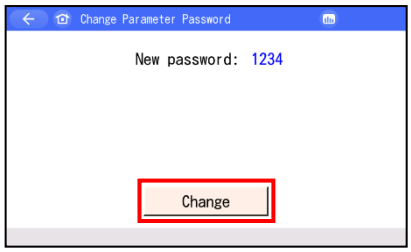
Input a system password.
Touch [ENT].

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

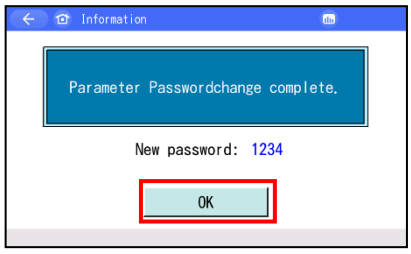


Enter the new parameter edit password to change to.
If the parameter edit password is not set, enter “0000”.

Touch [ENT].



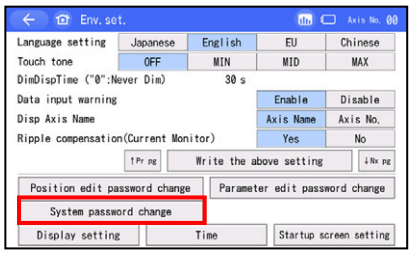
Touch [Change].



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

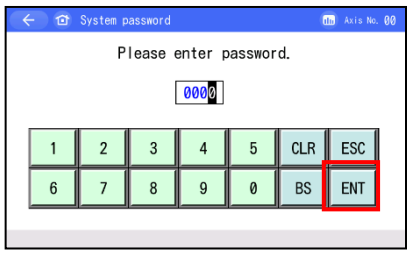
Touch [OK].

[System Password Change]
Change the system password.



Touch [System password change].

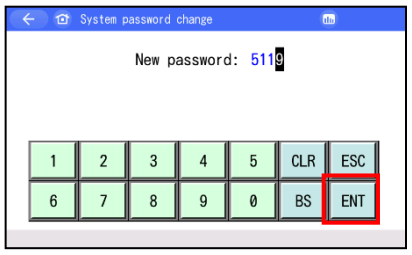
If the system password is not “0000”, the password entry screen appears.



Input the system password that is currently set.

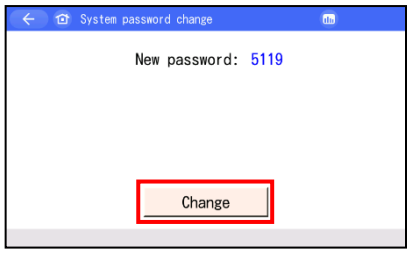
Touch [ENT].

The default system password is “5119”.

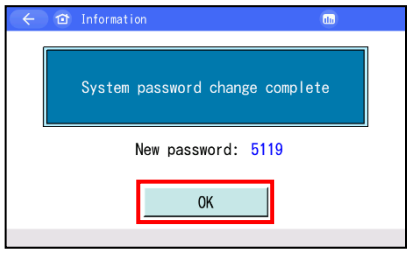


Enter the new system password to change to.
If you do not set the system password, enter “0000”.

Touch [ENT].



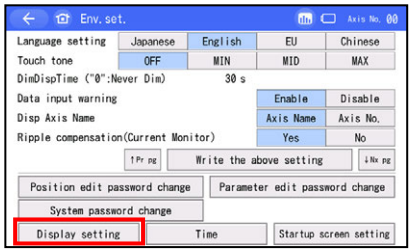
Touch [Change].



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

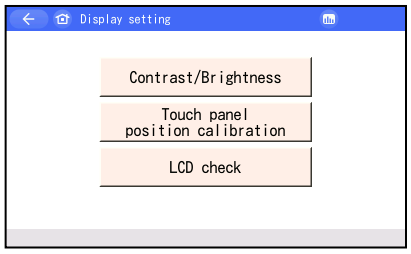
Touch [OK].

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



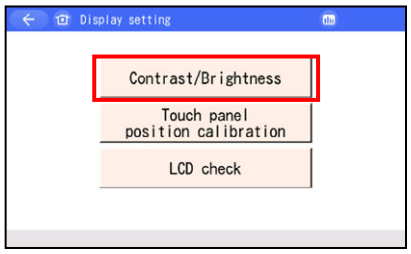
Touch [Display setting].

Display setting menu screen is displayed.



Select Display setting menu.

- Change the Contrast / Brightness
  You can adjust contrast (shading of liquid crystal) and brightness (of liquid crystal).



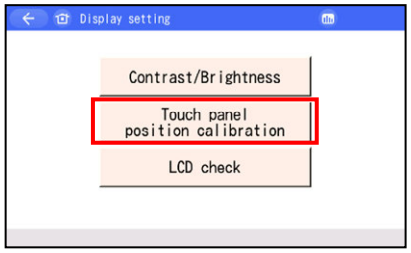
Touch [Contrast/Brightness].



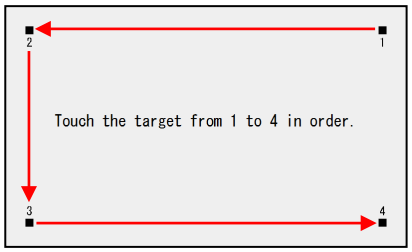
Contrast adjustment
Touch [–] and [+] under Contrast to adjust the contrast of the screen.

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

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



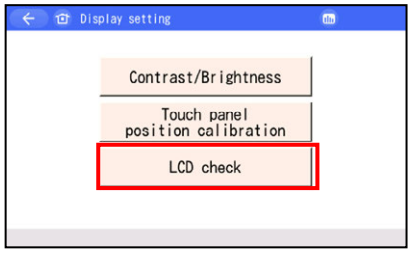
Touch [Touch panel position calibration].



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

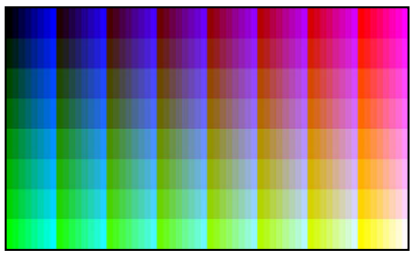
The display returns to Display setting menu screen.

● LCD Check
LCD display can be checked in the order of color pattern, white only and black only.



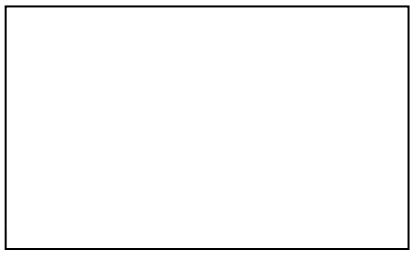
Touch [LCD check].

Color Pattern is displayed.



Touch any point on the screen.

White Only is displayed.



Touch any point on the screen.

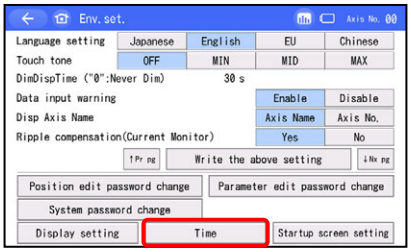
Black Only is displayed.



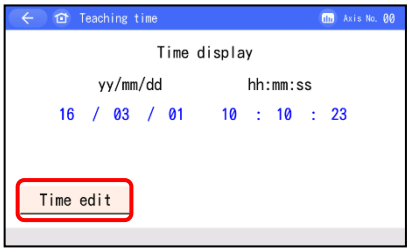
Touch any point on the screen.

The display returns to Display setting menu screen.

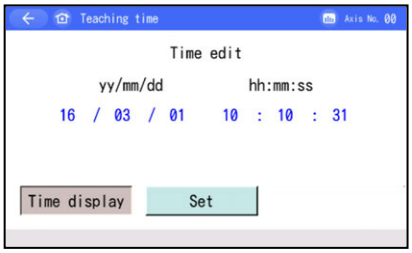
[Time Setting]
You can set the time for TB-03.



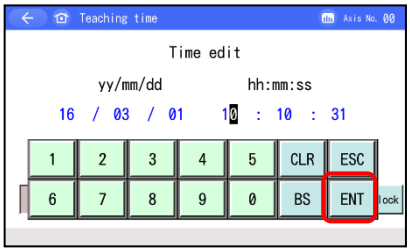
Touch [Time].



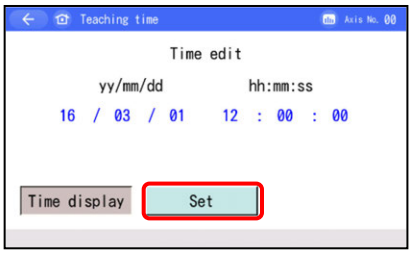
The time of TB-03 is displayed.
Touch [Time edit].



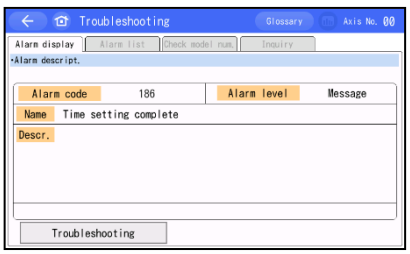
Touch the value of year, month, day, hour, minute or second that is required to be changed.



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

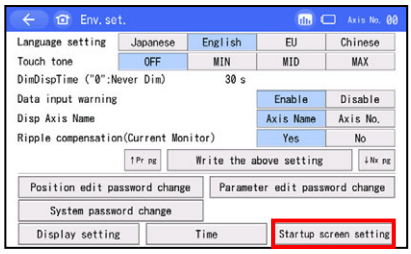


Touch [Set].

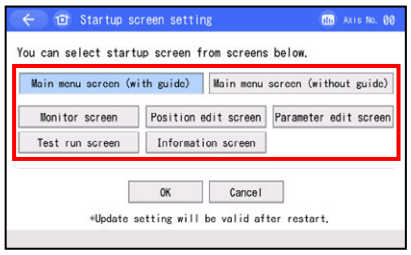


The clock setting complete window is shown and the clock in TB-03 gets changed.

[Startup screen setting]
Setting can be established for the window shown in the screen first after the power is turned on.



Touch [Startup screen setting].



Select a screen from those below for the screen shown first after the power is turned on.
[Main menu screen] (Note 1)
[Monitor screen]
[Position edit screen] (Note 2) (Note 3)
[Parameter edit screen]
[Test run screen] (Note 3)
[Information screen]

Touch either one to select and touch [OK].

Note 1 Note 1: Select either of [Main menu screen (with guide)] or [Main menu screen (without guide)], and the screen transits to the [Main menu screen (without guide)] window.

Note 2 Select [Position edit screen], and Simple Data Setting Screen should be displayed at the startup.

Note 3 The Menu 1 screen should be displayed at startup for ROBO PUMP.

3.17 Data Backup

Data is transferred between the SD card in the teaching pendant and the controller (ELECYLINDER and ROBO PUMP).

(Note) Type of Stored Data
This includes the position data, parameters and alarm list.
There is no position data in ROBO PUMP.
It is not applicable to the backup data storable in the RC PC software.

(Note) Extensions of the Stored Data
- *The file extensions of the data stored to the SD card are the same as those dealt in RC PC software, and are compatible. The position data is ptec, the parameters are EC:prec,prec2,prec3,prec4,prec5, and ROBO PUMP: prrpv.*
  [Refer to the details of the file extensions in the RC PC Software Instruction Manual]
- *The alarm list can only have the backup. It cannot be restored. Data is in a CSV file.*

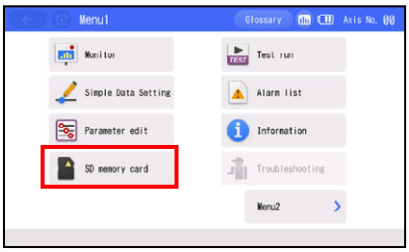
(Note) Directories of the Stored Data
The folders to store the backup data of the controller and the folder to read the data from when restoring the data to the controller are as listed below. The directories to store the files cannot be changed. When restoreing, the files existing in other directories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

(Note) Files with Chinese names are not supported.

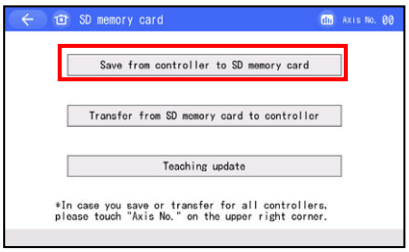
> ⚠ *Caution: For a SD memory card, choose a SD/SDHC memory card with 1G to 32G. (Toshiba-made recommended) Also, use FAT32 Format for the file system.*

3.17.1 Data Backup of the Controller

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

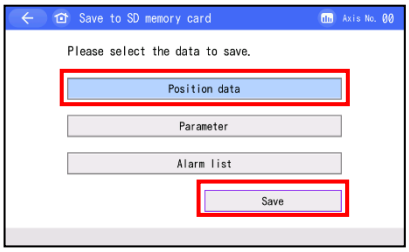


Touch [SD memory card] in Menu 1 screen.



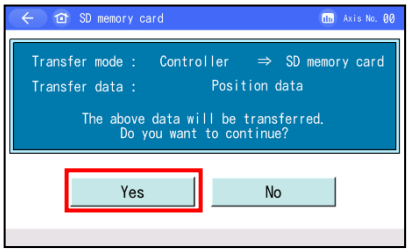
SD memory card screen opens.

Touch [Save from controller to SD memory card].



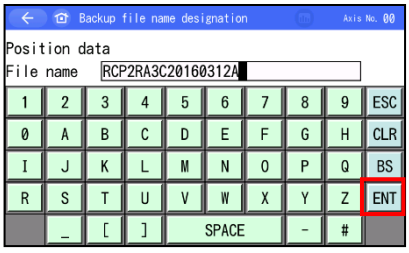
Select the data type for the backup such as [Position data] and touch it.
The data type been selected will be shown in light blue.
There is no position data in ROBO PUMP.

Touch [Save].



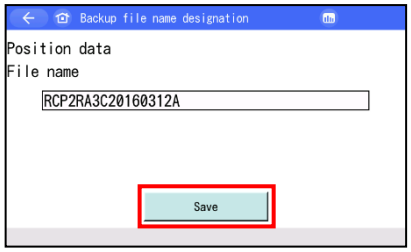
Touch [Yes].

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

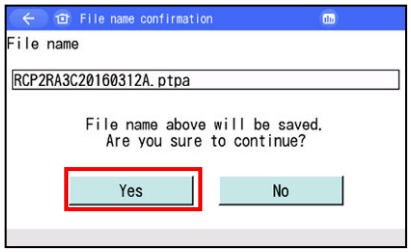


Numeric keys are displayed. Input a file name and touch [ENT].

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



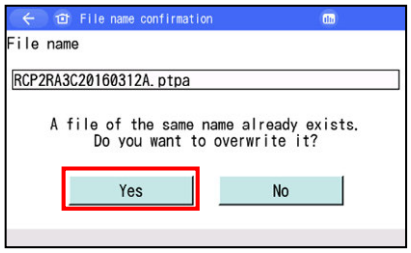
Touch [Save].



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

Touch [Yes].

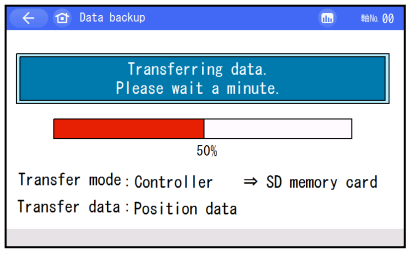
If [No] is touched, the screen goes back to the previous one to indicate the backup file name in which the numeric keys were shown.



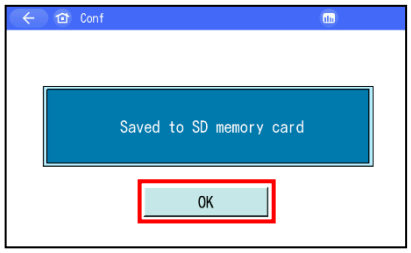
The screen below appears if the same name is found.

Touch [Yes] if overwriting data.

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



Transferring data screen will be shown.

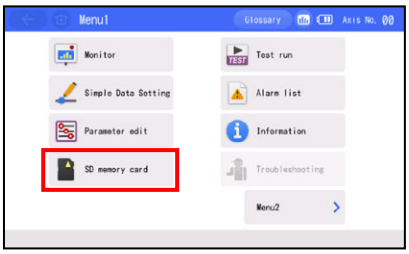


A message to tell the data transfer is complete pops up and the backup process is finished.

Touch [OK], and the screen returns to SD memory card screen.

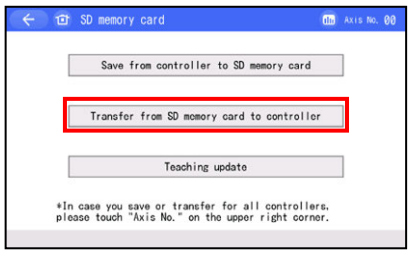
3.17.2 Restore to Controller

Data in the SD memory card is transferred to the controller.



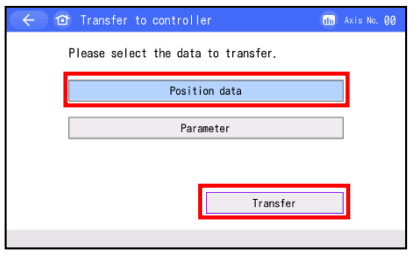
Touch [SD memory card] in Menu 1 screen.

For ROBO PUMP, have it conducted while it is desorbed.



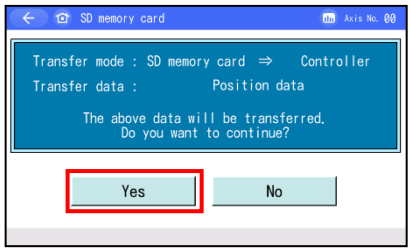
SD memory card screen opens.

Touch [Transfer from SD memory card to controller].



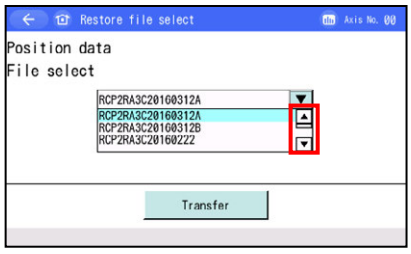
Select the data type to transfer to the controller, such as [Position data], and touch it.
The data type been selected will be shown in light blue.
There is no position data in ROBO PUMP.

Touch [Transfer].

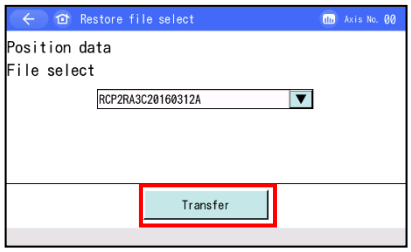


Touch [Yes].

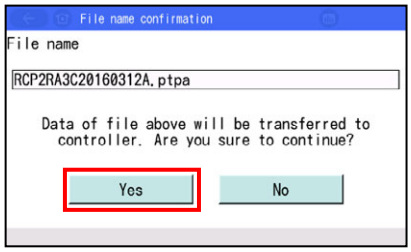
If [No] is touched, the screen goes back to the data backup screen.



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

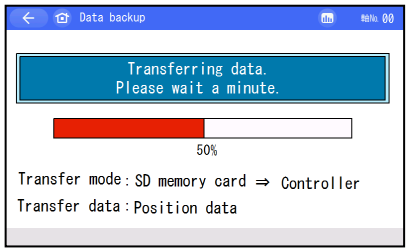


Touch [Transfer].



Touch [Yes].

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

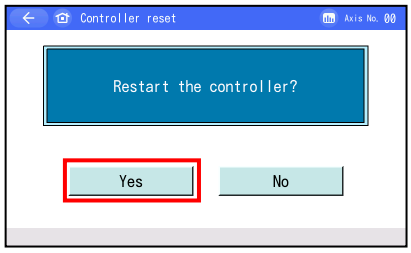


Transferring data screen will be shown.



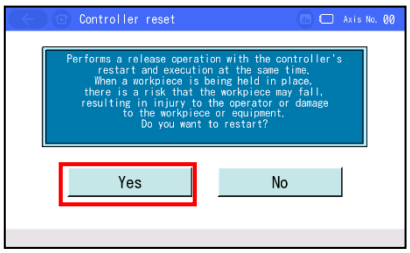
A message to tell the data transfer is complete pops up and the data transfer process to the controller is finished.

Touch [OK].



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

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

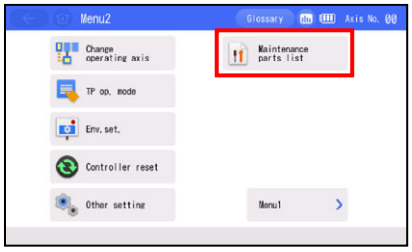


In the case of the ROBO PUMP
In order to have a release operation at the same time as execution of reboot, a message to pull attention should be displayed.

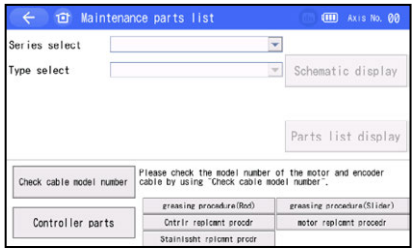
Confirm that there is no problem in rebooting, and touch [Yes].

3.18 Maintenance Parts List

Information of maintenance components is displayed.



Touch [Maintenance parts list] in Menu 2 screen.

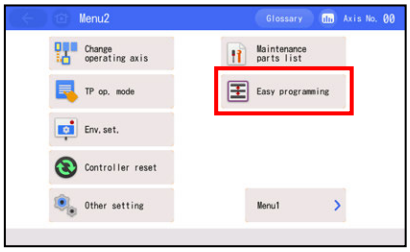


Maintenance parts list screen opens.

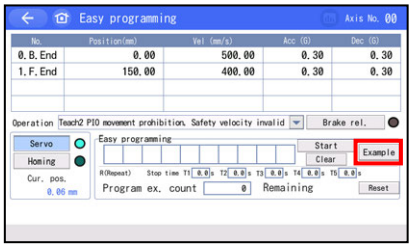
3.19 Easy Programming

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.
This function is available when the wireless axis operation setting of the teaching pendant is enabled and the teaching pendant is connected to an axis that supports operation via a wireless connection.
It is a feature not applicable for ROBO PUMP.

[How to Establish Setting]
Set the position number (0: backward end, 1: forward end) of the destination to the easy programming input part (step). In order to have a pause between operations, use prepared five timers T1 to T5. Timer can be set in 0.1 second unit from 0 to 99.9sec. When it is required to repeat operation, input R (repeat indication symbol) at the end.
The number of steps available to indicate is 10 at maximum including R.
If there is a space, the step after that is not valid. The easy programming stops. Steps after R are also invalid.

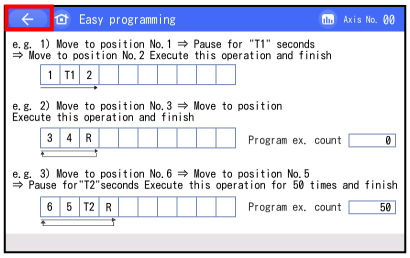


Touch [Easy programming] in Menu 2 screen.



Easy programming screen opens.

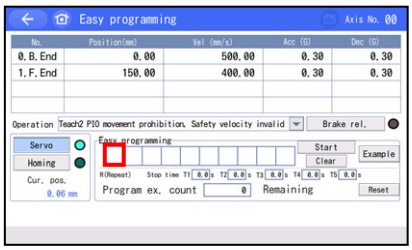
Touch [Example] and examples for how to construct a program are displayed.



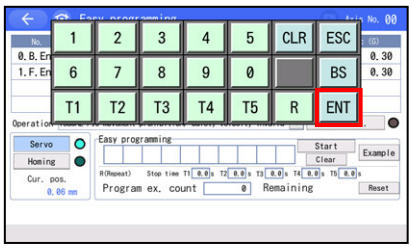
Touch [←] to return to the previous screen.

Take this as a reference when constructing an Easy programming.

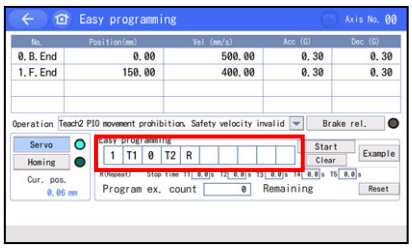
[Driving Easy Programming]



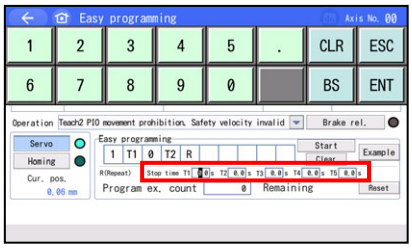
Touch the first (on the most left) step of the easy programmng.



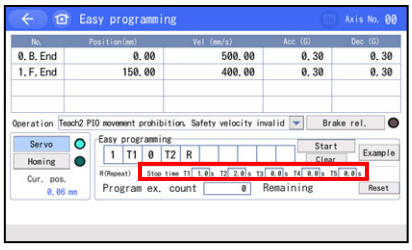
Input a position number or a timer (T1 to T5) and touch [ENT].



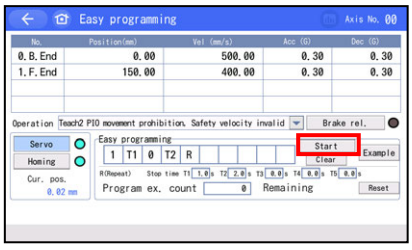
Set the next step and after in the same manner.
Set R at the end when it is required to repeat the operation.



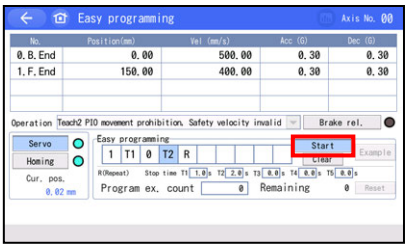
Touch a timer to use (T1 to T5) when it is required to have time for pause.



Set the time for pause.

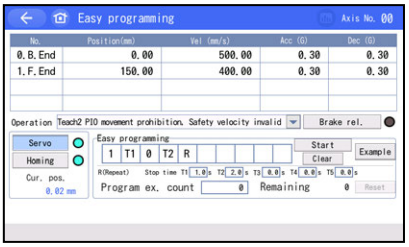


Have the servo ON and the home-return conducted, and then touch [Start] to start the operation.

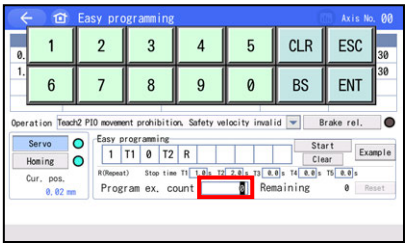


During the operation, the [Start] and the step number in execution turn to blue.

To stop operation, touch the [Start] again.



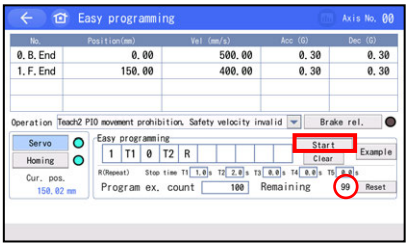
Operation stops.



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

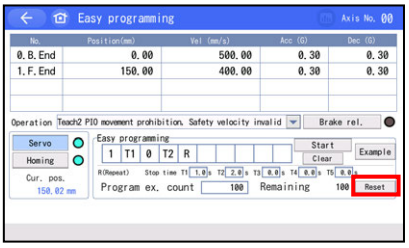


Set the number to repeat and touch [ENT].

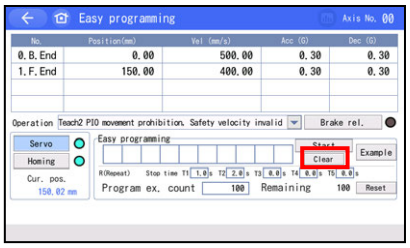


Touch [Start] to start operation.

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



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



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



Caution: When there is an alarm issued due to such a reason as making a mistake in position number indication, go back to Easy programming screen with [←]. In case of moving from Menu 2 screen to Easy programming screen, the set easy program will be deleted.

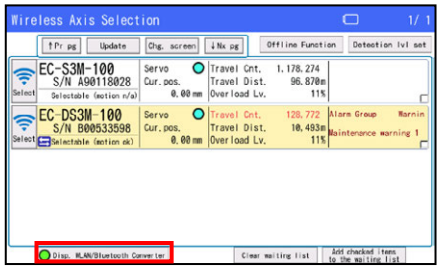
(Note) Simplified programs cannot be saved.

4. Compatible for Smart Web Units

4.1 Wireless axis selection screen (WLAN/Bluetooth converter display)

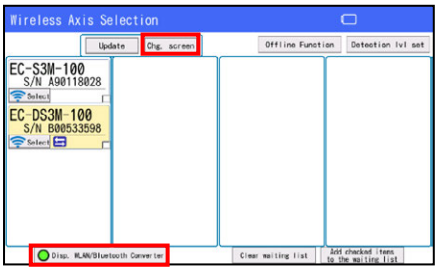
How to Transit to wireless axis selection screen
This screen is displayed by touching [Change Operating Axis] on the Menu 2 screen after the power is turned on or during a wireless connection, by touching the [Change Operating Axis] button in the upper-right corner of the screen, or by touching the [Select Axis] button of the GW.
This section explains the screen navigation procedure after power-on and the wireless axis selection screen (WLAN/Bluetooth converter display).

When Navigating from the wireless axis selection screen (4-Axis display)



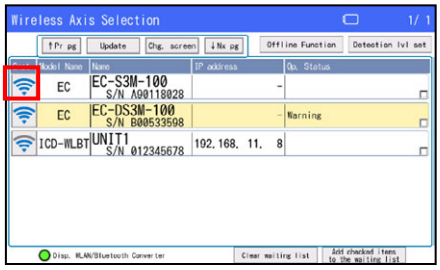
Touch the [WLAN/Bluetooth Converter Display] button to switch to the WLAN/Bluetooth Converter Display screen. (This button becomes available to touch when a WLAN/Bluetooth converter is detected.)

When Navigating from the wireless axis selection screen (16-Axis display)



Touch the Display Switch button or the [WLAN/Bluetooth converter display] button to switch to the WLAN/Bluetooth converter display screen.

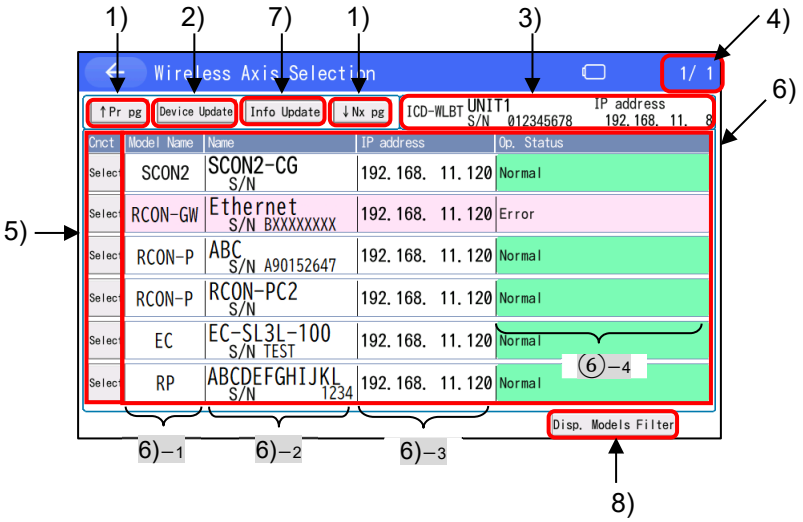
For the wireless axis selection screen (WLAN/Bluetooth converter display)



The converters available for operation with the teaching pendant are displayed. Touch the wireless icon on the left side of the desired converter to select it.

When a converter is selected, the WLAN/Bluetooth converter connection screen is displayed.

For WLAN/Bluetooth converter connection



1) [↑ Pr pg] and [↓ Nt pg] Buttons

You can change pages with these buttons. 11 pages (64 units) should be able to show at maximum.

2) [Refresh Device] Button

The list of controllers connected to the WLAN/Bluetooth converter selected on the wireless axis selection screen (WLAN/Bluetooth converter display) is updated.
Depending on the system configuration, some devices may take longer to appear because data collection requires additional time. If a device does not appear, wait approximately one minute and then touch the Refresh Information button.

3) WLAN/Bluetooth converter information display area

The name, serial number, and IP address of the currently connected WLAN/Bluetooth converter are displayed.

4) Page Number

Current page number and total number of pages should be shown.

5) [Select] Button

Communication with the selected controller gets started.

6) Data Display Area

Communication with the selected controller gets started. The devices are displayed in the order in which they were detected by the WLAN/Bluetooth converter.

6)-1 Model names

Displays the controller model name.

6)-2 Name

Displays the model name. If not configured, this field is left blank.
The serial number is also displayed on the lower line.

6)-3 IP address

Displays the IP address.

6)-4 Operating status

Displays operating status.

Normal Display
When information is obtained in the normal status, Normal is displayed.

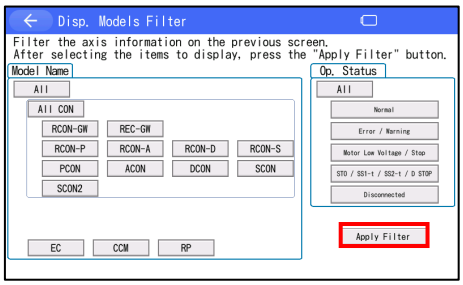
Alarm Display
When an alarm or warning occurs, the presence of an alarm or warning is indicated.
For devices with an active alarm, the background color of the data display area turns red.
For devices with an active warning, the background color of the data display area turns yellow.

Unsupported / Disconnected Display
For unsupported devices or when communication is disconnected, the background color turns gray.

Display Content	Alarm and warning not generated	Alarm generated	Warning generated	Not support	Disconnecting
Connection button	○	○	○	×	×
Model Names	○	○	○	○	×
Name	○	○	○	○	×
S/N	○	○	○	○	×
IP address	○	○	○	○	×
Operating status	○	○	○	○	○

7) [Refresh Information] Button
The list of controllers displayed on the Wireless Axis Selection Screen (WLAN/Bluetooth Converter Connection) is updated. Only the devices that were displayed before the button was pressed are updated. Devices newly added to the WLAN/Bluetooth converter connection are not included in the update.

8) [Display Device Filter] Button
It opens the screen used to filter the devices displayed on this screen.



The items displayed on the Wireless Axis Selection Screen (WLAN/Bluetooth converter connection) can be filtered.

Select the device types and operating statuses to be displayed, then touch the [Execute Filter] button.

For details of the functions available when connected to a CON or GW, refer to the [TB-03 (Wired) Instruction Manual (ME0376, ME0377)].

4.2 Restrictions During Wireless Communication

The following functions are restricted during wireless communication:

Model names	The following functions are restricted during wireless communication:
Servo monitor	Not available
Drive Recorder	Drive recorder data cannot be acquired or displayed (As the controller continues to collect data, the data can be acquired and displayed when connected via a wired connection.)
Axle number change	Not available (RCON Axis Number Assignment / Unit Configuration Settings in the Gateway Parameter Settings can still be used.)

When wireless axis operation is set to disabled in the wireless axis operation setting, the following functions are restricted:

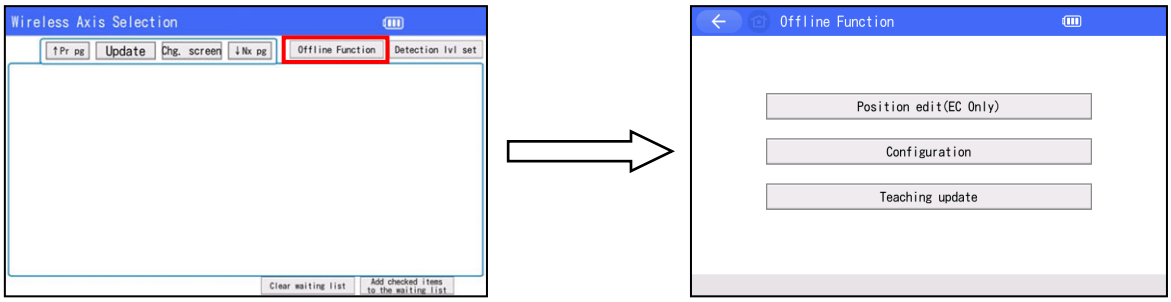
Model names	The following functions are restricted during wireless communication:
Position Editorial Guide	Not available
IO Control Guide	
Easy Program Setup	
Position Edit	Test Run Function not available
Easy Data Setup (EC Only)	Test Run Function not available
CCM Test Run (CCM only)	Not available
ROBO PUMP Settings (ROBO PUMP only)	Test Run Function not available
Test Run	Functions other than I/O Test function not available
Press Program	Test Run Function not available

⚠ *Caution: If the IP address or axis number of a controller is changed, the WLAN/Bluetooth converter or Ethernet/RS-485 converter may no longer be recognized correctly. In such cases, cycle the power of the system.*

Caution: If another tool is connected via a wired connection to a device that is being monitored or taught through a WLAN/Bluetooth converter, the device may not operate correctly.
If wireless communication becomes unstable or is disconnected while an axis is being operated from the TB-03, the axis operation may continue. Exercise caution in such situations.

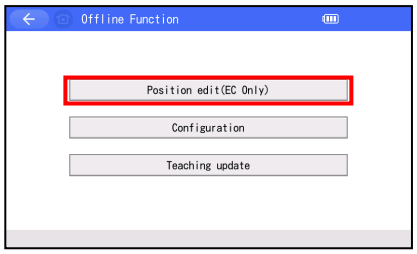
5. Offline Function

In case there is no actuator connected (offline), position edit, Cofiguration and teaching update should be available for the existing data in ELECYLINDER.



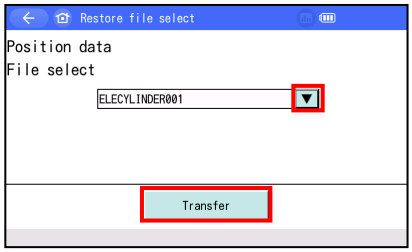
5.1 Position Edit (EC Only)

After reading out the existing data in ELECYLINDER and edit positions, data can be saved in a Secure Digital memory card. Creating new data is not available.



Touch [Position edit (EC only)].

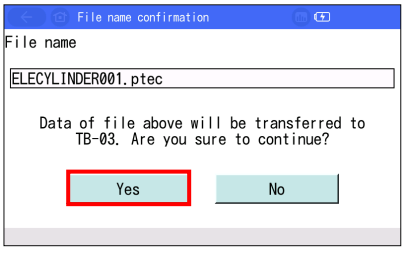
Restore file select window appears.



Touch the pulldown button and select a file to read out.

