



## ≡ SIMPLE SUSPENSION BRIDGE



Experiment for the study of the characteristics of a simple suspension bridge. Mounts on the Structures platform and connects to the Structures automatic data acquisition unit and software (VDAS® Onboard).



SHOWN FITTED TO THE STRUCTURES PLATFORM (STS1, AVAILABLE SEPARATELY)  
LAPTOP NOT INCLUDED

SCREENSHOT OF THE VDAS® SOFTWARE

### KEY FEATURES

- One of a range of experiment modules that teach structures principles
- Fits to the Structures platform for ergonomic use and space-saving storage
- Includes multiple loads for many combinations of loads including uniformly distributed loads (UDLs)
- A simplified version of a realistic structure to give students an understanding of real-life structures
- Direct measurement of cable tension for simple and quick experiments
- Supplied with a storage tray to keep smaller items safe
- Works with user-friendly software (VDAS®)



# ≡ SIMPLE SUSPENSION BRIDGE



## 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 tension in the suspension cable supporting the 'deck' of a suspension bridge. Students add loads to the deck held by the suspension cable between two supports. A load cell in the left-hand support measures the cable tension.

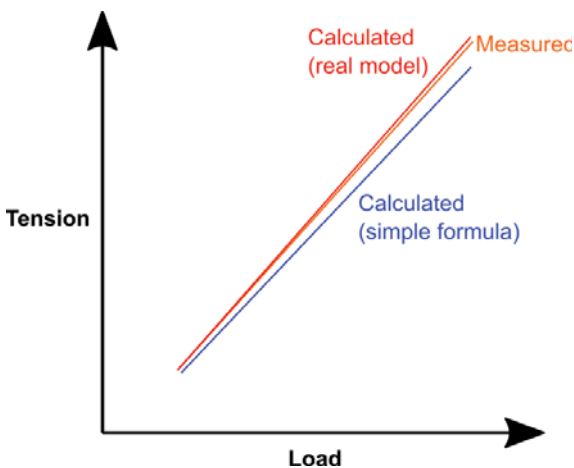
Students apply loads, which change the cable tension. They use textbook beam equations to predict the tension for any given load, comparing them to measured results. This helps confirm the reliability of the textbook equations and the accuracy of the experiment results. The theory shows the simplified parabola-based equation and the more realistic theory, based on the model. It also helps students understand the overwhelming influence of the deck mass against the relatively small loads such as vehicles passing over the bridge.

This product includes additional masses so students may apply a uniformly distributed load (UDL) and 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



TYPICAL EXPERIMENT RESULTS COMPARING THE MEASURED AND CALCULATED TENSION FOR AN INCREASING LOAD

## LEARNING OUTCOMES

- How bridge load affects the tension in a suspension cable
- Comparing a central point load with a UDL
- Exploring the ratio of bridge 'deck' mass and a moving load
- Comparing simple parabola-based theory with a more realistic analysis of the model

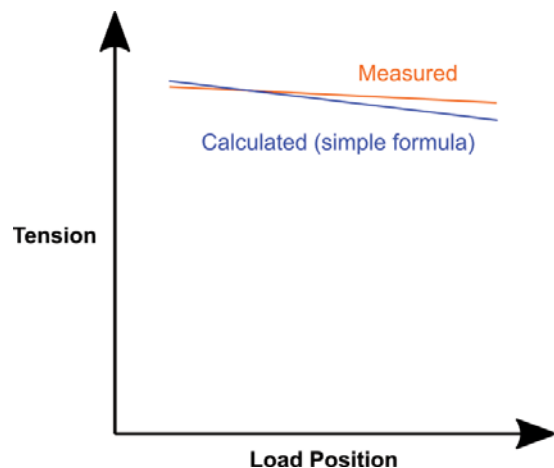
## ESSENTIAL ANCILLARY

- Structures Platform (STS1)

## SOFTWARE

TecEquipment 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 other loading conditions and portal properties, extending the learning experience beyond the practical laboratory session.



TYPICAL EXPERIMENT RESULTS COMPARING THE MEASURED AND CALCULATED TENSION FOR A MOVING POINT LOAD

# ≡ SIMPLE SUSPENSION BRIDGE



## 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

## SPECIFICATIONS

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

### DIMENSIONS AND WEIGHT:

- Nett (assembled): 760 mm long x 90 mm front to back and 340 mm high and 6 kg
- Approximate primary packed (with storage tray): 0.07 m<sup>3</sup> and 8 kg

### SPACE NEEDED:

- 1500 mm x 600 mm, level bench or desk

### ITEMS INCLUDED:

- Two bridge supports
- Cable suspension bridge and deck, 0.5 m span and 0.1 m sag
- Cable
- Nine mass hangers
- 50 x 20 g masses
- Hexagon tool for assembly
- Storage tray
- Comprehensive user guide

