



Description

One of a range of experiment modules that fit to the Structures platform, this product helps students to understand the analysis of statically determinate and indeterminate truss structures made from a number of 'members' held together by joints at their ends. Two supports hold the truss. One support allows rotation only and the other allows rotation and translation. Students apply a load to the truss at the free end Joint Boss. Strain gauges on each truss member measure the forces due to the load. A precision indicator measures the framework deflection due to the load. A hand-operated load cell assembly applies and measures the load. A simple thumbscrew engages and disengages an extra 'redundant' member. Students apply loads to the truss initially without the extra 'redundant' member engaged. This frame is stable and statically determinate (can be solved by static equilibrium). They then engage an extra 'redundant' member, making the frame statically indeterminate, requiring a more advanced analysis such as the strain-energy method. Students may measure the deflection of the frame for both cases and compare. Students use textbook equations and methods to predict the forces in each 'member', comparing them with the measured results. This helps confirm the reliability of the textbook equations and the accuracy of the experiment results. The strain gauges connect to a strain gauge amplifier, which connects (with the load cell) to the interface hub of the Structures platform for computer display and data acquisition

Items Included

- Strain Gauge Amplifier, 16 input
- Pinned and roller supports
- Additional Upright

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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- Trammel Arm with Digital Indicator of resolution 0.001 mm
- Load Cell of maximum capacity 650 N
- Pre-assembled truss of five joint bosses and eight square-section members
- Three cables for computer display and data acquisition
- Inclinometer
- Hexagon tools for fixings
- Storage Tray
- Software
- User Guide
- Structure Platform

The structure platform is made from precision, 6 slotted 100mm x 50mm anodised aluminium extrusions(2 No. arranged parallelly to each other) and steel end-plates with adjustable feet. Easy-to-read scales on each side of the platform.

The platform includes the use interface plug and play 'Hub' to simplify connections. The hub converts signals from the sensors on experiment module to USB data format for computer display and data acquisition.

Software

Works with user-friendly software made using LabVIEW from National Instruments to create data acquisition applications for Experiment Module

Experiments

- Strain Gauges as instruments.
- Forces within and deflections of:
- A truss structure that is statically determinate
- A truss structure that is statically indeterminate
- Member forces by the Method of Joints and Method of Sections.
- Member forces by the use of the strain energy method.
- Advantages and disadvantages of both versions of the truss.

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