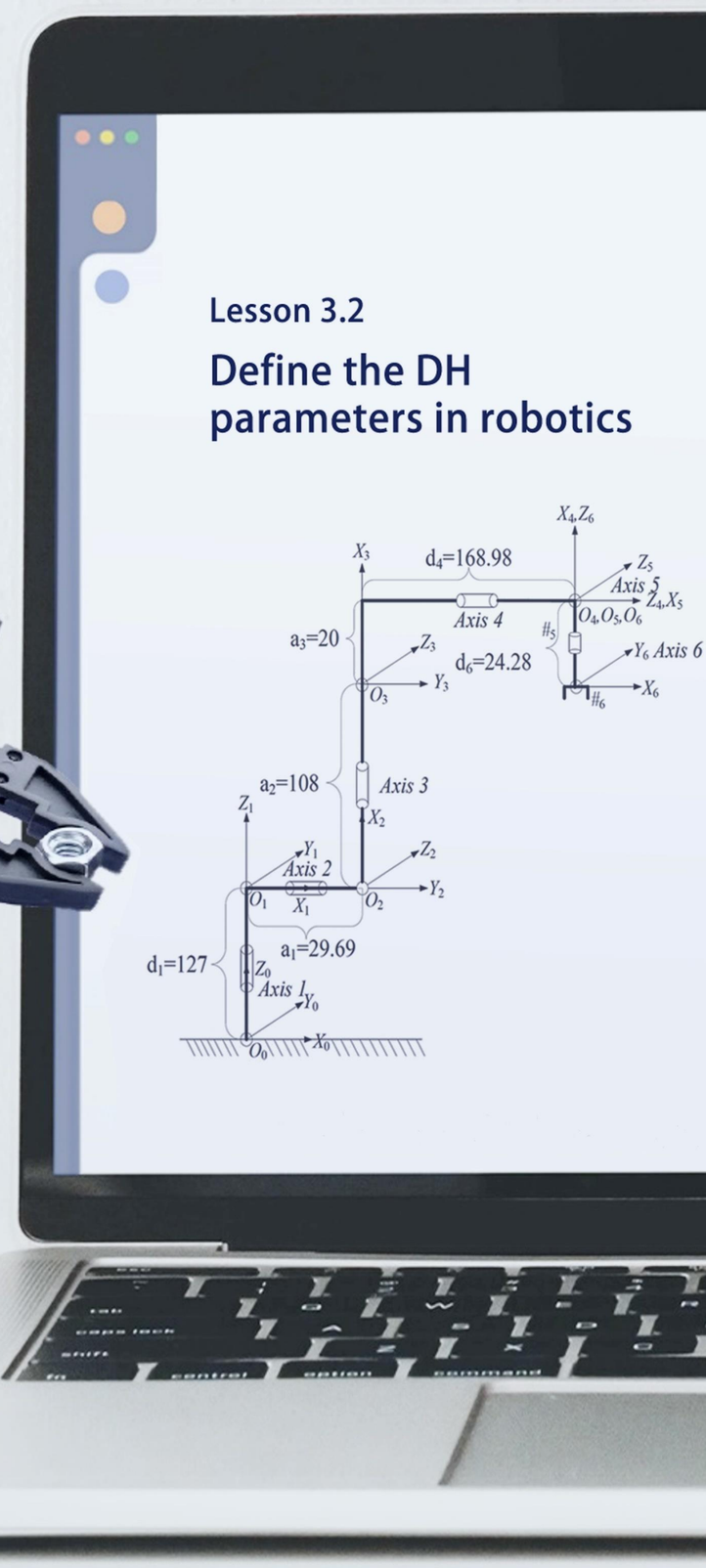
WLKATA®

ROBOTICS

WLKATA Product Selection Guidebook

Robotics Training Solution For AI and IoT Education



Professional · Safe · Desktop

WLKATA ROBOTICS

Contents

❑Main Product

Mirobot 6-Axis Robot Arm

Desktop 6-Axis Engineering Educational Robot Arm

◆ Product Description

Mirobot Robot Arm is a safe and easy-to-use desktop 6-axis educational robot, using the industrial six-axis robot arm as the design prototype. It is also an open-source AI robot comprehensive teaching platform.

Mirobot has functions such as writing and drawing, laser engraving, handling palletizing, etc. It supports Bluetooth, Wi-Fi, serial port, RS485, and other communication modes. It can be combined with hardware for smart factory education and application scenarios.

It is flexible to plan the movement and free to add any end tools to meet the learning needs of different ages. It also supports Python, C, C++, ROS, V-REP, MATLAB, and other software for secondary development.

EtherCAT RS485 ARDUINO ROS Matlab V-REP

Product Features

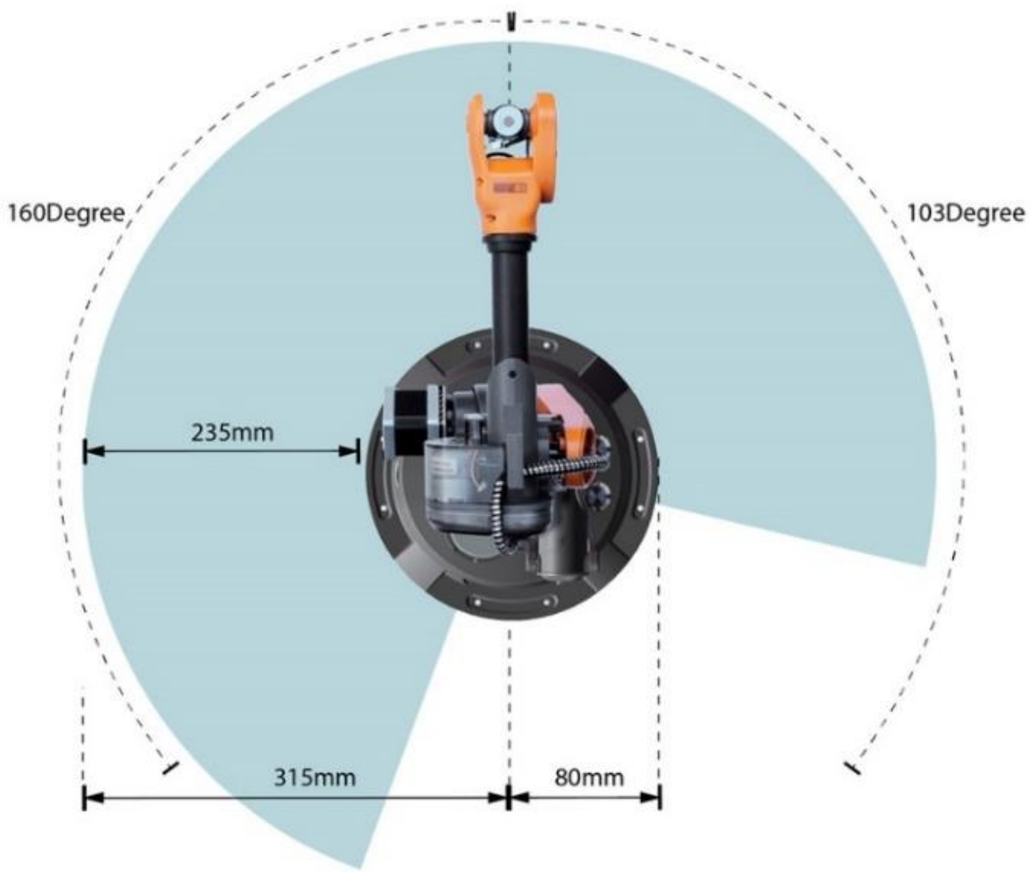
- **Professional and Easy-to-use:** Mirobot references the industrial six-axis robot arm as the design prototype; **has a variety of control methods such as PC, mobile APP, Bluetooth Teach Pendant, etc.** meets the needs of practical training and research in multiple scenarios.

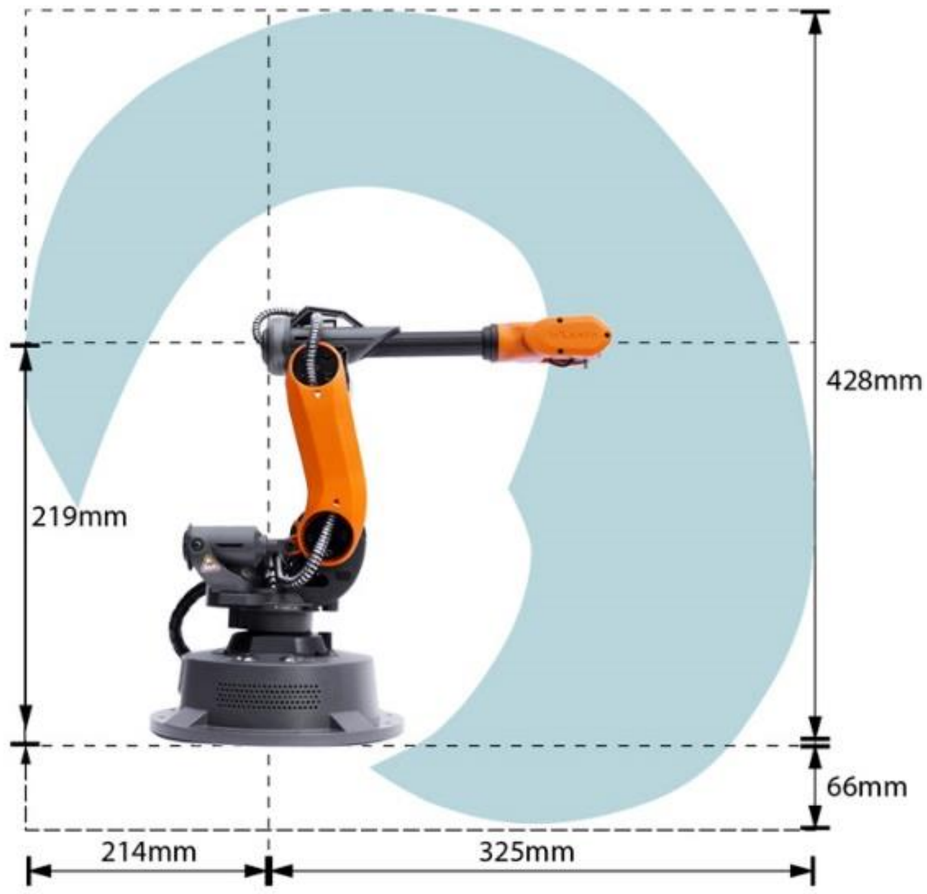
- **Lightweight and Safer:** net weight of 1.5Kg, chassis diameter of 160mm. **Integrated design to meet the needs of "classroom-research-practice" integration.**

- **Open-source and Extensibility:** Mirobot provides open-source for **robot learning and scientific research kinematics, vision and other algorithms, s**upports Bluetooth, Wi-Fi, RS485, and other communication methods, provides students with a new and innovative learning platform.

