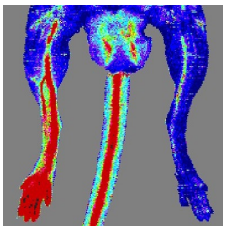
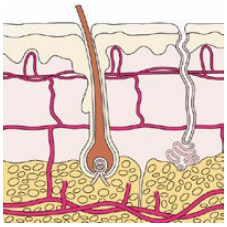
High resolution laser Doppler blood flow imaging

with moorLDI2-HIR

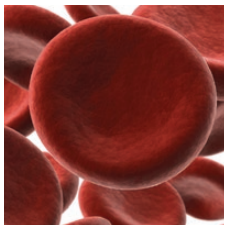


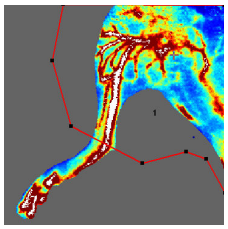












moor instruments

innovation in microvascular assessment

moorLDI2-HIR – High Resolution laser Doppler imaging

The moorLDI2-HIR High Resolution laser Doppler blood flow imager offers a unique, proven and high specification solution for pre-clinical research imaging. Using focussed laser optics and unique photo-detection / signal processing, the system enables you to see further into the tissue than conventional laser speckle imagers, making it the system of choice (Gold Standard) for applications such as the Hind Limb Ischemia model.

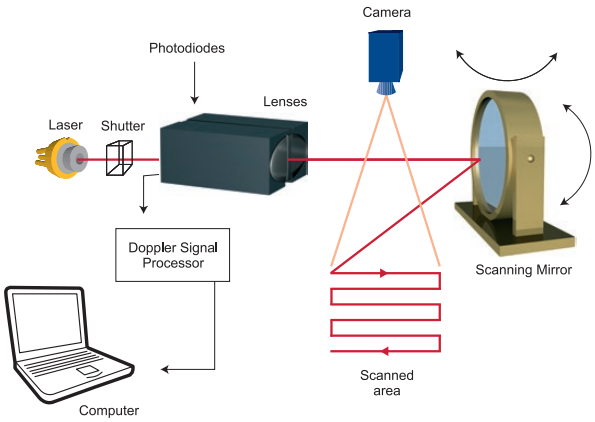
Features and Benefits

- **Non contact measurement –** painless, with no chemical tracers or dyes needed.
- **Daylight operation –** use in most lab or theatre settings.
- **High spatial resolution –** to catch the finest detail to 50 micron.
- **Focussed optics –** see further into collateral tissue beds.
- **Single and Repeat imaging modes –** compare flow from region to region within the same scan and scan the same region repeatedly to assess changes over time.
- **Digital Trigger In/ Out –** to synchronise with external devices.
- **Digital Signal Processing and High-Quality optics –** providing high sensitivity for response assessment and dependable communication and reliability.
- **Choice of stands –** for benchtop / laboratory use.

The Laser Doppler Technique

The Laser Doppler Technique Laser Doppler Imaging (LDI) is a technique first established commercially in the early 1990's and as such published studies now cover numerous pre-clinical, clinical research and clinical applications.

The moorLDI was the first system to offer the flexibility of small and large area scanning and a patented rapid scanning technique to enable much faster imaging. This combination furthered research possibilities and ultimately led on to the clinically proven moorLDI2-BI burn assessment system.



The high resolution version (moorLDI2-HIR) is particularly suited to pre clinical research such as hind limb ischemia, now considered the Gold Standard for assessment. In this case, the advanced optics have enabled clear visualisation of collateral vessel development, not clearly imaged using other techniques.

LDI is often compared to laser speckle imaging and whilst there are some similarities, LDI generally offers deeper penetration enabling enhanced visualisation of small vessels below the tissue surface. LDI as a technique (not enabled with moorLDI2-HIR) can also enable very large area imaging – up to 50cm x 50cm in one scan. For certain applications these features are critical.

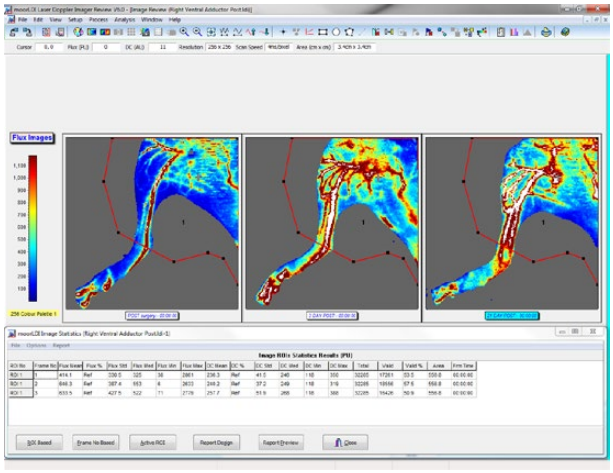
The system scans a very low power laser beam (less than half a typical laser pointer) across the tissue. Moving blood in the microvasculature causes a Doppler frequency shift of the laser light, which is photodetected and processed to generate a colour coded blood flow map, line by line. An in built camera records a colour photograph to aid visualisation of the scan site.

Applications and Software

Laser Doppler Imaging has been applied to a broad range of physiological and medical disciplines and references are numerous. Application notes are available free of charge on request for core applications, offering specific and detailed practical advice and hints to make the most of your imager.

The more common applications are;

Hind Limb Ischemia – Angiogenesis imaging, enabling accurate assessment of new vessel formation and the interventions that speed or slow the processes.



Hind limb angiogenesis model, images reproduced with kind permission of Professor James Faber, University of North Carolina

Tumour modelling – study the processes that restrict the growth processes.

Intra-operative measurements – limb and visceral ischaemia and reperfusion assessments.

Dermatology – quantification of inflammatory and irritancy reactions (e.g. response to intra-dermal capsaicin and other toxins). Track progress and treatment of various skin conditions such as psoriasis.

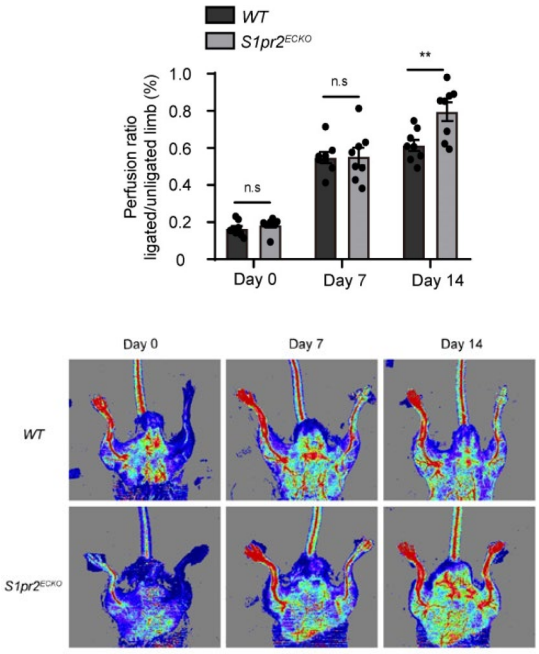
Pharmacology – local and systemic responses to topically applied and transdermal vaso-dilators.

Note: For human research applications (Plastic Surgery, Rheumatology, Wound Healing etc.), the moorLDI2-IR system may be more suitable as it offers large area imaging, up to 50cm x 50cm.

Please feel free to contact our application specialists for confidential and helpful discussion about your research ideas.

Your research

Please contact Moor or your nearest approved distributor to discuss your specific application. Ask to see the system in action and evaluate it at your own facility. Current publications using moorLDI2 are wide ranging and updated online at www.moor.co.uk.



Laser Doppler Images and figure reproduced from Zhou et al, 2022, Endothelial S1pr2 regulates post-ischemic angiogenesis via AKT/eNOS signaling pathway.

Software

Our dedicated software, now in its 6th generation has been refined over a number of years in response to our customer feedback. It is developed in-house by our dedicated team, giving us complete control over the software functionality. It is fully featured for setup, measurement, analysis, reporting and export.

About Moor Instruments

Moor Instruments, established in 1987, is a world leader in the design and manufacture of laser Doppler systems, used for the monitoring and imaging of blood flow in the microvasculature.

First hand experience of laser Doppler research and development within Moor dates back to 1978 and with this we have the breadth of knowledge to help with your application and the enthusiasm to help with answers to any of your questions.

By giving priority to performance, quality and service we strive to be our customers' number one choice.

Our dedicated design team are involved with a number of development projects for other partners and manufacturers. Whatever your needs, as a researcher, clinician or manufacturer, Moor will work harder for you.



moorLDI2-HIR with optional DS2 desktop stand

Specifications:

Quality Control
Moor Instruments is certified to ISO 13485. The moorLDI2-HIR is CE marked as a medical device.

Laser Source
moorLDI2-HIR; 785nm, Max 2.5mW, 0.7mm beam (target beam 660nm, Max 0.25mW)

All above models are Class 3R per IEC 60825-1:2014



Stand Options
There are two stands available for the moorLDI2-HIR, DS2 and BS1;

DS2 desktop stand, easy vertical adjustment provided by ratchet winding handle. Yoke style scan head holder to allow positioning and rotation in two axes.

BS1 desktop stand, manual vertical adjustment. Angular rotation in one axis.

Software
Dedicated Windows™ based software for measurement, processing and analysis supplied with each system.

Camera
Colour, 2592 x 1944 pixel resolution, auto focus.

Bandwidth
Low frequency cut-off (3dB) 20Hz, 100Hz or 250Hz, scan speed dependant.
High frequency cut-off (0.3dB) 3kHz, 15kHz or 22kHz, user selectable.

Spatial Resolution
Up to 512 x 512 pixels.
High resolution system: 0.05mm/pixel at 25cm.

Scan Speed
Scan speed is approximately 4ms/pixel, 10ms/pixel or 50ms/pixel (at maximum resolution). Scan duration is typically 40 seconds for a 64 x 64 pixel resolution.

General
Power source: Universal voltage, 84-264V AC, 50VA, 50 to 60Hz.
Dimensions: *W* x *H* x *D* mm, Weight: *kg*.
Power Supply: 107 x 56 x 171, 0.5.
Scan Head: 426 x 244 x 300, 9.0.
Operating environment: Clinic or laboratory, excluding domestic.
Operating temperature: 15-30ºC.

Safety Standards
Complies with:
IEC 60601-1:2005+A1:2012, IEC 60601-1-2:2015, IEC 60825-1:2014.
Medical devices directive 93/42/EEC and amendment 2007/47/EC.

Please note: Other variants of this imager are available with specifications more suited to clinical diagnosis and human research applications. Please do ask for further information.

Moor Instruments reserves the right to change specifications without notice.

moor instruments
innovation in microvascular assessment

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