

Robot Controller



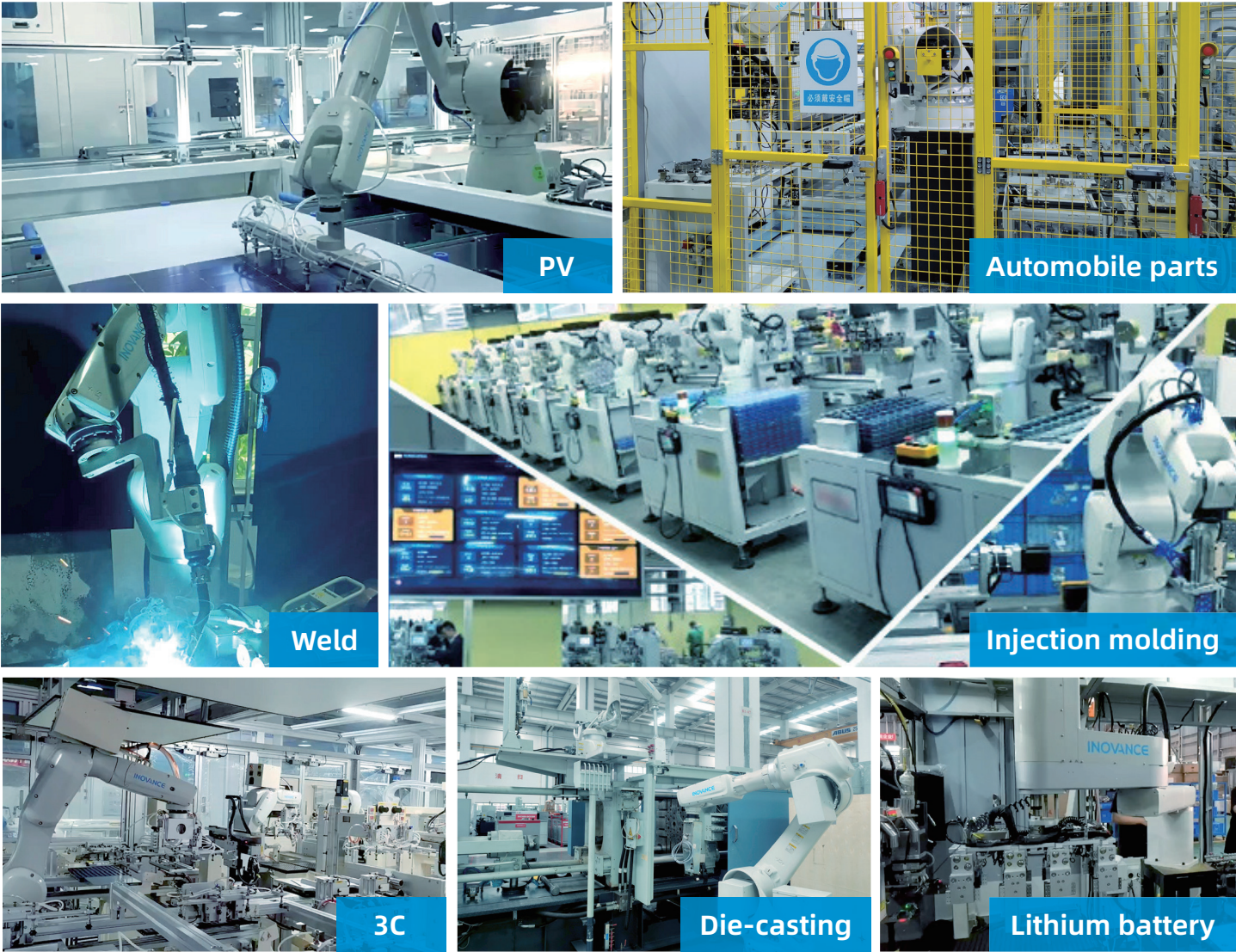
Controller Series	IRCB501 Series		IRCB501 High-protection Series
Mounting mode	Vertical mounting, horizontal mounting, 19" rack mounting		Vertical mounting, horizontal mounting, rack mounting
Standard I/Os	16 inputs and 16 NPN outputs (extendable)		
Communication interfaces	Ethernet interface: Used for TCP/IP, Modbus TCP, Ethernet/IP, MC communication		
	EtherCAT-IN interface: EtherCAT slave -IN interface		
	EtherCAT-OUT interface: EtherCAT master -OUT interface		
	EtherCAT interface: Used for extension of external axes		
	RS232/RS485 interface: Used for serial and Modbus RTU communication (RS485 only)		
Control mode	USB2.0 interface: Used for backup/upload programs and export robot status information		
	Optional interface: Profinet slave , CC-LINK slave		
Power supply	PC programming platform control, teach pendant control, remote I/O control, remote Modbus control, and API control		
	Input voltage: Single-phase 200 VAC to 240 VAC, 10A/20A, 50 Hz to 60 Hz Max. power consumption: 3.1 kW (depending on the robot model)	Input voltage: Single-phase 200 VAC to 250 VAC, 23A, 50 Hz to 60 Hz Max. power consumption: 4.5 kW (depending on the robot model)	
IP rating	IP20		IP54 + anti metal dust
Operating conditions	Temperature: 5° C to 40° C ; Relative humidity: 20% to 95% RH@30° C (non-condensing)		Temperature: 0° C to 45° C ; Relative humidity: 20% to 95% RH@30° C (non-condensing)
	Standard 330mm×338.5mm×130mm	High- Power 330mm×400mm×130mm	445mm×575mm×276mm
Dimensions	8kg	10kg	30kg
Weight	SCARA: IR-S4/7/10 Series IR-TS4/5 Series 6-Axis: IR-R7H Series IR-R4/R4H Series		SCARA: IR-S25 Series IR-S35 Series IR-S60 Series 6-Axis: IR-R11 Series IR-R15H Series
Applicable Robots	6-Axis: IR-R10 Series, IR-R25 Series		

