Vividia® Ablescope® Viewer for Windows User Guide

Overview

Vividia Ablescope Viewer is an image processing and measurement application software for USB digital cameras (microscopes, borescopes, dental cameras, inspection cameras) on Windows OS (Windows 10/8/7, XP, Vista etc.).

Vividia Ablescope Viewer software can preview, take pictures and record videos, and do image measurement on screen in real time for USB Windows cameras. **Vividia Ablescope Viewer** for microscopes and boresopes/endoscopes provides a calibration ruler on live image, and the ruler can be put anywhere, in any direction, and in any color and superimposed on an image. This is user-friendly for in real time measurement. **Vividia Ablescope Viewer** offers a variety of measurement tools: line segment length, distance, angles, distance between parallel lines, distance from a point to a straight line, length of curves, Radius and areas of circles and ellipses, length, width and area of a rectangle. Users can also insert text annotations and images in a picture.

Vividia Ablescope Viewer has many other functions like magnifying glass, image zooming, dragging. These features help users make more accurate measurements. **Vividia Ablescope Viewer** offers a ruler, magnification ratio, measurement function for microscopy applications. **Vividia Ablescope Viewer** also has other functions, such as:

Image fusion, which can stitch several images with different focus points into a long view depth photo.

Time lapse videos, which takes pictures with certain time intervals, and form a slide show file to play back.

Snapping local area images, take picture and video for specified image area.

High speed imaging, for cameras with frame frequency higher than 50 FPS.

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1. Software and System Requirements

Operation Systems

Vividia Ablescope Viewer can be run on Windows XP(SP2) and later versions, including Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 10.

Hardware requirements

Vividia Ablescope Viewer uses Microsoft DirectX9.0c image to speed up image process, so make sure the system is installed with video drivers. If your hardware system card supports DirectX10, it will boost some software functions, like image fusion.

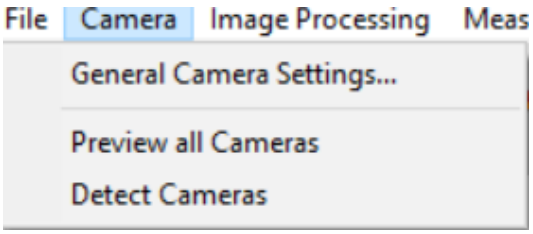
2. Using Cameras

Windows OS and **Vividia Ablescope Viewer** will detect **our** USB cameras available connected to computer. (Not all USB cameras are supported, please contact us for details). The cameras are displayed in the list of cameras and camera currently in use:

The Interface of Camera Selections and Settings

If there is more than one camera connected to your computer system, you can select camera in the drop-down list of all available cameras.

Windows OS supports hot-pluggable USB cameras. After you plug in a camera, you do not need to re-run the viewer software to see added / removed camera. You simply need to click “Detect Cameras” under "Camera" menu as shown below:



Detect All Available USB Cameras by **Vividia Ablescope**

2.1 Camera Preview Play

Click play button at the top of toolbar to start playback. After you start playing, the play button will turn into pause button, which is used to pause playback. One can click stop button to stop play, as shown below:

Camera Operation Toolbar: ***Snap, Record, Play/Pause, Stop***

In the figure above, from left to right are "snap photo" button, "record video" button, "play"/"pause" button and "stop" button respectively. These features can also be used with

shortcut keys on a keyboard:

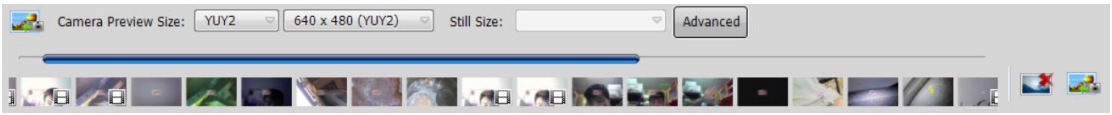
- Play / Pause: F9
- Record video / Stop recording: F2
- Stop: F11
- Snap Photo: F12

2.1.1 Full Screen Playing

Vividia Ablescope Viewer supports full-screen playback and measurement. Right-mouse click in the picture will switch between normal and full screen view modes. When in full screen, using shortcuts to easily operate the software.

2.1.2 Setting Camera Output Size and Format

Usually cameras support several video output formats and dimensions. Before playing camera preview, you can choose preview format and size. At the lower right side, click “Show Camera” icon button, a camera setting bar will display detailed settings of the camera:



Selecting Camera Output Format and Size

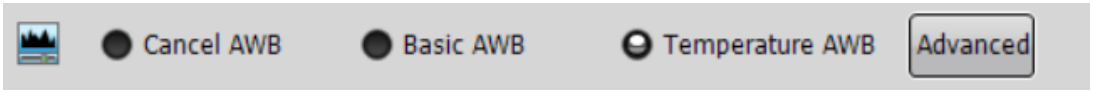
The camera preview size and format must be set before you start preview。

In the diagram above, you can select a camera preview / video-recording sizes, formats, and still picture capture size (the still picture capture size setting corresponds to a camera with hardware snap button or snap switch).

2.1.3 Camera Image Setting

You can make other settings on camera’s preview images: color adjustments such as color / black and white conversion, color enhancement, auto white balance, Gamma correction, saturation, brightness, contrast, horizontal mirror image, vertical flip etc.

