MICROLINKS TECHNOLOGY CO.,LTD

# User's Manual

## Microscope Application Program Operates Manual

**MLTC**

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# Microscope Application Program Operates Manual

## Contents

After the user use Microscope application program, it will show illustration picture in Fig.1-1. A tool is arranged and divided into the window. The main button and file tabulate is in 3 groups, which the left and right windows are the two sub windows. On the left window, it will show Microscope whether USB digital video device is connected. If it's not connected the button will be a white result as Fig.1-2 shows.

If the PC OS is Windows 2000 and can not open the Microscope AP(wmvcore.dll cannot be found), please update your Windows Media Player to Version 9.0 or above.

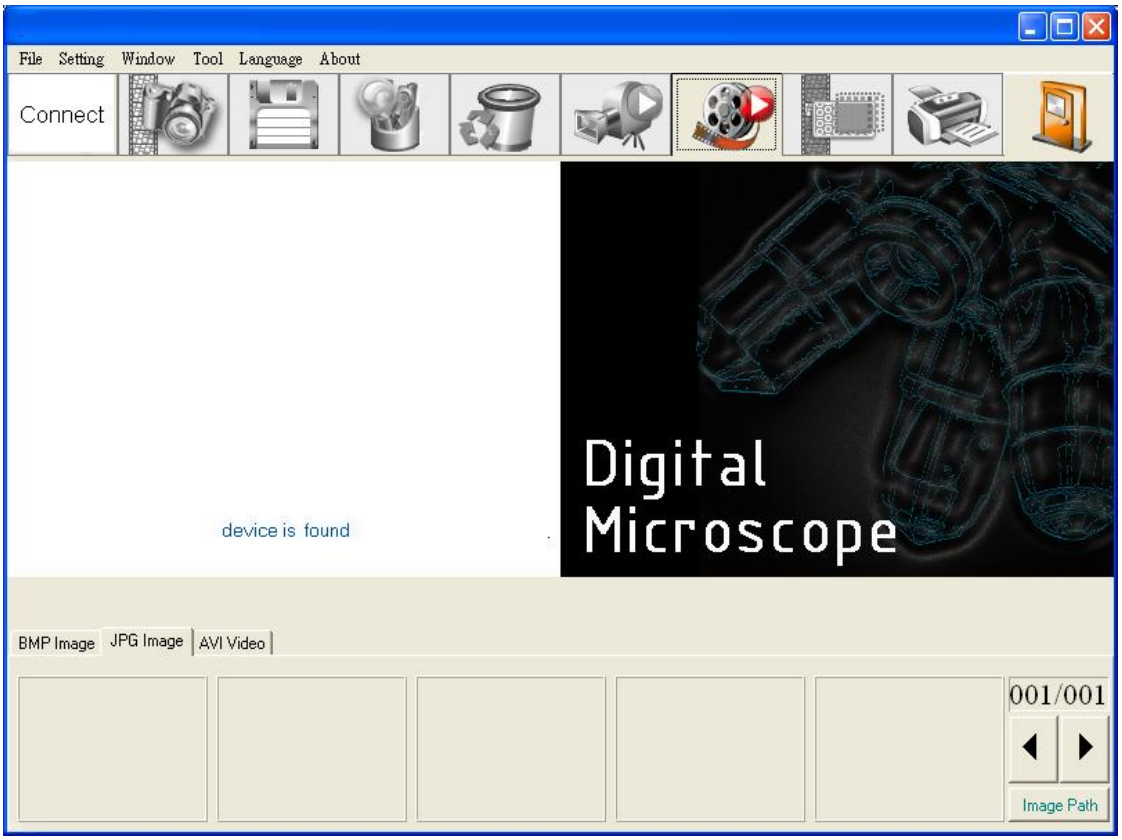



Fig.1-1 Main window picture

| USB Microscope connected button white icon | Portable Microscope connected button white icon |
|---|---|
|  Fig 1-2(a) |  Fig 1-2(b) |

Fig.1-2 Connected button white

In the following, those main functions will be divided into four groups, which includes:

## 1. Main Toolbars

See Fig.1-3 the toolbars of the application program which commonly uses, includes File, Setting, Window, Tool, Language and About altogether.

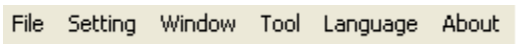



Fig.1-3 Main Toolbars

## 2. Main Function Buttons

Fig.1-4 is a main function buttons which are commonly used or is for basic function, which includes connecting, taking photos, saving photos, editing…etc. there are 10 functions button.

Fig.1-4 Main button group

## 3. The File List/Folder

Fig.1-5 is the tabulate of the saved images in the application program. The main list will list the files in the existing folder, which includes BMP folder, JPG folder and AVI folder.

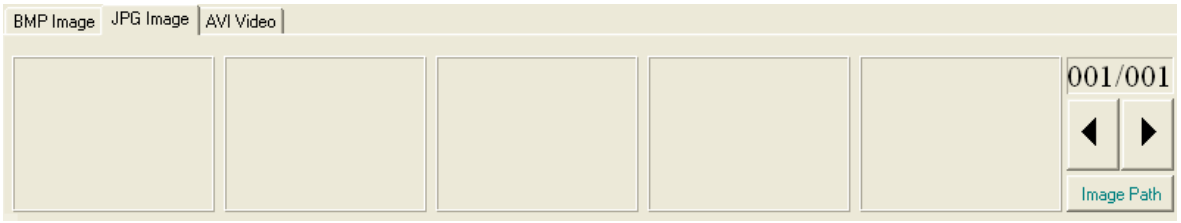



Fig.1-5 File List

## 4. Five Mode Functions

After open Microscope program, please click connect button shown in Fig.1-1, when it is connecting, four mode functions toolbar will show under the left side of sub-window.

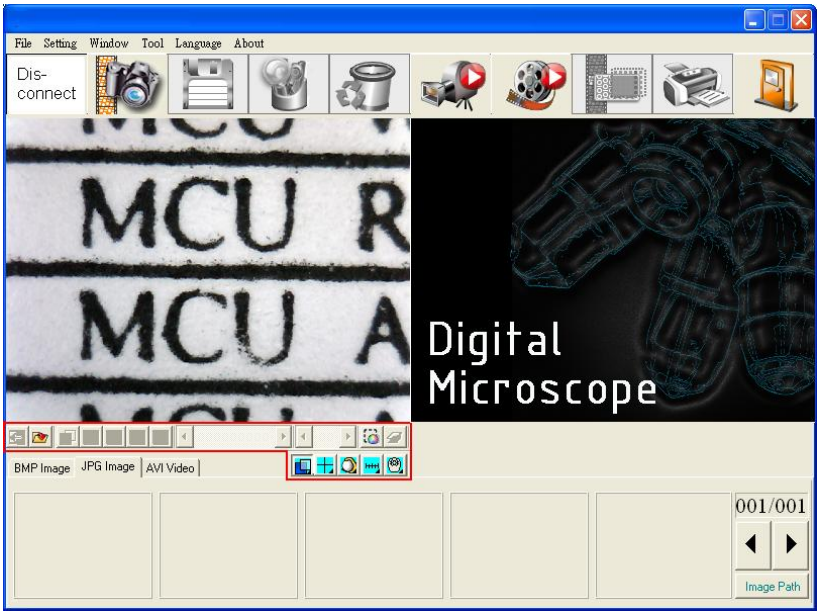



Fig.1-6 AP connecting

# 1. Main Toolbars

The tool arranges the group and pursues to show, which include file, setup, window, tool, Language and select greatly about 5 of the choices altogether.

## 1.1 File

In the beginning, “File” is used for users who want to open/save file from other path or Print setting...etc see Fig.2-1.

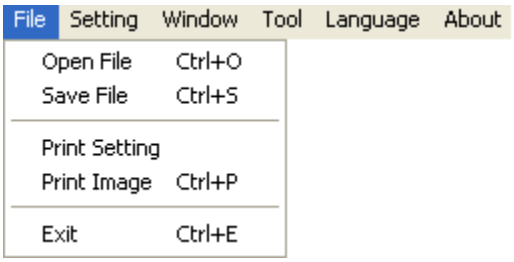



Fig.2-1 Choose file

### 1.1.1 Open File

Here are three types of file formats in the Open File, Bmp, Jpg and Avi as optional. The default route for the open file folder is according to the current preserving file format. About tabulates of the file folders, please refer to Section 3.1 for more detailed information. In short, please refer to below Fig.2-2, if the preserving photo is in Bmp tabulate, the open file route is for preserving Bmp photos. If the preserving photo is in Jpg tabulate, the open file route is for preserving Jpg photos. If the preserving video is in Avi tabulate, the open file route is for preserving Avi videos. Ctrl +O are a fast key.

