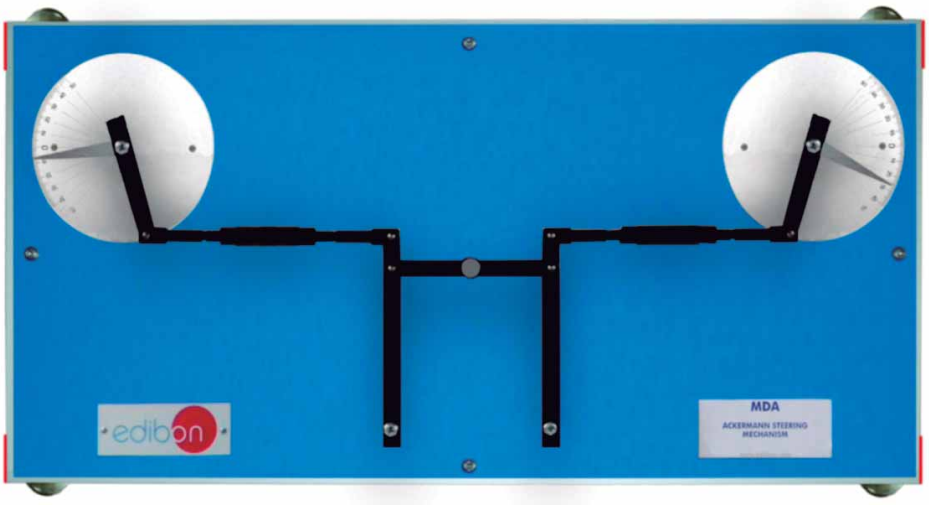
Technical Teaching Equipment

Ackermann Steering Mechanism

MDA

NEW



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INTRODUCTION

The Ackermann Steering Principle defines the geometric arrangement of linkages in the steering of a car or other vehicle. It is designed to solve the problem of wheels on the inside and outside of a turn when needing to trace out circles of different radii.

The Ackermann Steering Mechanism (MDA) allows to explain the special features of the Ackermann steering geometry and to study the influence of the steering angle with varying steering geometry.

GENERAL DESCRIPTION

The Ackermann Steering Mechanism (MDA) is a bench-mounting unit designed to determine the lead angle of a steering trapezoid in an Ackermann steering mechanism, the disadvantages of incorrectly adjusted track rods and the influence of the track rod length.

This unit consists of a complete Ackerman linkage model mounted on a flat board. The symmetrical linkage system consists of two levers, an intermediate steering rod, two track rods and two track rod arms, all linked with joints. The whole system can be pivoted left to right by hand. There are two rotating indicators attached to these track rod arms that mark the steering angle on scales.

The linkage system is fully adjustable so that the Ackerman angles can be varied. The length of the track rods may be modified by turning an adjustment nut to demonstrate the effect of mal-adjustment or damage of the steering.

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
(Worlddidac Member)

SPECIFICATIONS

Anodized aluminum structure with panel in painted steel.

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

The unit includes:

King pin spacing: 460 mm. approx.

Two levers made of aluminum.

An intermediate steering rod made of aluminum.

Two track rods, with individual adjustable length by means an adjustment nut.

Two track rod arms made of aluminum.

Two indicators to indicate the steering angle.

Two scales for angle displacement. Steering lock angle: ±50°, scale graduations: 1°.

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.- Determination of the lead angle of a steering trapezoid.

2.- Demonstrating how Ackerman angles are determined in a steering system.

3.- Study of the influence of the track rod length.

4.- Determining the steering error as a function of the steering angle with varying steering geometry.

5.- Determining the variation on turns caused by track mal-adjustment.

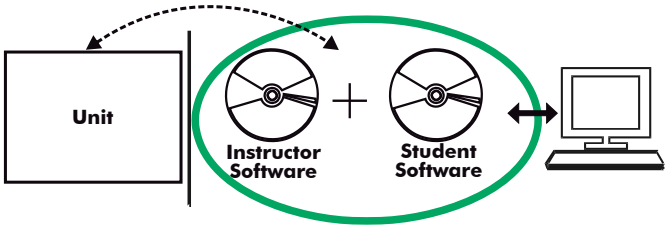
6.- Determining the variation on turns caused by damage.

DIMENSIONS & WEIGHT

-Dimensions: 620 x 300 x 100 mm. approx. (24.41 x 11.81 x 3.94 inches approx.).

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

MDA/CAI. Computer Aided Instruction Software System:



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

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.

Example of software screens

Instructor Software

MDA/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:

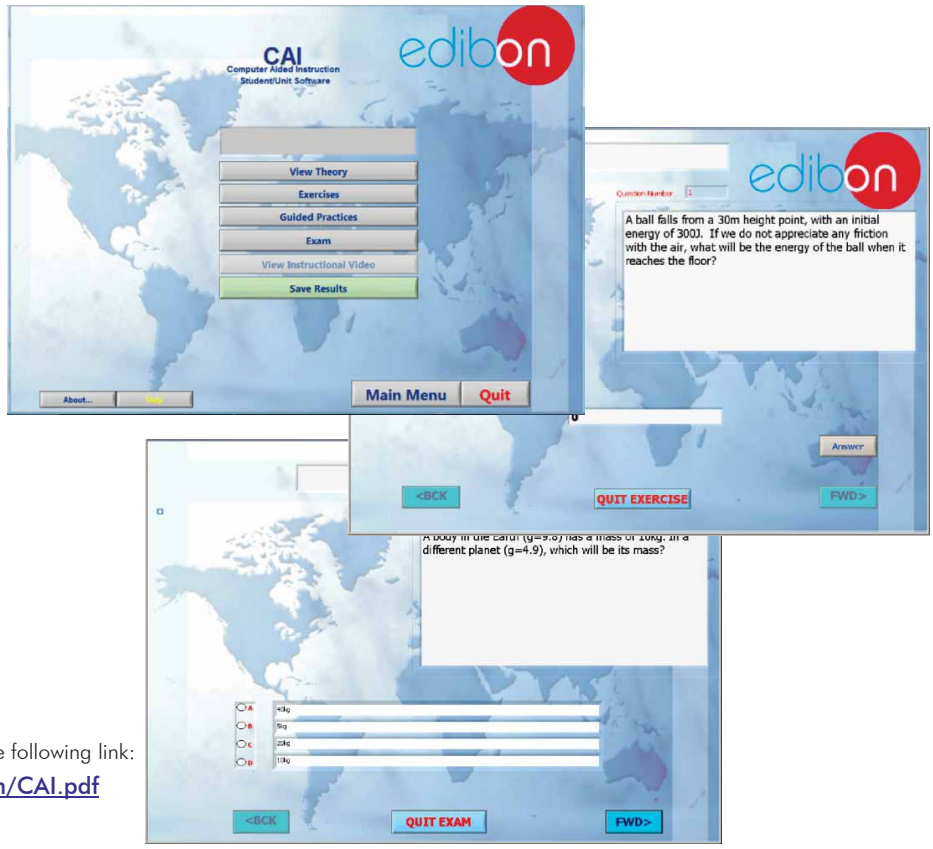
Theory: gives the student the theoretical background for a total understanding of the studied subject.

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.

Student Software



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

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

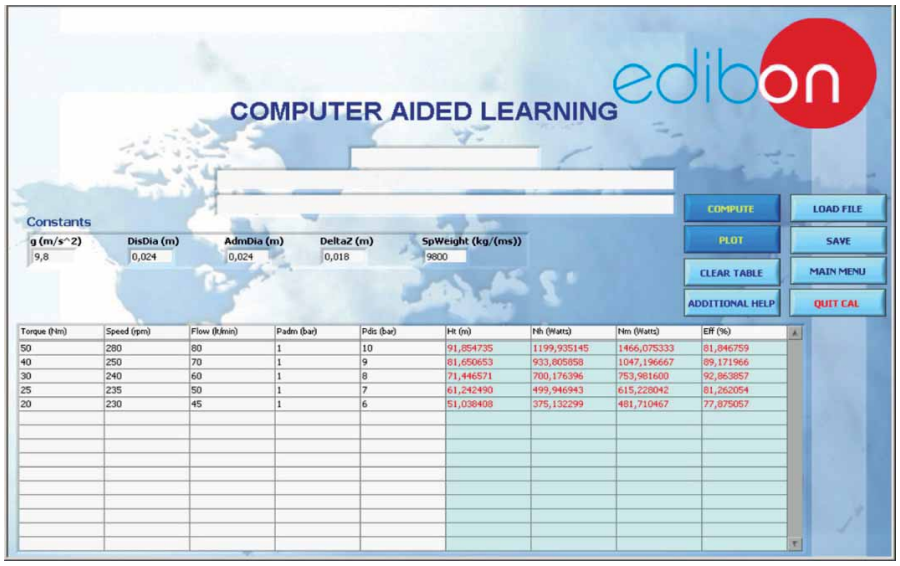
This Computer Aided Learning Software (Results Calculation and Analysis) "CAL" is a Windows based software, simple and very easy to use, specifically developed by EDIBON.

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.

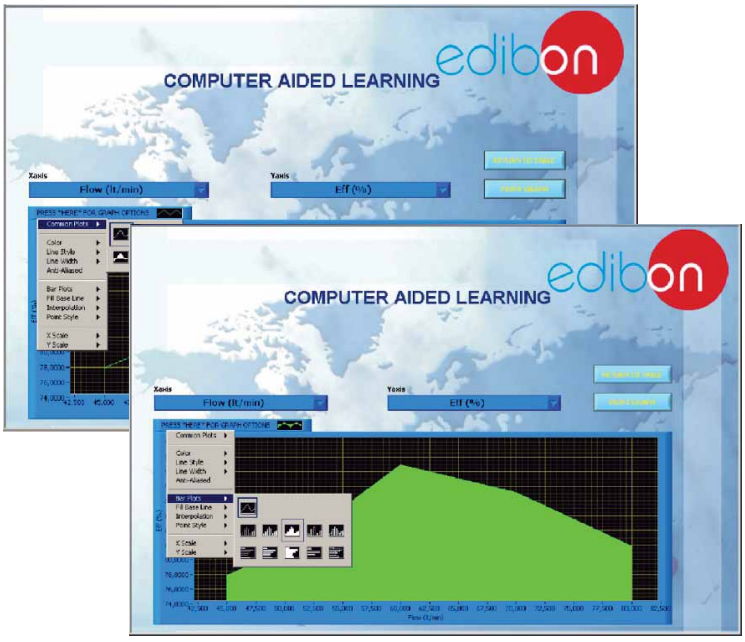
Above this table, it is shown "Constants" theoretically involved with the field of study. The values of these "Constants" may be modified to our convenience, assigning the appropriate values.

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

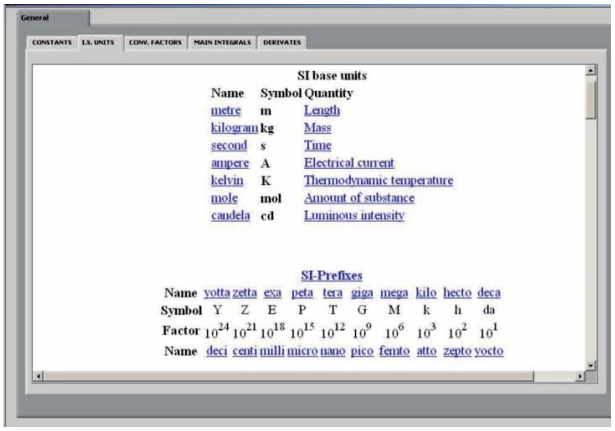
We can save and print the data of the experiment or calculations.

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 improvements of the product.

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