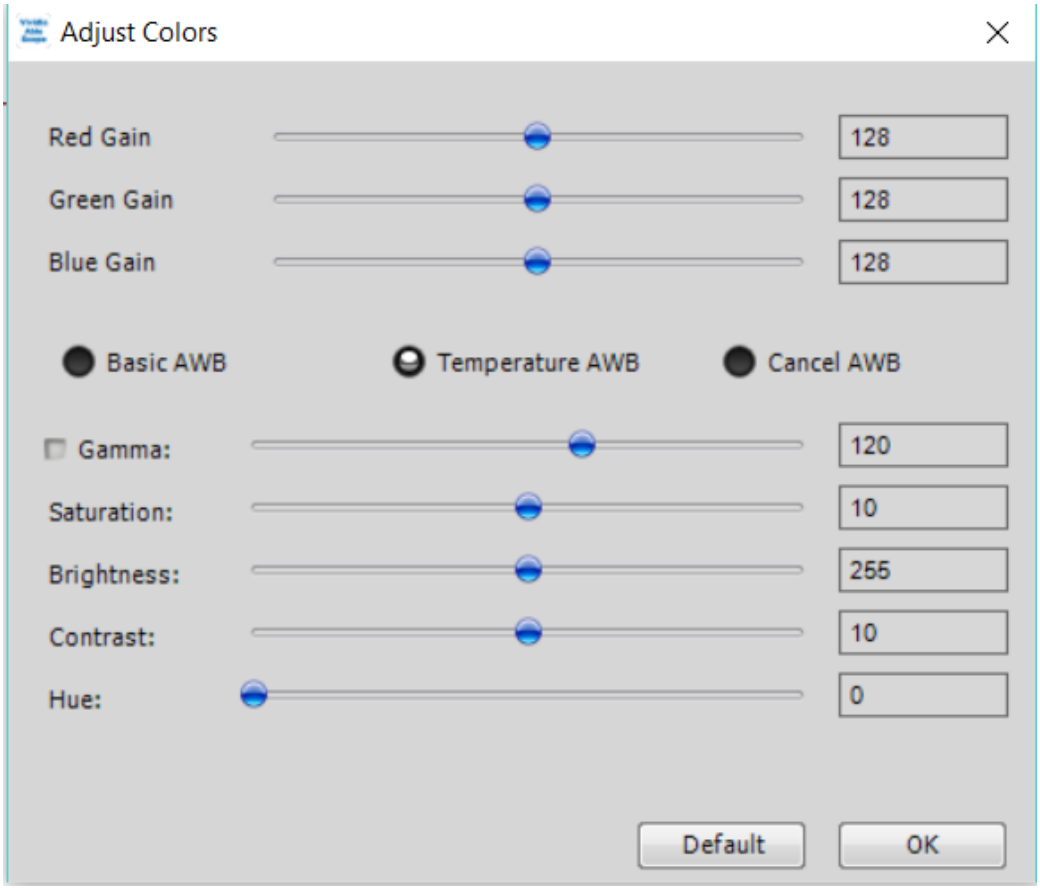
Click “Adjust Colors” Buttons will display white balance setting window:



White Balance Setting

White balance function displayed on this interface is adjusted by **Vividia Ablescope Viewer** software. It is not adjusted by camera hardware from camera's manufacturers. You should give priority to use camera white balance setting of camera manufacturers in the properties page. hardware parameter adjustment does not affect software performance. When the white balance adjustment of camera manufacturer cannot achieve the desired requirement, you can use the two kinds of white balance from the software: gray balance method white balance and color temperature balance. When the picture color is rich, gray balance will have better result; when the picture colors is not rich, color temperature white balance has better effect.

If the auto white balance of the above methods cannot reach the effect of color correction, you can click on the "Advanced" button to customize each color channel values to get correct colors:



Color Adjustment Settings

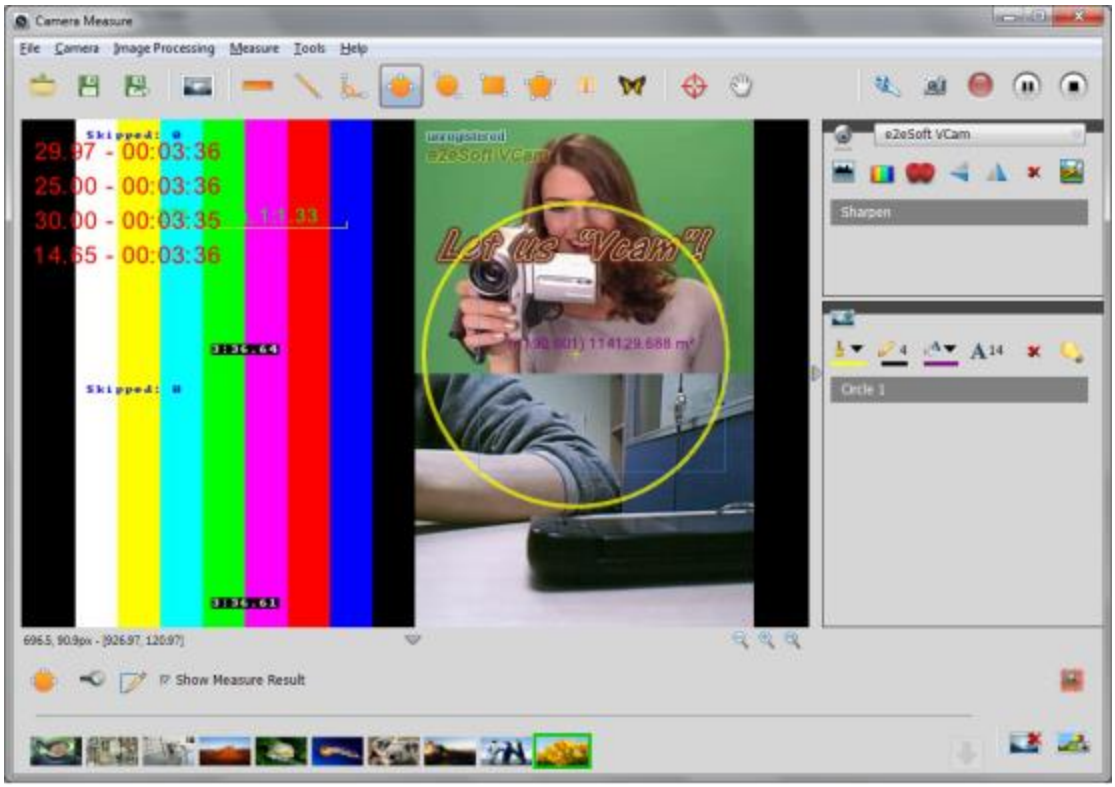
Note: white balance will reduce the camera's output speed (frame rate). After a good white balance selected and the colors in the picture display correctly, you should immediately cancel the white balance calculation. Color-gain parameters calculated by the software will be remembered and used automatically for late operations. White balance calculation is no longer needed.

2.1.4 Other Settings

Usually camera manufacturers will have a camera parameters window for users to adjust settings. Click “Camera Options” Buttons to access camera setting boxes.

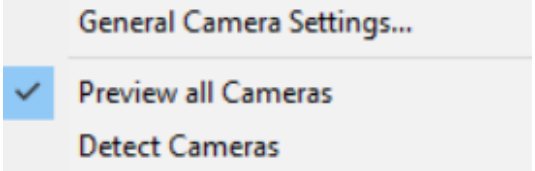
2.1.5 Play Multiple Cameras Simultaneously

Multiple cameras can be played simultaneously (the software supports up to four cameras to play at the same time) or one selected camera be played individually. The following figure shows the software is playing four cameras:



Four Cameras are played Simultaneously

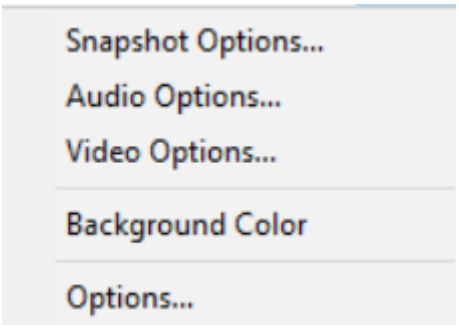
Under menu "Camera" selecting "Preview All Cameras" will enable multiple cameras to be played simultaneously and measured as showed below:



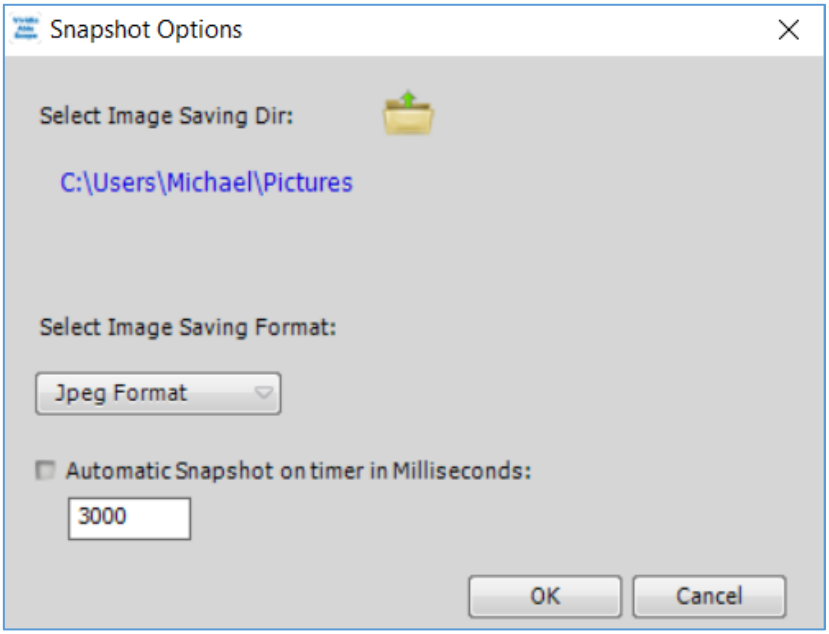
2.2 Timed Picture Taking

In addition to taking pictures during preview by clicking the “Snapshot” button, you can also specify the intervals to take many timed pictures. **When camera is under stopped status**, click the photos button to start timed picture taking, click stop button to stop timed picture taking.

In the "Tools" menu "snapshot Options" submenu, you can set interval for taking pictures, save path options etc.:



Snapshot Options Menu



Snapshot Options Setting Window

In the settings interface, you can set the snapshot save path, format and timed intervals for taking pictures.

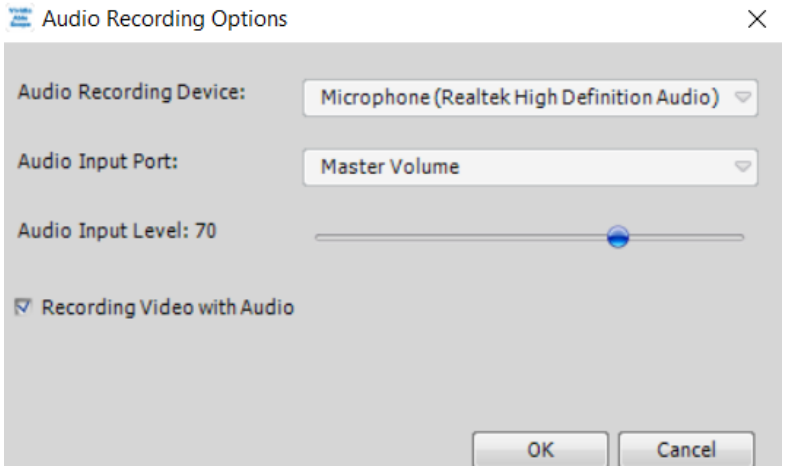
Note: The save path, format and time intervals of timed picture taking are associated with your computer's storage capacity. You should be aware of this when you are setting parameters

to avoid that too large file size causes damages to computer hardware, software, or data, especially when using timed photograph in unattended conditions.

2.3 Videos

Before you record video, you may need to set video options such as sound, video format etc.

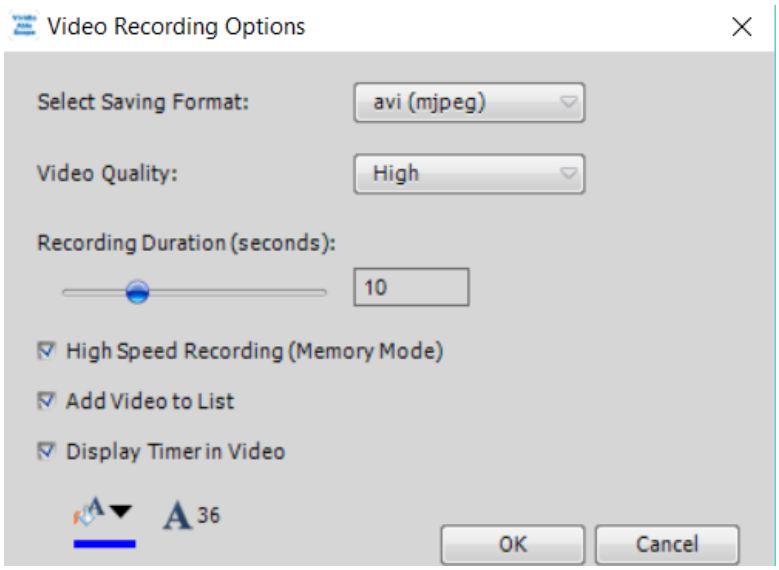
In the "Tools" menu "sound options", you can select recording device and recording volume:



Sound Recording Options

If you want to record sound for video, be sure to check "record sound during recording" box.

For videos, there are also options screen:



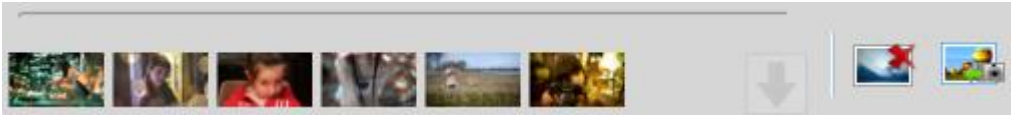
Video Recording Options Interface

You can select "display timer in the video" option. The recording time will be displayed on video. You can also set the text color and font size.

If you are using a high-speed camera, such as frame rate exceeds 50 FPS camera, we recommend that you select "high speed shooting" option. In this case, the software will record the last period images (for example, if the interface settings for 10 seconds) into video memory. When you stop recording video, the in-memory images will be saved as a video file. Software uses higher-speed memory writing into a hard drive method to achieve real time high speed video recording. Due to limited memory size, we do not recommend to records long videos. Usually microscopes and borescopes do not have audio functions.

3. Image Listing

All images are saved at the bottom of the software window: photo images, video, video files, image filed opened, image processed and/or synthesized image files:



Images and Videos List at the Bottom

For the images listed, you can click on an image to select it, and display it in the main window, and subsequently do operations and processes, such as measurement, annotation.

You can press and hold the CTRL or SHIFT keys to select more than one image files, and then delete or remove. You can also drag the image, change its position in the list.

You can double-click an image file on list to open the file folder that contains the images, select the image from there.

3.1 Add an Image File to the List

You can add a local image file to the image list and do measurement on it. In the "file" menu click the submenu "open ...". You can also click in the toolbar button to open the file. You can also double-click a blank spot in the list interface to open the folder directly.

Vividia Ablescope Viewer software supports Jpeg, Bitmap, Png, TIF image files as well as RAW(BAYER) image file format.

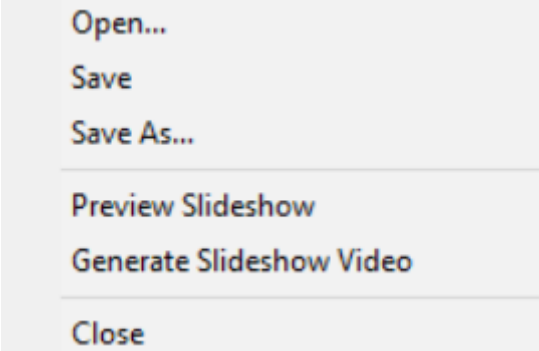
3.2 Delete an Image or Images

After selecting an image or several images on the list, you can use the DELETE keys or “Remove Images” buttons to remove images from the list. When removing, the holding down the CTRL key at the same time, the image file(s) will be completely removed from the hard disk.

3.3 Preview and Generate a Slideshow Video File

You can quickly make a slide show video file with the images on the list..

Select one of the image files as the starting image file of slide show file, click the "file" menu, submenu "Preview Slideshow" or "Generate Slideshow Video".



4. Image Processing

Select an image file on the list, you can do some useful image processing.

4.1 Image Fusion / Stitching

Image fusion can be applied to two or more microscope images of different focal lengths, and merges them into one picture. The following figures, **Figure A**, and **Figure B** have different focal length, some parts are clear and some parts are fuzzy and blur.

