3B SCIENTIFIC® PHYSICS

...going one step further

5g Accelerometer 1000561

Instruction sheet

10/15 Hh

1. Safety instructions

- Never exceed the maximum acceleration of 1500 times gravitational acceleration in any direction, to avoid permanent damage to the semiconductor built into the small black box!
- The maximum height from which the sensor can survive dropping onto a hard surface is 1.2 m.
- Only use the accelerometer 5-g for educational purposes!

The 5g accelerometer is not suitable for safety-related applications.

2. Description

Sensor box with permanently connected semiconductor acceleration sensor, Z-axis sensitive, for the measurement of gravity and the general acceleration of masses up to ±5 x g.

The effective axis (Z-axis) is marked with an arrow and the label “Earth’s Gravity Field” on the acceleration sensor.

“Capacitive" method of measurement (g-cell) with built-in signal linearisation, low-pass filtering, temperature compensation and automatic self-test.

The sensor box is automatically detected by the 3B NET*lab*™ interface.

3. Scope of delivery

1 Sensor box with permanently connected acceleration sensor, cable length 2 m.

1 Velcro strip, 500 mm long, 20 mm wide, self-adhesive

1 8-pin miniDIN connecting lead, 60 cm length

1 Instruction sheet

4. Technical data

Measurement range:	0 to ±50 m/s²
Sensor type:	Capacitive semiconductor sensor
Sensitivity:	Typically 400mV/g
Non-linearity:	No more than ±1% of the full measurement range.
Resolution:	0.03 m/s²
Band width:	typically 50 Hz
Drill hole for sensor attachment:	3 mm diam. max.

5. Operation

- Place the sensor box alongside the experiment and attach the acceleration sensor (small black box) to the mass to be investigated (target). Use the supplied Velcro strip or a clamp for this purpose.
- Read the value of the acceleration from the display on the 3B NET*log*™ unit.

6. Applications

Demonstration track and air track experiments:

Downward acceleration

Elastic and non-elastic impact

Oscillating spring-mass system

High-resolution measurement of objects' inclination

Pendulum oscillations

Jumping experiments; "bungee jumping"

7. Sample experiment

Acceleration measurement in a damped oscillating spring-mass system

Required equipment:

1 3B NET*log*™ @ 230 V	1000540
or	
1 3B NET*log*™ @ 115 V	1000539
1 3B NET*lab*™	1000544
1 5-g accelerometer	1000561
1 Stand base	1002835
1 Stand rod, 750 mm length	1002935
1 Stand rod, 250 mm length	1002933
2 Universal clamps	1002830
1 Coil spring 3 N/m	1002945
1 Weight 100 g, from	1003214

Set up the equipment for the experiment as in Fig. 1.

Run the 3B NETlabTM software with the appropriate template for the experiment using the 5g accelerometer.

Attach the acceleration sensor to the weight with a piece of Velcro.

Suspend the weight and acceleration sensor from the eye at the bottom of the coil spring and be careful not to hinder the oscillating motion.

Drape the connecting lead for the acceleration sensor over the universal clamp, as shown in Fig. 1. This adds further to the damping.

Pull down the weight by hand to the level of the stand base and release it.

Start recording the measurement data in 3B NET*lab*™ (Fig. 2).

Analyse the recorded chart.

Fig. 1 Acceleration measurement for a damped oscillation of a mass on a spring

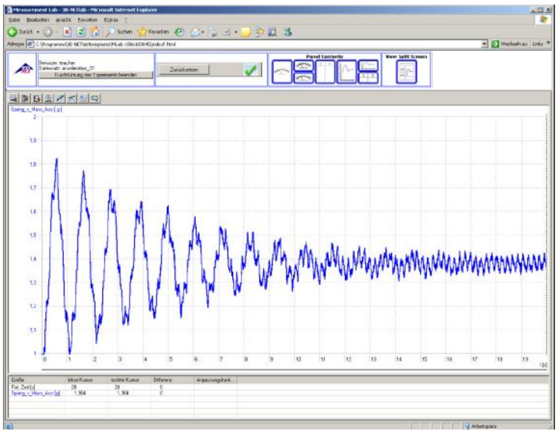

Fig. 2 Monitor display of the damped oscillation of a mass on a spring in 3B NET*lab*™