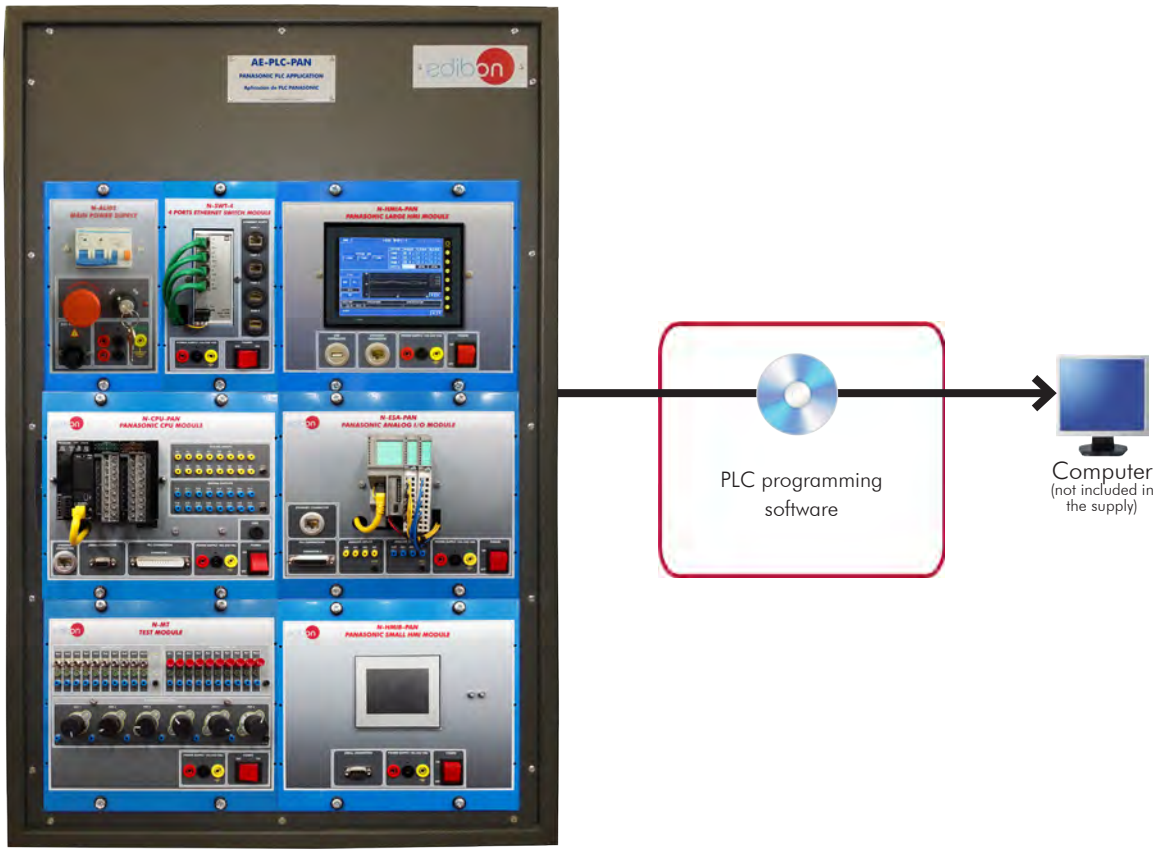
Engineering and Technical Teaching Equipment

PANASONIC PLC Application

AE-PLC-PAN



Unit: AE-PLC-PAN. PANASONIC PLC Application

Key features:

- **PLC programming software.**
- **Projector and/or electronic whiteboard compatibility allows the unit to be explained and demonstrated to an entire class at one time.**
- **Suitable for applied research, real industrial simulation, training courses, etc.**
- **Totally safe, using three safety systems (mechanical, electrical and electronic).**
- **Designed and manufactured under several quality standards.**
- **Optional ICAI software to create, edit and carry out practical exercises, tests, exams, calculations, etc., apart from supervising the knowledge and progress achieved by the user.**

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↳PRODUCTS
↳60.- MECHATRONICS & COMPUMECHATRONICS

For more information about Key Features, click here

ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)

European Union Certificate (total safety)

Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)

Certificate and Worlddidac Member

INTRODUCTION

The Programmable Logic Controllers (PLCs) were introduced in the late 1960s to replace the old circuits made of relays. These new systems, based on digital electronic, improved flexibility, functionality and troubleshooting. In all these years the PLC systems have grown in memory, versatility of the inputs and outputs signals, computing capacity, etc. At the same time, the price of this technology has been reduced over and over again. These and other improvements have allowed to keep the PLCs technology as a reliable option in the modern automation systems.

The PANASONIC PLC Application, "AE-PLC-PAN", is a PLC unit designed by EDIBON which use one of the last Panasonic PLC units. It allows the user to learn about PLC logic programming, different PLC programming languages, PLC to PC communication, etc.

The "AE-PLC-PAN" is provided with a set of practical exercises, through which the student will understand how to work with the PLC systems, without any background knowledge or experience.

GENERAL DESCRIPTION

The "AE-PLC-PAN" is a PLC application which contains one of the last Panasonic PLC models. The "AE-PLC-PAN" can be used alone, to study the PLC systems, or in conjunction with the EDIBON compatible units, to study a real application of the PLC systems.

The "AE-PLC-PAN" is a modular system with the common components that make up a complete PLC system. The PANASONIC PLC Base Unit, "AE-PLC-PAN-UB" always includes the power supply and the PLC CPU module, but there are also available a series of optional kits to complete the PLC system with the required functions of the programmable controller (test module, analog input and output signals, HMI devices, PLC internet connection, etc). These kits allows the user to learn about HMI programming, testing analog inputs and outputs signals, programming a web server application, etc.

SPECIFICATIONS

The AE-PLC-PAN-UB, **PANASONIC PLC Base Unit** includes:

N-ALI02

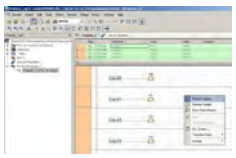
- N-ALI02. **Domestic Power Supply.**
  - Supply voltage (Single-Phase): 230 VAC, PH+N+G.
  - ON-OFF removable key.
  - Output Voltage Connections:
    - Two Single-Phase: 230 VAC.
    - Single-Phase supply wire connecting plug.
  - Differential magnetothermal, 2 poles, 25A, 30mA AC 6KA.

N-CPU-PAN

- N-CPU-PAN. **Panasonic CPU Module.**
  - Supply voltage (Single-Phase): 100-240Vac PH+N+G.
  - Overcurrent protection with fuse.
  - PLC device, Panasonic FP7:
    - High processing speed: 11ns per basic instruction (step).
    - Programming capacity: 120k basic instructions (step).
    - Data logging capacity: 256k words.
    - Independent memory for comments: 3MB.
    - Supports SDHC type generic memory cards up to 32GB.
  - Expansion module for digital inputs:
    - 16 digital inputs with allowable input range from 0V to 12V or 0V to 24V.
  - Expansion module for digital outputs:
    - 16 relay type digital outputs with voltage level of 24Vdc.
  - Web server function:
    - HTML web server included in the PLC.
    - Up to 16 sessions at the same time.
    - Compatible with most common search engines.
  - Connector for the digital input and output signals.
  - Connector to the Ethernet switch module (N-SWT-4 or N-SWT-8).

Specifications

- **PLC Programming Software.**



PLC Programming Software

Programming software developed according to the norm IEC 61131-3.

Compatible with Windows operating systems.

Five programming languages:

Ladder diagrams (LD). Structured text (ST). Instruction list (IL). Sequential function chart (SFC). Function block diagram (FBD).

Remote programming, service and diagnosis.

Minimum size of program.

Powerful debugging and monitoring tools.

Supports functions created by the user and function blocks.

Saves project files in the PLC.

Examples and quick tutorial included.

There are available the following optionals Kits to work with the AE-PLC-PAN-UB:

The PLC-PAN-K1, **PANASONIC PLC Kit 1 (Optional)** includes:

N-MT

- N-MT. **Test module.**

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

20 Digital Signal Generators:

10 Switches.

10 Push buttons.

Every output has attached a green LED.

Output voltage levels of 0Vdc and 24Vdc.

6 Analog Signal Generators:

6 Potentiometers.

Output voltage range from -10V to +10V.

Single-Phase supply hose connecting plug.

Differential magneto-thermal, 2 poles, 25A, 30mA AC 6KA.

The PLC-PAN-K2, **PANASONIC PLC Kit 2 (Optional)** includes:

N-ESA-PAN

- N-ESA-PAN. **Panasonic Analog I/O Module**.

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

Expansion unit for analog inputs:

Input voltage range from -10V to +10V.

4 analog inputs.

Resolution of 12 bits.

Expansion unit for analog outputs:

Output voltage range from -10V to +10V.

4 analog outputs.

Resolution of 12 bits.

Connector for the analog input and output signals.

Connector to the Ethernet switch module (N-SWT-4 or N-SWT-8).

N-SWT-4

- N-SWT-4. 4 **Ports Ethernet Switch Module.**

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

Compact switch module:

4 Ethernet ports.

Work as Ethernet interconnection point.

Specifications

The PLC-PAN-K3, **PANASONIC PLC Kit 3 (Optional)** includes:

- N-HMIB-PAN. **Panasonic Small HMI Module.**

N-HMIB-PAN

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

HMI device:

Touch screen.

TFT color display of 4096 colors.

Display size: 71.4 x 53.7 mm (3.5 inches).

Screen resolution of 320 (W) x 240 (H) dots.

Backlight: White LED.

SD/SDHC card slot.

Connector to the Ethernet switch module (N-SWT-4 or N-SWT-8).

- N-SWT-4. **4 Ports Ethernet Switch Module.**

N-SWT-4

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

Compact switch module:

4 Ethernet ports.

Work as Ethernet interconnection point.

- **HMI Programming software:**

HMI Programming Software

Tool to create screens:

This software is a tool created to program the touchscreen. Thanks to this tool, appropriate screens and images can be designed and created. Enables the transfer of the program to the touchscreen, uploading objects created from the terminal and print screens created.

Lots of functions. Creation of screens:

Includes many programming tools.

Text, diagram or data display devices, buttons for drawings, charts and pilot lights.

Creation of functional screens adaptable to each application.

Drawing functions: creation of different programming elements through icons and bitmaps.

Easy operation (drag and drop):

A library of elements allows for programming with the mouse by just selecting and moving elements to the desired locations (drag and drop).

Easy user libraries creation:

Libraries can be registered and stored to be used in later projects.

Printing. The project screens can be printed:

Screens can be printed after previewing, selecting and configuring them.

Bitmaps editor:

This tool allows the creation, reading and modification of bitmaps to use them as programming elements in the screen. Icons (buttons) can be created from images.

The PLC-PAN-K4, **PANASONIC PLC Kit 4 (Optional)** includes:

- N-HMIA-PAN. **Panasonic Large HMI Module.**

N-HMIA-PAN

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

HMI device:

Touchscreen.

TFT display of 64K colors and 16:9 format.

Size of the display: 187x147mm (7 inches).

Resolution: 800x480 WVGA.

Backlight with high brightness of 300cd/m2.

SD card slot.

Connector to the Ethernet switch module (N-SWT-4 or N-SWT-8).

- N-SWT-4. **4 Ports Ethernet Switch Module.**

N-SWT-4

Supply voltage (Single-Phase): 100-240Vac PH+N+G.

Compact switch module:

4 Ethernet ports.

Work as Ethernet interconnection point.

- **HMI Programming software:**

  Tool to create screens:

  This software is a tool created to program the touchscreen. Thanks to this tool, appropriate screens and images can be designed and created. Enables the transfer of the program to the touchscreen, uploading objects created from the terminal and print screens created.

  Lots of functions. Creation of screens:

  Includes many programming tools.

  Text, diagram or data display devices, buttons for drawings, charts and pilot lights.

  Creation of functional screens adaptable to each application.

  Drawing functions: creation of different programming elements through icons and bitmaps.

  Easy operation (drag and drop):

  A library of elements allows for programming with the mouse by just selecting and moving elements to the desired locations (drag and drop).

  Easy user libraries creation:

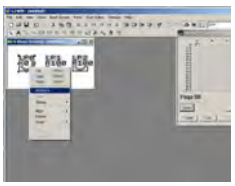
  Libraries can be registered and stored to be used in later projects.

  Printing. The project screens can be printed:

  Screens can be printed after previewing, selecting and configuring them.

  Bitmaps editor:

  This tool allows the creation, reading and modification of bitmaps to use them as programming elements in the screen. Icons (buttons) can be created from images.



HMI Programming Software

The PLC-PAN-K5, **PANASONIC PLC Kit 5 (Optional)** includes:

- N-MOD. **Modem Communication Module.**

  Supply voltage (Single-Phase): 100-240Vac PH+N+G.

  Internet router with RJ-11 socket to connect the phone line.

N-MOD

- N-SWT-8. **8 Ports Ethernet Switch Module.**

  Supply voltage (Single-Phase): 100-240Vac PH+N+G.

  Compact switch module:

  8 Ethernet ports.

  Work as Ethernet interconnection point.

N-SWT-8

- **Web Server programming software:**

  Easy programming of complete web applications to display and control all the variables of the PLC, without requiring previous experience in web programming.

  Library of buttons, pushbuttons, needle indicators, bar charts, etc for a quick programming of the applications.