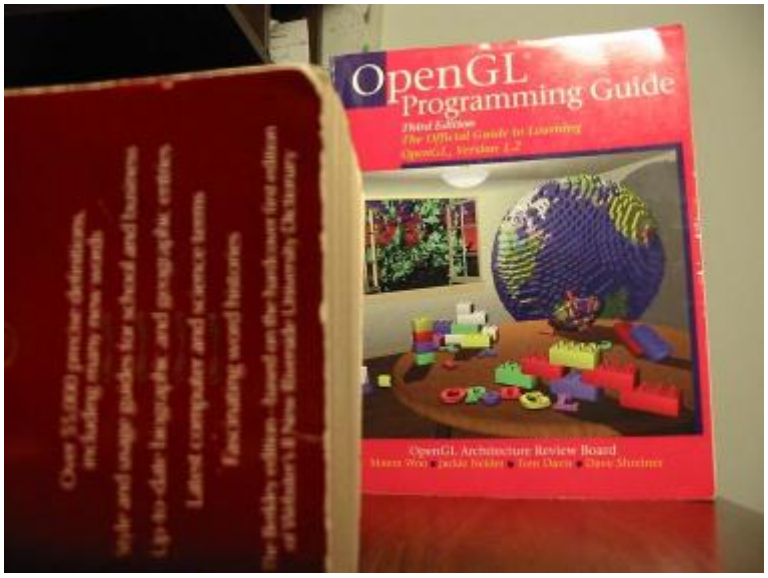


Figure A

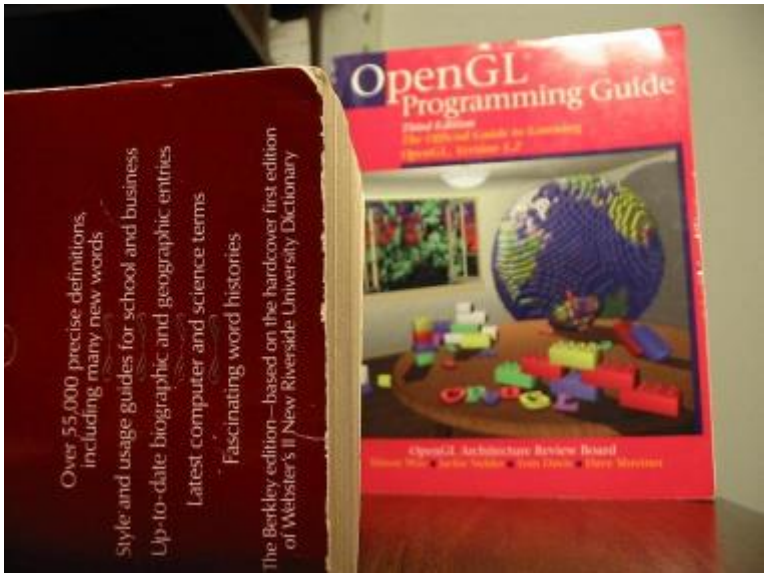


Figure B

Using image fusion / stitching process, a new figure, **Figure C,** is generated by integration of **Figure A** and **Figure B**. The Figure C has better and clearer image:

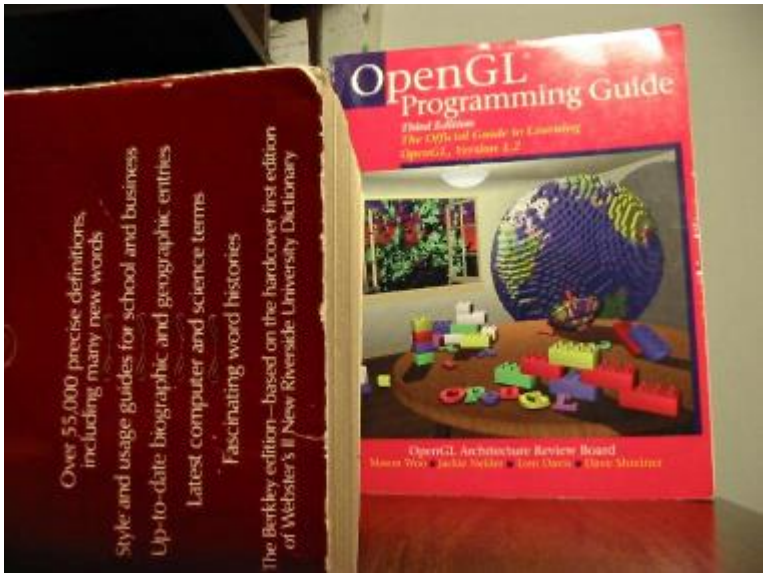


Figure C

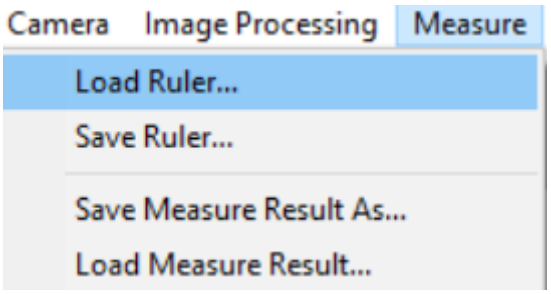
In the image list, select two or more than two image files having the same size (height and width); Then in the "Image Processing" menu, choose "Image Fusion" submenu. The new generated processed fusion image file will be automatically added to the image list.

5. Measurement

Vividia Ablescope Viewer can do geometric measurements on preview live video and/or image files. With the measurement tools, you can select the key points in the picture to draw and measure geometric shapes, such as lines, circles, and so on. The measurement results are listed, showed or exported.

Measurement results and geometry shapes are drawn directly on the image. You can click Save on the toolbar and the save a copy button to save the drawings and measurement results. The "Save" button will overwrite the original image file. Save a copy button will generate a new image file. You can draw directly on the camera video footage and do measurements; the measurement results are saved through save a copy.