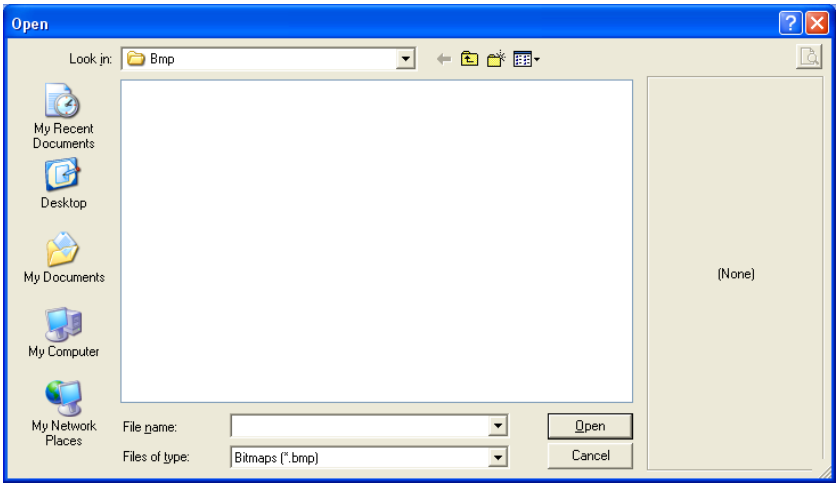



Fig.2-2 Open bmp file

### 1.1.2 Save File

There are only two file types for saving, Bmp and Jpg; the saved file is the image taken in the left sub-window, see Fig.1-1. The storing file name is named by the program automatically; the user can change the name by themselves. File name is annual in year (yyyy),

month(mm),day(dd),hour(hh),minute(nn),second(ss)setting,which.Bmp_20080829180445.bmp as 2008(yyyy) 08(mm) 29(dd) 18(hh) 04(nn) 45(ss), which this way is the name of file won't be repeated and can also be realized the date and time by stored file name.

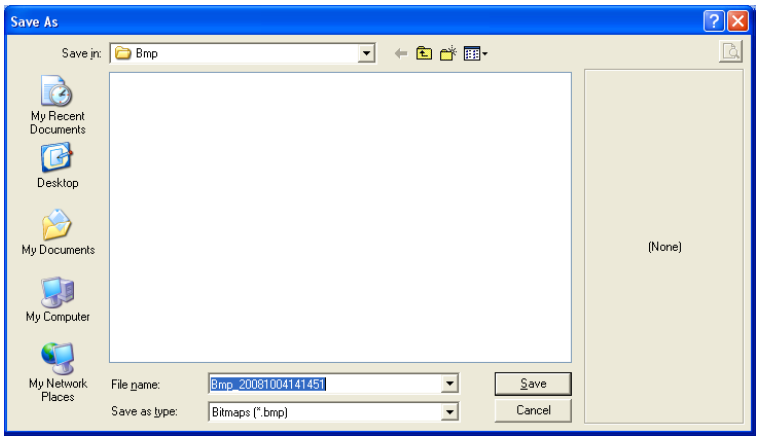



Fig.2-3 Save file

### 1.1.3 Printer Setup

Set up printer can adjust paper between size, source or printer type.

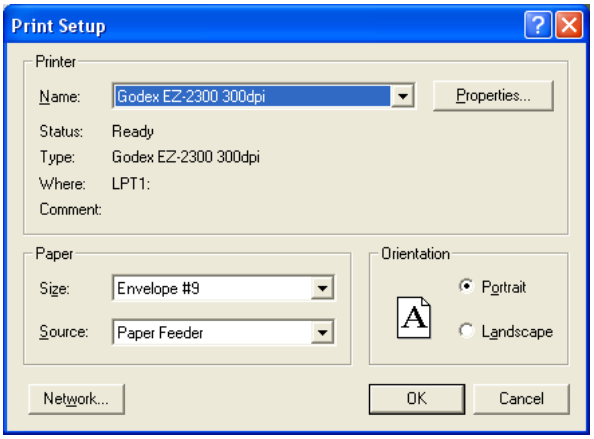



Fig.2-4 Setup printer

### 1.1.4 Print Picture

Ctrl+P are a fast key.

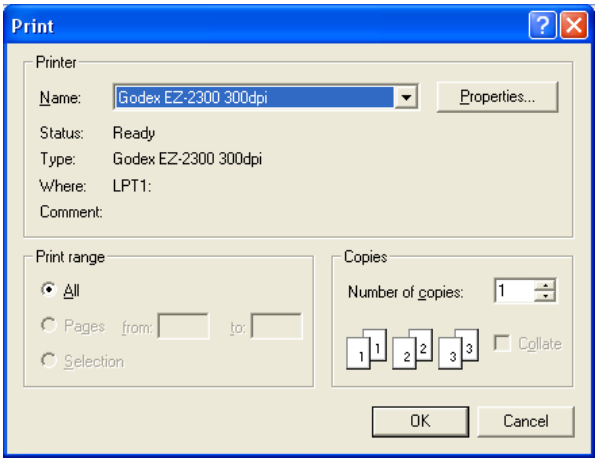



Fig 2-5 Print

### 1.1.5 Exit

Once to choose to exit, the program would close. Ctrl+E are a fast key.

## 1.2 Setting

The Setting function is mainly to set up Video Format and JPG compression quality as Fig.2-6 shows. If Microscope device isn't at the line, video format and video signal source unable to set up (setting in white bar); it can set up on the contrary.

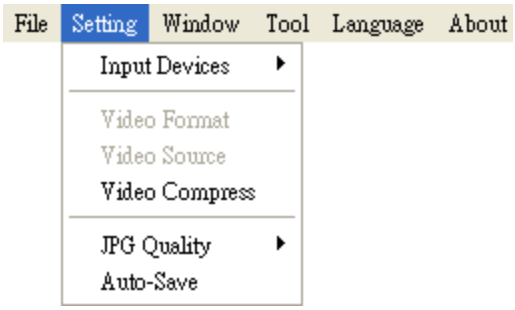



Fig.2-6 Select Setting

### 1.2.1 Input Devices Setting

Optional Input Devices, see Fig.2-7, when there are 2 or more Input Devices connecting to PC at the same time, you can choose which device you wish to use.

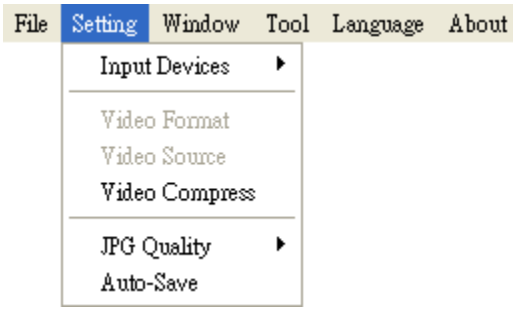



Fig.2-7 Optional Input Devices

### 1.2.2 Video Format

Video Format is mainly to set up the frame rate, color space and output size etc. Frame rate is frame numbers per second (fps) for playing. Adjust the output size will slower or faster the fps, for example, if the fps is higher, the preview video will be less clearly but with smooth performance. On the contrary, if the fps is lower, the image will be clearer but with a little lag phenomena. This is due to the more frames requires the more CPU loading then cause the lag phenomena. Output the image size means the video quality, the default output size is 640*480; the user may change to preference output size such as 320*240, 800*600, 1280*960…etc. The snapshot image size is according to output image size. Fig.2-8 is Windows built-in driver, which Color Space/Compression allows to choose YUY2

or MJPG.

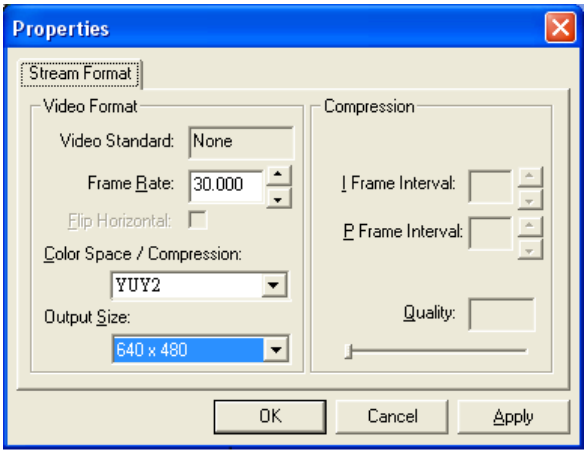



Fig.2-8 Video format table before installing Microscope driver

1.2.3 Video Format Source

Fig 2-9 are Properties of Video Format source which is build in the Windows driver. Fig 2-9 Video Proc Amp allows User to adjust the parameter, such as contract, brightness.etc.

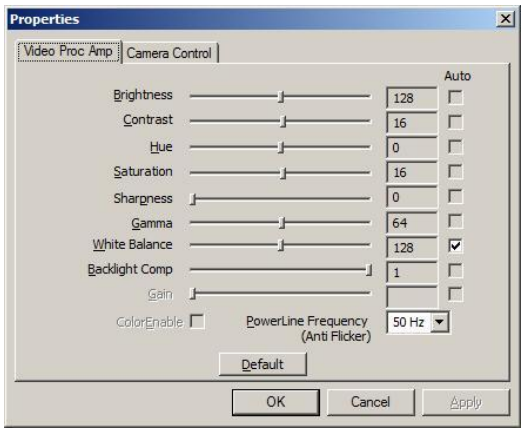



Fig2-9 Table of Video Proc Amp content

Fig 2-10 Camera Control

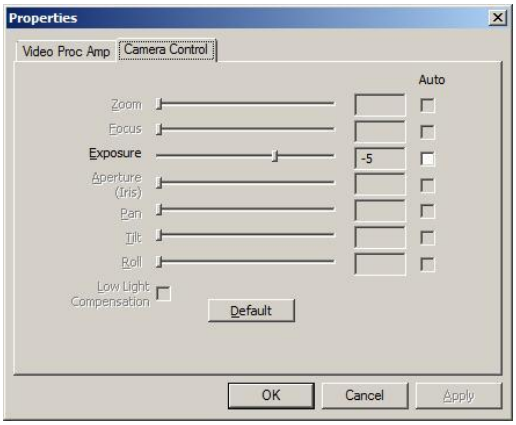



Fig 2-10Table of Camera Control

### 1.2.4 Video Compressor

Normally, the video size is huge before compressor. We can use Compressor function to reduce the file size. There are optional Compressors which are built-in or can be installed by DIVX or other tool. Once the installation is completed, you can see them at the optional Compressors.

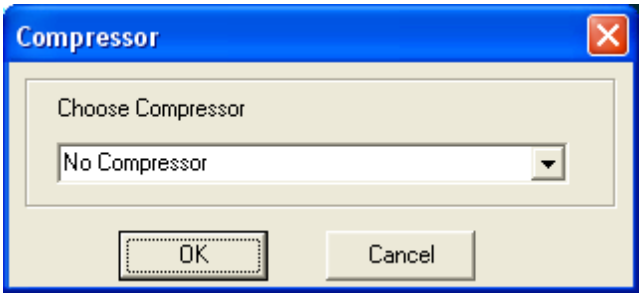



Fig 2-11 Optional Compressor

### 1.2.5 JPG Quality

User can choose different JPG quality. The JPG compressor could distorted the saved image in order to meet the saving size, in this situation, when the saved quality is low, the image quality could be low and the file size is low too. See Fig.2-12。

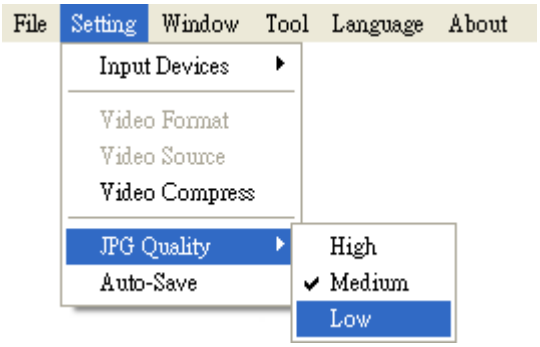



Fig 2-12 Setting JPG Qualiy

### 1.2.6 Auto-Save

From “Setting->Auto- Save” shown Fig.2-13, after checked auto-save, when clicking the save buttons it will not show the save dialog. The system will generate a file name and auto-save the file.

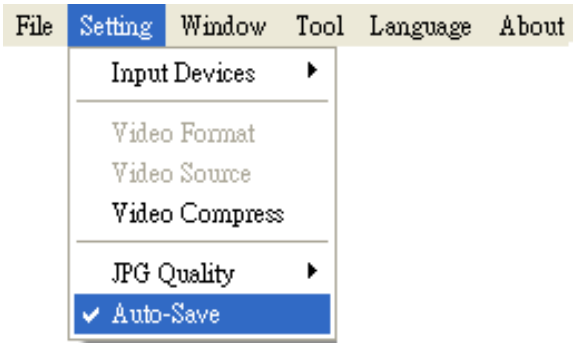



Fig 2-13Auto-save option

## 1.3 Window

The Windows can be chosen per USER's preferred window size. But it need depend on User's PC to choose a suitable resolution as Fig.2-14. For example, your PC is 1280*960 pixels; you can choose 1280*960. When the PC screen size is wide screen (16:9), it may cause imbalance ratio at "Full Screen" mode. The user may choose "Full Screen (4:3)" for an equally true ratio. When in "Video Resolution" mode, the window size is same as the output size. Please refer to 1.2.2.

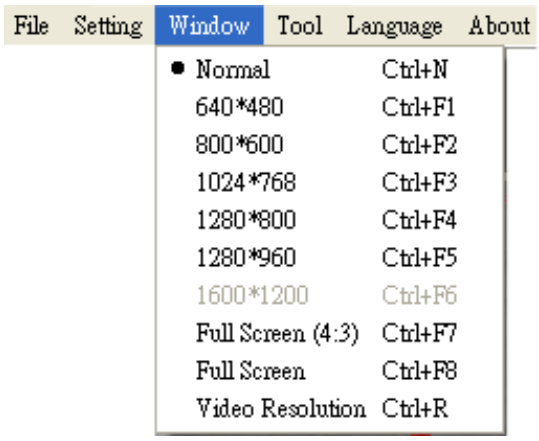



Fig 2-14 Optional window size

User can choose full screen under window mode. The original left sub-window in the AP will become a single window, available tool bar of the connection (disconnection), snapshot, video recording and video playing under the full screen.

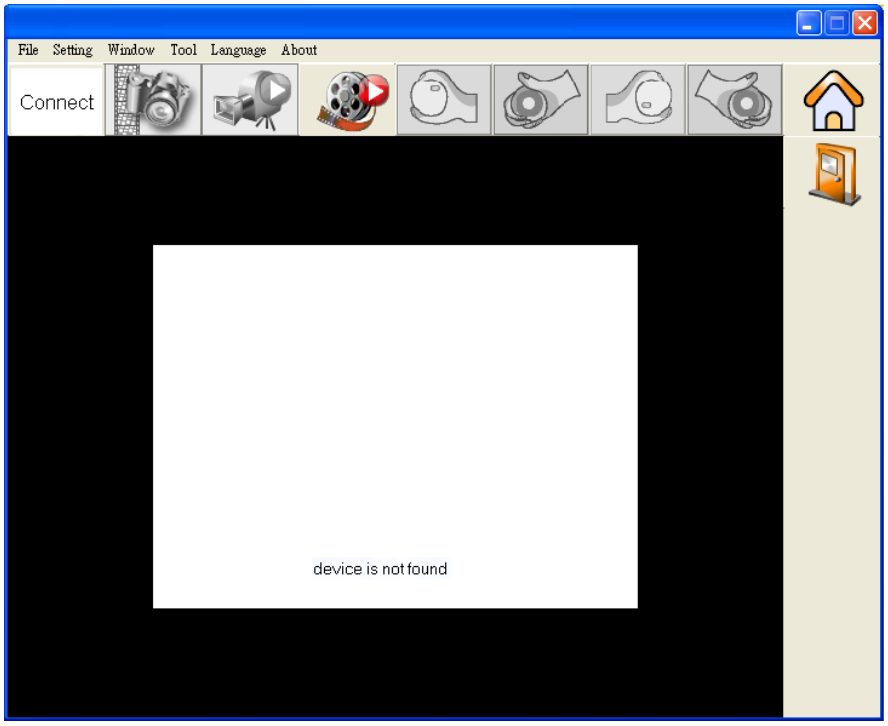



Fig 2-15 Full screen of 640*480 under Window mode

If changing to single window and want to return to normal mode, please click “Normal Mode button” see Fig.2-10

Fig 2-16 Normal Mode

Single window also has 4 functions of video control mode shown Fig.2-17. To preview other functions of “video control mode” please refer to section 4.3.

Fig 2-17 Functions of Video Control

Click snapshot button and will pop up Fig.2-18, it provides function of Open file, Save file, Delete image, Image process and Print image.


Fig 2-18 Image View of window

## 1.4 Tool

Use the Tool to open file and set up Path. See Fig 2-19.

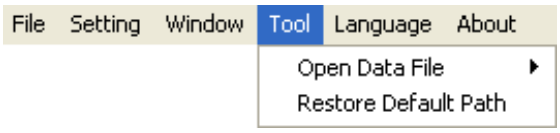



Fig 2-19 Tool

### 1.4.1 Restore default path

The function allows User to preserve the initial setting route, easily find and Save the video and photos at the preserved route.

### 1.4.2 Open Data file

Open files at BMP, JPG & AVI folder.

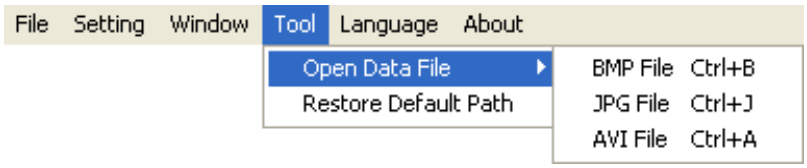



Fig 2-20 Open file folder

## 1.5 Language

The version includes 5 multi-languages; English, Traditional Chinese, Simplified Chinese, Japanese & German. The initial language will automatically follow up User's OS system. It can choose the other language, too.

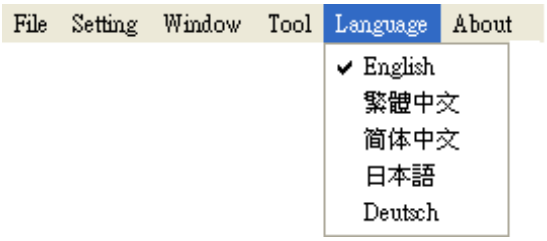



Fig 2-21 Select Lauguage

## 1.6 About

Show the Microscope relevant information.

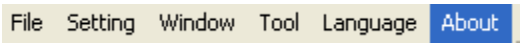



Fig 2-22 About

Learn the application program version, Microscope hardware manufacturer and the copyright of the application program.

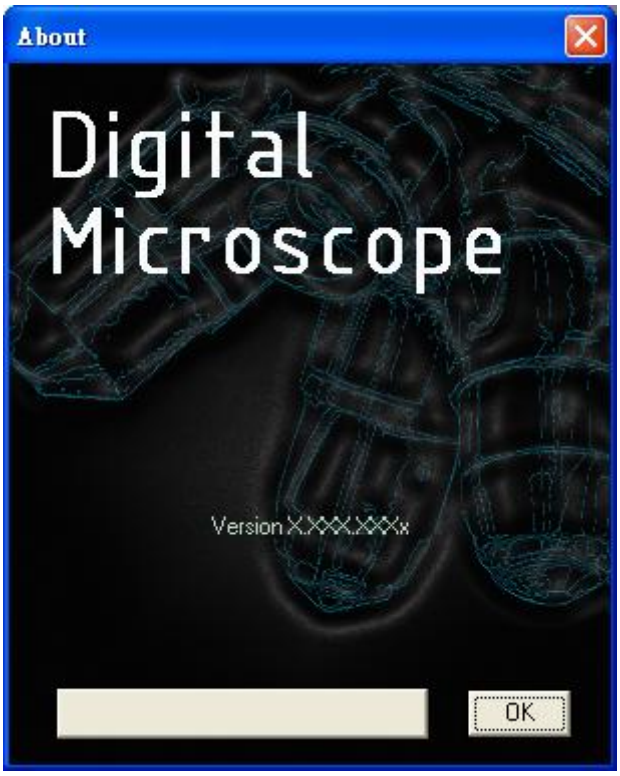



Fig 2-23 About Microscope

# 2. Main Function Buttons

Main function button group see Fig.1-4 which are commonly used or basic function, which includes connecting, taking pictures, saving, editing…etc. there are 10 functions button.

Fig.1-4 Main button group

## 2.1 Connect/Disconnect

### 2.1.1 Connect

Based on the purchased microscope model type, the connect icon are as Fig.3-1, the user will connect the line while pushing the connect button, namely connect with microscope device. If it cannot connect, please reinsert microscope device to the other USB port.

| USB Microscope connect icon | Portable Microscope connect icon |
|---|---|
|  |  |
| Fig 3-1(a) | Fig 3-1(b) |

Fig 3-1 Connect button icon

### 2.1.2 Disconnect

Based on the purchased microscope model, the disconnect icon are as Fig.3-2, by clicking this button to disconnect. When the user starts to play the video, microscope will be disconnected automatically. When re-connecting the microscope with the AP, the video format will go back to the default value.

| USB Microscope disconnect icon | Portable Microscope disconnect icon |
|---|---|
|  |  |
| Fig 3-2(a) | Fig 3-2(b) |

Fig 3-2 Disconnect button icon

## 2.2 Snapshot

Snapshot icon is as Fig.3-1, the function allows taking a photo in Preview, Video & Play, and image size depends on Video Format source, i.e. Height & Width.

Fig 3-3 Snapshot button icon

## 2.3 Save Image

Save image icon is as Fig.3-4, the saved file name is automatically created. The detail of the file name is as description 1.1.2.

Fig 3-4 Save image button icon

## 2.4 Edit the Picture / Exit Editor's Picture

### 2.4.1 Edit Picture

The editor is as Fig.3-5 including several convenient functions. When clicking editor icon as Fig.3-5, the toolbar for editing image will show up as Fig.3-6

Fig 3-5 Editor icon

Fig.3-6 Editor tool

The editing toolbars are upper roll and button roll.

Please click the original fit(  ) first then start to use the button roll tools. The edit text, pen(  ), line(  ), rectangle(  ), ellipse(  ) fucntions are only available until the original fit  has been selected.

Fig.3-7 Click ( ) to start editor tool

When click the edit text ( ) butoon, see Fig.3-8, the edit text group includes Edit text color( ), edit background color ( ), edit background color transparent ( ).

Fig.3-8 Click ( ) to start text tool

When click select ( ) button and use mouse to draw the range, the select group tools are available as Fig.3-9. The select tools includes cut ( ), copy ( ), paste ( ), save select ( ).

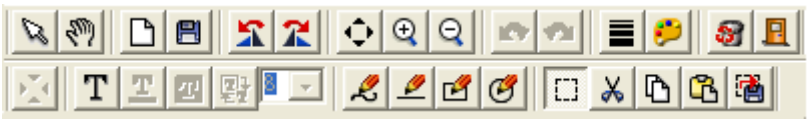


Fig.3-9 Click ( ) to start other functions

"Editor Image" toolbar includes many functions, below will explain each function:

- Normal : When this button is clicked, all the buttons will return to normal.
- Move Image : When the "original fit" button begins using, select "Move Image" and click mouse of left button to move on the image.
- New File : "New file" can open a blank page of image, image size is 400*300 by the Fig. 1-1 of the right side window size.
- Save Image : Save Fig.1-1 is right side window of image.The image size by video formal of output size.
- Rotate Left : Image can rotate left 90 degree.
- Rotate Right : Image can rotate right 90 degree.
- Fit The Window : This function can let image to fit the window size.

When selecting this function, it cannot use “edit text”, “select”, and “drawing” functions.

- Zoom In : Enlarg image without interpolation therefore if the scale larger than orginal size distortion will appare.
- Zoom Out : To shirk image.
- Rndo : To go back the movemenet and only can use up to 3 times.
- Redo : To go to next movemenet and only can use up to 3 times.
- Line Style : Choose line style by clicking “Line style” button and it will pop up Fig. 3-10 dialog box.

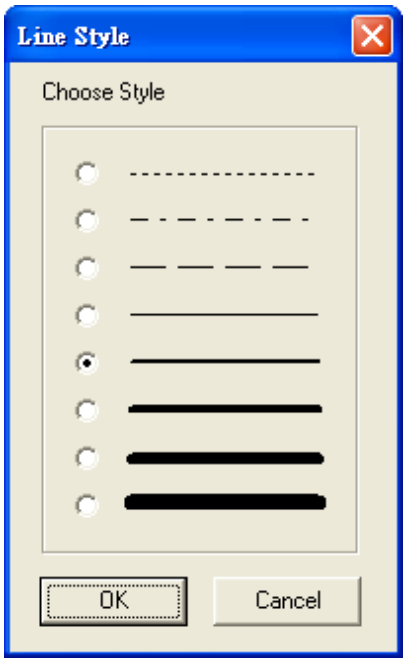



Fig.3-10 Choose line styles

- Color : To choose pen’s “color” click on the color button and it will pop up Fig. 3-11 dialog box.


