



Unit: AE-PLC-SIE. SIEMENS 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
 6.- MECHATRONICS,
 AUTOMATION &
 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)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

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

The "AE-PLC-SIE" 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-SIE" is a PLC application which contains one of the last SIEMENS PLC models. The "AE-PLC-SIE" 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-SIE" is a modular system with the common components that make up a complete PLC system. The SIEMENS PLC Base Unit, "AE-PLC-SIE-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-SIE-UB, **SIEMENS PLC Base Unit** includes:

- **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-ALI02

- **N-CPU-SIE. SIEMENS CPU Module.**

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

Overcurrent protection with fuse.

PLC device, SIEMENS S7-1200:

High processing capacity: 64bit calculation.

Program/data memory: 100KB.

Load memory: 4MB expandable with a Siemens memory card.

CPU processing times for bit operations: 0.085 μ s/instruction.

Counting frequency: 100 kHz.

18 digital inputs with allowable input range from 0V to 24V.

18 relay type digital outputs with voltage level of 24Vdc.

2 analog inputs with allowable input voltage range from -10V to +10V.

Expansion module for digital inputs and outputs.

Web server function:

HTML web server included in the PLC.

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).



N-CPU-SIE

• **PLC, HMI and Web server Programming Software.**

PLC, HMI and Web server Programming in the same software.

PLC Programming Software:

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

Compatible with Windows operating systems.

Three programming languages:

Ladder diagrams (LD), Structured text (ST) and Function block diagram (FBD).

Easy creation and parameterization of devices using an intuitive and visual network.

Homogeneous libraries system that allows the sharing of elements between different projects.

Integrated functions for project and system protection.

Diagnostics and online functions for the entire project:

Efficient error localization thanks to integrated system diagnostic, real-time trace and high performance online functions.

Perfect interaction between PLC and HMI thanks to the integration of the programming of these devices in the same software.

Saves project files in the PLC.

Examples and quick tutorial included.

HMI Programming Software:

Large library of images of pushbuttons, switches, different industrial process components, to an easy and quick configuration of the HMI programs. The library allows for programming with the mouse by just selecting and moving elements to the desired locations (drag and drop).

The Software allows to import image of the user.

Preconfigured screens to an easy commissioning of the HMI device.

Programming tools to an easy debugging of the HMI programs.

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.

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

The PLC-SIE-K1, **SIEMENS PLC Kit 1 (Optional)** includes:

• **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.

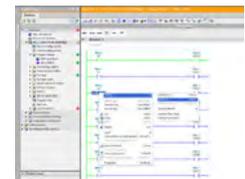
6 Analog Signal Generators:

6 Potentiometers.

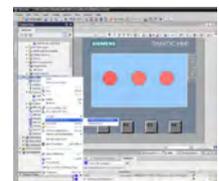
Output voltage range from -10V to +10V.

Single-Phase supply hose connecting plug.

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



PLC Programming Software



HMI Programming Software



N-MT

Specifications

The PLC-SIE-K2, **SIEMENS PLC Kit 2 (Optional)** includes:

- N-ESA-SIE. **SIEMENS 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-ESA-SIE

The PLC-SIE-K3, **SIEMENS PLC Kit 3 (Optional)** includes:

- N-HMIB-SIE. **SIEMENS Small HMI Module.**

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

HMI device:

Touch screen.

TFT display of 65536 colors.

Display size: 95 x 53.9 mm (4.3 inches).

Screen resolution of 272 (W) x 480 (H) pixels.

LED Backlighting.

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



N-HMIB-SIE

- **HMI Programming software** included with the AE-PLC-SIE unit.

The PLC-SIE-K4, **SIEMENS PLC Kit 4 (Optional)** includes:

- N-HMIA-SIE. **SIEMENS Large HMI Module.**

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

HMI device:

Touch screen.

TFT display of 65536 colors.

Display size: 154.1 x 85.9 mm (7 inches).

Screen resolution of 480 (W) x 800 (H) pixels.

LED Backlighting.

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



N-HMIA-SIE

- **HMI Programming software** included with the AE-PLC-SIE unit.

Specifications

The PLC-SIE-K5, **SIEMENS 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** included with the "AE-PLC-SIE" unit.

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

REQUIRED SERVICES

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

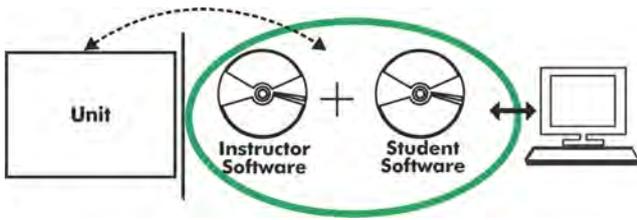
DIMENSIONS AND WEIGHTS

- AE-PLC-SIE:
- 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-SIE-K1. SIEMENS PLC Kit 1. (Optional)
- PLC-SIE-K2. SIEMENS PLC Kit 2. (Optional)
- PLC-SIE-K3. SIEMENS PLC Kit 3. (Optional)
- PLC-SIE-K4. SIEMENS PLC Kit 4. (Optional)
- PLC-SIE-K5. SIEMENS PLC Kit 5. (Optional)

AE-PLC-SIE/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.

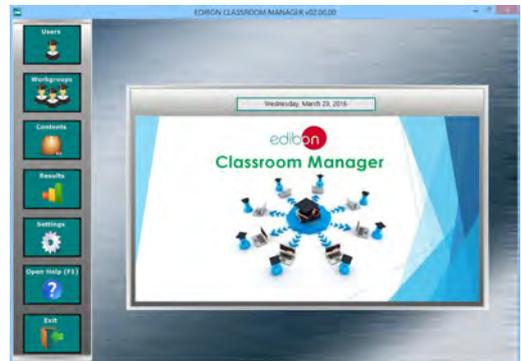
Instructor Software

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

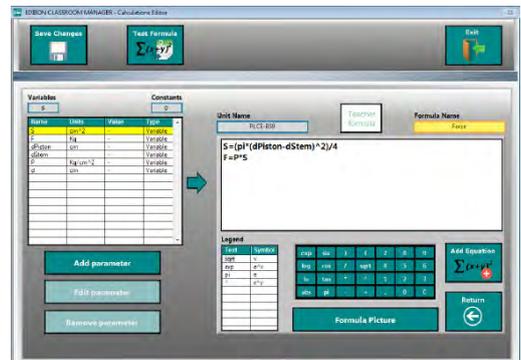
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

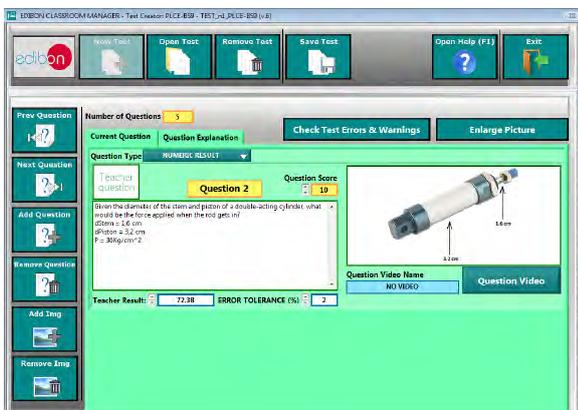
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- 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:

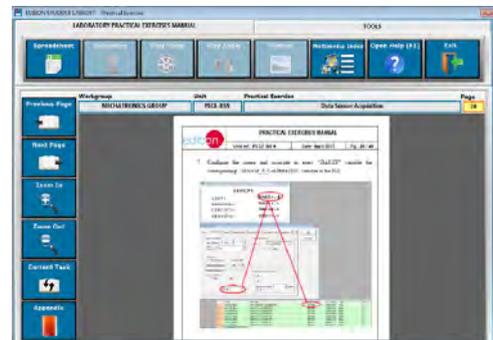
- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.
- 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:

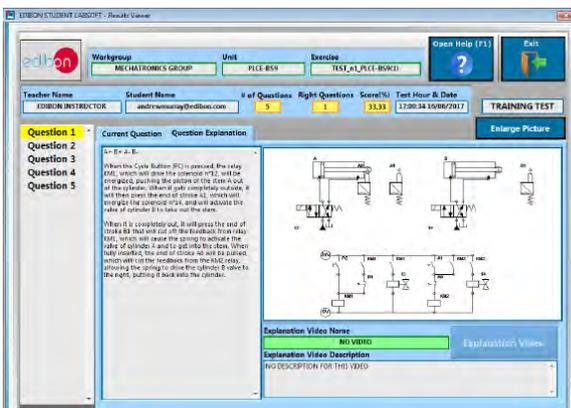
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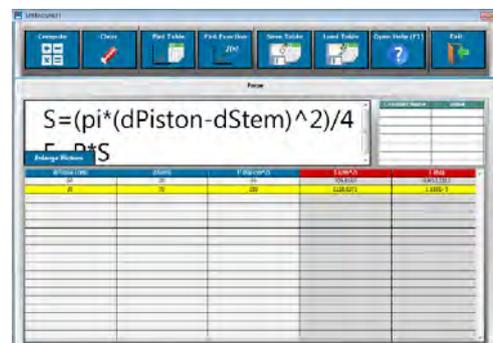
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



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.



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REPRESENTATIVE:

