



INTRODUCTION

The Acceleration of Geared Systems Unit “MAE” mainly consists of a gear train with three shafts, which are employed specially to transfer rotating motion in reality.

One of the most important applications of gears is the transfer of motion from the shaft of an energy source, as an internal combustion engine or an electrical motor, to another shaft located at a certain distance, which has to perform a specific work. So one of the wheels is connected to the energy source, it is known as drive gear, and the other is connected to the shaft that must receive the motion from the motor shaft, it is known as driven gear.

The main objective of the unit is to find the moment of inertia of a gear system as well as its acceleration.

GENERAL DESCRIPTION

The Acceleration of Geared Systems Unit “MAE” allows to perform tests to calculate the moment of inertia of a gear train system.

The MAE unit includes six gears. Two of them can have another position in the shafts to vary the gear ratio, allowing to obtain a different moment of inertia and, therefore, to accelerate the system.

Additionally, there are three masses of inertia, one per shaft. The position of these discs will modify the total moment of inertia and the acceleration of the system too.

There is one pulley in each shaft. Different masses are hung from these pulleys to observe how the acceleration of the gear system varies.

Depending on the position from which the mass is hung, the acceleration of the gears and the moment of inertia, will be modified.

To be able to calculate the total moment of inertia and the acceleration of the system, it is necessary to know the time required by the mass hung from the pulley to travel a given distance.



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

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum structure and panels in painted steel.

The MAE unit mainly consists of:

3 Shafts of different length and, therefore, different moment of inertia.

6 Gears:

Gear type 1:

Number of teeth: 90.

Moment of inertia I: 0.00427 kg·m².

2 Gears type 2:

Number of teeth: 60.

Moment of inertia I: 0.0011 kg·m².

2 Gears type 3:

Number of teeth: 70.

Moment of inertia I: 0.00268 kg·m².

Gear type 4:

Number of teeth: 80.

Moment of inertia I: 0.00336 kg·m².

3 Pulleys:

Diameter: 0.08 m.

Moment of inertia I: 0.00016 kg·m².

3 Masses of inertia of different diameters and, therefore, different moment of inertia.

In order to carry out some of the practices with MAE 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, Safety, Maintenance and Practices manual.

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Determination of the moment of inertia of a gear system under different arrangements.
- 2.- Determination of the moment of inertia of a gear system with one, two or three shafts.
- 3.- Determination of the minimum mass required to accelerate a gear system with one, two or three shafts.
- 4.- Comparison of the experimental and theoretical moment of inertia.
- 5.- Study of the gear ratio of the shafts when different moments or force couples are applied to the system.
- 6.- Determination of the acceleration of the system.

REQUIRED ACCESSORIES (Not included)

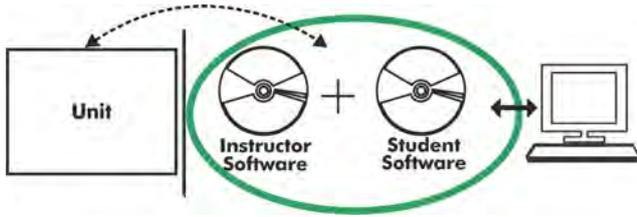
- Chronometer.
- 1 "B" Type Set of weights. Each Set B includes:
 - 6 weights of 200 gr. (0.44 pounds).
 - 6 weights of 100 gr. (0.22 pounds).
 - 2 weights of 50 gr. (0.11 pounds).
 - 2 weights of 20 gr. (0.044 pounds).
 - 2 weights of 10 gr. (0.022 pounds).
 - 1 support hook of 100 gr. (0.22 pounds).

DIMENSIONS AND WEIGHT

- Dimensions: 600 x 800 x 650 mm. approx.
(23.62 x 31.49 x 25.59 inches approx.).
- Weight: 25 Kg. approx.
(55 pounds approx.).

Optional

MAE/ICAI. Interactive Computer Aided Instruction Software System:



Without no physical connection between unit and computer (PC), this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM) totally integrated with the Student Software (EDIBON Student Labsoft -ESL). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

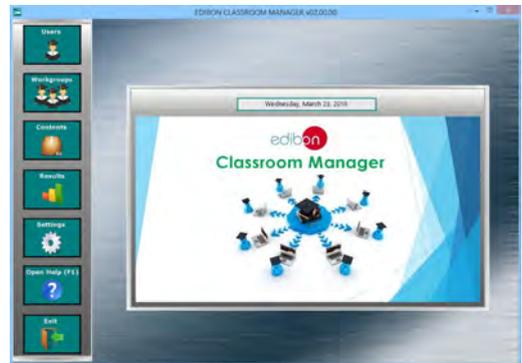
Instructor Software

-ECM. EDIBON Classroom Manager (Instructor Software).

ECM 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:

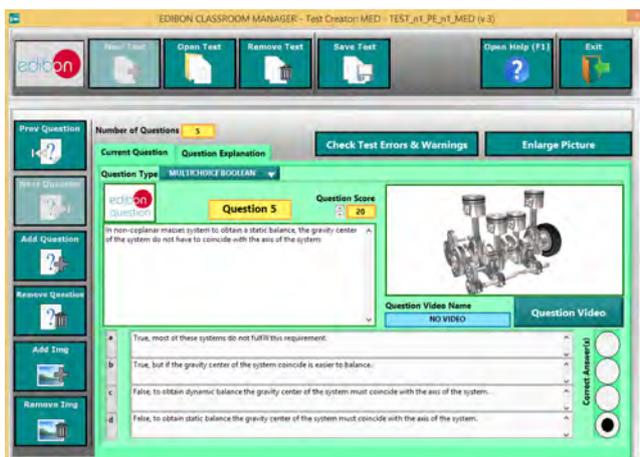
- User Data Base Management.
- Administration and assignment of Workgroups, Tasks and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- Updatable Contents.
- Report generation, User Progression Monitoring and Statistics.



ECM. 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. EDIBON Student Labsoft (Student Software).

ESL 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.

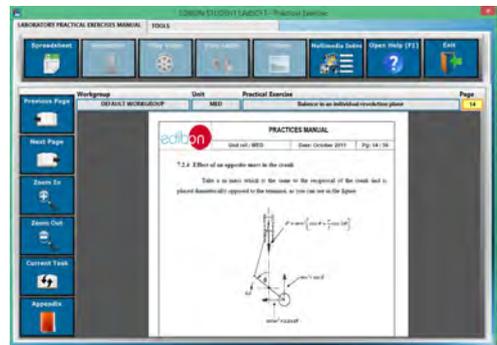
Innovative features:

- 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.**

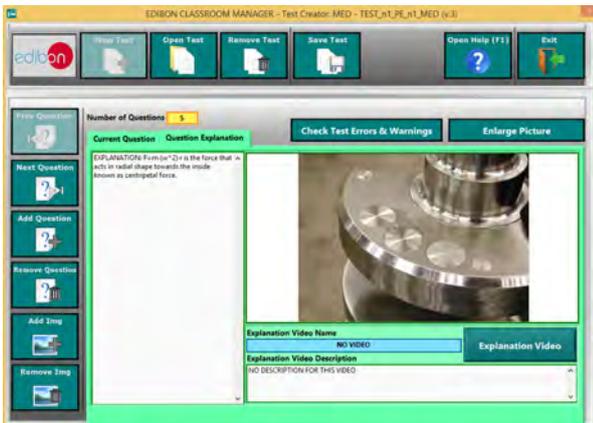
For more information see ICAI catalogue. Click on the following link:
www.edibon.com/products/catalogues/en/ICAI.pdf



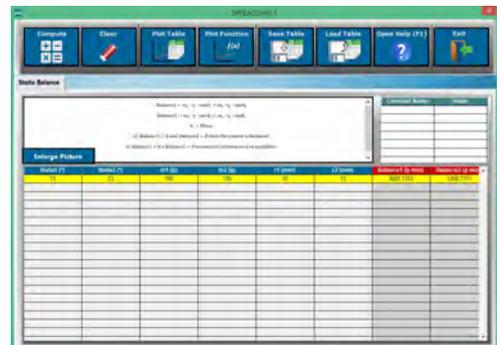
ESL. EDIBON Student LabSoft (Student Software) Application Main Screen



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.



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REPRESENTATIVE

