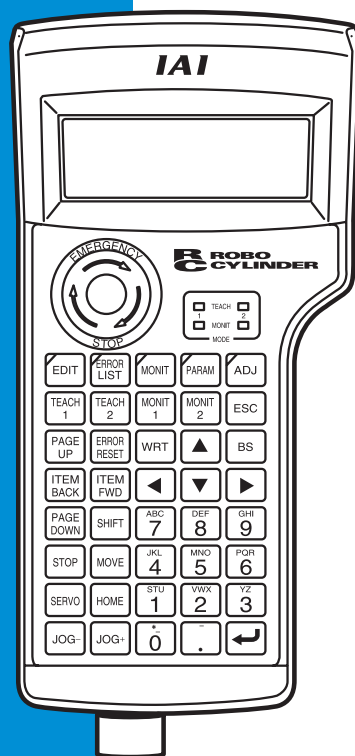




Teaching Pendant CON-T, CON-TG

Operating Manual Third edition



IAI America Inc.

Disconnection of the Teaching Pendant from the PCON / ACON / SCON Controller / ERC2

* After disconnecting the Teaching Pendant from the PCON / ACON / SCON controller / ERC2 with the AUTO/MANU switch, always turn the AUTO/MANU switch to AUTO.

* For the PCON / ACON controller / ERC2 without AUTO/MANU switch, always set the TP Operation Mode to “MONIT 2” before disconnecting the Teaching Pendant from the controller.

(Refer to “8.10 TP Operation Mode.”)

(Note) When the controller is set by connecting the Teaching Pendant to the PCON / ACON / controller without an AUTO/MANU switch, the conditions shown below occur.

When the controller is set by connecting the Teaching Pendant to the gateway unit/SIO converter, the conditions shown below occur.

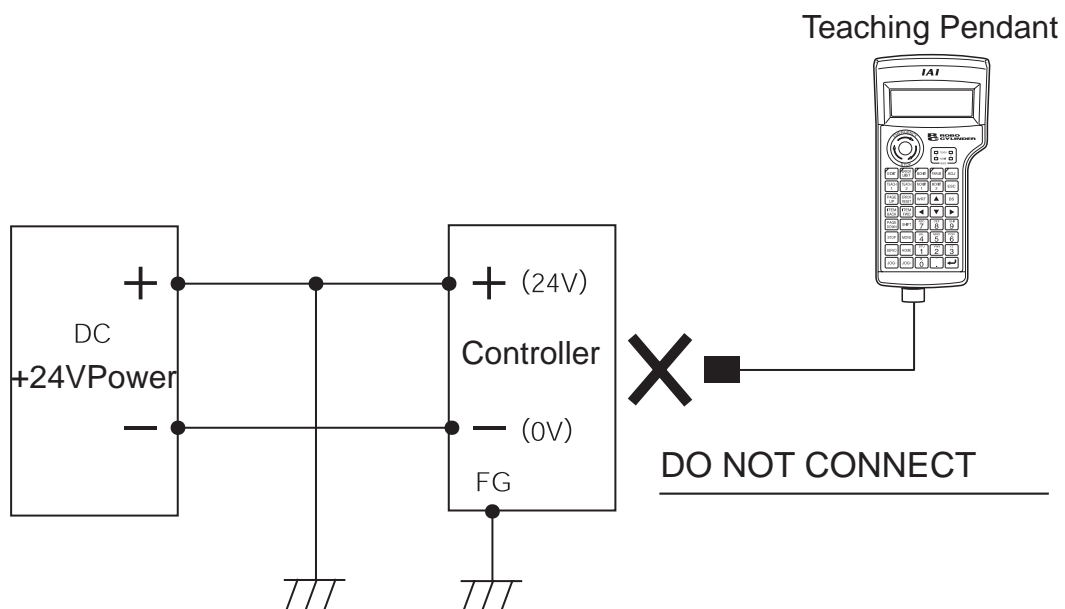
- If the Teaching Pendant is disconnected while the setting of “TEACH 1” or “TEACH 2” remains, I/O will become invalid and control from PLC will become impossible.
- If the Teaching Pendant is disconnected while the setting of “MONIT 1” remains, the maximum speed will become the safety speed set for the parameter regardless of a command from PLC.

Precautions in Teaching Pendant Connection

When the controller's power input "+" terminal is grounded, the applicable teaching pendant model cannot be connected.

When it is connected, the normal power is not supplied and it might cause the breakdown of the teaching pendant.

Applicable Models: CON-T, RCM-T, RCM-TD



Support Models

The following are the versions to which we have started support:

Table 1 List of Support Models

Model No.	CON-T Supported/Unsupported	CON-TG Supported/Unsupported	Support Started Version
RCP *1	○	×	V1.00
RCS *1	○	×	V1.00
E-Con *1	○	×	V1.00
RCP2 *1	○	×	V1.00
ERC	×	×	-
ERC2	*2	*2	V1.00
PCON	○	○	V1.00
ACON	○	○	V1.00
SCON	○	○	V1.00

*1: CON-T Teaching Pendant also supports the RCP, RCS, E-Con and RCP2 controllers.

*2: For the support for the ERC2, confirm it using the seal attached on the left side (viewed from the rear) of the cover.

Description on the Seal

I/O Type	Unsupported	Supported
NP	NP U5 M	NP T1 4904
PN	PN U3 M	PN T1 4904

* Check the model to connect and the version of the Teaching Pendant. If any unsupported model is connected, unexpected movement may occur.

* ERC2, PCON, ACON, or SCON cannot be used by linking to any model of those shown in *1.

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1. Foreword

Thank you very much for purchasing our Teaching Pendant for the Robo Cylinder. Improper usage or mishandling may result in a product not only being unable to deliver full functions but also produce unexpected troubles or shorten the product's life. Please read this Manual carefully and operate the product properly by paying attention to its handling. When operating the Teaching Pendant, always keep this Manual on hand and read the relevant items as required.

For the actuator and controller to be used, be sure to refer to the Instruction Manuals attached to the products.

<p>Caution: Do not edit position data while the actuator is operating by PLC, etc. Also, do not edit any position number not actually operated.</p>
--

2. Before You Begin

- (1) Be sure to read this Instruction Manual for proper use of this product.
- (2) Part or all of this Instruction Manual may not be used or reproduced without permission.
- (3) For any handling and operating methods other than those described in this Instruction Manual, interpret them as "don't" or "can't."
- (4) Please take note that we shall not be liable for any effects resulting from using this Instruction Manual.
- (5) Descriptions in this Instruction Manual are subject to change due to product improvements etc., without prior notice in the future.

3. Safety Precautions

- (1) Use a genuine product specified by us for wiring between the actuator and the Controller.
- (2) Keep out of the operating range of a machine such as an actuator while it is operating or in a ready state (condition in which the controller's power is ON). When using it in places where persons may approach, fence it off.
- (3) Before carrying out assembly and adjustment work or maintenance and inspection work of the machine, be sure to disconnect the power cord. While working, display the plate specified as such at an easy-to-read location. In addition, give special consideration to prevent third parties from turning on the power carelessly by hauling in the power cord to the operator. Alternatively, lock the power plug or receptacle and direct the operator to keep the key or prepare a safety plug.
- (4) When more than one operator works, advance work by determining the signal method and checking each other's safety. Especially, for work associated with axial movement regardless of power ON/OFF or motor-driven/manual operation, be sure to confirm safety by calling out to other(s) in advance.
- (5) When the user (customer) extends wiring, malfunction may occur due to faulty wiring. In this case, inspect wiring thoroughly and check it for properness before turning on the power.

4. Warranty and Scope of Warranty

The Teaching Pendant you purchased has been delivered upon completion of our strict shipping tests.

We shall warrantee this product as follows:

1. Warranty term

The warranty term shall be either of the following terms, whichever is reached first.

- 18 months after our shipment
- 12 months after delivery to the place designated by you

2. Warranty coverage

Where a defective condition occurs during proper use conditions and obviously under the responsibility of the manufacturer, within the term above, we shall repair the product without charge. However, any items that apply to the following are excluded from the warranty coverage:

- Defects resulting from changes over time such as natural color fading of paint
- Defects resulting from use wear of consumable parts (such as a cable)
- Defects resulting from sensory phenomena such as generated noise that have no functional effects
- Defects resulting from mishandling or improper use
- Defects resulting from an inadequacy or error in maintenance and inspection
- Defects resulting from the use of any part other than our genuine parts
- Defects resulting from a modification not approved by us or our dealers
- Defects resulting from Acts of God, accident, fire, etc.

Only a delivered product shall be singly warranted and no damage induced by the defect of the delivery product can be warranted. For repair, transport the product to our factory.

3. Service coverage

The cost of a delivered product does not include expenses for program creation and engineer dispatching. Therefore, the following are charged separately even within the warranty term:

- Maintenance and inspection
- Technical guidance and technical training in operating instructions
- Technical guidance and technical training on program-related matters such as program creation

5. Application Environment

- In order to avoid breakdown, please do not apply any type of machinery impact to the Teaching Pendant.
- Always hold onto the entire Teaching Pendant Body so that the Teaching Pendant Cable does not get pulled by unwanted cables.

Caution: This Teaching Pendant is designed exclusively for IAI RC Controllers (PCON, ACON, SCON, ERC2, RCP, RCS, E-Con and RCP2) and should not be used to connect with other devices.

: Turn the controller front side PORT switch OFF before connecting to controller equipped with a PORT switch.

6. Functions and Specifications of Teaching Pendant

CON-T Teaching Pendant was created exclusively for the PCON, ACON, SCON, RCP, RCS, E-Con and RCP2 Controllers, ERC2.

CON-TG was created exclusively for the PCON, ACON, SCON, Controllers, ERC2.

Through the communication between the controllers, the RC Controller is designed to function as the Display Operation Unit to edit or display the data (parameter data, position data, etc.) that is stored inside the controller, as well as to execute teaching without using the PC Interface Software.

For using the CON-TG teaching pendant, it is connected to the adaptor (RCB-LB-TG) for the teaching pendant, included to conform to the higher safety category.

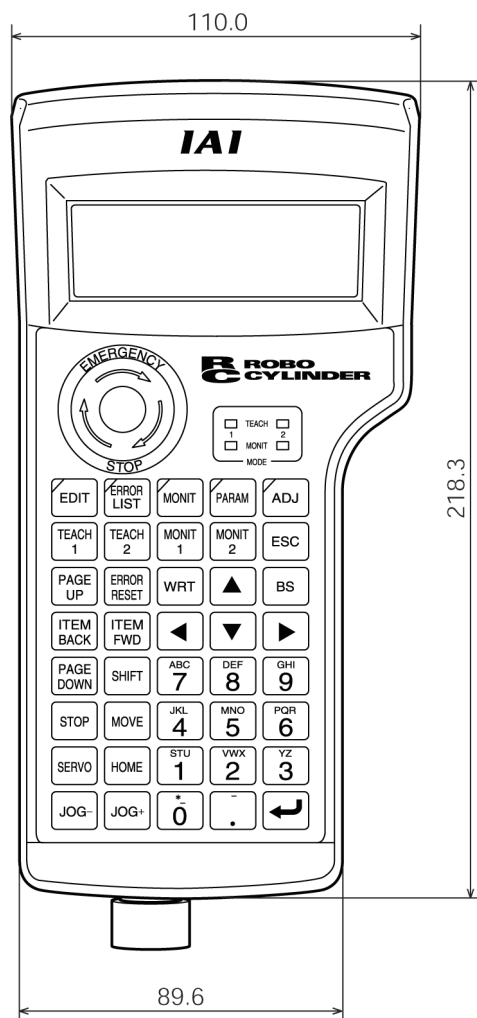
Refer to “7.3 Connection of CON-T to the Controller”.

6-1 Specifications

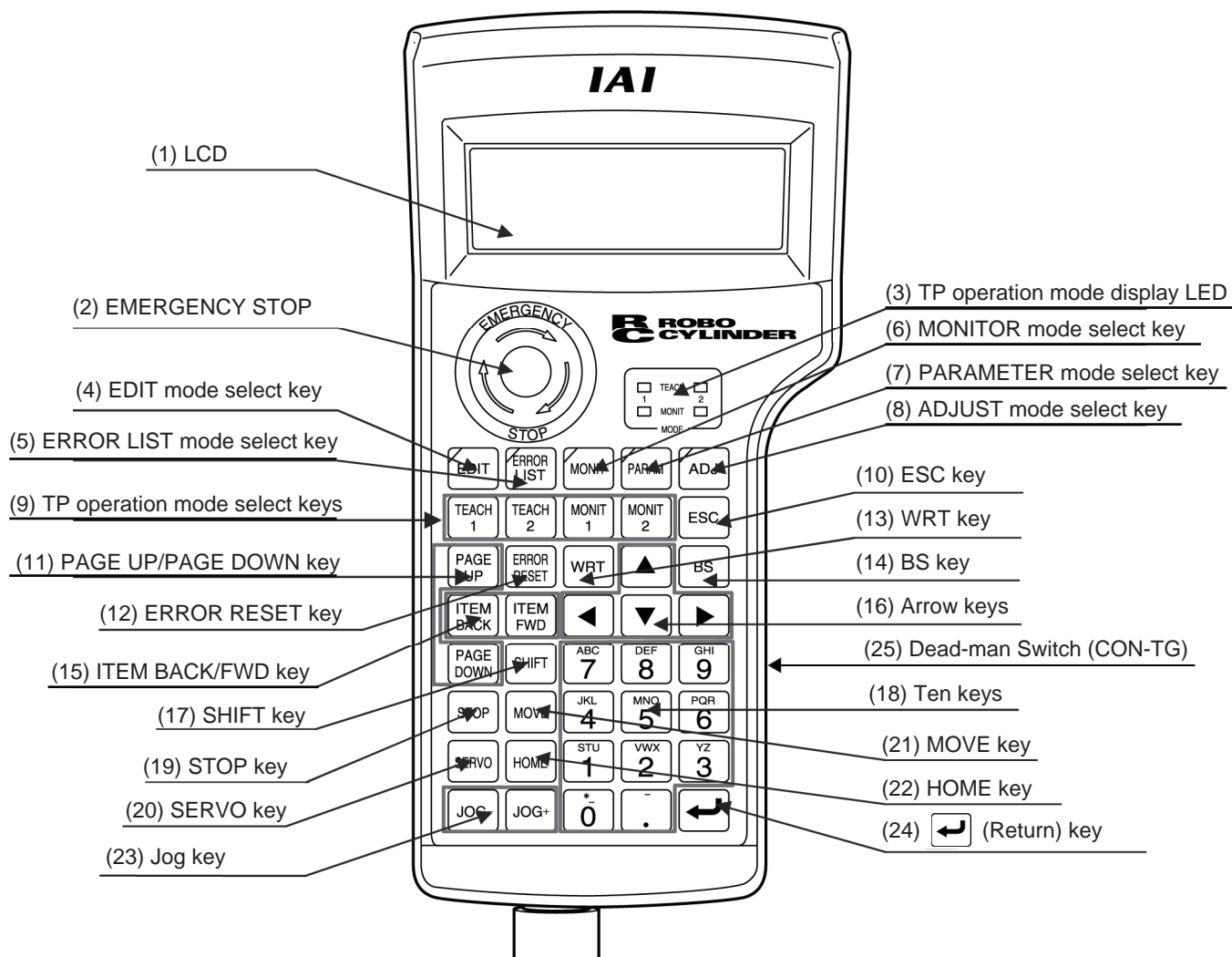
Item	Specification
Ambient Temperature & Humidity	Temperature: 0°~40°C Humidity: 85% RH or less * RH relative humidity
Operating Environment	Free of corrosive gas, especially, no excessive dust
Weight	400g (Excluding cables)
Cable Length	5m (Standard)

6-2 External View

External Dimensions



6-3 Description of Each Part



(1) LCD

This is a liquid crystal display with a maximum of horizontal: 20 characters per column and vertical: 4 columns per row. The edit or teaching contents of various set values are displayed.

(2) EMERGENCY STOP (Emergency Stop Push Button Switch)

This switch is a mushroom-shaped push-lock, turn-reset type switch.

This switch connects serially with the controller emergency stop signal line. Once pushed down, this switch will be in an emergency stop status and the power supply to the motor will be cut off (normally, closed: b contact).

(* For information on the emergency stop signal line and its status, refer to the RC Robo Cylinder Operating Manual.)

To reset the emergency stop status, turn the operating portion of this switch in the arrow direction.

Caution: If multiple controllers are connected using link cables, the EMERGENCY STOP switch is enabled only for the axis of the controller which is connected to the Teaching Pendant.

Caution: For the ACON-CG, PCON-CG and RCP2-CG (cutout relay external type) Series, the EMERGENCY STOP switch is enabled only when the emergency stop circuit is externally installed. Always read the operating manual of the controller carefully.

Caution: For the emergency stop wiring of each controller, refer to the operating manual of each controller.

(3) TP operation mode display LED

- TEACH1: The LED is lit in the Teach 1 mode.

PIO Prh: Enables writing of position data, parameters, etc., in the controller and commands of the actuator movement system.

SftyVel Efct: Keeps the maximum speed at the safety speed set for the parameter regardless of position data.

- TEACH2: The LED is lit in the Teach 2 mode.

PIO Prh: Enables writing of position data, parameters, etc., in the controller and commands of the actuator movement system.

SftyVel Non: Enables movement at the speed registered in position data.

- MONIT1: The LED is lit in the Monitor 1 mode.

PIO Prh: Enables monitoring only. Writing of position data, parameters, etc., in the controller and commands of the actuator movement system are disabled.

SftyVel Efct: Keeps the maximum speed at the safety speed set for the parameter regardless of position data.

- MONIT2: The LED is lit in the Monitor 2 mode.

PIO Prh: Enables monitoring only. Writing of position data, parameters, etc., in the controller and commands of the actuator movement system are disabled.

SftyVel Non: Enables movement at the speed registered in position data.

(4) EDIT mode select key

Moves to the "Edit/Teach" mode. This key is valid when the LED of the EDIT mode select key is lit.

(5) ERROR LIST mode select key

Moves to the "Error List" mode. This key is valid when the LED of the ERROR LIST mode select key is lit.

When alarm occurs at the controller, the LED of the "ERROR LIST" key is flashing.

(6) MONITOR mode select key

Moves to the "Monitor" mode. This key is valid when the LED of the MONITOR mode select key is lit.

(7) PARAMETER mode select key

Moves to the “User Parameter” mode. This key is valid when the LED of the PARAMETER mode select key is lit.

(8) ADJUST mode select key

Moves to the “User Adjustment” mode. This key is valid when the LED of the ADJUST mode select key is lit.

(9) TP operation mode select keys

Select TEACH1 (Teach 1 mode), TEACH2 (Teach 2 mode), MONIT1 (Monitor 1 mode) or MONIT2 (Monitor 2 mode).

The mode will move to the TP operation mode selected.

After movement, the LED of the operation mode selected lit.

(10) ESC key

- Return to the parent screen display

Although Teaching Pendant operation is composed of several layer nests, using this key will return the user to one upper layer (parent screen).

When you don't understand the operation, retry operation after returning to the upper layer with the **ESC** key.

- Input data cancel during data input operation

If you press this key during data input operation, the input data will be canceled.

- Stop switch during movement or continuous movement

Once this switch is pushed down during movement or continuous movement, operation will decelerate and stop immediately.

(11) PAGE UP/PAGE DOWN key

Changes screens by incrementing or decrementing edit and display item No. (Position No., Error List No., User Parameter No.).

(12) ERROR RESET key

When an error occurs at any level that allows recovery without software reset, the error reset and message clear can be performed with this key.

(13) WRT key

Transfers edited data to the controller. (Data will be saved to the memory of the controller.)

Only the data displayed on the LCD will be transferred. (Multiple position No. can't be transferred all together at the same time.)

If it is position data, transferred all together at position data.

(14) BS key

Backspace key. If you press this key during data input, the last input character will be cleared.

(15) ITEM BACK/FWD key

Changes items by incrementing or decrementing item No. on the Edit screen, Monitor screen or User Parameter screen.

(16) Arrow keys

- Edit screen

The cursor will move to each edit item in the screen. The screen will not be changed.

- Monitor screen, Error List screen

Changes the screen by incrementing or decrementing with the ▲ or ▼ key.

Changes the screen by incrementing or decrementing the axis No. among connection axes with the ◀ or ▶ key.

(17) SHIFT key

This key is not used since it is for a future function enhancement.

(18) Ten keys

These keys are used for numeric input.

(19) STOP key

Once this key is pushed down during movement or continuous movement, operation will decelerate and stop immediately.

(This key is valid in the Teach/Play mode.)

(20) SERVO key

Changes the servo ON/OFF of the actuator.

(This key is valid in the Teach/Play mode.)

(21) MOVE key

Starts the movement or continuous movement of the actuator.

(This key is valid in the Teach/Play mode with the servo ON status.)

(22) HOME key

Executes homing. (This key is valid in the Teach/Play mode with the servo ON status.)

(23) JOG-/JOG+ key

- JOG-: Negative direction jog movement
 - JOG+: Positive direction jog movement
- (This key is valid in the Teach/Play mode with the servo ON status.)

(24) (Return) key

This key is used for the confirmation of data input or operation.

(25) Dead-man Switch (CON-TG)

There are three stages for the dead-man switch. The ON/OFF in each stage are described as follows.

1st Stage	Switch OFF	The condition where finger is released from the switch, or the force of pressing the switch is very weak.
2nd Stage	Switch ON	Condition where the switch is pressed with appropriate force.
3rd Stage	Switch OFF	Condition where the switch is pressed strongly.

The servo-motor can be turned ON under the switch ON condition.

When the switch is turned OFF, the driving power source is disconnected and the servo-motor is turned OFF.

Even when the switch is turned OFF, the operations in the modes where turning ON the servo-motor is not required are available (such as edit mode).

7. Connection With the Controller

7-1 Connection with the Teaching Pendant

- (1) Connect the Teaching Pendant Cable to the Main Communication Port connector which is located on the front of the controller.

Always turn the PORT switch OFF first before connecting a controller having this switch.

For the locations of the Main Communication Port connector and PORT switch, refer to the operating manual for the controller you use.



- (2) After connecting, turn the PORT switch of the controller having this switch ON.

7-2 How to Disengage the Teaching Pendant

Hold down the  key in the Teaching Pendant. Then select "1. End" to finish all processes.

Then, turn the PORT switch OFF for the controller having this switch.

Operation:

1. Hold down the  key for more than 2.5 seconds.
2. Press the ten keys  to select "1. End."
3. Turn the PORT switch OFF for the controller having this switch.
4. Remove the Teaching Pendant connector.

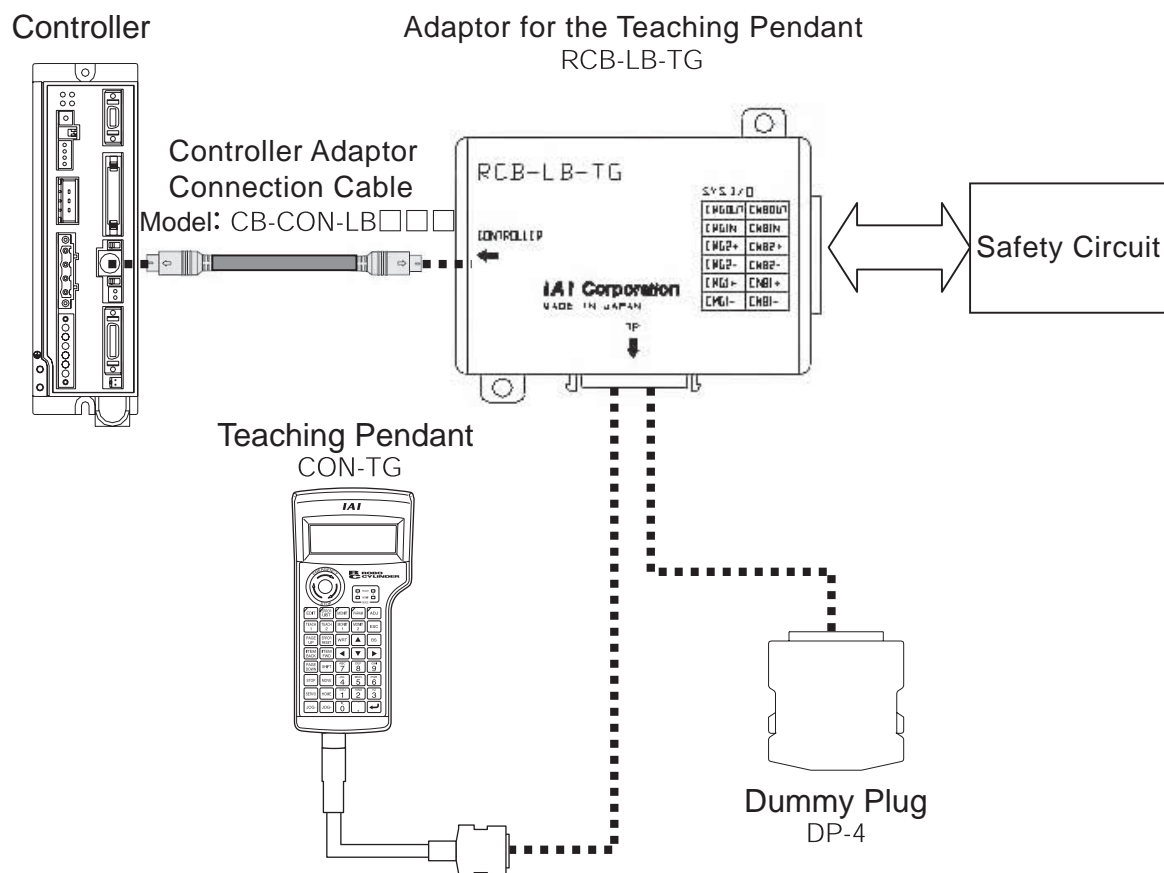
Caution: In the case of using PCON, ACON, SCON or ERC2, when the teaching pendant is disconnected, the controller is stopped momentarily in an emergency, but immediately after that, the emergency stop is cancelled.
Do not disconnect the teaching pendant during the controller operation.
Also, take the greatest care to design the emergency stop circuit including the emergency stop switch for the teaching pendant.

Caution: In the case of the PCON, ACON controller or ERC2 not having the AUTO/MANU switch, set the TP Operation Mode to "Monitor 2" before disconnecting the Teaching Pendant from the controller. (Refer to "8.10 TP Operation Mode.")

when controller setting is made by connecting the Teaching Pendant to the gateway unit or SIO converter:

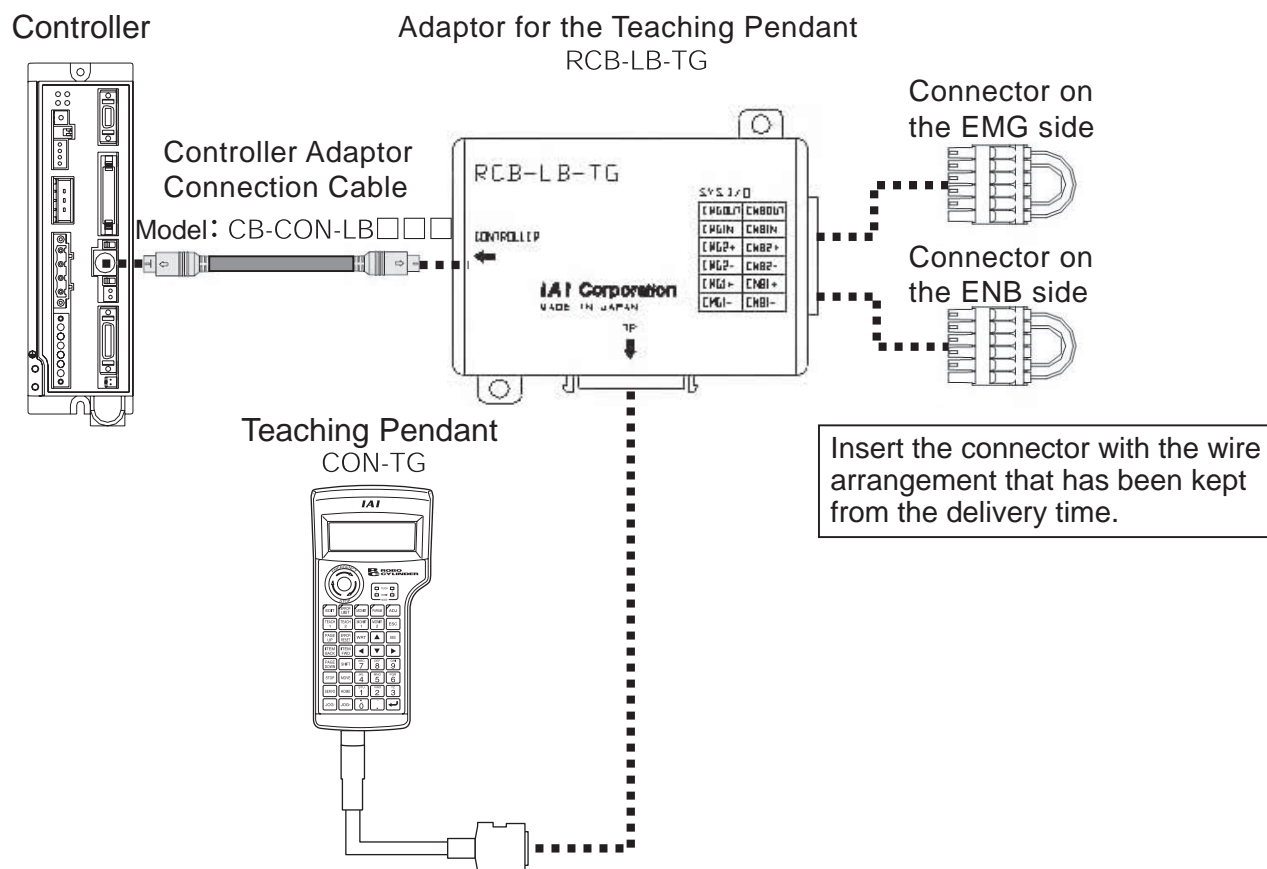
- If the Teaching Pendant is disconnected while the setting of "Teach 1" or "Teach 2" remains, I/O will become invalid and control from PLC will become impossible.
- If the Teaching Pendant is disconnected while the setting of "Monitor 1" remains, the maximum speed will become the safety speed set for the parameter regardless of a command from PLC.

7.3 Connection between CON-TG and the Controller

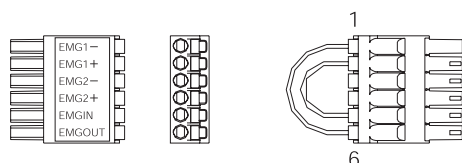


Caution: When the teaching pendant CON-TG is not to be connected, make sure to insert the dummy plug DP-4 into the adaptor for the teaching pendant.

When the CON-TG teaching pendant is used as the teaching pendant with the dead-man switch, connect it to the controller as shown in the following diagram.

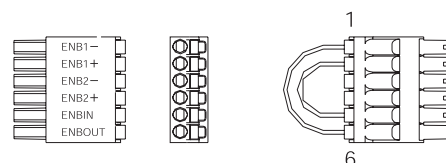


Wire Arrangement of the Connector on the EMG side at the time of delivery



Wiring	Color	Signal	No.
AWG24	YW	EMG1-	1
	YW	EMG1+	2
	—	EMG2-	3
	—	EMG2+	4
	YW	EMGIN	5
	YW	EMGOUT	6

Wire Arrangement of the Connector on the ENB side at the time of delivery

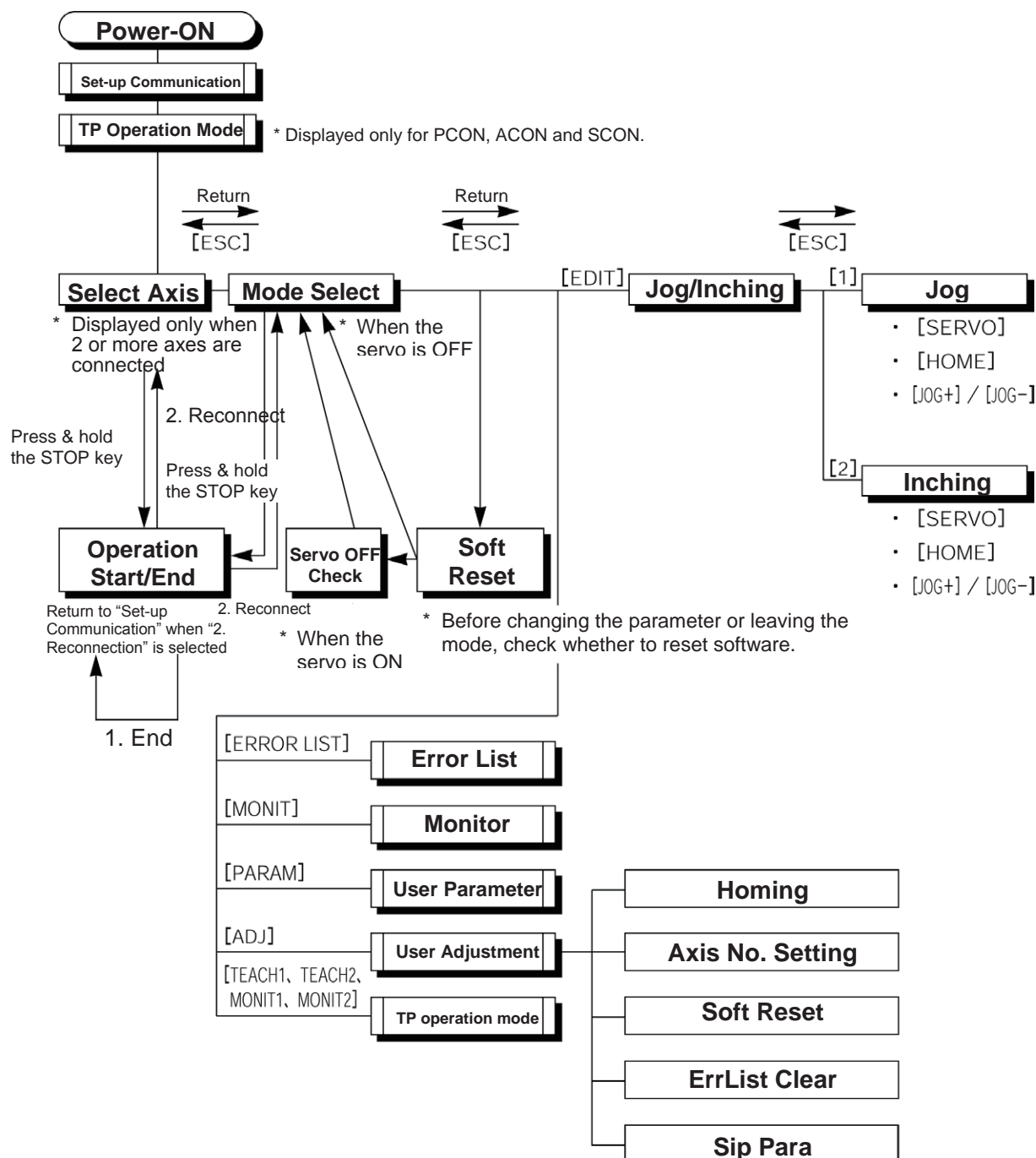


Wiring	Color	Signal	No.
AWG24	YW	ENB1-	1
	YW	ENB1+	2
	—	ENB2-	3
	—	ENB2+	4
	YW	ENBIN	5
	YW	ENBOUT	6

(2) Pulse Train (PCON-PL/PO, ACON-PL/PO and SCON: Pulse Train Mode)

The total picture of operations performed with the Teaching Pendant has the tree structure as shown below.

