Trademark and Copyright Information

Welcome

Thank you for buying a LluminsEye® high quality digital camera. We suggest you spend a few minutes carefully reading this use manual before installing and using your camera. Please keep this user manual in a safe place for future reference.

Warnings and Precautions

Precautions when using your LluminsEye®

Keep the camera away from the following:

- High temperatures and excessive humidity
- Direct sunlight or other heat sources
- Dust
- Extreme vibration

If the imaging sensor lens becomes dirty:

1. Try blowing the dust particles from it
2. Use a lint free cloth or proper lens cleaning cloth to gently wipe the lens.

Only use approved lens cleaning fluids.

NEVER TOUCH THE LENS WITH YOUR FINGERS!

Do not allow the camera to come into contact with water or any other liquid. If water or a foreign substance should get in the camera, unplug the camera immediately. Do not attempt to plug the camera in again until you have given it sufficient time to allow for drying. This does not necessarily mean the camera will work again! Do not open the camera case or attempt your own repairs. Internal components may create risk of electrical shock or fire. There are no user serviceable components inside.

Clean the outside of the camera by wiping it with a clean, dry cloth. Never use harsh or abrasive cleaners or organic solvents on the camera or any of its parts.

If you notice smoke or a strange smell coming from the camera, immediately unplug the camera and consult and authorized dealer.

System Requirements

Pc running either Windows® (32-bit & 64-bit) Xp, Vista, 2008 and 7; Mac OSX and Linux

Performance is not guaranteed is the following specification cannot be reached.

- DirectX 9.0 or later installed
- 2.0 GHz minimum processor (Recommended dual core 2.8GHz or more)
- USB 2.0 port
- CD-Rom drive
- 2GB RAM (Recommended 2GB or more)
- 200mb Free hard drive space

Performance is dependent on the PC's graphics card.

USB 2.0 is supported Windows ® XP,2003, Vista, 2008 and 7. Also Mac OSX and Linux (kernel 2.6 or Above).

Windows XP Pro must have service pack 2 (or later) installed in order for the camera to function correctly. To check is you have USB 2.0 installed on your computer go to:

Start > Settings > Control Panel > System or "right click" on "My Computer" and select "properties" from the context menu…

Click on the "Hardware" tab and then "Device Manager";

Within the "Universal Serial Bus controllers" (USB controllers) you will see a list of USB devices installed on your machine. In this example the red arrow is indicating the USB 2.0 device.

Apart from "USB 2.0" controllers, they may also be labeled as "Enhanced" or "Standard Enhanced" controllers. The so-called "Standard" or "Standard Universal" controllers are for the slower USB1.x system.
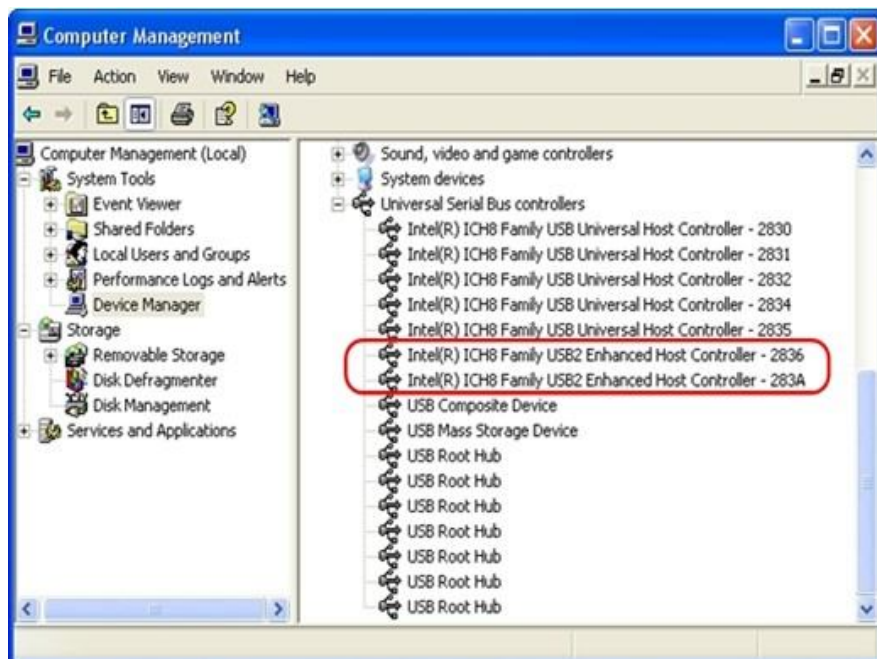
Package Contents

1x Camera

1 x Usb Cable

1 x Focusable C-mount Connection (optional)

Llumins Software Link, http://www.llumins.co.za/downloads.htm

Please follow instructions on the Website.

Product safety information:

This product is in compliance with the low-voltage, EMC, Health and Safety Regulations:

26/95EC, EN62471:2008

2004/108/EC, EN61326-1:2006,

EN 61000-3-2:2006+A2:2009, EN 61000-3-3:2008
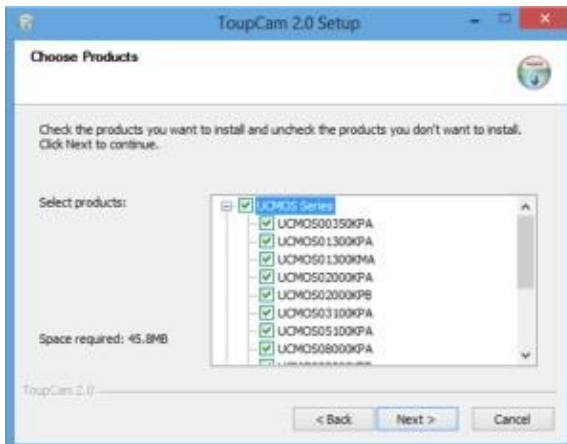
Installing the Driver and Software

1. Insert CD into CD-Rom.
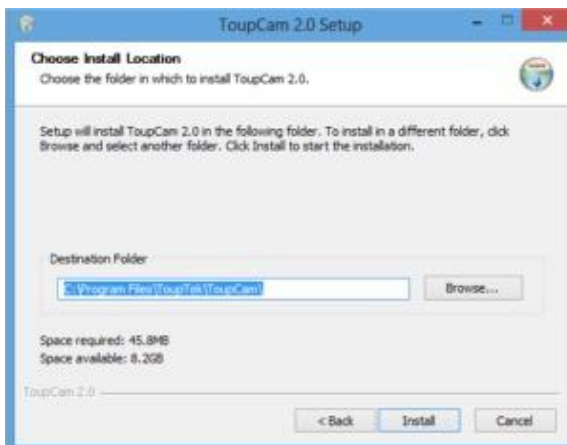2. Double Click "LluminsEyeDriver"

3. Click "Next"

4. Select "I Agree"

5. Select the driver consistent with the model of your product and then
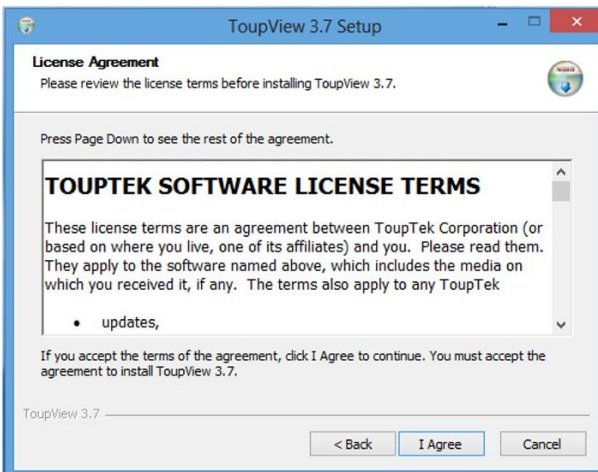
   Click "Next"

6. Browse to select an alternative Installation path or just click "Install" to select the default path.
7. Click "Finish", at the end of the installation. (If using Vista, Please plug the digital eyepiece into the USB slot before installing camera driver)
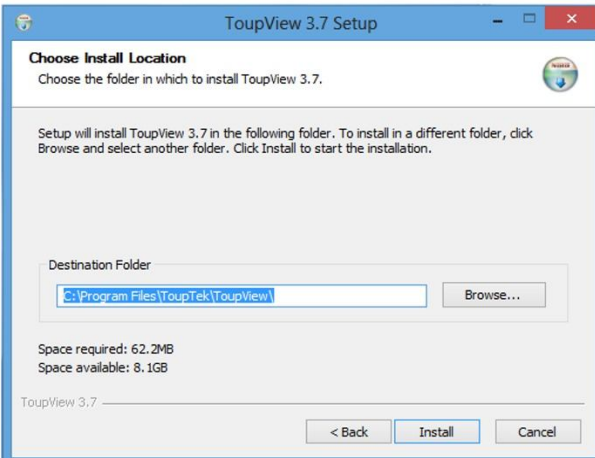
8. Select and Click to Install "LluminsToupViewSetup"

9. Click "Next"

10. Click the "I Agree"

11. Select the installation path. If the installation path is the default one, just click "Install"
12. Click "Finish", at the end of the installation. (after a successful installation, the Shortcut Icon " " ToupView will appear on the desktop)

Connect the camera to a Microscope

With the left hand, hold the camera and remove the dustcover by rotating it clockwise. Keep the interface vertically downward in the process to prevent dust from entering the lens area. Connect the camera to the C-mount, note: try to keep the camera and adaptor in a horizontal position during the installation, to prevent tiny dust particles to pollute the camera sensor surface and optical centre of the internal interface.

Connect the Camera

Connect the USB cable into a free USB slot on the computer (Requires USB 2.0 interface).

"New Hardware Found" or "Installing device driver software" displays at the bottom right of your PC screen. The camera is recognized.

➔ The Found new hardware wizard should start, Select "Install the software automatically"

→ Finish (If unidentified publisher / Windows Logo Testing appear, Select continue anyway)
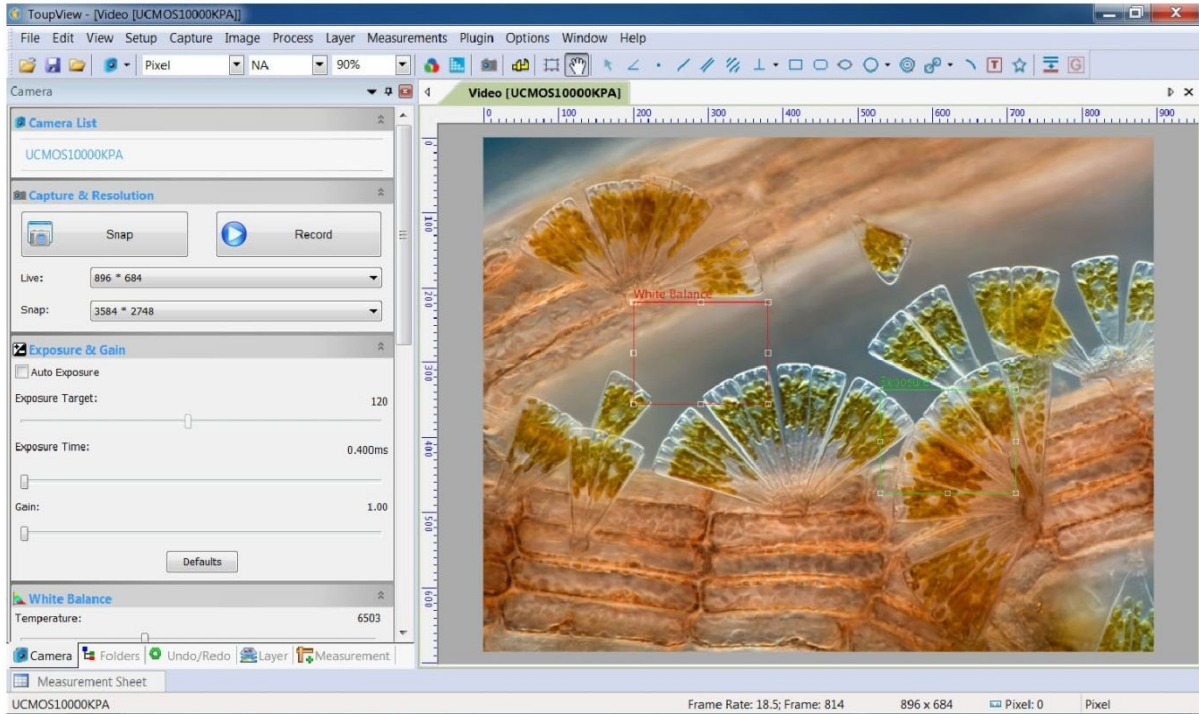
NOTE:

1. Plugging the USB connector to a USB port directly on the main PC/Laptop is recommended.
2. Do NOT use anything to extend the USB cable.

Using the camera

1. Double click the desktop icon , and start Toupview.

2. If the camera is connected with the computer correctly, click the device on the camera list found on the left sidebar and the Preview will open.
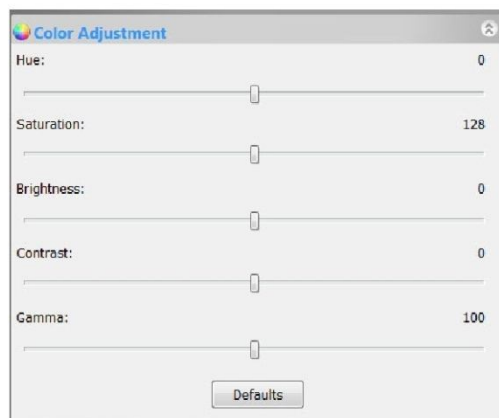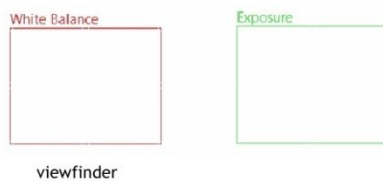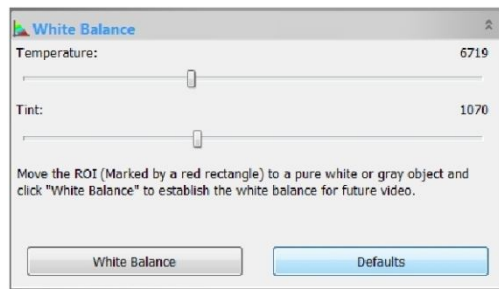

Camera Initialization Settings

In Video preview mode, the following settings are available for adjustment.

1. Buttons and Icons

1: Open (Ctrl + O)	7: Zoom	13: Track	19: Two Parallel	26: Two Circles
2: Save (Ctrl + S)	8: Video Source Properties	14: Object Select	20: Vertical	27: Arc
3: Browse (Ctrl + B)	9: Video Stream Format	15: Angle	21: Rectangle	28: Text
4: Camera List	10: Capture Image	16: Point	23: Ellipse	29: Polygon
5: Unit	11: Calibrate	17: Line	24: Circle	30: Manual Fusion
6: Magnification	12:Image Select	18: Parallel	25:Annulus	31:Gray Calibration

Capture & Resolution

Snap | Record

Live: 896 * 684

Snap: 3584 * 2748
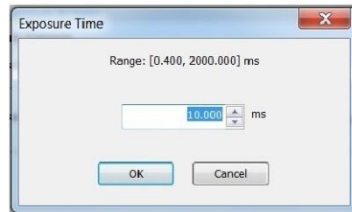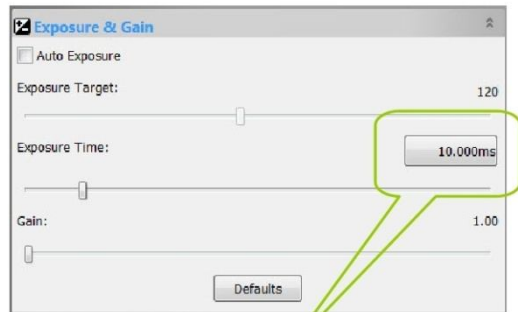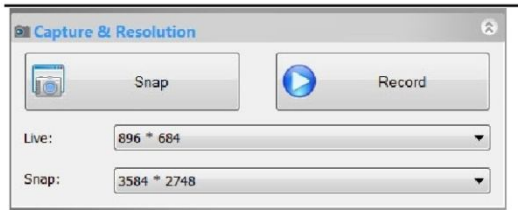
Snap: Capture single image **Record:** Capture video stream

Resolution settings: Choosing suitable resolutions will get both, smooth video and High resolution still images.

Exposure & Gain

☐ Auto Exposure
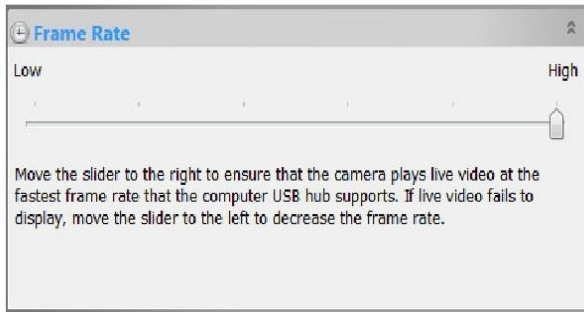
Exposure Target: 120

Exposure Time: 10.000ms

Gain: 1.00

Defaults

Exposure Time

Range: [0.400, 2000.000] ms

10.000 ms

OK | Cancel

1. Advanced users: unselect automatic exposure button, enter manual exposure mode.
2. Tune the microscope light source to a bright state and pull the exposure block left and right until the best visual effect is achieved. ONLY if the light source cannot meet the brightness demand, increase the analog gain value appropriately.
3. You may also enter precise exposure time values in the pop-up dialog box.

White Balance

Temperature: 6719

Tint: 1070

Move the ROI (Marked by a red rectangle) to a pure white or gray object and click "White Balance" to establish the white balance for future video.

White Balance | Defaults

White Balance | Exposure

viewfinder

Region of interest:

1. Click the White Balance bar to open the properties sheet and the view finder will appear in the preview window(marked white balance). Dragging the block to a blank area and clicking on "white balance" will automatically reference that area as white for the calibration of image color parameters. If the image result still has deviation from the actual image, turn to color adjustment to manually correct this.
2. The viewfinder should be placed in a blank background area to regulate White balance.
3. In automatic Exposure mode, the viewfinder marked with "Exposure" appears. Move it to a dark position on the image and the overall image will be light. Conversely, move it to a lighter area and the overall image will be dark.

Color Adjustment

Hue: 0

Saturation: 128

Brightness: 0

Contrast: 0

Gamma: 100

Defaults

1. Set Hue, Saturation and Brightness according to your requirement.
2. Adjust the contrast and gamma values to your preference and the output device.

Frame Rate

Low   High

Move the slider to the right to ensure that the camera plays live video at the fastest frame rate that the computer USB hub supports. If live video fails to display, move the slider to the left to decrease the frame rate.
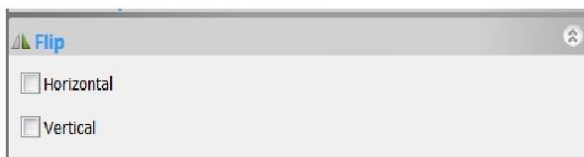
Different frame rates are available. You can select proper frame rates according to your computer performance.

Select the fastest frame rate if your computer is fast enough.

Color/Gray

◉ Color
◯ Gray

If you need to observe Color images, select "Color"

If you need to observe Black & White images, select "Gray"

Flip

☐ Horizontal
☐ Vertical

If the image on the screen appears in a different direction from what is viewed under the microscope, check the "level" and "vertical" option to correct the screen.
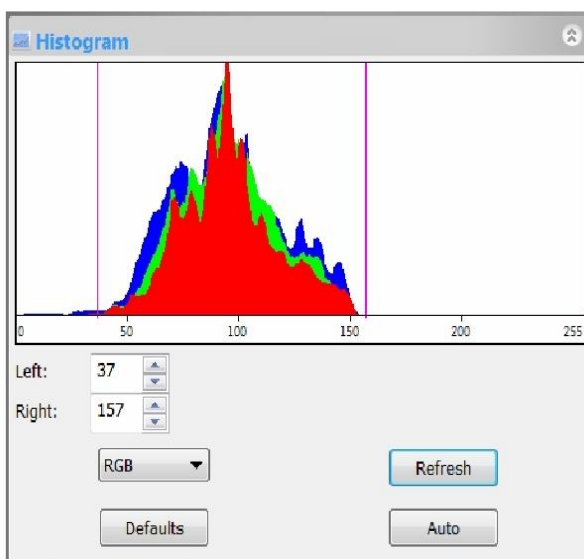

Power Frequency

◉ AC (50 Hz)
◯ AC (60 Hz)
◯ DC

Choose the right light source power frequency.

Sampling

◉ Bin
◯ Skip
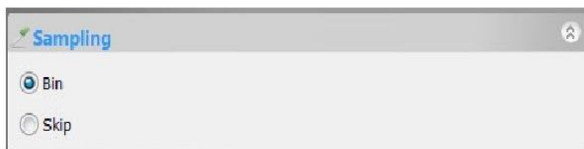
Optional sampling mode in low resolution: Bin or Skip

"Bin" will allow more sensor sensitivity and "Skip" will give faster video frame rates.

Histogram

Left: 37
Right: 157

RGB   Refresh

Defaults   Auto

Histogram:

1. By dragging the pink line on both sides of the histogram to the proper position, the histogram distribution of the image is changed and improves the contrast and brightness curve of the image.
2. You can also input accurate values in the box chart and make an extension of the histogram.
3. Click "Refresh" to update the histogram information, if the vision has moved or the scene changed.

2.   Calibrating the magnification

Put the TS-M1 stage Micrometer in the View Field and find the scale, set the live resolution Max. and zoom to 100% display. Click on the Calibrate button and a red line calibration tool will appear. Place the 2 ends of the red line on the scale, measuring the scale corresponding to the Pixel value. Select or Input the magnification of the current objective and enter the actual length of the selected scale in the pop-up dialog box. Click the "OK" button to finish the magnification calibration.
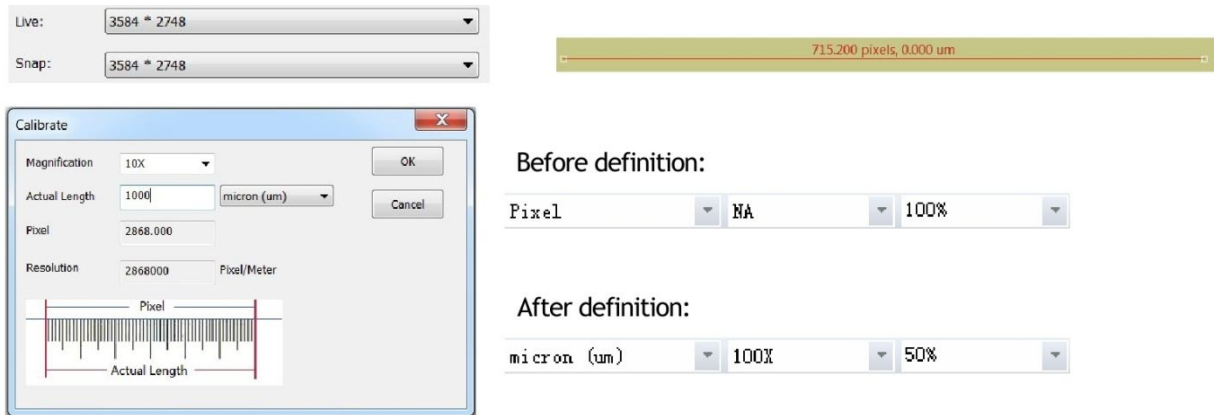

3.   Calibrating the grey values of Images

This function stabilizes brightness and uniform results can be achieved in multi shot and continuous shooting applications.
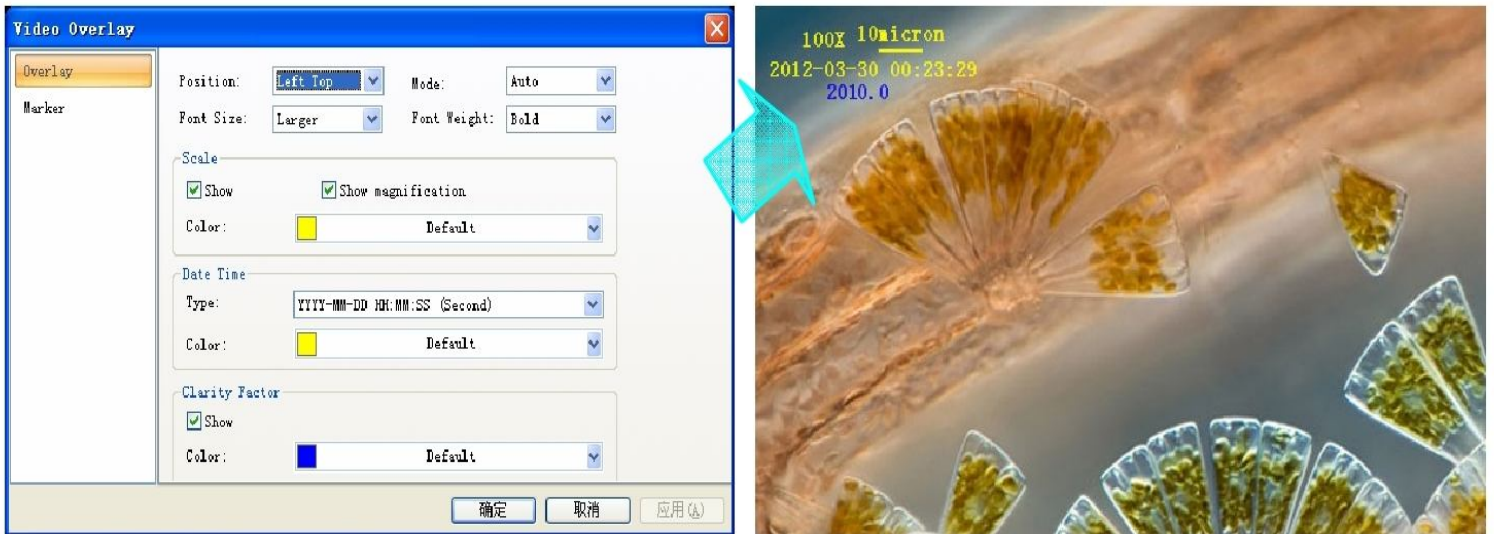
Method of use: Use the "Image Select" tool to select a reference region as the brightness setting in the video window background, click on the menu bar "input" menu "grey scale".

In the pop-up dialog box, scroll and display the current value of brightness and grey, then adjust the brightness of the microscope's light source to match the preset value, click "OK" and finish. The recommended value is 200.
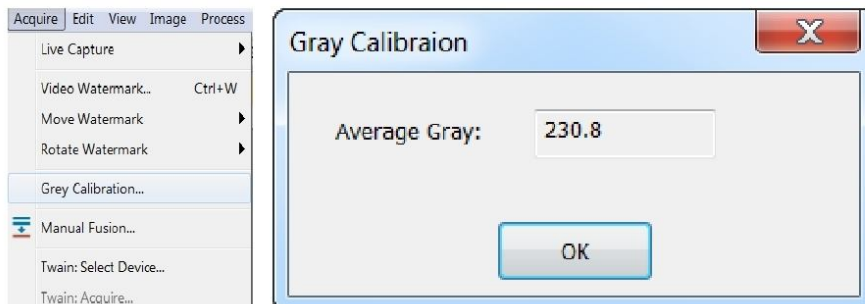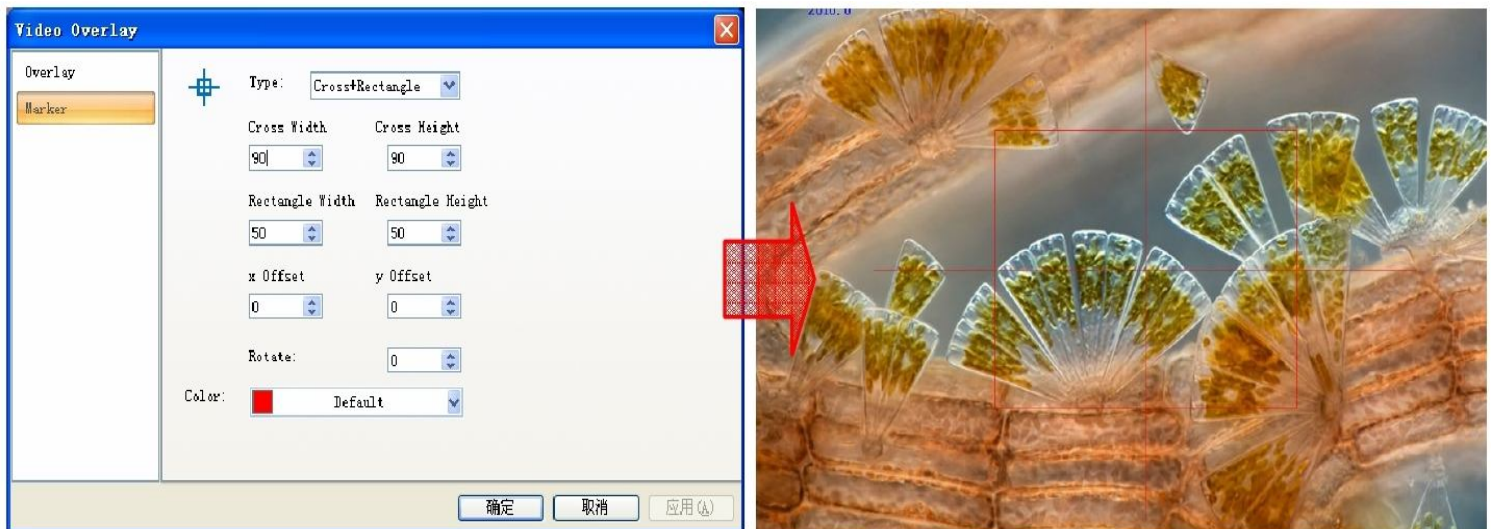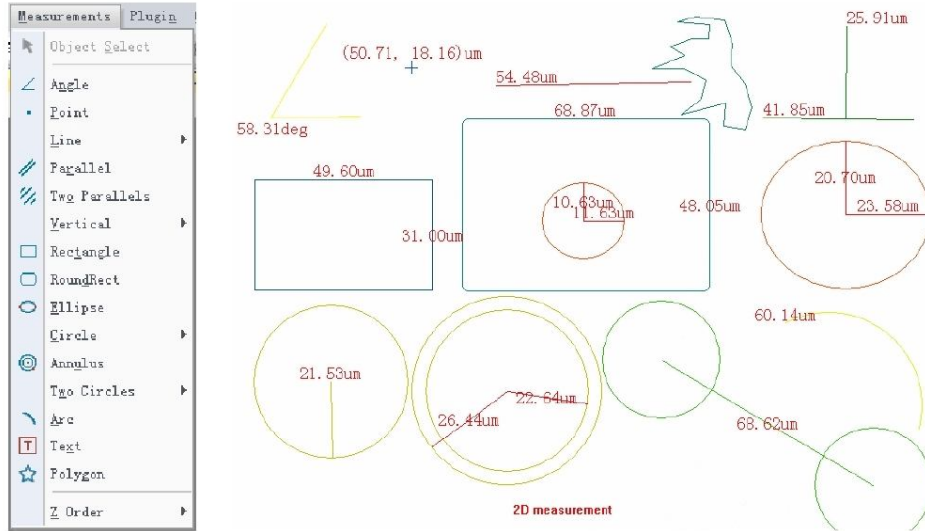
Special Functions and tools of Toupview

1. **Video Overlay** (Setup → Video Overlay → Overlay)

2. **Video Marker** (Setup →Video Overlay →Marker)

3. Video / Image Measurement

Capture and save

ToupView provides a variety of image or video recording modes ie: single pictures, Sequenced images, video capture and preservation.

