Cam and Follower Mechanism

MEX

Engineering and Technical Teaching Equipment

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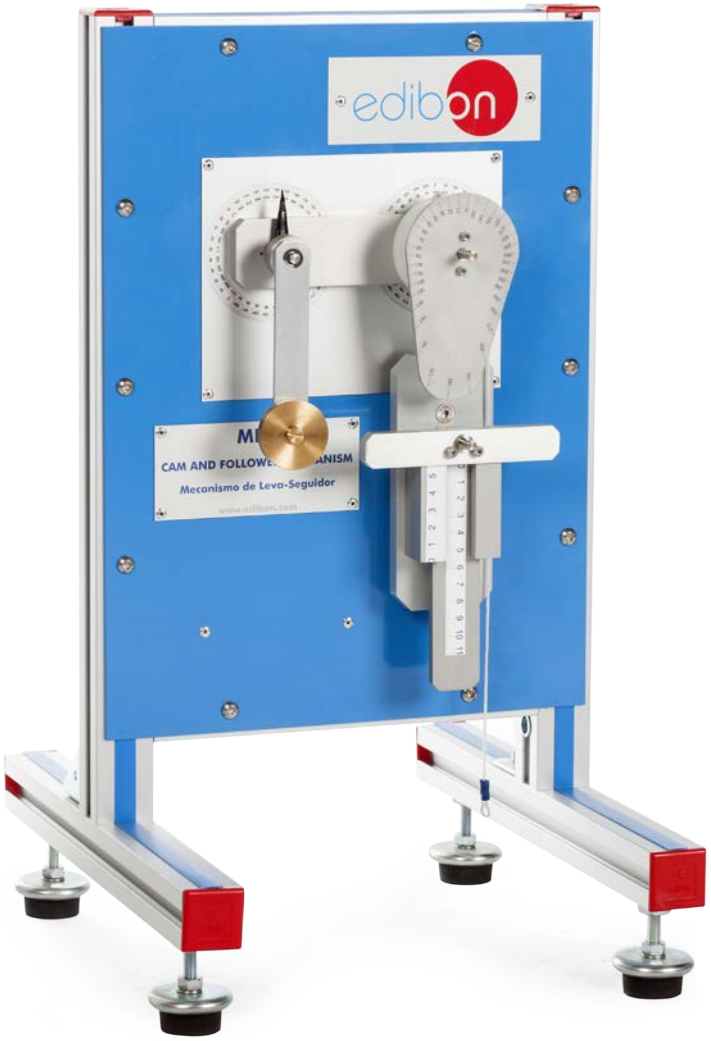
PRODUCTS
70.- MECHANICS



INTRODUCTION

The objective of a cam or eccentric is to give a reciprocating motion of a specified character to a part of a mechanism, called follower.

A cam or eccentric when combined with a follower, forms a mechanism which is technically called cam-follower or eccentric-follower. These mechanisms can transform a circular or linear motion into reciprocating linear motion or angular motion. Obtaining one movement or the other will depend on the mechanism configuration, and specifically on the arrangement of the follower with regard to either the cam or eccentric profile.

The main types of cams are:

Those whose profiles are designed to transfer a specific movement to the follower, for example a uniform acceleration or a simple harmonic motion.

Those whose profiles consist of straight lines, circular arcs and other mathematical curves.

There are several types of followers: roller-shaped, flat-shaped, point-shaped or wedge-shaped.

Any movement consists of three elements and their importance greatly depends on the speed with which the cam repeats its operations sequence. These elements are:

Displacement of the follower at any moment.

Velocity of the follower at any moment.

Acceleration of the follower at any moment.

The displacement of the follower for any cam's angle is obtained analytically or graphically. Then, velocity and acceleration are determined by mathematical or graphical differentiation.

GENERAL DESCRIPTION

The Cam and Follower Mechanism, "MEX", allows to study the cam-follower and eccentric-follower mechanisms. For that purpose, several plate cam models, one eccentric and several roller-shaped and flat-shaped followers models are supplied.

A plate cam, also called disc cam, consists of a plate which rotates around an axis perpendicular to its plane. Its profile is designed to give a reciprocating or oscillating motion to a follower, which touches the edge of the cam.

The unit comprises three followers which depend on the geometrical characteristics of the edge in contact with the cam. Two of them are roller-shaped followers with different diameters to study the influence of the diameter, and the other one is flat-shaped. Such followers constitute cam-follower mechanisms, which transform the circular motion of the cam into a linear or angular motion of the follower. One or the other motion will depend on the configuration of the mechanism and, specifically, on the position of the follower with regard to either the cam or eccentric profile.

The Cam and Follower Mechanism, "MEX", can also measure the turning force of every cam or eccentric provided, that is to say, by means of weights the force needed to be overcome in order to rotate the cam at several angular positions can be measured.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

The "MEX" unit mainly consists of:

Four cams (aluminum) of different shapes.

Eccentric (aluminum).

Two roller-shaped followers (brass) with different diameter, constituting mechanisms which transform the circular motion of the cam into the angular motion of the follower.

Flat-shaped follower (aluminum), constituting a mechanism which transforms the circular motion of the cam into a linear motion.

MEX detail

In order to carry out some of the practices with "MEX" unit 1 set of weights “B type”is required. (See required accessories)

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.- Demonstration of the action of a plate cam and an eccentric with different geometrical profiles and various types of followers: (“B type” set required)
   - Demonstration of the conversion of the circular motion of a plate cam into the angular motion of a roller follower.
   - Demonstration of the conversion of the circular motion of a plate cam into the linear motion of a flat follower.

2.- Study of the influence of the roller follower's diameter in the conversion of the circular motion of the plate cam into the angular motion of a roller follower.

3.- Determination and graphical illustration of the relationship between the displacement of the follower and the angular displacement of the cam for several types of cams and followers.

4.- Measurement of the force needed to be overcome in order to rotate a cam at different angular positions. (“B type” set required)

Additional practical possibilities:

5.- More advanced exercises may include the determination of the velocity and acceleration by graphical differentiation and comparison with values obtained by the equations of motion.

REQUIRED ACCESSORIES (Not included)

For some practices is required:

- 1 “B type" set of weights. Each "B type" set included:
  - 6 weights of 200 g. (0.44 pounds)
  - 6 weights of 100 g. (0.22 pounds)
  - 2 weights of 50 g. (0.11 pounds)
  - 2 weights of 20 g. (0.044 pounds)
  - 2 weights of 10 g. (0.022 pounds)
  - 1 support hook of 100 g. (0.22 pounds)

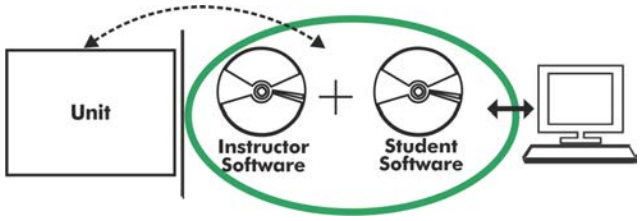
DIMENSIONS AND WEIGHTS

MEX:

-Dimensions: 370 x 400 x 510 mm approx.
(14.57 x 15.75 x 20.08 inches approx.)

-Weight: 10 Kg approx.
(22 pounds approx.)

MEX/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

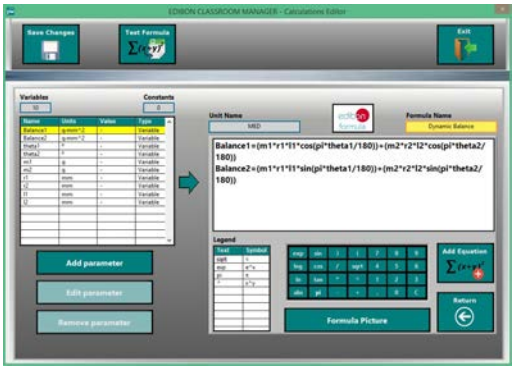
- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

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.

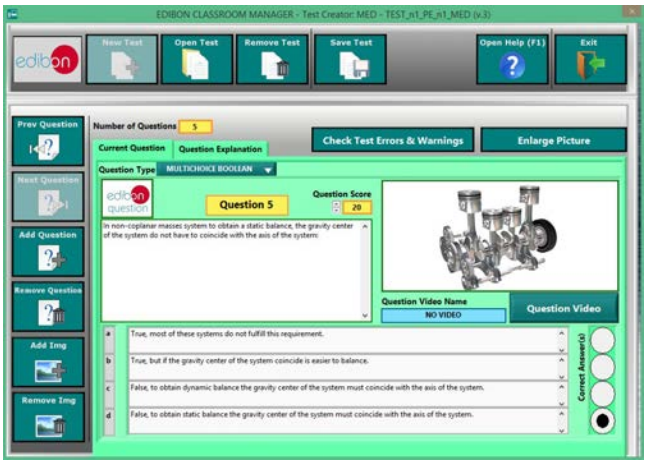
Innovative features:

- **User Data Base Management.**
- **Administration and assignment of 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.

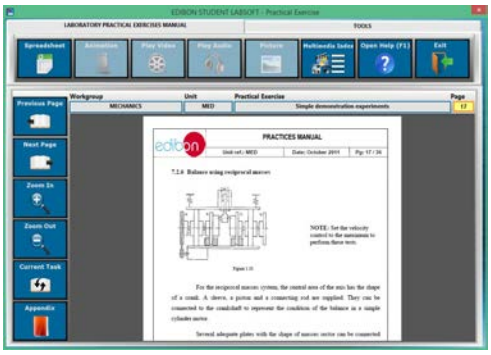
Innovative features:

- **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.**

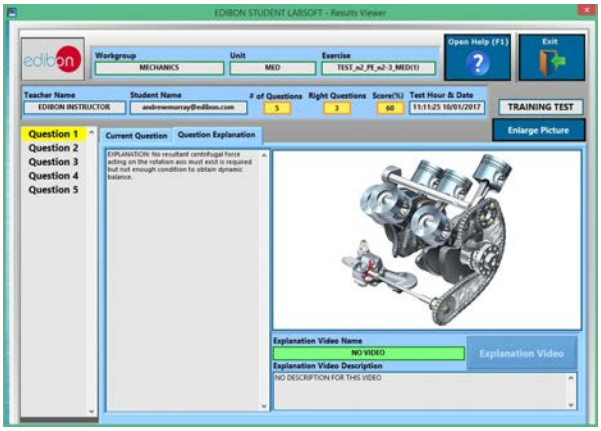
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen

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

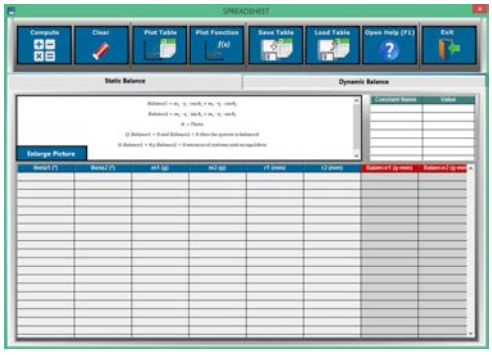
www.edibon.com/en/files/expansion/ICAI/catalog



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.

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REPRESENTATIVE: