NIG

Meter of gain of NVDs

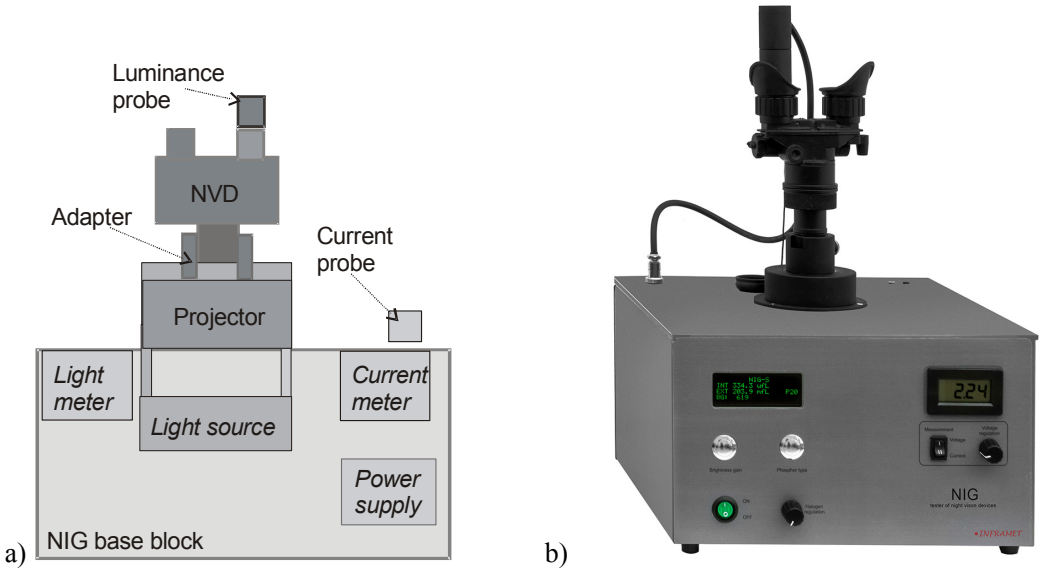

Fig. 1. NIG test station: a)Block diagram , b)photo

BASIC INFORMATION:

Brightness gain is one most important and difficult to measure parameters of night vision goggles/monoculars. At the same time this parameter decrease with time in contrast to other parameters like resolution or dark spots. Such a situation creates necessity to control brightness gain during life period of night vision devices.

All Inframet test stations offered to carry out basic or expanded testing of NVDs (NVT, NVS, NV14, NICOM, NIMAX stations) offer measurement of a long series of parameters including brightness gain. However, the stations mentioned above are large size, expensive test station and are not optimal for situation when required test range is limited to brightness gain.

Therefore Inframet offers NIG test station for tasks where requirements are limited to carry out measurement of brightness gain of night vision goggles/monoculars and optionally current consumption of battery of these devices. NIG station enables also to regulate power voltage applied to tested NVD and to check its performance in typical voltage range.

NIG station can be treated a simplified, miniaturized version of NVT station optimal for case of limited test requirements and lower budget situation. The test procedures used by the NIG station are based on recommendations of the MIL series military standards. The station enables testing of virtually all NVDs offered at market.

HOW IT WORKS:

Measurement of brightness gain

NIG station projects in direction of tested NVD an uniform image that fills totally FOV of tested NVDs. Luminance of the light source that generates this uniform image is set to the value recommended by MIL standards. The light source is highly uniform and performs like a Lambertian source within angle determined by FOV of typical NVDs. Output luminance of screen of image intensifier tube seen via ocular of tested NVD is measured using a small luminance probe located just behind the ocular. Microprocessor of NIG calculated brightness gain of tested NVD as a ratio of output luminance to input luminance of the light source.

Measurement of current consumption

User inserts a dummy battery into a battery compartment of tested NVDs and connects the dummy battery to power socket in NIG station. The second of two displays of NIG station presents value of the current consumption. User can also regulate power voltage and check how current and brightness gain vary with variable power voltage.

SPECIFICATIONS

NIG

Meter of gain of NVDs

Modules	NIG base block, LPN1 luminance probe, set of two exchangeable adapters for tested NVDs, PS1 power supply, dummy battery, battery power cables, power cable for PS1 power supply and optional blocks: MOP medium optics projector), and LOP large optics projector
Test capabilities	
Brightness gain measurement range	At least from 500 lm/lm to 10000 lm/lm
Current consumption measurement range	1mA to 700 mA
Power voltage regulation range	1.5V to 3.1V
Max aperture of optics tested NVD	30mm for typical version but can be optionally increased up to 150 mm
Station parameters	
Color temperature of light source	2850K±50K in spectral band 450nm to 900nm
Source illuminance *	typically 3.14 mlx but user can request a different illuminance level; light source with variable intensity can be also optionally delivered
Range of luminance probe	0.01-100 cd/m^2
Output readout	Two internal digital displays
Adapters for tested NVDs**	Set of exchangeable adapters for different types of NVDs
Dummy battery***	Typically simulating 1/2AA battery (different batteries are possible)
Power	110-230 VAC 50/60 Hz
Work temperature	5°C to 40°C
Work humidity	Up to 90% (non condensing)
Storage temperature	-5°C to 60°C
Units	SI (US - option)
Mass	about 10 kg
Dimensions	about 37 x 33 x 28 cm (base block)

* MIL standards require that illumination of simulated scenery should be below 1.713 mcd/m^2 (equivalent to 5x10-4 fL or 5.4 mlx). However, modern II tubes of high gain starts to work in saturated mode when source illuminance equal to this luminance value and measured gain is lower than value obtained for II tube working in linear range. Therefore Inframet prefers to use lower luminance level equal to 1 mcd/m^2 (equivalent to 3.14 mlx) but user can ask for any value of source luminance.

** User is expected to specify types of NVDs to be tested

*** User is expected to specify type of batteries used to power NVDs

OPTIONS

Typical NIG station is optimized for testing night vision goggles/monooculars of FOV about 40° and built using small optical objectives (aperture below 30 mm). Next, intensity of the light source can be regulated only in narrow range just to enable to achieve value of illuminance recommended by MIL standards.
However, NIG test station can be optionally delivered in versions capable to test also NVDs of narrow FOV having bigger optics and to do tests at variable illuminance levels.
Possible options are listed below:

1. MOP – medium optics projector – enables testing NVDs of optics up to 60 mm
2. LOP - large optics projector – enables testing NVDs of optics up to 150 mm
3. VILS – variable intensity light source – enables testing NVDs simulating illuminance in range from 20µlx to 0.2lx (useful for R&D projects)

Version 1.2

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