


MSEL

MSEL-PCX/PGX Program Controllers for PowerCON SCARA



Model List

Name	Controllers for PowerCON SCARA			
External view				
Type name	PCX3	PGX3	PCX4	PGX4
Type	3-axis standard specification	3-axis safety category compliant specification	4-axis standard specification	4-axis safety category compliant specification
Standard price	—	—	—	—
Connected actuator	IXP 3-axis specification		IXP 3-axis specification + additional axis (including gripper specification) IXP 4-axis specification	
Standard I/O	NPN, PNP (16IN/16OUT)			
Expansion I/O	NPN, CC-Link, DeviceNet, PROFIBUS-DP, EtherNet/IP, EtherCAT, PROFINET, RS232C, RS485C, IA network			
Number of positions	30,000			
Power-supply voltage	Single-phase AC100 ~ 230V			

Model

MSEL — [] — [] — SCARA — [] — WAI — [] — Additional axis — [] — WAI — [] — [] — [] — [] — [] — [] — [] — [] — [] — [] — [] — []

Controller type SCARA type Encoder type Options Motor type Encoder type Options Standard I/O type Expansion I/O type PIO cable type Power-supply voltage Actuator mounting specification

PCX3	3-axis standard specification
PGX3	3-axis safety category compliant specification
PCX4	4-axis standard specification
PGX4	4-axis safety category compliant specification

B Brake

*Only available for arm length 550/650. Make sure to select this when the transported object is 4kg or more.

20P	20 □ stepper motor
20SP	20 □ stepper motor (for RA2C, RA2BC)
28P	28 □ stepper motor
28SP	28 □ stepper motor (for RA3C)
35P	35 □ stepper motor
42P	42 □ stepper motor
42SP	42 □ stepper motor (RCP4W-RA5C and RCP4W-RA6C for high thrust specification)
56P	56 □ stepper motor

(For 20P:20 □ stepper motor)

(Note)
Basically the motor type has the same symbol as the motor type of the actuator to be connected, but there are models that do not match the motor type of some controllers and actuators. Please note that the appropriate models are listed below.
<For 28AP actuator>
•Controller Motor type "28SP" RCP2-RA3C
*Simple absolute specification cannot be connected.

*An additional axis can be selected only when the controller is of the 4-axis type and SCARA robot is of the 3-axis type (without gripper).

NP	NPN specification
PN	PNP specification

E	Not used
NP	Expansion PIO board (NPN specification)
DV	DeviceNet board
DV2	DeviceNet board (*) (with 2-way connector)
CC	CC-Link board
CC2	CC-Link board (with 2-way connector)
PR	PROFIBUS-DP board
EP	EtherNet/IP board
EC	EtherCAT Connection specification
PRT	PROFINET IO Connection specification
SE1	RS232C connection board
SE2	RS485C connection board
IA	IA network connection board (**)

* If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.
** It is required to connect to EIOU (contact to IAI for more detail).

(None)	Screw fixing specification
DN	DIN rail mounting specification

4	AC100 ~ 230V
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(None)	No cable
2	2m (standard)
3	3m
5	5m

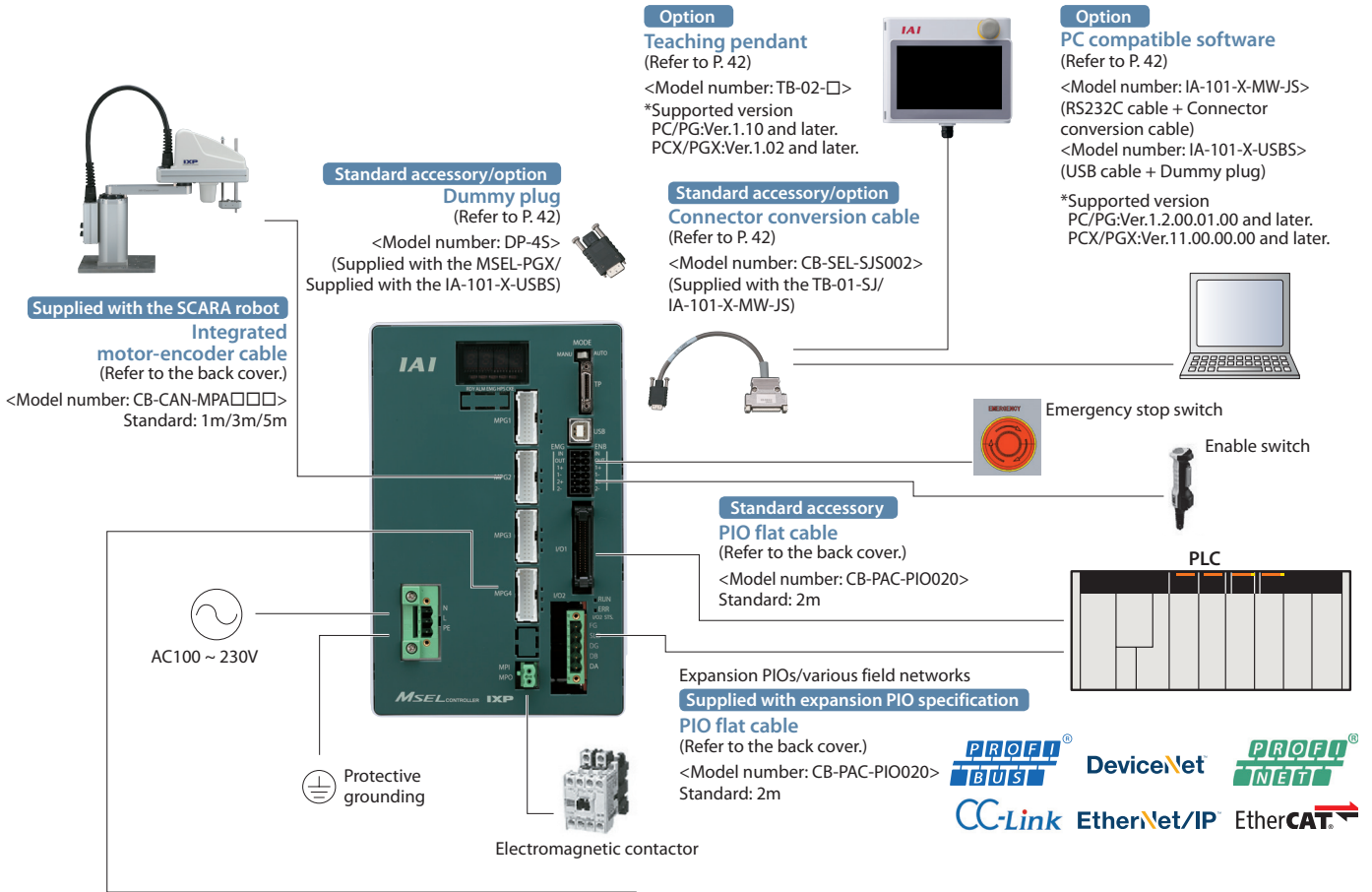
(None)	No option
B	Brake
HS	Home check sensor (*)

*The home check sensor can be selected only when an additional incremental axis is used with the SCARA 3-axis specification.

*The following codes are entered in □.
N: Standard specification
C: Cleanroom specification
W: Dust/Splash-proof specification

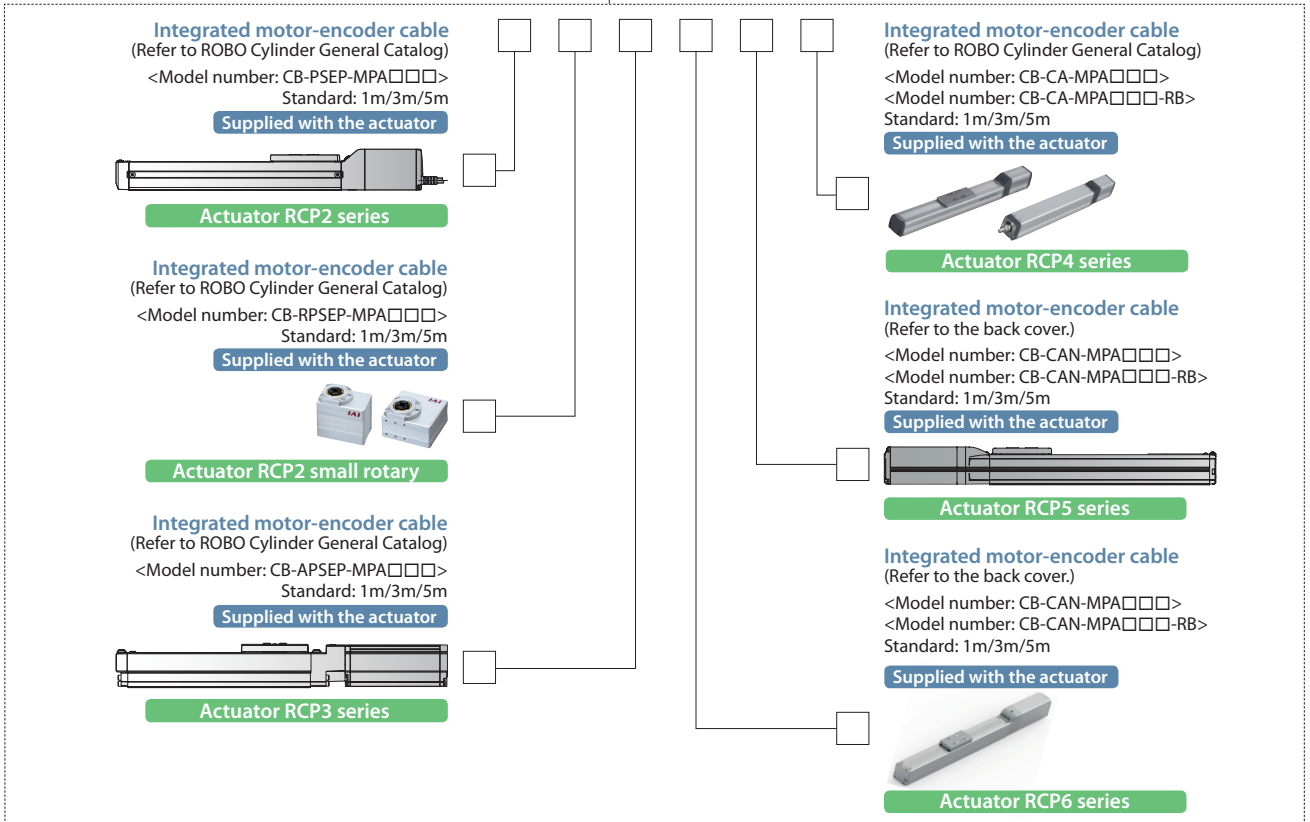
3N1808	For IXP-3N1808
4N1808	For IXP-4N1808
3N2508	For IXP-3N2508
4N2508	For IXP-4N2508
3N2508GM	For IXP-3N2508GM
3□3515	For IXP-3□3515
4□3515	For IXP-4□3515
3N3515GM	For IXP-3N3515GM
3N3510GL	For IXP-3N3510GL
3□4515	For IXP-3□4515
4□4515	For IXP-4□4515
3N4515GM	For IXP-3N4515GM
3N4510GL	For IXP-3N4510GL
3□5520	For IXP-3□5520
4□5520	For IXP-4□5520
3N5515GL	For IXP-3N5515GL
3N5515GW	For IXP-3N5515GW
3□6520	For IXP-3□6520
4□6520	For IXP-4□6520
3N6515GL	For IXP-3N6515GL
3N6515GW	For IXP-3N6515GW

System Configuration



<Actuator for Additional Axis>
 (Can be connected to a SCARA robot of 3-axis specification)

*Wire the emergency stop switch, enable switch, electromagnetic contactor, etc., as necessary. The same applies to the factory settings (shorting).



