

**Motic**<sup>®</sup>

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## Motic Images Plus 3.0 ML Software


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Windows OS User Manual

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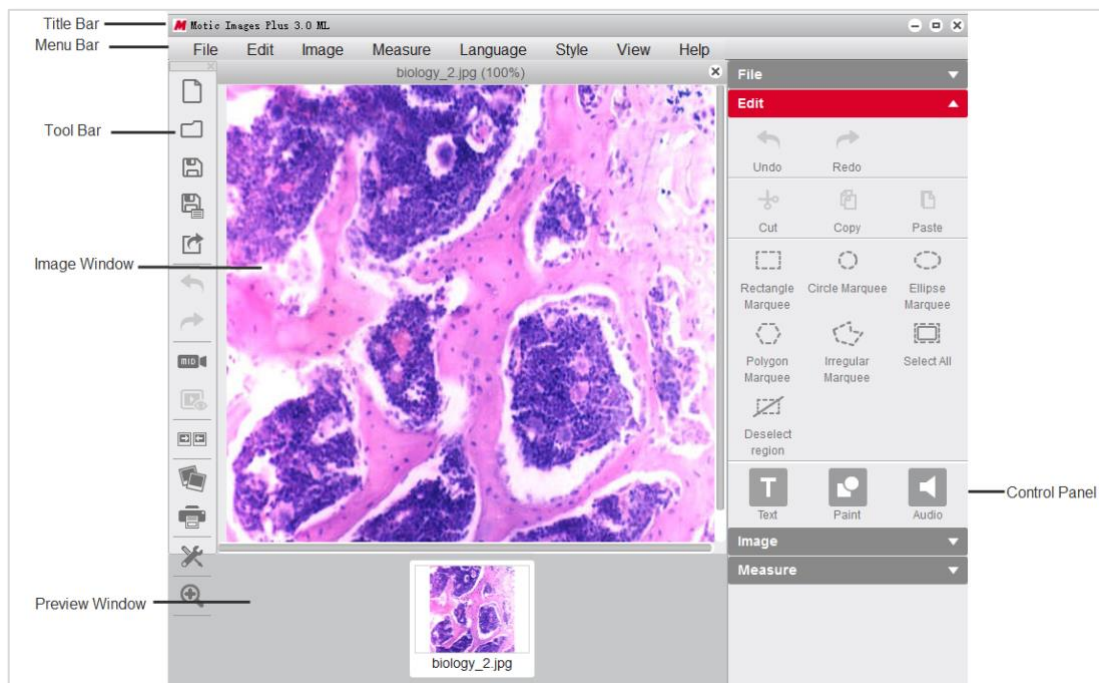


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Motic Images Plus 3.0 ML is multi-language software offered by Motic China Group Co., Ltd. It is especially designed to adjust interactively a live image supplied by a Motic USB camera, capture the optimized image and perform further analyzing and measuring tasks.

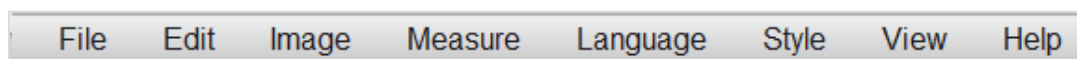
Opening Motic Images Plus 3.0 ML will display the following interface:



The interface is composed of the **Title Bar**, **Menu Bar**, **Tool Bar**, **Image Window**, **Control Panel** and **Preview Window**.

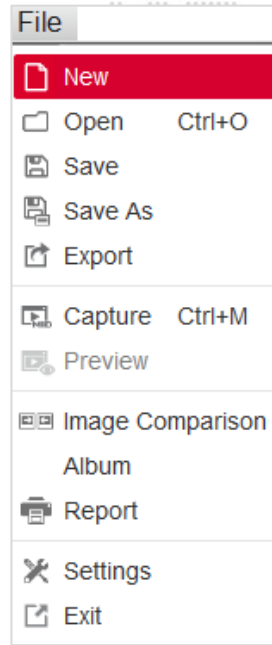
## Menus and tools

The **Menu Bar** includes the functions **File**, **Edit**, **Image**, **Measure**, **Language**, **Style**, **View** and **Help**. Click the buttons on the Menu Bar to display the corresponding tools.



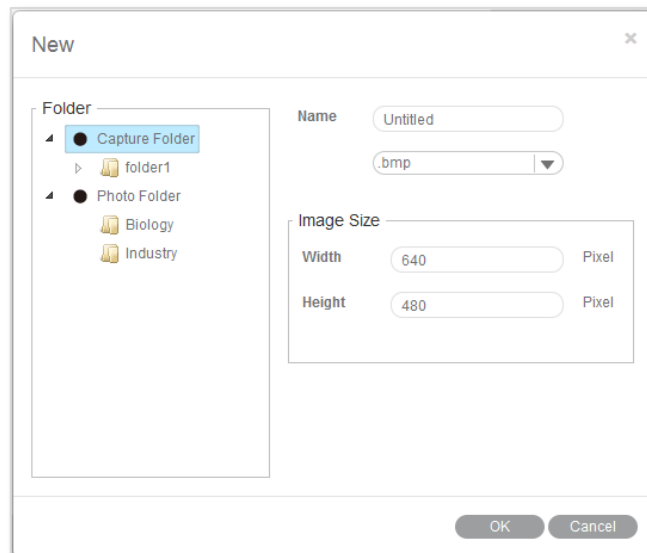
## Menus and tools / File

**File** includes the following commands: **New**, **Open**, **Save**, **Save As**, **Export**, **Capture**, **Preview**, **Image Comparison**, **Album**, **Report**, **Settings** and **Exit**. Shown below is the corresponding tool bar:



## Menus and tools / File / New

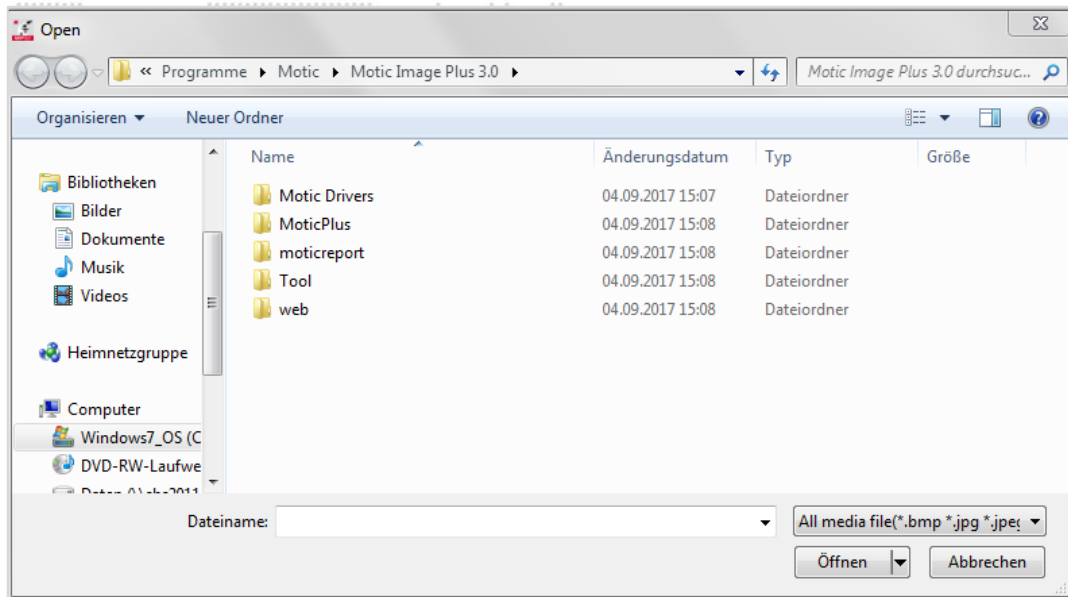
The **New** command enables to create a new image file:



Select the format of the image file (jpg; bmp; tiff; png) and the file name. "png" is a proprietary Motic format which can only be opened with Motic Images Software. Define the image size. Capture Folder defines the location where the new image file should be saved.

## Menus and tools / File / **Open**

The **Open** command allows users to open already existing image files:

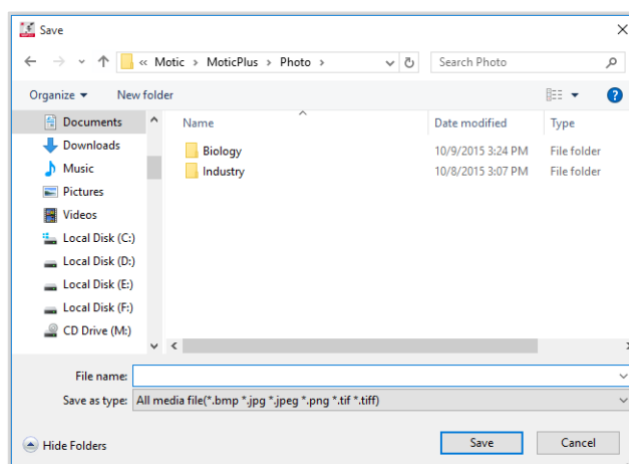


## Menus and tools / File / **Save**

The **Save** command allows to save the current image in the selected format.

## Menus and tools / File / **Save As**

The **Save As** command provides another method for saving the current image. The following dialog box will display allowing users to save the image to a different destination and in a different format than its source.



## Menus and tools / File / **Export**

**Export** saves the current image in a selected path.

## Menus and tools / File / Capture

Selecting the **Capture** command will bring up the Motic Live Imaging Module to handle images seen through the microscope connected to the computer.

*Note:* The capture device can be preset using the **Setting** command of the File menu or the **Setting** button on the File Toolbar:

Settings

Capture Audio

File Name = Capture + Serial number+ .jpg

Auto Capture

Every 1 Seconds Capture one image

Maximum Capture images 5

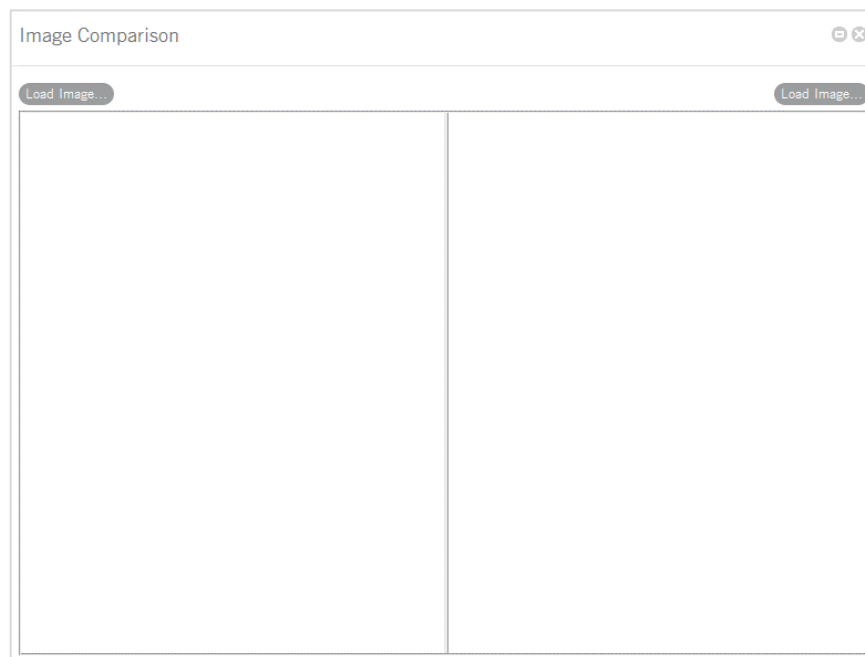
Image Size Auto

Using current date and time as file names

OK Cancel

## Menus and tools / File / Image Comparison

The **Image Comparison** command opens a window composed of two frames for a side-by-side comparison of two images.





There are four ways to load the images for comparison:

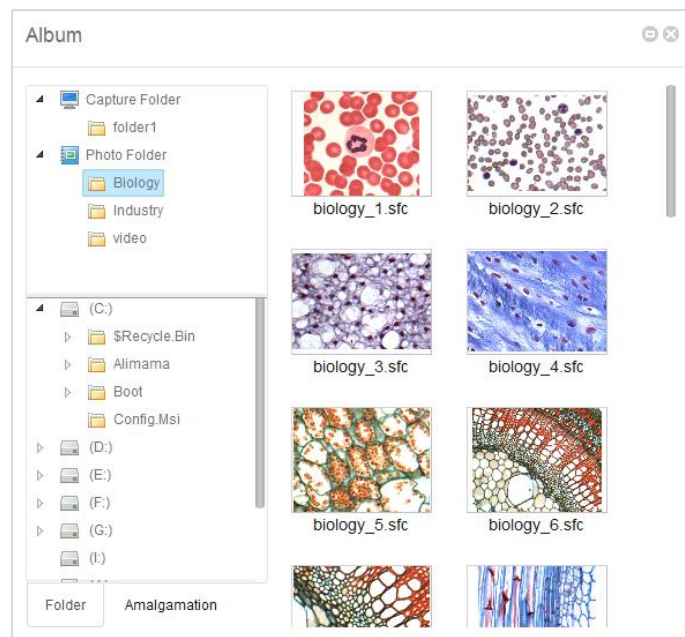
1. Double click on either frame to load images from the local disk.
2. Right click within either frame and select **Load Image** from the shortcut menu to load the desired images for comparison.

Load Image...  
Fit to Window

3. Images may also be dragged into either of the frames directly from the Album or Preview window.
4. Click "Load Image" button to import the selected image.

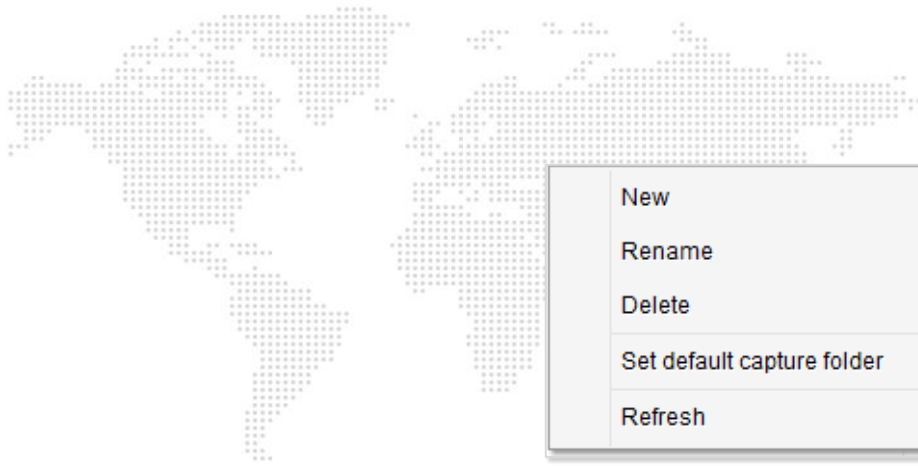
### Menus and tools / File / Album

The **Album** command allows to open already existing images from their thumbnails. It also opens the general WINDOWS explorer. Click the Album button to bring up the following window:



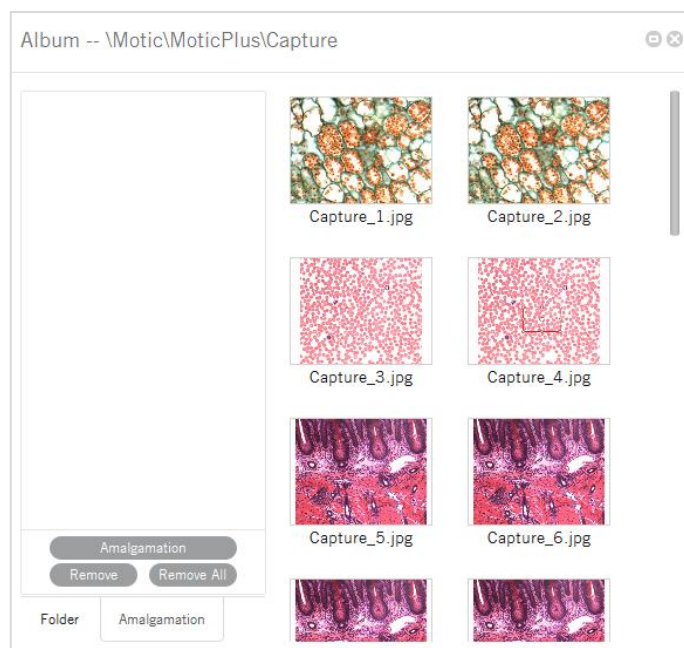
### Menus and tools / File / Album / Folder

The upper column displays the Motic Images Plus 3.0 ML image folders, the images captured will be saved here. The contents of an Image Folders on the left will be shown in a thumbnail display on the right. Double click on a thumbnail selects a file for single image display; "Drag and Drop" from thumbnail to Preview window is also possible. With **Set default capture folder** a predefined path for image storage can be set.

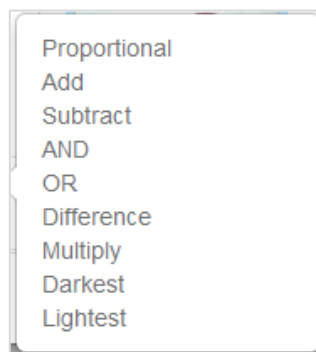


## Menus and tools / File / Album / Amalgamation

Amalgamation is a helpful tool for image overlay, especially for multiple stained samples in fluorescence. Click the **Amalgamation** tab to display the following interface:



Select the desired images and drag them into the Amalgamation panel. Click the Amalgamation button and a popup menu listing various amalgamation calculations will be displayed.



Select an amalgamation method and a dialog box will display to confirm the name of the resulting image. Check the different options to find the best possible amalgamation result. The overlay will be saved in the format "combination\_1."

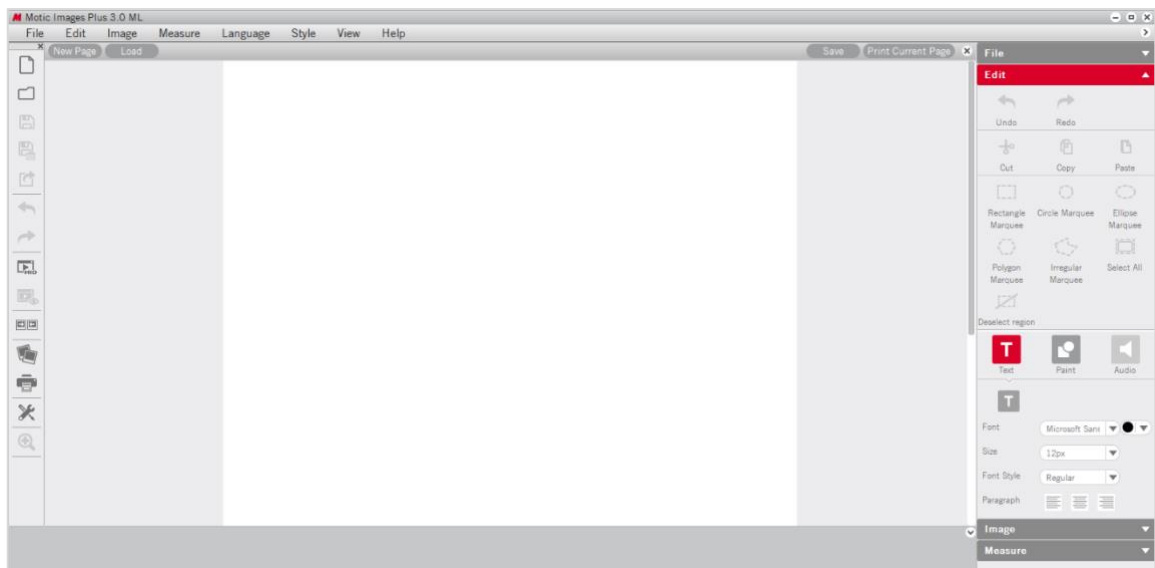
Clicking the **Remove/Remove All** buttons will remove selected image.

Users can also remove an image in the Amalgamation panel by left click for selecting it; then clicking the right mouse button to bring up the following popup menu:



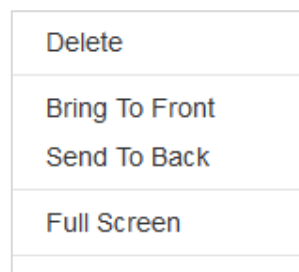
### Menus and tools / File / Report

The **Report** function is an integral part of Motic Images Plus 3.0 Software. Users are able to load images and add text fields for printing or export purposes. A report will be saved under proprietary format moticreport.mwp.



To close the report button click  located in the top right corner.

Click the right mouse button in the Motic Report window to bring up the following popup menu:



## Menus and tools / File / Report / Report Tool Bar

The Report Tool Bar is located at the top of the Report window and displays as follows:

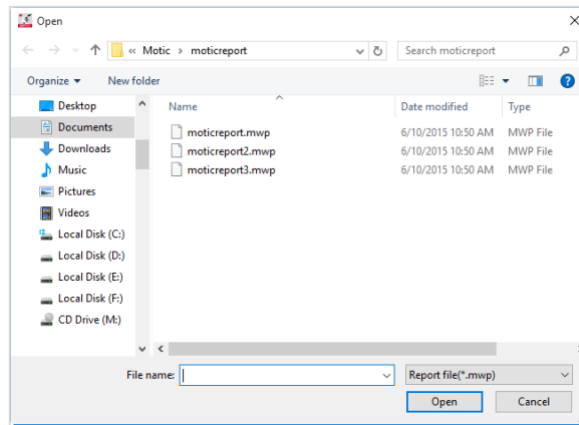


## Menus and tools / File / Report / Report tool Bar / New Page

The **New Page** button creates a new report page.

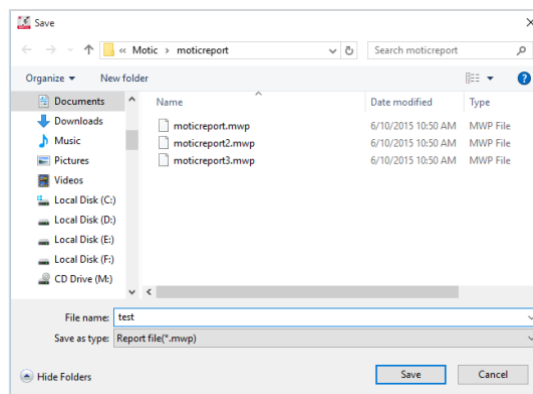
## Menus and tools / File / Report / Report tool Bar / Load

The **Load** button brings up the following dialog box from which an existing report may be opened.

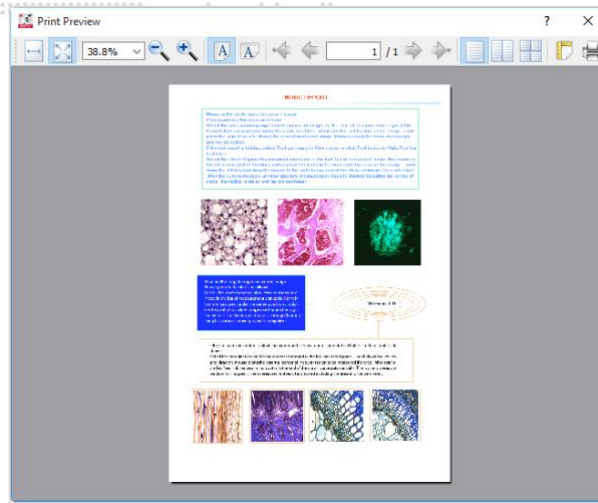


## Menus and tools / File / Report / Report tool Bar / Save

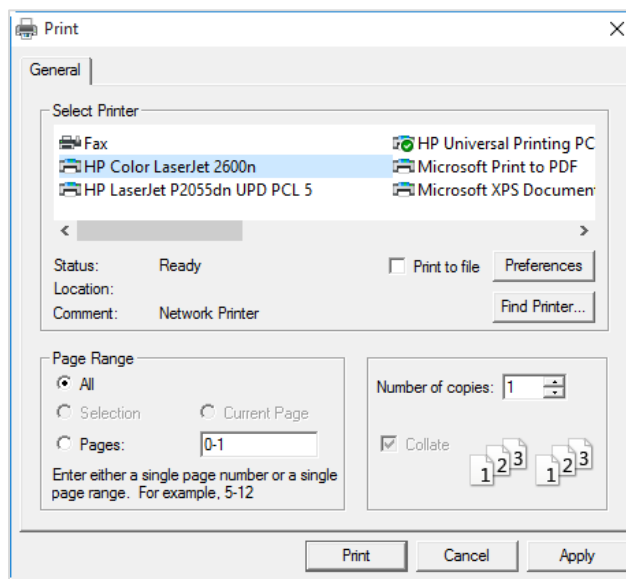
The **Save** button brings up the **Save As** dialog box which allows users to save the report documents as \*.mwp format files.



**Menus and tools / File / Report / Report tool Bar / Print Current Page**  
The **Print Current Page** button enables users to preview the current report.



**Menus and tools / File / Report / Report tool Bar / Print Setting**  
The **Print Setting** button brings up the Print dialog box.

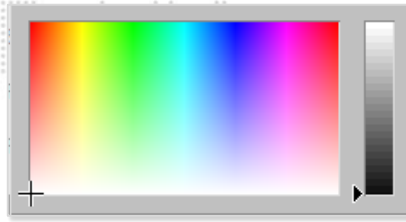


**Menus and tools / File / Report / Edit / Text**

Click the **Text** button and move the cursor to the location on the report where the text is to be displayed, click the left mouse button and begin typing.

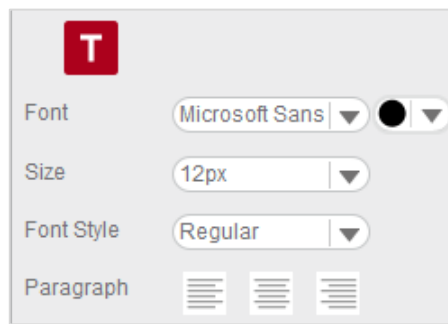
**Menus and tools / File / Report / Edit / Text / Color**

The **Color** button brings up the Color Palette through which users are able to select a text color.



**Menus and tools / File / Report / Edit / Text / Font**

The **Font** button brings up the Font dialog box.

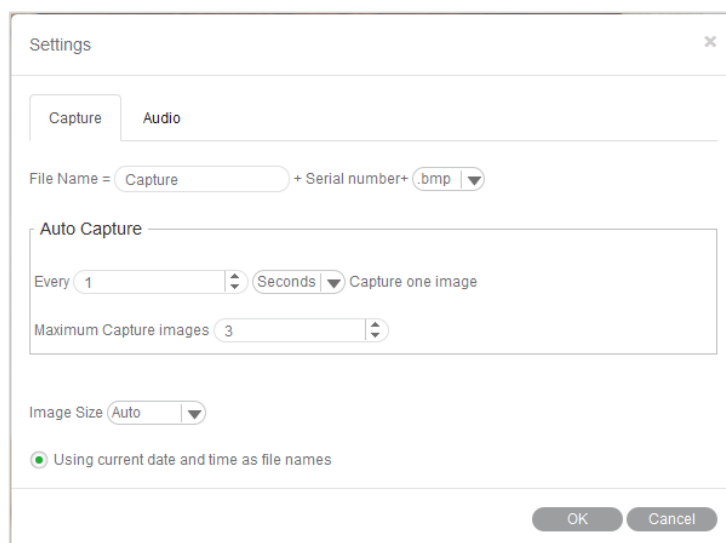


**Menus and tools / File / Settings**

The **Settings** command provides access to the parameter of Still Image capture, image sequences and Audio options.

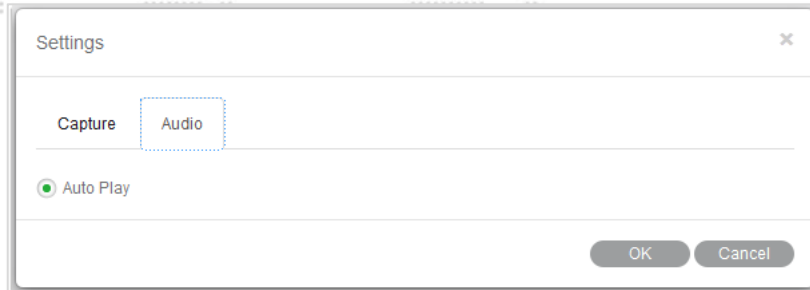
**Menus and tools / File / Settings / Capture**

Click the **Capture** tab to display the capture settings. Here, define the **file name**, **image size**, the frequency and the maximum number of images to be captured automatically. To choose the **Using current date and time as file names** option, click the respective check box. Click **OK** to confirm.



### Menus and tools / File / Settings / Audio

Click the check box to the left of the **Auto Play** option and the music selected in the Playlist of the Control Panel will play automatically each time Motic Images Plus 3.0 ML is opened. Click OK to confirm.

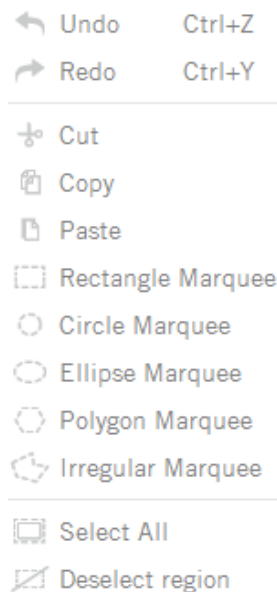


### Menus and tools / File / Exit

The **Exit** command closes the program after prompting users to save any unsaved files.

### Menus and tools / Edit

The **Edit** Menu allows to define selected areas for further handling. The corresponding tool bar functions are equivalent:



### Rectangle Marquee

A **Rectangle Marquee** will be defined by clicking and dragging the left mouse button.

To move the selected rectangular region, place the mouse pointer on the side of the figure, and then click and drag when the cross pointer appears. To change the size of the selected region, place the mouse pointer on a corner of the rectangle, and then click and drag the mouse when the hand pointer appears.

### Circle Marquee

The **Circle Marquee** will be defined by clicking the left mouse button to define the center and to drag for size variation. To move the circle, place the mouse pointer at the center, then click and drag the mouse when the cross pointer appears. To change the size of the selected region, place the mouse pointer at the extreme point of the radius, then click and drag the mouse when the hand pointer appears.

### Ellipse Marquee

The **Ellipse Marquee** is defined like a circle. To move the selected elliptical region, place the mouse pointer at the center of the ellipse, then click and drag the mouse when the cross pointer appears. To change the size of the selected region, place the mouse pointer at the extreme point of the major or minor half axis, then click and drag the mouse when the hand pointer appears.

### Polygon Marquee

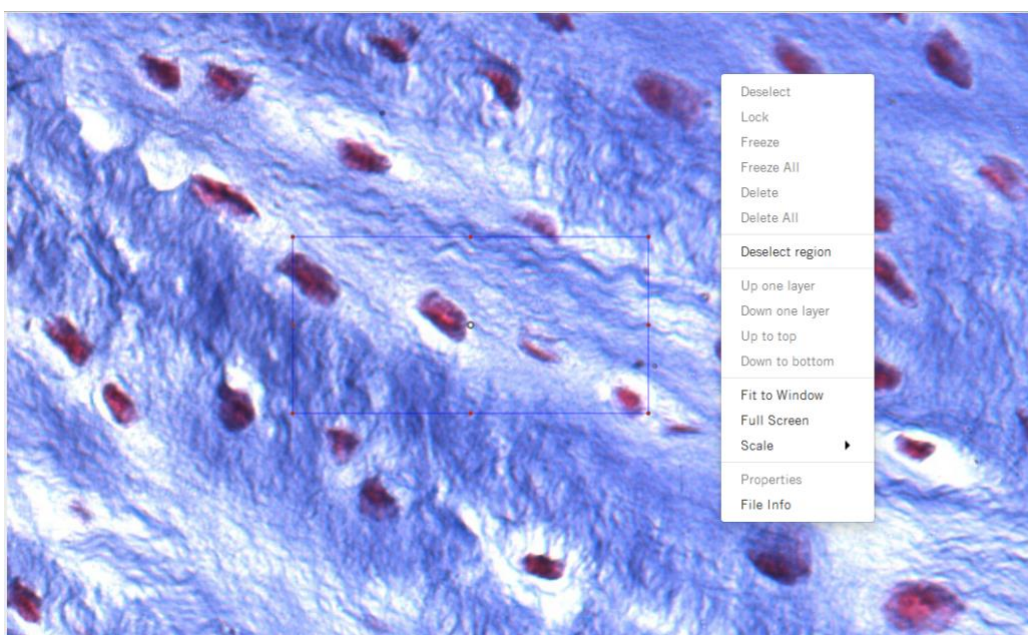
A **Polygon Marquee** is defined by clicking and dragging the left mouse button. To move the polygon, place the mouse pointer on the side of the polygon, then click and drag the mouse when the cross pointer appears. To change the size of the selected region, place the mouse pointer on a corner of the polygon, then click and drag the mouse when the hand pointer appears.