Teach Pendant Expansion Card

Teach Pendant Model	IR-TP200-L5-INT
cable length	5m
screen	Touch screen operation, function keys
IP rating	IP54

Expansion Card Model	IRCB501-0016TND-BD	IRCB501-1600END-BD	IRCB501-2ENID-BD	IRCB501-2PN-BD	IRCB501-FS-01-BD	IR-EC-CCLINK
Description	General I/O expansion card with 16 NPN outputs	General I/O expansion card with 16 inputs	2-channel differential input incremental encoder expansion card	PROFINET expansion card	Safety function expansion card	CC-LINK expansion card
Matching controller	IRCB501 Series, IRCB501 High-protection Series					

Robot application scenarios



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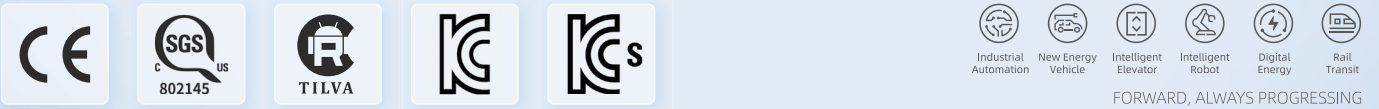
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Robot controller functions

Collision detection

Real time detection of the robot's operating status can effectively avoid gear jumping caused by robot collisions at low speeds, and achieve rapid stopping at high speeds, reducing damage to the robot and equipment caused by collisions.

Curve interpolation and fixed tool function

Even in situations where tools are fixed and robots hold workpieces for work, they can perform arbitrary curve interpolation according to requirements, and are widely used in processes such as gluing, polishing, and sewing. On the assembly line, interpolation of the trajectory in the following state can also be completed.

Vibration reduction

It can effectively reduce the shaking caused by resonance, eccentric load, and large load during the robot's movement process, making the robot's movement more stable and still ensuring excellent production performance during high-speed and high-precision operations.

High precision

Fully considering the influence of the robot's body structure, external factors, and visual system on the robot's motion accuracy, high-precision control algorithms are adopted to meet the high-precision applications of loading, unloading, and fitting. This algorithm is also applicable to continuous motion trajectories.

Dynamic following function

Whether it's a single product or multiple products of different types, colors, and sizes, it's easy to handle, switching between assembly line products with just one click. In situations where multiple machines are sorting at the same time, a set of vision can drive multiple robots, reducing the overall cost of the line.

Dynamatic I/O

In the robot motion path, precise control of IO opening and closing actions can be carried out based on actual conditions, which is widely used in detection, high-speed transportation, dispensing, laser and other occasions. IO control can be specified based on the position, time, and distance of the movement.

Technical Data



Series		IR-S4	IR-S7				IR-S10			IR-S25			IR-S35			IR-S60&GS60		IR-TS4	IR-TS5			
Model		IR-S4-40Z155-INT	IR-S7-50Z205-INT	IR-S7-60Z205-INT	IR-S7-70Z205-INT	IR-S10-60Z205-INT	IR-S10-70Z205-INT	IR-S10-80Z205-INT	IR-S25-80Z425-INT	IR-S25-100Z425-INT	IR-S25-120Z425-INT	IR-S35-80Z425-INT	IR-S35-100Z425-INT	IR-S35-120Z425-INT	IR-S60-120Z405-INT	IR-GS60-120Z405-INT	IR-TS4-35Z155-INT	IR-TS5-55Z155-INT				
Arm length	J1+J2(mm)	400	500	600	700	600	700	800	800	1000	1200	800	1000	1200	1200	1200	350	550				
	J1(mm)	225	225	325	425	225	325	425	350	550	750	350	550	750	600	600	175	275				
	J2(mm)	175	275	275	275	375	375	375	450	450	450	450	450	450	600	600	175	275				
Maximum speed	J1+J2(mm/s)	7200	7120	7850	8590	9100	9800	10500	8100	9400	9400	8100	9400	9400	7400	7400	6180	9712				
	J3(mm/s)	1300	1600	1600	1600	1600	1600	1600	2100	2100	1200	2100	2100	1200	1500	1500	1300	1300				
	J4(° /s)	2600	2000	2000	2000	2700	2700	2700	705	705	705	705	705	705	600	600	2600	2000				
Repeatability	J1+J2(mm)	±0.01	±0.02	±0.02	±0.02	±0.02	±0.02	±0.025	±0.05	±0.05	±0.08	±0.05	±0.05	±0.08	±0.05	±0.05	±0.01	±0.015				
	J3(mm)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.02	±0.02	±0.01	±0.01				
	J4(°)	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.005	±0.005	±0.01	±0.01				
Load	Rated(kg)	2	3	3	3	5	5	5	10	10	10	20	20	20	30	30	2	2				
	Maximum(kg)	4	7	7	7	10	10	10	25	25	25	35	35	35	60	60	4	5				
Permissible moment inertia of J4	Rated(kg·m²)	0.005	0.01	0.01	0.01	0.02	0.02	0.02	0.5	0.5	0.5	0.6	0.6	0.6	1.2	1.2	0.005	0.01				
	Maximum(kg·m²)	0.05	0.12	0.12	0.12	0.3	0.3	0.3	1.2	1.2	1.2	1.2	1.2	1.2	2.45	2.45	0.05	0.12				
Mounting base dimensions(mm)		120×120 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	150×150 (4-Φ9)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ16)	200×200 (4-Φ14)	200×200 (4-Φ14)	95×95×160 (6-Φ6.6)	95×95×160 (6-Φ6.6)				
Cable		Stand: 3m Optional: 5m/10m/15m/High Flexible (3m/5m/10m/15m)																				
Weight(excluding cables)		12kg	17kg	17.5kg	19kg	18.5kg	19kg	20.5kg	68.5kg	72.5kg	78kg	70.5kg	74.5kg	80.5kg	136kg	136kg	18.5kg	20kg				
Press-in force of J3		100N	150N	150N	150N	200N	200N	200N	250N	250N	250N	250N	250N	250N	450N	450N	100N	150N				
Customer signal line		15 signal lines 30V 0.5A										25 signal lines 30V 0.5A						15 (15pin:D-sub)				
		CAT5E										CAT5E										
Customer air piping		Φ6 mm × 2, 0.59 Mpa										Φ6 mm × 2, 0.59 Mpa						Φ6 mm × 2, 0.59 Mpa				
		Φ4 mm × 1, 0.59 Mpa										Φ8 mm × 2, 0.59 Mpa						Φ4 mm × 1, 0.59 Mpa				
Operating conditions	Ambient temperature ^[1]	5~40° C (no excessive temperature changes)										5~40° C (no excessive temperature changes)										
	Relative humidity	10~80%										10~80%										
Shipment Conditions	Ambient temperature	-10℃ ~55℃										-10℃ ~55℃										
	Relative humidity	≤ 80% RH,non-condensing										≤ 80% RH, non-condensing										
Storage Conditions	Ambient temperature	-10℃ ~55℃										-10℃ ~55℃										
	Relative humidity	≤ 80% RH, non-condensing										≤ 80% RH, non-condensing										
Noise level ^[2]		Laeq=70dB(A)										Laeq ≤ 80dB(A)						Laeq=70dB(A)				
Maximum motion range	J1(°)	±132	±132	±132	±132	±132	±132	±132	±139	±139	±139	±139	±139	±139	±135	±135	±225	±225				
	J2(°)	±141	±150	±150	±150	±150	±150	±150	±151	±151	±151	±151	±151	±151	±150	±150	±225	±225				
	J3(mm)	150	200	200	200	200	200	200	420	420	420	420	420	420	400	400	150	150				
	J4(°)	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±720	±720				
Standard cycle time(s) ^[3]		0.342	0.351	0.36	0.375	0.361	0.386	0.416	0.33	0.35	0.4	0.31	0.33	0.42	0.84	0.67	0.306	0.351				
Controller		IRCB501-4AD-INT		IRCB501-4CD-INT						IRCB501-4ED-INT						IRCB501-4MD-INT		IRCB501-4CD-INT				
Certification		KCs, KC, CE, cSGSus, FCC, Safety Function , Optional: Cleanliness Class 4																	CE, cSGSus, FCC, Safety Function		KCs, KC, CE, cSGSus, FCC, Safety Function	

Note

[1] If this product is used in a low temperature environment close to the lowest temperature of the product specification, or if it is suspended for a long time due to holidays and nights, it is recommended to warm up for 10 minutes before running

[2] Noise test conditions: 4 joint linkage, 100% speed and acceleration, duty cycle 50%, measurement position: the front of the robot, 1000mm away from the action area, and more than 50mm from the base mounting surface.

[3] Standard cycle time for 4kg SCARA: 1kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 7kg/10kg SCARA : 2kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 25kg SCARA : 2kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 35kg SCARA : 2kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 60kg SCARA : 5kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)
Standard cycle time for 4kg/5kg Inverted SCARA : 1kg load, the time required for the robot to go back and forth with a gate command (300 mm horizontally, 25 mm vertically)

Technical Data



Series		IR-R4	IR-R4H	IR-R7H		IR-R11			IR-R15H		IR-R10	IR-R25			
Model		IR-R4-56S-INT	IR-R4H-54S-INT	IR-R7H-70S-INT	IR-R7H-90S-INT	IR-R11-90S-INT	IR-R10-110S-INT	IR-R10H-120S-INT	IR-R15H-145S-K-INT	IR-R20H-120S-K-INT	IR-R10-140S-INT	IR-R16-210S-INT	IR-R25-178S-INT		
Structural style		Vertical axis cascading structure					Vertical axis cascading structure								
Number of Axes		6 axes					6 axes								
Maximum reach (mm)		560.6	545.7	722.3	911.9	901.9	1101.6	1201.2	1455	1218	1422	2107	1783		
Repeatability (mm)		±0.01	±0.02	±0.015	±0.02	±0.02	±0.02	±0.025	±0.04	±0.04	±0.05	±0.03	±0.03		
Maximum Load(kg)		4	4	7	7	11.3	10	10	15	20	10	16	25		
IP rating		IP40 (IP67 optional)					IP40 (IP67 optional)					Body: IP65 Wrist: IP67	Body: IP65 Wrist: IP67	Body: IP65 Wrist: IP67	
Max.Speed	J1 (°/s)	450	450	420	336	240	240	240	260	260	200	190	190		
	J2 (°/s)	460	460	336	280	180	180	180	240	240	200	175	175		
	J3 (°/s)	520	520	487.5	390	330	330	330	260	260	200	200	200		
	J4 (°/s)	560	560	550	550	450	450	450	470	470	375	400	400		
	J5 (°/s)	560	560	438	438	420	420	420	450	450	375	360	360		
	J6 (°/s)	900	900	764.7	764.7	720	720	720	705	705	600	610	610		
Maxi-mummotion range	J1 (°)	±170	±170	±170	±170	±170	±170	±170	±170	±170	±170	±170	±170		
	J2 (°)	-120~+110	-120~+110	-135~+80	-125~+80	-135~+100	-135~+100	-135~+100	-160~+90	-160~+90	-160~+60	-155~+80	-155~+80		
	J3 (°)	-69~+205	-65~+195	-70~+190	-70~+190	-66~+210	-66~+210	-66~+210	-76~+210	-76~+210	-80~+160	-75~+160	-75~+160		
	J4 (°)	±190	±190	±190	±190	±190	±190	±190	±190	±190	±180	±180	±180		
	J5 (°)	±120	±120	±120	±120	±125	±125	±125	±140	±140	±140	±140	±140		
	J6 (°)	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360	±360		
Allowed wrist torque	J4 (N·m)	8.86	8.86	16.9	16.9	20.45	18.59	18.59	26.5	35	22	25	50		
	J5 (N·m)	8.86	8.86	16.9	16.9	20.45	18.59	18.59	26.5	35	22	25	50		
	J6 (N·m)	4.9	4.9	9.4	9.4	10.8	9.8	9.8	12	20	9.8	12	30		
Allowed wrist inertia	J4 (N·m)	0.2	0.2	0.49	0.49	0.6	0.6	0.6	0.9	1	0.63	0.78	2.2		
	J5 (N·m)	0.2	0.2	0.49	0.49	0.6	0.6	0.6	0.9	1	0.63	0.78	2.2		
	J6 (N·m)	0.067	0.067	0.15	0.15	0.2	0.2	0.2	0.3	0.4	0.2	0.3	1.5		
Customer connections	Wiring	12 signal lines 30V 0.5A			17 signal lines 30V 0.5A		12 signal lines 30V 0.5A		17 signal lines 30V 0.5A		24 signal lines 30V 0.5A		18 signal lines 30V 0.5A		
	Air	Φ4 mm × 4, 0.59 Mpa					Φ4 mm × 4, 0.59 Mpa			Φ6 mm × 4, 0.59 Mpa			Φ8 mm × 1, 0.59 Mpa		
Operating conditions	Ambient temperature(° C)	0~45								0~45					
	Relative humidity						5% to 95% RH (non-condensing)					10% to 80% RH (non-condensing)		5% to 95% RH (non-condensing)	
	Maximum Temperature Gradient(° C/min)	1.5								1.5					
Shipment Conditions	Ambient temperature(°C)	0~45								0~45					
	Relative humidity						≤ 95% RH,non-condensing					≤ 80% RH, non-condensing		≤ 95% RH,non-condensing	
Storage Conditions	Ambient temperature(°C)	-10~55								-10~55					
	Relative humidity						≤ 95% RH,non-condensing					≤ 80% RH, non-condensing		≤ 95% RH,non-condensing	
Cable		Stand:5m optional: 3m/10m/15m/High Flexible(3m/5m/10m/15m)					Stand:5m optional: 3m/10m/15m/High Flexible(3m/5m/10m/15m)								
Weight		24kg	24.5kg	31kg	33kg	45kg	48kg	50kg	155kg	150kg	130kg	260kg	255kg		
Controller		IRCB501-6LD-INT					IRCB501-6FD-INT			IRCB501-6KD-INT			IRCB501-6ND-INT		
Mounting mode		Floor mounted/Ceiling mounted/Wall mounted													
Certification		Kcs, KC, CE, cSGSUs, FCC, Safety Function , Optional: Cleanliness Class 3							Kcs, KC, CE, cSGSUs, FCC, Safety Function , Optional: Cleanliness Class 4			Kcs, KC, CE, cSGSUs, FCC,Safety Function			