LightTrack OiS200
Modular Optical Imaging System

Intrinsic Signal | Speckle | Fluorescence | Optogenetics

580-3333 Ch Queen-Mary, Montreal (QC), H3V 1A2, Canada
Sales: +1 (438) 448-8840 • info@labeotech.com • www.labeotech.com

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Specifications

Articulated Illumination Arms

- Illuminations can easily be positioned at any angle with flexible articulated arms
- Multiple illumination arms available

Optical Enclosure

- Optional 2’ X 2’ X 2’ enclosure for light sensitive applications
- Curtain on the front for easy access or door opening upward
- Access holes on the back

Camera Positioning

- Subject placed on a lab jack for precise focus adjustment
- Focus and numerical aperture adjustment on the camera lens
- Camera height and angular adjustments (left to right)

Magnetic Positioner

- High quality steel plate allowing to use a magnetic positionner

Integrated & Ergonomic
Save lab space and installation time
Compatible with multiple applications

Better Results
Get better results in your study with reliable images synchronized with all your other equipment

Modular System
Select your LEDs and laser colors and the quantity of auxiliary inputs/outputs

Increased Performance-Price Ratio
Get more functionalities at a lower price

Applications

- Cerebral blood flow
- Neurovascular coupling & functional connectivity studies
- Neurological disorders
- Pharmacology
- Optogenetics
- Voltage sensitive dies (VSD)
- Epilepsy
- Alzheimer’s disease
- Aging
- Hypertension
- Ischemia
- Strokes

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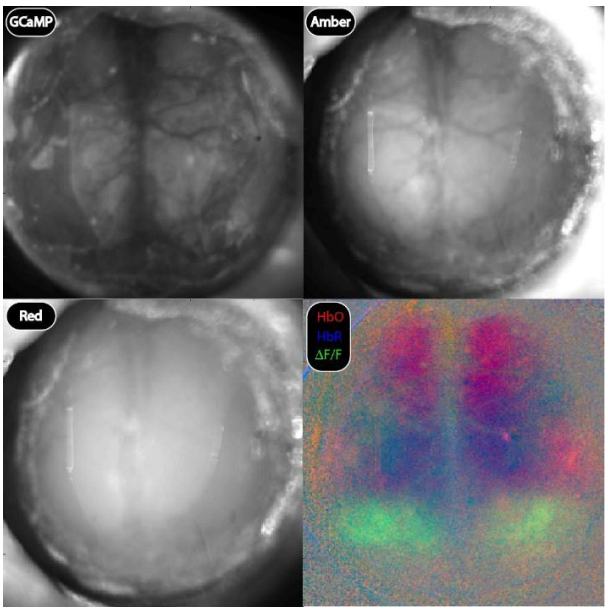
Software

Acquisition Parameters

- Frame rate up to 480 Hz, exposure time from 0.01 ms, illumination selection, stimulation settings

Saving

- Images, parameters & analog inputs saved on disk (SSD recommended for high frame rates)



Inputs/Outputs Options

Stimulation

- BNC connectors
- Digital coded or analog (1 or 2 channels)

Auxiliary Inputs

- BNC connectors
- 4 to 8 Inputs, 10 kSamples/second

Imaging Options

Intrinsic signal Optical Imaging (IOI)

- Red, amber and green illumination
- Adjustable spot size from 3 mm to 30 mm

Fluorescence Imaging

- Filtered LED illumination, filtered detection
- Wide selection of LEDs and filters
- Adjustable spot size

Speckle Imaging

- Laser diode with an adjustable spot size

Control Unit

Illumination Controls

- Manual illumination intensity pod

Compact Size

- 120 mm X 80 mm X 45 mm

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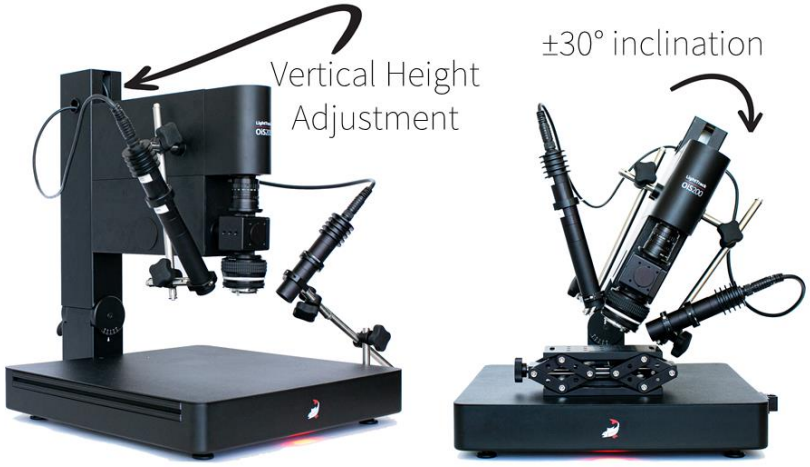
Hardware

Image anything with easy positioning



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Optogenetic Specifications (add-on)

Illumination

450 nm laser (589 nm, 637 nm & 660 nm available)
ChR2, Chrimson and more
Spot size down to 50 µm
Up to 1 W/mm2 power output
High-speed digital laser controller

2D Illumination Scanning

2D high speed galvo mirror system
Rapid pattern cycling

Optics

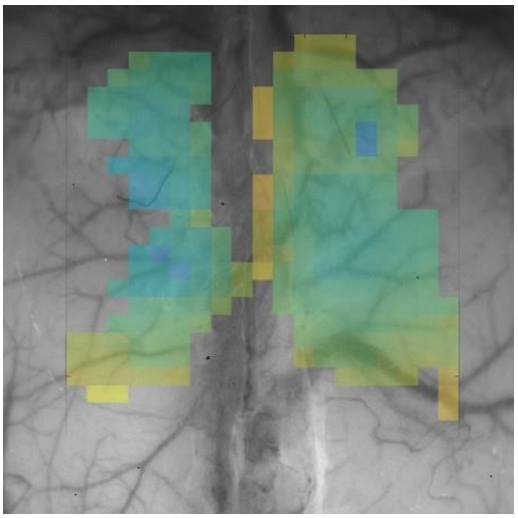
2 objectives in tandem configuration
Includes dichroic mirrors and optical filters to ensure compatibility with existing applications

Mechanics

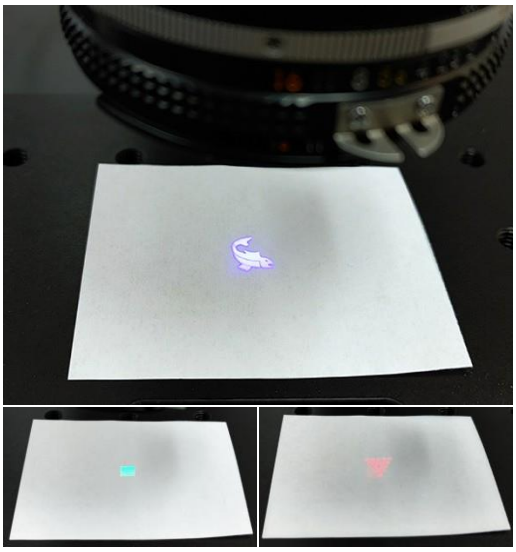
Seamless integration to the Modular Optical Imaging System, no additional lab space required

Software

Integrated stimulation map generation
Timing, pattern sequence and digital triggering for complete experiment recording
Synchronized with image acquisition



Latency map (0 to 50 msec) of the forelimb's movement generated by optogenetic stimulation.



2D stimulation pattern generated with the SMS option.

OPTION – Spatially Modulated Stimulation

360 X 360 light modulator
8 mm X 8 mm region
Up to 10 mW/mm2 power output
<50 µm resolution

- **Integrated & Ergonomic**
  Save lab space and installation time. Compatible with multiple applications.
- **Modular System**
  Laser wavelength can be changed to better suit applications. Fast interchangeable filters and laser source.
- **Precision**
  Fast and precise laser control (1 ms) and position (5 µm).
- **Increased Performance-Price Ratio**
  Get more functionalities at a lower price.