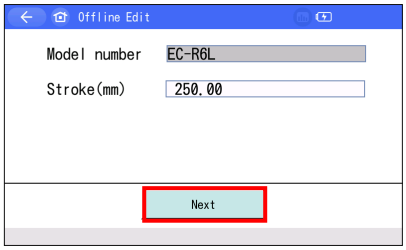
Touch [Transfer].

File name confirmation window appears.



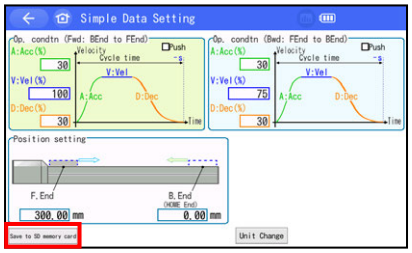
The selected file name should be displayed.

Confirm this file is the right one, and touch [Yes].



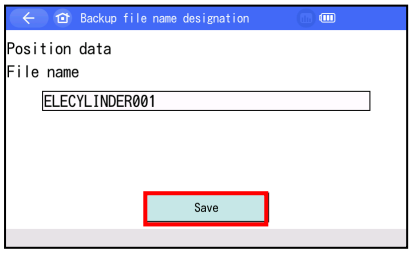
Confirm the Model number and input Stroke, and touch [Next].

Simple Data Setting window shows up.



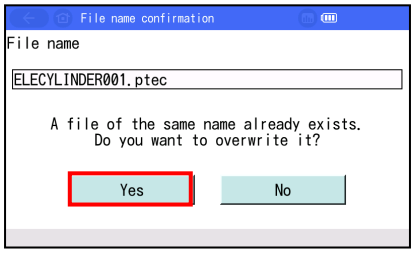
Edit the data, and touch [Save to SD memory card].

Backup File Name Indication Screen appears.



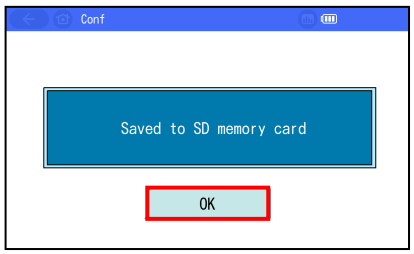
Input a file name that you would like to save.

Touch [Save].

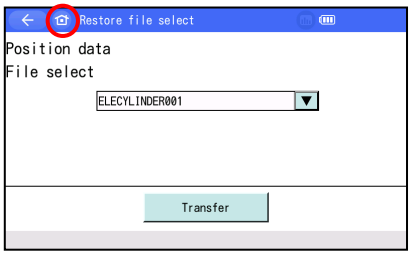


If there is the same name already existed, the overwriting confirmation screen should pop up.

Touch [Yes] if you accept to overwrite.



A screen stating saving complete should show up. Touch [OK].

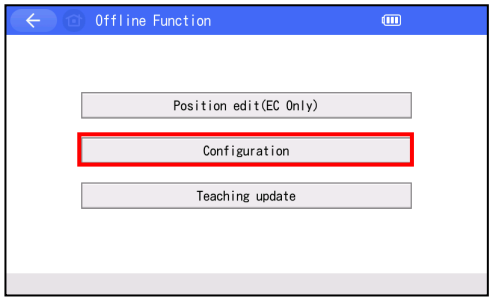


The display goes back to Restore file select screen.

Touch the home button on the top of the screen if you require to go back to Wireless Axes Select Screen.

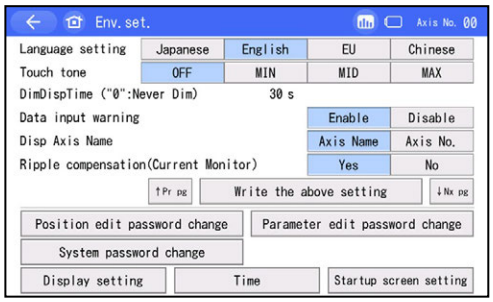
5.2 Configuration

Environment setting should be conducted here for the teaching pendant.
[3.16 Refer to Environment Setting]



Touch [Configuration].

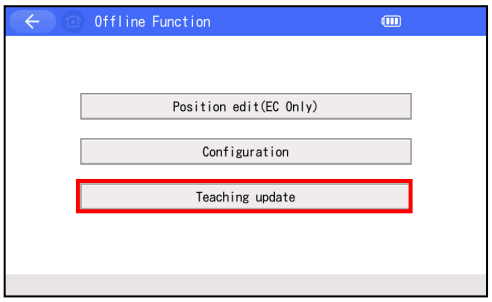
Environment Setting window shows up.



Establish settings for each item.

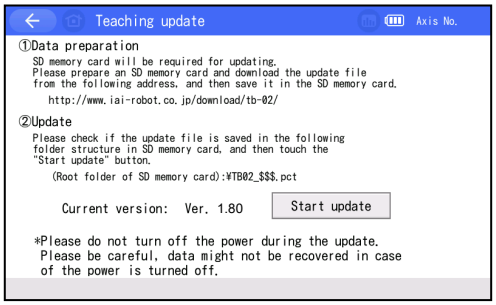
5.3 Teaching Update

Software update should be conducted here for the teaching pendant.
How to operate the window should follow [6.2 Teaching Update].



Touch [Teaching update].

Teaching update Window shows up.

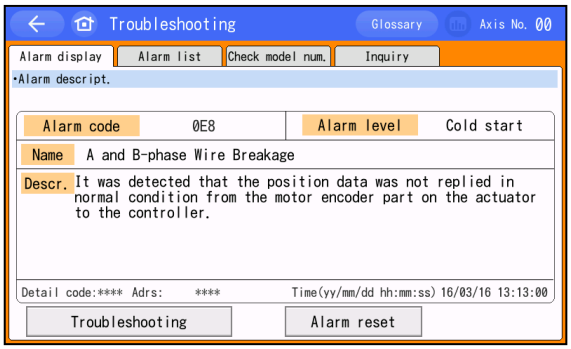


Refer to [6.2.2 How to Update when Offline] to perform updating.

6. Error Display

6.1 Occurrence of Alarm

If an alarm occurs, the alarm screen appears.



6.1.1 Alarms Detected by Controller

Alarms of codes 000 to 0FF, 800 to 8FF and E00 to EFF are those detected by the controller and the gateway.
These alarms include major alarms relating to the servo control system, power system, etc. For details on these alarms, refer to the instruction manual for your controller.

If an alarm occurs, remove the cause of each alarm and then perform the following operation.

- To reset operation -cancellation level alarms, touch [Alarm reset] on the alarm screen.
- To reset cold-start level alarms, reconnect the control power.

6.1.2 Messages Which Occur when Operating the Teaching Pendant

Codes from 100 to 3FF are messages which occur when operating the teaching pendant.

- 100 to 1FF: Message level (input errors, guide messages)
- 200 to 2FF: Operation cancellation level (errors having a disadvantage for operation)
- 300 to 3FF: Cold-start level (which requires re-power-on or reconnection)

The following table shows the list and countermeasures.

Code	Message	Contents, occurring cases, and countermeasures
112	Input data error	An inadequate value was entered in the parameter setting. Retype a proper value with reference to the actuator specification and the parameter list.
113	Data too small	The input value is smaller than the setting range. Retype a proper value with reference to the actuator specification and the parameter list.
114	Data too large	The input value is bigger than the setting range. Retype a proper value with reference to the actuator specification and the parameter list.
115	Not yet Homed	The operation of acquiring the current position was performed under the uncompleted home return in the teaching (display) mode. In first, execute the home return.
117	No position data	The target position is not set to the selected position number. In first, enter a target position.

Code	Message	Contents, occurring cases, and countermeasures
11E	Unmatched pairdata	Inadequate values were entered in the magnitude relation of the data in a pair. (e.g.) The case in which soft limit+ and limit- are the same on the parameter. Retype a proper value
11F	Value too small	The minimum settable travel to the target position depends on the lead length of the driving system and the resolution of the encoder. If the input target position is smaller than this minimum travel, this message is displayed. (e.g.) If the lead length is 20 mm for the actuators of RCP2 series, since the resolution of the encoder is 800 pulses, the minimum travel is 0.025 mm/pulse (= 20 ÷ 800). In this case, if 0.02 mm is entered in the target position, this alarm occurs.
121	Search value error	The final arrival position exceeds the soft limit due to the push-motion operation. Set a value within the soft limits.
122	Duplicate link	An axis number was allocated despite that more than one axis were connected. Always allocate the axis number only when one axis is connected.
123	Password error	The input value of the system password, position editing password, or position data edit password does not match the setting value. Retype the correct password.
131	Unrecognizable Large Category Code Detected	The software of this teaching tool is not applicable for the connected controller. Updating this teaching tool is necessary. Refer to [6.2 Teaching Update]
132	Detect Undefined Controller	An unsupported controller was recognized. Follow the process in [6.2 Teaching Update] to have you controller updated to the applicable version or later. Refer to [Supported Models] for the applicable version.
150	Write-in Prohibited	Writing was attempted to a domain prohibited for write-in. Consult with IAI if the phenomenon would not be improved even with reconnection.
160	SDcard open error	File cannot open. (e.g.) Backup was performed without SD card inserted.
161	SDcard write error	SD card cannot be written. (e.g.) Backup was performed under the following conditions. ・Free space of the SD card is insufficient. ・SD card write-protect switch is engaged. ・File is set to the write prohibit property in overwriting. ・An unsupported SD card is inserted.