Basic Controller Specifications

Specification item		Contents	
Power-supply input voltage		Single-phase AC100 ~ 230V ±10%	
Power-supply current		2.9Atp. (AC100V), 1.4Atp. (AC200V), 1.2Atp. (AC230V)	
Power-supply frequency range		50/60Hz±5%	
Motor type		Stepper motor (servo control)	
Supported encoder		Incremental encoder / Battery-less absolute encoder	
Data storage device		FlashROM/FRAM	
Number of program steps		9,999	
Number of positions		30,000	
Number of programs		255	
Number of multi-tasks		16	
Operation mode	Serial communications	○	
	Program	○	
SIO interface	Communication method		RS232 (asynchronous communications)
	Baud rate		9.6, 19.2, 38.4, 57.6, 76.8, 115.2kbps
	Live wire connection	TP port	×
		USB	○
Standard PIO interface	Input Specification	Number of input points	16 points
		Input voltage	DC24V±10%
		Input current	7mA/circuit
		ON voltage	DC16V Min.
		OFF voltage	DC5V Max.
		Leak current	Allowable leak current: 1mA max.
		Insulation method	Photocoupler insulation
	Output specification	Number of output points	16 points
		Load voltage	DC24V±10%
		Maximum current	100mA per point, 400mA per 8 points (Note 1)
		Saturated voltage	3V Max.
		Leak current	0.1mA Max.
		Insulation method	Photocoupler insulation
		Compliant expansion I/O interface	
Calendar/clock function	Retention time	Approx. 10 days	
	Charge time	Approx. 100 hours (fully charged) * Data can be retained even when the batteries are not fully charged.	
Protective functions		Overcurrent, abnormal temperature, low fan speed monitoring, encoder disconnection, etc.	
Operating temperature range		0 ~ 40°C	
Operating humidity range		85% RH max. (non-condensing, non-freezing)	
Installation	Installation direction	Installed vertically (exhaust side up)	
	Installation method	Mounted with screws or using a DIN rail	
Rush current		15Atp. (AC100 V), 30Atp. (AC200 V): 5ms max. (Ambient temperature 25°C/No cycling of the power)	
Air cooling method		Forced air cooling	
External dimensions		Width 130mm x Height 195mm x Depth 125mm	
Mass		Approx. 1,400g	

(Note 1) The total load current shall be 400mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)

PIO Signal Chart

Pin layouts for standard PIO connector/expansion PIO connector

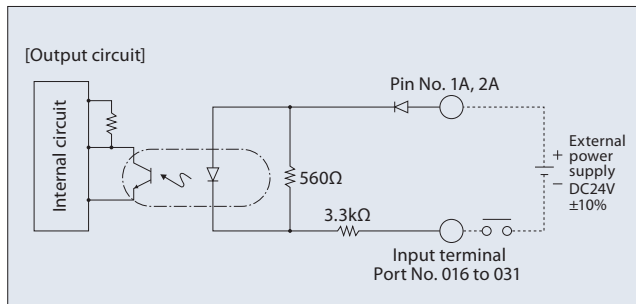
Pin No.	Category	Assignment	Pin No.	Category	Assignment
1A	24V	P24	1B	Output	OUT0
2A	24V	P24	2B		OUT1
3A	—	—	3B		OUT2
4A	—	—	4B		OUT3
5A	Input	IN0	5B		OUT4
6A		IN1	6B		OUT5
7A		IN2	7B		OUT6
8A		IN3	8B		OUT7
9A		IN4	9B		OUT8
10A		IN5	10B		OUT9
11A		IN6	11B		OUT10
12A		IN7	12B		OUT11
13A		IN8	13B		OUT12
14A		IN9	14B		OUT13
15A		IN10	15B		OUT14
16A		IN11	16B	OUT15	
17A		IN12	17B	—	
18A		IN13	18B	—	
19A	IN14	19B	0V	N	
20A	IN15	20B	0V	N	

Internal Circuits for Standard I/Os (NPN Specifications)

[Input section] External input specifications (NPN specifications)

Item	Specifications
Input voltage	DC24V ±10%
Input current	7mA/circuit
On/Off voltage	On voltage: DC16.0V min. Off voltage: DC5.0V max.
Insulation method	Photocoupler insulation

* The port numbers in the circuit diagram below represent the factory-set port numbers.
 * When the input is off, the allowable leak current is 1mA max.

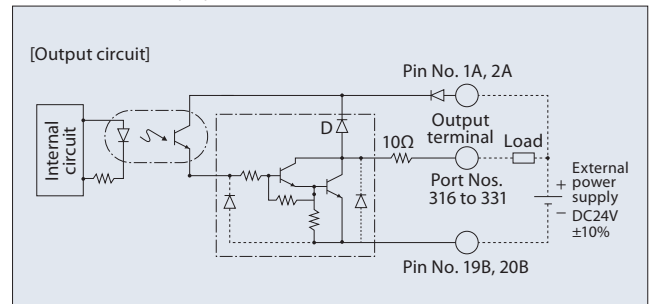


* For the standard IOs (PNP specifications), refer to the operation manual.

