Shear Force and Bending Momentum Unit

edibon

Technical Teaching Equipment

MMF

INTRODUCTION

The Shear Force and Bending Momentum Unit "MMF" has been designed to show experimentally that in a cantilever beam subject to transverse loads, at any cross section of the beam:

- The shear force is the algebraic sum of the transverse components of the forces to one side of the section.

- The bending moment is the algebraic sum of the moments of the forces to one side of the section.

Several experiments will be carried out in order to determine the magnitudes of these moments and shear forces, while observing the bending process in a beam.

GENERAL DESCRIPTION

The Shear Force and Bending Momentum Unit "MMF" is formed by an aluminum and steel structure that allows us to perform a mechanical study of different structures.

An articulated structure makes it possible to convert the application of one vertical force into both a bending moment and a shearing force on the beam.

Both effects are created by the use of a set of weights that balance the system using a double-pulley system.

The different points in which the force can be applied make it possible to study the different reactions of the beam, allowing us to compare the experimental and theoretical results.

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels in painted steel.

The MMF unit mainly consists of:

Double -pulley system which allows us to achieve equilibrium of the bending moment on the beam.

Double -pulley system which allows us to achieve equilibrium of the shear force on the beam.

Different application points for the loads.

A rule made in methacrylate that allows us to equilibrate the system with the absence of weights before beginning each experiment.

Three hooks made of steel to hang weights.

MMF detail

In order to carry out some of the practices with MMF unit, a "B Type" Set of weights is required. (See "Required Accessories" section).

Manuals:

This unit is supplied with the following manuals: Required services, Assembly and Installation, Starting-up, Security, Maintenance and Practices manual.

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Study of cantilever beams subject to loads at different points.

2.- Demonstration of the shear force as the algebraic sum of the transverse components of the forces to one side of the section.

3.- Demonstration of the bending moment as the algebraic sum of the moments of the forces to one side of the section.

4.- Study of the equilibrium and the applied balancing forces when the applied masses are varied.
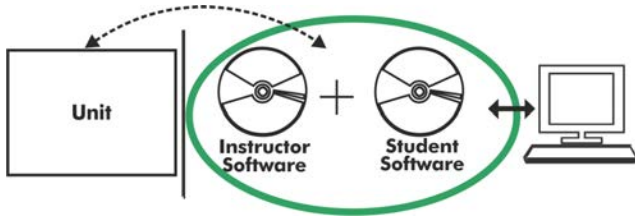
REQUIRED ACCESSORIES (Not included)

- 1 "B Type" Set of weights. Each "B Type" Set includes:

6 weights of 200 gr. (0.44 pounds approx.).

6 weights of 100 gr. (0.22 pounds approx.).

2 weights of 50 gr. (0.11 pounds approx.).

2 weights of 20 gr. (0.044 pounds approx.).

2 weights of 10 gr. (0.022 pounds approx.).

1 support hook of 100 gr. (0.22 pounds approx.).

DIMENSIONS AND WEIGHT

- Dimensions: 400 x 216 x 350 mm. approx.

(15.74 x 8.50 x 13.77 inches approx.).

- Weight: 8 Kg. approx.

(17.63 pounds approx.).

MMF/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 Workgroups, Tasks and Training sessions.

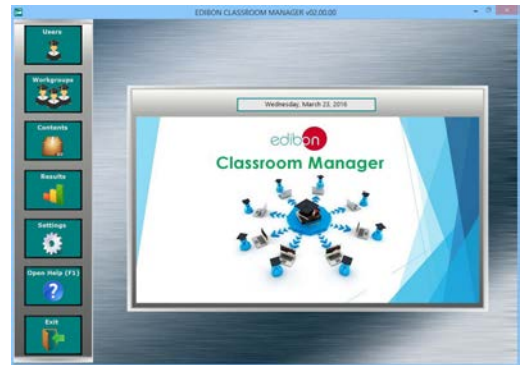Creation and Integration of Practical Exercises and Multimedia Resources.

Custom Design of Evaluation Methods.
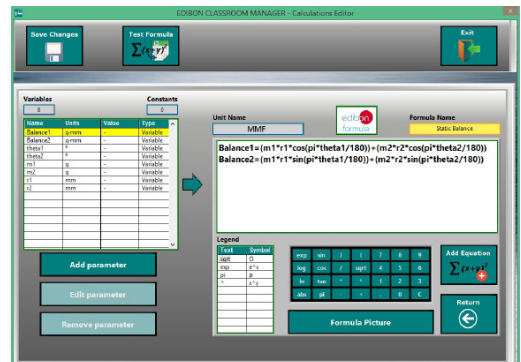
Creation and assignment of Formulas & Equations.
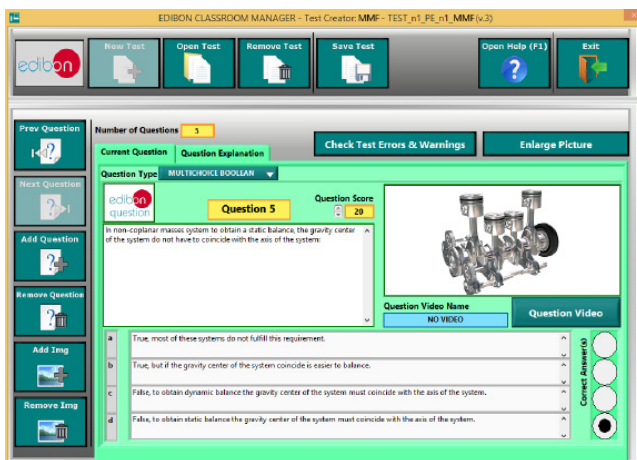
Equation System Solver Engine.

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

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-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.
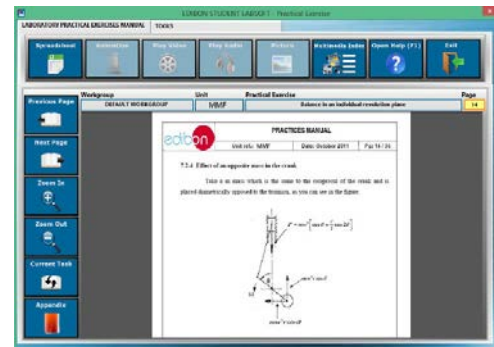
Innovative features:

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.

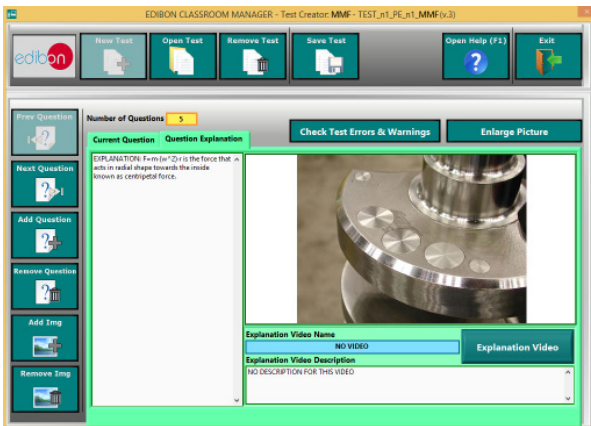For more information see **ICAI** catalogue. Click on the following link:

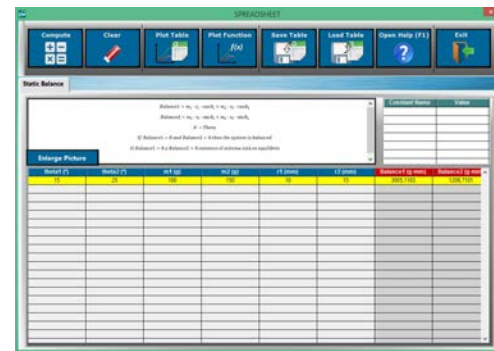www.edibon.com/products/catalogues/en/ICAI.pdf

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

BDAS. Basic Data Acquisition System and Sensors.
For being used with mechanical modules.
BDAS is designed to monitor the measurements of each mechanical module from a computer (PC).

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

INTERNATIONAL

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Edition: ED01/16
Date: December/2016