

Pin Jointed Frameworks (EDC-PJFM-308)

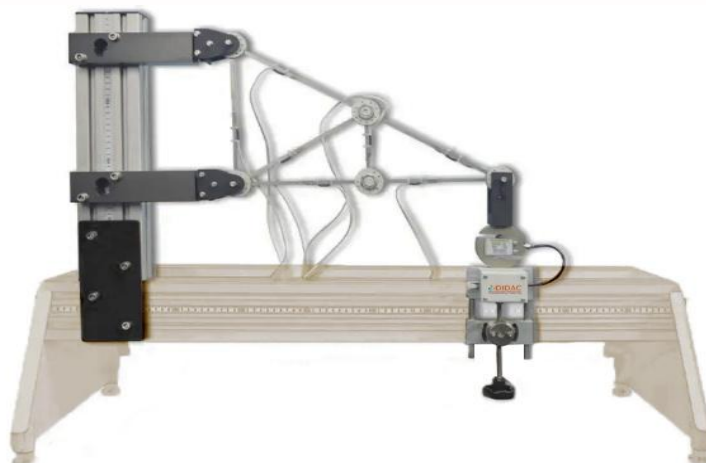
SPECIFICATIONS:

- Fits onto the Structures platform for ergonomic and stable use.
- Works with EDAQ software for real-time data acquisition and analysis.
- Users can analyze forces and deflections in four popular pin-jointed trusses:
 - The Warren truss.
 - The Roof truss (Howe/Pratt truss).
 - Simple cantilever truss.
 - Advanced cantilever truss.
- Users apply loads to the trusses and measure resulting forces and deflections.
- Strain gauges connect to a strain gauge amplifier, which, along with the load cell, links to the USB interface hub for digital display and data acquisition.

DESCRIPTION:

This Pin-Jointed Truss Experiment Unit allows users to explore force distribution and deflections in four common truss frameworks. The system features interchangeable square-section members, enabling easy construction of different truss configurations. The unit incorporates strain gauges on key structural members, linked to a strain gauge amplifier, providing accurate force measurement. Users can apply various loads using a load cell, observing deformation and stress responses in different structural designs. The system simplifies real-world structural concepts, making it ideal for understanding engineering principles such as force analysis and deflection behavior.

With full integration into EDAQ software, the experiment setup allows real-time data collection and graphical representation of results. Students can explore fundamental engineering concepts such as Bow's Notation, force analysis using the method of joints and sections, and strain-energy-based deflection calculations. Additional applications include studying wind loads on a roof truss and the effects of swaying loads on a cantilever truss. The package includes a strain gauge amplifier, pinned and roller supports, a trammel arm with a high-resolution digital indicator, square-section frame members, joint bosses, a load cell, storage trays, and essential tools



TECHNICAL DATA:

- **Structural Components:**

- Interchangeable square-section frame members:
 - 7 long members.
 - 4 medium members.
 - 2 short members.
- Eight joint bosses for secure truss assembly.
- Pinned and roller supports for different boundary conditions.
- Additional upright for framework stability.

- **Measurement & Load Application:**

- Strain gauge amplifier with 16 inputs for force measurement.
- Load cell with a maximum capacity of 650 N.
- Trammel arm with a digital indicator (resolution 0.001 mm) for deflection measurement.
- Inclinator for angular measurements.

- **Software & Data Acquisition:**

- **EDAQ software compatibility** for real-time data acquisition and graphical analysis.
- **USB interface hub connectivity** for streamlined digital data collection.

- **Learning Objectives:**

- Introduction to Bow's Notation.
- Understanding strain gauges as force-measuring instruments.
- Force and deflection analysis in different truss configurations.
- Analysis of Warren truss, Roof truss (Howe/Pratt), Simple cantilever truss and Advanced cantilever truss.
- Force calculations using the method of joints and the method of sections.
- Deflection analysis using the strain-energy method.
- Effects of wind loads on a roof truss.
- Impact of swaying loads on a cantilever truss.

- **Accessories Included:**

- Strain gauge amplifier (16 input).
- Pinned and roller supports.
- Additional upright.
- Trammel arm with digital indicator (0.001 mm resolution).
- Three cables.
- Set of square-section frame members (7 long, 4 medium, 2 short).
- Eight joint bosses.
- Load cell (650 N max capacity).
- Hexagon tools for assembly.
- Storage trays (for frame members and general items).
- Inclinator.
- Comprehensive user guide