

GT Vision image acquisition, managing and processing software

## GXCapture 8.1

### Instruction Manual




- Contents of the Instruction Manual

- GXC is the shortened name used for GXCapture
- Square brackets are used to indicate items such as menu

names, button names and window names that appear on the computer screen.

- >> indicates the selection procedure of the menu. Example:

[Capture] >> [Main Control] >> [FlatFielding]

-  : Marks tips for using the software.
-  : Marks information that should be read before use.
-  : Marks additional information that you may find helpful.

- Help

- Refer to [Help] >> [About GXCapture] menu to get software information and technical support.

- When contacting technical support, please try to list the below information:

- ① Camera model and S/N (serial number);
- ② Software version number;
- ③ Description of the problem. If you have some screenshots of the problem,

it will be much appreciated.

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## Main Features of GXCapture 8.1

- Advanced camera control
- Ability to take still images and video. Available image types: JPEG, BMP, TIFF and RAW.
- Convenient fluorescence imaging settings
- Live image measurements
- Image management
- Extend depth of focus (Focus Stacking)
- Image Stitching
- Fluorescence combination function for still images
- High dynamic range (HDR) function.
- Still image measurements.

## System requirement

<b>OS</b>	Windows XP/ Vista/ 7/ 8 (32 & 64bit)
<b>CPU</b>	Intel processor (Core2 Duo or higher is recommended)
<b>Memory</b>	2GB or More is recommended
<b>USB ports</b>	USB2.0 Hi-Speed port

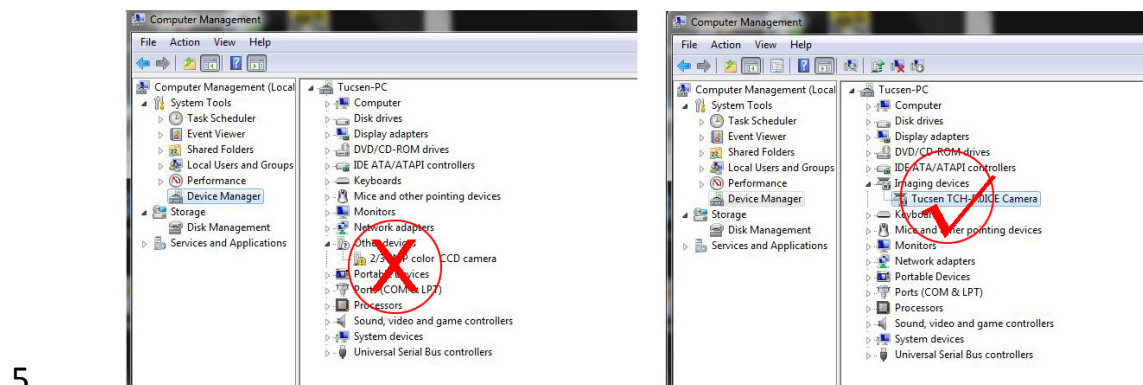
## Chapter1: Getting Started

This chapter explains preparatory steps and basic GXCapture (GXC) operations.


### What You Need

To use the GXCAM camera, you need to install the camera driver and application software GXCapture:

1. Find the GXCapture Setup.exe file from the CD, double-click on it to start the installation and hit “Next”.
2. The installer package selects the “C:\Program Files\” as the default file destination.
3. After installing the software, please install driver setup file also.
4. After the installation is finished, please go to the Device Manager to check if the driver was installed properly. When the driver is installed correctly, there is **no yellow mark** with the camera under the Imaging Device in Device Manager. Please see below picture:



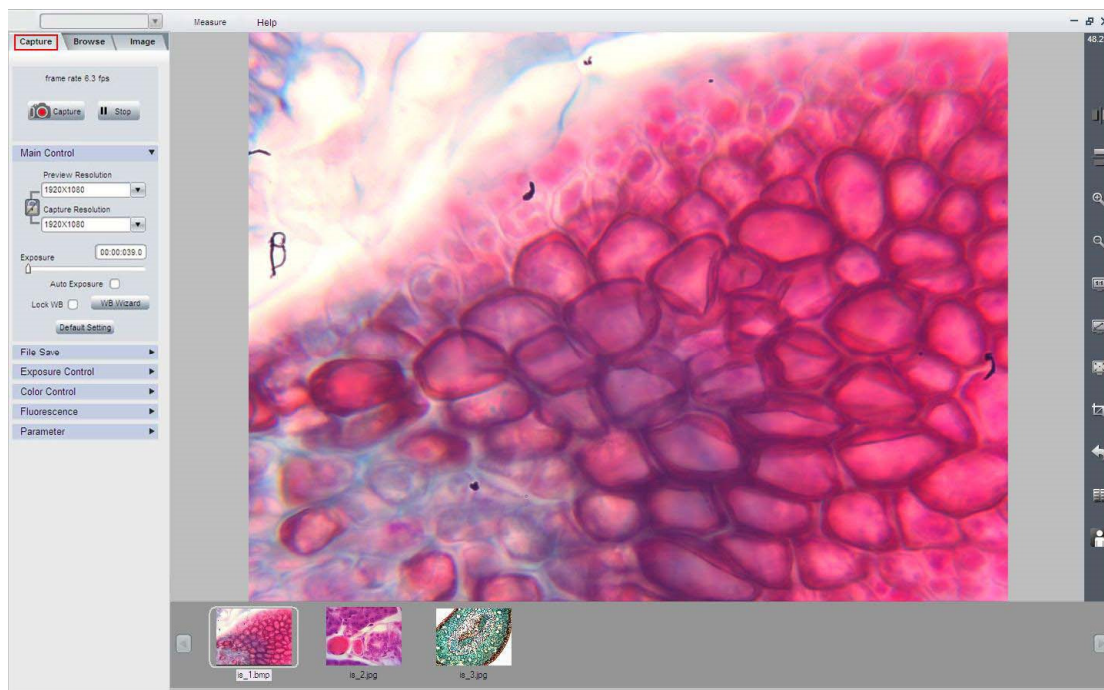
## Starting up GXCAPTURE

After the installation, a software shortcut  will be created on the desktop. Double-click on it to start GXCAPTURE (hereinafter, 'GXC').

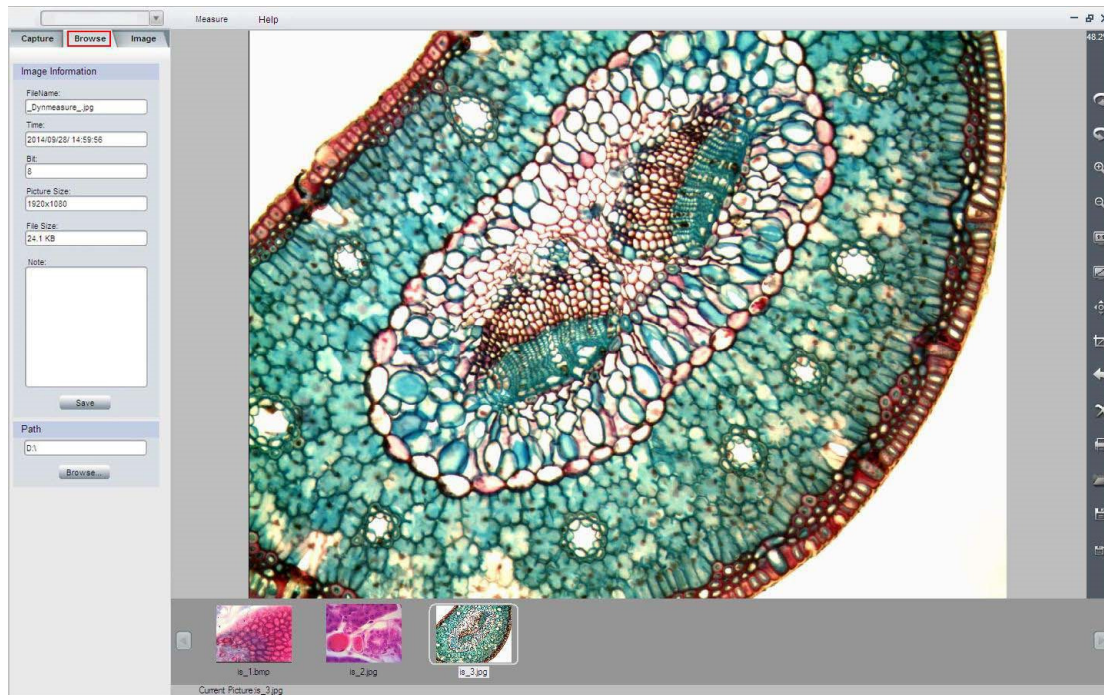
**Note:** Before starting the software, please connect the camera and turn on the power (if applicable) first.

When GXC starts up, the live image window appears. You can set up the parameters to get proper images, save still pictures or videos. The [Capture] window provides image acquisition settings. [Browse] windows allows you to manage all your images. And the [Image] window offers advanced image processing functions on captured images.

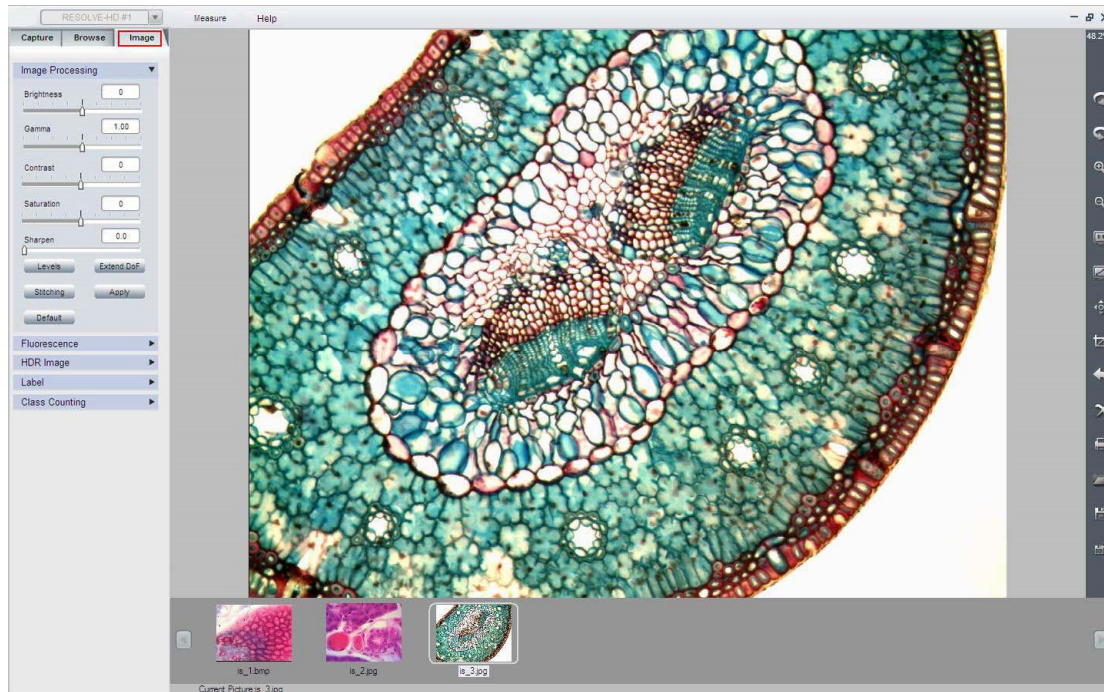
[Capture] window - typical appearance:



[Browse] window - typical appearance:

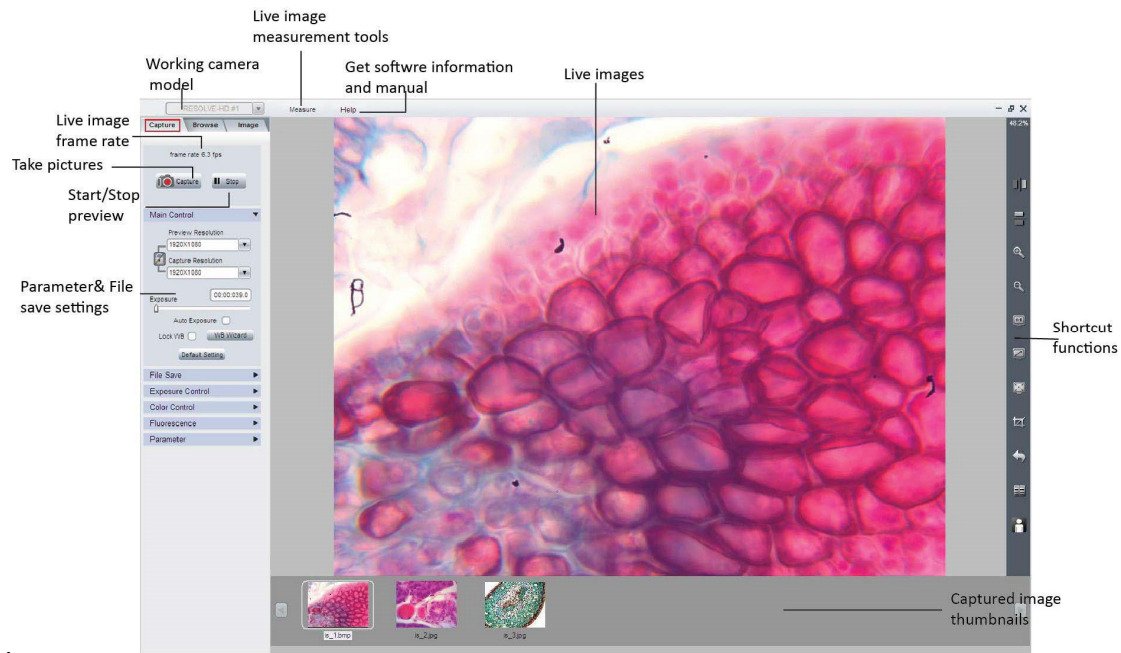


[Image] window - typical appearance:

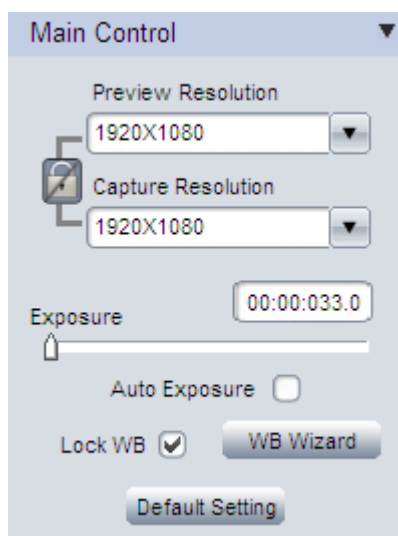


## Chapter 2: Image Acquisition

Adjust camera parameter settings to get the optimal live image; live image measurement and save still pictures and videos.




### Basic Control



Provides the basic camera settings:

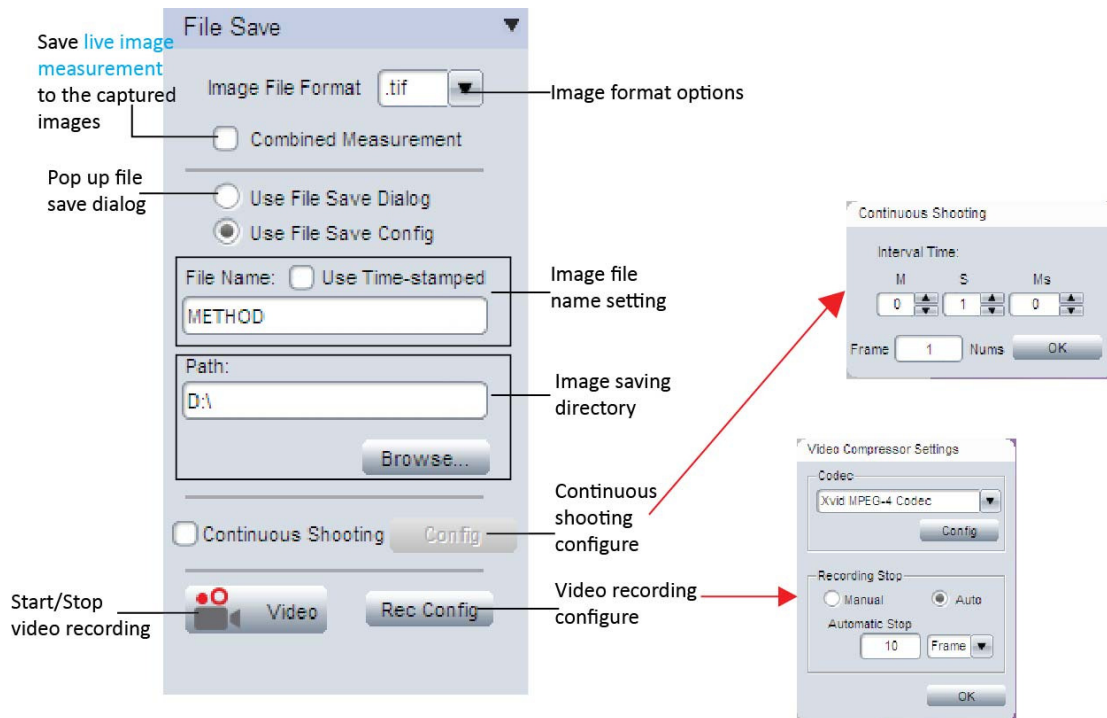


Preview Resolution 1920X1080	Live image resolution	Select resolution for live image
Capture Resolution 1920X1080	Captured image resolution	Select resolution for capturing
Exposure 00:00:033.0 Auto Exposure <input type="checkbox"/>	Exposure Time	Change Exposure time to adjust image brightness. Auto Exposure mode will adjust proper brightness image automatically.
Lock WB <input type="checkbox"/>	Lock White Balance	Unchecked: Auto White Balance mode. Apply white balance calculation for every frame image.  Checked: Lock the White Balance calculation result.
WB Wizard	White Balance Wizard	Wizard for getting better White Balance result.
Default Setting	Default settings	Restore all the parameters to default value

 After you set the correct exposure for the live image, it is recommended to apply White Balance to correct the live image colour. To get better white balance effects, please follow below steps:

1. Move the sample to the blank area;
2. Uncheck [Lock WB];
3. When the image appear the correct colour, check the [Lock WB] check box;
4. Move the sample back.

## Taking Still Images and Videos

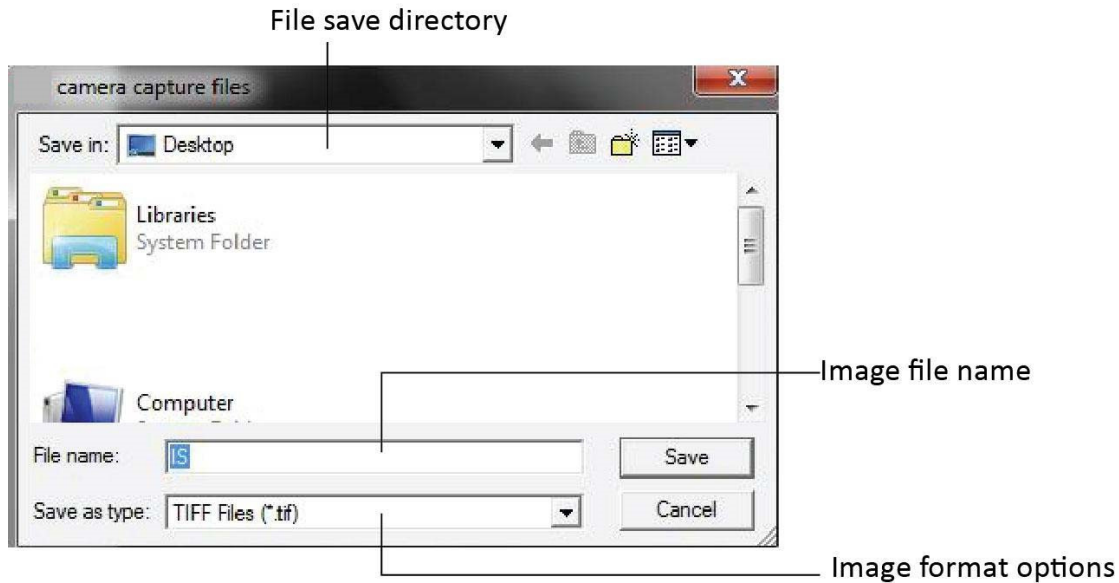


- In the [File format] dropdown menu, 4 file formats are available: **JPEG, BMP, TIFF and RAW.**



Raw image file contains minimally processed data from the camera. It needs to be read in some special software for example Photoshop, ImagJ etc. If it is the colour camera raw file, colour information only can be seen after decoding the Bayer matrix

- In [Use File Save Dialog] mode  **Use File Save Dialog**, a file save configure window will pop up every time when you push [Capture] or [Video] button. Enter the desired file name and directory path at this pop-up window.



- In [Use File Save Config]  Use File Save Config , you can pre-set the file saving name, format, image quantity, capturing interval time and saving directory. After you push the [Capture] or [Video] button , GXC will save files as you have set.

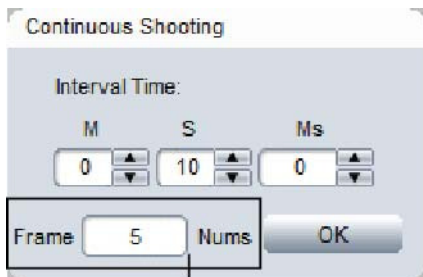
### Capturing and Saving Individual Images

- Enter preferred name in the [File Name] field  . If do not key in anything, “GX” is used by default.
- Select [Use Time-stamped]  Use Time-stamped to name the image by the capture time automatically. The time-stamp file name will be in the form of “MMDDHHmmSS”. Here “MM” indicates the month; “DD” indicates the day; “HH” indicates the hour; “mm” indicates the minutes; and “SS” indicates the seconds.

- Click [Capture] to take one image with the pre-set file name.

### Capturing and Saving a set of Images



- Click [Continuous Shooting] checkbox  Continuous Shooting, the software will automatically save a set of images after pressing [Capture] one time.
- Click [Config] to set continuous capturing image numbers and the interval time .



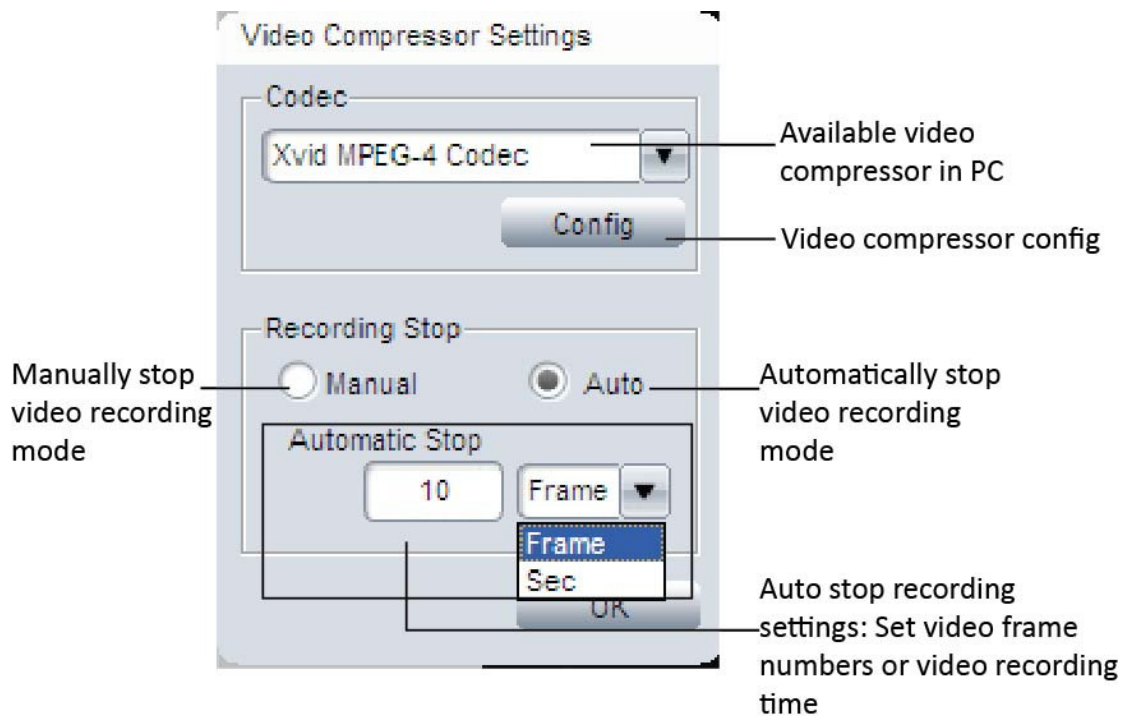
Number of frames for continuous shooting

- This set of image file names follows the same format as set for individual image capturing. If using [File Name], the image names will be in the form “X”, “X-1”, “X-2”... (where X is the character/s entered or “GX” by default).

## Video recording

Click [Video]  / , start/ stop video recording.

Click [Rec Config] to get video recording configure window.



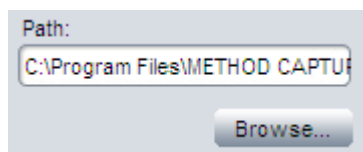
It provides [Manual] and [Auto] modes to stop the recording.

- In [Manual] mode, you need to click on [Video] button to start and stop the recording.
- In [Auto] mode, pre-set the number of frames or the time for videos and click on [Video], GXC will stop the recording automatically after save pre-set number of frames or pre-set time is up.
- [Rec Config]>>[Codec] will also list all the available video compressors on the PC.



The video taken without any compression will be a very large size. GX Will automatically search the [installed video compressors](#) installed on the PC.

## File Save Destination

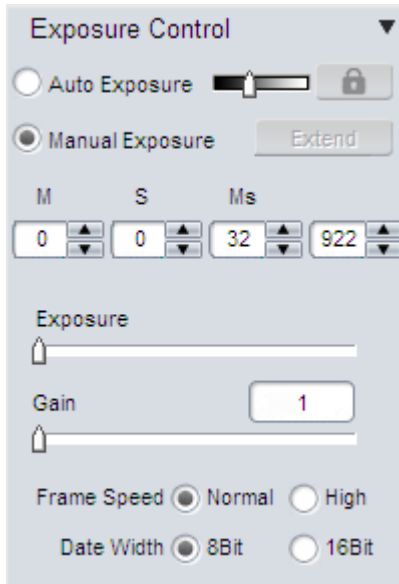


Click [Browse...] to change the file save destination. The default path is the software installation folder. Usually it is “C:\Program Files\GXCAPTURE\”.



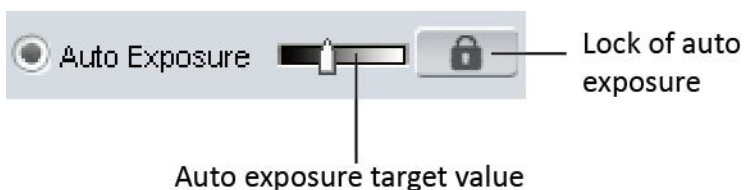
This default destination might **NOT** be allowed for storing any files if the user is not logged in as Administrator in [Windows Vista, 7 or later](#). The image may not save if the default path is used. We recommend either to change the file save path or release this folder “Write” authority for other user accounts.

## Exposure Control



Change the Exposure time, Gain to adjust the image brightness. Select frame speed to get different live image frame rate. Set 8-bit or 16-bit data width for captured images.


## Auto Exposure



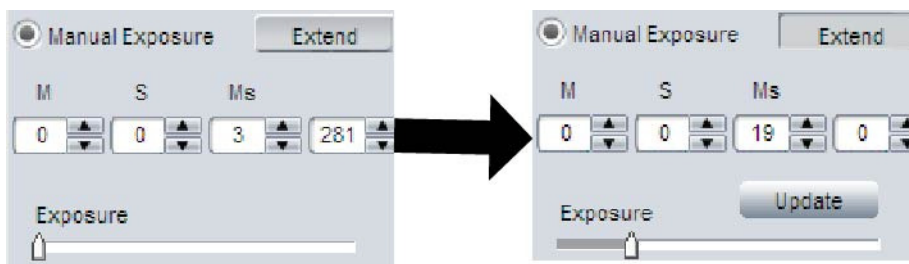
- Check [Auto Exposure] checkbox, software will adjust the exposure time automatically to get proper brightness for the live image.

**Auto exposure target value:** Set the reference exposure time for auto exposure adjustment. It helps the auto exposure to find the proper exposure time faster.



For example, if the imaging target is quite bright, we set lower target value to tell the software it is not necessary to set exposure too long.


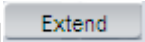
- Lock: It will **stop the auto exposure calculation**. While auto exposure is working, it will keep on calculating the image brightness to get proper exposure time. During this, if you already see a good live image for you, you can push  to lock it.

### Manual Exposure



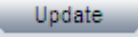
Adjust the exposure time manually. Two ways to change the exposure time:

- Key in the exposure time in the edit box directly , then click  to confirm it.
- Pull the slide bar to change the exposure time.

 [Extend]  is used to get longer exposure time. This function is **ONLY** available for **CCD** cameras. For other cameras especially the CMOS camera, the maximum exposure time is shorter than 1 second, then [Extend] will be greyed out.



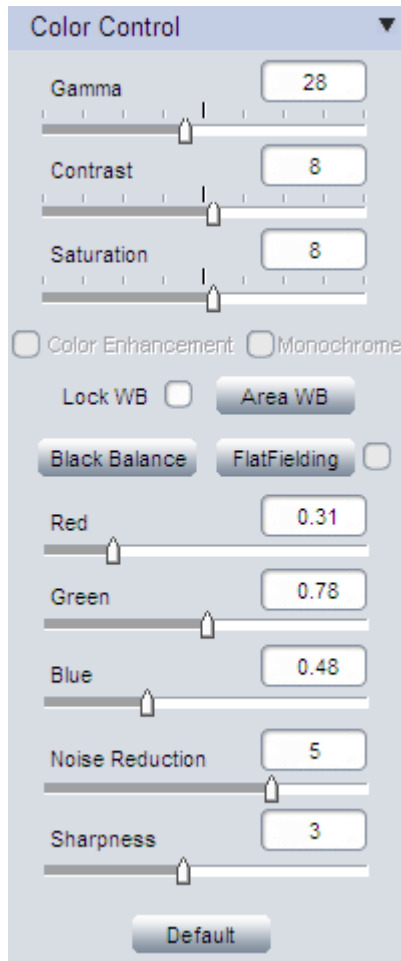


[Update]  appears after selecting [Extend]. Click on it to stop the previous exposure time and **restart the new one immediately**. In a long time exposure application, we strongly recommend to click [Update] to start the new setting. It will help to get the new exposed image earlier. If the exposure time is less than 2-3 seconds, it is not necessary to use it.

### Gain, Frame Speed & Data Width

Gain		Increase the power of the image data. Higher gain gives brighter images, but also makes the noise signal more obvious.
Frame Speed	High Speed	Corresponding to high pixel clock. Gives faster frame rate.
	Normal Speed	Offer lower frame rate than High Speed, but gives longer maximum exposure time.
Data Width	8-bit	8-bit images use $2^8 = 256$ gray levels to represent image details.
	16-bit	16-bit images use $2^{16}$ gray levels to represent image details. ONLY available for CCD & Discovery series cameras in .Tiff and .Raw formats.

## Colour Control



Adjust image colour, gamma, contrast and saturations.

## Flat Fielding Function

Flat fielding function is used to [correct the uneven background brightness](#).

- Click on [FlatFielding]  to start the flat fielding parameter calculation and apply to the live images.
- If you uncheck the check box , the calculated flat fielding parameter is [NOT applied](#) to the live images.



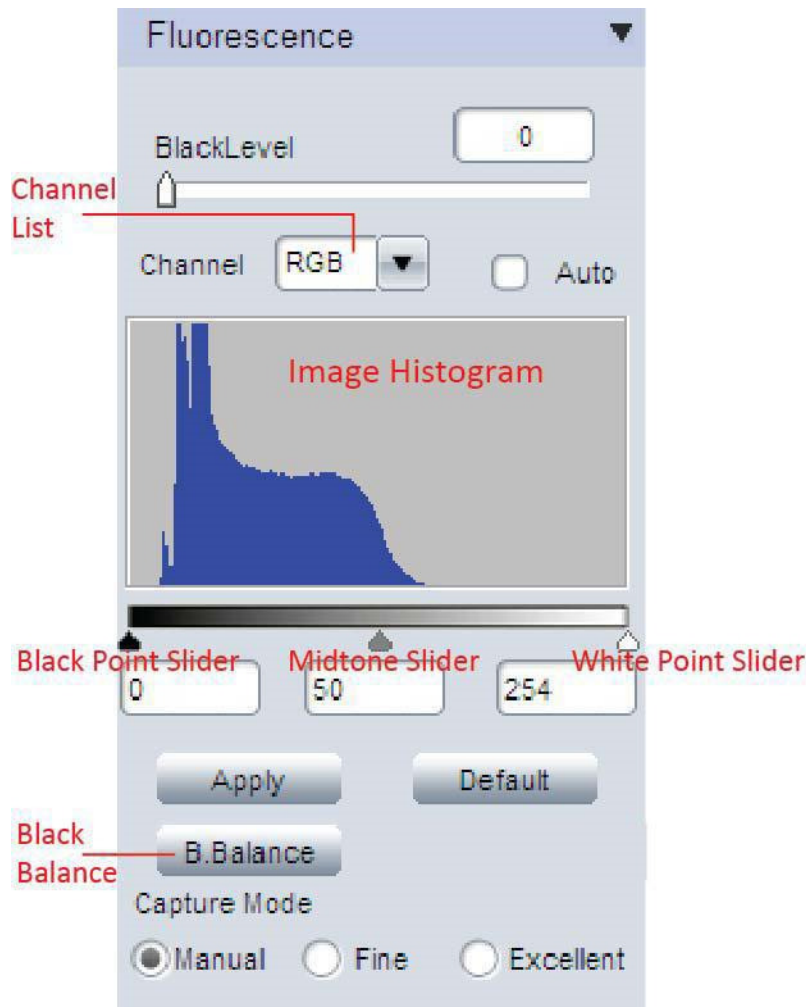
To get better flat fielding result, Move the sample to a blank area first, apply the flat fielding, then move the sample back.



When the lighting is changed, re-do the [FlatFielding] to correct the uneven brightness or when using a different objective.

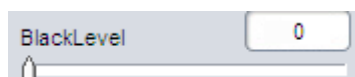
Gamma	Gamma is used to obtain correct reproduction of intensity. Default value (Gamma = 0) is recommended in most of cases.
Contrast	Contrast is the difference between the brightness brights and the darkest darks in an image. Higher contrast will make the shadows become darker and the highlights brighter. High contrast will lost more image details. Default value (Contrast = 0) is recommended.
Saturation	Adjust image saturation. Saturation is the intensity of color in the image.
Color Enhancement	Used to make the image color more vivid. Before doing White Balance, it recommends to uncheck this function, then apply WB. Not Available for HiChrome SII
Monochrome	Check the checkbox to get a grayscale image. Not Available for HiChrome SII
Lock WB	Lock White balance. When get good color preview, check the checkbox to lock the good white balance parameters for the coming images.
Area WB	Manually select the white color area in the image as the white balance reference
Black Balance	Black Balance. Correct black color. Usually use in fluorescence application. Not Available for HiChrome SII
FlatFielding	Correct image uneven brightness. Uncheck the check box: cancel background brightness correction.
Red	Adjust the intensity of red in the image. [Red] = 1 means the original intensity of red in the image.
Green	Adjust the intensity of green in the image. [Green] = 1 means the original intensity of green in the image.
Blue	Adjust the intensity of Blue in the image. [Blue] = 1 means the original intensity of blue in the image.
Noise Reduction	Reduce image noise, improve image quality. ONLY Available for HiChrome SII
Sharpness	Used to get sharper images. ONLY Available for HiChrome SII
Default	Restore the parameter settings to the initial value and apply white balance.

## Fluorescence Settings



Included in our software are useful parameter settings for fluorescence or low light imaging. It helps to get better images easier and faster.

### Black Level



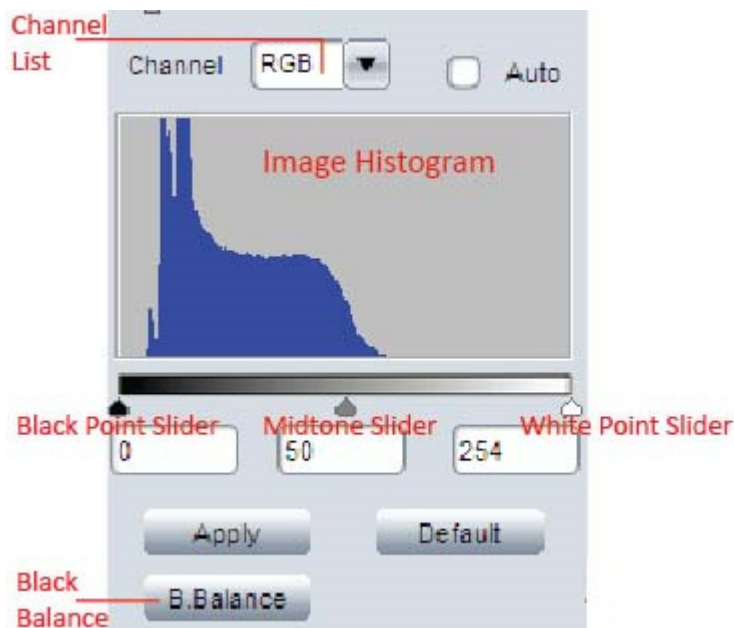
Black level function defines the brightness level at the darkest part of the image.

In low light imaging, it can help to see more details in the dark area.



In low light application, it usually needs quite a long exposure time to get proper images. If you set a long exposure time at the beginning, you might need quite a long time to find your target and get a proper image (wait for finishing a long exposure to get a new frame image, adjust, wait...). When searching for the imaging target at the beginning, we recommend to **set a shorter exposure time, but make larger Gain and Black level first**. After you find the target, then reduce the Gain and Black level, and increase the exposure time. This will aid in a better image acquisition.

## Levels



The levels tool can move and stretch brightness levels in a histogram using three main components: a black point, white point and midtone slider.

**Channel List:** This allows the user to choose whether to edit the RGB channel

or one of the three individual colour channels (Red, Green and Blue).

**[Auto] checkbox:** Adjust the live image levels [automatically](#).

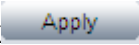
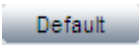
### **Manual adjustments of image levels:**

- **Black Point Slider:** It is used to set the black point or shadow values. Move the Black Point Slider towards right to darken the shadow areas in the image.
- **White Point Slider:** It is used to set the white point or highlight values. Move it towards left to brighten the highlights in the image.
- **Midtone Slider:** It is used to brighten or darken the midtones within an image. Movement to the left brightens the image by stretching out the shadows and compressing the highlight, whereas movement to the right performs the opposite.



Move the [White Point Slider towards left](#), it is able to reveal some information in dark area. If move [Black Point Slider towards right](#), it will reveal bright area information.

- It is also allowed to key in the image levels directly to do the adjustment.

After adjusting the levels, click  to [confirm](#) the setting. If you need to go back to the original image, click  to [restore](#) the image.

**[Black Balance]:** Gives camera a reference to “true black”. ONLY needed in dark field imaging.

## Capture Mode



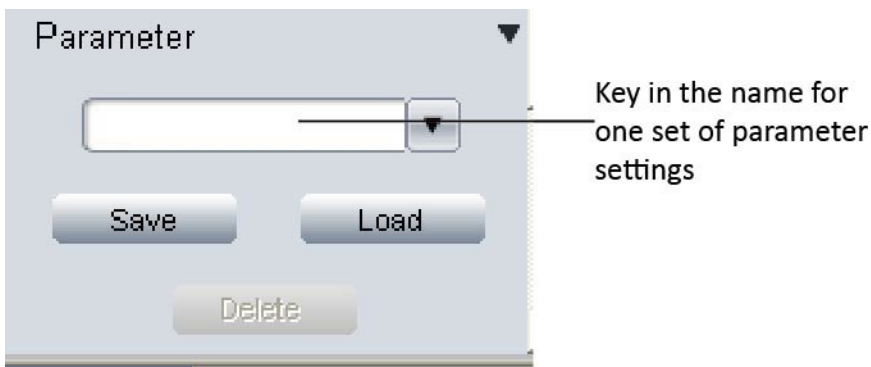
Three capture modes are specially developed for fluorescence imaging.

---

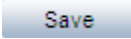

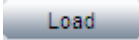
<input checked="" type="radio"/> Manual	Capture the image with current parameter settings
<input type="radio"/> Fine	Automatically <a href="#">reduce the gain</a> and <a href="#">extend the exposure</a> to get the same brightness image. ( <a href="#">Lower gain will give lower noise level images</a> )
<input type="radio"/> Excellent	Automatically save 10 images with current settings and then get an average image. ( <a href="#">It needs to take a while to capture an image in this mode.</a> )

---

## Parameter Group

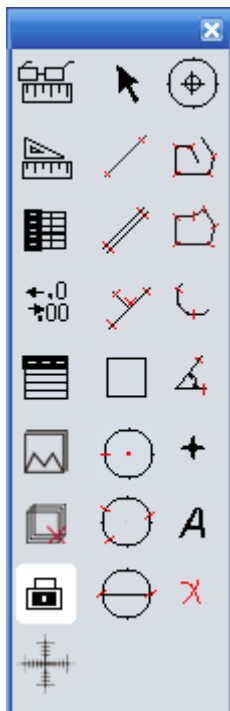





Save parameter sets for different applications. The saved parameters include exposure time, gain, frame speed, data width, gamma, contrast, saturation, colour enhancement status, monochrome, RGB gain and black level. It allows users to save [20 set parameters \(available in Ver 3.6 or later\)](#).

- **Save parameter function:** Enter a name for current parameter settings, click  to save it.
- **Load parameter function:** Click  to open drop-down menu, click on preferred parameter name and then push  to make selected parameters take effect on the live image.




















## Live Image Measurement




Click on [Measure] at the top of the GX to get the measurement tools



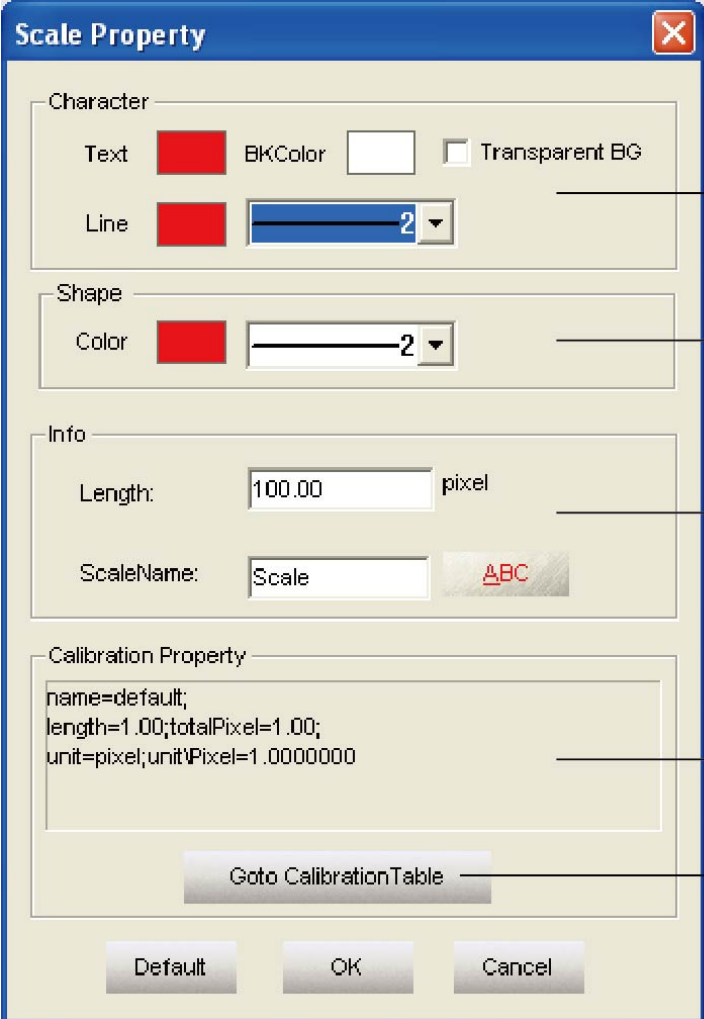
	Show Scale Line	On/off the scale line on the picture
	Calibrate	Create Calibration file
	Calibrate Table	Available calibration file list. Allow to add, edit and delete calibration file.



	Decimal	Set measurement precision. Allowed decimal range is from 0 to 7
	Measurement List	List all the measurement data
	Layer	Create multiple layers to apply measurements and save layer information
	Delete All	Delete <b>all</b> the measurements and layers
	UnLock/Lock	Unlock/lock the measurement operation. Allow to do same measurement continually when <b>LOCKED</b> . It is locked by <b>DEFAULT</b> .
	Select	Select to change measurement or the measurement data position
	Line	Measure the length
	Parallel	Measure the distance of parallel. Allow to do multiple parallels' distance measurement. <b>Double clicking</b> to end parallel measurement.
	Perpendicular	Measure the perpendicular length. Allow to do multiple perpendiculars' length measurement. <b>Double clicking</b> to end perpendicular measurement.
	Rectangle	Measure rectangle height, width, area and perimeter.
	2-points Circle	Use center point and point on the circle to draw a circle. Give the radius, area and perimeter of circle
	3-points Circle	Use 3 points on the circle to draw a circle. Give the radius, area and perimeter of circle
	Diameter Circle	Draw a circle according to the diameter. Give the radius, area and perimeter of circle
	Concentric Circle	Use center point and radius to draw concentric circles. Give concentric circles' radius, area and perimeter. Allow to do multiple concentric circles measurement. <b>Double clicking</b> to end concentric circles measurement
	Polyline	Measure the polyline length.
	Polygon	Measure polygon area and perimeter.
	Arc	Measure a curve angle, radius and length.
	Angle	Measure the angle
	Point	Counter. Count the quantity.



	Annotate	Add remarks on the images.
	Delete	Delete previous measurement. <a href="#">Select it then click on</a> the measurement to delete the measurement.
	Cross-ruler	On or off cross-ruler on the images. The unit of the ruler depends on the applied calibration file.



## Edit Scale Line





**Scale Property**

**Character**

Text  BKColor   Transparent BG


Line   2

**Shape**

Color   2

**Info**

Length:  pixel

ScaleName:  

**Calibration Property**

```
name=default;
length=1.00;totalPixel=1.00;
unit=pixel;unit\Pixel=1.0000000
```

Change scale text, background, line color and line thickness

Change scale frame color and thickness

Edit displayed scale line length, name and font

Scale information

Link to calibration table

Double click on the scale to get its properties and make changes to it.



- Edit scale character



Scale background color. Default is WHITE

Change text color Default is RED

Check to get transparent background

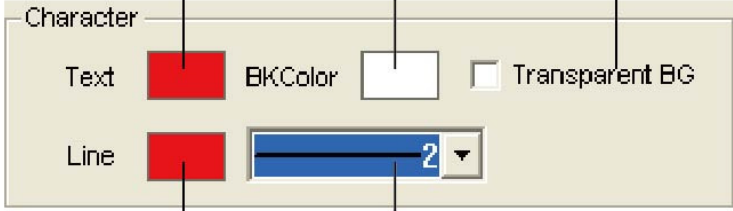
Character

Text  BKColor   Transparent BG

Line   2

Scale line color Default is RED

Set scale line thickness





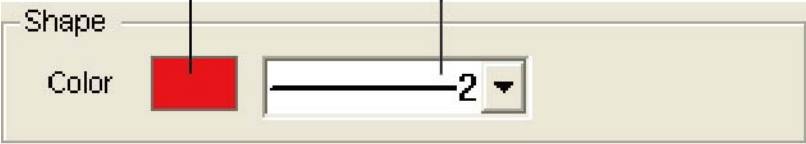
- Edit the frame of the scale

Change scale frame color Default is RED

Frame thickness

Shape

Color   2



- Edit scale line length and name


Edit scale name

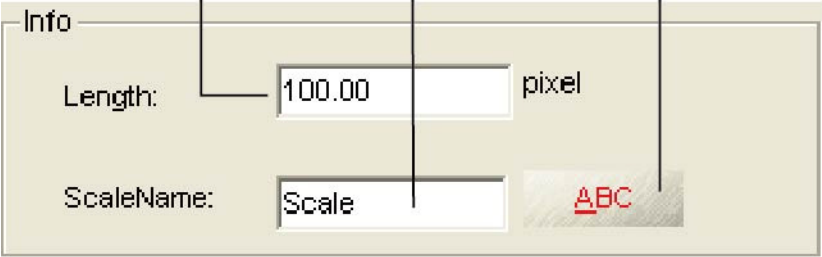
Change displayed scale line length

Change scale name font and text size

Info

Length:  pixel

ScaleName:  




## Create Calibration File

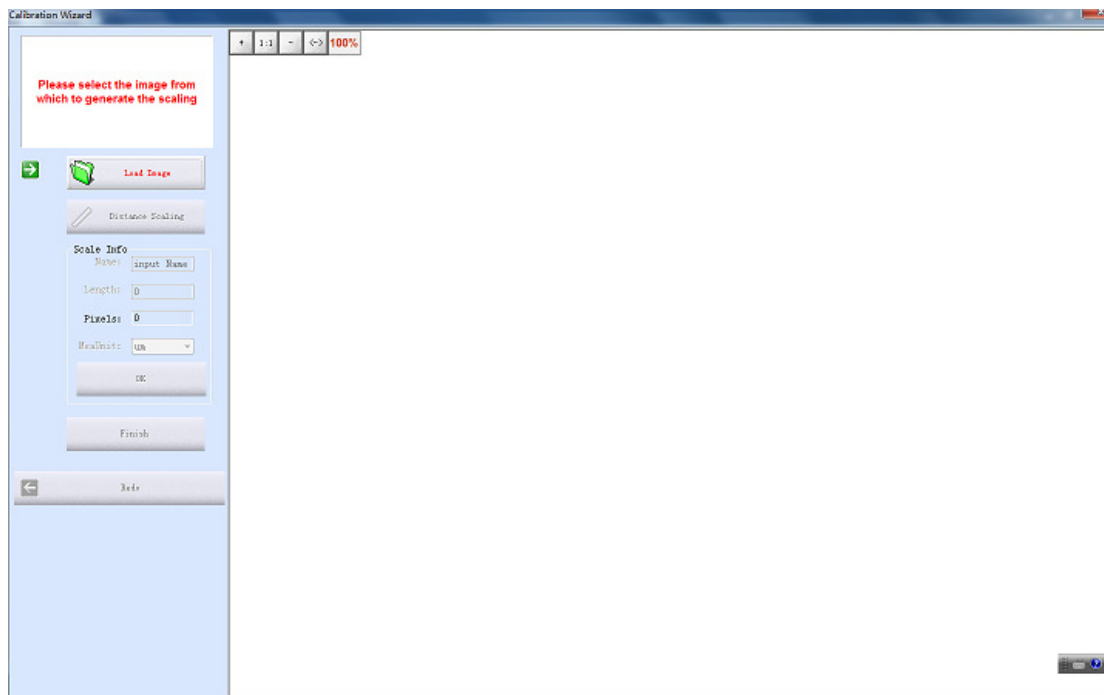
To measure the samples real size, the corresponding calibration file needs to be created first.

1. Take pictures of the calibration slide in all the required working objectives and resolution (if a reducing lens is also used in your application, it also requires you to take the calibration slide picture with the reduce lens attached).

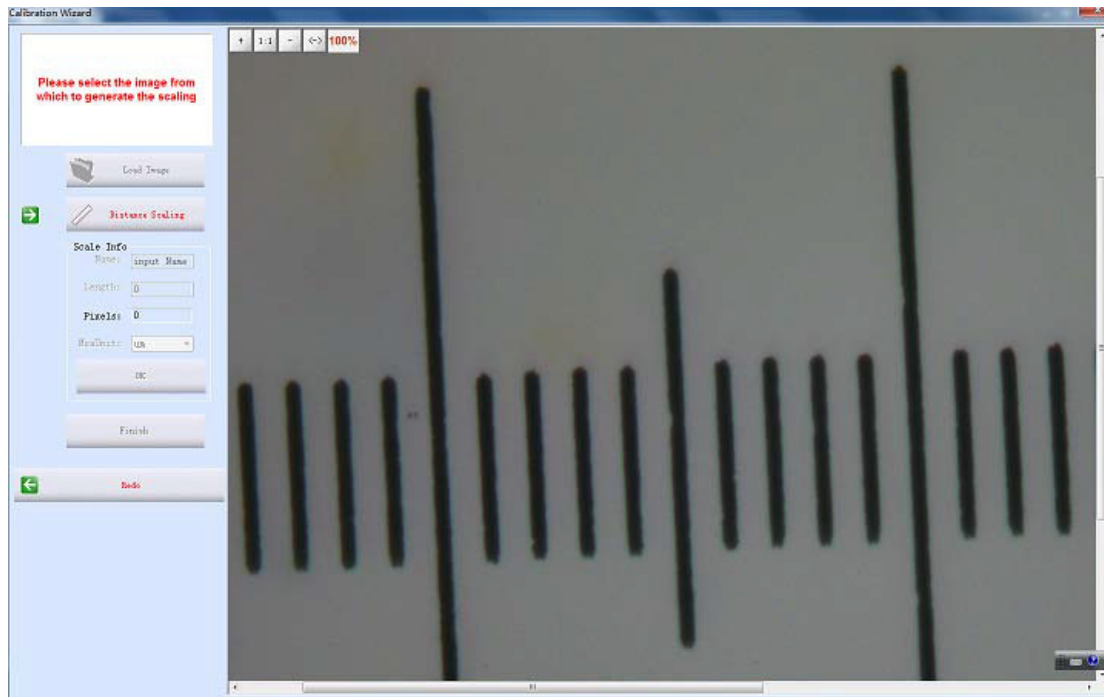


If **ONLY ONE** objective and **ONE** resolution is used in the application, one calibration slide picture is enough. The calibration slide picture **MUST** be taken with exactly the same lens or microscope settings as the target image taken.

2. Click  to start to create calibration file.



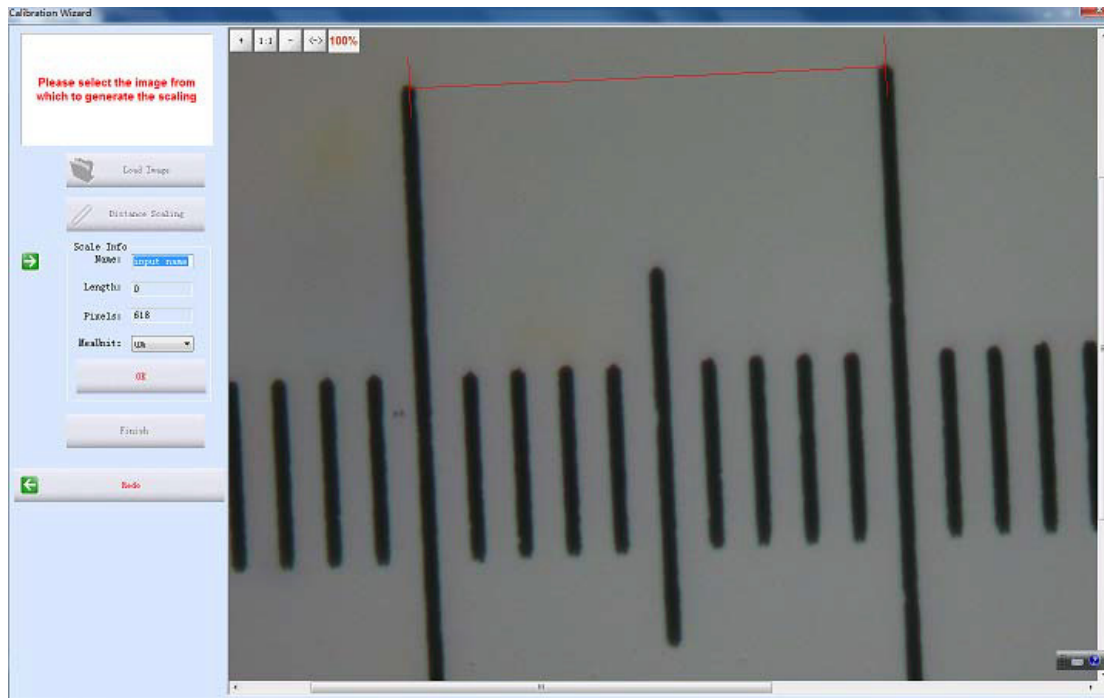
3. Click [Load Image] to load the calibration slide picture taken in Step1.



4. Click [Distance scaling] and move the cursor to the slide image, draw a line to get the reference length.



Using **longer** length as the reference length will give more accurate measurement results. For example, using 10 scale units as reference length will give more accurate result than using 1 scale unit.



5. Enter the name for the calibration file and the length of the line you draw.



If you need more than one calibration file, using **objective+reducing lens(if it is used)+resolution** as the name of the calibration file is recommended.

This can help to prevent using the wrong file to do the calibration.



When keying in the length, please pay more attention to the calibration **scale unit** and the **Measure Unit** used here. For example, the calibration scale unit is 0.1mm; the Measure Unit is selected as  $\mu\text{m}$ ; and the reference length is 10 scale units, so the length should be  $10 \times 0.1\text{mm} = 1000 \mu\text{m}$ .

Scale Info

Name:

Length:

Pixels:

MeaUnit:

6. Click [OK] to confirm the calibration. The new calibration file named “10X” is created in the [Calibrate Table].

### Calibration Table



Selected calibration file is highlighted in BLUE

Delete the selected calibration file

Name	Length	TotalPixel	Unit	Unit/Pixel
default	1.00	1.00	pixel	1.0000
10X	1000.00	234.00	um	4.2735

Apply to Image      Close      add      edit      del

Make selected calibration file take effect on image      Close calibration table      Create a new calibration file      Edit the selected calibration file

- Click  [Calibrate Table] to open the calibration table.
  - Select the correct calibration file for current image measurement.
-  Using the WRONG calibration file will make the measurement result

innacurate. Please make sure the calibration file is correctly corresponding to the current image. Hence, it is useful to name the calibration file with the capturing settings or objective name.

## Measurement List

The screenshot shows a 'Measure Table' window with a table containing the following data:

Name	Length_um	Width_um	Height_um	Area_umsq	Perimeter_um	Radius_um	Angle
L1	612.73						
Parallel1	734.60						
Perpendicular1	462.92						
R1		449.58	359.67	161700.66	1618.50		
C1				420057.97	2297.52	365.66	
P1				225746.95	2283.12		
Arc1					440.31	175.46	143.79
A1							28.92
Remark1							

Below the table are three buttons: 'Save to TXT', 'Save to Excel', and 'Copy'. An 'OK' button is also present. Arrows point from the buttons to explanatory text:

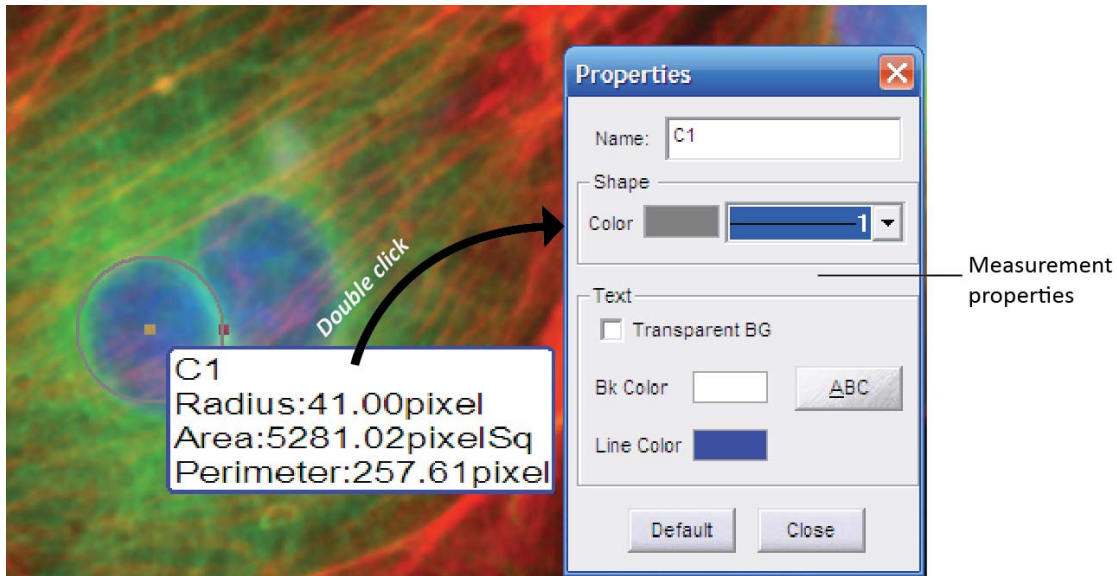
- 'Save to TXT': Export the measurement data to .txt file
- 'Save to Excel': Export the measurement data to Excel file
- 'Copy': Copy all the measurement data to a file: txt, word or excel.

All the measurement data is listed in the [Measurement List]. The software allows you to export all the measurement data to [TXT](#) or [Excel](#) file.

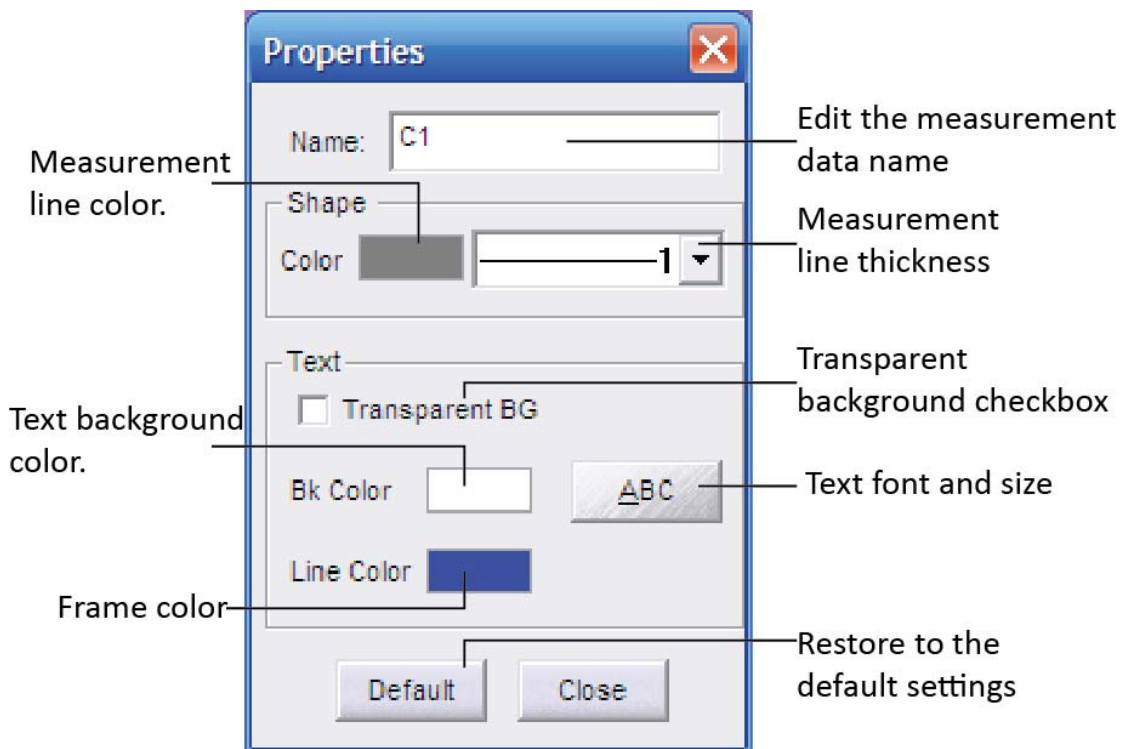
## Measurement

GX allows you to do line, parallel, perpendicular, rectangle, circle, polygon, arc and angle measurement. The [Count] function allows you to manually count the objects. And the [Annotate] function offers to add comments on the images.



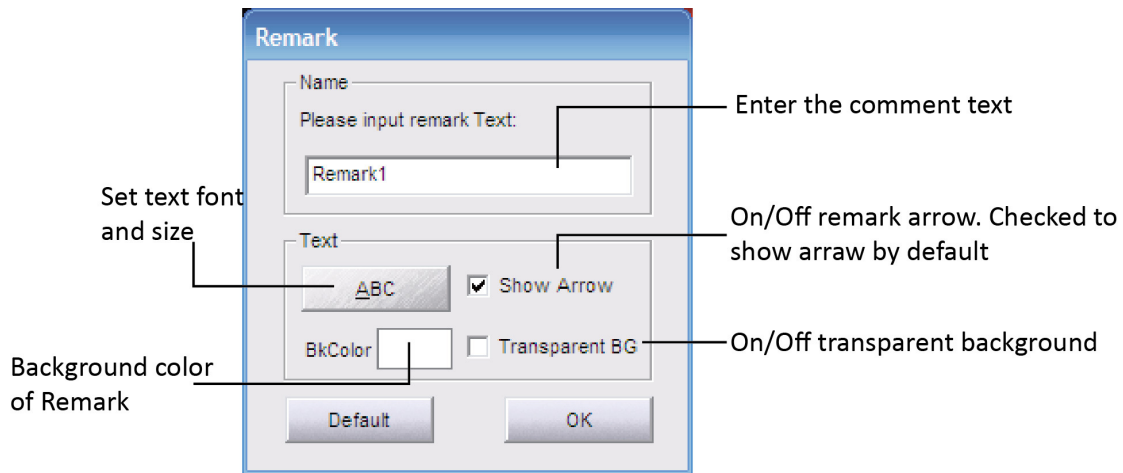


Double click on the measure data to get the measurement configure window. It allows you to change the measured data name, colour, thickness, background colour and the character font.




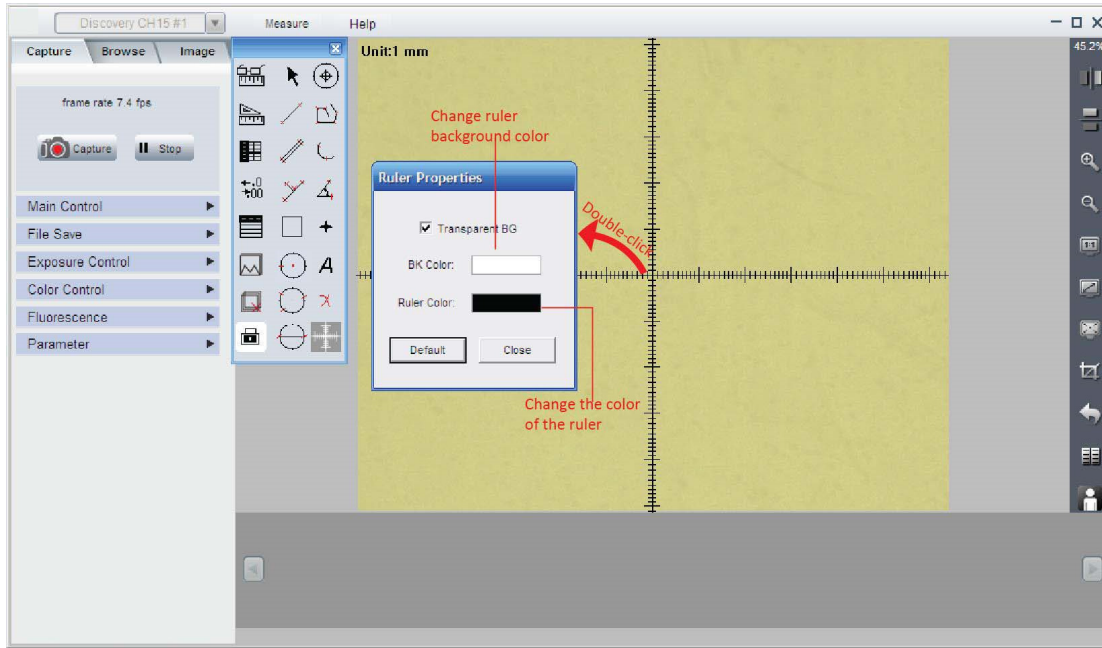
## Annotate

Select [Annotate] and click on the image area which you prefer to add a remark.  
 It allows you to edit the comment, change the background colour and on/off the annotate arrow.

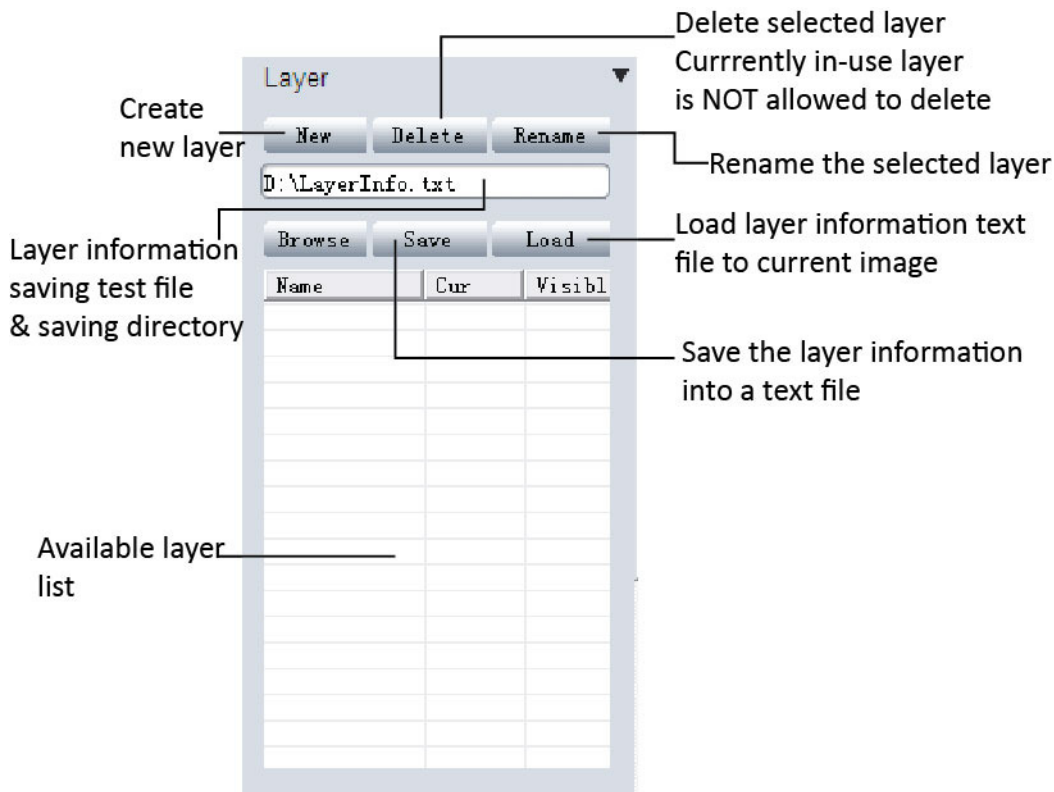


## Ruler

Click on  to show or cancel the cross-line on the images. The displayed ruler unit is determined by the selected calibration file. [Double-click on the ruler](#) to get the ruler property and change the ruler colour. [The default colour is BLACK.](#)



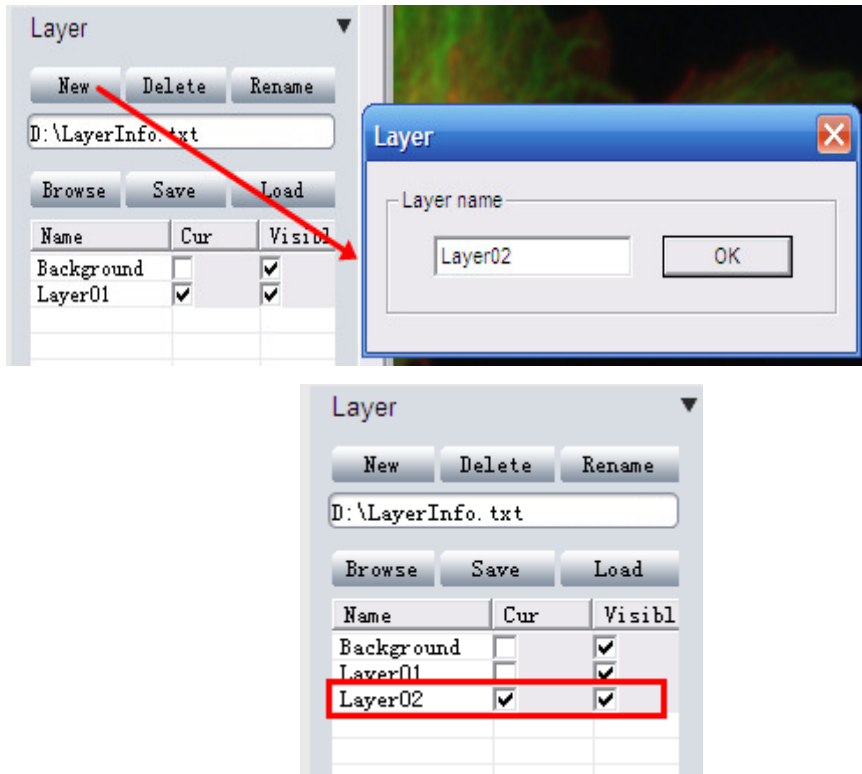
## Layer



Create multiple layers for loads of measurements. The layer function makes adding a large number of measurements on the processed image review simple and easy.

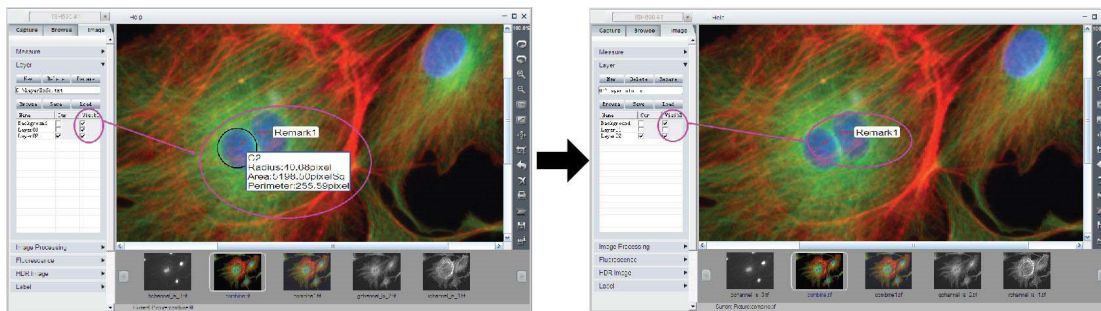
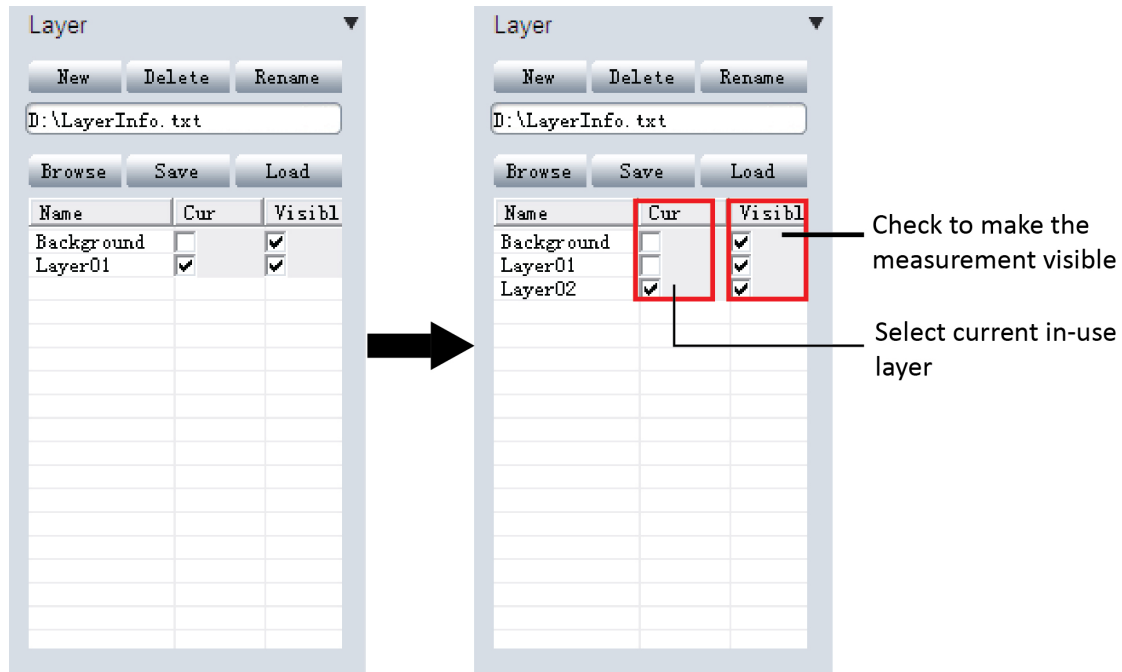
If you have already applied some measurements on the image, the [Layer] function automatically creates "Background" and "Layer01" for the current image.

Click [New] to create a new layer. Allow to key in the preferred name for the new layer. It uses "Layer02", "Layer03"... etc as the layer name by default.



Now loads of measurements can be applied on different layers. It allows you to choose any layers to view.

Checked [Cur] means the corresponding layer is displayed currently. Select different [Cur] to switch between different layers. In the [Visible] column, the selected check box means all the measurements in the corresponding layers also display on the current layer. Uncheck the check box, and the corresponding measurement will be invisible in the current layer

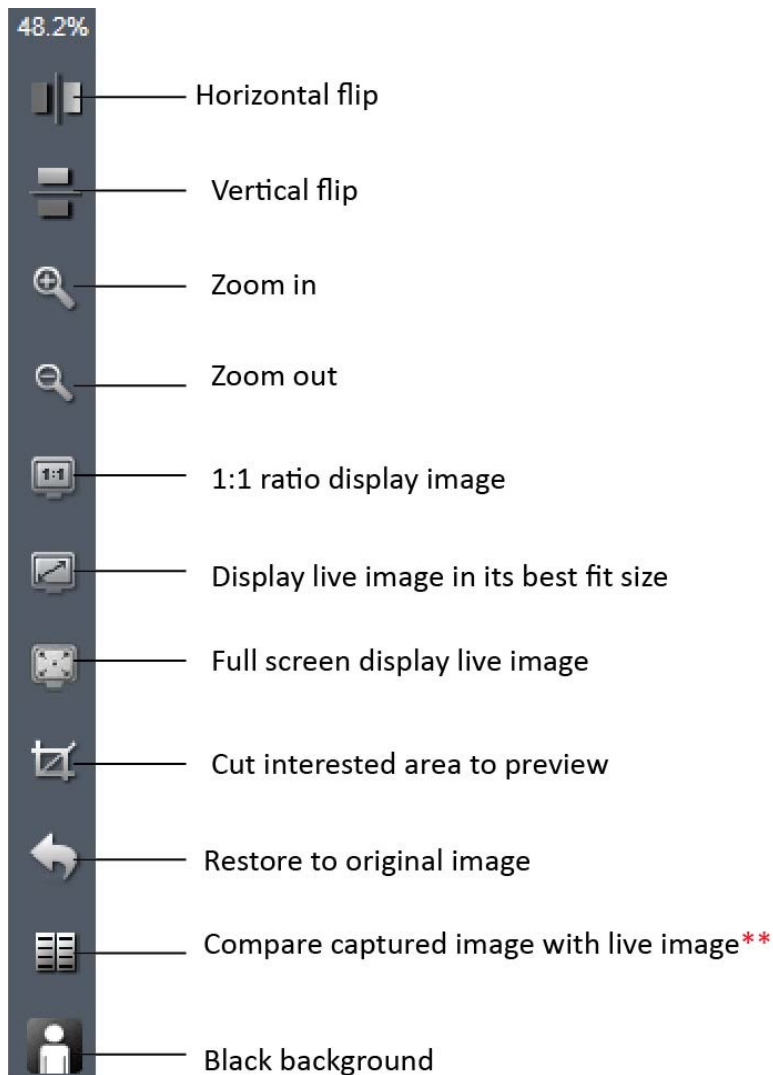


**The layer information is saved in a text file.**

- Click [Browse] to choose the text file saving directory and enter file name. Then click [Save] to save the current layer information in the text file. **The layer information will be saved as "LayerInfo.txt" in Disk D by default**
- Click [Browse] to find the existed layer information text file. Click [Load] to load the layer information to the current image.

## Live image shortcut

On the right hand side of the live image window, some shortcuts are provided to process the live image quickly.



\*\* Compare function: Live image will be displayed on the left side. Click on the taken image thumbnail to select it to compare with live images ([Chosen compared image will be enhanced in gray-white frame](#)).

## Chapter3: Image management

View images in [Browse] panel, it displays the image File name, capturing time, colour depth (bit), picture resolution and image size. It also allows you to [add comments to any individual image](#). When you view this image next time in the GX, it will show the image comment.

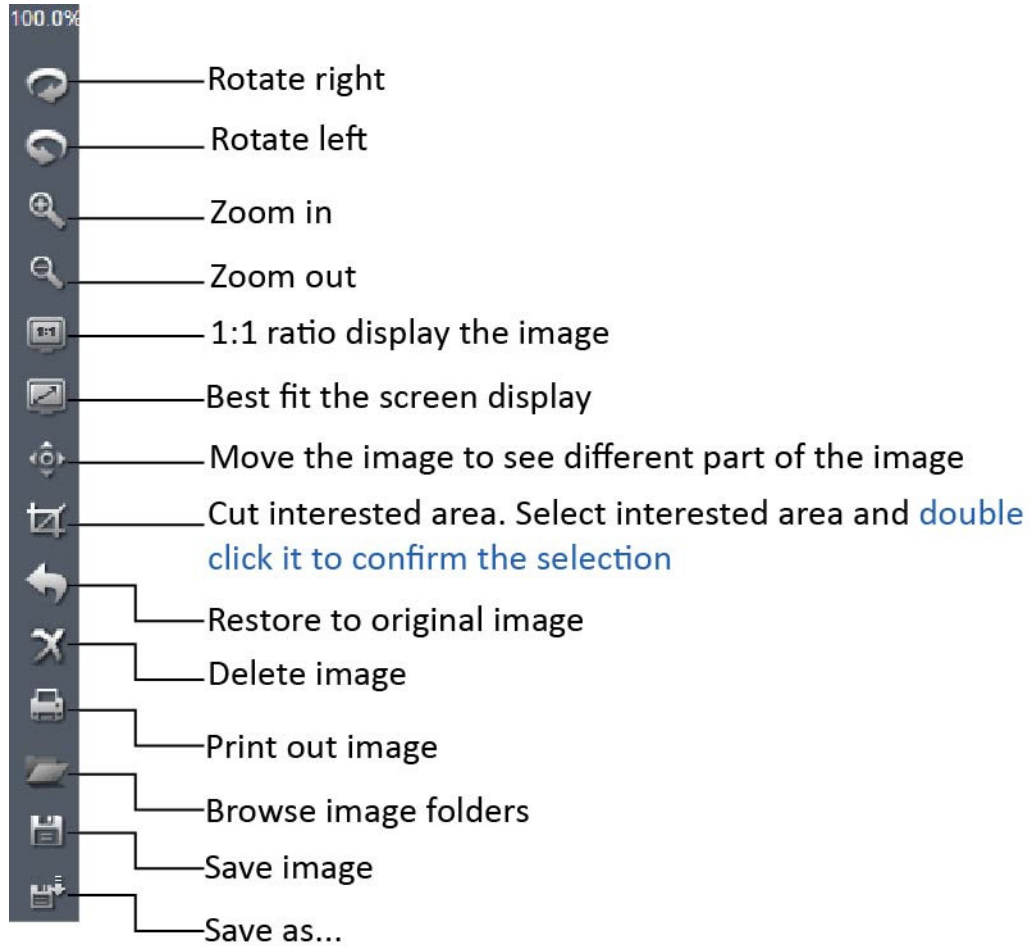
The screenshot shows a software interface with three tabs: 'Capture', 'Browse', and 'Image'. The 'Image' tab is active. Below the tabs is a section titled 'Image Information' containing several input fields: 'FileName:' with the value 'is\_1.bmp', 'Time:' with '2013/03/21/ 11:01:50', 'Bit:' with '24', 'Picture Size:' with '3488x2616', and 'File Size:' with '26.1 MB'. Below these fields is a 'Note:' section with a text area containing 'HELLO'. A 'Save' button is located below the note. At the bottom of the panel is a 'Path' section with a text field containing 'C:\Program Files\ISCapture\' and a 'Browse...' button.



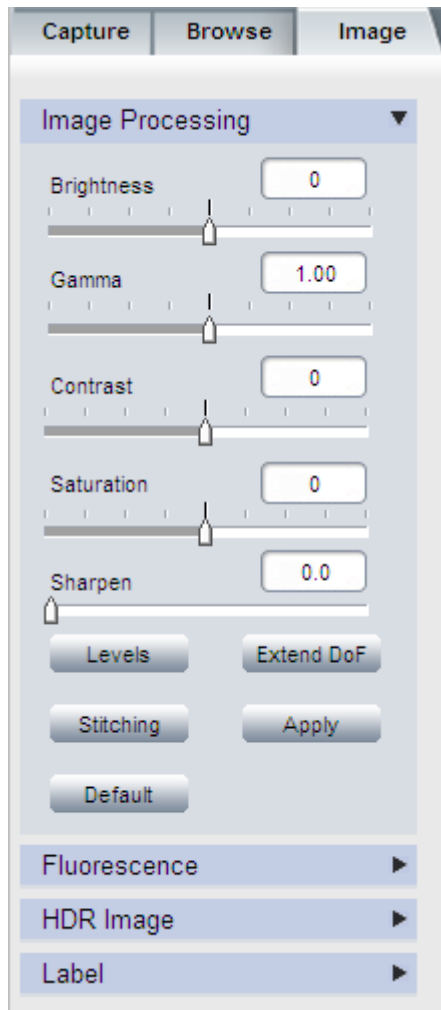
## Image Management and Processing Shortcuts

GX provides some quick functions on the right hand side of the software in

**Browse** or **Image** mode.

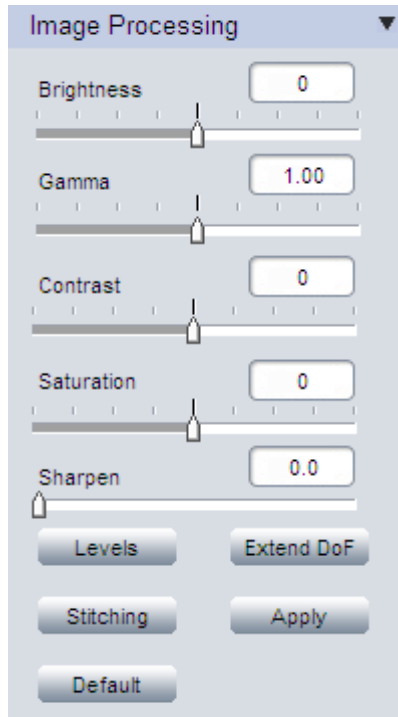


## Chapter4: Image Processing



In this section, GX provides advanced image processing functions and also allows you to do the measurement on the still images.

## Image Processing




Provide basic captured image processing functions and allows additional functions such as [extended Depth of Focus](#) and [image stitching](#).

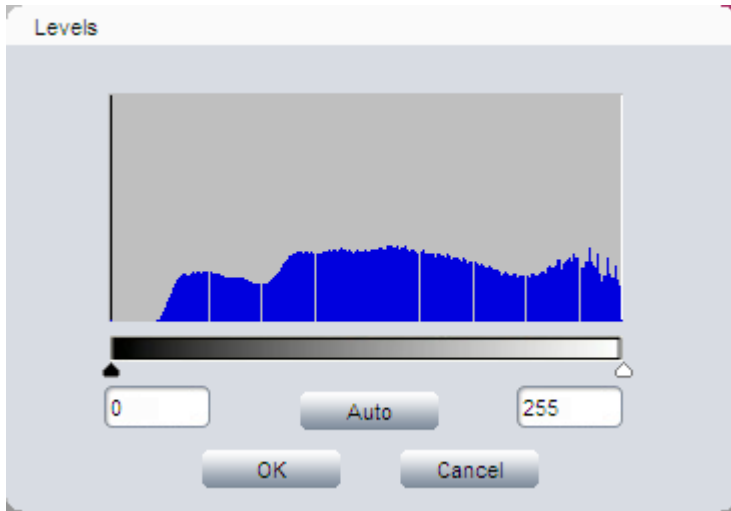
Brightness	Adjust captured image brightness. Default brightness = 0
Gamma	Adjust captured image gamma. Default gamma = 1.00
Contrast	Adjust contrast. Increase the contrast, the shadows become darker and the highlights brighter. Decrease the contrast, the highlights grow dim and the dark areas lighten up
Saturation	Adjust the color saturation. Fully-saturated colors are very bright, while low saturation are grayish.
Sharpen	Adjust the image sharpness. Sharpness is the contrast on the edges. Sharpening increases the bright and dark lines on edges.
Levels	Adjust image levels. Get more details in [Fluorescence]>>[Levels]
Extend DoF	Extend the <a href="#">Depth of Focus (DoF)</a>
Stitching	<a href="#">Image stitching</a> . Combine multiple images with overlapping fields of view to produce a segmented panorama or high-resolution image.
Default	Restore Brightness, Gamma, Saturation, Sharpen and levels back to the default value
Apply	Confirm to apply all the settings to the image.



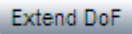
After clicking [Apply], all the settings are applied to the image. Please note , once you choose this you can **NOT** revert to the original image.

## Level

Push [Levels]  to get the image histogram. It allows you to adjust the image levels. The level adjustment is the same as live image level adjustment. Get more detail in [Capture]-->> [Fluorescence].



### Extend depth of focus

Push [Extend DoF]  to get below dialog box. Select the corresponding images and apply the function. This function combines multiple images to create one focused image.

Browse the image folder for stacking

Available image list

Selected image list

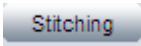
- Add images for stacking
- Delete selected image
- Add all the available same size images for stacking
- Delete all the selected images
- Stack all the selected images
- Suspend the Extend DoF

- Browse the image folder which you are going to do the stacking.
- All the images in the folder will be listed on the left hand side. Click on one image, the image will be highlighted in BLUE.
- Click [Add] to add the highlighted image to the right hand side (the selected source images for stacking).
- [Add all] button allows to add all **the same size** images in the left hand side to the right as stacking source images by just **one click**.
- Click [Fusion] to stack all the selected source images and get an image with an extended depth of field.



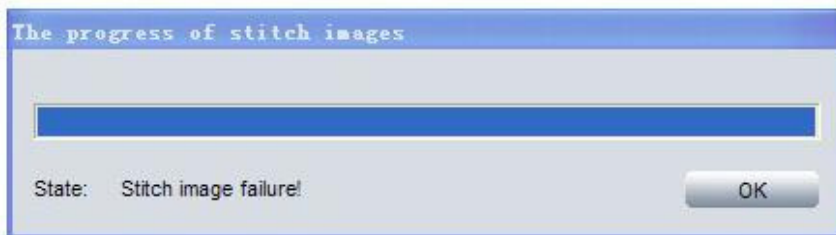
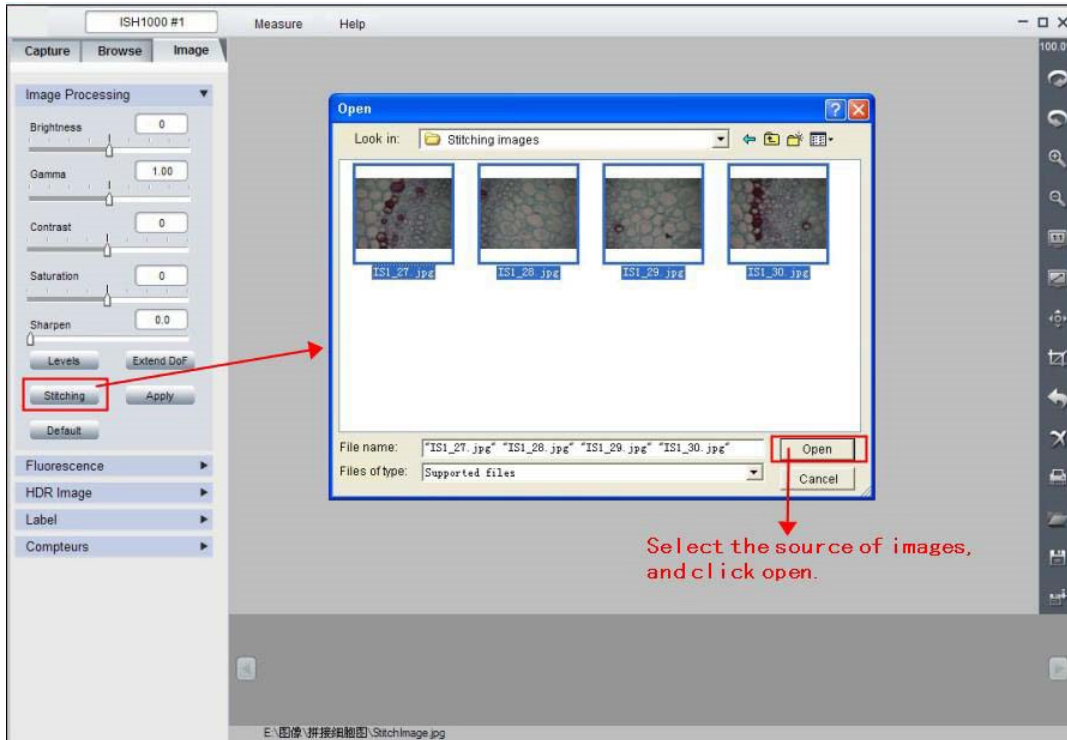
When selecting a wrong image as stacking source, just click on it and then click [Delete] to remove it. [Delete all] will remove all the selected images.

## Image stitching

Click on  to get the image stitching configuration. It combines multiple images with overlapping fields of view to produce a large panorama or high-resolution image.

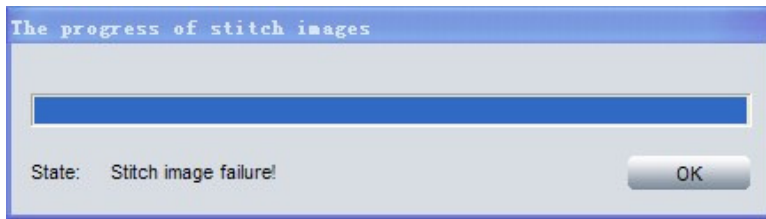
- 1) Click [Open] browse the stitching source images. **Select all** the source images and open them.
- 2) Click [Stitching] to start stitching all the source images.

3) Click [Save] to save the stitched image in the **same directory** as the source images with **the name of date and time stamped**.



If the source image did not meet the requirements, you will be prompted

image stitching failure!



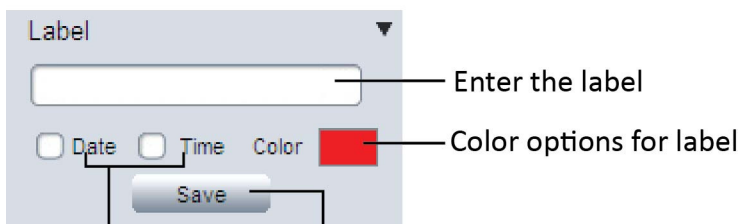
## Measure

Click on [Measure] at the top of the GX to get the measurement tools.

Then select the corresponding tools to measure the still images (get more details in [Capture]>>[Live Measurement]).



## Label



Enter the label

Color options for label

Check to display current date and time on image

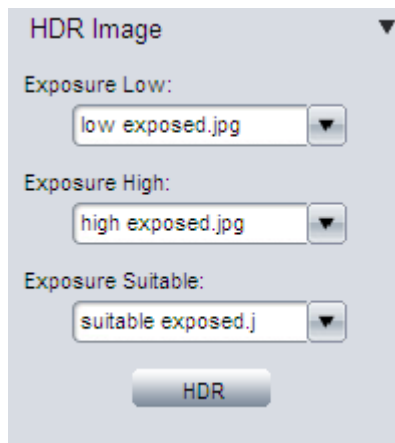
Confirm the operation

- The **label text** will be displayed on the **lower right corner** of the image.



- The **date and time** will be displayed on the **top right corner** of the image.
- After clicking [Save], the image with the label will be saved as image file name+ **\_bak**. For example, the original image file name is “GX.jpg”, then this image with a label will be saved as “GX\_bak.jpg”. So the original image is still kept.


## HDR Image



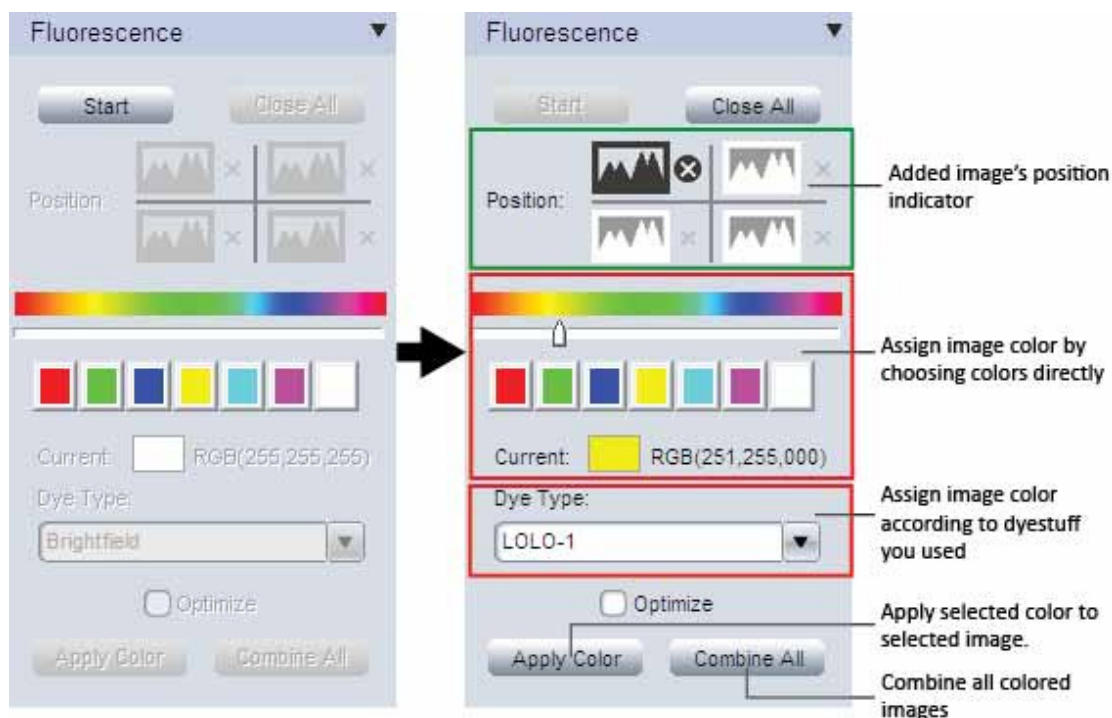
High Dynamic Range (HDR) image is used to get greater dynamic range of an image.

- Take pictures for **one same scene** with different exposure time and load them in the software.
- In the drop-down menu, select corresponding images for [Exposure Low], [Exposure High] and [Exposure Suitable].
- Push [HDR] button to combine different exposed images into one. The

generated HDR image will be named as “hdr\_image”.

💡 If the different exposed images are not loaded in the GXCAPTURE yet, the shortcut  on the right hand side of the GXCAPTURE allows you to browse any image simply.

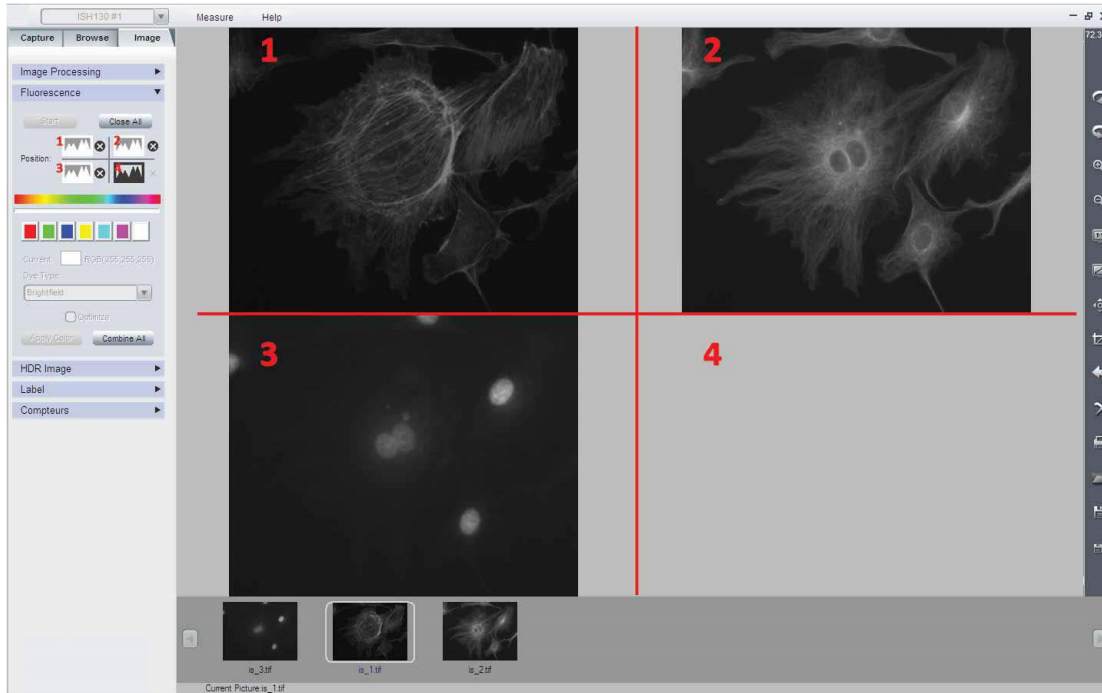
## Fluorescence



This function is used to assign Black & White fluorescence images with different colours and combine them together into one image.

**Step 1:** Open the images which are used for combination in GX , then click on [Start] to start the fluorescence combination.

**Step 2:** Click on image thumbnails to add corresponding images. The image position indicator shows the added images' position. Maximum 4 frame images are allowed to add for fluorescence combination.



**Step 3:** Click on one added image indicator to start applying colour for it.

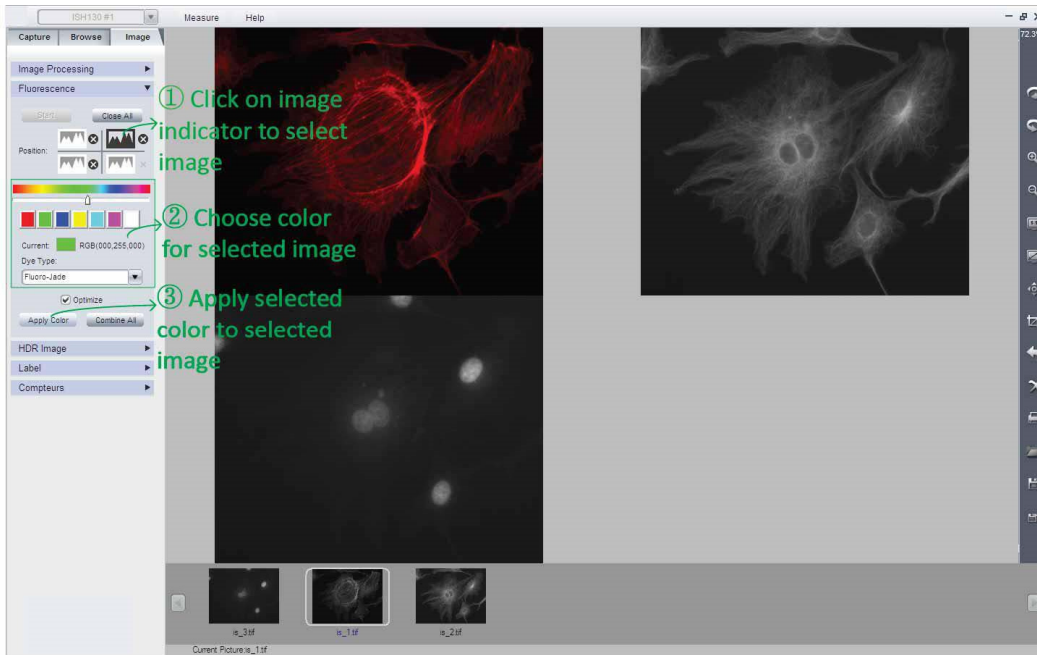
① Click on one image indicator to select it (The selected one will be in dark colour, unselected ones will be gray white).

② Assign colour for selected image.

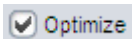
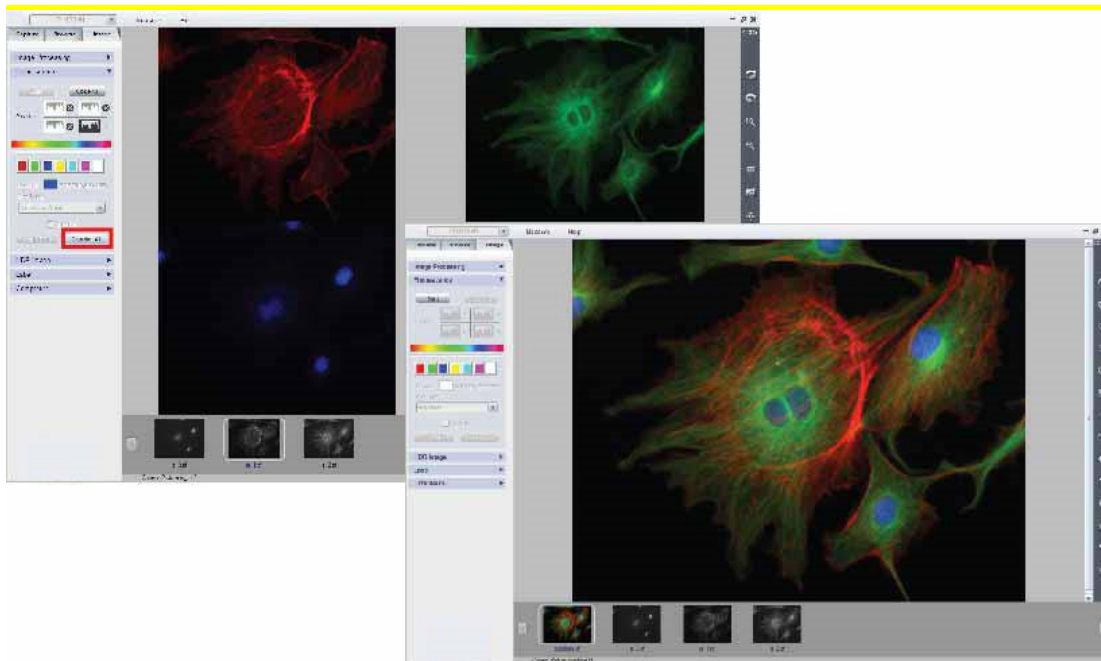
Two ways provided for colour assignment:

- a. Click on the preferred colour or slider to choose it.
- b. Assign the colour according to the fluorescence dye in the drop-down menu [Dye Type].

③ Click on [Apply Colour] button to add selected colour on the image.



**Step 4:** Click on [Combine All] to combine all the coloured images.



Optimize checkbox is recommended to select during the combination. It will optimize image background to get a better image. If the optimize function is not selected, the created image will keep all the original information. No extra processing is applied to the image data.



After combining the fluorescence image,



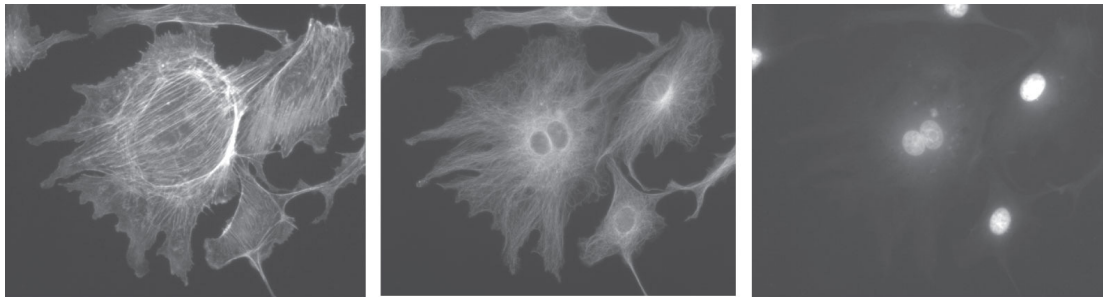
[Sharp] function in [Image Processing] can help to get

sharper images and see more image details.



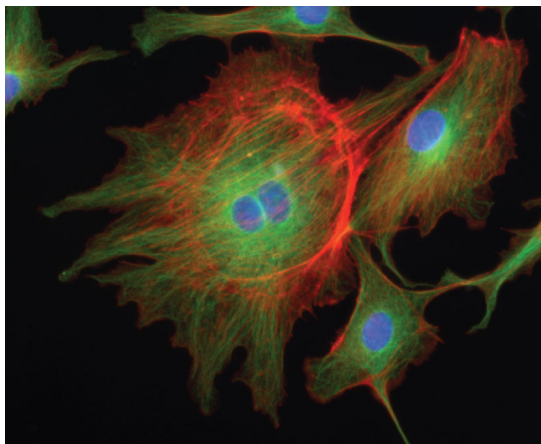
If you add the wrong image or wrong colour to selected image, just click on the tiny cross **✕** beside each indicator to delete it. If you want to cancel the current combination, just click on [Close All] to cancel the combination.

Original images:

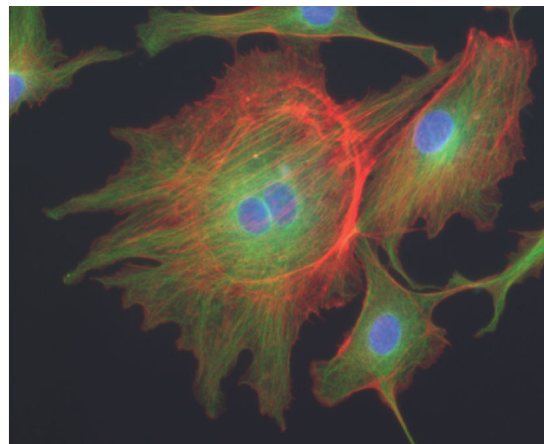


Original images

Combined image:

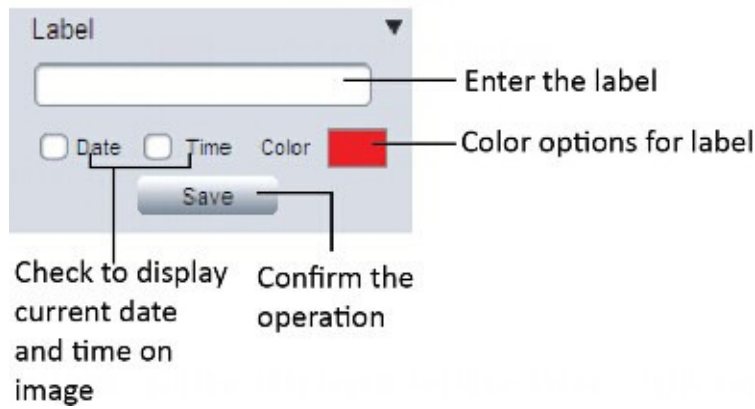


Combined image **with** optimization



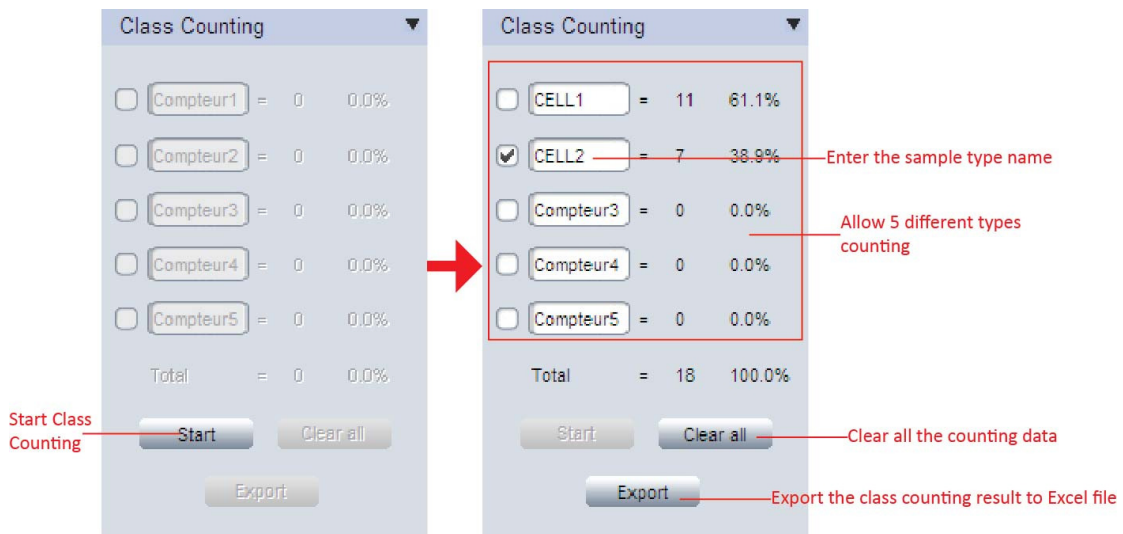
Combined image **without** optimization

## Label



- The **label text** will be displayed on the **lower right corner** of the image.
- The **date and time** will be displayed on the **top right corner** of the image.
- After clicking [Save], the image with the label will be saved as image file name+ **\_bak**. For example, the original image file name is “GX.jpg”, then this image with a label will be saved as “GX\_bak.jpg”. So the original image is still kept.

## Class Counting



Class counting function allows to do 5 different types samples counting manually. Each type will be assigned with different colour dots.

