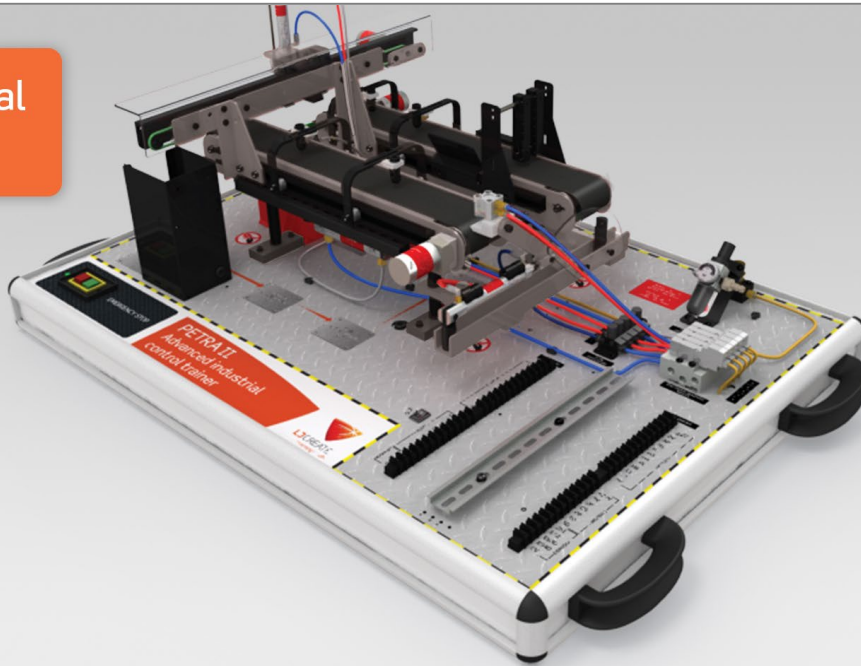# Product Information Sheet

PETRA II Advanced Industrial Control Trainer
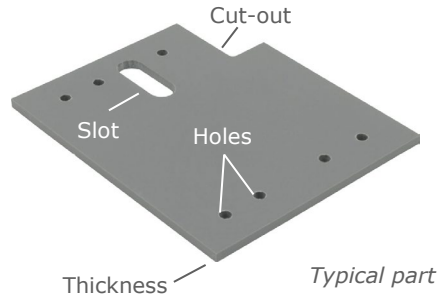
Includes digital curriculum

The PETRA II Advanced Industrial Control Trainer provides students with a complete, simulated factory automation process that can be controlled from one or more industry-standard programmable logic controllers (PLC).

The trainer is ideal for developing knowledge and skills in the areas of programmable controllers, engineering maintenance and condition monitoring techniques.

Students can use the PETRA II to develop and test PLC programs that:

- Move component parts along, and between, conveyor belts
- Control pneumatic actuators
- Monitor the outputs of a wide range of pneumatic and optoelectronic sensors
- Compare each part against its specification
- Reject non-conforming parts and accept parts that are within specification

The PETRA II includes two conveyors and a dispenser containing an assortment of parts, some of which are outside of specification.

Typical part

A pneumatic pick-and-place plunger travels along a carriage gantry to place parts on one conveyor and remove them from the other.

A pneumatically-activated gripper arm transfers parts between the conveyors.

A range of pneumatic and opto-electronic sensors allow the parts to be tested for compliance with the specification as they pass along the conveyors.

Starting with simple programs that monitor and control individual sensors and actuators, students develop their programming skills until they can control the complete industrial process to separate good and reject parts.

An on-board DIN rail and screw terminal connectors allow the PETRA II to be used with a wide range of industry-standard PLCs, including:

- Allen Bradley MicroLogix820
- Siemens Simatic S7-1200

A range of expansion connections allow additional sensors and actuators to be connected for student project work.

A set of switchable faults allow students to explore fault diagnosis in a complex plant. This includes intermittent faults which are not instantly obvious, but can be detected by features such as trend analysis.
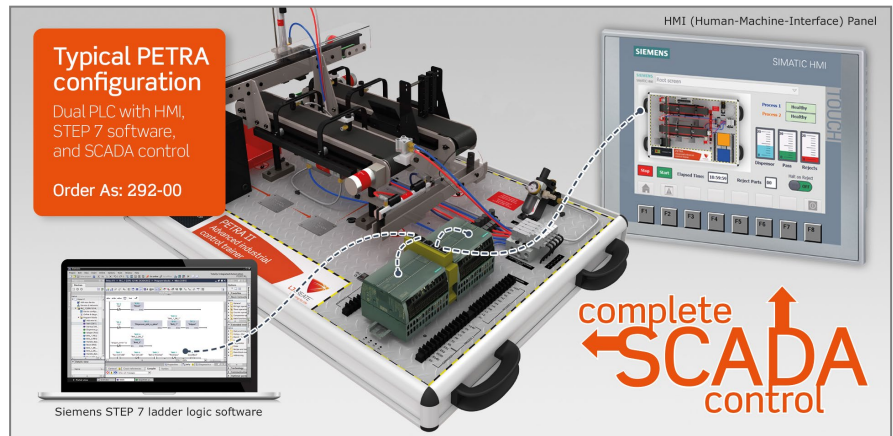
HMI (Human-Machine-Interface) Panel

Typical PETRA configuration
Dual PLC with HMI, STEP 7 software, and SCADA control

Order As: 292-00

Siemens STEP 7 ladder logic software

complete
← SCADA control

Also Available: The PETRA II Advanced Industrial Control Teaching Set can be used to teach the principles of SCADA control (order as 292-00)

PETRA II Trainer Features:

- Two conveyor belts
- Parts dispenser
- Set of 20 parts - some inside, and some outside specification
- Pneumatic pick-and-place plunger mounted on a carriage gantry
- Two-position pneumatically operated gripper arm
- Parts sensors:
  - Pneumatic sensor measures part thickness
  - Opto-reflective sensor detects whether a slot is present
  - Optical sensors (6) detect holes in different positions
  - Opto-reflective sensors (2) detect and measure cut-out

- System control sensors:
  - Infra-red sensor indicates when parts dispenser is empty
  - Arm position sensor detects position of gripper arm
  - Plunger position sensor indicates vertical position of pick-and-place plunger
  - 'Carriage in position' sensor indicates when plunger carriage is in the requested position

- Control inputs:
  - Plunger vacuum
  - Plunger activate
  - Plunger carriage position (2)
  - Conveyor belt activate (2)
  - Gripper arm position
  - Gripper arm activate

- On-board air pressure regulator
- Storage bins for separation of good and reject parts
- On-board DIN rail allows a wide range of industry-standard PLCs to be mounted on the unit
- Screw terminal connectors enable PLC connections to be changed easily
- Expansion connector allows connection of additional sensors and actuators for student project work
- On-board +24V DC connection may be used to power any PLC with a power requirement of 24V at 0.5A max

Typical Programming Activities:

- Creating, downloading and running ladder logic programs
- Controlling the conveyor belts
- Controlling the pick-and-place plunger
- Controlling the gripper arm
- Monitoring parts and system sensors
- Latches
- Timers
- Counters
- Shift instructions
- Output sequencing
- Complete industrial control sequence

Items Included:

- PETRA II Advanced Industrial Control Trainer
- 24V DC power adapter
- PLC connection leads
- User Manual
- Curriculum in Digital Format

Other Items Required:

- Programmable logic controller (PLC)
- Computer running PLC programming software
- Compressed air supply (max 0.6 MPa, 6 bar, 90 psi)

General Information:

- Trainer Dimensions (W x D x H): 1020 x 650 x 510 mm / 41 x 26 x 20 inches
- Packed Volume: Approx. 0.70 m^3 / 25ft^3
- Packed Weight: Approx. 38kg / 83.5lb
- Packed Dimensions (W x D x H): 1220 x 1016 x 549 mm / 48 x 40 x 22 inches

Also Available:

- 292-00 PETRA II Advanced Industrial Control Teaching Set (Includes 292-01 and 292-03)
- 292-03 Siemens HMI Pack for PETRA II Advanced Industrial Control Trainer (Includes 2x PLCs, STEP 7 Software, HMI Panel)
- 290-02/AB Allen Bradley Micrologix820 + Software Pack
- 290-02/SI Siemens S71200 + STEP 7 PLC Pack

Order Code: 292-01

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