

Teaching Pendant CON-T/TG

First Step Guide First Edition

Thank you for purchasing our product.

Make sure to read the Safety Guide and detailed Instruction Manual (CD) included with the product in addition to this First Step Guide to ensure correct use.

This Instruction Manual is original.

Warning : Operation of this equipment requires detailed installation and operation instructions which are provided on the CD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A copy of the CD Manual can be requested by contacting your nearest IAI Sales Office listed at the back cover of the Instruction Manual or on the First Step Guide.

- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Product Check

This product is comprised of the following parts if it is of standard configuration.

If you find any fault in the contained model or any missing parts, contact us or our distributor.

1. Parts (The option is excluded.)

No.	Part Name	Model	Reference
1	Main Body	[Refer to "How to read the model plate", "How to read the model"]	
Accessories			
2	Touch Pen	Built in the Main Body	
3	First Step Guide		
4	Instruction Manual (CD)		
5	Safety Guide		

2. Instruction Manuals related to this product, which are contained in the Instruction Manuals (CD).

No.	Name	Manual No.
1	Teaching Pendant CON-T, TG Instruction Manual	ME0178
2	Instruction Manual for the actuator with integrated ERC2 controller <PIO type>	ME0158
3	Instruction Manual for the actuator with integrated ERC2 controller <SIO type>	ME0159
4	PCON-C/CG/CF Controller Instruction Manual	ME0170
5	PCON-CY Controller Instruction Manual	ME0156
6	PCON-SE Controller Instruction Manual	ME0163
7	PCON-PL/PO Controller Instruction Manual	ME0164
8	ACON-C/CG Controller Instruction Manual	ME0176
9	ACON-CY Controller Instruction Manual	ME0167
10	ACON-SE Controller Instruction Manual	ME0171
11	ACON-PL/PO Controller Instruction Manual	ME0166
12	SCON Controller Instruction Manual	ME0161
13	ROBONET Instruction Manual	ME0208
14	RCS Series ROBO Cylinder Controller RCS-C Type Instruction Manual	ME0102
15	RCS Series ROBO Cylinder Controller RCS-E Type Instruction Manual	ME0103
16	E-Con Controller Instruction Manual	ME0122
17	RCP2 Series ROBO Cylinder Controller Instruction Manual	ME0136
18	ERC Actuator with Integrated Controller Instruction Manual	ME0137

3. How to read the model plate

Model	MODEL	CON-T
Serial number	SERIAL No.	900109941 A1
		MADE IN JAPAN

4. How to read the model

	CON-T-ENG
<Model>	
CON-T	: Standard Type
CON-TG	: Safety Category 4 Compliance Type
<Option>	
Unspecified:	Indication in Japanese
ENG	: Indication in English

Support Models

List of Support Models

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

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

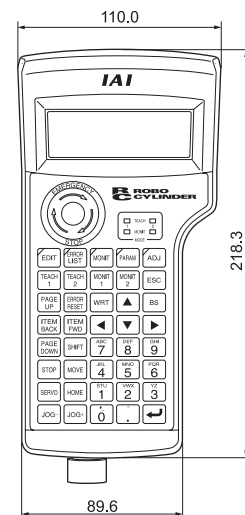
I/O Type	Unsupported	Supported
NP	NP U5 M	NP T1 4904
PN	PN U3 M	PN T1 4904

Controllers can be connected with a relay of SIO convertor to SE type of ERC2.

