

# SCARA ROBOTS **IXA-4NHN**



www.IntelligentActuator.com

# Maximum 50kg Payload Arm length 1,200mm Ultra large I scara Robot

Arm length 1,200mm

a Sheek

AXI

Maximum **50kg** Payload

## Standard cycle time

(IXA-4NHN12040)

0.61 seconds

## **Operating condition**

- ▶ 2 kg transfer
- Horizontal 300mm / vertical 25mm

Horizontal movement

Vertical movement

## **Operation range**

Perfect for transferring large workpieces thanks to its large operation range.



## **New control functions by controller**

## **Collision detection function**

When the SCARA robot detects a collision with an object, it will stop its operation promptly. The collision detection function reduces damages on the gripper, workpiece and robot at the time of a collision.



## \* It is an auxiliary function to reduce damages on peripheral devices. It does not prevent damages100%.

## Model specification items



Tupo	Model	Number	Arm leng	gth (mm)	Vertical stroke	Standard cycle time		Maximum payload	Reference page
Туре	Model	of axes	1st arm	2nd arm	(mm)	(s)	time (s)	(kg)	Reference page
High payload type	IXA-4NHN10040	4-axis	600	400	400	0.56	0.69	50	► P3
	IXA-4NHN12040	4-axis	800	400	400	0.61	0.69	50	► P9

# **IXA-4NHN10040**









\* Please check the Options reference pages to confirm each option.

Option * Please check the Options reference pages to confirm each option.						
N	lame	Model number	Reference page			
Built-in extende	d user cable	EXC	16			
Additional option table • Please check the Options reference pages to confirm each option.						
N	lame	Model number	Reference page			
User cable		CB-IXA-USRCS	17			
Flange		IXA-FL-1	17			
Protective flange	for external wiring *1	IXA-PFL-EW-1	17			
Protective flange	e for R-axis wiring	IXA-PFL-RW-1	17			
Side stay for		IXA-SST-ZW-2	18			
Upper stay for Z-axis wiring	Z-axis 400st	IXA-TST-ZW-2	18			
Solenoid valve s	et *1	IXA-SVP-1	18			

\*1 The protective flange for external wiring and the solenoid valve set cannot be installed at the same time. (Note) Please order separately.

## Cable length

Туре	Cable code	4-axis specification
	<b>5L</b> (5m)	0
Standard type	<b>10L</b> (10m)	0
	<b>1L</b> (1m) ~ 4L(4m)	0
	<b>6L</b> (6m) ~ 9L(9m)	0
	<b>11L</b> (11m)	0
Specified length	<b>12L</b> (12m)	0
	<b>13L</b> (13m)	0
	<b>14L</b> (14m)	0
	<b>15L</b> (15m)	0

(Note) Total price for the following cables. [4-axis spec.] Motor cable: 4, Encoder cable: 4, Brake cable: 1



(1) Please refer to P15 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance and the location. Operating continuously at the maximum set value could cause an overload error. For a continuous operation, either lower the acceleration/deceleration values or set a stop time after acceleration/deceleration, referring to the duty ratio (guideline).

(3) If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis (4th axis). Please refer to P17 for details.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

## XA SCARA Robots

## Main specifications

		Description	
	Ite	4-axis specification	
Max. paylo	ad (kg) (Note 1)	50	
	Combined max. speed	l (mm/s)	7540
Speed		1st arm (deg/s)	280
•	Max. speed of	2nd arm (deg/s)	380
(Note 2)	individual axes	Vertical axis (mm/s)	1200
		Rotational axis (deg/s)	920
Duch force	(N) (Note 3)	Upper limit	570
Push force	(N) (NOTE 3)	Lower limit	70
Arm length	n (mm)		1000
Individual	arm length (mm)	1st arm	600
mainauai	ann length (mm)	2nd arm	400
		1st arm (deg)	±137
0		2nd arm (deg)	±142
operation	range of individual axes	Vertical axis (mm)	400
		Rotational axis (deg)	±360

ltem		Description				
		4-axis specification				
Positioning Within horizontal surface :		±0.04mm				
repeatability	Vertical axis	±0.02mm				
(Note 4)	Rotational axis	±0.01 degrees				
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)				
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)				
Alarm lamp (No	te 5)	Amber color LED, small pilot lamp 1 pc. (DC24V supply required)				
Brake release switch (Note 6)		Brake release switch for preventing vertical axis free dropping.				
Tip axis	Allowable torque	15 N•m				
TIP axis	Allowable load moment	48 N•m				
Ambient operat	ional temperature and humidity	0-40°C, 20-85% RH or lower (non-condensing)				
Degree of prote	ction	IP10				
Vibration- and ir	npact-resistance	No impact or vibration should be applied.				
Noise (Note 7)		85 dB or lower				
International sta	indard	CE marking, RoHS				
Motor type		AC servo motor				
	1st arm	1000W				
	2nd arm	750W				
Motor wattage	Vertical axis	600W				
	Rotational axis	200W				
Encoder type		Battery-less absolute				
Encoder pulse		131072 pulse/rev				