Fig.3-11 Choose color

- Delete Image : The Fig.1-1 right side window of image will be deleted.
- Exit Editor : To exit image editor,the "image editor" toolbar will be closed.
- Orignal Fit : When the image size is bigger than the window, using this function, it can do "Edit text", "select", and "drawing" functions. The window won't see the whole image, but only some parts.
- Edit Text : Edit text is words that can be written on image.
- Edit Text Color : Text color can be changed by clicking "edit text color" button and it will pop up Fig.3-11 dialog box.
- Edit Text Background Color : Text background color can be changed just by clicking "edit background color" and it will pop up Fig.3-11 dialog box.
- Edit Text Background Transparent : Text background can be set as transparent with no background color.
- Text Size : Text size can be changed.
- Pen : Pen can draw anything and its function is like a regular pen and

pencil.

- Line：Draw stright line.
- Rectangle：Draw rectangle.
- Ellipse：Draw ellipse.
- Select：Selects the area on the image, after the selection, it can cut, copy, paste, and save the selection area function.
- Cut：Cut frame on the Fig.1-1 right side window of image.
- Copy：Copy selected frame on the Fig.1-1 right side window of image.
- Paste：Paste whats been cut or copied image to display on the Fig.1-1 right side window of image.
- Save Select：Save selected frame on the Fig.1-1 right side window of image.

### 2.4.2 Exit Editor's Picture

The editor's toolbar will close when exit the piture eidtior.

Fig.3-12 Editor icon

## 2.5 Delete Image

Delete image icon as Fig 3-13. The delete image is the image in right-sub-window(please refer to 1.1).

Fig.3-13 Delete image icon

## 2.6 Video recording / Stop Video Recording

### 2.6.1 Video Recording

Press video recording icon see Fig.3-14 and firslty name the file name, the file name is automatically created as Section 1.1.2. If you wish to change the file path, please refer to Section 3.2.3. If you need to compress the file size, please refer to Section 1.2.3

Fig.3-14 Video recording icon

### 2.6.2 Stop Recording

Fig.3-15 Stop recording icon

## 2.7 Video Playing / Stop Playing video

### 2.7.1 Video Playing

The recorded video will plays at left window as Fig.1-1. Once it palys, the microscope is automatically disconnected.

Fig.3-16 Film playing icon

When play the films, Fig 3-17 toolbar will show under the preview window.

Fig.3-17 Toolbar of film playing

Play "  " : Press the button can play video.

Pause "  " : Press the button can pause video.

Stop "  " : Press the button can stop video.

Repeat “  ”： Press the button can repeat play video.

Exit “  ”： Press the button can exit video mode.

No Flip “  ”：Video image’s flip direction, does not makes any flip shown in Fig.3-18.

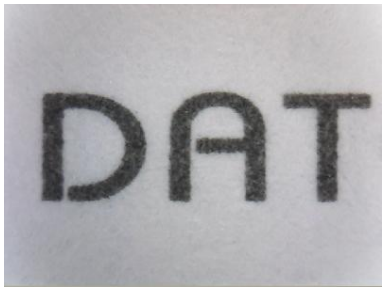



Fig.3-18 Video image with no flip

Vertical Flip “  ”：The video image upside down 180 degree, which is vertical flip, shown in Fig.3-19.

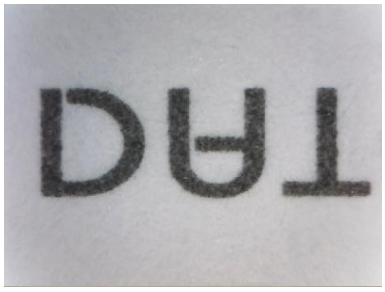



Fig.3-19 Video image do vertical flip

Horizontal Flip “  ”：The video image left and right mirror 180 degree flip which is horizontal flip shown in Fig.3-20.

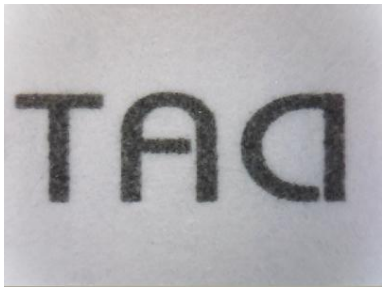



Fig.3-20 Video image do horizontal flip

Vertical and horizontal Flip “  ”：The video image will do horizontal and vertical flip shown in Fig.3-21.

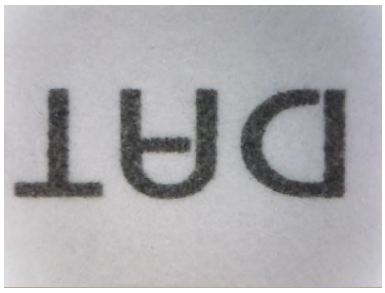


Fig.3-21 Video image becomes horizontal flip

Click right of mouse to show Fig.3-22


Fig.3-22

2.7.2 Stop playing

Once it stops play, the microscope is still disconnected.

Fig.3-23 Stop playing icon

## 2.8 Edit Image / Exit Image Editor

### 2.8.1 Image Editor

Image processing editor as Fig.3-24, microscope AP provides users few simple image processing editing functions.

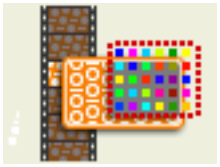


Fig.3-24 Image Editor Icon

While clicking the Image editor icon, the image processing function buttons as Fig.3-25 will show up on the right sub-window Fig.1-1.

Fig.3-25 Toolbar of Image Processing

Fig.3-25 Tool of Image Editor Once it clicks black and white or inverse it can set up the value. The image will be changed, too.

Fig.3-26 Changing Threshold

- Original Image "" : This button can let image return to original image.
- Gray Level "" : This button can let the image from color change to gray.
- Highlight Edge "" : This button can let the image show it's highlight edge.
- Highlight Pxiel "" : This button will strengthen in the picture between the
  - different pixels.
- Black/White "" : This button can let the image from color turn to black and white.
- Inverse "" : This button can let the image become inverse.
- Exit "" : This button is to exit video mode.

### 2.8.2 Exit Image Editor

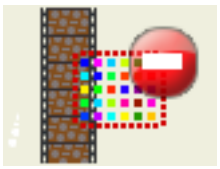


Fig.3-27 Leave Image Editor

## 2.9 Print Image

Fig.3-28 Printing image

## 2.10 Exit Application Program

Fig 3-29 Exit the Application Program

# 3. The File List/Folders

The file tabulates pages and signs as Fig.1-5, file tabulates is to list all file folders, which includes JPG folder, Bmp folder, and Avi Folder.

## 3.1 The File Tabulates

Fig.4-1 tabulate for BMP, JPG & AVI files

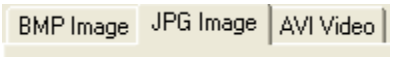



Fig.4-1 File tabulates

## 3.2 The File Tabulates On Page Number


Fig.4-2 The file tabulates on page number

### 3.2.1 Show the number of pages

001/001= X/ Y, X is sequence and Y is total number of pages.

### 3.2.2 Change page button

Fig.4-2 left and right button can be change page number. Left button is to decrease page number and right button is to increase page number.

### 3.2.3 Image Path

Click the “Image Path” to show Fig.4-3 and choose the file director

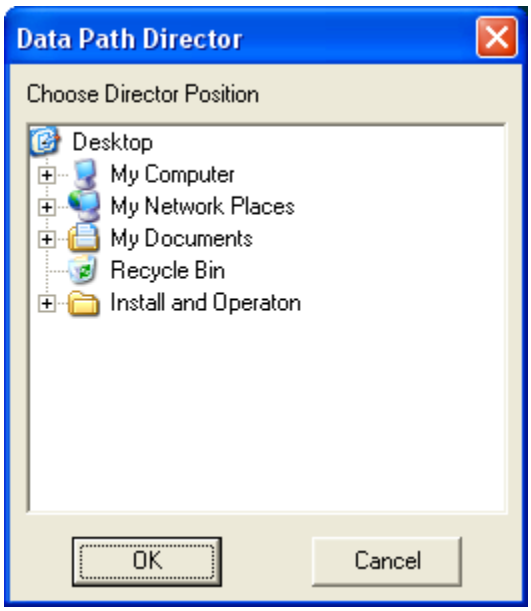



Fig.4-3 Data Path Director

## 3.3 Quick Click

Click right of Mouse on the saved image and show Fig.4-4, it can directly Open or Delete file.

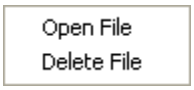



Fig.4-4 Quick click

# 4. Five Mode Functions

When connecting the AP with microscope device, the five mode functions will show up on the button position under left sub-window. The five mode functions are comparison, aiming, video control, measurement, and far distance control mode; see Fig.5-1. Select different mode to show the toolbar for operating.

1. Comparison mode :
   Comparison mode can do overlapping two frame. The frame can be whole or any size to compare. This mode can see two frams of simiarities.

2. Aiming mode :
   Provides a cross, area, rectangle and circular different aiming mode to aim the observation object .That can help capture observation object.

3. video control mode :
   The mode can control left hand or right hand to hold the machine, which can capture yourself or opsiticles, but the directions might not be correct. It can use the mode to adjust the dirctions and it can adjust contrast, brightness and exposure.

4. measurement mode :
   Measurement mode has ruler functions to measure at real time, which provides different measurement tools.

5. Far distance control mode :
   This mode is to control the machine from AP directly without touching the machine. This function allows to do photograpy, video record, zooming in/out, brightness control…etc.

Fig.5-1 Mode of toolbar

## 4.1 Comparison mode

When connected, the defult of the toolbar is set as to compare shown in Fig.5-2 and Fig.5-3. In Fig.1-6 right sub-window has no image so some part of the buttons wouldn't work in this mode. Comparesion mode can be overlap with another video image to compare and to cut half of the image for comparession.

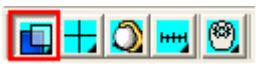


Fig.5-2 Comparison mode

Fig.5-3 Comparison mode toolbar

4.1.1 Load right side image “ ”

When capture one imge or open one image, the Comparison toolbar of “load right side image“ ” button can be choosen. Shown in Fig.5-4.

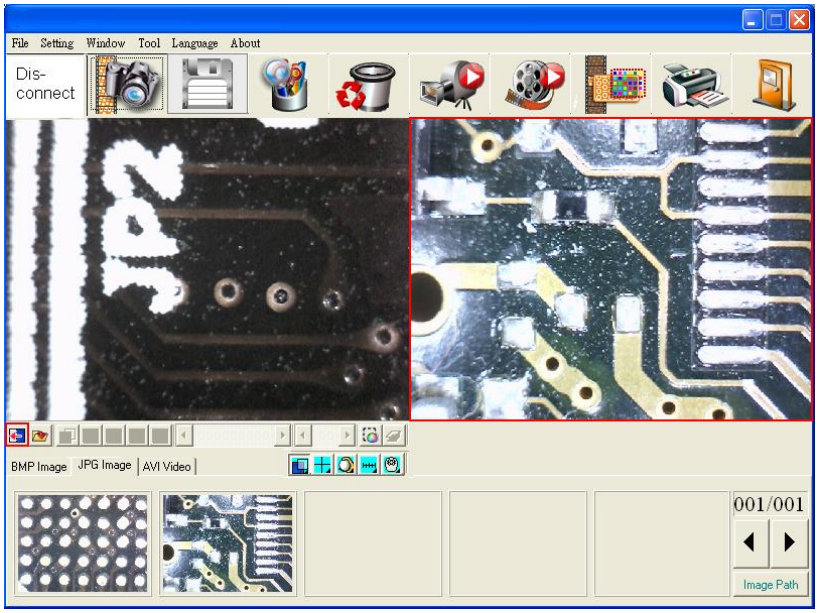



Fig 5-4 Right side window has image

When clicking “load right side image“ ” button see Fig. 5-4, image comparing functions is available see Fig.5-5. It can overlap image or cut half of the image and load into left sub-window for comparing. If want to leave comparison mode please click “load right side image“ ” again to go back preview mode.

Fig.5-5 Loading image will be compared

4.1.2 Load image “ ”

When the right sub-window doesn’t have image Fig.5-6, load & select image from file folder by clicking “load image“ ” button.

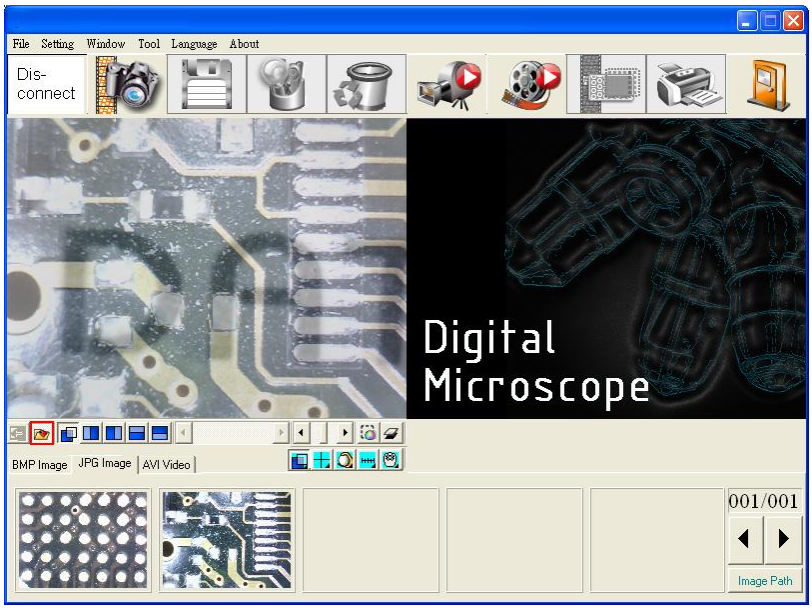



Fig.5-6 Load image button

Click “Load image” button. After opening the file, it can use overlapping and cut half image function. See Fig.5-7. If want to exit the program just click on “Load image” to go back to preview mode.

Fig.5-7 After loading image

### 4.1.3 Overlap comparison “ ”

The “overlap comparison” can makes the image transparence. With overlap in the video image, then at the same time shows two frames. Show in Fig.5-8.

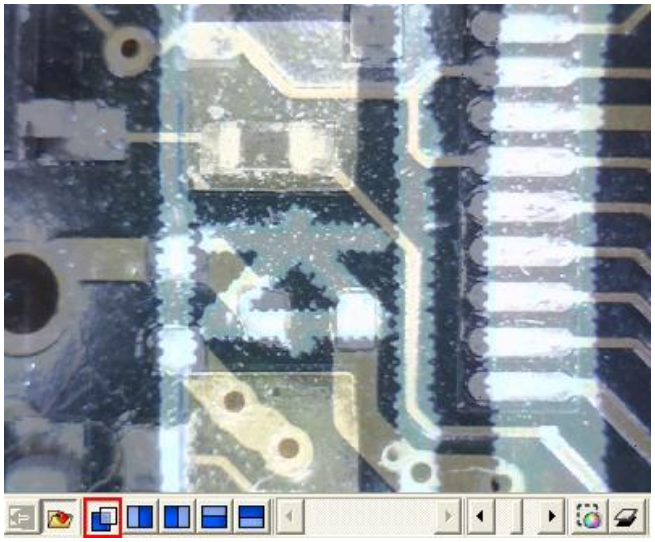


Fig.5-8 Overlap comparison

### 4.1.4 Left side comparison “ ”

When the window separates into left and right sides, the left side frame is video image, and the right side frame is loaded image. Show in Fig.5-9.

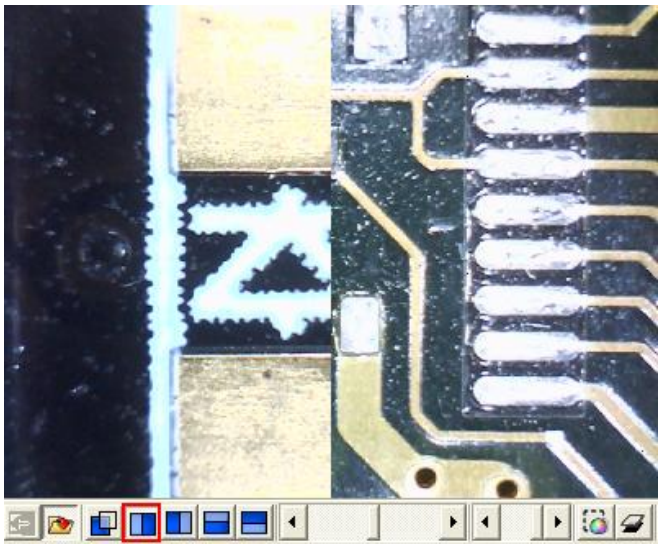


Fig. 5-9 Left side comparison

### 4.1.5 Right side comparison “ ”

The window separates to left and right, the right side frame is the video image and left side frame is loaded image. Show in Fig.5-10.

