DESCRIPTION

The S1-RT-101 Industrial Control Teaching Set is a robust industrial control teaching platform, offering an immersive, hands-on experience in PLC programming and industrial automation. Designed around a Siemens PLC, this system allows users to perform various tasks, including controlling a conveyor belt, managing pneumatic systems, and processing real-time input from sensors and actuators. The system integrates simulation software to introduce core concepts in programmable logic control and ladder logic, supporting real-time control of both the physical system and a simulated environment. This trainer is an ideal solution for educational institutions and training centers aiming to enhance students' practical understanding of industrial robotics.

FEATURES

- **Comprehensive Control:** Siemens industry-standard PLC enables control over conveyor belt speed, direction, and system automation.
- **Advanced Pneumatic Control:** Includes electro-pneumatic valves, single-acting cylinders, and position sensors to simulate real-world industrial processes.
- **Flexible Learning:** Integrated with Siemens Step 7 software and simulation tools for ladder logic programming and system control.
- **Real-time Control and Debugging:** Debug and run control programs remotely on the Siemens PLC.
- **Digital Curriculum:** Access to a complete set of digital learning materials covering industrial control and automation topics.
- **Remote PLC:** Downloading control programs to a remote Siemens PLC

SPECIFICATION

- **Sensors & Actuators:** Includes a 1x conveyor belt motor (speed and directional control), 2x infrared beam sensors, 3x electro-pneumatic valves, 3x Pneumatic single-acting cylinders, and 3x cylinder position sensors.
- **PLC:** Siemens Industry-standard PLC with Step 7 software license (290-02/SI)
- **Analog Inputs:** Supports analog input for controlling conveyor speed.
- **Manual Controls:** 2x Status indicator lamps, 2x start/stop buttons, 7x manual input switches, and 4x switched faults for system testing.

UTILITY REQUIREMENTS

Power: 100-270V AC, 50 Hz

Ethernet communication for remote PLC programming

Social Value: Opportunity for guest speakers and educational classroom displays to supplement learning.

DIMENSIONS

Overall Dimensions Lx W x H: 700mm x 600mm x 200mm.

Weight: 20kg Approx

STANDARDS COMPLIANCE

The SYP Technologies S1-RT-101 Industrial Control Teaching Set, complies with the following standards:

- **IEC 61131** for PLCs and industrial control programming.
- **ISO 12100** for safety of machinery and risk assessment.
- **ISO 9283** Performance standards for industrial robots.
- **EN 60204-1** for safety of electrical equipment in machines.
- **IEC 61355** for PLC software and functional block diagrams.

ACCESSORIES

- **Hand-Operated Air Compressor:** Provides pneumatic control for industrial automation activities.
- **USB and Ethernet Communication Leads:** Ensure reliable connectivity for program transfers and system monitoring.
- **Power Supply:** Includes necessary power adapters for global voltage ranges.
- **Digital Curriculum:** Comprehensive set of training materials available in digital format.

SOFTWARE & DATA LOGGING

- **Siemens Step 7 License:** Full access to Siemens industry-standard PLC programming tools.
- **Industrial Control Simulation Software:** Simulate control tasks and ladder logic programs, ensuring that students can practice and visualize automation before deployment.
- **Real-Time Data Logging:** Monitors performance, logs results, and assists in troubleshooting tasks to enhance practical learning.

PRACTICAL ACTIVITIES

- **Manual Control of Robots:** Understand the basics of manual robot operations in industrial settings, Human versus machine.
- **Logical Programming:** Practice using AND, OR, NOT and Truth tables and step logic to control automated systems.
- **Actuator Control:** Engage with exercises on latching actuators, counting parts, controlling timing events, and problem solving - sorting parts.
- **Conveyor Belt Control:** Program the speed and direction of a DC motor-driven conveyor belt.
- **Automation Challenges:** Tasks such as measuring the width of a part, sorting components by size, and debugging control programs on remote PLCs.
- **Troubleshooting:** Learn how to diagnose and resolve issues within industrial control systems using Siemens Step 7 remote programming software.

DELIVERY, INSTALLATION AND COMMISSIONING

Delivery:
The S1-RT-101 will be delivered directly to the specified laboratory location. Delivery will be completed under **Delivered At Place Unloaded (DPU)** terms, ensuring that SYP Technologies will handle all aspects of transportation, including insurance. Our courier services will provide the necessary offloading and transportation equipment, such as tailgate ramps and trolleys, to ensure smooth delivery.

Installation:
The **installation** of the S1-RT-101 will be conducted by skilled technicians from SYP Technologies. The process includes:

a. **Unpacking and positioning** the system in the laboratory.
b. Ensuring all **components, cables, and interfaces** are properly connected for immediate operation.
c. **Calibrating the equipment** for initial setup, ensuring the system is ready to function as per the university's requirements.
d. Handling any **special installation requirements**, such as electrical or utility connections, in compliance with the latest UK/international wiring and safety regulations.

Commissioning:

After installation, SYP Technologies will fully **commission the equipment** to verify its operation according to the specified performance parameters. Commissioning includes:

a. **Functional testing** of all system components.
b. **Calibration verification** to ensure precise readings across the full thermal conductivity range.
c. Demonstrating **data logging** and **software functionality** to the satisfaction of the university's research and technical staff.
d. **Testing under operating conditions**, ensuring the equipment meets all performance criteria outlined in the tender, including temperature, pressure, and sample type testing.

Training and Demonstration:

As part of the commissioning process, **comprehensive training** will be provided to staff. This includes :

a. Training on equipment operation.
b. Data management training, covering data logging, interpretation, and exporting test results.
c. Instructions on equipment maintenance, dismantling, and reassembly to ensure safe handling and operation in different laboratory settings.
d. Customization training, allowing the university's technical staff to adapt the equipment's software and hardware for future research needs.
e. **Training:** Minimum of one-day hands-on training included, covering all key aspects of the Industrial Control Teaching Set.

Delivery, installation and commissioning must be carried out during normal University hours and must not affect the day-to-day operations of the University or its students.

Documentation and Support:

Upon installation, SYP Technologies will provide full **documentation** of the S1-RT-101, including:

a. **User manuals** with step-by-step operating instructions.
b. **Maintenance guides** for scheduled servicing and calibration.
c. **Electrical schematics** and system diagrams for further technical reference.
d. Detailed documentation in English of delivered equipment (incl. schematics and circuit descriptions); iits operation, maintenance and service must be included and supplied on delivery. SYP Technologies will also offer **ongoing support** and be available for any questions or additional services following installation and commissioning.

WARRANTY, AND AFTER-SALES SERVICE

Warranty:

The S1-RT-101 comes with a **comprehensive 1-year full warranty** from the date of final acceptance testing. This warranty includes:

a. **Full coverage** for all parts, labor, and service costs related to equipment malfunctions or defects, excluding consumable items.

b. **Free technical support** during the warranty period, ensuring swift resolution of any operational issues.
c. **On-site repairs** and service, when required, with response times aligned with the university's operational needs.
d. The option to extend the warranty beyond the 1-year period, with **cost transparency** provided for extended coverage.

After-Sales Service:

SYP Technologies provides robust **after-sales support** to ensure the long-term performance of the S1-RT-101:

a. **Technical support**: Our dedicated support team is available to troubleshoot any issues or answer operational questions.
b. **Remote diagnostics**: The equipment's software allows remote access for troubleshooting and system diagnostics, enabling rapid identification and resolution of issues without requiring on-site visits.
c. **Spare parts availability**: We maintain a readily available stock of critical components, ensuring quick replacement and repair.