◆ Selection Guide

| Product Name |	Model	Highlights
Mirobot Education Kit	WL-MiroEDU-6R200-02MM	Accessories include micro servo gripper, pen holder, pneumatic set (single/double-finger suction cups, three-finger soft gripper)
Mirobot Professional Kit	WL-MiroPRO-6R200-02MM	Accessories include micro servo gripper, pen holder, pneumatic set (single/double-finger suction cups, three-finger soft gripper), Bluetooth teach pendant
Sliding Rail Set	WL-AC-SR500-01MM	Features automatic reset function
Conveyor Belt Set	WL-AC-CB600-01MM	Accessory includes photoelectric sensor which enables the detection and action response of objects





◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development

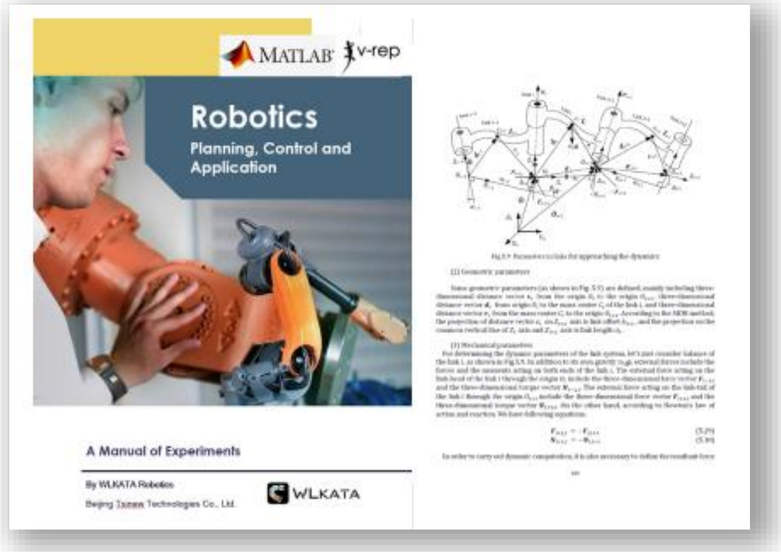
Product Parameters

Product Name	Detailed Parameters	
Mirobot Education Kit	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming
Sliding Rail Set (Optional)	Limit Load	10Kg
	Distance	500mm
	Maximum Speed	6000mm/min
	Size	860mm×285mm×111mm
	Weight	4.6kg
	Repeatability	0.5mm
Conveyor Belt Set (Optional)	Equipped with photoelectric sensors	
	Limit Load	5Kg
	Distance	530mm
	Maximum Speed	2400mm/min
	Size	610mm × 100mm × 50mm
	Weight	2.5kg

❑Curriculum Resources

Robotics Planning, Control and Application – Manual of Experiments Based on Mirobot

Content Description

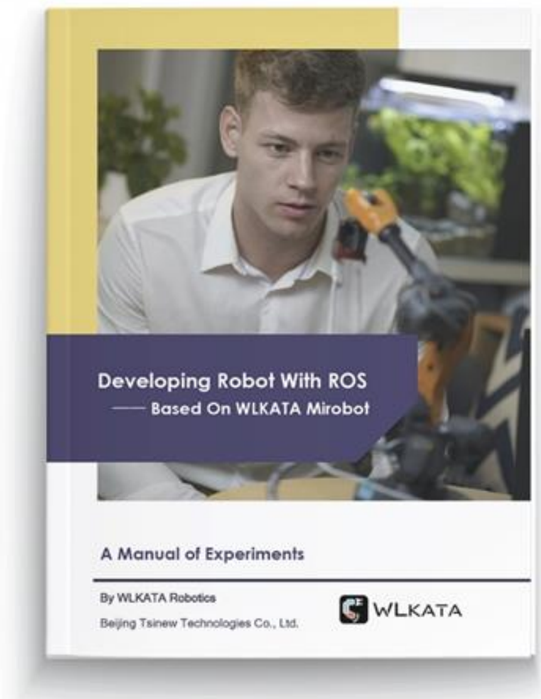


"Robotics Planning, Control and Application – Manual of Experiments Based on Mirobot" combines with the Mirobot robotic arm, includes the principle of robotics in the development process of the six-axis robot. It covers experimental projects such as the mathematical basis of robots, the forward kinematic analysis of robots, the calculation and control of robot inverse kinematics, and robot dynamics and control.

Course Catalog

Content	Chapter	Features
Chapter 1 Introduction	1.1 Initial Knowledge on Industrial Robots	The supporting content includes the experimental purpose, experimental principle, experimental steps, and experimental summary
	1.2 Robot Simulation System	
Chapter 2 Transformation	2.1 Transformation in Virtual Laboratory	
	2.2 Transformation Matrix into Euler Angles	
	2.3 Painting Demonstration and Frame Transformation in 2-Dimensional Space	
	2.4 Frame Transformation by Changing the Frame of the End-effector	
Chapter 3 Kinematics	3.1 Forward Kinematics	
	3.2 Co-simulation of Forward Kinematics with MATLAB and V-REP	
	3.3 Establishment and Computation of Forward Kinematics	
	3.4 Inverse Kinematics Modeling	
	3.5 Inverse Kinematics Computation and Co-simulation in MATLAB	
	3.6 Inverse Kinematics Solution and Co-simulation	
Chapter 4 Static	4.1 Static Computation Frame in 3D Deduction	
	4.2 Statics Computation of Manipulator	
Chapter 5 Dynamics	5.1 Dynamics Computation Frame 3D Deduction	
	5.2 Dynamics Computation of the Manipulator	
Chapter 6 Motion Control	6.1 Design of Driving Joint of Manipulator	
	6.2 Stepper Motor	
Chapter 7 Motion Planning	7.1 Motion Planning for Given Initial and Final Point	
	7.2 Motion Planning Given Initial Point, Final point and Intermediate Point	
	7.3 Example on Motion Planning of the Manipulator	
	7.4 Continuous Trajectory Motion Planning	
Chapter 8 Application of control algorithm for 6-axis desktop manipulator	8.1 Grasping Object Experiment Base on Inverse Kinematics	
	8.2 Desktop Robotic Arm Painting Using Motion Trajectory Planning	
	8.3 Laser Engraving via Robotic Arm	
	8.4 Grasp Objects Based on Color Recognition	

Developing Robot With ROS



Content Description

"Developing Robot With ROS – Based On WLKATA Mirobot" covers the basics of ROS tutorial, software framework, and basic functions of ROS, together with the development process of Mirobot robotic arm in ROS by introducing the function cases of robot arm motion control, machine voice, machine vision, etc., and is equipped with ROS charts, codes, etc.

Course Catalog

Content	Chapter	Features
Chapter 1 Getting to Know ROS	The Origin Of ROS, The Design Goals Of ROS, The Characteristics Of ROS	Source code, 3D models, courses PPT for educators, and supporting files of the experiments in the book are all include.
Chapter 2 Installation of ROS	Install Ubuntu in Virtual Machine and Install ROS In Ubuntu	
Chapter 3 The Fundamentals of ROS	3.1 ROS Architecture	
	3.2 Create A ROS Feature Package	
	3.3 ROS Node	
	3.4 Learn about ROS Topics, ROS Services and Parameters	
	3.5 Use roslaunch	
	3.6 Create ROS Msg and Srv	
	3.7 Write A Simple Publisher and Subscriber in C++	
	3.8 Run Publishers and Subscribers	
	3.9 Write A Simple Service and Client In C++	
Chapter 4 ROS Robotic Arm Modeling	4.1 Introduction to URDF Models	
	4.2 3D Model Export URDF	
	4.3 Processing of URDF Files Exported by Mirobot Robotic Arm in Solidworks	
Chapter 5 Mirobot Robotic Arm Controls in ROS	5.1 Mirobot Communication Protocols	
	5.2 ROS and Mirobot Communication Implementation	
Chapter 6 Controlling Mirobot with Moveit	6.1 Introduction to Moveit	
	6.2 Moveit Configuration - Setup Assistant	
	6.3 Import Mirobot Model into Gazebo Simulation Environment	
	6.4 Use Moveit to Control Robotic Arm	
	6.5 Simulating Motion Using The Moveit Control Model (Python)	
	6.6 Controlling Really Robotic Arm Movements With Moveit (C++)	
Chapter 7 Mirobot Feature Expansion	7.1 Recording and Playback of Robotic Arm Motion Data	
	7.2 Add an End Effector to Model	
	7.3 Add A Camera to Model to Get Image Information	
	7.4 Add Kinect to Model to Get Point Cloud Information	
	7.5 Add A Force Transducer to The Model to Collect Simulation Data	
	7.6 Add Speech Recognition for Robotic Arms	

Learning Robots with WLKATA Mirobot

Content Description

"Learning Robots with WLKATA Mirobot" focuses on K-12 STEM Education. It mainly covers fundamentals knowledge of robotics and practical experiment using Mirobot.

