Reactive Energy Control and Compensation

LIELBA - AE2

edibon
Technical Teaching Equipment

INCLUDED MODULES

ALI01. Industrial Main Power Supply

- Magneto-thermal protection.
- Differential protection.
- Double plug and terminals (three phase+singlephase).
- 2 lamps.
- 8 terminals.
- Mushroom security button.
- Removable key.

CAR08. 3-phase Variable Resistive Load (custom made)
- Value (ohms and W) to be chosen by the customer.

CAR11. 3-phase Capacitive Load

- 3 x 4.7microF.

CAR14. 3-phase Inductive Load

- Coil with several outlets.
- Value (H) to be chosen by the customer.

PRACTICAL POSSIBILITIES

1.- Assembly of the set with inductive load.
2.- Power Factor (cos φ) measurement.
3.- To calculate the necessary capacitors to get cos φ= 1.
4.- Capacitors connection and power factor measurement.

Application (several modules)

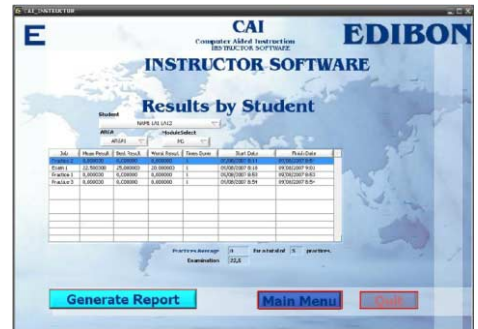Instructor Software + Student/Application Software
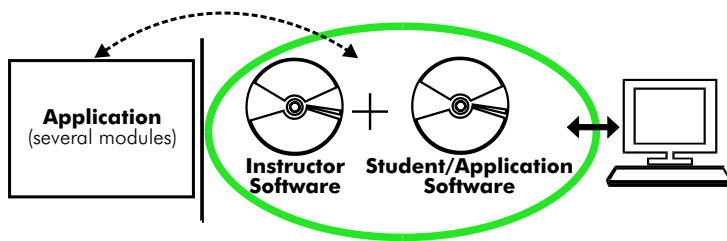
With no physical connection between applicacion/module and computer, this complete package consists on an Instructor Software (INS/SOF) totally integrated with the Student/Application Software. Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students. These, on the other hand, get a virtual instructor who helps them to deal with all the information on the subject of study.

With the **INS/SOF. Classroom Management Software Package (Instructor Software)**, the Teacher has a whole range of options, among them:

- Organize Students by Classes and Groups.
- Create easily new entries or delete them.
- Create data bases with student information.
- Analyze results and make statistical comparisons.
- Print reports.
- Develop own examinations.
- Detect student's progress and difficulties.

...and many other facilities.

The Instructor Software is the same for all the applications, and working in network configuration, allows controlling all the students in the classroom.

Examples of the Software screens

A.../SOF Computer Aided Instruction Software Packages (Student/Application Software).

It explains how to use the application or the module, run the experiments and what to do at any moment.

Each application has its own Student Software package.

- The options are presented by pull-down menus and pop-up windows.

- Each Software Package contains:

  Theory: that gives the student the theoretical background for a total understanding of the studied subject.

 **Exercises:** divided by thematic areas and chapters to check out that the theory has been understood.

  Guided Practices: presents several practices to be done, alongside the applications/modules, showing how to complete the exercises and practices.

  Exams: set of questions presented to test the obtained knowledge.
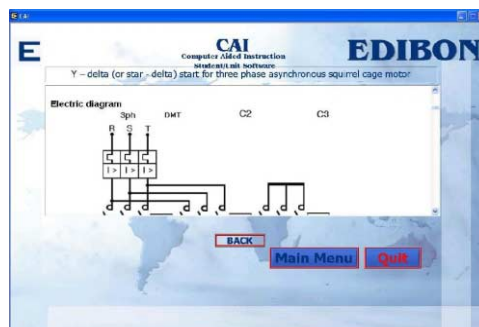
✱ Software is available in English and Spanish. Any other language available on request.

MUAD. Power Data Acquisition System
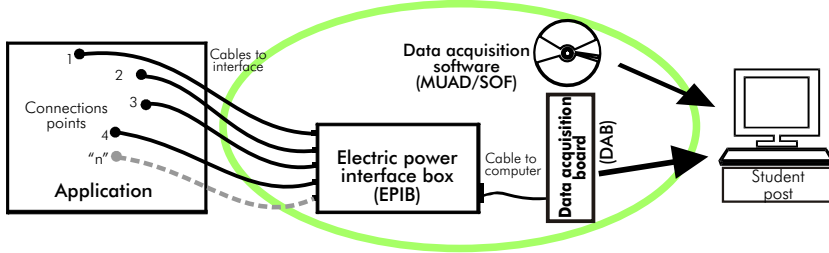
MUAD is the perfect link between the application/module and the PC. MUAD is a continuous data acquisition system with virtual instrumentation, that measures, analyzes and represents the parameters involved in the process.

