

1.3.07-11 Free fall with Cobra3



**What you can learn about ...**

- Linear motion due to constant acceleration
- Laws governing falling bodies
- Acceleration due to gravity

**Principle:**

The fall times  $t$  are measured for different heights of fall  $h$ .  $h$  is represented as the function of  $t$  or  $t^2$ , so the distance-time law of the free fall results as

$$h = \frac{1}{2} \cdot g \cdot t^2$$

Then the measured values are taken to determine the acceleration due to gravity  $g$ .

**Tasks:**

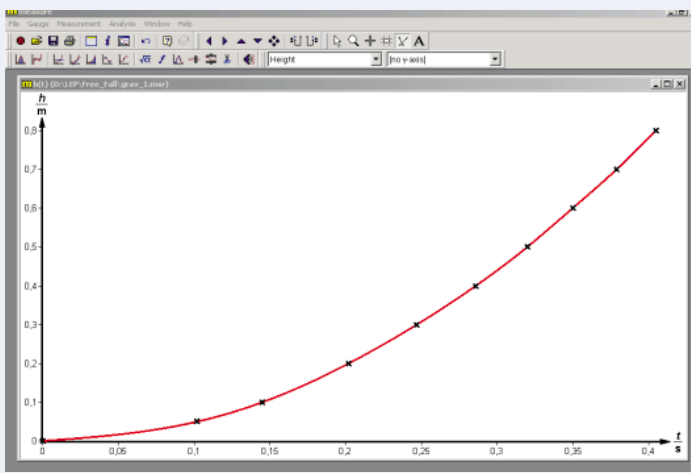
Determination of:

- Distance time law for the free fall.
- Velocity-time law for the free fall.
- Precise measurement of the acceleration due to gravity for the free fall.

**What you need:**

Falling sphere apparatus consisting of:	02502.88	1
Release unit	02502.00	1
Impact switch	02503.00	1
Cobra3 Basic Unit	12150.00	1
Power supply, 12V-	12151.99	1
RS 232 data cable	14602.00	1
Cobra3 Timer/Counter Software	14511.61	1
Tripod base -PASS-	02002.55	1
Support rod -PASS-, $l = 1000$ mm	02028.55	1
Right angle clamp -PASS-	02040.55	2
Measuring tape, $l = 2$ m	09936.00	1
Connecting cord, $l = 750$ mm, yellow	07362.02	1
Connecting cord, $l = 750$ mm, blue	07362.04	1
Connecting cord, $l = 1500$ mm, yellow	07364.02	1
Connecting cord, $l = 1500$ mm, blue	07364.04	1
PC, Windows® 95 or higher		

**Complete Equipment Set, Manual on CD-ROM included**  
**Free fall with Cobra3** P2130711



Height of fall as a function of falling time.