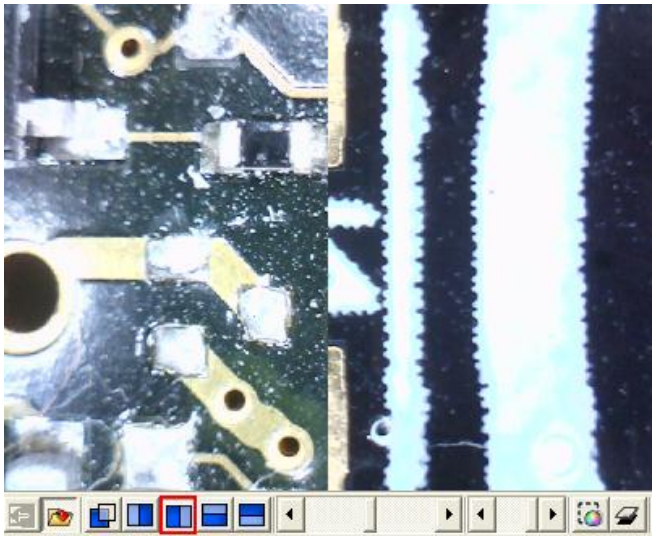


Fig.5-10 Right side comparison

4.1.6 Top side comparison “  ”

Window separates into two half which is top and bottom. Top is video image, and bottom is loaded image. Show in Fig.5-11.

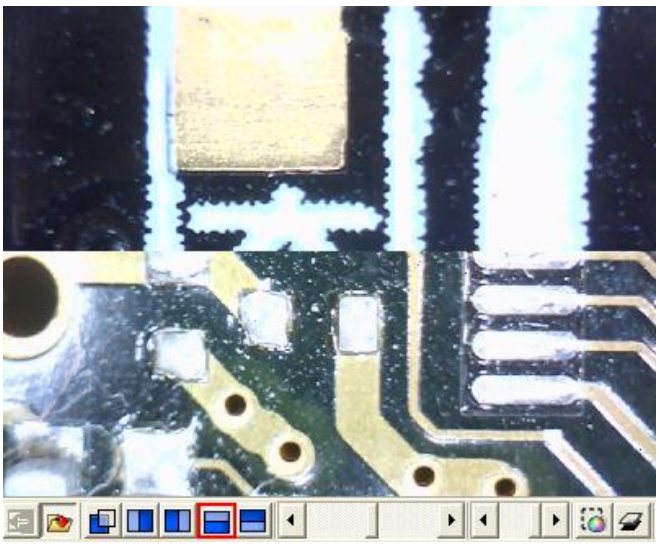


Fig.5-11 Top side comparison

4.1.7 Bottom side comparison “  ”

Window separates into two half, bottom side is video image, and top side is loaded image. Show Fig.5-12.

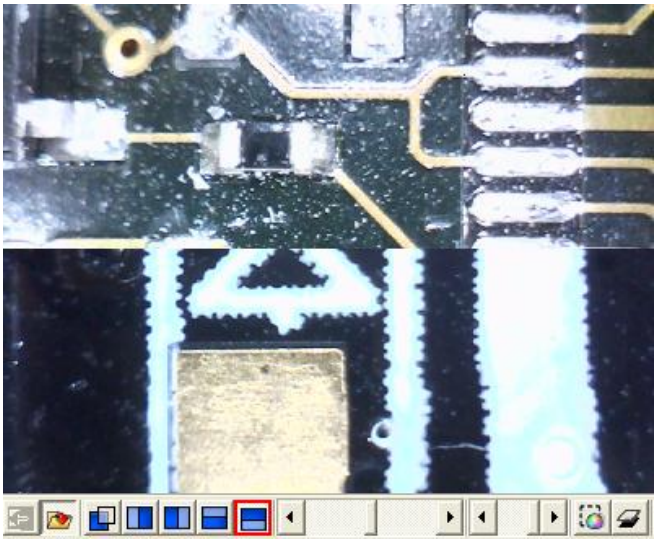


Fig.5-12 Bottom side comparison

4.1.8 Window ratio Adjustment

When choose half compare, can use this function to adjust the frame of ratio. Show Fig.5-13

Fig.5-13 Window ratio adjust by scrollbar

4.1.9 Transparent adjustment

Image can be adjusted from the scrollbar to change the pictures transparency. See Fig 5-14.

Fig.5-14 Transparency adjust by scrollbar

4.1.10 Knockout color "  "

Choose to knockout background color and some color on image can be cut out.

4.1.11 Combined image "  "

Before capture image click the button, which will combine video image and loaded image to combine. If not, the capture images will only video image.

## 4.2 Aiming mode

The aiming mode may draw different type like the cross, circular, rectangle, and area. It helps the user observation. It can draw the different aiming mode in the video image. Fig.5-15 is the selection to aiming mode, aiming toolbar shown in Fig.5-16. This mode may overlap the different aiming functions.

Fig.5-15 Aiming mode

Fig.5-16 Aiming mode toolbar

4.2.1 Draws cross “ ”

Click this button to draw the cross which may adjust the size by scrollbar. Show in Fig.5-17.

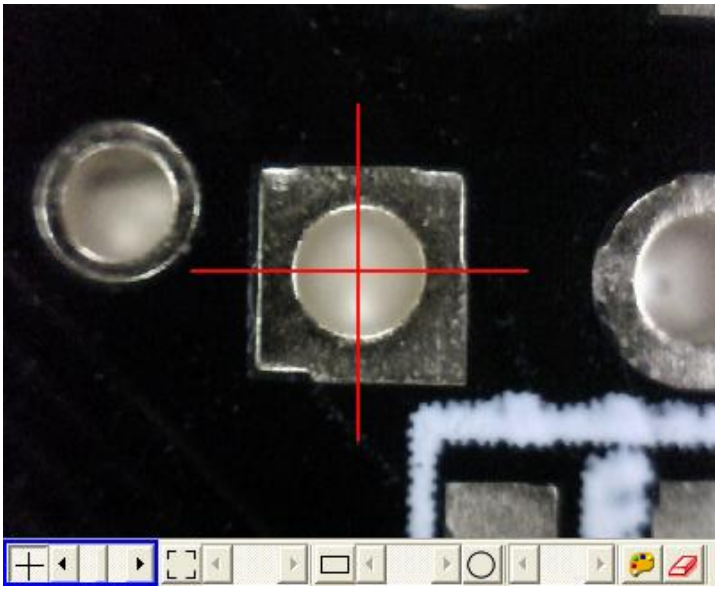


Fig.5-17 Draws cross

4.2.2 Draw area “ ”

Click the button to draw the area to adjust the size by scrollbar. Show in Fig.5-18.

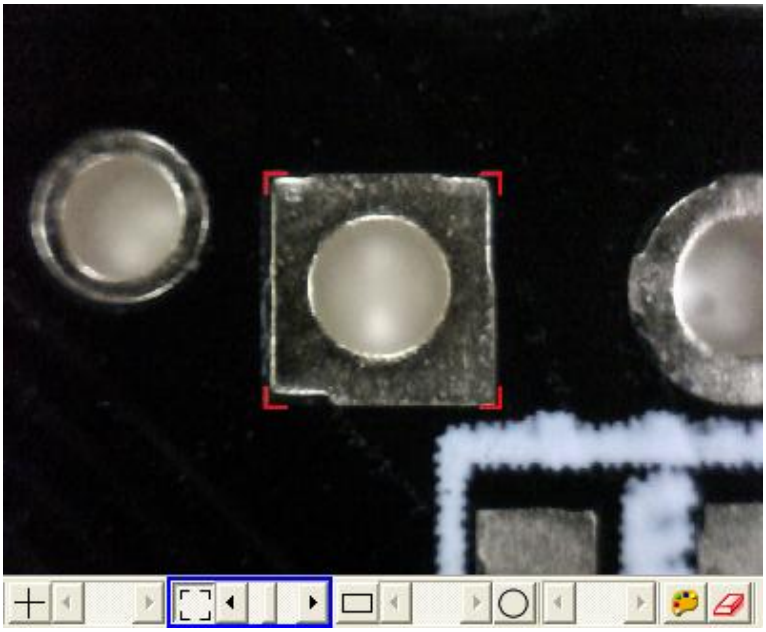


Fig.5-18 Draw area

4.2.3 Draw rectangle “ ”

Click this button to draw the rectangle to adjust the size by the scrollbar. Show in Fig.5-19.

