



33. Molecular Devices MetaMorph driver



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User Guide for JENOPTIK GRYPHAX® MetaMorph driver

The “MetaMorph driver” for JENOPTIK GRYPHAX® USB 3.0 cameras enables user to operate with MetaMorph microscopy automation & image analysis software solutions from Molecular Devices, LLC. The driver delivers essential functionalities of JENOPTIK GRYPHAX® cameras. Driver is supported under Windows operating systems.

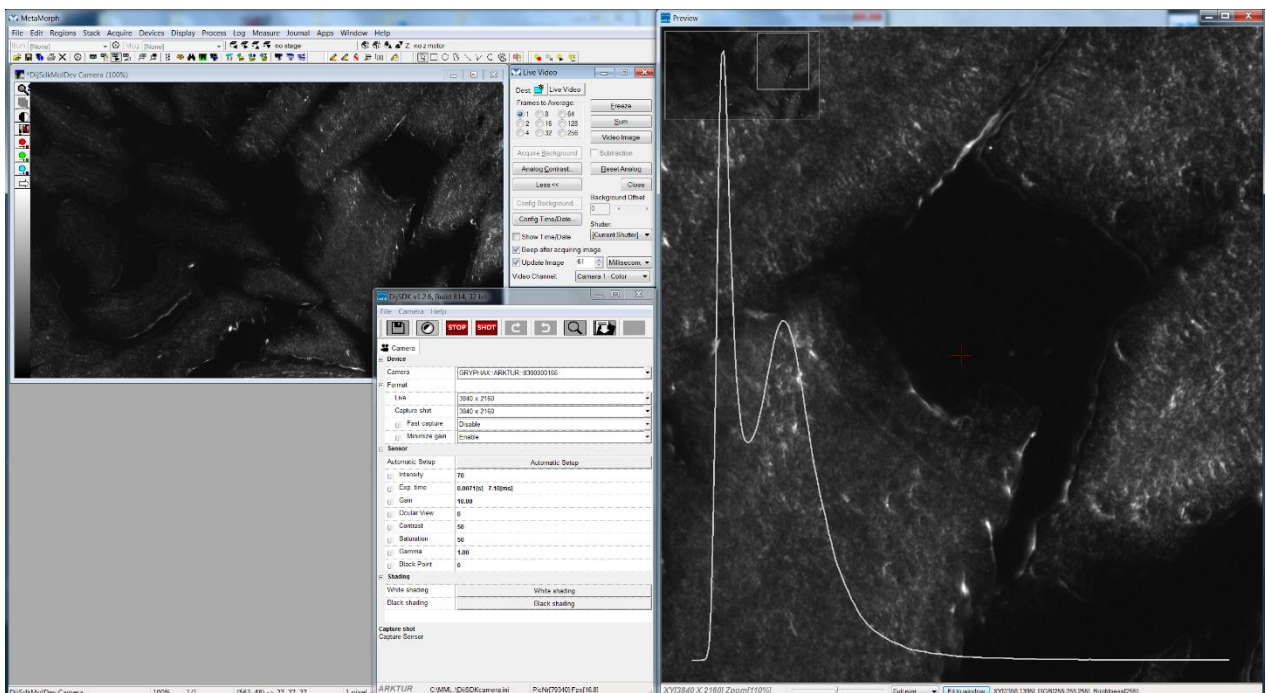
The JENOPTIK GRYPHAX MetaMorph driver is part of JENOPTIK GRYPHAX® software installation (as of version 2.0.0 or newer).

General Preparation:

The MetaMorph software version **7.8.0.0 – 32 bit or 64 bit** has to be installed before installation of JENOPTIK GRYPHAX MetaMorph driver. Recommended USB 3.0 interface card (with Renesas chipset) has to be installed in advance!

Overview:

JENOPTIK GRYPHAX camera operating under MetaMorph driver:





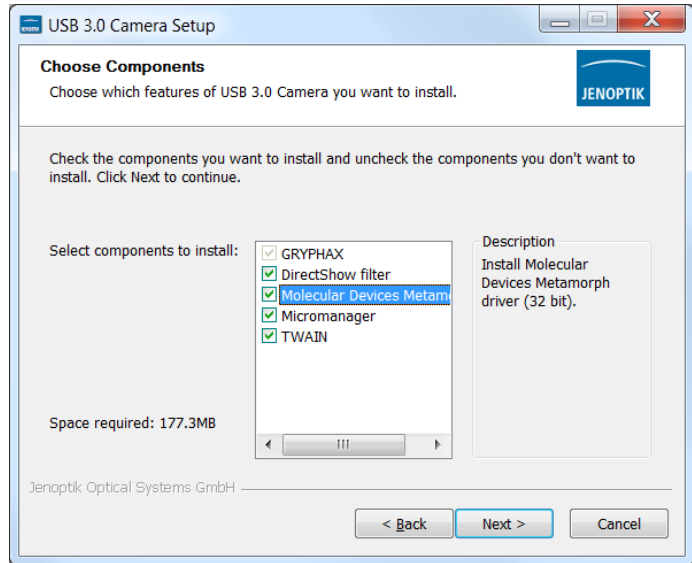
33.1 Installation:

To **install** the MetaMorph 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](#)

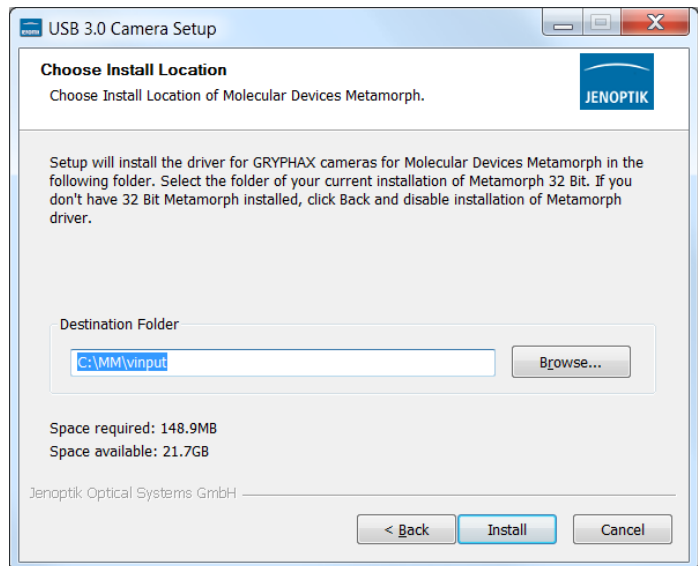
4. **Select** the MetaMorph driver from “Choose Components” page and proceed with “Next”.



5. **Choose** the install location of previously installed MetaMorph software.

Note: The MetaMorph driver must be installed at video input folder of MetaMorph installation: “...\\input”

Click on “Browse” button to choose alternative installation folder.



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




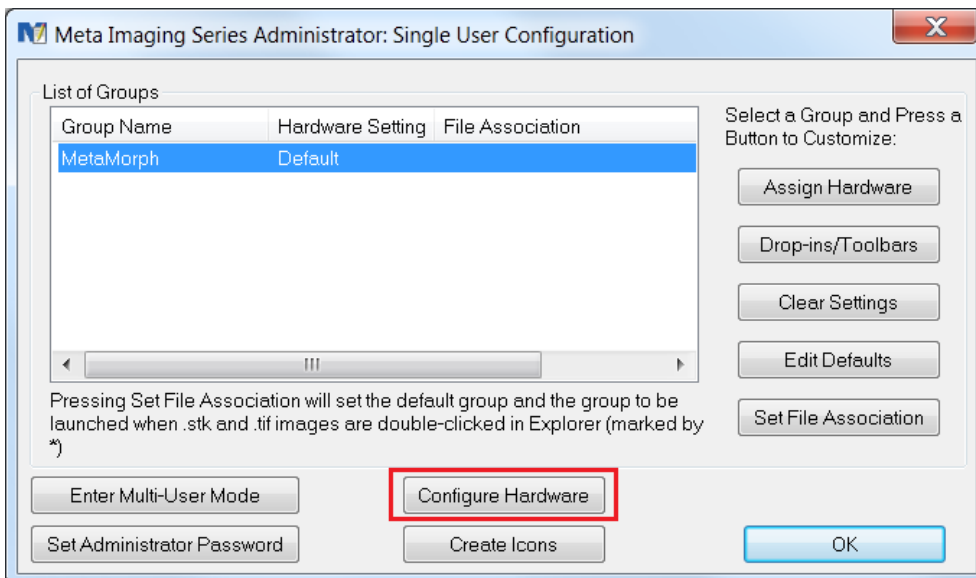
33.2 Hardware configuration:

After successful MetaMorph driver installation, it is necessary to configure the hardware configuration of MetaMorph software by using the “Meta Imaging Series Administrator” application.

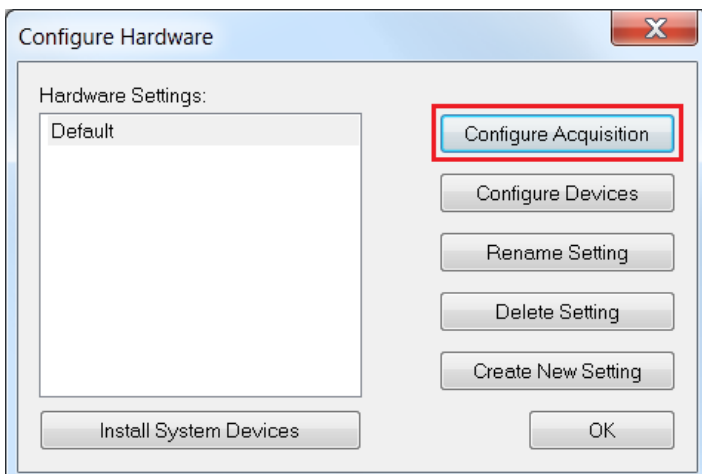
Important note: In case of trouble shooting, please take care that the Microsoft Visual C++ Redistributable for Visual Studio 2017 (x86) and x64 are installed on your computer to execute JENOPTIK GRYPHAX MetaMorph driver.

To proceed, please plug-in the JENOPTIK GRYPHAX® USB 3.0 camera to USB 3.0 port at recommended interface card.

- a) Start the hardware configuration tool: “Meta Imaging Series Administrator”
 Meta Imaging Series Administrator from Molecular Devices, LLC.
- b) Hardware wizard will start “Single User Configuration” - click on “Configure Hardware” button to access hardware settings page.

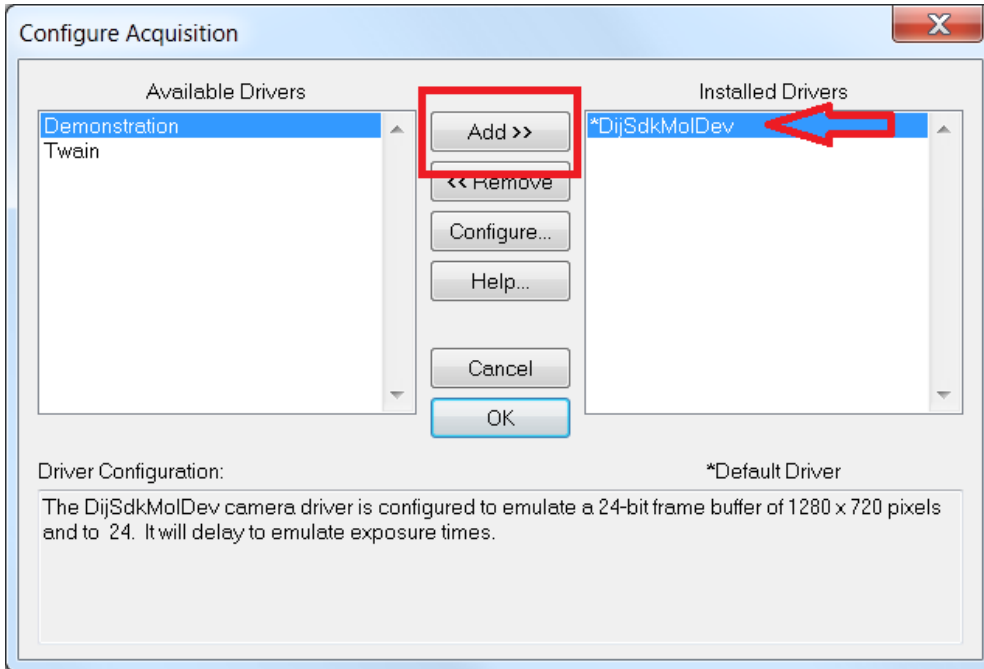


- c) Click on “Configure Acquisition” button to enter list of available acquisition drivers.



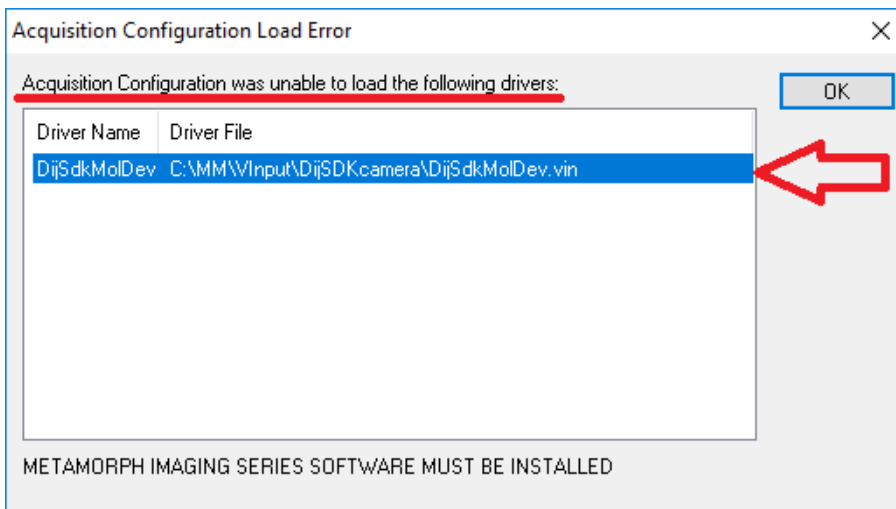


- d) Select JENOPTIK GRYPHAX USB3.0 camera driver called: "DijSdkMolDev" from available drivers list and press "Add >>" button to activate the selected camera driver.