[Output section] External output specifications (NPN specifications)

Item	Specifications	
Load voltage	DC24V ±10%	Uses TD62084 (or equivalent).
Maximum load current	100mA/point, 400mA/8 points Note)	
Leak current	0.1mA/point max.	
Insulation method	Photocoupler insulation	

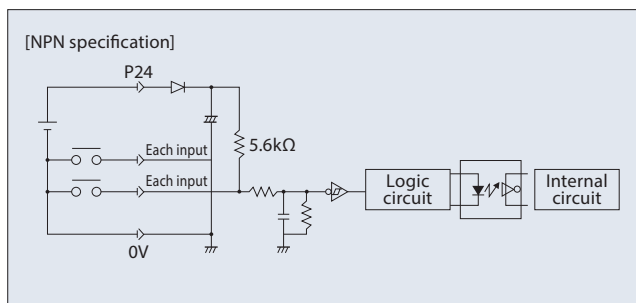
* The port numbers in the circuit diagram below represent the factory-set port numbers.
 Note: The total load current shall be 400 mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)



Internal Circuits for Expansion I/Os (NPN Specifications)

[Input section] External input specifications

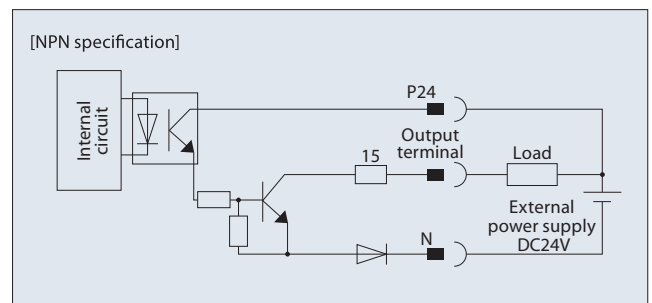
Item	Specifications
Number of input points	16 points
Input voltage	DC24V ±10%
Input current	4mA/circuit
On/Off voltage	On voltage: DC18V (3.5mA) min. Off voltage: DC6V (1mA) max.
Insulation method	Photocoupler insulation



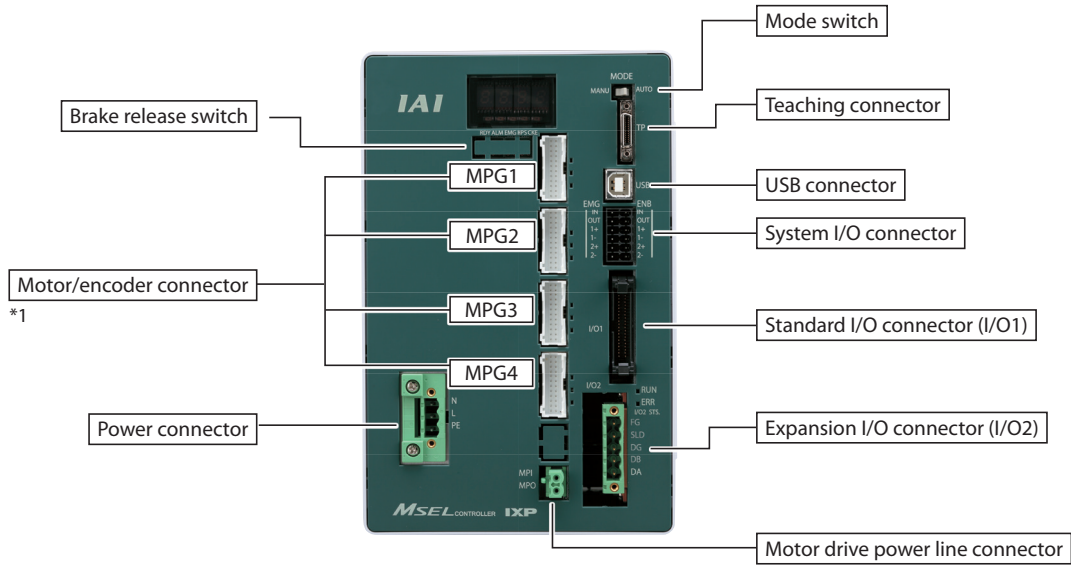
* For the standard IOs (PNP specifications), refer to the operation manual.