Code	Message	Contents, occurring cases, and countermeasures
162	SDcard read error	SD card cannot be read. (e.g.) If a SD card is not inserted or files cannot be read, at the time of restoring.
164	SDcard file format error	File format is not matched. (e.g.) If the content of the file which will be restored are different from the file format defined by data types.
183	IO-function changed	Messages to confirm the operation (It is not to say any operation mistake or abnormal occurrence)
184	Data transfer completed	
186	Time setting completed	
187	Brownout of RTC backup battery	Voltage of the battery inside the teaching pendant is reduced. *(Note) Settings for time, languages, and touch operation sound are initialized. Consult us about replacing the battery.*
188	Input warning of below Min. Vel	The velocity, which is less than the "minimum velocity" that depends on the lead and encoder pulses, was entered in the "velocity" of position data. The message is displayed, but entering data is possible. Retype a proper value after the confirmation of the specification, because the movement in less than the minimum velocity may cause abnormal noise and vibration.
189	Input warning of over ratings ACC/DCL	An acceleration/deceleration speed, which exceeds the "rated acceleration/deceleration speed" of the actuator connected, was entered in the "acceleration/deceleration speed" of the position data. The message is displayed, but entering data is possible. Retype a proper value after the confirmation of the specification, because the movement in the excess high acceleration/deceleration speed may lead to actuator failures.
18B	Battery not connected	• It is a condition that a battery cannot be detected or no battery connected. • Battery drive is not available. Operation should be available if connected to an AC adapter.
18C	Battery Error	• The battery cannot be charged in quick charging (connected to an AC adapter). • It can be concerned the malfunction of the battery. • Battery drive is not available. Operation should be available if connected to an AC adapter or CTL.

Code	Message	Contents, occurring cases, and countermeasures
18D	Battery Power Drop Warning	• It occurs when the battery voltage gets below the warning output threshold voltage (3.27V). * Operation can be continued till the voltage reaches 3.1V. The power should be turned off when it goes below 3.1V. • It is necessary to connect an AC adapter and charge the battery.
18E	Standby Axis List Load Failure	Failed to load the standby axis list file. The waiting axis list file is set to be loaded. To prevent loading the standby axis list file, please change "Wireless Standby Axis List Automatic Reading" to "Disabled" in the environment setting screen
202	Stop	Stop has been made from the safety circuit on the equipment side. Set the circuit to have +24V that is output from STOP+ to input to STOP-.
203	MotorPower sag	For the controller of the "external cutout relay type," the motor driving power is not supplied from MPI terminals adequately. *(Note) Despite that the proper voltage is applied to MPI terminals, if this error occurs, the controller may be broken down.*
204	ABS-Battery Power sag	ABS battery brownout at power-on was detected. Replace the ABS battery.
205	STO/SS1-t /DRV STOP	Safety Request Input Signal / Driver Stop Signal was input. Insert the dummy plug to the controller when unexpectedly output.
207	SS2-t	Motor energy supply has been cut by SS2-t (Safety Stop 2). It it has occurred unexpectedly, turn on SS2_IN(A/B) on the safety circuit.
20A	Servo OFF while moving	1) Movement operation was performed with the servo OFF. 2) Since the servo ON signal (SON) from PLC was turned OFF during the movement operation, the servo was turned OFF and the movement operation became impossible. Turn the servo ON before the operation.
20C	Start ON while moving	The start signal (CSTR) from PLC was turned ON during the movement operation, so the movement command was duplicated. Check the output of the start signal (CSTR) from PLC.
20D	STP OFF while moving	The pause signal (*STP) from PLC was turned OFF during the movement operation, so the operation became impossible. Check the output of the pause signal (*STP) from PLC.

Code	Message	Contents, occurring cases, and countermeasures
20E	Over soft-limit	It reached the soft limits. Check the settings of the soft limits, and use within the settings.
210	HOME ON while moving	The home return signal (HOME) from PLC was turned ON during the movement operation. Check the output of the home return signal (HOME) from PLC.
211	JOG ON while moving	The jogging movement signal (JOG) from PLC was turned ON during the movement operation. Check the output of the jogging movement signal (JOG) from PLC.
213	Suction / Release commands prohibited	Suction / Release command was issued while suction / Release commands are prohibited. • In Suction Command Set the operation status to "Standby" before conducting it. • In Release Command Set the operation status to “Suctioning” before conducting it.
220	Write prohibit (AUTO)	The position data or parameter was written during the AUTO mode. Write them after changing to the teaching mode.
221	Write prohibit (MON)	The position data or parameter was written during the monitor mode. Write them after changing to the teaching mode.
222	Move prohibit (AUTO)	The actuator movement was operated during the AUTO mode. Operate the movement after changing to the teaching mode.
223	Move prohibit (MON)	The actuator movement was operated during the monitor mode. Operate the movement after changing to the teaching mode.
224	Data Edit Prohibited Operation Status	It is the operation status that editing data is prohibited. Conduct release to set the operation status to “Standby” before editing.
225	Transmitted message-related error	There was an error while generating a sending message. (e.g.) The version of a teaching pendant is old Program error of a teaching pendant
226	Enable Circuit Open	• The deadman's switch is not gripped. • The parameter is wrong. • There is an alarm occurred in the gateway. Change the setting in Parameter No. 42 to "1".

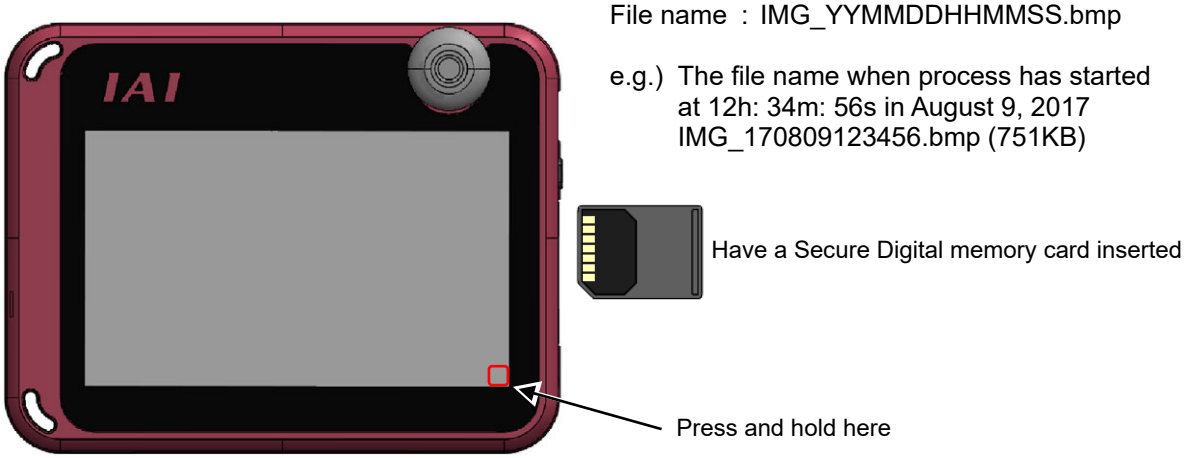
Code	Message	Contents, occurring cases, and countermeasures
228	Standby Axis List Registration Limit Exceeded	The maximum number of entries in the standby axis list has been exceeded. 1) Delete one or more entries from the standby axis list, and then perform the registration again. 2) If "Wireless Standby Axis List Automatic Reading " is set to "Enabled", remove the SD memory card or delete the standby axis list file, and then restart the teaching pendant. If 2) is tried, Alarm Code 18E "Standby Axis List Load Failure" will be displayed. However, you may continue operation without any problems.
301	Overrun error	Abnormality occurred on the serial communication with the controller 1) The controller connection cable may be open. Check the connection cable for wrong wiring or wire breakage. 2) The controller connection cable connector may be inserted improperly. Securely insert the connection cable connector. 3) Garbled data could occur due to the influence of noise. Review the wiring run, installation, etc. so that the noise does not influence them. 4) In the control of multiple units with the serial communication, the slave station number could be duplicated. Change the number so that the slave station number is not duplicated. If still having trouble, consult us.
302	Framing error	
303	Parity error	
304	SCI Recieve-Que overflow	
305	SCI Send-Que overflow	
306	Recieve-Buffer overflow	
308	Response time out	
30A	Packet Recieve-Que overflow	
30B	Packet Send-Que overflow	
30C	Not connected	The axis number of the controller cannot be recognized. 1) The controller may not be functioning properly. Check that the RDY lamp of the controller is lighted. If the lamp is not lighted, the controller is broken down. 2) The communication lines (SGA/SGB) of the provided cable could break. Replace to a spare teaching pendant or replace with a PC to see if the problem solves. 3) If a SIO converter is used, the link cable could not be connected, though the power, 24 V, is supplied to the converter. Supply the power after connecting the link cable between the converter and the controller. If still having trouble, consult us.

Code	Message	Contents, occurring cases, and countermeasures
30D	Recieve exept responce	The abnormal response was returned from the controller. (This may be a temporary abnormality caused by noise, etc.) If the condition occurs frequently, check the cables, noise elimination measures taken on the power supply, etc.
330	Wire-Linked in Wireless Communication	• It occurs on the teaching pendant in wireless communication when ELECYLINDER/ROBO PUMP in wireless communication gets connected with wire to another tool. (It is because wired communication should be prioritized.) • The display switches from Troubleshooting Window to Wireless Axes Select Window.
331	Wireless Communication Response Timeout Error	• It occurs when an error occurred in communication between a teaching pendant and wireless communication applicable equipment (ELECYLINDER, ROBO PUMP and WLAN/Bluetooth converter) while in wireless communication. • This alarm occurs when a communication error is detected between the WLAN/Bluetooth converter and the target controller during wireless communication via the WLAN/Bluetooth converter. • The display switches from Troubleshooting Window to Wireless Axes Select Window.

7. Appendix

7.1 Screenshot

The capture of the displayed screen (screenshot) can be saved in the Secure Digital memory card.
When capturing a screenshot, press and hold on the right bottom of the screen for approximately two seconds while a Secure Digital memory card is inserted.
After making a “pip” sound, screenshot saving process starts. (The sound will not be made if the touch operation sound is set off.) The saved file name will be displayed on the screen for three seconds when the saving is complete.



Domain to Save Data (cannot be changed)
The domain that the screenshot data is saved is the folder stated below in a Secure Digital memory card.
\TB_CON\ScreenShot\

[Caution]
1. *The saving process takes approximately 10 seconds at the maximum.*
2. *During the saving process, the monitor display (such as the current position) on the screen does not get updated.*
3. *There are some windows that you cannot get screenshots.*

> ⚠ *Warning: As keys do not work on the screen during saving process, **emergency stop will not work by keys**. Do not attempt to use this feature when an actuator is operated (continuous movement, simple program, etc.) from the teaching.*

7.2 Teaching Update

The software in TB-03 can be updated using a Secure Digital 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.
It should not update the softwares of ELECYLINDER or each controller.
This update should update all the softwares of TB-03 for ELECYLINDER (for wireless link and wired link)/ROBO PUMP/CON/SEP/MEC/SEL regardless of connection status.
Update takes approximately 35 minutes.

◆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.)

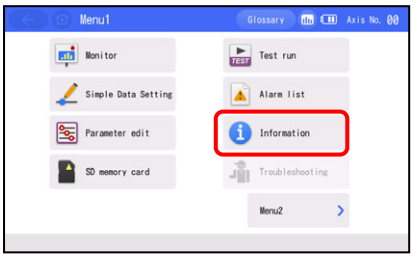
Preparation 3 Copy the unzipped update file TB-02_$$$.pct to the root folder of the SD memory card. ($$$ should be replaced by the version number in three digits.)
(Note) Update cannot be conducted if there are two or more update files in the root folder.

Preparation 4 Take the SD memory card cover off, and insert a SD memory card while the power to TB-03 is off. [Refer to 1.4, “How to Set in/out SD Memory Card”]

Preparation 5 Press the power switch on the right side of TB-03 to turn on TB-03.

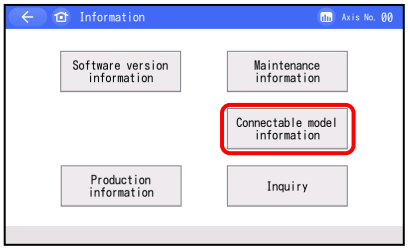
7.2.1 How to Update when Wireless Link

[Step 1] Perform from Preparation 1 to Preparation 5.



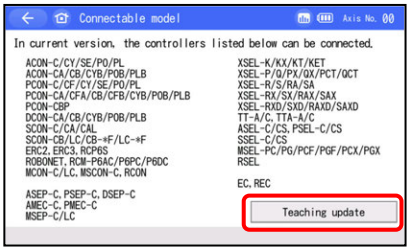
[Step 2]

Touch [Information] in Menu 1 screen.



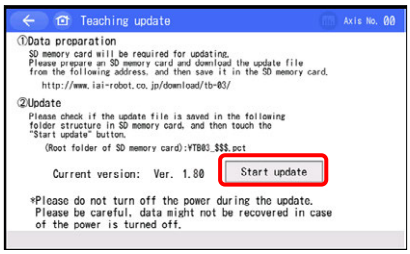
[Step 3]

Touch [Connectable model information].



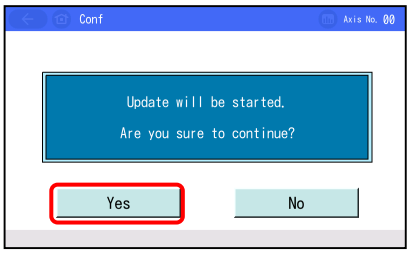
[Step 4]

Touch [Teaching update].



[Step 5]

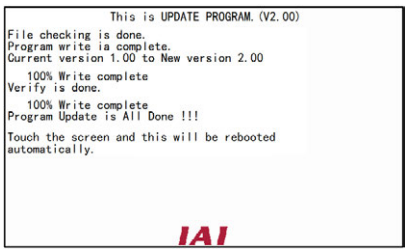
Touch [Start update].



[Step 6]

The updating confirmation screen shows up.

Touch [Yes].



[Step 7]

Start updating.
Touch the screen after you confirm the following messages;
“Program Update is All Done !!!”
“Touch the screen and this will be rebooted automatically.”
* There may be a case with the screen window reversed in white and black depending on the version of the software.

TB-03 will start up in the new version.

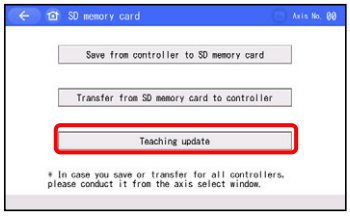
⚠ *Caution: Do not attempt to turn off the power to TB-03 while in updating.*

It is also available to perform by touching [SD memory card] → [Teaching update] in Menu 1 window.



[Step 1] Perform from Preparation 1 to Preparation 5.

[Step 2] Touch [SD memory card] in Menu 1 screen.

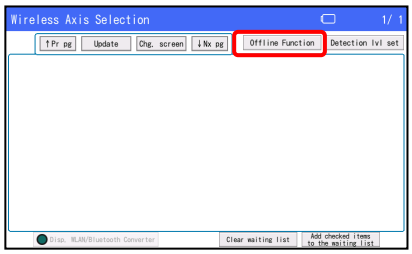


[Step 3] Touch [Teaching update].

[Step 4] Perform “Step 5” and after shown above.

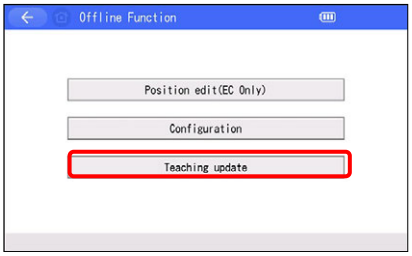
7.2.2 How to Update when Offline

[Step 1] Perform from Preparation 1 to Preparation 5.



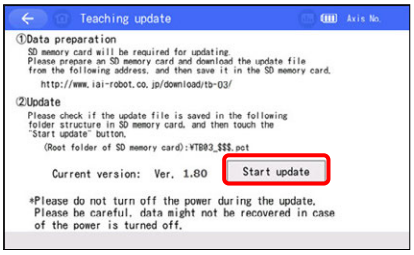
[Step 2]

Touch [Offline Function] in Wireless Axis Selecion screen.



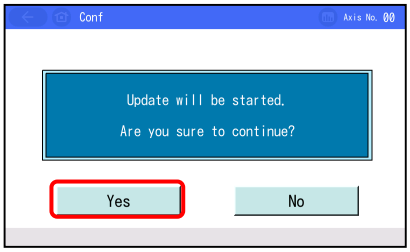
[Step 3]

Touch [Teaching update].



[Step 4]

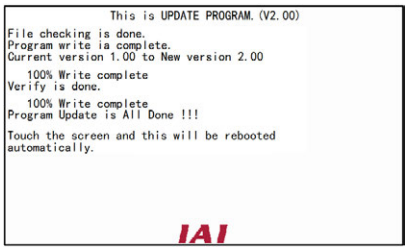
Touch [Start update].



[Step 5]

The updating confirmation screen shows up.

Touch [Yes].



[Step 6]

Start updating.

Touch the screen after you confirm the following messages;
“Program Update is All Done !!!”
“Touch the screen and this will be rebooted automatically.”

TB-03 will start up in the new version.

⚠ *Caution: Do not attempt to turn off the power to TB-03 while in updating.*

7.2.3 How to and Compulsorily Update (in Common for All Models)

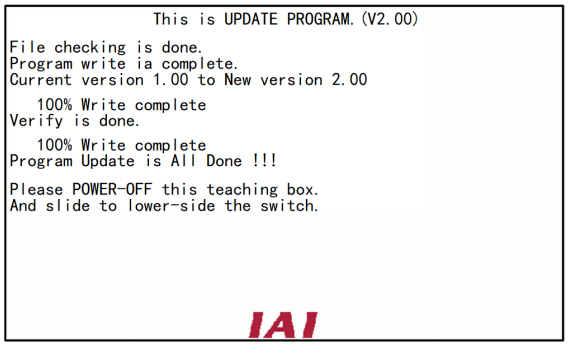
Follow the procedures below to update again in case the menu window of TB-03 would not be displayed due to a failure in updating for reasons such as the power got shut during updating process.

[Step 1] Perform from Preparation 1 to Preparation 4 in 6.2 ◆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 ◆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.

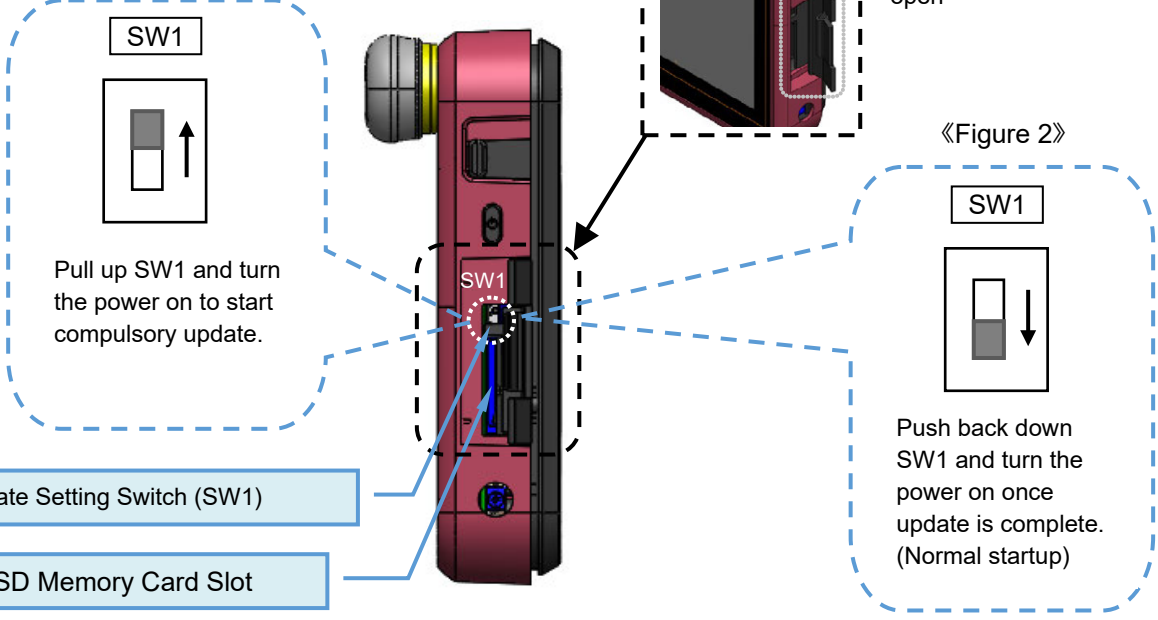


There may be a case that the black and white are in opposite depending on the version of the software.