### Irregular Marquee

With the **Irregular Marquee** command, users are able to define an irregular region by clicking and dragging the mouse. The selected irregular region may be moved using the drag-and-drop method when the cross pointer appears.



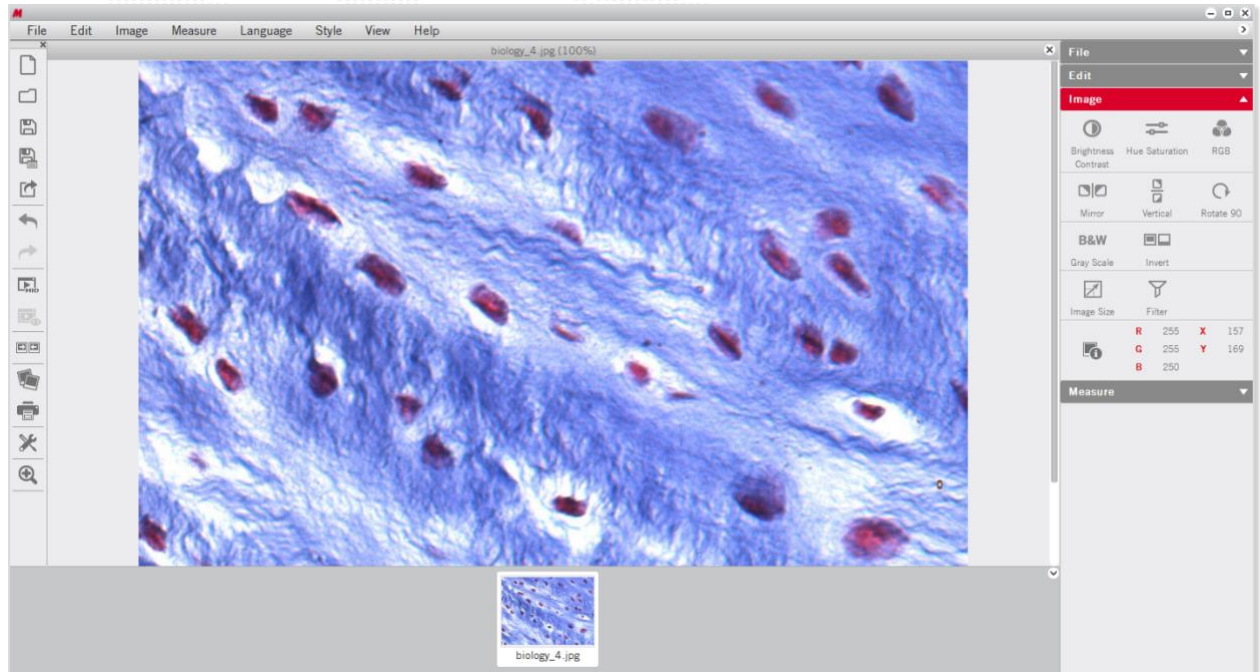
All selected areas can be deleted by  **Undo** or right mouse button: **Deselect region**





## Menus and tools / Image

The **Image** Menu includes the all commands for a post-capture image correction. The corresponding tool bar functions are shown below:



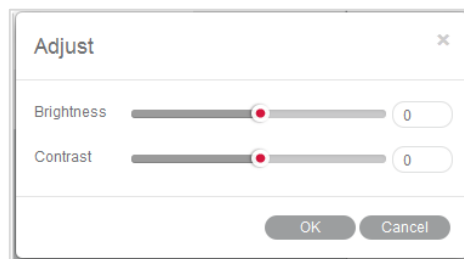
The **RGB** box displays the color information at the point of the cursor's current location.



The **XY** box displays the XY coordinates of the cursor's current location.

## Menus and tools / Image / Brightness/Contrast

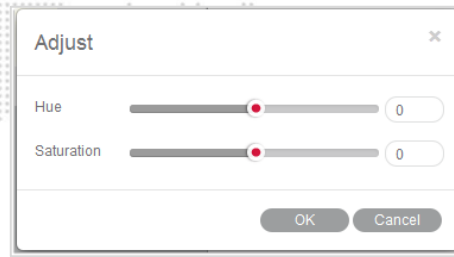
The **Brightness/Contrast** command displays separate sliders for both parameters.



The Default values are both set to "0". For brightness, the value range is -255 to +255; for contrast it is -127 to +127.

## Menus and tools / Image / Hue/Saturation

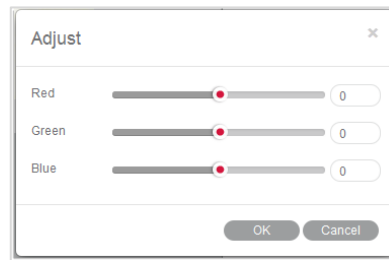
Select the **Hue/Saturation** command to bring up the following window:



**Hue** values can be varied from -360 to +360; the default value is “0”. **Saturation** range is from -100 to +100; default value is “0”.

## Menus and tools / Image / RGB

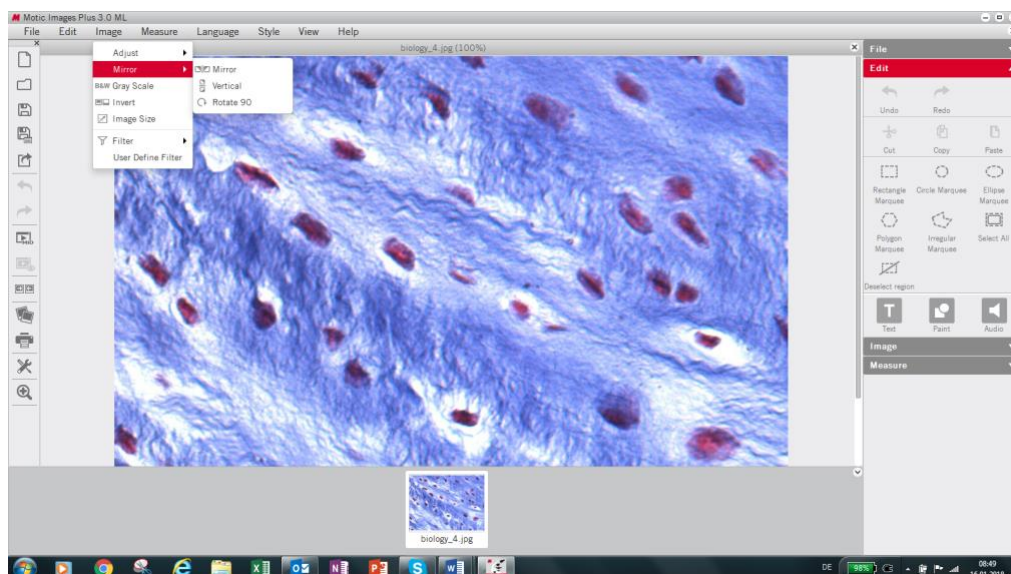
Select the **RGB** command to bring up the following window:



The three sliders are used to adjust the red, green and blue color channels of the active image. The value range always is from -100 to +100 with default value “0”.

## Menus and tools / Image / Mirror

The **Mirror** command mirrors the current image horizontally.



### Menus and tools / Image / **Vertical**

The **Vertical** command mirrors the current image vertically.

### Menus and tools / Image / **Rotate 90**

The **Rotate 90** command rotates the current image clockwise by 90 degrees.

### Menus and tools / Image / **Gray Scale**

The **Gray Scale** command converts the current image into a B/W image.

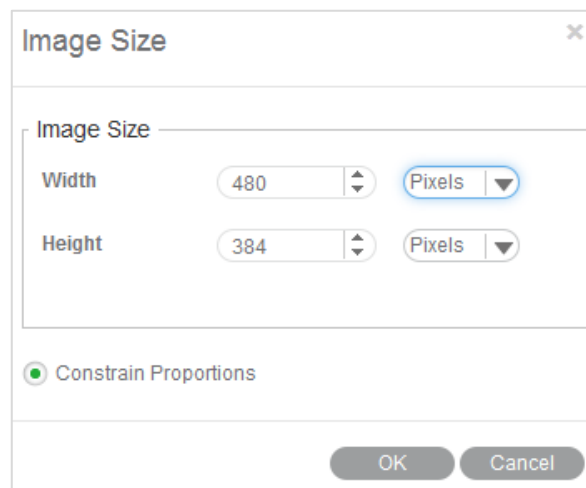
### Menus and tools / Image / **Invert**

The **Invert** command inverts the current image colors.

### Menus and tools / Image / **Image Size**

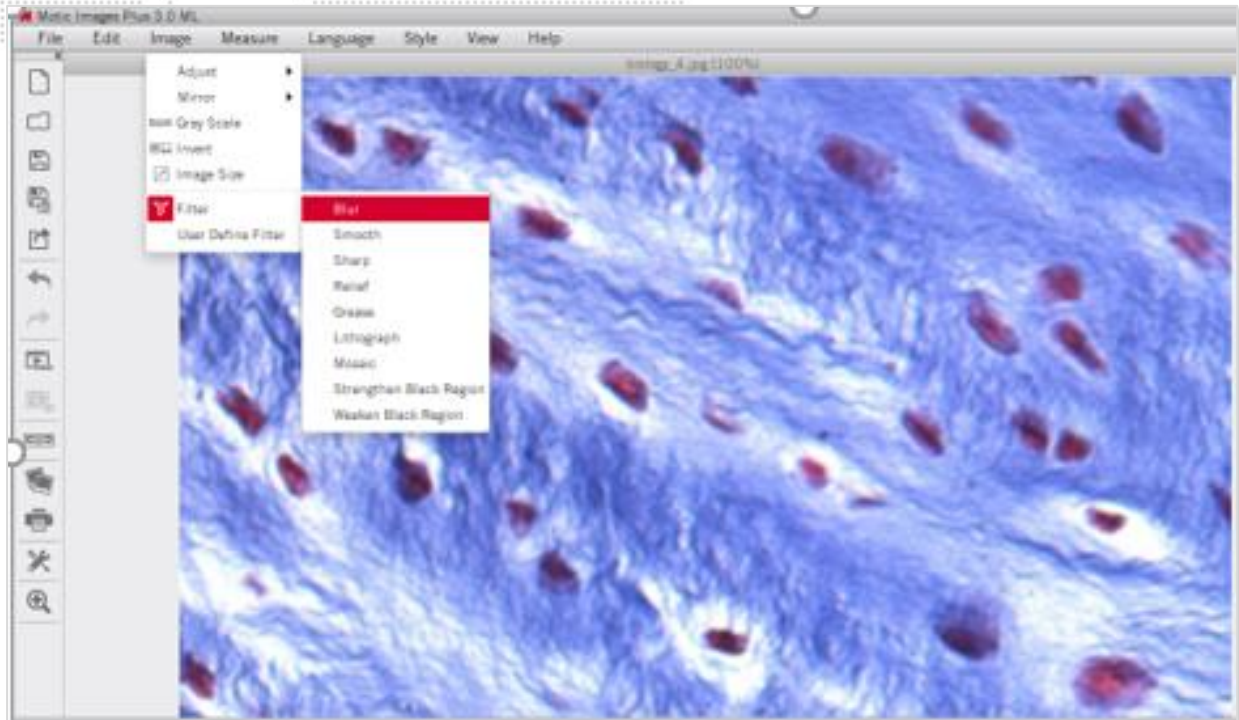
**Image Size** brings up the Image Size dialog box. The units may be "Pixel" or "Percent".

Select the **Constrain Proportions** checkbox to keep the image proportions even though the image size is changed. If Width or Height values are changed manually, the corresponding value will automatically be adjusted to keep the image proportions.



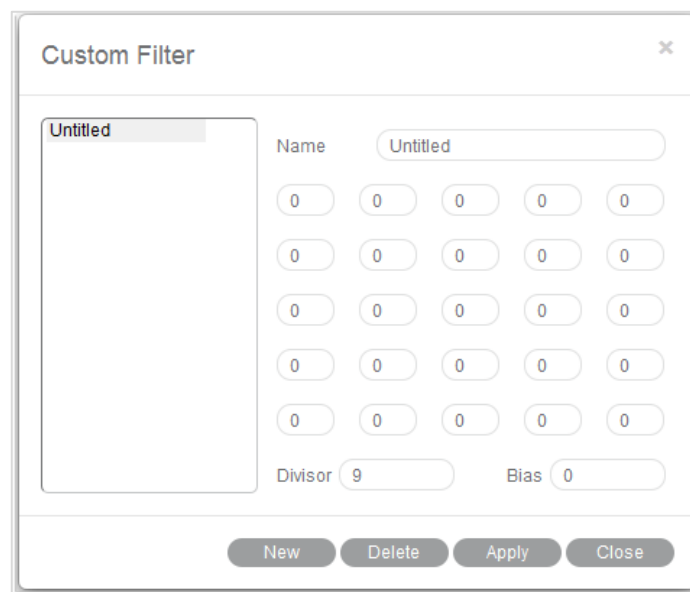
### Menus and tools / Image / **Filter**

The **Filter** command allows to apply several filters on the saved image.



### Menus and tools / Image / **User defined Filter**

The **User Define Filter** command allows the individual configuration of a filter.

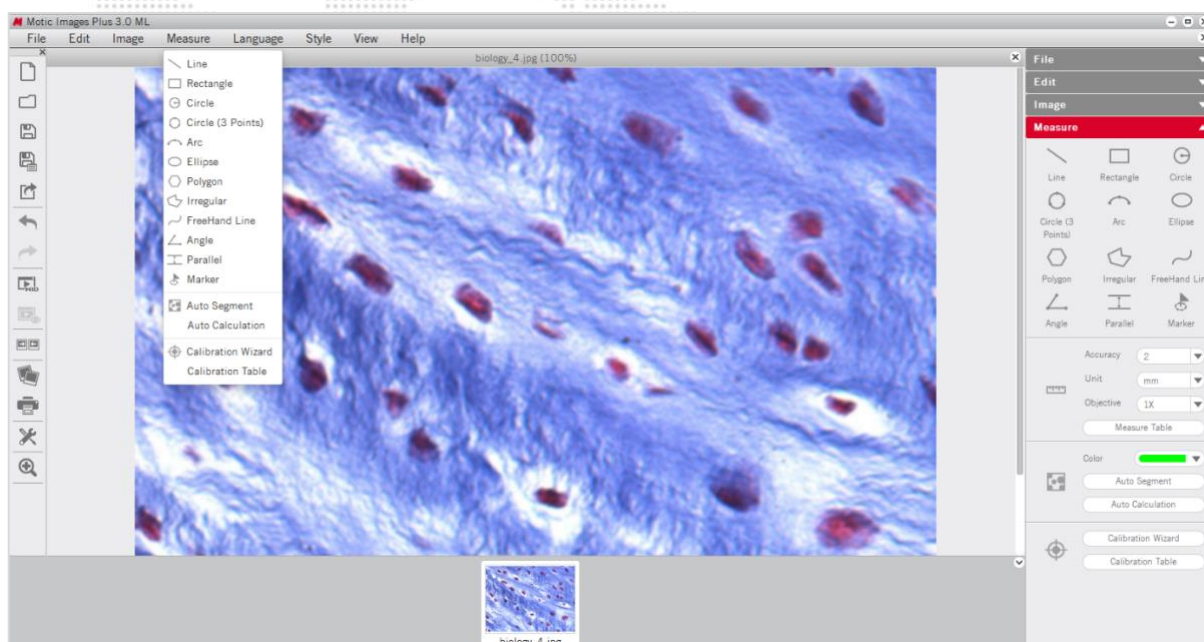


To define a new filter, click "New" and enter the name of the new filter. Enter values into the blanks to create a filter matrix with divisor and bias.

To open an existing filter, select an item from the list and click "Apply".

## Menus and tools / Measure

The **Measure** Menu includes the commands for measuring several geometrical figures as well as the quantification tools Auto Segment, Auto Calculation, Calibration Wizard and Calibration Table.



### Line

**Line** measures distances, diameter etc. Click the left mouse button and drag a line. The result is displayed immediately.

Place the mouse pointer at the extreme point of the line (arrow → hand pointer) and change the length interactively. Place the mouse pointer on the line, then click and drag the mouse when the cross pointer appears to move the line.

### Rectangle

The **Rectangle** command measures the width, height, area and perimeter of rectangles. Click and drag the left mouse button on the image to create a rectangle.

Place the mouse pointer at the vertex of the rectangle, then click and drag the mouse when the hand pointer appears to change the size of the rectangle. Place the pointer on an edge of the rectangle, then click and drag the mouse when the cross pointer appears to move the rectangle.

