edibon

Engineering and Technical Teaching Equipment

Automation Systems Simulation Software

AE-PLCA-AS

Software: AE-PLCA-AS. Automation Systems Simulation Software

INTRODUCTION

The prior design and simulation of industrial environments or processes to be carried out is one of the essential steps that must be followed to guarantee the correct operation of an industrial system.

The "AE-PLCA-AS" is supplied with a set of practical exercises that will help the students to understand the operation of industrial automation software, to simulate a 2D and 3D process and to perform SCADA control and supervision tasks on a real application and to carry out programming and communication tasks with the automata of the real application.

GENERAL DESCRIPTION

The "AE-PLCA-AS" software is designed to perform the following tasks: 2D and 3D simulation of a real automation system, data acquisition, supervision and control (SCADA) with a real automation system through OPC protocol communication and carry out automata programming directly from the software.

The "AE-PLCA-AS" designed by EDIBON allows the user to learn the basic concepts of industrial automation software that performs SCADA control functions, automata programming, 2D and 3D automation systems simulation, configuration of the properties of pneumatic and hydraulic components, etc. without any previous knowledge or experience.

SPECIFICATIONS

The "AE-PLCA-AS" includes:

2D and 3D systems simulations.

Configurable simulation speed with the modes "normal simulation", "slow motion simulation", "step-by-step simulation" and "pause".

3D editor to import pieces made with compatible formats (.STEP, .STL and .IGES) with most 3D design programs (3D Studio, Solid Edge, CATIA, Solid works, etc.). Capacity to generate 2D and 3D animations associated to the results of the simulation the user is working with.

Possibility to design systems supervision applications.

Capacity for simulating the following systems and synchronizing all the types of simulations included in the software:

- Hydraulic and electrohydraulic: according to ISO 1219-1 and 1219-2 standards, with an extensive library of hydraulic and electrohydraulic components with its standardized symbol.

- Pneumatics and electro-pneumatics: with an extensive library of pneumatic, electro-pneumatic and pneumatic logic components.

Capacity to modify the most important parameters of each hydraulic and pneumatic component, such as: efficiency curves, external loads, leaks, viscosity, thermal characteristics, etc.

- Digital electronics: with an extensive library of standard electronic components (logic gates, amplifiers, transistors, displays, ultiplexers, etc.).

- Electrical Single-Line Diagram: with a library that enables to create diagrams for all levels of voltage usually employed in power generation, transport and distribution networks.

- Electrical engineering: with a library that contains a great amount of components to create simple and complex electrical circuits. The models of the components included are generic and real and belong to several manufacturers.

All the libraries include the components and its standardized symbol.

Capacity to program with the following languages:

- GRAFCET: allows encapsulated stages for a better organization of the programmed control structures.

- Block Diagram: blocks included are preset but they can be completely configured by the user.

- Ladder: includes three libraries to program automata from Siemens, Allen Bradley and those fulfilling the IEC61131-3 standard, allowing the PLC to program directly. It also allows for creating and simulating the PLC program in the automated system simulated by the software.

- Digital logic: with an extensive library of logic gates and components configured by the user.

- Function blocks with configurable structured text.

Direct programming in the PLCs from the manufacturers Siemens, Allen Bradley and those fulfilling the IEC61131-3 standard of the programs simulated in the software.

Supervision, control and simulation of the manufacturing process of each station and the complete assembly by an open SCADA system (modification, optimization and development of other projects based on the supplied SCADA system). It allows the user to simulate, supervise and control a real process from the computer.

Software. AE-PLCA-AS

Compatible with all the stations and the complete system "AE-PLCA-CIM". It includes the models of the stations that form the "AE-PLCA-CIM" unit to be configured and modified.

The SCADA system included is structured by branched screens, the user can access the SCADA system of every station that form the unit from the main SCADA screen.

Each SCADA screen contains a control panel with "Start" and "Stop" buttons, a "Manual/Automatic" switch, "Reset" button and "Emergency stop" button. Besides, it includes a display of the alarms generated in each station (fault warnings, lack of pieces warnings, etc.).

Chart with the signals that indicate the current production state in each station, indicating every motion in real time from the computer.

Possibility to control in real time all the variables of the complete system and of every station remotely from the computer, without time limit. Access to the PLC variables, to the library of the components (pneumatic, hydraulic, etc.). Independent windows for 3D models and for the control panel.

Communication with the PLCs of the unit is performed via OPC protocol.

Includes the 3D simulation of the automation system with the control panel and the visualization of the alarms generated by the system.

Manuals:

This unit is supplied with the following manuals: Required services, Installation, Interface and control software, Starting-up, Safety regulations, Maintenance, Calibration, Practical exercises, 2D and 3D system simulation, Automation system simulation, Software environment and language and Application programming.
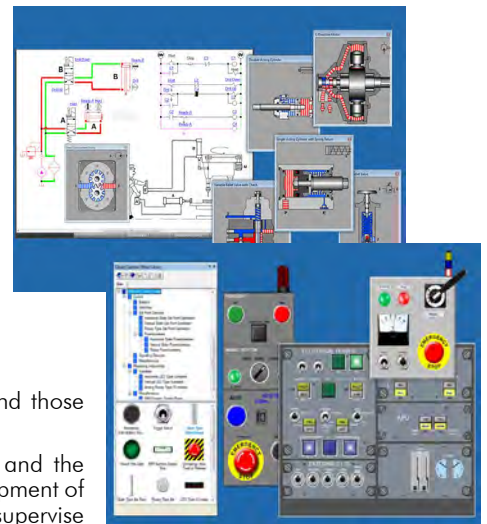
EXERCISES AND PRACTICAL POSSIBILITIES

1.- Introduction to industrial automation software.

2.- Simulation of pneumatic elements.

3.- Simulation of hydraulic elements.

4.- Simulation of electrical elements.

5.- Simulation of electro-pneumatic elements.

6.- Simulation of electrohydraulic elements.

7.- Connection to a PLC via OPC protocol.

8.- Programming a PLC from the industrial automation software.

9.- Introduction to a SCADA system.

REQUIRED SERVICES

- Computer.

AE-PLCA-AS/ICAI. Interactive Computer Aided Instruction Software System:
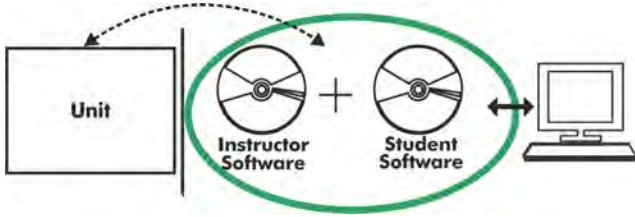
Whit no physical connection between unit and computer, **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.
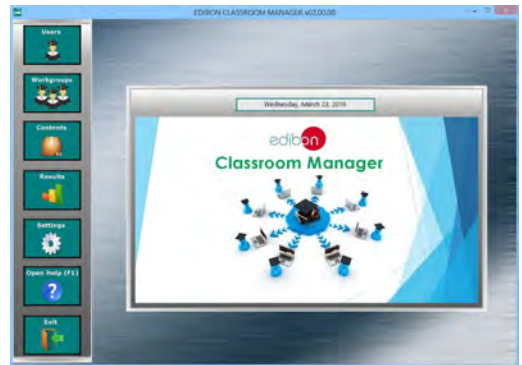
Instructor Software

### -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 Workgroups, Tasks 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.
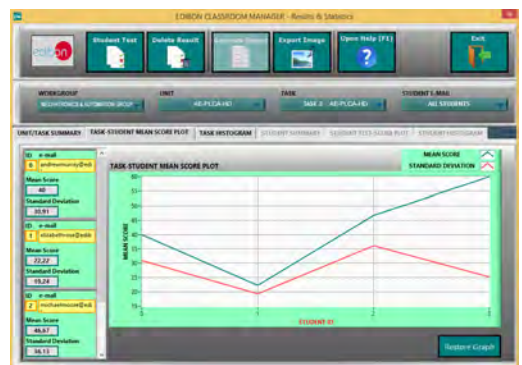

ECM-SOF. EDIBON Classroom Manager
(Instructor Software) Application Main Screen
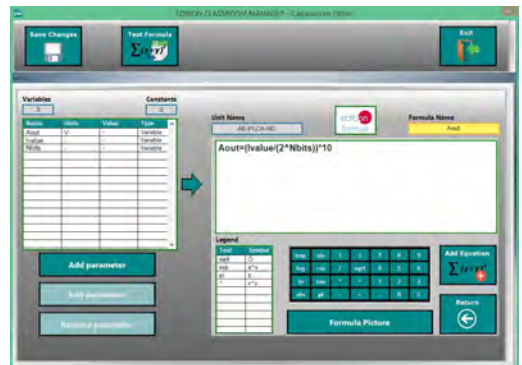
ECAL. EDIBON Calculations Program Package - Formula
Editor Screen
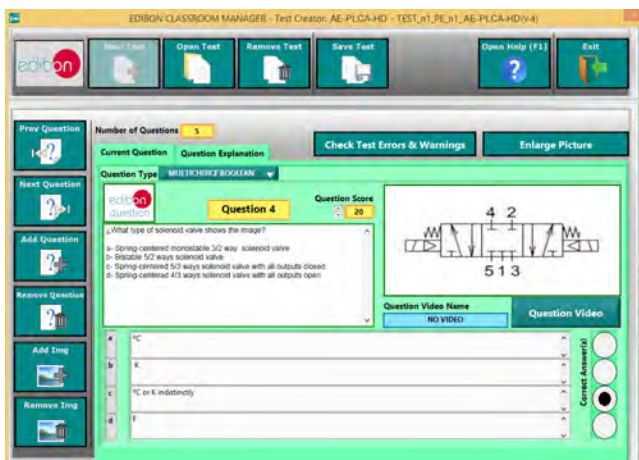
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with
Numeric Result Question

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

-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.
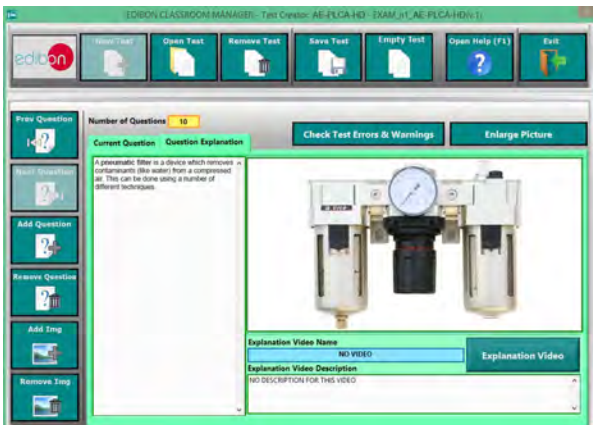
> Multimedia-Supported auxiliary resources.

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

www.edibon.com/products/catalogues/en/ICAI.pdf
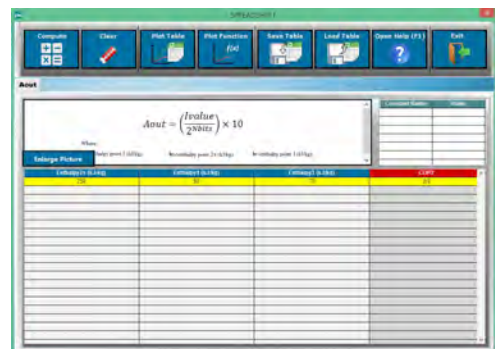

ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen

EPE. EDIBON Practical Exercise Program Package Main Screen

ERS. EDIBON Results & Statistics Program Package-Question Explanation

ECAL. EDIBON Calculations Program Package Main Screen

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