In addition to the direct saved images, the measurement results can also be saved as text, EXCEL, or project formats.

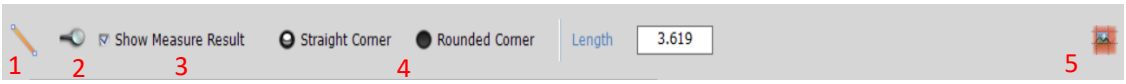


Measurement Menu

In the “Measure” menu, click on "Save Measure Result As". The measurement results can be saved as non-image mode, and later loaded into a different image.

- **Universal Measurement Setting**

Each measurement has its own different interface, but will generally include the following settings:



Universal Measurement Setting

When measuring in the picture drawn is selected, this setting is used to change the current measurement parameters. Otherwise it changes global measurement parameters.

Labeled in the diagram above 1 is used to indicate the current type of measurement, such as straight lines.

Label 2 is a button to lock the selected measure. Locked measurement cannot be selected and moved by a mouse. If you want to remove a locked measurement, you should select and delete it from the measurement results list on the right side of window.

Label 3 is a selection box to choose whether the measuring results displayed on image.

Straight Corner or Rounded Corner (Label 4) is referring to angles of intersecting line segments drawn on image. This option's effect is more obvious when drawing lines are thick.

Label 5 is vertices button. Click this button will enter the vertex fine-tune interface as below.

- **Vertex Fine-Tuning**

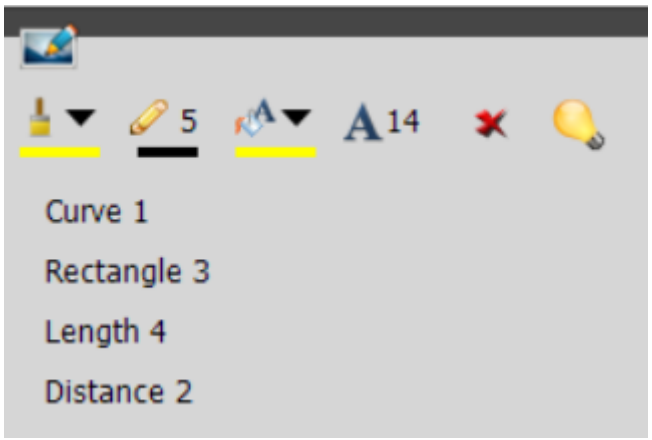
Vertex Fine-Tuning

Vertex fine-tuning to enter the numerical values of coordinates of the measuring point after

click . When a mouse cannot choose a point precisely, fine-tuning interface can be used to choose coordinates. Click on the leftmost button, you can switch between different vertex.

- **Manage Measurement Results**

The measurement list is on the right side of window with all measured results:

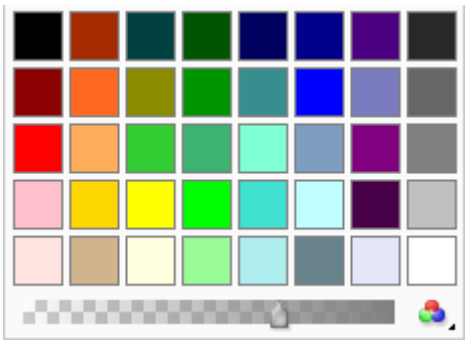


List of Measured Results

In the measurement results list, you can select a measurement result to change settings, Hide / Show measurement, or remove measurement. You can also directly select a measurement on the screen with a mouse click, then press the DELETE key to delete.

- This button is used to change measurement line drawing color or fill color. When there is no measurement selection, this button will set global color measurement color and subsequent measurement color;
- This button is used to change the width of measurement line drawing;
- This button is used to change the display color of the text of measurement results;
- This button is used to change the font size of text of measurement results;
- This button is used to delete a measurement;
- Button to Show / Hide measurements on screen;

When you use or to change a color, the following screen will appear:



Color Setting

In color settings box, there are some commonly used colors for direct selection or click on the Button to select more colors. This is used to set the transparency of a color.

5.1 Zoom In/Out and Drag

When measuring, you can scale an image to make it easier to select measurement points and to observe. Roll the mouse over an image to zoom in or out on an image. You can also drag the scroll bar to change zoom percentage in the following interface:

Changing Display Zoom Ratio

You can also double-click the left mouse button in the picture, this will switch between displays in 1:1 and filling the window.

When an image is not in a filling window display mode, you can drag the image to a different position in a window. This helps watch different regions of an image and choose edge zones of an image. There are in two ways to drag an image: hold down the CTRL key and use the left mouse button to drag an image; Click in the toolbar change the operation mode to drag image.

If you use the right mouse button to change to full screen, use CTRL key + the left mouse button to drag an image more conveniently.

You can also use these three buttons to change the zoom ratio of an image.

5.2 Grid and Cross

Grid and cross can be used to help measurement. Grid lines in pixel units are drawn in the picture to form grid; the crosshairs is drawn in the screen center to form cross line. Click the tool bar button to display grid and cross settings interface as shown below:

Grid and Cross Settings

The buttons listed above can be used to set size of the lattice spacing of grid lines (in pixels), grid line color, color of the cross and whether to show grid lines and/or a crosshair.

Grid Lines to Divide Image into Small Equal Areas

5.3 Magnifying glass

Magnifying glass magnifies mouse cursor area to facilitate image points selection. Using **F4** key can quickly show / hide the magnifying glass. Click button in the tool bar to display setting interface as shown below:

Magnifying Glass

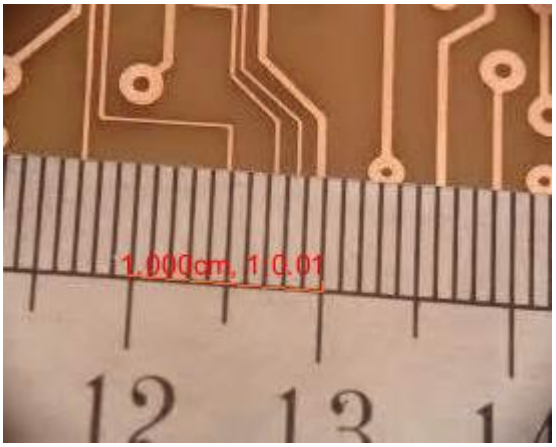
In the Magnifier Setting window, you can set:

- Magnifying power
- Magnifier displays radius
- Magnifier following mouse movement or not

When the cursor is outside the scope of image, Magnifier will not display.

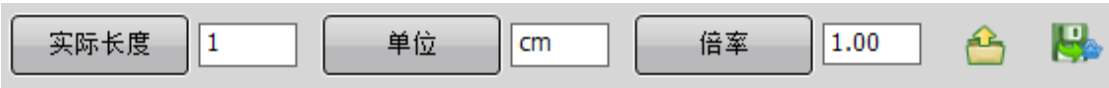
5.4 Setting Ruler

In order to display the measurement results, the software needs to know the ratio of image pixels and the actual distance. you should set the ruler to get conversion ratio. You can set the ruler as this: place a ruler in front of camera lens, let the ruler displayed in the shooting range, drag the two vertices of the ruler to a known length of line segment, as shown below:



Drag Ruler Vertices to Set Length

Click button on toolbar to display the ruler settings interface:



Ruler Setting Interface

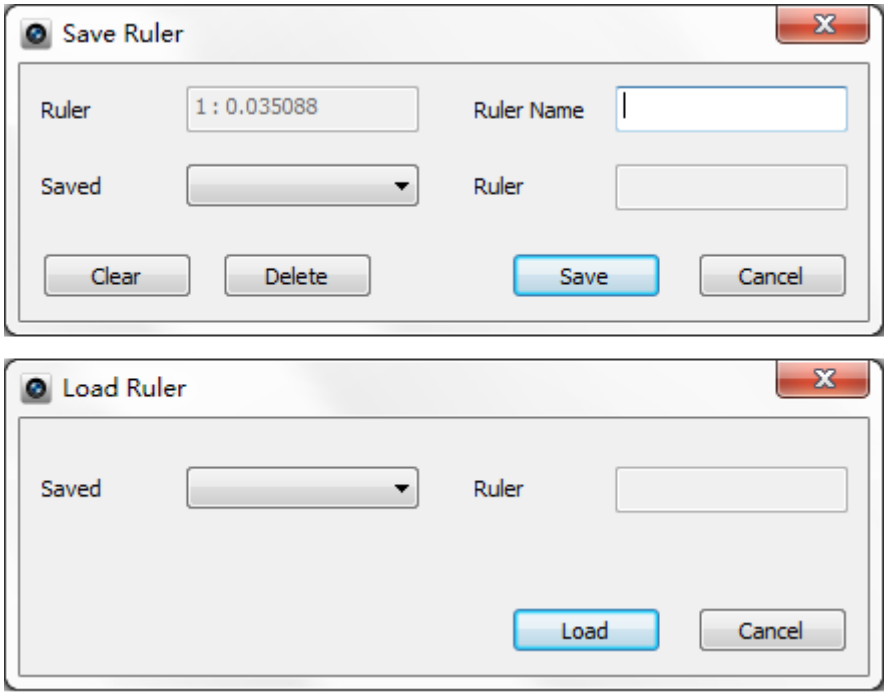
In ruler settings interface, enter the actual length of the ruler in edit box, click "the actual length" button to set the value. Displayed next to a ruler on the screen 1.000cm 1:0.01 respectively are:

Actual length + Unit / Pixel Conversion ratio

If you want to change the ruler units, such as mm, cm, inch etc., enter a unit string, then press "unit" button to set the unit.

If you are using a microscope camera, in the "magnification" edit box, enter the current magnification of the lens, then press magnification button. When you switch the microscope magnification lens, you do not need to change the actual length of the rulers, only need to enter the current magnification rate.

Click the button to load a saved ruler, click the button to save the current ruler:



Save and Load a Ruler

5.5 Length Measurement

Click button on the tool bar, press the left mouse button at the start point of measurement segment in the picture, hold and drag the mouse to the end point of the measurement line, release the left mouse button. You can then change the vertex to change measurement segment:

Measuring Length

In length measurement and calibration, the vertex are labeled with black and white boxes, while color boxes are used temporarily for intermediate points of lines. When you use mouse to drag the middle point, the intermediate point will be changed to the vertices, and you can measure a polyline.

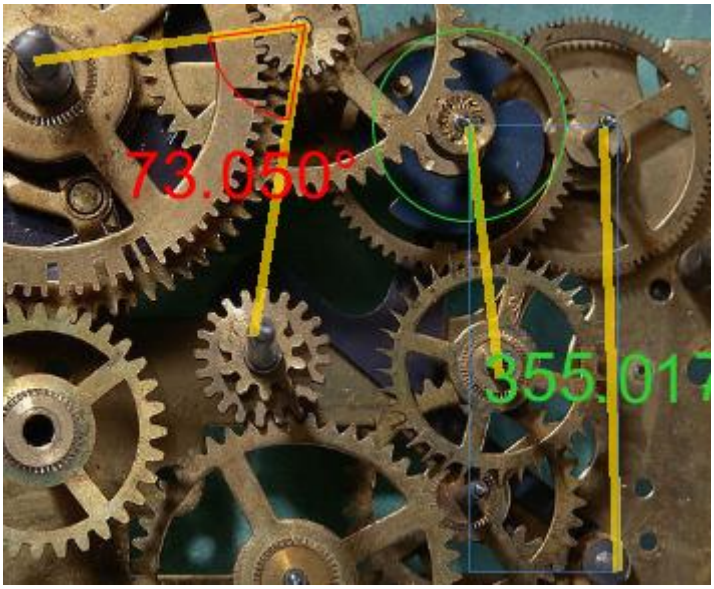
As describe before, you can click button to directly input vertex values to fine-tune the vertex coordinates.

If the measurement result text covers some effective screen, you can drag the text to a different location.

5.6 Measuring Angles

Vividia Ablescope Viewer provides two methods for measuring angles: three-points method and four points measuring method. Three-point measuring method has a common intermediate point. In four-point measuring method, vertex 1 and 2 form a line segment, vertex 3,4 constitute

the second segment.



Measuring Angles: Three-Point and Four-Point Methos

Click button on the tool bar to measure angles.

If you have selected a three-point method, press the left mouse button, hold and drag to another point, release the mouse button to generate an angle to measure. You can change the three vertices of an angle.

If you have selected a four-point measuring method, click mouse to select the four vertices.

5.7 Measuring Distance Between Two Parallel Lines

Click button on the tool bar to measure the distance between two parallel lines. Holding the left mouse button and drag to the other point, then release the mouse left button. You can change the vertex coordinates afterwards.

5.8 Measuring Distance Between a Point to a Straight Line

Click button on the tool bar to measure distance between a point and a line. Holding the left mouse button and drag to the other point, then release the mouse button. You can change the vertex coordinates later.

5.9 Measuring Curves

Click button on toolbar to measure a curve's length. Hold the left mouse button and drag to other point, then release to draw a curve. You can drag the middle point to change curve or change vertex coordinates.

5.10 Measuring Circles

Click icon on toolbar to measure circles. Hold the left mouse button and drag to the other point release to draw a circle. Later you can change vertex coordinates. **Vividia Ablescope Viewer** uses three points to define a circle. You can change the coordinates of the three points.

Circle Measurement

Software gives the radius and the area of the circle.

5.11 Measuring Ellipse

Click button on toolbar to measuring ellipses. Holding the left mouse button and drag to the other point and release to draw an ellipse. You can then change coordinates of vertexes. Software using two points to define an ellipse for measurement.

5.12 Measuring Rectangles

Click button on toolbar to measure rectangles. Press and hold the left mouse button and drag to other point, then release to draw a rectangle. You can change the vertex coordinates. Software uses two points to define a rectangle for measurement.

5.13 Measuring Polygons

Click button on toolbar to measure a polygon. Press and hold the left mouse button and drag to other point, then release to draw a polygon. You can change the vertex coordinates or drag intermediate point to increase the number of vertexes. Software gives the area of the polygon.

5.14 Annotation

Click on toolbar to add text annotations on screen or a image:

Annotation Setting

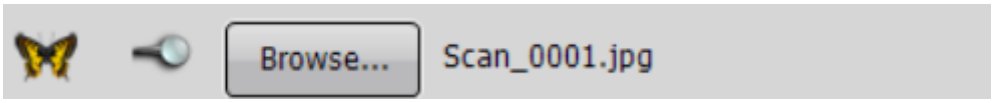
Enter text you want to add in the text box, then click "settings" button, then click on picture with mouse to place text there.

In the picture, you can drag the text box to change the location and size, or you can change font size through button in measurement list on the right:

Text Annotation

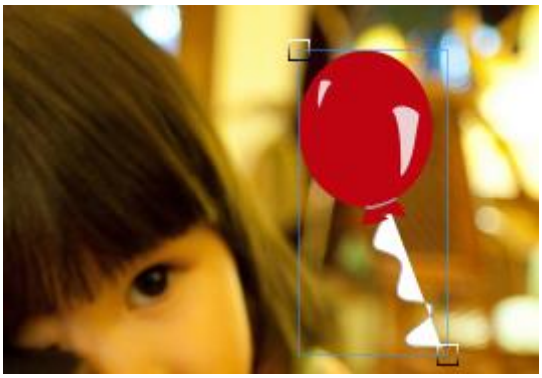
5.15 Add Cliparts and Pictures

Click on toolbar to insert clipart or image on screen. Select artwork file in the settings interface, then click button, then click in picture with your mouse:



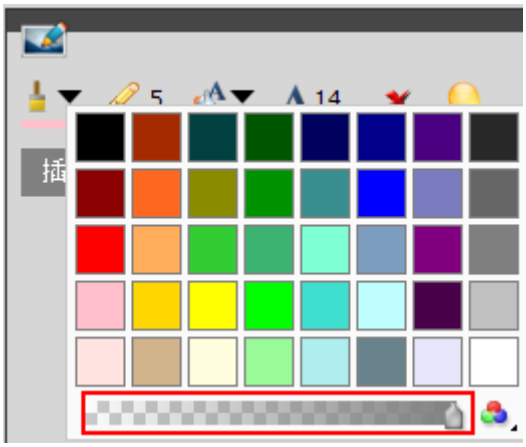
Clipart Insertion Setting

You can drag the added image on screen, also change the size of the image.:



Frame of Inserted Image

Software supports a variety of image file formats. The software also allows to set the opacity of the inserted images. The opacity can be changed through the following opacity interface:



Change Transparency of Inserted Image

If the image has its own clear channel to adjust opacity, for example, a PNG image, we recommend that you adjust opacity value to maximum value.

6. Technical Support from Vividia Ablescope

You can contact us at Vividia Technologies (USA) or Ablescope (China)

Vividia Technologies

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