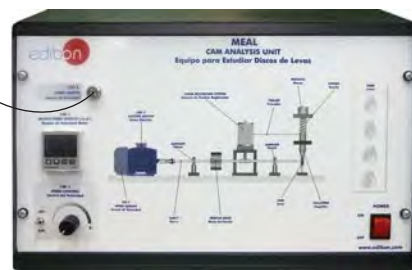


Available cams

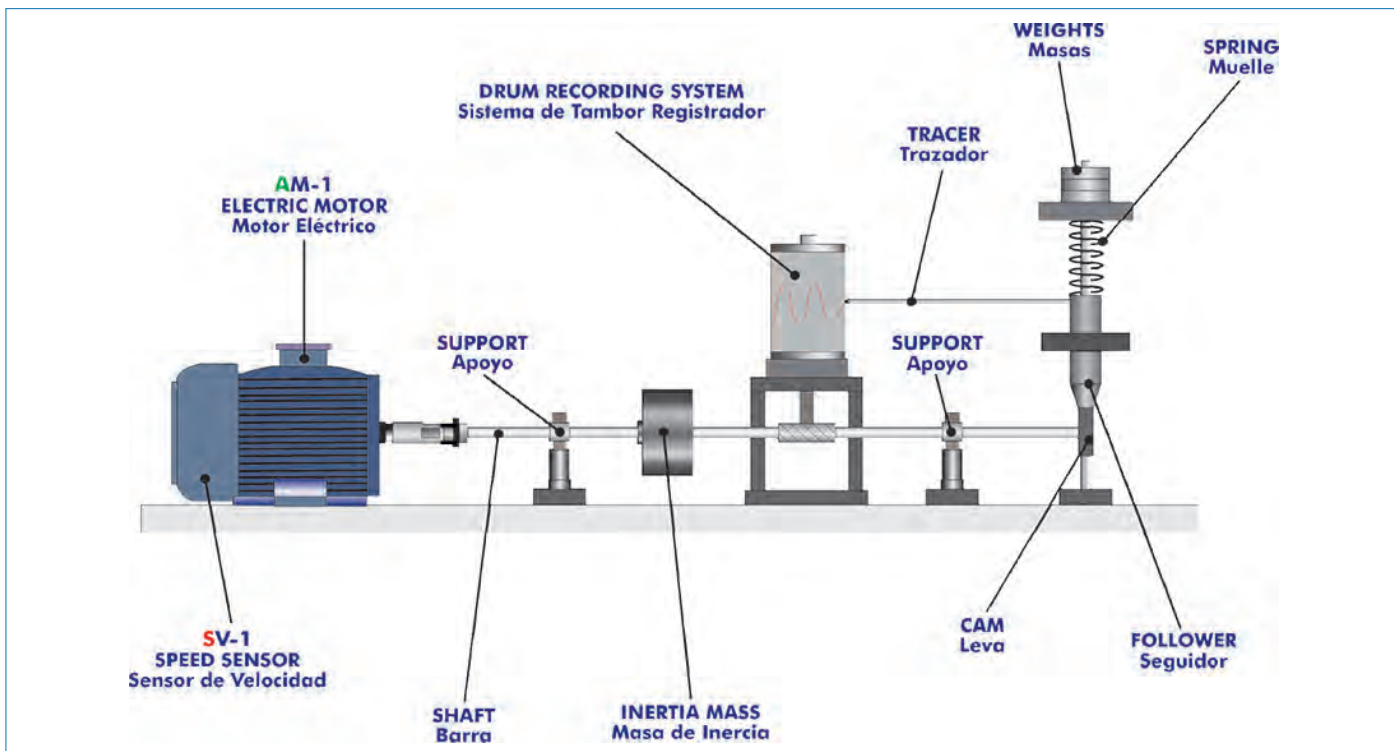


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 Products
 Products range
 Units
 7.- Mechanics & Materials



Electronic console

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9000: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14000 and ECO-Management and Audit Scheme (environmental management)



Worlddidac Quality Charter Certificate and Worlddidac Member

INTRODUCTION

A cam is a mechanical element that rotates or moves forwards and backwards to create a set motion in contact with an element known as follower.

In fact, a cam can be employed to obtain an unusual or irregular motion that would be difficult to obtain with any other coupling.

The rising and falling speed of the follower can be controlled in function of the profile of the cam. When the cam completes one turn, the follower performs a series of motions that consists of rising, stopping and returning.

The Cam Analysis Unit "MEAL" allows the students to observe and study the dynamic behavior of the cam mechanisms under several operation conditions.

GENERAL DESCRIPTION

The Cam Analysis Unit "MEAL" allows to observe the effect of the profile of a cam, the study of the displacement, velocity and acceleration profiles of the cam and the identification of the factors that can modify the dynamics of the cam.

This unit consists of a motor, an extension shaft, a set of interchangeable cams, several different followers, a set of springs and weights and a drum recording system to register the lifting and displacement of the cam.

The motor is coupled to an extension shaft that allows to rotate the cams. The cams are easily mounted at the end of the fixed shaft. A large inertia mass is connected between the motor and the cam to guarantee a constant operation at several speeds.

The follower is coupled to a shaft that moves vertically and includes weights and springs, employed to simulate a valve. The upper end of the spring surrounds the vertical shaft. The compression spring will push the follower on the face of the cam.

The stress of the spring and the inertia of the follower can be modified using different weights. Several interchangeable springs are supplied to change the operation of the valve and its response. To demonstrate the "oscillation of the valve", the springs, the weights and the velocity can be modified.

The tracer draws a register of the lifting and displacement of the cam on a piece of paper (displacement curves) using the drum recording system.

The paper is attached to a cylindrical drum register to represent the motion of the cam.

The design guarantees that the elements of the unit can be observed during the motion process. For that purpose, a transparent safety cover is fitted over the unit.

A speed sensor measures the speed of the motor during the practical exercises. The unit includes a console with a digital screen to show the speed of the motor.

SPECIFICATIONS

Bench top unit.

Unit mounted on an anodized aluminum frame with painted steel panel.

Main metallic elements made of stainless steel.

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

Electric motor with variable speed:

Power: 250W approx.

Velocity: 0-670 rpm approx.

Velocity controlled from the console. The unit allows to measure the velocity of the motor and visualize it in the screen of the console.

An extension shaft made of stainless steel.

A speed sensor, range: 0-1000 rpm.

Four interchangeable cams:

Two circular cams with different radii of lateral curvature.

One concave cam.

One tangent cam.

Two different followers:

One roller follower.

One flat surface follower.

Three interchangeable springs with different constants. Values: 5.026 N/mm, 2.601 N/mm and 0.613N/mm.

1Weight of 200 g.

Drum recording system, consisting of a tracer and a recording drum.

Transparent safety cover.

Electronic console:

Metallic box.

Connector of the speed sensor.

Connector of the motor.

ON/OFF controller of the motor.

Speed control of the motor.

Digital screen for the speed of the motor.

The unit includes rolls of graph paper and several marker pens.

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.- Observation of the effect of the cam profile on the dynamics of the cam.
- 2.- Comparison of different cam designs.
- 3.- Theoretical study of the displacement, velocity and acceleration profiles of different types of cams and followers.
- 4.- Experimental study of the displacement profiles of different types of cams and followers.
- 5.- Comparison of the theoretical and experimental displacement curve of the cams with different types of springs, weights and rates.
- 6.- Study of the influence of a moving mass.
- 7.- Study of the influence of the spring rigidity.
- 8.- Study of the influence of the rotation axis of the cam.
- 9.- Experimental study of the limit velocity.

Additional practical possibilities:

- 10.- Study of the inertia of the follower and compression rate of the spring.
- 11.- Plotting of lift curves for non-matching tracer.
- 12.- Plotting of lift curve for skipping tracer.

REQUIRED SERVICES

- Electrical supply: single-phase, 220V/50Hz or 110V/60Hz.

DIMENSIONS AND WEIGHTS

MEAL:

Unit:

-Dimensions: 750 x 500 x 500 mm. approx.
(29.53 x 19.68 x 19.68 inches approx.)

-Weight: 70 Kg. approx.
(154.3 pounds approx.).

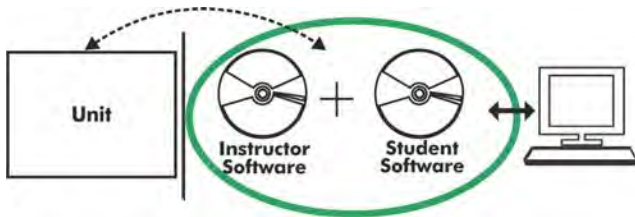
Electronic console:

-Dimensions: 490 x 330 x 310 mm. approx.
(19.29 x 12.99 x 12.20 inches approx.)

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

Optional

MEAL/CAI. Computer Aided Instruction Software System:



With no physical connection between unit and computer (PC), this complete software package consists of an Instructor Software (INS/SOF) totally integrated with the Student Software (MEAL/SOF). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

Example of software screens

Instructor Software

INS/SOF. Classroom Management Software (Instructor Software):

The Instructor can:

- Organize Students by Classes and Groups.
- Create easily new entries or delete them.
- Create data bases with student information.
- Analyze results and make statistical comparisons.
- Generate and print reports.
- Detect student's progress and difficulties.
- ...and many other facilities.

This software, working in network configuration, allows controlling all the students in the classroom.



Student Software

MEAL/SOF. Computer Aided Instruction Software (Student Software).

It explains how to use the unit, run the experiments and what to do at any moment.

- This software contains:

Theory: gives the student the theoretical background for a total understanding of the studied subject.

Exercises: divided by thematic areas and chapters to check out that the theory has been understood.

Guided Practices: presents several practices to be done with the unit, showing how to perform the exercises and practices.

Exams: set of questions to test the obtained knowledge.



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

www.edibon.com/products/catalogues/en/CAI.pdf

MEAL/CAL. Computer Aided Learning Software (Results Calculation and Analysis):

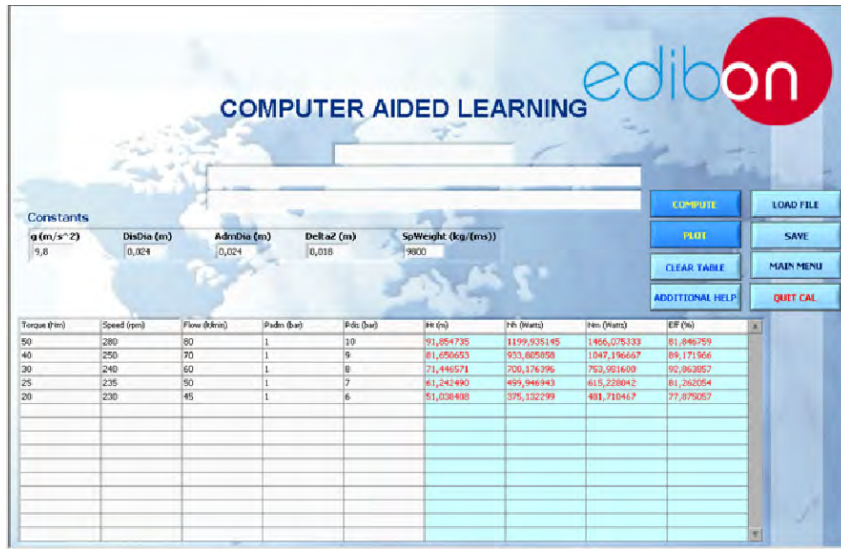
This Computer Aided Learning Software (Results Calculation and Analysis) "CAL" is a Windows based software, simple and very easy to use, specifically developed by EDIBON.

CAL is a class assistant that helps in doing the necessary calculations to extract the right conclusions from data obtained during the experimental practices. With a single click, CAL computes the value of all the variables involved and performs the calculations.

Also, CAL allows to plot and print the results. Within the plotting options, any variable can be represented against any other.

Available different plotting displays.

It has a wide range of information, such as constant values, unit conversion factors and integral and derivative tables.



On a table, we introduce data obtained during the development of the exercise.

Above this table, it is shown "Constants" theoretically involved with the field of study. The values of these "Constants" may be modified to our convenience, assigning the appropriate values.

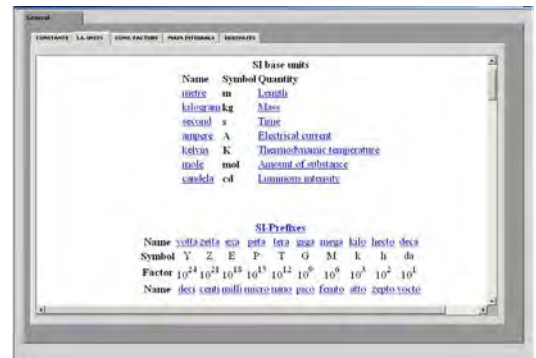
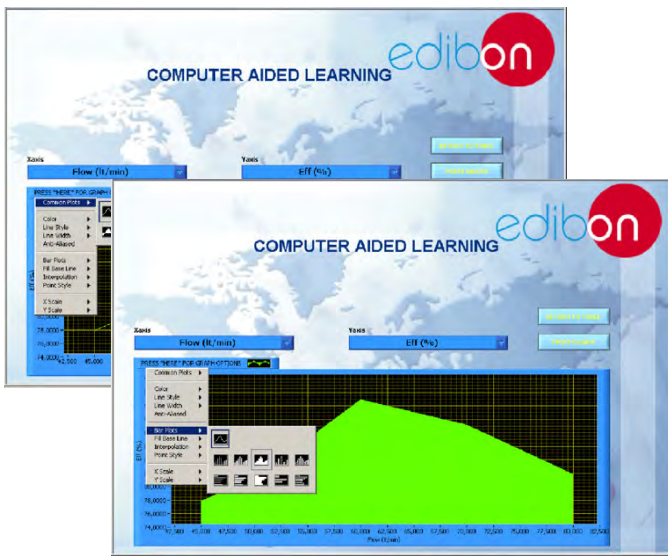
Simply, by clicking on "COMPUTE", CAL performs the calculations of the desired variables.

We can save and print the data of the experiment or calculations.

Also we can load any data file saved previously.

With the calculated variables, CAL gives the option of plotting the results. It is possible to represent any variable against any other. It has the option of representing the graph with different layouts. Screens below give an example of the multiple choices.

CAL has a wide range of help information. By clicking the button "ADDITIONAL HELP" opens a window where we have information about typical Constants, International System Units, Conversion Factors, and Table of Main Integrals and Derivatives (General), and there is other specific help for the particular unit.



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

www.edibon.com/products/catalogues/en/CAL.pdf

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



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