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

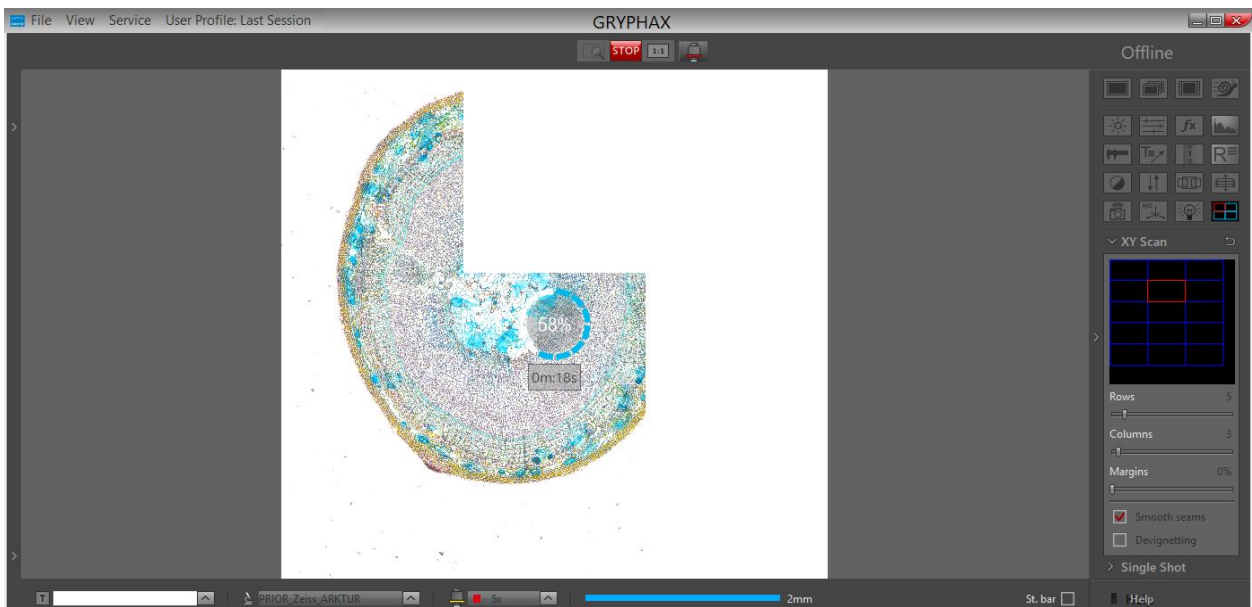# XY Scan tool of JENOPTIK GRYPHAX® software

General description:

The "XY Scan tool" of JENOPTIK GRYPHAX software enables user to control automation systems include motorized stages from 3rd party manufacturers to create automated panorama images by stage support.

The motorized stage devices are supported to automatically scan X, Y-axis directly inside at GRYPHAX application to create automated panorama images. I.e. to scan a specimen area bigger than the current camera view using XY motorized stage (if available).

The scan process is based on moving the stage in XY direction on a predefined grid, capturing images at grid cells and stitching them together to create the single, bigger picture.

The status of tool is "experimental" only.

Overview JENOPTIK GRYPHAX software with activated XY Scan tool:

General Preparations:

In order to allow the XY scan tool to work, the connected XY stage has to be activated first.
The activation can be done by using HOME button in XYZ stage tool. Without activation, the tool will display 'XY stage not activated' message on the preview box. After activation, the preview area gets black background and the message disappears.

Open XYZ Stage tool and press the button "Home" Home for stage calibration and home position movement. Afterwards, the XYZ Stage tool and the XY Scan tool are ready for use.

For detailed information, please see chapter XYZ Stage tool!

Note: To operate with XY Scan tool the COM port must configured beforehand and re-calibrate for home position of stage is necessary after each software start! Otherwise, tool controls are not available.

Important Note: Always keep attention to the motorized stage and microscope during automatic home calibration and automatic scan movement! User is always responsible for any stage movement during operation!

