T-01 Forces in a 2-bar Truss

(1 TS-01 Truss member Set1; 1 SL-01 & SL-02 String Lines with end clasps)

Aims: This experiment is designed to allow students to observe measure and compare the static displacements and associated force equilibrium conditions at the common connection node of a 2-bar truss (both members of equal initial length and stiffness) to loading applied at that node (orientation of load to be selected by the instructor from a Table).

Learning Outcomes:

After performing this experiment, students will be able to:

(i) Use the Spreadsheet supplied to compare the predicted forces in each member of a 2-bar truss induced by the applied load using the method of joints with the experimentally obtained values of these forces.

(ii) Identify the influence orientation of the applied load relative to the orientation of each member in the two-bar truss would have on the induced internal member forces.

(iii) Reinforce their understanding of the equilibrium of co-planar forces in the context of the equilibrium of forces at the pin-joint of a 2-bar truss.

(iv) Appreciate the role played by a member's characteristic stiffness in the stiffness method in the evaluation of internal actions from the individual member elongation/contraction.

Equipment/Resources Required:

(i) **TM-00** (Pixi with window frame in “landscape” configuration with transparent film & pens; Set of chrome/stainless steel bearing balls (weight forces) and load buckets; Digital Scales for weight force evaluation)

(ii) A digital camera – Better than 8Mega Pixel preferred (Hi-Res phone cameras are suitable)

(iii) **xyRectify** photogrammetric software on a suitable Notebook, Laptop or PC – if desired.