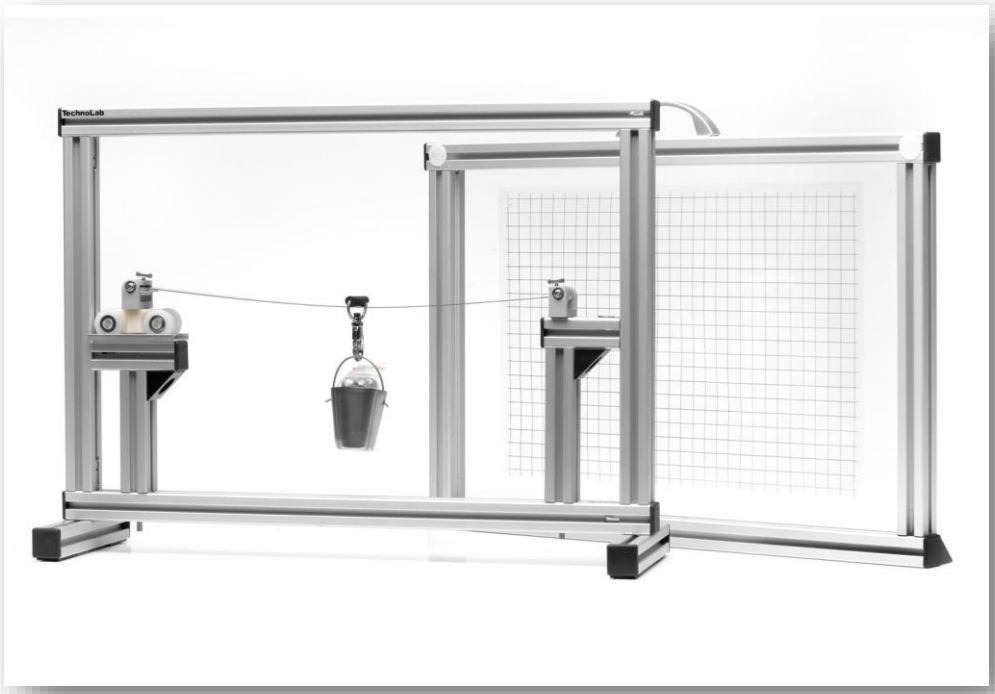

F-04 Deflections of a Simply Supported Beam - Effect of cross-section

(1 BM-01 Beam Material Set1; 1 PC-01 Pin-Support Column-1; 1 RC-1 Roller-Support Column-1)

Aims: This experiment is designed to allow students to observe measure and compare the static displacements of simply supported beams under the action of point loads (number and locations of these loads to be selected by the instructor) and distributed loads. Cross-sections for cantilevers of the same material can be chosen by the instructor from a selection noted in a list.

Learning Outcomes:

After performing this experiment students will be able to:

(i) Use the Spreadsheet supplied to compare the predicted displaced shape (based upon the double integration method) with its experimentally observed counterpart.
(ii) Identify the influence different section properties of the same material from the selection chosen would have on the relative stiffness/ flexibility of these beams.
(iii) Reinforce their understanding of equilibrium of forces in the context of flexure, through measurement of reaction forces
(iv) Appreciate the characteristic differences made to the deflected shape of a beam by a distributed load and its point force equivalent.

Equipment/Resources Required:

(i) **TM-00** (Pixi with window frame in “landscape” configuration with transparent film & pens; Set of two adjustable assemblies of stainless steel weights; Digital Scales for weight force evaluation
(ii) Specimen set of beams
(iii) A digital camera – Better than 8Mega Pixel preferred (Hi-Res phone cameras are suitable)
(iv) **xyRectify** photogrammetric software on a suitable Notebook, Laptop or PC – if desired.