

## Deflection of Beams & Cantilevers (EDC-DBCM-304)

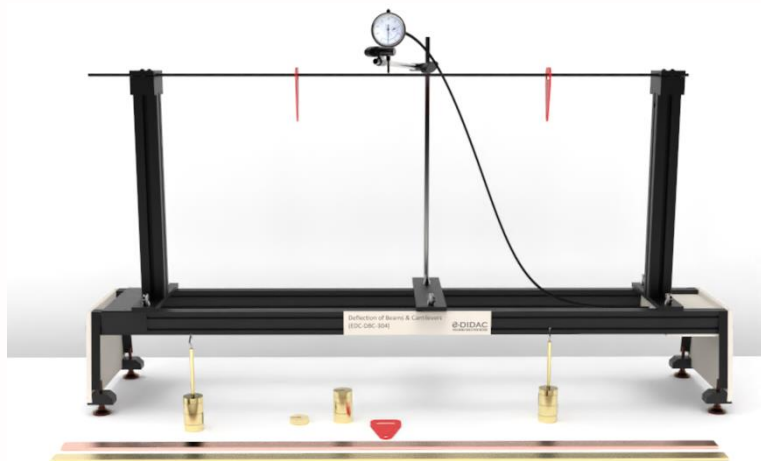
### SPECIFICATIONS:

- Fits onto the Structures platform for ergonomic and stable use.
- Includes a Vernier caliper for precise cross-section measurement.
- Beam Configurations & Load Applications: Users can set up beams in different configurations:
- EDAQ software for real-time data acquisition and analysis.
- Digital deflection indicator has its own display and can also connect to the USB Interface Hub of the Structures platform.
- Includes five beams of 850 mm length with different materials and cross-sections:
  - Aluminum: 19 x 3.2 mm, 19 x 4.8 mm, and 25.4 x 3.2 mm
  - Brass: 25.4 mm x 3.2 mm
  - Mild Steel: 25.4 mm x 3.2 mm

### DESCRIPTION:

This beam bending experiment module is designed for structural mechanics studies, allowing users to investigate the relationship between beam configurations, material properties, applied loads, and resulting deflection. It provides flexible experimental setups, supporting cantilever, simply supported, fixed, and propped cantilever beam configurations. The system features fully adjustable load and deflection measuring positions, allowing users to analyze deflection at different points along the beam. A high-resolution digital deflection indicator ensures accurate deflection readings, and a Vernier caliper is included for precise cross-section measurement. The beams are available in aluminum, brass, and mild steel with varying cross-sections, providing a comprehensive understanding of elastic modulus and Second Moment of Area ('I' value).

The module is fully integrated with EDAQ software, enabling real-time data acquisition, display, and logging via a USB interface hub. Users can analyze results instantly, export data, and compare deflections under point loads and UDLs (Uniformly Distributed Loads). The package includes two beam supports with different fixing methods, five beams, a storage tray, nine mass hangers, 50 x 20 g masses, hexagon tools for beam fixings, cables, and a comprehensive user guide. This setup is ideal for engineering students and professionals, providing hands-on experience in beam bending and structural analysis.



## TECHNICAL DATA:

---

- **Beam Specifications:**
  - **Length:** 850 mm (nominal).
  - **Cross-sections:**
    - **Aluminum:** 19 x 3.2 mm, 19 x 4.8 mm, 25.4 x 3.2 mm.
    - **Brass:** 25.4 x 3.2 mm.
    - **Mild Steel:** 25.4 x 3.2 mm.
- **Support & Fixing Methods:**
  - Two beam supports with two fixing methods:
    - Simply supported
    - Fixed/encastre
  - **Load application:** Supports point loads and UDLs.
- **Measurement Instruments:**
  - High-resolution digital deflection indicator (with its own display and USB connectivity).
  - Vernier caliper for precise cross-section measurement.
- **Software & Data Acquisition:**
  - Compatible with EDAQ software for real-time data logging and analysis.
  - USB interface hub for data collection and display.
- **Learning Objectives:**
  - Beam bending formula and structural 'stiffness'
  - Deflection due to different loading conditions.
  - Effects of beam fixing conditions on deflection (Simply supported beams, Fixed or 'encastre' beams, Cantilever beams, Propped cantilever).
  - Shape of a deflected beam
  - Beam length and deflection
  - Analysis of Young's modulus and Second Moment of Area ('I' value).
  - Understanding beam bending theory and reciprocal theorem (Maxwell-Betti).
- **Accessories Included:**
  - Two beam supports with two fixing methods.
  - Digital deflection indicator.
  - Five different beams (Aluminum, Brass, Mild Steel).
  - Nine mass hangers.
  - 50 x 20 g masses.
  - Hexagon tools for beam fixings.
  - Vernier caliper.
  - Storage tray.
  - Comprehensive user guide.