To return to the previous screen, press the ESC key.



8-1 Initial Screen and TP Operation Mode Screen During Power – UP

When Teaching Pendant is connected to the controller, power is supplied to the Teaching Pendant and operation starts.

In the case of a controller with a PORT switch, power will be supplied to the Teaching Pendant and operation will start once power is supplied to the Teaching Pendant.

Upon power-on, the LCD display screen (hereinafter called the “screen”) displays the Teaching Pendant software version as follows:



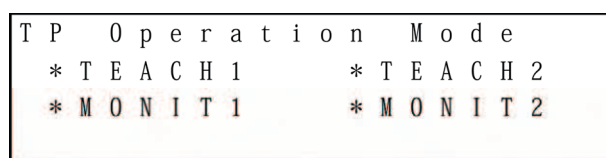
```
IAI  R C  T P
TP                               V e r 1 . 0 0

C o n n e c t i n g . . .
```

Fig. 8.1 Initial Screen During Power – UP

In the case of the PCON, ACON, SCON controller or ERC2 the screen will automatically move to the TP Operation Mode selection screen once checking of the connection is completed.

In the case of the RCP, RCS, E-Con or RCP2 controller, the screen will automatically move to the Select Axis screen if multiple units are connected.







Select and press one of the , ,  or  keys. The screen will move the controller selection (Axis Select) screen.



Fig. 8.2 TP Operation Mode Selection Screen

Select an operation mode from the following 4 menu items:

- TEACH1: The LED is lit in the Teach 1 mode.
 - PIO Prh: Enables writing of position data, parameters, etc., in the controller and commands of the actuator movement system.
 - SftyVel Efct: Keeps the maximum speed at the safety speed set for the parameter regardless of position data.
- TEACH2: The LED is lit in the Teach 2 mode.
 - PIO Prh: Enables writing of position data, parameters, etc., in the controller and commands of the actuator movement system.
 - SftyVel Non: Enables movement at the speed registered in position data.
- MONIT1: The LED is lit in the Monitor 1 mode.
 - PIO Prh: Enables monitoring only. Writing of position data, parameters, etc., in the controller and commands of the actuator movement system are disabled.
 - SftyVel Efct: Keeps the maximum speed at the safety speed set for the parameter regardless of position data.
- MONIT2: The LED is lit in the Monitor 2 mode.
 - PIO Prh: Enables monitoring only. Writing of position data, parameters, etc., in the controller and commands of the actuator movement system are disabled.
 - SftyVel Non: Enables movement at the speed registered in position data.

8-2 Controller Selection (when using multiple units)

In the case of multiple units connected serially via the communication line, the axis selection screen will be displayed. For a single unit, since there is no need to select the axis, the first screen below will not appear (refer to Section 8.3 entitled Operational Mode Selection of this manual).

If the jig No. is incremented or decremented with the  or  key, power-on controllers will be displayed in order when the power is applied to the Teaching Pendant. Display the controller to be selected.

Then, press the return key. The selection will be confirmed and the screen will change to the “Mode Select” screen.

The controller can connect up to 16 units. However, the PCON, ACON or SCON group controllers cannot be used by linking to the RCP, RCS, E-Con or RCP2 controllers.

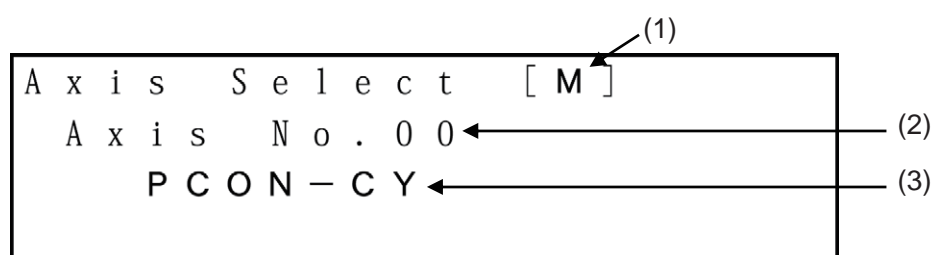


Fig. 8.3 Axis Selection Screen

(1) Protocol type display M: Modbus, T: proprietary protocol

(2) Axis No. display

(3) Connection axis display: In the case of PCON, ACON or SCON, the series name and type name of the connection axis such as PCON-CY will be displayed.

In the case of RCP, RCS, E-Con or RCP2, “Connected” will be displayed.

Caution: In the case of controllers with the PORT switch, only the powered controller(s) will be detected when the PORT switch is ON and power is present for the Teaching Pendant.

The content explained hereinafter will be based on operation in response to the selected axis (controller).

8-3 Operation Mode Selection

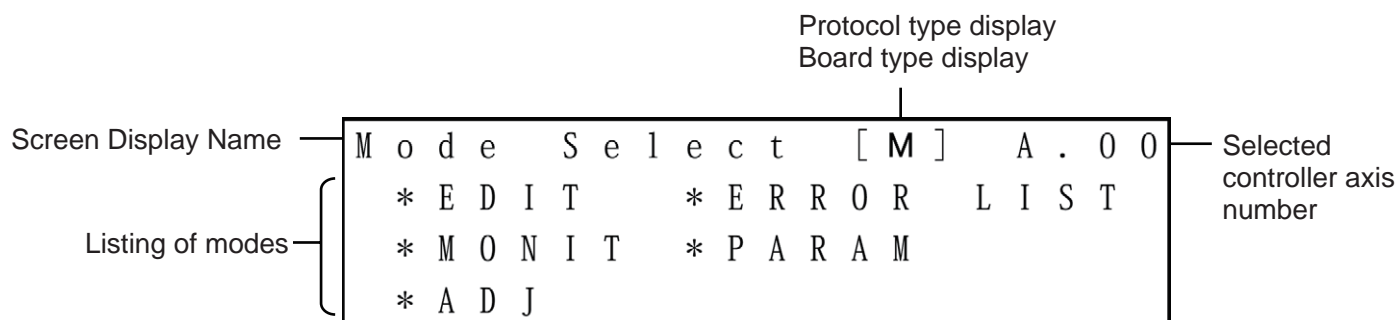


Fig. 8.4 Mode Selection Screen

For the modes, select one of the 5 options as it appears on the above screen.

To select it, press one of the , , ,  or  keys.

The screen will move to the screen of the selected mode.

However, it cannot move to any mode with the key LED out.

Category of Modes

- | | |
|------------------|--|
| (1) * EDIT | Positioner (PCON-PL/PO, ACON-PL/PO and SCON: Mode other than the Pulse Train mode)
Display and Edit function for positioner table
(Refer to 8.4 and 8.5)
Pulse Train (PCON-PL/PO, ACON-PL/PO and SCON: Pulse Train Mode) Jog Operation, Inching Operation
(Refer to 8.5.8) |
| (2) * MONIT | Controller status display (Refer to 8.6) |
| (3) * ERROR LIST | Alarm content detailed display (Refer to 8.7) |
| (4) * PARAM | Setting of axis zone signal output range and axis attributes (Refer to 8.8) |
| (5) * ADJ | Executing homing and axis number setting of controller series (Refer to 8.9) |


8-4 Edit/Teaching

8-4-1 PCON, ACON or SCON

When the “*EDIT” mode is selected, the Edit/Teach select screen will be displayed.

E d i t / T e a c h		A . 0 0
1 . M D I	2 . C l e a r	
3 . A l l C l e a r		
4 . T e a c h / P l a y		

Fig. 8.5 Edit/Teach Select Screen

When the  key is pressed to select MDI, the contents of the position data table stored in the controller will be displayed.



A: Absolute coordinate specification (ABS)





I: Relative coordinate specification (INC)

		Position No.		Editing axis No.
M D I		N o .	0	A . 0 0
P o s	A		0 . 0 0	m m
V e l			1 0 . 0 0	m m / s

Fig. 8.6 Position and Velocity Data Screen

Specification of Position No.

When the position No. is incremented or decremented with the  or  key, the position data of the displayed position No. will be displayed in order.

Alternatively, move the cursor to the position No. with the , ,  or  key, input a numeric value with the ten keys and press the return key. The position data of the specified position No. will be displayed.

The position data table screen is divided and displayed as below.

When the **ITEM BACK** or **ITEM FWD** key is pressed, the cursor in the screen will move. Pressing the key again after the cursor has reached the top or bottom line will change the screen.

In the same way, when the return key is pressed, the cursor in the screen will move. Pressing the key again after the cursor has reached the top or bottom line will change the screen.

ITEM BACK

or return key

ITEM FWD

or return key

Press it several times

Press it several times

Press it several times

Press it several times

Press it several times

ITEM BACK

or return key

ITEM FWD

or return key

ITEM BACK

or return key

ITEM FWD

or return key

ITEM BACK

or return key

ITEM FWD

or return key


Pos	A	0.00	mm	Acc	0.50	G	Push	0%	Zone+	0.00	mm	Acc	Decr	Mode	0	Cmd	Mode	0
Vel		10.00	mm/s	Dcc	0.50	G	LoTh	0%	Zone-	0.00	mm	Incremental	0	Stop	Mode	0		0
							Range	0.01	mm									

8-4-2 RCP, RCS, E-Con or RCP2

When the “*EDIT” mode is selected, the Edit/Teach select screen will be displayed.

E d i t / T e a c h	A . 0 0
1 . M D I	2 . C l e a r
3 . A l l C l e a r	
4 . T e a c h / P l a y	

Fig. 8.7 Edit/Teach Select Screen

When the  key is pressed to select MDI, the contents of the position data table stored in the controller will be displayed.



A: Absolute coordinate specification (ABS)





I: Relative coordinate specification (INC)

		Position No.	Editing axis No.	
M D I	N o .	0	A .	0 0
P o s	A	0 .	0 0	m m
V e l		1 0	m m	/ s
A c c	D c l	0 .	5 0	G

Fig. 8.8 Position and Velocity Data Screen

Specification of Position No.

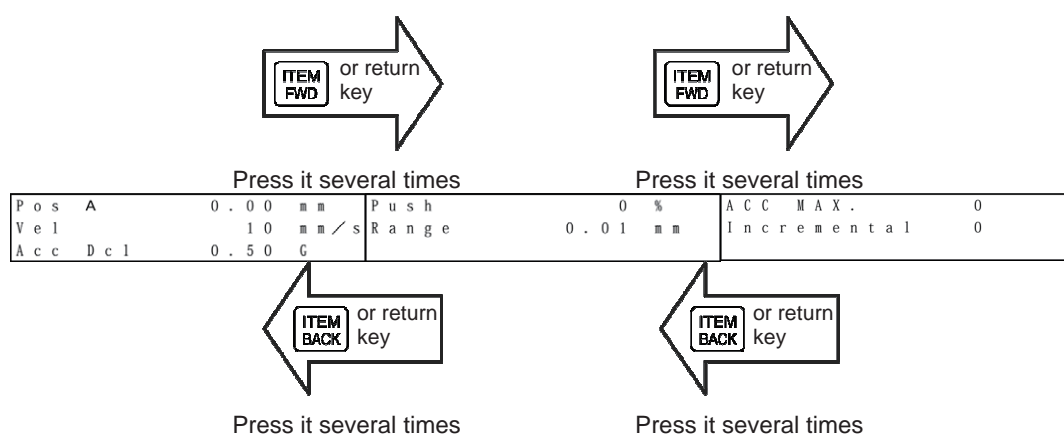
When the position No. is incremented or decremented with the  or  key, the position data of the displayed position No. will be displayed in order.

Alternatively, move the cursor to the position No. with the , ,  or  key, input a numeric value with the ten keys and press the return key. The position data of the specified position No. will be displayed.

The position data table screen is divided and displayed as below.

When the **ITEM BACK** or **ITEM FWD** key is pressed, the cursor in the screen will move. Pressing the key again after the cursor has reached the top or bottom line will change the screen.

In the same way, when the return key is pressed, the cursor in the screen will move. Pressing the key again after the cursor has reached the top or bottom line will change the screen.



8-5 Position Data Table Contents

8-5-1 Position Data Table Contents for PCON, ACON, SCON, ERC2

The setting items of the position data table are No., Position, Vel, Acc/Dcl, Push, LoTh, Range, Zone+, Zone-, AccDcl Mode, Cmnd Mode and Stop Mode. They are displayed in 6 screens.

The items of Zone+, Zone-, AccDcl Mode and Stop Mode are enabled (ON) or disabled (OFF) according to the controller type.

List of ON/OFF of Position Table According to Model

Position Table	Zone +/-		AccDcl Mode			Stop Mode	
			Trapezoid	S-shape	First-order Delay	Full Servo	Auto Servo OFF
ERC2	○	PIO pattern: 3	○	×	×	○	○
ERC2-SE	○	-	○	×	×	○	×
PCON-C/CG/CF	○	PIO pattern: 0, 1, 2, 4, 5	○	×	×	○	○
-CY	○	PIO pattern: 1	○	×	×	○	○
-SE	○	-	○	×	×	○	×
ACON-C/CG	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○		○
-CY	○	PIO pattern: 1	○	○	○		○
-SE	○	-	○	○	○		×
SCON positioner	○	PIO pattern: 0, 1, 2, 4, 5	○	○	○		○

(1) No. Indicates the position data number.

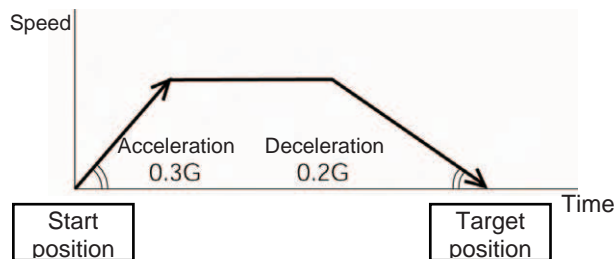
⚠Warning: Always specify absolute coordinates for the 3-point type of PCON-C/CG, ACON-C/CG and SCON-C and the proximity switch type of PCON-CY and ACON-CY.
If you specify relative coordinates, a position data error will occur.
In the above case, if you specify "Push," push completion cannot be judged.

(2) Position: Input the target position to move the actuator to, in [mm].

- Absolute Coordinates: Input the target location by determining the distance between the original point and target position. No negative value can be input.
- Relative Coordinates: Input the target location by determining the distance between the current position and target position. Any negative value can be input (if coordinates are in the negative direction).

(3) Vel: Input the speed at which the actuator will be moved, in [mm/sec].
The initial value will depend on the actuator type.

(4) Acc/Dcc: Input the acceleration/deceleration at which the actuator will be moved, in [G].
Basically, use acceleration/deceleration within the catalog rated value range.
The input range allows larger value input than the catalog rated values, on the assumption that the tact time will be reduced if the transfer mass is significantly smaller than the rated value.
Make the numeric value smaller if transfer work vibrates and causes trouble during acceleration/deceleration.



The acceleration will become sudden if the numeric value is made larger and it will become gradual if the numeric value is made smaller.

