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Light Screen

Type 2523A

For Velocity and Accuracy Measurement of Projectiles

Weatherproof optical system for highly accurate measurement of projectile velocities and dispersion up to 3000 m/s. The light screen is suited to work in harsh outdoor conditions as well as indoor testing facilities.

- Analog outputs for transonic projectiles
- Highly accurate over a wide velocity range
- IP66 rating for outdoor use
- Closely integrated into KiDynamic software

Description

The Type 2523A operates with optical light gates working in the infrared spectrum to detect the velocity of projectiles. The wavelength and the analog output allow the robust detection of subsonic, transonic, and supersonic projectiles with a single system.

Additionally, the analog output voltage is proportional to the shadow of the passing object allowing the detection of the projectile shape. Furthermore, even clouds of projectiles can be detected with the correct software processing.
For high velocity projectiles, fast signal conditioning and data acquisition is required, such as with Kistler transient recorder 2529A.

Application

The 2523A can be applied in a wide range of applications where projectiles at high velocity need to be measured. This includes:

- Testing of tooling such as nail guns
- EPVAT Testing

Included Accessories

- none

Optional Accessories	Type/Art. No.
• Coaxial BNC-BNC cable	2519AZ100Asp

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Technical Data

Principle of measurement		4 high-speed optical gates 2 vertical (velocity) 2 oblique (position)
Caliber range	mm	4 ... 40 [1]
Velocity range	m/s	50 ... 3 000 [1]
XY coordinate inaccuracy highest value, 200 ... 1 500 m/s, projectile base trigger		<5 mm or <0,5 % of XY range or 0,5 · caliber
Velocity inaccuracy 200 ... 1 500 m/s, 1 000 mm measuring base, projectile base trigger	%	<0,2
Safe passage area (WxH)	mm	1 050x1 200
Effective sensor area (WxH)	mm	950x950
Measuring base for velocity	mm	1 000
Dimensions WxHxD (approx.)	mm	1 350x1 850x1 100
Trigger modes	edge	rising/falling (= projectile nose/base)
Schock wave filter selectable software filter	µs	0 ... 1 000
Threshold level, selectable	%	–75 ... 75 of meas. range
Output signals		BNC X and Y output
Gain range, selectable		1, 2, 5, 10
Power	VDC W	10 ... 24 40
Operating temperature range	°C	–30 ... 45
Degree of protection		IP66
Air humidity (condensing or non-condensing)	%	100
Altitude (maximum)	m	3 000

[1] extended range on request

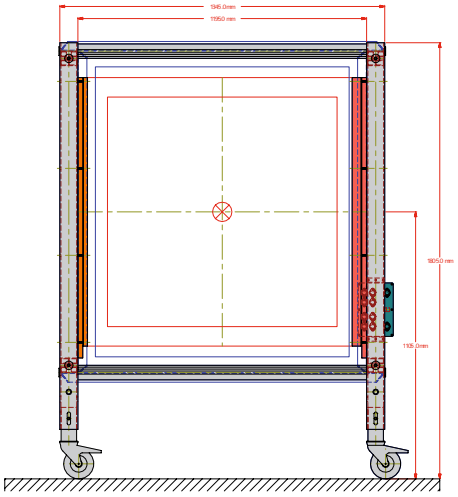

Fig. 1: Dimensions front

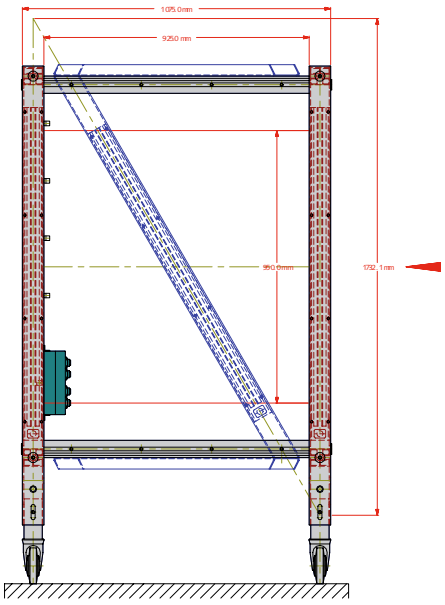

Fig. 2: Dimensions side

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Working principal

The target system contains two vertical gates (at the input and output frame), which measure time. The interval depends only on the projectile velocity and is independent of the projectile position. Two diagonal gates (one across width and one across height – coordinates X and Y) are placed between the vertical gates. These diagonal gates generate pulses, which depend on the projectile position. Fig. 3 shows the typical signals produced by the two projectiles A and B on the diagonal gate and the two vertical gates. The coordinate of the projectile can be computed from the ratio of the intervals 1-2 and 1-a (or 1-2 and 1-b)

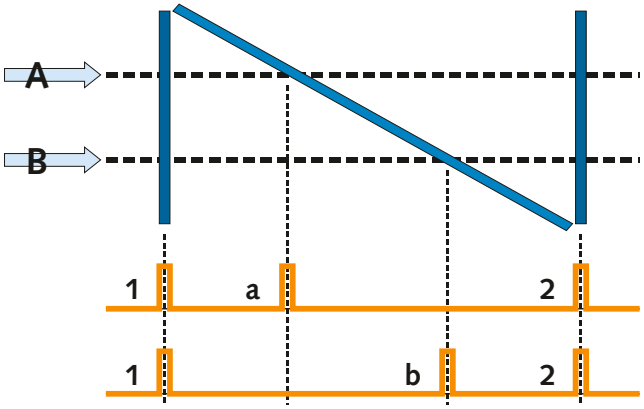

Fig. 3: Relationship between coordinates and time intervals