

NV14

Universal tester of night vision devices

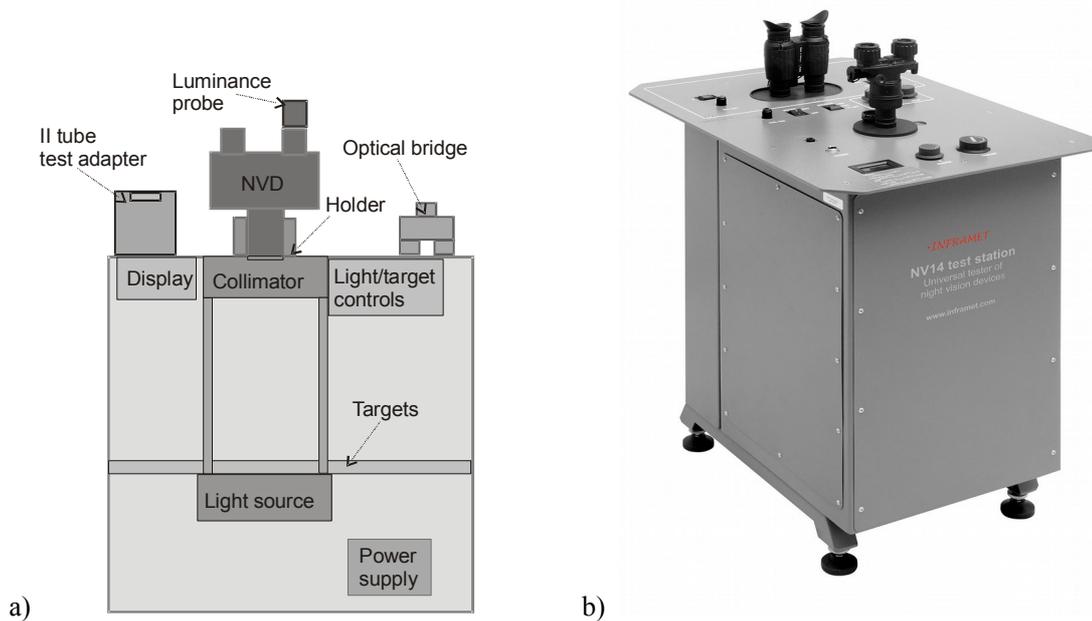


Fig. 1. NV14 test station: a)block diagram, b)photo

BASIC INFORMATION:

NV14 test station is a compact, stand alone, user friendly test station optimized for testing of surveillance night vision devices of magnification from 1 to 3 (optionally 4). Such devices represent majority of night vision devices offered on market: all night vision goggles, monoculars, and most of night vision sights and binoculars. .

The station projects images of some standard targets into direction of tested night vision device fixed on the upper wall and looking down. The user can control light intensity and type of target to be projected. The tested NVD generates distorted copies of the projected standard images. Images generated by tested NVD are evaluated by human observer or with help of some measuring tools (luminance probe, optical bridge) important parameters of night vision devices are determined.

The station can be optionally equipped with an adapter that enables simplified testing of image intensifier tubes, too.

NV14 test station can be treated as a NVT station with bigger internal collimator (55 mm for NV14 and 30mm for NVT station) modified to test not only night vision goggles/monoculars but also to test night vision sights/binoculars. The station enables testing night vision sights/binoculars of apertures up to about 70 mm (magnification 3-4). If sights/binoculars of bigger aperture or magnification are to be tested then NVS test station is recommended. Next, NVT station is recommended when only night vision goggles/monoculars are to be tested due to convenient mechanized target exchange in NVT station instead of manual target exchange in NV14 station.

The test procedures used by the NV14 station are based on recommendations of the MIL series military standards.

NV14 belongs to NV series test station for testing night vision devices offered by Inframet.

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FEATURES:

- Optimized for testing night vision goggles/monoculars. It can also be used for testing night vision sights/binoculars of magnification not higher than 4.
- Compact, stand alone, user friendly test station optimized for maintenance tests of night vision devices
- Wide range of performance tests: focus, resolution (center, peripheral, high level), screen quality (dark spots), brightness gain, field of view, Minimal Resolvable Contrast (resolution tests for variable contrast USAF1951 targets), collimation error of two channels (ability to detect boresighting errors), gain disparity.
- Maintenance checks: Operational defects (shading, edge glow, flashing, flickering/intermittent operation, emission points); Cosmetic defects (Dark Spots, Bright Spots, Fixed-Pattern Noise, Chicken Wire, Image Disparity, Output Brightness Variation, Image Distortion) according to ASAM recommendations
- Built using dual switch-able light source (polychromatic 2850K color temperature source or monochromatic LED source) in situation when typical stations are built using only a monochromatic light source.
- Optional adapter that enables simplified testing of image intensifier tubes (measurement of resolution)
- Available in form of a series of versions optimized for different applications

SPECIFICATIONS

| | |
|------------------------------------|--|
| Modules | NV14 base module (different versions), LPN1 luminance probe, set of exchangeable adapters, PS1 power supply, OB12 optical bridge, OB21 optical bridge, basic/ expanded set of targets |
| Light Sources | Option for testing II tubes: RM module, MM microscope Dual switchable light source: 1) 2850K color temperature halogen source, 2)LED 590 nm (or 660 nm) monochromatic LED source |
| Illuminance range of light sources | at least from 0.1 mlx to 50 lx |
| Regulation resolution | 0.05mlx (at low intensity range) |
| Regulation type | continuous (any value can be set within the regulation range) |
| Regulation mechanism | manual |
| Regulation stability | better than 2% of the set value |
| Aperture of built in collimator | 55 mm |
| Collimator resolution | at least 50 lp/mrad |
| Type of tube holders | exchangeable holders for different types of NVDs |
| Targets | set of exchangeable targets (resolution, MRC, FOV, distortion, image quality patterns) |
| Range of luminance probe | 0.01-100 cd/m ² |
| Output readout | internal digital screen |
| Control method | two manual Light knobs |
| Power | 230 VAC 50/60 Hz |
| Operating temperature | 5°C to 40°C |
| Units | metric (US - option) |
| Mass | 22 kg |
| Dimensions | 420×560×420 mm |

*specifications are subject to change without prior notice

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VERSIONS

| Version code | Measurement capabilities | Modules | Recommendations |
|--------------|--|--|---|
| NV14-A | focus (infinity checking), resolution (center, peripheral, high light level), screen quality (dark spots), brightness gain, FOV | NV14-A base module, LP1N luminance probe, set of exchangeable adapters, PS1 power supply, basic set of targets | standard testing monocular night vision devices |
| NV14-B | focus (infinity checking), resolution (center, peripheral, high light level), screen quality (dark spots), system gain, FOV, collimation errors, gain disparity | NV14-B base module, LP1N luminance probe, set of exchangeable adapters, PS1 power supply, OB12 optical bridge, OB21 optical bridge, basic set of targets | standard testing of both monocular and binocular night vision devices |
| NV14-C1 | focus (infinity checking), resolution (center, peripheral, high light level), screen quality (dark spots), system gain, FOV, MRC, halo, distortion | NV14-C1 base module, LP1N luminance probe, set of exchangeable adapters, PS1 power supply, expanded set of targets | extended testing monocular night vision devices |
| NV14-C2 | focus (infinity checking), resolution (center, peripheral, high light level), screen quality (dark spots), system gain, FOV, collimation errors, gain disparity, MRC, distortion | NV14-C2 base module, LP1N luminance probe, set of exchangeable adapters, PS1 power supply, OB12 optical bridge, OB21 optical bridge, expanded set of targets | extended testing monocular/binocular night vision devices |

All versions enable also to carry out the following checks.

1. Operational defects (shading, edge glow, flashing./flickering/intermittent operation, emission points)
2. Cosmetic defects (Dark Spots, Bright Spots, Fixed-Pattern Noise, Chicken Wire, Image Disparity, Output Brightness Variation, Image Distortion)

Option:

R- measurement of resolution of II tubes. RM resolution module and MM microscope are delivered.

G – measurement of luminance gain and MOB of II tubes.

COMPARISON TO OTHER COMMERCIAL TEST STATIONS

There are other commercially available test stations that can be used for testing night vision. Here we will present advantages of the NV14 station in comparison to other commercially available test systems.

- Much wider test capabilities, especially in case of expanded versions. More parameters can be measured.
- NV14 station enables testing both both night vision goggles/monoculars and night vision sights/binoculars. Typical test stations enable only testing night vision goggles/monoculars.
- NV14 station is built using dual switch-able light source (polychromatic 2850K color temperature or monochromatic light source) in situation when typical stations are built using only a monochromatic light source. Due to use of polychromatic 2850K color temperature calibration of NV14 is valid for any type of night vision device. Calibration of typical stations is valid only for one type of NVD of specified spectral sensitivity.
- Stand-alone and ergonomic design. No tables are needed to use NV14 station. The station is put on a floor. The user can sit on a chair, insert vertically tested NVD to the holder and carry out tests. Typical test stations require additional table.

Version 4.2

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