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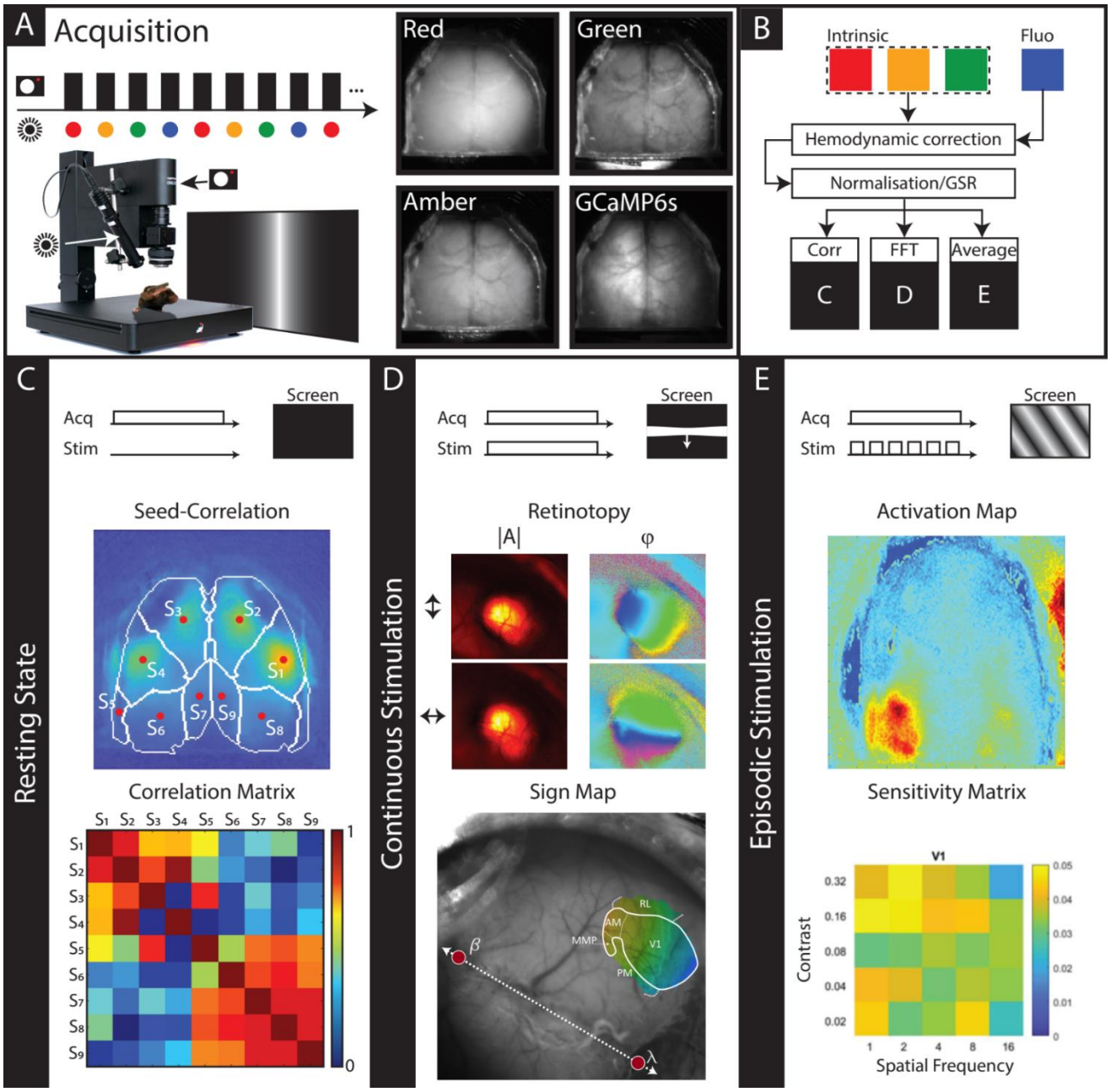
Imaging Application Examples



On the figure: **A)** Example of a possible setup with a screen to do visual stimulation during acquisition. 4 different illuminations are used: 3 for hemodynamic correction (Red, Green and Amber) and one for fluorescence (Blue). **B)** Analysis pipeline: after classification of each channels, the fluorescence images are corrected for hemodynamic fluctuations. Then, Normalisation and GSR can be applied to get the ΔF/F signal. Finally, 3 different paradigms are presented: Resting State, Continuous Stimulation, Episodic stimulation. **C)** Typical results obtained in Resting State: From the ΔF/F signal, the correlation matrix between each seeds (red dots). **D)** A periodic stimulation is presented to the mice. Then, on ΔF/F data, a Fourrier Transform is computed to get the amplitude and phase maps at the stimulation frequency. From these, the visual areas can be maped on the cortex. **E)** Different stimulation parameters are used and repeated few times to get a good average on the response. After each set of parameters repetitions are separated, a matrix showing the maximal amplitude of the response is generated.

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