[Output section] External output specifications

Item	Specifications
Number of output points	16 points
Rated load current	DC24V ±10%
Maximum current	50mA/circuit
Insulation method	Photocoupler insulation

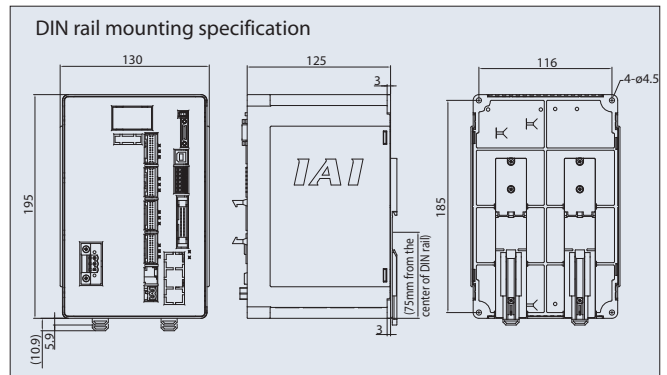
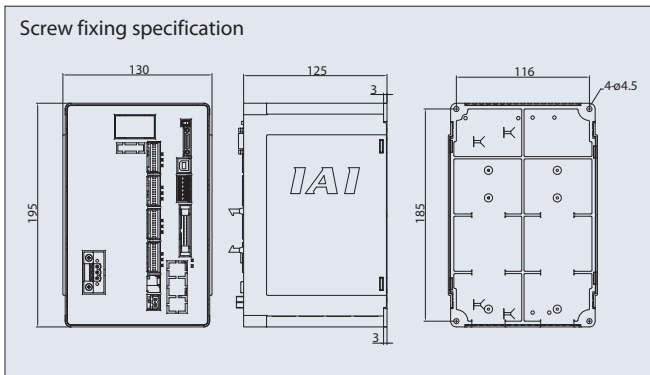


Name of Each Part



*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connector. It may cause malfunction or failure.

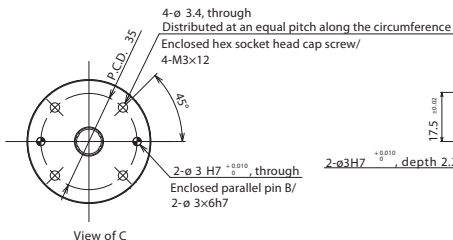
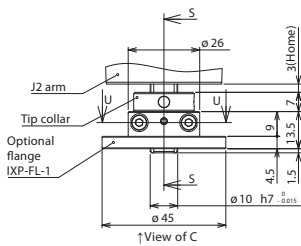
External dimensions



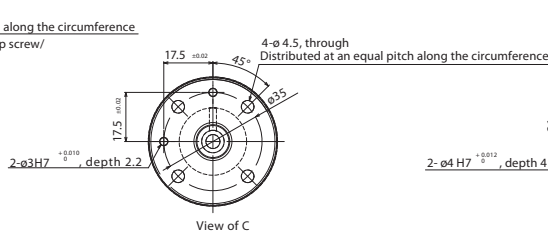
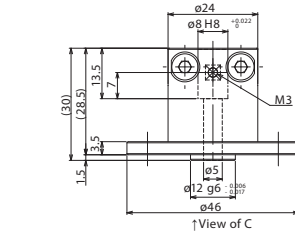
Options

Flange

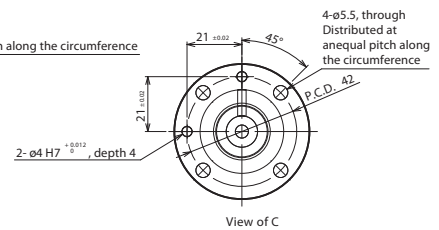
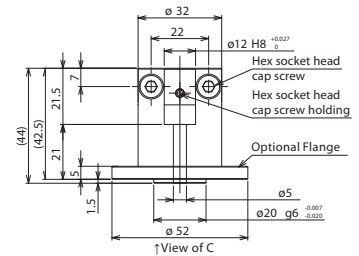
Features: It is a tool used to attach an object on the arm tip on the Z-axis.