## Tip shaft allowable load inertia moment

The 4th axis allowable inertia moment is the allowable inertial moment value for the center of rotation conversion of the 4th axis (rotational axis) of the SACRA robot. Make sure that the offset value from center of the rotation of the 4th axis to the tool center of gravity is within the guideline values listed below. If the tool center of gravity is far from the 4th axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.

Number of axes	Tip shaft allowable load inertia moment			
4-axis specification	0.5 kg • m²			



Horizontal direction	Vertical direction
200mm or less	150mm or less

## Cycle time

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.

2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion) [Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time] The cycle time for continuous operation.

. .

Item	nine
Standard cycle time	0.56 seconds
Continuous cycle time	0.69 seconds

Horizontal movement



#### Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting guideline graph.

1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting. 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value.

a) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty guideline.
 4) Duty (%) = (Operation time / (Operation time + Stop time)) x 100
 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.

6) Set the moment of inertia and payload to the allowable value or lower.
 7) The load mass represents the moment of inertia and weight at the center of rotation of the 4th axis.

8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration

may occur. 9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

## PTP Operation





## CP Operation

Horizontal





#### Vertical





CP operation: Acceleration/deceleration Limitations







The actuator on this page can be operated by the controller indicated below. Select the right type that suits the application of use.																				
								Cor	trol n	nethe	bc									
Name	External view	Max. number of connectable axes	voltage			positioning points	Reference page													
	view	view connectableaxes voltage Positioner train Program DV C	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT	SSN	ECM	positioning points						
XSEL-SAX4 (for IXA)	200	4	3-phase 200VAC	_	_	•	•	•	•	•	_	-	_	•	•	_	_	_	36666	Please contact IAI for more detail

(Note) Refer to P8-17 of the General Catalog 2021 for network abbreviations such as DV and CC.

## **IXA-4NHN12040**





Battery-less Absolute

rm Lenat 1200



Option * Please check the Options reference pages to confirm each option.							
1	lame	Model number	Reference page				
Built-in extende	d user cable	EXC	16				
Additional option table * Please check the Options reference pages to confirm each option.							
1	lame	Model number	Reference page				
User cable		CB-IXA-USR C-CS	17				
Flange		IXA-FL-1	17				
Protective flange	for external wiring *1	IXA-PFL-EW-1	17				
Protective flang	e for R-axis wiring	IXA-PFL-RW-1	17				
Side stay for Z-axis wiring	Z-axis 400st	IXA-SST-ZW-2	18				
Upper stay for Z-axis wiring	Z-axis 400st	IXA-TST-ZW-2	18				
Solenoid valve	set *1	IXA-SVP-1	18				

\*1 The protective flange for external wiring and the solenoid valve set cannot be installed at the same time. (Note) Please order separately.

#### Cable length

Туре	Cable code	4-axis specification
Standard turns	<b>5L</b> (5m)	0
Standard type	<b>10L</b> (10m)	0
	<b>1L</b> (1m) ~ 4L(4m)	0
	<b>6L</b> (6m) ~ 9L(9m)	0
	<b>11L</b> (11m)	0
Specified length	<b>12L</b> (12m)	0
	<b>13L</b> (13m)	0
	<b>14L</b> (14m)	0
	<b>15L</b> (15m)	0

(Note) Total price for the following cables. [4-axis spec.] Motor cable: 4, Encoder cable: 4, Brake cable: 1



(1) Please refer to P15 for Notes 1 - 8.

(2) The maximum set value for acceleration/deceleration varies depending on the weight of the object being transported, the travel distance and the location. Operating continuously at the maximum set value could cause an overload error. For a continuous operation, either lower the acceleration/deceleration values or set a stop time after acceleration/deceleration, referring to the duty ratio (guideline).

(3) If the motor is replaced, absolute reset must be performed. An adjustment jig will be required to perform an absolute reset on the rotational axis (4th axis). Please refer to P17 for details.

(4) A continuous operation cannot be performed for SCARA robots at 100% of speed and acceleration. Refer to the "Acceleration/Deceleration Setting Guidelines" for executable operating conditions.

## 

## Main specifications

		Description	
	Ite	4-axis specification	
Max. paylo	ad (kg) (Note 1)	50	
	Combined max. speed	l (mm/s)	8308
Speed		1st arm (deg/s)	270
•	Max. speed of	2nd arm (deg/s)	380
(Note 2)	individual axes	Vertical axis (mm/s)	1200
		Rotational axis (deg/s)	920
Duch force	(N) (Note 3)	Upper limit	570
Push force	(N) (Note 3)	Lower limit	70
Arm length	n (mm)		1200
Individual	arm length (mm)	1st arm	800
Individual	ann length (mm)	2nd arm	400
		1st arm (deg)	±137
0		2nd arm (deg)	±142
operation	range of individual axes	Vertical axis (mm)	400
		Rotational axis (deg)	±360

	ltem	Description				
		4-axis specification				
Positioning	Within horizontal surface	±0.05mm				
repeatability	Vertical axis	±0.02mm				
(Note 4)	Rotational axis	±0.01 degrees				
User wiring		10-core (9-core + shield) AWG24 (rated 30V/Max. 1A)				
User piping		Outer diameter Φ6, inner diameter Φ4, air tube 3 pcs. (max. usable pressure 0.6MPa)				
Alarm lamp (No	te 5)	Amber color LED, small pilot lamp 1 pc. (DC24V supply required)				
Brake release sw	/itch (Note 6)	Brake release switch for preventing vertical axis from dropping.				
Tip axis	Allowable torque	15 N•m				
TIP axis	Allowable load moment	48 N•m				
Ambient operat	ional temperature and humidity	0-40°C, 20-85% RH or lower (non-condensing)				
Degree of prote	ction	IP10				
Vibration- and in	npact-resistance	No impact or vibration should be applied.				
Noise (Note 7)		85 dB or lower				
International sta	indard	CE marking, RoHS				
Motor type		AC servo motor				
	1st arm	1000W				
	2nd arm	750W				
Motor wattage	Vertical axis	600W				
	Rotational axis	200W				
Encoder type		Battery-less absolute				
Encoder pulse		131072 pulse/rev				

## Tip shaft allowable load inertia moment

The 4th axis allowable inertia moment is the allowable inertial moment value for the center of rotation conversion of the 4th axis (rotational axis) of the SACRA robot. Make sure that the offset value from center of the rotation of the 4th axis to the tool center of gravity is within the guideline values listed below. If the tool center of gravity is far from the 4th axis center, it is necessary to reduced speed and acceleration/deceleration appropriately. The overhang distance is limited depending on the payload and operating condition.

Number of axes	Tip shaft allowable load inertia moment
4-axis specification	0.5 kg⋅m²



Horizontal direction	Vertical direction
200mm or less	150mm or less

## Cycle time

The standard/continuous cycle time represents the time required when an operation is performed with a cycle operation setting at maximum speed, under the following conditions.

2kg transport, vertical movement 25mm, horizontal movement 300mm (rough positioning arch motion) [Standard cycle time]

The time required for maximum speed. This is a general guideline for high speed performance. Note that continuous operation is not possible under maximum speed operation.

[Continuous cycle time] The cycle time for continuous operation.

, ,

Item	lime
Standard cycle time	0.61 seconds
Continuous cycle time	0.69 seconds

Horizontal movement



#### Acceleration/Deceleration Setting Guidelines

The SCARA Robot IXA cannot operate continuously at the maximum acceleration/deceleration or maximum speed specified in the catalog. To operate at the maximum acceleration/deceleration, set a stop time referring to the continuous operation duty guideline graph. If a continuous operation is required, do so within the continuous operation guideline range shown in the acceleration/deceleration setting

guideline graph.
1) For a PTP operation, always use the WGHT command in the program to set the weight and moment of inertia. For the SCARA robot, the maximum acceleration/deceleration for each payload is set at 100%. When the payload differs, the operation time will also vary even at the same acceleration/deceleration or speed setting. 2) Adjust the acceleration/deceleration setting value by gradually increasing it from the continuous operation reference value. 3) If an overload error occurs, lower the acceleration/deceleration as required, or set a stop time by referring to the continuous operation duty guideline.

4) Duty (%) = (Operation time / (Operation time + Stop time)) x 100 5) When moving the robot horizontally at high speed, operate the vertical axis as close to the upward end as possible.

6) Set the moment of inertia and payload to the allowable value or lower

7) The load mass represents the moment of inertia and weight at the center of rotation of the 4th axis. 8) Operate the robot at an appropriate acceleration/deceleration according to the weight and moment of inertia for the 4-axis specification. Otherwise, the drive section may become prematurely unusable or damaged, or vibration may occur.

9) If the load moment of inertia is high, vibration may occur in the vertical axis, depending on the position of the vertical axis. In such a case, decrease the acceleration/deceleration for operation as required.

#### PTP Operation





## CP Operation





#### Vertical





CP operation: Acceleration/deceleration Limitations









The actuator on this page can be operated by the controller indicated below. Select the right type that suits the application of use.

							Control method									Mary much as of				
Name	External view	Max. number of connectable axes	Power supply voltage	Positioner Pulse Program					Max. number of positioning points		Reference page									
	VIEW	connectable axes	voitage	Positioner	Positioner train Program		DV	CC	CIE	PR	CN	ML	ML3	EC	EP	PRT	SSN	ECM	positioning points	
XSEL-SAX4 (for IXA)	1994	4	3-phase 200VAC	_	_	•	•	•	•	•	—	_	-	•	•	_	_	_	36666	Please contact IAI for more detail

(Note) Refer to P8-17 of the General Catalog 2021 for network abbreviations such as DV and CC.

Precautions	
(Note 1) Payload	Payload is the maximum weight that can be carried. The optimal acceleration automatically sets the weight of the load and the moment of inertia in the program. A heavier load will cause a lower acceleration to be configured.
(Note 2) Maximum operation speed during a PTP operation	The value of the maximum operation speed in the specifications is for PTP command operation. For CP operation commands (interpolation operation), there are limitations on operations at high speed.
(Note 3) 3rd axis push force control range	The controllable range of the push force by the 3rd axis is the push force of the tip part of the vertical axis. This will be the push force when there is no load (nothing mounted) on the 3rd axis. Continuous pushing is not possible. The upper limit is the push force when the push force setting value is 70%. The lower limit is the push force when the push force setting value is 20%. There is some tolerance on the actual push force.
(Note 4) Positioning repeatability	This represents the ability to reproduce the same positioning result when an operation is repeated at the same speed, acceleration/deceleration, and arm system, between the operation start position (The value is for JIS B 8432 Ambient temperature 20°C constant). This is NOT the absolute positioning accuracy. Note that when the arm system is switched while starting from multiple positions to the target position, or when the operation conditions (such as operation speed or acceleration/deceleration setting) are changed, the value may fall outside of the positioning repeatability specification value.
(Note 5) Alarm pilot lamp	The Alarm indicator lamp is installed on the user panel part. It will be activated when the controller generates an error. The customer is required to form a circuitry for supplying 24VDC to the LED terminal in the user wiring part using the controller I/O output signal.
(Note 6) Brake release switch	The brake release switch is located on the user panel part. 24V DC power must be supplied to the controller to release the brake, regardless of whether the brake release switch is used or not.
(Note 7) Noise	This is the value measured when all axes are operating at their maximum speed. Noise may change depending on operating conditions and the surrounding reverberation environment (JIS B 6195)
Operation range	When switching the arm system, the arms extend once in a straight line. Beware of potential interference with the peripheral devices.
(Note 8) Cable	Brake cable (max. 15m)         2nd arm / vertical axis / rotational axis         Motor cable, encoder cable         (max. 15m)         1st arm encoder cable         1st arm motor cable         (max. 15m)

## **Options and maintenance parts**

Options

## Built-in extended user cable specification

Model EXC

**Description** The following cables (1) to (3) are built in the SCARA robot body. The body mass increases by 0.5 kg.

	- III -	Conn	ector			
	Cable type	User panel side	Rear panel side	Application example		
1	Ethernet cable	TM21CP- 88P(03) (Hirose Electric)	09_45_452_1561 (HARTING)	Vision camera, etc.		
2	10-core composite cable	7-core: DF11-8DS-2C (Hirose Electric)	LF10WBRB-12P	Solenoid valve power cable (supports solenoid valve set option) Vision camera power, etc.		
	Capie	5-core: No connector	(Hirose Electric)			
3	13-core composite cable	DF62C-24S-2.2C (Hirose Electric)	DF62P-24EP-2.2C (Hirose Electric)	Power and signal lines Electric gripper (RCP4-GR series)		







#### ①Ethernet cable



210-core composite cable

Color	Signal	Pin No.			Pin No.	Signal	Color
Red	SV1a	1			- 1	SV1a	Red
White	SV1b	2	I		2	SV1b	White
Black	SV2a	3	I		- 3	SV2a	Black
Blue	SV2b	4	I		- 4	SV2b	Blue
Green	SV3a	5	I		- 5	SV3a	Green
Yellow	SV3b	6	I		- 6	SV3b	Yellow
Brown-purple	COM	7	I		- 7	COM	Brown-purple
-	-	8			- 8	24V(+)	Red
					9	GND	Black
Color	Signal	Pin No.			10	FG	Green/Yellow
Red	24V(+)	-	<u> </u>		11~12	-	-
Black	GND	-					
Green/Yellow	FG	-					
			Sh	eath			

#### ③13-core composite cable



## **Options and Maintenance parts**

Series Type code					Single unit		Maintenance Parts	* Wiring and piping optior		
		Ţ	ype	Flange	User cable	Wiring and	Absolute reset	Nam	Model	
couc	coue			riange		piping options	adjusting jig	External wire protecting f	IXA-PLF-EW	
High IXA payload type			10040					R-axis wire protecting flag	nge	IXA-PLF-RW
	NHN	10040	IXA-FL-1	CB-IXA-USR 🗌 🗌 -SC	*	JG-IXA4	Z-axis wire side stay	(Z-axis)400ST	IXA-SST-ZW	
	INFIIN	120.40					Z-axis wire upper stay	(Z-axis)400ST	IXA-TST-ZW	
	type		12040					Solenoid valve set	IXA-SVP-1	



Single unit model

JG-IXA4



## User cable

This user cable is connected to the D-sub connector for user wiring at the rear panel.





## Protective flange for external wiring

The flange is used to protect the wire that is external to the robot.

\* When this option is used, the D-sub connector for user panel cannot be used.

## Single unit model number IXA-PLF-EW-1

(Single unit mass 0.6kg/material aluminum, steel)

(Note) The model code represents one piece of a flange. Please place an order for required quantity.





## Protective flange for R-axis wiring

This flange protects the wire that goes through the hollow part of the tip axis.

Single unit model number IXA-PLF-RW-1

(Single unit mass 0.3kg / material aluminum, steel)





## Options and Maintenance parts

## Side stay for Z-axis wiring

This Side Stay is for wiring at the Z-axis side without using the hollow part.

Single unit model IXA-SST-ZW-2

(Z-axis stroke 400mm), (Single unit weight: 0.9 kg / Material: steel)





## Upper stay for Z-axis wiring

This is an auxiliary stay for wiring between the user panel and joint bracket U for Z-axis operations.

Single unit model

**IXA-TST-ZW-2** 

(Z-axis stroke 400mm), (Single unit weight: 0.25kg / Material: steel)





#### Solenoid valve set

This is an optional solenoid valve when installing an air chuck at the tip. When the robot built-in cable is used for power supply to the solenoid valve, select the built-in extended user cable (option: EXC).

Single unit model

(Single unit weight: 0.5 kg)







Model	F10M3Fstn.1~3 F10T3-FJ-CPS DC24V
Maker	Koganei
Number of positions	3 positions
Number of ports	5
Valve function	Closed center
Fluid to be used	Air
Operation method	Internal pilot type
Acoustic conductance	0.93 dm³/(s·bar)
Effective sectional area (Cv value)	4.6mm <sup>2</sup> (0.25)
Piping connecting diameter	φ4 and φ6 dual joint
Pressure range for use	0.2 ~ 0.6MPa
Rated voltage	DC24V
Lubrication	Not necessary

18

## XSEL-SAX Controller



## XSEL-SAX Controller

C		ns Ta	
She		ins la	
200	catio	113 14	DIE

	CAV have
Controller type	SAX type
Compatible motor output	200W~1000W
Number of controlled axes	1st to 4th axes: SCARA robot
Max. output of connected axes	Three-phase 3600W
Control power input	Single-phase 200/230VAC ±10%
Power frequency	50/60Hz
Insulation resistance	$10 M\Omega$ or more (at 500VDC between the power supply terminal and I/O terminal, and between the external terminal batch and case)
Withstand voltage	1500VAC (1 minute)
Power capacity (max.)	4NHN10040 : 8522.6VA 4NHN12040 : 8388.8VA
Position detection method	Battery absolute
Safety circuit configuration	Duplex possible
Drive-source cutoff method	External safety circuit
Emergency stop input	BB contact input (External power supply, duplex possible)
Enable input	B contact input (External power supply, duplex possible)
Speed setting	1mm/s and up. Upper limit depends on the actuator specification
Acceleration/deceleration setting	0.01G and up. Upper limit depends on the actuator specification
Programming language	Super SEL language
Number of programs	255 programs
Number of program steps	20,000 steps (total)
Number of multi-tasking programs	16 programs
Number of positions	36,666
Data recording element	Flash ROM + non-volatile RAM (FRAM): system battery (button battery) not required
Data input method	Teaching pendant or PC compatible software
Standard I/O	I/O 48-point PIO board (NPN/PNP), I/O 96-point PIO board (NPN/PNP) 2 boards attachable
Expansion I/O	None
Serial communication function	Teaching port (D-sub25 pin), USB port (Mini-B) 1ch RS232C port (D-sub 9 pin), Ethernet (RJ-45)
Expansion motion control function	Up to 32 axes are connectable to the controller that is compatible with MECHATOROLINK-III for SCON-CA/CB, PCON-CB, ACON-CB, DCON-CB and MCON-C.
Fieldbus communication function	DeviceNet, CC-Link, CC-Link IE Field, PROFIBUS-DP, EtherNet/IP, EtherCAT
Clock function	Retention time: about 10 days Charging time: about 100 hours
Regenerative resistance	Built-in 1k $\Omega$ /20W regenerative resistance (Can be expanded by external regenerative resistance unit connection)
Protection function	Motor overcurrent, overload, motor driver temperature check, overload check, encoder disconnection detection, soft limit over, system malfunction, absolute battery error, etc.
Ambient operating temperature, humidity and ambience	0-40°C, 5%-85%RH (Non-condensing, Non-freezing). Avoid corrosive gas and excessive dust.

\* For the power supply capacity etc., please refer to the operation manual or contact IAI.

## External dimensions

Туре	Controller specification	Front view
SAX	Three-phase specification	

## XSEL-SAX Controller

# Options Regenerative resistance unit Model RESU-1 (Standard specification) RESUD-1 (DIN rail mounting specification) Bult-in regenerative resistance value 2350 80W Bult-in regenerative resistance value 2350 80W

Mounting method

Attached cable

#### Description

Unit that converts the regenerative current generated during motor deceleration to heat. Although the controller is equipped with a regenerative resistance inside, and additional external regenerative resistance unit may be necessary if the load in the vertical axis is large and the capacity is insufficient. Refer to the General Catalog 2021 for external dimensions.

Guideline fo	or installation	
	Model	Required number of regenerative resistance units
NHN	10040	10 units
	12040	TO UTILIS

## Dummy plug



#### Touch panel teaching pendant

Features A teaching device equipped with functions such as position teaching, trial operation and monitoring.

Model

TB-02-

-0 🕞





#### Specifications

Notes

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 (TB-02 single unit only)

Make sure to connect a stop switch to the system I/O connector when the actuator is operated with a USB

IA-101-XA-MW with an emergency stop.

connection. If a stop switch cannot be prepared, use the

DIN rail mount

CB-ST-REU010

Screw mount

#### PC-compatible teaching software

## Model IA-101-N

## Features

This is PC-compatible software (Downloadable) only.

When both the controller and the PC are connected with a USB cable or Ethernet cable, use only the software. The following cable is to be prepared by the customer.

#### Description

Software (Downloadable), Compatible with Windows 7/8/8.1/10

\* Please purchase through your distributor and a download link will be sent to your valid email address.

	Controller side connector	Maximum cable length			
USB cable specification	USB Mini-B	5m			
Ethernet cable specification	10/100/1000BASE-T(RJ-45)	100m			



#### USB cable (to be prepared by the customer)

Ethernet cable (to be prepared by the customer)

**21** XSEL-SAX

## PC dedicated teaching software compatible with safety category 4 (for XSEL-SAX)



## - Notes

The model number for cable only is CB-ST-A2MW050, and that comes with an emergency stop box as a set is CB-ST-A2MW050-EB. When the teaching tool is not used, connect the dummy plus DP-2 (attached to the controller) to the teaching connector.



To purchase a replacement cable, use the model name listed below.

## **Maintenance Parts**

Emergency stop box

 $\bigcirc$ 

Table of applicable cables

Product r	nodel number	Motor robot cable	Encoder robot cable	Brake cable				
IXA 4NHN10040		CB-X-MA	CB-X1-PA	CB-IXA-BK				
IXA	4NHN12040	(1st axis only : CB-XMC-MA 🗌 🗌 )	CB-XI-PA	CB-IXA-BK				
Product r	model number	PIO fi						
		CB-X-PI	0					
XS	SEL-SAX	Flat cable for	multi-point PIO					
		CB-X-PIC						

## 

\* Please indicate the cable length (L) in  $\Box \Box \Box$ , (e.g. 050 = 5m), maximum 15m



Minimum bending radius r = 51mm or more (Dynamic bending condition)

\* Only the robot cable is available for this model.

## 

\* Please indicate the cable length (L) in  $\Box \Box \Box$ , (e.g. 080 = 8m), maximum 15m



Minimum bending radius r = 55mm or more (Dynamic bending condition) \* Only the robot cable is available for this model.

## 



Minimum bending radius r = 44mm or more (Dynamic bending condition \* Only the robot cable is available for this model.

## \* Please indicate the cable length (L) in $\Box \Box \Box$ , (e.g. 050 = 5m), maximum 15m



## 





Flat cable (50-core)

UL2651 AWG28×2 Cable 1 (Pins 1-50)

Cable 2 (Pins 51-100)

No.	Color	Wiring	No.	Color	Wiring	No.	Color	Wiring	
1	Brown1		18	Gray2		35	Green4		
2	Red1		19	White2		36	Blue4		
3	Orange1		20	Black2		37	Purple4		
4	Yellow1		21	Brown-3		38	Gray4		
5	Green1		22	Red3		39	White4		
6	Blue1		23	Orange3		40	Black4		
7	Purple1		24	Yellow3		41	Brown-5	Flat cable	
8	Gray1	Flat cable	25	Green3	Flat cable	42	Red5	(pressure-welded)	
9	White1	(pressure-welded)	26	Blue3	(pressure-welded)	43	Orange5	,,	
10	Black1		27	Purple3		44	Yellow5		
11	Brown-2		28	Gray3		45	Green5	1	
12	Red2		29	White3		46	Blue5		
13	Orange2	1	30	Black3	1	47	Purple5	1	
14	Yellow2		31	Brown-4		48	Gray5	1	
15	Green2	1	32 Red4	1	49	White5	1		
16	Blue2		33	Orange4	1	50	Black5		
17	Purple2	1	34	Yellow4	1				

## 

\* Please indicate the cable length (L) in  $\Box \Box \Box$ , (e.g. 080 = 8m), maximum 10m

Cable 1								Cable 2													
Category	Pin No.	Color	Port No.	Function	Category	Pin No.	Color	Port No.	Function	Category	Pin No.	Color	Port No.	Function	Category	Pin No.	Color	Port No.	Function		
Ι	1	Brown- 1	-	External power supply 24VDC for pin No. 2~25, 51~74	-	26	Blue- 3	-	External power supply 24VDC for pin No. 27~50, 76~99		51	Brown- 1	300	Alarm output		76	Blue- 3	324	General-purpose outp		
	2	Red-1	000	Program start		27	Purple-3	024	General-purpose input	1	52	Red-1	301	Ready output		77	Purple-3	325	General-purpose out		
	3	Orange-1	001	General-purpose input	]	28	Gray-3	025	General-purpose input		53	Orange-1	302	Emergency stop output		78	Gray-3	326	General-purpose out		
	4	Yellow-1	002	General-purpose input	1	29	White-3	026	General-purpose input		54	Yellow-1	303	General-purpose output		79	White-3	327	General-purpose out		
	5	Green-1	003	General-purpose input	]	30	Black-3	027	General-purpose input		55	Green-1	304	General-purpose output		80	Black-3	328	General-purpose out		
		Blue-1	004	General-purpose input		31	Brown-4	028	General-purpose input		56	Blue-1	305	General-purpose output			Brown-4	329	General-purpose out		
	7	Purple-1	005	General-purpose input		32	Red-4	029	General-purpose input		57	Purple-1	306	General-purpose output		82	Red-4	330	General-purpose out		
	8	Gray-1	006	General-purpose input		33	Orange-4	030	General-purpose input		58	Gray-1	307	General-purpose output		83	Orange-4	331	General-purpose out		
	9	White-1	007	Program designation (PRG No.1)	)	34	Yellow-4	031	General-purpose input		59	White-1	308	General-purpose output		84	Yellow-4	332	General-purpose ou		
	10	Black-1	008	Program designation (PRG No.2)		35	Green-4	032	General-purpose input		60	Black-1	309	General-purpose output	1.1	85	Green-4	333	General-purpose ou		
	11	Brown-2	009	Program designation (PRG No.4)		36	Blue-4	033	General-purpose input			Brown-2	310	General-purpose output		86	Blue-4	334	General-purpose ou		
	12	Red-2	010	Program designation (PRG No.8)		37	Purple-4	034	General-purpose input		62	Red-2	311	General-purpose output		87	Purple-4	335	General-purpose ou		
	13	Orange-2	011	Program designation (PRG No.10)		38	Gray-4	035	General-purpose input		] [	Iſ	63	Orange-2	312	General-purpose output		88	Gray-4	336	General-purpose ou
Input	14	Yellow-2	012	Program designation (PRG No.20)		39	White-4	036	General-purpose input		64	Yellow-2	313	General-purpose output	t t t	89	White-4	337	General-purpose ou		
1	15	Green-2	013	Program designation (PRG No.40)	Ľ.	40	Black-4	037	General-purpose input		65	Green-2	314	General-purpose output		90	Black-4	338	General-purpose ou		
	16	Blue-2	014	General-purpose input		41	Brown-5	038	General-purpose input		66	Blue-2	315	General-purpose output		91	Brown-5	339	General-purpose ou		
	17	Purple-2	015	General-purpose input	1	42	Red-5	039	General-purpose input		67	Purple-2	316	General-purpose output		92	Red-5	340	General-purpose ou		
	18	Gray-2	016	General-purpose input		43	Orange-5	040	General-purpose input		68	Gray-2	317	General-purpose output		93	Orange-5	341	General-purpose ou		
	19	White-2	017	General-purpose input		44	Yellow-5	041	General-purpose input		69	White-2	318	General-purpose output		94	Yellow-5	342	General-purpose ou		
	20	Black-2	018	General-purpose input		45	Green-5	042	General-purpose input		70	Black-2	319	General-purpose output		95	Green-5	343	General-purpose ou		
	21	Brown-3	019	General-purpose input		46	Blue-5	043	General-purpose input		71	Brown-3	320	General-purpose output		96	Blue-5	344	General-purpose ou		
	22	Red-3	020	General-purpose input		47	Purple-5	044	General-purpose input		72	Red-3	321	General-purpose output		97	Purple-5	345	General-purpose ou		
	23	Orange-3	021	General-purpose input		48	Gray-5	045	General-purpose input				73	Orange-3	322	General-purpose output		98	Gray-5	346	General-purpose ou
	24	Yellow-3	022	General-purpose input		49	White-5	046	General-purpose input				74	Yellow-3	323	General-purpose output		99	White-5	347	General-purpose ou
	25	Green- 3	023	General-purpose input		50	Black- 5	047	General-purpose input	-	75	Green- 3	-	External power supply 0V for pin No. 2~25, 51~74	-	100	Black- 5	-	External power supp for pin No. 27~50, 76~		

## 

Socket: HIF60100D-1.27R(Hirose)

ſ

\* Please indicate the cable length (L) in  $\Box$ , (e.g. 050 = 5m), maximum 15m



## IAI America, Inc.

USA Headquarters & Western Region (Los Angeles): 2690 W. 237th Street, Torrance, CA 90505 (800) 736-1712 Midwest Branch Office (Chicago): 110 E. State Pkwy, Schaumburg, IL 60173 (800) 944-0333 Southeast Branch Office (Atlanta): 1220 Kennestone Circle, Suite 108, Marietta, GA 30066 (678) 354-9470

onnector

## www.intelligentactuator.com

JAPAN Headquarters: 577-1 Obane, Shimizu-ku, Shizuoka-shi, Shizuoka, 424-0103, JAPAN The information contained in this product brochure may change without prior notice due to product improvements.

#### IAI Industrieroboter GmbH

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

IAI (Shanghai) Co., Ltd. Shanghai Jiahua Business Center A8-303, 808, Hongqiao Rd., Shanghai 200030, China

#### IAI Robot (Thailand) Co., Ltd.

825 Phairojkijja Tower 7th Floor, Debaratana Rd., Bangna Nuea, Bangna, Bangkok 10260, Thailand