LIP

Tester of laser pointers/illuminators

a) b)

Fig.1. Photo of LIP station a)LBIS beam imaging system b) LCOP power meter

BASIC INFORMATION:

Laser systems are nowadays frequently used to indicate point of interest (laser pointers) or to illuminate area of interest under surveillance using NVDs or VIS-NIR cameras (laser illuminators). There are also laser devices that fuse functions of both pointer and illuminator. Great majority of these laser devices emit light in NIR spectral band or more rarely in visible band.

Both laser pointers, laser illuminators or laser pointer/illuminators are apparently simple devices but can be of crucial importance in some applications (defense, security, search&rescue, automotive industry, etc).

Laser pointers are characterized by two crucial parameters: power and divergence angle. Low power or too high divergence angle can make impossible pinpointing the target to be seen by night vision device, VIS-NIR camera or by human eye.

Laser illuminators are characterized by three crucial parameters: power, divergence angle and beam uniformity. Low power, too high divergence angle or poor beam uniformity can significantly reduce ability to recognize illuminated target.

Due to reasons mentioned above proper testing laser pointers and laser illuminators is important for both manufacturers and final users.

LIP station is a test station optimized for testing laser pointers, laser illuminators or fused laser pointers/illuminators. The LIP station is built from two main blocks: LBIS beam imaging system and LCOP power meter. LBIS system is a hi-tech imaging system of ultra high dynamic capable to adapt to various level of power of tested laser pointers/illuminators (dynamic over 100 000) and to present light intensity distributions created by tested laser systems. The second block enables easy measurement of power of virtually all laser pointers and laser illuminators. The LCOP meter range is optimized to fit to range of laser pointers/illuminators that are met on international market.

Design

LBIS beam imaging system is built as an optical collimator combined with a VIS-NIR camera or regulated FOV. The optical collimator focuses incoming laser beam onto diffussor plate. The image of the laser spot is analysed using the VIS-NIR camera of ultra high dynamic capable capture realistically image of laser spot of any intensity. LBIS is computerized station and measurement of divergence angle and uniformity are done using software.

LCOP optical power meter is built from three modules: optical probe, electronic meter, power supply. The optical probe is a calibrated large area silicon photodiode. Special design of the probe enables to achieve ultra high dynamic and uniform directional sensitivity.

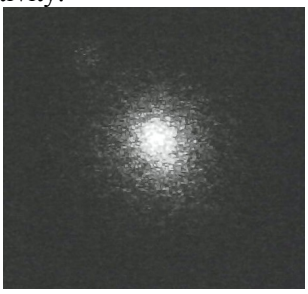

Fig.2. Image of illuminated field by by laser illuminator of poor illumination uniformity

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Basic parameters

Tab 1. Basic parameters of LCOP optical power meter

Spectral range	400-1060nm
Active aperture	24mm
Measured power range	0,001mW - 3W
Measured power resolution	0,001mW
Nonlinearity	<1%
Operating temperature range	+10 ˚C to +35˚C
Storage temperature range	-5˚C to +50˚C
Dimensions	226x76x169 mm
Mass	About 4kg

Tab.2. Basic parameters LBIS imaging system

Spectral sensitivity range	400-1000 nm
Aperture	At least 46mm
Optimization	optimized for testing lasers of power in range 0,1mW - 3W and divergence angle in range from 0.25mrad to 200mrad
Camera dynamic	$>10^6$
Camera resolution	1280x1024
NFOV	24 mrad
WFOV	240mrad
Operating temperature range	+10 ˚C to +35˚C
Storage temperature range	-5˚C to +50˚C
Dimensions	1129x345x245mm
Mass	About 23kg

Options

Inframet can deliver optional computer programs to calculate maximal operational range of laser pointer at simulated work conditions (target size, target reflectivity, weather conditions, level of target illumination, laser pointer parameters).

Advantages of LIP test station

- Efficient, user friendly tool for final performance evaluation of laser pointers and laser illuminators
- Ability to measure not only power and divergence angle but also illumination uniformity
- Compact design suitable for both laboratory, depot or field applications
- Station optimized for testing virtually all laser pointers/illuminators on international market

version 3.3

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