### Circle

The **Circle** command measures the radius, area and perimeter of circles.

Place the mouse pointer at the extreme point of the radius, then click and drag the mouse when the hand pointer appears to change the size of the circle. Place the mouse pointer on the center of the circle, then click and drag the mouse when the cross pointer appears to move the circle.

### Circle (3 points)

The **Circle (3 points)** command measures the radius, area and perimeter of circles. Define a circle by 3 points. Place the mouse pointer on any of the three points on the circle, then click and drag the mouse when the hand pointer appears to change the size of the circle. Place the mouse pointer on the circle, then click and drag the mouse when the cross pointer appears to move the circle.

### Arc

The **Arc** command allows users to measure the radius, perimeter, angle and arc length.

Click and drag the mouse to create an arc with 3 points. Place the mouse pointer at one red point of the arc, then click and drag the mouse (arrow → hand pointer) to change the shape of the arc. Place the mouse pointer on the arc, then click and drag the mouse (arrow → crosspointer) to move the arc.

### Ellipse

The **Ellipse** command measures the major half axis, minor half axis, area and perimeter.

Place the mouse pointer on the extreme point of the major or minor half axis, then click and drag the mouse when the hand pointer appears to change the size and shape of the ellipse. Place the mouse pointer on the center of the ellipse, then click and drag the mouse when the cross pointer appears to move the ellipse.

### Polygon

The **Polygon** command measures the area and perimeter.

To complete a polygon, double click the left mouse button on the end point.

Place the mouse pointer on any edge of the polygon, then click and drag the mouse when the hand pointer appears to change the size of the polygon. Place the mouse pointer on any point of the polygon, then click and drag the mouse when the cross pointer appears to move the polygon.

### Irregular

The **Irregular** command measures the area and perimeter of irregular figures. Click and drag the left mouse button on the image to drawn an irregular image, release the button to complete the shape automatically. Click and drag the mouse when the cross pointer appears to move the irregular figure.

### Freehand line

This **Freehand Line** command allows users to measure the length of free lines.

Place the mouse pointer on the free line, then click and drag the mouse when the cross pointer appears to move the free line.

### Angle

3 points set by the left mouse button will define an **Angle**. Depending on the drawing, the internal or external angle is measure. Place the mouse pointer at the end of the angle leg, then click and drag the mouse (arrow → hand pointer) to change the angle. Place the mouse pointer on any point of the angle, then click and drag the mouse (arrow → crosspointer) to move the angle.

### Parallel

**Parallel** allows to measure the distance between 2 parallel lines. Draw the first line and end it by mouse click. Moving the mouse creates a parallel line. Both lines can be moved by clicking the grey middle marking (arrow → cross).

### Marker

Using **Marker** allows to highlight defined points of interest. The x/y coordinates are displayed.

## Auto Calculation

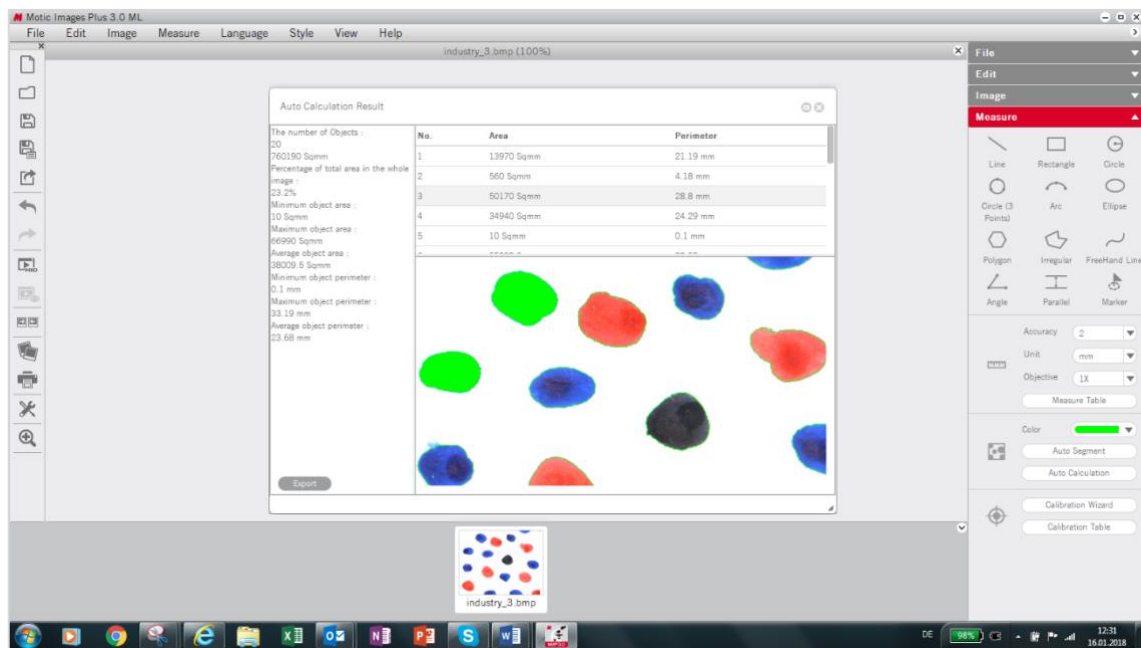
The **Auto Calculation** command provides detailed data of the objects segmented from the image.

The Auto Calculation Result window will then be displayed, such as number of objects, total area, percentage of total area, minimum object area, maximum object area, average object area, minimum object perimeter, maximum object perimeter, average object perimeter and the serial number, area and perimeter of respective objects.

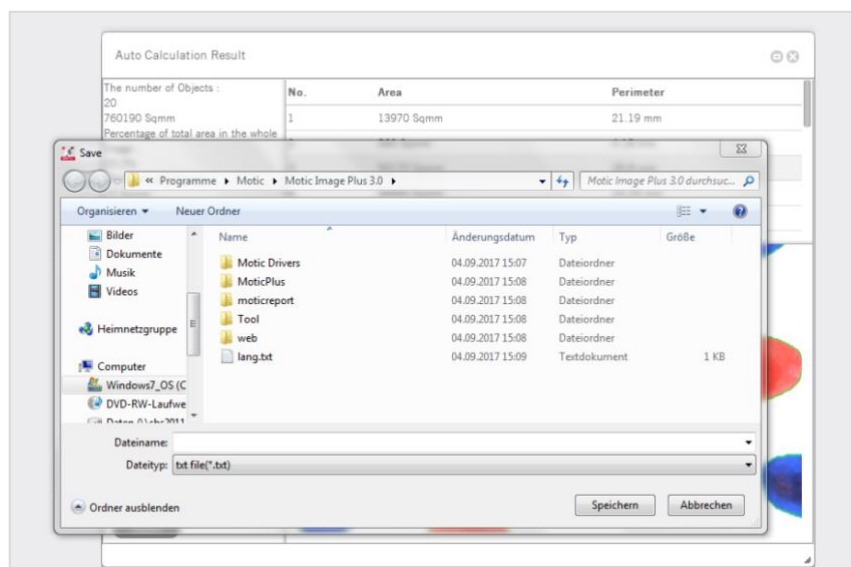
To access the data of a certain object, click on the object in the image window and the data for that object will be highlighted.

Click on the data of the desired object(s) and the corresponding object(s) will flicker in the image window.

Click and drag on a particular data item to change its location in the list of results.



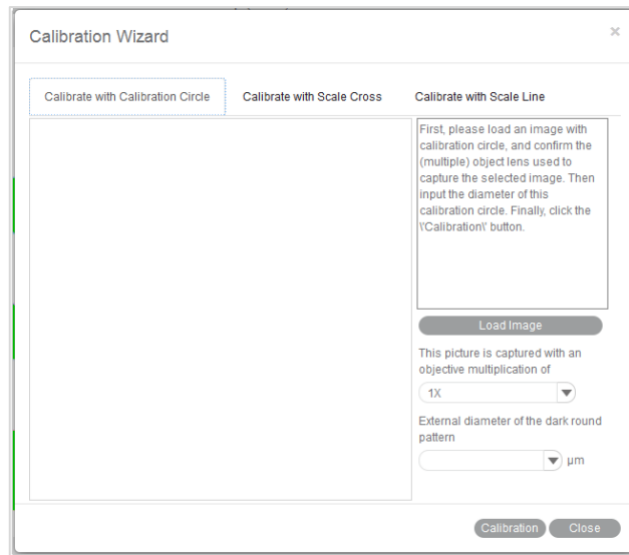
Click **Export** to bring up the Save As dialogue for export the calculation results as a Text file (\*.txt) or CVS file (\*.csv).



## Calibration Wizard

A correct calibration is essential for any kind of measurement, for correct scale bars and grid dimensions. The **Calibration with Calibration Circle** is based on the dot patterns metallized on the glass calibration slide provided with Motic cameras. The calibration with Scale Cross and Scale Line are intended to be used in case the smallest dot on the calibration slide is even too large to be captured completely by an image.

Select the Calibration Wizard command to bring up the following interface:



### Calibration with Calibration Circle

To calibrate with a calibration circle, select the respective Calibration Wizard tab. Click **Load Image** to select a calibration circle from your image database. Confirm the objective lens used to capture the selected image and input the diameter of the calibration circle. Click the **Calibration** button to open a new dialogue box. Check the x/y-axis values; they should only differ by one decimal place. Activate the **"Scale"** option (if not active by Default setting). This function will adjust e.g. the scale bar depending on the display mode (resolution, Full screen). Enter a **New Sign Name** to refind your calibration easily within the calibration table. Next, click the **Save** button to finish calibration.

### Calibration with Scale Cross

To calibrate with a scale cross, select the respective Calibration Wizard tab.

Click **Load Image** button to select a scale cross from your image database.

When the image is loaded, a circle will appear on the scale cross. If desired, choose a different color.

Place the center of the circle (set as "O") exactly into the center of the scale cross. Next, take a reddish marked point ("A") in the X-direction and drag it on the horizontal line to a certain scale division, then perform identically in Y-direction ("B"). The magnifier window under the image window may help to place the points accurately.

Confirm the objective lens used to capture the selected image and input the actual length of "OA" in the "Width" bar and the actual length of "OB" in the "Height" bar. Take note about the scaling of the scale bar. Click the **Calibration** button to open a new dialogue box. Continue as under **Calibration with Calibration Circle**.



### Calibration with Scale Line

To calibrate with scale line, select the respective Calibration Wizard. This wizard performs calibration in X- and Y-direction separately, using the same image type: a scale cross.

Click **Load Image** to open the image of a scale cross. Click the **Horizontal** tab to activate a horizontal line overlaying the scale cross. If desired, choose a different color. Extend the line by dragging with the left mouse button to a defined scale division. Confirm the objective lens used to capture the selected image and input the actual length.

Please repeat this procedure for Y-direction (**Vertical** tab). Click the **Calibration** button to continue as in **Calibration with Calibration Circle**.

### Calibration Table

The **Calibration Table** shows all calibration data saved for later usage.

If the **Scale** check box is selected, the measurement results will stay correct, no matter which display format/resolution is used.

Sign names	µm/pixel-X axis	µm/pixel-Y axis	Objective	Scale	Sign image width	Sign ima
100X	1	1	100	false	320	240
10X	10	10	10	false	320	240
1X	100	100	1	false	320	240
20X	5	5	20	false	320	240
2X	50	50	2	false	320	240
3X	33.333333	33.333333	3	false	320	240
40X	2.5	2.5	40	false	320	240

Sign Name      Capture

Scale

OK      Delete

### Menus and tools / Language

Select a language from the drop down list.

### Menus and tools / Style

4 color styles are provided, click "Style" button and select one of them to switch the interface style.



### Menus and tools / View

Displays the panel status. When you select it, the panel will display in the software interface.

## Menus and tools / Image / Help

The **Help** menu has two commands:

### Help

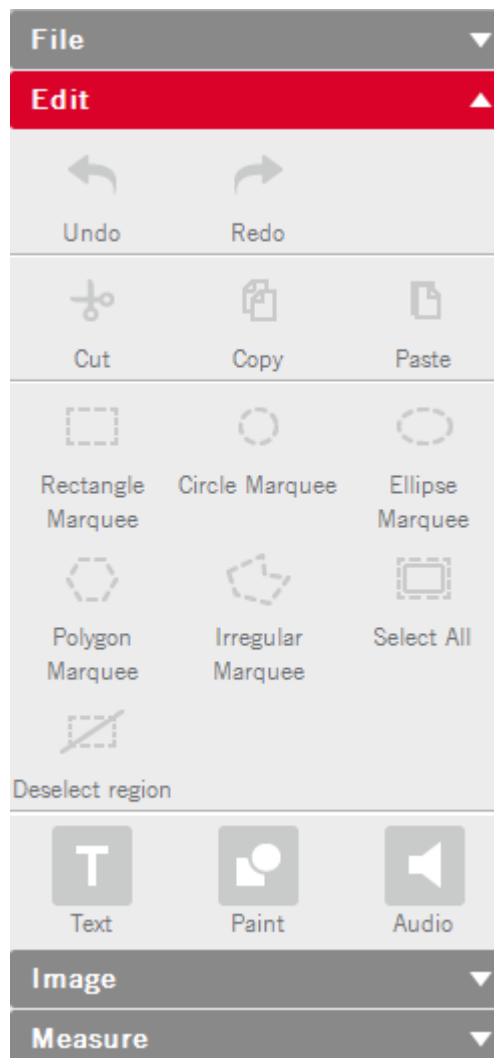
Provide detailed instructions on how to use the program.

### About

Display the program's copyright and version information.

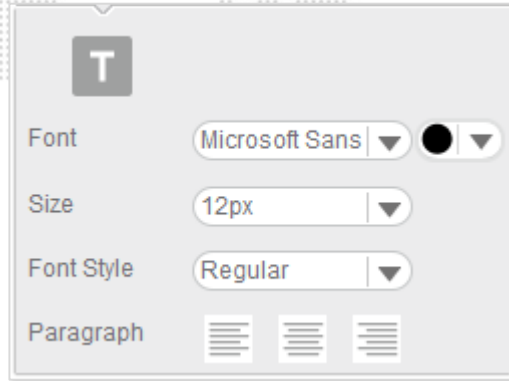
## Control Panel

When an image is opened in Motic Images Plus 3.0 ML, the following **Control Panel** will display inside the **Edit** Tab.



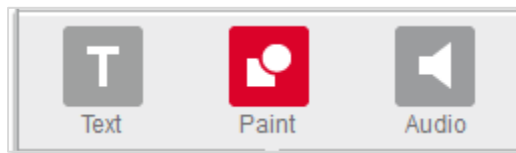
### Control Panel / Edit / **Text**

The Control Panel is composed of the following tabs: Text, Paint, Measure, and Audio. Click **Text** in the Control Panel to display the text editing options.



### Control Panel / Edit / **Paint**

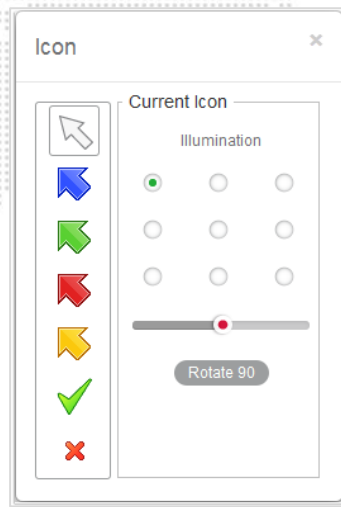
The **Paint** tab in the Edit Control Panel allows to draw geometrical figures.



The following figures can be drawn: line, rectangle, polygon, circle, ellipse, freehand. All figures can be edited.



Click the **Icon** button to bring up a dialog box which provides a variety of icons to add to the current image.



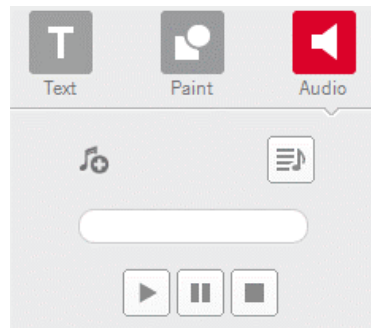
Select a desired icon and click on a position of the image to place it.


**Illumination** will vary a shadow-effect representing the direction of an illumination. The slider under the circles varies the illumination angle.

Click the **Rotate 90** button to rotate the icon 90° clockwise.

### Control Panel / Edit / Audio

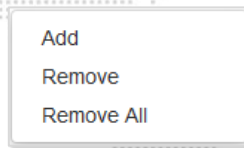
Click the Audio tab to display the **Audio** control panel:



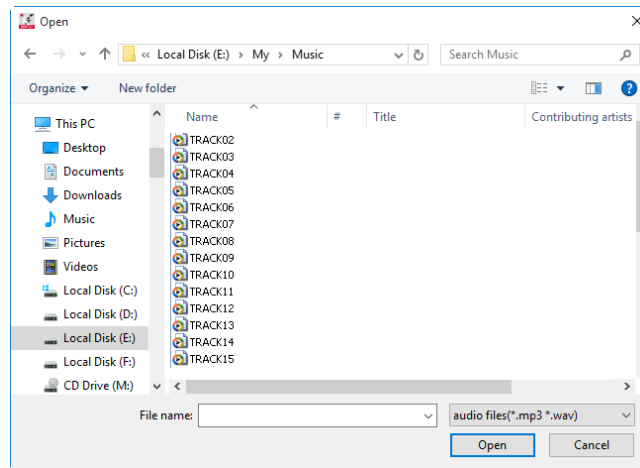
**Play List**  brings up the Playlist window, to which external audio files can be added.

File	Path
Sleep Away.mp3	C:\Users\Public\Music\Sample Music\Sleep Away...
Maid with the Flaxen Hair.mp3	C:\Users\Public\Music\Sample Music\Maid with ...
Sleep Away.mp3	C:\Users\Public\Music\Sample Music\Sleep Away...

Click the right mouse button in the window to display this popup menu:



To add music to the playlist, select the **Add** command to display the open dialog box:



Select the desired music files, click the **Open** button and the selected music will be added to the playlist. If the Auto Play option in the Audio panel of the Setting dialog box has been selected, the music in the playlist will be played automatically each time Motic Images Plus 3.0 ML is started.

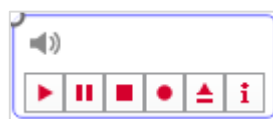
To remove the music listed in the playlist, select the Remove All command from the popup menu.







The buttons refer to Start, Pause and Stop.




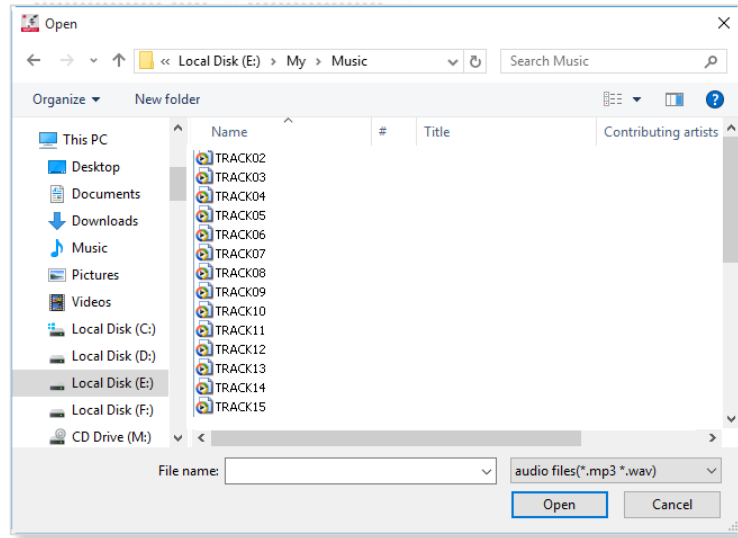
Clicking dedicates the audio file to an individual image file. Move the cursor onto the image and click left to display the following box:



The buttons ,  and  refer to Start, Pause and Stop. Click the Record button  to display the Record window with which users are able to record sound, music, etc.

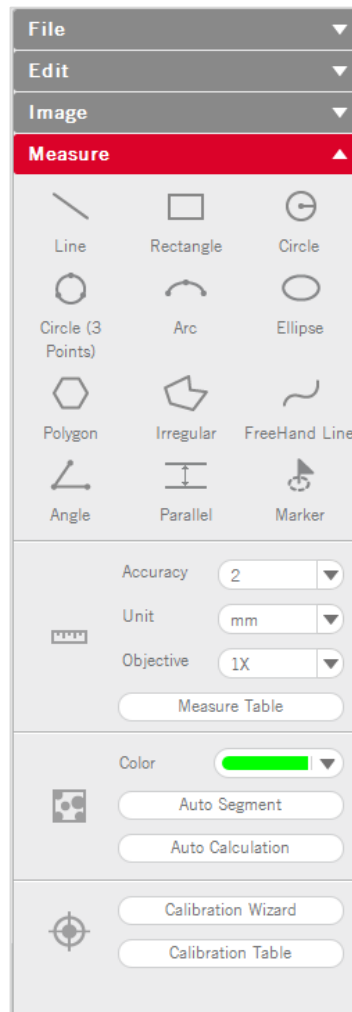


Click the  button to bring up the Open dialog box from which users can open existing audio files.

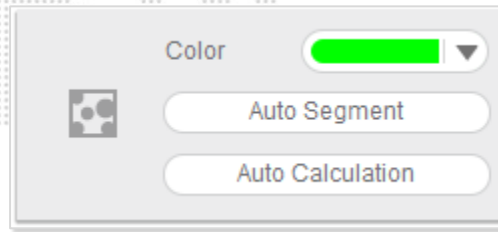


## Control Panel / Measure

Click the Measure tab to display the **Measure** control panel.



From the **Objective Lens** drop down list, select the objective lens that was used to capture the current image. The color of Auto Segment can be selected.

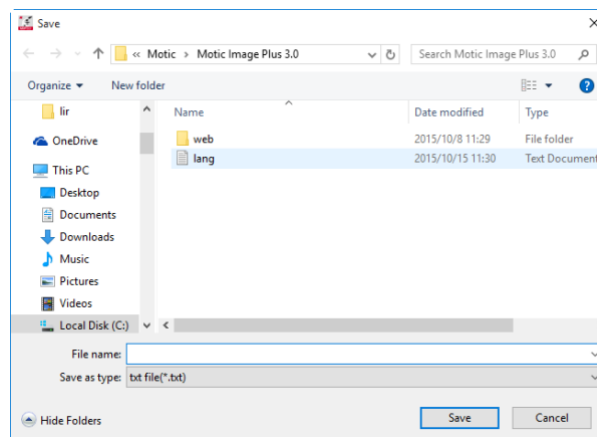


The **Measure Table** button opens the following window which is composed of two tabs, Measure Table and Options. The **Measure Table** tab lists all measurement results.

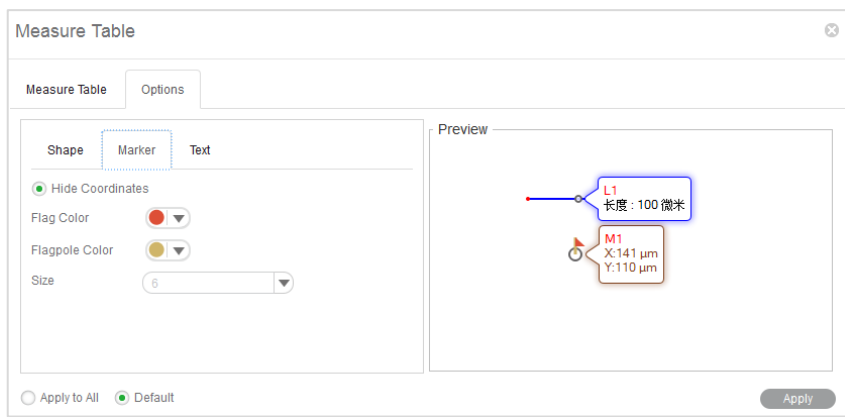
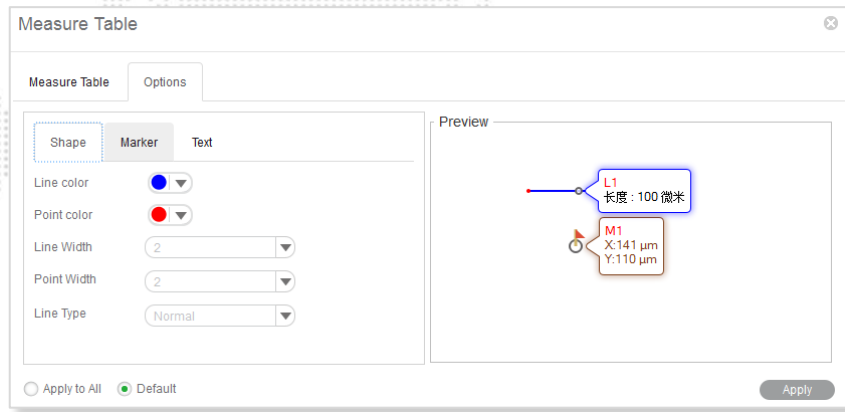
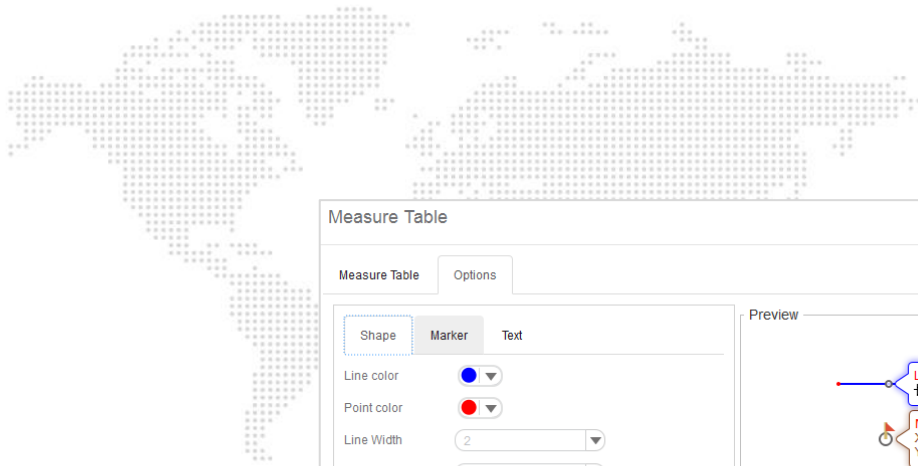
Measure Table		Options						
	Length	Width	Height	Area	Perimeter	Radius	Major half axis	Minor half axis
L1	31.82 µm							
R1		17.05 µm	11.05 µm	188.39 Sqµm	56.2 µm			
E1				159.64 Sqµm	45.19 µm		7.95 µm	6.4 µm
E2				254.6 Sqµm	62.99 µm		13.28 µm	6.1 µm
E3				167.34 Sqµm	47.39 µm		9.01 µm	5.91 µm

Export

To export the data in the Measure Table, click "Export" to bring up the following dialog box with which users are able to save the data as \*.txt or \*.csv files.

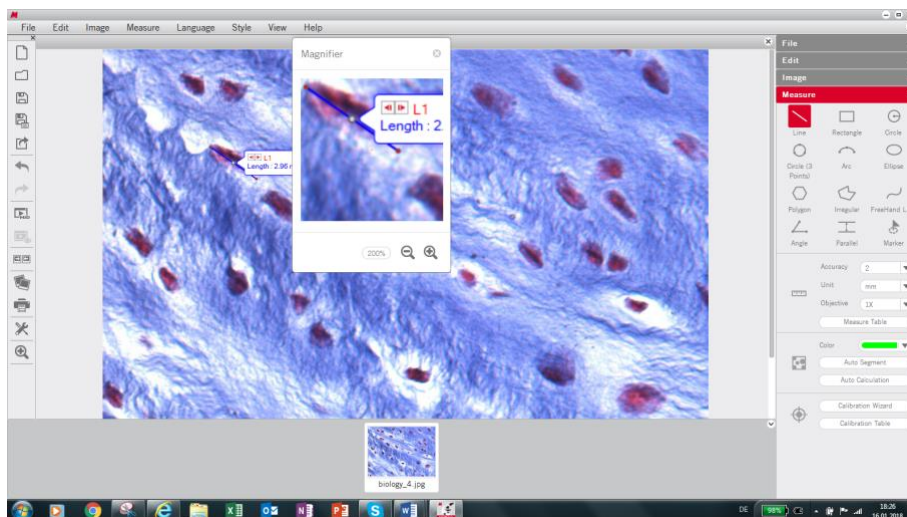




The Measure table can be edited as well:



## Toolbar / Magnifier

The **Magnifier** is a helpful tool especially for measurements. Start and end of a line, etc. can be precisely defined.



Click the  button to increase the magnification up to 800%. and click the  button to reduce it.

## Preview Window



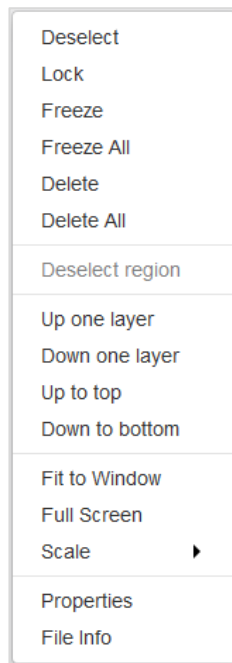
The **Preview Window** is located to the bottom of the image window. It shows all images actually opened.



## How to use the Popup Menu

### How to use the Popup Menu.... / ...in the Image window

Click the right mouse button in the image window to display the following popup menu:



#### Deselect

This command deselects the selected objects.

#### Lock

This command locks the selected region(s) making it impossible to move it/them around.

#### Freeze

This command freezes the location and size of the selected figure and fixes it to the image.

#### Freeze All

This command freezes the location and size of all the figures and fixes them to the image.

#### Delete

This command deletes the selected region.

#### Delete All

This command deletes all regions that have not been locked or frozen.

### Deselect region

This command deselects the selected regions.

### Up one layer

This command brings the selected region up one layer.

### Down one layer

This command brings the selected item down one layer.

### Up to top

This command brings the selected item to the top layer when there are several items on the image.

### Down to bottom

This command brings the selected item to the bottom layer when there are several items on the image.

### Fit to Window

This command resizes the image to fit into the current window.

### Full Screen

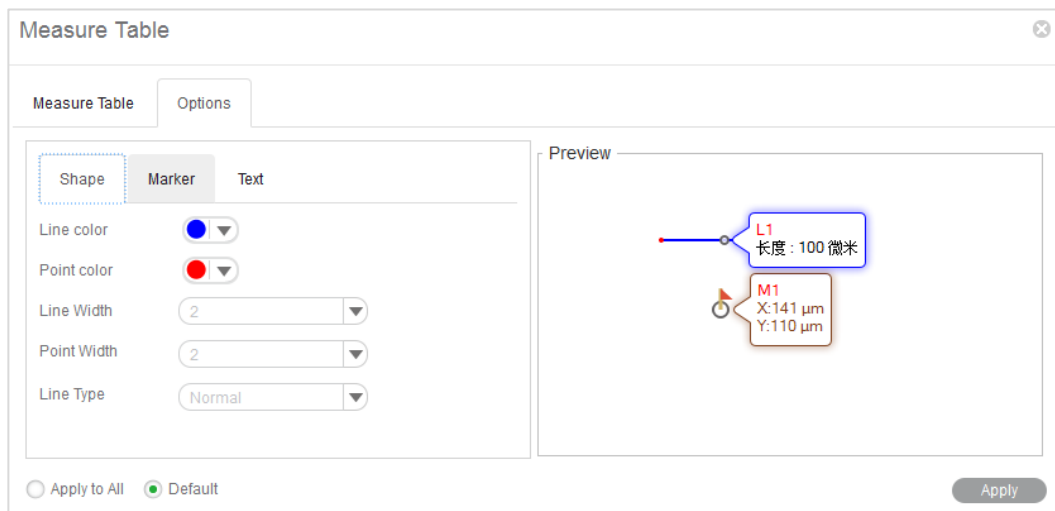
This command brings the image window into full screen view.

### Scale

This command resize the current image by scale.

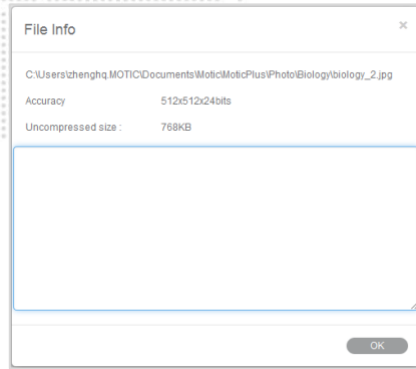
### Properties

This command brings up the properties dialogue to define the selected object's parameters.