  Applications can be programmed to control and monitoring the digital and analog variables of the PLC system.

  Allow to configure different access levels with a pre-configured log-in page.

  Screen sized auto-adjusted depend on the device used to access.

  The web server application is compatible with the following search engines:

  Windows: Google Chrome, Mozilla Firefox, Safari and Internet Explorer.

  OS X: Safari, Google Chrome and Mozilla Firefox.

  IOS: Safari and Google Chrome.

  Android: Google Chrome, Internet Explorer, Android browser.

Cables and Accessories, for normal operation.

Manuals:

This unit **is supplied with 7 manuals:** Required Services, Assembly and Installation, Control Software, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Using variables.
2.- Using digital inputs I.
3.- Using digital inputs II.
4.- Testing digital inputs (PLC-PAN-K1).
5.- Using digital outputs.
6.- Testing digital outputs.
7.- Using analog signals I (PLC-PAN-K1 and PLC-PAN-K2).
8.- Using analog signals II (PLC-PAN-K1 and PLC-PAN-K2).
9.- Square wave generator.
10.-HMI simple program (PLC-PAN-K3 or PLC-PAN-K4).
11.-Using digital outputs with HMI device I (PLC-PAN-K3 or PLC-PAN-K4).
12.-Using digital outputs with HMI device II (PLC-PAN-K3 or PLC-PAN-K4).
13.-Reading data from a register with the HMI device (PLC-PAN-K3 or PLC-PAN-K4).
14.-Writing data to a register with the HMI device (PLC-PAN-K3 or PLC-PAN-K4).
15.-Switching screens of the HMI device (PLC-PAN-K3 or PLC-PAN-K4).
16.-Internet connection of the PLC unit (PLC-PAN-K5).
17.-Control digital inputs with a web server application (PLC-PAN-K5).
18.-Control digital outputs with a web server application (PLC-PAN-K5).
19.-Control analog inputs with a web server application (PLC-PAN-K5).
20.-Control analog outputs with a web server application (PLC-PAN-K5).

REQUIRED SERVICES

- Electrical supply: single-phase, 220 V/50 Hz or 110 V/60 Hz.
- Computer.

DIMENSIONS AND WEIGHTS

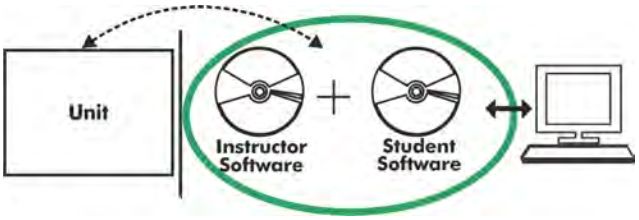
AE-PLC-PAN:

- Dimensions: 490 x 330 x 310 mm approx.
  (19.29 x 12.99 x 12.20 inches approx.)
- Weight: 6 Kg approx.
  (13 pounds approx.)

RECOMMENDED ACCESSORIES (Not included)

- PLC-PAN-K1. PANASONIC PLC Kit 1. (Optional)
- PLC-PAN-K2. PANASONIC PLC Kit 2. (Optional)
- PLC-PAN-K3. PANASONIC PLC Kit 3. (Optional)
- PLC-PAN-K4. PANASONIC PLC Kit 4. (Optional)
- PLC-PAN-K5. PANASONIC PLC Kit 5. (Optional)

AE-PLC-PAN/ICAI. Interactive Computer Aided Instruction Software System:



With no physical connection between unit and computer (PC), **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

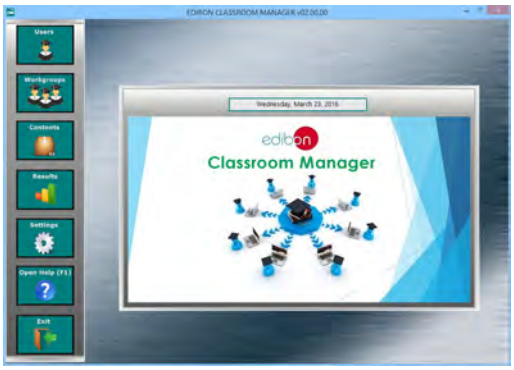
Instructor Software

- ECM-SOF. **EDIBON Classroom Manager (Instructor Software).**

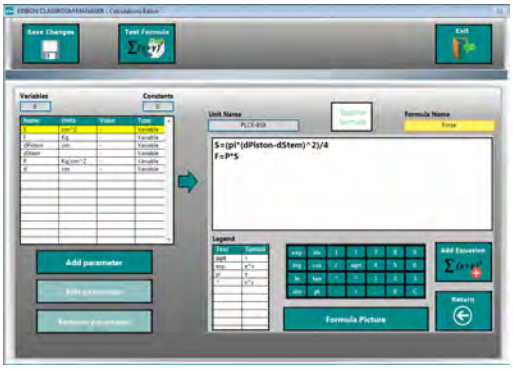
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