IXP-FL-1 (For 1808/2508)



IXP-FL-2 (For 3515/3510/4515/4510)



IXP-FL-3 (For 5520/5515/6520/6515)

Model number	Standard price	Weight
IXP-FL-1	—	80g

Model number	Standard price	Weight
IXP-FL-2	—	120g

Model number	Standard price	Weight
IXP-FL-3	—	290g

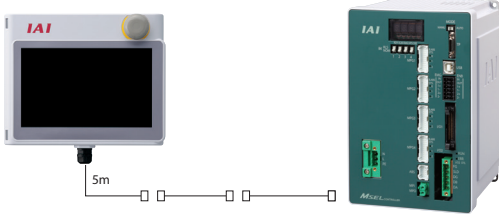
Options

Touch panel teaching pendant

Features: Teaching device for positioning input, test operation, and monitoring.

Model number: TB-02-□

Configuration:



Specifications

Rated voltage	24V DC
Power consumption	3.6W or less (150mA or less)
Ambient operating temperature	0~40°C
Ambient operating humidity	20~85%RH (Non-condensing)
Environmental resistance	IP20
Weight	470g (only TB-02 unit)

Dummy Plug

Features:

This plug is required for the safety category specification (MSEL-PGX) and when the MSEL is operated using a USB cable. (The MSEL-PGX type and PC compatible software IA-101-X-USBS comes with this dummy plug.)

Model number: DP-4S

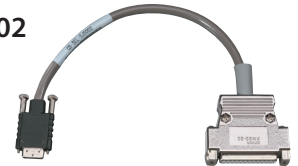


Connector Conversion Cable

Features:

This cable is used to convert the D-sub 25-pin connector of the teaching pendant or RS232C cable to the MSEL teaching connector. (The TB-01-SJ and IA-101-X-MW-JS comes with this connector conversion cable.)

Model number: CB-SEL-SJS002



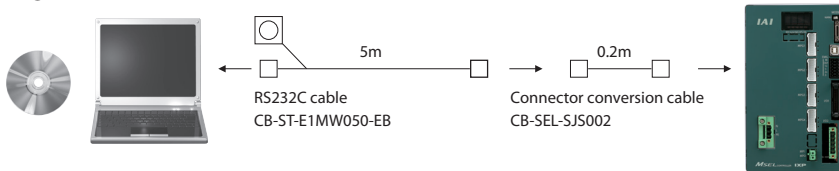
PC Compatible Software (Windows Only)

Features:

The startup support software provides program/position input, test operation and monitoring functions, among others. With its enhanced functions required for debugging, this software helps shorten the startup time.

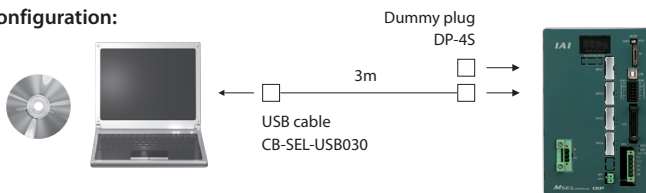
Model number: IA-101-X-MW-JS (RS232C cable + Connector conversion cable)

Configuration:

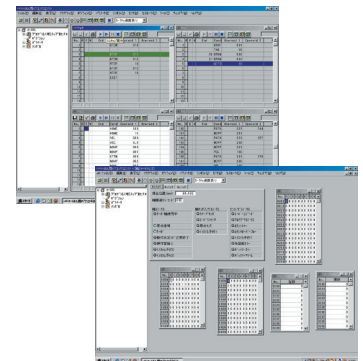


Model number: IA-101-X-USBS (USB cable + Dummy plug)

Configuration:



Windows :
XP SP2/Vista/7/8 /10 or later



The MSEL-PCX/PGX are supported by
Ver. 11.00.00.00 or later.

The CB-ST-E1MW050-EB cannot be used when "Building an enable system that uses a system I/O connector and external power supply" or "Building a redundant safety circuit." (The CB-ST-A1MW050-EB must be used instead.)

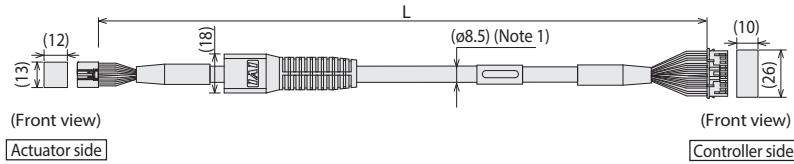
Service Parts

Please refer to the models listed below when arrangements such as cable replacement are needed after purchasing the product.

