

# PeriCam PSI System

## Real-time microcirculation imaging

The PeriCam PSI System is a blood perfusion imager based on the Laser Speckle Contrast Analysis (LASCA) technique.<sup>1-6</sup> LASCA provides new means to study the microcirculation in ways that were not possible in the past.

The PeriCam PSI System combines speed – instant real-time imaging – with high resolution images.



### Simple to get started



*Prepare subject,  
Enter recording information*

- ✓ Indicator laser visualizes measurement area
- ✓ Color camera documents set-up
- ✓ No need to focus
- ✓ Automatic working distance calculation
- ✓ Save commonly used settings in projects
- ✓ Define Regions Of Interest - ROIs

### Analyze data while recording



*View perfusion images, graphs and  
calculations simultaneously*

- ✓ Analyze data in real-time
- ✓ Add/Edit ROIs during measurement
- ✓ Automatic background compensation once per second

### Advanced data reviewing

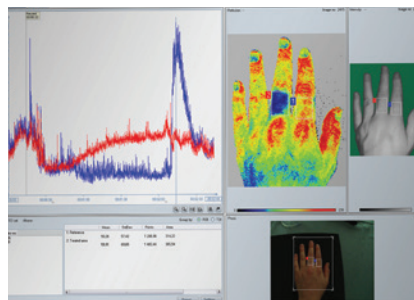


*Export data as pdf or avi files*

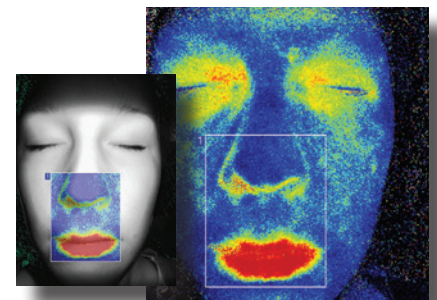
- ✓ Edit ROIs for single image, complete run or sections of a run
- ✓ Time periods Of Interest - TOIs
- ✓ Perfusion overlay feature
- ✓ View recording in playback mode at different speeds



*Simple instrument handling*



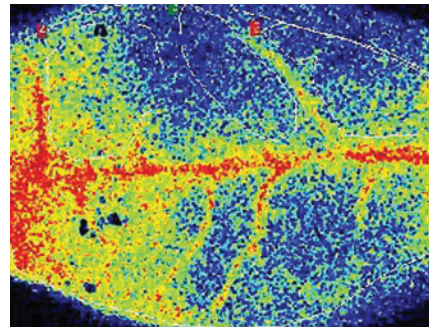
*Perfusion images, graphs and  
calculations shown simultaneously*



*Overlay of blood perfusion ROI in  
intensity image*

### Laser Speckle technique

Tissue illumination by laser light produces an interference pattern, a speckle pattern, on the tissue surface. When the illuminated object is static, the speckle pattern is stationary. However, when moving particles, such as blood cells, are present, the speckle pattern will fluctuate over time. By analyzing these intensity fluctuations, information about the blood perfusion in the tissue is obtained.



Mouse brain during cortical spreading depression

## PeriCam PSI System Specifications

<b>Measurement Principle:</b>	LASCA (LAsER Speckle Contrast Analysis)
<b>Image Size:</b>	Normal Resolution model: ~5.9 x 5.9 cm – 15 x 15 cm High Resolution model: ~20 x 27 mm
<b>Image Acquisition Rate:</b>	50 Hz: 94, 44, 21, 16, 10, 5, 2, 1, 0.5, 0.2 images per second 60 Hz: 112.8, 52.8, 25.2, 19.2, 12, 6, 2.4, 1.2, 0.6, 0.2 images per second
<b>Precision:</b>	+/- 4% (Motility Standard) +/- 3 PU (Zero Perfusion)
<b>Accuracy:</b>	+/- 4% (Motility Standard) +/- 3 PU (Zero Perfusion)
<b>Image Resolution:</b>	Maximum 1386 x 1036 measurement points Normal Resolution model: 100 µm/pixel (at 10 cm) High Resolution model: 20 µm/pixel
<b>Scale:</b>	0-3000 PU
<b>Camera Resolution:</b>	Measurement Camera: 1388 x 1038 pixels Documentation Camera: Color, 752 x 580 pixels, up to 1 image per second
<b>Working Distance:</b>	Automatic working distance calculation
<b>Background Compensation:</b>	Automatic background compensation once per second
<b>Lighting Conditions:</b>	Normal, ambient room lighting
<b>Laser Specifications:</b>	Measurement laser: 785 nm, 70 mW, Class 1 per IEC 60825-1:2007 - Safe to use without eye protection Area indicator laser: 650 nm, HR: 3 mW, NR: 7 mW Class 1 per IEC 60825-1:2007 - Safe to use without eye protection
<b>Software:</b>	PIMSoft, Windows based, Export options: pdf, avi, xml, binary Available in several languages
<b>Dimensions and Weight:</b>	Scanner head: 22 x 15 x 20 cm, ~2.4 kg

Due to Perimed's commitment to continuous improvement of our products, all specifications are subject to change without notice.

### References

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2. Laser Doppler, speckle and related techniques for blood perfusion mapping and imaging. Briers, J. D. Physiological measurement 22(4), p. R35-R66, 2001
3. Linear response range characterization and in vivo application of laser speckle imaging of blood flow dynamics. Nelson, J. S. et al. Journal of Biomedical Optics 11(4), p. 1, 2006
4. Dynamic imaging of cerebral blood flow using laser speckle. Boas, D. A. et al. Journal of cerebral blood flow and metabolism 21(3), p. 195-201, 2001
5. Development of a laser speckle imaging system for measuring relative blood flow velocity. Sowa, M. G. et al. International Society for Optical Engineering, Bellingham WA, WA 98227-0010, United States, p. 634304, 2006
6. Excellent reproducibility of laser speckle contrast imaging to assess skin microvascular reactivity. Roustit M. Microvasc Res. 2010

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