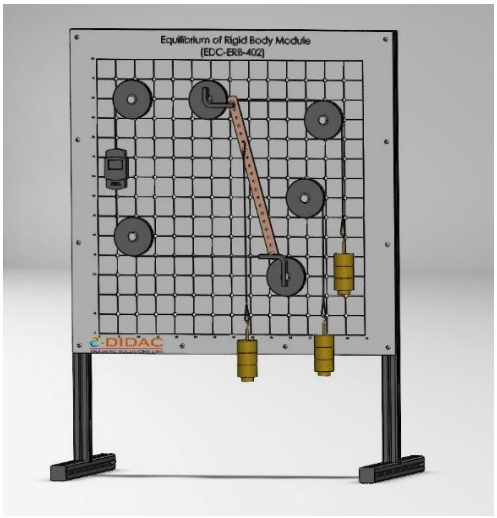
Equilibrium of a Rigid Body Module (EDC-ERBM-402)

SPECIFICATIONS:

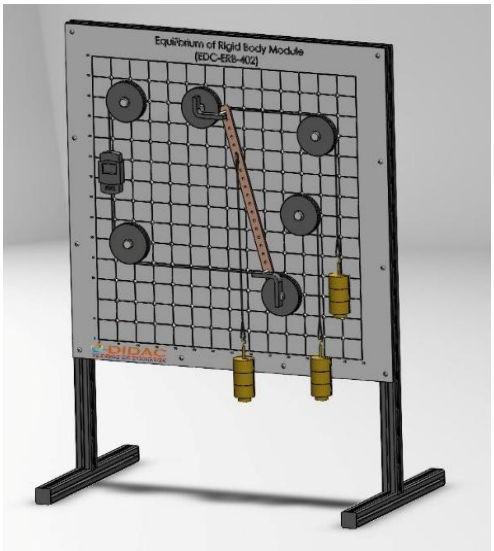
- Hands-on experiment for understanding equilibrium conditions of a leaning ladder.
- Application of the "freeing" principle in engineering mechanics to visualize forces and moments.
- Top support designed as a floating bearing and bottom support as a fixed bearing for real-world simulation.
- Full compensation of support forces using cable forces in the x and y directions.
- Sliding clamp weight with a built-in millimeter scale for precise positioning.
- Includes a storage system with foam inlay for organized component management.

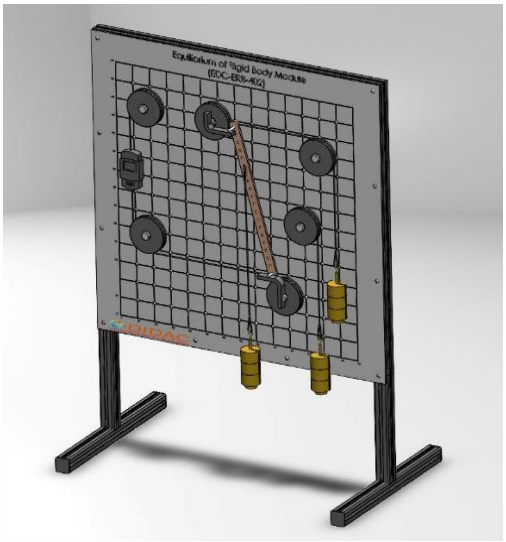


DESCRIPTION:

The Leaning Ladder Equilibrium Experiment is a highly visual and interactive setup designed for students to explore equilibrium conditions and support reactions in static mechanics. This experiment demonstrates the core principle of "freeing", allowing students to replace real-world forces with standardized symbols for better analysis. In the process, a body or a system such as a bar are virtually removed from the environment. The top support is a floating bearing, while the bottom support is fixed, accurately representing real-life constraints. By applying cable forces in x and y directions, students can fully compensate support reactions, gaining a deep understanding of force interactions in statics. The built-in millimeter scale enables precise measurement of clamp weight positioning, facilitating accurate calculations of forces and moments.

This system allows students to conduct hands-on experiments by adjusting the position of the clamp weight and angle of inclination to study their effects on support forces. The experiment setup fits into the mounting frame, ensuring compatibility with existing teaching equipment. With a comprehensive set of weights, guide pulleys, and instructional material, this system is ideal for classroom demonstrations and individual student engagement, making the learning of statics principles both practical and engaging.





TECHNICAL DATA:

- **Specification & Technical Data:**
  - Development of the static principle of "freeing".
  - Full compensation of support forces using cable forces.
  - Sliding clamp weight with precise positioning.
  - Built-in ruler with millimeter scale for accurate measurements.
  - Two supports: 1 fixed bearing, 1 floating bearing.
  - Three guide pulleys for force direction control.
  - Storage system with foam inlay for safe organization of components.
- **Ladder & Measurement Specifications:**
  - Ladder length: 650 mm.
  - Ladder weight: 2 N.
  - Built-in rule graduation: 1 mm.
  - Clamp weight: 20 N.
  - Tape measure length: 3000 mm, graduation: 1 mm.
- **Weights Included:**
  - 3 × 1N (hanger).
  - 9 × 5N weights.
  - 12 × 1N weights.
- **Dimensions & Weight:**
  - Total weight: 28 kg.
- **Learning objectives/experiments:**
  - Experimental development of the core principle of "freeing" in statics;
  - Calculation of the support forces for a given position of the clamp weight and for a known angle of inclination
  - Application of the 1 and 2 equilibrium conditions in statics
  - Full compensation of the support forces by cable forces
  - How does the clamp weight position affect the support forces
  - How the angle of inclination affects the support forces
- **Items Included:**
  - 1 model of a ladder.
  - 2 bearings (fixed & floating).
  - 3 guide pulleys.
  - 1 set of weights.
  - 1 clamp weight.
  - 3 cables.
  - 1 tape measure.
  - 1 storage system with foam inlay.
  - 1 set of instructional material.