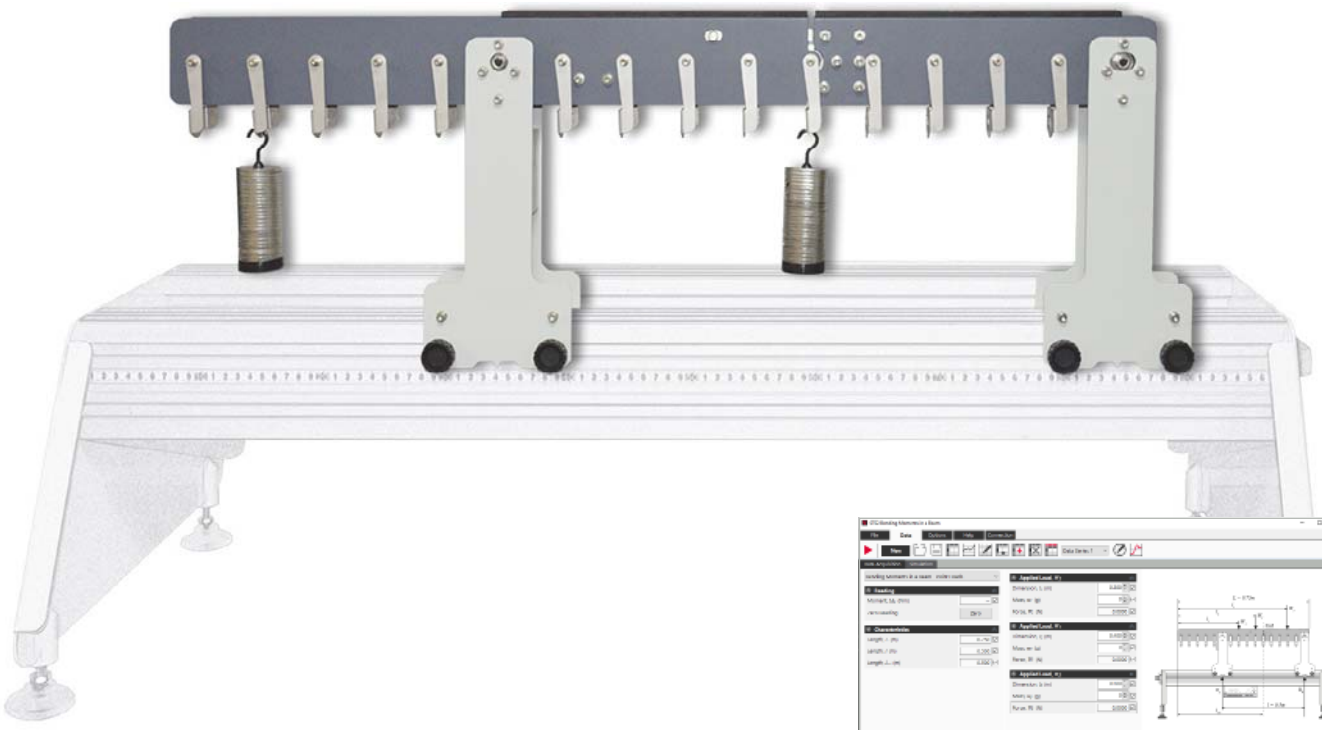
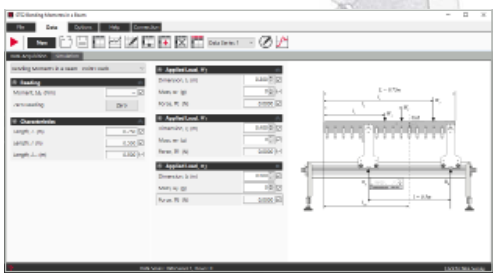
BENDING MOMENTS IN A BEAM

VDAS® ONBOARD STS2

Experiment that illustrates and proves the basic theory of bending moments in a beam. Mounts on the Structures platform and connects to the Structures automatic data acquisition unit and software (VDAS® Onboard).





SCREENSHOT OF THE VDAS® SOFTWARE

KEY FEATURES

- One of a range of experiment modules that teach structures principles
- Fits to the Structures platform (STS1) for ergonomic use and space-saving storage
- Unique beam 'cut' and load cell system for an accurate measurement of bending moment
- Includes multiple loads for many combinations of loads including uniformly distributed loads (UDLs)
- Supplied with a storage tray to keep smaller items safe
- Works with user-friendly software (VDAS®)
- Direct reading of bending moment at the 'cut' for quick and simple experiments
- Complementary shear force experiment available: Shear Force in a Beam (STS3)

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BENDING MOMENTS IN A BEAM

VDAS® ONBOARD STS2

DESCRIPTION

One of a range of experiment modules that fit to the Structures platform (STS1, available separately), this product helps students to understand how loads affect the bending moment in a beam.

Students apply loads to hangers suspended along the beam, held between two supports. One support allows rotational movement only, acting as a pinned support. The other support allows translational movement, acting as roller support. A load cell at the cut at mid-span of the beam measures the bending moment due to the load. The beam has a central span with an overhanging end, so that students can create both positive and negative bending moments ('sagging' and 'hogging').

Each support includes pointers that work with the scale on the platform for accurate positioning. Students use textbook equations to predict the bending moments due to the load, comparing them with measured results, and learn how to create the influence line and bending moment diagrams. This helps confirm the reliability of the textbook equations and the accuracy of the experiment results.

This product includes a uniformly distributed load (UDL) that may be applied across the span of the beam for comparison of results with a single point load.

The load cell connects to the USB interface hub of the Structures platform for computer display and data acquisition (VDAS® Onboard).

STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

LEARNING OUTCOMES

- Bending moment at the cut due to a varying single point load
- Bending moment at the cut due to a moving single point load
- Bending moment at the cut due to a uniformly distributed load
- Influence lines and superposition

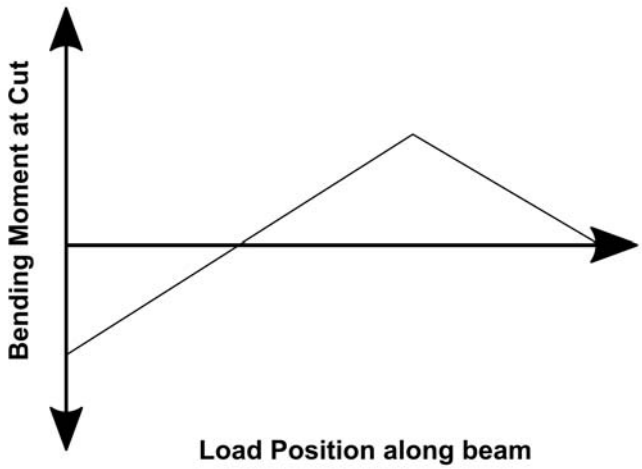
ESSENTIAL ANCILLARY

- Structures Platform (STS1)

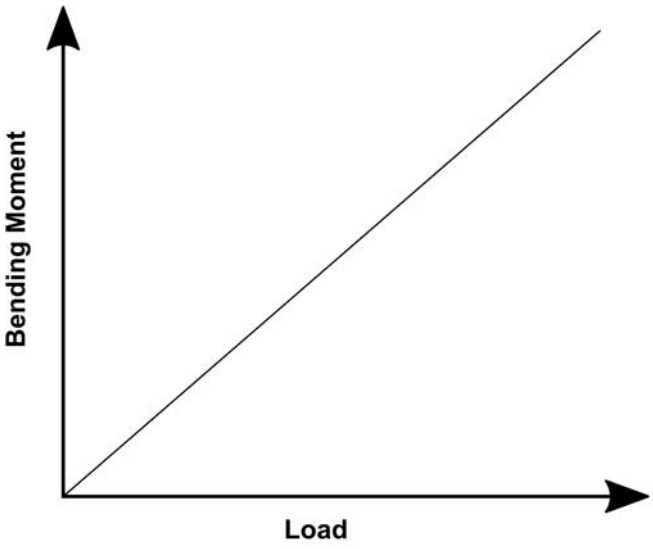
SOFTWARE

TecQuipment has created data acquisition applications (VDAS® Onboard) for each experiment module, with additional simulated experiments.

The simulated experiments allow students to simulate the hands-on laboratory experiments, verifying their results. They also allow simulation of alternative set-ups, such as having the beam 'cut' at different positions and calculating the support reactions, extending the learning experience beyond the practical laboratory session.



TYPICAL EXPERIMENT RESULTS SHOWING HOW A MOVING LOAD AFFECTS THE BENDING MOMENT AT THE CUT



TYPICAL EXPERIMENT RESULTS COMPARING BENDING MOMENT WITH A VARYING LOAD AT A FIXED POINT

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BENDING MOMENTS IN A BEAM

VDAS® ONBOARD STS2

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

–25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

DETAILED SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specifcation without prior notice.

DIMENSIONS AND WEIGHT:

- Nett (assembled): 840 mm long x 80 mm front to back and 300 mm high and 7 kg
- Approximate primary packed (with storage tray): 0.08 m^3 and 9 kg

SPACE NEEDED:

- 1500 mm x 600 mm, level bench or desk

ITEMS INCLUDED:

- Two supports, holding a beam of 0.8 m length and 0.5 m span
- Bending moment load cell built into the centre span of the beam
- Cable
- Four mass hangers
- 50 x 20 g masses
- Two UDL bars
- Storage tray
- Comprehensive user guide