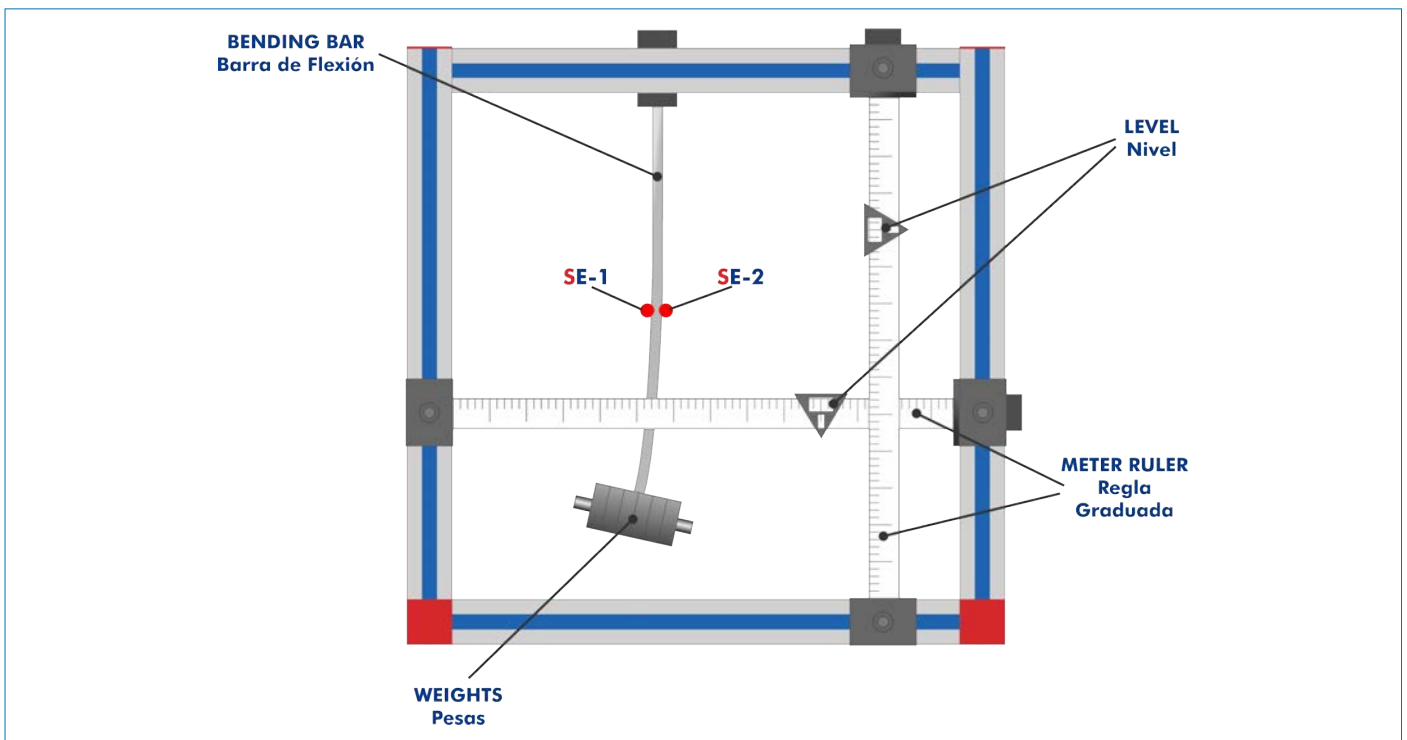




PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



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

Free vibration analysis is the study of the type of propagation of elastic waves in a homogeneous material and the determination of the effects generated and the propagation mode.

Vibrations can be measured and characterized measuring the oscillation or alternating displacement of certain points as an elastic wave passes, since it helps to predict the behavior of a structure under different load distributions. Most of the time engineers use a bar as a simple model instead of a complicated system.

The Unit for Studying Free Vibration of a Bar, "MEVLB", allows the experimental study of the natural frequencies of the free vibration of a bending bar and according to Rayleigh's method.

GENERAL DESCRIPTION

The Unit for Studying Free Vibration of a Bar, "MEVLB", allows to study the features of the free vibrations of a bending bar.

The natural frequency of the bending bar can be modified adding additional loads at the free end of a bar or varying the free clamping length.

The bar is manually deviated to start damped vibrations. The oscillation amplitudes can be measured with the strain gauges. The initial amplitude and free length of the bar are measured with two metering rules.

The bending bar can be mounted horizontally or vertically in any side of the frame.

The unit includes software for data acquisition and to study the oscillation motion, allowing the plotting of the oscillations and the obtaining of the main parameters that define them.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

The "MEVLB" unit mainly consists of:

Bending test bar:

Material: anodized aluminum.

Length: 650 mm.

Section: 20 x 3 mm.

Two strain gauges of 120 Ω attached to the bar by a Wheatstone half-bridge configuration.

Support to simulate the anchoring of the bar and to allow the variation and adjustment to the length of the bar.

Hanger for the masses with knobs to fix the masses.

Set of masses made of stainless steel: ten masses of 100 g.

Two measuring rules, one horizontal and one vertical, to measure both the length of the bar and the initial amplitude of the motion.

Two levels, each one installed on a rule, to guarantee the perpendicularity between them.

Range of maximum amplitudes: ± 150 mm.

Software for data acquisition.

Electronic console:

Metallic box.

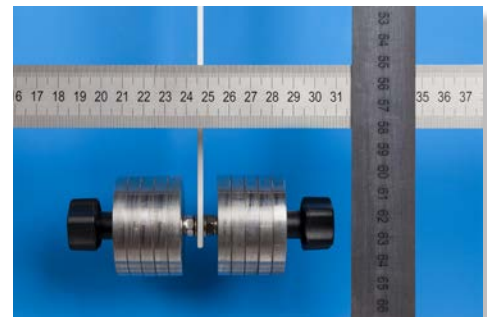
Connectors of the two strain gauges.

Main switch.

USB connector to the computer.

Cables and Accessories, for normal operation.

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



MEVLB detail

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Study of free vibration of a horizontal bending bar.
- 2.- Study of free vibration of a vertical bending bar.
- 3.- Determination of natural frequencies of a bending bar according to Rayleigh's method and comparison with the experiment.
- 4.- Study of the influence of weight on natural frequencies and other parameters of oscillation.
- 5.- Study of the influence of clamping length on natural frequencies and other parameters of oscillation.

REQUIRED SERVICES

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

DIMENSIONS AND WEIGHTS

MEVLB:

Unit:

-Dimensions: 750 x 400 x 1050 mm approx.
(29.52 x 15.74 x 41.33 inches approx.)

-Weight: 15 Kg approx.
(33 pounds approx.)

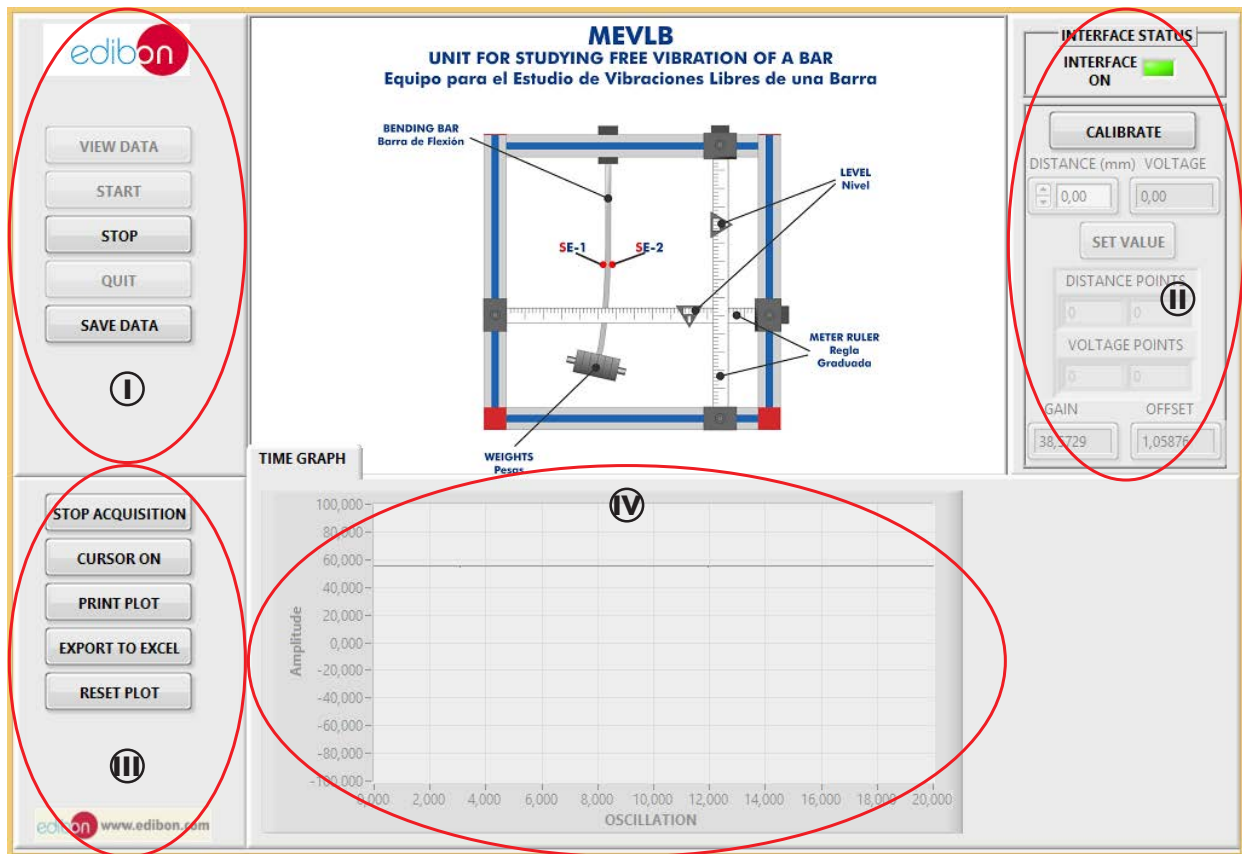
Electronic console:

-Dimensions: 300 x 190 x 130 mm approx.
(11.81 x 7.48 x 5.11 inches approx.)

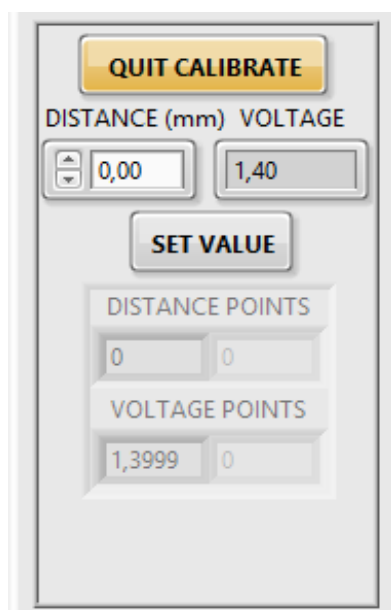
-Weight: 2.5 Kg approx.
(5.51 pounds approx.)

SOFTWARE MAIN SCREENS

Main screen




- ① Main software operation possibilities.
- ② Calibration section.
- ③ Graphics configuration.
- ④ Real time graphics displays.



Calibration section.

SOME REAL RESULTS OBTAINED FROM THIS UNIT

Actuators to run data acquisition, activate cursors to study motion, export collected data to Excel, etc.