Basic Specifications

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

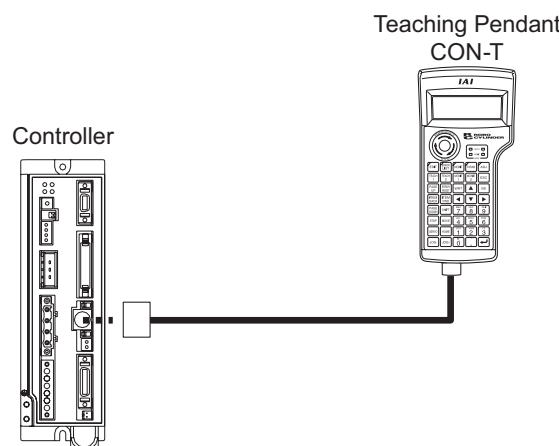
External Dimensions



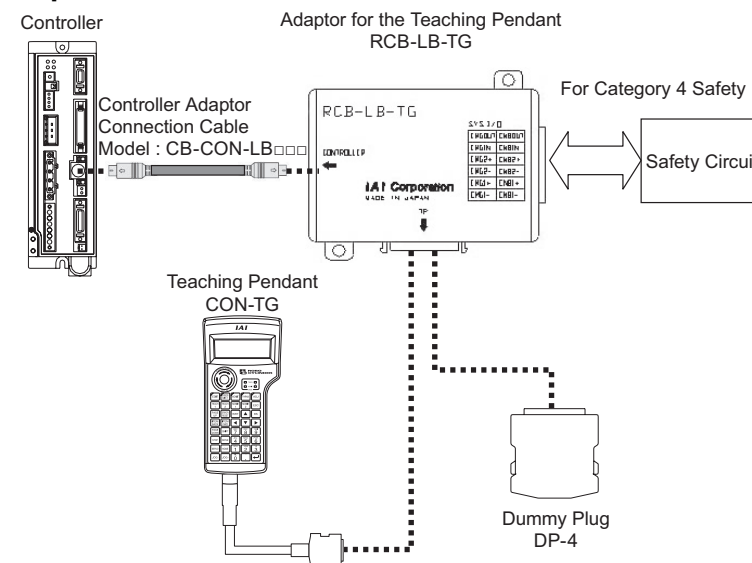
Connection Diagram

Always turn the PORT switch OFF first before connecting a controller having this switch. After the connection is established, put the PORT switch back to the "ON" side.

[CON-T]

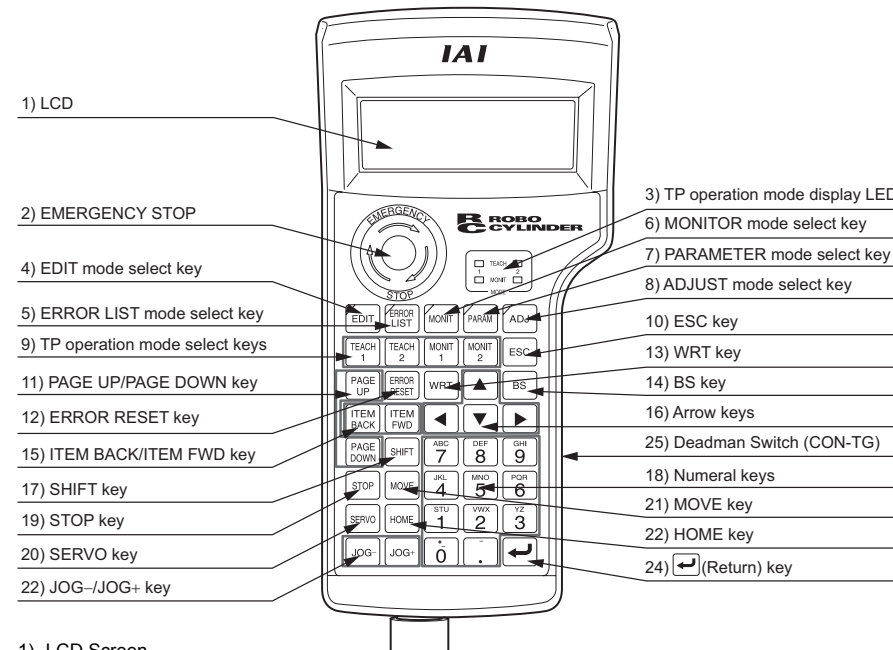


[CON-TG]



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.

Operation Panel



- LCD Screen
- 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).
- 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 Per : 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 when operating with using PLC.
 - MONIT2 : The LED is lit in the "Monitor 2" mode.
PIO Per : 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 when operating with using PLC.

- 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 writing position data, all data is transferred together.

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

- 15)ITEM BACK/ITEM 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)Numeral 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)Deadman Switch (CON-TG)
There are three stages for the deadman 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)

Position Data

[PCON, ACON, SCON, ERC2]

Set the Position Data to operate the actuator.

1) No.	2) Pos	3) Vel	4) Acc	5) Dcl	6) Push	7) LoTh	8) Range	9) Zone+	9) Zone-	10) Acc/Dcl Mode	11) Incremental	12) Cmd Mode	13) Stop Mode
000	0.00	100.00	0.20	0.20	0	0	0.01	0.00	10.00	0	0	0	0
001	10.00	100.00	0.20	0.20	0	0	0.01	95.00	105.00	0	0	0	0
002													
003													

- 1) No. ... Indicates position number.
- 2) Pos ... Set the position where the actuator is moved.
- 3) Vel ... Set the actuator speed.
- 4) Acc ... Set the actuator acceleration.
- 5) Dcl ... Set the actuator deceleration.
- 6) Push ... When the push & hold operation is to be performed, set the current limit value (%) except for “0”.
When “0” is set, the positioning operation is performed.
- 7) LoTh ... In the case of the PCON-CF Controller, the load output signal will be output when the command torque exceeds the threshold if it is set.
- 8) Range ... Defines the distance before the target position to output the positioning complete signal during the positioning operation.
During the pressing operation, it enables to set the distance to perform the pressing operation after reaching the target position.
- 9) Zone+/- ... Defines the zone where the PZONE output signal turns on.
- 10) Acc/Dcl Mode ... In the case of the ACON and SCON controllers, one of the acceleration/deceleration patterns can be selected from the trapezoid pattern, S-shape motion or the first-order delay filter.
- 11) Incremental ... Set to “0” when desired the absolute position command. Set to “1” for the relative position command.
- 12) Cmd Mode ... This is ineffective even if performing a setting. It is set to “0” at delivery. (V1.00 or earlier)
- 13) Stop Mode ... Standby power saving mode after positioning is complete can be selected from Auto Servo, OFF or Full-Servo Control System. Power saving mode is invalid if it is set to “0”.

[RCP, RCS, E-Con, RCP2, ERC]

Set the Position Data to operate the actuator.

1) No.	2) Pos	3) Vel	4) Acc/Dcl	5) Push	6) Range	7) Acc only MAX	8) Incremental
000	0.00	100.00	0.20	0	0.01	0	0
001	10.00	100.00	0.20	0	0.01	0	0
002							
003							

- 1) No. ... Indicates position number.
- 2) Pos ... Set the position where the actuator is moved.
- 3) Vel ... Set the actuator speed.
- 4) Acc/Dcl ... Set the actuator Acceleration/Deceleration
- 5) Push ... When the push & hold operation is to be performed, set the current limit value (%) except for “0”.
- 6) Range ... Defines the distance before the target position to output the positioning complete signal during the positioning operation.
During the pressing operation, it enables to set the distance to perform the pressing operation after reaching the target position.
- 7) Acc only MAX ... Set to “0” to reflect the setting done in (4) Acc/Dcl for the acceleration/deceleration speed.
Set it to “1” and the acceleration speed automatically becomes the maximum acceleration speed corresponding to the load. Deceleration speed will follow the setting in (4) Acc/Dcl.
- 8) Incremental ... Set to “0” when desired the absolute position command. Set to “1” for the relative position command.

Operation

After the power to the controller is turned on, the display shows as shown below.
Operation is to be performed on the operation panel. [Refer to Operation Panel]

I A I R C T P
T P Ver 1.00
Connecting...

Following screen will be displayed only for ACON, PCON, SCON and ERC2.

T P Operation Mode
* T E A C H 1 * T E A C H 2
* M O N I T 1 * M O N I T 2

Select “TP Operation Mode”.

Following screen will be displayed when connected to multiple axes.

A x i s S e l e c t [M]
A x i s N o . 0 0
P C O N - C Y

Select the controller axis No. that the setting is desired.

M o d e S e l e c t [M] A . 0 0
* E D I T * E R R O R L I S T
* M O N I T * P A R A M
* A D J




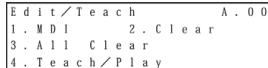







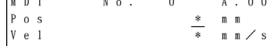



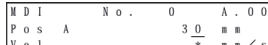





Press either of , , ,  or  to select a mode and perform an operation that corresponds to each mode.

Operation Mode	
*EDIT	Positioner (PCON-PL/PO, ACON-PL/PO and SCON : Mode other than the Pulse Train mode) Display and Edit function for positioner table, Jog Operation, Inching Operation
*MONIT	Pulse Train (PCON-PL/PO, ACON-PL/PO and SCON : Pulse Train Mode) Jog Operation, Inching Operation
*ERROR LIST	Controller status display
*PARAM	Alarm content detailed display
*ADJ	Setting of axis zone signal output range and axis attributes
	Executing homing and axis number setting of controller series

How to Operate (Examples)

Position Data Setting

Example of 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.		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.

	Operation	Screen	Reference
6.		<div>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</div>	During new position data registration, the initial values set with the user parameters for Vel, Acc, Dcl, etc., will automatically be input. In the left screen, the initial value is set as 100mm/sec.
7.	Input <div>YZ</div> <div>3</div> <div>0</div> <div>0</div> here, and then press the Return key. Press the <div>WRT</div> key. (The cursor will automatically move to the next [No. 1].)	<div>M D I N o . 1 A . 0 0 P o s A 2 5 0 . 0 0 m m V e l 3 0 0 m m / s</div>	The screen will change to the screen of Position No. 1 for Acc and Dcl.
8.	Change the screen to the screen for Pos and Vel with the <div>ITEM BACK</div> key. Move the cursor to "Pos" with the <div>ITEM BACK</div> key.	<div>M D I N o . 1 A . 0 0 P o s * m m V e l * m m / s</div>	
9.	Move the cursor to the "Pos" input position with the <div>◀</div> , <div>▼</div> , <div>▲</div> or <div>▶</div> key. Input <div>VWX</div> <div>2</div> <div>MNO</div> <div>5</div> <div>*</div> <div>0</div> here, and then press the Return key.	<div>M D I N o . 1 A . 0 0 P o s A 2 5 0 m m V e l * m m / s</div>	In order to stop during numeric input, press the [ESC] key to cancel the input.
10.		<div>M D I N o . 1 A . 0 0 P o s A 2 5 0 . 0 0 m m V e l 1 0 0 . 0 0 m m / s</div>	The cursor will automatically move to the "Vel" input position.
11.	Input <div>YZ</div> <div>3</div> <div>0</div> <div>0</div> here, and then press the Return key. Press the <div>WRT</div> key. (The cursor will automatically move to the next [No. 2].)	<div>M D I N o . 1 A . 0 0 P o s A 2 5 0 . 0 0 m m V e l 3 0 0 m m / s</div>	The screen will change to the screen of Position No. 2 for Acc and Dcl.

Disconnecting Process

Make sure to follow the following process when disconnecting the teaching pendant from the controller.

Operation :

- 1) Press the

STOP

 key for more than 2.5 seconds.
The screen will change to the TP end screen.

0 p e r a t i o n S t a r t / E n d
T P [E f c t]
1 . C o m p l e t e
2 . R e c o n n e c t i o n

- 2) Press the

STU

1

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

0 p e r a t i o n S t a r t / E n d
T P [N o n]
1 . C o m p l e t e
2 . R e c o n n e c t i o n

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

- (Note 1) For PCON, ACON, SCON and ERC2, the system turns to transient emergency stop when disconnecting the teaching pendant, then the emergency stop becomes cancelled straight after it. Thus, the equipment while in operation such as the actuator will stop.
Do not disconnect the teaching pendant during the operation.
Also, exercise precaution to the design of the emergency stop circuit including the emergency stop switch for the teaching pendant.
- (Note 2) For PCON, ACON controller and ERC2 which are not equipped with the AUTO/MANU switch, set the TP Operation Mode to "MONIT2" before disconnecting the teaching pendant.
If the controller setting is performed with the teaching pendant connected to the Gateway Unit or SIO Converter;
- and the teaching pendant is disconnected while set to "TEACH1" or "TEACH2", I/O becomes invalid and a control from PLC will be disabled.
 - and the teaching pendant is disconnected while set to "MONIT1", the maximum speed is kept at the safety speed set for the parameter regardless of the command from PLC.

Troubleshooting

If the connection does not work properly, check the following item.

Hardware Related Error Detected on Teaching Pendant

Code	Error Description	Cause and Treatment
308	Response Timeout Error No response is returned from the controller.	1) A wire breakage is caused in the controller connection cable. Check the wiring for or wire breakage in the connection cable. 2) It is temporary error due to noise. Re-input the power to the controller.



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