[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.

《Figure 1》



《Figure 2》

7.2.4 Troubleshooting

Condition	Considerable Cause	Check Items and Counteractions
[Teaching Update] or [Start Updating] is not active (grayed out) and cannot touch it.	1. No memory card is inserted (or can be identified). 2. There is no update file found in the route folder of the memory card. 3. There are several update files found in the route folder of the memory card.	1. Make sure that a SD memory card with 1GB to 32GB capacity formatted in FAT32 is firmly inserted. 2.3. Check that there is one file existed in the route folder of the memory card named “TB02_$$$.pct” (three digits of version number come in $$$).
Display appears stating “Software is not installed.” when the power gets turned on.	Software in normal condition is not written due to a reason such as failure in update.	Perform compulsory update. Refer to [6.2.3 How to and Compulsorily Update]
Display appears stating “File Format Error (Check sum Error)” at the start of update.	“TB02_$$$.pct” saved in the memory card is either not an update file or destroyed.	Save the update file again and try updating again.
Display appears stating “SD Card Access NG !!! ” at the start of update.	The memory card is inappropriate.	Try another memory card and update.
There is nothing shown on the screen after more than 1 minute passed after the update has started.	There is nothing shown on the screen after more than 1 minute passed after the update has started.	[Process for Recovery] 1. Take out the memory card. 2. Turn the power off. 3. Conduct the compulsory update. Refer to [6.2.3 How to and Compulsorily Update]
Display appears stating “Update_Appl_WrteFROM NG !!!” during updating process.	The memory card was taken out during updating process.	Do not attempt to take out the memory card till updating is complete.
Display appears stating “SD Card Not Inserted !!!” at the start of compulsory update.	No memory card is inserted (or can be identified).	Make sure that a SD memory card with 1GB to 32GB capacity formatted in FAT32 is firmly inserted.
Display appears stating “File not found. !!! ” at the start of compulsory update.	1. There is no update file found in the route folder for the memory card. 2. There are several update files found in the route folder of the memory card.	Check that there is one file existed in the route folder of the memory card named “TB02_$$$.pct” (three digits of version number come in $$$).

8. Warranty

8.1 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

8.2 Scope of Warranty

Our products are covered by warranty when all of the following conditions are met. Faulty products covered by warranty will be replaced or repaired free of charge:

(1) The breakdown or problem in question pertains to our product as delivered by us or our authorized dealer.

(2) The breakdown or problem in question occurred during the warranty period.

(3) The breakdown or problem in question occurred while the product was in use for an appropriate purpose under the conditions and environment of use specified in the Instruction Manual and catalog.

(4) The breakdown or problem in question was caused by a specification defect or problem, or by a quality issue with our product.

Note that breakdowns due to any of the following reasons are excluded from the scope of warranty:
- Anything other than our product
- Modification or repair performed by a party other than us (unless we have approved such modification or repair)
- Anything that could not be easily predicted with the level of science and technology available at the time of shipment from our company
- A natural disaster, man-made disaster, incident or accident for which we are not liable
- Natural fading of paint or other symptoms of aging
- Wear, depletion or other expected result of use
- Operation noise, vibration or other subjective sensation not affecting function or maintenance

Note that the warranty only covers our product as delivered and that any secondary loss arising from a breakdown of our product is excluded from the scope of warranty.

8.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.

8.4 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.

8.5 Conditions of Conformance with Applicable Standards/Regulations, Etc., and Applications

(1) If our product is combined with another product or any system, device, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules. The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc. In such a case we will not be liable for the conformance of our product with the applicable standards, etc.

(2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact us if you must use our product for any of these applications:

- Medical equipment pertaining to maintenance or management of human life or health
- A mechanism or mechanical equipment intended to move or transport people (such as a vehicle, railway facility or aviation facility)
- Important safety parts of mechanical equipment (such as safety devices)
- Equipment used to handle cultural assets, art or other irreplaceable items

(3) Contact us at the earliest opportunity if our product is to be used in any condition or environment that differs from what is specified in the catalog or Instruction Manual.

8.6 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

9. EU Declaration of Conformity

9.1 EU Declaration of Conformity

As this product is complied with the Wireless Directive, here attaches a document for EU Declaration of Conformity.

IAI Quality and Innovation

IAI CORPORATION
577-1 Obane, Shimizu-Ku, Shizuoka City, Shizuoka 424-0103 Japan

EU DECLARATION OF CONFORMITY

Manufacturer:

IAI CORPORATION
577-1 Obane, Shimizu-Ku, Shizuoka City, Shizuoka 424-0103 Japan

Authorized representative within the Community:

IAI Industrieroboter GmbH
Ober der Röth 4, D-65824 Schwalbach am Taunus, Germany

We make this declaration under the responsibility of the manufacturer.
Hereby declares that the equipment described below:

Equipment:

RADIO EQUIPMENT SYSTEM

TB-03 series
IABL series

Complies with the provisions of the RED 2014/53/EU, European Directives and the following harmonized standards:

EN 55032: 2015
ETSI EN 300 328 V2.2.2

And also complies with the provisions of the RoHS Directive 2011/65/EU+(EU)2015/863, based on the following specifications applied:

EN IEC 63000: 2018

Done at Shizuoka, Japan,

On July 30 , 2021

President Toru Ishida

CE

ORIGINAL

Change History

Revision Date	Description of Revision
September 2017	First Edition
August 2018	Edition 1B • Applicable models added to supported models • Information added for EU/China/Korea in caution for handling regarding wireless connection • Correction made to description in 6.2 Teaching Update • Feature replaced, Correction made
October 2018	Second Edition • Applied to axis operation in wireless connection • 3.6.2 and 3.14 Figures swapped for Maintenance Information Screen, descriptions revised • 3.8 Figure swapped for Parameter Edit Screen • Correction made
November 2018	Edition 2B • Data Setter changed to (Touch Panel) Teaching Pendant
February 2019	Edition 2C • Models added for ELECYLINDER supported
May 2019	Third Edition • Models added for ELECYLINDER supported • 3.6.1 and 3.15 Selection of with or without ripple compensation added to display of current/current ratio • 3.7.3 [Servo OFF] and [Brake rel.] buttons added in ELECYLINDER Simple Data Setting Screen
March 2020	Fourth Edition • Models that support ELECYLINDER added • Complied with certifications in Mexico • 1.5.3 Caution When Battery Taken Off added
July 2020	Fifth Edition • 3.2 Operation Menu - "Other Settings" → "Operating noise adjustment" added • 3.5 Menu Select [Menu 2 List] - Other Settings "Operating noise adjustment" added • 3.6.2 Maintenance Information Window statement added regarding rotary types • 3.7 Rotary type added • 3.7.2 Note added stating Pressing Operation (Belt driven types (EC-B6 and B7) are not available for performing pressing operation) Rotary type added • 3.7.4 Loading Posture Setting / Payload Setting added

Revision Date	Description of Revision
July 2020	• 3.13 Pressing Operation (The belt driven types (EC-B6 and B7) are not available for pressing operation.) added • 3.13.2 Operating noise adjustment added • 3.14.1 Axis Name Edit Change made to teaching figures • 3.16.1 Change made to teaching numeric key pad figures
April 2021	Edition 5B • The supported models added • Terms integrated
May 2021	Edition 5C • The supported models added • Change made connectable model figures • Correction made
April 2022	Edition 5D • The supported models added • 1.11.2 Correction made in how to read model code • 3.13.2 Comment added in Operation Noise Tuning
June 2022	Edition 5E • Image of window swapped • Supported models added, Correction made • 1.8 Description revised regarding built-in battery • 3.7.4 Descriptions added for Payload Setting Not Applicable Model • 3.13 Description revised regarding Other Setting • Chapter 8 EU Declaration of Conformity added
September 2022	Edition 5F • Supported models added
May 2025	Sixth Edition • Applicable for ROBO PUMP Standard type (RP-VPM) • Applicable for Wire Cylinder (EC-WER1/WEGR2) • Became applicable for 3 position mode specification (option model code MF) of ELECYLINDER • The table of supported models of ELECYLINDER is integrated with the description of SEL system. • 1.11 Actuator Drive Unit descriptions added, changed • 3.4 16-axis display screen added • 3.4.2 Detection level set, Standby axis List function added • 3.5, 3.6 Stop status icon display on screen added • 3.7 Caution contents added for ELECYLINDER 3-finger gripper • 3.7.4 GRBP□(W) and GRTR□ added to subject models not applicable for payload setting • 3.7.5 Auto servo OFF added • 5.1.2 Message added, deleted

Revision Date	Description of Revision
May 2025	• 10.2 Teaching Update descriptions revised Forced update, troubleshooting added • Correction made, terms integrated, explanation revised
July 2025	Edition 6B • 1.1.2 Instruction manual related to this product added • Chapter 3 Descriptions revised • Correction made
October 2025	Edition 6C • Changes due to discontinuation of including the First Step Guide
June 2026	Seventh Edition • Chapter 4 Compatible for Smart Web Units added and overall revised

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