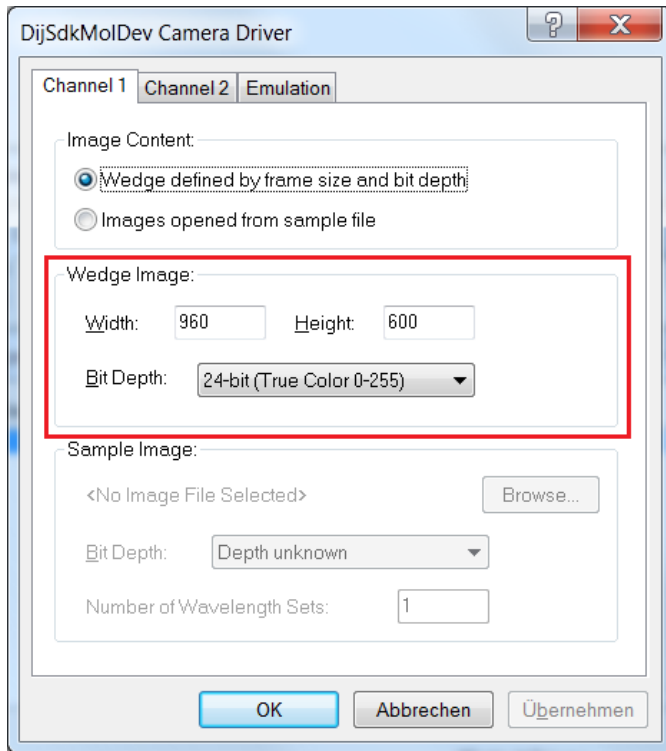


Note: In case that the hardware configuration tool does not list the JENOPTIK GRYPHAX driver called: "DijSdkMolDev" or the tool is unable to load, please close the hardware configuration.

Afterwards install the necessary system files: "Microsoft VC2017_x86 redistributables" from JENOPTIK GRYPHAX USB Stick located under: ...toolsvc_redist.x86.exe or download from official Microsoft website!




- e) Press **“Configure”** button to enter settings page for selected driver to change image properties: width, height and bit depth.



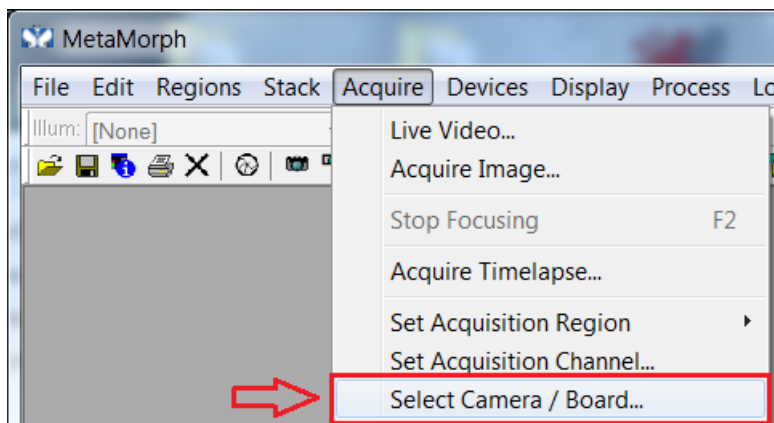
- f) Save settings and leave **“Meta Imaging Series Administrator”** tool by pressing **“OK”** buttons. Now you are prepared to operate with JENOPTIK GRYPHAX® USB 3.0 cameras at MetaMorph.



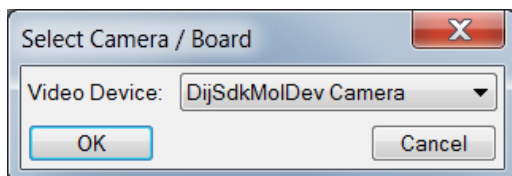
33.3 Start MetaMorph and select driver:

Start MetaMorph application  MetaMorph from your installation directory.

Select camera driver under menu: “Acquire | Select Camera / Board...” to activate the JENOPTIK GRYPHAX cameras.



