High image quality –
giving you the details
to make the right decisions.

Exposure tool and Histogram of JENOPTIK GRYPHAX® software

General description:

The "Exposure tool" of JENOPTIK GRYPHAX software enables user to control camera image brightness manually or **automatically** to reach optimal exposed images. By using the "Histogram" user can observe optimal image brightness conditions at a glance.

Overview JENOPTIK GRYPHAX software with activated Exposure tool and Histogram:
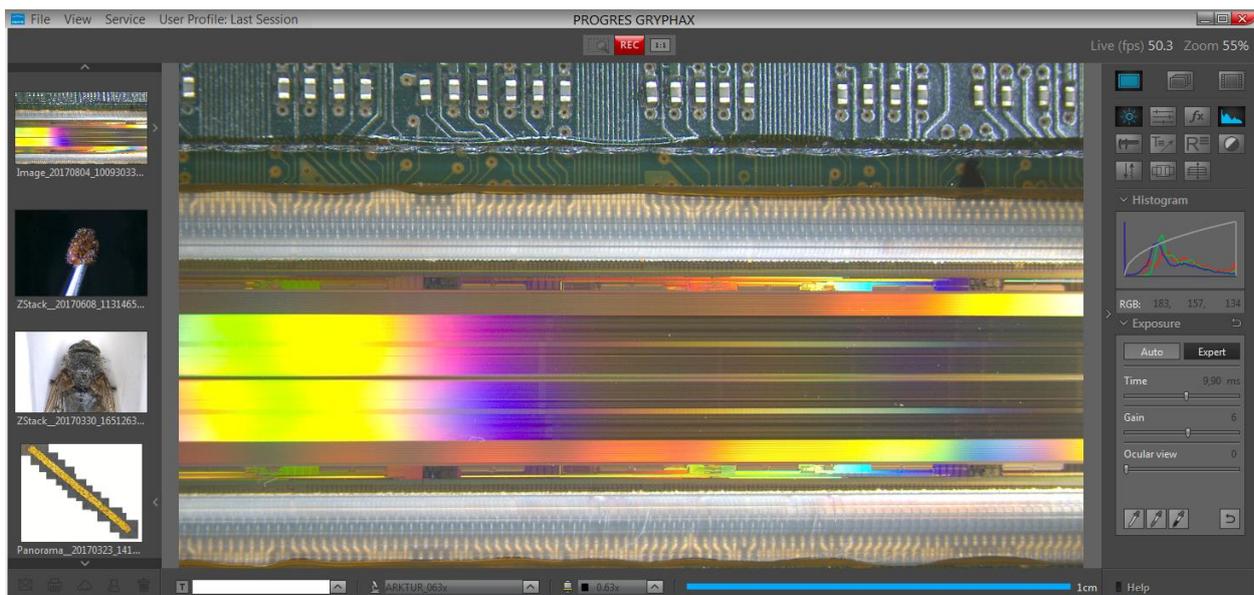
Open Tool bar:

All JENOPTIK GRYPHAX camera control and image processing tools are located at the "Toolbar".

To activate the "Exposure tool" or "Histogram" open the software "Toolbar" by pressing the arrow ◀ on right-hand software site or use keyboard short cut (**ctrl / cmd + T**)

9.1   Open Exposure:

To open Exposure tool click to the Exposure icon [icon] at the "Toolbar", the Exposure widget will be opened and contains <u>two separate mode</u> Tabs for: [Auto | Expert]

"Auto" – for automatically brightness control for optimal tracking of brightness by e.g. objective change

"Expert" – for manually brightness control by using Exposure time and Gain value to reach **max. exposure time**

Auto tab is activated as default and contains the following functions:

- **Intensity** – to adjust image desired target brightness of image preview from active camera displayed on screen by slider or value

- **Current exposure time** – display current exposure time of live preview (changing according automatic exposure control)

- **Ocular view** – optional to adapt the color impression from microscope eyepieces to the image at screen (Color cameras only)

- **Auto** (Bright-Field)-**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.

- **Grey balance pipette** – set manually grey balance at live preview

- **Reset Grey balance** – reset grey balance back to factory settings
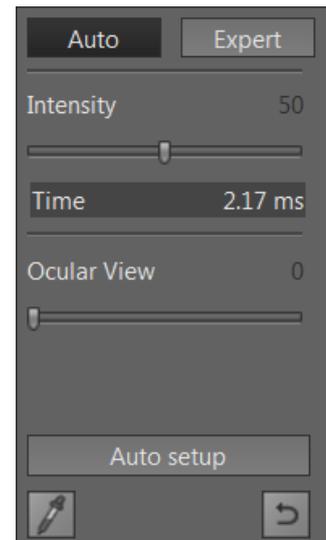
Expert tab contains the following expert functions:

- **Time** – set exposure time manually by slider or enter value

- **Gain** – set gain value manually by slider or enter value

- **Ocular view** – optional to adapt the color impression from microscope eyepieces to the image at screen (Color cameras only)

- **Black Point*** – optionally to enhance noise level in dark image areas; values according the black point pipette

- **White Point pipette (1)** – set manually white point at live preview

- **Grey balance pipette (2)** – set manually grey balance at live preview

- **Black Point pipette (3)** – set manually black point at live preview

- [icon] **Reset balances (4)** – reset back to factory settings
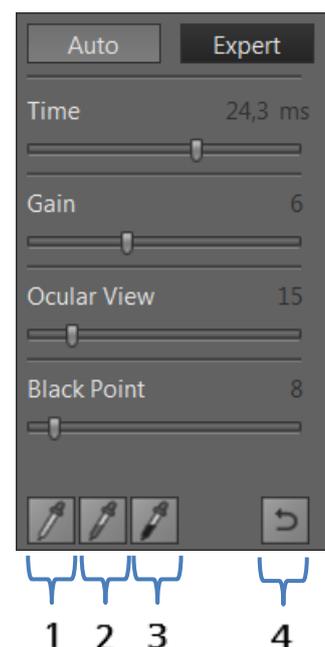
*(Available as of JENOPTIK GRYPHAX version 2.1 or newer)

9.2   Maximum exposure time

Maximum exposure time for captured images can be reached by using max. exposure time **in combination** with max. gain value at "Expert tab". For e.g. RIGEL camera max. live exposure is 2000 ms **+** max. gain value of 60 = **120 seconds exposure time** for captured images in case that option "Minimize Gain" is activated at preferences!

Enter values directly by click on value – edit box appear to change and update the value

<u>Note:</u> To reset grey balance or black / white point separately, select according option before press reset button! Otherwise all balance and points will be reset together.

9.3   Set Grey Balance:

Activate grey balance icon from Exposure widget. Mouse pointer immediately change to pipette pointer and display small magnifier window and pixel values of according image position at image window.

Click into **"grey" region** of preview image to set new grey values and the image will automatically change the grey balance of RGB preview image.

<u>Note:</u> This option is most important to get best color reproduction from specimen! Option only available for color cameras.

9.4   Set Black Point:

Activate black point icon from Exposure widget. Mouse pointer immediately change to pipette pointer and display small magnifier window and pixel values of according image position at image window.

Click into **"black" (dark image) region** of preview image to set manually new black offset and the image will automatically change the black offset at preview image and the noise level will be reduced instantly.

At **Black Point slider*** the current used black point value is displayed and can be adjust manually.

Important Note: Black point is a very powerful function and will <u>reduce</u> the image bit depth of preview and captured images! Image can be destroyed or show pixel artefacts. Do not set "Black Point" into bright image areas to avoid corrupted images!

9.5   Set White Point:

Activate white point icon from Exposure widget. Mouse pointer immediately change to pipette pointer and display small magnifier window and pixel values of according image position at image window.
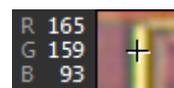
Click into **any region** of preview image to set new brightest area at preview image. The software will automatically set RGB values to max value (255) at related region and the "Expert" Exposure tool change the exposure time accordingly.

*(Available as of JENOPTIK GRYPHAX version 2.1 or newer)

9.4   Open Histogram:

To open Histogram click to the Histogram icon at the tool bar, the Histogram widget will be opened and is separated into two different sections: **Histogram section** (**1**) and **Pixel value section*** (**2**).

Histogram widget is displaying the following information:

- Histogram curve (RGB or Monochrome) according image data
- Gamma curve according select Gamma value
- Pixel value* of <u>current</u> mouse position (*valid as of version 1.1.12)
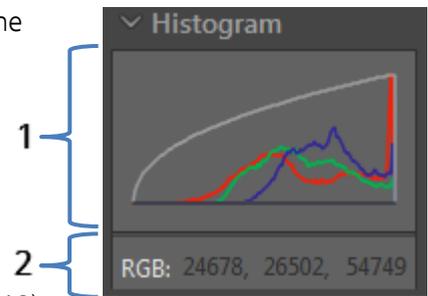
<u>Note:</u> "Pixel values" are displayed while mouse pointer is <u>inside</u> of image window only. The values depends on the image bit depth. For live preview and recorded images with 8 bit format, the values are displayed in 8 bit (0-255).For recorded images with 16 bit format the values are displayed as 16 bit (0-65535).

Perform Auto-Setup:

Auto (Bright-Field)-**Setup*** – option is supposed to set-up all relevant camera image parameter to reach best image quality! It can be used at any time. Additionally, the automatic white balance and the color correction to the used light source will be applied. "Auto Exposure control" is enabled as well.

<u>Note:</u> Remove the specimen **before** proceed the Auto-setup function to get optimal results!

Tool status:

- Activated tools are highlighted in blue. Click on tool icon again to deactivate appropriate tool.
- Tools which are not access able are "greyed out" by software automatically and cannot be reached.

Collapse / expand button on each tool to hide separate widgets on active tool section.

Reset button on a tool sets all properties to their initial values. Initial values are fixed.

Video tutorial:

Press the link to watch the video tutorial for Exposure tool & Histogram of JENOPTIK GRYPHAX software.

Limitations:

- Exposure tool is not reachable during Multi-Fluorescence mode.
- Exposure tool widget is blocked while video record or time-lapse, Z-stack or Panorama is running.
- Exposure mode "Auto" is disabled and cannot be reached during Panorama and Z-Stack mode.
- Exposure tool can be activated while image live preview from camera is active only.
- Auto-Setup is designed to work for bright-field application with color and monochrome cameras.

*(Available as of JENOPTIK GRYPHAX version 2.1 or newer)