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## User Guide for PROGRES GRYPHAX® Micromanager driver

The “[Micromanager driver](#)” for PROGRES GRYPHAX® USB 3.0 cameras enables user to operate with Micromanager - the open source microscope software solution. The driver delivers essential functionalities of PROGRES GRYPHAX® USB 3.0 cameras. Driver is supported under Windows operating systems.

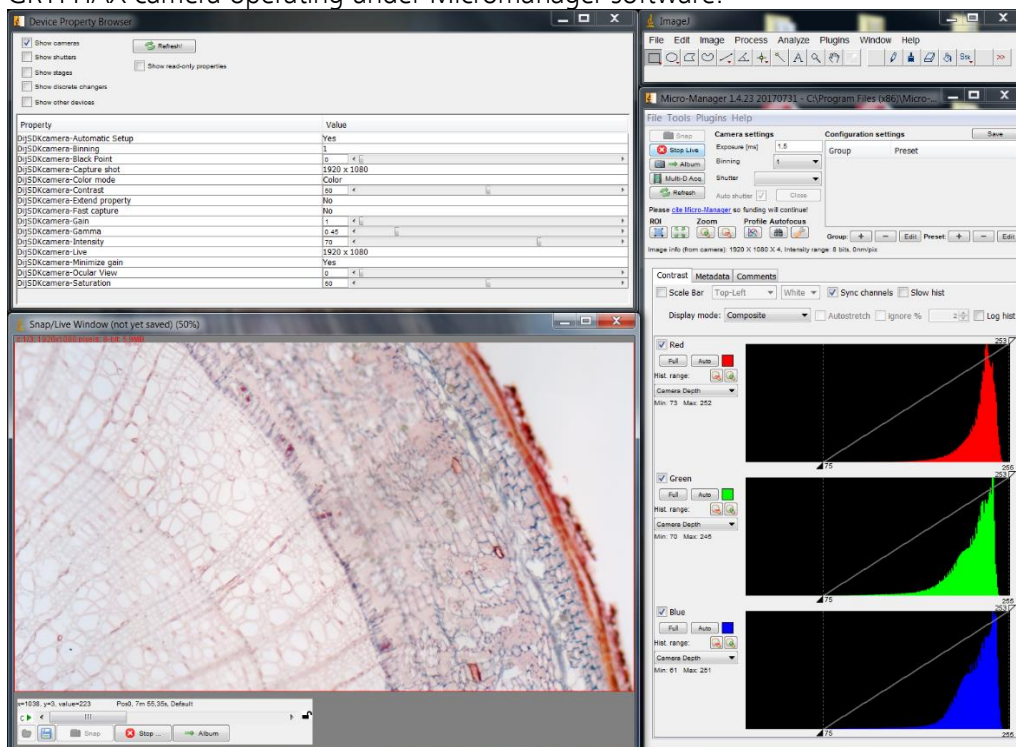
The GRYPHAX Micromanager driver is part of PROGRES GRYPHAX® software installation (as of version 2.0.0 or newer).

### General Preparation:

The Micromanager software version **1.4.23\_20170731 – 32 bit** has to be installed before start installation of GRYPHAX Micromanager driver. Recommended USB 3.0 interface card (with Renesas chipset) has to be installed in advance!

### Overview:

GRYPHAX camera operating under Micromanager software:





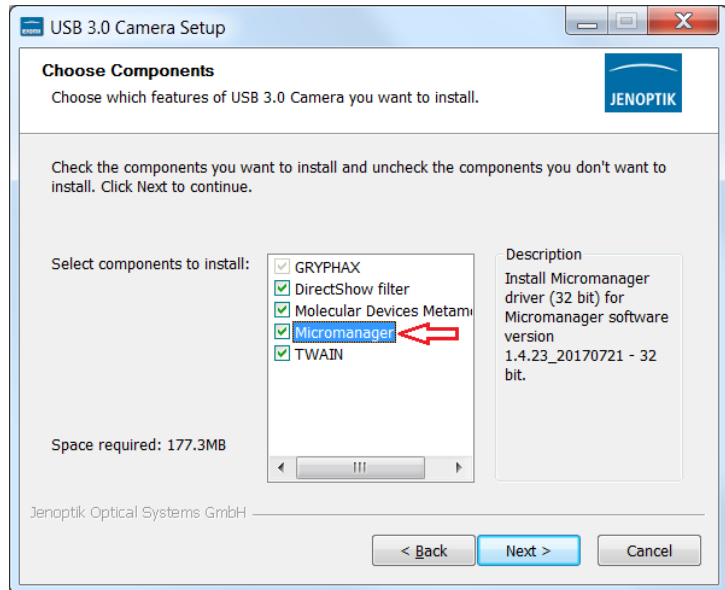
## Installation:

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

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

[DOWNLOAD UPDATE](#)

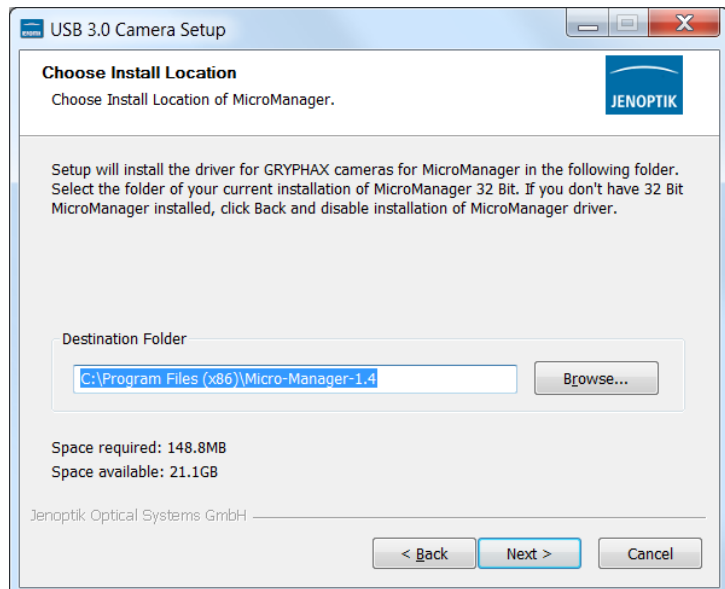
1. **Select** the GRYPHAX Micromanager driver from “Choose Components” page and proceed with “Next”.



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

Note: The GRYPHAX Micromanager driver must be installed at root folder of Micromanager installation: “...(x86)\Micro-Manager-1.4”

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



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




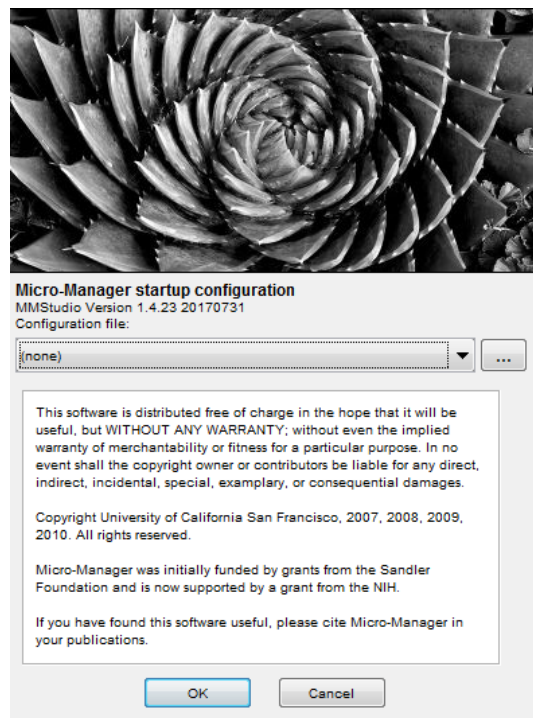
## Hardware configuration:

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

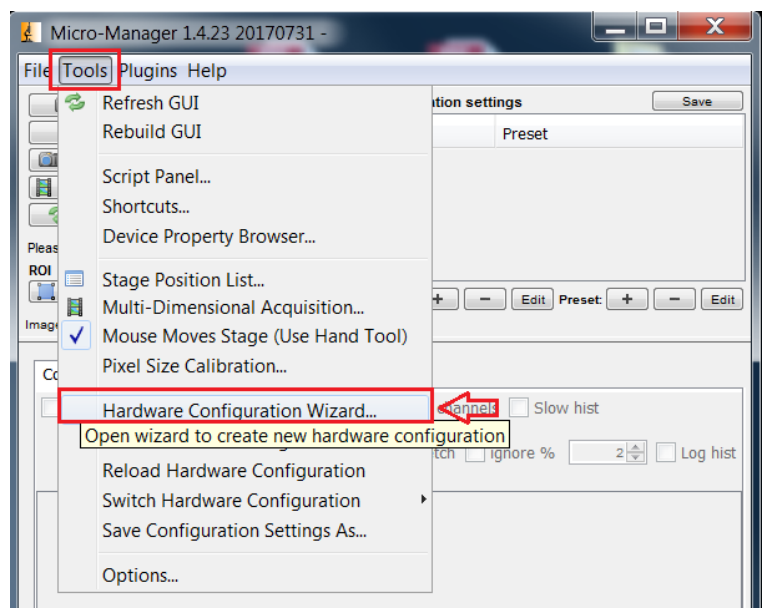
Note: To **operate** with GRYPHAX cameras under Micromanager software a hardware configuration file is mandatory. Please follow the next steps to configure hardware settings file.

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)

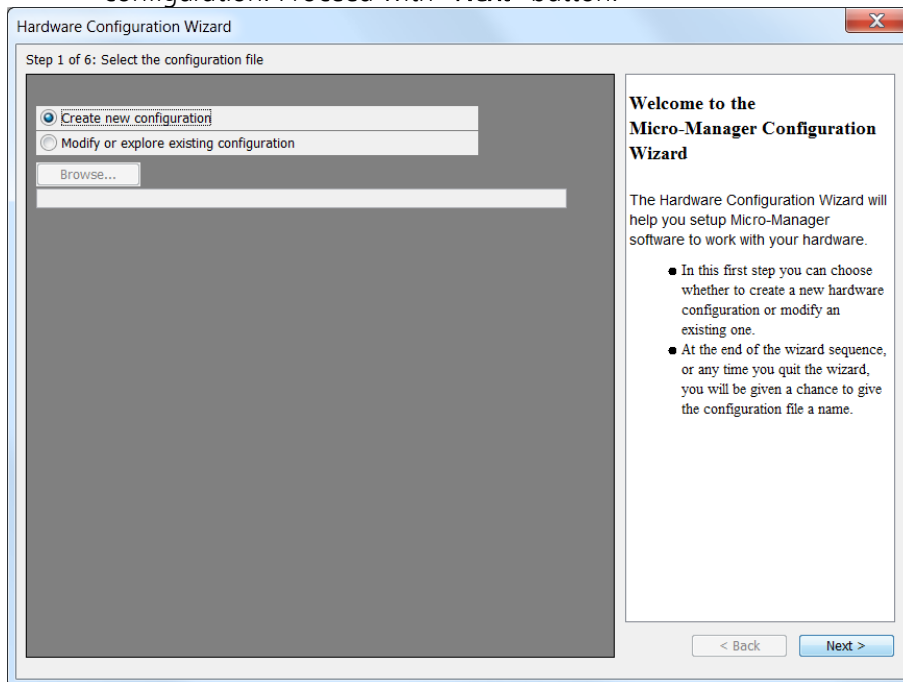
Start the Micromanager software  **Micro-Manager-1.4** from installation directory without "Micromanager startup configuration".



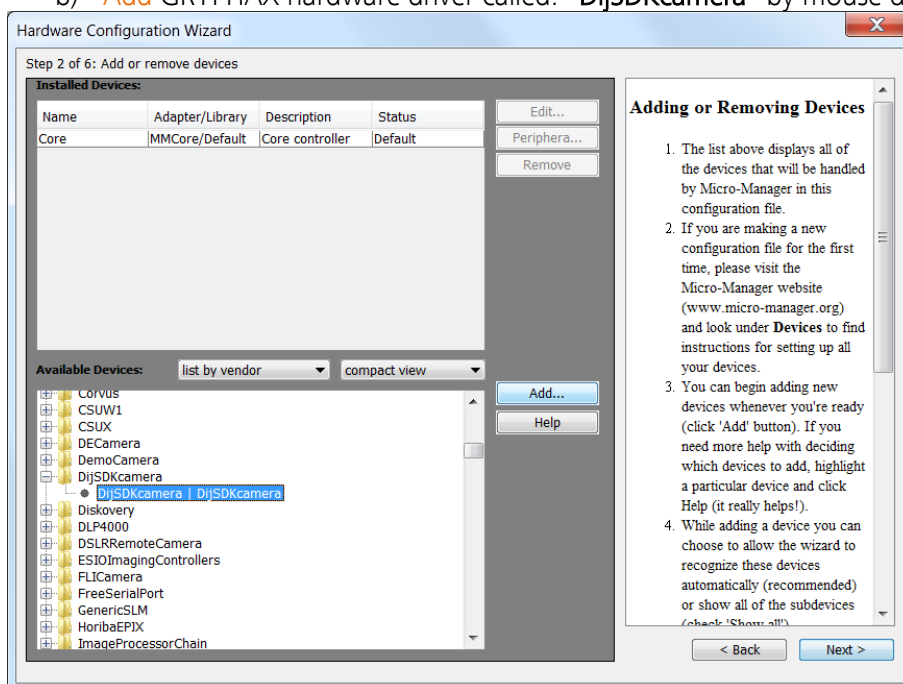
To **create** a Micromanager configuration with GRYPHAX camera support, please navigate to the title bar of Micro-manager and activate option: "Hardware Configuration Wizard..." from menu: "Tools".



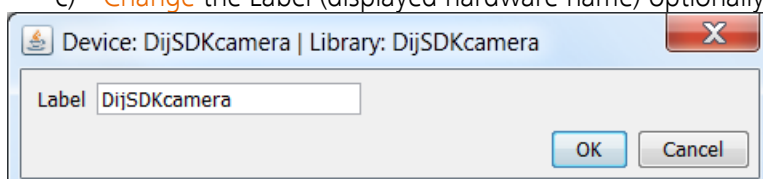
a) Follow up the configuration wizard by modify existing configuration or by create of a new configuration. Proceed with "Next" button.



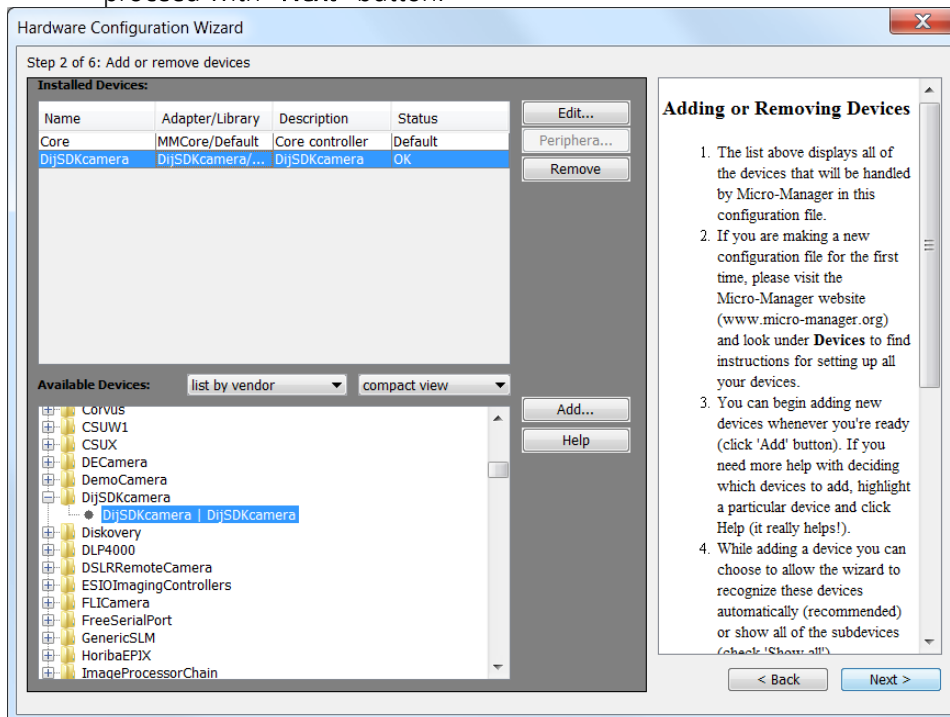
b) Add GRYPHAX hardware driver called: "DijSDKcamera" by mouse double click or "Add" button.



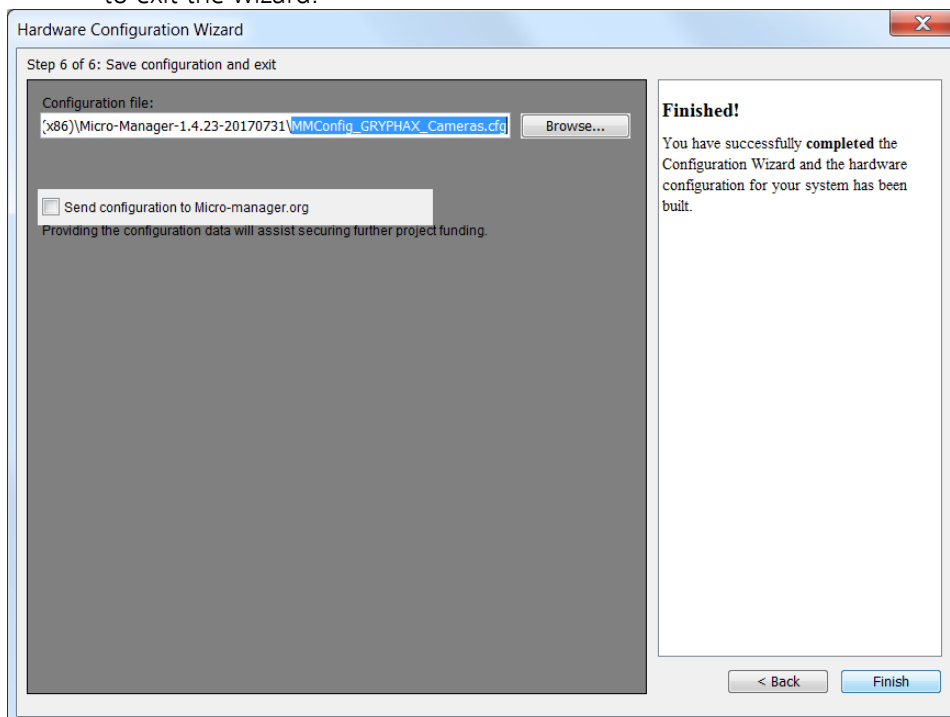
c) Change the Label (displayed hardware name) optionally and confirm by "OK" button.



d) After successfully adding the 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.

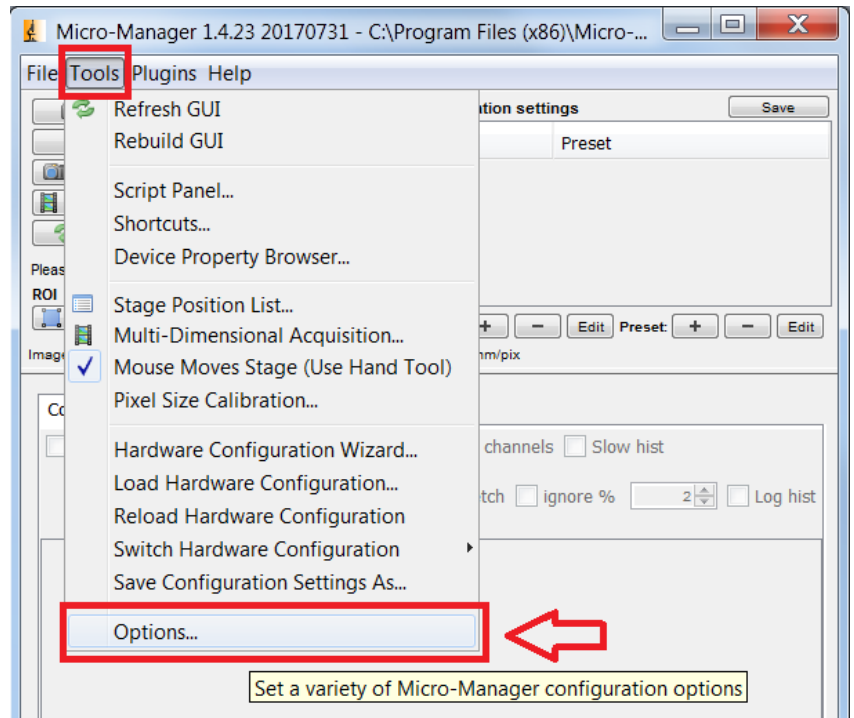


f) Configuration of hardware support file is completed. Now you are prepared to operate with GRYPHAX USB 3.0 cameras together with Micromanager software.



Configure recommended memory settings:

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

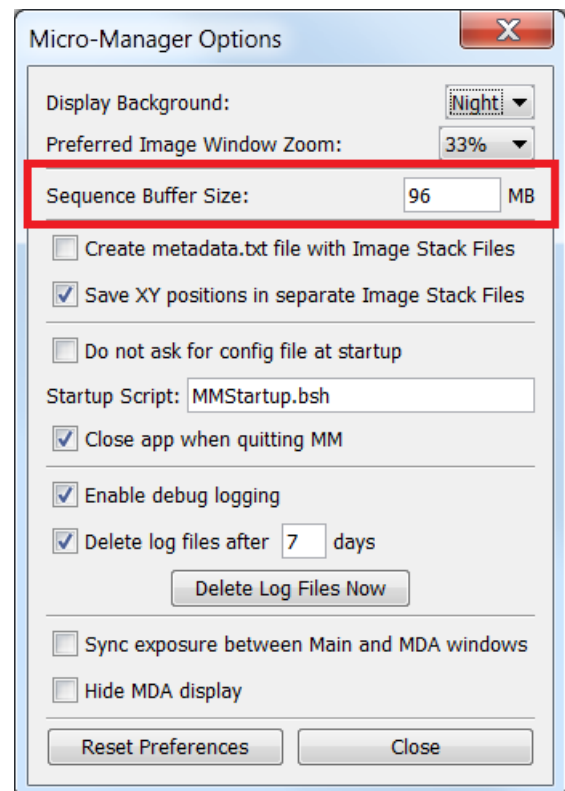


**Change** the "Sequence Buffer Size" between: **96 to 256 MB** (recommended size to operate with GRYPHAX cameras).

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

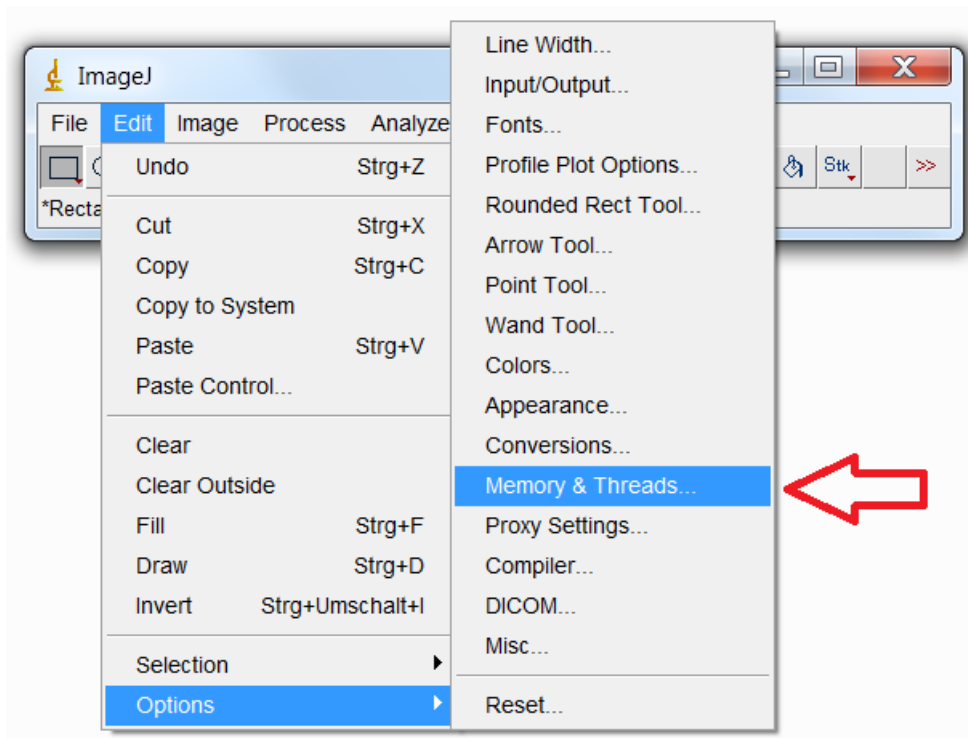
[https://micro-manager.org/wiki/Micro-Manager\\_Configuration\\_Guide#Memory\\_Settings](https://micro-manager.org/wiki/Micro-Manager_Configuration_Guide#Memory_Settings)

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



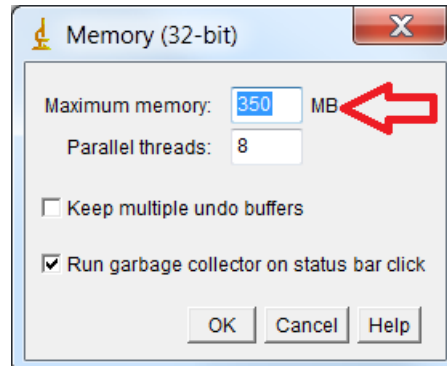


To **edit** memory settings for **ImageJ** software, please navigate to the title bar of ImageJ and open option: **“Options”** from menu: **“Edit”**.




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


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

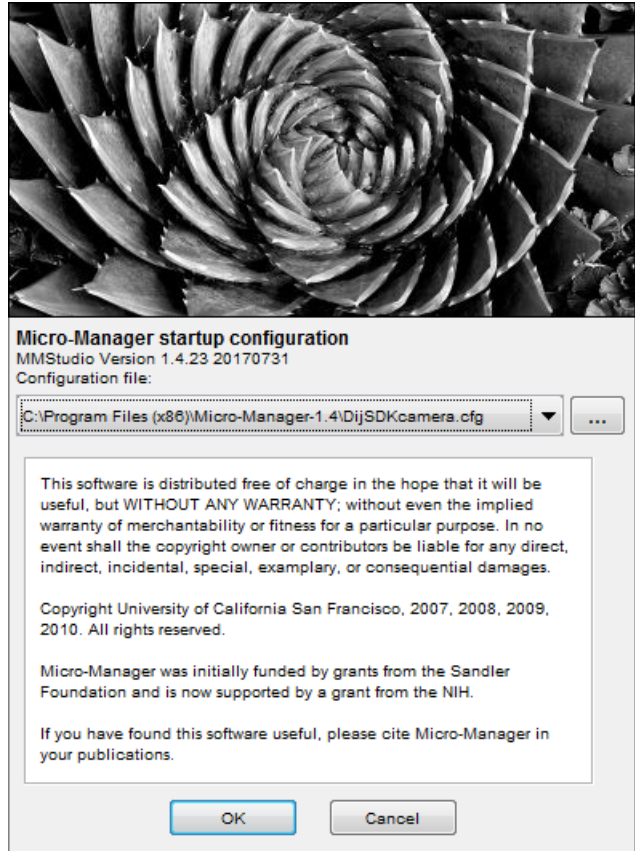




Start Micromanager and select hardware configuration:

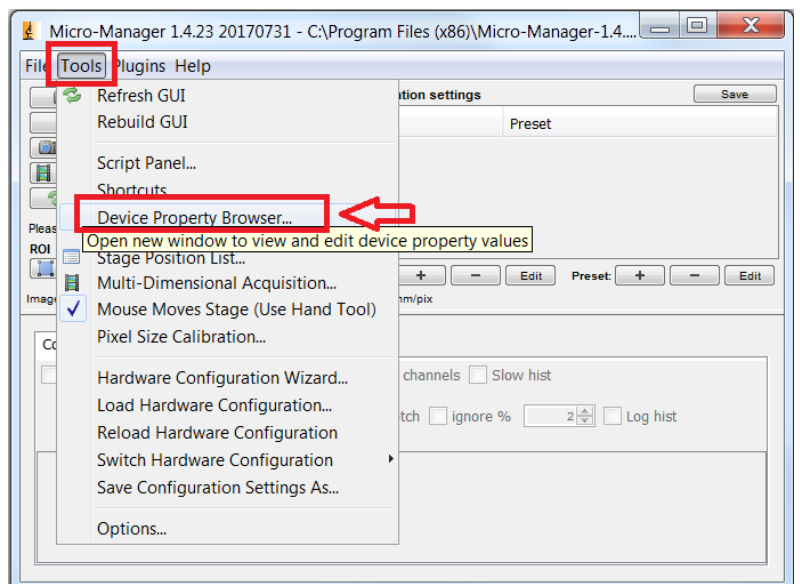
Start Micromanager application  **Micro-Manager-1.4** from your installation directory.

Select hardware configuration with GRYPHAX USB 3.0 camera support from "Micromanager startup configuration dialog" to activate the GRYPHAX cameras. Click on "..." button to load config file from PC.



To setup camera functions, please navigate to the title bar of Micromanager and open the "Device Property Browser" from menu: "Tools".

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





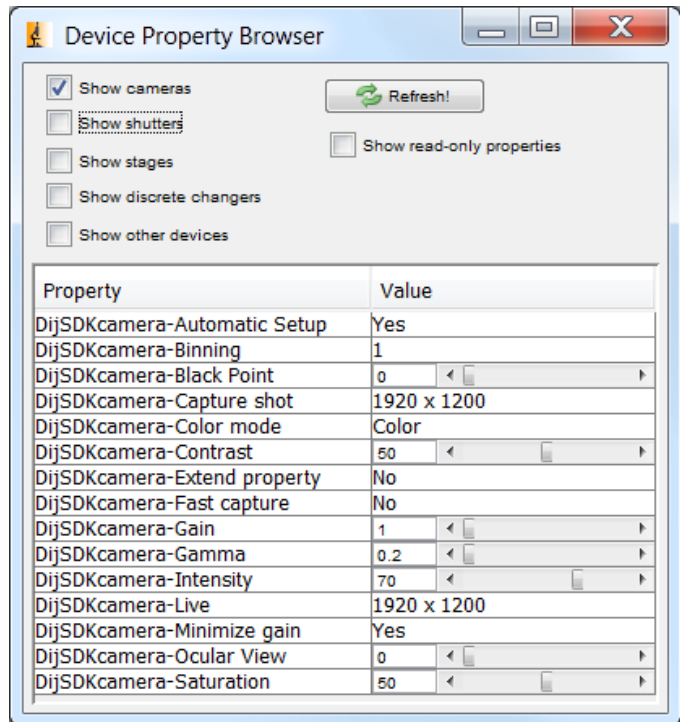
At "Device Property Browser" all relevant camera values can be changed.

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

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

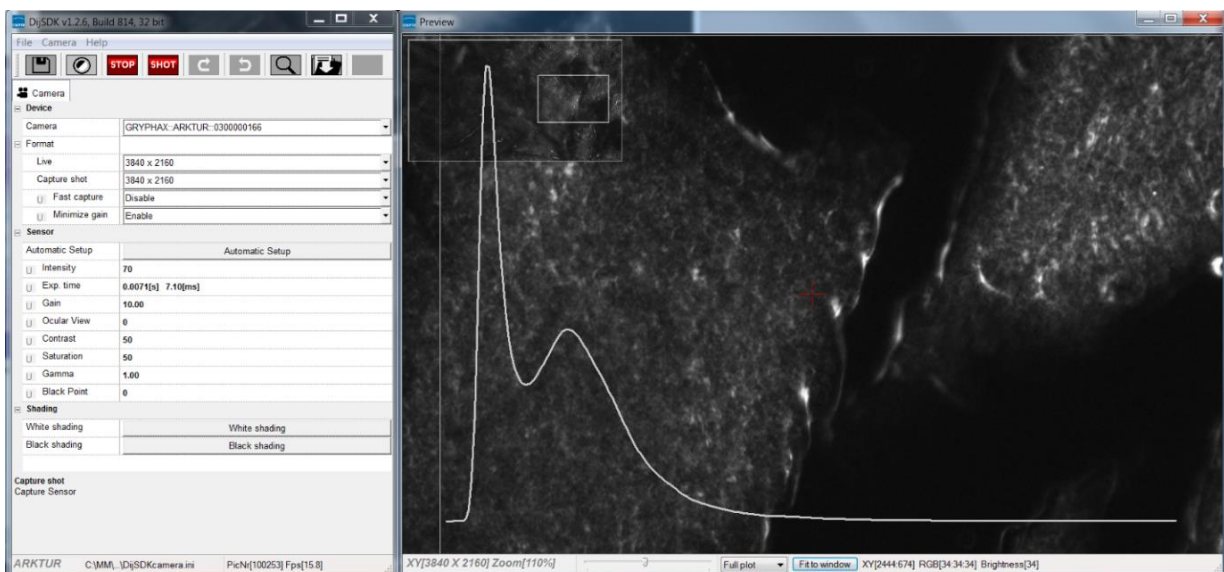
At the driver settings window you can prepare all camera relevant settings to get best results from camera. Additionally, you can observe your settings e.g. white balance directly at the live preview window.

For further details, please see next pages.



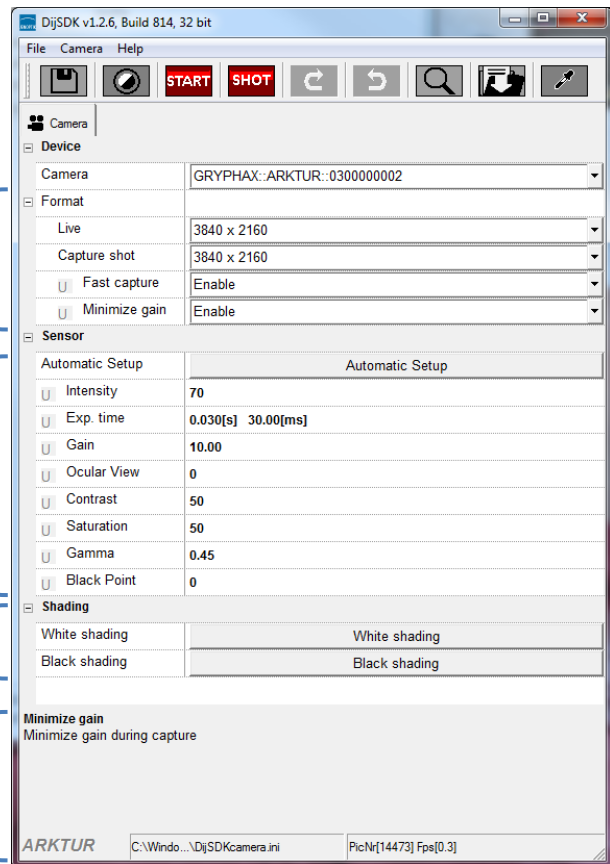
Note: Due to the limitation of Micromanager, not all values and parameter of Device Property Browser can be adjusted during live preview or single image capture!

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



### 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\\AppData\Roaming\DijSDK\...) for each camera type and will be reused after open of driver again. Settings are not connected to individual camera serial numbers.

### 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.\*

\*function 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!

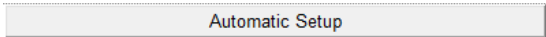
Fast capture	Disable
Minimize gain	Enable

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.



### 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. 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

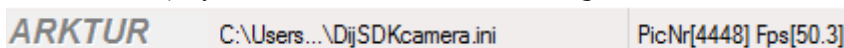
\*function available for color cameras only

### 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.



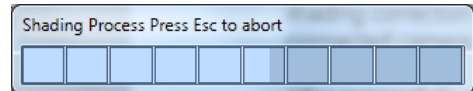


### Create / delete white shading:

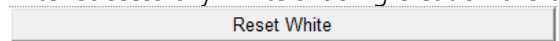
White shading function corrects intensity variation across the image, caused by the microscope or objectives.

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"**



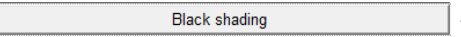
The white shading correction is now available and used. To deactivate the white shading press **"Reset White"** and the white shading correction file will be deleted and cannot be reloaded again. After reset / delete of shading file, a new shading file has to be created to activate shading again.

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

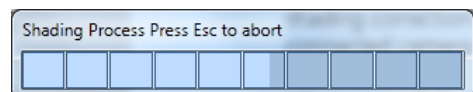
Note: Driver can save just one shading file for each camera type. The file is valid to the individual camera serial number!

### Create / delete black shading:

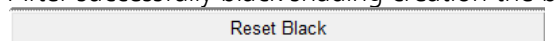
Black shading function enhance noise level for long time exposed image.

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!



### 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.

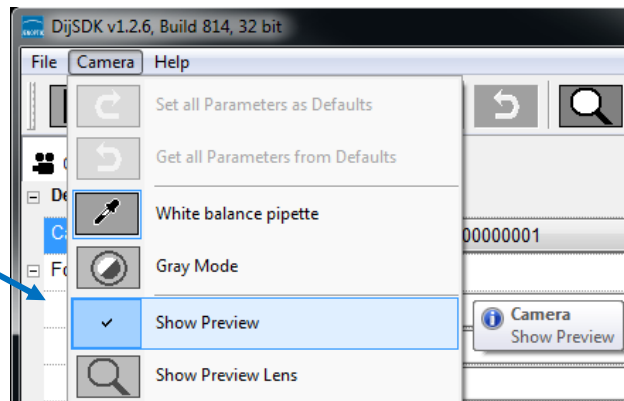
Live image will be restarted automatically at preview windows after transfer of single image.

### Start / Stop Live:

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

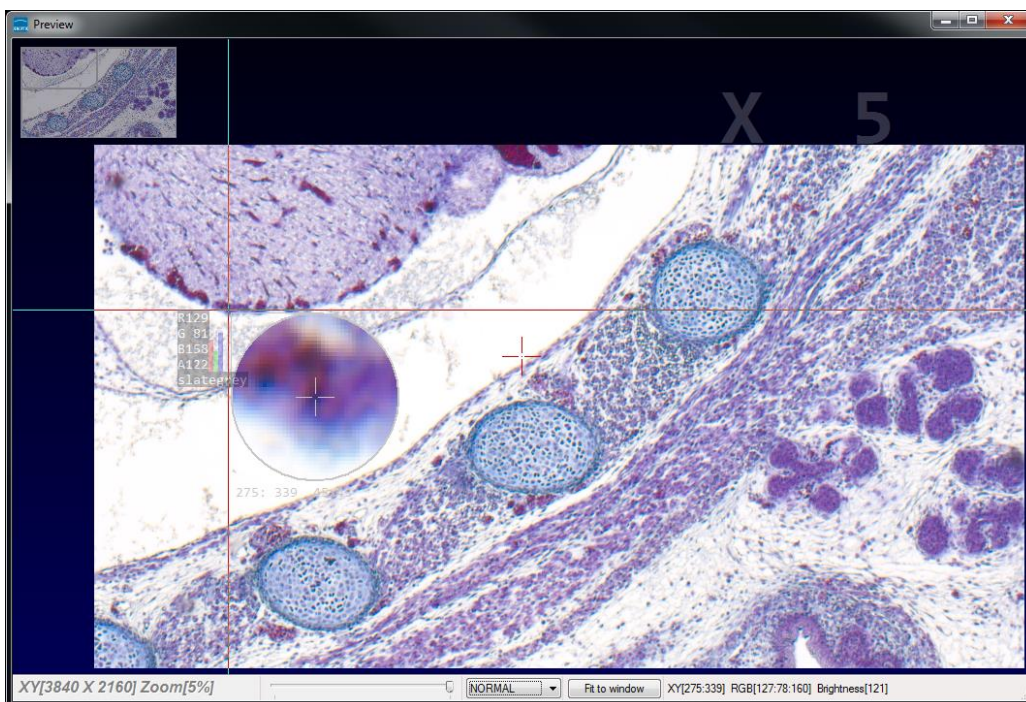
### Open / close preview window:

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



### Preview window:

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





### 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%]**

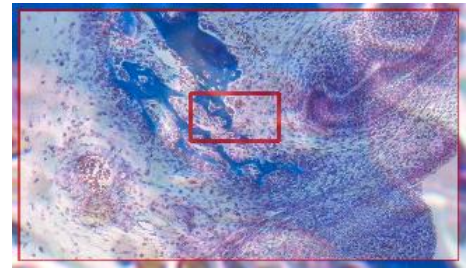
Zoom slider or scroll wheel to change zoom level. Left position out, right position zoom in.



zoom

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

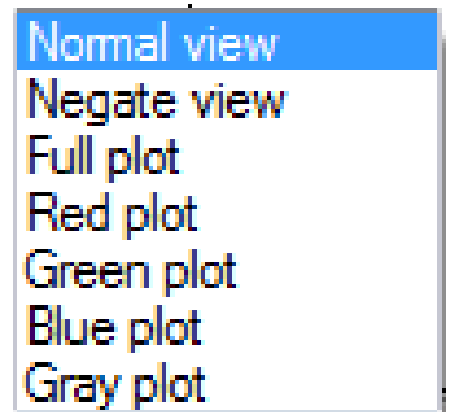
“Full plot” – to activate RGB and gray channel of histogram as overlay

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

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

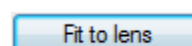
“Blue plot” – to activate blue color channel of histogram as overlay

“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.





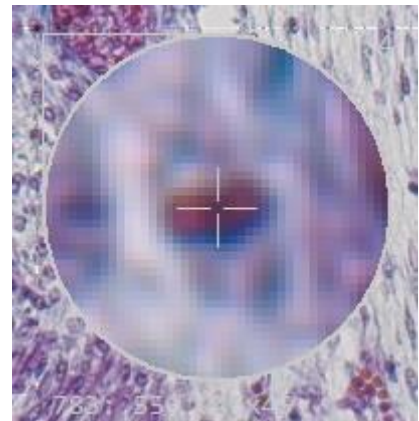
Display of RGB values and image coordinates of corresponding mouse pointer position.

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.

**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”.



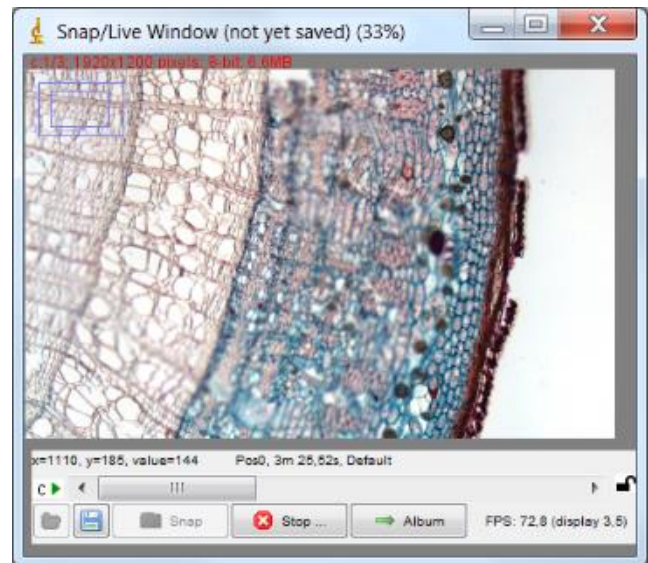


### Start live preview:

To **start** live preview from camera press “**Live**”

 button from main window.

Micromanager will show live preview with pre-selected values from Device Property Browser at separate image window.



### Start single image snap:

To **start** single image snap from camera press

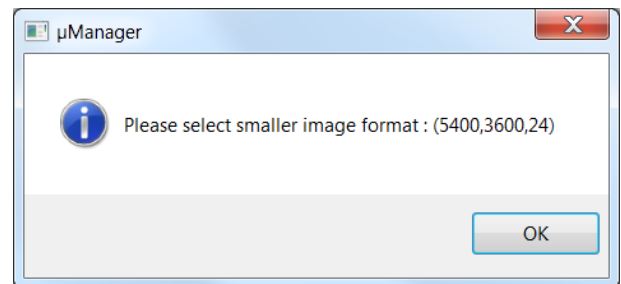
“**Snap**”  button from main window.

Micromanager 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.

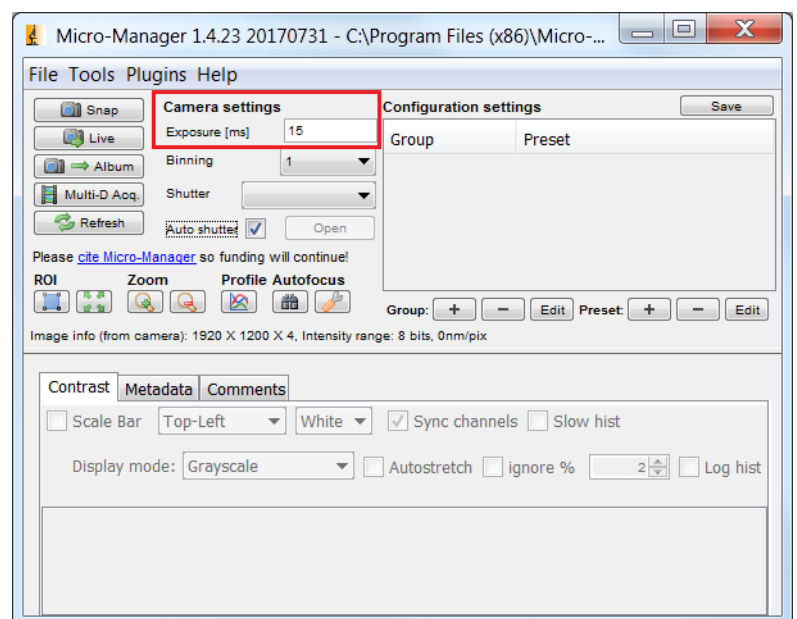
Please **change** memory settings for Micro-Manager “**Sequence Buffer Size**” or reduce image resolution.



### Change Exposure Time:

To **edit** exposure time value for live preview and single image snap by option:

“**Exposure**” at Camera setting from Micromanager 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)



**Limitations:**

- a) Micromanager software V1.4.23\_20170731 - 32 bit (Device API version 67) support only.
- b) Only PROGRES GRYPHAX USB 3.0 camera supported.
- c) Windows 7 SP1 / 10 support only.
- d) Camera driver functionalities are limited due to the Micro-Manager limitations.

Learn more about PROGRES GRYPHAX® software and the easy workflows and tools.

Watch our video tutorials.

[VIDEO TUTORIALS](#)

HELPFUL? We appreciate your feedback.

[FEEDBACK](#)

We looking forward to hearing from you and remain sincerely,

Your PROGRES GRYPHAX® Team