

Press Release

Far-field analysis of infrared sources

The VTC 2400 infrared camera enables production-ready testing of laser-based components and LiDAR systems.

Munich, May 2022 – *The infrared camera VTC 2400 from Instrument Systems was developed specifically for the far-field analysis of IR emitters and designed for use in both the lab and production environment. It is recommended for the analysis of VCSEL applications, such as 3D-sensing in smartphones or LiDAR systems in the automotive industry. The cost-effective system consists of a light-permeable, diffusely scattering screen and a monochrome camera specially designed for measurements in the near infrared range. The visualization of the spatial radiation properties of the radiation source on an additional screen makes for a highly flexible measurement setup. A traceable calibration of the VTC 2400 further guarantees a minimum error budget. Manufacturers are thus able to exploit the full performance potential of VCSELs while ensuring reliable operation.*

Due to their unique properties, surface-emitting lasers with a vertical cavity (VCSELs) are indispensable components for price-sensitive, laser-based applications. Sustainable development necessitates the transfer of lab-proven VCSEL tests to production lines. In particular with safety relevant components such as LiDAR systems or face-ID, manufacturers must ensure that each VCSEL reacts correctly in the terminal. For this purpose, each single emitter must be tested in the near field, as well as the complete VCSEL array in the far field. In the production environment this calls for mass-market, fast and highly reliable quality control of the relevant measurands, e.g. absolute power, wavelength, single emitter defects, numerical aperture and beam homogeneity.

The VTC 2400 from Instrument Systems is a high-resolution infrared camera that was developed specifically for the 2D far-field analysis of the radiant intensity distribution of VCSELs and IR emitters. The cost-efficient measuring system consists of a light-permeable, diffusely scattering screen and a monochrome camera specially designed for measurements in the near infrared range. Thanks to the light-shielding camera housing, the system is suitable for both lab and production applications. In the measurement setup the screen stands between the radiation source (DUT) and the infrared camera, so that the typical spatial radiation properties of the DUT are displayed on the screen. The infrared camera VTC 2400 captures this 2-dimensional image in a single measurement and converts by calibration the irradiance [W/m²] to the radiant intensity distribution [W/sr] of the DUT.

Mapping of the radiation source on an additional screen makes for a highly flexible measurement setup. Basic measurement parameters, e.g. distance to the DUT, angular field of view or angle resolution can be optimally adjusted for the application in hand. This permits precise reconstruction of the radiant intensity distribution and identification of the maximum intensity (hot-spot) as required e.g. for laser safety evaluation.

The VTC 2400 has a radiometric calibration traceable to PTB standard. Together with the unique measurement concept, this guarantees a minimum error budget and a high level of measurement precision. Manufacturers are thus able to exploit the full performance potential of VCSELs while ensuring reliable operation.



Figure: The VTC 2400 with its two standard versions covers all typical aperture angles of IR sources. The VTC 2400-100 is designed for angles up to maximum $\pm 25^\circ$; the VTC 2400-200 for angles up to maximum $\pm 60^\circ$.

Text material and images:

<https://instrumentsystems.owncloud.online/index.php/s/5qTzmZQFQPjNU9Z>

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, as well as laser/VCSEL characterization 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.

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