Caution: Enter appropriate values for Vel and Acc/Dec in such a way as to prevent excessive impact or vibration from being applied to the actuator in consideration of the installation conditions and the shape of transferred work by referring to the “List of Actuator Specifications” in the Appendix.
Increasing such values largely relates to the transfer mass and the actuator characteristics vary depending on the model, consult IAI regarding the input-limiting values.

(5) Push: - Select the positioning operation or push operation.
The default value is “0.”
0: Normal positioning operation
Other than 0: Indicates the current-limiting value and indicates the push operation.

Caution: In the case of PCON, ACON, SCON or ERC2 there are cases where the input value to “Push” may be rounded off to a multiple of the minimum resolution of the controller (during data acquisition from the controller).

- (6) LoTh: - In the case of the PCON-CF controller, the load output signal (PIO) will be output if the command torque exceeds the value (%) set to "LoTh."

Set the test range with "Zone+/-".

Use it to judge whether push has been performed normally.

- * For details, refer to the Operating Manual of PCON-CF Controller.

- (7) Range: - The "positioning operation" and "push operation" have different meanings.

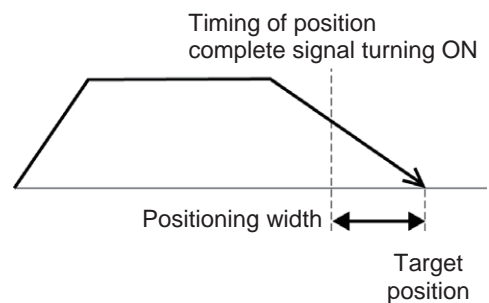
Positioning operation:

It defines the distance to the target position from a position at which the position complete signal turns ON.

The default value is 0.1 mm.

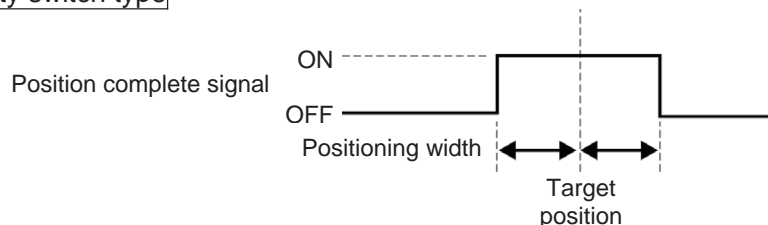
Standard type

Since increasing the positioning width value hastens the next sequence operation, it becomes a factor for tact time reduction. Set the optimum value by considering the balance of the entire equipment.



However, it defines the width of the position complete signal to turn ON for the 3-point type of PCON-C/CG, ACON-C/CG and SCON and the proximity switch type of PCON-CY and ACON-CY.

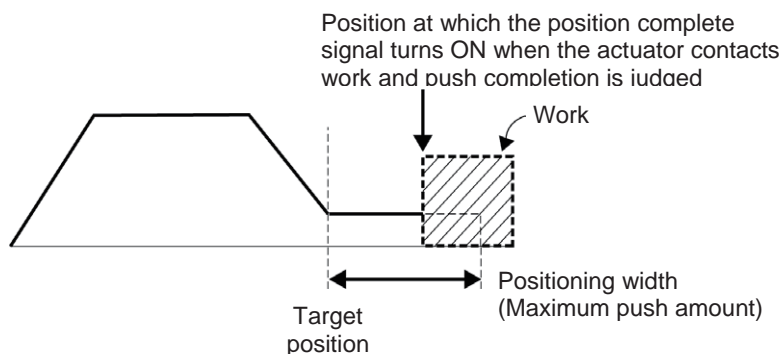
3-point type and proximity switch type



Push operation:

It defines the maximum push amount from the target position in the push operation.

Set the positioning width in such a way as to prevent positioning completion before the actuator contacts work by considering mechanical variations of work.

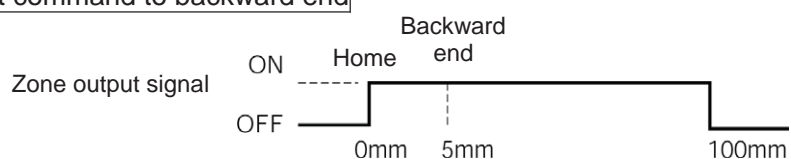


- (8) Zone +/-: - It defines the zone where the zone output signal of the standard type turns ON.
Individual setting is available for each target position to give flexibility.

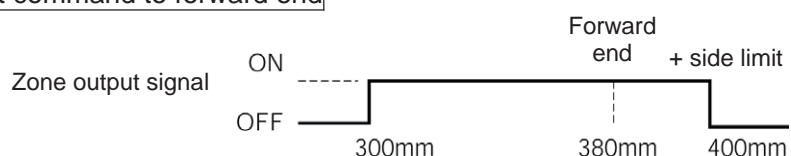
[Setting example]

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

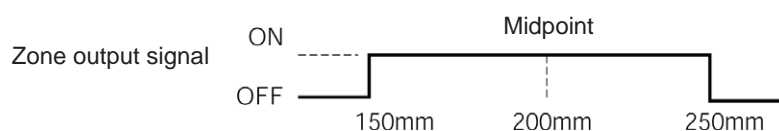
Movement command to backward end



Movement command to forward end

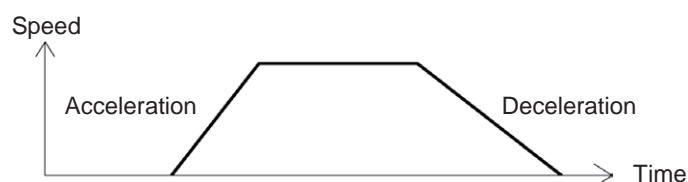


Movement command to midpoint



- (9) Acc/Dcl Mode: - It defines the acceleration/deceleration characteristics.
The default value is 0.
0: Trapezoid pattern
1: S-shaped motion
2: First-order delay filter

Trapezoid pattern

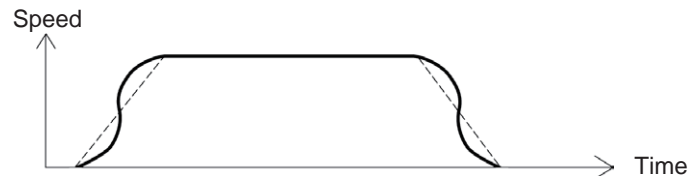


* Set the acceleration and deceleration in the "Acc" and "Dcl" fields of the position table.

S-shaped motion

A curve, which is gradual at the beginning of acceleration but rises sharply halfway, is drawn.

Use it in the applications for which you want to set the acceleration/deceleration high due to tact time requirement but desire a gradual curve at the beginning of movement or immediately before stop.



- * Set the degree of the S-shaped motion with the parameter No. 56 [S-shaped motion ratio setting]. The setting unit is % and the setting range is between 0 and 100.

(The above is the image graph when 100% setting is made.)

If "0" is set, the S-shaped motion becomes invalid.

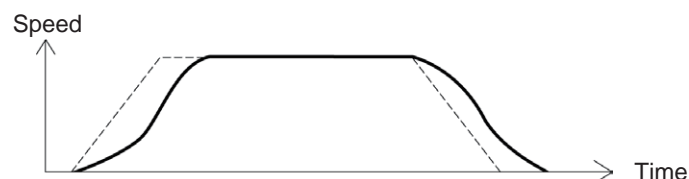
However, it will not be reflected in jogging/increment movement by PC or Teaching Pendant operation.

(Note) It cannot be set for the PCON controller. The parameter No. 56 is reserved.

First-order delay filter

More gradual acceleration/deceleration curves are drawn than the linear acceleration/deceleration (trapezoid pattern).

Use this in the applications by giving micro vibrations to work during acceleration/deceleration not desired.



- * Set the degree of the first-order lag with the parameter No. 55 (constant for the position command first-order filtering). The setting unit is 0.1 msec and the setting range is between 0.0 and 100.0.

If "0" is set, the first-lag filter will become invalid.

However, it will not be reflected in jogging/increment movement by PC or Teaching Pendant operation.

(Note) It cannot be set for the ERC2, PCON controller. The parameter No. 55 is reserved.

(10) Cmd Mode: - This field is invalid.

The factory setting is 0.

(11) Stop Mode: - It defines the power saving method on standby after completion of positioning to the target position set in the "Position" field of the position number.

- 0: Invalid power saving method * The default setting is 0 (invalid).
- 1: Auto servo OFF method. Delay time defined with the parameter No. 36
- 2: Auto servo OFF method. Delay time defined with the parameter No. 37
- 3: Auto servo OFF method. Delay time defined with the parameter No. 38
- 4: Full servo control method

Full servo control method

The holding current can be reduced by servo-controlling the pulse motor.

The degree of reduction varies depending on the actuator model, load condition, etc., but the holding current decreases approximately by a factor of 2 to 4.

No displacement occurs since this method maintains the servo ON status.

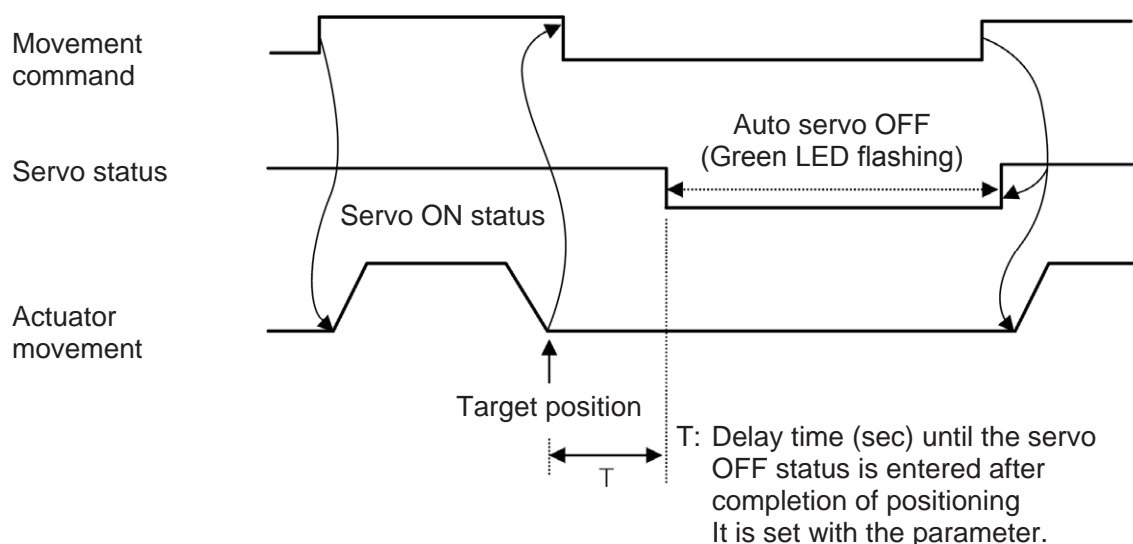
The actual holding current can be checked on the monitoring screen of PC-compatible software.

Auto servo OFF method

When a given length of time has elapsed after completion of positioning, the servo OFF status is automatically entered.

(Since the holding current does not flow, the power consumption can be saved by the same amount.)

When a movement command is subsequently given from PLC, the status returns to the servo ON and the actuator starts to move.



8-5-2 Position Data Table Contents for RCP, RCS, E-Con and RCP2

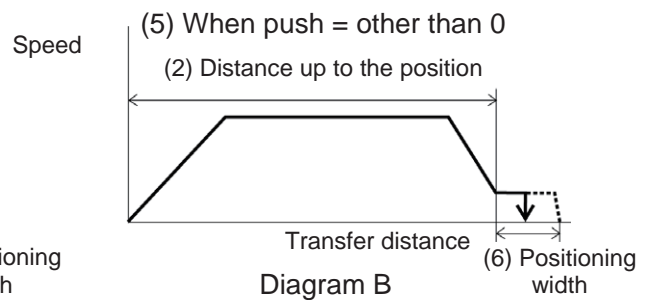
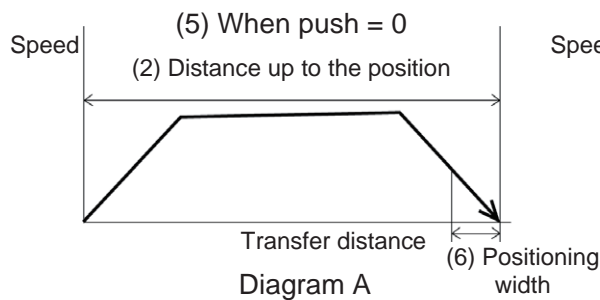
The setting items of the position data table are No., Position, Vel, Acc/Dcl, Push, Range and Acc only MAX. They are displayed in 3 screens.

- (1) No. Indicates the position data number.
To specify relative coordinates, move the cursor here and press the minus key. The “=” sign will appear between No. and Position.
By pressing the minus key again, “=” disappears and the screen returns to absolute coordinates.
- (2) Position: Input the target position to move the actuator to, in [mm].
- Absolute Coordinates: Input the target location by determining the distance between the original point and target position. No negative value can be input.
 - Relative Coordinates: Input the target location by determining the distance between the current position and target position. Any negative value can be input (if coordinates are in the negative direction).

Caution: In the case of PCON, ACON or SCON, there are cases where the input value to “Push” may be rounded off to the multiple of the minimum resolution of the controller (during data acquisition from the controller).

- (3) Vel: Input the speed at which the actuator will be moved, in [mm/sec].
The initial value will depend on the actuator type.
- (4) Acc/Dcc: Input the acceleration/deceleration at which the actuator will be moved, in [G].
The initial value will depend on the actuator type.
- (5) Push:
- Select the positioning operation or push operation.
The default value is “0.”
0: Normal positioning operation
Other than 0: Indicates the current-limiting value and indicates the push operation.
 - In the case of push mode, data number is the servo motor current control value during push. Uses a value that matches the actuator with a maximum value of 100%.

- (6) Range:
- Enter the positioning completion detection width in mm (distance to the target position) in the positioning mode.
 - The distance to the target position indicates that the value input here is the upstream distance prior to reaching the target position and the position complete signal is output when the actuator enters that upstream range.
The default value will depend on the actuator type. (see diagram A)
 - Enter the maximum push amount (distance from the target position) in the push mode. [mm] (see diagram B)
 - When the push direction is a negative direction from the displayed coordinate, a “negative” sign should be placed in the range column.



- (7) Acc only MAX: - Selects either the assigned acceleration or the maximum acceleration. Inputs are either 1 or 0. The default value is set as 0.

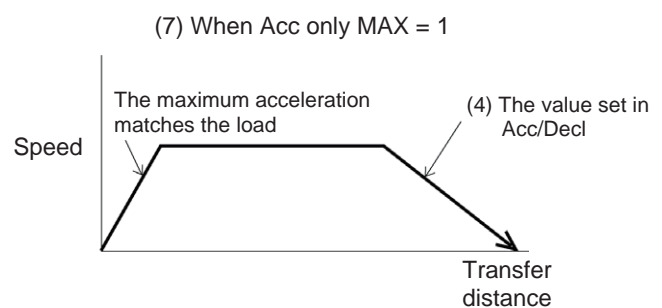
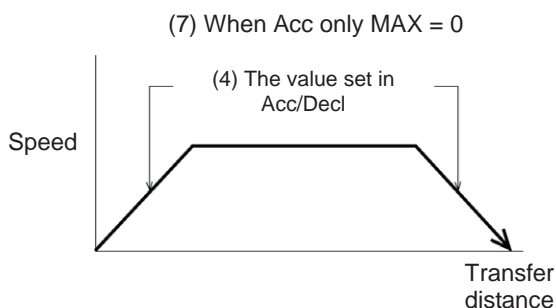
0: Assigned acceleration

The value placed in (4) will be used as the actual acceleration value and deceleration value.

1: Maximum acceleration

This will automatically utilize the maximum acceleration matched to the load.

Deceleration remains as the assigned value in (4).



8-5-3 Data New Input

The following 4 ways to input new position data exist:

- (1) Numeric Input (MDI) Numeric input the position data directly from the Teaching Pendant ten keys.
(For the input example, see page 35.)
- (2) Direct Teach Turn the servo controller OFF, manually move the slider to match the desired location and read and command that location into the position table.
(For the input example, see page 44.)
- (3) Jog Use the arrow key to jog move and match the desired location and read that location (current position) into the position table.
(For the input example, see page 47.)
If you continue pressing the arrow key, the actuator will move at a specified speed (1, 10, 30, 50, 100 mm/sec). However, only the maximum speed will be gained if the maximum speed is slower than the specified speed.
- (4) Increment Use the arrow key to incrementally move and match the desired location and read that location (current position) into the position table.
(For the input example, see page 49.)
If you press the arrow key once, the actuator will move by a specified pitch (0.03, 0.10, 0.50 [mm]). If you continue pressing the arrow key, the actuator will move by jogging at 1 mm/sec. in 2 sec. The speed will then increase every one second. Finer movement than jogging is possible.

Examples of each operation will be explained as follows.

Caution : When input position data is performed first after power-on or method of (2), (3), or (4), it is required to perform home return in advance. (Increment specification)
: Jog and Increment movement prior to homing incomplete status is possible up to the slider end. Visually, perform the interference check.


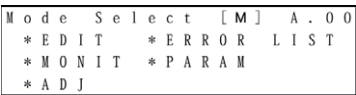

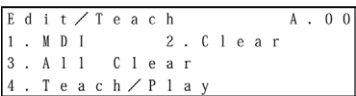

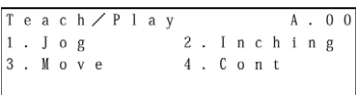





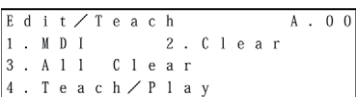
1) Homing

Perform temporary stop reset and servo ON input in advance.

Alternatively, disable servo ON input and temporary stop reset with User Adjustment.

(There is no servo ON input for RCP.)


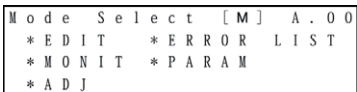

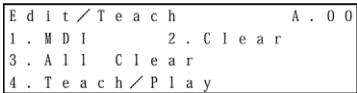


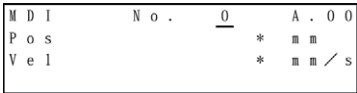




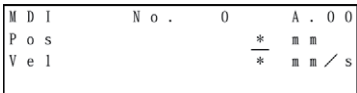


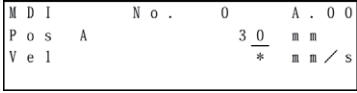




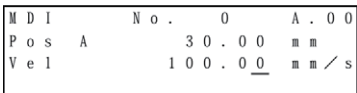
Caution: Operating instructions are described on the screens of PCON, ACON and SCON.

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "MDI."		
3.	Press the  key to select Jog.		
4.	If the SV OFF (servo OFF) status is displayed on the screen, press the  key.		The servo will automatically be turned ON. "SV ON" (servo ON) will be displayed on the screen.
5.	Press the  key.		Homing will automatically be performed.
6.	Press the  key twice to return to the Edit/Teach screen,		

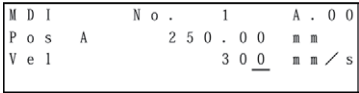
2) Numeric Input

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2




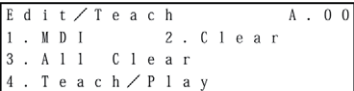


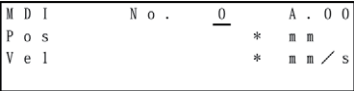




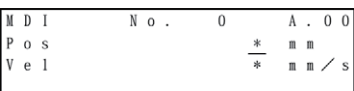


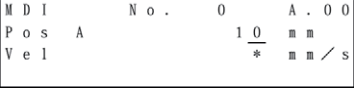




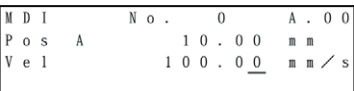
Example 1: 2 point continuous loop move 30mm <-> 250mm, Speed 300mm/sec

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "MDI."		
3.	Set 0 into the position No. with the  or  key.		For any unregistered data, the display will show "*" sign.
4.	Move the cursor to the "Pos" input position with the  ,  ,  or  key.		
5.	Input   here, and then press the Return key.		<p>In order to stop during numeric input, press the  key to cancel the input.</p> <p>Example) With the left operation, by pressing  immediately after inputting  , the status will return to the "*" display.</p>
6.			<p>During new position data registration, the initial values set with the user parameters for Vel, Acc, Dcc, etc., will automatically be input.</p> <p>In the left screen, the initial value is set as 100 mm/sec.</p>

	Operation	Screen	Reference
7.	<p>Input <input type="text" value="3"/>^{YZ} <input type="text" value="0"/>[*] <input type="text" value="0"/>[*] here, and then press the Return key.</p> <p>Press the <input type="text" value="WRT"/> key.</p> <p>(The cursor will automatically move to the next [No. 1].)</p>	<pre> MDI No. 1 A.00 Pos A 250.00 mm Vel 300 mm/s </pre>	The screen will change to the screen of Position No. 1 for Acc and Dcc.
8.	<p>Change the screen to the screen for Pos and Vel with the <input type="text" value="ITEM BACK"/> key.</p> <p>Move the cursor to "Pos" with the <input type="text" value="ITEM BACK"/> key.</p>	<pre> MDI No. 1 A.00 Pos * mm Vel * mm/s </pre>	
9.	<p>Move the cursor to the "Pos" input position with the <input type="text" value="Left Arrow"/>, <input type="text" value="Down Arrow"/>, <input type="text" value="Up Arrow"/> or <input type="text" value="Right Arrow"/> key.</p> <p>Input <input type="text" value="2"/>^{VWX} <input type="text" value="5"/>^{MNO} <input type="text" value="0"/>[*] here, and then press the Return key.</p>	<pre> MDI No. 1 A.00 Pos A 250 mm Vel * mm/s </pre>	In order to stop during numeric input, press the <input type="text" value="ESC"/> key to cancel the input.
10.		<pre> MDI No. 1 A.00 Pos A 250.00 mm Vel 100.00 mm/s </pre>	The cursor will automatically move to the "Vel" input position.

	Operation	Screen	Reference
11.	<p>Input <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="0"/> here, and then press the Return key.</p> <p>Press the <input type="text" value="WRT"/> key.</p> <p>(The cursor will automatically move to the next [No. 2] position.)</p>	 <pre> MDI No. 1 A. 0 0 Pos A 2 5 0 . 0 0 mm Vel 3 0 0 mm / s </pre>	<p>The screen will change to the screen of Position No. 2 for Acc and Dcc.</p>


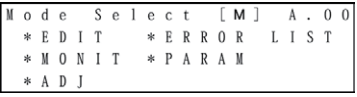

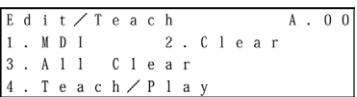


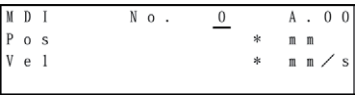




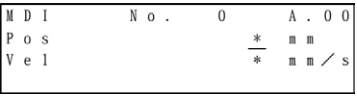


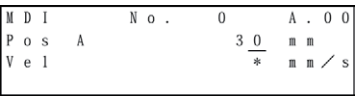




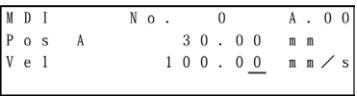
Example 2:	2 point continuous loop move Push operation 10mm position <-> 80mm position (Push range 5mm)
------------	--

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "MDI."		
3.	Set 0 into the position No. with the  or  key.		For any unregistered data, the display will show "*" sign.
4.	Move the cursor to the "Pos" input position with the  ,  ,  or  key.		
5.	Input   here, and then press the Return key.		In order to stop during numeric input, press the  key to cancel the input. Example) With the left operation, by pressing  immediately after inputting   , the status will return to the "*" display.
6.			During new position data registration, the initial values set with the user parameters for Vel, Acc, Dcc, etc., will automatically be input. In the left screen, the initial value is set as 100 mm/sec.

	Operation	Screen	Reference
7.	<p>Press the Return key.</p> <p>Press the WRT key.</p> <p>(The cursor will automatically move to the next [No. 1] position.)</p>	<pre> MDI No. 0 A. 0 0 Pos A 1 0 . 0 0 mm Vel 1 0 0 . 0 0 mm / s </pre>	<p>At the left, the user parameter is used as it is.</p> <p>The screen will change to the screen of Position No. 1 for Acc and Dcc.</p>
8.	<p>Change the display to the screen for Pos and Vel with the ITEM BACK key.</p> <p>Move the cursor to "Pos" with the ITEM BACK key.</p>	<pre> MDI No. 1 A. 0 0 Pos * mm Vel * mm / s </pre>	
9.	<p>Input DEF 8 * 0 here, and then press the Return key.</p>	<pre> MDI No. 1 A. 0 0 Pos A 8 0 mm Vel * mm / s </pre>	
10.		<pre> MDI No. 1 A. 0 0 Pos A 8 0 . 0 0 mm Vel 1 0 0 . 0 0 mm / s </pre>	<p>The cursor will automatically move to "Vel."</p>
11.	<p>Change the display to the screen for Acc and Dcc with the ITEM FWD key.</p>	<pre> MDI No. 1 A. 0 0 Acc 0 . 0 5 G Dcc 0 . 0 5 G </pre>	<p>The screen will change.</p>
12.	<p>Change the display to the screen for Push, LoTh and Range with the ITEM FWD key.</p>	<pre> MDI No. 1 A. 0 0 Push 0 % LoTh 0 % Range 0 . 1 0 mm </pre>	<p>The screen will change.</p>

	Operation	Screen	Reference
13.	<p>Input the current value during push.</p> <p>In this example, input 30%.</p> <p>Input <input type="text" value="3"/> <input type="text" value="0"/> and then press the Return key.</p> <p>Press the Return key again to move the cursor to "Range."</p>	<pre> M D I N o . 1 A . 0 0 P u s h 3 0 % L o T h 0 % R a n g e 0 . 1 0 m m </pre>	* For push control, refer to the Controller Operating Manual.
14.	<p>Input the maximum push range during push into the Range.</p> <p>In this example, input 5 mm.</p> <p>Input <input type="text" value="5"/> and then press the Return key.</p> <p>Press the <input type="text" value="WRT"/> key.</p>	<pre> M D I N o . 1 A . 0 0 P u s h 3 0 % L o T h 0 % R a n g e 5 m m </pre>	The screen will change to the screen of Position No. 2 for Push, LoTh and Range.

Example 3: Relative Coordinates pitch movement 30 mm → 40 mm → 50 mm....

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "MDI."		
3.	Set 0 into the position No. with the  or  key.		For any unregistered data, the display will show "*" sign.
4.	Move the cursor to the "Pos" input position with the  ,  ,  or  key.		
5.	Input   here, and then press the Return key.		<p>In order to stop during numeric input, press the  key to cancel the input.</p> <p>Example) With the left operation, by pressing  immediately after inputting  , the status will return to the "*" display.</p>
6.			<p>During new position data registration, the initial values set with the user parameters for Vel, Acc, Dcc, etc., will automatically be input.</p> <p>In the left screen, the initial value is set as 100 mm/sec.</p>

	Operation	Screen	Reference
7.	Press the Return key. Press the WRT key. (The cursor will automatically move to the next [No. 1] position.)	<pre> M D I N o . 0 A . 0 0 P o s A 3 0 . 0 0 m m V e l 1 0 0 . 0 0 m m / s </pre>	At the left, the user parameter is used as it is. The screen will change to the screen of Position No. 1 for Acc and Dcc.
8.	Change the display to the screen for Pos and Vel with the ITEM BACK key. Move the cursor to "Pos" with the ITEM BACK key.	<pre> M D I N o . 1 A . 0 0 P o s * m m V e l * m m / s </pre>	
9.	Input STU 1 * 0 here, and then press the Return key.	<pre> M D I N o . 1 A . 0 0 P o s A 1 0 m m V e l * m m / s </pre>	
10.		<pre> M D I N o . 1 A . 0 0 P o s A 1 0 . 0 0 m m V e l 1 0 0 . 0 0 m m / s </pre>	The cursor will automatically move to "Vel."
11.	Change the display to the screen for Acc and Dcc with the ITEM FWD key.	<pre> M D I N o . 1 A . 0 0 A c c 0 . 0 5 G D c c 0 . 0 5 G </pre>	The screen will change.
12.	Change the display to the screen for Push, LoTh and Range with the ITEM FWD key.	<pre> M D I N o . 1 A . 0 0 P u s h 3 0 % L o T h 0 % R a n g e 0 . 1 0 m m </pre>	The screen will change.

	Operation	Screen	Reference
13.	Change to the screen for Zone + and Zone- with the ITEM FWD key.	<pre> MDI No. 1 A . 0 0 Zone+ 0 . 0 0 mm Zone- 0 . 0 0 mm </pre>	The screen will change.
14.	Change to the screen for Acc Dcl Mode and Incremental with the ITEM FWD key. Move the cursor to "Incremental" with the ITEM FWD key.	<pre> MDI No. 1 A . 0 0 Acc Dcl Mode 0 Incremental 0 </pre>	
15.	Set to "Incremental" (relative coordinate specification). Input STU 1 and then press the Return key. Press the WRT key.	<pre> MDI No. 1 A . 0 0 Acc Dcl Mode 0 Incremental 1 </pre>	The screen will change to the screen of Postion No. 2 for Cmdnd Mode and Stop Mode.


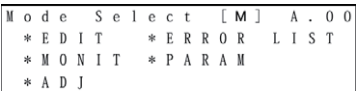

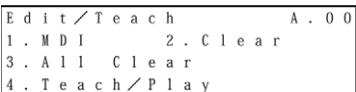

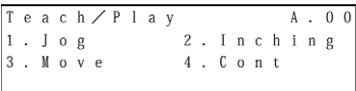





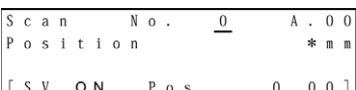
3) Direct Teach

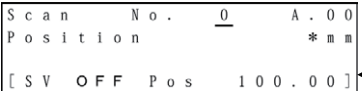



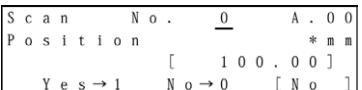
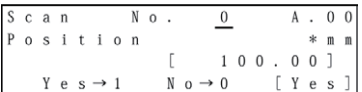


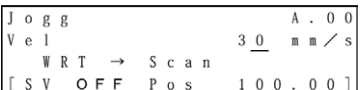
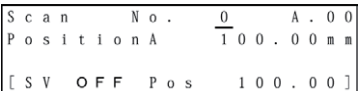
(Method: Manually moving the actuator, matching to the desired position and teaching that position into the position table)



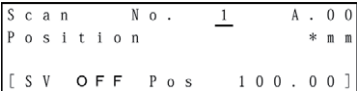
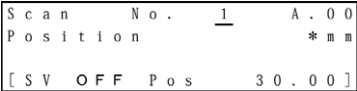

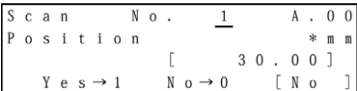
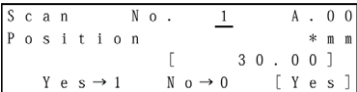


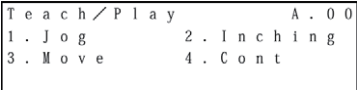
When direct teach operation is performed first after power-on, it is required to perform home return operation in advance. (Refer to page 32.) (Increment specification)

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

Example: 2 point continuous loop Point A --> Point B, speed 300mm/sec

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "Teach/Play."		
3.	Press the  key to select "Jog." (Note) Even if "2. Inching" is selected, the same direct teaching will be available.		
4.	Press the  key.		
5.	Set the position No. you want to input with the  and  key. Press the  key to put into the servo OFF status.		<p>Any remaining data will be written over.</p> <p>For any unregistered data, the display will show "**" sign.</p>

	Operation	Screen	Reference
6.	Manually move the slider and match to the desired position. Press the Return key.		<p>The controller status will be displayed on the bottom row of the screen.</p> <p>Servo Control: OFF Position: 100.00</p> <p>You can change the position No. you want to input with the  and  key.</p>
7.	Press the  key to select "Yes."		
8.	Press the Return key.		<p>As for Vel, Acc, Dcc, etc., the initial value set with the user parameter will automatically be input.</p> <p>(Note) If scan is performed without executing homing, the error message "Homing Incomplete" will be displayed.</p> <p>Return to the screen of 6 above with the ESC key to put into the servo ON status and press the  key to execute homing.</p>
9.	Press the  key.		
10.			

	Operation	Screen	Reference
11.	Set the position No. you want to input with the  or  key.		
12.	Manually move the slider and match to the desired position. Press the Return key.		
13.	Press the  key to select "Yes."		
14.	Press the Return key.		
15.	Press the  key.		
16.			The screen will return to the Teach/Play select screen.

4) Jog Teach




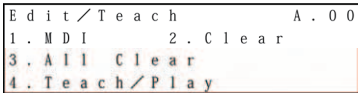

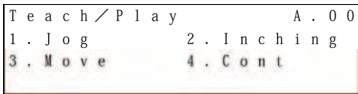






(Method: Tagging the actuator, matching to the desired position and teaching that position into the position table)



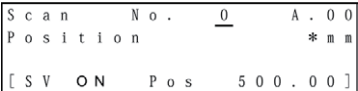

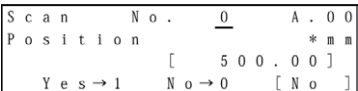
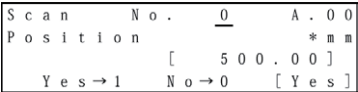


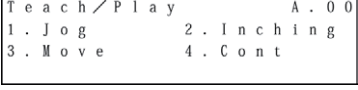
However, only the maximum speed will be gained if the maximum speed is slower than the specified speed.

When jog operation is performed first after power-on, it is required to perform home return operation in advance. (Refer to page 34.) (Increment specification)

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

Example: 2 point continuous loop Point A --> Point B, speed 300mm/sec

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "Teach/Play."		
3.	Press the  key to select "Jog."		
4.	Input the desired jog speed with the ten keys and press the Return key. The input range is from 1 mm/sec to the safety speed set for the parameter.		
5.	Move the slider with the  or  key and match to the desired position.		
6.	Press the  key.		

	Operation	Screen	Reference
7.	Set the position No. you want to input with the  or  key. Press the Return key.		Any remaining data will be written over. For any unregistered data, the display will show “*” sign.
8.	Press the  key to select “Yes.”		
9.	Press the Return key.		As for Vel, Acc, Dcc, etc., the initial value set with the user parameter will automatically be input.
10.	Press the  key.		
11.			The screen will return to the Teach/Play select screen.

5) Inching

(Method: Incremental movement using arrow key, matching to the desired position and teaching that position into the position table)


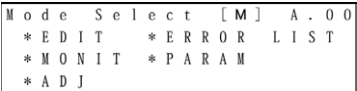

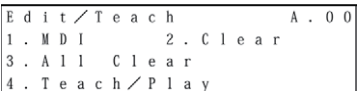

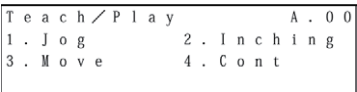



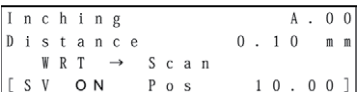


If you press the JOG- and JOG+ key once, the actuator will move by a specified pitch.



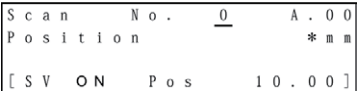

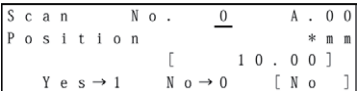
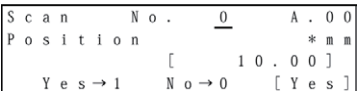



If you continue pressing the arrow key, the actuator will move by jogging at 1 mm/sec. The speed will increase every one second. Finer movement than jogging is possible.

When inching movement is performed first after power-on, it is required to perform home return operation in advance. (Refer to page 32.) (Increment specification)

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

Example: 2 point continuous loop Point A --> Point B, speed 300mm/sec

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "Teach/Play."		
3.	Press the  key to select "Inching."		
4.	Input the desired inching distance with the ten keys and press the Return key. The input range is from 0.01 mm to 1.00 mm.		
5.	Move the slider with the  and  key and match to the desired position.		
6.	Press the  key.		

	Operation	Screen	Reference
7.	Set the position No. you want to input with the  or  key. Press the Return key.		Any remaining data will be written over. For any unregistered data, the display will show “*” sign.
8.	Press the  key to select “Yes.”		
9.	Press the Return key.		As for Vel, Acc, Dcc, etc., the initial value set with the user parameter will automatically be input.
10.	Press the  key.		
11.			The screen will return to the Teach/Play select screen.

8-5-4 Data Modification

You may write over all of the position data.

Similar to new input, the following 4 cases exist:

- (1) Numeric Input (MDI): Manually enter the position data directly from Teaching Pendant ten keys.
- (2) Direct Teach: Turns the servo OFF, manually move the slider to the desired location and read that location (current position) into the position table.
- (3) Jog: Use the arrow keys to jog to the desired location and read that location (current position) into the position table.
- (4) Increment: Use the arrow keys to incrementally move and read that location (current position) into the position table.

Caution during data modification:

- * As for manual input, the data entered will erase the old data.
- * The position will be updated only when the Return key is pressed to read in the current location (direct teach, jog, increment). It does not influence speed and others.
- * Once the position data is cleared, the previous data will no longer remain anywhere. Therefore, when the next position data is registered, any data other than position will be default values.

When clearing to re-set the push assign position data, be sure to confirm all items of the position data to input required data.

8-5-5 Clear • All Clear

In this section, we will give specific examples of how to clear data in the position table.




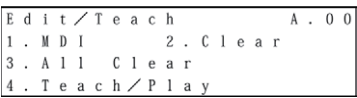


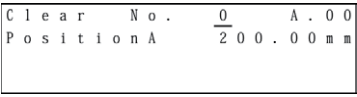

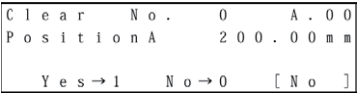
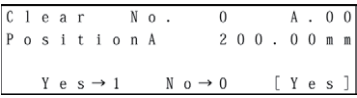
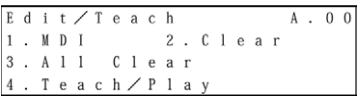
- (1) Clear: Resets the assigned position data. The data will become unregistered.
(For the input example, see page 52.)
- (2) All Clear: Resets all of all position data. (For the input example, see page 53.)

1) Clear

(Method: To clear the position data of assigned location)


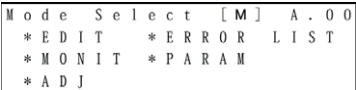

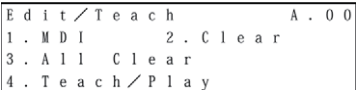

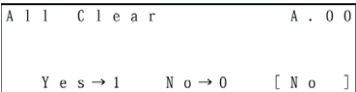
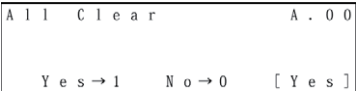
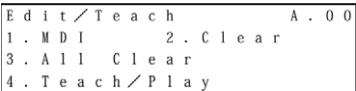
Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

Example: Clear the row of position data number 2.

	Operation	Screen	Reference
1.	Press the  key.		
2.	Press the  key to select "Clear."		
3.	Set the position No. you want to clear with the  or  key. Press the Return key.		
4.	Press the  key to select "Yes."		
5.	Press the Return key.		
6.			The data of the specified position No. will be cleared.

2) All Clear (Operation: To clear all position data)

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

	Operation	Screen	Reference
1.	Press the  key.	 <pre> Mode Select [M] A.00 *EDIT *ERROR LIST *MONIT *PARAM *ADJ </pre>	
2.	Press the  key to select "All Clear."	 <pre> Edit/Teach A.00 1.MDI 2.Clear 3.All Clear 4.Teach/Play </pre>	
3.	Press the  key to select "Yes."	 <pre> All Clear A.00 Yes→1 No→0 [No] </pre>	
4.	Press the Return key.	 <pre> All Clear A.00 Yes→1 No→0 [Yes] </pre>	
5.		 <pre> Edit/Teach A.00 1.MDI 2.Clear 3.All Clear 4.Teach/Play </pre>	All position data will be cleared.

8-5-6 Move

You may move towards a position registered in the position data table (1 step move) and continuously move through the continuous position data.

In this section, the move will differ from jog and increment move used with the arrow key. This will be moved towards a position that was registered in the position data table within the controller.

Use this move for test operation etc.

- (1) Move 1 step move from the current location to the assigned position number registered in the position table.
- (2) Continuous Continuous operation from the assigned position data number to the continuous position data number until an empty location is reached.

* What is Continuous?

In the case of the position data similar to the table below, when a Continuous command is executed from the position No., the place where data exists continuously (to the position before unregistered data (*)) will operate as one group (Example: Position No.2 → No. 3 → No. 1 → No.2 and so on).

No.	Posi.		Vel. Acc./Dcc.
	mm	mm/s	G
0	*	*	*
1	100.00	20	0.05
2	200.00	33	0.11
3	333.33	100	0.22
4	*	*	*
5	555.55	333	0.22
6	666.66	444	0.11
7	777.77	777	0.07



In the case of the Teaching Pendant, continuous movement is performed only through 64 positions such as position No. 0-63 and No. 64-127.

As shown in the example below, continuous movement continues by returning to position No. 61 after No. 63 (returning to the first position No. where position data is continuously input).

No movement is made from position No. 63 to No. 64.

No.	Position	Velocity
	mm	mm/s
0	*	*
1	100.00	20
60	*	*
61	300.00	30
62	400.00	40
63	500.00	50
64	600.00	60
65	700.00	70



Specific examples will be provided to explain operation procedures.


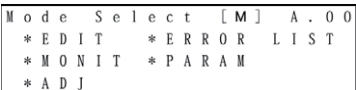

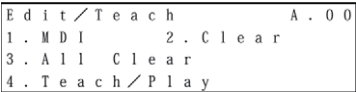

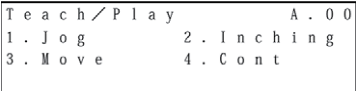
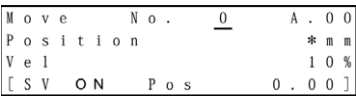


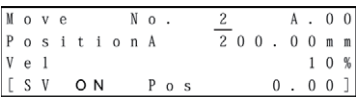
Caution: With regard to PCON, ACON, SCON, ERC2 complete positions will be output.
 The positioning complete output will not turn ON when push mode does not encounter a force.
 When move or Continuous is performed first after power-on, it is required to perform home return operation in advance. (Refer to page 32.) (Increment specification)











1) Move


(Operation: Registered position data number assigned move)

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

Example: Current position → move towards position number 2, 3

	Operation	Screen	Reference
1.	Press the  key.		
2.	Pres the  key to select "Teach/Play."		
3.	Press the  key to select "Move."		
4.			For any unregistered data, the display will show "*" sign.
5.	Set the position No. you want to move with the  or  key. Press the Return key.		

	Operation	Screen	Reference
6.	Select "Vel" with the  or  key.	<pre> Move No. 2 A.00 Position A 200.00mm Vel 10% [SV ON Pos 0.00] </pre>	<p>Speed is divided into 3 levels and can be selected using the  or  key.</p> <p>With the  key, the speed will change in the incremental direction (10%→50%→100%).</p> <p>With the  key, the speed will change in the decremental direction (100%→50%→10%).</p> <p>(Note) When PCON, ACON or SCON is connected, the maximum speed will be the safety speed set for the parameter if the MANU operation mode is set to the Teach mode 1 (safety speed: valid).</p>
7.	If you press the  key, movement will be made to the location of the position No. you set.	<pre> Move No. 2 A.00 Position A 200.00mm Vel 10% [SV ON Pos 0.00] </pre>	When the servo is not ON, press the  key to put into the servo ON status.
8.	<p>When moving towards position of No. 3 continuously:</p> <p>Set 3 into the position No. with the  key.</p> <p>If you press the  key continuously, movement will be made to the location of position No. 3.</p>	<pre> Move No. 3 A.00 Position A 300.00mm Vel 10% [SV ON Pos 200.00] </pre>	

	Operation	Screen	Reference
9.	Press the  key.	<pre> Move No. 3 A.00 Position A 300.00mm Vel 10% [SV ON Pos 300.00] </pre>	
10.		<pre> Teach/Play A.00 1. Jog 2. Inching 3. Move 4. Cont </pre>	The screen will return to the Teach/Play select screen.

Caution: When moving towards position in push mode.

After the actuator pushes the work and position complete output turns ON, the actuator is in a state of continuously pressing the work.




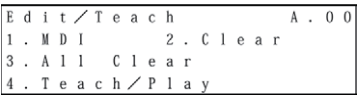

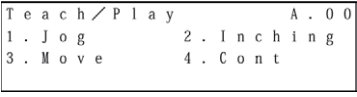
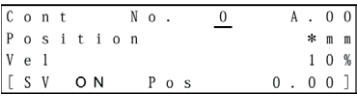


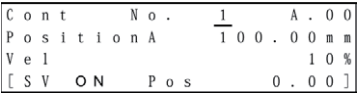
Be extremely careful about handling at this time.



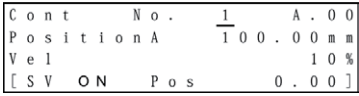





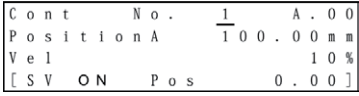




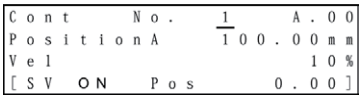
2) Continuous Move


(Operation: Registered position data number assigned continuous move)

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2

Example: Current position → Continuous move towards position numbers 1 to 3

	Operation	Screen	Reference
1.	Press the  key.	 <pre> Mode Select [M] A.00 *EDIT *ERROR LIST *MONIT *PARAM *ADJ </pre>	
2.	Press the  key to select "Teach/Play."	 <pre> Edit/Teach A.00 1.MDI 2.Clear 3.All Clear 4.Teach/Play </pre>	
3.	Press the  key to select "Cont."	 <pre> Teach/Play A.00 1.Jog 2.Inching 3.Move 4.Cont </pre>	
4.		 <pre> Cont No. 0 A.00 Position *mm Vel 10% [SV ON Pos 0.00] </pre>	For any unregistered data, the display will show "*" sign.
5.	Set the position No. you want to move first with the  or  key. Press the Return key.	 <pre> Cont No. 1 A.00 Position A 100.00mm Vel 10% [SV ON Pos 0.00] </pre>	






	Operation	Screen	Reference
6.	Select "Vel" with the  or  key.		<p>Speed is divided into 3 levels and can be selected using the  or  key.</p> <p>With the  key, the speed will change in the incremental direction (10%→50%→100%).</p> <p>With the  key, the speed will change in the decremental direction (100%→50%→10%).</p> <p>(Note) When PCON, ACON or SCON is connected, the maximum speed will be the safety speed set for the parameter if the MANU operation mode is set to the Teach mode 1 (safety speed: effective).</p>
7.	<p>If you press the  key, continuous movement will start.</p> <p>The screen display will change to the screen of the position No. currently moving.</p>		<p>When the servo is not ON, press the  key to put into the servo ON status.</p>
8.	<p>When stopping continuous operation, press the  or  key.</p> <p>When the key is pressed, operation will decelerate and stop.</p> <p>When performing continuous operation again, press the  key.</p>		

	Operation	Screen	Reference
9.	When operation stops, press the  key.)	<div> Cont No. 1 A.00 Position A 100.00mm Vel 10% [SV ON Pos 0.00] </div>	
10.		<div> Teach/Play A.00 1. Jog 2. Inching 3. Move 4. Cont </div>	The screen will return to the Teach/Play select screen.

8-5-7 Servo ON/OFF

Servo ON/OFF can be performed.

Caution: Operating instructions are described on the screens of PCON, ACON, SCON, ERC2



	Operation	Screen	Reference
1.	Press the  key.	<pre> Mode Select [M] A.00 *EDIT *ERROR LIST *MONIT *PARAM *ADJ </pre>	
2.	Press the  key to select "Teach/Play."	<pre> Edit/Teach A.00 1.MDI 2.Clear 3.All Clear 4.Teach/Play </pre>	
3.	Press the  key to select "Cont."	<pre> Teach/Play A.00 1.Jog 2.Inching 3.Move 4.Cont </pre>	
4.		<pre> Cont No. 0 A.00 Position *mm Vel 10% [SV ON Pos 0.00] </pre>	For any unregistered data, the display will show "*" sign.
5.	If you press the  key in the servo ON status, the status will change to the servo OFF.	<pre> Cont No. 0 A.00 Position *mm Vel 10% [SV OFF Pos 0.00] </pre>	
6.	If you press the  key in the servo OFF status, the status will change to the servo ON.	<pre> Cont No. 0 A.00 Position *mm Vel 10% [SV ON Pos 0.00] </pre>	

Servo ON/OFF can also be performed in the same way in "1. Jog," "2. Inching," or "4. Cont" mode.

8-5-8 Pulse Train (PCON-PL/PO, ACON-PL/PO, SCON: Pulse Train Mode) Based Jogging

In the case of the PCON-PL/PO, ACON-PL/PO, or SCON controller (pulse train mode), if you select “Jog” on the Jog/Inching select screen, servo ON/OFF, homing, or jog operation can be performed. If you select “Inching,” inching operation can be performed.


Press the  key.


If you press the  key, jog operation can be performed. If you press the  key, inching operation can be performed.

J o g / I n c h i n g		A . 0 0
1 . J o g	2 . I n c h i n g	

(1) Jog operation





The Jog screen will be displayed.

If you press the  key, the cursor will move in the positive direction of the displayed coordinates.

If you press the  key, the cursor will move in the negative direction of the displayed coordinates.

J o g	A . 0 0	
V e l	3 0	m m / s
[H E N D	0 F F]	
[S V	O F F	P o s 0 . 0 0]

② Servo ON/OFF ① Current position ③ Jog speed ④ Homing

① Current position: Indicates the current position. The unit can be changed between mm and pulse with the , ,  or  key.

② Servo ON/OFF: If you press the  key, the servo ON/OFF status will be reversed.

③ Jog speed: Input the desired jog speed with the ten keys and press the Return key. The input range is from 1 mm/sec to the safety speed set for the parameter.

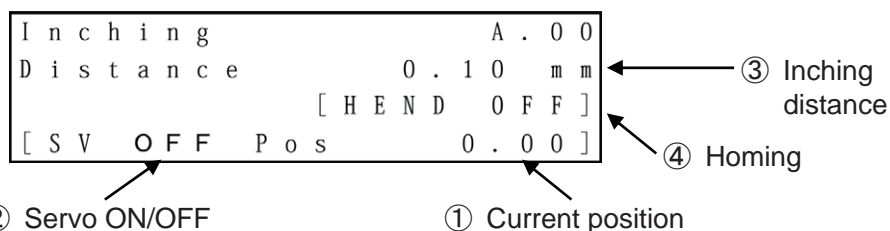
④ Homing: If you press the  key, homing will be performed.

(2) Inching operation

The Inching screen will be displayed.

If you press the **JOG+** key, the cursor will move in the positive direction of the displayed coordinates.

If you press the **JOG-** key, the cursor will move in the negative direction of the displayed coordinates.



① Current position: Indicates the current position. The unit can be changed between mm and pulse with the **◀**, **▼**, **▲** or **▶** key.

② Servo ON/OFF: If you press the **SERVO** key, the servo ON/OFF status will be reversed.

③ Inching distance: Input the desired inching distance with the ten keys and press the Return key. The input range is from 0.01mm to 1.00mm set for the parameter.

④ Homing: If you press the **HOME** key, homing will be performed.

8-6 Monitor

The I/O status and current position will be displayed for all the controllers connected on the serial communication line.

Press the  key.

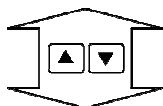
```

M o n i t o r                A . 0 0
A x i s   S t a t u s
P o s                0 . 0 0 m m
V e l                0 . 0 0 m m / s
  
```



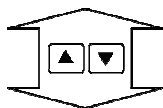
```

M o n i t o r                A . 0 0
A x i s   S t a t u s
S V   O N           E r r   N o . 0 0 0
C u r r e n t   R a t e   1 6 . 5 %
  
```



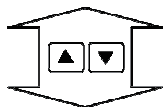
```

M o n i t o r                A . 0 0
P I O   P a t t e r n       [ 0 ]
I N    0 0 0   S T 0       [ O F F ]
I N    0 0 1   S T 1       [ O F F ]
  
```



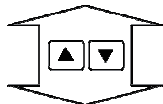
```

M o n i t o r                A . 0 0
P I O   P a t t e r n       [ 0 ]
I N    0 0 2   S T 2       [ O F F ]
I N    0 0 3   S O N       [ O F F ]
  
```



```



M o n i t o r                A . 0 0
P I O   P a t t e r n       [ 0 ]
O U T   0 0 2   L S 2       [ O F F ]
O U T   0 0 3   S V         [ O N ]
  
```






```

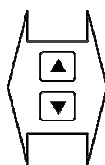
M o n i t o r                A . 0 0
P I O   P a t t e r n       [ 0 ]
O U T   0 0 2   L S 2       [ O F F ]
O U T   0 0 3   S V         [ O N ]
  
```

The figure at the left shows an example of the PCON-CY controller.

* The display contents vary depending on the controller or controller's I/O pattern. For details, refer to the operating manual of each controller. If you press the  or  key, the axis to monitor can be changed.

If you press the  or  key, the screen will change.

To end monitoring, press the  key.




```


M o n i t o r                A . 0 0
P I O   P a t t e r n       [ 0 ]
O U T   0 0 4   H E N D     [ O N ]
O U T   0 0 5   * A L M     [ O N ]
  
```


After this, the screen will change to the special input port or version display screen.


- ① On the axis status screen, if you press the  key, the screen will change to the input port monitor screen.

If you press the  key, the screen will change to the version display screen.

- ② On the input port screen, if you press the  key, the screen will change to the output port monitor screen,

If you press the  key, the screen will change to the axis status screen.

- ③ On the output port screen, if you press the  key, the screen will change to the input port monitor screen.

If you press the  key, the screen will change to the special input port monitor screen.

● Display description

	M o n i t o r	A . 0 0
	A x i s S t a t u s	
①	P o s	0 . 0 0 m m
②	V e l	0 . 0 0 m m / s

	M o n i t o r	A . 0 0	
	A x i s S t a t u s		
③	S V O N	E r r N o . 0 0 0	④
⑤	C u r r e n t R a t e	1 6 . 5 %	

① Displays the axis position in [mm].

In the case of the PCON-PL/PO, ACON-PL/PO or SCON controller (pulse train mode), if you press the *
0 key, the display will change to the pulse display.

② Displays the speed of the moving axis in [mm/sec].

In the case of the PCON-PL/PO, ACON-PL/PO or SCON controller (pulse train mode), if you press the *
0 key, the display will change to the pps display.

	M o n i t o r	A . 0 0
	A x i s S t a t u s	
	P o s	0 . 0 0 p u l s e
	V e l	0 . 0 0 p p s


③ Displays the servo ON/OFF status of the axis.

④ Displays the error No. when an error occurs.

⑤ Displays the percent rated current in [%].

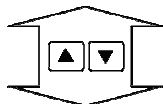
In the case of the PCON, ACON, SCON, ERC2 controller, if you press STU
1 key, the current value will be displayed in [mA].

	M o n i t o r	A . 0 0
	A x i s S t a t u s	
	S V O N	E r r N o . 0 0 0
	C u r r e n t R a t e	1 9 8 m A

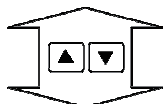
If you press the  key on the last screen of input ports, the special input port screen will be displayed.

The special input port screen will display special input ports such as HMCK (home check sensor).

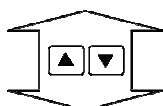
M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 0 0	--	[0 F F]
0 0 1	--	[0 F F]



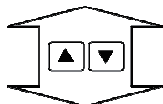
M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 0 2	--	[0 F F]
0 0 3	H M C K	[0 F F]



M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 0 4	--	[0 F F]
0 0 5	--	[0 F F]





M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 0 6	--	[0 F F]
0 0 7	E N B L	[0 N]






M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 0 8	--	[0 N]
0 0 9	--	[0 N]



M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 1 0	--	[0 F F]
0 1 1	--	[0 F F]

If you press the  or  key, the axis to monitor can be changed.

If you press the  or  key, the screen will change.


To end monitoring, press the  key.


M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 1 4	--	[0 N]
0 1 5	--	[0 F F]




M o n i t o r		A . 0 0
S p e c i a l	i n p u t	p o r t
0 1 2	--	[0 N]
0 1 3	--	[0 F F]



After this, the screen will change to the special input port or version display screen.


- ① On the special input port monitor screen, if you press the  key, the screen will change to the output port monitor screen.

If you press the  key, the screen will change to the version display screen.

If you press the  key on the last screen of special input ports, the version display screen will be displayed.

M o n i t o r	A . 0 0
P C O N - C Y	V e r A E 0 3 F F D 8
T P	V e r 1 . 0 0

If you press the  or  key, the axis to monitor can be changed.

To end monitoring, press the  key.

8-7 Error List

Errors occurring after the connection of the Teaching Pendant and those occurring after a controller's power-on will be displayed.

Press the  key.

Error List	0	A . 0 0
Error No.	[0 E 8]	
[A , B disconnect]		
Detailed Code	[- - - -]	

Alarm detailed code

(In the case of "0," - - - - will be displayed.)

The Error List screens of PCON, ACON or SCON are comprised of 0 to 16.


The previous 16 alarm-level errors including the last (latest) error will be displayed.

In the case of PCON, ACON or SCON, the alarm list contents will be maintained even after the power is turned OFF.


The Error List screens of RCP2, RCS, E-Con or RCP2 are comprised of 0 to 8.

The previous 8 alarm-level errors including the last (latest) error and one last-detected error of the warning level will be displayed.

Error List	0	A . 0 0
Error No.	[0 E 8]	
Address	[- - - -]	
Time	[0 0 0 0 : 0 0 : 1 2]	





On the screen where the error description is displayed, if you press the  key, Address and

Time will be displayed.

If you press the  key, the screen will return to the previous screen.

(Note) The power ON log (no error) displays that the power has been applied to the controller. No error has occurred.

Time displays the time elapsed from this power ON log (no error).

If you press one of the , ,  or  keys, the mode will change to the mode of the pressed key.

8-8 User Parameters

8.8.1 User Parameters

Parameters are displayed and edited.

Press the  key.

```

User Parameter      A . 0 0
No .      1
Zone + [ m m ]
                                     5 0 . 0 0
    
```

```

User Parameter      A . 0 0
No .      1
Zone + [ m m ]
                                     5 0 . 0 0
    
```



```

User Parameter      A . 0 0
No .      2
Zone - [ m m ]
                                     4 0 . 0 0
    
```





```

Software Reset      A . 0 0

Yes → 1      No → 0      [ Y e s ]
    
```


Each parameter can be changed using the  or  key.

When the cursor is located at “No.,” it is also possible to change to the desired user parameter by directly inputting a numeric value of the parameter No. with the ten key and pressing the Return key.


When changing a parameter, move the cursor to the parameter value with the , ,  or  key or Return key.

Input a numeric value with the ten key and press the Return key.

Press the  key.


The screen will change to the next screen. Press the  key.

When “1” (Yes) is selected for “Is the writing data written?,” the screen will change to the Software Reset screen.

Press the  key and press the Return key.

S e r v o O F F	A . 0 0
Y e s → 1 N o → 0	[Y e s]

When the servo is ON, the screen will change to the Servo OFF confirmation screen.

If you press the  key and then press the Return key, the controller will restart and the screen will change to the Mode Select screen. Since servo is automatically turned OFF, it is not required to turn SON input OFF.

Models which support the software reset (restart) are PCON, ACON, SCON, ERC2.

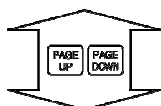
For any model which does not support the software reset, restore the power to the controller.

On the following page, user parameter display examples of the PCON-CY controller are provided.

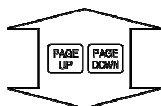
* The contents will vary depending on each controller. Refer to the operating manual of each controller.

Examples of PCON-CY Controller

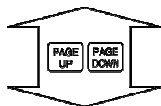
User Parameter	A . 0 0
No .	<u>1</u>
Zone + [mm]	5 0 . 0 0



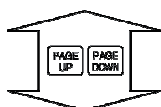
User Parameter	A . 0 0
No .	<u>2</u>
Zone - [mm]	4 0 . 0 0



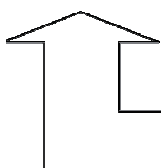
User Parameter	A . 0 0
No .	<u>3</u>
Soft Limit + [mm]	1 5 0 . 3 0



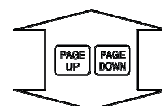
User Parameter	A . 0 0
No .	<u>4</u>
Soft Limit - [mm]	- 0 . 3 0



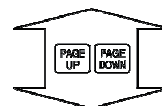
User Parameter	A . 0 0
No .	<u>5</u>
Home Dir (0 : C W 1 : C C W)	1



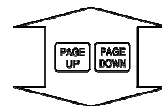
User Parameter	A . 0 0
No .	<u>6</u>
Push Comp [msec]	2 5 5



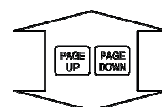
User Parameter	A . 0 0
No .	<u>7</u>
Servo Gain No .	8



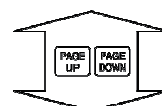
User Parameter	A . 0 0
No .	<u>8</u>
Vel Init [mm / s]	2 5 0



User Parameter	A . 0 0
No .	<u>9</u>
Acc / Dec Init [G]	0 . 3 0



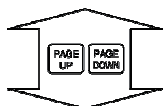
User Parameter	A . 0 0
No .	<u>10</u>
Rnge Init [mm]	0 . 1 0



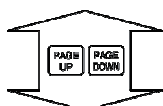
On following page

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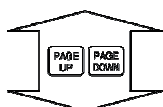
```
User Parameter A.00
No. 12
Pos Hold Cur [%]
30
```



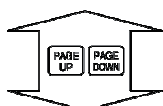
```
User Parameter A.00
No. 13
Home Cur [%]
30
```



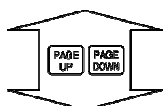
```
User Parameter A.00
No. 16
SIO Baudrate [bps]
230400
```



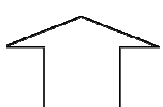
```
User Parameter A.00
No. 17
Dly Time [msec]
0
```



```
User Parameter A.00
No. 18
Home Sensor
0
```

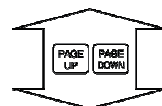


```
User Parameter A.00
No. 21
Servo ON (1:Dsb)
0
```

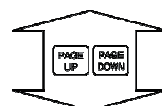


PAGE UP PAGE DOWN

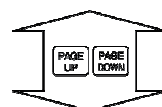
```
User Parameter A.00
No. 22
Home Offset [mm]
3.00
```



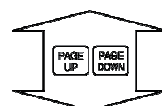
```
User Parameter A.00
No. 23
Zone 2+ [mm]
10.00
```



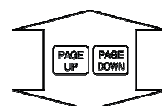
```
User Parameter A.00
No. 24
Zone 2- [mm]
20.00
```



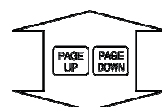
```
User Parameter A.00
No. 25
PIO Pattern
0
```



```
User Parameter A.00
No. 28
Pole Sense Dir
0
```



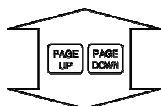
```
User Parameter A.00
No. 29
Pole Sense Tim [msec]
10
```



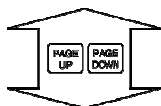
On following page

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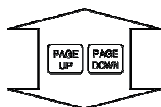
User Parameter	A.00
No. 31	
Prop Gain	184



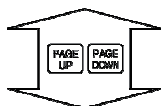
User Parameter	A.00
No. 32	
Int Gain	2816



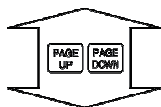
User Parameter	A.00
No. 33	
Torque Filter	0



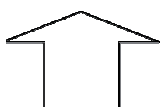
User Parameter	A.00
No. 34	
Push Vel [mm/s]	20



User Parameter	A.00
No. 35	
Safety Vel [mm/s]	250

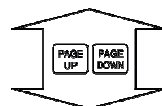


User Parameter	A.00
No. 36	
Auto Servo OFF1 [sec]	0

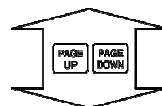


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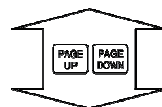
User Parameter	A.00
No. 37	
Auto Servo OFF2 [sec]	0



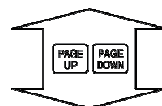
User Parameter	A.00
No. 38	
Auto Servo OFF3 [sec]	0



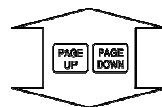
User Parameter	A.00
No. 39	
PEND Output Method	0



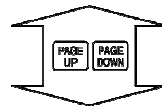
User Parameter	A.00
No. 42	
Enable Fnc (1:Dsb)	0



User Parameter	A.00
No. 43	
Home Conf Snsr	0



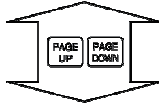
User Parameter	A.00
No. 45	
Silent Interval Sc1	0



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User	Parameter	A . 0 0
No .	4 6	
Vel	0 v e r r i d e [%]	
		1 0 0



```

User Parameter A . 0 0
No . 5 3
Stop Mode Default
                                0

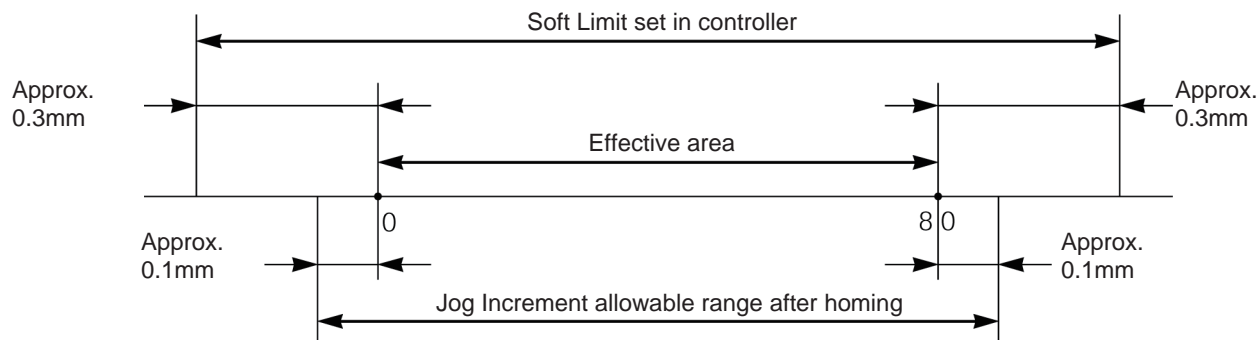
```

- When soft limit is modified at the customer site, please set a value which extends 0.3mm outside of the effective area.

Example: When setting the effective area between 0mm~80mm

Soft limit + side: 80.3

Soft limit - side: -0.3



Caution: Please restore the controller power after making parameter changes. Alternatively, reset software in the case of any model which supports the software reset function. Although pressing the emergency switch or port switch ON/OFF will rewrite the parameter, there may be ones that will not be changed.

* Regarding parameter, please refer to the Controller Operating Manual.

8.8.2 Pause, Servo ON Input Enable and Disable Setting

(1) Pause

Pause input can be enabled or disabled with user parameter No. 15.

0: Enb, 1: Dsb

(2) Servo ON input

Servo ON input can be enabled or disabled with user parameter No. 21.


0: Enb, 1: Dsb

8-9 User Adjustment

8-9-1 Homing Operation and Axis Number Setting

Execute homing.

Set the axis number of the controller (PCON, ACON, ERC2, RCP-RSI, RCP-RM1, etc.).

Press the  key.

U s e r	A d j u s t m e n t	A . 0 0
A d j u s t	N o .	[0]
A l l o c .	A x i s N o .	[0]

- If you input 1 into Adjust No. and press the Return key, homing will be performed.

- Axis number setting

Move the cursor to Adjust No. with the ▼ key. Input the axis number and press the Return key.

Input 2 into Adjust No. and press the Return key.


- * In the case of the PCON-C/CG and other controllers for which the axis number is set with the rotary switch on the front panel of the controller, axis number setting is not available.

Caution: Caution: Do not input any numeric value other than 1, 2, 3, 4 and 5119 into Adjust No. In the case of the RCP or RCP2 controller, 0 or 2 is set to parameter No. 25 (PIO pattern) (when there is no servo ON input), do not input 92 into Adjust No., either. The controller will be inoperable due to no servo ON input.

8-9-2 Software Reset


Software reset (controller restart) will be performed.


The compatible models are PCON, ACON, SCON, RCP2, ERC2

Input  into "Adjust No." and press the Return key.

S o f t w a r e R e s e t A . 0 0
Y e s → 1 N o → 0 [Y e s]


The screen will change to the Software Reset screen.

Press the  key and press the Return key.

(When not resetting software, press the  key and press the Return key. The screen will return to the Mode Select screen.)

S e r v o O F F A . 0 0
Y e s → 1 N o → 0 [Y e s]

When the servo is ON, the screen will change to the Servo OFF confirmation screen.


Press the  key and press the Return key. Then the controller will restart and the screen will change to the Mode Select screen. Since the servo is automatically turned OFF, it is not required to turn SON input OFF.

8-9-3 Error List Clear

All the contents of the error lists will be cleared.


The compatible models are PCON, ACON, SCON, ERC2

U s e r	A d j u s t m e n t	A . 0 0
A d j u s t	N o .	[0]
A l l o c .	A x i s N o .	[0]


Input  into "Adjust No." and press the Return key.

E r r o r	L i s t	C l r	A . 0 0
Y e s → 1	N o → 0	[Y e s]	

The screen will change to the Error List Clr screen.

Press the  key and press the Return key.





The error list will be cleared and the screen will return to the Mode Select screen.


(When not clearing the error list, press the  key and press the Return key. The screen will return to the Mode Select screen.)

8-10 TP Operation Mode

The operation mode will be set in the manual mode (MANU).


The compatible models are PCON, ACON, SCON, ERC2.

When changing the TP operation mode, press the key of the mode you want to change from among the , ,  and  keys.

As an example, when changing from the TEACH1 mode status to the TEACH2 mode, press the  key.

T P O p e M o d e C h a n g e			
T E A C H 1		→	T E A C H 2
Y e s → 1		N o → 0	[Y e s]

The screen will change to the TP Ope Mode Change data writing confirmation screen.

If you press the  key and press the Return key, the TP mode will change and the screen will change to the Mode Select screen.

The LED of TEACH2, which is the TP operation mode display LED, will light.

Select the operation mode from the following 4 menu items:

- Teach 1: The LED is lit in the TEACH1 mode.

PIO Prh: Enables writing of position data, parameters, etc., in the controller and commands of the actuator movement system.

SftyVel Efct: Keeps the maximum speed at the safety speed set for the parameter regardless of position data.

- Teach 2: The LED is lit in the TEACH2 mode.

PIO Prh: Enables writing of position data, parameters, etc., in the controller and commands of the actuator movement system.

SftyVel Non: Enables movement at the speed registered in position data.

- Monitor 1: The LED is lit in the MONIT1 mode.

PIO Prh: Enables monitoring only. Writing of position data, parameters, etc., in the controller and commands of the actuator movement system are disabled.

SftyVel Efct: Keeps the maximum speed at the safety speed set for the parameter regardless of position data.

- Monitor 2: The LED is lit in the MONIT2 mode.

PIO Prh: Enables monitoring only. Writing of position data, parameters, etc., in the controller and commands of the actuator movement system are disabled.

SftyVel Non: Enables movement at the speed registered in position data.

8-11 End

Before removing the Teaching Pendant from the RC controller, be sure to execute End.

Operation:

1. Press the  key for more than 2.5 seconds.

The screen will change to the TP end screen.


```
Operation Start / End
TP [Efct]
1. Complete
2. Reconnection
```

2. Press the  key to select "Complete."

The screen display will change to "Non" and the Teaching Pendant will be disconnected from the controller.

```
Operation Start / End
TP [Non]
1. Complete
2. Reconnection
```

In the case of any controller with a PORT switch, turn the controller PORT switch to OFF and remove the Teaching Pendant connector.

When reconnecting the Teaching Pendant to the controller without removing it, press the  key to select "Reconnection." Reconnection will be established and operation will start from the initial screen.

Caution: When multiple axes are connected with a controller link cable, after recycling power of a controller that is not directly connected to the Teaching Pendant, please execute a reconnect.

Caution: In the case of the PCON or ACON controller with no AUTO/MANU switch, set the TP operation mode to "Monitor 2" before removing the Teaching Pendant. (Refer to "8.10 TP Operation Mode.")

when the controller is set by connecting the Teaching Pendant to the gateway unit/SIO converter, the conditions shown below occur.

- If the Teaching Pendant is disconnected while the setting of "Teach 1" or "Teach 2" remains, I/O will become invalid and control from PLC will become impossible.
- If the Teaching Pendant is disconnected while the setting of "Monitor 1" remains, the maximum speed will become the safety speed set for the parameter regardless of a command from PLC.


9. Message Area

In the message screen, content during error and warning will be displayed.

Code No.	Error Label	Error Reset	Reference
000~07F	Controller Warning	Yes	Controller rejects command
080-0FF	Controller Error	Note	Error inside the controller
100~1FF	TP Message	Yes	Input error, guide message, etc.
200~2FF	TP Movement Release	Yes	Movement continuation impossible
300~3FF	TP Cold Start Error	No	TP Power install or reconnect are necessary.

TP: Teaching Pendant


Note) Refer to "9.3 Controller Error."

- * In the case of any error with error reset "Yes," if you press the  key, the error will be reset. All the error lists in the controller can be cleared with error list clear of User Adjustment. (Refer to 8.9.3.)

9-1 Warning Label Error (Code No. 000h – 07Fh)

Warning message is cleared by recovery procedure as follows:

Release operation:

1. First, confirm the cause of the warning and resolve the problem.
2. Press down  key.

Warning is probably due to the following possibilities:

- RS485 communication abnormality
- Teaching Pendant operational mistake

a) RS 485 communication related abnormality

Indicates occurrence of any abnormality on the RS485 communication line.

Code No: 05Ah, 05Bh, 05Dh, 05Eh, 07Fh (Communication error detected by the controller)

Cause: (1) Teaching Pendant is in conflict with other devices (PLC or PC.)

For example, when move command is delivered by PIO signal from teaching while communicating to other devices (PLC), "075h" will occur during homing.

(2) Influence by foreign noise or connections is not properly installed.

The Teaching Pendant and RC controller execute packet communication (move instruction, data transfer, etc.) at all times. At this time, when data changes due to noise, the RC controller will determine that it is incorrect data and will reject the data.

Solution: (1) Confirm the above causes. In the case of frequent warning occurrences, please separately set the signal cable and power line.

(2) Be sure to use one unit to operate the RC controller.

See to it that the Teaching Pendant will not conflict with the PIO signal.

9-2 Teaching Pendant Message Level Error

Teaching Pendant Operational Mistake:


When you attempt to input an incorrect value, the message label error will occur.

Code No: 112h, 113h, 114h, 118h, 11Eh, 11Fh, etc. (keypad input value is incorrect.)

9-3 Controller Error

An alarm detected from the controller side can be displayed.

This is a serious error due to an abnormality related to servo control and electricity. Please read through the RC Controller operating manual carefully for error compliance.

If any errors of the below code numbers occur, it is required to perform the error reset of the controller (press the  key) to reset it in the case of a movement release level error. It is required to perform the reset of the controller software in the case of a cold start level error. (Refer to 8.9.2.) With regard to the controllers not equipped with the software reset function, it is required to turn on the power again.

Code No: 0B0h, 0B1h, 0B8h, 0B9h, 0BBh, 0BCh, 0BDh, 0BEh

0C0h, 0C1h, 0D0h, 0D1h, 0D8h, 0E0h, 0E8h, 0E9h, 0EAh, 0F8h

For details of error codes, refer to the operating manual of the controller you use.

* Appendix

Parameter (Shipment) Initialization Method

Parameters will be changed (initialized) to shipment parameters.

The compatible models are PCON, ACON and SCON.

Caution: Please take note that if parameter (shipment) initialization is performed, user-set parameters will be changed to shipment parameters.

U s e r A d j u s t m e n t	A . 0 0
A d j u s t N o .	[0]
A l l o c . A x i s N o .	[0]

Input MNO
5 STU
1 STU
1 GHI
9 for “Adjust No.” and press the Return key.

P a r a m e t e r I n i t	A . 0 0
Y e s → 1 N o → 0	[Y e s]

The screen will change to the Parameter Init execution confirmation screen.

Press the STU
1 key and press the Return key.

(When not performing parameter initialization, press the *
0 key and press the Return key. The screen will return to the Mode Select screen,)

S o f t w a r e R e s e t	A . 0 0
Y e s → 1 N o → 0	[Y e s]

The screen will change to the Software Reset screen.

Press the STU
1 key and press the Return key.

When the servo is ON, the screen will change to the Servo OFF confirmation screen.

S e r v o O F F	A . 0 0
Y e s → 1 N o → 0	[Y e s]

Press the STU
1 key and press the return key.

Parameters will be initialized and become shipment parameters.

Since the servo is automatically turned OFF, it is not required to turn SON input OFF.

Caution: If software reset has not been executed, parameters have been rewritten to shipment parameters but operation will not be performed with shipment parameters.
After the next reset or power-on, the parameters will be effective.


Teaching Pendant Error Messages

As an example, if an input value is larger than the set range during MDI-mode position data input, the following error screen will be displayed:


```

T P   E r r o r
E r r o r   N o .       [ 1 1 4 ]
[ D a t a   t o o   l a r g e   ]

```

If you press the  key, the screen will return from the error display screen to the previous screen.

In this case, the screen will return to the MDI-mode position data input screen.

The screen will return to the previous screen from the error display screen even using the  key. However, in this case, controller alarm reset will be performed simultaneously.

(Note) Since emergency stop, motor voltage reduction and absolute battery voltage reduction are not alarms, the alarm code will display “- - -” sign.

Listed in the table below are Teaching Pendant specific errors.

For error of controller, refer to the Operating Manual of each controller.

Code	Message name	Description
112	Input Incorrect Error	An incorrect value was entered for a parameter. (Example) 9601 was entered as the serial communication speed by mistake. Reenter a correct value.
113	Input Under Error	The entered value is smaller than the setting range.
114	Input Over Error	The entered value is larger than the setting range. Refer to the actuator specifications or parameter table and reenter a correct value.
115	Homing Incomplete	The current position was written when home return was not yet completed. Execute home return again.
117	No Move Data	Target position is not set under the selected position number. Enter the target position first.
11E	Pair Data Mismatch	The values indicating the magnitude relationship of a pair of data are incorrect. (Example) The same value was entered in both the parameters for + and – soft limits. Reenter correct values.
11F	Absolute Value Error	The minimum movement toward the target position is determined by the lead length of the drive system and resolution of the encoder. This message indicates that the entered target value is smaller than the minimum movement. (Example) If the actuator is the RCP2 Series actuator and the lead length is 20 mm, the encoder's resolution is 800 pulses and accordingly the minimum movement becomes $20 \div 800 = 0.025$ mm/pulse. In this case, this message will be displayed if 0.02 mm is entered at the target position.
121	Push search end over	The final position in push operation exceeds the soft limit. This has no negative effect if the actuator contacts the work. If the actuator misses the work, however, the soft limit will be reached and this message is displayed as a warning. Change either the target position or positioning band.

Code	Message name	Description
122	Allocate, multi-axes connect	Address was assigned when multiple axes were connected. Assign each address only when one axis is connected.
133	Change to axis number prohibit	In the case of the PCON-C/CG, ACON-C/CG, or SCON controller, the axis number is set with the rotary switch on the front panel. It cannot be set with the Teaching Pendant.
-	Change to axis number OK Controller initialize OK Home Change All Clear IO function changed	These messages are displayed to confirm operation. (They do not indicate an operation error or other abnormality.)
201	Emergency Stop	An emergency stop condition was detected. (This is not an error.) It is displayed for PCON, ACON and SCON.
-	Emergency Stop	This message indicates an emergency stop condition. (This is not an error.) It is displayed for PCON, ACON and SCON.
-	Motor voltage drop	This message indicates the motor drive power shut-off condition due to an open circuit between the MPI terminal and MPO terminal. (Note) If this message occurs when a circuit between the MPI terminal and MPO terminal is closed, a controller failure is suspected.
-	ABS battery voltage drop	This message indicates that the battery voltage dropped when the power was turned ON.
20A	During movement, Servo OFF	This message indicates that the servo ON signal (SON) was turned OFF by the PLC while the actuator was moving and that the servo turned OFF and the movement was disabled as a result.
20C	During movement, CSTR-ON	This message indicates that the start signal (CSTR) became "1" by the PLC while the actuator was moving and that duplicate movement commands occurred as a result.
20D	During movement, STP-OFF	This message indicates that the temporary stop signal (*STP) was turned OFF by the PLC while the actuator was moving and the movement was disabled as a result.
20E	Soft limit over	This message indicates that a soft limit was reached.
210	HOME-ON during operation	This message indicates that a home return signal (HOME) became ON from PLC and duplicate movement commands occurred during movement operation.
211	JOG-ON during operation	This message indicates that a home return signal (HOME) became ON from PLC and duplicate movement commands occurred during movement operation.
220	Write in AUTO prohibited	This messages indicates that parameter writing operation was performed in the AUTO mode of the PCON-C/CG, ACON-C/CG, or SCON controller.
221	Write in Monitor mode prohibited	This message indicates that position data or parameter writing operation was performed in the Monitor mode.
222	Operation in AUTO prohibited	This message indicates that actuator movement operation was performed in the AUTO mode.
223	Operation in Monitor mode prohibited	This message indicates that actuator movement operation was performed in the Monitor mode.
301 302 304 305 306 308 30A 30B	Over Run Error (M) Framing Error (M) SCIR-QUE OV (M) SCIS-QUE OV (M) R-BF OV (M) Response Time Out (M) Packet R-QUE OV Packet S-QUE OV	These messages indicate an error in the serial communication with the controller. Cause: [1] Garbage data due to the effect of noise [2] Duplicate slave numbers when multiple controllers are controlled by serial communication. Action: [1] Adjust the wiring in a manner eliminating the effect of noise and review the installation of equipment, etc. [2] Change the slave numbers to avoid duplication. If the message is still displayed after taking the above actions, please contact IAI.

Code	Message name	Description
307	Memory Command Reject	This message indicates that the command was refused in the serial communication with the controller.
309	Wright Address Error	<p>This message indicates that an indeterminate WRITE address error occurred in the serial communication with the controller.</p> <p>These conditions do not occur in normal operation. Should they occur, record the entire error list before cutting off the power for use in the cause investigation. Also, contact IAI.</p>
30C	No Connect Error	<p>This message indicates that no controller axis number is recognized.</p> <p>Cause: [1] The controller is not operating properly. [2] Only the supplied communication cable (SGA/SGB) is disconnected. [3] If a SIO converter is used, 24V is supplied to the converter but the link cable is not connected. [4] The ASDRS switch settings are duplicated by mistake when multiple connectors are linked.</p> <p>Action: [1] Check if the RDY lamp on the controller is lit. If the lamp is not lit, the controller is faulty. [2] If a spare Teaching Pendant is available, replace the current pendant with the spare unit, or with a PC and see if the message disappears. [3] Supply power after connecting the link cable between the converter and controller. [4] Make sure the ADRS switch settings are not duplicated.</p> <p>If the message is still displayed after taking the above actions, please contact IAI.</p>



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