Logical Control Operations Application

AEL-CM1

edibon

Engineering and Technical Teaching Equipment

INTRODUCTION

Over the years, industry has always sought to improve the efficiency of the processes and the least human intervention. One of many technologies have made this possible is the digital logic, which is a wiring with switches, timers, contactors, etc. This logic, gives an output in form of 0 or 1 to the system. In the past, this logic was wired physically to implement some kind of control, but nowadays with the development of digital systems it is usually to do it through micropocessors.

GENERAL DESCRIPTION

The Logical Control Operations Application, "AEL-CM1", has been designed by Edibon to study basic logics operations using timers, push-button, signaling lamps, contactors, thermal relays and combinations of them used in the industrial world.

This application allows the students acquire knowledge about how carry out different logic wirings with several relays and circuit breakers. The user will learn a lot of control logics, for example "OR" and "AND" logic, locking systems, etc. These control logic are very much used in the industry to automate processes or other operations, such as starting of motors.

This application includes all necessary modules and accessories for programming the basics control logic and lamps which show the circuit breakers state.

The AEL-CM1 includes the following modules:

- N-ALI01. Industrial Main Power Supply.

- N-PUL02. Emergency Push-Button Module.

- N-PUL48. Three Double Chamber Push-Buttons Module.

- N-LAM02. Three Auxiliary Lamps Module.

- N-CON01.3-poles Contactor (24 VAC) (2 units).

- N-REL30. Synchronization Relay Module.

- N-ALI03. AC Auxiliary Power Supply.

Additional and recommended applications:

- AEL-CM2. Application of Manual Starters and Velocity Commutators with Asynchronous Motors.

- AEL-CM3. Automatic Control Operations II.

- AEL-CM4. Automatic Control Operations with Contactors and Sensors IV.

Expansion learning software:

In addition, Edibon provides expansion learning software (AEL-CM1/ICAI) to reinforce knowledge about this field.

This software is formed by:

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

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

The application AEL-CM1 can be mounted on rack (option A) or on rail (option B):

Option A:

This application needs the following rack:

- N-RACK-A.

Optionally the AEL-WBR. Electrical Workbench (Rack) can be supplied to place the rack/s.

Option B:

This application can be mounted on rail.

Optionally the AEL-WBC. Electrical Workbench (Rail) can be supplied to mount the modules.

The application includes the following modules:

- **N-ALI01. Industrial Main Power Supply.**

    Supply voltage: 400 VAC, 3PH+N+G.

    ON-OFF removable key.

    Output voltage connections:

    Three-Phase + Neutral: 400 VAC

    Single-Phase: 230 VAC

    Three-Phase supply hose with IP44 3PN+E 32A 400V connecting plug.

    Differential magnetothermal, 4 poles, 25 A, 300 mA AC 6 KA.

N-ALI01

- **N-PUL02. Emergency Push-Button Module.**

    One emergency push-button to connect or disconnect the control circuit.

    Nominal voltage: 24 VAC

    Contacts:

    One Normally Open Contact (NO)

    One Normally Close Contact (NC)

    Ground terminal.

N-PUL02

- **N-PUL48. Three Double Chamber Push-Buttons Module.**

    Two independent chambers.

    Nominal voltage: 24 VAC.

    Three double chamber push-buttons (green and red).

    Contacts:

    Three Normally Open Contacts (NO) for green switch

    Three Normally Close Contacts (NC) for red switch

    Ground terminal.

N-PUL48

- **N-LAM02. Three Auxiliary Lamps Module.**

    Nominal voltage: 24 VAC.

    Three lamps (red, yellow and green).

    Ground terminal.

N-LAM02

Specifications

- N-CON01. **3-poles Contactor (24 VAC). (2 Units).**

  Nominal voltage for power contacts: 400 VAC.

  Nominal voltage for control contacts: 24 VAC.

  Nominal voltage for the control coil: 24VAC.

  Contacts:

  One three-phase Normally Open Contact (NO) for power circuit

  Three Normally Open Contacts (NO) for control circuit

  Two Normally Close Contacts (NC) for control circuit

  Ground terminal.

N-CON01

- N-REL30. **Synchronization Relay Module.**

  Nominal voltage for power contacts: 400 VAC.

  Nominal voltage for control contacts: 24 VAC.

  Nominal voltage for the control coil: 24VAC.

  Contacts:

  One three-phase Normally Open Contact (NO) for power circuit

  Three auxiliary contacts:

  One instantaneous Normally Open Contact (NO)

  One time Normally Open Contact (NO)

  One time Normally Close Contact (NC)

  Ground terminal.

N-REL30

- N-ALI03. **AC Auxiliary Power Supply.**

  Supply voltage (Single-Phase): 230 VAC PH+N+G.

  Output voltage:

  Single-Phase 24 VAC/12 VAC.

  24 VDC.

  0-24 VDC through potentiometer.

N-ALI03

- **All necessary cables to realize the practical exercises are included.**

Cables and Accessories, for normal operation.

Manuals:

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

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Checking the working of the main power supply.