VIEW DATA

START

STOP

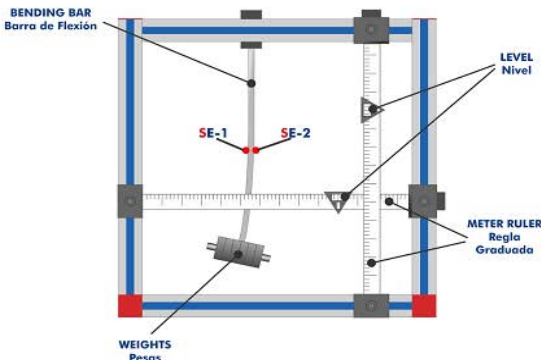
QUIT

SAVE DATA

MEVLB

UNIT FOR STUDYING FREE VIBRATION OF A BAR

Equipo para el Estudio de Vibraciones Libres de una Barra



BENDING BAR
Barra de Flexión

LEVEL Nivel

METER RULER
Regla Graduada

WEIGHTS Pesas

SE-1 SE-2

INTERFACE STATUS

INTERFACE ON

QUIT CALIBRATE

DISTANCE (mm) VOLTAGE

0,00 1,40

SET VALUE

DISTANCE POINTS

0 0

VOLTAGE POINTS

1,3999 0

STOP ACQUISITION

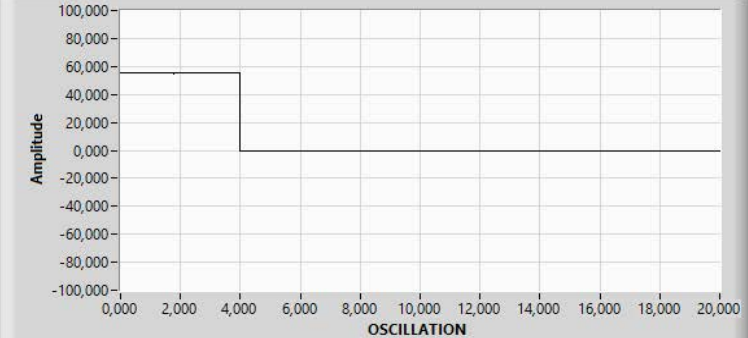
CURSOR ON

PRINT PLOT

EXPORT TO EXCEL

RESET PLOT


TIME GRAPH



Amplitude

OSCIATION

Cursors representation on the chart (vibration time versus amplitude) to study motion.



VIEW DATA

START

STOP

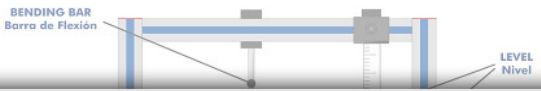
QUIT

SAVE DATA

MEVLB

UNIT FOR STUDYING FREE VIBRATION OF A BAR

Equipo para el Estudio de Vibraciones Libres de una Barra



BENDING BAR
Barra de Flexión

LEVEL Nivel

INTERFACE STATUS

INTERFACE ON

QUIT CALIBRATE

DISTANCE (mm) VOLTAGE

0,00 1,40

SET VALUE

DISTANCE POINTS

0 0

VOLTAGE POINTS

99 0

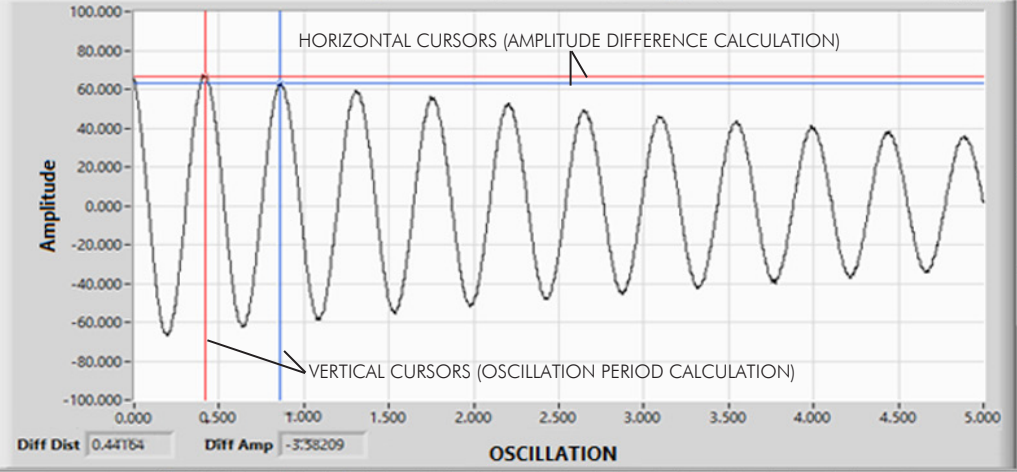
RUN ACQUISITION

CURSOR ON

PRINT PLOT

EXPORT TO EXCEL

RESET PLOT



HORIZONTAL CURSORS (AMPLITUDE DIFFERENCE CALCULATION)

VERTICAL CURSORS (OSCILLATION PERIOD CALCULATION)

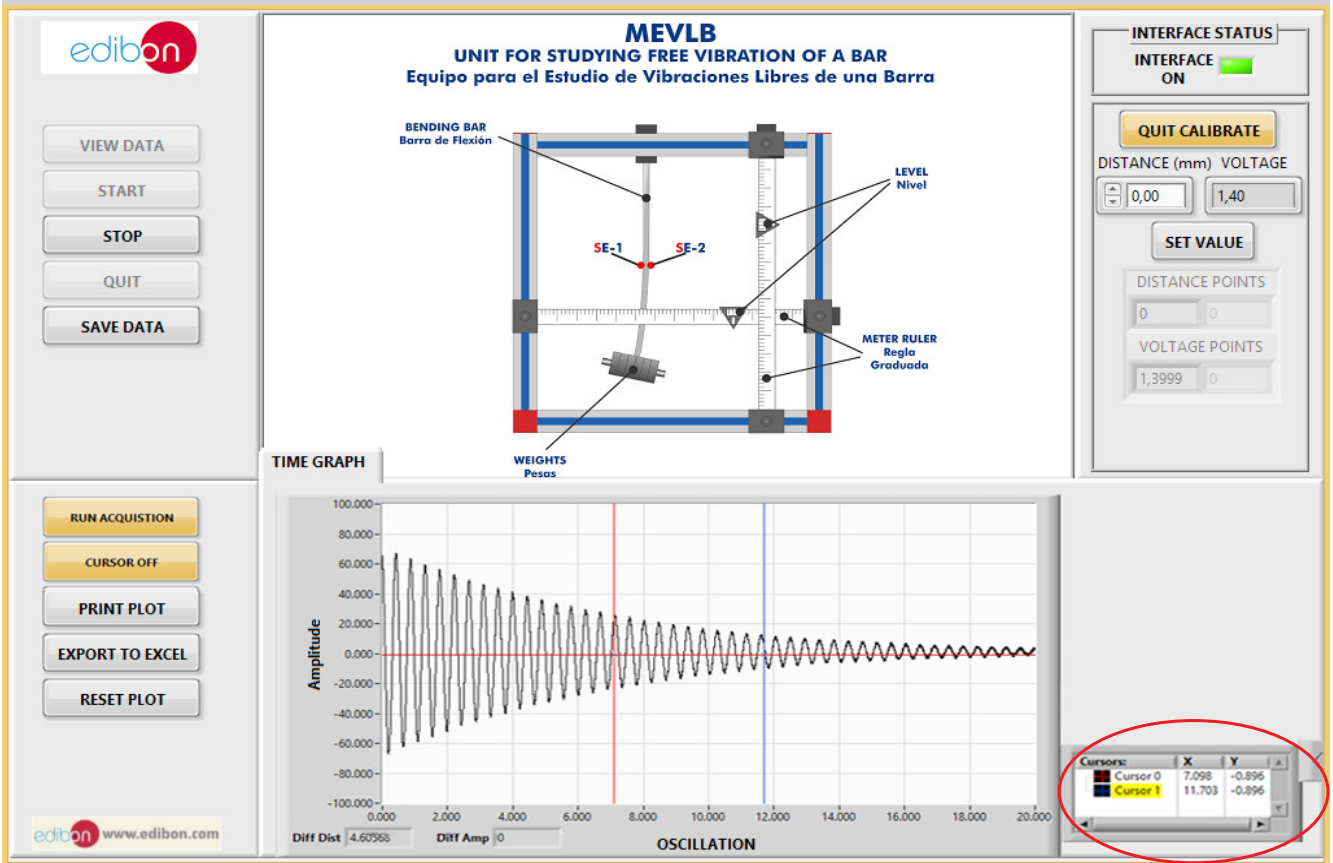
Diff Dist 0,441764 Diff Amp -3,38209

OSCIATION

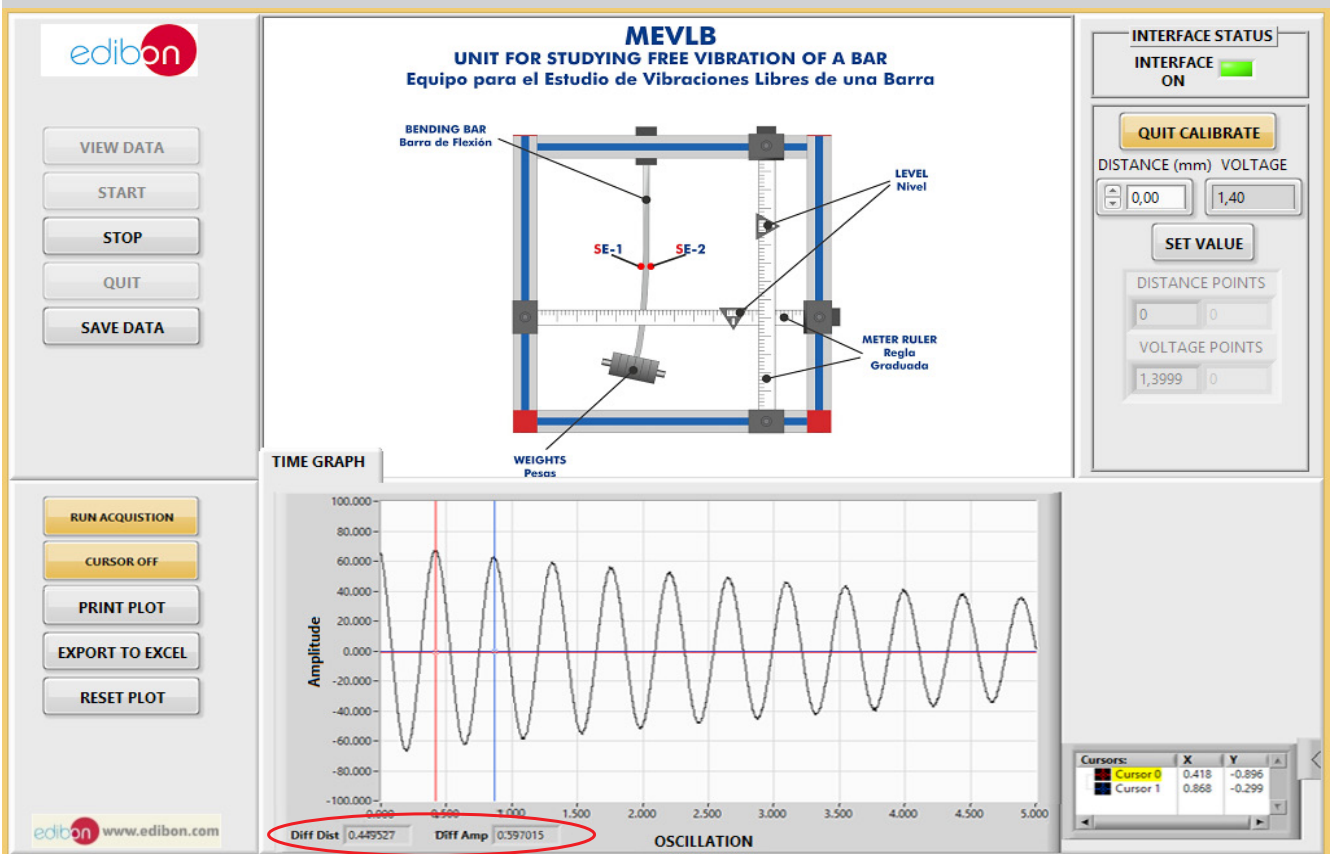
Cursors	X	Y
Cursor 0	0.418	66.567
Cursor 1	0.860	62.985

Some **real** results obtained from this Unit

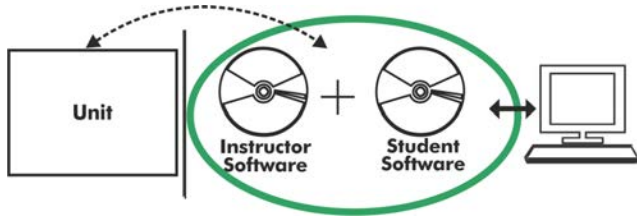
Cursors valves view.



Cursors differences view.



MEVLB/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.

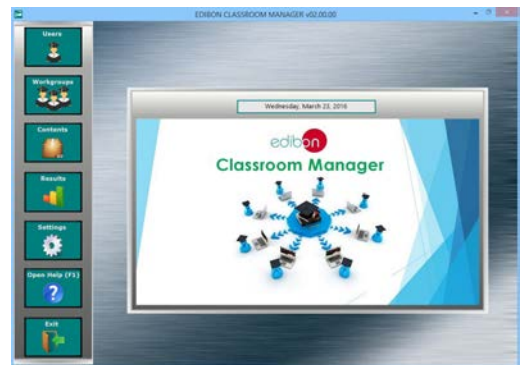
Instructor Software

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

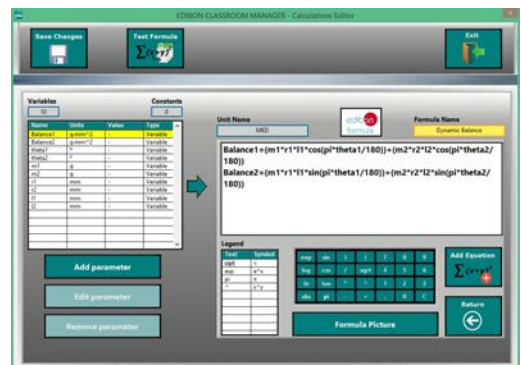
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

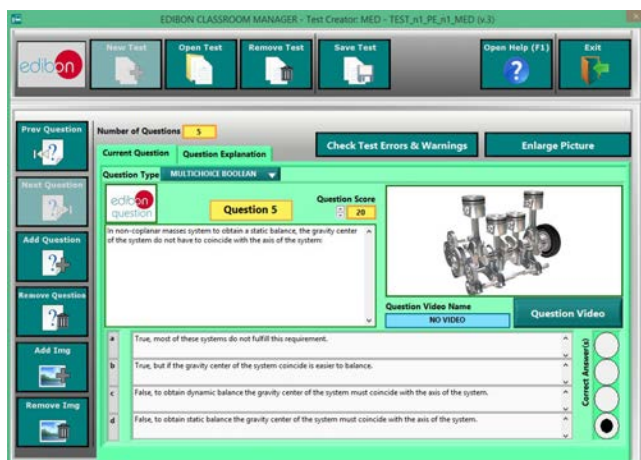
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

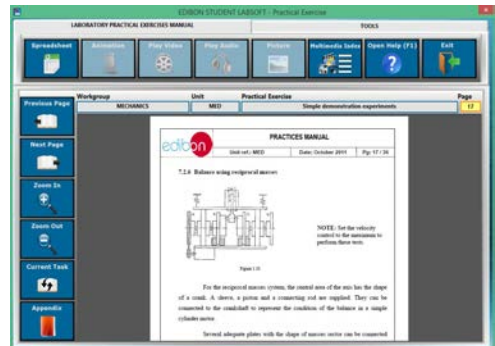
- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.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

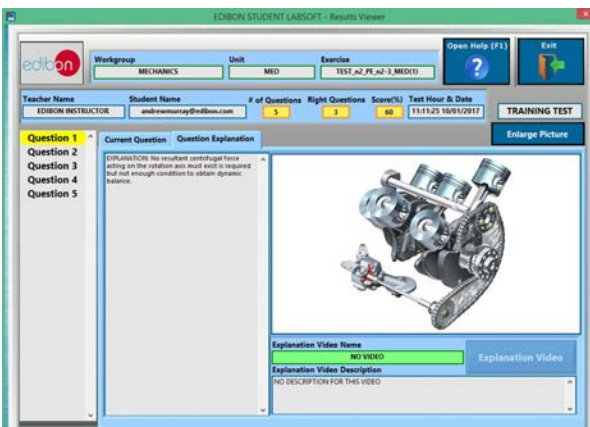
www.edibon.com/en/files/expansion/ICAI/catalog



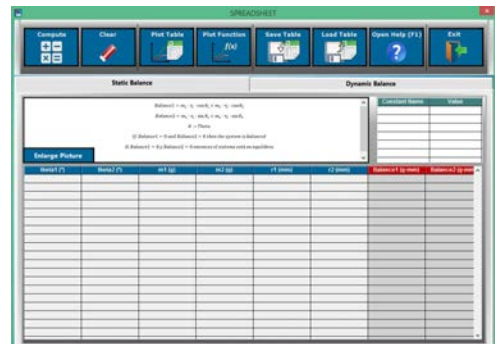
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



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:

