

## PHI OPTICS GRADIENT LIGHT INTERFERENCE MICROSCOPY (GLIM) CELLVISTA GLIM SYSTEM

### Microscope configuration

#### Minimal for manual ROI imaging (GLIM Basic)

- Inverted microscope stand (Zeiss, Nikon, Leica, Olympus)
- Differential Interference Contrast (DIC) illumination, including DIC/Brightfield objectives (10X to 100X, dry or oil immersion), and condenser turret (DIC I, II, III prisms)

#### Recommended for multiple ROI, 2D/3D scanning, multichannel imaging (GLIM Pro)

- Inverted Zeiss AXIO Observer 7, Nikon ECLIPSE Ti2, Leica DMI8, Olympus IX83 stands with motorized Z-drive and motorized XY stage
- Differential Interference Contrast (DIC) illumination, including DIC/Brightfield objectives (10X to 100X, dry or oil immersion), and condenser turret (DIC I, II, III prisms)
- Fluorescence illumination including light source and filters, automated fluorescence turret

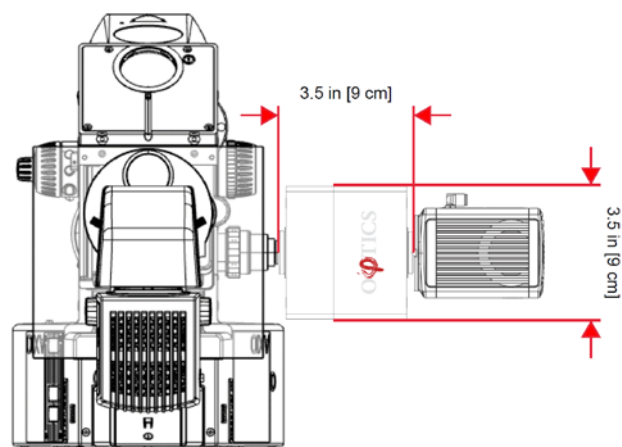
### CellVista GLIM Basic configuration (standard)

- GLIM Basic **HARDWARE MODULE** with standard LCVR unit for up to 5 fps live GLIM images at full camera resolution
- CellVista Basic **SOFTWARE PLATFORM** for manual ROI acquisition including timelapse and fluorescence channels
- GLIM-compatible desktop **COMPUTER** incl. monitor, accessories (cables, keyboard/mouse), MS Windows 11
- USB sCMOS Camera

### CellVista GLIM Pro configuration (standard)

- GLIM Pro **HARDWARE MODULE** with high-speed LCVR unit for up to 15 fps live GLIM images at full camera resolution
- CellVista Pro **SOFTWARE PLATFORM** for 2D and 3D automated scanning and acquisition, including timelapse and fluorescence channels
- GLIM-compatible desktop **COMPUTER** incl. monitor, accessories (cables, keyboard/mouse), MS Windows 11
- high speed (CameraLink or CoaXPress) and high QE (>80%) sCMOS Camera

## GLIM hardware module dimensions



L x W x H : 9 x 9 x 9 cm / 3.5 x 3.5 x 3.5 in (without camera)

- Length of cable from GLIM module to LCVR controller: 61 cm (24 inches)

## Environmental specifications

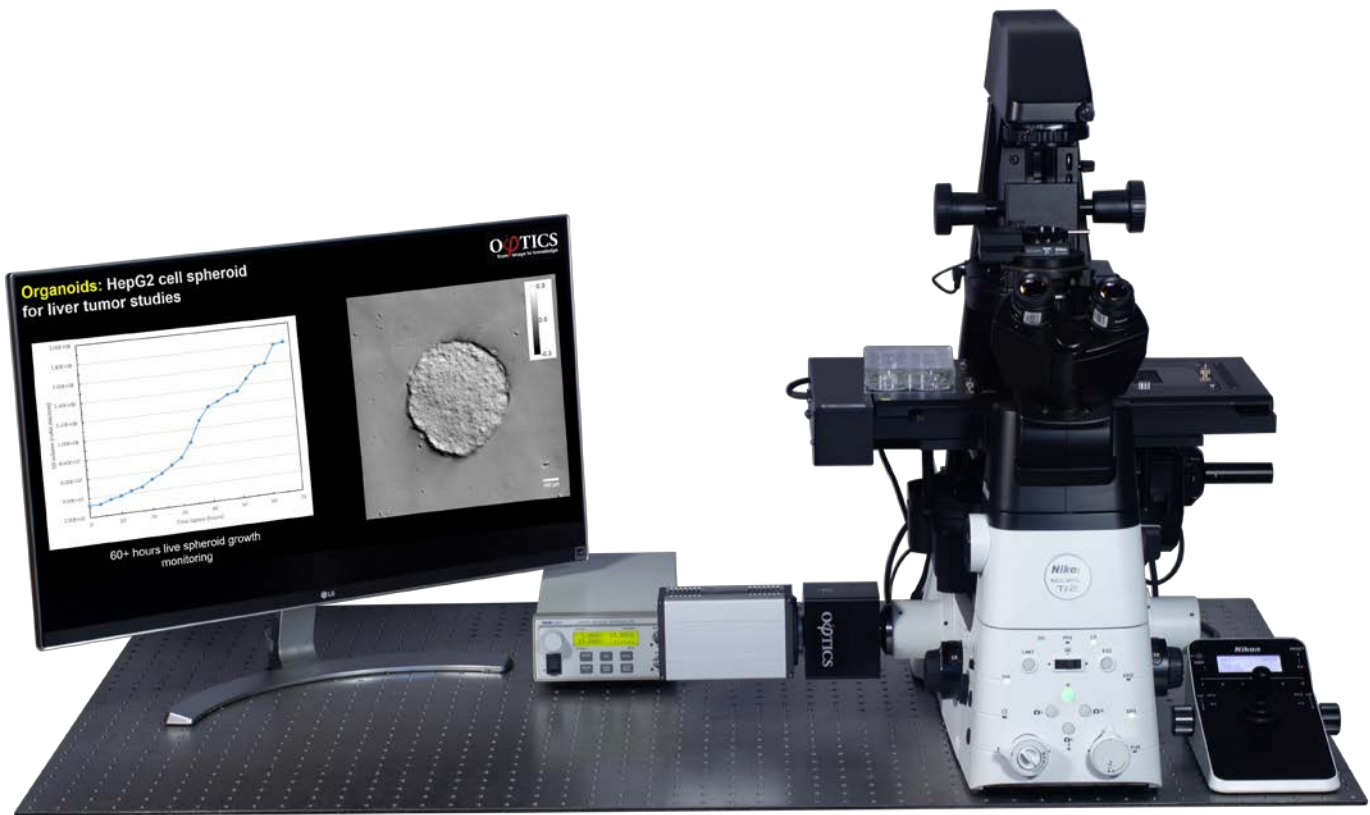
- Operating Ambient Temperatures: +10°C to +40°C
- Storage/Transport: -30°C to +60°C
- Power requirements: 100-240 VAC, 50/60Hz

## Microscope camera port connection

Use regular (1x) C-mount adapter (no magnification)

## Cameras currently compatible with CellVista software

- HAMAMATSU ORCA-Flash 4.0 and ORCA-Fusion
- ANDOR Zyla and Neo
- TELEDYNE Photometrics Prime BSI
- EXCELITAS PCO Panda and Edge
- Other cameras can be integrated upon request



*CELLVISTA GLIM PRO module connected to a NIKON Eclipse Ti2 microscope*



*CELLVISTA GLIM PRO module connected to a LEICA DMI8 microscope*

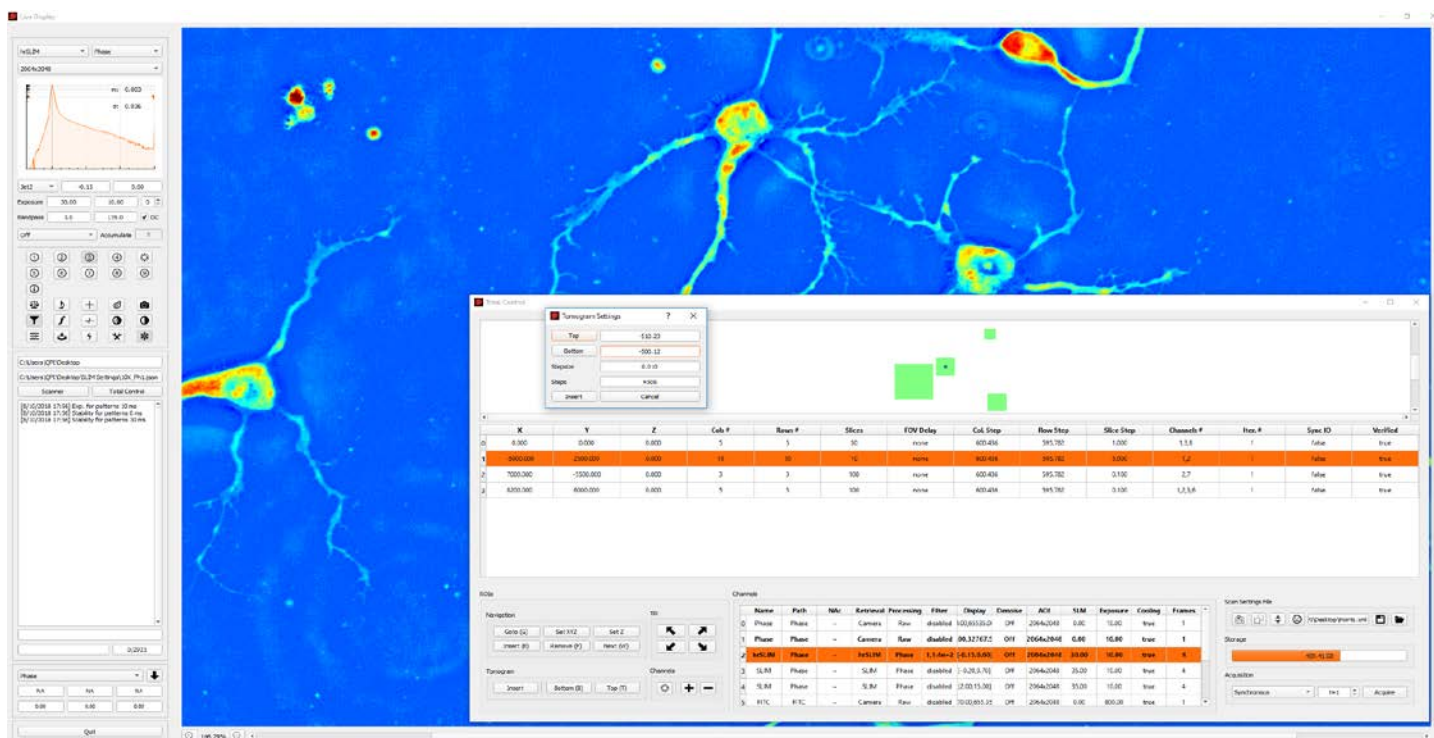
## Image processing and display

### Image Display/Acquisition Speed

- GLIM: Up to 15 frames per second (fps) at full camera resolution with Phi Optics CellVista Pro software and GLIM-compatible desktop PC
- Regular microscope output (fluorescence, DIC, brightfield): up to 100 frames per second for standard configuration