2.- Checking the working of the auxiliary power supply.

3.- Checking the working of lamps.

4.- Signaling of contactor state.

5.- Logic OR operator in electrical circuits.

6.- Logic OR operator with locking in electrical circuits.

7.- Logic AND operator in electrical circuits.

8.- Sequential operation with contactor and timers.

9.- Utilization of static timer with excitation delay.

REQUIRED SERVICES

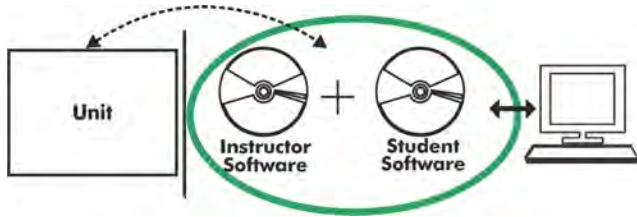- Electrical supply: three-phase, 380V/50 Hz or 208V/60 Hz, 20 Kw.

DIMENSIONS AND WEIGHTS

AEL-CM1:

- Dimensions: 640 x 320 x 920 mm approx.

  (25.19 x 12.59 x 32.22 inches approx.)

- Weight: 60 Kg approx.

  (132 pounds approx.)

AEL-CM1/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.
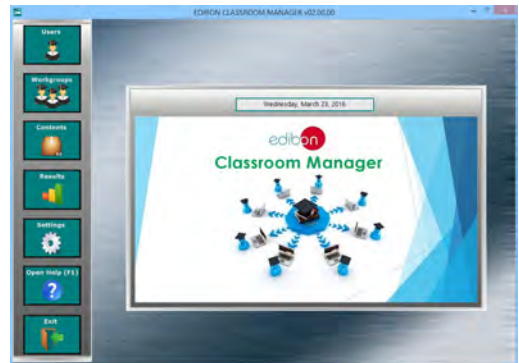
Instructor Software

- 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.**
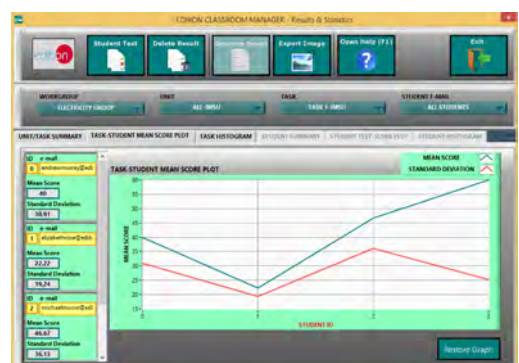

ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen
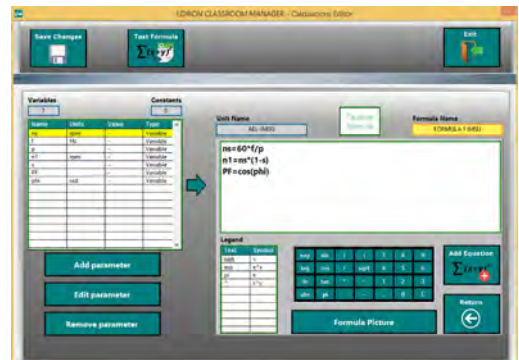
ECAL. EDIBON Calculations Program Package - Formula Editor Screen
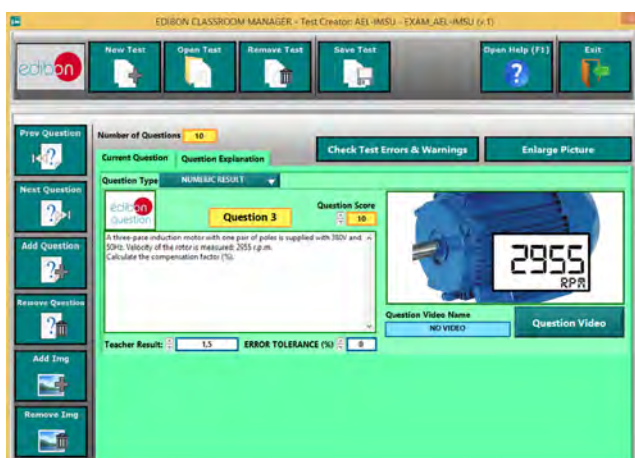
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question

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

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.

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

EPE. EDIBON Practical Exercise Program Package Main Screen

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

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

ERS. EDIBON Results & Statistics Program Package - Question Explanation
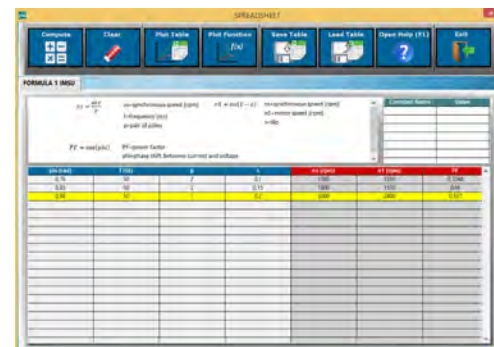
ECAL. EDIBON Calculations Program Package Main Screen

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

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INTERNATIONAL

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