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Touch Panel Teaching
TB-01/TB-01D/TB-01DR
Applicable for Program Controller
First Step Guide Fourth Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual as well as this First Step Guide to ensure correct use.
This Instruction Manual is original.

Warning : Read the instruction manual carefully and follow the instruction manual when handling this equipment.
Please downloaded the user's manual from our website.
You can download it free of change. User registration is required for first time users.
URL:www.iai-robot.co.jp/data_dl/CAD_MANUAL/
Keep a printout of the introduction manual near the equipment in which this product is installed so that it can be checked at all times, or display it on your computer, tablet terminal, etc. so that you can check it immediately.
If you need a bound copy of the instruction manual, order it from the nearest sales office listed in the First Step Guide or at the end of the instruction manual. It will be provided for a fee.

Product Check

The standard configuration of this product is comprised of the following parts.
If you find any fault with the product you have received, or any missing parts, contact us or our distributor.

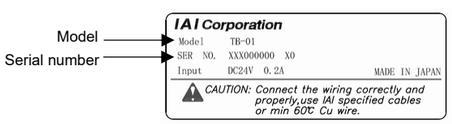
1. Parts (The option is excluded)

No.	Part Name	Model	Reference
1	Main Body	Refer to "How to read the model plate", "How to read the model of the controller"	
Accessories			
2	Cable for Position Controller	CB-TB1-C050	when model C and SC selected
3	Cable for Program Controller	CB-TB1-X050	when model S, SJ and SC selected
4	Conversion Cable	CB-SEL-SJS002	when model SJ and SC selected
5	Touch Pen	Built into teaching pendant	
6	First Step Guide	ME0327, ME0328	
7	Safety Guide	M0194	

2. Instruction Manuals related to this product.

No.	Name	Manual No.
1	Instruction manual for touch-panel teaching pendant TB-01/TB-01D/ TB01DR	ME0325
2	Instruction manual for XSEL-J/K/KE controller	ME0116
3	Instruction manual for XSEL-JX/KX controller	ME0119
4	Instruction manual for XSEL-KT/KET controller	ME0134
5	Instruction manual for XSEL-P/Q/PCT/QCT controller	ME0148
6	Instruction manual for XSEL-PX/QX controller	ME0152
7	Instruction manual for XSEL-R/S/RX/SX/RXD/SXD controller	ME0313
8	Instruction manual for XSEL-RA/SA/RAX/SAX/RAXD/SAXD controller	ME0359
9	Instruction manual for tabletop robot TT	ME0149
10	Instruction manual for tabletop robot TTA	ME0320
11	Instruction manual for SSEL controller	ME0157
12	Instruction manual for ASEL controller	ME0165
13	Instruction manual for PSEL controller	ME0172
14	Instruction manual for MSEL controller	ME0336

3. How to Read the Model Plate



4. How to Read the Model No

(Standard type)

TB-01-N-ENG-CE

<Model number>
TB-01 : Standard type

< Cable specifications >
N : No cable (only main unit)
S : With Cable for Program Controller
C : With Cable for Position Controller
SJ : With Cable for Program Controller and Conversion Cable
SC : With Cable for Program Controller, Conversion Cable and Cable for Position Controller

< Oversea Standards >
Not specified : Not complied with CE
CE : Complied with CE

<Option>
Not specified : Screens are displayed in Japanese. (Display can be changed to other language)
ENG : Screens are displayed in English. (Display can be changed to other language)
CHI : Screens are displayed in Chinese. (Display can be changed to other language)
(No Chinese display in Ver. 2.00 and later)

(With deadman switch type and Type with deadman switch attached on the right)

TB-01D-N-CHI-CE

<Model number>
TB-01D : With deadman switch type
TB-01DR : Type with deadman switch attached on the right

<Cable Type>
N : With No Cable (Main body only)

< Oversea Standards >
Not specified : Not complied with CE
CE : Complied with CE

<Option>
Not specified : Screens are displayed in Japanese. (Display can be changed to other language)
ENG : Screens are displayed in English. (Display can be changed to other language)
CHI : Screens are displayed in Chinese. (Display can be changed to other language)
(No Chinese display in Ver. 2.00 and later)

There is no cable set form for TB-01D and TB-01DR.
Prepare a following cable.
• Position controller cable : CB-TB1-C050
• Position controller TP adapter connection cable : CB-TB1-GC050

* It is necessary to have a dedicated cable to connect to XSEL-J and XSEL-JX controllers.
[Refer to instruction manual 4.12.2 XSEL-J, XSEL-JX Dedicated Cable]

Support Models

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

For how to handle the position controllers (ERC2, ERC3, ACON, DCON, PCON, SCON, MCON, MSCON, RACON, RPCON, RCP6S, ASEP, DSEP, PSEP, MSEP, AMEC, PMEC), refer to "Instruction Manual for Touch Panel Teaching to Apply for TB-01, TB-1D, TB01DR Position Controllers" provided separately.

List of Supported Models

Model Name	Support Started Version
XSEL-J/K	V1.00
XSEL-JX/KX	V1.00
XSEL-KT/KET	V1.00
XSEL-P/Q/PCX/QCT	V1.00
XSEL-PX/QX	V1.00
XSEL-R/S	V1.00
XSEL-RX/SX	V1.00
XSEL-RXD/SXD	V1.00
XSEL-RA/SA/RAX/SAX/RAXD/SAXD	V1.60
TT, TTA	V1.00
ASEL, PSEL, SSEL	V1.00
MSEL-PCX/PGX	V1.02
MSEL-PC/PG	V1.10
MSEL-PCF/PGF	V1.70

Specifications Check

1. Basic Specifications

Item	TB-01/ TB-01D/ TB-01DR type
Body	Black
Display Colors	65536 colors (16-bit colors)
Backlight Type	White LED backlight
Touch Panel Display	3.5 inch TFT color LCD QVGA
Touch Detection Type	4-wire resistive type
Hardware Keys	40-key input with jog, function keys, etc.
External Memory	SD/SDHC memory card (Note 1) interface installed (1G to 8G) (Toshiba-made recommended)
Environmetal Resistance	IP 40 or equivalent
Size	169.5mm (H) × 210mm (W) × 88.6mm (D)
Mass	TB-01: 507g approx. (excluding cable) TB-01D/TB-01DR: 539g approx. (excluding cable)
Cable Length	5m(Standard)
Wall-mounting Hook	Hook available to use with M8 hex socket head cap screw
Touch Pen	ϕ5 × 100mm
Strap	Width 6mm, reversed length 190mm (Option)

