

## 32. Micro-Manager driver



Versatility – giving you the freedom to work with your favorite equipment.



# User Guide for JENOPTIK GRYPHAX<sup>®</sup> Micro-Manager driver

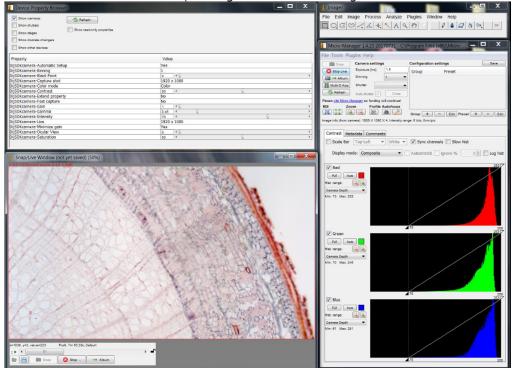
The "Micro-Manager driver" for JENOPTIK GRYPHAX® USB 3.0 cameras enables user to operate with Micro-Manager - the open source microscope software solution for control of automated microscopes. The driver delivers essential functionalities of JENOPTIK GRYPHAX® USB 3.0 cameras. Driver is supported under 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 <u>before</u> 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

 Select the Micro-Manager driver from "Choose Components" page and proceed with "Next".

🔜 USB 3.0 Camera Setup		
Choose Components Choose which features of USB 3	0 Camera you want to install.	JENOPTIK
Check the components you wan install. Click Next to continue.	t to install and uncheck the comp	oonents you don't want to
Select components to install:	GRYPHAX Giter Giter Molecular Devices Metam Micromanager TWAIN	Description Install Micromanager driver (32 bit) for Micromanager software version 1.4.23_20170721 - 32 bit.
Space required: 177.3MB	<	
Jenoptik Optical Systems GmbH —	< <u>B</u> ack	Next > Cancel

2. Choose the install location of previously installed Micromanager 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.

USB 3.0 Camera Setup	
Choose Install Location	
Choose Install Location of MicroManager.	JENOPTIK
Setup will install the driver for GRYPHAX cameras for MicroManager Select the folder of your current installation of MicroManager 32 Bit. MicroManager installed, click Back and disable installation of MicroMa	If you don't have 32 Bit
Destination Folder	
C:\Program Files (x86)\Micro-Manager-1.4	Browse
Space required: 148.8MB	
Space available: 21.1GB	

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.

<u>Note:</u> 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.

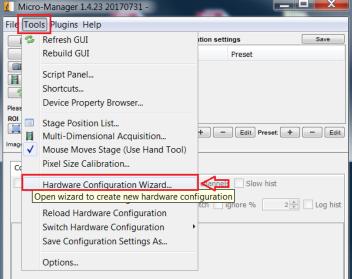
For detailed information, please visit official Micro-Manager support website: <u>https://micro-manager.org/wiki/Micro-Manager\_User%27s\_Guide</u> (Note: This is an external link outside our influence area, which can be removed or invalid)

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

<u>Important Note:</u> Micro-Manager – Device Interface version = 69 is supported only!

Micro-Manager startup configure	ration	
MMStudio Version 1.4.23 20170731 Configuration file: (none)		▼
This software is distributed free of useful, but WITHOUT ANY WARR, warranty of merchantability or fitn event shall the copyright owner or indirect, incidental, special, exan Copyright University of California : 2010. All rights reserved.	ANTY; without even the implied ess for a particular purpose. In no contributors be liable for any dir aplary, or consequential damage	ect, s.
Micro-Manager was initially funde Foundation and is now supported If you have found this software use your publications.	by a grant from the NIH.	n
ок	Cancel	
r 1.4.23 20170731 -		
s Help		
	ition settings	Save
GUI	Preset	

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".

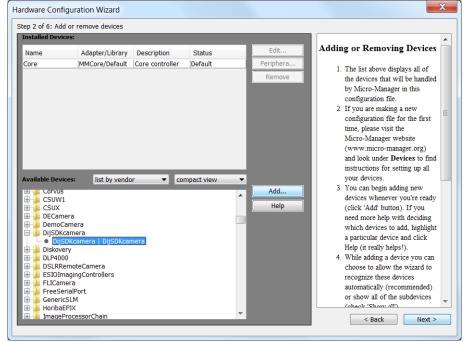




a) Follow up the configuration wizard by modify existing configuration or by create of a new configuration. Proceed with "Next" button.

Hardware Configuration Wizard	X
Step 1 of 6: Select the configuration file	
Create new configuration     Modify or explore existing configuration	Welcome to the Micro-Manager Configuration Wizard
Browse	The Hardware Configuration Wizard will help you setup Micro-Manager software to work with your hardware. • In this first step you can choose whether to create a new hardware
	<ul> <li>configuration or modify an existing one.</li> <li>At the end of the wizard sequence, or any time you quit the wizard, you will be given a chance to give the configuration file a name.</li> </ul>
	uie configuration nie a name.
	< Back Next >

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.

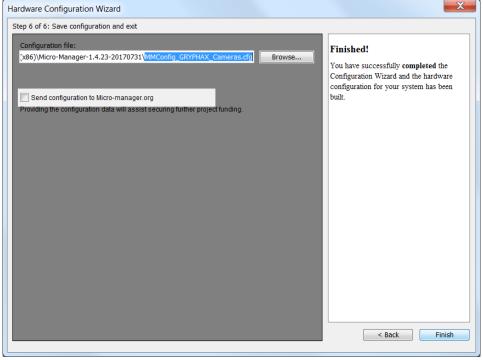
🛓 Device: DijSDKcamera   Library: DijSDKcamera		X
Label DijSDKcamera		
	ОК	Cancel



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

Hardware Config	uration Wizard						X
Step 2 of 6: Add	or remove devices						
Installed Device	s:						
Name	Adapter/Library	Description	Status		Edit	Adding or Removing Devices	
Diskovery     Diskovery     DLP4000     DSLRRen     DILP4000     DILP400     DILP40     DILP400     DILP	MMCore/Default DijSDKcamera/ DijSDKcamera/ iss list by vendo ra mera mera mera mera mera moteCamera gingControllers ra alPort LM	Core controller DijSDKcamera	Default OK	•	Periphera Remove	<ol> <li>The list above displays all of the devices that will be handled by Micro-Manager in this configuration file.</li> <li>If you are making a new configuration file for the first time, please visit the Micro-Manager website (www.micro-manager.org) and look under Devices to find instructions for setting up all your devices.</li> <li>You can begin adding new devices whenever you're ready (click 'Add' button). If you need more help with deciding which devices to add, highlight a particular device and click Help (it really helps!).</li> <li>While adding a device you can choose to allow the wizard to recognize these devices automatically (recommended) or show all of the subdevices</li> <li>(shack: 'Shaur.all')</li> <li>Next &gt;</li> </ol>	

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".

	_	-Manager 1.4.23 20170731 - C:\Program	Files (x86)\Micro-	<b>- • • × •</b>
File	Too	Is Plugins Help	1	
	3	Refresh GUI	ition settings	Save
		Rebuild GUI	Preset	
Pleas		Script Panel Shortcuts Device Property Browser		
ROI Imag		Stage Position List Multi-Dimensional Acquisition Mouse Moves Stage (Use Hand Tool) Pixel Size Calibration	+ - Edit P	reset + - Edit
		Hardware Configuration Wizard	channels Slow	r hist
		Load Hardware Configuration Reload Hardware Configuration	tch 📃 ignore %	2▲ Log hist
	1	Switch Hardware Configuration		
		Save Configuration Settings As		
		Options		
		Set a variety of Micro-N	anager configura	tion options

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

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

Micro-Manager Options		
Display Background: Night ▼ Preferred Image Window Zoom: 33% ▼		
Sequence Buffer Size: 96 MB		
<ul> <li>Create metadata.txt file with Image Stack Files</li> <li>Save XY positions in separate Image Stack Files</li> <li>Do not ask for config file at startup</li> <li>Startup Script: MMStartup.bsh</li> <li>Close app when guitting MM</li> </ul>		
<ul> <li>✓ Enable debug logging</li> <li>✓ Delete log files after 7 days</li> <li>Delete Log Files Now</li> </ul>		
Sync exposure between Main and MDA windows         Hide MDA display         Reset Preferences         Close		



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

File	Undo Str Cut Str Copy Str Copy to System	Analyze rg+Z rg+X rg+C rg+V	Line Width Input/Output Fonts Profile Plot Options Rounded Rect Tool Arrow Tool Point Tool Wand Tool Colors Appearance	X & Stk. >>
		rg+F rg+D nalt+I ▶	Conversions Memory & Threads Proxy Settings Compiler DICOM Misc Reset	

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

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

🧕 Memo	ry (32-bit)	X
Maximum	memory: 350	мв
Parallel	threads: 8	
🗆 Keep m	ultiple undo buffers	
🔽 Run gar	rbage collector on st	atus bar click
	OK Car	ncel Help

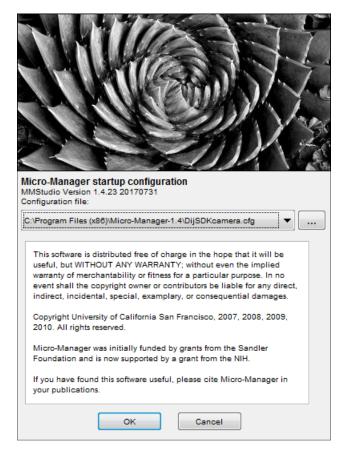


# 32.5 Start Micro-Manager and select hardware configuration:

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

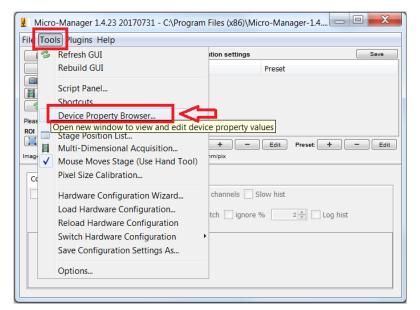
Select hardware configuration with JENOPTIK GRYPHAX USB 3.0 camera support from "Micro-Manager startup configuration dialog"

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.

device Property Browser				x
Show cameras Show shutters Show stages Show discrete changers Show other devices	🕏 Refre	ad-only pro	perties	
Property	Valu	e		
DijSDKcamera-Automatic Setup	Yes			
DijSDKcamera-Binning	1			
DijSDKcamera-Black Point	0			P.
DijSDKcamera-Capture shot	1920	x 1200		
DijSDKcamera-Color mode	Color			
DijSDKcamera-Contrast	50	•		•
DijSDKcamera-Extend property	No			
DijSDKcamera-Fast capture	No			
DijSDKcamera-Gain	1			•
DijSDKcamera-Gamma	0.2			•
DijSDKcamera-Intensity	70	•		*
DijSDKcamera-Live	1920	x 1200		
DijSDKcamera-Minimize gain	Yes			
DijSDKcamera-Ocular View	0	. ₹ [		•
DijSDKcamera-Saturation	50	•		•

<u>Note:</u> 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!

📑 DijSDK v1.2.6, Build	1 814, 32 bit	Preview
File Camera Help		
	STOP SHOT C 5 Q 💽	
E Camera		
Camera	GRYPHAX::ARKTUR::030000166	
E Format		
Live	3840 x 2160 •	
Capture shot	3840 x 2160 -	
U Fast capture	Disable	
U Minimize gain	Enable	
Sensor		
Automatic Setup	Automatic Setup	
U Intensity	70	
U Exp. time	0.0071[s] 7.10[ms]	
U Gain	10.00	
U Ocular View	0	
U Contrast	50	
U Saturation	50	
U Gamma	1.00	
U Black Point	0	
Shading		
White shading	White shading	
Black shading	Black shading	
Capture shot		
Capture Sensor		
ARKTUR CIMM	DisDKcamera.ini PicNr(100253) Fps(15.8)	. XY[3840 X 2160] Zoom[110%] Full plot + Fito window XY[2444-674] RGB[34-34:34] Brightness[34]

