



The **KOF-025/E** educational system has been designed to solve easily and at a more than affordable price all the training problems related to the study of PLCs and of industrial process controls.

The **KOF-025/E** makes available in a single structure all the equipment required to carry out exercises at any level of complexity, from the simplest to the most demanding.

It is therefore perfectly suitable to support courses at any level of learning.

The **KOF-025/E** engineering has been focused on achieving great flexibility in a small size and with a low weight, for the sake of both simple storage and easy transportation.

Upon Customer's request it is possible to assemble any kind and brand of PLC.

The **KOF-025** is a stand-alone training system, complete of any accessory to perform immediately experiences of different complexity and kind belonging to the industrial automation field. The manuals and software included in the system provide theoretical and practical subjects.

## THE MAIN FEATURES OF KOF-025/E MODELS ARE:

- Industrial PLC with both analog and digital Inputs/Outputs (see below specifications)
- Anodised aluminium support panel with explanatory silk-screen printings
- Bistable input switches (signal adapter and conditioner)
- Output read-out leds
- Safety bushes 4 Ø mm for input and output signals
- One normalised 0-10V variable analog generator output
- 24V DC regulated power supply included
- Special aluminium carrying case
- Connection cable set
- User's manuals with practical exercises
- PC programming software
- PC-PLC serial cable with RS-232/RS-422 converter

The **PLC** inside the **KOF-025/E** is a software and hardware device specially designed for educational purposes, to be connected to a PC through the RS-232 serial port, for the study and simulation of industrial medium size PLC. The system consists of four parts:

- 1) A remote input-output hardware device built in a desktop case mod. **PLC-PAD** which includes:
  - 1) no.24 ON/OFF 24 Vdc inputs (+50 Vdc max)
  - 2) no.16 ON/OFF relay outputs (free potential)
  - 3) no.2 analog normalized signal inputs (0÷10V)
  - 4) no.1 analog normalized signal output (0÷10V)
  - 5) no.1 PWM signal output (0÷16 KHz)
  - 6) no.2 industrial front connectors for I/O signals
  - 7) no.1 rear 64 ways connector for I/O signals
  - 8) no.2 status leds
  - 9) no.1 RS-232C standard serial port (PC connection)

The I/O signals pass through normalized industrial high reliable connectors suitable for intensive use.

The digital and the analog signals are acquired by the PC and their status is displayed in real time on the monitor. The remote device-PC data exchange is made by a high speed RS232 serial port which enables the use of any PC (even notebook) without any modification or upgrading.

- 2) A Software (for Windows 95/98/2000/NT) manages the PLC programs edited by means of any text editor. It uses an easy to learn and user friendly window graphical interface. The program processing is displayed on the PC Screen through a standard PLC front panel representation. The programming of the PLC is achieved using the standard AWL language (Instructions List) according to DIN 192239 rules which is used by Siemens to program its PLC SIMATIC S5-S7 family and also adopted by other important PLC manufacturers. Ladder logic programming language will be available soon. The software includes an Help on line function. The software can be purchased also separately as a stand alone product .

- 3) AC/DC adapter (220Vac/12Vdc-1A)

- 4) Educational Manual with exercises and instructions for use.

## PERFORMANCES

The **PLC** allows to learn the operation and the programming of an industrial PLC and to simulate, in real mode, complex industrial processes. For its low price it represents the best cost effective solution to fit a complete laboratory including a number of workstations suitable for all the students. The students have the possibility to program, to perform changes or corrections and to check the program's operation in a very short time also connecting external devices. It is designed for educational purposes to cover the requirements of students and teachers aiming to learn quickly and easily the topics related to the PLC's programming and their use. The possibility to connect input/output external analog or digital devices (i.e. push buttons, lamps, relays, drives, etc.) directly to the hardware unit allows to manage even complex processes.

## OPERATIONAL MODES

The system allows the development of programs of up to 10.000 statements that can be performed in run or step-by-step modes. The use of the step-by-step mode is particularly useful during the program DEBUGGING.

In this mode the display shows:

- the name of the program in execution
- the current instruction
- the ACC1 and ACC2 accumulators contents
- rising and falling accumulators edges
- the RLC register content
- the Timers (no 15 available)
- the Counters (no 15 available)
- the Merkers (no 15 available)
- the inputs and outputs status (analog and digital) and others indications useful for checking the machine conditions (real time mode)

**AVAILABLE FACILITIES :**

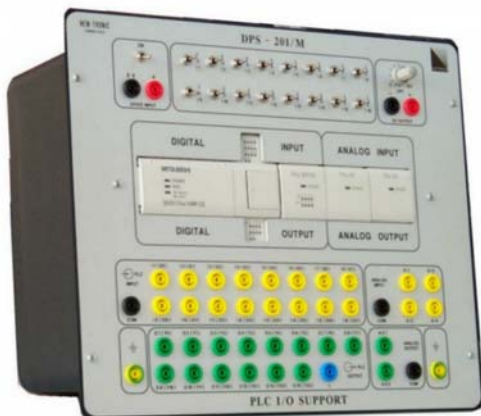
- Loading of a program in ASCII format according to the **DIN 192239** standard
- Possibility to use any Text Editor selectable through a configuration file
- Selection of the serial port to be used for the PC connection (i.e. COM1, COM2, etc.)
- Possibility of inserting comments within the program
- On-Line Help for the main commands (printable)

**FUNCTIONS**

Available PLC standard functions:

- Main LOGIC functions: U, O, UN, ON, S, R, =, U(, O(
- Functions acting on the ACCUMULATORS: L, T
- TIMER functions: SV, SI, SE, SA, SS
- COUNTER functions: ZV, ZR
- LOGIC functions between the ACCUMULATORS: UW, OW, XOW
- Comparing functions between the ACCUMULATORS: !=F, <=F, ><F, >=F, <F, >F, +F, -F
- JUMP functions: SPA, SPB
- Managing of OB, PB, FB, SB functional blocks

The analog inputs are mapped in EB3, EB4 and moved into the accumulators. The ACCUMULATORS can be



loaded: by the L function, with DECIMAL (KF) or HEXADECIMAL (KH) constants or with the state of the inputs as BYTE (LEBx) or WORD (LEWx). There are available 15 Merkers, 15 Timers, 15 Counters widely covering any application need.

**TECHNICAL DATA**

- no 24 digital inputs 24 Vdc ( 50 Vdc max)
- no 16 digital relays outputs (Imax 2A at V=30Vdc)
- no 2 analog inputs (0÷10Vdc /0-255 steps)
- no 1 analog output (0÷10Vdc /0-255 steps)
- no 1 PWM output (0÷10V/0÷16 KHz)
- no 3 multi ways connectors for I/O remote connections
- no 1 Serial high-speed (9600 Baud) RS-232 port
- power supply: 12Vdc/1A (external adapter included)
- Pentium PC in Windows O.S. environment is required

**NOTE:** It is possible to expand the **KOF-025/E** training set with application modules