### Image Acquisition software: PHI OPTICS CELLVISTA platform

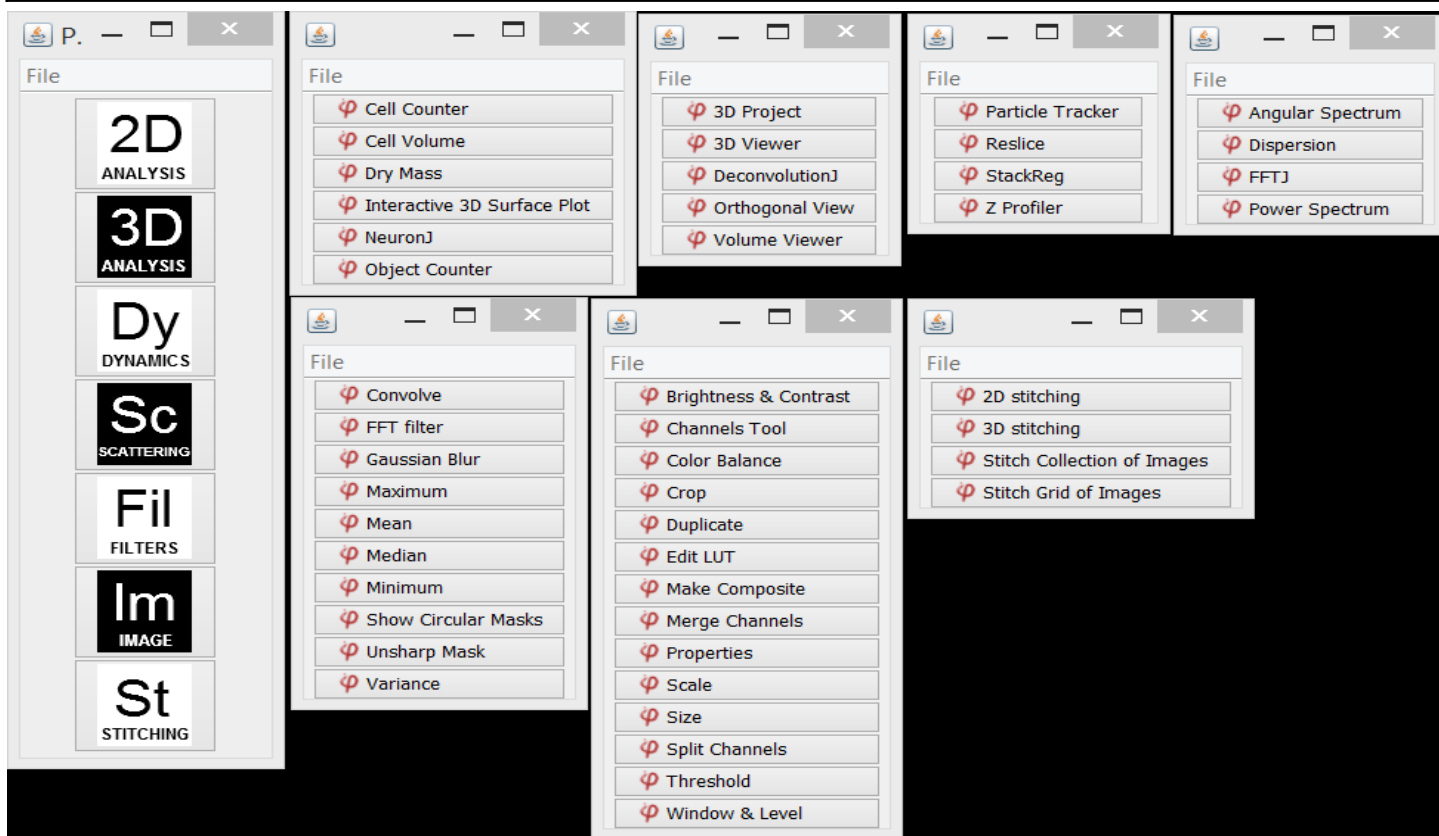
- Includes **Live Display** of user configurable channels (GLIM, fluorescence, brightfield, DIC) and manual ROI acquisition (snapshots)
- **GLIM maps**: direct measurement of phase, dry mass, height or refractive index of the sample
- **AUTOMATED SCANNING** module for programmable acquisition capabilities including:
  - control of the microscope motorization components (PRO version only): illumination shutters, condenser control, fluorescence turret, Z-drive, XY-stage
  - **TOMOGRAM** operation (PRO version only) for automated Z-stack acquisition (step size resolution defined by motorized focus Z-drive)
  - **GRIDSCAN** operation (PRO version only) for programmed scanning of predefined sample area, with focus correction maps, stitching and background correction
  - **TIMELAPSE** operation (BASIC and PRO versions) for automated time series acquisition (defined timesteps and cycles)
  - **4D operation** (depending on software version) to customize your advanced experiment with multiple ROI list and combined operations for each ROI: multichannel acquisition (GLIM, fluorescence, brightfield, DIC), GRIDSCAN, TOMOGRAM, TIMELAPSE.
  - **Output**: Tagged Image File Format (TIFF), no compression, up to full camera resolution (e.g. 2048 x 2048 pixels for ORCA-Flash 4.0), 32-bit floating point format



*CELLVISTA PRO software platform for 4D multi-ROI, multi-channel image acquisition*

## Image Analysis Software

- GLIM output is compatible with all major image-processing software: ImageJ (NIH), CellProfiler (MIT), IMARIS (Bitplane), MetaMorph (Molecular Devices), ZEN (Zeiss), NIS Elements (Nikon), MATLAB (MathWorks)
- Phi Optics provides an ImageJ Plugin Toolkit for image and data processing of 2D, 3D and time lapse series: open access ImageJ / FIJI based analysis pipelines for assay data analysis:
  - Data assembly:
    - stitching/mosaic of full well fields of view (any microscope channel)
    - 3D assembly of Z-stacks (any microscope channel)
    - Object (organelle, cell, spheroid, protein particle) counting, size, and 3D morphology, dry mass per object and population, including time dependent statistics per cell and population in Microsoft Excel format



*Plugin toolkit for image analysis using ImageJ / FIJI platform*

## Measurement resolution

- Transverse resolution - diffraction limited (e.g .250 nanometers with 63x/1.4NA objective)
- Axial optical sectioning - up to 1 micron for 1.4NA objectives