

## Photo Gate 1000563

### Instruction sheet

10/23 Hh/ALF/UD



- 1 Photo gate
- 2 Mounting plate
- 3 Stand rod
- 4 mini DIN connection cable
- 5 Knurled screw M6x15

### 1. Description

The photo gate can be used in two operating modes.

1. Internal photo gate mode: photo gate with an infrared light source and an infrared detector with a very short signal delay for measuring time intervals with moving bodies, e.g. during free fall, in air track experiments and for pendulum oscillations, as well as for counting pulses.

2. Laser photo gate mode: laser diode detector built in at the side for setting up a wide-range gate along with a laser pointer, e.g. during sporting events.

The photo gate is equipped with a built-in LED function display: beam broken = 1 (TTL high). When disabled or when the beam is interrupted, the LED function display comes on.

The narrow gate arm in front of the infrared source includes a sliding mechanical shutter that

is used for disabling internal photo gate mode and activating laser photo gate mode.

### 2. Scope of delivery

- 1 Photo gate
- 1 Stand rod, length: 130 mm
- 1 8-pin mini DIN connection cable, length: 1 m
- 1 Knurled screw M6x15
- 1 Mounting plate for photo gate

### 3. Options

1 Digital Counter (230 V, 50/60 Hz)	1001033
or	
1 Digital Counter (115 V, 50/60 Hz)	1001032
or	
1 Connection Cable MiniDIN8 - BT	1021688
1 Data logger	
1 Software	

More information about digital measurement can be found on the product's webpage in the 3B Webshop.

### 4. Technical data

Separation of prongs:	82 mm
Rise time:	60 ns
Spatial resolution:	< 1 mm
Time resolution:	10 $\mu$ s

### 5. Operation

- Screw onto the stand rod using the arm attached to the thinner of the two prongs of the gate and the M6 nut provided for this purpose.
- Insert the 8-pin mini DIN or the MiniDIN8 - BT connection cable into the mini DIN connector on the broader prong of the gate and connect it to the digital counter or the data logger.
- Activate internal photo gate mode by opening the mechanical shutter. Subsequently, mount and focus the device for the intended application.
- Activate laser photo gate mode by closing the mechanical shutter and (roughly) focus the laser light source onto the opening at the side of the photo gate. To achieve this, mirrors may be used to deflect the laser beam. Make fine adjustments to the photo gate.

### 6. Applications

Determining the position, velocity and acceleration of moving bodies

Determining the acceleration due to gravity  $g$  in free fall experiments

Measuring periods of oscillating bodies (e.g. using torsion apparatus 1018550 and Kater's reversible pendulum 1018466).

### 7. Set-up variations, Sample experiments



Fig. 1: With stand rod and any kind of stand apparatus, e.g. for experiments with air track

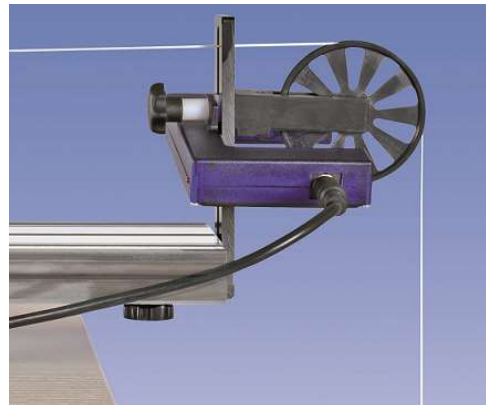


Fig. 2: With knurled screw for attachment to track in conjunction with spoked pulley



Fig. 3: With holding plate e.g. in experiment with torsion apparatus or reversible pendulum

## 8. Storage, cleaning and disposal

- Keep the equipment in a clean, dry and dust-free place.
- Do not use any aggressive cleaning agents or solvents to clean the equipment.
- Use a soft, damp cloth for cleaning.
- The packaging should be disposed of at local recycling points.
- Should you need to dispose of the equipment itself, never throw it away in normal domestic waste. If being used in private households it can be disposed of at the local public waste disposal authority.
- Comply with the applicable regulations for the disposal of electrical equipment.

