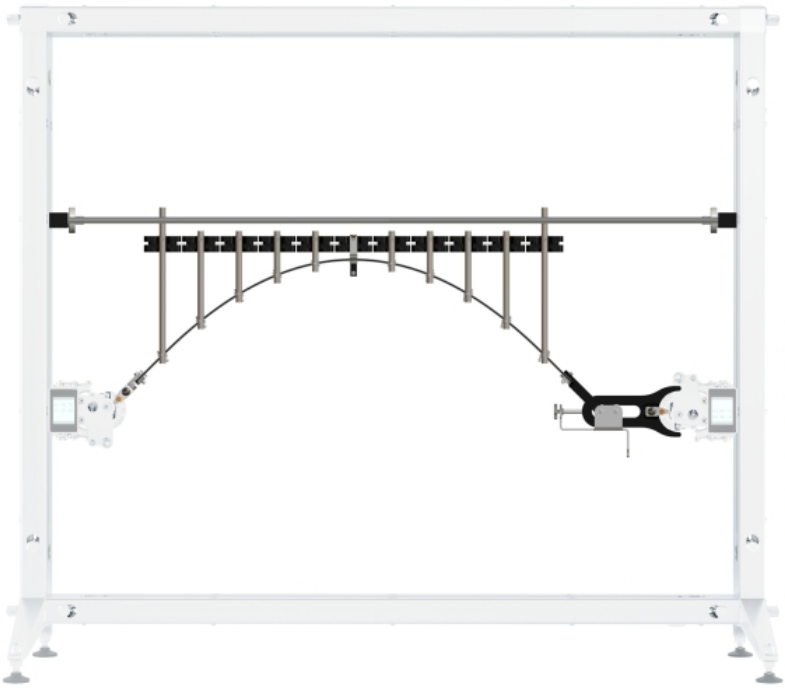
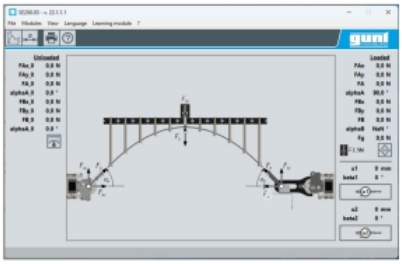
SE 200.03

MEC - Parabolic arch bridge





Description

- **wireless setup of an arch bridge together with smart, communication-enabled accessories**
- **bearing for measuring force and displacement**
- **click system for easy setup and reconfiguration**
- **automatic identification in the GUNT software and assignment of optional loads**

An arch bridge consists of an arch that either supports the bridge from below or holds the bridge from above. Arch bridges are used to span long distances.

SE 200.03, in combination with other accessories of the MEC Line, enables the smart, digitally supported experimental setup of an arch bridge. The experiment includes an arch bridge with a supporting arch underneath the roadway. Supports, loads and distance measurement are available as smart accessories. The experimental arrangement is set up in the SE 200 mounting frame. The stainless steel mounting frame provides direct and wireless data transmission and power supply for the smart components. The click system ensures that the components easily snap into place.

The arch shape is parabolic. The supports from the roadway to the arch can be removed. A load can be placed at each of eleven positions on the roadway. It is also possible to investigate a moving load. Line loads can be generated by combining several load elements. Alternatively, the line load from the optional accessories can be used. The roadway is flexible. A bridge bearing can be used as a fixed or floating bearing.

In experiments, the forces on the supports and the displacement on the floating bearing or the supports are recorded using a distance measurement device. They are displayed as a measured value directly on the smart components and in the GUNT software. The exact position of the loads on the roadway is recorded using a binary code (Gray code). The GUNT software identifies the position and location of the applied loads and reacts dynamically to changes. The arch forces and the angle at the supports are calculated. The measured values are analysed in real time.

All components are clearly laid out and well protected in a storage system.

Learning objectives/experiments

- measurement of the arch forces on
  - unloaded arch bridge
  - loaded arch bridge
- measurement of the support forces as a function of the loading on the arch bridge
- effect of a moving load
- accessories of the modular MEC Line can be combined for any setup and extension of the experiments

GUNT Media Center, develop digital skills

- retrieve information from digital networks
- E-Learning course with fundamental knowledge and detailed presentation of the experiment procedure and engaging animations
- assured learning success through digital worksheets

