

PLC TRAINING PANEL

Mod. PLC-V8/EV

Inside a laboratory for automation technologies, the trainer mod. PLC-V8/EV is the necessary tool for the high level training of technicians operating in modern process industry, for installations maintenance and program designing levels. Totally carried out with industrial components, the trainer PLC-V8/EV enables the development of a solid experimentation and a high content of knowledge on PLC programming and the solution of more complex problems related to automation, with particular reference to process control with HMI/SCADA software and to communication in industrial networks.

The PLC installed in the trainer mod. PLC-V8/EV is one of the most powerful and used in industry. It provides many digital inputs and outputs accessible by means of terminals of two diameters (\varnothing 4 mm and \varnothing 2 mm) present on the front panel of the trainer. The digital outputs are available as relay outputs or transistor outputs for all those applications which need quicker timing. The logic state of the digital inputs and outputs is displayed via LED diodes on the PLC. The analog signals processing allows it to be used within the industrial regulations in closed-loop PID controls. With two rotating potentiometers, you can adjust the voltages or currents level at the analog inputs.

In this way, no external power supply is necessary for the generation of references.

The front panel of the trainer PLC-V8/EV shows the silk screen panel of the diagrams and the inner components of the equipment, complete with any name. This wide and clear vision of the system increases its teaching value, facilitating the layout of connections and the development of the exercises. A 3 and $\frac{1}{2}$ – digits digital voltmeter displays the voltage across the analog inputs and outputs according to the position of a rotating switch. The programming software in WIN 7 Professional (32/64 Bit) enables the development of programs of exercises with PLC in the most used languages of industrial automation **KOP**, **FUP**, according to IEC 61131-3 standards.

The connection between Personal Computer and PLC is made via supplied Ethernet interface. Moreover, the PLC can be connected to industrial networks according to **ProfiNet** protocols. At last, the development of the exercises is guided effectively by the theoretical/experimental handbooks available with the trainer.



TRAINING PROGRAM:

The trainer PLC-V8/EV enables the theoretical analysis and the experiments on the following main exercises:

- PLC architecture
- Instructions processing: the cycle concept
- Synchronous, asynchronous and priority cycles
- 2 rotating potentiometers for setting the analog references
- \varnothing 4 mm and \varnothing 2 mm standard safety terminals for the connection of I/O to external devices
- Communication Protocol: TCP/IP
- Industrial communication interface: ProfiNet
- Performing times, cycle and reaction
- Boolean Algebra
- **KOP** and **FUP** basic programming
- Combinational logic functions
- Sequential logic functions
- Addressing
- Timers & counters
- Clock generators
- Monostable and bistable circuits
- Algebra operation: addition, subtraction, multiplication, division
- BCD/binary and Binary/BCD conversions
- Integrated functions of fast counting, frequency measurement, positioning
- Program Blocs
- PID control with auto-tuning
- Interrupt related to internal and external events
- Programming and use of industrial operators panels
- Industrial networks: ProfiNet

Typical application

- Mechatronics modules

PID regulations

- Process control (Level, flow, pressure, temperature)

PLC and PC Communication

- Inputs/Outputs diagnosis
- Internal states diagnosis
- I/O and internal variables forcing
- PLC networks (Master/Slave)

TECHNICAL SPECIFICATIONS:

- Tabletop metal box with press-formed aluminium section structure
- Side handles, not protruding, for easy transport in the laboratory
- Front panel, in insulating material, with silk screen representation of the diagrams and inner components of the equipment
- 24 Vdc/2 A power supply for control of the digital inputs and outputs. With electronic protection against short-circuits and overloads.
- 24 Vac/2 A power supply relay outputs control with fuse protection against overloads
- 1 3 and 1/2-digit digital voltmeter for measurement of the voltage present across the inputs or the analog output 0.1 Vdc resolution.
- 1 Rotating switch for voltmeter input selection
- 2 analog inputs V/I: 0÷10 Vdc, 0÷20 mA
- 1 analog output V/I: ±10 Vdc, 0÷20 mA
- 14 Digital standard inputs of which 6 special for fast counting
- Digital inputs simulator with permanent and pulse state switches
- 10 24 Vdc digital outputs of which 2 with f=100 kHz pulses
- Safety terminals, standard \varnothing 4 mm and \varnothing 2 mm for connection of the inputs and outputs to external devices.

Digital outputs interfacing

- With 10 Aac/2 Adc relay
- Transistor for fast applications

PLC characteristics

- Power Supply: 24 Vdc
- Hardware clock: YES
- Backup time: 240 h
- Working record: 50 kbyte
- Data record: 2 Mbyte
- Speed: 0,1 μ s for binary instruction
- Programming interface: TCP/IP
- Network interface: PROFINET
- Digital inputs: 14 at 24 Vdc; potential separation; protection from polarity inversion. Bit, byte, word addressing, from which 6 with fast counting functions
- Input state display: YES (green LED)
- Digital outputs: 10 at 24 Vdc/0,5A; galvanic separation from CPU; immunity against short-circuits. Bit, byte, word addressing from which 2 with f = 100 kHz pulses

- Output state display: YES (LED diodes)
- Analog inputs: 2 voltage/current
- Range of the analog input voltage: 0..10 Vdc
- Range of the analog input current: 0÷20 mA
- Analog outputs: 1 voltage/current
- Range of the analog output voltage: ±10 Vdc
- Range of the analog output current: 0..20 mA
- Ethernet cable for connection to PC included
- Single-phase power supply cable

Power supply: 230 Vac 50 Hz single-phase
(Other voltage and frequency on request)

Dimensions: 415 x 400 x 150 mm

Net Weight: 10 kg

LABORATORY KIT mod. KPLC-8/EV

It is also available a laboratory kit consisting of:

- No. 6 PLC trainer panels mod. PLC-V8/EV

INCLUDED**PLC PROGRAMMING SOFTWARE**

Software for developing PLC programs using KOP and FUP languages and for creation of basic HMI screens. Windows 7 Professional (32 bit/64 bit) programming environment.

THEORETICAL-EXPERIMENTAL HANDBOOK AND APPLICATION GUIDE**TECHNICAL HANDBOOK ON DVD WITH CONTROLLER SPECIFICATIONS, OPERATION, MAINTENANCE AND COMMUNICATION INSTRUCTIONS****OPTIONAL****TOUCHSCREEN OPERATOR PANEL**

- Mod. T8-IOP/EV or, as an alternative
- Mod. T7-IOP/EV

**HMI SUPERVISION SOFTWARE Mod. SV/EV**

Industrial HMI software with graphic pages, suggested for supervision and servicing practices when using operator panels. Windows 7 Professional (32 bit/64 bit) programming environment.

4-PORT RJ45 SWITCH - 24 Vdc Mod. CSM/EV