

# EQUIPMENT FOR STUDYING FREE FALL AND ATWOOD'S MACHINE

## Mod. F-GFALL/EV

### DESCRIPTION

Displaying the phenomenology of the free fall of a body is always difficult because time intervals and covered distances are short. This equipment is designed for the teaching of this topic in two phases: Atwood's machine and free fall.

Atwood's machine enables to study the fall of a body subject to a constant force, but at low speed so that friction of the air is negligible. This characteristics allows to appreciate the phenomenology concerning free fall, even visually. This apparatus consists of a vertical stand of aluminium where the various system configurations can easily be assembled. A complete set of tests can be carried out.

Uniformly accelerated motion, fall with viscous friction, oscillatory motions in fluids, oscillatory motions with constant forces can be studied. The notions learnt with the first configuration enable students to carry out a classical test of free fall, with the second configuration, besides determining the acceleration of gravity and assessing the effects of the air on motion.

All system parameters (velocity, forces, accelerations) can be acquired via EVlab datalogger and proper sensors. Furthermore, the equipment also includes a specific software that enables to carry out all the tests simply and to compare theoretical hypotheses with experimental measures, besides displaying the motions examined, on charts and tables, in real time.

### TRAINING PROGRAM

- Studying uniformly accelerated motion
- Studying oscillatory motion with constant acceleration
- Studying damped oscillations in a fluid
- Studying viscous friction
- Determining the value of the acceleration of gravity
- Studying the inclined plane
- Effects of the air on the free fall of a body
- Principle of Archimedes in dynamic conditions

### TECHNICAL SPECIFICATIONS

- Stand of aluminium for accessories of Atwood's machine and free fall, 1 m tall, assembled on a 40 x 40 cm steel support
- 1 iron sphere for free fall
- 2 inclined planes 40 cm long, 4 cm wide with goniometer
- 3 pulleys for Atwood's machine
- Supports for sensors (photogate and force sensors)
- Releasing electromagnet



Atwood's machine

Apparatus for free fall

- 2 trucks
- Masses for Atwood's machine
- Plexiglas tank for fluids
- Accessories for studying oscillations

### REQUIRED (NOT INCLUDED)

- **EVLAB DATALOGGER mod. EV2010/EV** including **SOFTWARE EVLAB WORKSPACE mod. SW-F-GFALL/EV** for a total control of interactive experiments
- Force sensor **mod. EVS-03/EV**
- 2 photogate sensors **mod. EVS-04-PLUS/EV**
- **PERSONAL COMPUTER**



### SUPPLIED WITH THEORETICAL - EXPERIMENTAL HANDBOOK