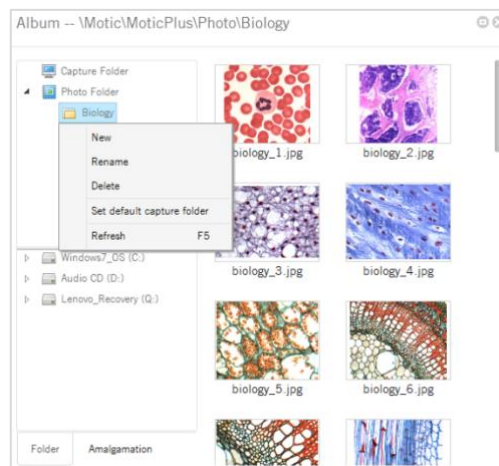
### File Info

This command brings up the File Info dialog box which provides information about the current image.



## How to use the Popup Menus... / ...in the Album window

Click the right mouse button in the upper column of the Folder panel to bring up the following popup menu:



### New

To add a sub-folder to the selected folder.

### Rename

This command enables users to rename the selected folder.

### Delete

This command enables users to delete the selected folder.

### Set as default capture folder

This command enables users to set the selected folder as the default capture folder. Images captured using this program will then be saved in the selected folder automatically.

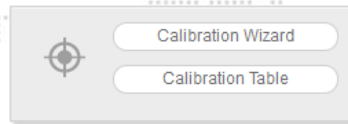
### Refresh (F5)

This command enables users to refresh the contents displayed in the upper column of the Folder panel. Pressing the F5 key will refresh the contents as well.

## Calibration

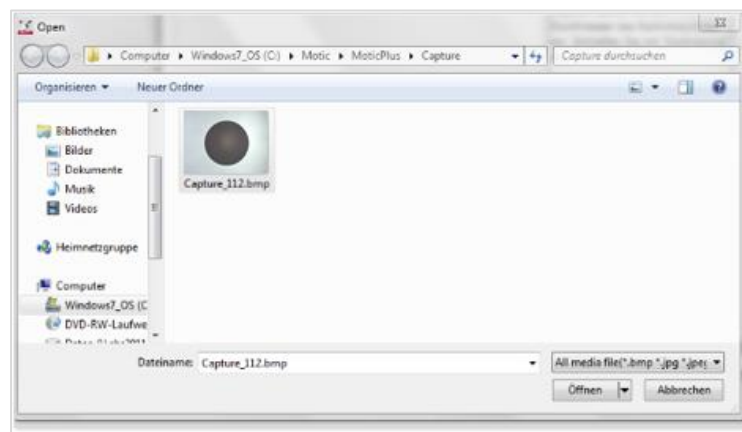
Any kind of measurement, scale bar or grid needs a precise calibration for a correct quantification. Place the calibration slide (within the delivery package of your Moticom) into the raypath of the microscope and focus one a calibration circle (in fact it's a dot). Depending on the objective/camera adapter/camera sensor combination, the correct dot has to be chosen. As all dots on the calibration slide

are placed in one line, it is easy just to use the x-drive of the microscope stage to move from one dot to another. Before taking a picture, note that the selected dot should be grabbed completely, at the same time being as large as possible in the image field. This will improve the precision of all measurements. Click the Calibration button in the Measure tool bar to display the corresponding toolbar.

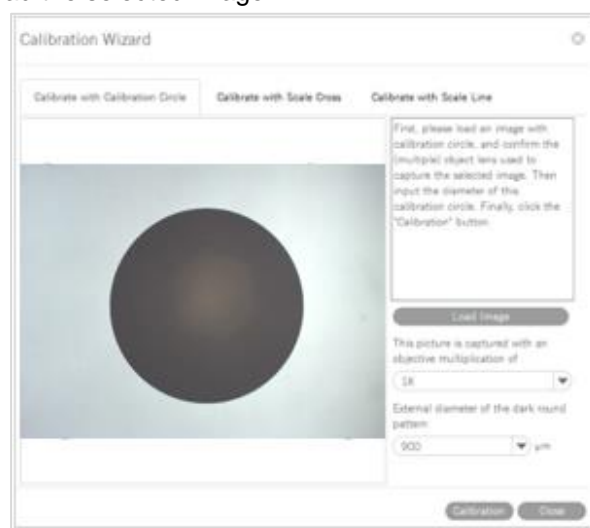


## Calibrate... / ... with Calibration Circle

Select the Calibration Wizard command. Select a calibration method by selecting the corresponding tab. Click the Load Image button to open an in image with a calibration circle to be selected for calibration.



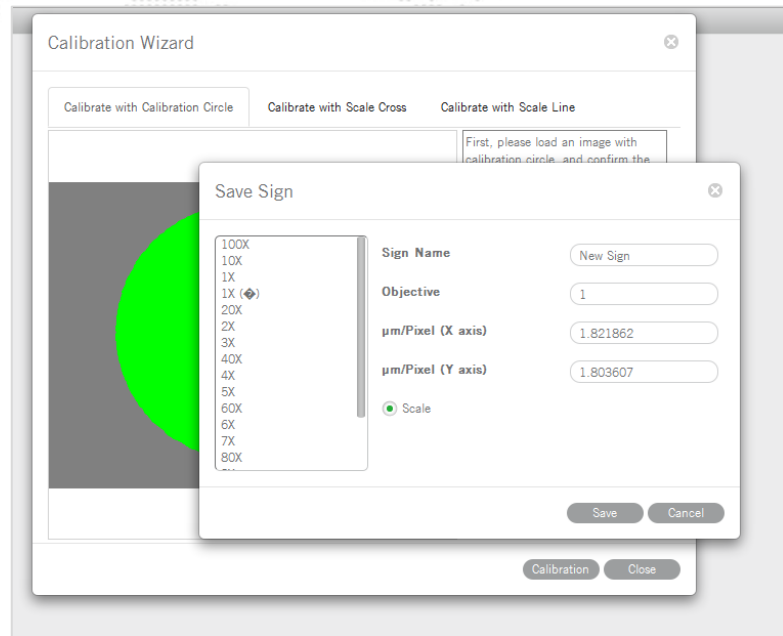
Click the **Open** button to load the selected image.



Select the magnification of the objective used for taking this picture, enter the diameter of the calibration dot (vacuum-metallized on the calibration slide) in the corresponding box. Click "**Calibration**" to continue. Check the x/y-axis values; they should only differ one decimal place. If not, the illumination is inappropriate.

Please note: The calibration slide is intended to work with transmitted light. In incident light, the dot appears bright. In this case please invert the image before loading for calibration.

Activate the **"Scale"** option (if not active by Default setting). This function will adjust e.g. the scale bar value depending on the display mode (resolution, Full screen). Enter a **New Sign Name** to refind your calibration easily within the calibration table. Next, click the **Save** button to finish calibration.



### Calibrate... / ... with Scale Cross

To **calibrate with a scale cross**, select the respective Calibration Wizard.

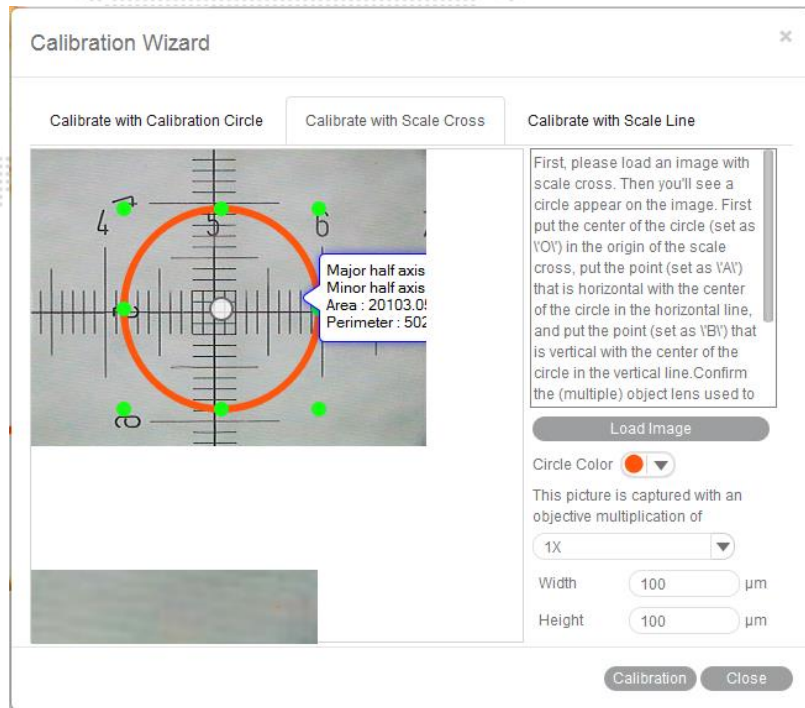
Click **Load Image** button to select a scale cross from your image database.

When the image is loaded, a circle will appear on the scale cross. If desired, choose a different color.

Place the center of the circle (set as "O") exactly into the center of the scale cross. Next, take a reddish marked point ("A") in the X-direction and drag it on the horizontal line to a certain scale division, then perform identically in Y-direction ("B"). The magnifier window under the image window may help to accurately place the points.

Confirm the objective lens used to capture the selected image and input the actual length of "OA" in the "Width" bar and the actual length of "OB" in the "Height" bar. Take note about the scaling of the scale bar.

Click the **Calibration** button to open a new dialogue box. Continue as under **Calibration with Calibration Circle**.

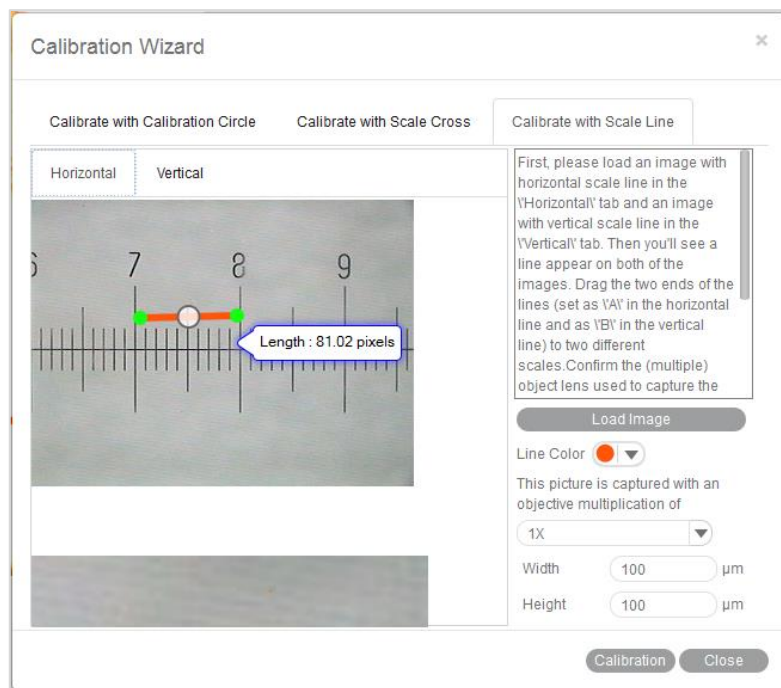


### Calibrate... / ... with Scale Line

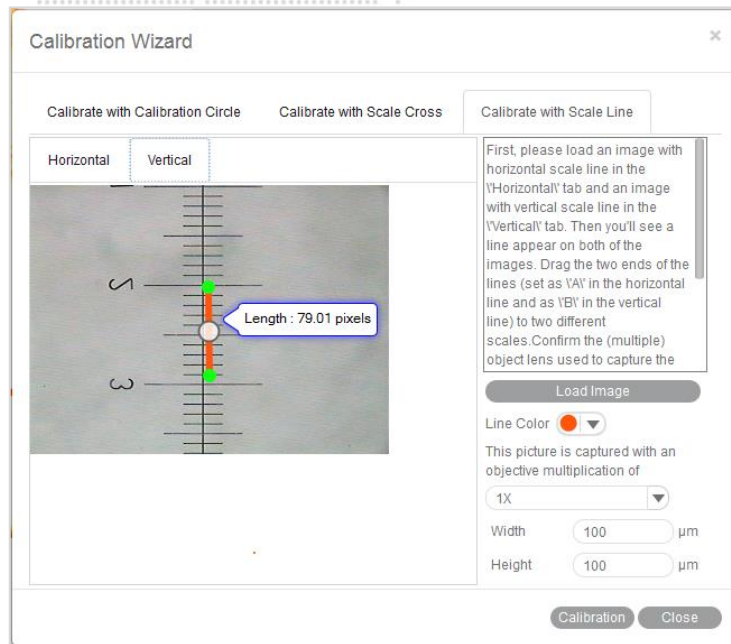
To calibrate with scale line, select the respective Calibration Wizard. This wizard performs calibration in X- and Y-direction separately, using the same image type: the scale cross.

Click **Load Image** to open the image of a scale cross.

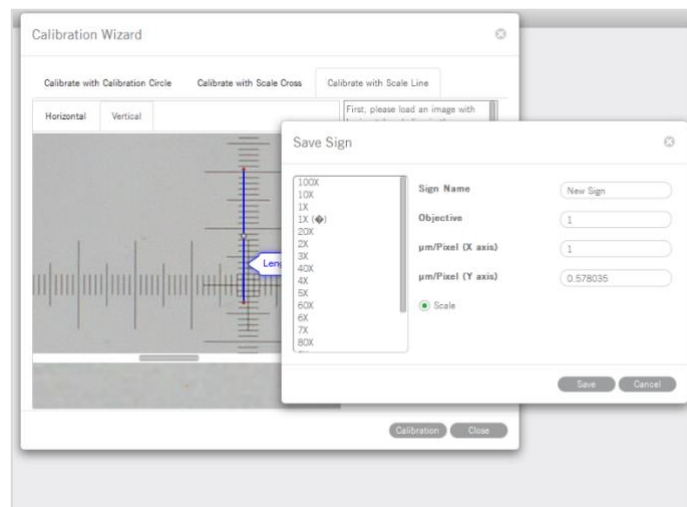
Click the **Horizontal** tab to activate a horizontal line overlaying the scale cross. If desired, choose a different color. Extend the line by dragging with the left mouse button to a defined scale division. Confirm the objective lens used to capture the selected image and input the actual length.



Please repeat this procedure for Y-direction (**Vertical** tab).



Click the **Calibration** button to continue as in **Calibration with Calibration Circle**.



When calibration is completed, click **Save** to close the Calibration Wizard.





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## **Motic Live Imaging Module**

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Windows OS User Manual

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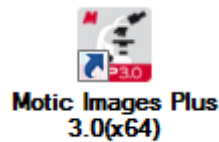


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This software module is meant to improve a live image before capturing a final picture. Several parameters to adjust the live image like resolution, white balance, color correction etc. can be varied simply and optimized interactively. Exposure time can be set according to the illumination situation of the microscope. The default capture folder for still images and videos can be defined. Further processing and image analysis is possible in a separate software module, an integral part of the complete software package Motic Images Plus 3.0.

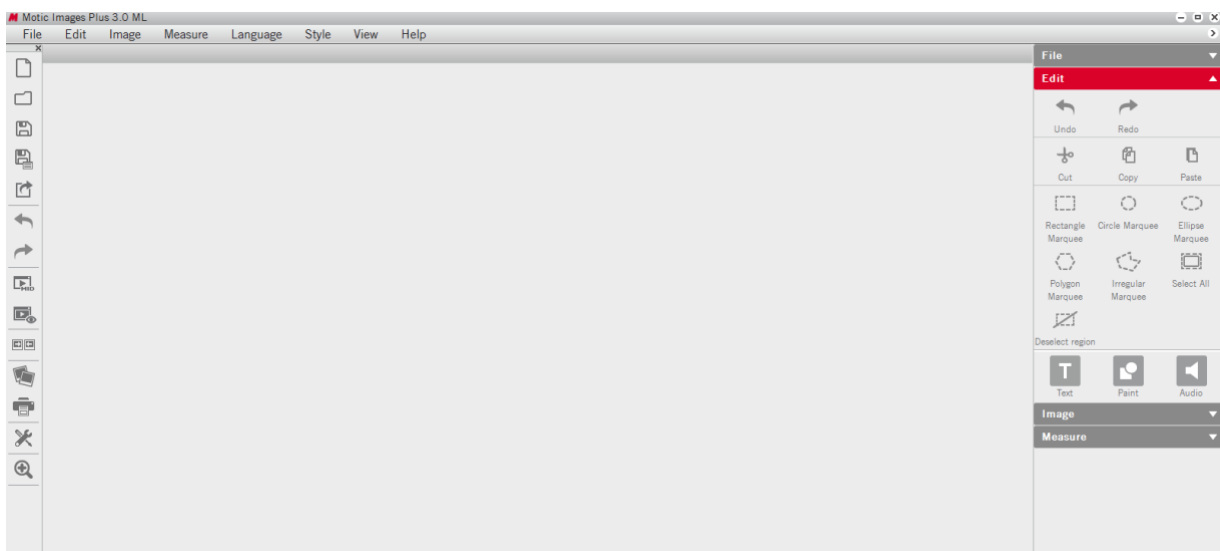
Double click with left mouse button on



opens the program. Please note before installation that the new software version MI Plus 3.0 is available in separate versions for 32- and 64 Bit computers. This is in contradiction to the previous Motic Images Plus 2.0 software version.



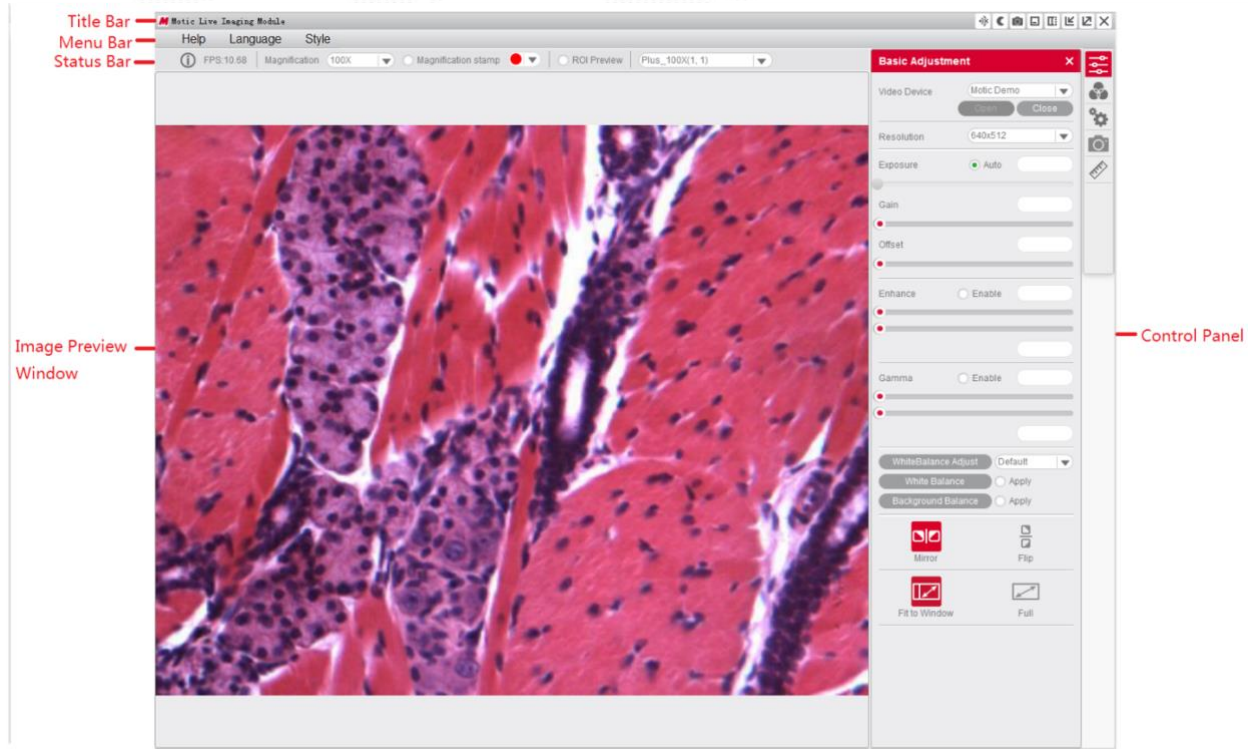
To open the Live Image Module, click on “Motic Imaging Device” in the left column.



The Live Imaging Module opens.

## Menus, bars and tools

The new interface consists of the **Title Bar**, **Menu Bar**, **Status Bar**, **Image Preview Window** and **Control Panel**.



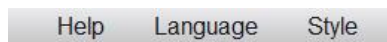
### Menus, bars and tools / Title bar



Displays the module name and shortcut menu.

*Note: The shortcut menu is available under Windows OS only.*

### Menus, bars and tools / Menu Bar



Displays the basic menu:

#### Help

Click the button to open the Help dialogue.

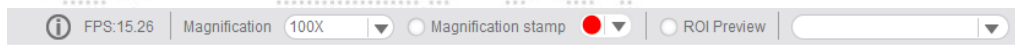
#### Language

Change the interface language from the dropdown menu. This can be done without shutdown of the software.

#### Style

Change the interface style.

## Menus, bars and tools / **Status Bar**



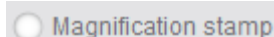
### FPS

Frames per second = Frame rate.

### Magnification

Select the current objective you are using on the microscope. After calibration the scale bar will show the correct value.

### Magnification Stamp



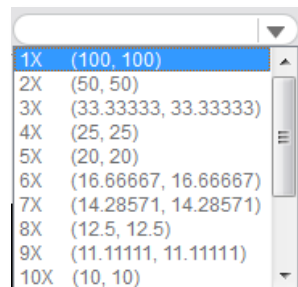
Click to display/hide the selected objective displayed on the uppermost right side of the image.

### ROI Preview

To view only a selected part of the image in full resolution, click and drag a Region Of Interest on the live image with your left mouse button, then click the "ROI Preview" button. Click the button again to restore the original image. The shape and border color of the ROI can be set in the Advanced Setting Panel.

### Calibration Value



Select a calibration value from the "calibration value" dropdown list and the currently measured value will be changed.



## Menus, bars and tools / **Image Preview Window**

Displays the real-time live image coming from your Moticom or Digital Microscope. Click the button on the title bar to hide this window, re-click to display it again.

## Menus, bars and tools / Control Panel

Click one of the following icons to display the corresponding control panel. Click the button  on the title bar to hide the control panel, click on  to display it again.



**Basic Adjustments**



**Color Adjustments**



**Advanced Settings**




**Image/Video Capture**



**Measurements**

## Menus, bars and tools / Control Panel / Basic Adjustment

The button  opens the Basic Adjustment Panel to perform basic device settings and image adjustments.

### Video Device

Displays the connected imaging device.

**Note:** If several Motic devices have been connected and the auto-opened device is not what you want, please click "Close", select the desired device from the dropdown list and click "Open". MoticamX and Motic Demo are named per default.

### Resolution

You can switch between different resolution settings. The setting changes the amount of data that are transmitted to the computer by the imaging device. The higher the resolution the lower the frame rate (FPS).

### Exposure Time

Setup your microscope properly and focus on your slide. With "Auto" you will get a first image. If necessary, deactivate "Auto" and correct the exposure time by moving the respective slider. Especially with high contrast samples, this manual adjustment is recommended.

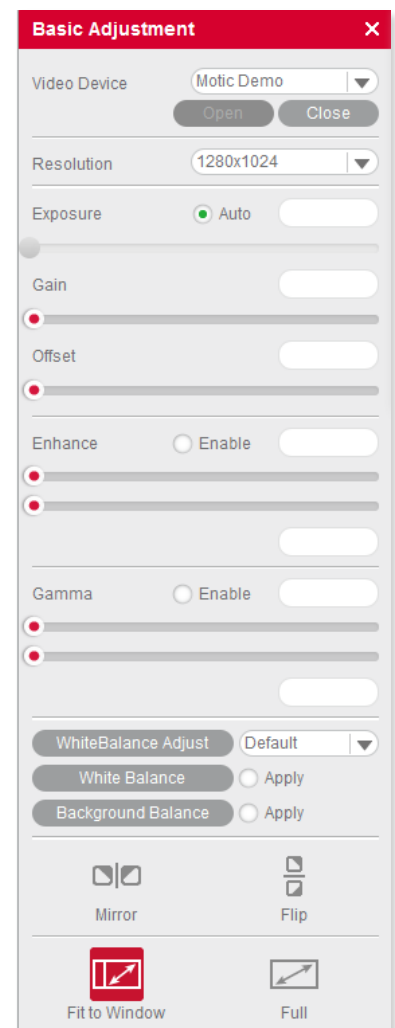
**Note:** Some camera chips have built-in auto-exposure controls. If you wish to override, use the slider to adjust the settings manually.

### Gain

This function is an electronic amplification of the sensor signal ("brightness"). It increases also the electronic noise. Should only be used if the image brightness cannot be adjusted properly by exposure time (e.g. moving = living samples).

### Offset

Sets the "zero" brightness value. Recommended to be used for POL, dark field or Fluorescence. Move the slider to minus values.





### Enhance

With two sliders, the minimum and maximum gray level value can be set independently. The image data will be re-mapped according to the settings in order to enhance contrast.

### Gamma

"Gamma" translates the electronic image signal from the camera sensor into image brightness on the respective monitor. Depending on screen technology and screen setup (LCD, LED, etc.) the brightness/color impression can be set individually.

### White Balance 1

"White Balance" will help to get the best possible color similarity to what you see through the eyepieces. Setup your microscope properly and focus on your slide. You may remove the slide from the microscope and click on the "White Balance" button. Or you may keep the slide on the stage and look for an "empty" area within your sample. With left mouse button pressed please define a "background" area without color; activate "White balance". Once defined, this setup can be overwritten arbitrarily.

**Note:** Some imaging chips have an automatic hardware white balance. You will see the white balance being adjusted automatically as close to the real color as possible. In order to adjust the color even closer, please use the tools in the Color Adjustment Panel.

### White Balance 2

Several types of microscope illumination (Halogen, LED 3000K, LED 5000K) can be chosen from the list. Further, the background color may be selected by clicking into the color field. The chosen setup can be saved.



### Background Balance

The "Background Balance" function reduces the effects of uneven illumination, mostly caused by the camera adaption. Please setup your microscope properly, focus on your slide and adjust the microscope's illumination. Take the slide away from the stage and activate "Background Balance". The screen now displays a background calculated as even. Place the slide back onto the stage. The power of "Background Balance" is limited: it does not work with an extreme uneven/incorrect illumination.

**Note:** If necessary, please perform the above steps again when changing the objective.

### Mirror

To mirror the live image horizontally.

### Flip

To rotate the live image by 180°.


### Fit To Window

The live image will be resized to fit into the display window, allowing to show the camera's full Field of View. The width-to-height ratio will be kept.

### Full

To view the live image in full screen mode. Press "Esc" to exit the full screen mode.

## Menus, bars and tools / Control Panel / Color Adjustment

The button  opens the Color Adjustment Panel.

### Color Correction

Click "Enable" to activate this function. Positive values amplify the colors, especially in the blue/red range (H&E stainings). Negative values reduce the color impression down to a black/white image. We recommend a +7 setting.

### Red Gain

Electronic amplification of the RED channel.

### Red Brightness

Adjust the red channel brightness value by dragging the slider.

### Green Gain

Electronic amplification of the GREEN channel.

### Green Brightness

Adjust the green channel brightness value by dragging the slider.

### Blue Gain

Electronic amplification of the BLUE channel.

### Blue Brightness


Adjust the blue channel brightness value by dragging the slider.

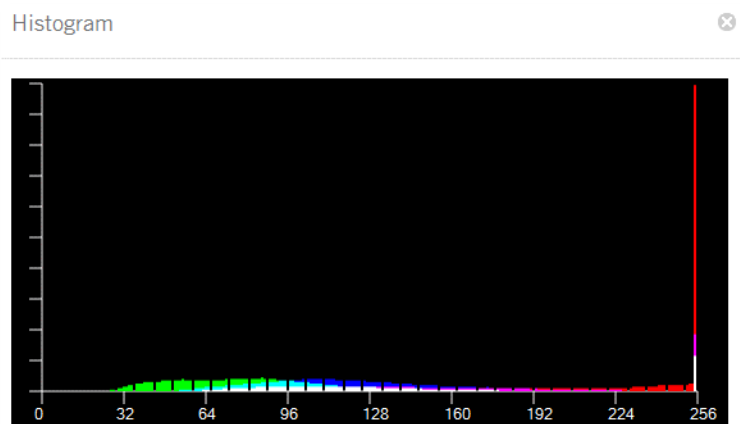
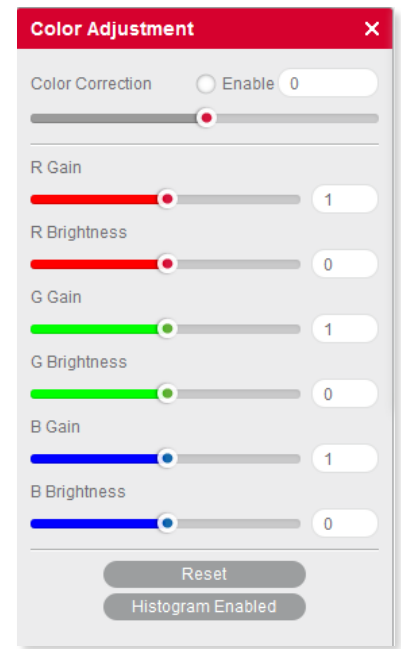
### Reset

Click the "Reset" button to restore the factory settings.


### Histogram Enabled

The histogram shows the gray value distribution within the entire image or a user defined ROI. The horizontal coordinate represents the gray scale 0-255, while the vertical coordinate represents the gray value frequency per color channel.

By default, the histogram function is applied on the entire image. To display the histogram of a user defined ROI, first drag the mouse in the image preview window to define an ROI, then activate the histogram window and select the  command, click the command again to cancel it.



## Menus, bars and tools / Control Panel / Advanced Settings

Click the button  to open the Advanced Setting Panel for further adjustments and measurements.

### Filter

First drag the mouse in the Image Preview Window to define an ROI, then select a filter from the drop down list.

### Invert

Inverts the color/brightness information of the original.

### Grayscale

Creates a B/W image.

### Emboss

Creates an embossed image.

### Red

Only the red color channel is displayed.

### Green

Only the green color channel is displayed.

### Blue

Only the blue color channel is displayed.

### Red inverted

Combines **Red** and **Invert**.

### Green inverted

Combines **Green** and **Invert**.

### Blue inverted

Combines **Blue** and **Invert**.

### Edge Detection

Drag the mouse in the Image Preview Window to define an ROI, then check the Edge Detection box and drag the slider bar to adjust the sensitivity for enhancing the edges of objects within the defined ROI.

### Sharpness

Activates the Sharpness function. Set the sharpness value by adjusting the slider bar.


*Note: This function only works on the whole image.*

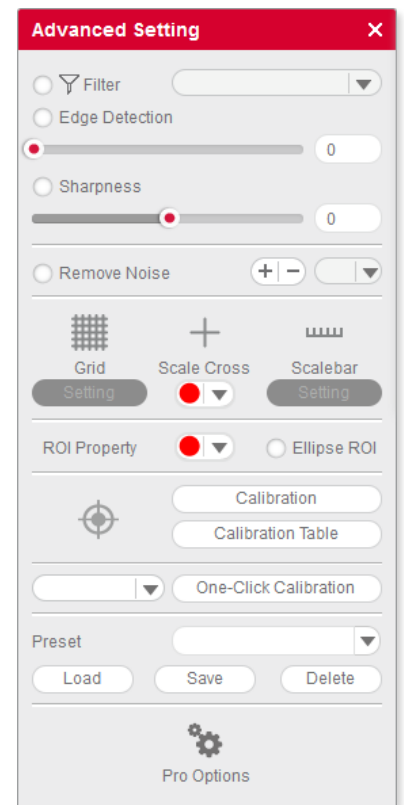
### Remove Noise

Activate this function and select a value from 1-4. The larger the value, the greater the effect and the slower the live image will be.

*Note: This function only works on the whole image.*

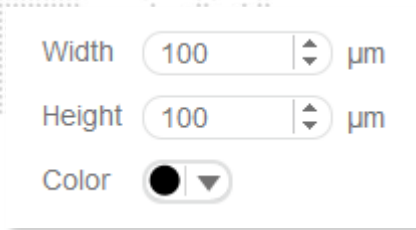
### Grid

Click  to display the grid lines in the Image Preview Window.




## Grid Setting

 allows to set the width, height and color of the grid.




Width   $\mu\text{m}$

Height   $\mu\text{m}$

Color  


## Scale Cross

The Scale Cross function is used for an identical positioning of multiple samples.  activates the Cross Line; per default first in the middle of the preview window. The coordinates displayed are pixel coordinates. In order to move the Scale Cross to a different position, please use the right mouse button.

## Color

The color of the Scale Cross can be selected.

## Scale Bar

 activates a horizontal and/or vertical scale bar. To move the individual scale bar, use the left mouse button to drag and drop it to the desired position.

## Setting Scale Bar

To edit the Scale Bar, please use the following menu:



Horizontal   $\mu\text{m}$       Vertical   $\mu\text{m}$

Thickness  pixel      Font Size

Line Color       Setting

Unit

## ROI Properties

### Ellipse ROI

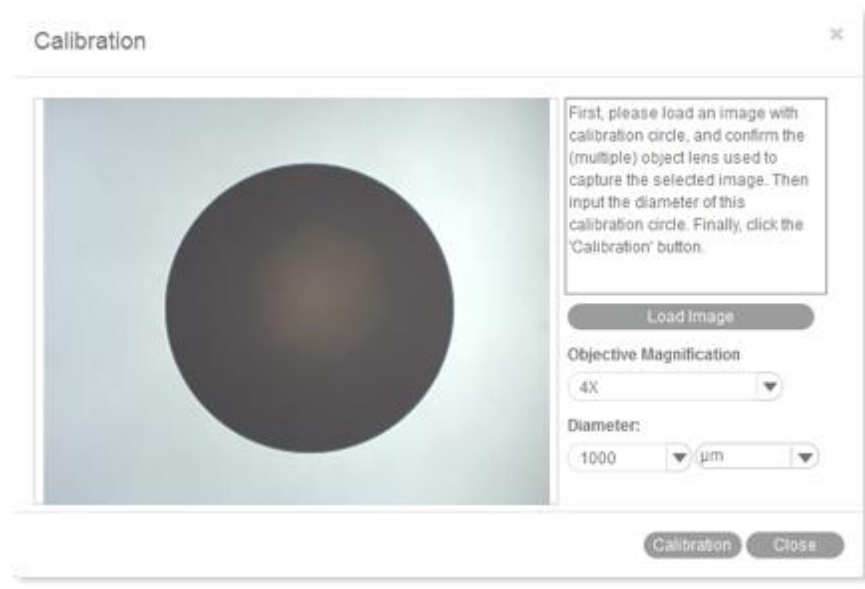
The default rectangle ROI shape will be converted to an elliptic ROI.

### Color

Click the color bar to set the ROI's border color from the displayed color palette.

## Calibration

Any kind of measurement, scale bar or grid needs a precise calibration for a correct quantification. Place the calibration slide (within the delivery package of your Moticam) into the raypath of the microscope and focus one a calibration circle (in fact it's a dot). Depending on the objective/camera adapter/camera sensor combination, the correct dot has to be chosen. As all dots on the calibration slide are placed in one line, it is easy just to use the x-drive of the microscope stage to move from one dot to another. Before taking a picture, note that the selected dot should be grabbed completely, at the same time being as large as possible in the image field. This will improve the precision of all measurements. Open the calibration dialogue and load the picture taken:



Select the magnification of the objective used for taking this picture, enter the diameter of the calibration dot (vacuum-metallized on the calibration slide) in the corresponding box. With "Calibration" the following interface opens:



Select a unique sign name which can easily be found again in the calibration table. "Zoom" should be activated by default. If not, please do activate. This setting ensures that all quantification data (scale bars, grids, measurements) are automatically adjusted to the active display mode on the screen (varying resolution, full screen, etc.), thus being active also when saving the image. Please check the x/y-axis values: they should be as identical as possible (one decimal place difference should be maximum). Click "Save".

### Calibration Table

The Calibration Table saves all new calibrations. In the initial state, the default data displayed in this table are "factory data" and are marked with "false" in the "Zoom" column.

To apply your individual calibration results, select the necessary calibration from the list, which should be marked as "true" in the "Zoom" column (if you had activated "Zoom" during the calibration process).

With the selection of a calibration, all data for scale bar, grid width and measurements will be updated automatically.

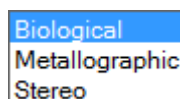
Sign Name:	μm/pixel-X axis	μm/pixel-Y axis	Objective	Zoom	Sign image width	Sign image height
100X	1	1	100	false	320	240
10X	10	10	10	false	320	240
1X	100	100	1	false	320	240
20X	5	5	20	false	320	240
2X	50	50	2	false	320	240
3X	33.33333	33.33333	3	false	320	240
40X	2.5	2.5	40	false	320	240

Sign Name: 10X  
 Zoom  
 Ok Delete

To delete calibration results from the table, select a desired item and click "Delete".

### One-Click Calibration

This kind of "calibration" does not refer to quantification, but to predefined camera settings for three types of microscope samples (Biological, Metallographic, Stereo):



### Preset

With this function, you may save and load the parameters you have set with "Basic Adjustments", "Color Adjustments" and "Advanced Settings".

### Load

The next time you wish to return to these settings, select from the dropdown list, click "Load" and the settings in the corresponding panel will change accordingly.

### Save

Adjust the parameters in the corresponding panel until the image quality meets your requirements; enter a name in the blank and click the "Save" button to save these settings.

### Delete

Click "Delete" to remove the current item from the list.

### Cooler Enabled

Check "Cooler Enabled" to enable the cooler of a Moticam Pro camera with Peltier cooling.

## Pro Options

Click  to display the following options:

- Histogram
- Capture a highest resolution image
- Capture a high quality image by average several frames of images
- Capture a high quality image by adjust gain value to 1X gain
- Enable topmost window
- Enable Motic Hub
- Version information

### Histogram

Opens the histogram window.

### Capture a highest resolution image

Captures an image with maximum resolution, no matter what resolution is used at the moment.

### Capture a high quality image by averaging several frames of images

Captures continuous 4 images at the current resolution to merge a high quality image (with reduced noise).

### Capture a high quality image by gain value to 1X gain

Adjusts the gain value to 1X and captures a high quality image (graph camera signal/monitor brightness with gradient 1X).

### Enable topmost image

Bring the live image into the foreground.

### Enable Motic Hub

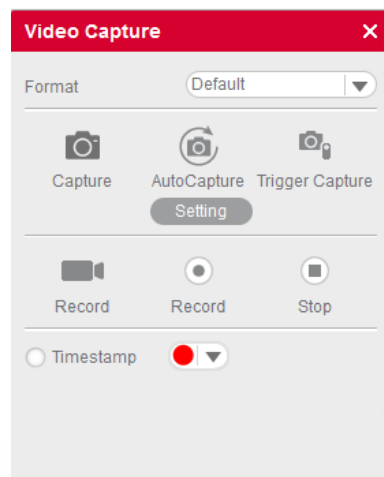
Activates the Motic Hub function; your computer will be able to transmit the live image as a WiFi signal.

### Version

Software version

## Menus, bars and tools / Control Panel / Video Capture

The button  opens the Video Capture Panel for image capturing and video recording.



### Format

From the dropdown list "Format" select an image size to capture an image. If "Default" is selected, the size will be the current display resolution. If you choose a higher resolution, the image will be extrapolated.

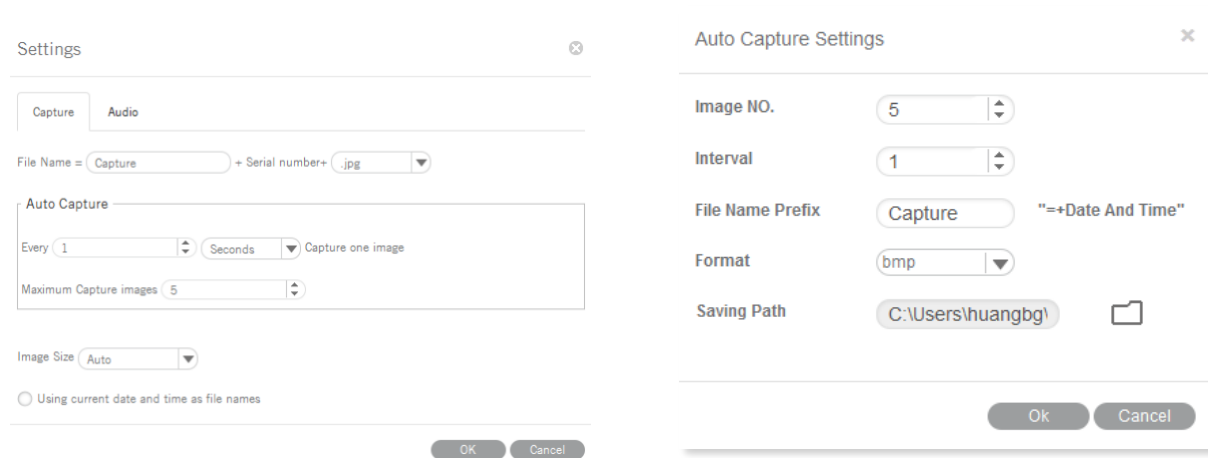
### Capture

Captures a complete Still Image or only a defined ROI. Selection of an ROI allows to individually define the region you like to document.

### Auto Capture

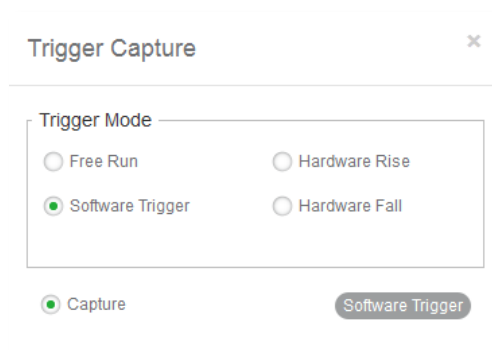
The definition of a sequence of Still Images is per default done through "Settings" in the main software: Number of images, chronological distance, format and name.

If you open this module directly without opening the main software, a slightly different dialogue will appear:



### Trigger Capture

Only possible with Moticam Pro models. Freezes and captures the current image.



**Note:** "Hardware Rise" and "Hardware Fall" are available with a camera having a hardware trigger feature.


### Record

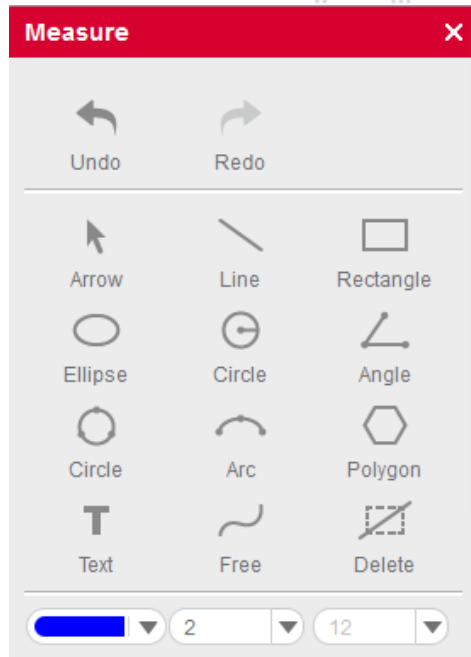
Specify a path to save a video. A time stamp for Still Images and videos can be applied.



## Menus, bars and tools / Control Panel / Measure

The MIDevice live measurement module greatly simplifies the workflow and improves the efficiency as the user does not need to capture an image before performing measurements.

The button  opens the Live Measurement Panel for interactive measurements.



**Arrow**

The length of the arrow will be displayed.



**Line**

The length of the straight line will be displayed.



**Rectangle**

Height, width and area of the rectangle will be displayed.



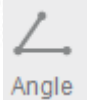
**Ellipse**

Width, height, perimeter and area of the ellipse will be displayed.



**Circle**

Radius, perimeter and area of the circle will be displayed.



**Angle**

Depending on the drawing direction, the measurement of an internal or external angle is possible.



**Circle (3 Points)**

Draw a circle with three points and radius, perimeter and area are displayed.



**Arc (3 Points)**

Draw an arc with three points and radius, length and angle are displayed.



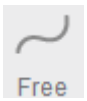
**Polygon**

Draw a polygon and measure perimeter and area.



**Text**

Draw a rectangular text field for comments.



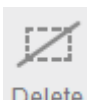
**Freehand Line**

Displays the length of a freehand line.



**Parallel Line**

Draw parallel lines in the image and measure their distance.



**Delete**

Select one figure to delete; double click to delete all figures from the image.



**Settings**

Allows to edit the measuring data.

Line color	<input type="color" value="blue"/>	Line Width	<input type="text" value="2"/>
Font	<input type="text" value="Microsoft Sar"/>	Size	<input type="text" value="12"/>
Font Style	<input type="text" value="Regular"/>	Unit	<input type="text" value="µm"/>

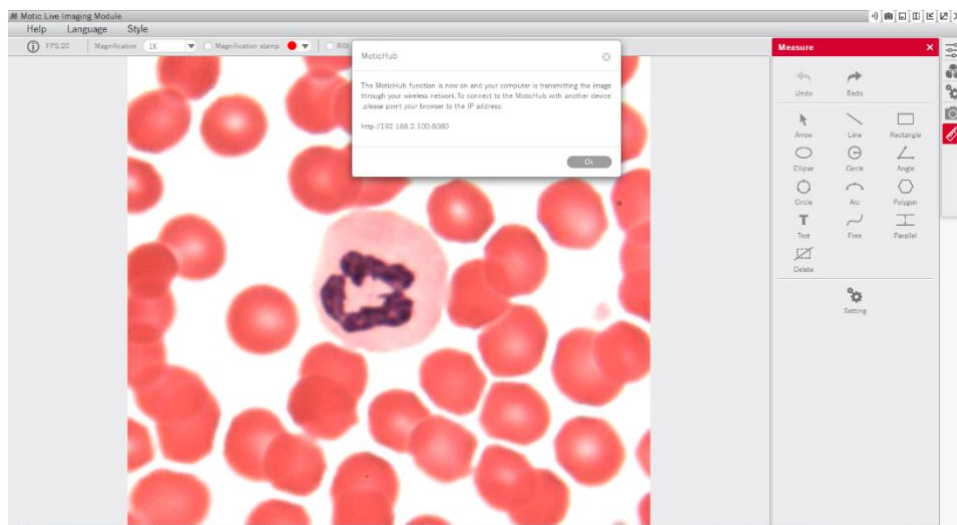
**Note:** To ensure correct measurements, please perform calibration before doing a live measurement.

## MoticHub

MoticHub can transmit the live image from an MIDevice source via WiFi to a variety of recipients (PC, laptop, tablet, smart phone). A variety of browser (Google Chrome, Moticonnect App) display the live image with an interactive parameter setting.

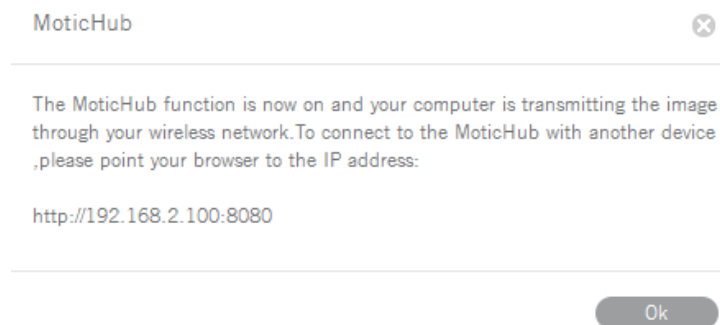
### Enable the MoticHub function

1. Please connect your computer to a wireless network (router).
2. Connect your Motic camera to a computer.
3. Please click the “Wi-Fi” button in the title bar to enable the MoticHub function.



### Access MoticHub

The WiFi signal can be handled by PC browser or Motic APP (free of charge) on an external device. Please connect the mobile device or computer to the MoticHub network (wireless router or Wi-Fi hotspot), then launch browser and enter [http:// IP address /port number](http://192.168.2.100:8080).



**Compatible Browser:** FireFox, Chrome, Safari.

**Compatible Operation System:** Windows, Mac OSX, Linux, IOS and Android 4.0 or higher OS.

Through GooglePlay the relevant MotiConnect App (free of charge) is available.

## System Configuration

### Minimum configuration requirements

**CPU:** Intel(R) Pentium(R) 4; 2.8GHz or higher

**Memory:** 512MB or more

**Display:** Standard VGA 32MB color, no less than 1024x768, supporting DirectX 8.0

**HD space:** 500MB or more

**Sound card:** Common full duplex sound card

### Recommended configuration

**CPU:** 2 x Intel(R) Pentium(R) D; 2.8GHz or higher

**Memory:** 1G or more

**Display:** Standard VGA 32MB color, no less than 1024x768, supporting DirectX 8.0

**HD space:** 10GB or more

**Sound card:** Common full duplex sound card