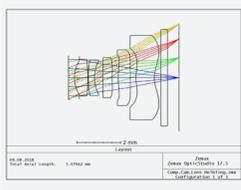


Optics, Embedded Vision and Sensor systems

Our service portfolio:



Optical Design and Calculations



Laser systems & beam shaping



Low-cost Sensor Systems & Modules



Optical Devices



Embedded Vision & Single-Board Computer



Image enhancement & ISP tuning



Camera & Camera Modules: Evaluation & Development



AI and computer vision algorithms



Innovation together we do it

Founded in 1963, the Helbling Group operates internationally and combines engineering and consulting expertise. The Helbling Group is managed by 37 Partners and employs over 630 people at locations in Switzerland, Germany, Poland, the USA and China. The Helbling Group focuses on providing selected services in the areas of innovation and product development, management consulting, mergers & acquisitions, business turnarounds and financial performance management, IT, real estate and construction planning.

Helbling Technik is a division of the Helbling Group and currently employs over 500 professionals. Our vision "Innovation, together we do it" positions Helbling Technik as a trusted long-term partner within its clients' innovation network. Helbling Technik's highly qualified engineers, computer scientists, physicists and human factors experts use state-of-the-art development tools, processes, laboratories and tools to develop innovative and successful products and support clients around the world from idea to market launch.

Kontakt

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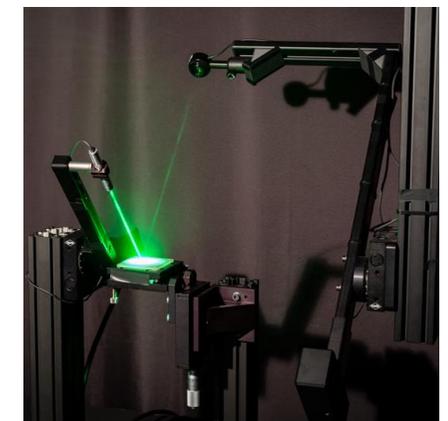


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Goniometer Based Light Scattering Measurement

From understanding the effects of stray light in your system to optimizing illumination optics by homogenizing light distributions through scattering.



Helbling Technik Wtl AG
Innovation, together we do it

Professional measurement of light scattering

The scattering of light on technical surfaces and inside materials results in a wide range of effects: on the one hand, for example camera lenses can produce undesirable light reflections or ghost images. On the other hand, in illumination optics, light scattering can be used specifically for optimization, for example to homogenize light distribution. The goniometer of Helbling is suited to measure such phenomena, from scattering behavior of technical surfaces and volume scattering of materials to the characteristics of sources and detectors.

Typical goniometer measurements include:

- Material and surface characterization, e.g., for ambient lighting modules or back-illuminated HMI (human machine interfaces).
- Characterization of stray light.
- Far-field characterization of light source intensity distributions.

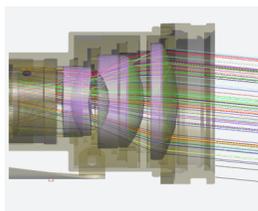


Homogeneous back-illumination of human machine interface.

Goniometer speeds up development processes

Your advantages:

- Precise light scattering measurement: Accurate determination of the bidirectional scattering distribution function (BSDF), including total integrated scattering (TIS) for the optimization of optical systems. From the measurement data, transmission and half-peak divergence can be derived.
- Versatile measurements: Both, reflection (BRDF) and transmission (BTDF) measurements of optical materials and surfaces, as well as characterization of light sources are possible.
- Modelling of scattering materials: Import of measurement data to LightTools allows Gegenbauer-fit for modelling of scattering materials.
- Improved optical system validity: By replacing estimated scattering parameters with real measurement data, the goniometer enhances the reliability and performance of optical simulations.



BSDF-based stray light analysis of a imaging lens, performed in LightTools.

Helbling perfects implementation of an innovative technology



Additional services complete the portfolio of Helbling:

- Lightguide design and tailoring of freeform optics for specific light distribution or ambient lighting.
- Design of imaging and illumination optics including stray light analysis and tolerancing.
- Well-equipped optics laboratory for feasibility studies, experiments and optical analyses.

At Helbling, all developments follow an established development process:

- Analysis of the task.
- Definition of requirements.
- Development, implementation, optimization and verification.
- Industrialization.
- Support of market introduction and lifecycle management.
- Helbling is ISO9001/ ISO13485 certified.