



## 32. Micro-Manager driver



Versatility –  
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with your favorite equipment.



# User Guide for JENOPTIK GRYPHAX® Micro-Manager driver

The “Micro-Manager driver” for JENOPTIK GRYPHAX® USB 3.0 cameras enables user to operate with **Micro-Manager - the open source microscope software** solution for control of automated microscopes. The driver delivers essential functionalities of JENOPTIK GRYPHAX® USB 3.0 cameras. Driver is supported under Windows operating systems.

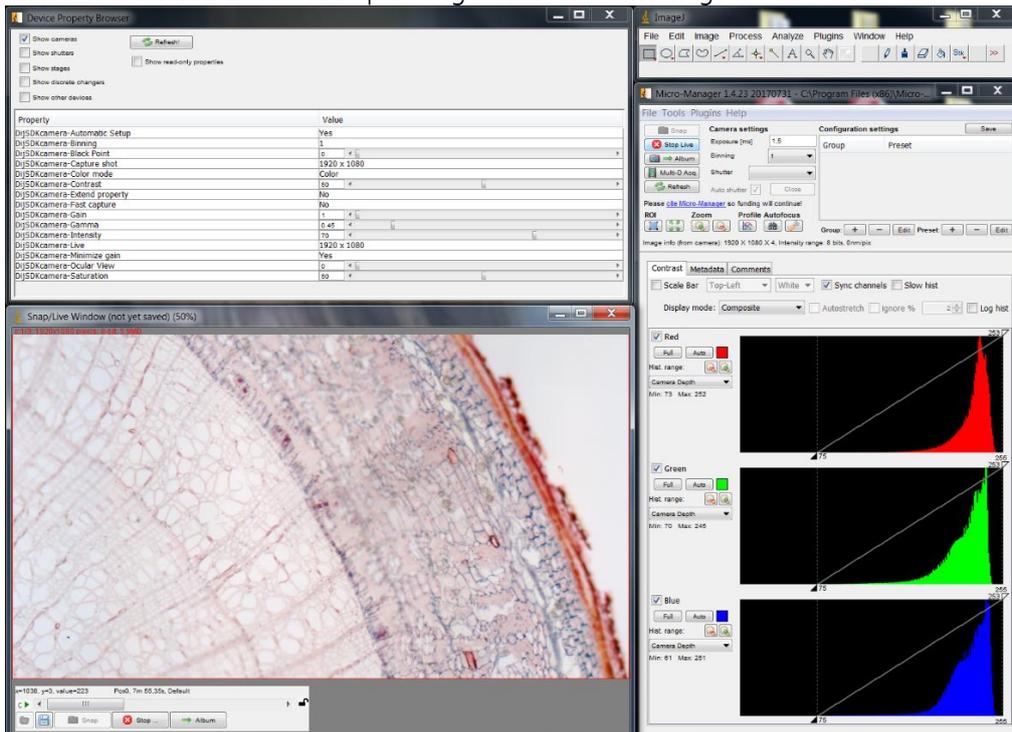
The GRYPHAX Micro-Manager driver 32 bit version is part of JENOPTIK GRYPHAX® software installation as of version 2.0.0 or newer. The Micro-Manager driver 64 bit version is part of GRYPHAX V2.2.0.

### 32.1 General Preparation:

Depending on the driver and system version, the Micro-Manager software version **2.0.0 Gamma – 32 bit** or **2.0.0 Gamma – 64 bit** has to be installed before start installation of JENOPTIK GRYPHAX Micro-Manager driver. Recommended USB 3.0 interface card (with Renesas chipset) has to be installed in advance!

### Overview:

JENOPTIK GRYPHAX camera operating under Micro-Manager software:





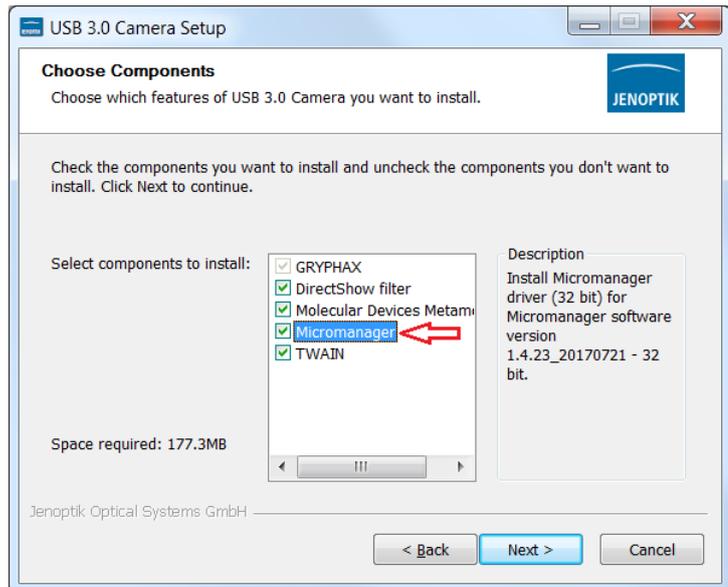
## 32.2 Installation:

To **install** the JENOPTIK GRYPHAX Micro-Manager driver, please run the JENOPTIK GRYPHAX® software installation **version 2.0.0.0** (USB 3.0 Camera-v2.x.x.x.exe) or newer.

Latest JENOPTIK GRYPHAX® software can be downloaded from Jenoptik website for free after registration.

[DOWNLOAD UPDATE](#)

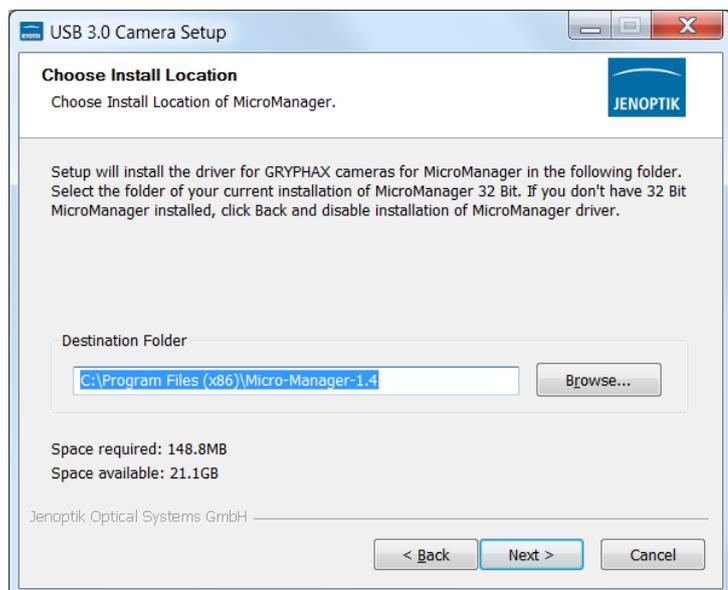
1. **Select** the Micro-Manager driver from “Choose Components” page and proceed with “Next”.



2. **Choose** the install location of previously installed Micro-manager software.

Note: The Micro-Manager driver must be installed at root folder of Micro-Manager installation: “...**(x86)**\Micro-Manager-2.0\”  
Or “...**\Program Files**\Micro-Manager-2.0\”

**Click** on “**Browse**” button to choose alternative installation location.



3. **Follow** the installation procedure to complete installation.



### 32.3 Hardware configuration:

After successful Micro-Manager driver installation, please plug-in the JENOPTIK GRYPHAX USB 3.0 camera to USB 3.0 port at recommended interface card.

Note: To **operate** with JENOPTIK GRYPHAX cameras under Micro-Manager software a hardware configuration file is mandatory. Please follow the next steps to configure hardware settings file.

For detailed information, please visit official Micro-Manager support website:

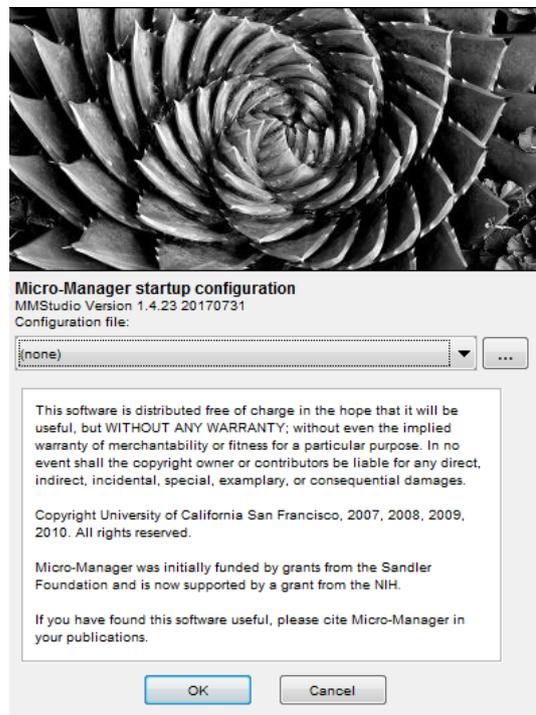
[https://micro-manager.org/wiki/Micro-Manager\\_User%27s\\_Guide](https://micro-manager.org/wiki/Micro-Manager_User%27s_Guide)

(Note: This is an external link outside our influence area, which can be removed or invalid)

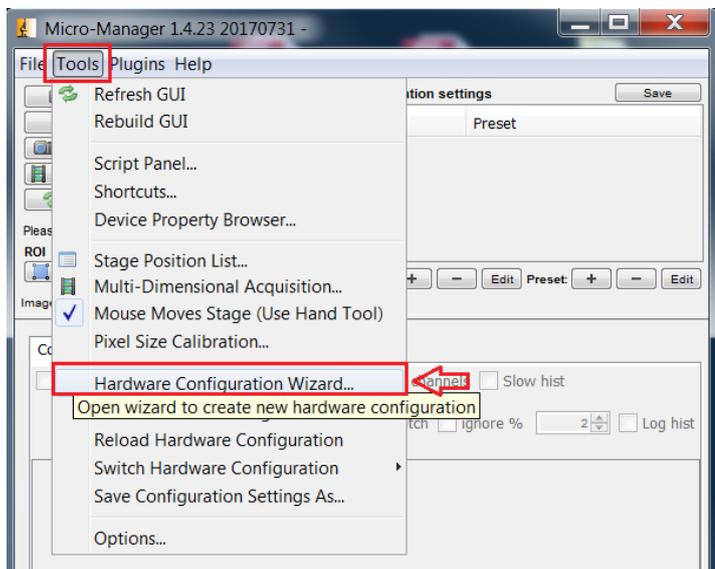
Start the Micro-Manager software

📁 **Micro-Manager-1.4** from installation directory without "Micro-Manager startup configuration".

**Important Note:** Micro-Manager – Device Interface version = 69 is supported only!

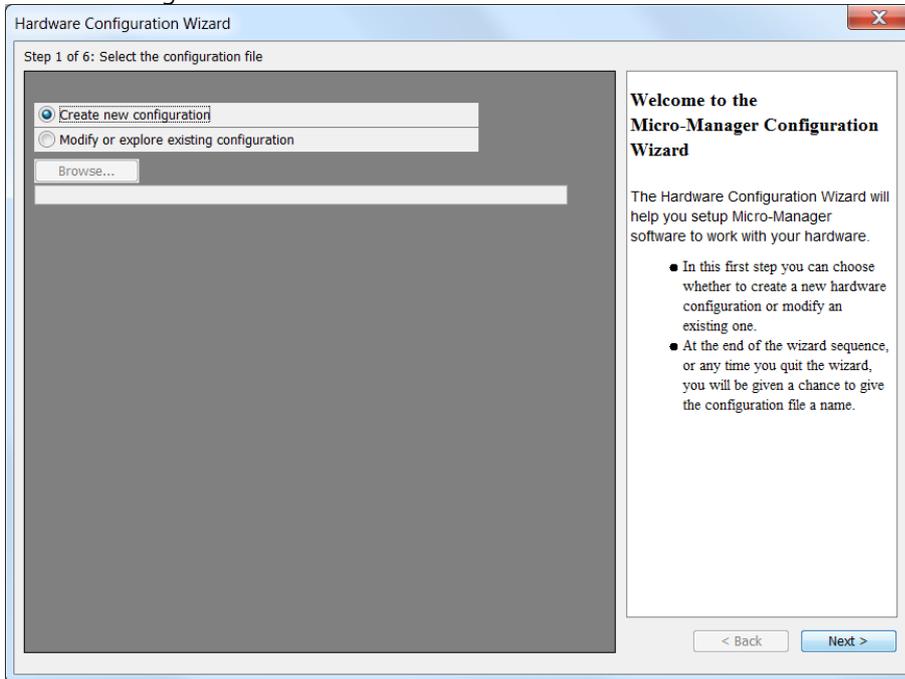


To **create** a Micro-Manager configuration with JENOPTIK GRYPHAX camera support, please navigate to the title bar of Micro-manager and activate option: "Hardware Configuration Wizard..." from menu: "Tools".

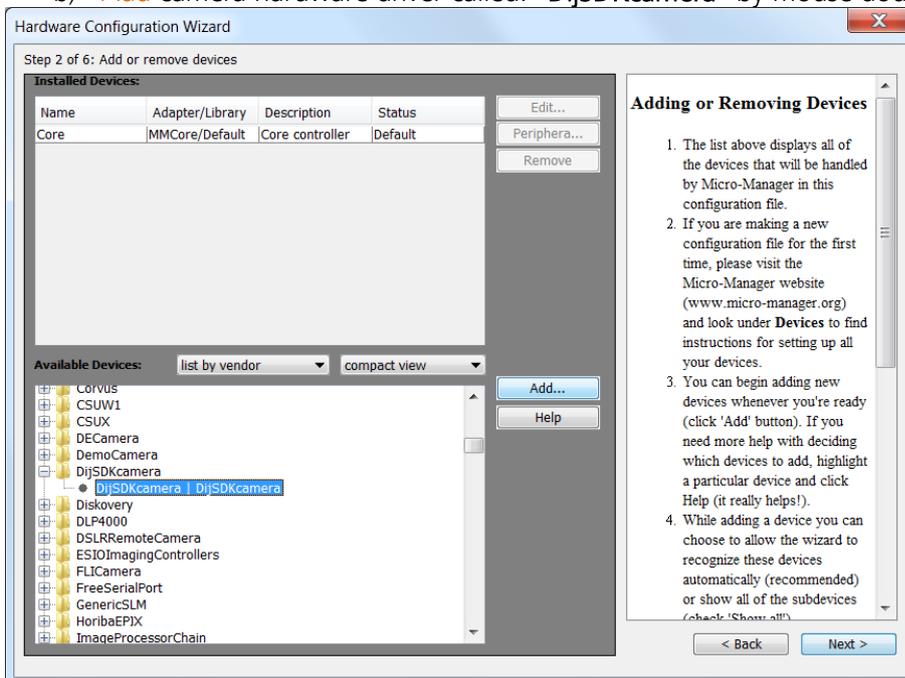




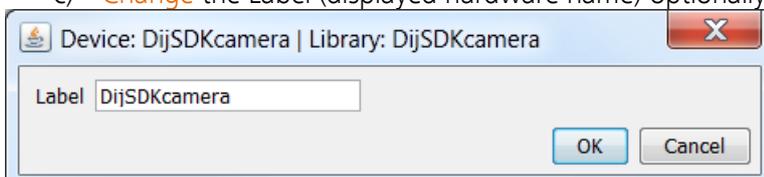
a) Follow up the configuration wizard by modify existing configuration or by create of a new configuration. Proceed with "Next" button.



b) Add camera hardware driver called: "DijSDKcamera" by mouse double click or "Add" button.

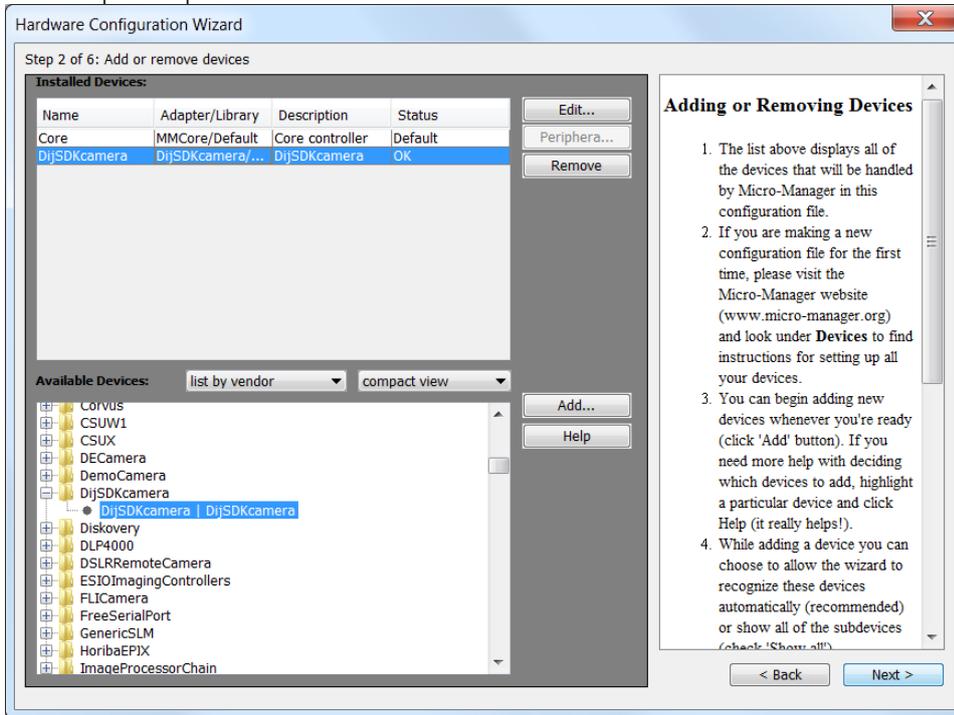


c) Change the Label (displayed hardware name) optionally and confirm by "OK" button.

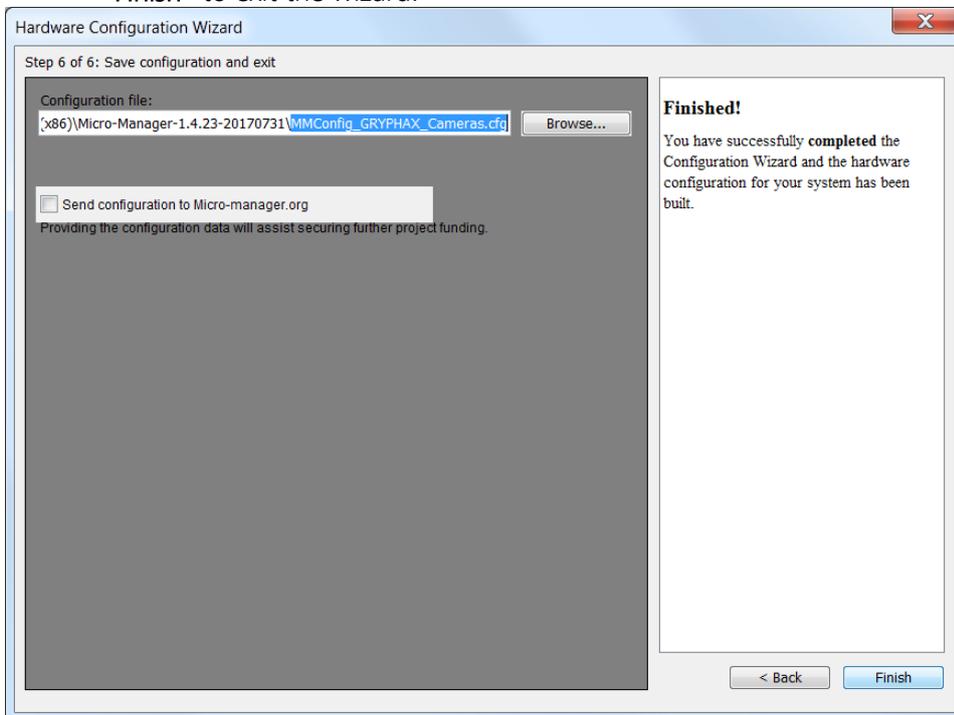




d) After successfully adding the JENOPTIK GRYPHAX camera driver to the list of "Installed Devices", please proceed with "Next" button.



e) **Complete** the hardware configuration by save of new / changed configuration and press "Finish" to exit the wizard.

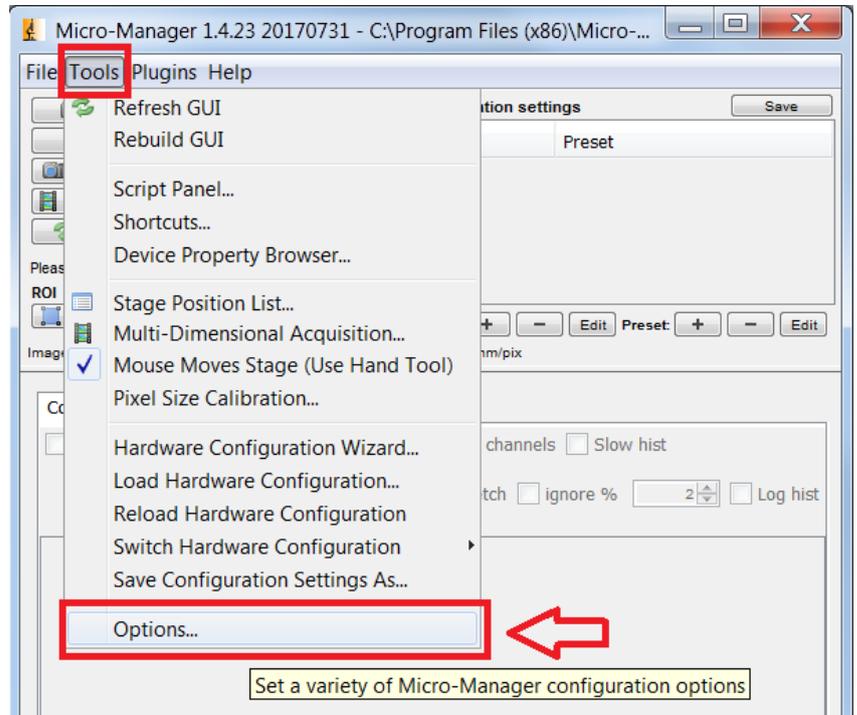


f) Configuration of hardware support file is completed. Now you are prepared to operate with JENOPTIK GRYPHAX USB 3.0 cameras together with Micro-Manager software.



### 32.4 Configure recommended memory settings for 32 bit version:

To **edit** memory settings for **Micro-Manager** plug-in, please navigate to the title bar of Micro-manager and open option: “Options...” from menu: “Tools”.



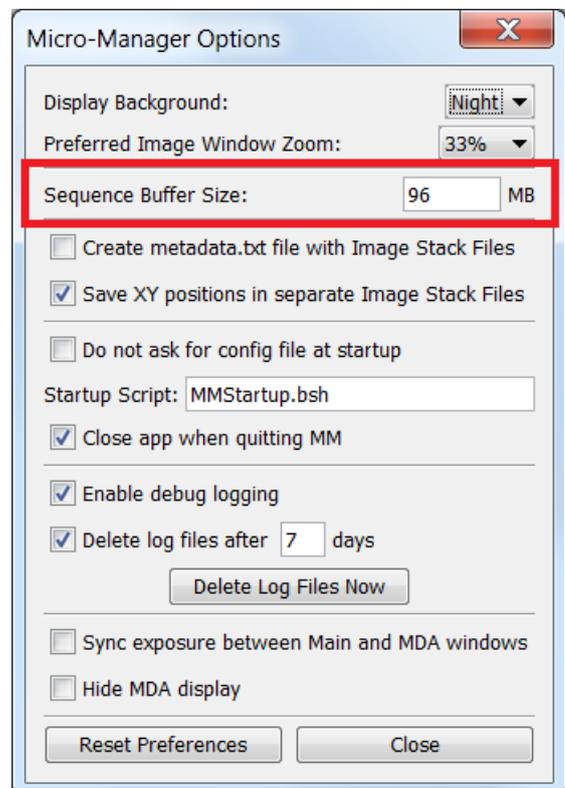
**Change** the “Sequence Buffer Size” between: **96 to 256 MB** (recommended size to operate with JENOPTIK GRYPHAX cameras).

For detailed information, please visit official Micro-Manager support website:

[https://micro-manager.org/wiki/Micro-Manager\\_Configuration\\_Guide#Memory\\_Settings](https://micro-manager.org/wiki/Micro-Manager_Configuration_Guide#Memory_Settings)

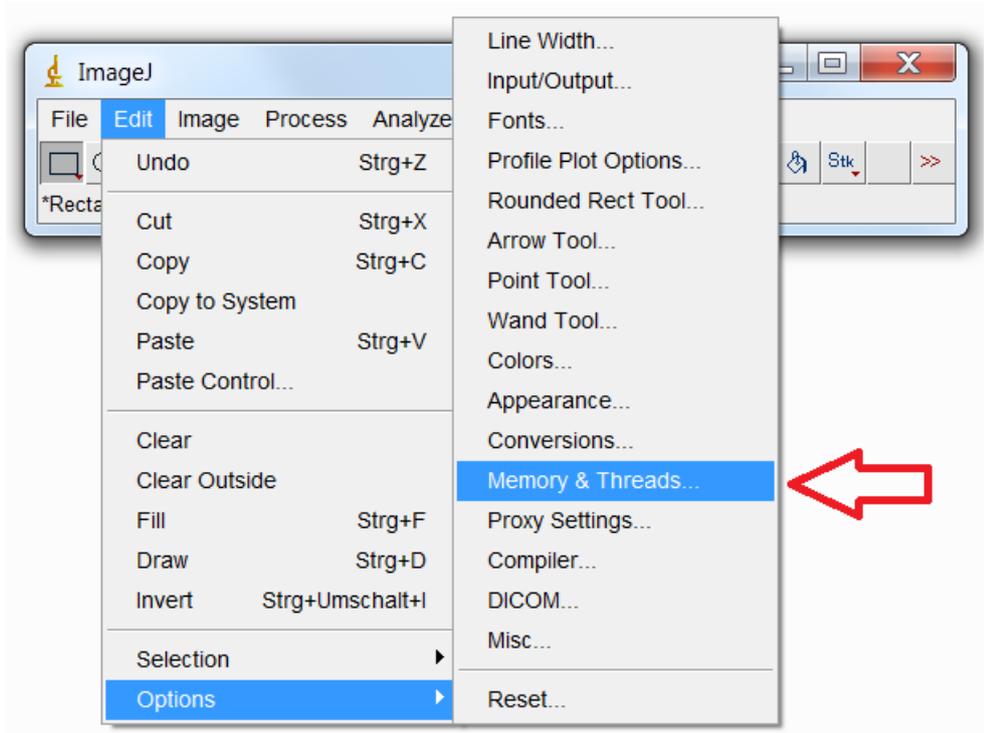
(Note: This is an external link outside our influence area, which can be removed or invalid)

**Note:** The best working buffer size varies depending on used hardware and software environment!



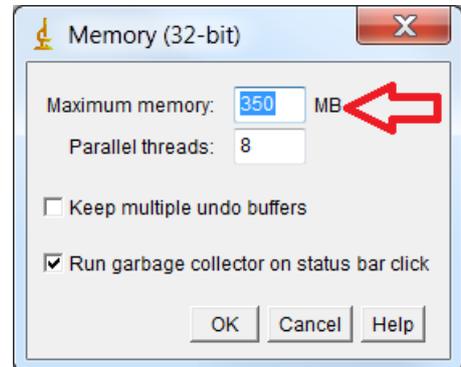


To **edit** memory settings for **ImageJ** software, please navigate to the title bar of ImageJ and open option: **“Options”** from menu: **“Edit”**.



**Change** the **“Maximum memory”** size to approx.: **350 MB** (recommended size to operate with JENOPTIK GRYPHAX cameras).

Note: The best working memory size varies depending on used hardware and software environment!

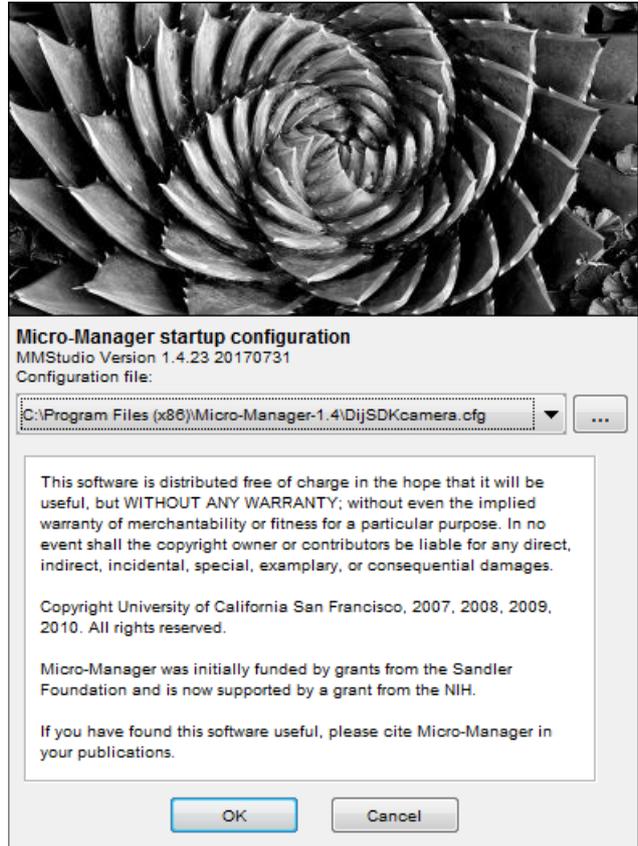




### 32.5 Start Micro-Manager and select hardware configuration:

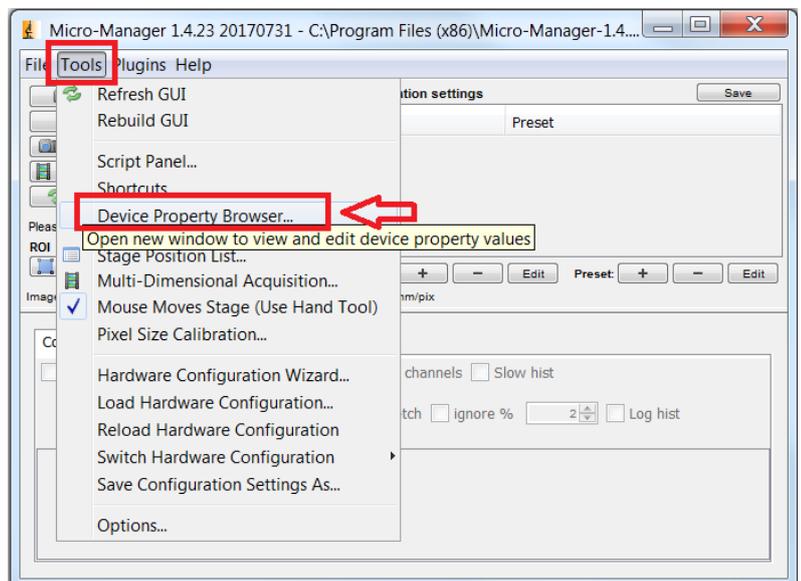
Start Micro-Manager application  **Micro-Manager-1.4** from your installation directory.

Select hardware configuration with JENOPTIK GRYPHAX USB 3.0 camera support from “Micro-Manager startup configuration dialog” to activate the cameras. Click on “...”  button to load configuration file from PC.



To setup camera functions, please navigate to the title bar of Micro-Manager and open the “Device Property Browser” from menu: “Tools”.

Afterwards, a new window will be open to view and edit camera property values.





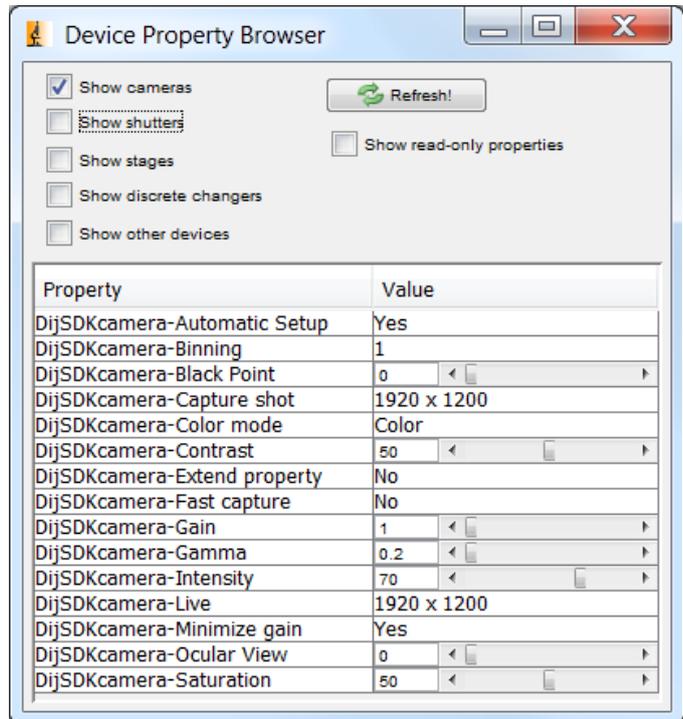
At "Device Property Browser" all relevant camera values can be changed.

By option "Extend property" you can activate the extended property dialog with more function compared to the "Device Property Browser".

Afterwards, the camera driver windows for camera settings and live preview will appear automatically.

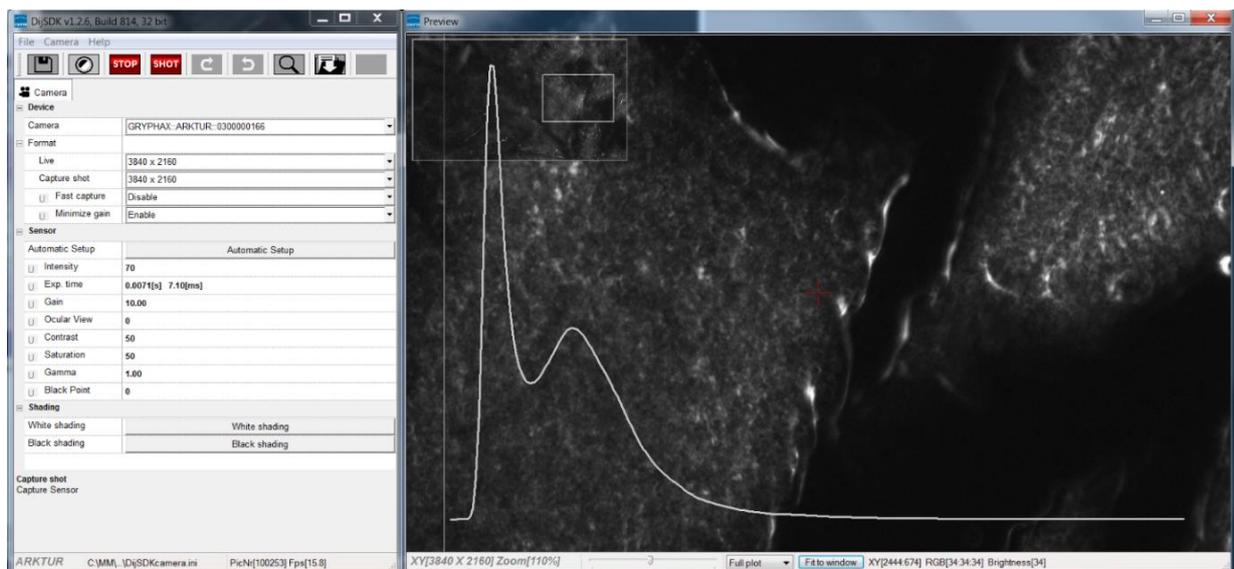
At the driver settings window you can prepare all camera relevant settings to get best results from camera. Additionally, you can observe your settings e.g. white balance directly at the live preview window.

For further details, please see next pages.



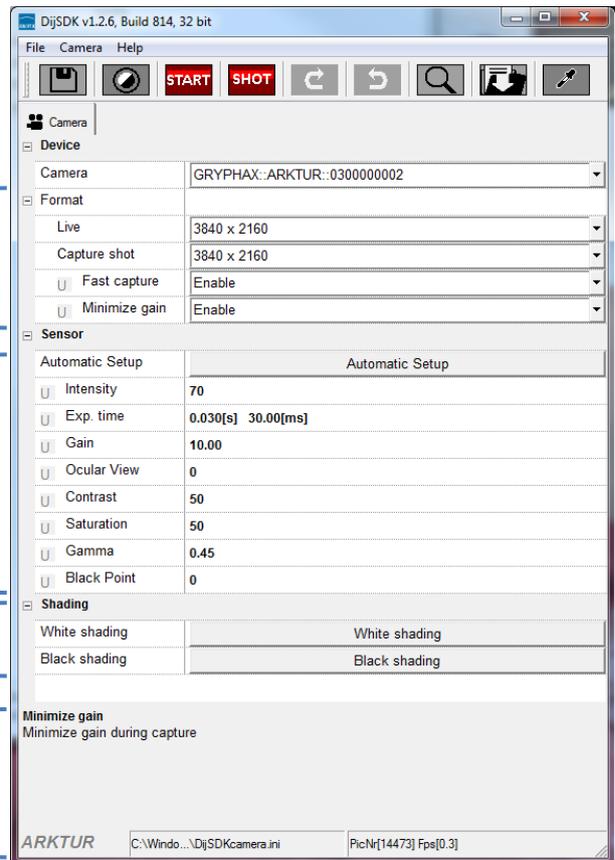
Note: Due to the limitation of Micro-Manager, not all values and parameter of Device Property Browser can be adjusted during live preview or single image capture!

JENOPTIK GRYPHAX camera driver windows for extended camera settings and live preview:



### 32.6 Overview of settings window:

1. Toolbar – contains most important tools
2. Select active camera
3. Format - change image settings for:
  - Live and Capture shot resolution
  - Fast capture mode
  - Option – Minimize gain during capture
4. Image parameter settings\*
5. Create / delete Shadings
6. Information field for help text & status



**Note:** All settings are saved (under folder: C:\Users\

### 32.7 Toolbar:



The Toolbar of driver contains the following functions:

-  Save camera settings manually to currently used settings file.
-  Change between color mode and black / white mode for color cameras.\*
-  Start / Stop **Live image preview** at the preview window.
-  Shot button to **start transfer single capture shot** image via driver interface.
-  Magnifier tool to activate / deactivate magnifier glass at preview window.
-  Save image option to save last displayed live image from preview window to hard drive.
-  White balance pipette to set manually white balance for color cameras at preview window.\*

\*functions available for color cameras only



Select camera:

To **activate** or change camera, select the appropriate camera from dropdown list of driver.

Camera	GRYPHAX::ARKTUR::0300000002
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After activation of camera from dropdown list, the according settings to the camera type will be loaded from settings file and used.

GRYPHAX::ARKTUR::0300000001
GRYPHAX::SUBRA::0100000105
GRYPHAX::NAOS::0200000003
GRYPHAX::ARKTUR::0300000001
GRYPHAX::ARKTUR::0300000002
GRYPHAX::PROKYON::0600000004

Note: In case of first camera start, the "Automatic setup" process will be proceed.

Format:

Under format section user can set-up different image resolution for live preview and capture shot.

Live	3840 x 2160
Capture shot	3840 x 2160

"Fast capture mode" reduces processing time and transfer time for image transfer via driver.

By **activation** of "Fast capture mode" the driver will use the selected live resolution for single shot (image transfer) instead of the selected capture shot resolution!

Fast capture	Disable
Minimize gain	Enable

By **activation** of option "Minimize gain during capture" the gain value will be minimized for capturing and adjusting the exposure time accordingly. This option is recommended and will reduce noise level and enhance image quality.



### 32.8 Camera image parameter:

Important: All *camera image parameter* are saved during close driver for each camera type and will be reused after open of driver again.

The *Automatic Setup* option can be used at any time to set all camera image parameter to default values. The applied shading correction will be deactivated. Additionally, the automatic white balance and the color correction to the used light source will be applied and "Auto Exposure control" is enabled.



All *camera image parameter* can be adjusted by scroll slider or by enter of value.



The *Exposure control* option contains the following parameter: Intensity value, Exposure time and Gain value.

Intensity	75
Exp. time	0.033[s] 33.00[ms]
Gain	1.00

Set *Intensity* level to activate the *automatic exposure control* function. The selected value corresponds the mean intensity value in percent. Available range from 0 to 100%

Change *exposure time* value or *gain* value to *activate manual exposure control*.

*Ocular View*\* – to adapt the color impression from the eyepieces (microscope) to the image on screen.

*Contrast* – to enhance image contrast for live and captured images.

*Saturation*\* – to change color saturation for live and captured images.

*Gamma* – to change gamma value for live and captured images.

*Black Point* – to enhance noise level in dark image areas.

Ocular View	0
Contrast	50
Saturation	50
Gamma	0.45
Black Point	0

\*function available for color cameras only

Reset settings separately:

All *camera image parameter* can be reset to default value separately by pressing reset icon .

Status bar information:

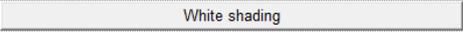
Status bar displays the connected camera, settings location, frame number and frame rate.



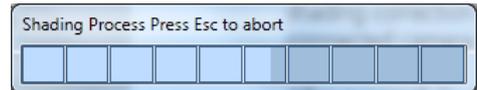


### Create / delete white shading:

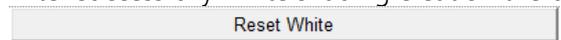
White shading function corrects intensity variation across the image, caused by the microscope or objectives.

Click on the button **“White shading”**  to create a white shading correction. The driver will automatically create a white shading correction file for the connected camera type.

This will take up to some seconds, the progress indicator will be shown during creation. Press “Esc” will abort process.



After successfully white shading creation the button will change status to **“Reset White”**



The white shading correction is now available and used. To deactivate the white shading press **“Reset White”** and the white shading correction file will be deleted and cannot be reloaded again. After reset / delete of shading file, a new shading file has to be created to activate shading again.

The shading files will be saved on: **“C:\Users\\AppData\Roaming\DijSDK\”** and are reused after driver restart and appropriate camera type is connected.

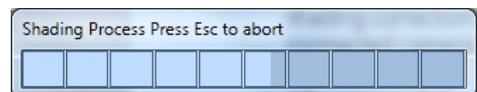
Note: Driver can save just one shading file for each camera type. The file is valid to the individual camera serial number!

### Create / delete black shading:

Black shading function enhance noise level for long time exposed image.

Click on the button **“Black shading”**  to create a black shading correction. The driver will automatically create a black shading correction file for the connected camera type.

This will take up to some minutes, the progress indicator will be shown during creation. Press “Esc” will abort process.



After successfully black shading creation the button will change status to **“Reset Black”**



The black shading correction is now available and used. To deactivate the black shading press **“Reset Black”** and the black shading correction file will be deleted and cannot be reloaded again. After reset / delete of shading file, a new shading file has to be created to activate shading again.

The shading files will be saved on: **“C:\Users\\AppData\Roaming\DijSDK\”** and are reused after driver restart and appropriate camera type is connected.

Note: Driver can save just one shading file for each camera type. The file is valid to the individual camera serial number!



### 32.9 Capture / Transfer images:

To **transfer** single images press the “Shot” button  on the toolbar. The live preview image will be stopped and a single image will be transferred by driver interface to the application.

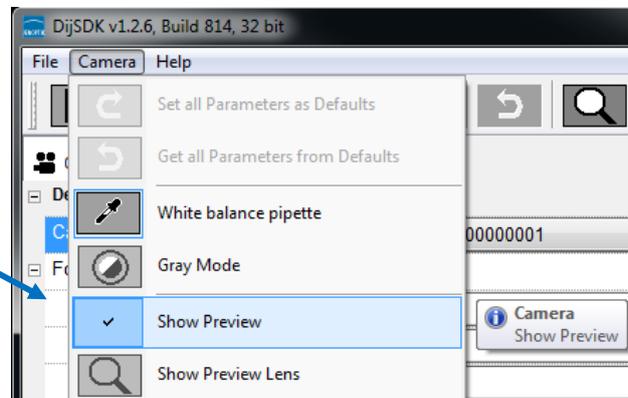
Live image will be restarted automatically at preview windows after transfer of single image.

### 32.10 Start / Stop Live:

To stop or restart live preview at the preview window, press live control button  at the toolbar.

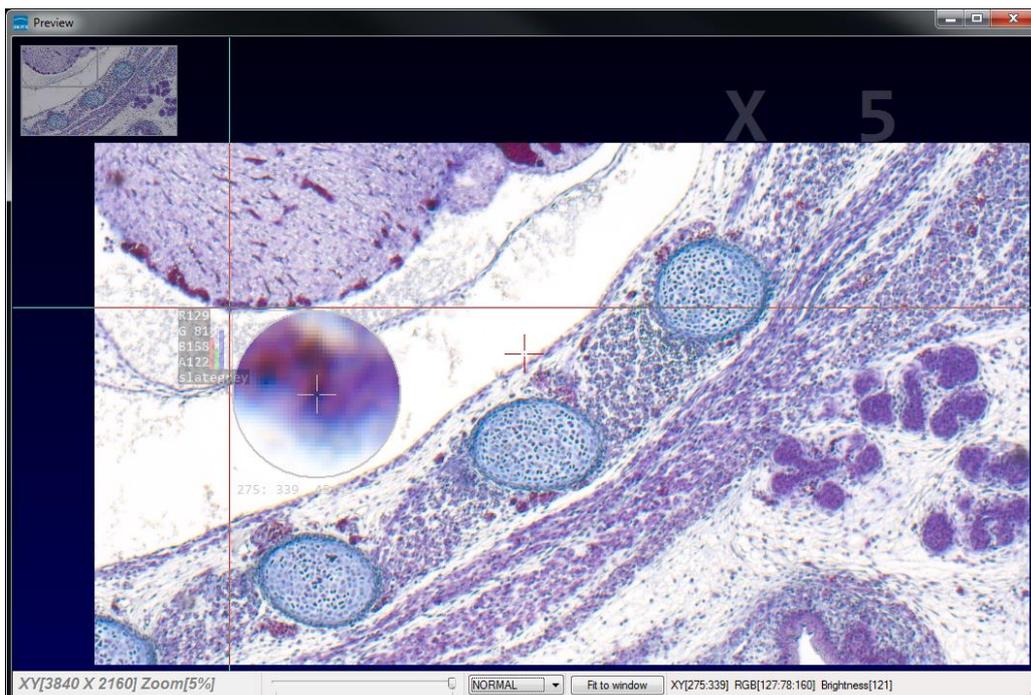
### Open / close preview window:

To deactivate or activate the preview window of driver, navigate to the “camera” menu entry and choose “Show Preview”.



### 32.11 Preview window:

The *preview window* displays the live stream preview from the camera as well as the capture shot images.





### 32.12 Preview window tools and options:

Preview window contains the following tools and information at the toolbar:



Image dimensions (X/Y) of current live preview **XY[3840 X 2160]**

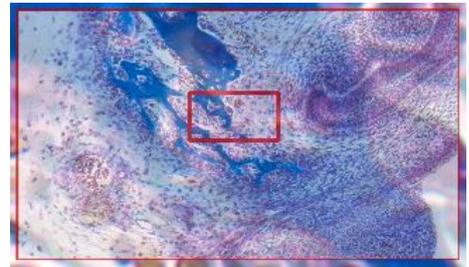
Display of current selected zoom level from preview window **Zoom[200%]**

Zoom slider or scroll wheel to change zoom level. Left position zoom out, right position zoom in.



Image overview as overlay to display whole image in case of 1:1 view or image zoom over live preview.

Note: To change image section, use the rectangle from overview.



Display Mode drop down menu **Normal view** to change between different view options:

“Normal view” – view image as color or b/w image without histogram

“Negative view” – invert image values to get negative image view

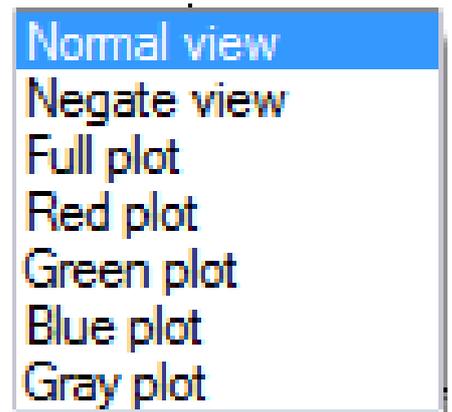
“Full plot” – to activate RGB and gray channel of histogram as overlay

“Red plot” – to activate red color channel of histogram as overlay

“Green plot” – to activate green color channel of histogram as overlay

“Blue plot” – to activate blue color channel of histogram as overlay

“Gray plot” – to activate gray channel of histogram as overlay



Fit to screen function activated by button **Fit to Window** or by double click on left mouse button into the live preview window.

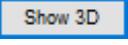
Fit to lens function to change back to 1:1 view and enable zoom slider. **Fit to lens**

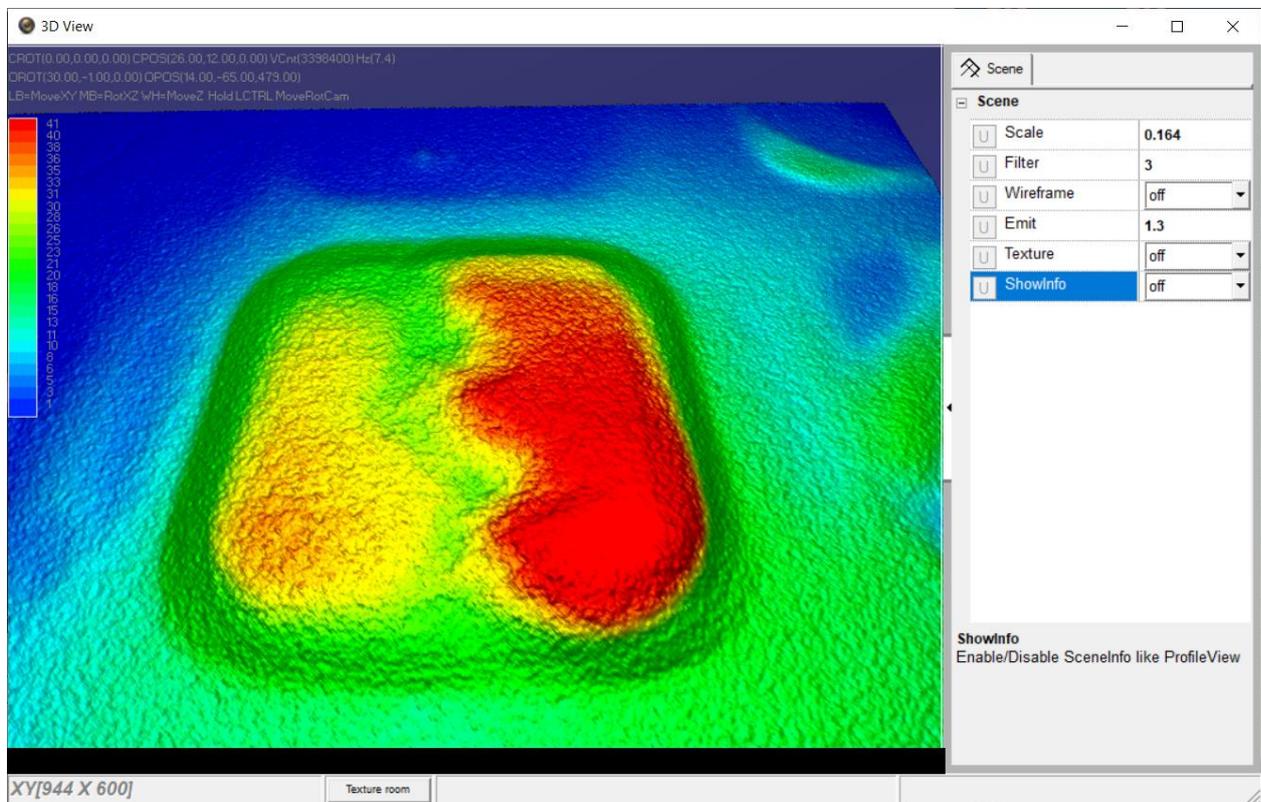
Display of RGB values and image coordinates of corresponding mouse pointer position.

