Belt Friction Unit with Dynamometers

MCF/A

INTRODUCTION

A belt is a loop of flexible material used to link two or more rotating shafts mechanically. Belts may be used as a source of motion, to transmit power efficiently, or to track relative movement. Belts are looped over pulleys. In a two pulley system, the belt can either drive the pulleys in the same direction or it may be crossed, so that the shafts have opposite directions. As a source of motion, a conveyor belt is one application where the belt is adapted to carry a load between two points continuously. Belt friction is a term describing the friction forces between a belt and a surface, such as a belt wrapped around a bollard. When one end of the belt is being pulled, only part of this force is transmitted to the other end. The friction force makes tension in the belt be different at both ends.

In practice, the theoretical tension acting on the belt or rope calculated by the belt friction equation can be compared to the maximum tension the belt can support. This helps a designer of such a rig to know how many times the belt or rope must be wrapped around the pulley to prevent it from slipping. Mountain climbers and sailing crews demonstrate a standard knowledge of belt friction when accomplishing basic tasks.

GENERAL DESCRIPTION

The Belt Friction Unit with Dynamometers, "MCF/A", has been designed to allow students to carry out investigations to compare the driving torque for a given angle of overlap of a flat belt and a V-belt.

With this unit, the relationship between tensions at both sides of a belt can be observed, the differences between flat (different materials) and V-belts can be evaluated and the effect of the angle of lap, among others, can be investigated.

The pulley is driven by knobs and two dynamometers record the traction force at both sides of the belt. The tension of the belt can be adjusted at each side by a threaded spindle.

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels made of painted steel.

The "MCF/A" unit mainly consists of:

Pulley with grooves that fit the belts:

One for flat belt or round belt.

Two V-belts (one is correctly fitted and the other is badly fitted).

The pulley is balanced and mounted on bearings to reduce frictional losses.

The angle of overlap can be varied up to 180° in increments of 10°.

Belts:

Round belt made of hemp rope. Diameter: 5 mm.

Flat V-belt made of rubber. Width: 10 mm.

Two flat belts made of leather/polyamide. Width: 10 mm.

Two dynamometers:

Range: 0 -100N.

Accuracy: ±1N.

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.- Study of the operation of a belt drive.

2.- Evaluation of the differences between a flat belt and a V-belt.

3.- Investigation of the relationship between the belt tension and the angle of lap for a flat belt.

4.- Comparison of the torque for a given angle of lap.

5.- Determination of the coefficient of friction between the pulley and the belt for the belt sections.

6.- Verification of the belt tension equation.

7.- Analysis of the effect of a badly fitted V-belt.

DIMENSIONS AND WEIGHTS

MCF/A:
- Dimensions: 550 x 500 x 600 mm approx.
              (21.65 x 19.68 x 23.62 inches approx.)
- Weight: 10 Kg approx.
              (22 pounds approx.)

MCF/A/ICAI. Interactive Computer Aided Instruction Software System:
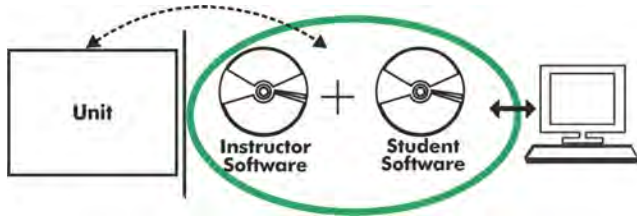
With no physical connection between unit and computer, **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.
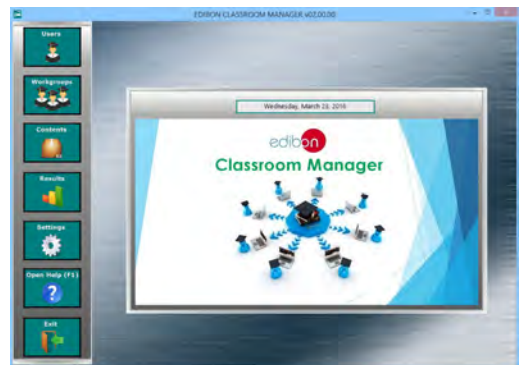
<u>Instructor Software</u>

### - 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
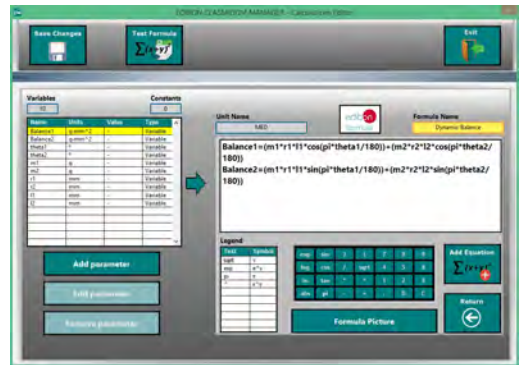
ECAL. EDIBON Calculations Program Package - Formula Editor
Screen
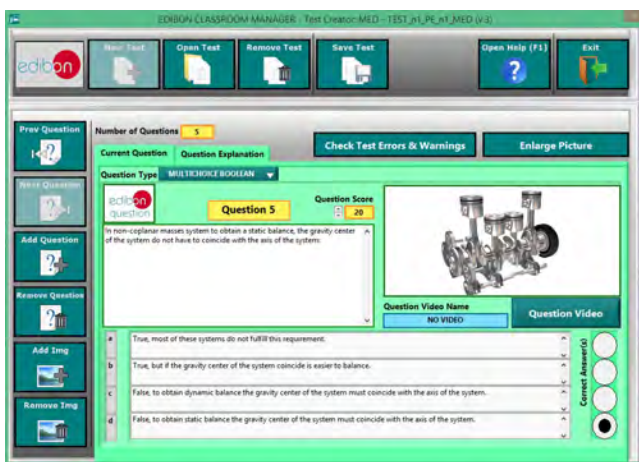
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with
Numeric Result Question

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

- 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.

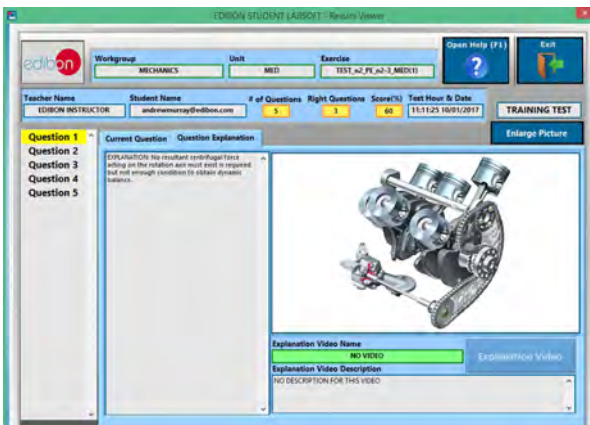For more information see **ICAI** catalogue. Click on the following link:
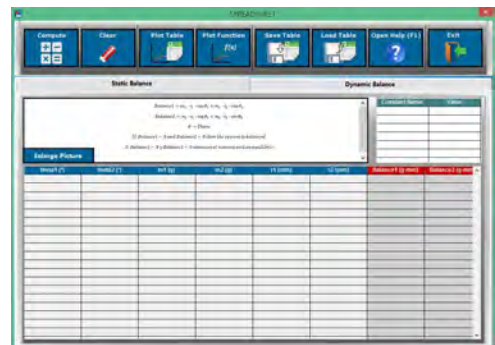www.edibon.com/en/files/expansion/ICAI/catalog

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.

INTERNATIONAL

REPRESENTATIVE:

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