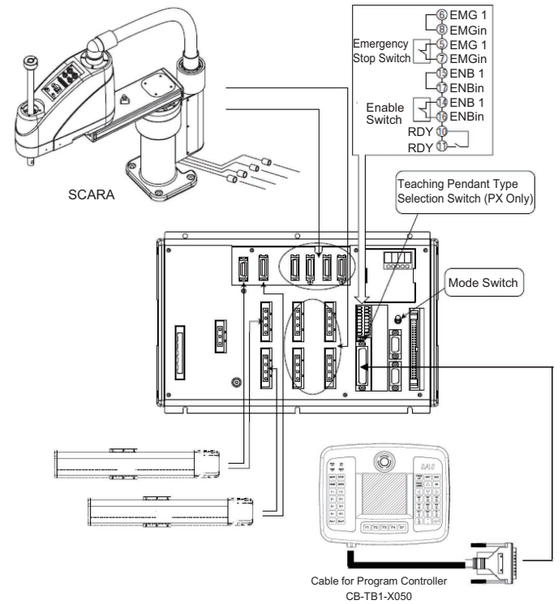
Item		TB-01/ TB-01D/ TB-01DR type
Function	Languages	Japanese/English/Chinese (No Chinese display in Ver. 2.00 and later)
	Touch Sound	ON/OFF Volume Settable in 3 steps, S, M, and L
	Monitor	Input port, output port, input/output port, global flags, global variables, axis status, system statuses, error list, version information, control constant table administration information, maintenance information
	Position Data Edit	Target position, speed, acceleration, deceleration, target arm system, comment
	Operational Functions	Set position operation, jog operation
	Parameter Edit	I/O, all axes common, each axis, driver encoder, I/O slot card, other
	Version Information	Main, driver, TP, other
	Alarm History	Depends on connected controller
	Data Storage	Applicable to have data saved to and read from external Secure Digital memory card (Position data, program, symbol, parameter, global data, alarm list)
	Display Adjustment	Brightness adjustable for contrast and backlight
	Clock Setting	Clock setting available with real time clock (Backup held with CR2032 button battery)
	Maintenance Information	Total moving count, Total moving distance, etc. (XSEL-R/S/RX/SX/RXD/SXD/RA/SA/RAX/SAX/RAXD/SAXD, TTA, MSEL-PCX/PGX/PC/PG are applicable)
Communication	Communication Standard	Based on RS232C
	Communication Conditions	Transmission Speed 9,600bps/19,200bps/38,400bps /57,600bps/115,200bps/230,400bps
	Protocol	Dedicated format
	Connector	D sub 25 pin
	Number of Connectable Controllers	Depends on controller to be connected
Font		Japanese Bitmap Font: Gothic Fonts supplied by LIM Corporation Ltd. are used.

2. Environmental Specifications

Item	TB-01/TB-01D/TB-01DR type
Rated Voltage	24V DC
Operational Voltage Range	21.6 to 26.4V DC
Power Consumption	3.6W or less (150mA or less)
Ambient Operating Temperature	0 to 50°C
Ambient Operating Humidity	20 to 85%RH(non-condensing)
Ambient Storage Temperature	-20 to 60°C
Ambient Storage Humidity	10 to 85%RH(non-condensing)
LCD Life	20,000 hours (in ambient temperature at 25°C)
Vibration Endurance	10 to 55Hz (1-minute period) Double amplitude 0.75mm to X, Y and Z directions for 10min
Shock Endurance	147 m/s², 11msec, applied 4 times each in X, Y and Z directions
Environmental Resistance	IP40 (in initial condition)

Connection Diagram

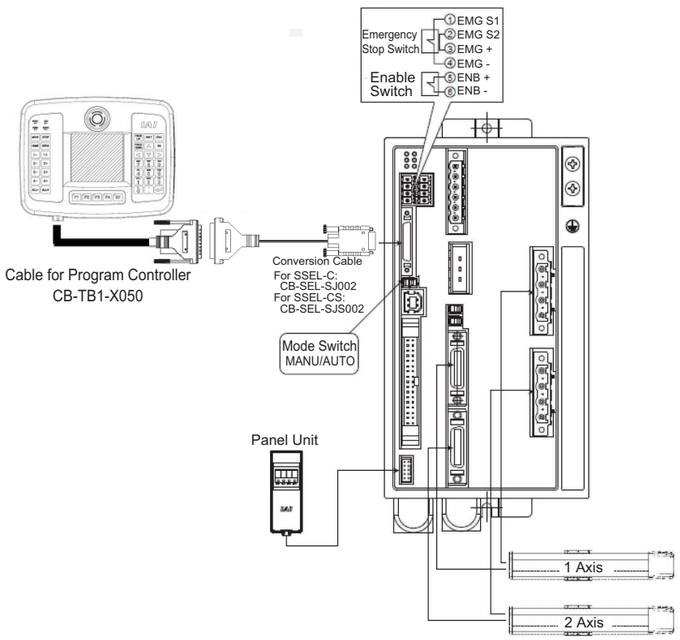
[Examples for Connection 1] Shown below are examples for how to connect to the XSEL-PX/QX/RX/SX/RAX/SAX/RXD/SXD/RAXD/SAXD controller.



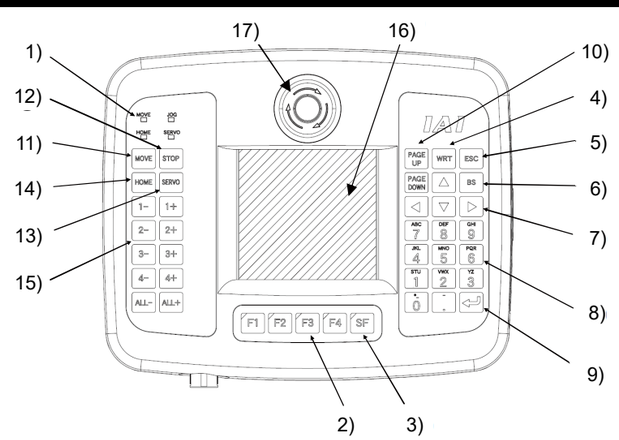
(Note) Set the teaching pendant type selection switch of the X-SEL-PX type to the left.

[Examples for Connection 2]

Shown below are examples for how to connect to the SSEL controller.
Connect it to the teaching connector using the conversion cable.



Operation Panel



1) LED
   - JOG When this LED is lit, jog operation is possible with 1-, 2-, 3-, 4-, ALL-, 1+, 2+, 3+, 4+ or ALL+.
   - MOVE When this LED is lit, position movement or continuous movement operation is possible with 1-, 2-, 3-, 4-, ALL-, 1+, 2+, 3+, 4+ or ALL+.
   - SERVO When this LED is lit, servo ON/OFF operation is possible with 1-, 2-, 3-, 4-, ALL-, 1+, 2+, 3+, 4+ or ALL+.
   - HOME When this LED is lit, homing operation is possible with 1-, 2-, 3-, 4-, ALL-, 1+, 2+, 3+, 4+ or ALL+.

2) F1 to F4 keys (Function keys)
   Correspond to each item in the Touch-panel operation display screen (function key section).
   The LED is lit when the relevant key is operable.

3) SF key (Shift key)
   If there are more than 5 selectable functions (“→” will be displayed at right side of the function key area), it will change the display items in the function key area.) When the key is operable, its LED is lit.

4) WRT key (Write key)
   Transmits edit data to the controller. (Data will be saved in the memory of the controller.)

5) ESC key (Escape key)
   Returns to the previous status from the current status.

6) BS key (Backspace key)
   If you press this key during data input, clear one letter before.
   At other time, clear the data where the cursor is placed.

7) ◀ ▲ ▼ ▶ keys (Cursor keys)
   Moves the cursor.

8) 0~9 . keys (Numeric keys)
   You can input number, alphabet, and sign.
   When the cursor is at any item requiring the input of characters other than “0” to “9” (such as hexadecimal and character strings), the input mode selection is displayed in the function key area.
   (Alph: alphabet symbol input, Num: numerical value input)

9) ↵ key (Return key)
   Confirms the input data and moves the cursor position forward .

10) PAGE UP PAGE DOWN keys (PAGE UP/PAGE DOWN keys)
    Increment or decrement edit and display item No. (Position No., Program No., Step No., etc.)

11) MOVE key (Move key)
    Enables actuator movement or continuous operation. The LED of MOVE is lit. When you press a jog key such as 1+ and 1- after enabling movement or continuous operation, movement action starts. However, it is required to switch servo ON when the servo is OFF.
    Jog operation is made possible after the action has been completed or stopped. The LED of JOG is lit up.

12) STOP key (Stop key)
    Stops actuator movement or continuous movement.

13) SERVO key (Servo key)
    Enables axis servo ON/OFF switching operation. The LED of SERVO is lit up. When you press a + jog key such as 1+ after enabling servo ON/OFF switching operation, the servo is turned ON. When you press a - jog key such as 1-, the servo is turned OFF.
    Jog operation is made possible after the servo has been turned ON/OFF. The LED of JOG is lit.
    However, when the servo is OFF, the actuator cannot be moved by jog or inching operation unless the servo is turned ON.

14) HOME key (Home key)
    Enables homing operation. The LED of HOME is lit. When you press a jog key such as 1+ and 1- after enabling homing operation, homing starts. However, it is required to turn the servo ON when the servo is OFF. Jog operation is made possible after homing has been completed. The LED of JOG is lit.

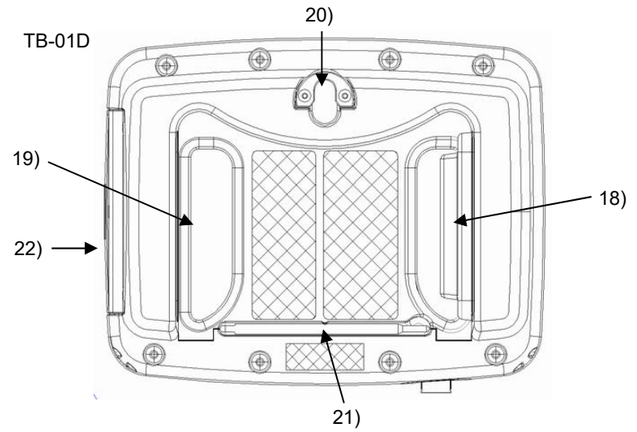
15) 1- 1+ 2- 2+ 3- 3+ 4- 4+ ALL- ALL+ keys (Jog keys)
    - 1- Minus direction jog movement for the 1st axis and 5th axis
    - 1+ Plus direction jog movement for the 1st axis and 5th axis
    - 2- Minus direction jog movement for the 2nd axis and 6th axis
    - 2+ Plus direction jog movement for the 2nd axis and 6th axis
    - 3- Minus direction jog movement for the 3rd axis and 7th axis
    - 3+ Plus direction jog movement for the 3rd axis and 7th axis
    - 4- Minus direction jog movement for the 4th axis and 8th axis
    - 4+ Plus direction jog movement for the 4th axis and 8th axis
    - ALL- Minus direction jog movement for all axes
    - ALL+ Plus direction jog movement for all axes

    By pressing either of the keys while the backlight is off, it will be turned back on.

16) Touch-panel operation display screen
    The screen consists of a TFT Color LCD Type and a touch panel.
    Various settings that have been edited or taught are displayed.
    To operate the screen, use a finger or the touch pen to touch desired parts of the touch panel.

    *1 In a use of the LCD display for a long term, the brightness may drop.
    In order to extend the life of the LCD display, establish the setting in the environment setting to turn-off time automatically, and remove it from the controller when it is not in use.
    *2 This touch panel is of analog resistance membrane type, so do not touch two or more locations on the screen at the same time.
    If two or more locations are touched at the same time, the centers of all touched locations may respond and trigger multiple operations.
    *3 When operating the touch panel, do not apply a force exceeding 0.5 N.
    If any greater force is applied, the touch panel may be damaged.
    *4 The life of touch panel is approx. 1 million touches at the same location. (Assuming a use environment of 25°C)

17) EMERGENCY STOP (Pushbutton switch for emergency stop)
    This switch actuates an emergency stop.



18)19) Dead man Switch
(It is placed at 18) for TB-01D and 19) for TB-01DR. It is not equipped on TB-01.)
The dead man switch has three conditions corresponding to three levels. The meaning of ON/OFF in each condition is explained below.

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

When the switch is ON, the servo can be turned ON.
When the switch is OFF, the drive source is cut off and the servo remains OFF.
Even when the switch is OFF, operation is still possible in modes where the servo need not be ON (such as in the edit mode).

20) Wall-mounting hook
This hook is used to mount the touch panel on a wall.

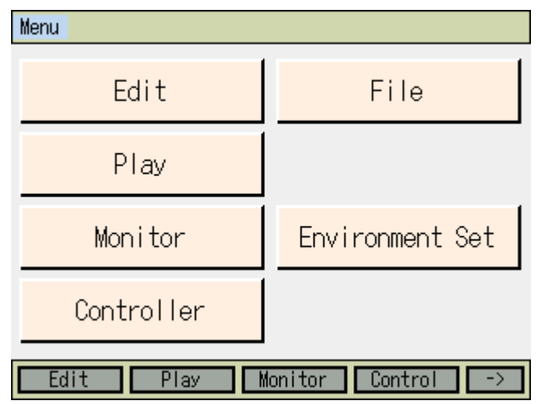
21) Touch pen
This touch pen is used to touch the touch-panel operation display screen.

22) SD memory card slot
The SD memory card is inserted into this slot. Open the lid and insert the SD memory card.
- Face the card’s label toward the operation panel, and insert until a click is heard.
- To remove the card, press it lightly. It will pop out slightly, so pull it out straight.

[Caution] Some card such as a new memory card may be difficult to take out.
Try to put it in and out several times and it gets easier to take out.

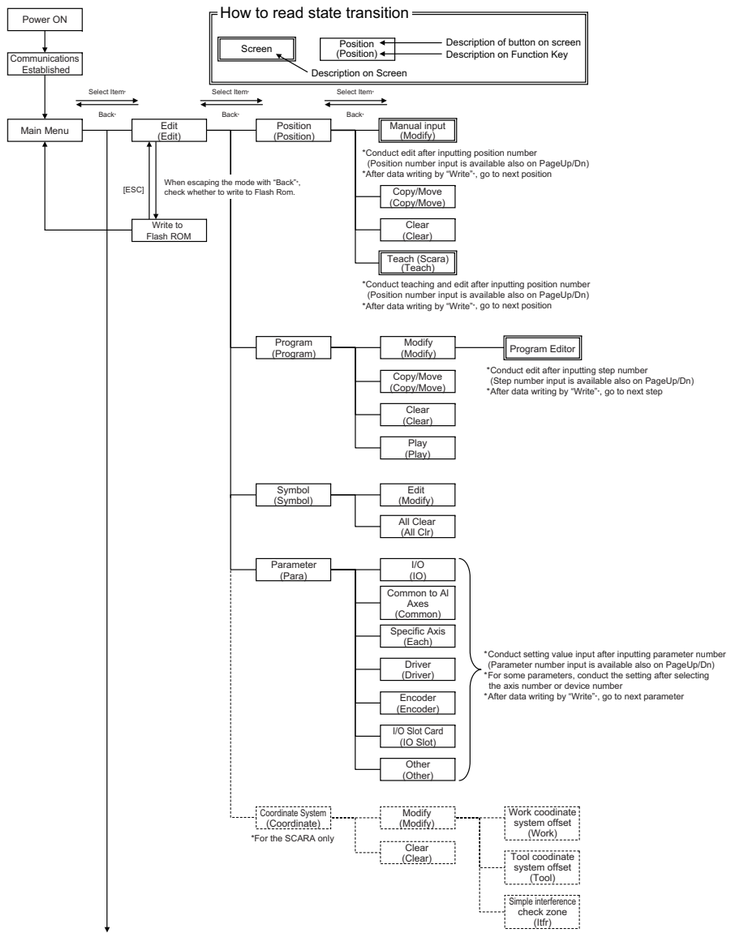
Menu Selection

There are six menus in Menu that you can select and touch. The screen changes to the touched menu.

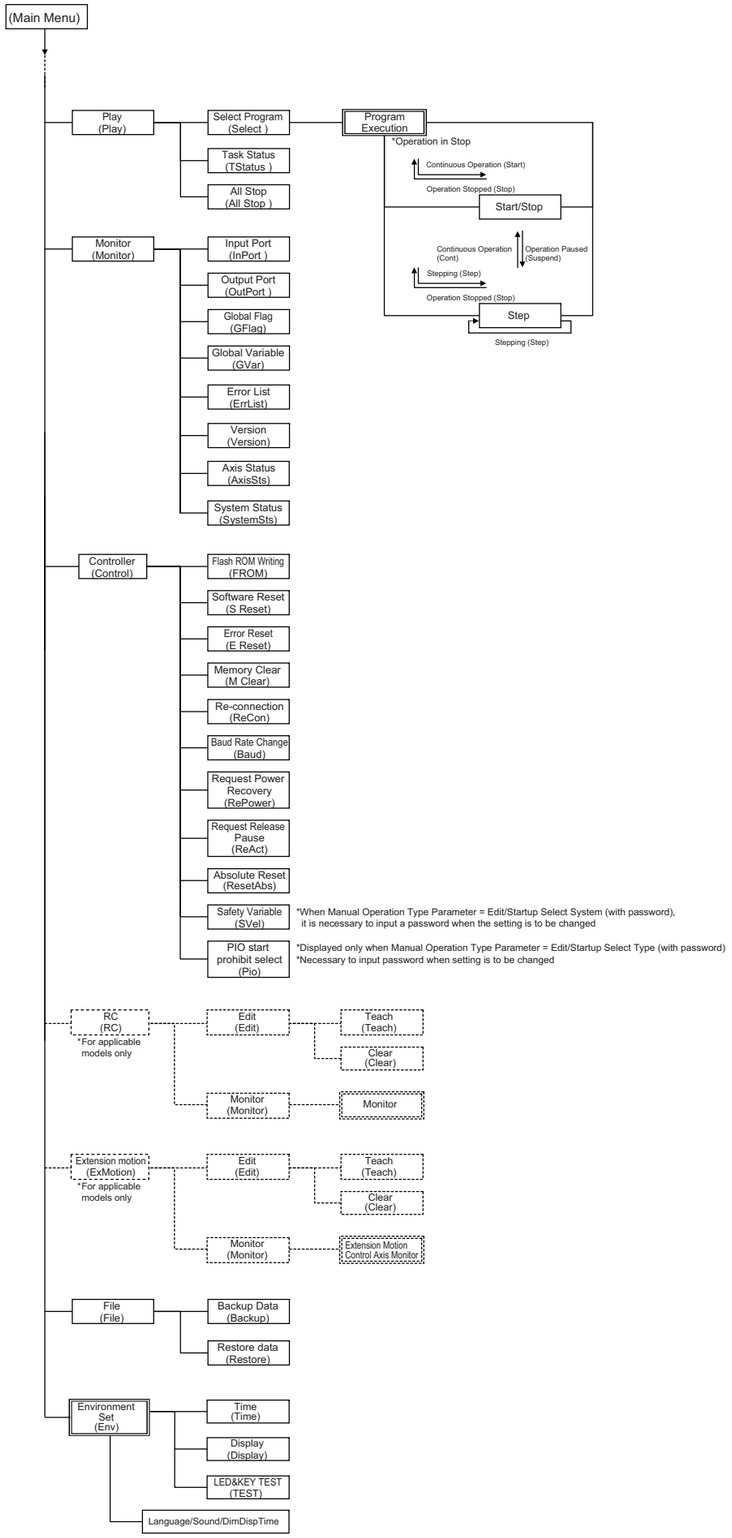


Menu list
- Edit To edit position data, programs, symbols, parameters and coordinate system definition data
- Play To execute programs
- Monitor The controller status is displayed
- Controller To write in flash ROM, reset software and so on
- File To backup data in controller and restore
- Environment Set Set the language, touch tone and time setting, etc.

State Transition Diagram



(State Transition Diagram Continued)



Before Asking Questions

When connection is not possible, check following.

Problem	Solution
Can not communicate with the controller.	If the mode switch of the controller is in “AUTO”, turn to “MANU”.
"enb" is displayed on LED.	When you are using XSEL-P and PX controller and the teaching box model selection switch is on the “right", turn to “left”.

External Dimensions

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