XY[783:550] RGB[136:81:115] Brightness[110]

**Presentation mode** – to change live preview window view between “full screen” and “normal window” by click on middle mouse button (scroll wheel) into the preview window. Whole live preview will be displayed on the screen.

**Experimental pseudo 3D-View\*** – to display a 2D image as a virtual 3D image.

Press button “Show 3D”  to activate a separate preview window for pseudo 3D live preview.



The window shows a 3D color map image and display options to adjust the scenario.

\*(Available as of JENOPTIK GRYPHAX version 2.2 or newer)

### Adjust View:

**Move** the 3D image by mouse operation on preview window.

**Zoom in / out** by mouse wheel on preview window.



Open scene settings menu on the right-hand side. Click on the arrow and swipe left to open.

**Scene settings:**

**Scale** – to set the scaling factor for depth

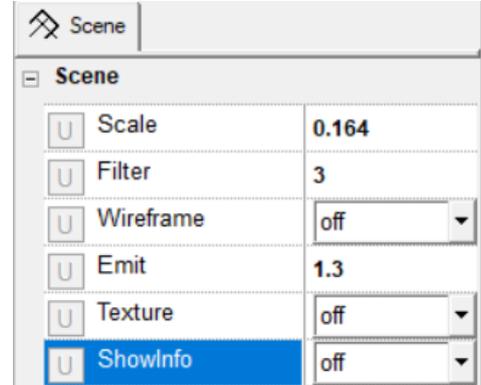
**Filter** – to change filter settings for details and smoothness

**Wireframe** – to enable / disable wireframe support of GPU card

**Emit** – to increase / decrease shining

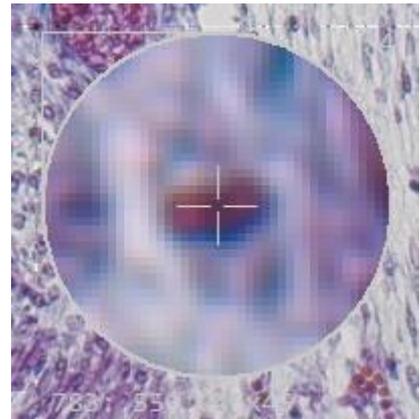
**Texture** – to turn on / off “JetColorRoom” without textures

**ShowInfo** – to enable / disable scene information



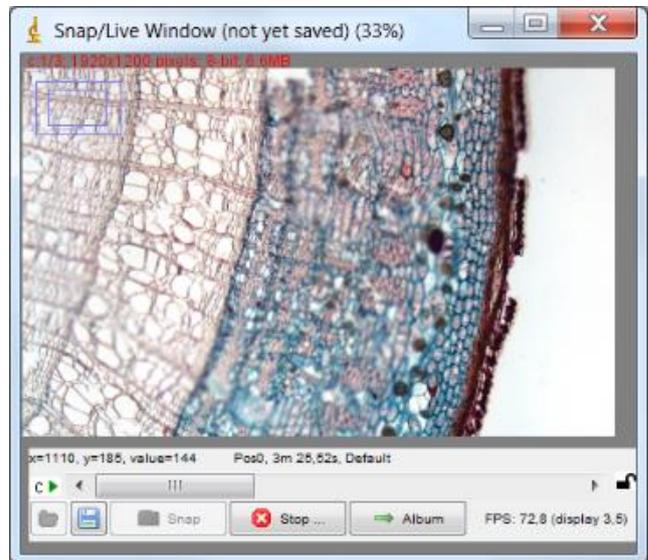
Magnifier glass activated by Magnifier button  to zoom in 4x times on live preview.

Note: By right-hand mouse click the magnifier appearance changes between “rectangle” and “circle glass”.

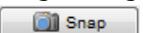


### 32.13 Start live preview:

To **start** live preview from camera press “**Live**”  button from main window. Micro-Manager will show live preview with pre-selected values from Device Property Browser at separate image window.



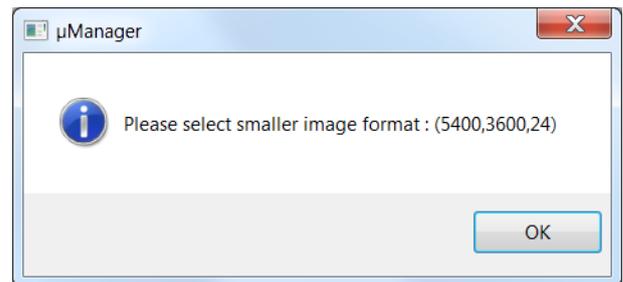
### 32.14 Start single image snap:

To **start** single image snap from camera press “**Snap**”  button from main window. Micro-Manager will capture a single image with pre-selected values from Device Property Browser at separate image window.

### Warning message:

Micro-Manager driver will display the following warning message in case that previously configured memory size is insufficient to start live preview or single image capture.

Please **change** memory settings for Micro-Manager “**Sequence Buffer Size**” or reduce image resolution.

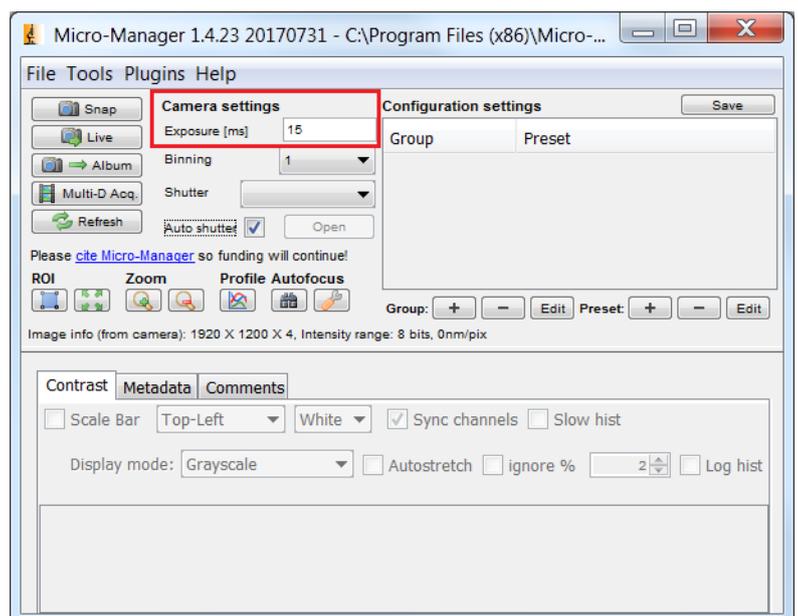


### 32.15 Change Exposure Time:

To **edit** exposure time value for live preview and single image snap by option: “**Exposure**” at Camera setting from Micro-Manager main window.

Exposure time value are displayed in “**ms**” milliseconds.

For detailed information, please visit official Micro-Manager support website:



[https://micro-manager.org/wiki/Micro-Manager\\_User%27s\\_Guide#The\\_Micro-Manager\\_Main\\_Window](https://micro-manager.org/wiki/Micro-Manager_User%27s_Guide#The_Micro-Manager_Main_Window)

(Note: This is an external link outside our influence area, which can be removed or invalid)



### 32.16 Limitations:

- Micro-Manager software **V2.0.0\_GAMMA - 32 bit (Device API version 69)** support only\*.
- Micro-Manager software **V2.0.0\_GAMMA - 64 bit (Device API version 69)** support only\*.
- Only JENOPTIK GRYPHAX USB 3.0 camera supported.
- Windows 7 SP1 / 10 support only.
- Camera driver functionalities are limited due to the Micro-Manager limitations.

\*(Part of JENOPTIK GRYPHAX version 2.2.0 or newer and DijSDK 2.5.2 or newer)