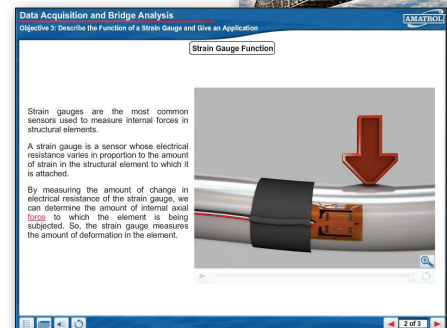
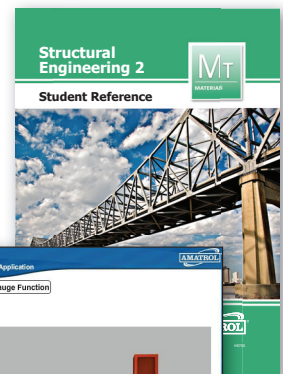


Structural Engineering 2 Learning System

96-SE2



Student Reference Guide



Interactive Multimedia Curriculum

Learning Topics:

- Moments and Equilibrium
- Stress and Bending
- Moments in Beams
- Moment of Inertia
- Data Acquisition
- Strain Gauges
- Truss Bridge Analysis:
Method of Joints
- Truss Bridge Analysis:
Method of Sections

Amatrol's Structural Engineering 2 Learning System (96-SE2) adds to the 96-SE1 Structural Engineering 1 Learning System to teach statics, data acquisition, and bridge design analysis. The data acquisition system uses structural members equipped with strain gauges to measure the forces acting on a structure, constructed by the learners, and the system records these values to provide a clear picture of how the structure is reacting to the applied force. Through calculations and data acquisition analysis, learners will analyze the forces in truss bridge designs.

The 96-SE2 includes a data acquisition system, bridge components fitted with strain gauges, a test fixture hardware package, and interactive multimedia student curriculum. The learning content covers topics such as bending stress and the moment of inertia, data acquisition, and truss bridge analysis.



Technical Data

Complete technical specifications available upon request.

Data Acquisition System

- Signal conditioner unit with (8) analog channels
- Single active gauge
- DC dual power supply +/- VDC 0.16 amp
- USB cable, A-B MCC DAQ software, 8 digital inputs, 12 bit resolution, 200,000 samples/second sampling rate, voltage ranges +/- .05
- Windows based data acquisition and analysis software with graphics controls/indicators, simultaneous display of up to eight signals, real time calculation/display of results

Bridge Component Set 2B

- 7" beams with pre-applied and wired strain gauges (4)
- 9.9" beams with pre-applied and wired strain gauges (4)

Beam Component Set 1

- Wood beam
- Foam beam

Test Fixture Kit 2

- Clevis top beam
- Connection plates (2)
- Clevis pin $\frac{1}{4}$ x $\frac{1}{2}$ long (3)
- Clevis pin $\frac{1}{4}$ x $\frac{3}{4}$ long (3)
- Cotter hairpins (6)
- Beam load bar
- Top beam, test structure
- $\frac{1}{4}$ -20 x $\frac{3}{4}$ pan head screws (4)
- $\frac{1}{4}$ -20 x 1 $\frac{1}{2}$ pan head screws (4)

Interactive Multimedia Curriculum (MB785)

Instructor's Guide (CB785)

Installation Guide (DB785)

Student Reference Guide (HB785)

Additional Requirements

- Structural Engineering 1 (96-SE1)

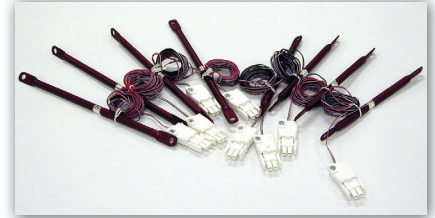
Utilities

- Electricity supplied by 96-SE1

See the Forces at Work on the Bridge Members with Data Acquisition!

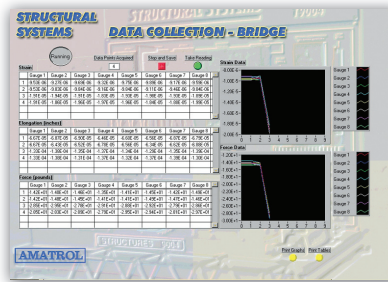
The 96-SE2 Learning System includes 8 structural members equipped with strain gauges. Strain gauges are the most common sensors used to measure internal forces in structural elements. The strain gauge generates varied amounts of electrical resistance in proportion to the amount of strain in the structural element where the gauge is attached. Learners can determine how much internal force is being placed on the element by measuring the amount of change in electrical resistance.

Once learners are taught how strain gauges are used to determine forces, they will build several structures using these structural elements, apply a load to the structure, and use a data acquisition system to record data from all eight strain gauges. Once this data has been collected, learners will be taught how to evaluate the results.



Strain Gauges on Structural Elements

Data Acquisition System Collects and Displays Data Graphically

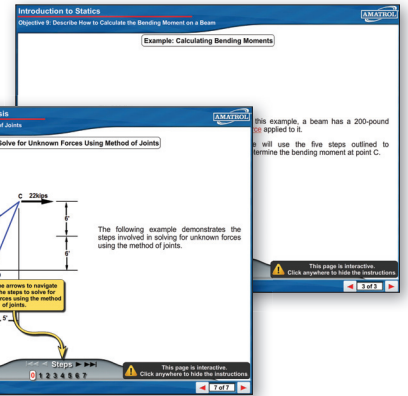


Bridge Design Software

The 96-SE2 uses industrial quality data acquisition software, which can be configured to display data graphically as well as numerically. Learners will configure the software to collect data from 1 to 8 pre-mounted strain gauges. The strain gauges are pre-wired to connect to a signal conditioner unit that has 8 analog channels.

Interactive Multimedia is Key to Understanding Forces on a Structure

Statics is the area of mechanics that deal with forces that act on bodies at rest under equilibrium conditions. Amatrol's multimedia presents this complex topic in an easy to understand method using animations, interactions, and 3D graphics. Learners see how forces cause reactions throughout a structure including rotational forces called moments as well as bending moments that occur when a structural element is fixed and not allowed to rotate. Learners will be walked through calculations to determine the forces acting on a structure using the Method of Joints and the Method of Sections.



Interactive Multimedia Curriculum

Student Reference Guide

A sample copy of the Structural Engineering 2 Student Reference Guide is included with the system for your evaluation. Sourced from the system's multimedia curriculum, the Student Reference Guide takes the entire series' technical content contained in the learning objectives and combines them into one perfect-bound book. Student Reference Guides supplement this course by providing a condensed, inexpensive reference tool that learners will find invaluable once they finish their training making it the perfect course takeaway.