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



32.6	Overview of settings window:	DijSDK v1.2.6, Build 814,	32 bit				
		File Camera Help					
1.	Toolbar – contains most important tools		ART SHOT C 5 Q 💽 🖉				
		Camera					
2	Select active camera	Device					
۷.		Camera	GRYPHAX::ARKTUR::030000002				
		Format					
3.	Format - change image settings for: 🚽	Live	3840 × 2160 •				
		Capture shot	3840 x 2160 •				
•	Live and Capture shot resolution	U Fast capture	Enable				
•	Fast capture mode	U Minimize gain	Enable				
•	Option – Minimize gain during capture	Automatic Setup	Automatic Setup				
•	Option – Minimize gain during capture	Intensity	70				
		U Exp. time	0.030[s] 30.00[ms]				
		Gain 10.00					
٨	Image parameter cottings*	Ocular View	0				
4.	Image parameter settings* 🥂 🛁	Contrast	50				
		Saturation 50					
		Gamma	0.45				
		U Black Point	0				
	2	Shading					
5.	Create / delete Shadings 🚽	White shading	White shading				
	-	Black shading	Black shading				
	Г	Minimize gain					
		Minimize gain during capt	ure				
6	Information field for help text & status -						
0.	intornation held for help text a status						
		ARKTUR C:\Windo	\DijSDKcamera.ini PicNr[14473] Fps[0.3]				

**Note:** All settings are saved (under folder: C:\Users\<user name>\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.

## 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.
- In 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.

	1 <sup>-</sup>	
Camera	GRYPHAX::ARKTUR::030000002	-

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

GRYPHAX::ARKTUR::030000001
GRYPHAX::SUBRA::0100000105
GRYPHAX::NAOS::020000003
GRYPHAX::ARKTUR::030000001
GRYPHAX::ARKTUR::030000002
GRYPHAX::PROKYON::060000004

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

#### Format:

Under format section user can set-up <u>different</u> 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 <u>live resolution</u> 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 <u>Automatic Setup</u> option can be used at any time to <u>set all camera image parameter to default values</u>. 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.

Intensity 75		
The <i>Exposure control</i> option contains the following	Intensity	75
parameter: Intensity value, Exposure time and Gain value.	d Gain value. 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.

<i>Ocular View</i> * – to adapt the color impression from the eyepieces (microscope) to the image on screen.	Ocular View	0	
<i>Contrast</i> – to enhance image contrast for live and captured images.	Contrast	50	
	Saturation	ration 50	
<i>Saturation</i> * – to change color saturation for live and captured images.	Gamma	0.45	
<i>Gamma</i> – to change gamma value for live and captured images.	Black Point	0	
<i>Black Point</i> – to enhance noise level in dark image areas.			

\*function available for color cameras only

#### Reset settings separately:

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

#### Status bar information:

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

 ARKTUR
 C:\Users...\DijSDKcamera.ini

 PicNr[4448] Fps[50.3]



#### 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" 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.

s	hading I	Proce	ss Pres	ss Esc	to ab	ort		

After successfully white shading creation the button will change status to "Reset White"
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\<user name>\AppData\Roaming\DijSDK\" and are reused after driver restart and appropriate camera type is connected.

<u>Note:</u> 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" 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 <u>minutes</u>, the progress indicator will be shown during creation. Press "Esc" will abort process.

Shading Process Press Esc to abort									

After successfully black shading creation the button will change status to "Reset Black" 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\<user name>\AppData\Roaming\DijSDK\" and are reused after driver restart and appropriate camera type is connected.

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



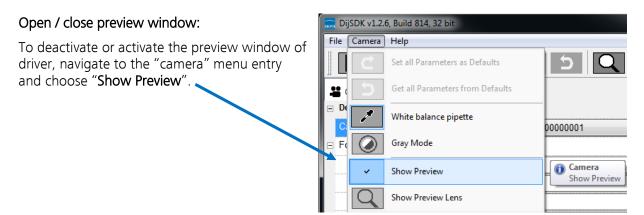
## 32.9 Capture / Transfer images:

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.

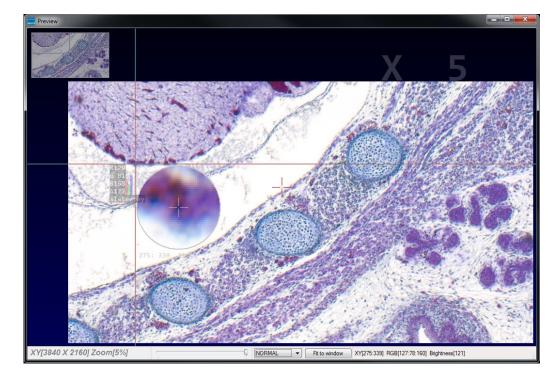
## 32.10 Start / Stop Live:

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



#### 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:

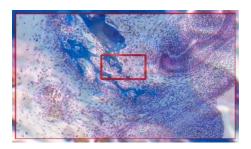
Preview window contains the following tools and information at the toolbar:



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.

<u>Note:</u> 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 <u>without</u> 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

Normal view
Negate view
Full plot
Red plot
Green plot
Blue plot
Gray plot

Fit to lens

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.



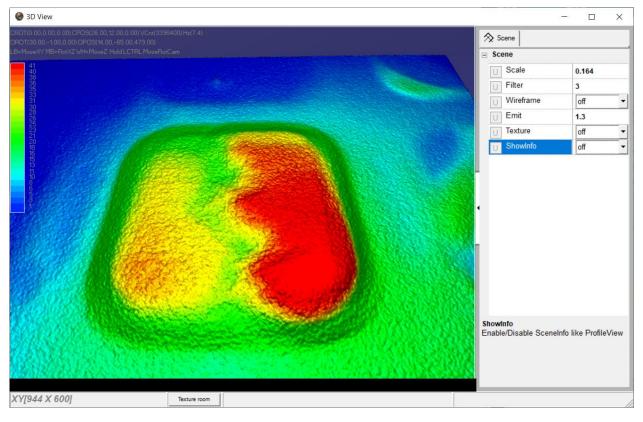
Display of RGB values and image coordinates of corresponding mouse pointer position.

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.

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

Press button "Show 3D" 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 site. 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

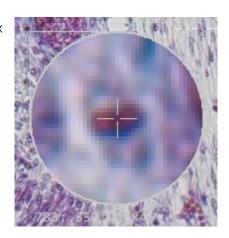
Texture – to turn on / off "JetColorRoom" without textures

ShowInfo – to enable / disable scene information

🛇 Scene					
- Scene					
UScale	0.164				
U Filter	3				
U Wireframe	off 🝷				
UEmit	1.3				
U Texture	off 🝷				
U ShowInfo	off 👻				

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

<u>Note:</u> 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" 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 cofigured memory size is insufficient to start live preview or single image capture.

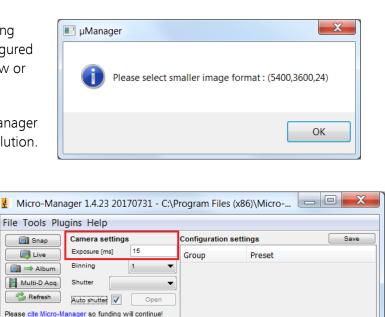
Please change memory settings for Micro-Manager "Sequence Buffer Size" or reduce image resolution.

# 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:



▼ White ▼ Sync channels Slow hist

Group: + - Edit Preset: + - Edit

▼ Autostretch ignore % 2 🚔 Log hist

Profile Autofocus

🖄 🛗 🥜

Image info (from camera): 1920 X 1200 X 4, Intensity range: 8 bits, 0nm/pix

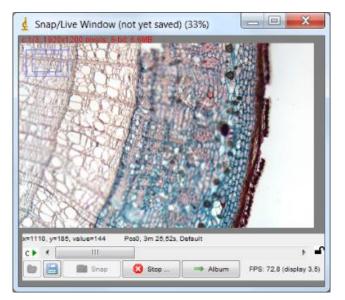
https://micro-manager.org/wiki/Micro-Manager\_User%27s\_Guide#The\_Micro-Manager\_Main\_Window (Note: This is an external link outside our influence area, which can be removed or invalid)

ROI

Scale Bar Top-Left

Contrast Metadata Comments

Display mode: Grayscale





## 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)