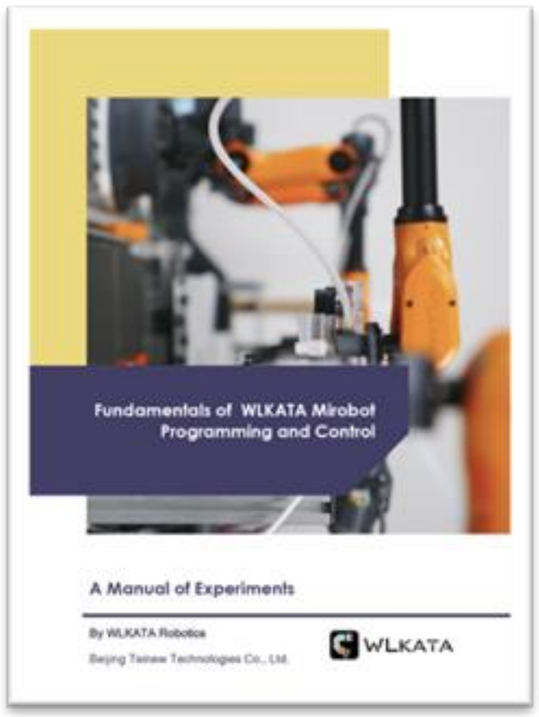
Course Catalog

Content	Chapter
Chapter 1 Introduction of Mirobot robot arm	1.1 Introduction of WLKATA Mirobot
	1.2 The Use of WLKATA Studio
Chapter 2 What is Robot?	2.1 The Development History of Robots
	2.2 Definition of Robot
Chapter 3 Robots of All Kinds	3.1 Classification by Application Field of Robot
	3.2 Classification by Degree of Development of Robot
	3.3 Classification by Robot Motion Form
Chapter 4 Move, Mirobot!	4.1 The Structure of Mirobot
	4.2 Degree of Freedom
	4.3 Move, Mirobot!
Chapter 5 The Position of the "Hand"	5.1 Cartesian Coordinate System
	5.2 Coordinate Control Mode
Chapter 6 Signature of Mirobot	6.1 Locate The Drawing Plane
	6.2 Signature of Mirobot
Chapter 7 Creative Painting	7.1 Drawing Interface
	7.2 Menu Bar
	7.3 Canvas
	7.4 Toolbar
Chapter 8 Drawing Rectangles	8.1 Blockly
	8.2 Draw A Rectangle
Chapter 9 Drawing Magic Star	9.1 Task Overview
Chapter 10 Draw A Chessboard	10.1 Program Structure
	10.2 Draw Chessboard
Chapter 11 Forklift Driver	11.1 Teaching Mode
	11.2 Coordinate System of The Tool
	11.3 Forklift Driver

Course Catalog

Content	Chapter
Chapter 12 Excavator	12.1 Working Principle of Excavator
	12.2 Excavation, Loading and Unloading
Chapter 13 Palletizer	13.1 Gripper
	13.2 Palletizing
Chapter 14 Dominoes	14.1 Variables
	14.2 Placing Dominoes
Chapter 15 Bricklayer	15.1 Pneumatic Kit
	15.2 Brickwork

WLKATA Mirobot Robotic Arm Programming And Control



Content Description

"WLKATA Mirobot Robotic Arm Programming And Control" mainly covers the Kinematics Algorithm of 6-axis Manipulator with various control method including Blockly, Python Programming, ROS-Based Motion Control. The book also covers the SDK of the robot arm and develops robotic visual sorting in OpenCV.

Course Catalog

Content	Chapter
Chapter 1 Introduction to WLKATA Mirobot Six-axis Robot Arm	1.1 Mechanical Structure of Manipulator
	1.2 Electrical Principle of Manipulator
	1.3 Technical Parameters of Manipulator
Chapter 2 Kinematics Algorithm of Six-axis Manipulator	2.1 Spatial Description and Transformation
	2.2 Forward Kinematics of Robot Arm
	2.3 Inverse Kinematics of Robot Arm
Chapter 3 Use of Mirobot 6-Axis Robot Arm	3.1 Introduction of WLKATA Studio
	3.2 Installation of WLKATA Studio
	3.3 Robotic Arm Connection
	3.4 Debugging of Robotic Arm
	3.5 Robot Firmware Upgrade
	3.6 Basic Control of The Robotic Arm
Chapter 4 "Teaching & Replay" Mode Of Robotic Arm	4.1 The Introduction of Motion Modes
	4.2 Use of "Teaching & Replay" Mode
	4.3 Robotic Arm Move Blocks
Chapter 5 Blockly Programming Control Of Robotic Arm	5.1 Introduction To WLKATA Studio Blockly Programming Instructions
	5.2 Blockly Programming Application
Chapter 6 Python Programming Control Of Robotic Arm	6.1 The Origin of Python
	6.2 WLKATA Studio Python Programming Guide
	6.3 Python Controlled Robotic Arm Palletizing
Chapter 7 Mirobot Motion Control Based On ROS	7.1 ROS Introduction
	7.2 The Principle of Communication Between Mirobot and ROS
	7.3 Move End Effector via ROS(C++)
Chapter 8 SDK of Robot Arm	8.1 Introduction of API Functions
	8.2 Application of Mirobot SDK
Chapter 9 Robotic Arm Control Based on OpenCV	9.1 Introduction to Visual Set
	9.2 Camera Debugging and Image Processing
	9.3 Visual Garbage Classification

❑Additional Set

AI Vision Set

Product Description

AI Vision Set is a Python-based programming machine vision suite. Compared to the more complex Ubuntu-based machine vision, the AI vision suite is an entry-level machine vision product.

AI vision Set can achieve color recognition, contour recognition, picture recognition, digital recognition, QR code recognition, face recognition, etc. It can be combined with the Mirobot robotic arm to realize the automatic identification and grasping.

Selection Guide

Product Name	Model	What Is Included
AI Vision Set	WL-AC-ViMV-Re300	AI Vision Set*1
AI Vision Set Cell	WL-EAS-AIViMV-Re300	AI Vision Set*1; Mirobot Education Kit*1; WLkata Production Line Smart Base - S*1

Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development
11	Fundamentals of Python Programming
12	Fundamentals of Robotics and Visual Communication
13	Camera Calibration: Master Calibration Method of Visual Camera, Calculation Methods of Robot Coordinate System, and Visual Coordinate System

Product Parameters

Product Name	Detailed Parameters	
Mirobot Education Kit	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming
AI Vision Set	Camera Module	Color: Colour
		Pixels: 640×480
		Processor: ARM 32-bit Cortex-M7 CPU
		Operating Temperature: -20°C ~ +70°C
	Lens	Focal length: 1.2mm/3.6mm
		Aperture: F2.0
		Installation Dimensions: M12*0.5
	Display Screen	Screen Type: 1.8″ TFT LCD
		Resolution: 160×128
		Color: 64k RGB565

Deep Learning Vision Set

Product Description

Deep Learning Vision Set is a Jetson Nano based machine learning vision set; using open-source deep learning framework PyTorch, and with cross platform computer vision library OpenCV.

It can be combined with Mirobot to realize AI functions such as target detection and image recognition.

Selection Guide

Product Name	Model	What Is Included
Deep Learning Vision Set	WL-AC-MeCV-Re1080	Deep Learning Vision Set *1
Deep Learning Static Objects Sorting Set	WL-PL-AiGS-CV	Deep Learning Vision Set *1; Mirobot Education Kit*1
Deep Learning Static Objects Sorting Set Cell	WL-EAS-MeCV-Re1080	Deep Learning Vision Set *1; Mirobot Education Kit*1; WLkata Production Line Smart Base - S*1

Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development
11	Fundamentals of Python Programming
12	Fundamentals of Robotics and Visual Communication
13	Camera Calibration: Master Calibration Method of Visual Camera, Calculation Methods of Robot Coordinate System, and Visual Coordinate System
14	Image Annotation and Dataset Creation
15	YoloV5 Model Training and Deployment

Product Parameters

Product Name	Detailed Parameters	
Mirobot Education Kit	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming
Deep Learning Vision Set	Camera Module	Color: Colour
		Resolution: 2952×1944
		Supply voltage: 3.6V~5V
		Operating Temperature: -20°C ~ +70°C
		Adjustable Parameters: brightness, contrast, hue, saturation, sharpness, white balance, exposure value
	Controller	CPU: Quad-core ARM -A57@1.43GHz GPU: 128-core Maxwell
		Video Encoder: 4K @ 30 | 4 x 1080p @ 30
		Interfaces: 4*USB3.0, USB 2.0 Micro-B, HDMI, DP
	IPS Display	Resolution: 1024*600
		Interfaces: HDMI, AV, VGA
		Size: B701-GM 7 inch

Robot Arm Vehicle

Product Description

WLkata Robot Arm Vehicle - The AGV Mecanum mobile base, which can be equipped with a robotic arm, expands the application scenarios of the robotic arm. AGV Mecanum omnidirectional mobile vehicle is compatible with maker creations and has rich sensing features. It support Bluetooth, Wi-Fi connection mode and secondary development.

Selection Guide

Product Name	Model	What Is Included
Wlkata Vehicle Base	WL-AC-Mac-55MM	Wlkata Mecanum Vehicle Base*1
Wlkata Robot Vehicle In One	WL-EA-Mac-55ReMM	Wlkata Mecanum Vehicle Base*1; Mirobot Vehicle Version*1

Experiment Content

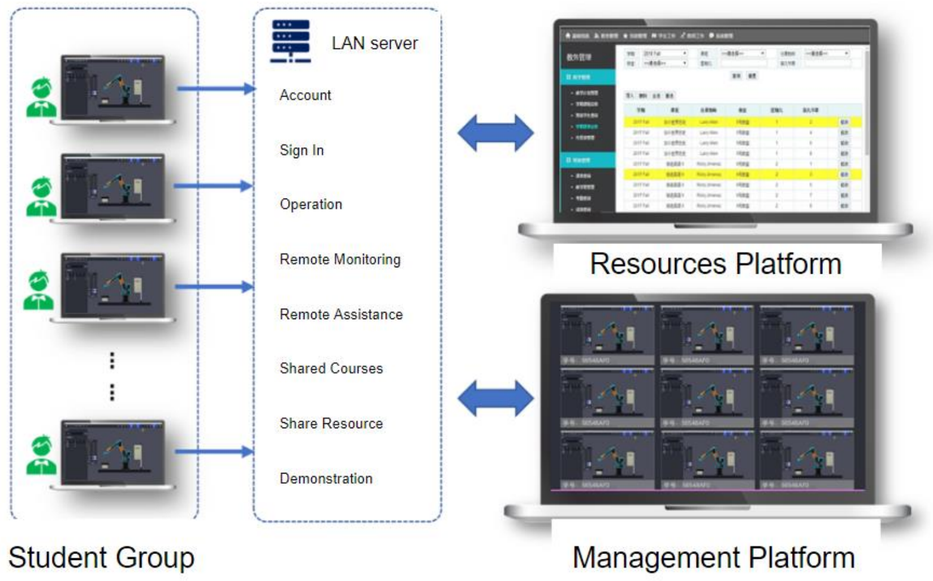
No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development
11	Omnidirectional Mobile Car Line Follower Algorithm
12	Omnidirectional Mobile Car Movement Principle
13	Robotic Arm Communicates With Base
14	Fundamentals of Arduino Microcontroller Programming
15	Mobile Robotic Arm Automatic Grasping

WLKATA ROBOTICS

Product Parameters

Product Name	Detailed Parameters	
Mirobot Vehicle Version	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Camera Module	Image Sensor: OV2640 (2.0 Megapixel Camera)
		Processor: Kendryte K210
		Display: 2.0-inch IPS screen with 320*240 resolution
		Supply Voltage: 3.3~5.0V
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming
WLkata Robot Arm Vehicle	Controller	ATMega 2560
	Product Size	290mmx220mmx90mm
	Net Weight	3.5Kg
	Limit Load	10Kg
	Battery Capacity	8000mAh
	Operating Voltage	12V
	Control Method	APP, PS2 Controller
	Wheel Diameter	3 inch
	Rated Speed	105rpm

IOA Virtual Factory



◆ Product Description

Mirobot IOA Virtual Factory Set —IOA Virtual Factory Software combined with Mirobot can achieve 1:1 virtualization simulation, provides custom drag-and-drop for robot workstation production line design; 1:1 digital twin control simulation; includes physical workstation to realize real life simulation application of smart factory.

IOA Virtual Factory Software supports the establishment of student learning management systems to facilitate learning progress tracking and grading.

◆ Selection Guide

| Product Name |	Model	What Is Included
IOA Virtual Factory Software	WL-AC-IOA-3D	IOA Virtual Factory Software*1
Mirobot IOA Virtual Factory Set	WL-MiroIOA-6R200-3D	IOA Virtual Factory Software*1; Mirobot Professional Kit*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development
11	Smart Factory Structure Design and Construction
12	IOA Virtual Electrical Wiring
13	Industrial Robot Integration and Programming Simulation
14	IOA Intelligent Control Integration and Simulation

Product Parameters

Product Name	Detailed Parameters	
Mirobot Professional Kit	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Bluetooth Teach Pendant	Connection: Bluetooth
		Function: Angle/Coordinate control of the robotic arm, supports point teaching control
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming

Product Parameters

Product Name	Detailed Parameters	
IOA Virtual Factory Software	Digital Twin System	Include robot model library, logistics model library, sensor library, electromechanical control library, and mechanical library
	Virtual Electrical Wiring	Support robot controller virtual electrical IO wiring, support Excel electrical wiring table exporting
	Virtual Teaching Programming	Realize virtual teach-in programming of robots and support a variety of virtual teach-in programming of industrial robots, including NRT motion control system, Eft Robox teach pendant, AUBO robot teach pendant, etc.
	Virtual Controller	A variety of virtual controllers, including Siemens S7-1200, S7-1500 series PLC, Mitsubishi PLC, ZMC308 motion controller, VPLC machine vision controller, Python virtual controller, etc.
	XR Virtual Simulation	Support multi-user collaborative software for mobile APP, VR, and AR virtual simulation
	Virtual Simulation	Include Virtual robot controller and 3D robot body, implement virtual teaching programming and integrated control
	Virtual Control	Support 1:1 access of real robots to realize twin control simulation of virtual 3D and real robots
	Integrated Control Simulation	Support the combination of PLC motion controller to achieve multi-robot system integration control simulation

❑Comprehensive Teaching And Training Platform

Fruit Picking Line

◆ Product Description

At present, many national research institutes and universities are conducting research on agricultural harvesting. The fruit picking production line mainly combines the small industrial prototype 6-axis desktop robot arm and color recognition module and realizes the fruit picking and sorting process through the mechanical arm picking and sensor recognition.

This set of production lines mainly cultivates the application thinking of robot and sensor technology in the field of agriculture and provides support for learning and research in the field of smart agriculture.

◆ Selection Guide

Product Name	Model	What Is Included
WLkata Mirobot Fruit Picking Line	WL-PL-FP-RGB3	Mirobot Education Kit*1; Accessory Package of Wlkata Mirobot Fruit Picking Line*1
WLkata Mirobot Fruit Picking Line Cell	WL-PL-EAS-FP-RGB3	Mirobot Education Kit*1; Accessory Package of Wlkata Mirobot Fruit Picking Line*1; WLkata Production Line Smart Base - S*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development
11	Principles of Color Sensor Technology
12	Robot Communication with Microcontroller

Logistic Warehousing Sorting Line

◆ Product Description

Logistic Warehousing Sorting Line simulates the intelligent logistics scenario of the whole process of warehouse including loading, palletizing, loading, etc. This scenario teaches the programming control of the Mirobot robotic arm and multi-device collaboration. The palletizing robotic arm places the goods on the shelves on the pallet, and then the conveyor belt transports the goods to the workstation of the 3-axis handling robotic arm. After that, the handling robotic arm transports the goods to the front of the shelf, and the palletizing robotic arm places the goods back on the shelves.

The production line simulates the intelligent logistics warehousing system of the demonstration industry through the cycle of the above steps.

◆ Selection Guide

Product Name	Model	What Is Included
WLkata Mirobot Logistic Warehousing Sorting Line	WL-PL-LW-Miro1	Mirobot Education Kit*1; 3-Axis Robotic Arm*1; Conveyor Belt Set*1; Accessory Package of Wlkata Mirobot Logistic Warehousing Sorting Line*1
Wlkata Mirobot Logistic Warehousing Sorting Line Cell	WL-PL-EAM-LW-Miro1	Mirobot Education Kit*1; 3-Axis Robotic Arm*1; Conveyor Belt Set*1; Accessory Package of Wlkata Mirobot Logistic Warehousing Sorting Line*1; WLkata Production Line Smart Base - M*1

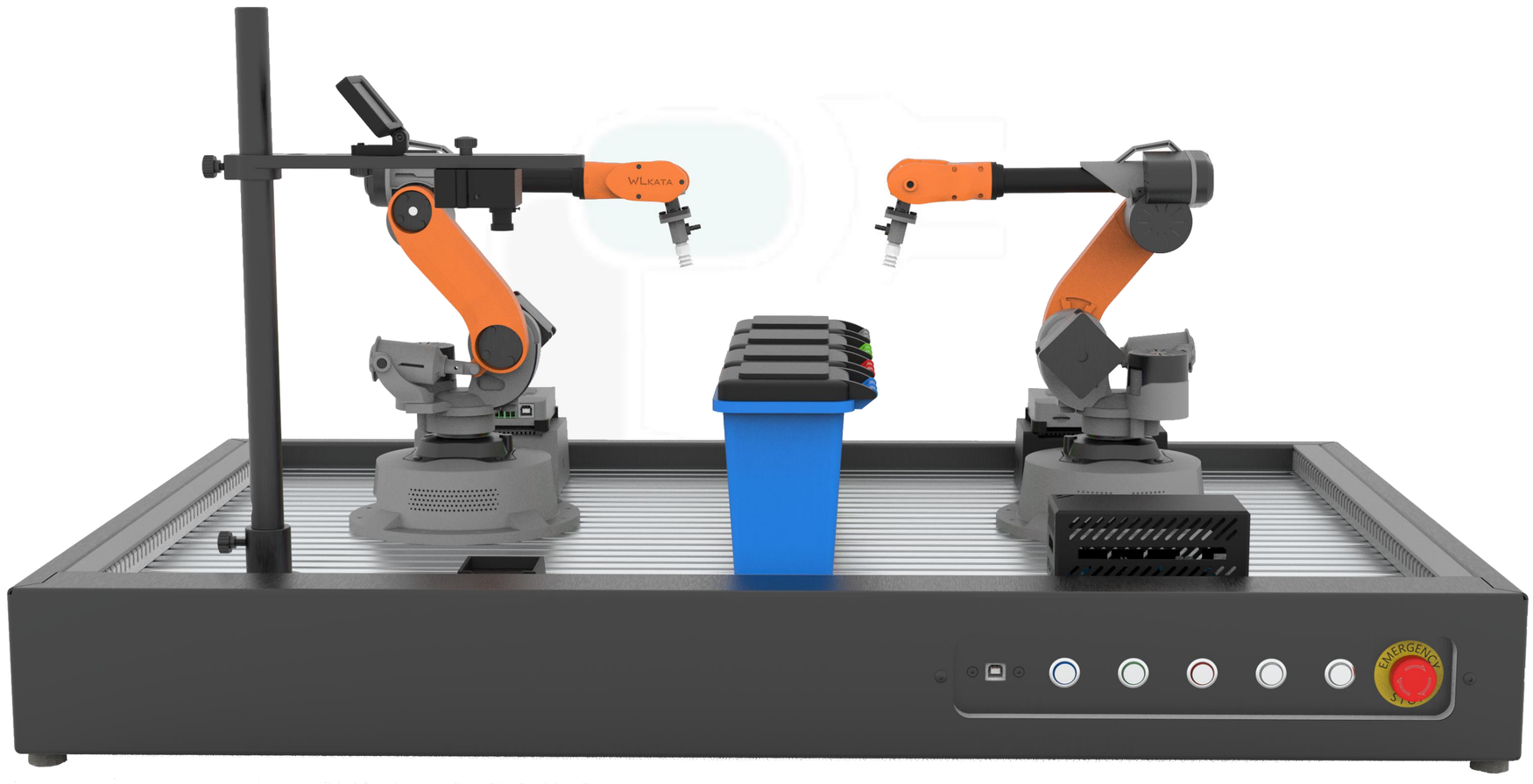
◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Robotic Arm D-H Parameters
3	Understanding of Robotic Arm Coordinate Mode
4	Understanding of Robotic Arm End Effector
5	Understanding of Electrical Parameters of Robotic Arm
6	Understanding of Robotic Arm Basic Control Command
7	Understanding of Robotic Arm Movement
8	Robot Arm Programming Control Logic
9	Robotic Arm Application Development
10	3-axis Robotic Arm Programming and Control
11	Conveyor Belt Programming and Control
12	Principles of Photoelectric Sensor Technology
13	Fundamentals of Multi-device Collaborative Communication

Product Parameters

Product Name	Detailed Parameters	
Mirobot Education Kit	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming
WLkata 3-Axis Robotic Arm	Controller	Desktop-grade robotic arm based on the ATMega 2560 open-source hardware chip
	Number of Axes	3
	Limit Loads	500g
	Workspace	320mm
	Net Weight	2.85Kg
	Interface	USB\WiFi\Bluetooth\RS485
	Base Dimensions	158mm x 158mm
	Axis Parameters	1 Axis: -195° ~ +135°
		2 Axis: -20° ~ +90° Maximum speed 60°/s
		3 Axis: 0° ~ +90° Maximum speed 65°/s
	Application	Studio, Grblcontroller 3.6, Blockly graphical interface programming

AI Static Garbage Sorting Production Line



Product Description

WLkata AI Static Garbage Sorting Production Line combines Mirobot robotic arm and AI vision suite to realize different types of garbage identification and robotic arm sorting tasks. Students can improve Python programming, robotic arm programming and collaborative work by completing the entire workflow of the production line. The AI Vision Set can also realize more visual recognition functions such as shape or code scanning to build more complex logistics and automation scenarios by adding conveyor belt and sliding rail sets.

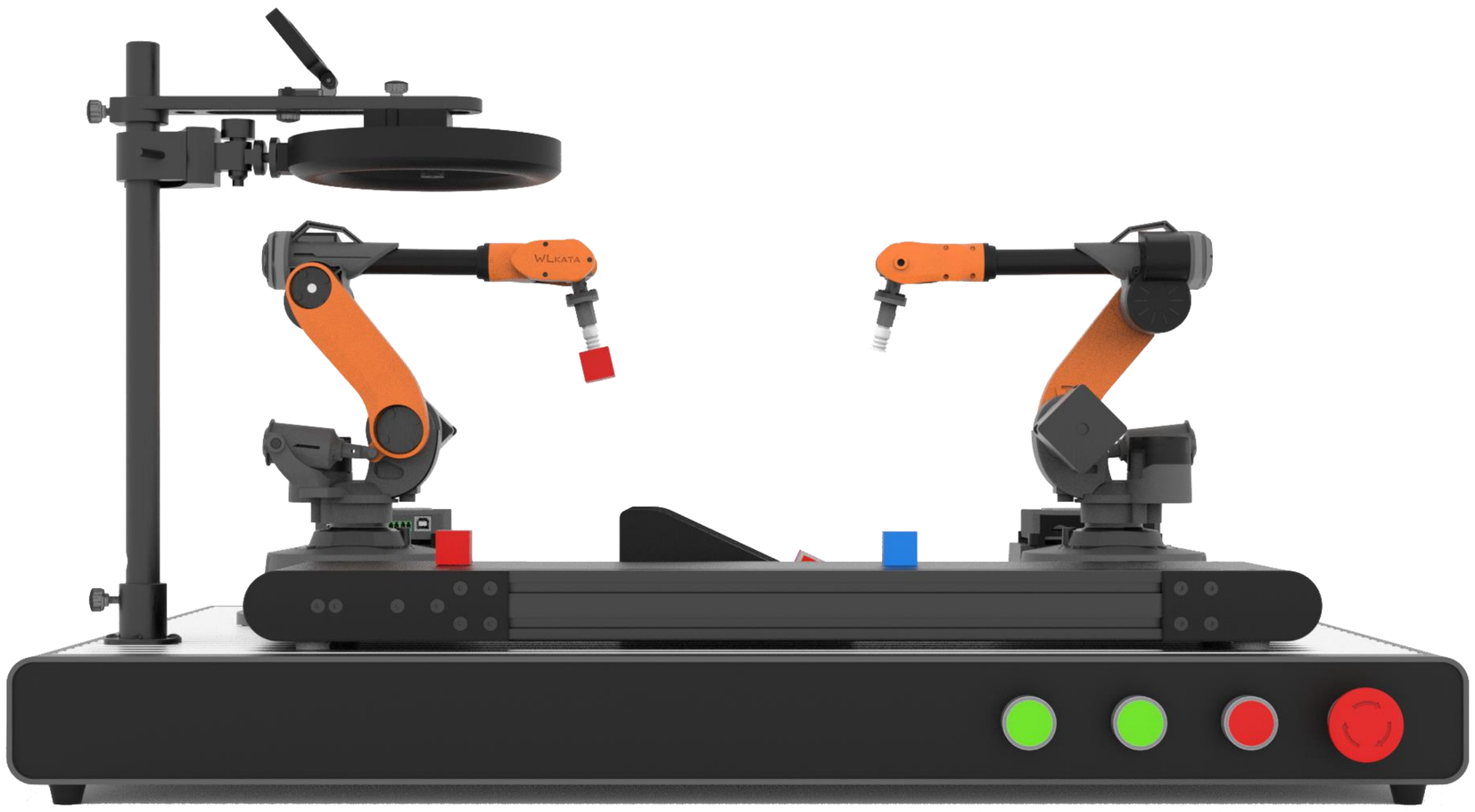
Selection Guide

Product Name	Model	What Is Included
WLkata Mirobot AI Static Garbage Sorting Production Line	WL-PL-GS-RGB3	Mirobot Education Kit*2; AI Vision Set*1; Accessory Package of Wlkata Mirobot AI Static Garbage Sorting Production Line*1
WLkata Mirobot AI Static Garbage Sorting Production Line Cell	WL-PL-EAM-GS-RGB3	Mirobot Education Kit*2; AI Vision Set*1; Accessory Package of Wlkata Mirobot AI Static Garbage Sorting Production Line*1; WLkata Production Line Smart Base - M*1

Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development

AI Automatic Sorting Production Line



◆ Product Description

AI Automatic Sorting Production Line is composed of AI vision Set, robotic arm, transmission unit, and sensor unit. The target object is dynamically identified. The vision set performs sorting tasks with the robotic arm, enabling the robotic arm intelligent sorting. The production line improves students' practical ability to build systems during experiments. The identification type can be changed to create more complex application scenarios and improve the ability of innovation and development.

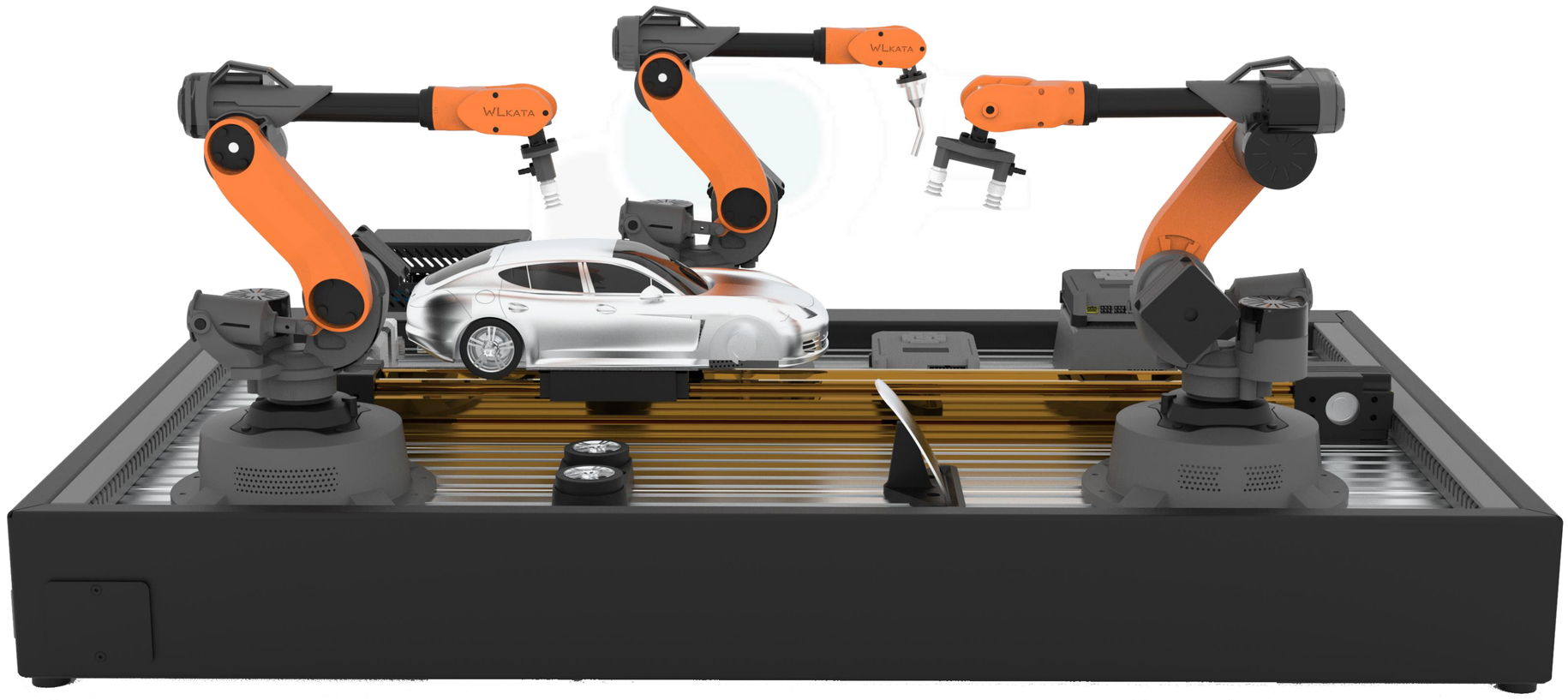
◆ Selection Guide

Product Name	Model	What Is Included
WLkata Mirobot AI Automatic Sorting Production Line	WL-PL-AiGS-RGB3	Mirobot Education Kit*2; AI Vision Set*1; Conveyor Belt Set*1; Accessory Package of Wlkata Mirobot AI Automatic Sorting Production Line*1
WLkata Mirobot AI Automatic Sorting Production Line Cell	WL-PL-EAM-AiGS-RGB3	Mirobot Education Kit*2; AI Vision Set*1; Conveyor Belt Set*1; Accessory Package of Wlkata Mirobot AI Automatic Sorting Production Line*1; WLkata Production Line Smart Base - M*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Robotic Arm D-H Parameters
3	Understanding of Robotic Arm Coordinate Mode
4	Understanding of Robotic Arm End Effector
5	Understanding of Electrical Parameters of Robotic Arm
6	Understanding of Robotic Arm Basic Control Command
7	Understanding of Robotic Arm Movement
8	Robot Arm Programming Control Logic
9	Robotic Arm Application Development
10	Fundamentals of Multi-device Collaborative Communication
11	Fundamentals of Python Programming
12	Fundamentals of Robotics and Visual Communication
13	Camera Calibration: Master Calibration Method of Visual Camera, Calculation Methods of Robot Coordinate System, and Visual Coordinate System

Automobile Assembly Line



Product Description

Industrial robots are most widely used in the automotive manufacturing industry. The smart factory for automobile production integrates a variety of artificial intelligence technologies such as intelligent control and sensors. The production line based on the real car production scene, vividly showing the car assembly, welding, assembly, and other processes.

Automobile Assembly Line is an effective combination of man and machine, and fully reflects the flexibility of the equipment. It combines conveyor systems, accompanying end-effectors, and measuring equipment to meet the assembly requirements of auto parts.

Selection Guide

Product Name	Model	What Is Included
Wlkata Mirobot Automobile Assembly Line	WL-PL-Aa-Tec3	Mirobot Education Kit*3; Sliding Rail Accessory Set*1; Accessory Package of Wlkata Mirobot Automobile Assembly Line*1
Wlkata Mirobot Automobile Assembly Line Cell	WL-PL-EAM-Aa-Tec3	Mirobot Education Kit*3; Sliding Rail Accessory Set*1; Accessory Package of Wlkata Mirobot Automobile Assembly Line*1; WLkata Production Line Smart Base - M*1

Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Electrical Principles of Robotic Arm
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Coordinate Mode
5	Understanding of Robotic Arm End Effector
6	Understanding of Electrical Parameters of Robotic Arm
7	Understanding of Robotic Arm Basic Control Command
8	Understanding of Robotic Arm Movement
9	Robot Arm Programming Control Logic
10	Robotic Arm Application Development
11	Linear Guide Program Control
12	Automobile Assembly and Welding Process Simulation
13	Multi-device Collaborative Programming Control

Deep Learning Moving Garbage Sorting Line

◆ Product Description

WLkata Deep Learning Moving Garbage Sorting Line is a sorting system based on Jetson Nano's multifunctional AI chip and 6-axis intelligent robotic arm. It adopts the open-source deep learning framework PyTorch with the cross-border platform computer vision library OpenCV. It also has AI functions such as object detection and image recognition and can be combined with conveyor belts to achieve intelligent garbage classification.

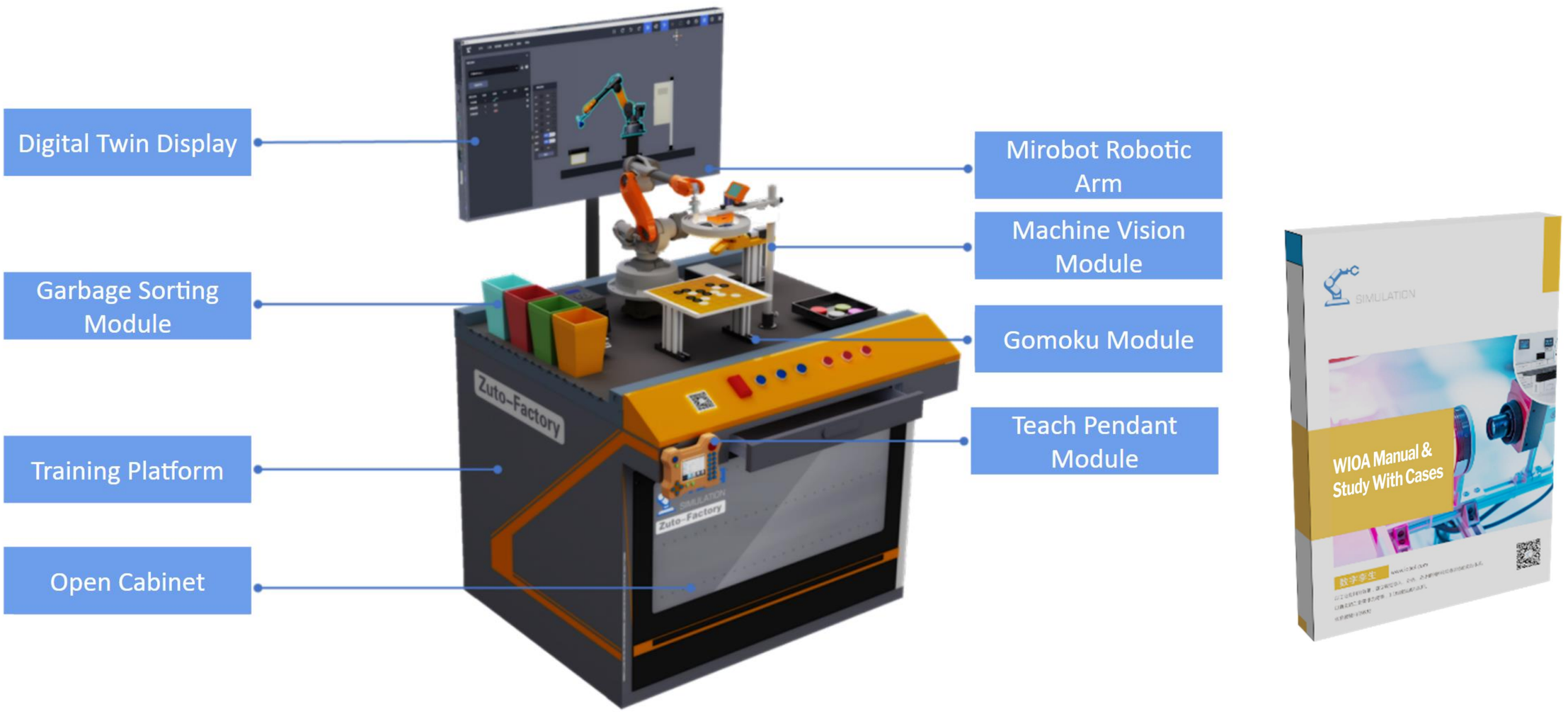
◆ Selection Guide

Product Name	Model	What Is Included
Wlkata Mirobot Deep Learning Moving Garbage Sorting Line	WL-PL-AiGSM-CV	Mirobot Education Kit*2; Deep Learning Vision Set *1; Conveyor Belt Set*1; Accessory Package of Wlkata Mirobot Deep Learning Moving Garbage Sorting Line*1
WLkata Mirobot Deep Learning Moving Garbage Sorting Line Cell	WL-PL-EAM-AiGSM-CV	Mirobot Education Kit*2; Deep Learning Vision Set *1; Conveyor Belt Set*1; Accessory Package of Wlkata Mirobot Deep Learning Moving Garbage Sorting Line*1; WLkata Production Line Smart Base - M*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure
2	Understanding of Robotic Arm D-H Parameters
3	Understanding of Robotic Arm Coordinate Mode
4	Understanding of Robotic Arm End Effector
5	Understanding of Robotic Arm Basic Control Command
6	Robot Arm Programming Control Logic
7	Robotic Arm Application Development
8	Fundamentals of Python Programming
9	Fundamentals of Robotics and Visual Communication
10	Camera Calibration: Master Calibration Method of Visual Camera, Calculation Methods of Robot Coordinate System, and Visual Coordinate System
11	Image Annotation and Dataset Creation
12	YoloV5 Model Training and Deployment

Robotics Integrated Training Station



◆ Product Description

WIOA Robotics Integrated Training Station includes machine vision control system, machine vision simulation system, six-axis robot, industrial computer system and 3D digital twin system. The platform is composed of modular methods and is supported by digital display boards and training platforms which forms a practical training simulation platform for advanced integration and comprehensive application of robots.

◆ Selection Guide

Product Name	Model	What Is Included
WLkata WIOA Robotics 3-in-1 Training Station	WL-PL-Mevision-3D	Mirobot Education Kit*1; WIOA Machine Vision Set*1; Training Station System *1; IOA Virtual Factory Software*1; Training Station Accessory Package*1; User Manual and Study With Cases*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Robotic Arm Structure and Electrical Principles
2	Understanding of Robotic Arm D-H Parameters
3	Understanding of Robotic Arm Coordinate Mode
4	Understanding of Robotic Arm End Effector
5	Understanding of Electrical Parameters of Robotic Arm
6	Robot Arm Programming Control Logic
7	Basic Applications for Machine Vision and Automatic Control
8	Visual Simulation and Automation Integration
9	Position Recognition and Grasping Automation Based WLKATA 6-axis Robotic Arm
10	Integration of Vision Applications for Mirobot 6-axis Robotic Arm
14	Extended Applications for Machine Vision and Industrial Intelligence

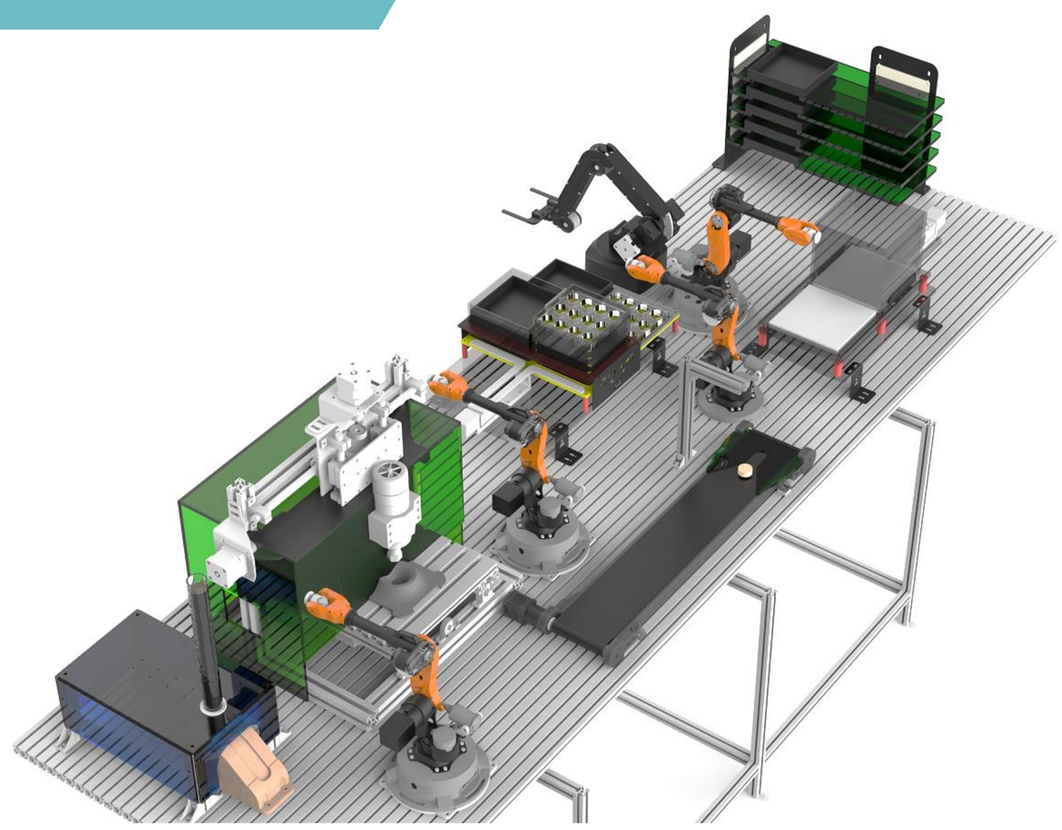
Product Parameters

Product Name	Detailed Parameters	
Mirobot Education Kit	Number of Axes	6+1
	Limit Loads	600g
	Workspace	315mm
	Net Weight	1.5Kg
	Communication Interface	USB/Wi-Fi/Bluetooth/RS485
	Base Dimensions	Diameter 160mm
	Axis Motion Parameters (Load 160g)	1 axis: -110° ~ +160° maximum speed 85°/s
		2-axis: -35° ~ +70° maximum speed 60°/s
		3-axis: -120° ~ +60° maximum speed 65°/s
		4-axis: -180° ~ +180° maximum speed 200°/s
		5-axis: -200° ~ +30° maximum speed 200°/s
		6-axis: -360° ~ +360° maximum speed 450°/s
	Pen Holder	Range: 7~10mm
	Servo Gripper	Range: 0~30mm
		Torque: 0.6 Kg/cm
	Pneumatic Suction Cups	Suction Cup Diameter: 12mm
		Pressure: -60Kpa
	Three-finger Soft Gripper	Range: 5~40mm
		Pressure: -60/120Kpa
	Multifunctional Extender Box	Chip: Xtensa® 32-bit LX6 Single-Core Processor 168MHz
		Operating Temperature: 5℃~45℃
		Screen Size: 1.3 inch OLED
	Application	WLKATA Studio, Grblcontroller3.6, Blockly Graphical Programming
IOA Virtual Factory Software	Digital Twin System	Include robot model library, logistics model library, sensor library, electromechanical control library, and mechanical library
	Virtual Electrical Wiring	Support robot controller virtual electrical IO wiring, support Excel electrical wiring table exporting
	Virtual Teaching Programming	Realize virtual teach-in programming of robots and support a variety of virtual teach-in programming of industrial robots, including NRT motion control system, Eft Robox teach pendant, AUBO robot teach pendant, etc.
	Virtual Controller	A variety of virtual controllers, including Siemens S7-1200, S7-1500 series PLC, Mitsubishi PLC, ZMC308 motion controller, VPLC machine vision controller, Python virtual controller, etc.
	XR Virtual Simulation	Support multi-user collaborative software for mobile APP, VR, and AR virtual simulation
	Virtual Simulation	Include Virtual robot controller and 3D robot body, implement virtual teaching programming and integrated control
	Virtual Control	Support 1:1 access of real robots to realize twin control simulation of virtual 3D and real robots
	Integrated Control Simulation	Support the combination of PLC motion controller to achieve multi-robot system integration control simulation

Product Parameters

Product Name	Detailed Parameters	
WIOA Machine Vision Set	camera	Color camera, 300 color CMOS image pixels, configurable focus lens
	Visual light source	Equipped with a visual ring light source, adjustable light source power adapter
	Stand	Adjustable aluminum alloy bracket, height 450mm, angle, adjustable height
	Accessory	Configure manual fixing brackets, light source fixing brackets, and manual adjustment nut accessories
Training Station System	system	Pre-installed with the Linux operating system and embedded deep learning framework Tengine, supports Andriod 8.1
	interface	Equipped with USB, HDMI, RJ45, Wi-Fi, BT, MIPI, eDP and other conventional interfaces, supports rich embedded expansion interfaces as GPIO, I2C, SPI, and TT
	Deep learning framework	Supports direct deployment of training framework models such as Caffe/TensorFlow/Pytorch/MxNet/ONNX/Darknet Supports network performance optimization strategies such as layer fusion and quantization, provides a unified API (C/Python/JNI) interface Provides custom operators for extended interfaces
	CPU parameters	RK3399, 2xA72@1.8GHz+4xA53@1.4GHz
	GPU parameters	Mali-T860MP4, supports OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11, AFBC (Frame Buffer Compression)
	memory	LPDDR3 4GB
	power supply	Input 100VAC~240VAC, 50Hz; Output 12VDC, 2A
	LCD touchscreen	5.5-inch touchscreen, MIPI interface, resolution 1280 * 720
	Driver installation package	Machine vision control case drive package includes virtual simulation machine vision API and machine vision training API development package
User Manual and Study With Cases	Machine vision complete development manual, including IO driver, image import, contour extraction, QR code recognition, image training and other videos together with training case development packages; 3D Virtual Simulation Development Kit, can links with the vision controller through virtual 3D robot system to achieve digital twin simulation resource packs including garbage sorting, logistics sorting, shape matching, etc.	

Chess Manufacturing Line



◆ Product Description

Chess Manufacturing Line completely present the application of robots in intelligent manufacturing. The complete production line includes a chess raw material unit, a laser engraving production unit, a Mirobot robotic arm handling unit, a conveyor belt handling unit, and an assembly and storage unit. In actual intelligent manufacturing, the whole set of solutions adopts integrated control and the form of project functional unitization. The integrated control ensures that the production scheme is smooth and functional unitization facilitates production commissioning.

Extended Application: Industrial customization of as bookmarks and business cards production can be realized by changing the production process.

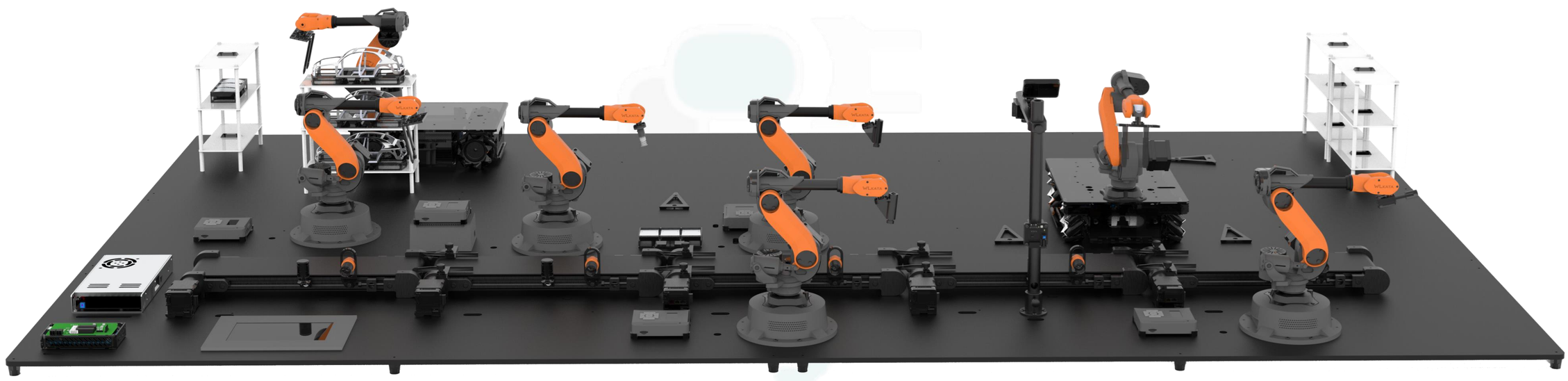
◆ Selection Guide

Product Name	Model	What Is Included
Wlkata Chess Manufacturing Line	WL-PL-CM-CD24	Mirobot Education Kit*4; 3-Axis Robotic Arm*1; AI Vision Set*1; Conveyor Belt Set*1; Engraving Machine*1; Accessory Package*1； Chess Manufacturing Line Base*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Intelligent Manufacturing System
2	Understanding of Robot System
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Movement
5	Understanding of Robotic Arm End Effector
6	Understanding of Robotic Arm Coordinate Mode
7	Understanding of Mobile Robots
8	Sensor Connection
9	Fundamentals of Configuration Software Custom Programming
10	Fundamentals of Python Programming
11	Camera Calibration: Master Calibration Method of Visual Camera, Calculation Methods of Robot Coordinate System, and Visual Coordinate System
12	Understanding of Automotive Automated Production System
13	CNC Machining Process
14	Automated Packaging Process

Automotive Manufacturing Simulation Line



◆ Product Description

In order to better realize industrial flexible production and restore the automatic production process flow of "assembly, welding, solder joint detection, grinding" in the automobile production process and form a complete set of automobile production line production program, the production line is based on unit equipment. At the same time, real-time integrated control, visual inspection, data collection and processing are carried out, and feedback is obtained through visual inspection and data backhaul of the node. It is dispatched by the master and assigned to AGVs for retrieval or repair. The code can be stored in the multi-function control box through WLKATA Studio, which is convenient for students to modify according to the scene, and provides a safe, open and friendly platform for students to learn robot programming and control and intelligent manufacturing system engineering.

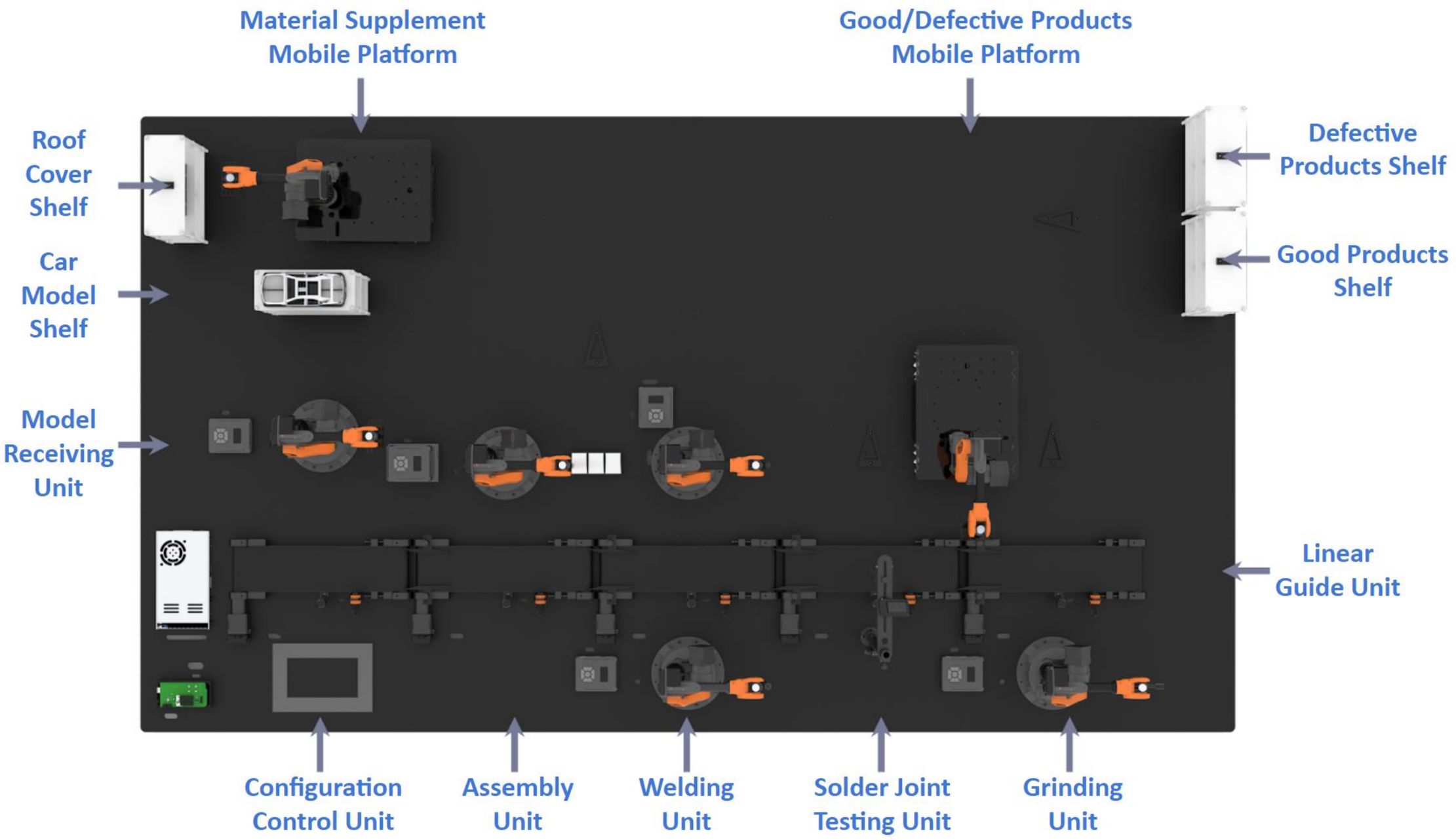
◆ Selection Guide

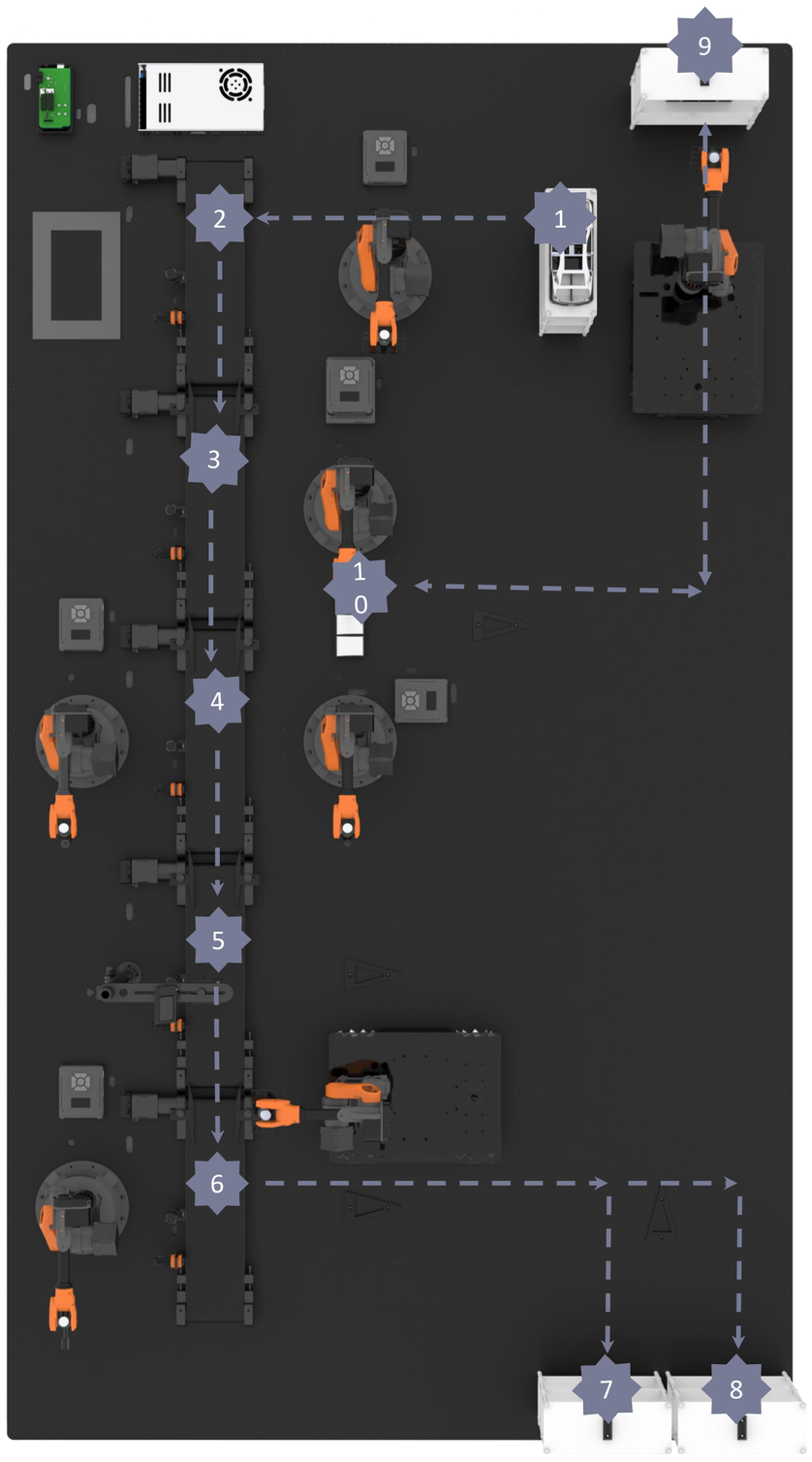
Product Name	Model	What Is Included
WLKATA Mirobot Automotive Manufacturing Simulation Production Line	WL-PL-AS-Tec5	Mirobot Education Kit*5; Wlkata Robot Vehicle In One*2; Short Conveyor Belt*5; AI Vision Set*1; Display Screen*1; Accessory Package*1

◆ Experiment Content

No.	Experiment Content
1	Understanding of Intelligent Manufacturing System
2	Understanding of Robot System
3	Understanding of Robotic Arm D-H Parameters
4	Understanding of Robotic Arm Movement
5	Understanding of Robotic Arm End Effector
6	Understanding of Robotic Arm Coordinate Mode
7	Understanding of Mobile Robots
8	Sensor Connection
9	Fundamentals of Configuration Software Custom Programming
10	Fundamentals of Python Programming
11	Camera Calibration: Master Calibration Method of Visual Camera, Calculation Methods of Robot Coordinate System, and Visual Coordinate System
12	Understanding of Automotive Automated Production System
13	Mobile Car Movement and Control Principle
14	Mobile Robotic Arm Automatic Grasping
15	Integration of Robotics, Vision, Sensor Technology Applications

Production Process





Process Description:

1. The robotic arm sends the car model from the supply shelf (1) to the conveyor unit and enters the production line;
2. Car model goes through the conveyor unit (2), (3), (4), (5), (6) to complete the assembly, welding, solder joint testing, grinding and other processes;
3. AGV mobile robots transport the good/defective products from (6) to (7) and (8) shelf;
4. Roof material is removed and replenished from (9) by AGV mobile robots to (10).

Scenario Description:

1. Each process can be tested independently as an experimental project;
2. There is a three-color indicator light indication in the operation of the process;
3. The production line supports WIFI, 5G, edge computing research and development.

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