

AM-1
THREE SHAFT GEAR TRAIN
Tren de engranajes de tres ejes

SV-1
TORQUE
Par
SW-1

SV-2
TORQUE
Par
SW-2

MESE
GEARED STUDY DRIVE UNIT
Equipo Motriz para
Estudio de Engranajes

AFR-1

MESE/1
TOOTHED BELT DRIVE
Transmisión por
Correa Dentada

MESE/2
ROUND BELT DRIVE
Transmisión por
Correa Redonda

MESE/3
CHAIN DRIVE
Transmisión por
Cadena

MESE/4
HELICAL GEAR DRIVE
Transmisión por
Engranaje Helicoidal

MESE/SI
STATICS AND INERTIA TEST MODULE
Módulo para Ensayos de Estática e Inercia

SV- SPEED SENSOR **SW-** WATTMETER **AFR-** BRAKE **AM-** MOTOR
Sensor de Velocidad Vatímetro Freno Motor

INTRODUCTION

Transmission mechanisms transmit power between two or more elements of a machine.

Gear systems have been used since ancient times to solve problems of transport, impulsion, lifting and movement. Primitive transmissions include, for example, gearboxes and spur gears in windmills or water mills and were mainly used for pumping, milling or lifting.

In everyday life transmissions are usually associated with cars. Nevertheless, transmissions are used for a wide range of applications.

A mechanical transmission is designed to exchange mechanical energy. It differs from pneumatic or hydraulic transmissions in the fact that mechanical transmissions use the movement of solid bodies.

Typically, transmissions change the rotation speed of an input shaft, providing a different speed at the output. They are used to transmit power, changing the gear ratio.



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)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

GENERAL DESCRIPTION

The Geared Study Drive Unit, "MESE", has been designed to dynamically study different gears, including a standard three shaft gear train for study, which can be modified with a simple setting to obtain a simple transmission.

For the dynamic study the transmission under study will be arranged and the motor that provides power to the input of the transmission and the dynamometer brake located at the output of the transmission to provide the braking force at the output will be activated.

The motor connected at the input of the transmission regulates the rotation speed, the dynamometer brake connected at the output of the transmission uses the electromagnetic braking effect and the hysteresis to work at a constant torque regardless the input speed and load.

The sensors, located in the motor and the dynamometer brake, measure the speed and torque of the input and output shafts and, therefore, their power. The performance and efficiency of the transmission under study will be obtained with those data.

The couplings for the transmission, motor and dynamometer brake are quick and easy, flexible clamps are used. The unit is properly ventilated to avoid overheating problems. To avoid contact with the unit in operation, it's protected while allowing the student to observe the process.

There are other additional recommended elements (not included) in the Geared Study Drive Unit, "MESE", for the study of other gears, such as Toothed Belt Drive, "MESE/1"; Round Belt Drive, "MESE/2"; Chain Drive, "MESE/3" and Helical Gear Drive, "MESE/4".

Additionally, the Statics and Inertia Test Module, "MESE/SI", studies the angular acceleration and the static efficiency. The static study can be carried out thanks to a set of weights used to apply rotation forces to the shaft of an inertia flywheel included or to the gear train of the Geared Study Drive Unit, "MESE". The "MESE/SI" module includes a sensor for measuring angular acceleration. Thus, inertia is experimentally studied.

The Statics and Inertia Test Module, "MESE/SI", is an independent accessory that does not require the Geared Study Drive Unit, "MESE" to carry out the practical exercises. Although this unit would provide the three-axle gear train, to expand its functionality and increase practical possibilities.

SPECIFICATIONS

The "MESE" unit includes the following elements:

- Bench-top unit.

- Anodized aluminum frame and panels made of painted steel.

- Main metallic elements made of stainless steel.

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

- Asynchronous motor.

- Electromagnetic brake.

- Braking torque adjustment.

- Motor speed and torque controller.

- Flexible couplings for precise alignment.

- Three shaft gear train:

 - Input shaft: 80 teeth.

 - Intermediate shaft: 60 and 120 teeth.

 - Output shaft: 120 teeth. Possibility to work without connection to study a simple gear.

- Two fans for the correct cooling of the unit.

- Two torque sensors, one on the motor and the other on the dynamometer.

- Two speed sensors (inductive tachometer), one on the motor and the other on the dynamometer brake.

- Two wattmeters, one on the motor and the other on the dynamometer.

- Assembly tools.

- Electronic console:

 - Metallic box.

 - Main switch.

 - Motor switch.

 - Brake dynamometer switch.

 - Two displays to observe the values of the torque, speed and power sensors of both the motor and the dynamometer.

- Cables and Accessories, for normal operation.

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

Additional recommended elements (Not included):

MESE/SI. Statics and Inertia Test Module.

Intertia flywheel.

Speed sensor (inductive tachometer).

Set of weights.

Transport case.

MESE/1. Toothed Belt Drive.

Toothed belt with adjustable tension.

Driver: 30 teeth.

Follower: 45 teeth.

MESE/2. Round Belt Drive.

Round belt with adjustable tension.

Driver: $\varnothing = 40$ mm.

Follower: $\varnothing = 60$ mm.

MESE/3. Chain Drive.

Roller chain with adjustable tension.

Driver: 20 teeth.

Follower: 30 teeth.

MESE/4. Helical Gear Drive.

Pinion: 80 teeth.

Wheel: 120 teeth.

EXERCISES AND PRACTICAL POSSIBILITIES

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|---|--|
| <p>1.- Study of simple and compound gear systems.</p> <p>2.- Dynamic study, efficiency and speed of simple gear trains.</p> <p>3.- Dynamic study, efficiency and speed of compound gear trains.</p> <p>4.- Characteristics of the gear systems.</p> <p>Additional practical possibilities:</p> <p>5.- Study of different types of drives.</p> <p>6.- Dynamic study, efficiency and speed of different types of drives.</p> <p>7.- Study of the angular speed of the drive systems (included the accessory MESE/SI).</p> <p>8.- Static study of the gear systems (included the accessory MESE/SI).</p> <p>9.- Study of inertia flywheels (included the accessory MESE/SI).</p> <p>10.- Experimental calculation of inertia and mass moments (included the accessory MESE/SI).</p> <p>11.- Study of toothed belt drives (included the accessory MESE/1).</p> <p>12.- Study of round belt drives (included the accessory MESE/2).</p> <p>13.- Study of chain drives (included the accessory MESE/3).</p> <p>14.- Study of helical gear drives (included the accessory MESE/4).</p> | <p>15.- Comparison of different gear systems (included the accessory MESE/4).</p> <p>- Several other exercises can be done and designed by the user.</p> |
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REQUIRED SERVICES

- Electrical supply: single-phase 200 VAC – 240 VAC/50 Hz or 110 VAC – 127 VAC/60 Hz.

DIMENSIONS AND WEIGHTS

MESE-T:

MESE:

Unit:

- Dimensions: 600 x 600 x 400 mm approx.
(23.62 x 23.62 x 15.74 inches approx.)
- Weight: 35 Kg approx.
(77 pounds approx.)

Electronic console:

- Dimensions: 300 x 190 x 130 mm approx.
(11.81 x 7.48 x 5.12 inches approx.)
- Weight: 3 Kg approx.
(6.6 pounds approx.)

MESE/SI:

- Dimensions: 400 x 500 x 200 mm approx.
(15.74 x 19.68 x 7.87 inches approx.)
- Weight: 15 Kg approx.
(33 pounds approx.)

MESE/1:

- Dimensions: 300 x 120 x 120 mm approx.
(11.81 x 4.72 x 4.72 inches approx.)
- Weight: 2 Kg approx.
(4 pounds approx.)

MESE/2:

- Dimensions: 300 x 120 x 120 mm approx.
(11.81 x 4.72 x 4.72 inches approx.)
- Weight: 2 Kg approx.
(4 pounds approx.)

MESE/3:

- Dimensions: 300 x 120 x 120 mm approx.
(11.81 x 4.72 x 4.72 inches approx.)
- Weight: 2 Kg approx.
(4 pounds approx.)

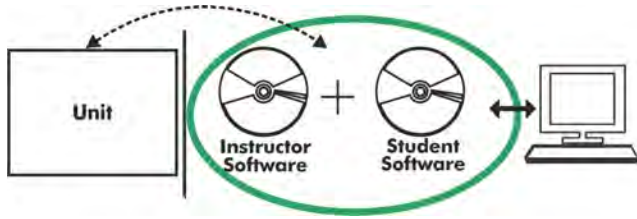
MESE/4:

- Dimensions: 220 x 80 x 220 mm approx.
(8.66 x 3.14 x 8.66 inches approx.)
- Weight: 2.5 Kg approx.
(5.5 pounds approx.)

ADDITIONAL RECOMMENDED ELEMENTS (Not included)

- MESE/SI. Statics and Inertia Test Module.
- MESE/1. Toothed Belt Drive.
- MESE/2. Round Belt Drive.
- MESE/3. Chain Drive.
- MESE/4. Helical Gear Drive.

MESE/ICAI. Interactive Computer Aided Instruction Software:



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.

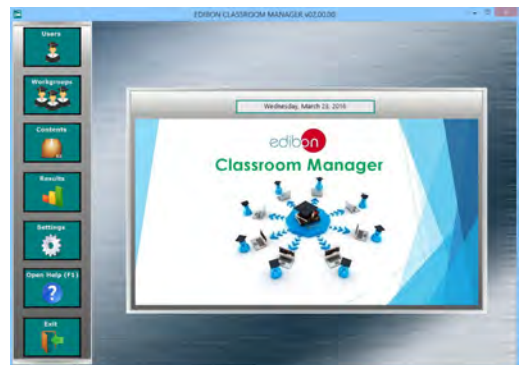
Instructor Software

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

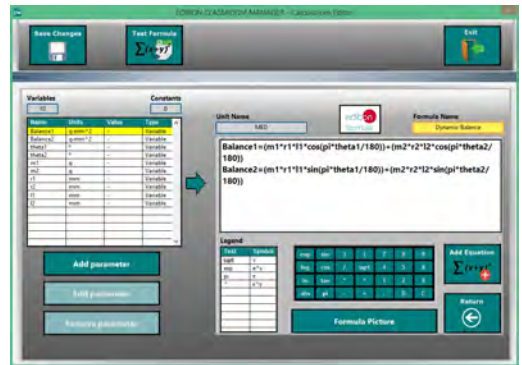
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

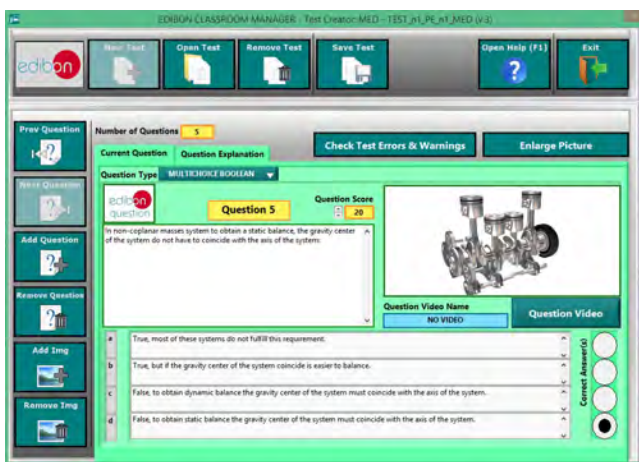
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

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:

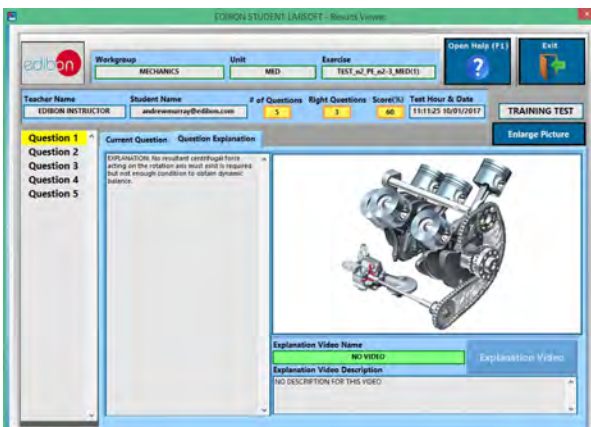
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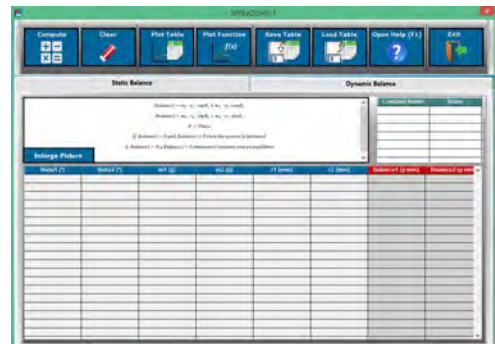
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



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.

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



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REPRESENTATIVE:

