

# ➤ World leading supplier of engineering teaching equipment

## Structures ranges

PA Hilton is the market leader in the manufacture and provision of quality engineering teaching equipment for universities and colleges worldwide.

Use of our Modular Structures range allows universities to deliver lab sessions four times faster than other systems – enhancing the learning experience for students and allowing better use of a valuable financial asset. Choosing PA Hilton maximises your return on investment.

Our comprehensive range enhances the learning of structural statics, covering the spectrum of study areas, including Force, Bending, Shear, Elasticity, Beams, Arched Bridges, Suspension Bridges, Trusses, Frameworks and Portals.

Transform the learning experience and make better use of lab time.

Structures



**REPRESENTED BY:**  
Allegheny Educational Systems, Inc.  
320 East 3rd Avenue  
Tarentum, PA 15084  
Phone: 800-232-7600  
[www.alleghenyedusys.com](http://www.alleghenyedusys.com)



### HST1 Universal Frame and Stand

- Versatile 'two' Frames in 'one'; floor standing and bench frame
- Can be used for wall mounted apparatus if wall space limited
- Potential for mounting 2-3 experiments at a time



### HST100 Bench Mounted Frame

- Ideal if laboratory floor space restricted
- Extra Height feet included
- Used for a majority of 'HST' Structures Experiments



### HST2 Simple Suspension Bridge

- Visually realistic Suspension bridge
- Solid bridge deck
- Cable Tension measured using load cells



### HST3 Plastic Bending of Beams

- High quality, robust and durable design
- Three supports; Simple, fixed, propped cantilever
- Commercially available specimen size

### HST3A HST3 Beam Specimens

- Set of 10 additional Test beams



### HST4 Three Hinged Arch

- Visual reality of Three Hinged Arch
- Unrestricted loading positions along arch span
- High quality, sturdy and robust sections



### HST5 Two Hinged Parabolic Arch

- Visual reality of an Arch
- Seven load points
- Loads can be applied at the same time or one at a time

### HST5A Semi-Circular Arch

- Semi-Circular arch for HST5
- Fit compatible with HST5
- Same experiments as HST5 but different shaped arch



### HST7 Deflection of Frames

- High quality, robust and durable components
- Realistic steel welded portals
- 5 x optional portals available

### HST7A Optional Rectangular Portal with Overhanging Top Member

- Welded Rectangular Portal
- Overhanging top member
- Roller Bearings
- Knife Edge

### HST7C Optional Unsymmetrical Portal Frame

- Welded Unsymmetrical Portal
- Roller Bearings
- Knife Edge

### HST7D Optional Redundant Square Frame

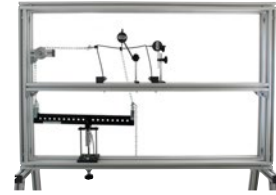
- Welded Redundant Square Portal
- Roller Bearings
- Knife Edge

### HST7e Optional Open Square Frame

- Welded Open Square Frame

### HST7G Optional Square Portal Frame

- Welded Square Portal
- Roller Bearings
- Knife Edge



### HST8 Plastic Bending of Portals

- Commercially available specimen material
- Rectangular & Pitched portals supplied (10 each)
- Realistic Portal shapes



### HST8A Optional Rectangular Portal Specimens

- Set of 10 Rectangular Portals



### HST8B Optional Pitched Portal Specimens

- Set of 10 Pitched Portals



### HST9 Shear Force in a Beam

- Visually realistic, 'cut' beam
- Takes internal forces and shows them externally
- Shear Force output via load cell



### HST10 Bending Moment in a Beam

- Visually realistic, 'cut' beam
- Takes internal forces and shows them externally
- Bending Force output via load cell



### HST11 Continuous and Indeterminate Beams

- Most comprehensive Beam apparatus available
- Three movable reaction piers for all experiments
- All reactions piers vary height



### HST12 Deflection of Curved Bars

- Six specimens supplied as standard
- Two Digital Dial Gauges supplied for HDA200 & software connection
- Deflections measured at tip of specimens



### HST13 Deflection of Beams and Cantilevers

- Wide variety of beam experiments achievable
- simply supported, cantilever, propped cantilever and encastre (built in)



### HST16 Redundant Truss

- True pin jointed structure
- Load can be applied at three joints
- No disassembly required



### HST17 Forces in a Truss (Resolution)

- True pin jointed structure
- Load can be applied at three joints
- No disassembly required



### HST18 Suspended Centre Span Bridge

- Visual reality of centre span bridge
- 2 x Point load or 1 x rolling load
- Six Reaction load cells



### HST19 Pin Jointed Frameworks

- Visually realistic ROOF truss and WARREN truss
- True pin jointed structures
- No disassembly required



### HST20 Bending Stress in a Beam

- Only requires one HDA200 to view all key parameters
- Span can be adjusted
- Quick and easy installation of 'T' Beam



### HST21 Unsymmetrical Bending & Shear Center

- Three test beams supplied as standard
- 360° adjustment in one degree increments
- Free end deflection measured relative to its fixed end



### HST22 Torsion of Rods and Tubes

- Low profile apparatus
- Five specimens provided; solid, tube, 'slit'
- Torque output using Load cell



### HST23 Equilibrium of Forces

- Unique to HST Structures Range
- Very visual experiment
- Model Warren and 'N' truss options available

### HST23A Equilibrium of Parallel Forces

- HST23 Optional experiment
- Co-planar vertical forces
- Special Case experiment
- Co-planar vertical forces, Warren and 'N'

### HST23B Equilibrium of Rigid Body

- HST23 Optional experiment
- Real life application
- Visual experiment



### HST31 Suspension Cable

- Unique to HST Structures Range
- Point or Uniformly Distributed Load (UDL)
- Wide variety of loading arrangements



### HST35 Strain Measurement for Structures

- Unique to HST Structures Range
- Five test specimens; Cantilever, bending, box, tapered
- Strain gauges on all specimens



### HST38 Deflections of Trusses

- Three Trusses from one kit
- True pin jointed structures.
- Assembly of each truss



### HST45 Buckling of Struts

- Four test specimens, spring steel, four different lengths
- Force and Deflection connect to HDA200 Interface
- Dial Gauge can traverse specimen length

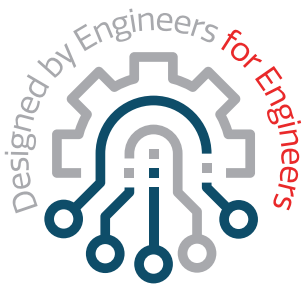


### HST46 Combined Shear Force & Bending Moment

- Two experiments in one; Bending and Shear
- Visually realistic, 'cut' beam
- Load cell output for Bending and Shear Force



Maximise students per session, so **more efficient use of lab and student time.**



## Innovative teaching software

### HSTS Structures Software Package

PA Hilton offers leading-edge software technology that enables a wide variety of experiments within the Structures range to be simulated prior to testing on the hardware.

With a suite of 20 experiment softwares, the package broadens the learning experience with its ability to both simulate, or capture in real-time, the experimental data. The HSTS can be run offline in a standalone mode away from hardware, or accompanying the hardware experiment online – making it an invaluable tool for comparing actual and theoretical results.

The software also offers a wide range of experiment parameters that are not available on the hardware. Parameters that can be widely adjusted include: Load, Modulus of Elasticity, Material, Material width/height/diameters/lengths.

Students will be able to save their captured data, and export them to spreadsheet software for further analysis and presentation.



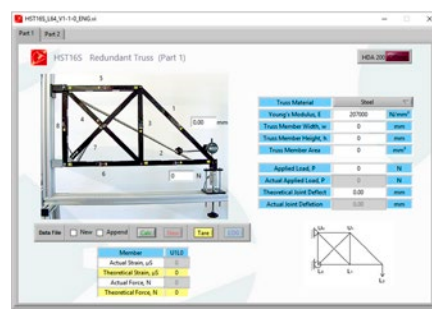
### HDA200 Interface

This unique and compact unit is essential for all relevant Structures range experiments that require the key parameters of Force, Strain, Deflection and Angle to be captured and displayed.

Designed for use with 18 HST Structures experiments, this versatile equipment can run standalone with the experiment hardware, or in parallel with the experimental software.

The on-board Data Acquisition Facility captures and displays data via its integral four-line back-lit LCD display. The experiment software allows the operator to retrieve this data for reviewing at any time.

The USB-connected interface allows for quick and easy monitoring of the experiment and can be bench or HST1 frame mounted.



Investing in PA Hilton Structures range has been a strategic step for us in developing the Structural Analysis Laboratory for UG students.

With the finely designed apparatus, students can see in action the load-response characteristics of a wide range of structural elements and systems, verify their results in real-time and also extrapolate the results with the help of the simulation tool.

I highly recommend PA Hilton as a valuable aid to structural engineering teaching.

Dr Kaustav Sarkar  
Assistant Professor at the School of Engineering  
Indian Institute of Technology Mandi  
Kamand, India

+44 (0) 1794 388 382

[www.pahilton.co.uk](http://www.pahilton.co.uk)

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