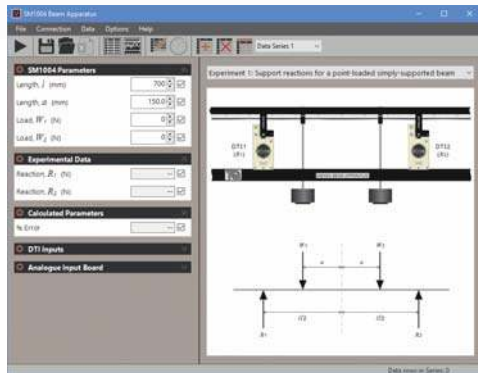# BEAM APPARATUS

VDAS® SM1004

Examines the deflection and forces on different types of beams for a wide range of supports and loads; also demonstrates Young's modulus.

- Includes textbook with full theory
- Simply supported and cantilever beam tests with up to four supports with any loading
- Three load cells with digital indicators measure reaction forces or act as rigid sinking supports
- Precision digital indicators for accurate deflection measurements

LEARNING OUTCOMES:

- Verification of the bending equation
- Determination of flexural rigidity and elastic modulus (Young's modulus)
- Verification of static equilibrium
- Deflection of beams on two simple supports with point loads
- Reciprocal properties for loads and deflection
- Simple and propped cantilevers with any loading
- Continuous beams – statically indeterminate cases for simply supported beams and cantilevers on more than two supports with any loading (including measurement of unknown reactions)
- Simply supported and cantilever beams with sinking supports

With the SM1004a Specimen Beams, these additional experiments can be done:

- The effects of material and section shape on flexural rigidity
- Bending characteristics of a brass/steel compound beam, with and without shearing connection between the two layers
- Equivalent sections – characteristics of a metal-faced wooden beam
- Deflections on a non-uniform (tapered) beam or cantilever

FREE-STANDING STRUCTURES EXPERIMENTS

MATERIALS TESTING AND PROPERTIES

FREE-STANDING STRUCTURES EXPERIMENTS

MATERIALS TESTING AND PROPERTIES

The apparatus consists of an upper cross-member carrying graduated scales, and two lower members bolted to T-legs to form a rigid assembly. The three load cells and cantilever-support pillar slide along the lower members and can be clamped firmly in any position. The load cells have direct digital readout and each is fitted with a hardened steel knife edge which can be adjusted to set the initial level, or to simulate a sinking support. Locking pins can convert each load cell to a rigid support when required. The cantilever support is a rigid pillar with a sturdy clamping arrangement to hold the beams when built-in end conditions are required. Four weight hangers and a set of weights are supplied to apply static loads.

RECOMMENDED ANCILLARIES:

- Versatile Data Acquisition System –   299
  Bench-mounted version (VDAS-B)
- Additional Specimen Beams (SM1004a)

### ALTERNATIVE PRODUCTS:

- Deflection of Beams and Cantilevers Kit (ES4)   11
- Stiffness – Bending and Torsion (TE16)   152
- Beam and Leaf Spring (SM1000g)   165
- Deflection of Beams and Cantilevers (STR4)   202
- Continuous and Indeterminate Beams (STR13)   204

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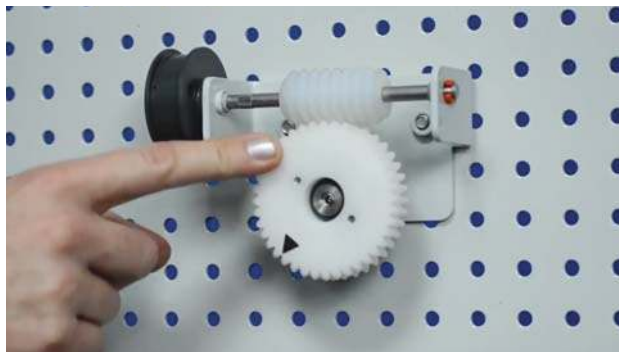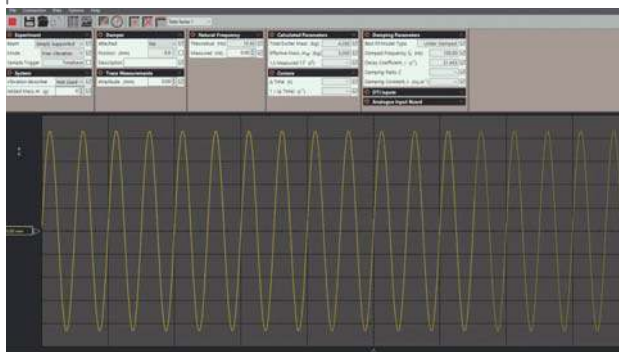

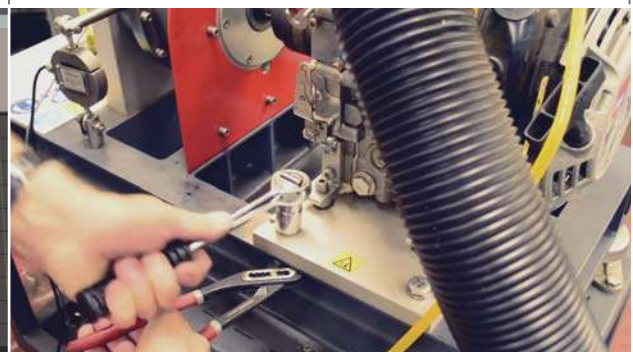GEAR TRAINS (ES13)
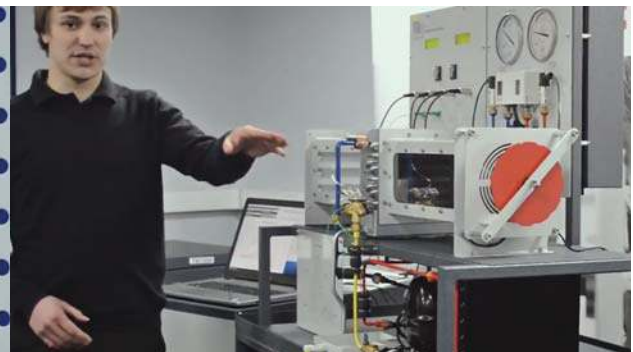
AIR CONDITIONING TRAINER (EC1501)

ROTATING FATIGUE MACHINE (SM1090)

HYDROLOGY AND RAINFALL (H313)

TRACE DAMPING MODELS (VDAS®)

SMALL ENGINE TEST SET (TD200)