

JAKA®

JAKA MiniCobo Collaborative Robot

Education Industry

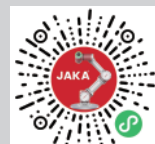


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JAKA
Mini-Program

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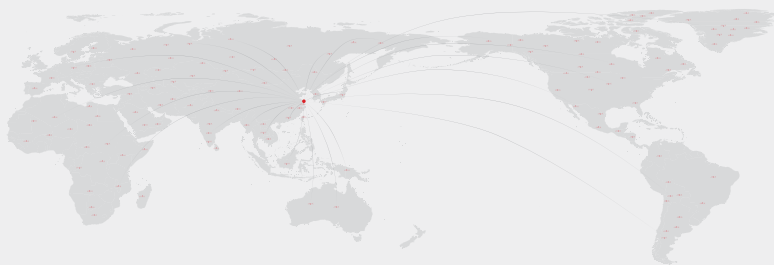
Company Introduction

2014 JAKA Robotics
Co-founded by engineers and roboticists

We understand that the pursuit of excellence requires searching high and low, far and wide, for new ideas and innovation. We named ourselves 'JAKA' , which stands for Just Always Keep Amazing, in appreciation for our strive towards excellence.

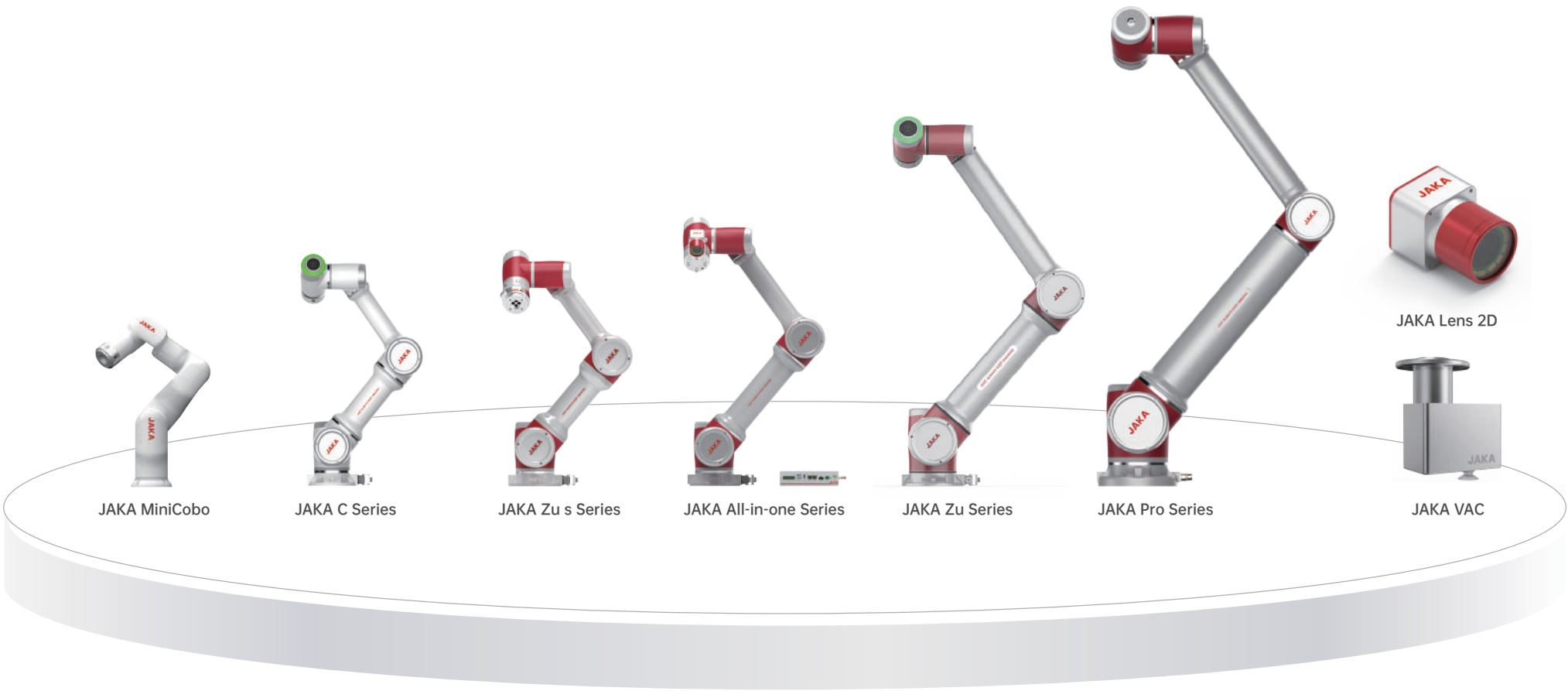
JAKA Robotics is a high-tech company that focuses on innovative research, development and production of new generations of collaborative robots. It stands at the forefront of creating truly smart factories, meeting the requirements of industrial robotics while maintaining high levels of useability and simplicity. Our moto, 'Free Your Hands by JAKA' , represents our drive to help companies, all over the world, automate all manner of tasks.

So far, JAKA has worked with more than 300 companies, from all over the world, across multiple industries, to provide automation solutions. In total, more than 10,000 JAKA cobots have already been deployed. Their flexibility and efficiency help those in the automobile, electronics and semi-conductor manufacturing industries, while their ease-of-use has made them accessible to those in education, commerce and new retail industries.




Global leader in flexible, intelligent cobots
Ushering in a new generation in automation productivity

Easy to use	Safe	Reliable	Versatile




JAKA MiniCobo


Developing a technological ecosystem of depth, with experiment-led development




Payload
1.0kg




Working Radius
580mm



Net Weight
9.4kg



Repeatability
±0.1mm



The JAKA Minicobo is compatible with Ethernet protocols (TCP/IP) and control interfaces such as Modbus and Profinet. It can simply and quickly integrate end effectors, grippers, suction, vision systems and force control modules. JAKA also provides an ROS package and SDK secondary development package, meaning that operators can quickly adapt the cobot to suit new or experimental applications.

- Lab construction
- Curriculum development
- Academic competitions
- Innovation platform
- Project research

ROS/SDK Deep Integration

- Support for ROS, providing full function package
- Rich secondary development capability and big data interaction interfaces
- SDK supports C, C++, C# and Python



Frictionless hardware-software ecosystem

- Full range of hardware-software pairing options
- Able to meet the needs of multiple educational and scientific research projects
- Support for TCP/IP, Modbus and Profinet protocols



Graphical programming intuitive learning

- Easy, wireless control and teach through the JAKA app
- Graphical programming and drag teach functionality
- Multiple active and passive safety mechanisms, ensuring the safety of man-machine collaboration



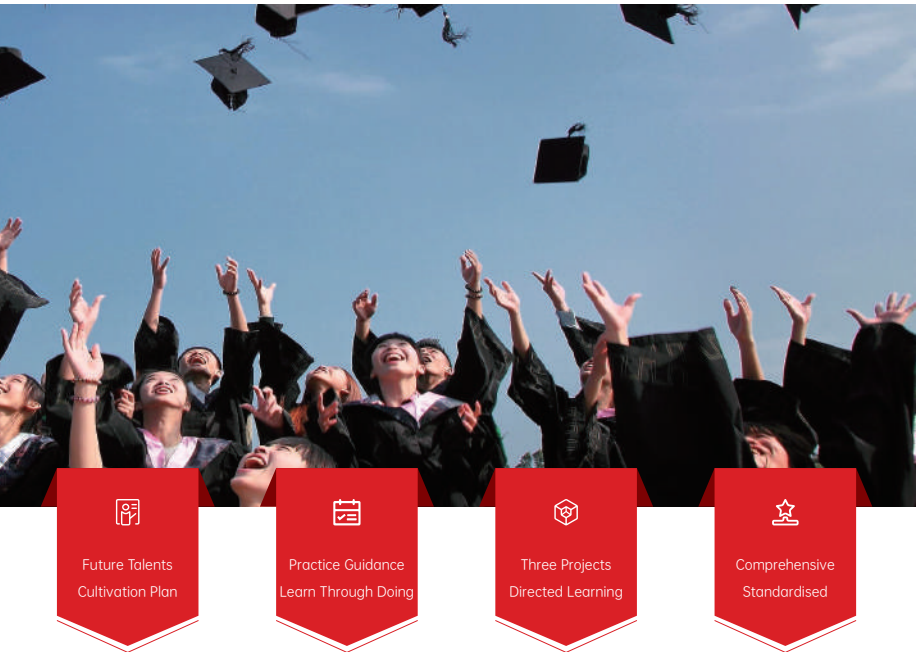
Supporting educational activities through versatility

- Detailed experimental teaching materials and operational instructions provided
- Means to combine typical industrial applications in classroom scenarios
- Can meet the needs of teaching at university-level, as well as professional scientific research



JAKA 'Stars Program'

The JAKA 'Stars Program' was launched to cultivate talented individuals in robotics, artificial intelligence, intelligent manufacturing and other industries, in response to the national policy for the development of the robotics industry, in China's 14th Five Year Plan. The experimental teaching platform of the Stars Program places the JAKA Minicobo at its core, and through the configuration of vision, end effector, force control sensor, AGVs and more, combined with a large number of experimental scenarios, it introduces three educational projects. By sharing JAKA' s considerable body of knowledge, hard technology capabilities and product support, JAKA seeks to integrate teaching and practice, thereby empowering the talents of the future.



'New Engineering' Construction

Based on an experimental teaching platform, the Stars Program focuses on typical application scenarios. As a platform, it has the advantages of being accessible, secure and open, while transferring skills and knowledge that are widely compatible with 'New Engineering'

The Stars Program teaching platform can be combined with other hardware and technical avenues, in order to create innovative platforms involving, for example, artificial intelligence, voice interaction, face recognition, EMG signal reading and more.

Competitions and Experimental Practice

The Stars Project combines typical industrial applications with teaching, developing practical skills as an integrated part of educational practice. At the same time, the teaching platform explores a rich interaction between software and hardware, so as to meet the needs of both teachers and students, and their independent experimental practice or pedagogy.

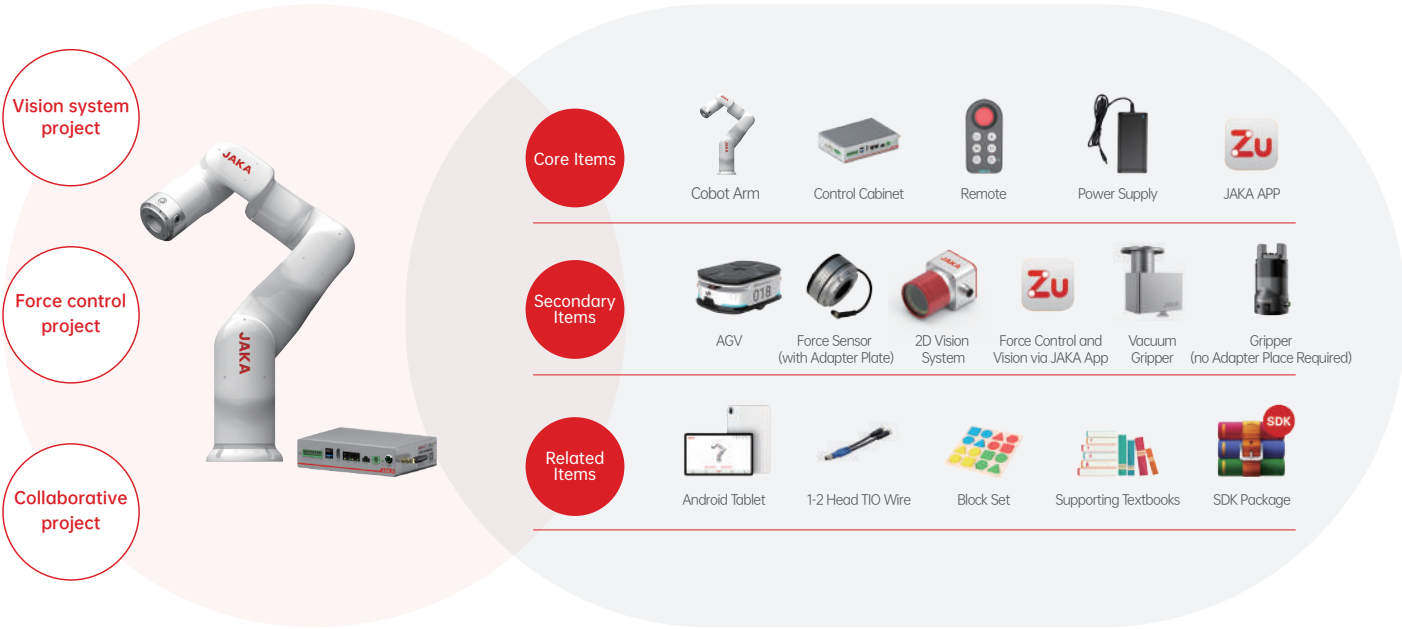
The versatile and wide-reaching software-hardware interactions that make up with Stars Program can inform the development of additional curriculums. The theoretical knowledge and practice guidance are applicable in courses on robotics, machinery, electrical engineering, computer science and more.

Stars Program Development in the Education Industry

Innovative Platform Development

Curriculum Development

	Category	Vision Project	Force Control Project	Collaborative Project
Robot	Cobot	✓	✓	✓
Vision	2D Vision	✓	✓	✓
Force Control	6-Axis Force Sensor		✓	✓
Vacuum Gripper	Suction Cup	✓	✓	✓
Gripper	Electric Gripper	✓	✓	✓
Mobile Platform	AGV/ARM			✓
Other	Tablet	✓	✓	✓
	Block Set	✓	✓	✓
	TIO Special Cable	✓	✓	✓



Scan QR for Stars Program introduction

Vision Project Recommended Applications



Size, colour & shape classification
Bar code scanning, defect detection

Force Control Project Recommended Applications




Assembly Force detection
Constant force Innovative applications

Collaborative Project Recommended Applications




Intelligent picking Cross-scenario handling
Moving Innovative application


Basic Cobot Teaching Platform



Platform Introduction

The Basic Cobot Teaching Platform is composed of a JAKA Minicobo module, a basic function module, a vision module and a computer learning module. It aims to combine theoretical knowledge learning with basic function practice, to enable the quick mastery in applying robotics knowledge. The platform is equipped with a complete curriculum, which can be applied in basic courses such as robot theory, machine vision, intelligent manufacturing and more.






Platform Configuration

Cobot module

Basic function module


Vision module

Computer learning module



Platform advantages


- Operable via JAKA APP, with graphical and drag programming
- Combines theory with practice, to facilitate understanding and practical use skills
- Provides complete courses and routines, with best-practice examples, as access point for deeper robotics knowledge
- The integrated, customized design makes it perfect for use in a multimedia classroom
- Useable with any tablet, with a simple and intuitive operational interface



Experiments


Serial	Experiment
1	Robot cognition and assembly
2	Robot system settings
3	Basic robot operation
4	IO communication
5	Vision system and cognition
6	Vision system and communication
7	Parts sorting
8	Basic case study


Vision System Development Platform



Platform Introduction

The Vision System Development Platform is composed of a JAKA Minicobo module, a vision system module, and an end gripper. It is supported with an array of learning components, a complete curriculum and experimental scenarios. As an experimental teaching platform, it is suitable for professional practical teaching of robotics, automation, electronics, applied computer science and more.






Platform Configuration


Cobot module

Vision system



Experiments

Serial	Experiment
1	Safety operation procedures
2	Collaborative robot cognition
3	Use and control of teaching device
4	Basic commands and position points
5	IO point operations
6	Vision system and cognition
7	Industrial camera connection and calibration
8	Edge contour extraction
9	Bar code and QR code scanning
10	LED lamp colour selection
11	Dimension measurement of mechanical parts
12	Vision system and communication
13	Hand-eye calibration
14	Bottle cap positioning and sorting
15	Parts assembly
16	Fixture design and adaptation
17	Robot system integration



Platform advantages

- Operable via JAKA APP, with graphical and drag programming
- Wireless connection, with no teaching pendant
- Equipped with collision detection, it supports six levels of collision protection
- Rich communication interfaces supporting a variety of end effectors in plug-and-play
- Supports C, C++, C#, Python and ROS
- Can quickly establish a new vision application, with the help of colour and bar code recognition
- Capable of character recognition, measurement, calibration, alignment, image processing and more
- New scenarios can be quickly and easily established

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Hybrid Cobot Development Platform

Platform Introduction

The Hybrid Cobot Development Platform combines the JAKA Minicobo with an AGV mobile platform. It is capable of simultaneous localization and mapping (SLAM), automatic navigation and obstacle avoidance. Equipped with a vision system, end effectors, force control sensors and more, it can complete experimental projects such as motion planning, visual grasping, and mobile material handling. It is an excellent educational and scientific research tool for robot technology, artificial intelligence, and intelligent manufacturing.



Platform Configuration

- Cobot module
- AGV module
- Vision system (optional)
- End effectors (optional)

Platform advantages

- Modular disassembly and assembly, adaptable according to application, object, or experiment
- Wide variety of available end effectors
- Equipped with SLAM capability, automatic navigation, obstacle avoidance, three-dimensional mapping and more advanced technology
- Integrated software supports the control of multiple modules in the same software
- Supports C, C++, C#, Python and ROS

Experiments

Serial	Experiment
1	ROS development environment
2	ROS message publishing and receiving
3	ROS service request and response
4	Gmapping algorithm, for map building and navigation
5	Robot movement control
6	Lidar use and position calibration
7	Autonomous navigation
8	Collaborative robot cognition
9	Basic cobot commands and position points
10	Vision system and communication
11	Hand-eye calibration

JAKA

Based on years of collecting industry application use cases, and project-matching them within the JAKA+ ecosystem, the JAKA Minicobo is able to offer a one-stop shop, a diverse solution for the education industry. It enables both theoretical and practical training, for use in laboratory construction, and the training of professional and technical personnel.

A proud part of **100+** scientific research projects, at colleges and universities







Product Specs		
Payload	1.0kg	
Weight (including cable)	9.4kg	
Working radius	580mm	
Repeatability	±0.1mm	
Freedom of movement	6 axis	
Programming	Graphical & drag and drop programming	
Type of teaching pendant	PC, mobile terminal (tablet/phone)	
Collaborative operation	GB 11291.1-2011 standard	
Range of motion and speed		
Part	Circular motion	Top speed
Axis 1	±360°	180°/s
Axis 2	±120°	180°/s
Axis 3	±130°	180°/s
Axis 4	±360°	180°/s
Axis 5	±120°	180°/s
Axis 6	±360°	180°/s
End effector	/	1.5m/s
Additional Info		
Rated power	150W	
Temperature range	0-50°C	
IP level	IP40	
Robot installation	Installation at any angle	
Effector I/O port	Digital input 2	
	Digital output 2	
	Analog input 1	
Effector I/O power supply	24VDC	
Effector I/O size	M8	
Texture of material	Aluminium alloy, PC	
Base diameter	124mm	
Length of cobot power cable	6m	



Control cabinet	
Model	JAKA MiniCab
Input power supply	20-60VDC
Input current	≤40A
Size	180×128×47(mm)(L×W×H)
IP level	IP20
I/O port	7 ports, inputs and outputs configurable
I/O power supply	24VDC
Installation method	Installation method Panel / guide rail
Communication standard	TCP/IP, Modbus TCP, Modbus RTU, Profinet, Ethernet/IP
Weight	1.1kg
Texture of material	Aluminium, steel



JAKA Academy

Providing lifelong technical training
Establishing a high-level training academy
especially for the robot industry

Online & offline flexible teaching

- Three training bases in Shanghai, Changzhou and Shenzhen
- Online lecture halls



10,000+

Professional talents

500+

Training courses

Lectures by professors and industry experts

10+

Doctoral professional lecturers

