

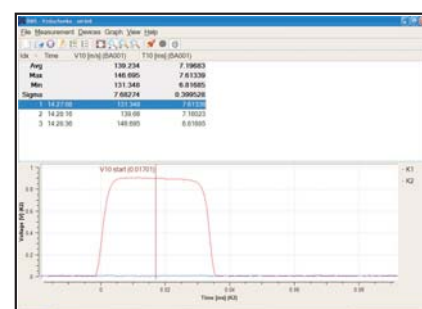
## INTELLIGENT LIGHT GATES LS04

Intelligent light gates LS04 serves for measuring projectile velocities and rate of fire. Two modifications LS04 (LAS) and LS04 (LED) are offered. Modification **LS04 (LAS)** is assigned to measure the projectile velocities and rate of fire.

Modification **LS04 (LED)** is assigned to measure the projectile velocities, which are in need of a special signal analysis when the signal is generated by a projectile flying through a gate (e.g. in the case of determination of pellets cluster centre of gravity) and rate of fire.



Intelligent light gates LS04 (LAS) - Base 1m



Software Velocity Measurement v. 2.0



Mobile imaging unit being provided with a contactless display Tablet PC



Intelligent light gates LS04 (LAS) - Base 2m

### Technical description

Intelligent light gates LS04 operates on principle to pick-up the projectile flying through two luminous gates firmly fixed in a defined base. When a projectile is flying through the first gate, a signal START is recorded, by flying through the second gate a signal STOP is subsequently recorded, too. By means of a time-meter unit the time of projectile flight between both gates is measured. When heaving time measured at given base length, the projectile velocity is calculated. When measuring the rate of fire, moreover time intervals between individual projectiles flying through the first gate are recorded. The gates are placed on a rugged duralumin frame being provided with adjustable height and travelling wheels to secure a simple transport. The travelling wheels are omnidirectional with a combined brake to control when the wheels are rotating and turning. The device contains an integrated evaluating unit based on an industrial PC, which secures time-interval measurements and their recalculation to real values of quantities measured. The whole measuring is automatically started by the projectile flying through the first gate. The evaluating unit and a service PC are connected by means of cordless connection (WiFi), or by means of interface Ethernet, Rs232, possibly the evaluating unit is connected in to local network LAN. In accordance with a request of user, it is possible to supply the mobile imaging unit with a contactless display Tablet PC (Touch Screen). Client program **Software Velocity Measurement v. 2.0** operating under OS Windows secures an imaging and archiving momentary and statistically treated values of velocity and rate of fire. Data are filed in the text set, which can be processed by common table processor or by text procesor (MS Excel, Word...).

### Modification LS04 (LAS)

Laser diode with a special linear optics is utilized as a source of limunous radiation. A triangle profile of picked-up area is originated by means of light wobbling from one point. By utilization of this light source and pick-up electronics fits for it, a higher resistance to perturbative effects (e.g. blast wave, flash, flame) when compared to commonly used sources provided with LED. The evaluating unit utilizes a start stop counter for measuring the time of projectile flight between gates (velocity) and flying counter for measuring the time between shoots (rate of fire). With regard to the fact, that a course of projectile flying through signal is not treated (evaluated), this variant doesn't make possible a projectile shape analysis. And that is not suitable for measuring the velocity of shot-gun projectiles, if a determination of projectile flying through moment is required by means of pellets cluster centre of gravity.

### Modification LS04 (LED)

A source of light radiation is created by a number of infrared LED. An area picked-up is of a rectangle shape. The evaluating unit is recording a signal course, which is generated by projectile flying-through and subsequently a mathematical analysis is performed. The signal course can be also imaged and then an instant time of the projectile flying through can be determined manually. When measuring the velocity in the course of dose, the number of shots is limited dependently on the sampling frequency and actual rate of fire.

### Specifications

Measuring the projectile velocity

- range 50-2000 m/s
- resolution 0,2 m/s
- accuracy 1%

Measuring the rate of fire

- range 60-3000 rpm
- resolution 1 rpm
- accuracy 1%

Projectile calibre range	4 up to 20 mm (maximal projectile calibre tested cartridges was 20x102 mm) (The device supports measuring the velocity of thrown objects up to the size of 100x100 mm)
Area picked-up	isosceles triangle, base 700 mm, height 950 mm for LS04 (LAS) rectangle of 700 mm x 900 mm for LS04 (LED)
Base	2 m (1 m optionally)
Hight of axis	adjustable within 950 up to 1450 mm for LS04 (LAS) 750 up to 1250 mm for LS04 (LED)
Interface	10/100 Ethernet, WiFi (IEEE 802.11b), RS232
Range of temperature	+5 <sup>o</sup> C up to +50 <sup>o</sup> C
Mains feed	230 V / 50 Hz (12 V or 24 V optionally)

### Software Velocity Measurement v. 2.0

Supported by OS: Windows 98, 2000, XP, Linux

HW configuration recommended : Pentium II/366, 128 MB RAM, 10GB HDD (or better configuration)

Evaluated values: actual, minimal, maximal and mean values of velocity and rate of fire, time of flying through between gates, time among shots and other quantities in accordance with requirements of device users.

Output: text file

## DIMENSIONAL SCHEMES