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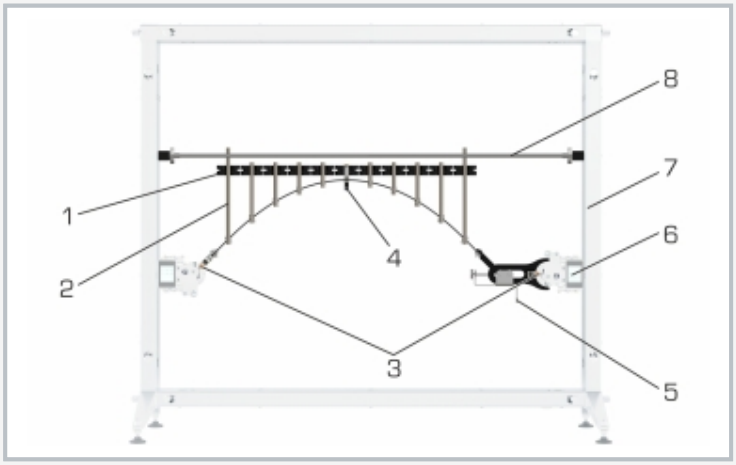
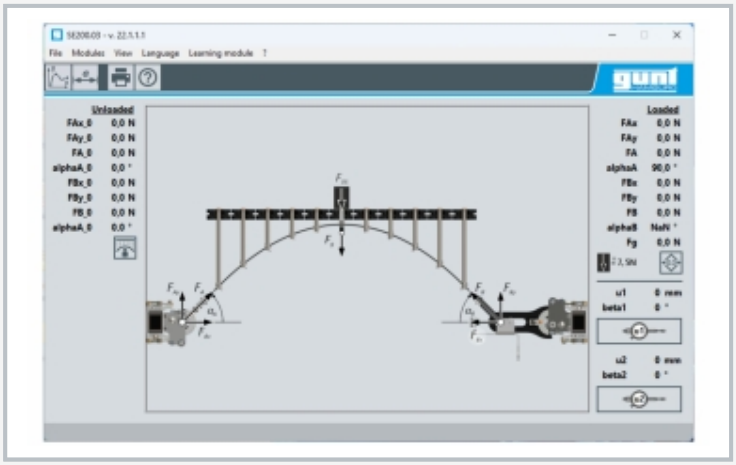
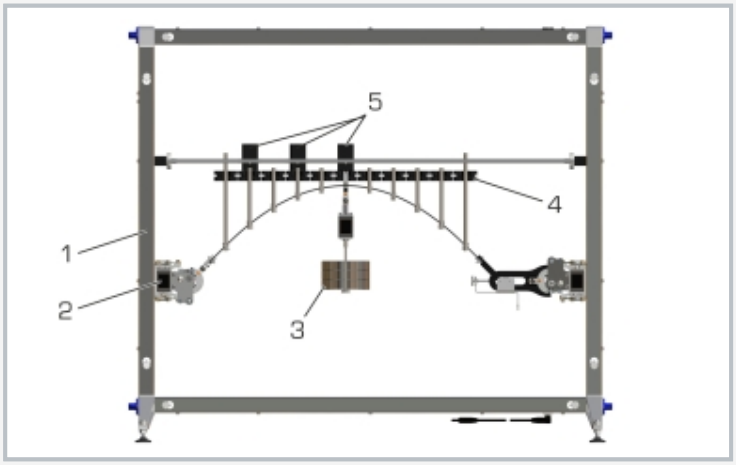


1 roadway with 11 sections, 2 support, 3 holder for support, 4 holder for vertical load, 5 stop for measuring the displacement, 6 support SE 200.21, 7 mounting frame SE 200, 8 reinforcing brace



Screenshot of the GUNT software with measured bearing forces and calculated variables such as angles and arch forces



Setup example: 1 mounting frame SE 200, 2 support SE 200.21, 3 vertical load SE 200.24, 4 arched bridge, 5 loads SE 200.25

Specification

[1] measurement of the bearing forces on an arch bridge under different loads
[2] arch bridge with supporting arch underneath the roadway
[3] setup of the entire experiment arrangement in the SE 200 mounting frame
[4] click system for simple, fast experimental setup without cabling
[5] flexible roadway
[6] loading of the arch bridge with optional individual loads (including as moving load), line load, vertical load
[7] automatic identification and exact position detection of the loads on the roadway by means of a binary code (Gray code)
[8] one bridge bearing can be used as a fixed or floating bearing
[9] measurement of displacement at the floating bearing or the supports via optional distance measurement
[10] display of measured values and visual representation of the forces in the GUNT software
[11] GUNT software via USB under Windows 11
[12] digital multimedia teaching material online in the GUNT Media Center: E-Learning course, worksheets

Technical data

Bridge sections
- 11 pieces
- 1 holder each for positioning the load
- centre bridge section with holder for vertical load

Roadway length: 658mm

LxWxH: 800x600x200mm (storage system)
Weight: approx. 18kg (total)

Required for operation

Accessories from the GUNT MEC Line series, PC with Windows recommended

Scope of delivery

1 arch bridge
1 GUNT software
1 set of instructional material
1 online access to the GUNT Media Center
1 storage system with foam inlay

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Required accessories

SE 200	MEC - Frame digital & smart
2x	
SE 200.21	MEC - Support
min. 1, max. 2	
SE 200.25	MEC - Load

Optional accessories

max. 2	
SE 200.23	MEC - Distance measurement
max. 1	
SE 200.24	MEC - Vertical load
max. 1	
SE 200.26	MEC - Line load