MUAD allows voltage and current acquisition and measurement, data processing, frequency spectrum and all the functions of a digital oscilloscope.

We easily connect the Electric Power Interface Box (EPIB) to the application/module with the supplied cables (there are several connection points placed for it). The EPIB is connected to the PC through the Data Acquisition Board (DAB), and by using the Data Acquisition with Virtual Instrumentation Software, the student can get results from the undertaken experiment/practice, see them on the screen and work with them.

The MUAD system allows voltage and current measurement and acquisition, data processing, frequency spectrum and the functions of a digital oscilloscope.

This MUAD System includes EPIB + DAB + MUAD/SOF:

1)Hardware :
  1.1) EPIB. **Electric power interface box** (dimensions: 300 x 120 x 180 mm. approx.):
  Interface that carries out the conditioning of the diverse signals that can be acquired in a process, for their later treatment and visualisation.
  In the front panel, the elements are separated in two parts: left-hand part to VOLTAGE sensors, and right-hand part corresponds with CURRENT sensors.
  Analog Input Channels:
    8 analog input channels. Sampling range: 250 KSPS (Kilo samples per second).
    4 Tension sensors AC/DC, 400V. 4 Current sensors.

  1.2) DAB. **Data acquisition board** :
  PCI Data acquisition board (National Instruments) to be placed in a computer slot.
  Bus PCI.
  Analog input:
    Number of **channels= 16** single-ended or 8 differential.
    Resolution=16 bits, 1 in 65536.
    Sampling rate up to: 250 KSPS (Kilo samples per second).
    Input range (V)=± 10V.
    Data transfers=DMA, interrupts, programmed I/0.
    Number of DMA channels=6.

  Analog output:
    Number of **channels=2.**
    Resolution=16 bits, 1 in 65536.
    Maximum output rate up to: 833 KSPS
    Output range(V)=±10.
    Data transfers=DMA, interrupts, programmed I/0.
  Digital Input/Output:
    Number **channels=24inputs/outputs.**
    D0 or DI Sample Clock frequency: 0 to 1 MHz.
  Timing: **Counter/timers=2.**
    Resolution: Counter/timers: 32 bits.

2) MUAD/SOF. **Data acquisition software** :
  Data Acquisition Software with Graphic Representation:
    Amicable graphical frame.
    Compatible with actual Windows operating systems.
    Configurable software allowing the representation of temporal evolution of the different signals.
    Visualization of a tension of the circuits on the computer screen.
    Sampling velocity up to 250 KSPS. (Kilo samples per second) guaranteed.
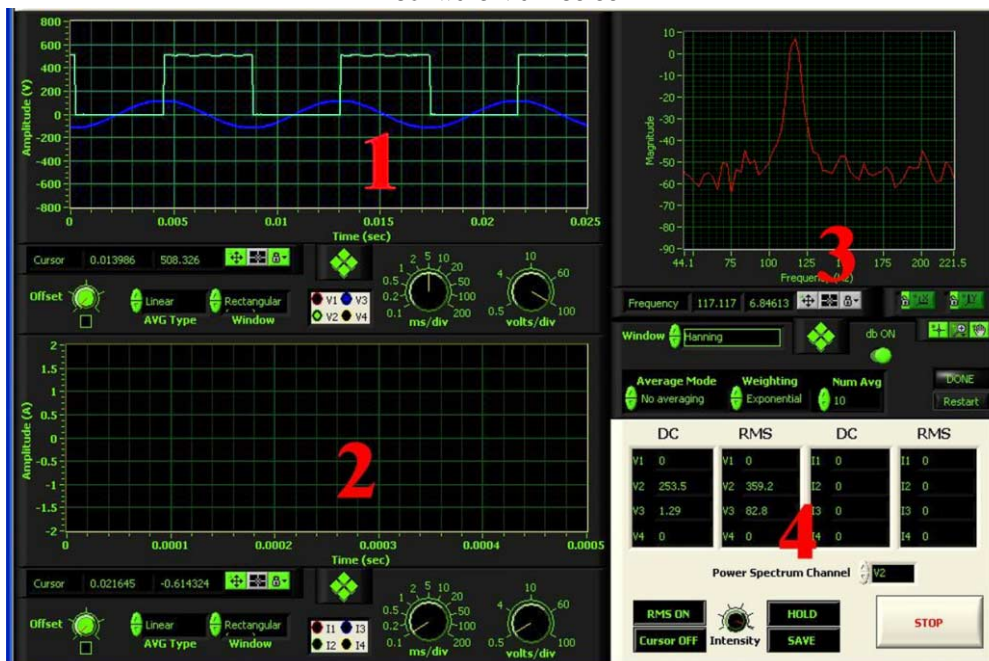
EPIB