Open Tool bar:

All JENOPTIK GRYPHAX tools are located at the "Toolbar".

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

Stage Preparation:

1. Connect the stage device to the computer and configure the communication port (COM) before open GRYPHAX application

2. Calibrate "Home" Home position at XYZ Stage tool. It must be done in advance after each application start!

3. Use the XYZ Stage tool to move to image start position by motorized stage

4. Configure XY Scan parameters from widget before start creating of automated panorama images

In case the connected XY stage device is not calibrated, a warning message will be displayed and the whole XY scan tool are disabled. Without activation, the tool will display 'XY stage not activated' message on the preview box.
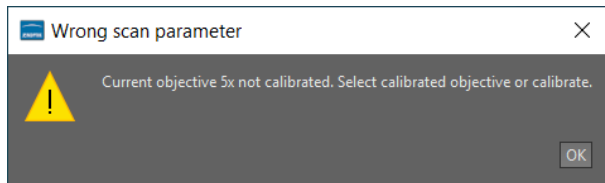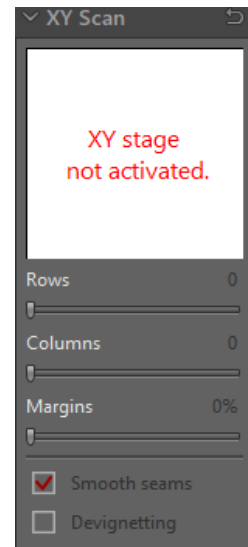

Figure 3 - warning message
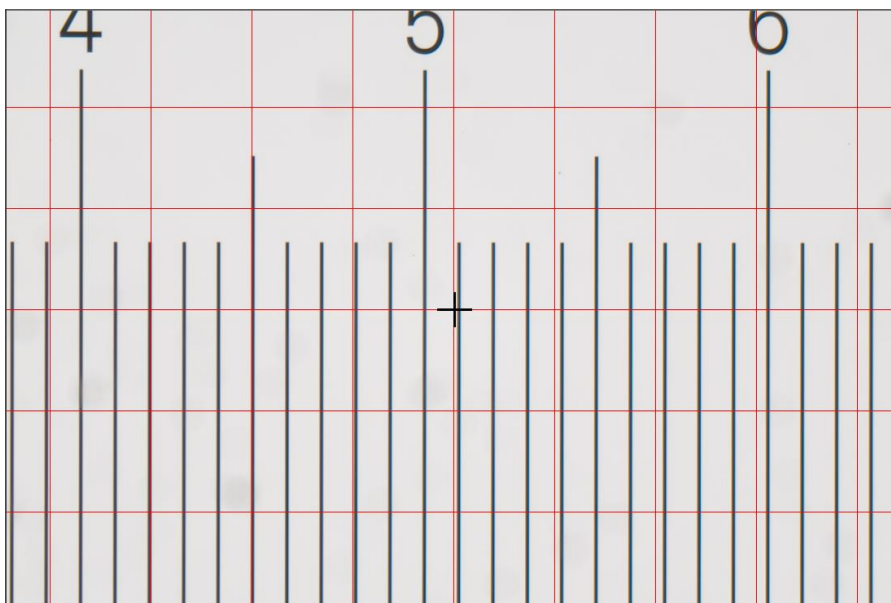

Figure 2 - XY Scan tool offline

Camera Preparation:

To reach to best results with *XY scan tool* you have to adjust the alignment of camera related to the stage **before** you start using *XY scan tool*.

To adjust the alignment you can use the "Grid" function (keyboard short cut "g") and the JENOPTIK GRYPHAX® calibration slide / stage micrometer (order number: 588374).

Grid overlay on live image from JENOPTIK stage micrometer to adjust alignment:

Operation:

To open XY scan tool click to the tool icon 🔲 at the "Toolbar", the automated XY Scan widget will be opened and contains the following options by two sections:

Overview section:

Position overview section – displays the number of combining images
Also see live the current position of scan image and update during scan

The preview box shows the actual scan grid relative to the whole XY stage area. The grid is drawn with blue colour. By clicking with the mouse on the preview box, one can change the view to the 'zoom' mode where only the current scan area is presented instead of the whole XY stage area.

Options section:

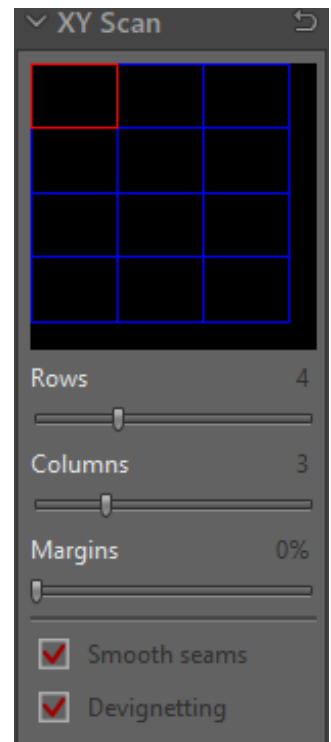**Rows** – number of possible rows can be adjusted by slider or value box

Columns – number of possible columns can be adjusted by slider or value box

Margins – to overlay image and position for scan (to avoid hard transitions between each image)
Values from 0% to 50%; recommended to use 10-15%

Smooth seams – to smooth the seams between neighbor images

Devignetting – to avoid vignetting at the edges of images

Note: After setup of all XY scan parameter from widget. <u>Do not move the stage</u>, unless the image position at XY scan tool will be not correct anymore.

Margins

Sets how individual grid cells overlaps vertically and horizontally during scanning. The value sets a percentage of a single image (cell) width and height.

Smooth seams

If 'Margins' value is set above 0%, this check box allows the overlapping areas of adjacent images to blend via gradual transparency. This may reduce visibility of edges (seams) between adjacent images.

Devignetting

When this option is on, individual images are post-processed after the capture to reduce vignetting. I.e. the difference in average lightness between the centre and corners of the image. Devignetting helps reducing 'checkered' look of the final image.

Start:

To start automated image stitching, press the "REC" button and wait until the whole sample is scanned and the generated panorama image is finished.

The acquisition time to scan the sample is depending on the number of images (rows, columns).

During recording, the status indicator is displayed on the image window.
An approximate time to finish will be displayed.

Please avoid vibrations during scan process. Otherwise, the images combining would be affected!

The maximum image size is limited to 300 Megapixels in total.
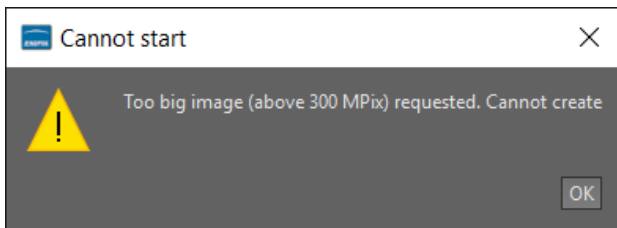If warning message for image size appear, please reduce the number of images (rows, columns).

Figure 4 - warning too big image

Note: The automated panorama gives a limited level of control for example; there is only one, predefined direction of scanning - top to bottom - right - bottom to top - right etc.
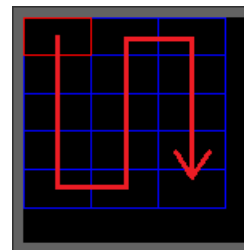

Figure 5 - scan movement

Stop:

To stop automated image combining press "Stop" button. The combining will be canceled and stage will immediately stops at current position.

Limitation:

- Available as of JENOPTIK GRYPHAX version 2.2.0 or newer
- Status of tool is experimental
- Only available for supported motorized scan devices (PRIOR controller)
- Image size is limited to 300 mega pixels
- File size is limited 1.5 GB
- No live preview during image combining visible
- Movement direction is fix and cannot be changed
- No script programming available
- No z- focus support