

# TM 110

## Fundamentals of statics



### Description

- versatile experimental unit demonstrating planar mechanical force systems
- scope of experimentation can be extended by supplementary sets

The experimental unit demonstrates fundamental principles of statics such as the equilibrium of forces and moments, resolution of forces, the law of levers, and more.

The base element is an upright panel. Feet enable the panel to stand on a laboratory bench. All parts required for the experiment can be quickly attached to the rails around the edges. The imprinted line grid and grid-marked lever rods permit precise assembly. The lengths marked on the grid make it easy to define angles. A wide range of mountings, such as cables, rods, pulleys, torque disks, pivot bearings and the like, can be easily fixed in place and combined. Ball bearings integrated into the panel permit low-friction torque experiments. The versatility of the experimental unit helps students to explore their creativity in developing their own experiments.

Large-format force gauges are particularly well suited to demonstration purposes. The adjustable transparent dial enables input loads, such as dead-weights, to be taken into account.

As a special teaching aid, it is possible to write directly on the panel with erasable markers. Markings, sketches and comments can be added to supplement the experiments. All parts are clearly laid out and well protected on a storage system. The storage systems are stackable, providing for space-saving storage.

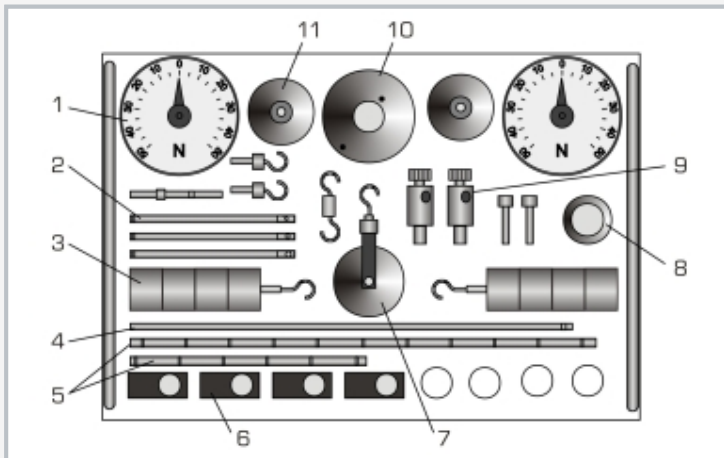
Three supplementary sets are available to extend the scope of experimentation, providing additional experiments relating to the inclined plane, friction, pulley blocks and gear wheels.

### Learning objectives/experiments

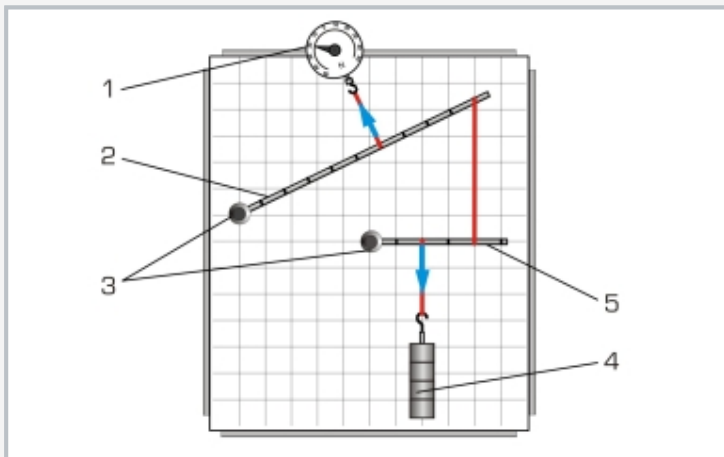
- accumulation and resolution of forces with force parallelogram
- equilibrium of forces
- law of levers, determination of moments and equilibrium of moments
- combined lever systems
- forces in bearings
- deflection and resolution of force by fixed and free pulleys
- together with supplementary sets
  - ▶ inclined plane; friction (TM 110.01)
  - ▶ pulley blocks (TM 110.02)
  - ▶ gear wheels (TM 110.03)

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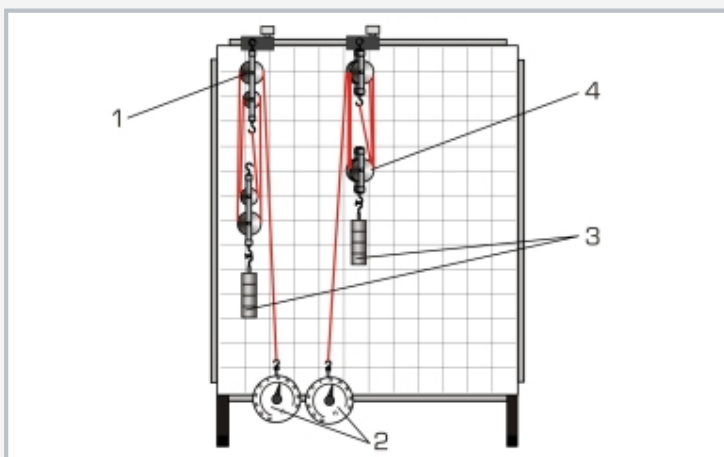
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1 force gauge, 2 pull rod, 3 weight with hanger, 4 pull-and-push rod, 5 lever rod, 6 slide fixings, 7 free pulley, 8 torque disk, 9 pivot bearing, 10 torque disk with bearing, 11 pulley



Experimental setup combined lever system:  
1 force gauge, 2 long lever rod, 3 pivot bearing, 4 weight, 5 short lever rod; red: cables, blue: forces



Experimental setup with the pulley blocks supplementary set (TM 110.02):  
1 four-cable pulley block, 2 force gauge, 3 weight, 4 six-cable pulley block

### Specification

- [1] experimental setup to demonstrate simple, planar force systems
- [2] panel with rails around the edges for easy mounting of various experimental components
- [3] panel with imprinted 50mm line grid and facility to write on using erasable marker
- [4] lever rods with 50mm grid
- [5] wide range of mountings: cables, rods, pulleys, torque disks, pivot bearings and the like
- [6] force gauges for tensile and compressive forces, with large-format display
- [7] transparent dial on force gauge rotatable
- [8] storage system to house all parts

### Technical data

#### Panel

- WxH: 600x700mm, 13kg
- line grid: 50mm

#### Force gauges for tensile and compressive force

- measuring range:  $\pm 50\text{N}$
- display diameter:  $\varnothing = 110\text{mm}$
- protected against overloading

#### Weights

- 2x 5N (hanger)
- 6x 5N

WxH: 600x700mm (panel)

LxWxH: 604x404x132mm (storage system)

Weight: approx. 30kg

### Scope of delivery

- 1 panel
- 1 set of mountings
- 1 set of weights
- 1 storage system with foam inlay
- 1 set of instructional material

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### Optional accessories

TM 110.01	Supplementary set - inclined plane and friction
TM 110.02	Supplementary set - pulley blocks
TM 110.03	Supplementary set - gear wheels
WP 300.09	Laboratory trolley