ImageFocus Plus

Software



euromex
microscopes holland

user manual

v.631331

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General Introduction

ImageFocus Plus (IF Plus)is a powerful software solution that integrates the controlling the working of micro-imaging cameras, the calculating imaging, image processing and the flowing work of measuring and counting, from it, users can obtain an improved user experience;

ImageFocus Plus is able to drive and control our cameras which are installed on the microscopes from different manufacturers, it helps to bring you the best performance in your micro-imaging jobs

When you need to make the best uses of the potentials of your microscopes and their cameras, ImageFocus Plus is able to apply accurately almost all the parameters you select, and it optimizes to these settings of these parameters through its user-friendly designs

ImageFocus Plus enables users to set up their customized desktops according to their actual applications. When users combine the customized desktops with his customized working flows, there will be a distinct layout of the software working appearance, the user is ensured the accuracy of his experiment results no matter the software is working with multi-tasks or under multi-users circumstances

ImageFocus Plus achieves senior quality images due to its powerful real-time calculating engine. The function of real-time stitching helps you to obtain a super wide of FOV image which is the result of real-time auto-images-stitching, when you moving your mechanic stage of the microscope. Real time EDF functions is able to offer you a combined picture of Extended Depth of Focus (EDF)(EDF) rapidly with less than one second

From the users' points of view, assuring the best operating procedures, the developers of ImageFocus Plus refined the all-new camera operating workflow as Efficient image acquisition > Image editing > measurement > report by modularizing designs. This workflow, acts in concert with the latest image processing algorithms, greatly saves the users' operation time and then improves their working efficiency

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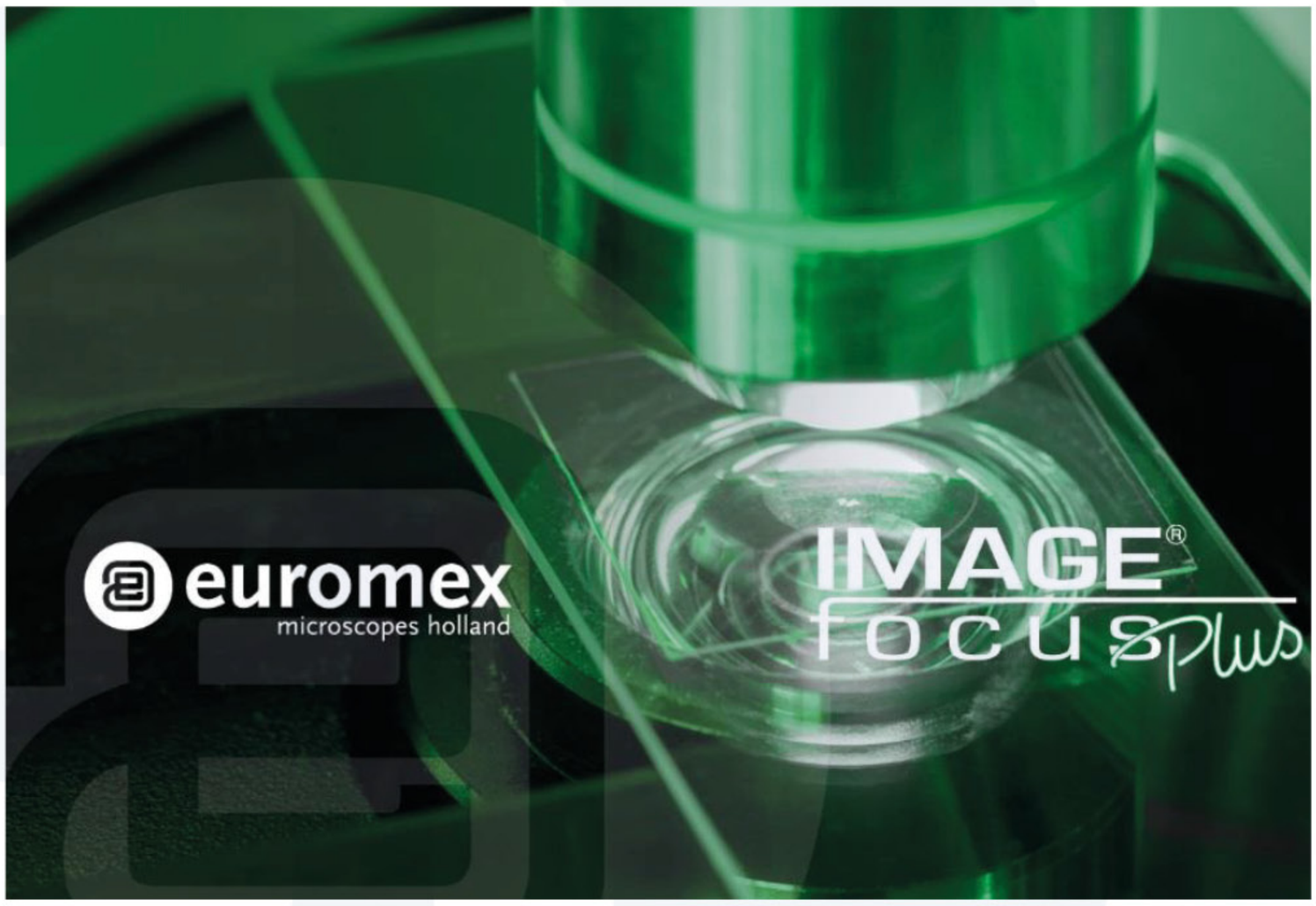
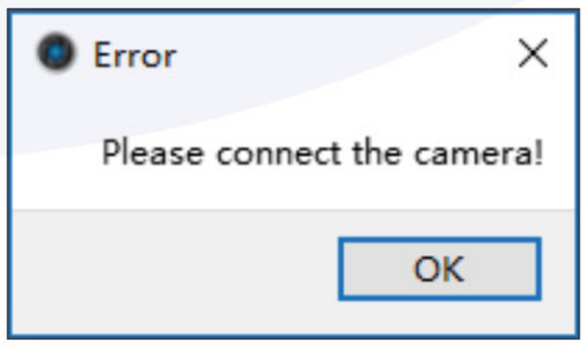


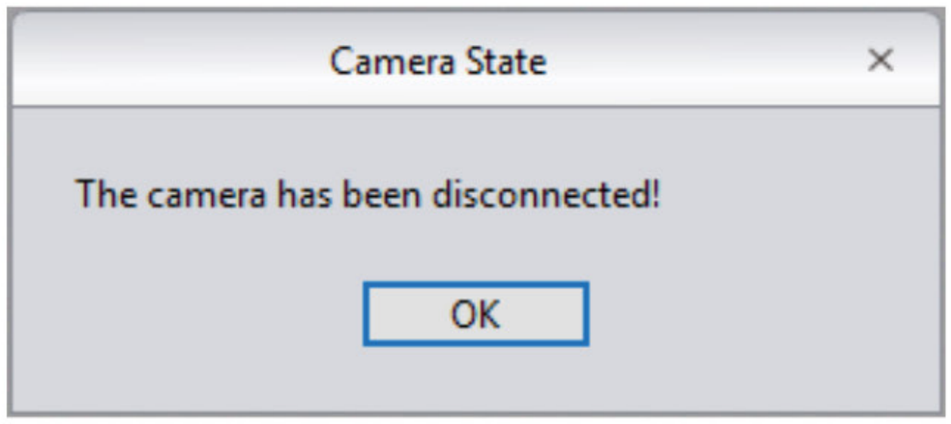
Starting Interface

Note:

1. The software starts within 10 seconds, within 10 seconds
2. If no cameras connected or not assigned cameras connected, warning information will show up as the right figure(1) when user try to run the software
3. If abruptly disconnected with camera when running, the software will show up this warning information as the right figure (2)



①



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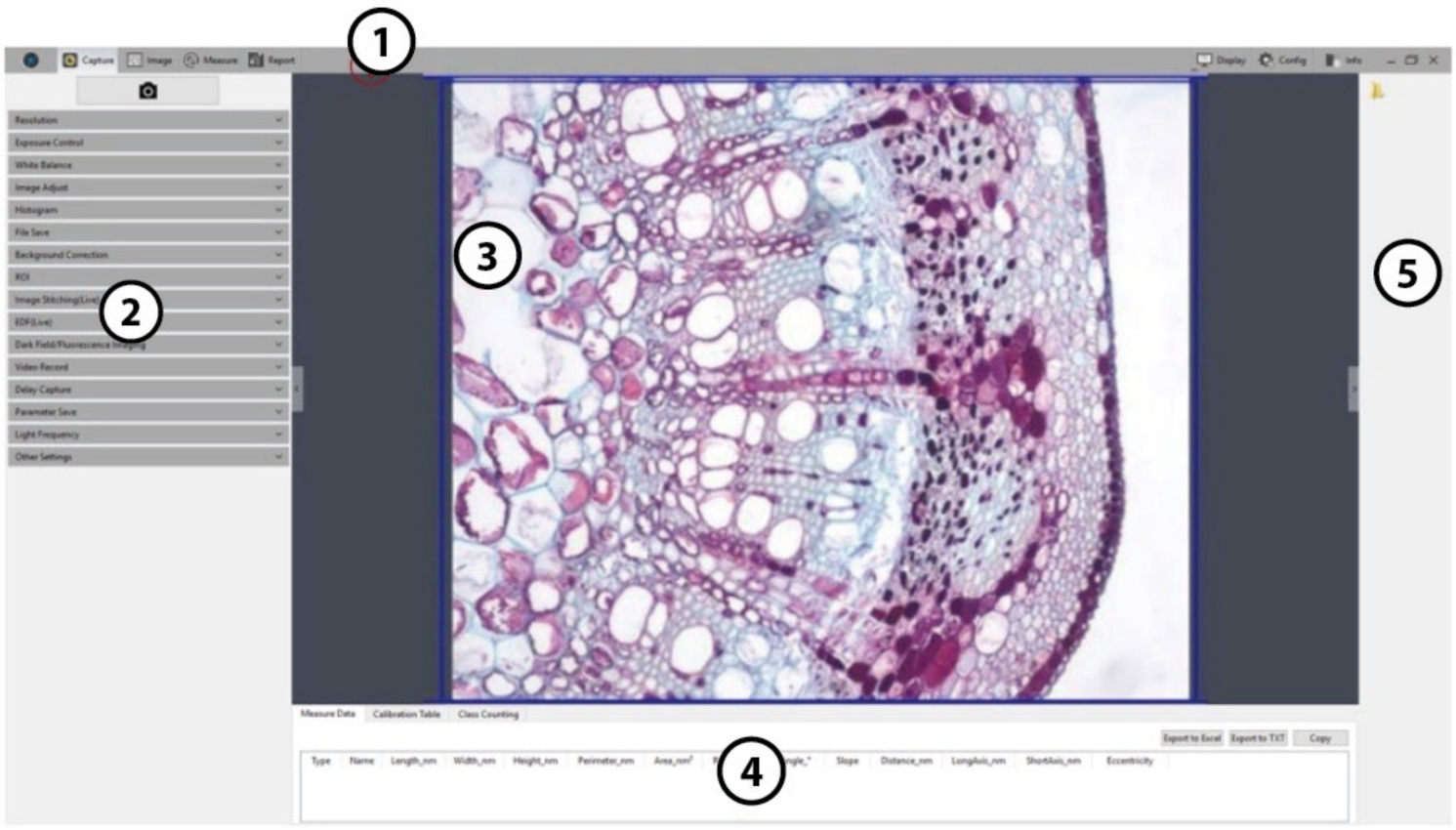
Windows

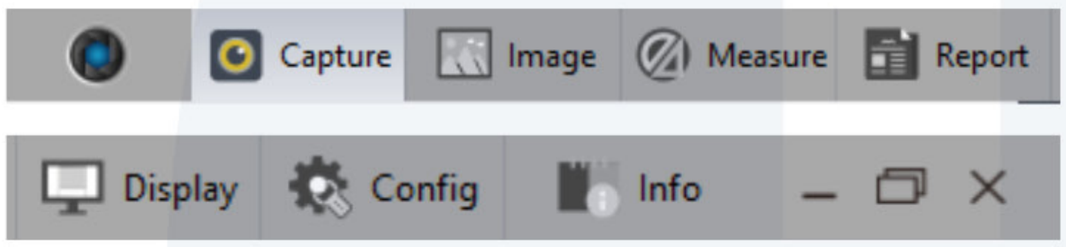
The main interface consists of five sections



1. Status bar
2. Controle bar
3. Preview window
4. Date bar
5. Image bar

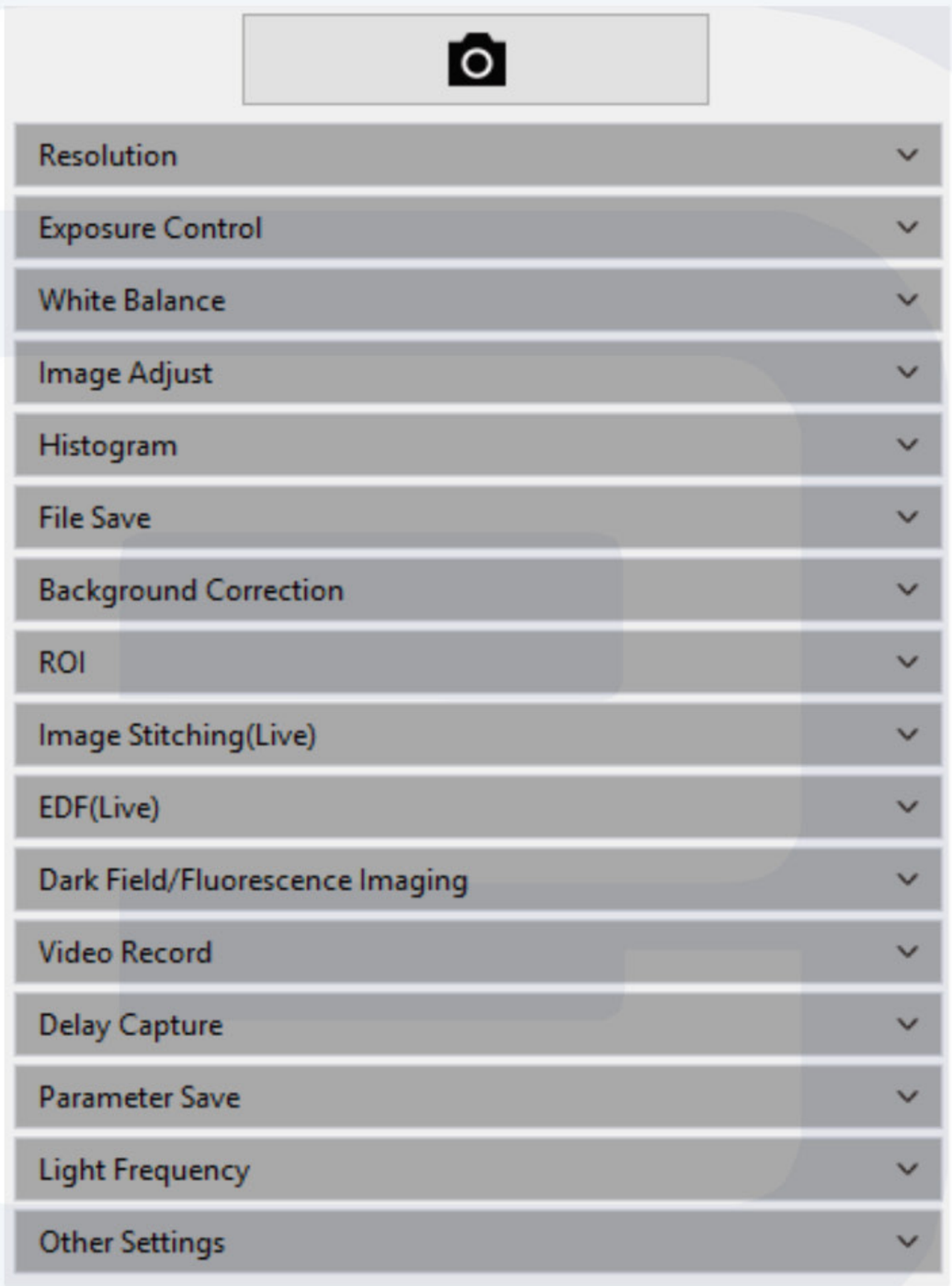
Status Bar

There are seven main modules in the status bar, they are Capture / Image / Measure / Report / Display / Config / Info. Click on the certain bar, the software will switch to related interface



Control Bar

To display all the functions of the software work for the camera, Click button ⌄ to unfold all the functions display. Click button ^ to fold up all the functions display



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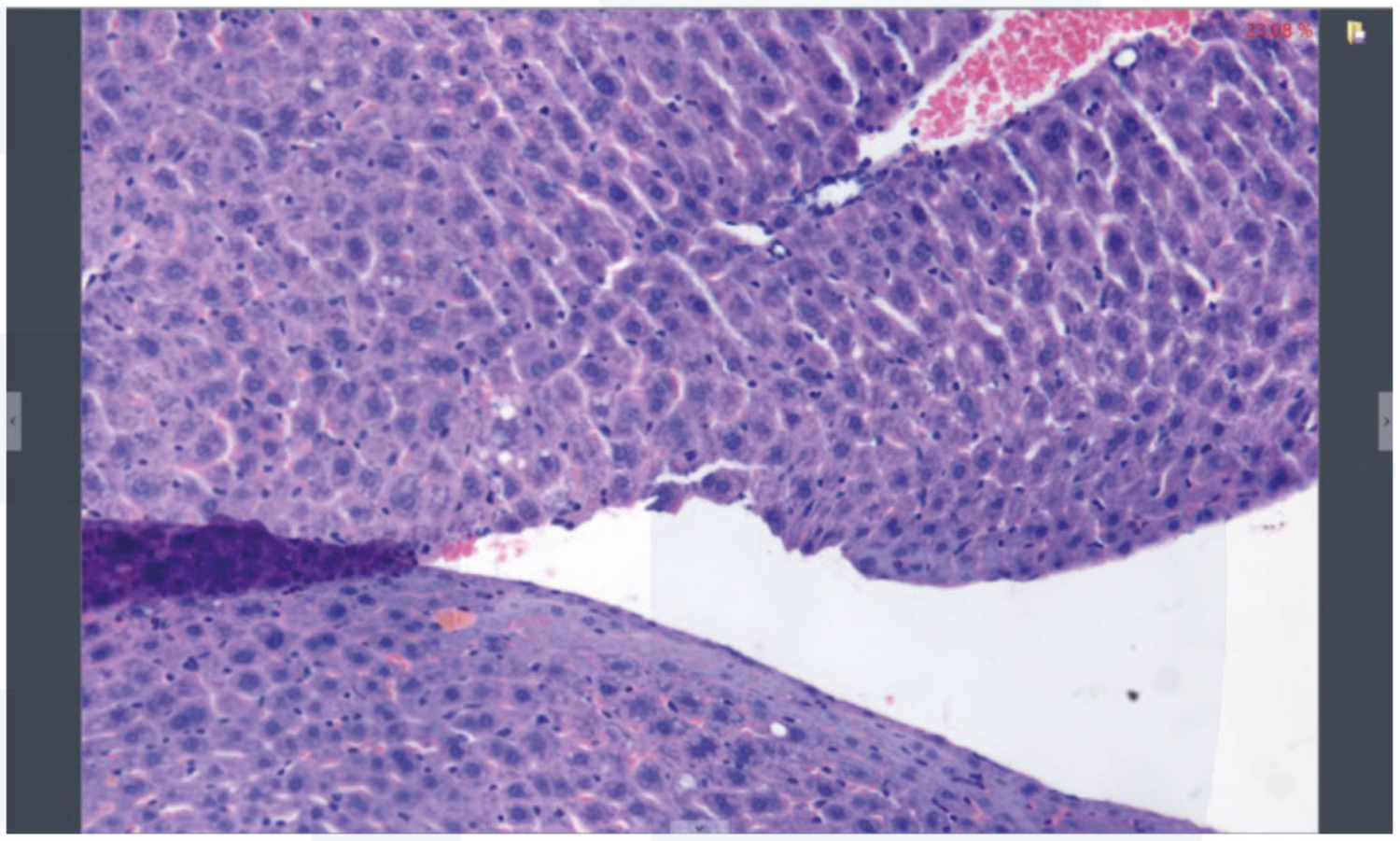
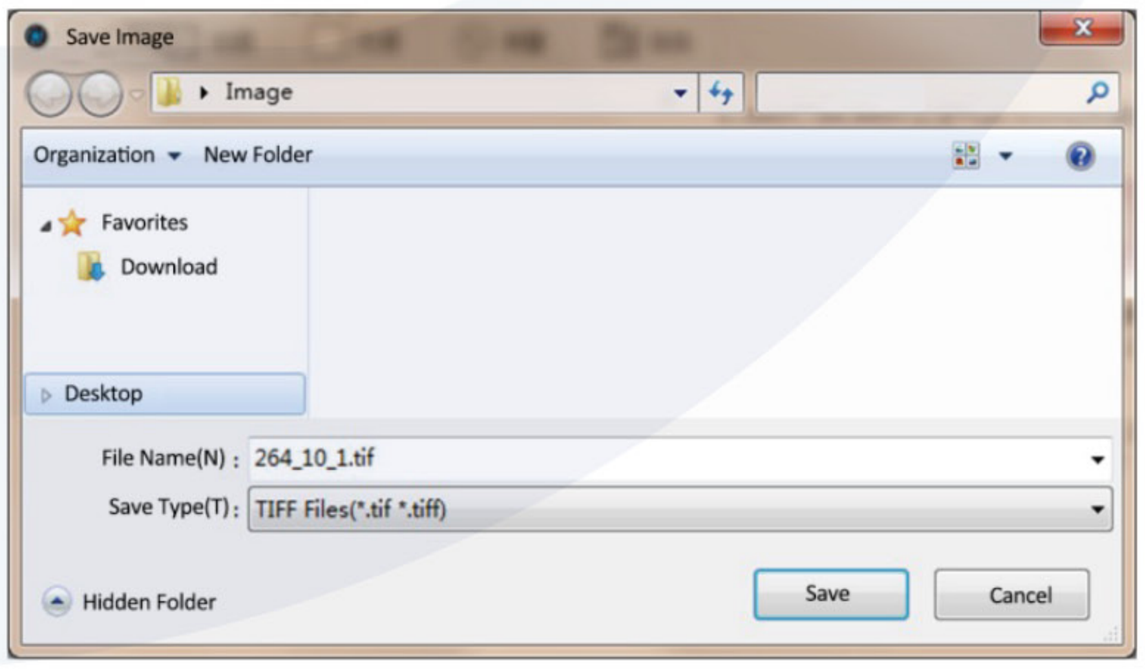


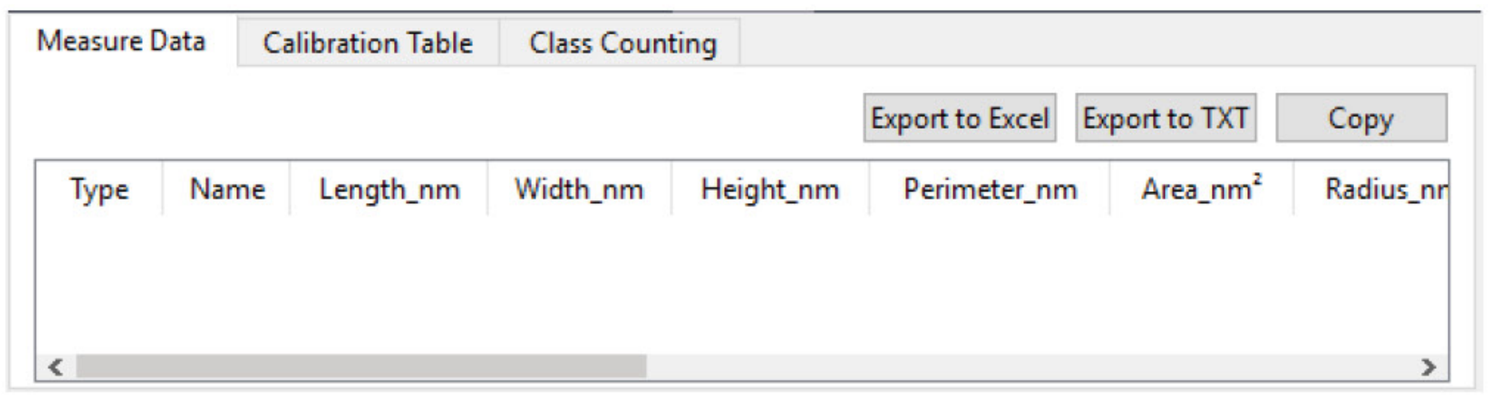
Preview Window

To display the real-time viewing and captured images;
Use the wheel of the mouse to zoom in and out of the image, show the magnified area around the cursor in the middle of the screen
Hold down the left button / right button / scroll wheel m of ouse to drag the image display area;



Save image

Click the control button at the edge of the window:  can expand or contract the corresponding operating bar;
Click the  button to save the currently selected picture as another document, then the following window will pop up. **The software supports four image formats for saving or saving as:** [BMP] [JPEG] [TIFF] [PNG]



Data Bar

Displays measurement and statistics tables

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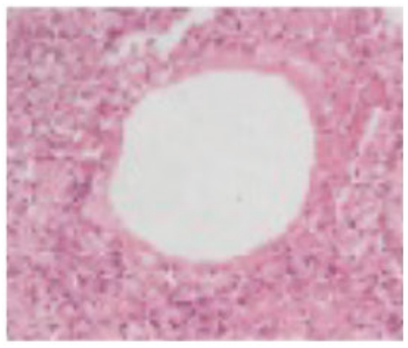
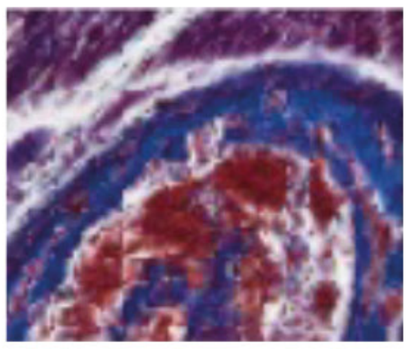
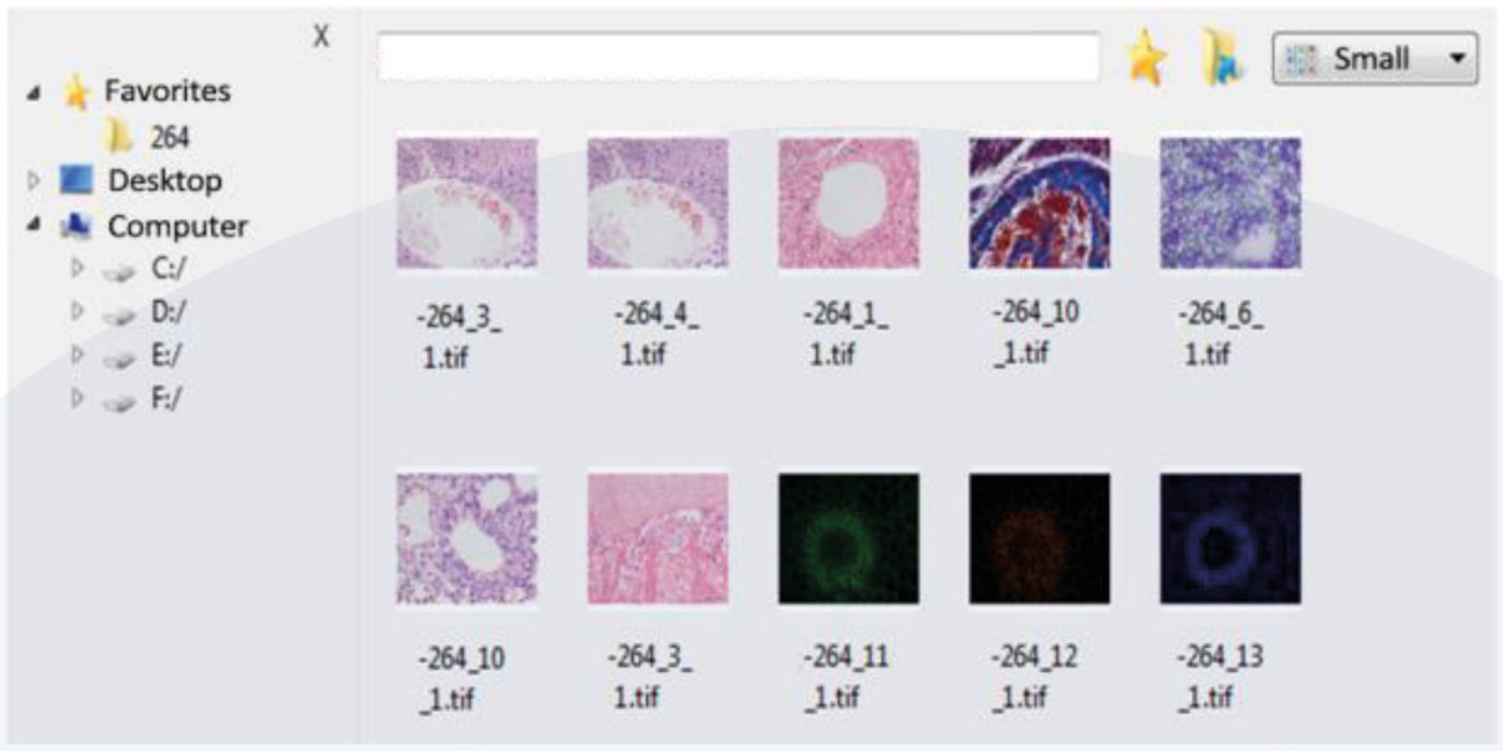
Image Bar

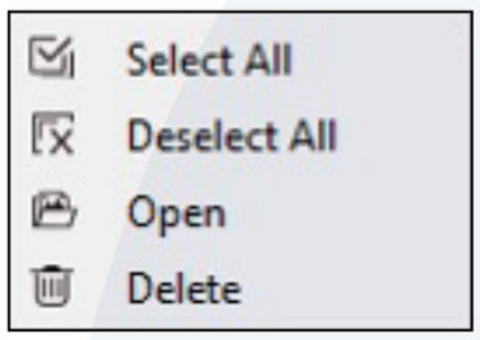
Display all the thumbnails of captured images, videos movies, images from other saving paths. Click on any thumbnail, the main interface will switch to the [Imaging] window for image processing

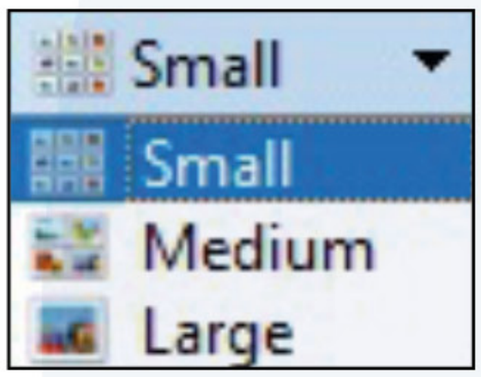




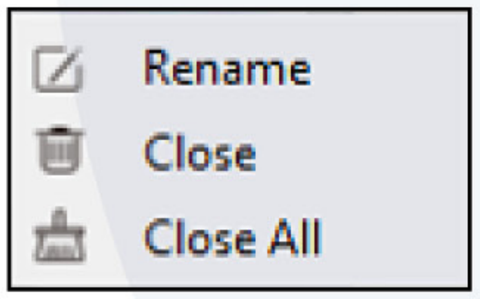


1. Click the button to locate the saving path of the file, select the path in which the image need to import or open, the interface will switch to the following:





- Select the files-saving path on the left side. Click the X button to close the window
- The saving path and all the images under this path will display on the right side of the window.
- Click the button to add the current saving path to the favorites folder for the next time of speedy opening
- Click the button to return to the upper directory.
- Right click on a image or on the blank area of the interface to pop up the operation menu, under which, “Select All” “Deselect All” “Open” “Delete” operations are able to performed
- Click on the icon of dialog box of images to choose the sizes of the image you want to display



2. Right-click on an image, the dialog box of operations will pop up and show the operations, such as “Rename” “Close” “Close all” for you to choose

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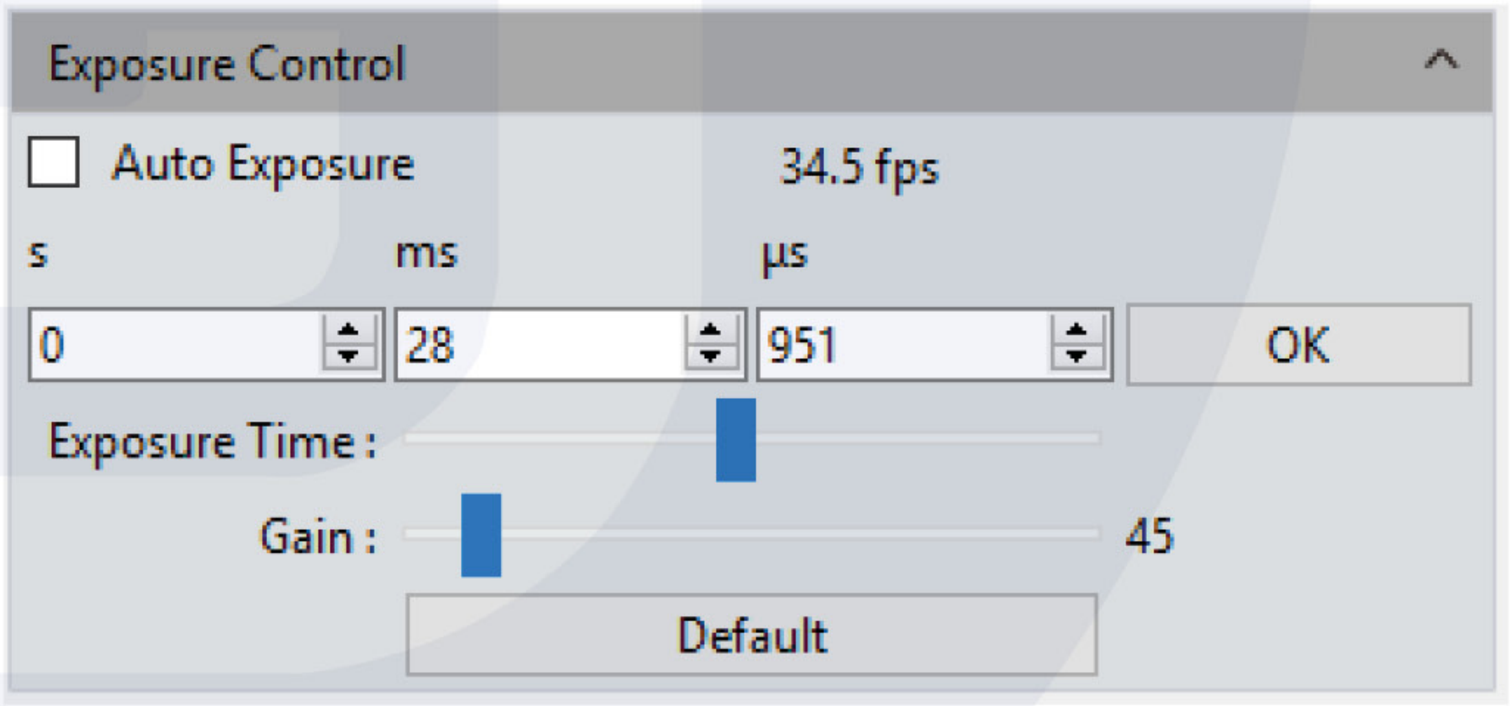
Capture



Resolution

Resolution Setting

Resolution: select the resolution of previewing



Exposure

Set the exposure time of camera and then the value of real-time frame per Second(FPS)will show up

Auto Exposure: check the blank in front of the [Auto Exposure], the software automatically adjusts the exposure time according to the brightness of the image to obtain an image with appropriate brightness. The automatic exposure time range is 300us~350ms by the factory setting

Manual Exposure: Uncheck the [Auto Exposure], The software switches to manual exposure mode, user can manually input the exposure time into the blank according to his actual demands for the image, then click [OK] button to apply, or manually adjust the exposure time linearly through the slider. The manual exposure time range is 130us~15s

Gain: User can select the most suitable gear of gain according to his specific applications and needs on images previewing. Increasing the gain increases image brightness, but also introduces more noise, but with the increasing noise

Default: Click the [default] button to restore this module's parameters to the factory default ones. The default setting of exposure is the (auto exposure)

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White Balance

User can adjust the parameters of white balance according to the actual light source to obtain better image effects which closely meet the needs of his

White balance: By adjusting the ratio of the three individual components of red, green and blue, the camera is able to reflect the true image color under various illuminating conditions. The default setting of the white balance of the camera is Auto-white balance. User can uncheck [Lock White Balance] under the environment with stable illuminating conditions, while the user can check [Lock White Balance] to lock the current white balance setting under unstable illuminating conditions

Gray: Check to converts a color image to a monochrome image.

Red, Green, and Blue(Gain): Manually adjust the gain values of the red, green, and blue channels for suitable white balance effect, adjusting range is 0~683

Color temperature(CCT): The current close color temperature can be achieved by adjusting the three gains which are the above Red, Blue and Green. It can also be manually adjusted and matched to the close color temperature according to illuminating environment. By the way of calibrating the white balance will be more accurately to achieve the correct color temperature. Color temperature setting range is 2000K to 15000K

Default: Click the [Default]button to restore this module's parameters to the factory default ones. The default setting of white balance is [Auto-white balance]

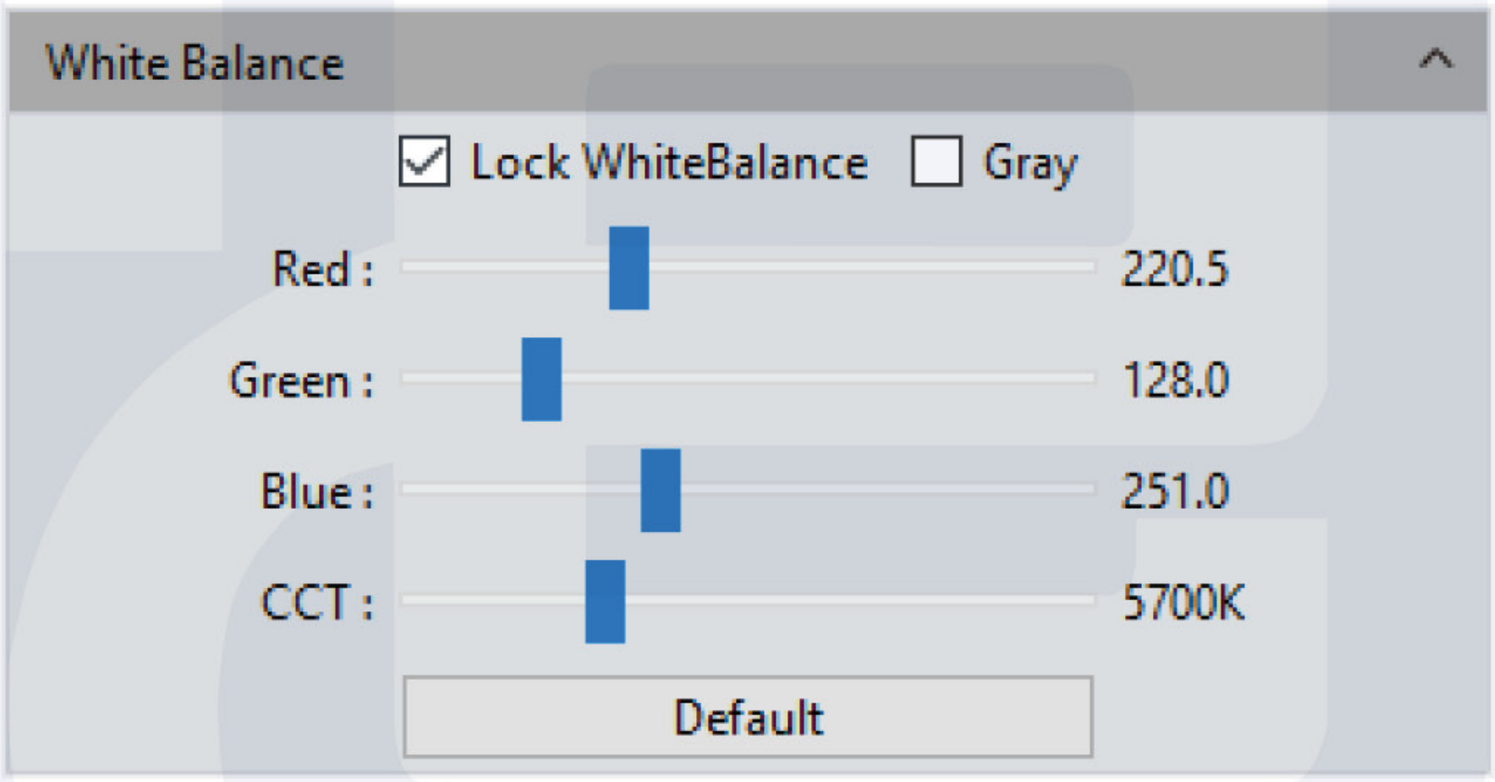

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Image Adjust

Hue: The shade of the color, adjusting ranges from 0 to 360

Saturation: the purity of the color, the higher the purity, the more vivid performance, the lower the purity, the bleaker of the effect, setting range is 0~255

Light: the brightness and darkness of the image, setting range is0~255

Contrast: the difference in brightness level between the brightest white and the darkest black in the light and dark areas of an image, setting range is 0~63

Permeability: the enhancement effect of the image, setting range is 0~48

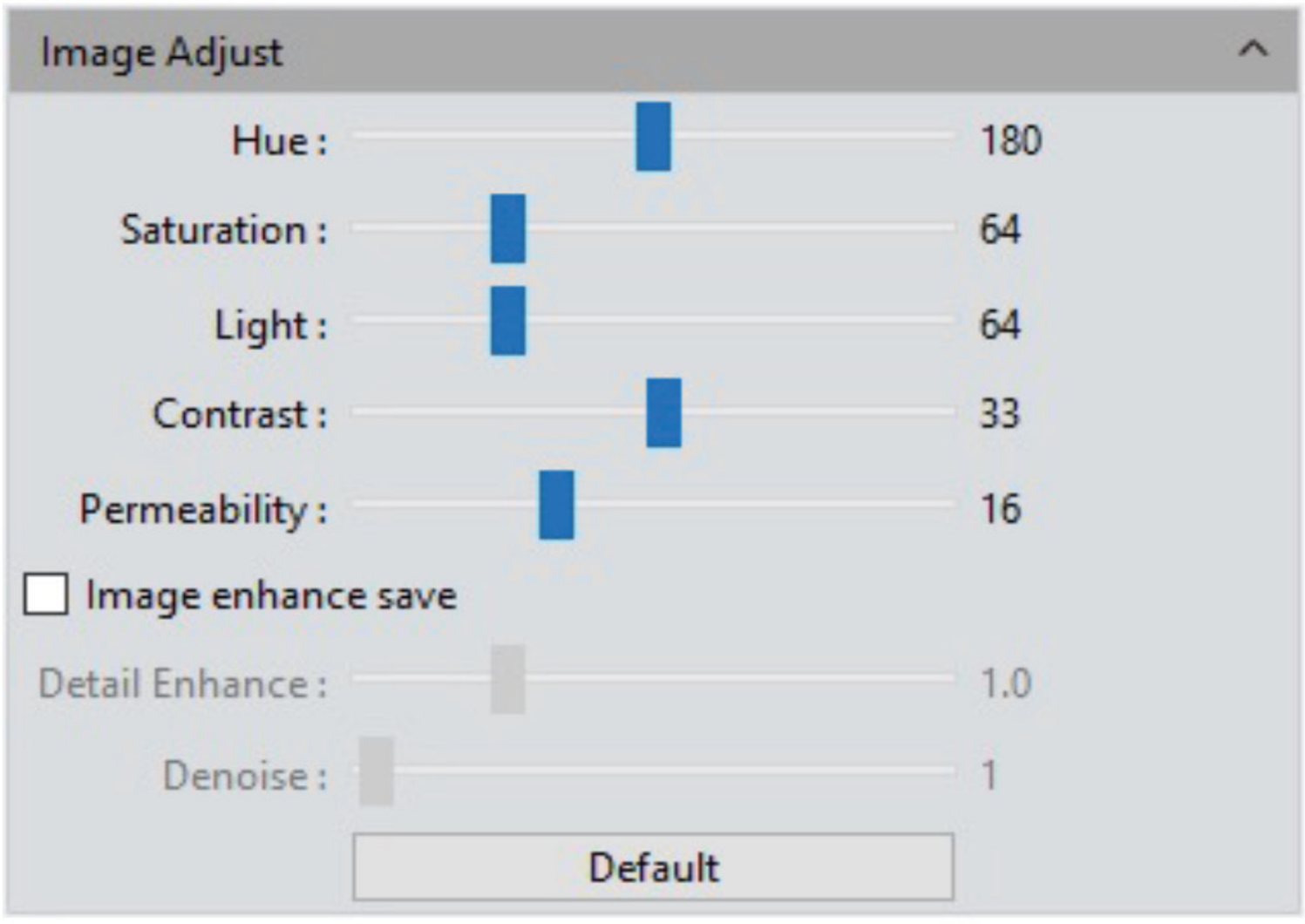
Image enhance save: User may check this frame to make the adjusted parameters of details enhancing and noise reducing into effects to the images to be captured later

Details Enhance: The enhancements of the showing out of the more details information in the image , setting range is 0~4

Denoise: Reduce noise in the image, setting range is 1~63

Default: Click the [Default]button to restore this module's parameters to the factory default ones

The factory default values of some parameters (settings) for image capturing(acquisition) are as followed:
Tone: 180
Contrast: 33
Saturation: 64
Brightness: 64
Permeability: 16 [Image Enhancement Save] on uncheck
Image Enhancement: 1
Noise reduction: 1



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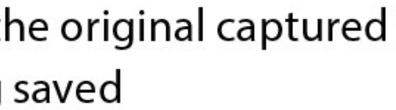
File Save

Capture the currently needed data from the real-time video data stream and record it into image format for later development and analysis.

Click  the button to capture a live previewing image

File name: The name of the file to be saved is named as "TS" format by default, and it allows to name the file personally by user. The software supports the format of "custom + time-stamp" for naming. There are five formats of time-stamp naming (1)

Format: The image formats could be saved as JPG\TIF\PNG\DICOM. The default format is TIF. These four image formats can be checked separately or simultaneously. The captured images in different formats will be displayed at together when their saving formats are selected to be simultaneously

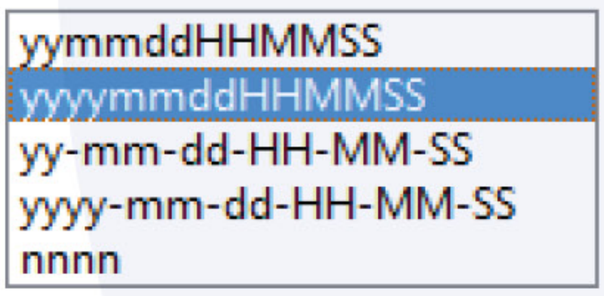
JPG: it is an information-losing and compressed image saving format, its image size is small, but the final quality of the image is degraded compared with the original captured image because of the image data-losing during being saved

TIF: a Lossless image saving format, which can save all the data transmitted from the camera to your saving device without losing, this format is good for the saving and converting of images with high image quality requirements

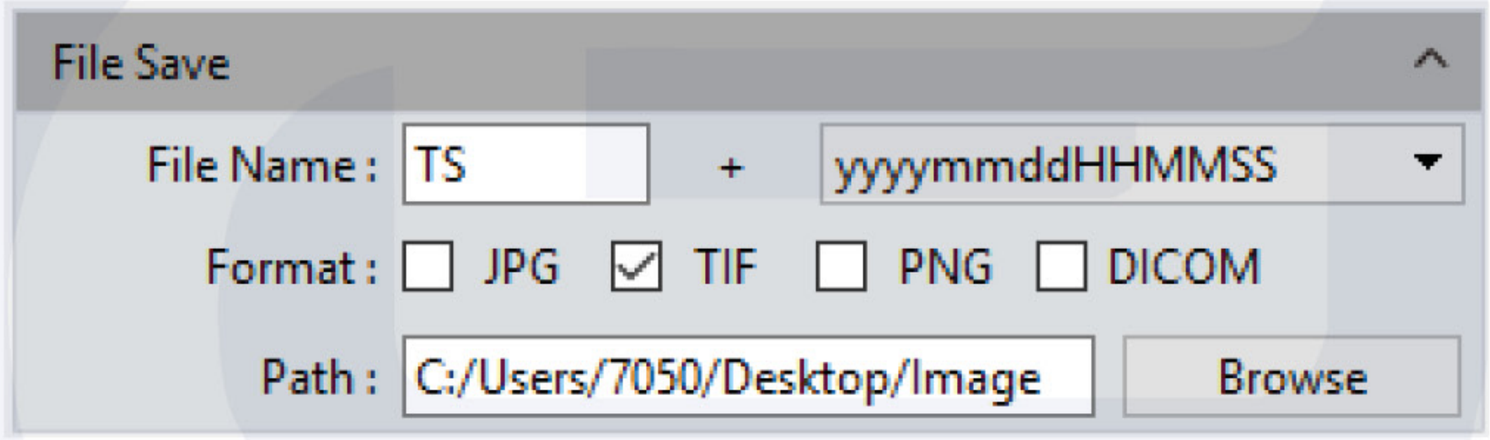
PNG: Portable network graphics is a lossless but compressed bit-image format that uses the way of lossless data compressing algorithm derived from LZ77 with a high compressing ratio and a small file size

DICOM: Digital imaging and communication of Medical, an international standard format for medical images and related information. It defines a medical image format that can be used for data exchanging and meet the requiring of clinical practices and applications

Path: To save the image files to the folder that is under the certain of defined path. User can click the [Browse] button to change the saving paths. The default saving path is C:/Users/Administrator/Desktop/Image



(1)



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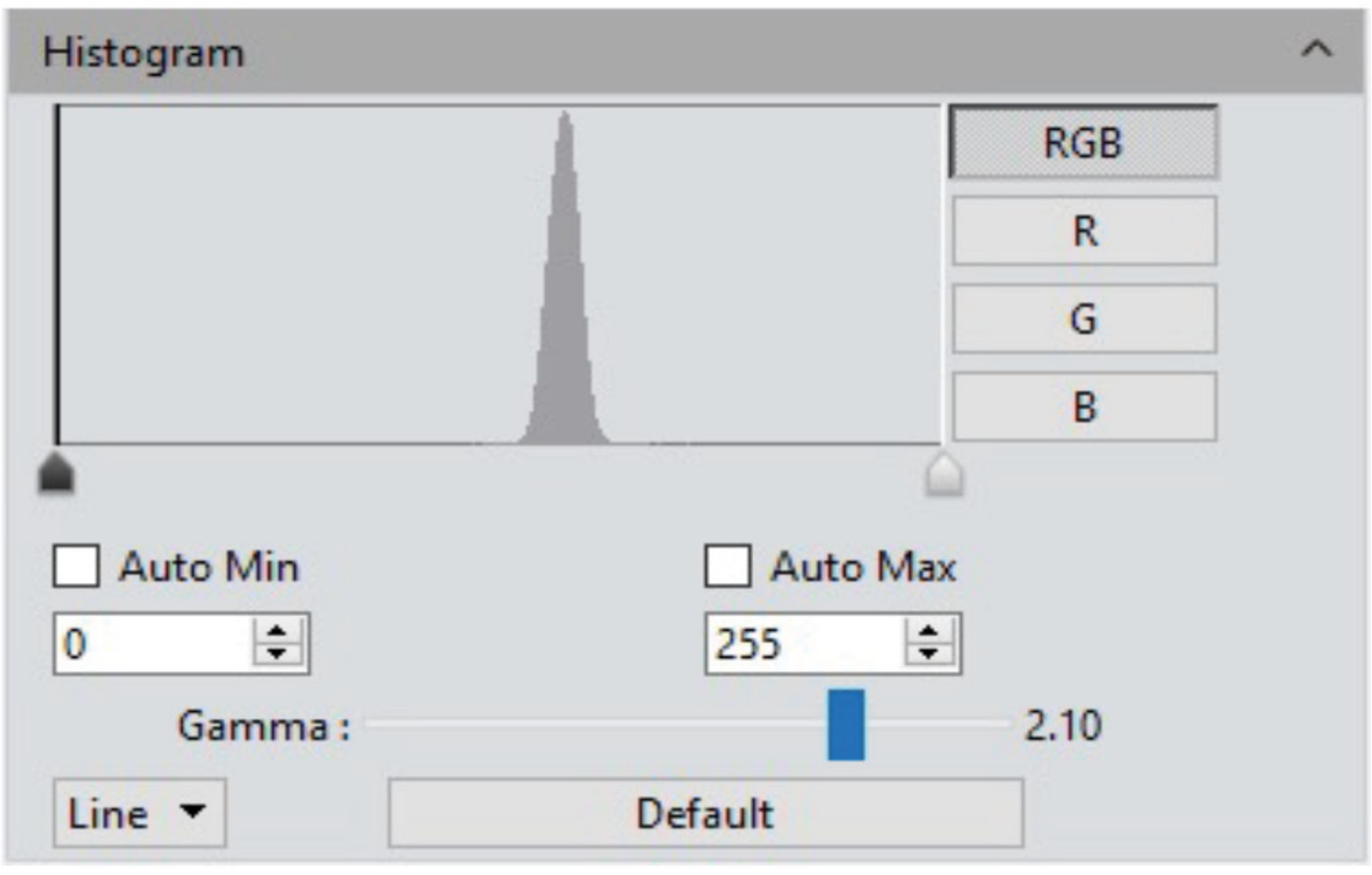
Histogram

User can try the software function of color level Adjusting to obtain more realistic images for observation and analysis.
The color level adjusting means to redefine the R\G\B color levels in each channel and then re-allocate of the pixel values in among. Adjust the color level (gradation) to increase the range of the highlight area in the image, image becomes brighter, or using the contrary way to make the bright image darker. User can also adjust the components of the RGB three channels separately to change the image color of the corresponding channel

- **Manual Color Level:** User can manually adjust the image's dark tone (left gradation), the gamma and highlight brightness level (right color gradation) on the histogram to regulate the image's tones, such as the contrast, shading and image layers, then obtain the correct balance of the whole image
- **Auto Color Level:** Check [Auto Min] and [Auto Max] to automatically adjust the brightest and darkest pixels in each channel as white and black, and then re-allocate the pixel values in proportion
- **Gamma:** adjust the median of the color level, setting range is 0.64 to 2.55;
- **Default:** Click [Default] button to restore the module's parameters to the factory default ones. The default of color level adjusting is manual , and the default gamma value is 2.10

Note:

- The composing and displaying of the histogram curve is the result of the software's running real-time data statistics, so some the sources of the software will be occupied. When this module applied, the camera frame rate may be slightly affected to drop. When the module stop working, the data statistics are turned off and the frame rate of the camera is able to reach to the maximum.
- After cancelling the automatic color level adjusting, the level value will stay in the value as it was



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Background Correction

Flat Field Calibration: In actual microscope applications, the images captured by the camera may be uneven or carry color patches, due to the problems of microscopes' light sources, optical path systems, or the dirty spots on the microscope eyepieces and objectives. With flat field correction, those types of defects could be effectively reduced, the imaging effects will be more uniform, and the color reproduction of the images is smoother and more realistic

Operations:

A. Click [Flat Field Calibration Wizard] to move the viewing field of camera to a blank background, as shown in the right figure (1)

B. Click [Next] to move the first background to another new blank background, click [OK] to apply the Flat Field Calibration function, as shown in the right figure (2)

C. Select [☑ uncheck] to exit the flat field correction mode. If you need to apply it again, re-check it, no need for repeating the wizard procedures again

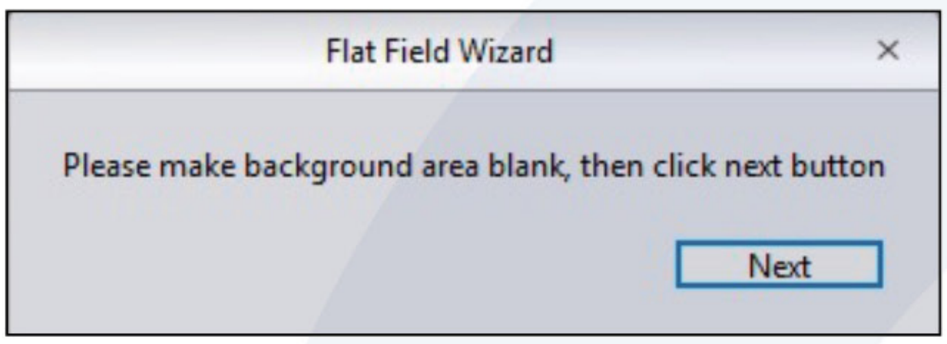
Note:

A. The Flat Field Calibration requires the manually setting of the exposure time, so that the image brightness will not overflow up or down, and all the pixel values are range from 64DN to 254DN

B. The brightness of other areas of the two backgrounds which are used for references of correction should be almost the same except that there are some moving spots on the two backgrounds. These two background should not be those of "significantly inconsistent"

C. To standardize the background for the flat field correction, it is recommended to use plastic, ceramic or professional white balance paper as the standard samples

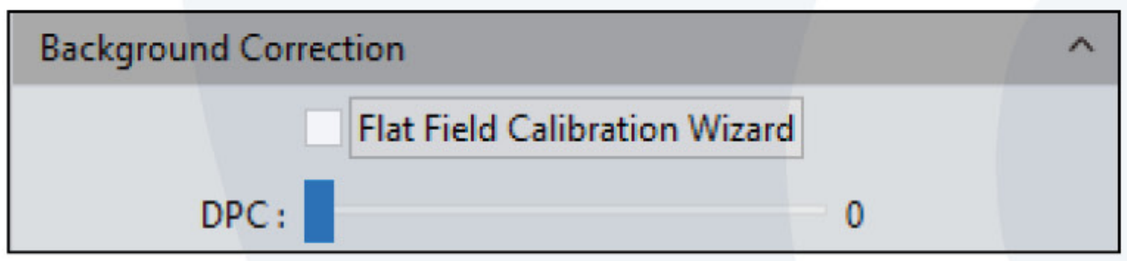
D. Flat Field Correction requires that the background it use as reference to be a blank one and the light illumination on it is uniform. The correction should be conduct again if the camera or the microscope changed their lens or objective



1



2



DPC: The ability to reduce the dead pixels on the image, setting range is 0~3

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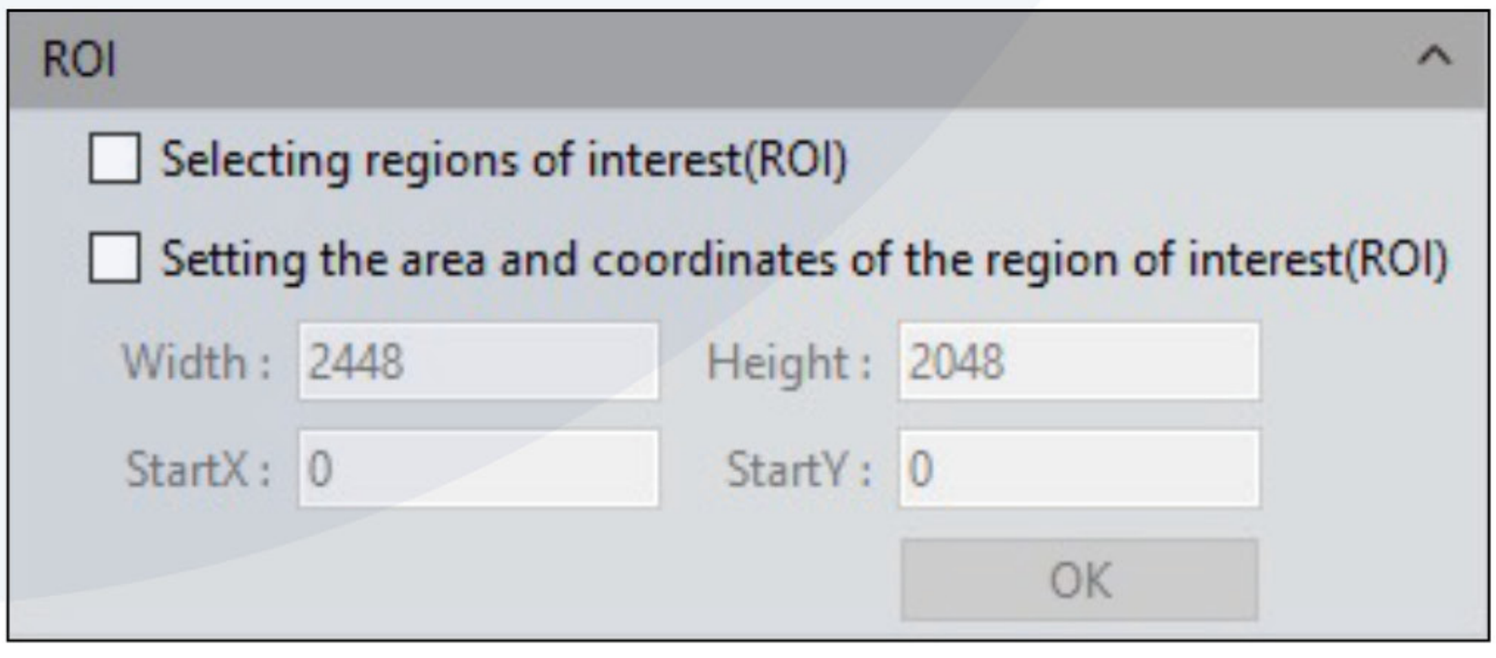
ROI

ROI (Region of interest) is an application that user runs the software to define a window area of interest within the effective and sensitive detecting area of the camera sensor and just allow the image information within this defined window to be read out and then show out a localized area of image. A smaller ROI area reduces the amount of information and tasks of image transferring and computer processing, which results in increased frame rate of the camera

Select regions of interest (ROI): Using a computer mouse. Check on the ROI frame, then move the computer mouse to the previewing image to define the window area you would like it to be your ROI, this window area will display the coordinate value and resolution of the current running point. Click on the [√] below the cursor to apply the ROI settings into effect

Setting the area and coordinates of the region of interest (ROI): Manually entering the starting point coordinate value and the resolution size to define the exact ROI area. Enter the actual point offset position of the rectangular area as well as the width and height, then click [OK] to apply the ROI settings into effect



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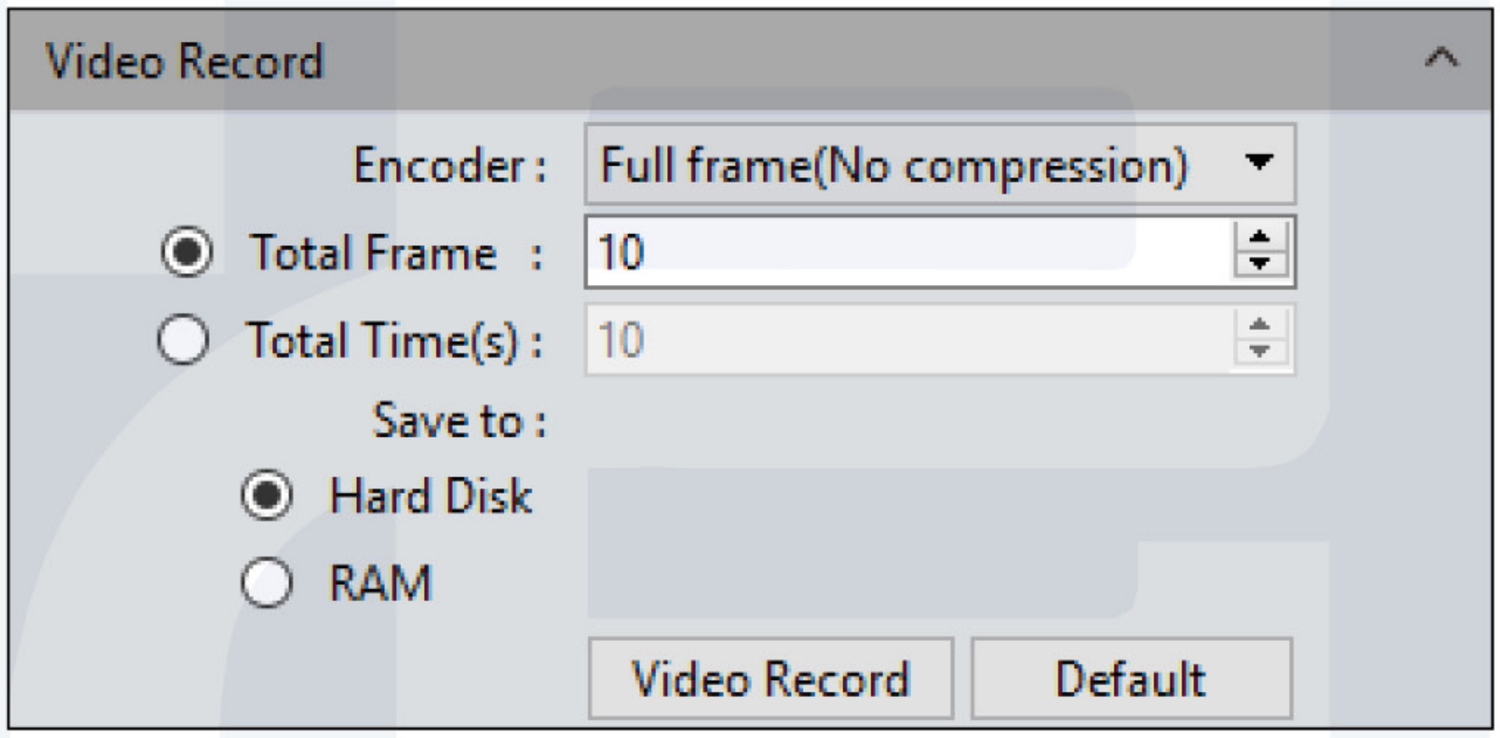
Video Record

Click on [Video Record], Save the image data into video formats for playing back to observe the process of the samples' live movements

- **Encoder:** The software provides two compressing formats: [Full frame (No compression)] and [MPEG-4], the video sizes generated by different compressing formats are inconsistent, and the user may choose either one format according to his actual needs
- **Total Frame:** Capture images according to how many frames was set to be captured, setting range is 1~9999 frames
- **Total Time(s):** The length of time of capturing images based on how long the time was set to, setting range is 1~9999 seconds
- **Save to Hard Disk:** Instant loading and writing in. The image data is being loaded and written into the hard drive of the computer during the image capturing process. In this mode, the transmission speed from the camera to computer will reduce due to the computer's loading and writing in images data into its hard drive, so this mode is not suitable for capturing the images of quickly changing scenes or backgrounds, but it is suitable for long-time period of capturing
- **Save to RAM:** The image data is saved in the RAM of the computer temporarily, after the image capturing, all the image data is transferred to the hard drive of the computer to save.Select Save to RAM and enable the RAM to save images. The maximum numbers of images that can be saved by RAM and display will be shown out. This saving mode allows the camera to maintain a high transmission speed of the images when capturing and avoid data losing due to a low transmission speed. This saving mode is limited by the volume of the computer's RAM, so it is not suitable for long-time period or huge volume of capturing
- **Default:** Click the [Default] button to restore the module's parameters to the factory default ones. The default saving mode is the compressed mode with full resolution frame, with the total number of frames to be 10 frames, and the total default capturing time is 10 seconds, image data default to be saved to the local hard drive



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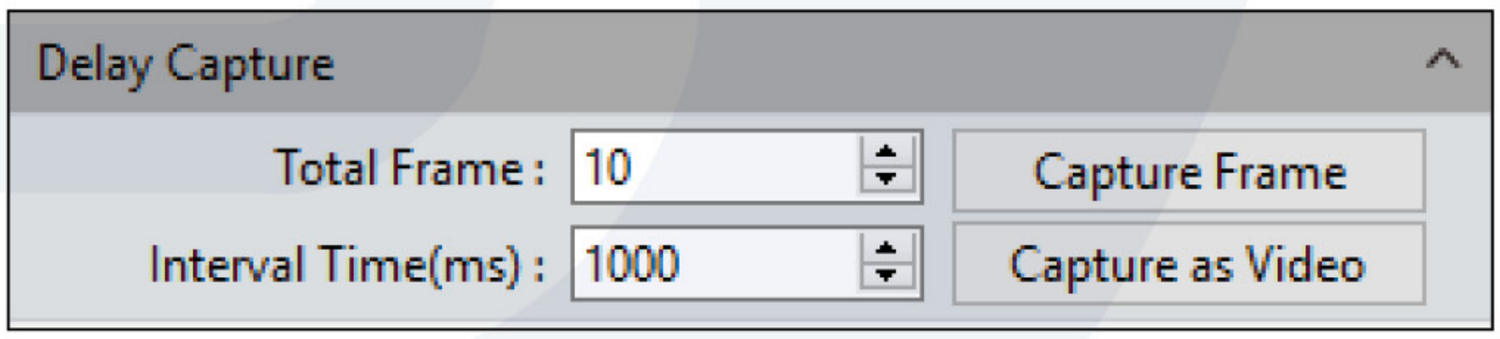
Delay Capture

- **Total Frame:** Capture images according to how many frames was set to, system default to be 10 frames, setting range is 1~9999 frames
- **Interval Time(ms):** The time interval is 1000ms by default, the minimum value is zero, which means capturing images without intervals
- **Capture Frame:** Capture and save multiple frames of images continuously according to the preset parameters, Click [Stop] to terminate the continuously capturing before the capturing task is finished
- **Capture si Video:** Capture multiple frames of images according to preset parameters and convert them into a movie directly. Click [Stop] to terminate the continuously capturing before the capturing task is finished

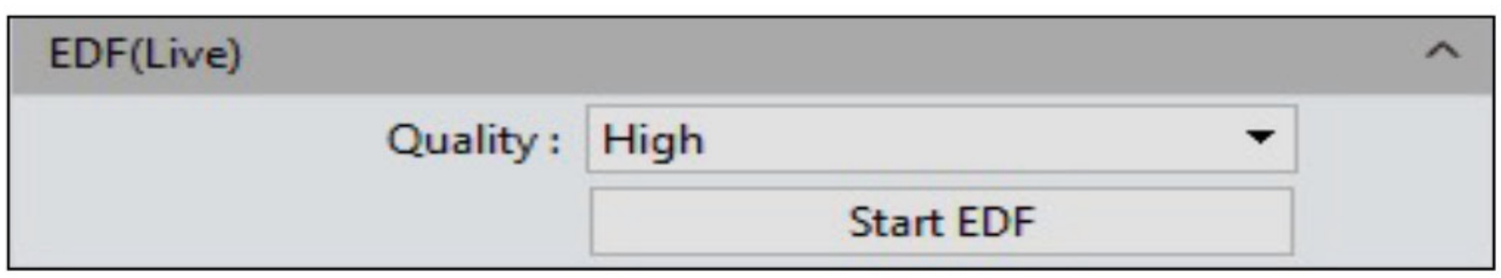


EDF(Live)

EDF makes it possible to stack and merge the images acquired by microscope with different focused panels or positions on a certain thick specimen or sample. The new stacked and merged image is able to present the clear full forms and information of the specimen or sample

Quality: The higher quality level of the new image requires, the slower speed in its merging, but results in coming out of image with better quality.
Click the [Start EDF] button to run. Continuously turn the fine knob of the microscope to focus on one plane to next other, the software is able to merge the obtained plane images instantly and show out a live and clearest image

Click the [Stop EDF] button to end the stacking and merging application, a new merged image including all the depth focusing information will be generated in the image gallery



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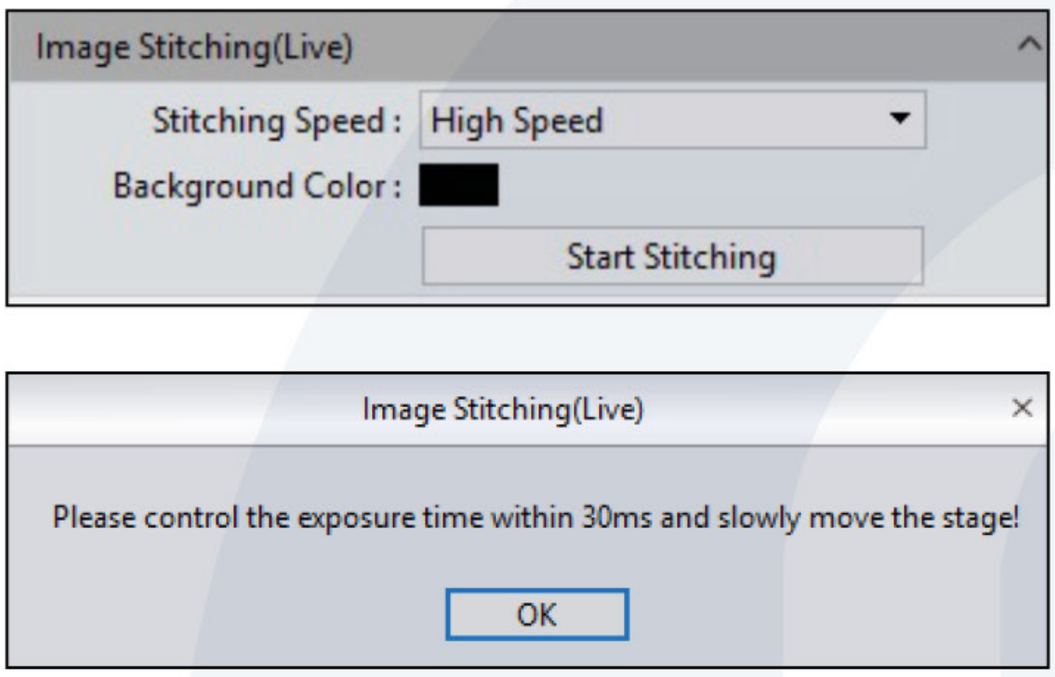
Imaging Stitching (Live)

The model of real-time image stitching supports to acquire several individual images with adjoining positions on the specimen or sample, and to have them combined into a stitched image which present the whole form of the specimen

- **Stitching Speed:** Two options: High Speed and High Quality. the default is High Speed
- **Background Color:** The default background color of the invalid area on the stitched-to-composed image is black , but you can change it. Click on ■ to select the desired color in the palette. And it will effective after stitching is completed
- **Start Stitching:** Click on it ,the prompt of operation such as right figure (1) will pop up; The cache memory of the computer will be used to save image data within the stitching procedure. The right figure (2) shows the real-time displaying window while stitching. Move the specimen to another new position (no more than ¾ away from the former position) and then stop, the navigation bar in the stitching window will show green(means normal to begin), as shown in the right figure (3) , the software conducted a stitching, move the specimen again to another new position (still following the distance principle mentioned above, no more thatn3/4), stop and let the software to process another stitching. Repeat the above operation until the whole live-stitched image meets your expectation. If the navigation bar turns red, as shown in the right figure (4) , it means that this present position is out of the limitation area to be able to do the stitching, so you need to move the specimen back to the last position for effective stitching



(1)

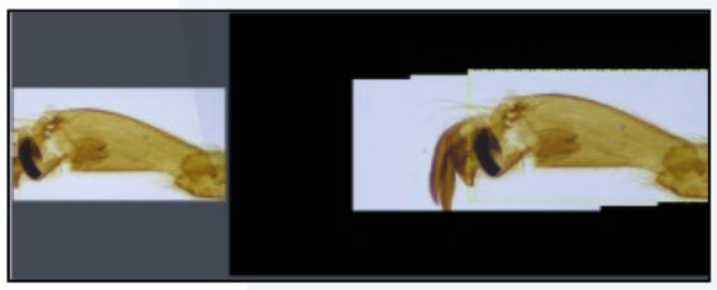
Click [Stop Stitching] to end the stitching, and a stitched and composited image will be generated in the image gallery

Note:

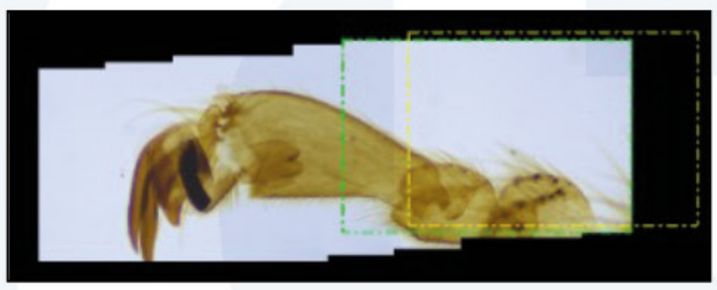
A. It is recommended to conduct a white balance correction and flat field correction before starting the stitching to ensure to achieve the best quality images.

B. Since the stitched images are in huge sizes and will surly occupy massive memory of the computer, so it is recommended to conduct the stitching operations through a computer with sufficient memory volume. The operating system software which is 32-bit could not run the stitching software module.

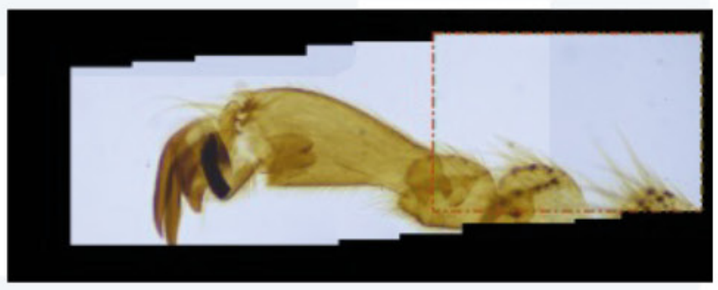
C. When the processing of stitching taking up 70% of the computer memory volume, the stitching module will stop working automatically



(1)



(2)



(3)

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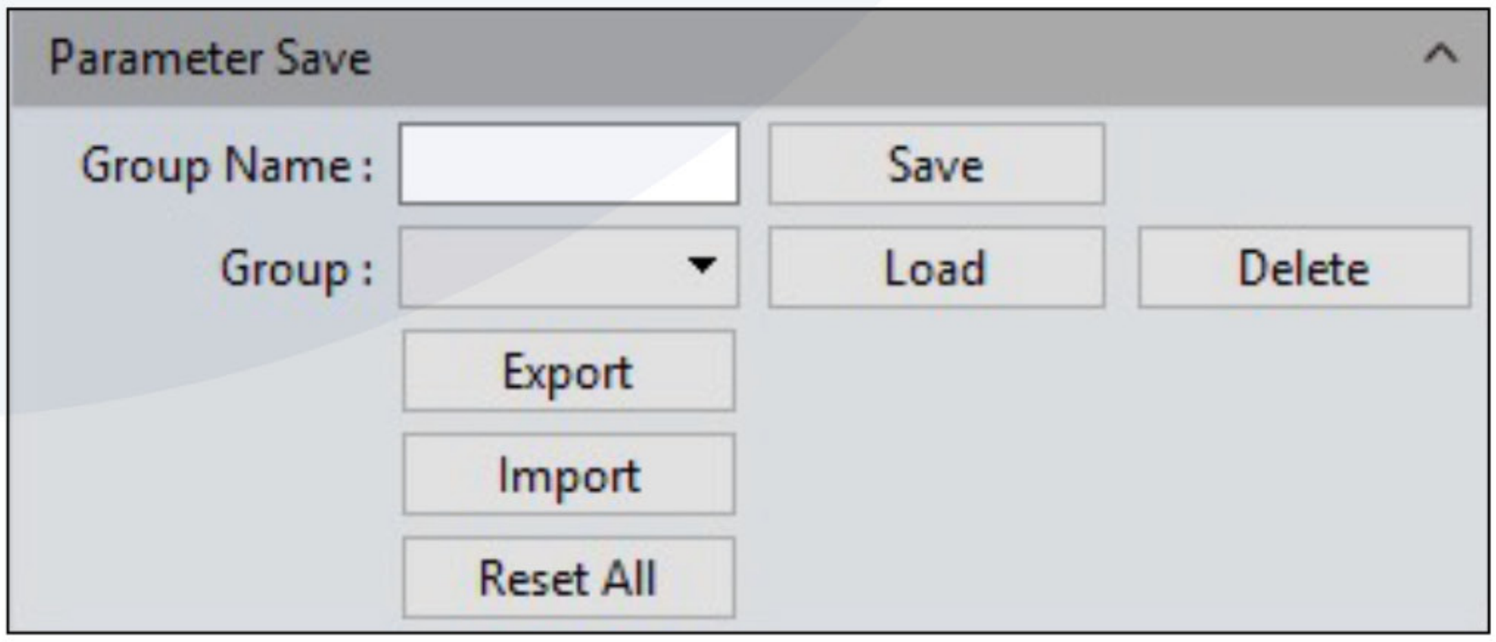
Parameter Save

This software supplies the function of managing the groups of experiment parameters for the users' conveniences using the camera in different applications or platforms. User can save and re-load the set parameters from different experiment statuses and then apply them to the new experiments projects, this function will surely save the users' time, develop the working efficiency and ensure the reproducibility of the experimentresults. The parameter group saver allows the users to save all the software functions and modules mentioned above (exception is the flat field correction module)

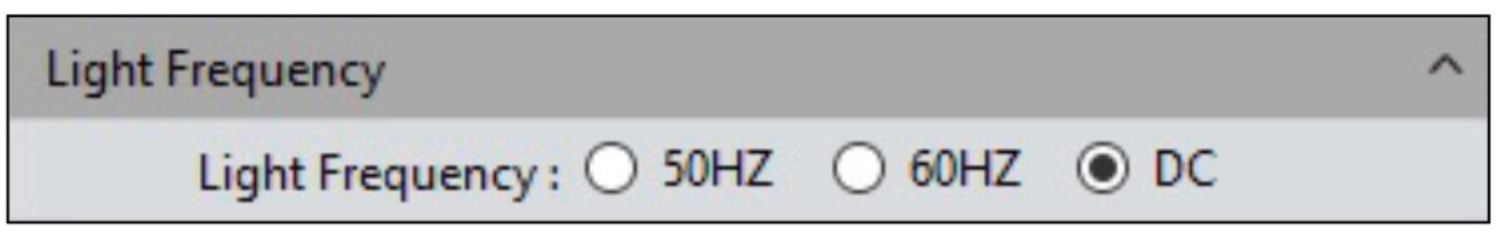
Copying and loading the files of parameter group to other computer platforms can realize the cross-platform applications of these parameters, so the user's experimental conditions are ensured to be as uniform as possible;
The name of the parameter group: To name the parameter group, input the name you desired and load it, the window's context menu will display those parameter groups which have been saved or loaded

- **Load:** Load the parameter group to current working status;
- **Export:** Save the files of the parameter groups to specified folder documents;
- **Reset all:** Restore to the factory default settings will delete all the files of parameter groups set and saved by the users before
- **Save:** To save the current parameters into a named parameter group file
- **Delete:** To delete the currently selected files of parameter group
- **Import:** To load the selected files of parameter group from the selected folder



Light Frequency

Users can select the corresponding light source frequency according to the actual applications or conditions. Suitable frequency of light source is good for the normality of the live images and excludes the phenomenon of stroboscopic on the live images. The default light source frequency is the frequency of direct current



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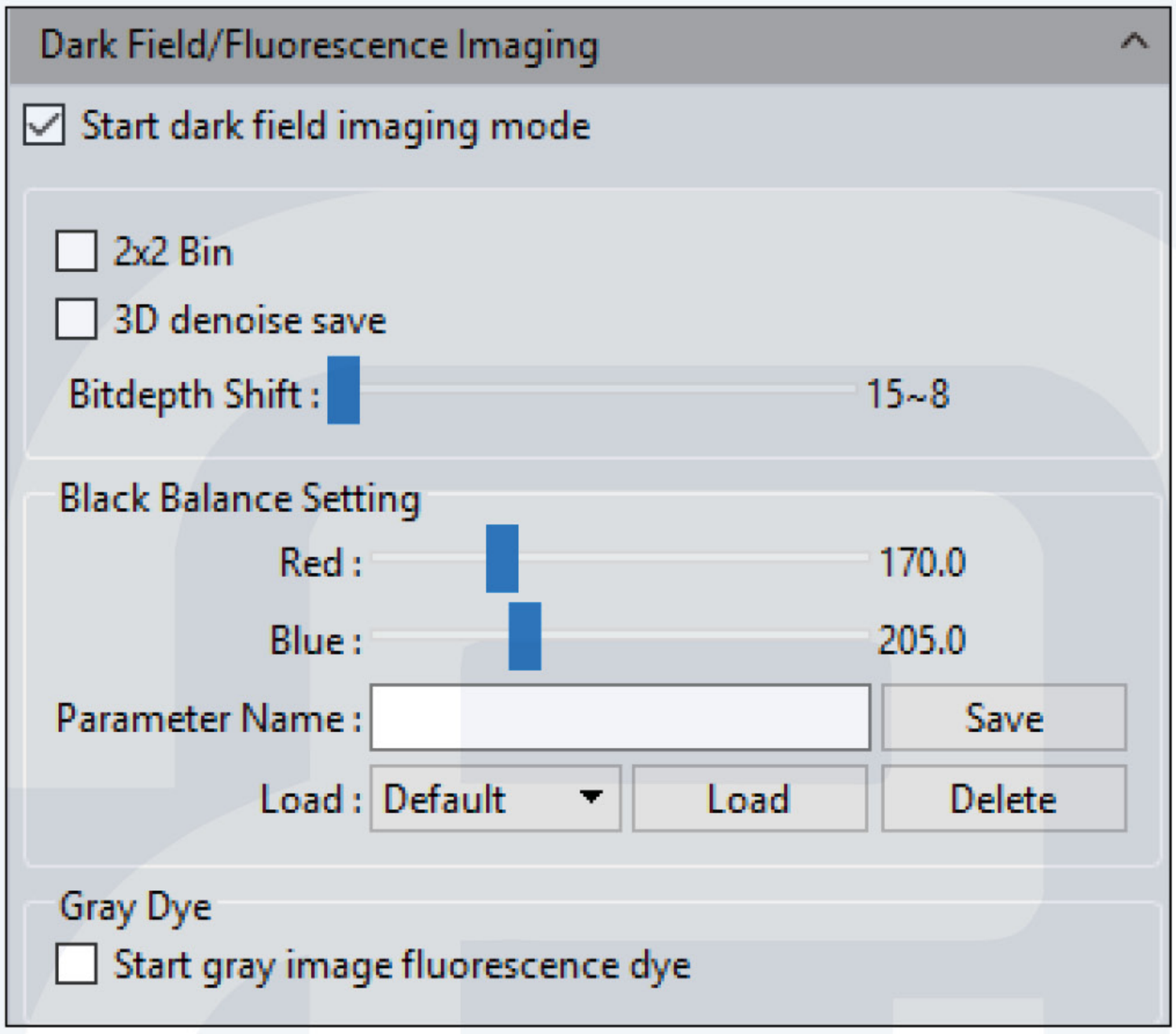
Dark Field/Fluorescence Imaging

User can adjust the black balance parameters of the live image according to his actual working conditions or requirements to achieve better image quality

- **2x2Bin:** increase the output speed while reduce resolution
- **3D DenoiseSave:** Apply this module to reduce the noise in the image
- **Bitdepth Shift:** The images displayed on the computer screen are all 16-bit data images. ImageFocus Plus allows the user to select different bit of data to display and preview according to his actual needs.
- **Black Balance Setting:** The setting of color leveling, means to reset the ratio pixel values of R/B color in each channel
- **Parameter Name:** Before saving the R/B ratio pixel values set by the user, user may create a name for the file of parameters group to save these parameters and the file name may be used to direct the user to reload these settings for the next application

A. Save: Save the current settings parameters group into the named file above
B. Load: Load the saved parameters group to apply for the current status
C. Delete: Delete the current saved parameters group file



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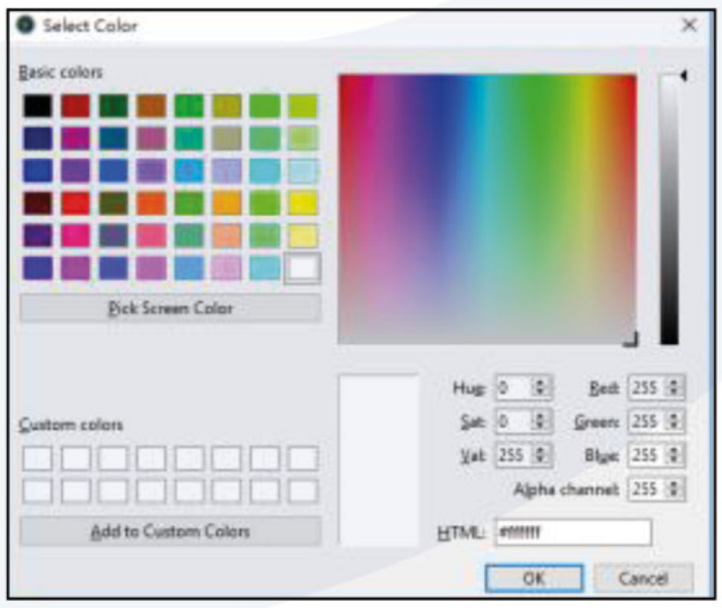
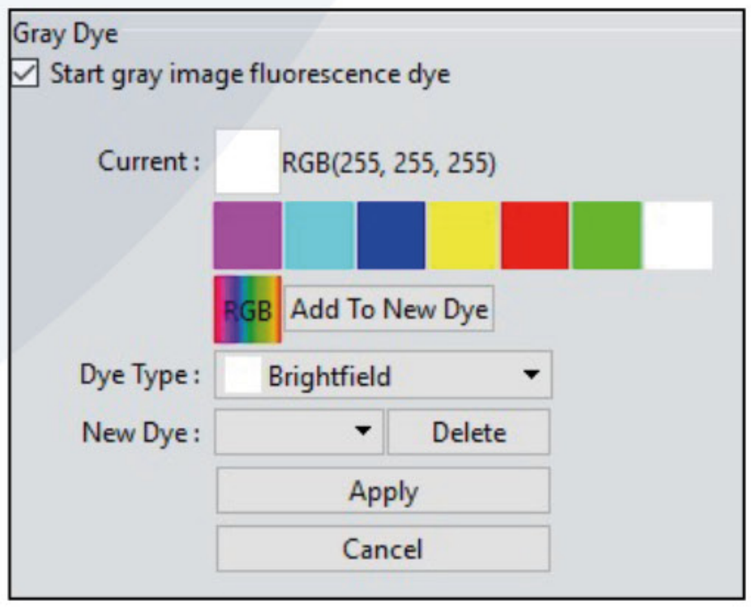
Gray Dye

The original images captured by mono-cameras are monochrome. For this reason, User can change the color mapping whatever he like. He can use the pseudo color palette to select the color he wants to map on the target image, or he can take the advantages of the Fluorochrome Bank to define the color on his target image by click on the [Apply] button after selecting the fluorochrome he used in the specimen from the fluorochromebank. Through color mapping, the final image is able to be as lifelike as that from the eyepieces of the microscope. Click on [Cancel] to remove the color mapping

- **Current :** This window displays the currently available colors that can be selected by the user, there are the seven commonly colors. Click on RGB to make the full color palette appear, from which, user has many more choices of color to pick. After the color selecting, click on [Add to New Dye] to add the selected color as a new character after the above seven color.Click on [Delete] to delete the color added by the user before

- **Dye Type:** It is the fluorochrome bank, user can find out the fluorochrome he used in the specimen and map the corresponding color on the monochrome image





Other Settings

- **Negative:** Change the color of the current image to its inverse color.
- **HDR:** Click to achieve higher dynamic range and more image details for better image quality.

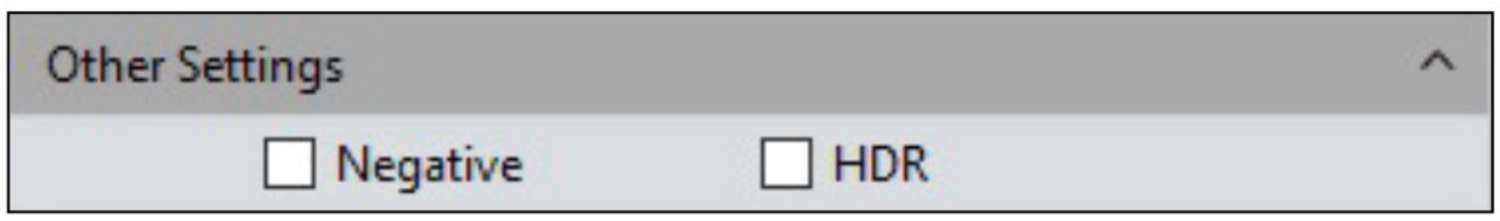


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Image

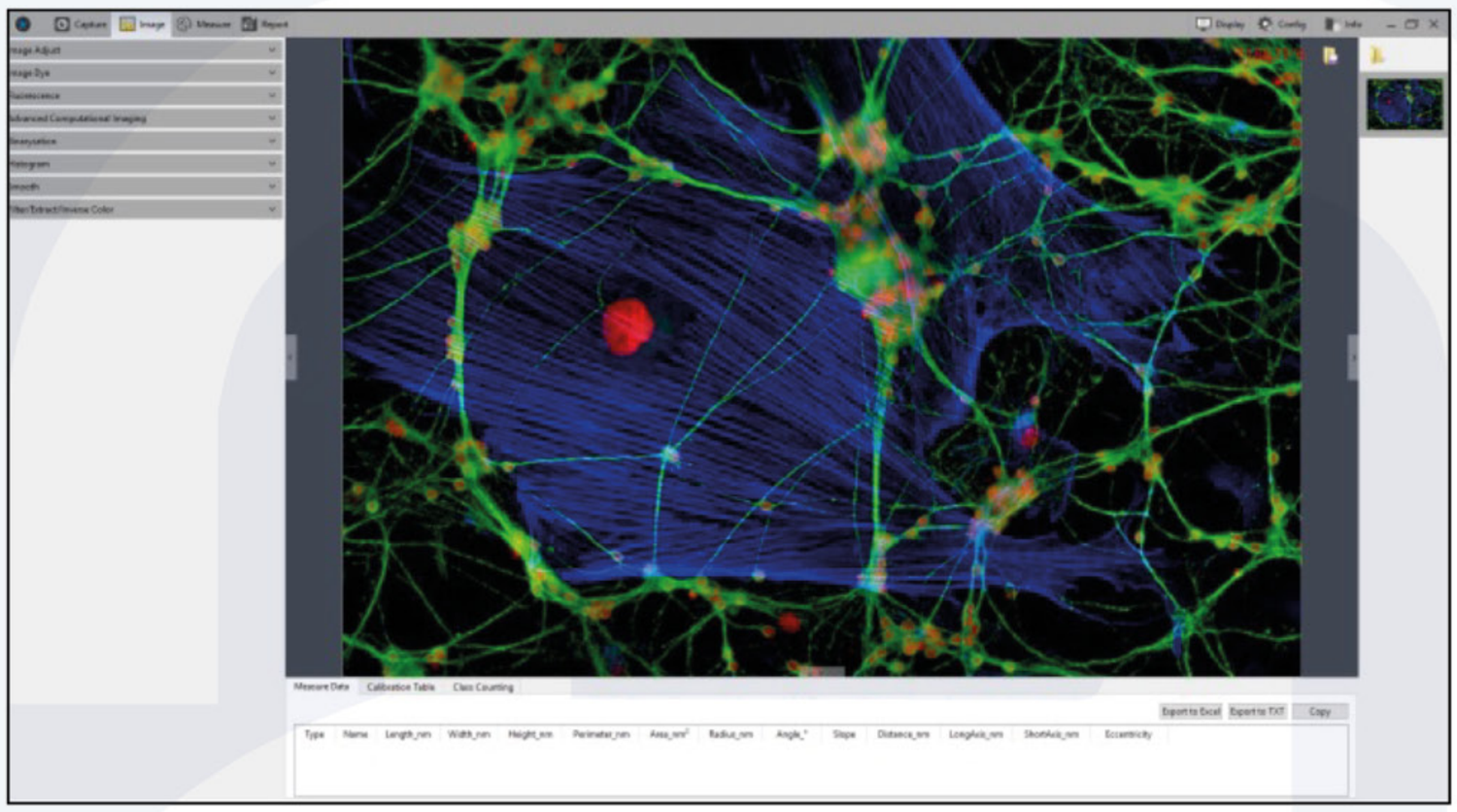
Control Interface

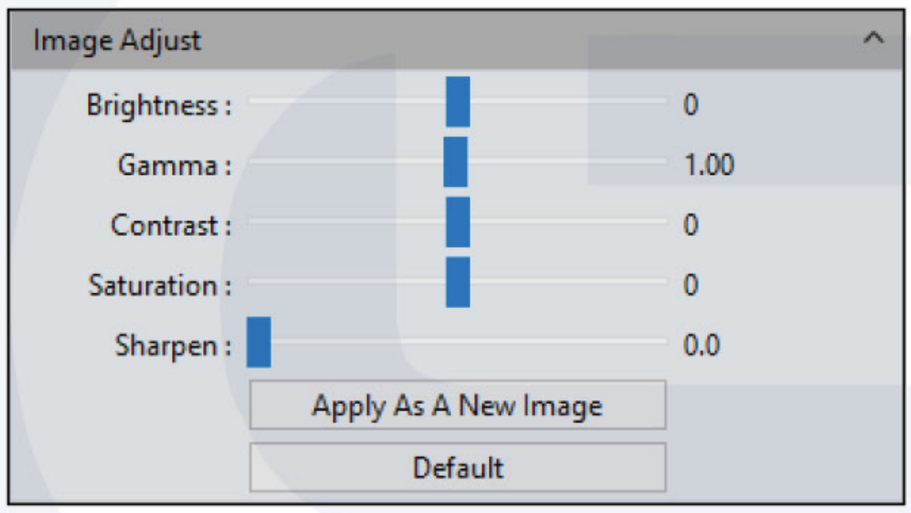
The following image processing functions are available: Image Adjust, Image Dye, Fluorescence, Advanced Computational imaging, Binarization, Histogram, Smooth, Filter/Extract/Inverse Color

Image Adjust

Adjust the image parameters to revise the effects of the captured images

- **Brightness:** The brightness of the image, the default value is 0, adjusting range is -255~255
- **Gamma:** Adjust the brightness of the image displayed on the monitor; the default value is 1.00, adjusting range is 0.01~2.00
- **Contrast:** The ratio between the darkest areas and brightest areas of the image, the default value is 0, adjusting range is -80~80
- **Saturation:** The purity of the color, the higher value of the saturation, the brighter the color is, the default value is 0, adjusting range is -180~180
- **Sharpen:** Focus on blurred edges of the image to improve the sharpness or focal length of a certain part of the image, leads to a more vivid color in the specific area of the image. The default value is 0, and adjusting range is 0~3
- Finishing the adjustments of the parameters for the image, Click [Apply As A New Image], the set parameters will be applied to the original image which then change to a new image with the adjusted characters. The new image also be saved by this command
- **Default:** Click the [default]button to restore the adjusted parameters to the factory default ones





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Fluorescence

In the researching fields of biological related sciences, different fluorochromes are used to label different cell structures.On the applications of micro-fluorescent observations, a complete fluorescent cell image contains multiple of fluorescent areas which belong to different cell structure who has its own special affinity to certain of fluorochromes. Due to the limitation to the wavelength of the emission fluorescencein the microscope turret, user can only observe one colorof image each time. Fluorescent combing module let user to combine multiple single-colorimages which all belong to the same observing field into one multi-colorimage

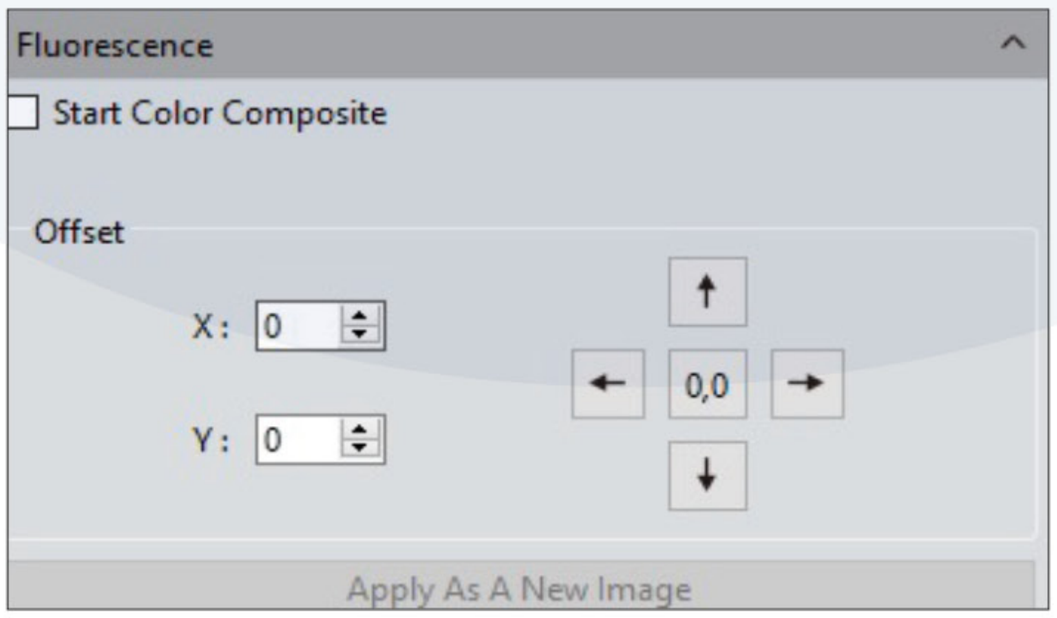
Operations:

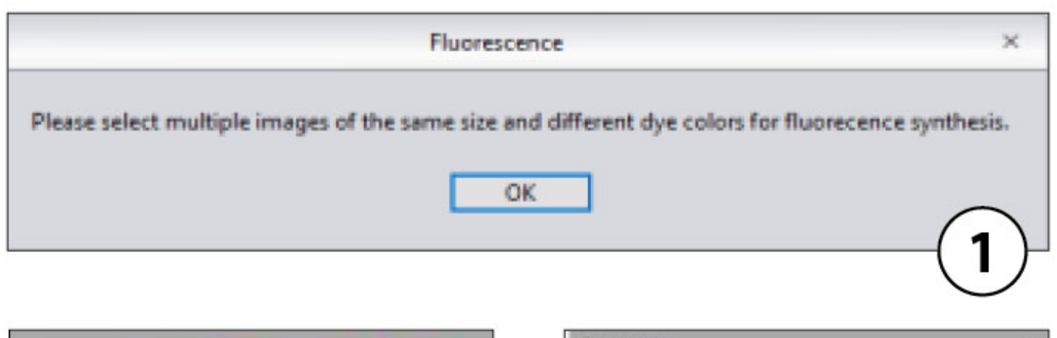
A. Select the image which needs fluorescent channels combing from its path and open onto the window

B. Click on [Start Color Composite] to select a group of images with the same observation field as the one opened before. The maximum pieces of images could be selected to combine together are 4 pieces. The operating directions window will pop-up, as shown in the right figure (1)

C. To the image gallery on the right, check to select the original images for combing, as shown in the right figure (2), then the combined image will display for you to preview, as shown in the right figure (3)

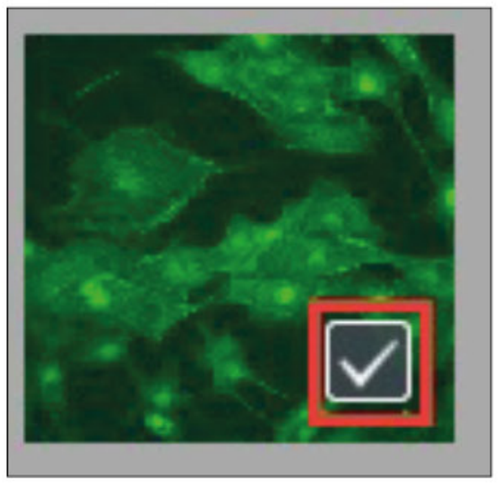
D. Click [Apply As A New Image] to add the combined image to the image gallery and let it display in the center of the working interface, the fluorescent combing processing finished

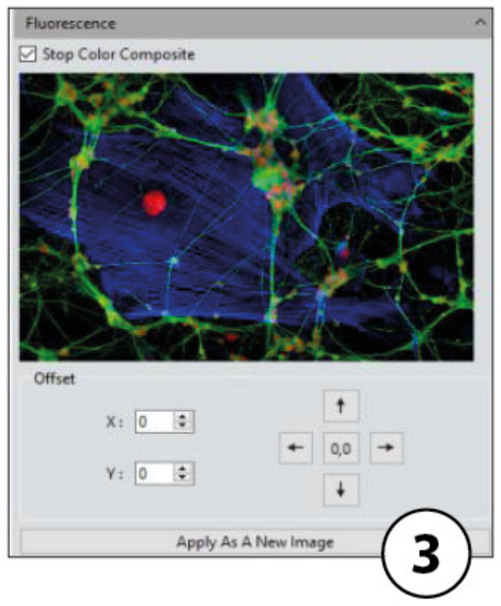




Pixel Drifting Correction:

The mechanical vibrations from the fluorescence filters' switching can lead to the pixel drifting of each captured single-channel image to others when they were captured individually , so it leads to the situation that these captured single-channel images are not exact under the same observation field and area, with slight drifts. Drift Correction module is able to let the user to correct these pixel drifting and finally ensure all the single-channel images to be under the exactly same observation field and area, thus results in the perfect results of multi-channels combing. One correction unit stands for one pixel, Click on [0,0] to restore to the original point





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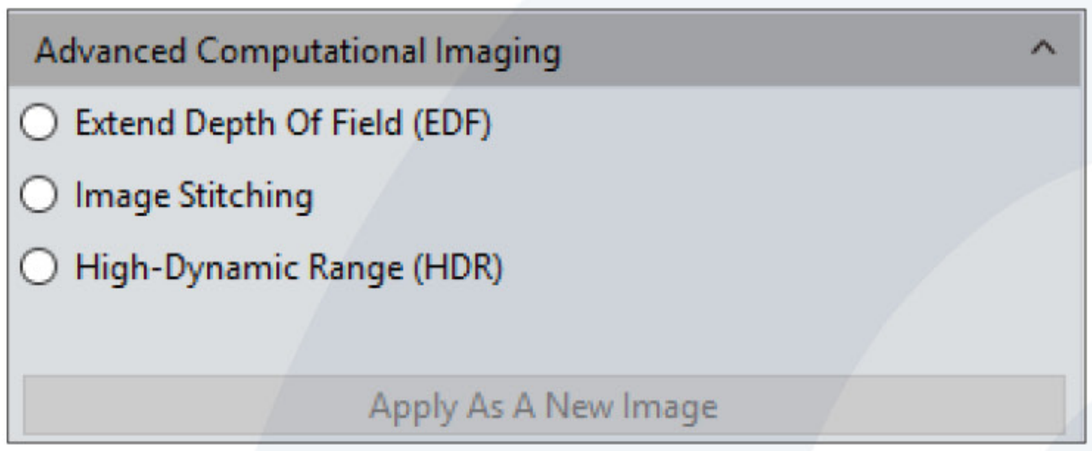
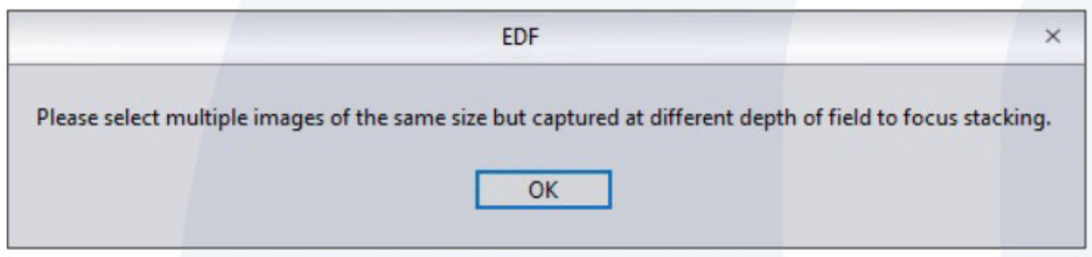
Advanced computational imaging

ImageFocus Plus offers users with three kinds of Post-processing technologies for Image packages. They work on the merging of batch of captured images

- **Extend Depth of Field (EDF):** Pick up those images which were captured from the same observation field but not on the same focused planes, use those clear focused areas of each captured image together to merge a new image which carries all clear focused areas in whole image
- **Image Stitching:** Stitch several images which have overlapping parts to one and other into a large, seamless, high-resolution image. (Note: When taking pictures, 20% to 30% overlap should be ensured between two adjacent images. Please select the “time stamp” or use the consecutive 3-digit serial number to name the image: 001,002...)
- **High-Dynamic Range(HDR):** Take a batch of images with different exposure times, merge the three images which are the insufficient exposure one, the moderate exposure one and the excessive exposure one into new image with high dynamic range





1

Operations:

1. User may select the image processing method he needs. Pick up multiple of images with the wizard of operation. Let us take the EDF processing as an example: After selecting this processing application, window of operating direction will pop-up, as shown in the right figure (1)
2. Then click on the Combination at the bottom of the interface;
3. The combining process requires for a while, the window will display the on-progress, for example: EDF 4/39
4. When the combing is completed, a thumbnail of the combined image will be generated and present in the left menu bar, as shown in the right figure (2)
5. Click on [Apply As A New Image] button, The new combined image will be add to the image gallery and shown up in the center of the working interface and the combing process comes to ending



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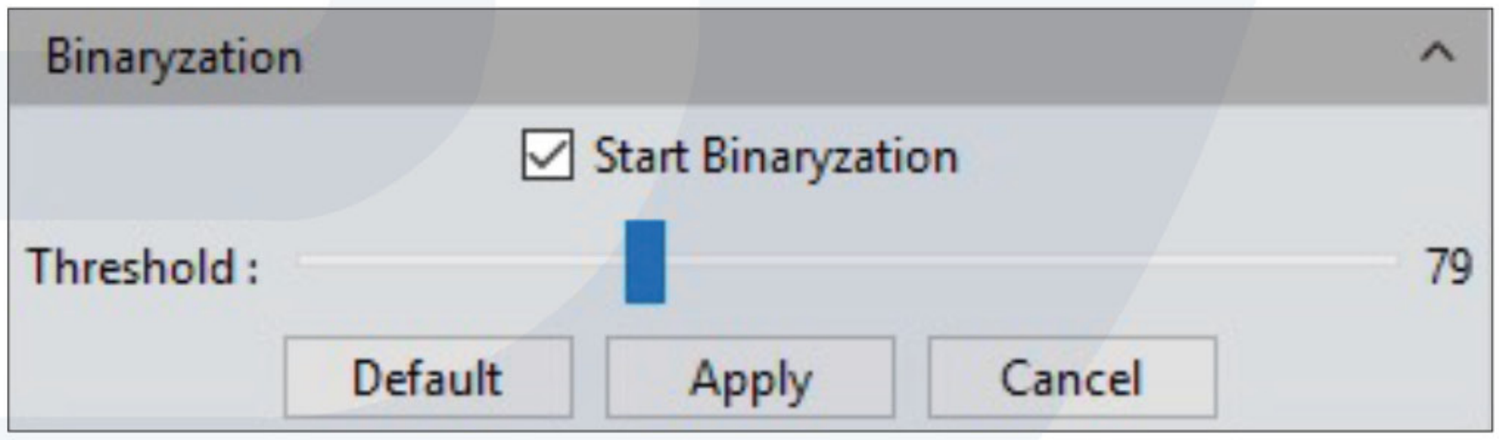
Binaryzation

ImageFocus Plus software provides user with image binaryzation,which is to set the grayscale value of the pixels on the image from 0 to 255, it is the process of presenting the whole image with a distinct black and white effect(A binary image ,which is a digital image that has only two possible values for each pixel)

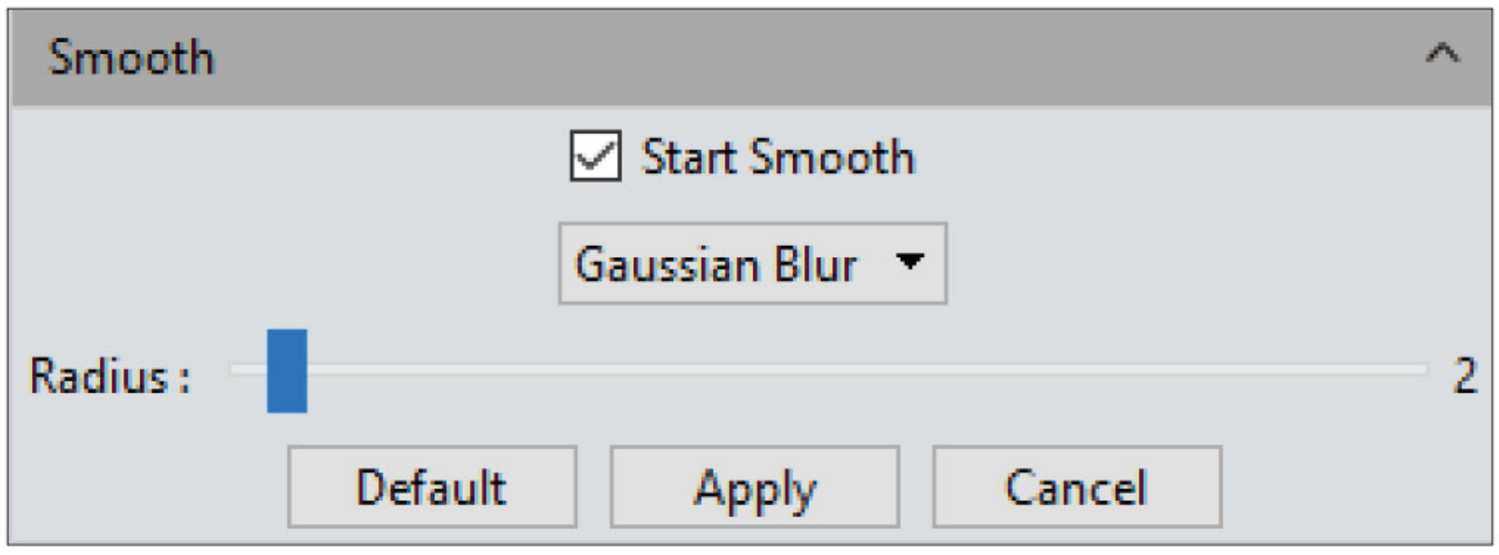
- **Default:** Click the default button to restore the module's parameters to the factory default ones
- **Apply:** When the parameter adjustments are completed, click [Apply] to make the parameter settings work into effects on the original image and generate a new image, the new image can be save as to other path or documents
- **Cancel:** Click the Cancel button to cancel the parameters set into the module before



Smooth

ImageFocus Plus software provides users with three image smoothing techniques for blurring images to reduce the noise and the level of detail: ① Gaussian Blur ② Box Filter ③ Median Blur, setting range is 0~30

- **Default:** Click the [default] button to restore the module's parameters to the factory default ones
- **Apply:** When the parameter adjustments are completed, click [Apply] to make the parameter settings work into effects on the original image and generate a new image, the new image can be save as to other path or documents
- **Cancel:** Click the [Cancel] button to cancel the parameters set into the module before



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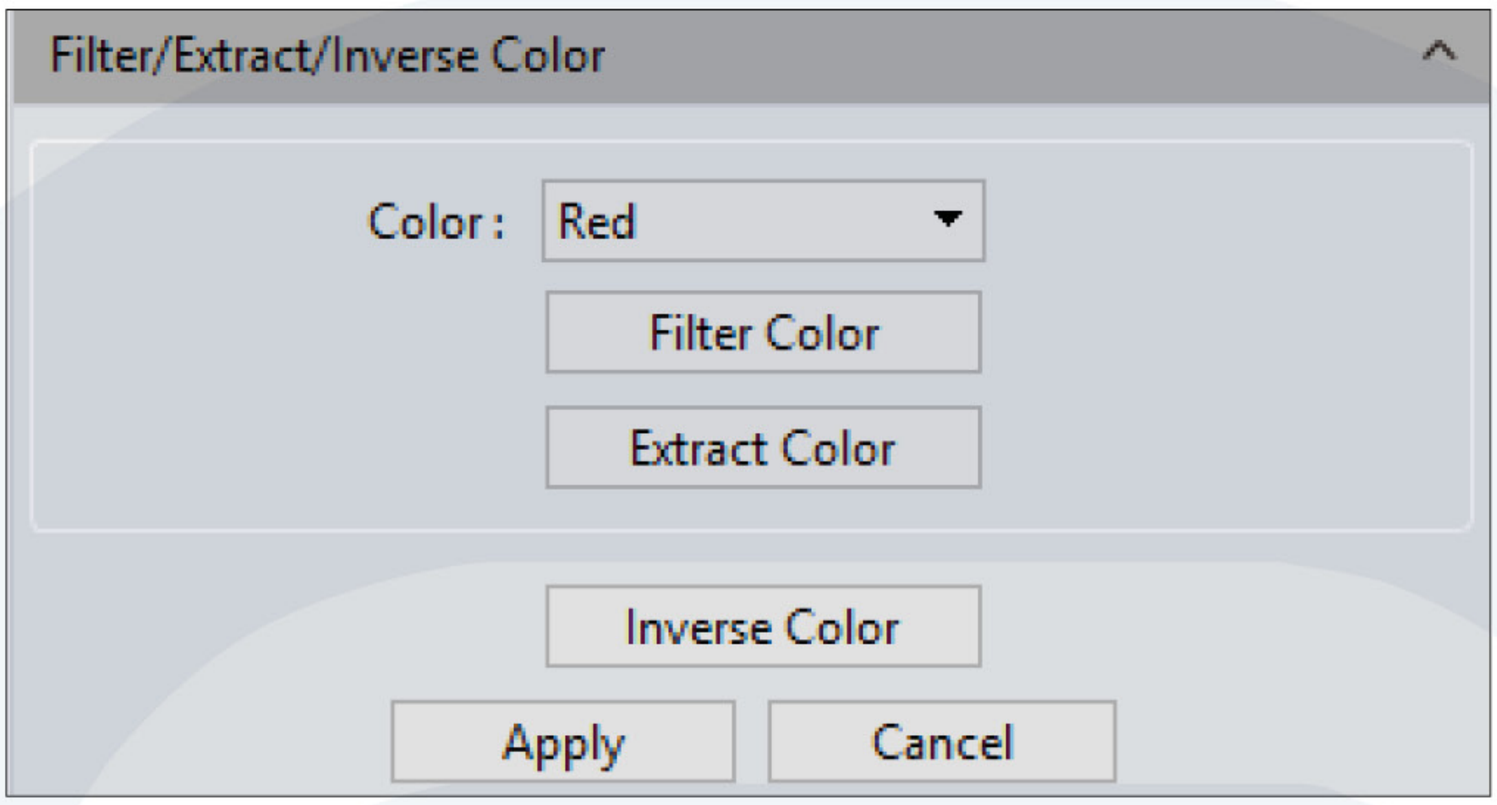
Filter/Extract/Inverse Color

ImageFocus Plus provides users with the methods of Filter/Extract/Inverse Color for the still images to meet users' individual applications

- **Color:** select Red/Green/Blue
- **Filter Color:** check the color level information in each channel and combine the complementary colors of the mixed colors with the base color. The combined color is always the brightest color
- **Extract Color:** extract the certain of color from the RGB color group
- Inverse Color: invert the colors in the RGB group to their complementary colors
- **Apply:** when the parameter adjustments are completed, click [Apply] to make the parameter settings work into effects on the original image and generate a new image, the new image can be save as to other path or documents
- **Cancel:** click the [Cancel] button to cancel the parameters set into the module before



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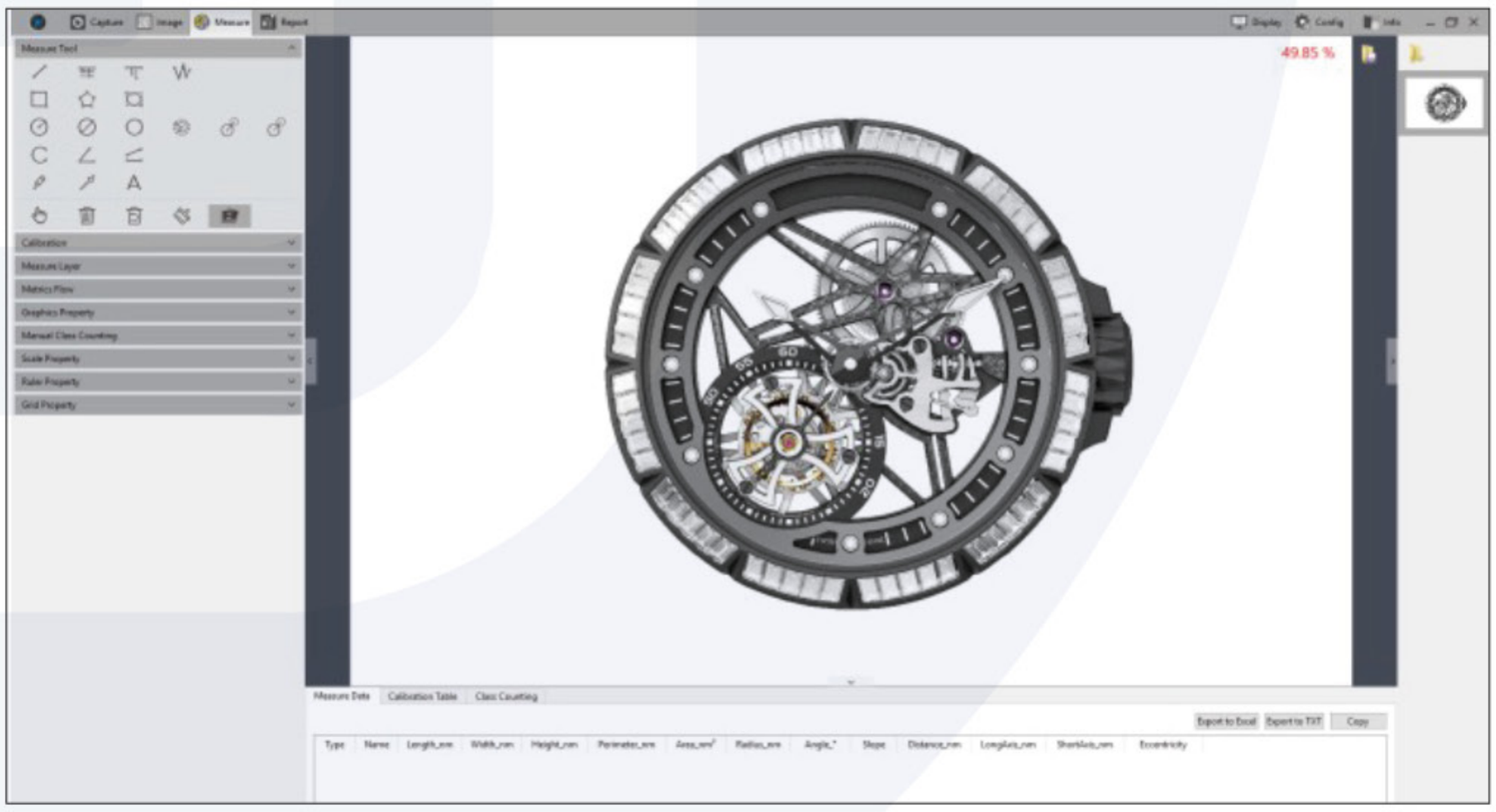
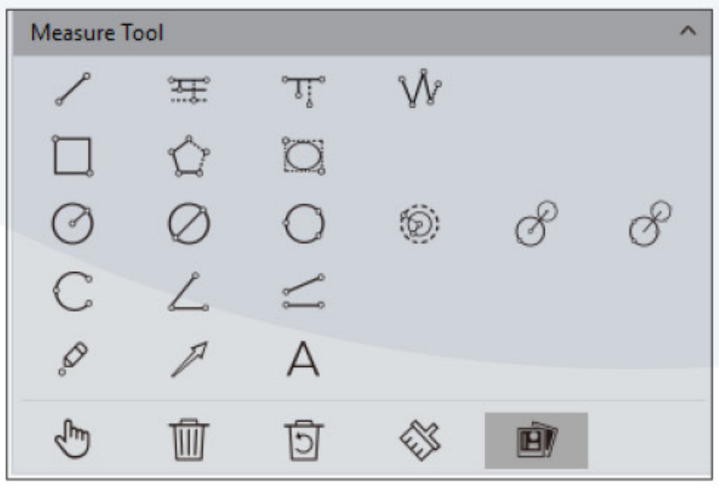
Measure

Control Interface

Capture provides tools for images measuring. For example, if you want to know the distance between two points in the image, using the measurement tools, you can simply draw a line between the two points and get real-time measurement data. Capture provides users with a rich set of measurements in image analyzing. The principle of the measuring function in Capture is based on image pixels as the basic execution unit. For example, the length of the line feature is determined by the number of pixels along the line. Pixel-level measurements can be converted to more practical units, such as millimeters(mm) or inches, using measurement calibration module in the software and calibration ruler





Measure Tool

Line Parallel: Draw a line segment graphic and then finish drawing with one more click

Parallel Line: Draw a line segment, then left click again to draw its parallel lines, double-left-click to finish drawing

Vertical Line: Draw a line segment, then left click again, draw its vertical line, double-left-click to finish drawing

Polyline: Left click, add a new line segment to the existing polyline, double-left-click to finish drawing

Rectangle: Left click to select two endpoints to draw a rectangular, the length, width, perimeter and area of the rectangular can be measured

Polygon: Left click to draw the polygon multiple times, double click to finish drawing

Ellipse: Left-click to select two endpoints to draw an elliptical graph the perimeter, area, major axis, short axis, and eccentricity of the ellipse can be measured

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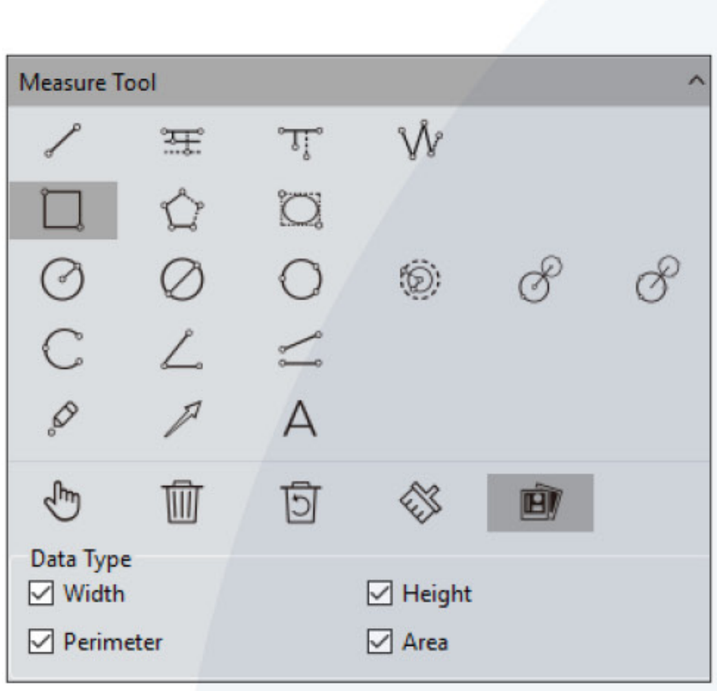

Measure Tool

Radius Circle: Left-click to select the center of the circle, and click again to define the radius length , then click to to finish drawing

Diameter Circle: Click two times to define the two diameter endpoints separately to draw the circle, then one more click to finish drawing

3Point Circle: Click three times separately on the selected circle, and then one more click to finish drawing

Concentric Circles: Draw a circle with its radius, Click the position to be the center of the circle, then double click finish drawing

4-Point Double Circle: First click to position the center of the first circle, second click to define the radius length of the first circle. The third click to position the center of the second circle, the fourth click to define the radius length of the second circle

6-Point Double Circle: Click three times to select three points on the first circle, and click another three times to select the three points of the second circle, then end the drawing

Arc: Draw a curved line by taking three points on the circle, finish the drawing with the third click

3-Point Angle: the angle between two connected lines. Click to draw the endpoint and intersection point of the two lines, take the third click to finish drawing

4-Point Angle: the angle between two unconnected lines. Click to draw the endpoints of the two lines, position the intersection point and take the fourth click to finish drawing

Dot: Dot marking or dot counting, manually count the quantity of targets or mark them

Arrow: The arrow mark is made by two times of clicks

Text: Add a text note to the image

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Select: The measured graphics or text notes on the image are able to be selected. When the mouse moved to the vicinity of the graphics or texts, the mouse symbol changes to , use the , to drag the graphics and texts

Delete: To delete the drawn or measured graphs

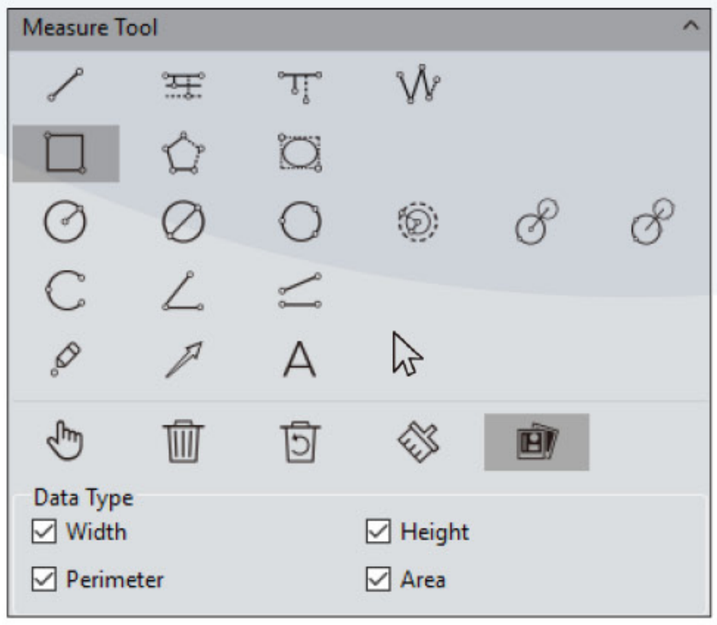
Back Undelete: Undo the last delete operation

Clear All: Delete all the drawn and measured graphics or texts on the current layers

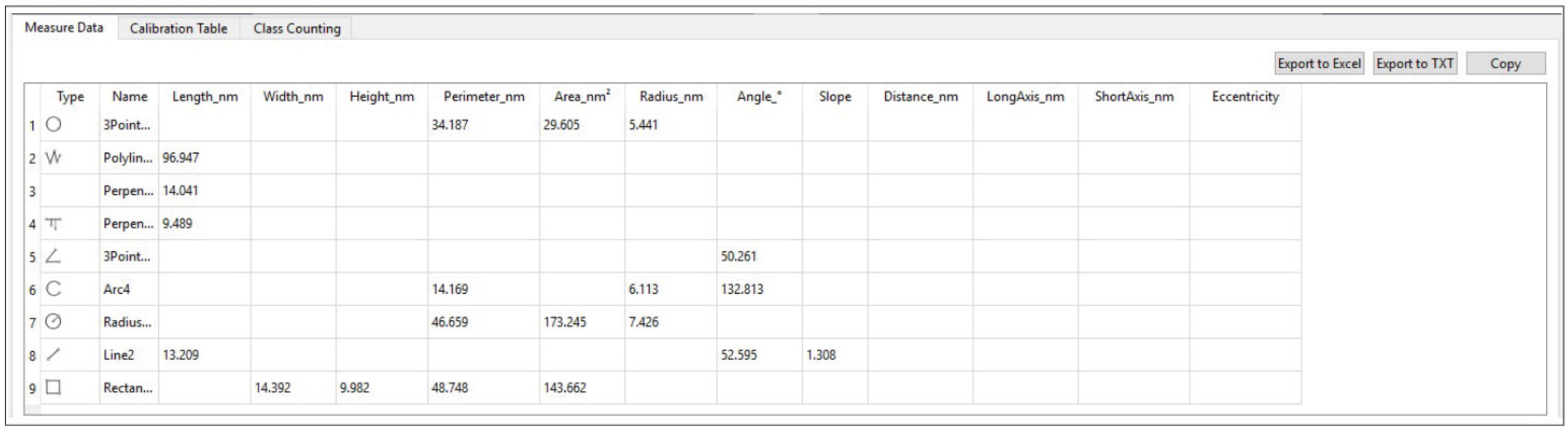
Combined: When saving the image, the drawn or measured graphics or texts will be attached onto the image. The default status of the software to this module is active

Data Property: Each type of graphic has its own data property type, such as the properties of length, perimeter, area, etc. When drawing the graphic, the property of it will also display

Within the status of graphics drawing, right click the mouse to quit and exit status and recover to the under selecting status. When the mouse is in the , state, scroll the wheel to zoom in on the picture, and hold down the mouse to drag the picture. When the mouse is in the , state, scroll the wheel to zoom in on the image, hold down the mouse on the graph to drag the graph, and hold down the mouse on the endpoint of the graph to change the graph



All drawing and measuring graphic data information will be saved in the measurement table. Click [Export to Excel] or [Export to TXT] to transfer the data information to EXCEL form format or TXT document format. Click [Copy] to copy the entire table to other places for paste


Measure Data | Calibration Table | Class Counting

Export to Excel | Export to TXT | Copy

	Type	Name	Length_nm	Width_nm	Height_nm	Perimeter_nm	Area_nm²	Radius_nm	Angle_°	Slope	Distance_nm	LongAxis_nm	ShortAxis_nm	Eccentricity
1		3Point...				34.187	29.605	5.441						
2		Polylin...	96.947											
3		Perpen...	14.041											
4		Perpen...	9.489											
5		3Point...							50.261					
6		Arc4				14.169		6.113	132.813					
7		Radius...				46.659	173.245	7.426						
8		Line2	13.209						52.595	1.308				
9		Rectan...		14.392	9.982	48.748	143.662							

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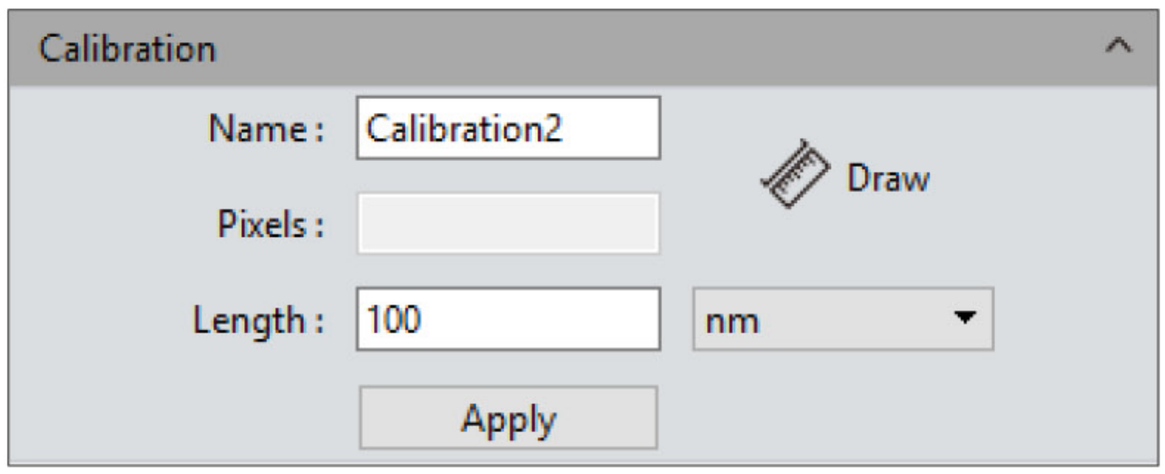
Calibration

Create a calibration table: to convert the number of pixels into practical and international standard units of measuring. Click [Draw], draw a straight line on the image, convert the length into measuring unit by the indicated pixels number on the line. Create a name for the calibration scale and confirm the converting formula from pixel to measuring unit



Note:

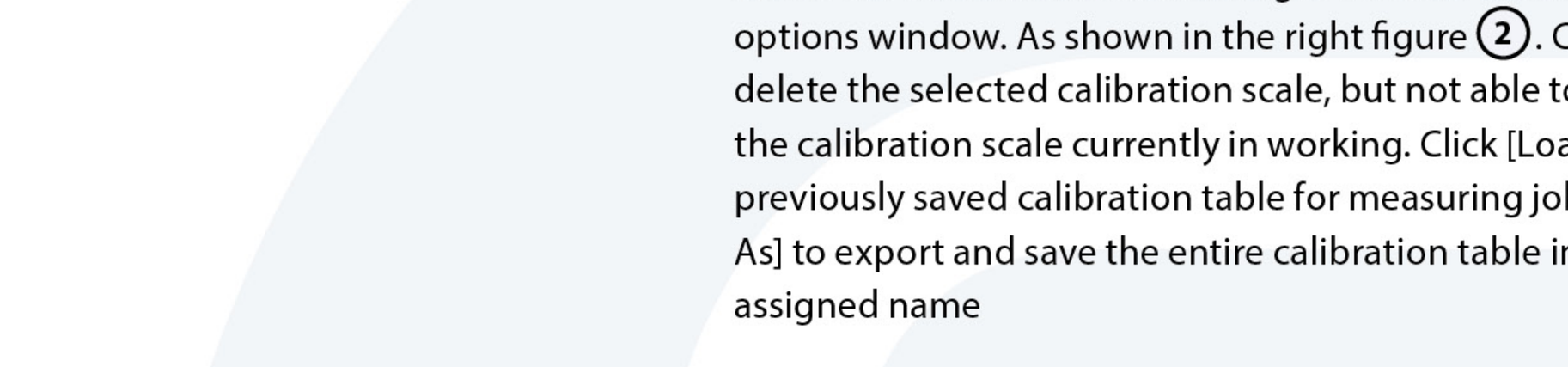
The acceptable measuring units to be converted to are:

nm\μm\mm\inch\1/10inch\1/100inch\1/1000inch

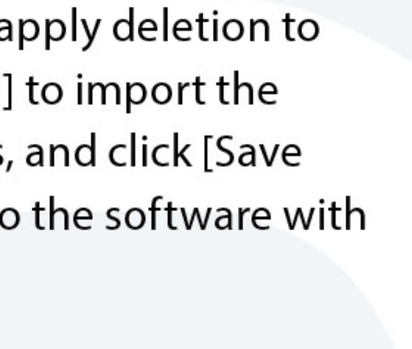
- **View/Edit Calibration Table:** Users can create multiple groups of calibration scales at the same time for the switching uses of multiple measuring application scenes. The calibration scales can be viewed or edited on the calibration table as shown in the right figure ①
- Select a calibration ruler and check the [Current] to switch the one calibration scale to other or change the incorrect scale to correct one and then apply it to the later measuring application
- Select the calibration scale and right click the mouse to take out the options window. As shown in the right figure ②. Click [Delete] to delete the selected calibration scale, but not able to apply deletion to the calibration scale currently in working. Click [Load] to import the previously saved calibration table for measuring jobs, and click [Save As] to export and save the entire calibration table into the software with assigned name

Note:

Calibration processing can be performed more accurately with a micrometer. Using an incorrect calibration table will lead the measurement results to be completely wrong. Special cautions must be used to select the correct calibration table before working on images measuring



①



②

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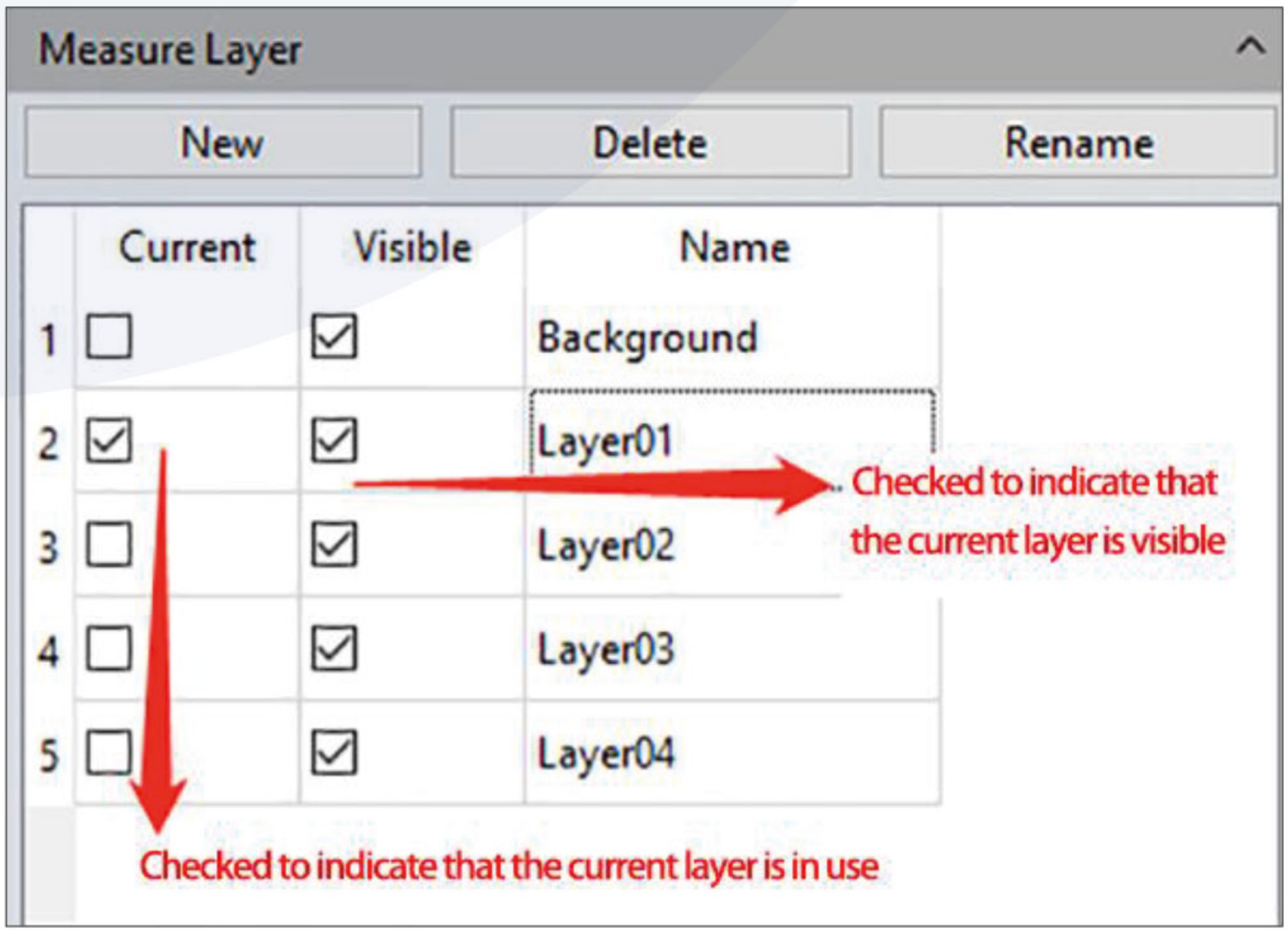
Measure Layer

- Creating multiple layers on the image, user can make different measurements on different layers of the image
- This layer creating module meet the needs of a large number of image measuring and image further processing applications
- If some targets on the current image have already been measured, the layer creating function will automatically create a “Background” and named it as “Layer 01”, the current measurement results will be automatically displayed in “Layer 01”.
- You can choose to display the measurement data from different layers or choose to view the different layers
- Check the box which the related layer belong to under the defined window of [Current] to display the layer you want to preview. Check on different box to switch to different layer you want to display
- Check on the box under the defined window of [Visible] to display the measurement results of the corresponding layer
- Click [New] to create a new layer, you can customize the new layer name. The default layer naming principle is by “Layer 01”, “Layer 02”, “Layer 03”, it means that the layer name with increased number, which related from early to later by the time the layer was created
- Click [Delete] to delete the selected layer
- Click [Rename] to rename the selected layer



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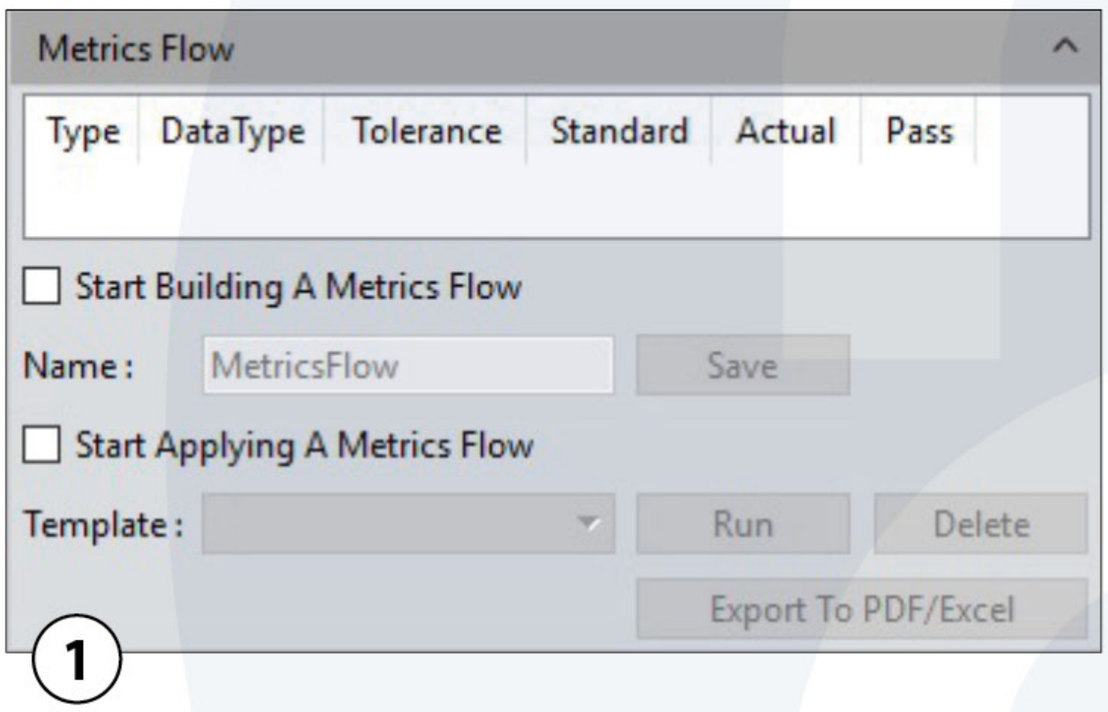
Metrics Flow

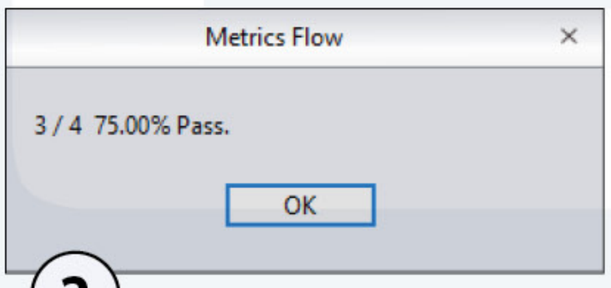
Capture provides powerful metrics flow function for convenient and semi-automatic measurements in the passing-rate detection of batches of industrial devices or parts

1. Open a group of the devices or parts images saved in the image gallery
2. Select the image of the standardized sample (or we call this image as the reference image) to calibrate and set the tolerances for later measurements and detections
3. Click[Start Building A Metrics Flow] to create a new metrics template
4. Use the different measurement tools to measure or draw any of the desired shapes on the reference image opened before. The running template will record the whole measuring or drawing process and save the measuring results or drawing graphics as the reference specifications. As shown in the right figure ①
5. After setting the referencing information on the template, user can name the template personally, click [Save] to complete the setting and saving of the measurement flow template
6. Click [Start Applying A Metrics Flow], select the created template, click [Run] button to apply the template, click [Delete]to delete the template created and saved before
7. Select the image to be detected and operate as the procedure as that on creating template
8. After the operating of the software on the image to be detected, [Run] button will be released and a window showing the detecting results will pop up automatically. As shown in the right figure ② ③
9. Click [Export to PDF / Excel], to save as PDF format or export to in Excel format with the detecting results
10. Continue to click [Run] to select the next image need to be detected, repeat the procedures of steps 7, 8, and 9 directed above
11. After finishing all the images need to be detected, click [Stop Applying A Metrics Flow] to stop the working of the software function of measurement flow

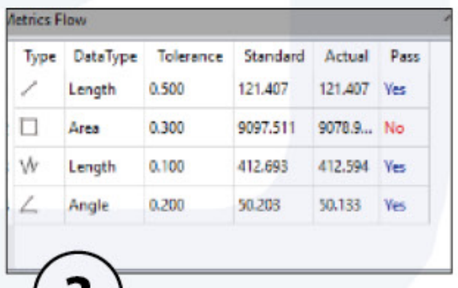


①





②



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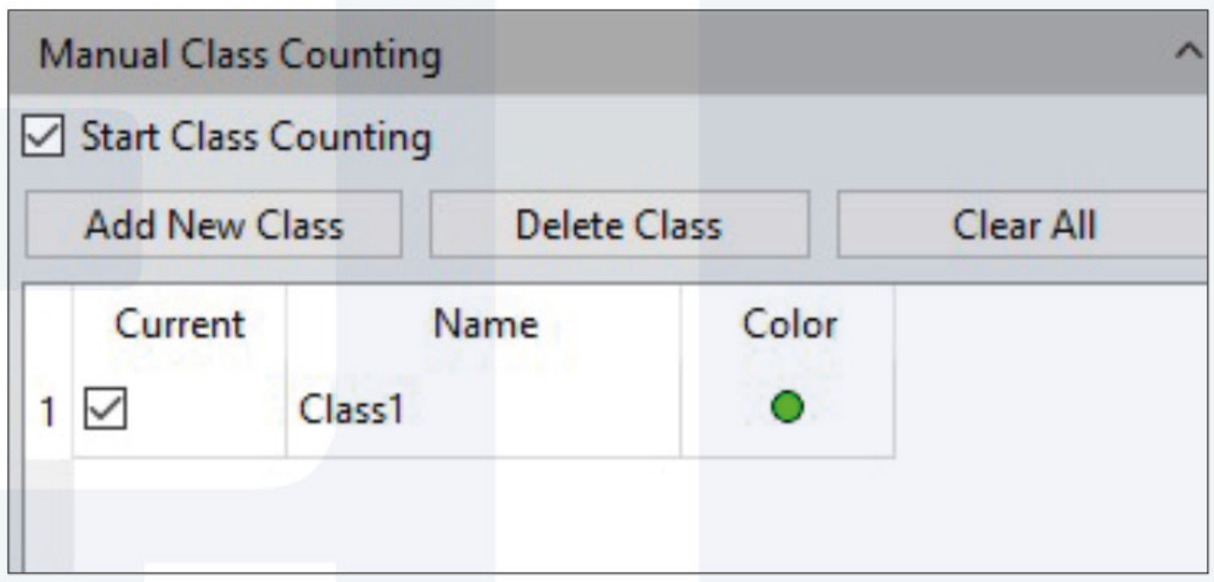
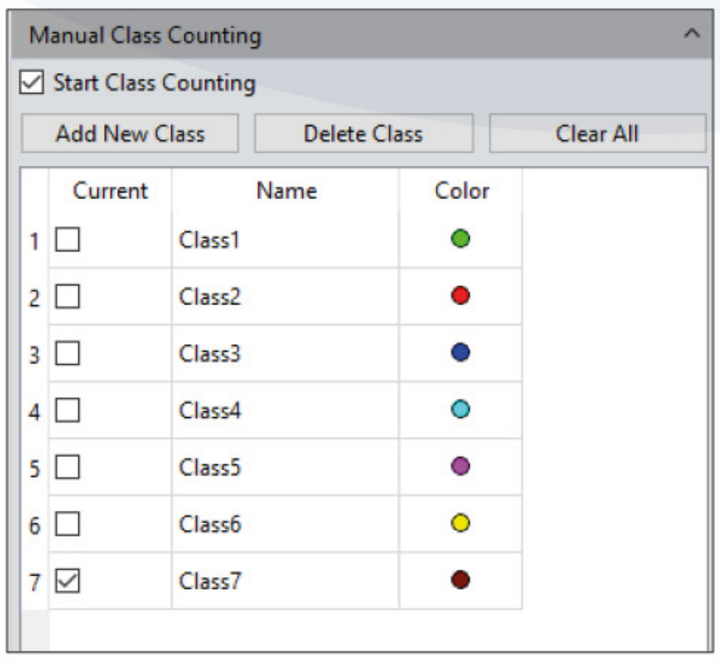
Manual Class Counting

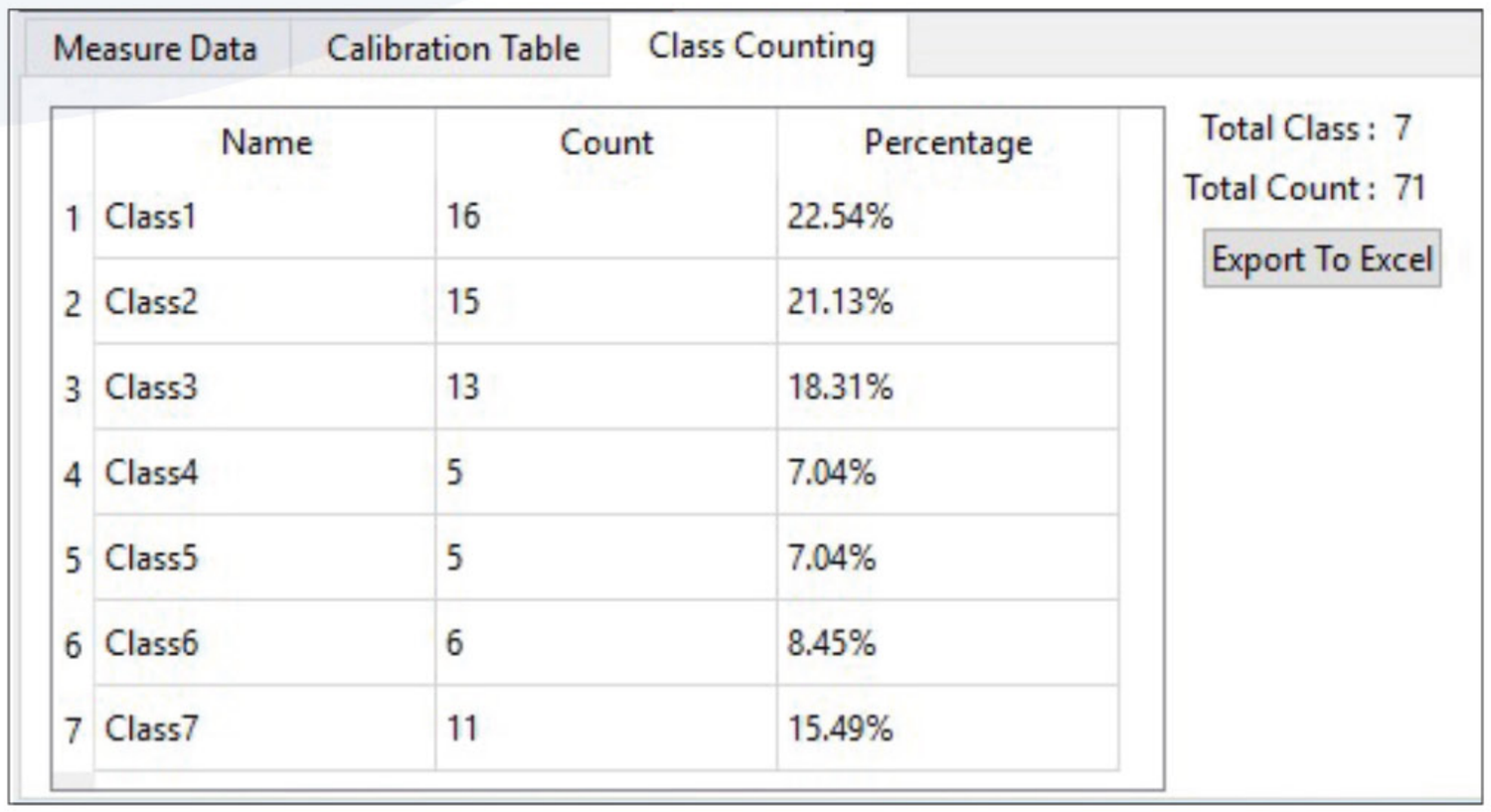
User can classify and count different categories of cells with the manual counter from the Capture software, there are 7 different categories available



- Double-click the category button to name the category personally
- Click the button of [Color] to display the palette to choose the desired color
- Click [Add New Class] to creata new category
- Click [Delete Class] to delete the selected category
- Click [Clear All] to clear all categories and clear the whole counter table simultaneously
- Click [Start Class Counting] to select a certain category, click the left mouse button on the targets on image to count. The counted results will be automatically display on the counting table, as shown in the following figure (1)
- After the counting with one or different categories, all the counting results data will be displayed on the counting table, select [Export to Excel], and export the data to the Excel forms, as shown in the following figure (2)



(1)



(2)

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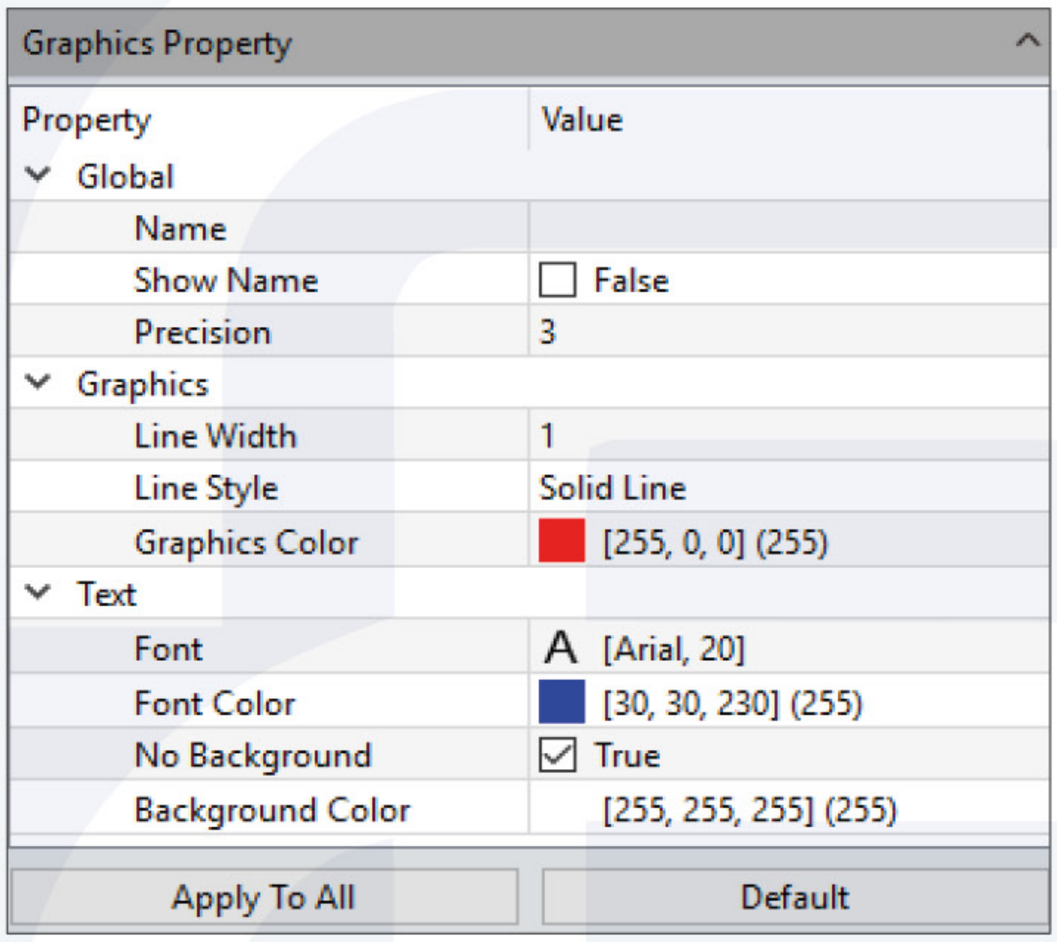
Graphic Property

Capture allows the user to set the graphic properties to meet the user's needs

- Create or change a name on the blank right next to the [Name] column
- Show Name: Check if you do not need to display of the name
- Precision: choose the display precision after the decimal point, the default value is 3, the range is 0~6
- Line Width:To display line width of the measurement tool currently applied on the image. The default is value 1, the range is 1~5
- Line Style:Select the styles of measurement tools currently applied on the image. The default style is the solid line, software supporting solid lines, dashed lines, dotted lines, dotted lines, and two dotted lines
- Graphics Color:choose the colors for the measurement tools applied on the image, the default color is red, colors could be chosen from […]
- Font:Choose the font format for the currently applied measurement data, the default format is [Arial 20], click on […]to choose the desired format
- Font color:Choose the color for the currently applied measurement data, the default color is blue, click on […]to select the desired color
- No Background:check or uncheck the blank of True to set the background as transparent background , or with background, transparent background is the default setting
- Background Color: Select the background color for the current measurement data on the image. Click out […] to choose the desired background color, the default background color is white
- Apply to All:Apply all the set parameters above to the measured graphs
- Default:Resort and apply the default parameters settings to the measured graphs



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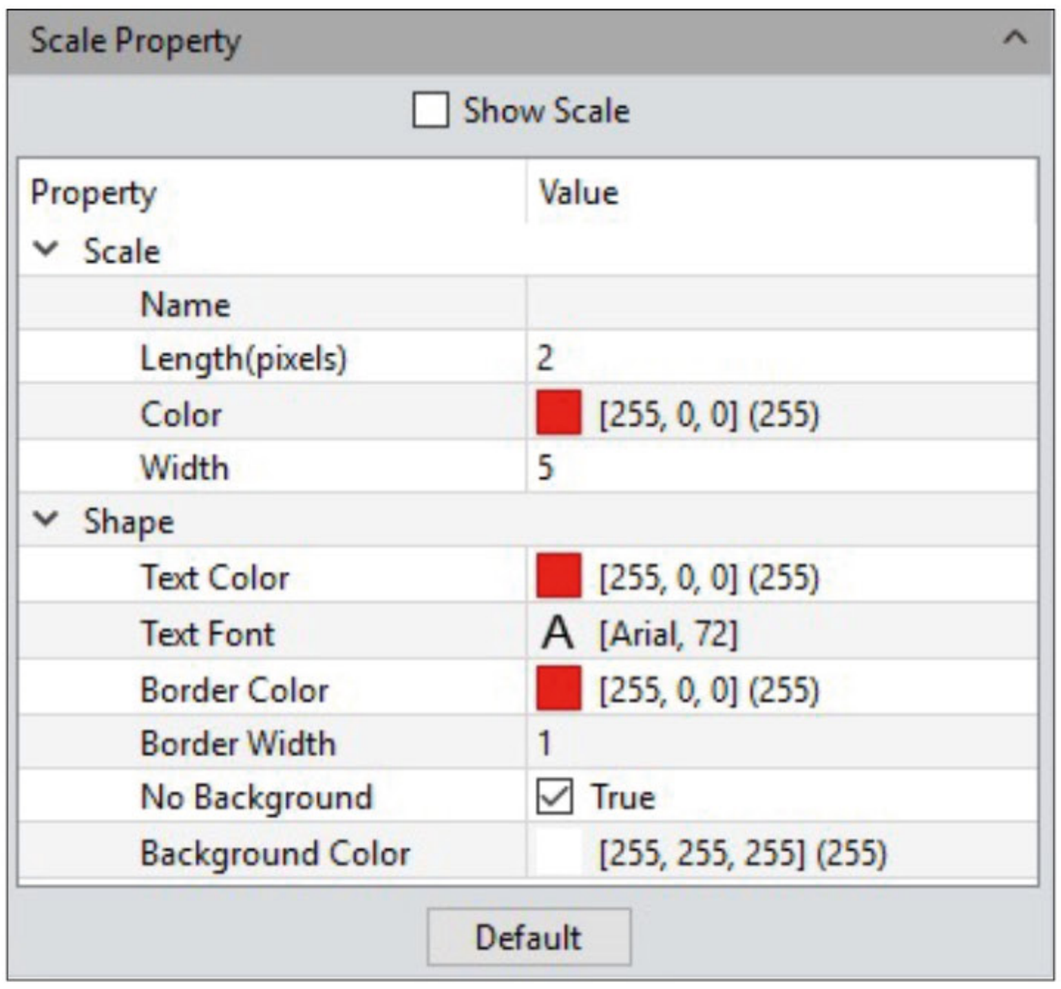
Scale Property

ImageFocus Plus allows the user to set the scale properties for the user's actual needs

- **Show Scale:** check on the blank to select to display the scale on the measured image or not; the default setting is not showing the scale, if check to show the scale, the scale will automatically be shown on the left top of the image, use can use the mouse to drag the scale to the position he desires
- **Name:** Create name for the scale applied o the current, the default setting is blank
- **Length:** The default value is 100 pixels, that is, the scale is displayed in total length of 100 unit pixels, and this value can be modified by entering new value
- **Color:** Choose the color for the current applied scale on the image, the default color is red, Click on[…]to choose the desired scale color
- **Width:** enter the value of width for the scale on applied the image, the default value is 5, range 1~5
- **Text Color:** Choose the color for text of the scale currently applied on the image, the default color is red, click on […]to select the desired color
- **Text Font:** Choose the font format for scale currently applied on the image, the default format is [Arial 28], click on […]to choose the desired format
- **Border Color:** Choose the color for border of the scale currently applied on the image, the default color is red, click on […]to select the desired color
- Border Width:enter the value of width of the scale currently applied on the image, the default value is 5, range 1~5
- **No Background:** check or uncheck the blank of True to set the background as transparent background , or with background for the scale currently applied on the image , transparent background on the scale is the default setting
- **Background Color:** Select the background color for scale currently applied on the image. Click on […]to choose the desired background color, the default background color is white
- **Default:** Resort and apply the default parameters settings to the scale on the image



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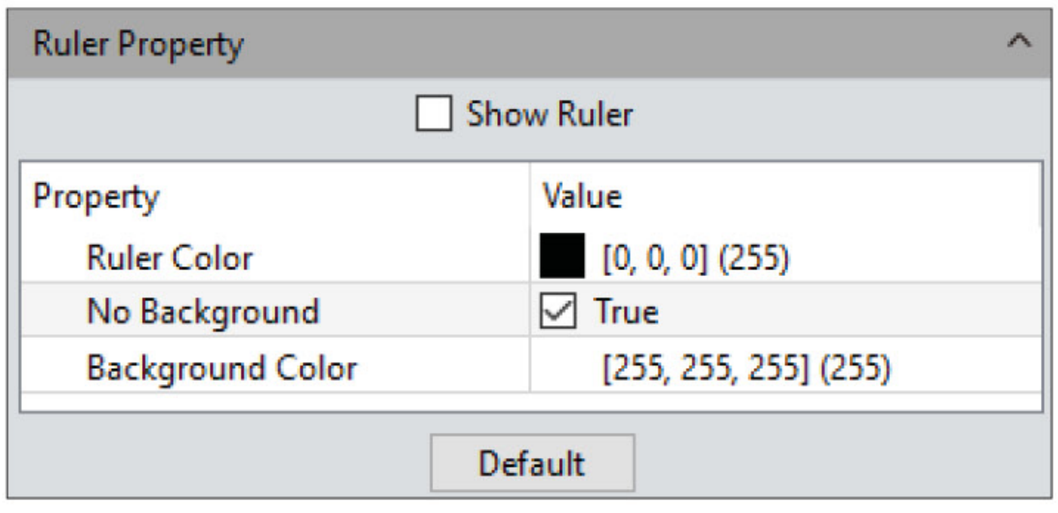
Ruler Property

ImageFocus Plus allows the user to set the crosshair properties of the image according to his actual needs

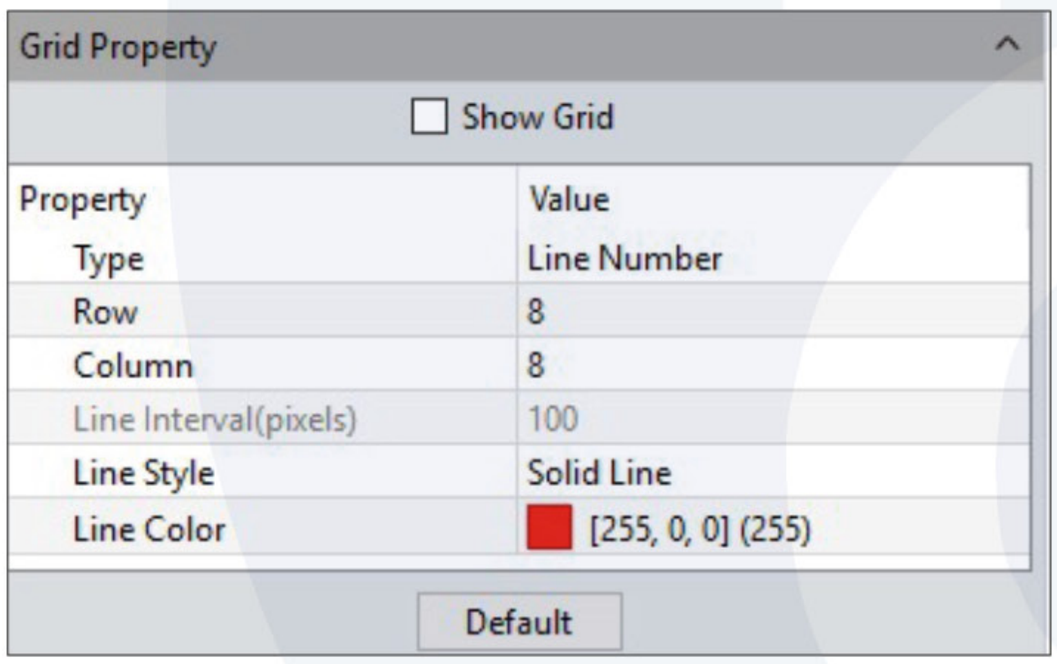


- **Show Ruler:** check on the blank to select to display the crosshair on the image or not; the default setting is not showing the crosshair
- **Ruler Color:** choose the color for the current applied crosshair on the image, the default color is black, Click on […]to choose the desired crosshair color
- **No Background:** check or uncheck the blank of True to set the background as transparent background , or with background for the crosshair currently applied on the image , transparent background on the crosshair is the default setting
- **Background Color:** select the background color for crosshair currently applied on the image. Click on […]to choose the desired background color, the default background color is white
- **Default:** resort and apply the default parameters settings to the crosshair on the image

Grid Property

ImageFocus Plus allows the user to set the grid properties of the image according to his actual needs

- **Show Grid:** check on the blank to select to display the grid on the image or not; the default setting is not showing the grid
- **Type:** Select the way to set the grid to apply to the current image
- **Row/Column:** If you choose to define the line number, you can enter the numbers of the line on rows and columns applied on the image.Thedefault numbers of row grid and column grid are both 8
- **Line Interval:** If you choose to define the grid by the line interval, you can enter the number of grids you need into the blank of Line Interval, the default number of line interval is 100



- **Line style:** Choose the line style for the grid to apply on the image there are 5 styles of grid could be chosen from, the solid lines, dashed lines, dotted lines, dotted lines, and two dotted lines
- **Line Color:** Choose the color for the grid to apply on the image, the default color is red, Click on […]to choose the desired grid color
- **Default:** Resort and apply the default parameters settings to the grid on the image

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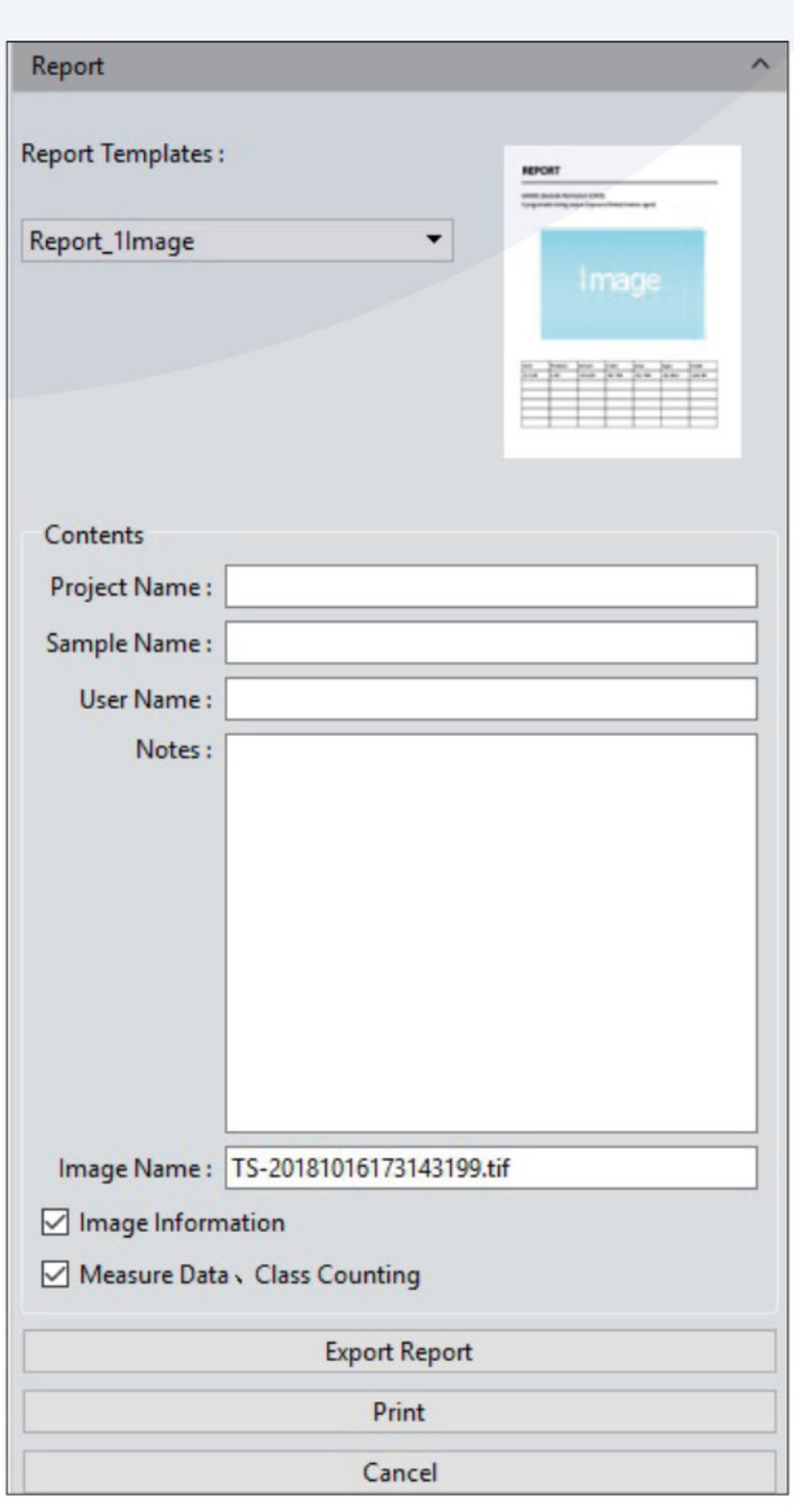
Report

ImageFocus Plus provides report formats to export the measurement data to your working report documents

- **Report Templates:** choose your desired format of report template
- **Project Name:** enter your personal name for the project you are working on, this name will show up on your working report
- **Sample Name:** enter the name of your sample in this project, this name will show up on your working report
- **User Name:** enter the name of the user, or conductor, or worker, or reporter
- **Notes:** enter the notes, supplement information or any or the comments you need to record down from reference for this job in this working report
- **Image Name:** enter the name of the image you captured before, then the image can automatically be loaded on the report
- **Image information:** check on the blank to show the information of the image you just pulled out, un-check to vanish the information, the default setting is showing out the information of the image on the report
- **Measure Data, Class Counting:** check on the blank to show the measurement and counter tables of the current image on the report, the default setting is showing out the measurement and counter tables of the image on the report
- **Export Report:** export current report into a document of with PDF format
- Print:Print the current report
- **Cancel:** cancels this operation, it means clearing out all the report information just entered or loaded in



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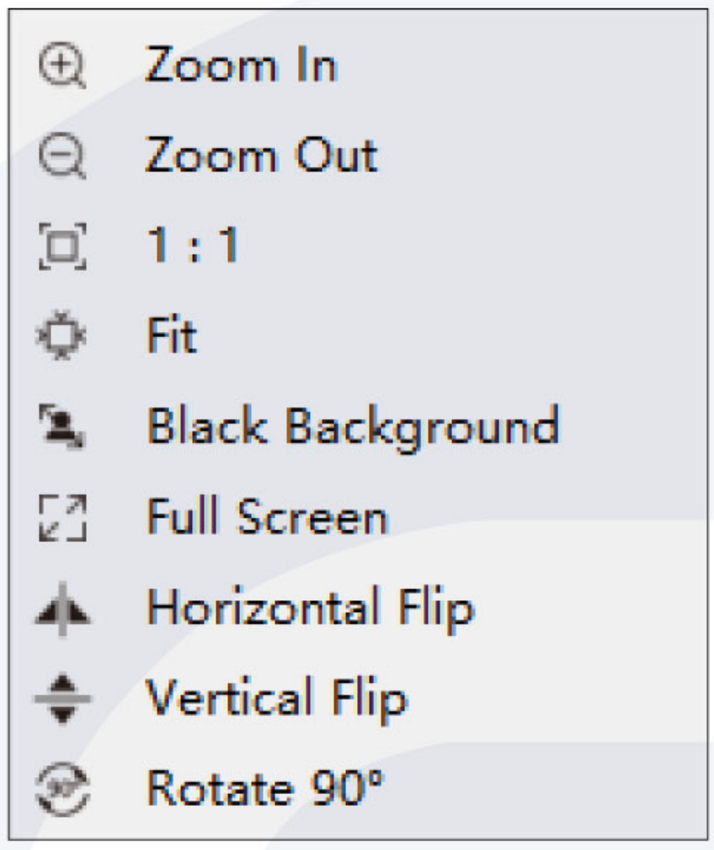
Display

- **Zoom In:** Magnify the current image and let it display larger than its original size
- **Zoom Out:** Reduces the current image and let it display smaller than its original size
- **1:1:** The current displaying image is in its 1:1 original size
- **Fit:** Adjust the showing size of the image to fit the software operating window
- **Black Background:** The image is in full screen and the background of the image is default to be black. Type the[Esc] button of the computer keyboard or click on the Back Arrow symbol on the right down corner of the screen to exit the black background mode
- **Full Screen:** Enable the image to be full screen. Type the[Esc] button of the computer keyboard or click on the Back Arrow symbol on the right down corner of the screen to exit the full screen mode
- **Horizontal Flip:** Horizontally mirrors the current image
- **Vertical Flip:** Vertically mirrors of the current image
- **Rotate 90°:** Rotate the current image clockwise, 90 degrees each click



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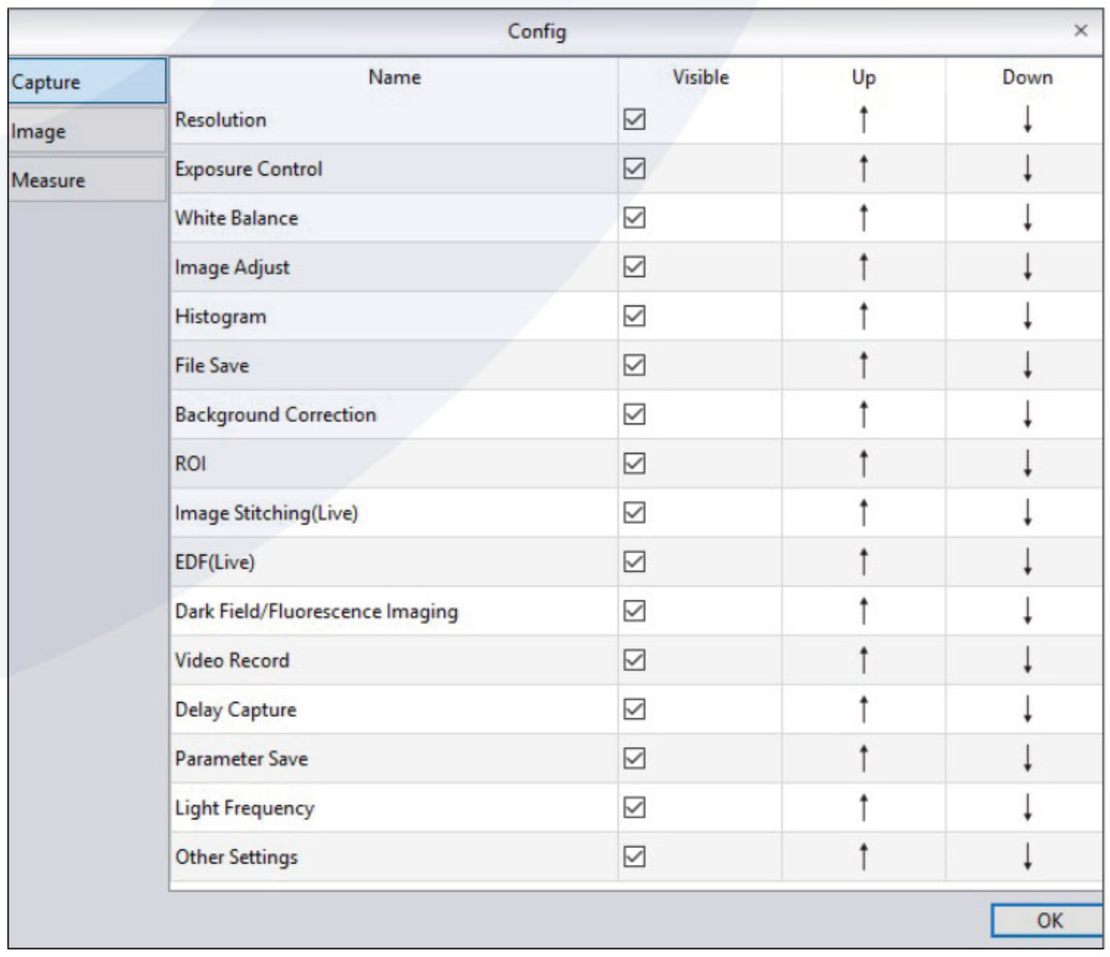
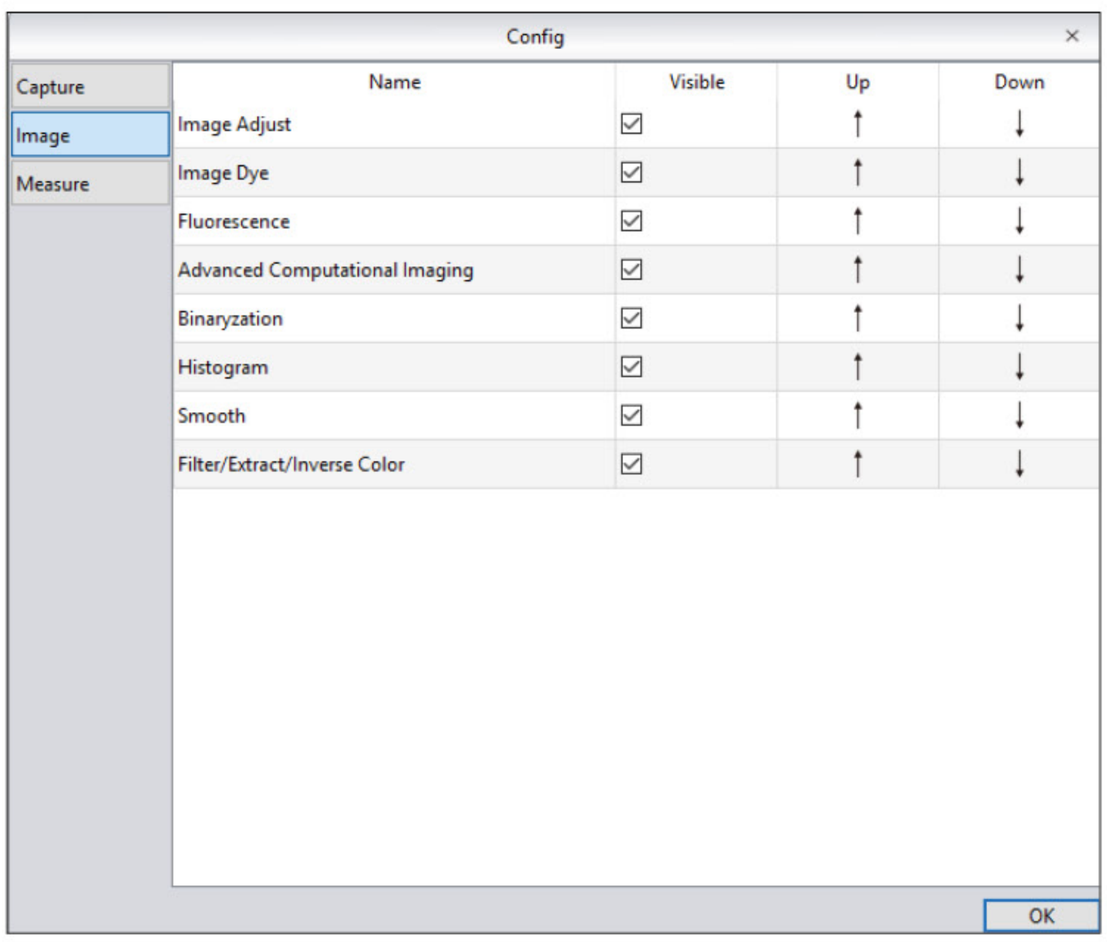
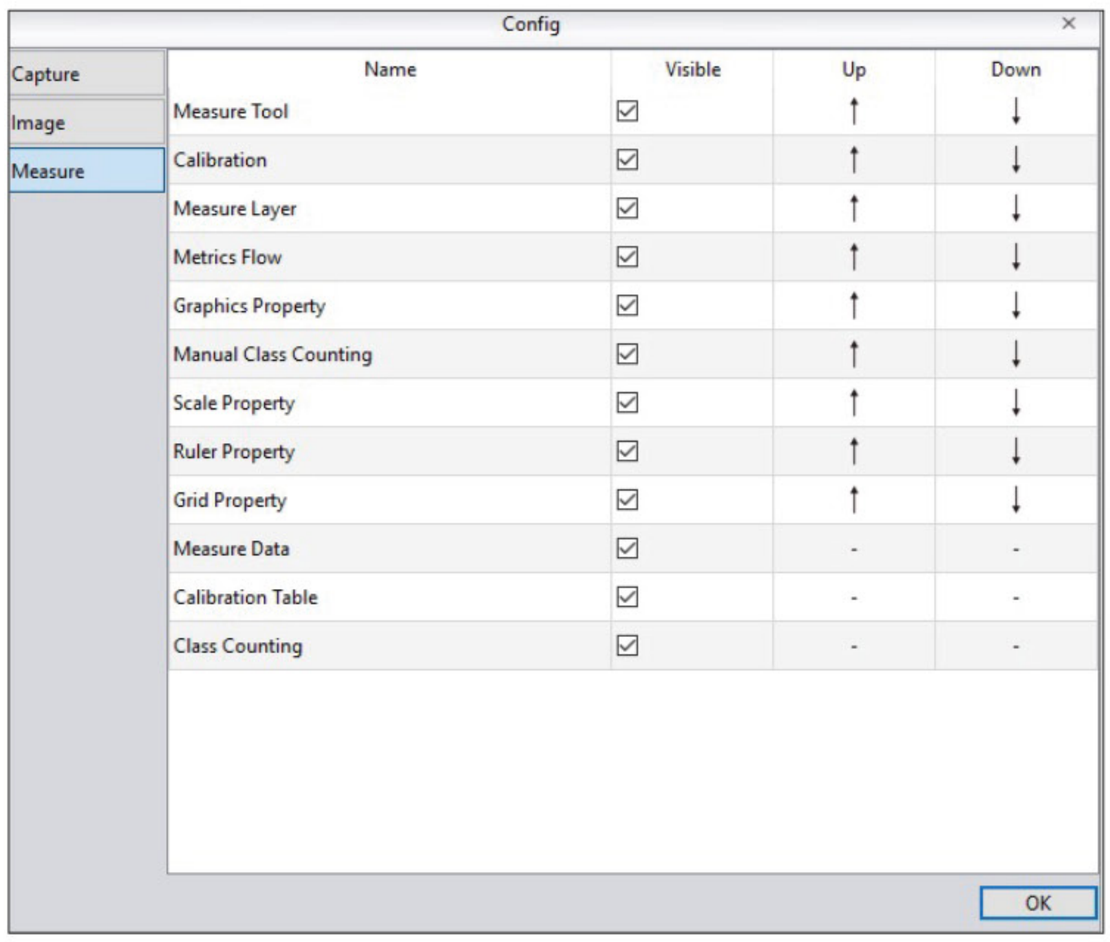
Configuration

- **Shown:** Check module to display on the software interface.Unchecking of the blank next to the module means that the module will not be displayed on the interface. All modules are checked by default
- **Up:** The shown module can be moved up, and the interface layout changes accordingly to the moving
- **Down:** The shown module can be moved down, and the interface layout changes accordingly to the moving







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Info

Preferences

The software language can be selected. The software needs to be restarted to take the language setting into effect

Help

The software operation instructions can be called out for the user to learn and refer

About

There is more information, such as the camera current working, the versions of the software and the information of the operating system could be found under the [More Information] section



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Customer Services

In order to save your time, please prepare the following information in advanced before contacting your Euromex microscopes Reseller:

- Camera model and S/N (product serial number)
- Software version number and computer system configuration information
- As details as possible of description of the problems and any images help to indicate and show to the problems
- Copy of your invoice

Notes

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CE LRQA CERTIFIED ISO 9001 LRQA CERTIFIED ISO 13485 LRQA CERTIFIED ISO 14001