

NCLIP

Tester of aligning of night vision clip ons



Fig. 1. Photo of exemplary night vision clip on located before a telescopic sight on a rifle



Fig. 2. Photo of NCLIP test station

BASIC INFORMATION:

Night vision clip on is a detachable electro-optical system that when attached to a rifle before a telescopic sight then creates an imaging system capable to generate clear images of observed scenery even under ultra dark night conditions. In this way a soldier/hunter can shoot using a rifle with telescopic sight at day conditions, and using a system: night vision clip on and a telescopic sight at night conditions.

In detail, night vision clip on system is a afocal system that amplified light emitted by targets of interest but still simulates targets at original distance for the telescopic sight. Perfect night vision clip, when attached to the rifle should not produce an effect of image shift. If this effect is noticeable then the shooter will miss the target even after perfect aiming.

NCLIP is a computerized test station developed to measure deflection angle of tested night vision clip on.

Measurement of this alignment error is done by a way of computer analysis of images generated by telescopic sight without and with the night vision clip on. This computerization significantly improved accuracy of measurement of the alignment errors, shortens measurement time, eliminated human subjectivity error and made possible to archive test results. NCLIP system is also a perfect tool to support adjusting angular position of optics of the night vision clip to achieve near zero deflection angle. The user simply looks on laptop screen and adjust angular position of optical elements of the night vision clip until perfect position is achieved.

Tested night vision clip on is attached to the test station using the standard Picatinny (MIL-STD 1913) rail like in case of real rifles. The station can be also optionally used to measure image rotation and resolution of night vision clip ons.

BLOCKS OF NCLIP STATION

NCLIP is a modular station build from following blocks: TG10 target generator, CNV770 collimator, MP1913 mechanical platform, IM50 imager, BP rail, laptop, BOR computer program.

TEST CAPABILITIES

Test capabilities depends on version of the test station.

NCLIP-A - image deflection angle of night vision clip on.

NCLIP-B - image deflection angle and image rotation angle of night vision clip on.

NCLIP-C - image deflection angle, image rotation angle and resolution of night vision clip on.

Test capabilities can be optionally expanded.

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SPECIFICATIONS

Parameter	Value
Acceptable diameter of output optics of NV clip on	Up to 80mm
Fixing position to test station	standard Picatinny rail
Range of measurement of deflection angle	Up to 40 mrad
Resolution of measurement of deflection angle	Not worse than 0.03 mrad
Range of measurement of rotation error	up to 5°
Resolution of measurement of rotation angle	0.5°
FOV of tested clip on	<12° (recommended case) < 30° (optional case)
Minimal required brightness gain of NV Clip On	500 lm/lm
Reticle	Cross with graduations in X and Y (software generated)

DESIGN SPECIFICATION

Parameter	Value
Focal length of CNV770 collimator	700mm
Aperture of CNV770 collimator	70 mm
Resolution of CNV770 collimator	At least 60 lp/mrad
Sensitivity of IM50 imager	Not worse than 0.1 lx
Spectral band of IM50 imager	400-700 nm
Resolution of IM50 imager	Not worse than 8 lp/ mrad
Simulated illuminance range	At least from 1 mlx to 100 lx

WHY NCLIP?

Alignment error (deflection angle) of night vision clip ons can be measured using non computerized test systems based on autocollimators. These test systems can work but are sensitive to human subjectivity errors and real measurement accuracy is rather low. NCLIP is a new generation test station that use fully achievements of modern computer technology. This computerization has significantly improved accuracy of measurement of the alignment errors, shortened measurement time, eliminated human subjectivity error and made possible to archive test results.

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