Engineering and Technical Teaching Equipment

INTRODUCTION

A worm gear is a gear arrangement in which a worm (which is a gear in the form of a screw) meshes with a wheel. Like other gear arrangements, a worm gear can reduce rotational speed or allow higher torque to be transmitted.

The Worm and Wheel Unit, "MTSF", allows to study the torque and to determine the efficiency and the transmission ratio of a worm gear.

GENERAL DESCRIPTION

The Worm and Wheel Unit, "MTSF", allows to demonstrate the principle of a worm gear.

The unit consists in a worm and a wheel. These parts are mounted on ball bearings and fixed to a vertical panel.

The worm and wheel are positioned a set distance apart to mesh correctly. Both parts run in bearings with the worm operating with an additional thrust bearing.

Attached to the end of the worm is a pulley of known effective diameter. This pulley helps to exert the effort required to raise a load. A cord is wrapped around the pulley and ends in a weight holder for applying the effort load.

Attached to the back of the wheel is another pulley of known effective diameter. This pulley is used for the loading of the system. Again a cord is wrapped around the pulley and ends in a weight holder to provide torque. This holder helps to exert the load onto the system via the weights set provided.

Forces are generated by the sets of weights and can be quickly and easily varied. Students add the weights to the pulley of the wheel and apply a suitable weight to the pulley of the worm in order to raise the load. Then, students record the weight values and calculate the efficiency, mechanical advantage and friction of the system.

SPECIFICATIONS

Anodized aluminum frame and panels made of painted steel.

Diagram in the front panel with distribution of the elements similar to the real one.

The unit is self-contained and the wheel, worm and pulleys are mounted on ball bearings.

The unit includes:

Wheel:

Material: bronze.

Worm:

Material: steel.

Modulus: 4 mm.

Number of gears: 1.

Power transmission: 10.

The worm and wheel pair has a transmission ratio of 30:1.

Two pulleys:

Material: aluminum.

One pulley is located on the worm shaft (diameter: 40 mm) to help to exert the effort to raise a load and the other pulley on the wheel shaft (diameter: 120 mm) to load the system.

Set of weights:

Weights on worm side:

1 x 50 N.

1 x 20 N.

2 x 10 N.

2 x 5 N.

It includes a 5 N weight holder.

Weights on wheel side:

1 x 5 N.

4 x 2 N.

2 x 1 N.

2 x 0.5 N.

It includes a 0.5 N weight holder.

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.- Learning the key variables and correlations of a worm gear.

2.- Learning the basic terminology of gearing (number of teeth, reference circle and modulus).

3.- Investigation of transmission ratio, torque, friction and selflocking.

4.- Experimental determination of velocity ratio.

5.- Comparison of the determined velocity ratio with the calculated value.

6.- Determination of effort with variation of load.

7.- Determination of friction with variation of load.

8.- Determination of efficiency with variation of load.

9.- Determination of limiting efficiency of the unit.

DIMENSIONS AND WEIGHTS

MTSF:

-Dimensions: 400 x 400 x 800 mm approx. (15.75 x 15.75 x 31.50 inches approx.)

-Weight: 30 Kg approx. (66 pounds approx.)

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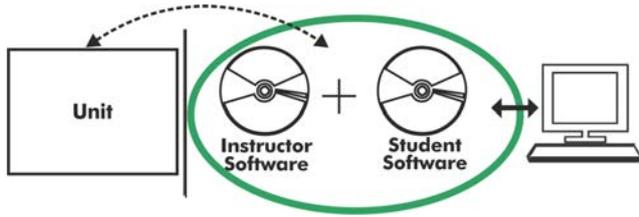
With no physical connection between unit and computer, **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment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