Select JENOPTIK camera driver called: “DijSdkMolDev Camera” from drop down list and accept with “OK”.



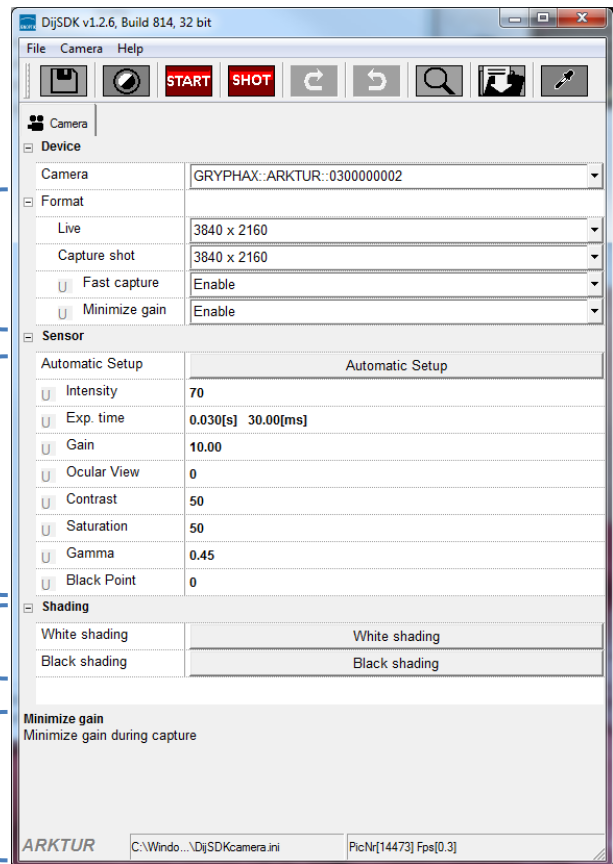
Afterwards, the JENOPTIK GRYPHAX MetaMorph camera driver windows for camera settings and live preview will appear automatically.

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

For detailed description, please look to the section: “**Advance camera settings**” from document!

33.4 Overview of settings window:

7. Toolbar – contains most important tools
8. Select active camera
9. Format - change image settings for:
 - Live and Capture shot resolution
 - Fast capture mode
 - Option – Minimize gain during capture
10. Image parameter settings*
11. Create / delete Shadings
12. 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.

33.5 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

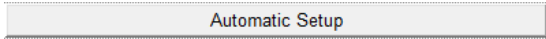
By **activation** of option "Minimize gain during capture" the gain value will be minimized for capturing and adjusting the exposure time accordingly. This option is recommended and will reduce noise level and enhance image quality.



33.6 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

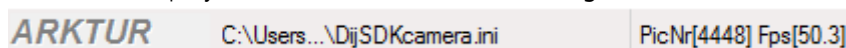
*function available for color cameras only

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.



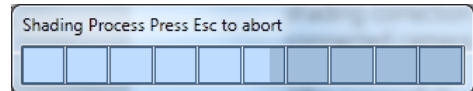


Create / delete white shading:

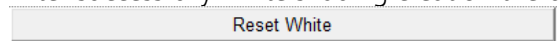
White shading function corrects intensity variation across the image, caused by the microscope or objectives.

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”**



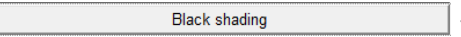
The white shading correction is now available and used. To deactivate the white shading press **“Reset White”** and the white shading correction file will be deleted and cannot be reloaded again. After reset / delete of shading file, a new shading file has to be created to activate shading again.

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

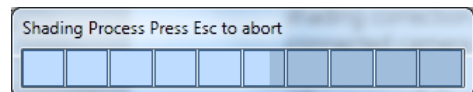
Note: Driver can save just one shading file for each camera type. The file is valid to the individual camera serial number!

Create / delete black shading:

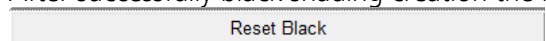
Black shading function enhance noise level for long time exposed image.

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\ 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!



33.7 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.

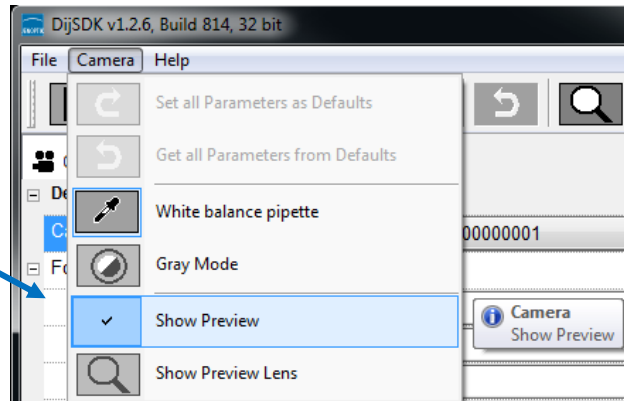
Live image will be restarted automatically at preview window after transfer of single image.

33.8 Start / Stop Live:

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

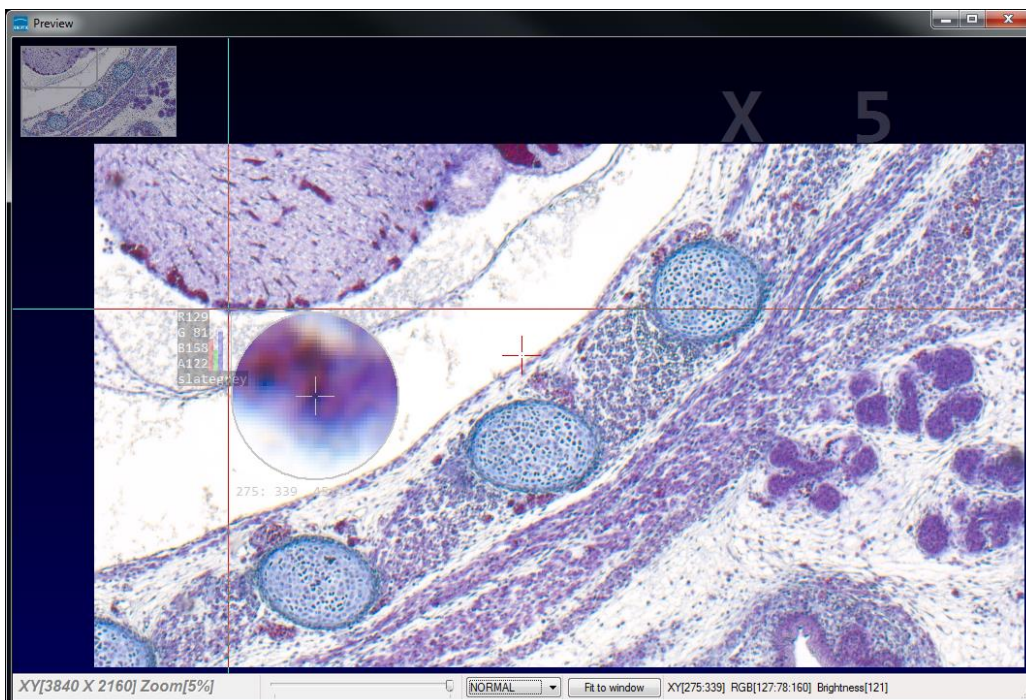
Open / close preview window:

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



33.9 Preview window:

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





33.10 Preview window tools and options:

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

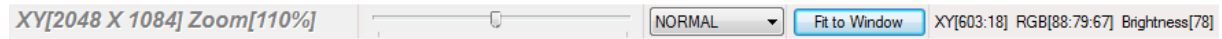


Image dimensions (X/Y) of current live preview **XY[3840 X 2160]**

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.

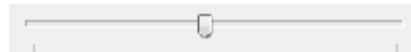
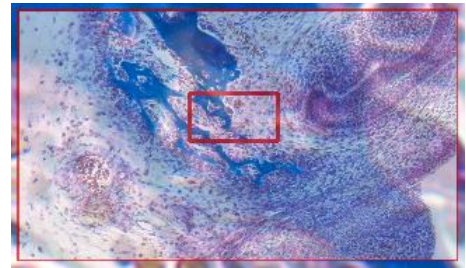


Image overview as overlay to display whole image in case of 1:1 view or image zoom over live preview.

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

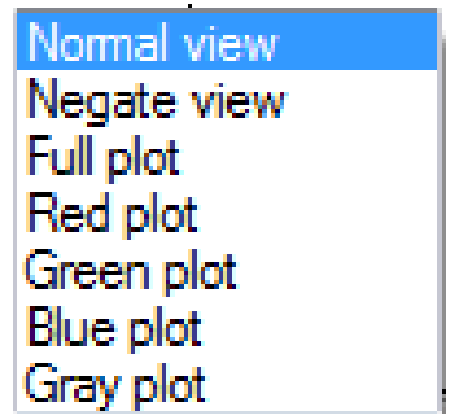
“Full plot” – to activate RGB and gray channel of histogram as overlay

“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**



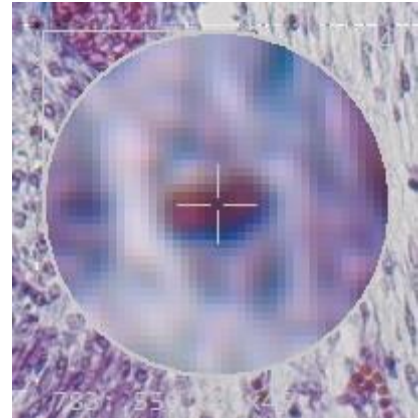
Display of RGB values and image coordinates of corresponding mouse pointer position.

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.

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

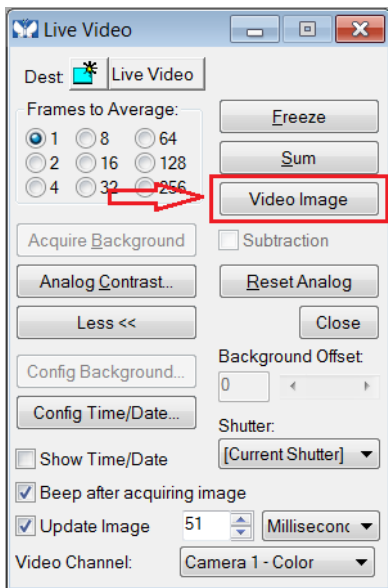
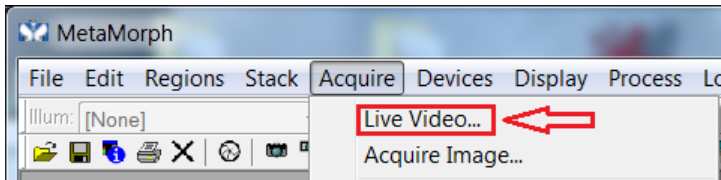
Note: By right-hand mouse click the magnifier appearance changes between “rectangle” and “circle glass”.





33.11 Start live preview:

To **start** live preview from camera, please navigate to the title bar of MetaMorph and activate option: "Live Video..." from menu: "Acquire".



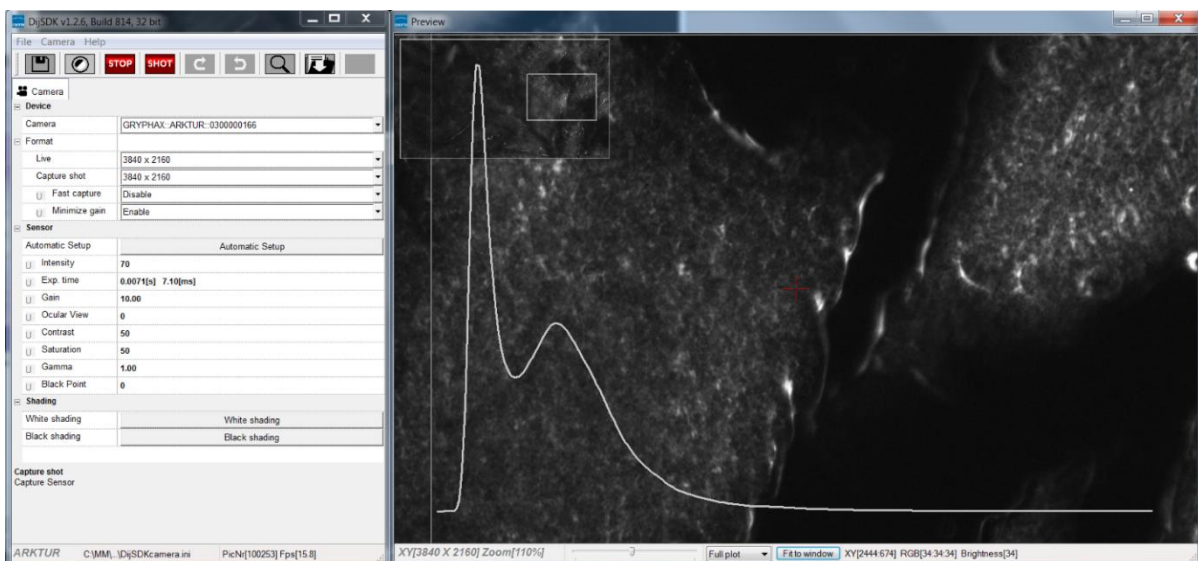
A separate property dialog will appear.

Start video preview by press: "Video Image" button. The live preview getting from camera are open up at separate window.

Note: The live preview has to be activated at "Advance camera settings" dialog; otherwise, no live preview will be transferred to the MetaMorph software!

To **control** the live update rate (frame rate) you need to check the Option "Update Image" and set the image update time according you application.