1. **Single Pictures and Video**
   During the Video "Live" mode, you can use the "snap" button at any time.
   You can also use the Shortcut key "F8" to freeze a picture.
   Click the Record Button or the shortcut key "F9" to record movies.
   Pictures can be saved to a specified directory by clicking "File" menu "Save as" tab and "Batch saves" are also featured.
   Note: Video recording quality depends on the transmission and recording performance of the computer.

2. **Capturing a sequence of pictures (Time-Lapse)**

This function allows you to capture a sequence of images with the same time interval. You can set the interval accurately between 2 and 3600 seconds and also the total number of shots to be taken. Open path: Menu Bar "Capture" menu "Time-Lapse"
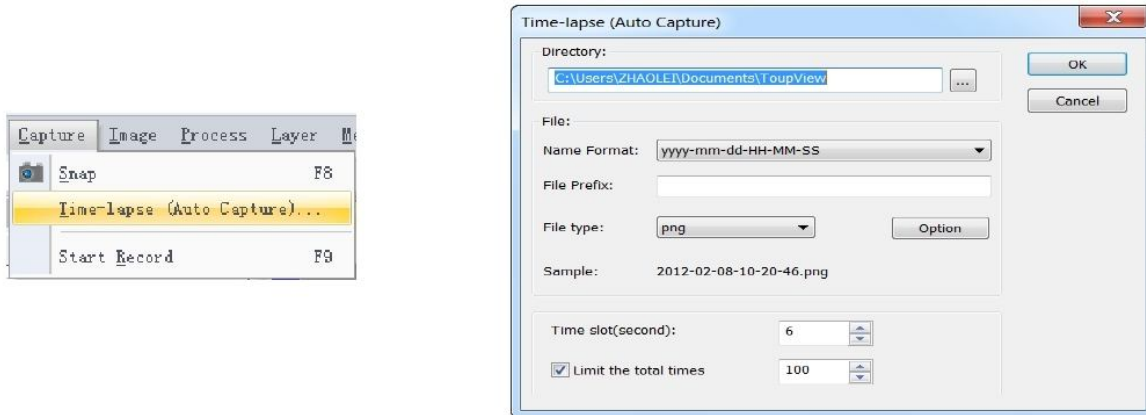
The auto save function can be set to save files with serial number or date and time information and can be coupled with a prefix. There are various file storage format's available with options. For example, when saving as JPG format, you can set the parameters in the options and adjust compression and quality properties of the pictures saved.

# Trouble Shooting

WARNING:

Please do not attempt to open the camera case. There are no user serviceable parts inside.

USB Device Conflicts

When there are a number of USB devices installed on your pc at the same time, unexpected errors can arise. The cause can be insufficient available USB bandwidth, or possibly too much combined current being drawn by these devices. If you experience any problems, unplugging some USB devices could eliminate this issue. This would also eliminate conflicts with other cameras. If you are using a extended USB cable, please ensure the cable's bandwidth is sufficient to support high speed USB 2.0 standards. If the camera is not working properly, please remove the extension cable.

Image Preview is Black Screen / Capture Problems

Communication fault between camera and computer will produce this message:
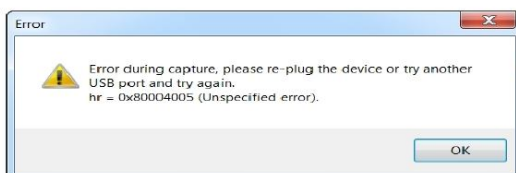
Fault: **Solution:**

1. Light source of Microscope closed   Open light source and adjust brightness

2. The preset exposure time is too short   Unclick auto-exposure and set the exposure time

3. If USB cable accidently disconnects   Close video, reconnect cable and open video

4. Bad USB connection or lack of power   Change to another USB interface and/or cable

5. Computer giving driver errors   Reinstall the driver

IMAGE MOTION LAG, Slow-moving

Fault: **Solution:**

1. Preview resolution is set too high   Decrease the video size for preview resolution
2. Light source lighting inadequate   Cancel auto exposure, shorten exposure time
    (automatic exposure mode)   Increase the brightness level of the light source
3. The preset manual exposure is too long   Shorten the exposure, increase light brightness
4. The frame rate is set "Low"   Adjust the frame rate in the "frame rate" properties
5. Computer performance does not   use a Computer with adequate performance
    Meet the requirements

Color Noise on the screen

Fault: **Solution:**

1. Analog gain value is too large/ poor lighting   Reduce the gain, increase light source brightness
2. The Exposure time setting is too long.   Long exposure time leads to thermal noise of the
    extended use of device   photosensitive chip. Camera needs to cool down.
3. The brightness of light is too low   Switch to a more light sensitive camera, such as the
    below the ability of the camera   EXCCD.