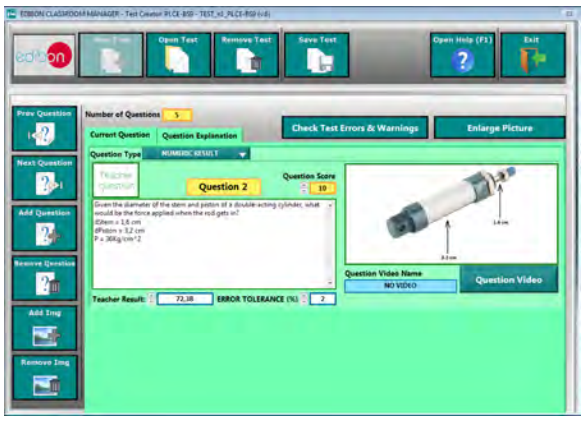
- **User Data Base Management.**
- **Administration and assignment of Workgroup, Task and Training sessions.**
- **Creation and Integration of Practical Exercises and Multimedia Resources.**
- **Custom Design of Evaluation Methods.**
- **Creation and assignment of Formulas & Equations.**
- **Equation System Solver Engine.**
- **Updatable Contents.**
- **Report generation, User Progression Monitoring and Statistics.**



ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question

ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional

Student Software

- ESL-SOF. **EDIBON Student Labsoft** (**Student Software**).

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

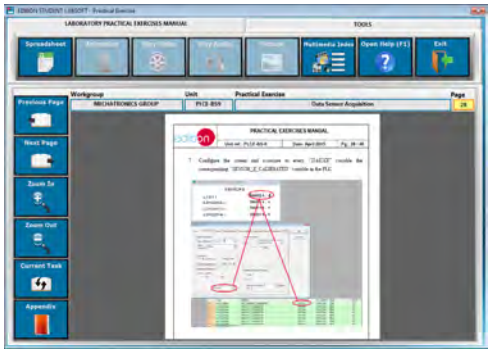
Innovative features:

- **Student Log-In & Self-Registration.**
- **Existing Tasks checking & Monitoring.**
- **Default contents & scheduled tasks available to be used from the first session.**
- **Practical Exercises accomplishment by following the Manual provided by EDIBON.**
- **Evaluation Methods to prove your knowledge and progression.**
- **Test self-correction.**
- **Calculations computing and plotting.**
- **Equation System Solver Engine.**
- **User Monitoring Learning & Printable Reports.**
- **Multimedia-Supported auxiliary resources.**

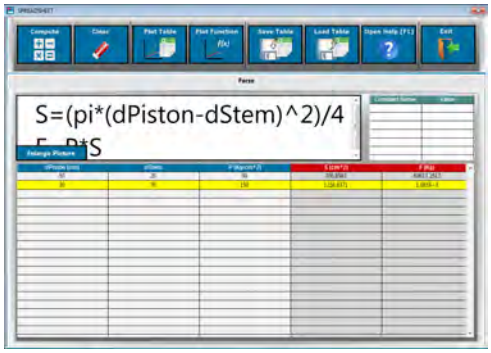
For more information see **ICAI** catalogue. Click on the following link:

www.edibon.com/en/files/expansion/ICAI/catalog

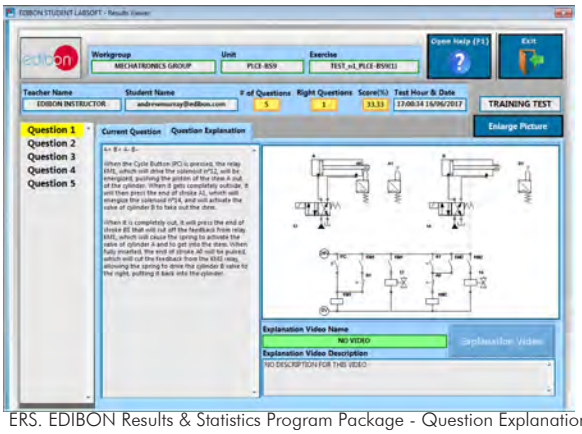
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ECAL. EDIBON Calculations Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation

✱ Specifications subject to change without previous notice, due to the convenience of improvement of the product.

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