+

DAB

+

MUAD/SOF

Software Main Screen

1.- Voltage channels section

2.- Current channels section

3.- Power spectrum section

4.- General control panel section

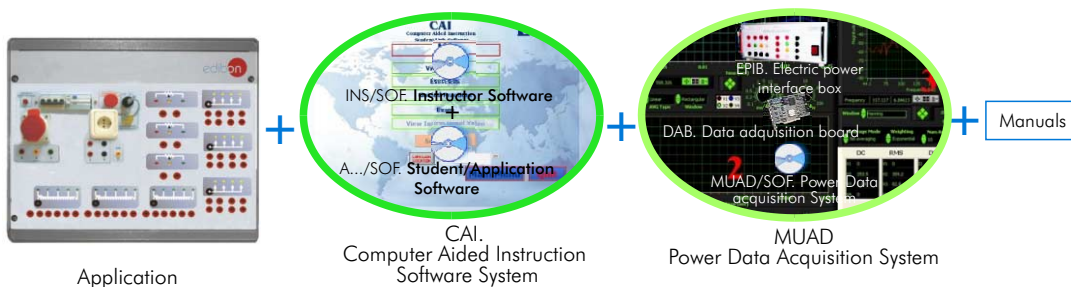www.edibon.com

Manuals and Accessories

Manuals:

Manuals are developed following the SELF-TEACHING principle, thus facilitating to the utmost student's productivity when completing the practices/exercises. <u>8 Manuals are supplied with each application.</u>
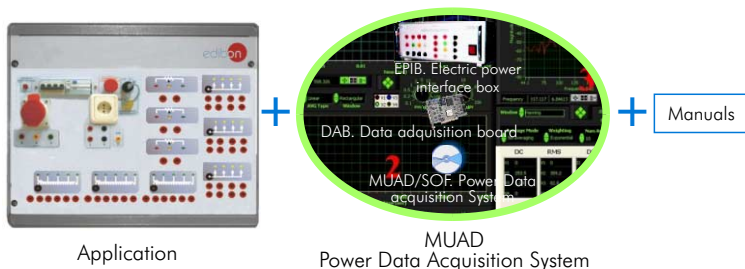
Accessories:

With the each application will be supplied a safety wires kit for doing all practices (CABD), net cable, adaptors, etc, for normal operation.
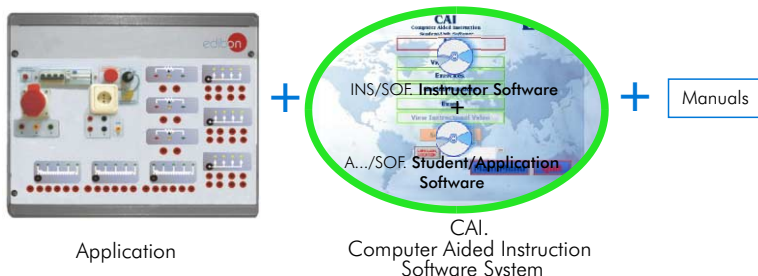
Working possibilities:

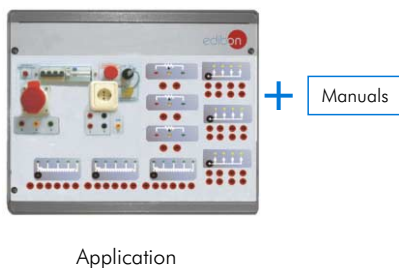### 1) **Working possibility CAI + MUAD** (EDIBON complete system)

Application

CAI.
Computer Aided Instruction
Software System

MUAD
Power Data Acquisition System

Manuals

2) **Working possibility MUAD**

Application

MUAD
Power Data Acquisition System

Manuals

3) **Working possibility CAI**

Application

CAI.
Computer Aided Instruction
Software System

Manuals

4) **Simplest Working possibility**

Application

Manuals

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

REPRESENTATIVE: