



Robot Training Device – Technical Specification Sheet

1. General Description

The Robot Training Device is designed for hands-on training and learning in process control related to logistics transportation, classification, inspection, and storage processes.

It provides both theoretical and practical understanding of industrial robot control and smart factory automation, incorporating PLC, vision inspection, and deep learning-based process modules.

The setup allows individual and integrated operations for comprehensive smart factory training aligned with industrial standards.

2. Key Features

- Enables process control practice covering **supply, inspection, vision inspection, discharge, and storage**.
- Supports **smart factory control understanding** using industrial-grade robots and PLCs.
- Integrated **deep learning and rule-based vision inspection system**

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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with C# programmable interface.

- Supports **edge machine vision** capable of simple Y/N verification and multi-class classification.
- Components designed for **safety, durability, and modularity** with anodized AL 3T nameplates.
- Compatible with **TIA Portal software** and **IEC61131-3 standard** programs.
- Equipped with **redundancy system, OPC UA data communication,** and **industrial-grade safety circuits.**
- Practical materials for **16-week training** included, offering 10+ exercises per controller and source code for development.

3. Technical Specifications

A. Industrial Robot Manipulator

Parameter	Specification
Number of Axes	6
Payload	≥ 4 kg
Reach	580 mm
Arm Load	≥ 0.2 kg
Protection	IP40
Controller	Omnicores E10/Equivalent.
Wrist Signal & Power	16 signals integrated
Air Supply	4 lines (Max. 6 bar)

B. Robot Controller

Parameter	Specification
Power Supply	AC 220V, 60Hz
Protection	IP20
Built-in I/O	16 Digital In / 8 Digital Out
Safety	General Stop, Auto Stop, Emergency Stop
24VDC Output	4A for external equipment
Communication	Profinet / Profibus

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C. Flexible Pendant

- Multi-touch display supporting **pinch, swipe, and tap** gestures.
- **Hot-swappable** for use among multiple robots.
- Offers **extensive customization** and modern, intuitive operation.

D. End Effector (Air Type)

Component	Material / Details
Body	Aluminum Alloy
Piston	Ø16 Stainless Steel
Lever / Guide / Stopper	Stainless Steel
Rubber Magnet	Synthetic Rubber
Gasket	NBR

E. External Sub Frame

Parameter	Specification
Size	≥ 1200 × 1200 mm
Base Plate	Aluminum 12T
Doors	Front: Acrylic 12T, Side/Back: Iron 1.6T
Structure	R-Type corners for safety
Mobility	4 Casters (Load: 340 kg/EA)
Finishing	Single cover for safety and appearance

F. Upper Frame

Parameter	Specification
Height	≥ 1600 mm
Frame	Aluminum profile
Doors	2/4-sided Acrylic 12T (Light Blue Smog)
Tower Lamp	DC 24V, LED, 3 Colors (R/Y/G) with Buzzer
Cradle	For teaching pendant, interference-free design

G. Electrical Panel

Includes MCCB, CP, noise filter, 24VDC 100W power supply, terminal blocks,

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electromagnetic contactor, relays, and power strip.

All wiring conforms to **industrial safety standards** and provides robust short-circuit and overload protection.

H. Operation Panel

- Engraved aluminum nameplates for durability.
- Includes **Power Switch, Power Lamp, Select Switch, 3 Push Buttons (Green/Red/Blue)**, and **Emergency Stop (Push-Lock, Turn Reset)**, all 24VDC rated.

I. Pneumatic System

Component	Specification
Service Unit	One-touch coupler, filter, regulator, lubricator, shut-off valve
Max Pressure	10 bar
Rated Flow	≥ 500 L/min (at 6 bar)
Solenoid Valves	5/2-Way (2 single, 1 double) DC 24V, LED indicator
Valve Base	Integrated muffler outlet design

J. Process System

Modules: Supply, Transport, Inspection, Take-out

- **Supply Module:** Aluminum magazine tower for ≥5 workpieces (Ø25×20 mm), fiber sensor, 16 mm cylinder with 45 mm stroke.
- **Pallet System:** 3×3 slots, 50×50 mm, tiltable with position groove detection.
- **Conveyor:** ≥400×80×1T mm, DC 24V geared motor (>50 rpm), timing belt type.
- **Inspection Module:** Inductive & capacitance sensors (DC 12–24V).
- **Take-out Module:** Cylinder Ø16 mm × 75 mm, acrylic faulty box 80×70×100 mm.

K. Vision Inspection Module

Feature	Specification
Image Sensor	1/2.8" Color CMOS (SVGA 720×540) /Equivalent
Shutter Speed	29 μs to 10 ms
Frame Rate	45 Hz

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Feature	Specification
Lens Options	12 mm / 16 mm (liquid or manual)
Lighting	4-color LED ring (RGBW)
Communication	Ethernet (TCP/IP, PROFINET, Ethernet/IP, OPC UA)
Power	24V ±10%
Certification	CE, FCC, RoHS, TUV, NRTL
Tool Software	In-Sight Explorer EasyBuilder with AI Vision Toolset
Accessories	Power cable, GigE 1m, PoE 2m

L. PLC System

Component	Specification
CPU	SIMATIC S7-1500 (1517TF)/Equivalent
Voltage / Power	DC 24V / 7W
Program Memory	1 MB (Program), 5 MB (Data)
Expansion	Up to 32 modules
Interfaces	2x RJ45 (PROFINET, PROFIBUS)
Programming	LAD, FBD, STL, SCL, GRAPH
Touch Panel	7" TFT Display, Ethernet Communication

M. Safety System

- **Safety Light Curtain:** Type 4, Detection 25 mm opaque object, Width 185–2065 mm, Range 0.2–7 m, Category 4/PLe.
- **Light Curtain Cable:** 3 m, M12 (8-pin).
- **Muting Cap:** For light curtain muting.
- **Emergency Switch:** 2a+1b contact, red actuator.
- **Safety Door Switch:** 3 units with adjustable key type.
- **Safety Controller:** 8 safety inputs/outputs, PROFINET & PROFIBUS communication.

N. Software & Cloud Integration

- **TIA Portal V19** for PLC, HMI, and safety programming (LAD, FBD, SCL, STL).
- **Cloud Tenant Access (1 User)** for IoT training, dashboarding,

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workflow design, and real-time analytics.

- Includes **DevOps tools, Cloud Foundry, and AWS integration.**
- **Online Training Library** for continuous learning and IoT expansion.

O. Others

- All components match industrial specifications.
- Supplied with all relevant cables, accessories, and **programs on USB.**
- Conforms to **CE, RoHS, FCC, and K certification standards.**

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