(Check in the general catalog for the cable for added axis.)

Model Number	CB-CAN-MPA □ □ □ □	Integrated Motor-Encoder Cable	for
	CB-CAN-MPA □ □ □ □ -RB	Integrated Motor-Encoder Robot Cable	IXP/RCP4-SA3/RA3/RCP5

* Please indicate cable length (L) in □ □ □, (e.g. 080 = 8m) maximum 20m.



Minimum bending radius 5m or less length R = 68mm or more (Dynamic bending condition)
 Longer than 5m R = 73mm or more (Dynamic bending condition)

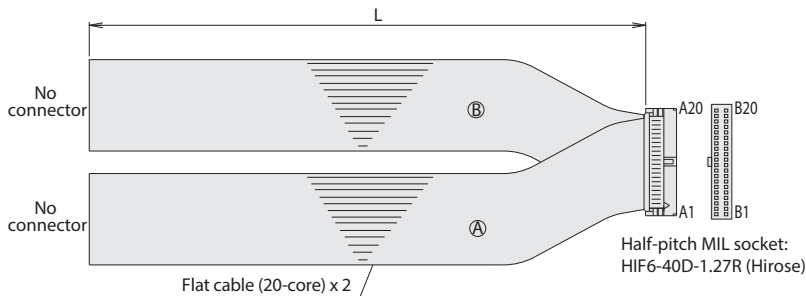
* The robot cable is designed for flex-resistance: Please use the robot cable if the cable has to be installed through a cable track.

(Note 1) If the cable is 5m or longer, ø9.1 cable diameter applies for a non-robot cable and ø10 for a robot cable.

Pin No.	Signal name	Pin No.	Signal name
3	φA/U	1	φA
5	VMM/V	2	VMM
10	φ A/W	3	φB
9	φB/-	4	VMM
4	VMM/-	5	φ A
15	φ B/-	6	φ B
8	LS+/BK+	7	LS+
14	LS-/BK-	5	LS-
12	-/A+	11	SA (mABS)
17	-/A-	12	SB (mABS)
1	A+/B+	13	A+
6	A-/B-	14	A-
11	B+/Z+	15	B+
16	B-/Z-	16	B-
20	BK+/LS+	9	BK+
2	BK-/LS-	10	BK-
21	LS_GND	17	VCC
7	VPS	19	GND
15	VCC	15	VPS
13	GND	20	LS_GND
19	—	22	—
22	BAT+	21	— (CFvcc)
23	—	23	—
24	FG	24	FG

Model Number	CB-PAC-PIO □ □ □ □	PIO Flat Cable	for
			MSEL/PCON-CA/MSEP-LC

* Please indicate cable length (L) in □ □ □, (e.g. 080 = 8m) maximum 10m.



HIF6-40D-1.27R

No.	Signal name	Cable color	Wiring	No.	Signal name	Cable color	Wiring
A1	24V	Brown-1	Flat cable (A) (crimped) AWG28	B1	OUT0	Brown-3	Flat cable (B) (crimped) AWG28
A2	24V	Red-1		B2	OUT1	Red-3	
A3	—	Orange-1		B3	OUT2	Orange-3	
A4	—	Yellow-1		B4	OUT3	Yellow-3	
A5	IN0	Green-1		B5	OUT4	Green-3	
A6	IN1	Blue-1		B6	OUT5	Blue-3	
A7	IN2	Purple-1		B7	OUT6	Purple-3	
A8	IN3	Gray-1		B8	OUT7	Gray-3	
A9	IN4	White-1		B9	OUT8	White-3	
A10	IN5	Black-1		B10	OUT9	Black-3	
A11	IN6	Brown-2		B11	OUT10	Brown-4	
A12	IN7	Red-2		B12	OUT11	Red-4	
A13	IN8	Orange-2		B13	OUT12	Orange-4	
A14	IN9	Yellow-2		B14	OUT13	Yellow-4	
A15	IN10	Green-2		B15	OUT14	Green-4	
A16	IN11	Blue-2		B16	OUT15	Blue-4	
A17	IN12	Purple-2		B17	—	Purple-4	
A18	IN13	Gray-2		B18	—	Gray-4	
A19	IN14	White-2		B19	0V	White-4	
A20	IN15	Black-2		B20	0V	Black-4	

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