



# Life science & Bio-medical optics

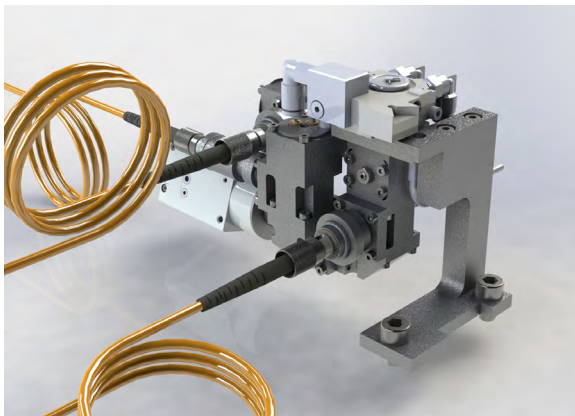
- Ophthalmology
- Biomedical Spectroscopy
- Biomedical Microscopy
- Tissue Optics

# Ophthalmology

Demcon Focal has many years of experience in the design, engineering and manufacturing of ophthalmology devices with dedicated software.

For our OEM customers this has resulted in products such as:

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- Low cost fundus camera
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- OCT based fundus camera
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- Compact retinal oximetry imager
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- Corneal topographer
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- Vitrectomy Xenon light source for eye surgery
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# Biomedical microscopy

For our OEM customers we developed an optical microscopy system that is capable of imaging a single cell in a lab-on-a-chip environment. In addition to a bright imaging function, a fluorescence measurement function was also added to the microscope in order to measure the cells that were labeled with fluorochromes. The design had to fit into existing image cytometry equipment. For this purpose we developed ½ inch optical building blocks that can be used to fit the filters, splitter and lens elements. Alignment of the optical elements prior to fixation is also possible within the building blocks.

The typical specifications for the microscope that have been achieved are:

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- Resolution 5  $\mu\text{m}$
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- Field of View / 0,25 mm
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- Microscope size +/- 100x100x100 mm<sup>3</sup>
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## Tissue optics

The HandScan measures blood flow in joints, in the hands and the wrists by means of diffuse optical transmission in combination with blood flow modulation. Optical technology makes the system safe for the patient and quick and inexpensive to use - one session takes just 2.5 minutes.

Hemics markets the HandScan as a compact, user-friendly and affordable device. It is responsible for the data algorithm, which translates the measurement data from the scanner into clinical

information for the rheumatologist. Demcon is responsible for the systems engineering, electronics, mechanics, optics and embedded software. In addition to the illumination module, an intuitive user interface and industrial design require special attention, with a view to the acceptance of the device in the daily practice of the rheumatologist.



## Biomedical spectroscopy

The development of biological tissue imaging techniques improve the detection of morphological changes in vivo, which can result in the earlier detection of diseases. Within Demcon Focal many of these biological tissue imaging techniques with state-of-the-art image analysis have been investigated and realized. Among them are:

- Confocal microscope with a focusing system to record texture images of human skin. This information can be used by dermatologists to investigate skin cancer.
- Infrared Thermal Imaging for Automated Detection of Diabetic Foot Complications.
- Spectral imaging of skin bruises to objectively determine the age of the bruise.



# DEMCON | Focal

Demcon Focal is part of the international Demcon group and is specialized in design, engineering and assembly of bespoke opto-mechatronic (sub-)systems, for high technological markets like semiconductor, bio-medical, life science, aerospace, industrial manufacturing and others. Often these systems are used in applications where accuracy, stability and rapid movement or exploitation in extreme environments is required.

Demcon Focal achieves customized design and engineering in a multidisciplinary approach, entailing optical, vision, data, electronic, software, mechanical and system engineering. Activities include high-level requirement engineering, concept optical design, prototyping, detailed engineering, system integration, manufacturing and testing activities.

Demcon Focal also performs specialized volume production that requires trained engineers, dedicated equipment and a clean environment. We can offer system service and support and we have production facilities available for complex optical modules.

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