



## Strain Gauge Trainer (Bending, Torsion and Tensile) (SMT-SM-05)

The Strain Gauge Trainer contains everything needed to show students how resistance strain gauges work on three different structures. Strain gauges are used extensively in sensor systems to detect forces, moments and deformations. Students use the small set of masses to load the bending and torsion systems, and the large set of masses to load the tension system. Students can also connect and compare the performance of quarter, half and full-bridge strain gauge connections for each structure.

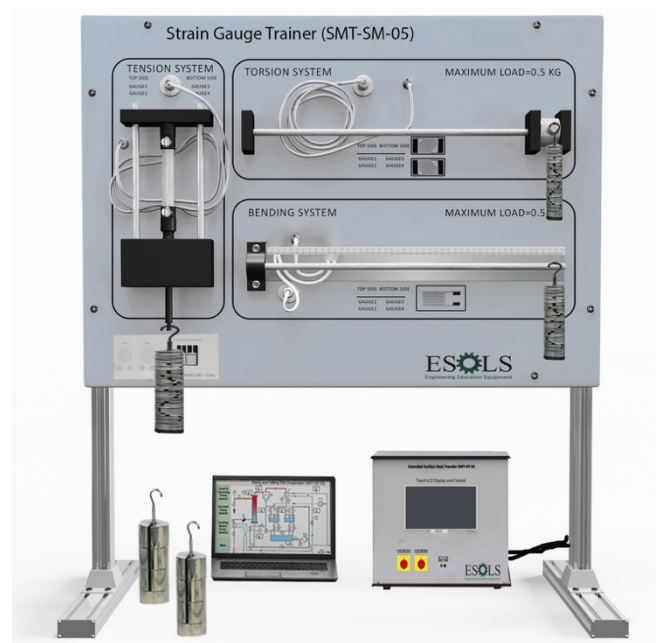
The bending system uses gauges to measure direct tensile and compression strain. The torsion system shows the use of shear/torque strain gauges. The tension system shows the use of two gauges at right angles in a 'Tee' rosette. The tension system also finds and proves Poisson's ratio for tensile and compressive strains in metals. The strain display includes a set of high-accuracy dummy strain gauge resistors (plugs) and controls. These allow the student to connect the strain gauges on the structures as quarter, half or full-bridge networks. The strain display works with and gives correct readings for all bridge connections and different gauge factors.

The unit has Touch LCD display for visualization of process and the measurements. The Unit is also connected to Software for computer connectivity and data analysis. The Touch screen and computer software is included in the package.

## TECHNICAL SPECIFICATIONS

### Specifications:

- Touch LCD with GUI Interface for better monitoring and accurate measurement of Plant variables.
- Includes electronic strain display to show all readings, and automatically calculates strain
- Uses strain gauges on three different and popular structures for realistic experiments
- Compact, self-contained, desk-mounting trainer
- Storage system for parts.
- ESOLS DAQ Software for monitoring and control.



## Technical Data:

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- Tension bar
  - Measuring length: 50mm
  - cross-section: 2mmx10mm
- Bending bar
  - length: 385mm
  - cross-section: 5mmx20mm
- Torsion bar
  - length: 500mm,  $\varnothing=10$ mm
- Weights
  - small: 10x 0.5N, 1x 1N (hanger)
  - large: 1x 5N, 2x 10N, 1x 20N, 1x 5N (hanger)
  
- Strain gauge measuring point: full bridge, 350 $\Omega$
- Amplifier
  - measuring range:  $\pm 24$ mV
  - resolution: 1 $\mu$ V
  - zero balancing adjustment range:  $\pm 1$ mV
  - supply voltage: 10VDC
- Frame opening WxH: 480x450mm
- Weight: approx. 20kg
- Touch LCD with GUI Interface for better monitoring and accurate measurement of Plant variables.
- ESOLS DAQ Software for monitoring and control.
  - Graphical visualization.
  - Security mechanism for login.
  - USB Connected
  - Compatible with Windows 7,8.1,10.
- Digital Instrumentation
- Capability to modify according to end user.
- Can be used in Research Purposes.

## Experimental Data:

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- Introduction to the equipment and the different bridge connections (quarter, half and full-bridge)
- Strains and stresses in a bending system
- Strains and stresses in a torsion system
- Strains and stresses in a tension system, Poisson's ratio and Young's modulus
- Comparison of different strain measurement systems and how they could measure force