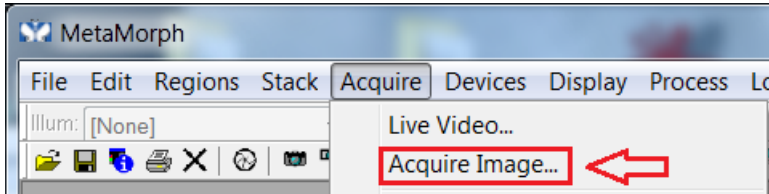
Additionally, the JENOPTIK GRYPHAX MetaMorph camera driver windows for camera settings and live preview will always appear automatically. Preview window of driver can be deactivated. For detailed description, please look to the section: "Advance camera settings" from document!



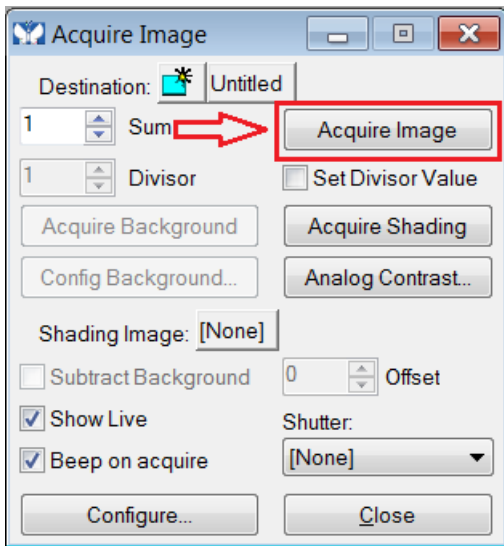


33.12 Capture & Transfer Image:

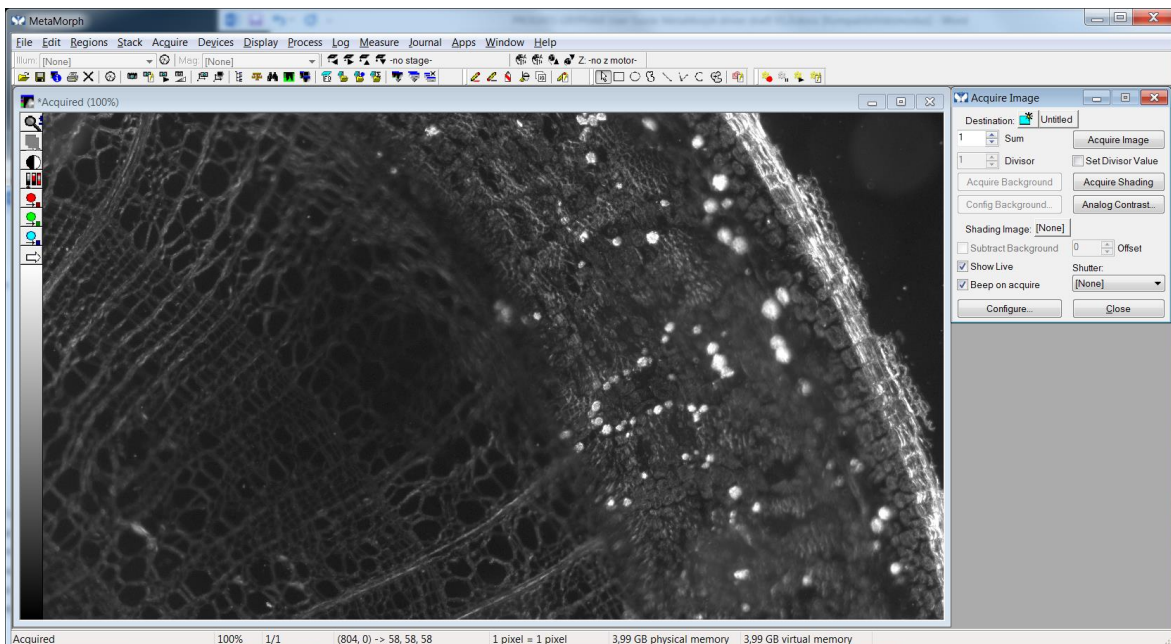
To **start** image capture from camera, please navigate to the title bar of MetaMorph and activate option: "Acquire Image..." from menu: "Acquire".



The "Acquire Image" dialog will be open. **Start** image capture by press: "Acquire Image" button.



Each acquired image is opened and displayed at separate window.





33.13 Limitations:

- MetaMorph software **V7.8.0.0** – 32 bit support only.
- MetaMorph software **V7.8.0.0** – 64 bit support only*.
- Only JENOPTIK GRYPHAX USB 3.0 camera supported.
- Windows 7 SP1 / 10 support only.
- Microsoft Visual C++ Redistributable for Visual Studio 2017 necessary to execute MetaMorph driver.

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