NED™ V-Series Production Benchtop Tester

Reality X Verified®

The NED™ V-Series production/benchtop testers is a 2D spectral imaging colorimeters that includes a 2D CCD image sensor, CIE matching filters and high performance spectroradiometer (optional) to deliver high speed, high resolution, and high accuracy testing of near-eye displays. The V-Series features models V24-75 providing a 75-degree Field-of-View (FOV) and the V24-100 providing a 110-degree Field-of-View (FOV). This platform provides rapid, highly accurate, and repeatable measurement system covering luminance, CIE chromaticity (x, y, u', v'), correlated color temperature (CCT), dominant and peak wavelength, spectral power distribution, and uniformity. The NED V-Series equips device makers with automated accurate color, luminance, distortion, and uniformity measurements, while providing good human eye equivalent resolution imaging over a wide FOV especially for high volume production environments. It leverages the auto focus function of the VDU colorimeter lens with a custom small entrance pupil in the front lens and spectral accuracy color and luminance for characterization of Virtual Reality, Augmented Reality, Mixed Reality and Heads-Up Displays (VR, AR, MR, and HUDs). Laboratory grade accuracy and flexibility are combined with high speed and durability for demanding production environments.

Design Validation and Quality Assurance of AR, VR, MR, and Heads-Up Displays

High Volume Benchtop Testing

- 3-5 mm entrance pupil to emulate the human eye
- 0 to 8 diopters electronic/software focus lens accommodates different virtual image distances.
- High sensitivity, high dynamic range for color and luminance measurements
- Dedicated, easy to use software with quick test results, plots and pass/fail analysis
- SDKs and support for easy integration into production lines

Measurement Parameters
Color and Luminance
FOFO or Sequential Contrast
Checkerboard Contrast
Color Uniformity Luminance
Uniformity Field of View (FOV)
Chromatic Aberration
ANSI Contrast
Geometric Distortion
Color Gamut Area
MTF and Contrast
Flicker (optional)

Original system calibration is performed in Gamma Scientific's NVLAP accredited laboratory (NVLAP Lab Code 200823-0) using NIST-traceable standards.

contact@gamma-sci.com | +1.858.279.8034 | www.gamma-sci.com

NED™ V-Series Production Benchtop Tester

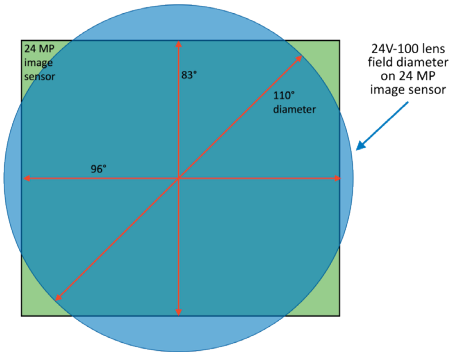
GAMMA SCIENTIFIC™

Camera Specifications		
Active Image (H x V)	5320 x 4600 (24.47 MP)	
Pixel Size	2.7 µm (H) x 2.7 µm(V)	
Sensor Size	19.3 mm Diagonal (Type 1.2)	
Measurement Range	0.1 cd/m² to 100,000 cd/m²	
Luminance*1, 2, 3	Accuracy	±1% relative to spectroradiometer
	Repeatability	± 0.10%
Color	Accuracy	±0.001 in CIE x, y relative to spectroradiometer
	Repeatability	0.0005 in CIE x, y
Measurement Range	30 µs to 10 seconds	
Measurement Parameters	Luminance (cd/m²) Correlated color temperature (CCT) CIE chromaticity coordinates (1) CIE 1931 x,y; (2) CIE XYZ values Delta u, v (Duv)	
	Angular resolution (cycles/degree)	
	Angular position (degrees)	

Spectroradiometer Specifications		
Wavelength Range (nm)	380 to 780	
Wavelength Data Increment (nm)	1	
Wavelength Reproducibility	± 1 nm	
Stray Light	-25 dB max	
Polarization	< 3%	
Integration Time Range	100 µs to 5000 ms	
Luminance*1, 2, 3	Measurement range	0.05 ~ 100,000 cd/m²
	Accuracy	±2%
	Repeatability	±0.2%
Color	Measurement range	0.05 ~ 100,000 cd/m²
	Accuracy	±0.002 in CIE1931 x, y
	Repeatability (2σ)	0.0005 in CIE1931 x, y

System Configuration	
Interface	USB-C, RS232
Power	48V 2.5A via an external 110-240V power adaptor
Dimensions	2220 D x 259 W x 190 H (without handle, 242 H with handle), 8.2 KG (without lens)
Environmental	15 to 35 °C, non-condensing relative humidity, 70%
Polarization	<3%

Lens/Field of View (FOV) Configuration Options *4		
Model/Configuration #	V24-75	V24-100
Equivalent Visual Resolution (Snellen)	20/16	20/20
Resolution (pixel per degree, PPD)	93	55
FOV Horizontal	56°	96°
FOV Vertical	49°	83°
FOV Diagonal	74°	110° (diameter)



*1. Luminance and color testing are based on Gamma Scientific standard of spectral radiance
*2 Measure in normal mode with temperature 23 ± 2°C and relative humidity 50% or less
*3 Accuracy and repeatability specifications are for 100-5000 cd/m2 range
*4. Field of View is calculated. Actual field of view may vary.
*5 Specifications are subject to change without notice

Rev. 05.18.23

CE