

Press Release

Measure what the human eye sees: optical testing of AR/VR headsets

LumiTop AR/VR with periscope lens enables two-eye measurement for AR/VR headsets, even under tight spatial constraints.

Munich, February 2021 – *Perfect user experience for AR/VR headsets calls for extensive, fast and highly accurate optical tests during production. In order to meet this specific challenge, Instrument Systems has developed the LumiTop AR/VR 2D imaging colorimeter. The LumiTop's AR/VR lens simulates the human eye and measures color and luminance exactly as seen by the user. The unique periscope design enables synchronized two-eye measurements, and the proven LumiTop principle guarantees fast, traceable and highly accurate measurements.*

AR/VR devices are an exciting new way of visual interaction with the environment in real time. Besides the virtual display, the headsets contain several types of light sources and sensors that enable users to immerse themselves in the virtual world. To ensure a perfect user experience, extensive and highly accurate optical tests are necessary. Besides standard optical tests, new parameters that are specific to near-eye displays, e.g. eyebox dimensions, are critical for quality assurance. A uniform display is fundamental for an undisturbed viewing experience. Accurate luminance and colors are a basic requirement for natural perception. Contrast is important for good legibility of virtual text. Distortion of the image due to tolerances in the mechanical and optical setup have an immediate impact on the display quality and must be kept below the human perception threshold.

In order to meet these test requirements, the LumiTop AR/VR 2D imaging colorimeter designed by Instrument Systems has been optimized for the production testing of near-eye displays (NEDs). The AR/VR lens in the LumiTop simulates the human eye and measures color and luminance exactly as seen by the user. A wide camera field of view (120°), various pupil sizes and an adjustable focus distance facilitate a wide range of testing applications.

The unique periscope lens design guarantees easy access to the NED and enables an optimal measurement position, even under the tight spatial constraints of fully assembled headsets. A hardware trigger enables perfectly synchronized one-shot two-eye measurements with two LumiTops.

LumiTop AR/VR is also based on the proven LumiTop principle. While an RGB camera takes the image of the NED in one shot, a reference spectroradiometer corrects the results to yield highly accurate absolute luminance and color values. The measurement results are fully

traceable to national standards and therefore allow low manufacturing tolerances, especially important for distributed manufacturing. Simultaneous measurement of a 2D image, spectrum and flicker makes LumiTop a very fast, comprehensive and highly accurate imaging light measurement device for AR/VR tasks in production. Instrument Systems also offers testing solutions for the IR sources (NIR LED, VCSEL) often used for gesture and object recognition within an AR/VR headset.

Photo 1:

LumiTop with AR/VR lens delivers highly reproducible, traceable and highly accurate color and luminance measurements for headset displays.

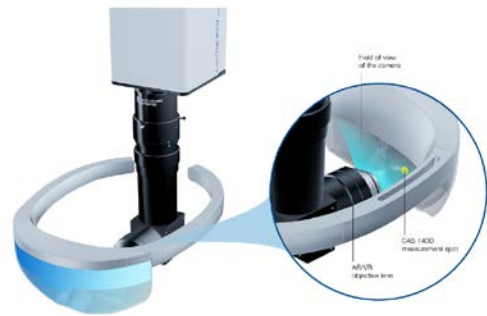
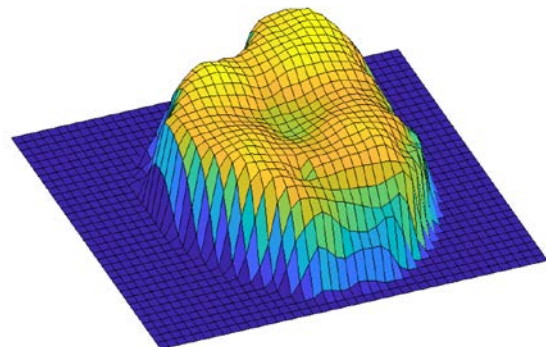


Photo 2:

Contrast across the near-eye display of an AR head-mounted device.



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Company portrait of Instrument Systems GmbH

Instrument Systems GmbH, founded in Munich in 1986, develops, manufactures and markets all-in-one solutions for light measurement applications. Its core products are array spectrometers and imaging colorimeters. The company's main fields of activity are LED/SSL and display metrology, spectral radiometry and photometry, where today Instrument Systems is one of the world's leading manufacturers. The Optronik line of products for the automotive industry and traffic technology is developed and marketed at its Berlin facility. Instrument Systems has been a wholly-owned subsidiary of the Konica Minolta Group since 2012.

File copy requested to:

Dr. Karin Duhnke, Instrument Systems Optische Messtechnik GmbH, Kastenbauerstr. 2, 81677 Munich, Tel. +49 (0)89-45 49 43-426, E-mail: duhnke@instrumentsystems.com