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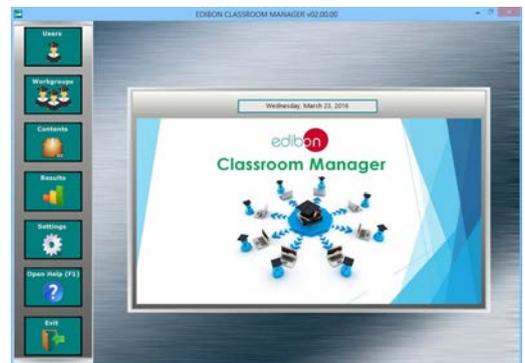
ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen
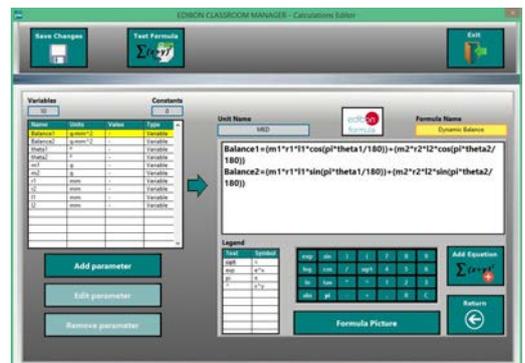
ECAL. EDIBON Calculations Program Package - Formula Editor Screen
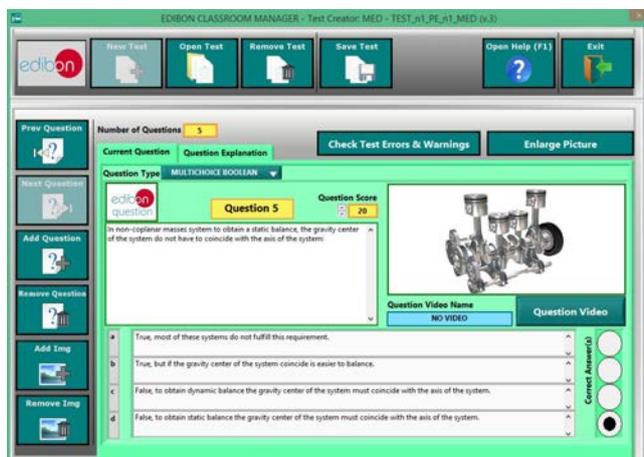
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question

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

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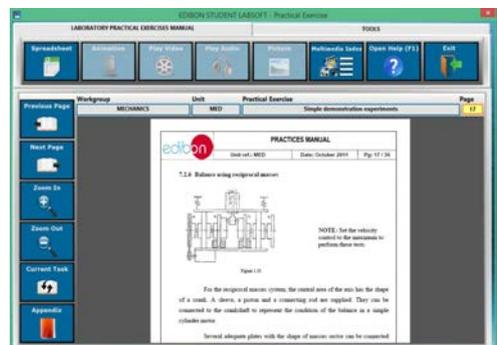
EPE. EDIBON Practical Exercise Program Package Main Screen
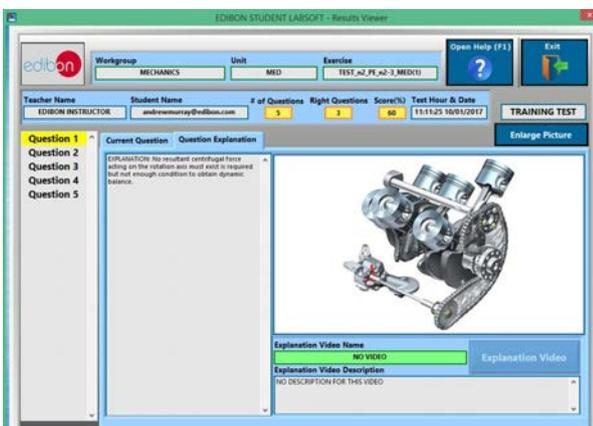
ERS. EDIBON Results & Statistics Program Package - Question Explanation
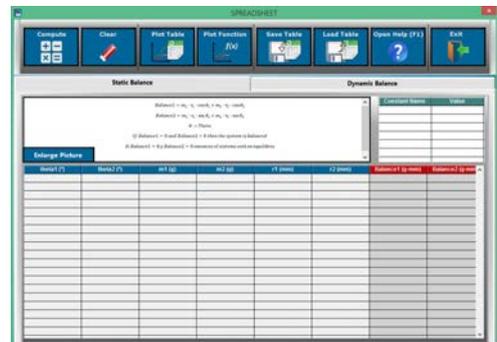
ECAL. EDIBON Calculations Program Package Main Screen

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

INTERNATIONAL

C/ Del Agua, 14. Polígono Industrial San José de Valderas.
28918 LEGANÉS. (Madrid). ESPAÑA - SPAIN.
Tel.: 34-91-6199363   Fax: 34-91-6198647
E-mail: edibon@edibon.com   Web: **www.edibon.com**

REPRESENTATIVE: