



HD1500MET image acquisition, managing and processing

software

## ISCapture

### Instruction Manual

- Key to the Instruction Manual
  - ISC is shortened name used for ISCapture.
  - Square brackets are used to indicate items such as menu names, button names and window names that appear on the computer screen.
- Help
  - Refer to [Help] >> [About ISCapture] menu for software information and technical support.
  - Provide the following information when it is

required to obtain the technical support:



1 Camera model and S/N (serial number);



2 Software version number;



3 Description of the problem. Screenshots of the

problem would be useful.

### System requirements

<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

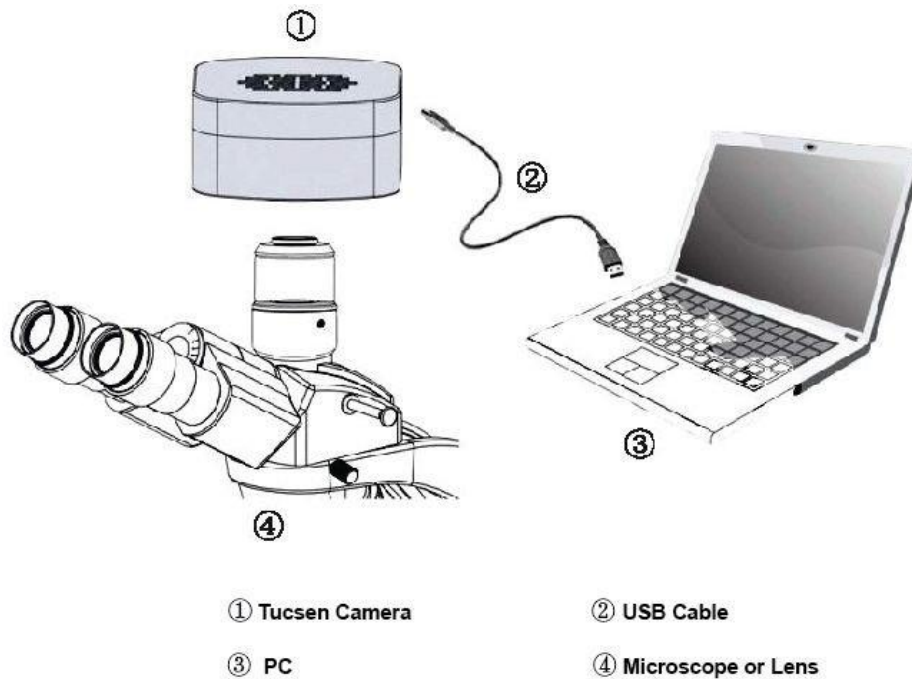


<b>CHAPTER 1: HD1500MET CAMERA QUICK START.....</b>	<b>3</b>
CAMERA INSTALLATION.....	3
DRIVER INSTALLATION.....	3
SOFTWARE INSTALLATION.....	4
START ISCAPTURE.....	4
ISCAPTURE PARAMETER SETTINGS.....	5
<b>CHAPTER 2: IMAGE ACQUISITION.....</b>	<b>8</b>
BASIC CONTROL.....	9
TAKE STILL IMAGES AND VIDEOS.....	10
<i>Capturing and Saving Individual Images.....</i>	<i>11</i>
<i>Capturing and Saving a set of Images.....</i>	<i>11</i>
<i>Video recording.....</i>	<i>12</i>
<i>File Save Destination.....</i>	<i>13</i>
EXPOSURE CONTROL.....	13
<i>Auto Exposure.....</i>	<i>14</i>
<i>Manual Exposure.....</i>	<i>14</i>
<i>Gain, Frame Speed &amp; Data Width.....</i>	<i>15</i>
<i>Levels.....</i>	<i>15</i>
COLOR CONTROL.....	16
<i>Flat Fielding Function.....</i>	<i>17</i>
FLUORESCENCE MODE.....	18
<i>Pseudo Color function.....</i>	<i>18</i>
<i>Black Level.....</i>	<i>19</i>
<i>Fluorescence Wizard.....</i>	<i>19</i>
<i>Temperature Control.....</i>	<i>20</i>

PARAMETER.....	21
LIVE IMAGE MEASUREMENT.....	21
<i>Measurement List.....</i>	<i>22</i>
<i>Edit Scale Line.....</i>	<i>23</i>
<i>Create Calibration File.....</i>	<i>24</i>
<i>Calibration Table.....</i>	<i>26</i>
<i>Measurement List.....</i>	<i>27</i>
<i>Measurement.....</i>	<i>27</i>
<i>Annotate.....</i>	<i>28</i>
<i>Ruler.....</i>	<i>28</i>
<i>Layer.....</i>	<i>29</i>
LIVE IMAGE SHORTCUT.....	31
<b>CHAPTER 3: IMAGE MANAGEMENT.....</b>	<b>32</b>
IMAGE MANAGEMENT AND PROCESSING SHORTCUTS.....	32
<b>CHAPTER 4: IMAGE PROCESSING TAB.....</b>	<b>33</b>
IMAGE PROCESSING.....	33
<i>Level.....</i>	<i>34</i>
MEASURE.....	34
FLUORESCENCE.....	35
LABEL.....	37
CLASS COUNTING.....	38
ADVANCED FUNCTIONS.....	39

## Chapter 1: HD1500MET Camera Quick Start

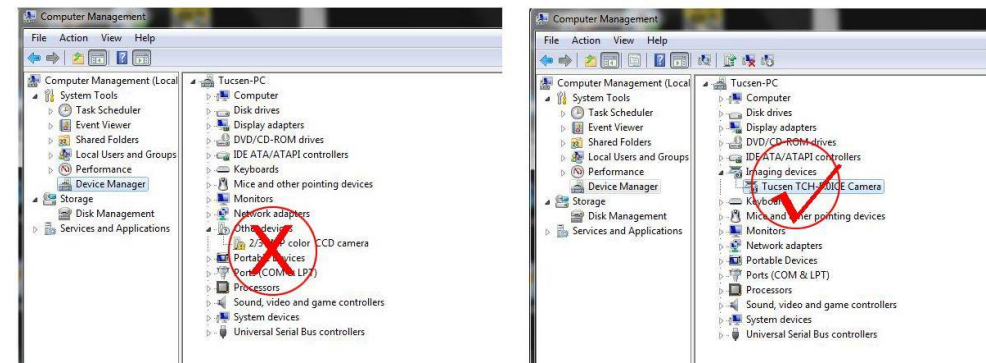
### Camera Installation



### Driver Installation

1. Connect the camera to the PC. Insert the CD comes with the camera, copy the driver “Tucsen Camera Driver (H Series) Setup.exe” to the computer. Double click on it to start the installation. Follow the [Next] button to finish the installation.


2. Go to the Device Manager and check whether the driver is installed properly. If there is **NO YELLOW FLAG** with the camera under **Imaging Device in Device Manager**, the driver is installed successfully (see Figure 1).



## Software Installation

1. Copy the software ISCapture installer to the PC. Double-click on it to start the installation. Follow the [Next] button to finish the installation.




2. After finish the installation, a software shortcut  will be

created on the desktop.

Note: If previous version ISCapture was installed in your PC, the installer will automatically detect it and ask to remove it first before install the new one.

If the previous installed ISCapture is still running, it will ask to close the software and then start the installation.

## Start ISCapture

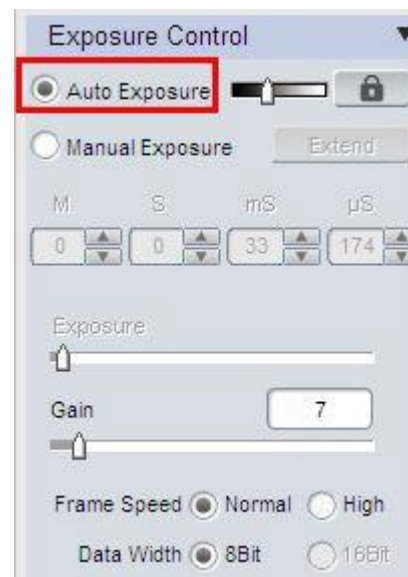
1. Connect the camera to the PC. Be sure the driver is already installed properly.
2. Double-click the ISCapture shortcut  to start the software.
3. Software will automatically detect the device and start the preview.



If get the “No Camera” or “Initialization Failed” error, it could be the camera is not detected by the PC or the driver is not installed properly. Please go to Device Manager to check the camera driver installation status.

## ISCapture Parameter Settings

1. Set [Auto Exposure](#). Observe the preview and adjust the microscope (or lens) to make image in focus.



Normally Auto Exposure function can get proper brightness preview. If preview is still dark, manually set [Gain](#) to the middle of the slider.

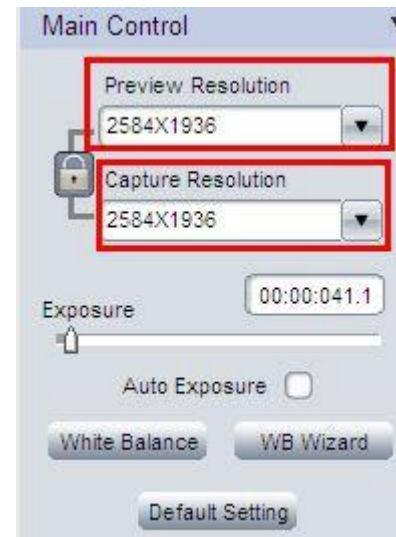
When get preview in focus, set [Gain](#) back to the initial value, change to [Manual Exposure](#) mode and extend the exposure time manually until get proper brightness images.


2. Click [WhiteBalance](#) button to correct image color.



To get better white balance result, please move the sample to the blank area and then hit [WhiteBalance](#) button, then move back the sample. Or also can click [WBWizard](#) and follow the steps to finish the white balance.

3. Change resolution, get different preview and capture images.



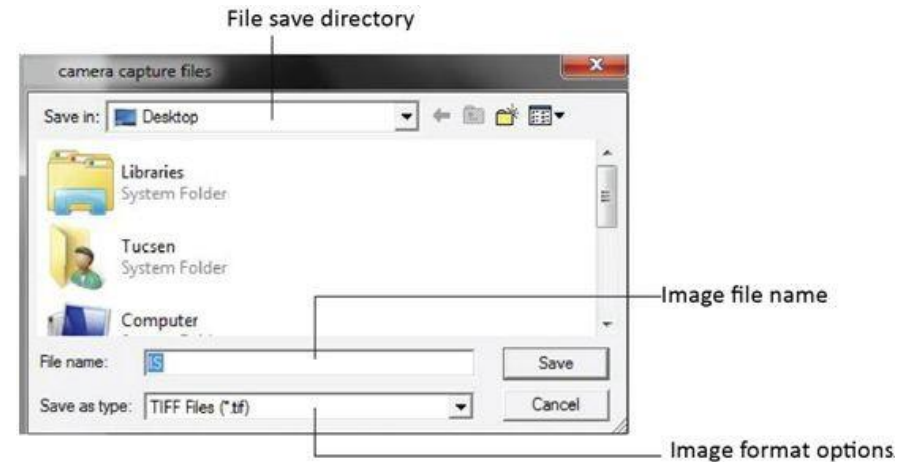
Click the Lock tag  to lock/unlock the preview and capture resolution. Unlocking it allows to set different preview and capture resolution (Usually use for low resolution preview, high resolution for capture).


4. Go to [FileSave](#) tab to set image save format, directory and file name.

a. Select [Use FileSave Config](#) to pre-set the capture image format, save directory and file name.

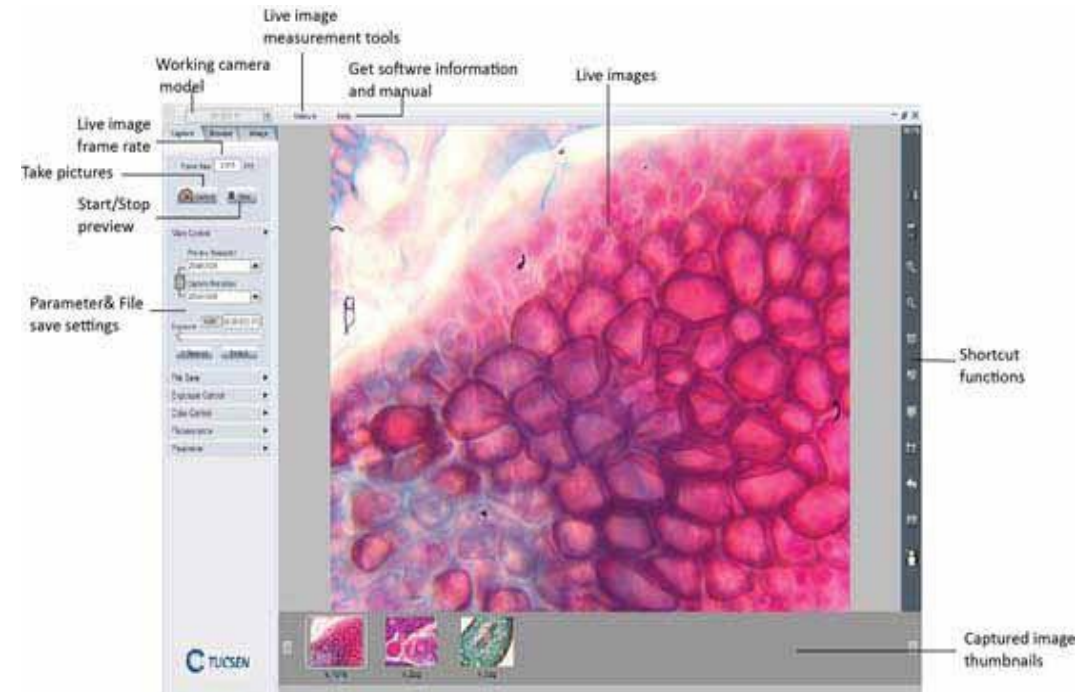


- b. Select [UseFileSaveDialog](#) to use pop up dialog to set capture image file name, save directory and format.



Every time click Capture button , the file save dialog will pop up to ask to set file name, save directory and image format.



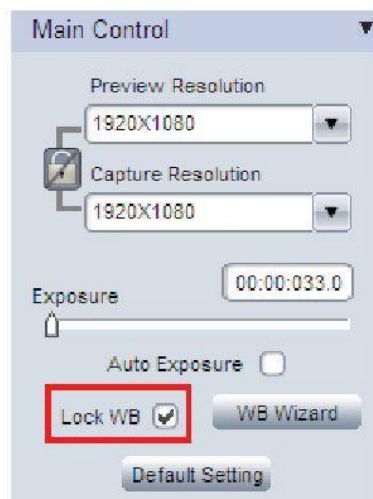
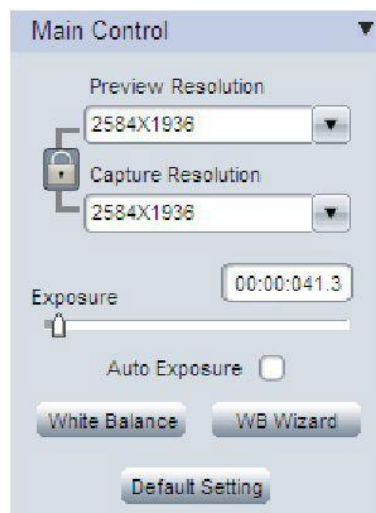


## Chapter 2: Image Acquisition

Capture tab allows to do parameter settings, capture still images, record videos and live image measurement.

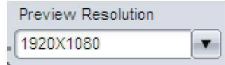
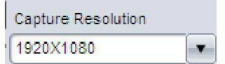
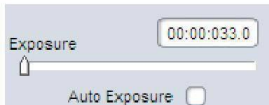
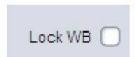
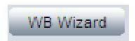



## Basic Control



TrueChrome II attached

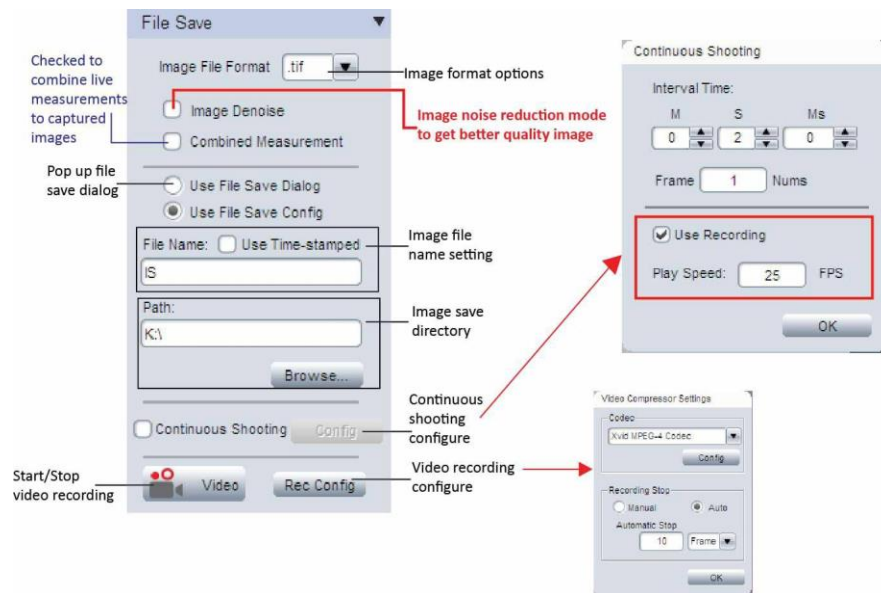
Provide basic exposure setting, white balance and image resolution settings.

	Live image resolution	Select resolution for live image
	Captured image resolution	Select resolution for capturing
	Exposure Time	Change Exposure time to adjust image brightness. Auto Exposure mode will adjust proper brightness image automatically.
	Lock White Balance	Unchecked: Auto White Balance mode. Apply white balance calculation for every frame image. Checked: Lock the White Balance calculation result.
	White Balance Wizard	Wizard for getting better White Balance result.
	Default settings	Restore all the parameters to default value

**Note:** [Lock WB] ONLY will appear when HD1500MET camera is attached.

**NO DRIVER INSTALLATION IS NEEDED WHEN USE HD1500MET.**

## Take Still Images and Videos



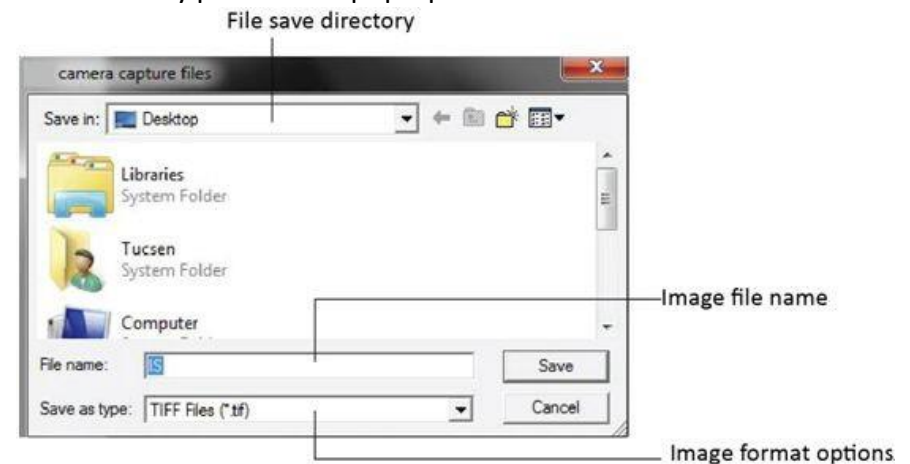
- In the **[File format]** dropdown menu , 4 file formats are available: **JPEG, BMP, TIFF and RAW**.

**Note:** 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 color camera raw file, color information only can be seen after decoding the Bayer matrix

- **[Image Denoise]**: checked to do the image noise reduction to save better quality image.

**Note:** In long time exposure application, it needs to wait quite a while to save an image.

- **[Combined Measurement]**: Checked to save the live measurements to the captured image.
- In **[Use File Save Dialog]** mode **Use File Save Dialog**, a pop up file save configure window will appear when the **[Capture]** or **[Video]** button is pushed. Enter the desired file name and directory path at this pop-up window.



- **[Use File Save Config]** **Use File Save Config**, allows the file

save name to be pre-set, format, image quantity, capture interval time and the file save directory. Upon executing [Capture] or [Video] button , ISC will save files as set.

## Capturing and Saving Individual Images

- Enter preferred name in the [File Name] field  . If do not key in anything, “IS” 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.

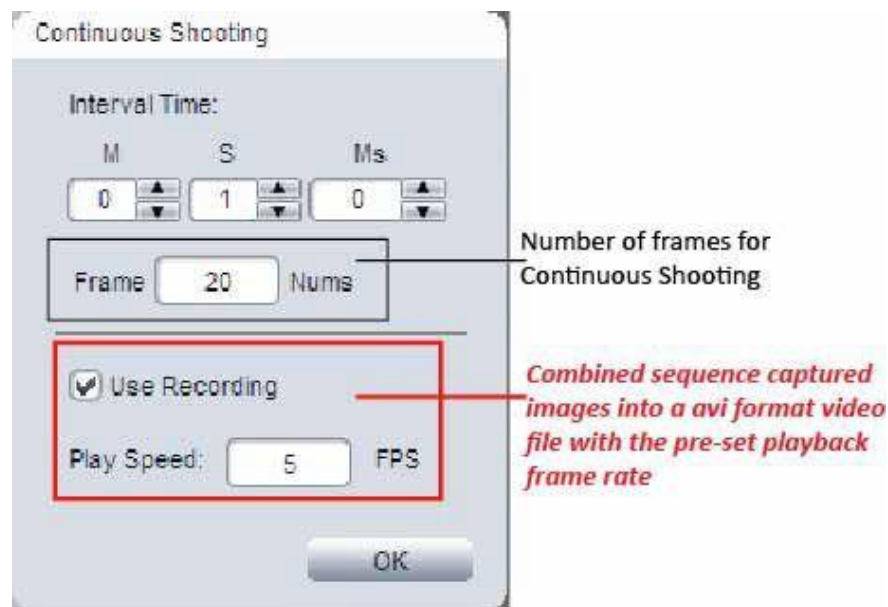
## Capturing and Saving a set of Images

- Click [Continuous Shooting] checkbox ☒ Continuous Shooting, the

software will automatically save a set of images after a single [Capture] is executed.


- Click [Config] to set continuous capturing image numbers and the interval time .

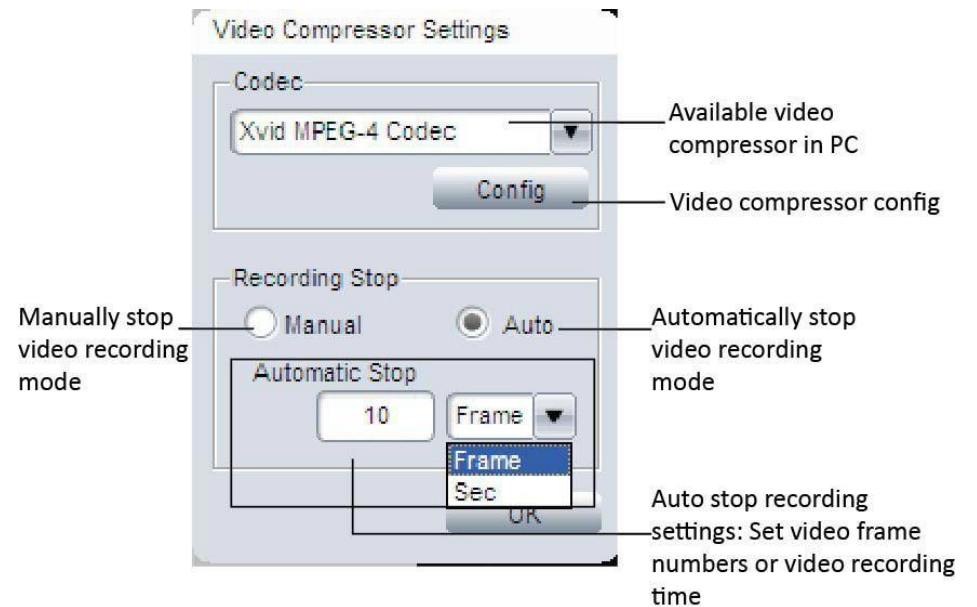
Check **[Use Recording]** checkbox to combine all the continuous shot images into a avi format video file. The created video file will be playback as the frame rate set in this dialog.



- This set of image file names follows the same way format as set for individual image capturing. If [File Name] is used, image names will be in the form "X", "X-1", "X-2"... (where X is the character/s entered or "IS" 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.

- [Manual] mode, [Video] button is pushed to start and stop the recording.
- [Auto] mode, pre-set the number of frames or the time for videos and [Video] is pushed, ISC 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.

**Note:** The video taken without any compression will be very large size. ISC will automatically search the [installed video compressors](#) installed on the PC.

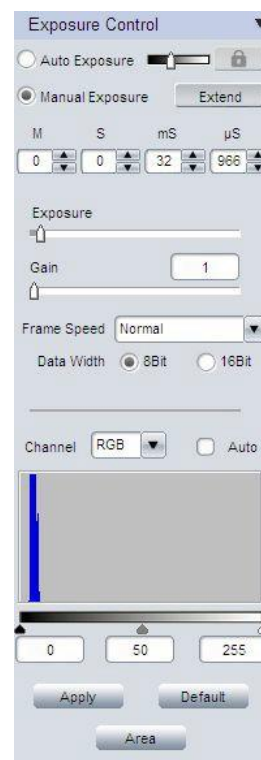
## File Save Destination



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

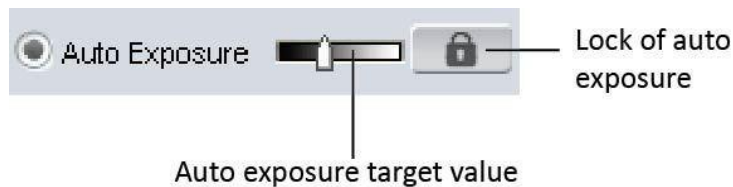
**Note:** This default destination might **NOT** be allowed storing any files if the user is not logged in as Administrator in [Windows Vista, 7 or later](#). Image may not save if the default path is used. We recommend either to change the file save path or release this folder “Write” authority for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


## Exposure Control



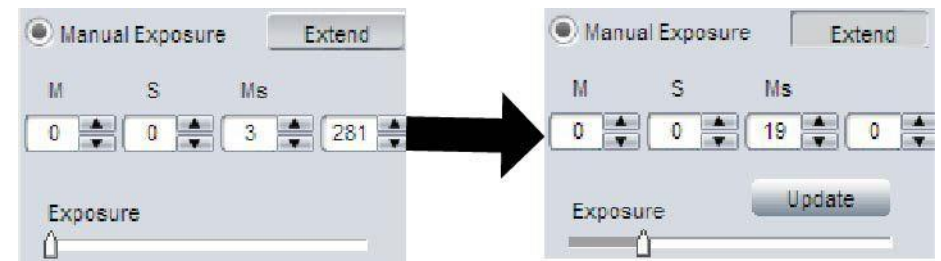
Change the Exposure time, Gain to adjust the image brightness. Select frame speed to get different live image frame rate. Set 8-bit or 16-bit data width for captured images.

## Auto Exposure





- Check [Auto Exposure] checkbox, software start to adjust the exposure time automatically to get proper brightness of 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, a lower target value is set, it will indicate a shorter exposure time to the software.
- **Lock:** 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.

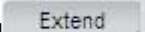
## Manual Exposure



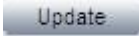
Adjust the exposure time manually. Two ways to change the exposure time:

- 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 gray out.

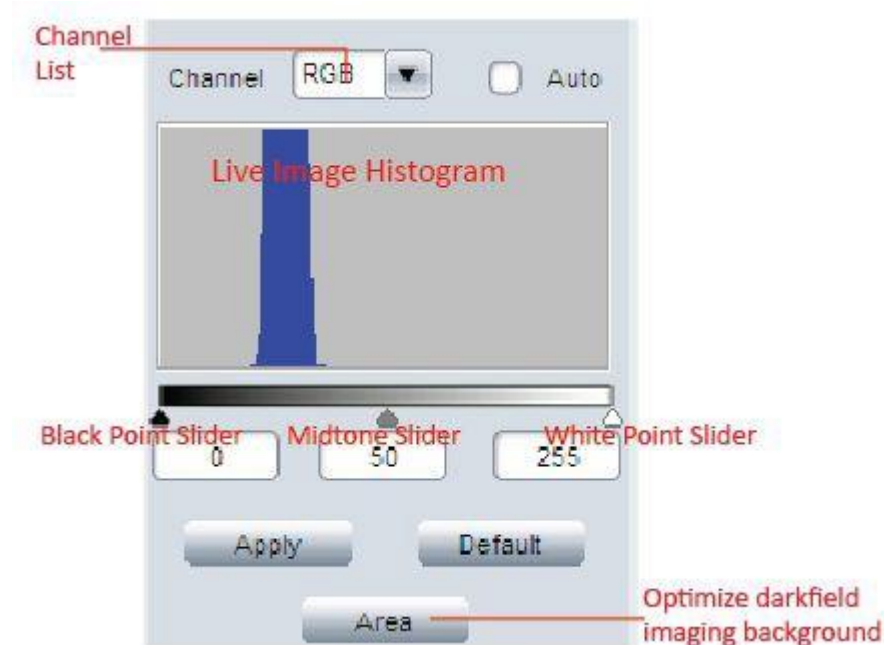


[Update]  appears after [Extend] is selected. Click on it to stop the previous exposure time and [restart the new one immediately](#). For long exposure applications, we strongly recommend that [Update] is used to start a new setting. This will help to get the new exposed image earlier. If the exposure 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	Available different available frame speeds depend on the camera model. Higher frame speed gives faster live image frame rate. Lower frame speed gives longer exposure time range. For dark field imaging , lower frame speed is recommended.
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.

## 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 to choose whether to edit RGB channel or one of the three, individual, color 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.

**Note:** 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.

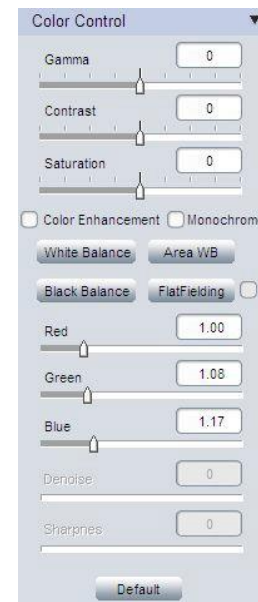
- It is also allowed to key in the image levels directly to do the adjustment.

After adjusting the levels, click  to **confirm** the setting. If

need to go back to the original image, click  to **restore** the image.

**[Area]:** Manually select the dark image area as a reference to optimize the dark field imaging background. **ONLY needed in dark field imaging.**

## **Color Control**







Used for adjusting image color, gamma, contrast and saturation.

## 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 it to the live images.
- When the check box  is unchecked, the calculated flat fielding parameter is **NOT applied** to the live images.



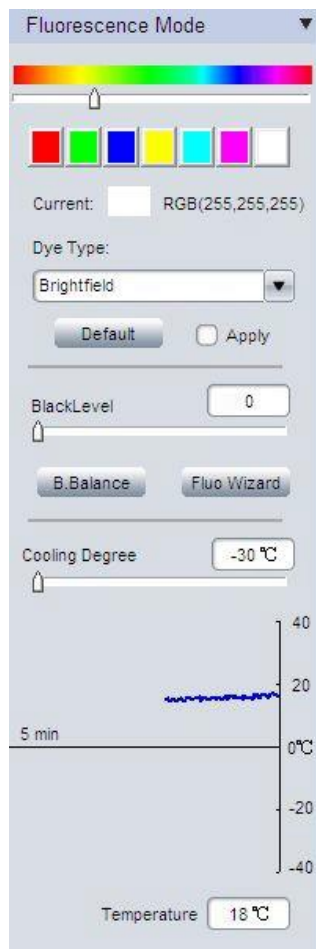
To get better flat fielding result, Move the sample to a blank area first, apply the flat fielding, then move the sample back.



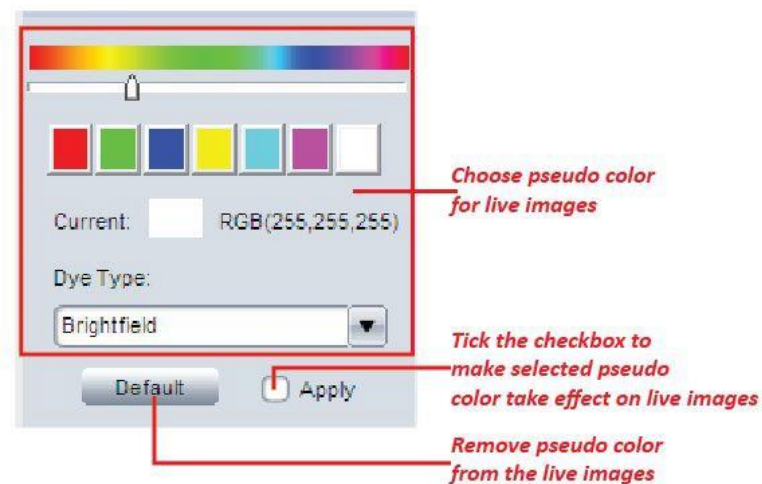
When the lighting is changed, **re-do the [FlatFielding]** to correct the uneven brightness.

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. <b>Not Available for TrueChrome II</b>
Monochrome	Check the checkbox to get a grayscale image.
Lock WB	Lock White balance. When get good color preview, check the checkbox to lock the good white balance paremeters 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. <b>Not Available for TrueChrome II</b>
FlatFielding	Correct image uneven brightness. Uncheck the check box: candle 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.
Denoise	<b>Reduce image noise, improve image quality. ONLY Available for TrueChrome II</b>
Sharpness	<b>Used to get sharper images. ONLY Available for TrueChrome II</b>
Default	Restore the parameter settings to the initial value and apply white balance.

## Fluorescence Mode



## Pseudo Color function

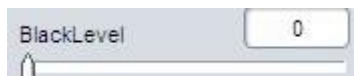


This function is **ONLY** available for CCD monochrome and Discovery MH15 cameras. Apply pseudo color to the live images.

Two ways provided for color assignment:

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

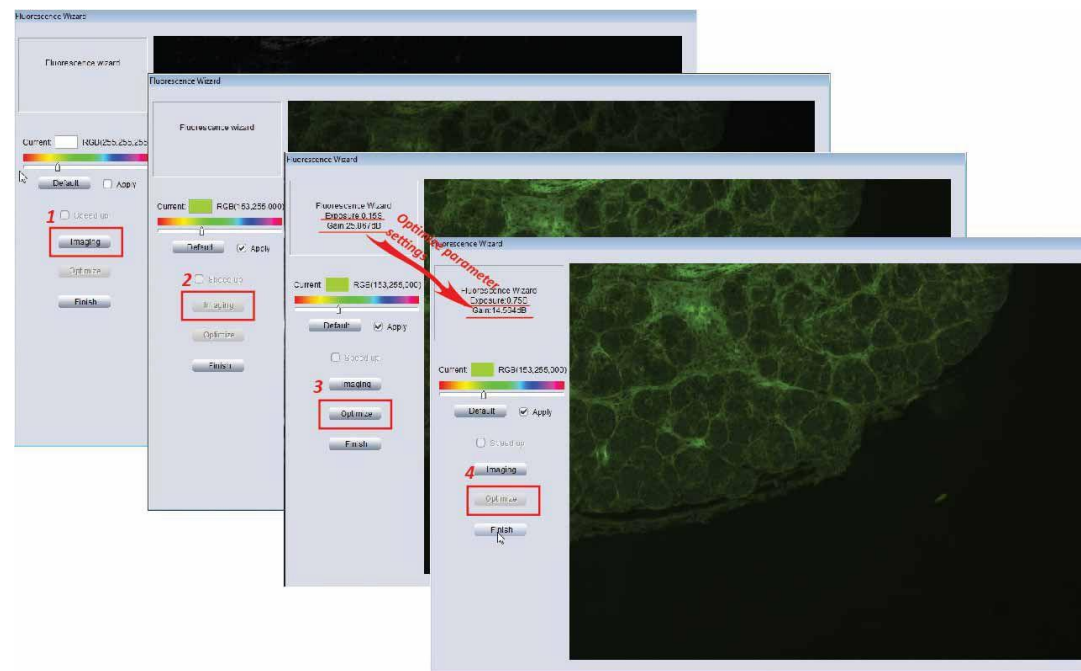
## Black Level



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.

**Note:** 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 long time to find your target and get a proper image (wait for finishing 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. Or you can follow the [Fluorescent Wizard] in the next section to get proper settings for low light applications.

## Fluorescence Wizard



[Fluo Wizard] function is used to **QUICKLY** get fluorescence images. It automatically adjust the parameters to get proper dark images.

**Step1:** Click on [Imaging] to get live images. In this step, it will automatically set HIGH GAIN and SHORT EXPOSURE TIME to get the imaging object visible.

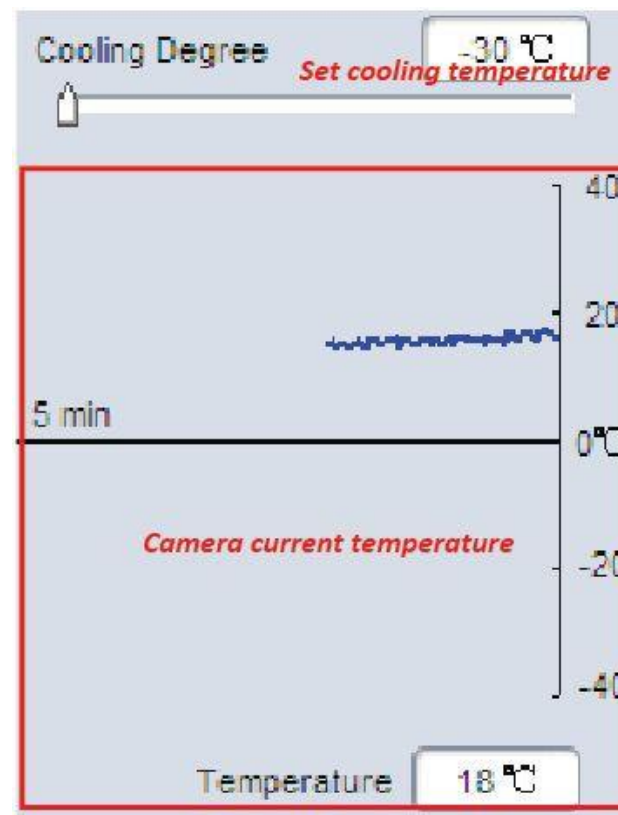


Short exposure time will give faster frame rate which will be easier for adjust the focus. High gain make the image bright but also bring significant noise. So it is normal to get noisy image in this step.

**Step2:** When get bright enough images, adjust your microscope (or lens) to make the image in focus.

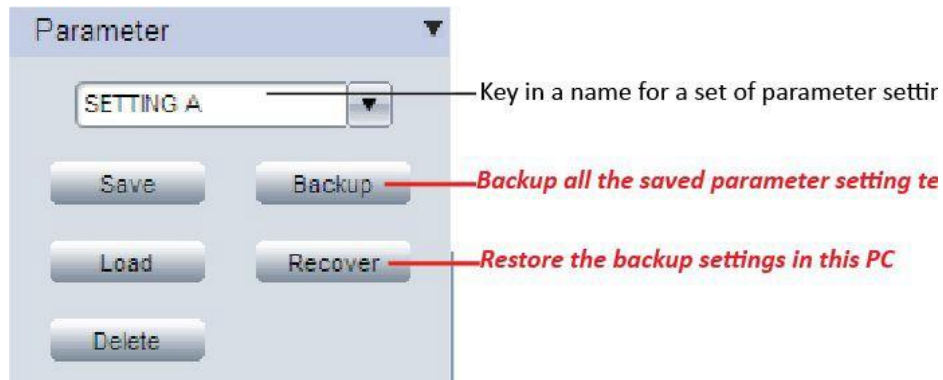
**Step3:** Click [Optimize] to optimize the parameter settings: set longer exposure time and reduce the gain value at the same time automatically to get low noise images.

## Temperature Control



This function is **ONLY** available for the CCD cameras assembled with temperature control chip.

## Parameter



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



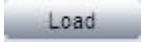

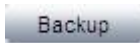

- **Save parameter function:** Enter a name for current parameter settings, click  to save it.
- **Load parameter function:** Click  to open drop-down menu, choose the preferred parameter team and then push  to make selected parameters take effect on the live

image.

- **Delete function:** Choose a parameter team and click  to remove it from the PC.

- **Backup function: backup all the saved parameter teams. Click  to get a pop up dialog which allows to select the parameter setting information save directory.**

- **Recover function: Restore all the backup settings.**

**Note:** User can copy the backup files to another PC and click  to restore all the settings in another PC.

## Live Image Measurement

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





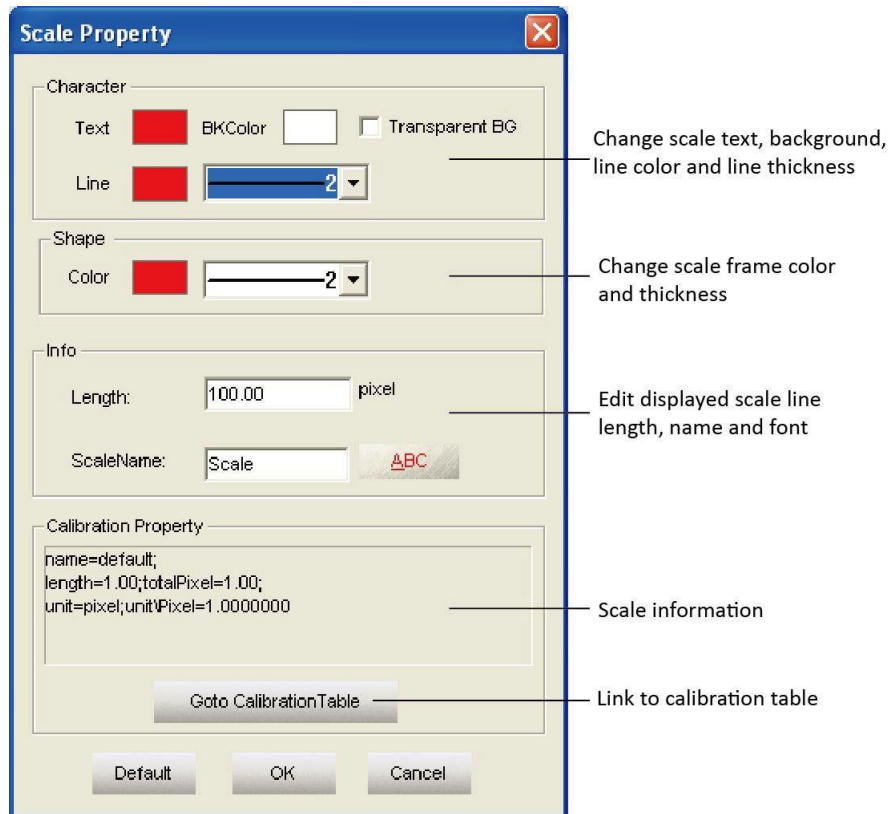
## Measurement List

	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 all the measurements and layers
	UnLock/Lock	Unlock/lock the measurement operation. Allow to do same measurement continually when LOCKED. It is locked by DEFAULT.
	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. Double clicking to end parallel measurement.
	Perpendicular	Measure the perpendicular length. Allow to do multiple perpendiculars' length measurement. Double clicking 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. Double clicking to end concentric circles measurement
	Polyline	Measure polyline length.
	Polygon	Measure polygon area and perimeter.
	Arc	Measure a curve angle, radius and length.
	Angle	Measure the angle
	Count	Counter. Manually count the quantity.
	Annotate	Add remarks on the images.
	Delete	Delete previous measurement. Select it then click on 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.

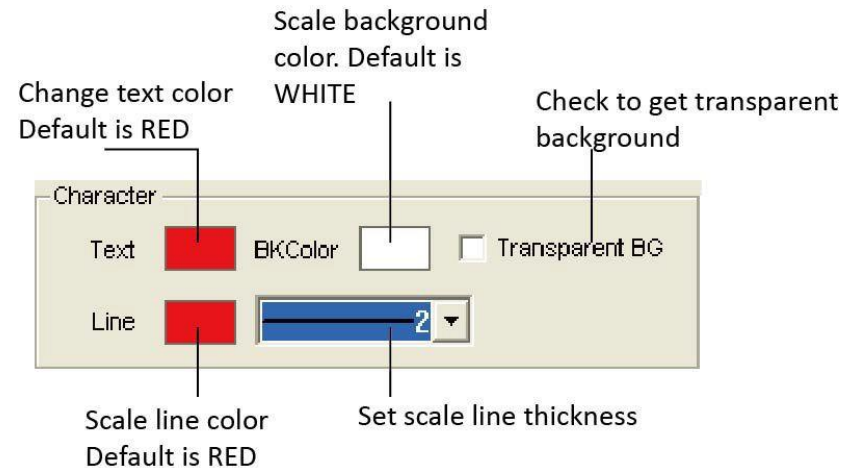


## Edit Scale Line

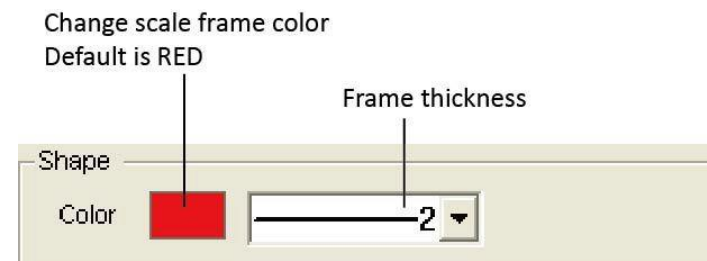


Double click on the scale to get its properties and make changes to it.

- Edit scale character




- Edit the frame of the scale



- Edit scale line length and name

Edit scale name  
 Change displayed scale line length  
 Change scale name font and text size


Info  
 Length: 100.00 pixel  
 ScaleName: Scale 

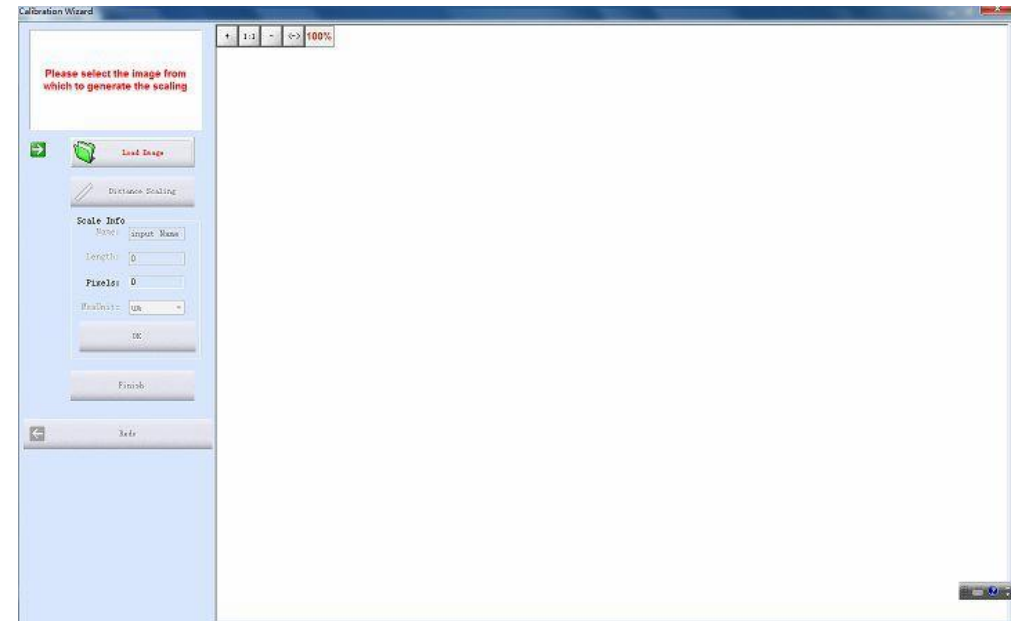
## Create Calibration File

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

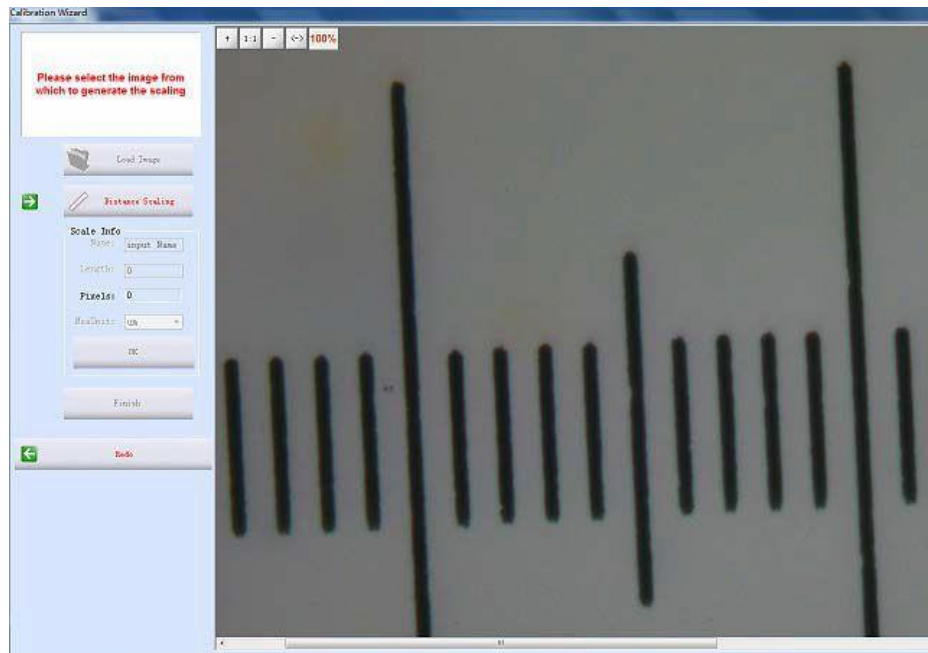
1. Take pictures of the calibration slide in all the required working objectives and resolution (if a reducing lens is also used in your application, it also requires you to take the calibration slide picture with the reduce lens attached).

**Note:** 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.

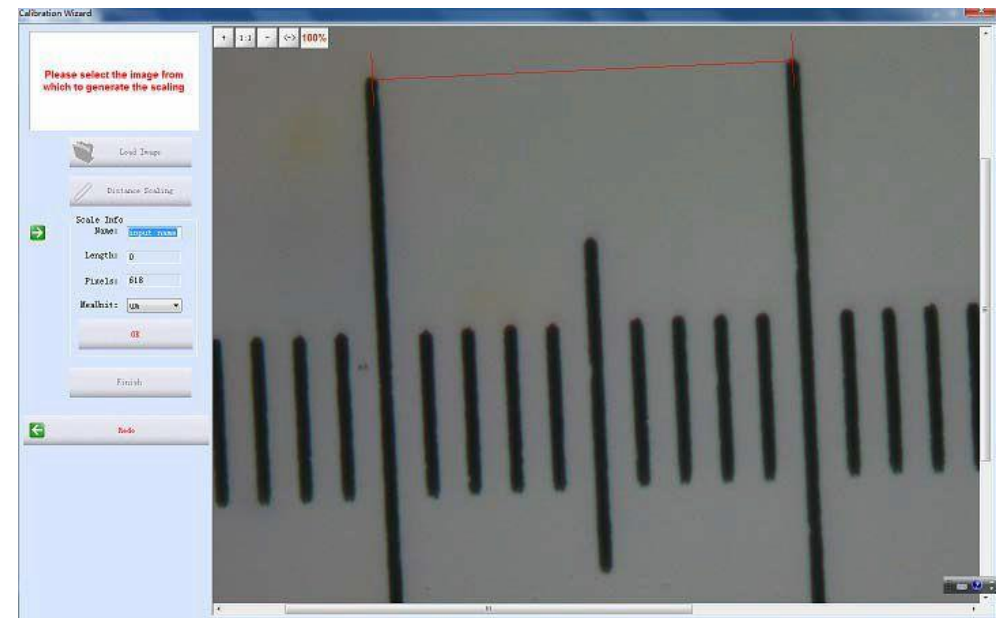


3. Click [Load Image] to load the calibration slide picture taken in Step1.



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

**Note:** 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.

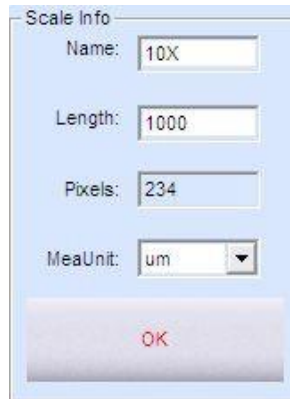


5. Enter the name for the calibration file and the length of the line you draw.

**Note:** 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.

**Note:** 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  $10 \times 0.1\text{mm} \times 1000 = 1000 \mu\text{m}$ .



Scale Info

Name: 10X

Length: 1000

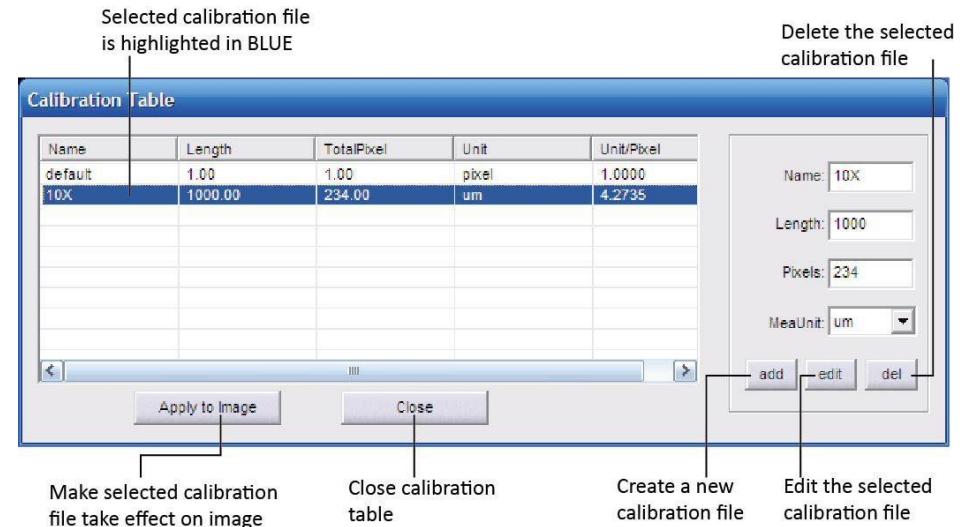
Pixels: 234

MeaUnit:  $\mu\text{m}$

OK

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	$\mu\text{m}$	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

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							

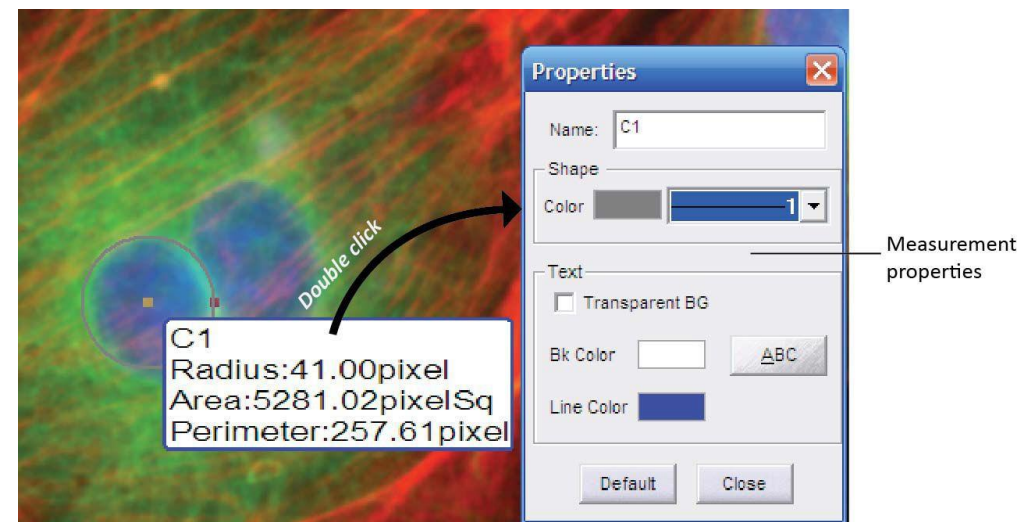
[Save to TXT](#)    [Save to Excel](#)    [Copy](#)    [OK](#)

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

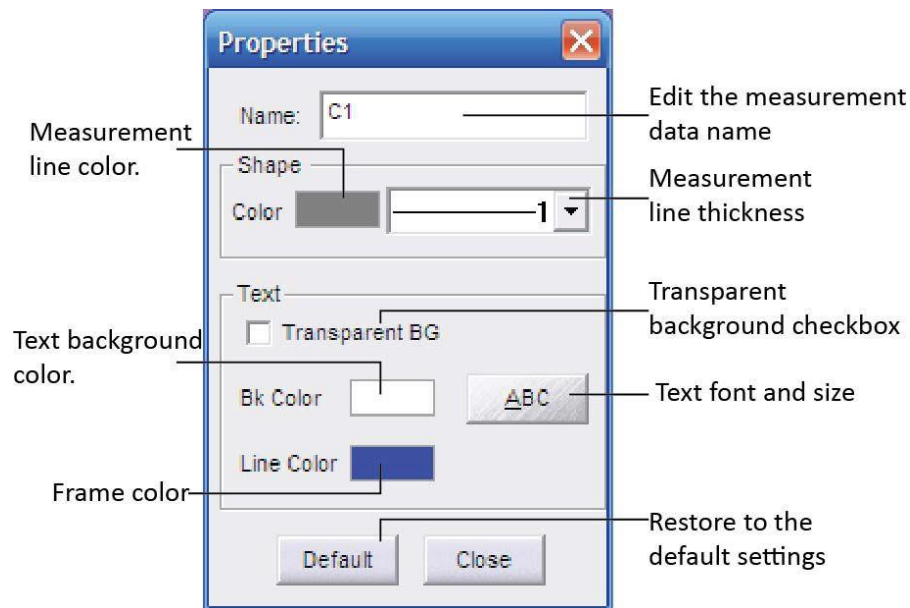
All the measurement data is listed in the [Measurement List]. The software allows you to export all the measurement data to [TXT](#) or [Excel file](#).

## Measurement

ISC 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.

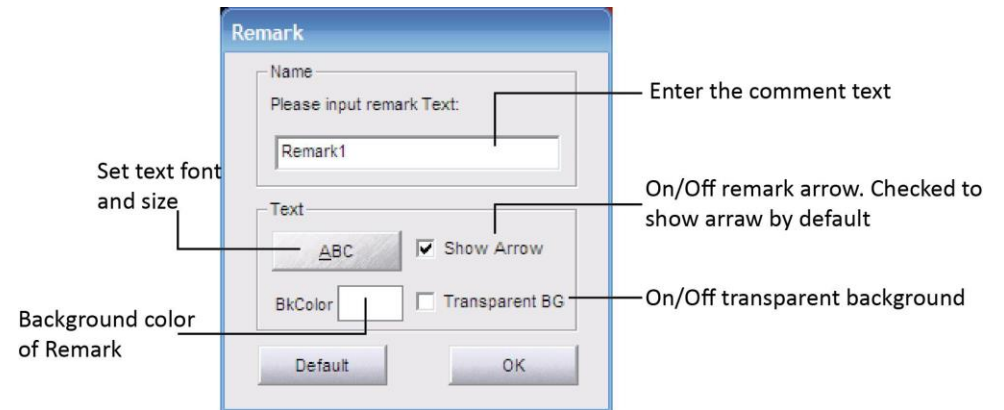


Double click on the measure data to get the measurement configure window. It allows you to change the measured data name, color, thickness, background color and the character font.




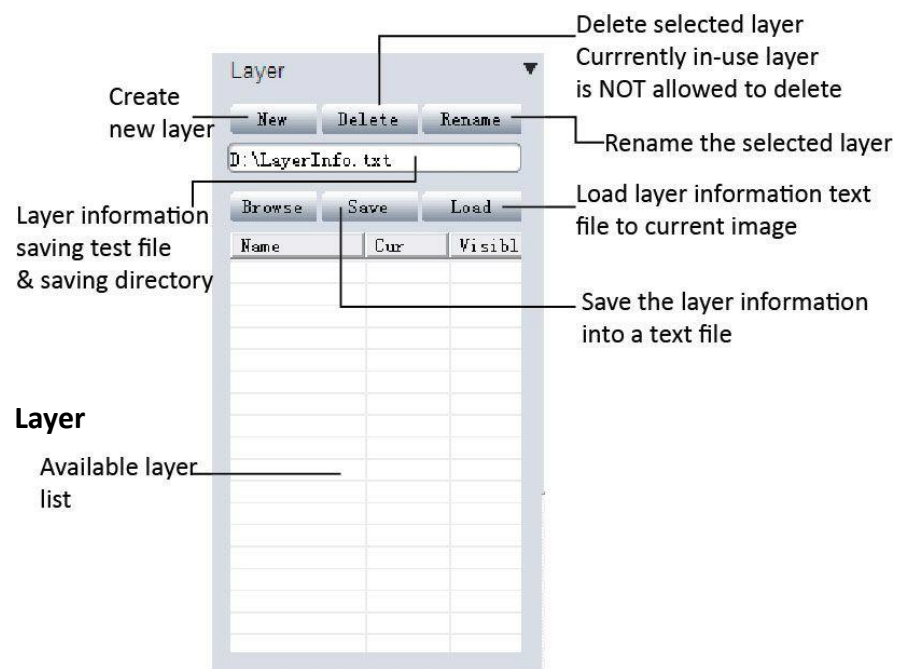
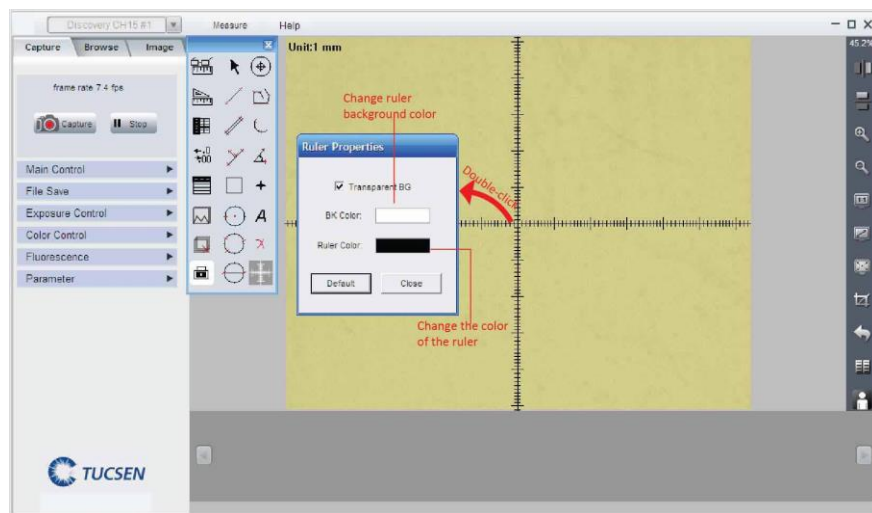
## Annotate

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 color 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 color. [The default color is BLACK.](#)

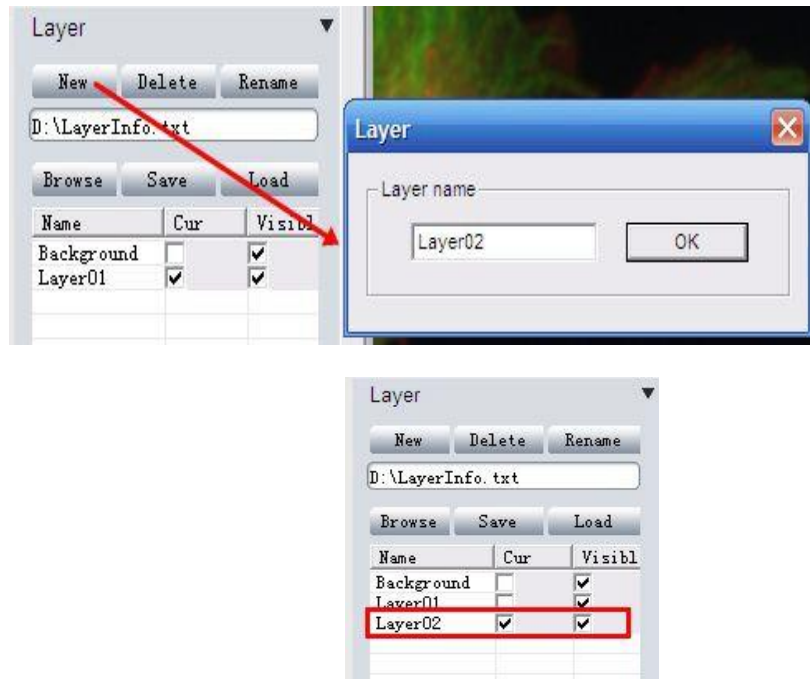


Create multiple layers for loads of measurements. The layer function makes adding a large number of measurements on the processed image review simple and easy.

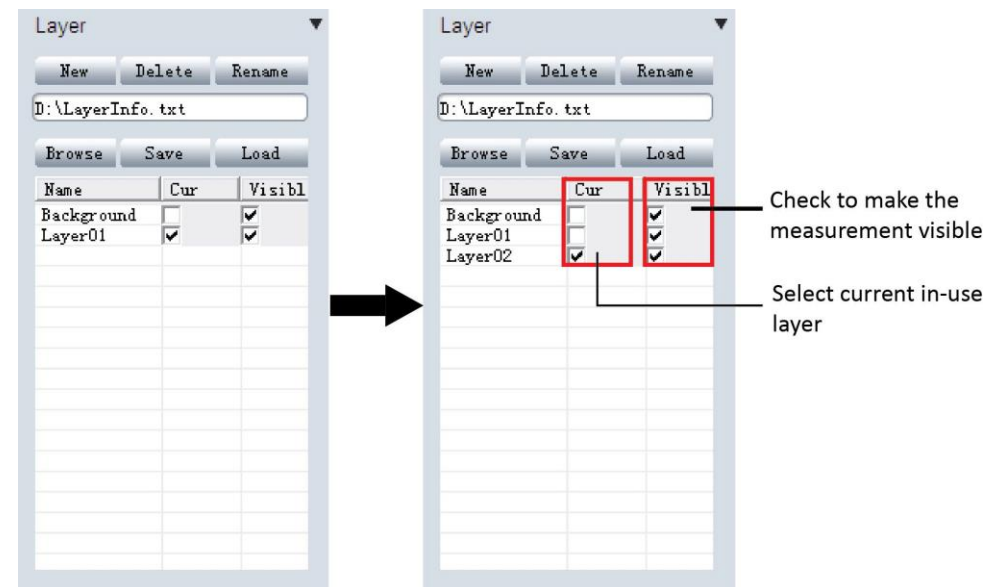
If you have already applied some measurements on the image, the [Layer] function automatically creates “Background” and “Layer01” for the current image.



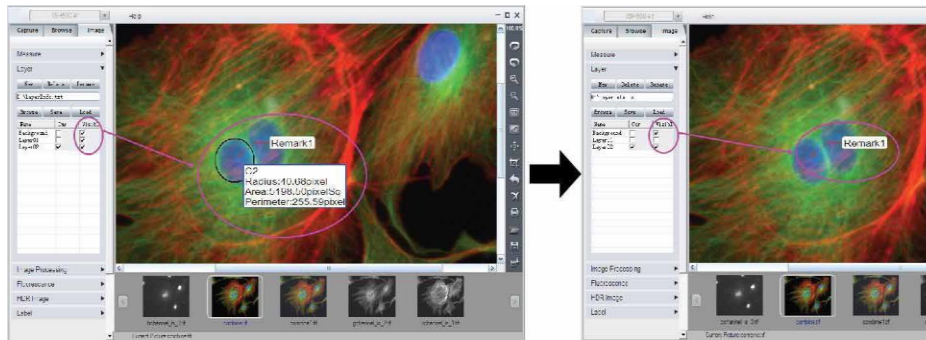
Click [New] to create a new layer. Allow to key in the preferred name for the new layer. It uses “Layer02”, “Layer03”... etc as the layer name by default.



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



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

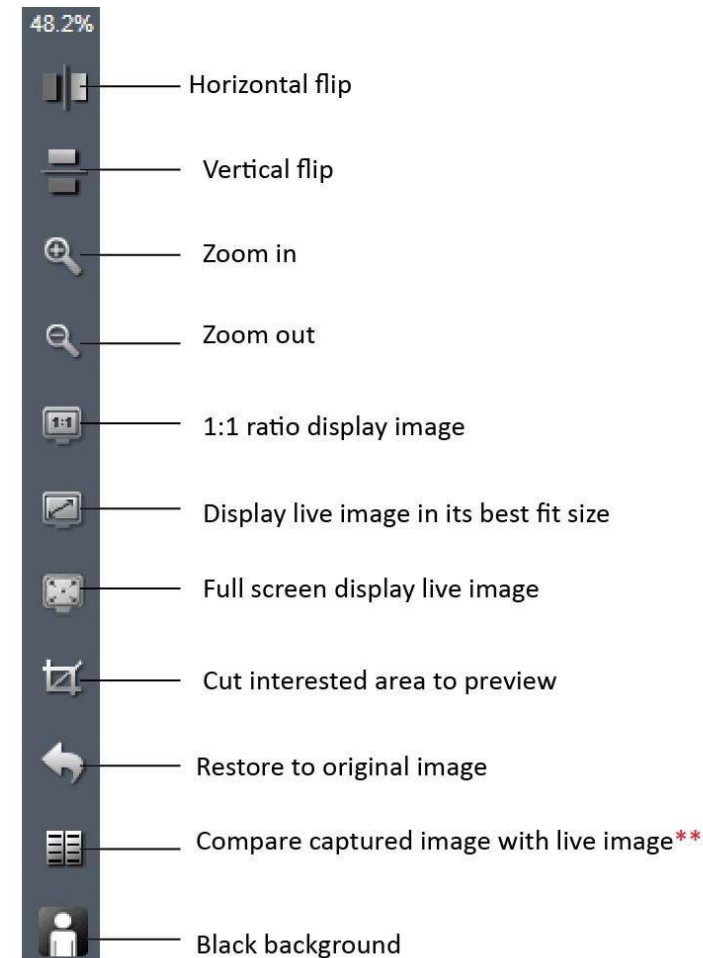


### The layer information is saved in a text file.

- 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**).

## Chapter 3: Image Management

View images in [Browse] panel, it displays the image File name, capturing time, color 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 ISC, it will show the image comment.

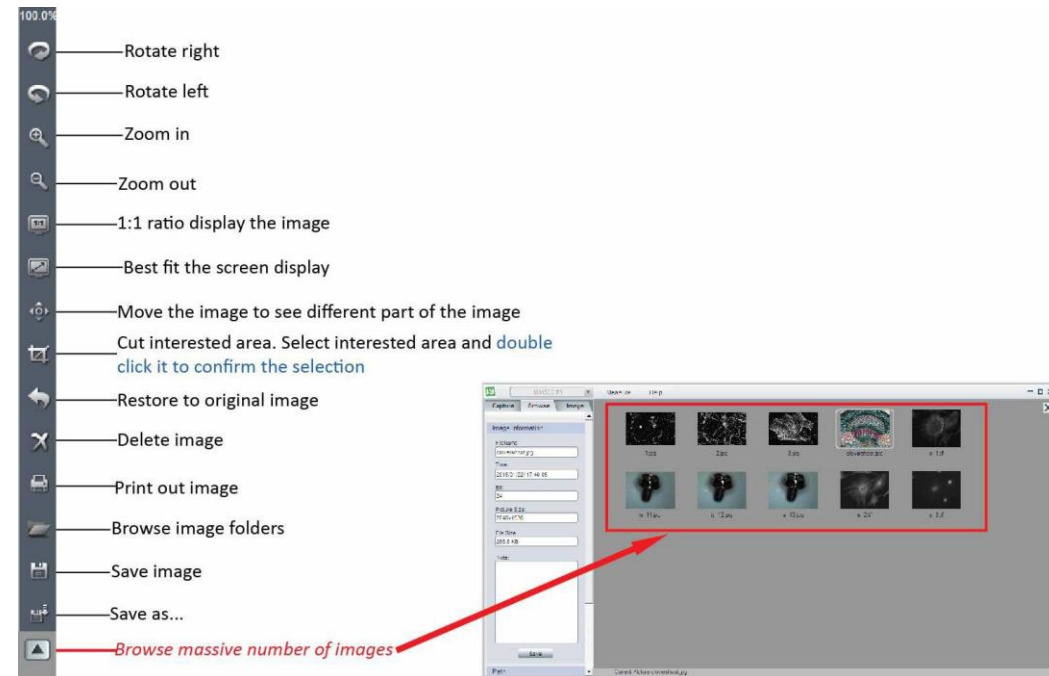


The screenshot shows the 'Image' panel of the ISC software. It contains the following fields and controls:

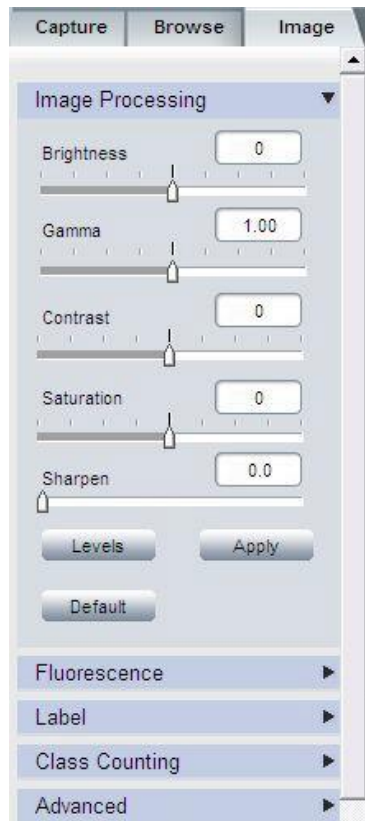
- Image Information**
  - FileName: is\_1.bmp
  - Time: 2013/03/21/ 11:01:50
  - Bit: 24
  - Picture Size: 3488x2616
  - File Size: 26.1 MB
  - Note: HELLO
  - Save button
- Path**
  - C:\Program Files\ISCapture\
  - Browse... button

## Image Management and Processing Shortcuts

ISC provides some quick functions on the right hand side of the software in **Browse** or **Image** mode.

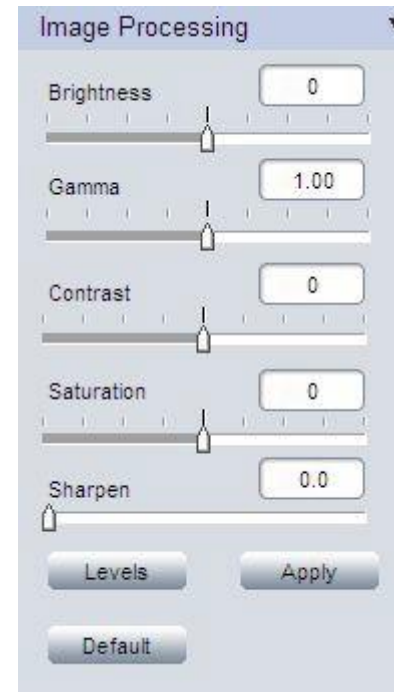


## Chapter 4: Image Processing Tab



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

## Image Processing




Provide basic still image processing functions.

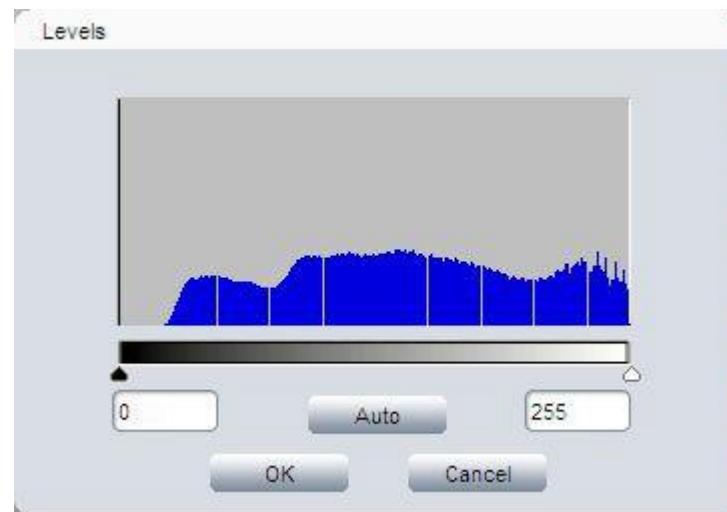
Brightness	Adjust captured image brightness. Default brightness = 0
Gamma	Adjust captured image gamma. Default gamma = 1.00
Contrast	Adjust contrast. Increase the contrast, the shadows become darker and the highlights brighter. Decrease the contrast, the highlights grow dim and the dark areas lighten 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 [Exposure Control]>>[Levels]
Default	Restore Brightness, Gamma, Saturation, Sharpen and levels back to the default value
Apply	Confirm to apply all the settings to the image.

**Note:** 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]-->> [Exposure

Control]-->>[Levels].



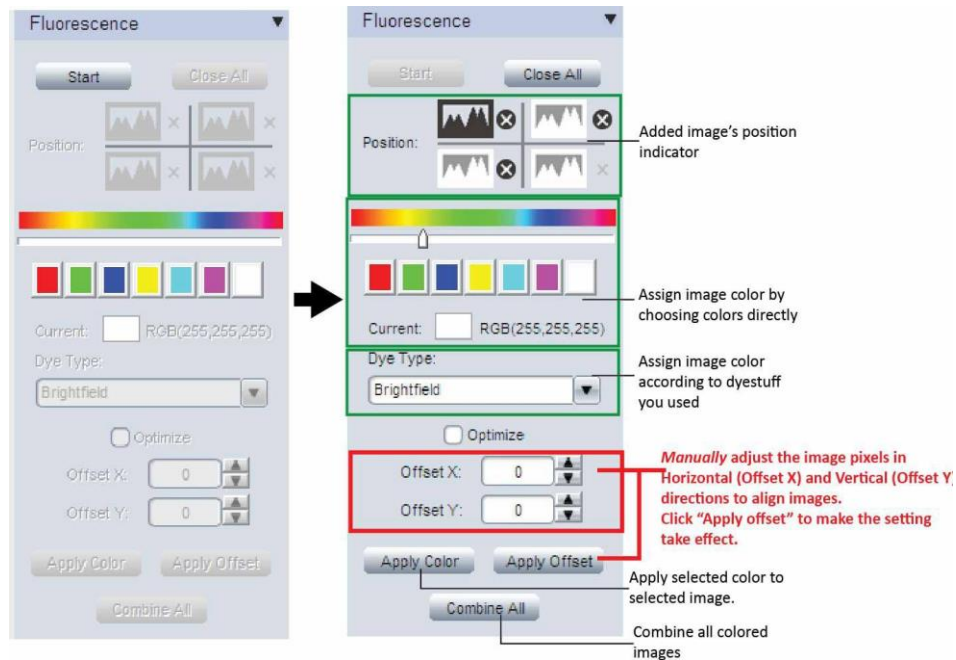
## Measure

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

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



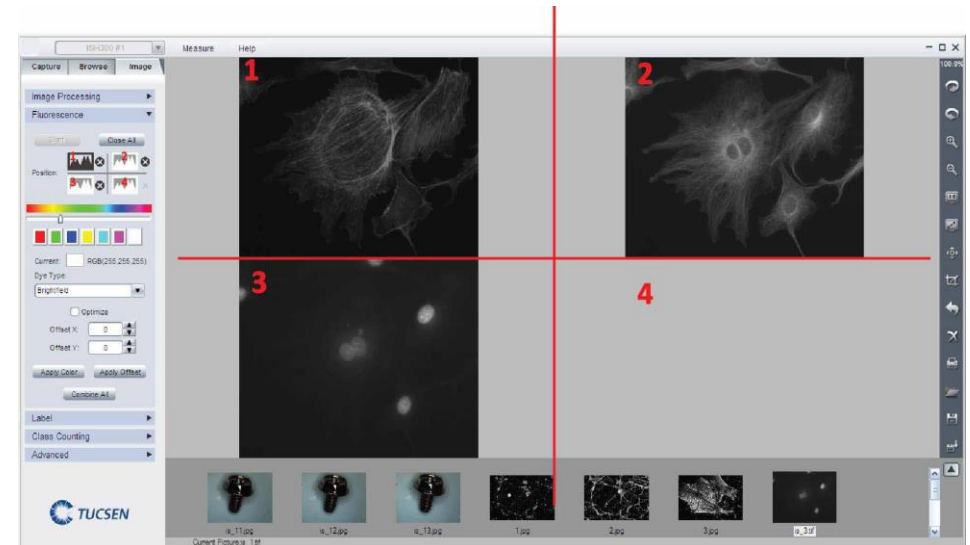
## Fluorescence



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

**Step 1:** Open the images which are used for combination in ISC , 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 color for it.

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

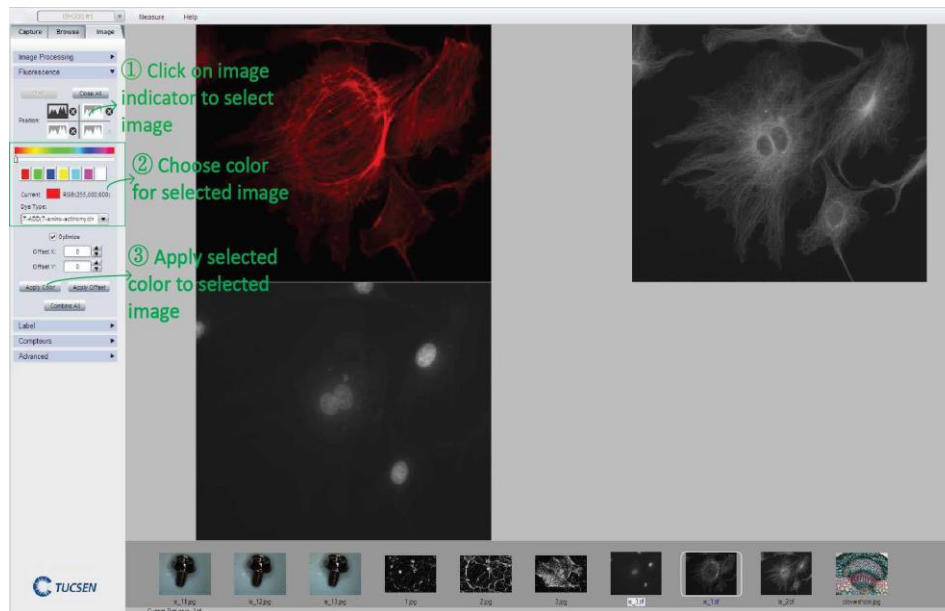
② Assign color for selected image.

Two ways provided for color assignment:

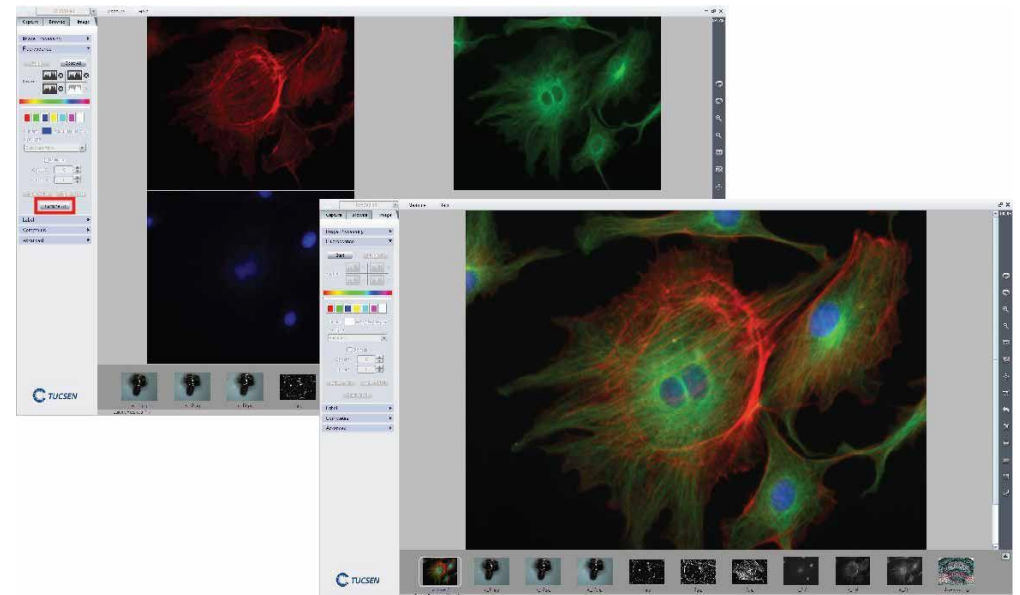


- a. Click on the preferred color or slider to choose it.
- b. Assign the color according to the fluorescence dye in the drop-down menu [Dye Type].

③ Click on [Apply Color] button to add selected color on the image.



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



**Note:** ☒ Optimize 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.

**Note:** After combining the fluorescence image,




[Sharp] function in [Image Processing]

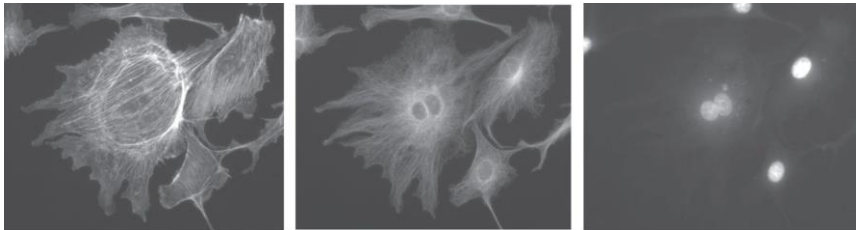


can help to get [sharper images](#) and see more image details.



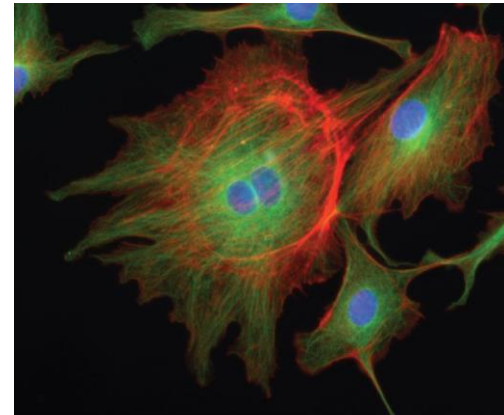
If you add the wrong image or wrong color to selected image, just click on the tiny cross  beside each indicator to delete it. If you want to cancel the current combination, just click on [Close All] to cancel the combination.

Original images:

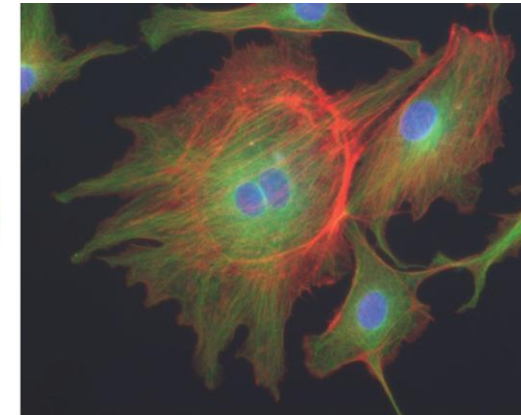


Original images

Combined image:

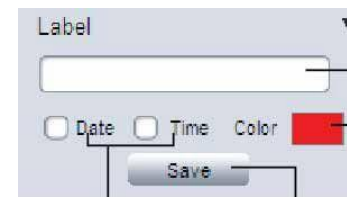


Combined image **with** optimization



Combined image **without** optimization

## Label



Enter the label

Color options for label

Check to display  
current date  
and time on  
image

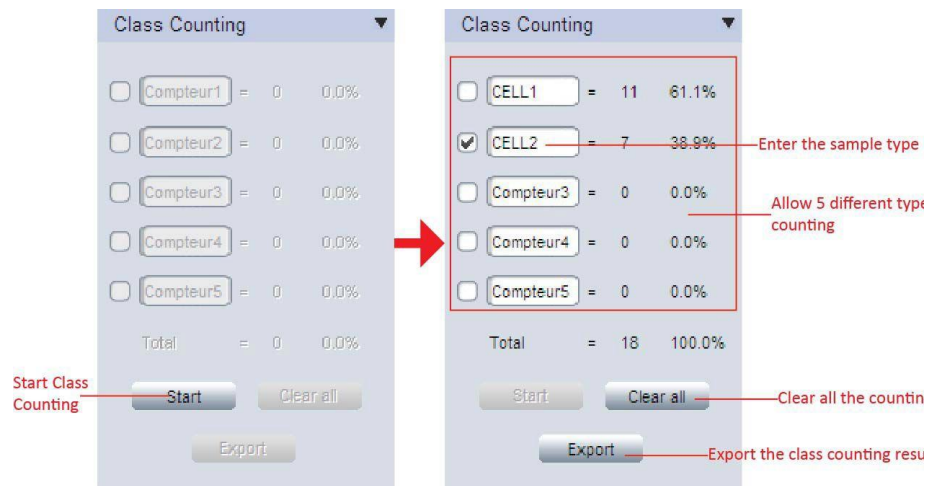
Confirm the  
operation

- The [label text](#) will be displayed on the [lower right corner](#) of the

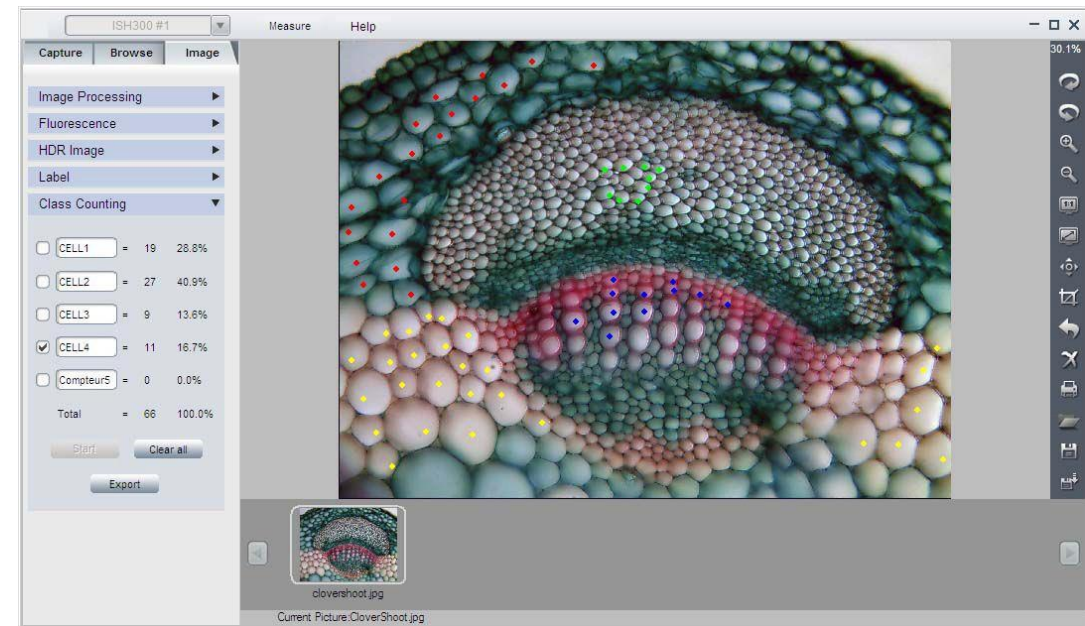
image.

- 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 "IS.jpg", then this image with a label will be saved as "IS\_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 color dots.

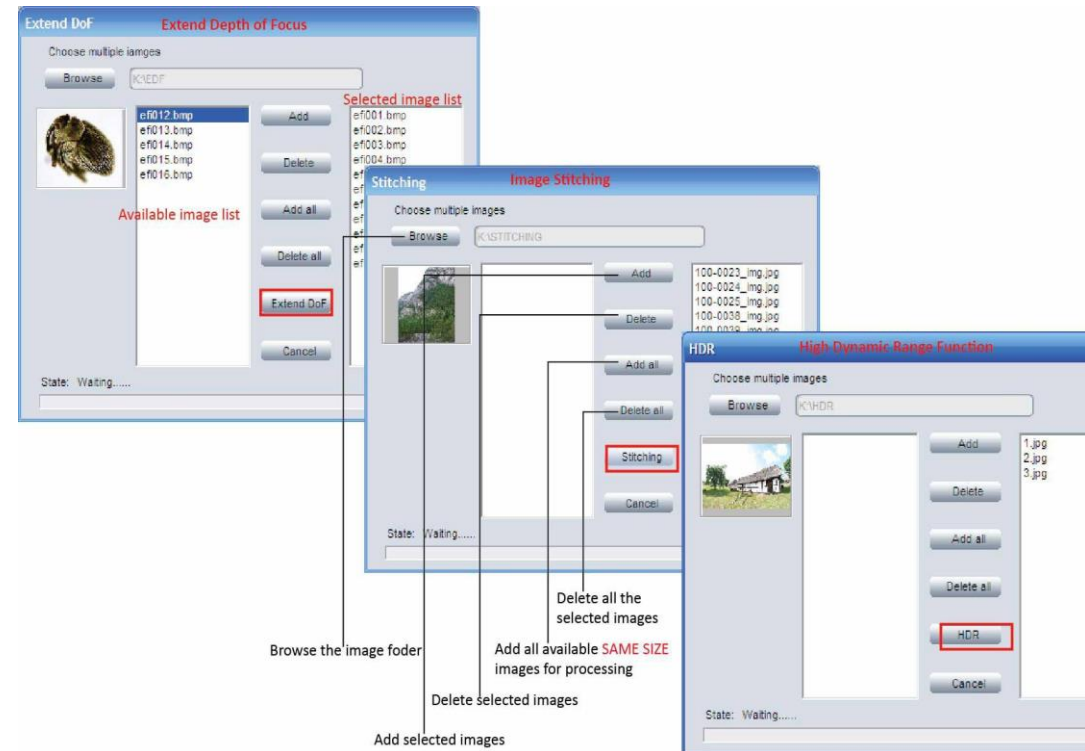


## Advanced Functions



Extend DoF (Extend Depth of Focus), Stitching (Image Stitching) and HDR (High Dynamic Range Image).

Push [Extend DoF]/[Stitching]/[HDR] to get below dialog box. Select the corresponding images and apply the function. This function combines multiple images to create one focused/panorama/ high dynamic range image.



- Browse the image folder which you are going to do the processing.
- All the images in the folder will be listed on the left hand side. Click on one image or select multiple images, the images will be highlighted in BLUE.



- Click [Add] to add the highlighted image to the right hand side (the selected source images for processing).
- [Add all] button allows to add all **the same size** images in the left hand side to the right as stacking/ stitching/ HDR source images by just **one click**.
- Click [Extend DoF]/[Stitching]/[HDR] to stack all the selected source images and get an processed image.

**Note:** When selecting a wrong image, just click on it then click [Delete] to remove it. [Delete all] will remove all the selected images.

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