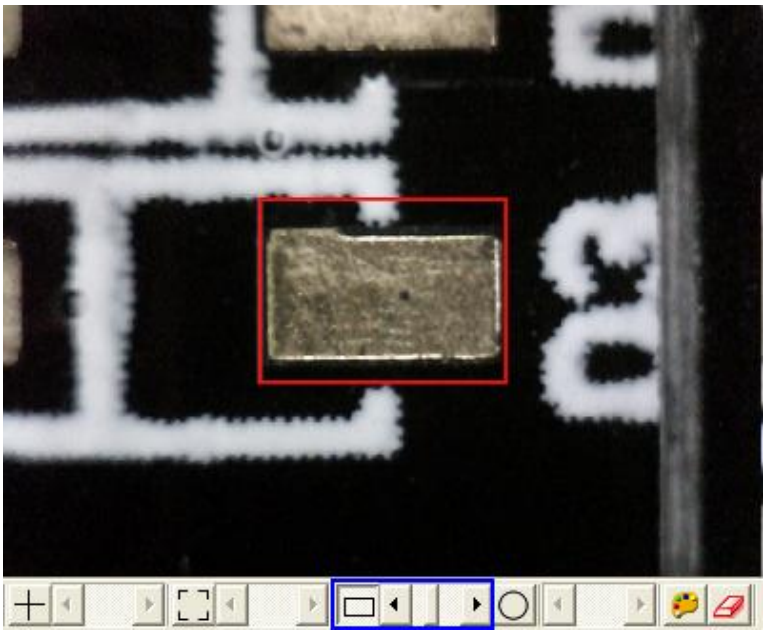


Fig. 5-19 Draw rectangle

4.2.4 Draw Circular “ ”

Click this button to draw circular to adjust size by scrollbar. Show in Fig.5-20.

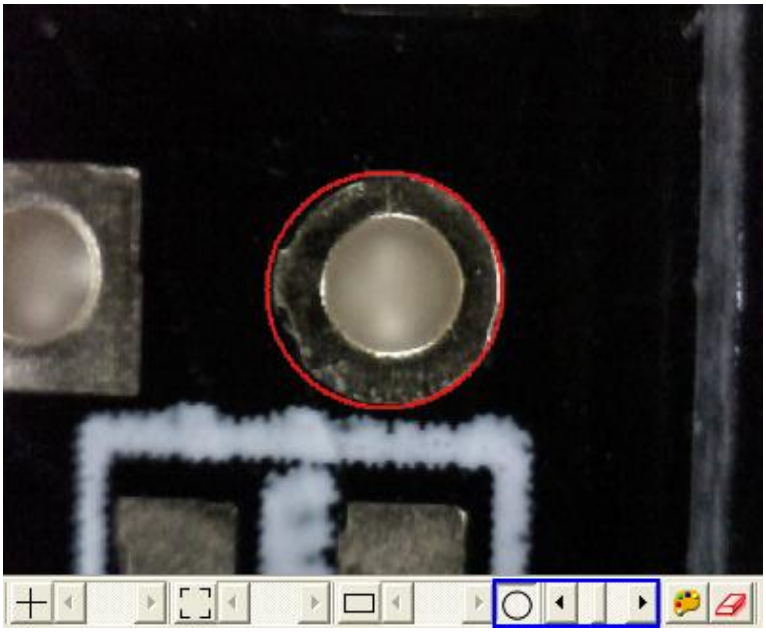


Fig.5-20 Draw Circular

4.2.5 Choose color “  ”

Click this button, will pop up choose color dialog box and from there to choose color.

4.2.6 Clear frame “  ”

To clear all aiming lines on fame

## 4.3 Video control mode

This toolbar has the functions to flip video image. When the left or right hand holds the microscope to look at self or observation, the video image will flip and move direction to be opposite. By the mode, it can preview the correct direction. The brightness, contrast and exposure tool can be adjusted and also can cause the video image to be clearer in different scene. Fig.5-21 is the selection video control mode. Fig.5-22 is its toolbar.

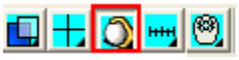


Fig.5-21 Video control mode

Fig.5-22 Video control mode toolbar

4.3.1 No Flip “  ”

Video image’s flip direction, does not makes any flip shown in Fig.5-23

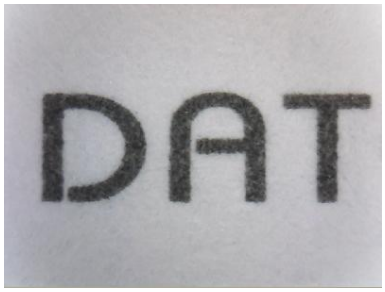



Fig.5-23 Video image with no flip

4.3.2 Vertical Flip “  ”

The video image upside down 180 degree, which is vertical flip, shown in Fig.5-24.

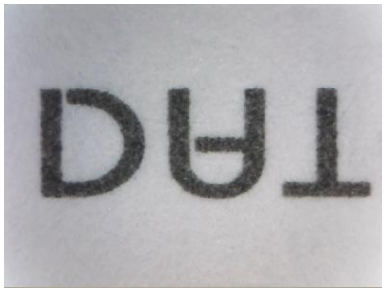



Fig 5-24 Video image do vertical flip

4.3.3 Horizontal Flip “  ”

The video image reverse between left & right for 180 degree flip which is horizontal flip shown in Fig.5-25.

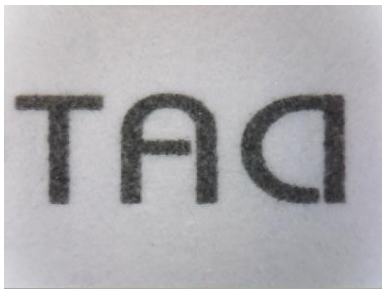


Fig 5-25 Video image do horizontal flip

4.3.4 Vertical and horizontal Flip “  ”

The video image will do horizontal and vertical flip shown in Fig.5-26.

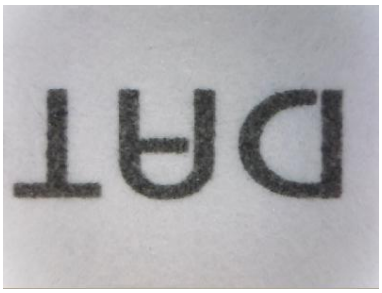


Fig 5-26Video image do horizontal & Vertical flip

4.3.5 Adjust Brightness “  ”

To adjust brightness is to click on the brightness button. By scrollbar adjust brightness. If want to default just click it again.

4.3.6 Adjust Contrast “  ”

To adjust contract just click the contrast button which can adjust by the scrollbar. If want to default just click it again.

4.3.7 Adjust Exposure “  ”

When adjusting the exposure, click on the exposure button and to default just click it again. If this button cannot click, it means there’s no diver to support this function. If adjust has no response, then go to “setting->video source” it will pop up shown Fig.5-6. The “auto

mode control" must be unchecked. If want to use "auto mode control" must be checked again.

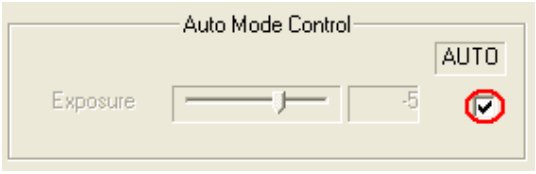



Fig.5-27 Auto mode control

## 4.4 Measurement mode

Measurement mode provide a scale which can be draw ruler and to measure observation object. Another way is to Freeze frame or loading image after then measuring. The measurement toolbar has line, circular, rectangle etc. Also, it can show length, area, radius, diameter, etc, information. Fig.5-28. is measurement mode; its toolbar is shown in Fig.5-29.

Fig.5-28 Measurement mode

Fig.5-29 Measurement mode toolbar

Before measuring, make sure to calibrate the scale, please note "scale setting" the explanation.

### 4.4.1 Freeze frame "  "

This function can let the previewing video image to freeze. Once the image freezes.

### 4.4.2 Load image "  "

The image which was captured before can be reloaded again. Users can use the measurement function after reloading the image

### 4.4.3 Save image "  "

After measuring, it can save image by clicking "save image "  " button. The save file name will be marked as vertical and horizontal scale. If want to load the image to do

measurement, then just click “scale setting” “ ” button to set vertical and horizontal scale, and these scale of value form file name. If file name has v420h560 of string means horizontal 5.60mm and is vertical is 4.20mm.

4.4.4 Copy to clipboard “ ”

Select “Copy to Clipboard” “ ” button then the current frame will be copied to clipboard ,also, it will be pasted to right side windows at Fig.1. After copying, it can be pasted on word or excel. Etc.

4.4.5 Scale setting “ ”

(1) Select suitable ruler

Before setting scale, first find the higher accurate ruler to measure. Use generally ruler shown as Fig.5-30.

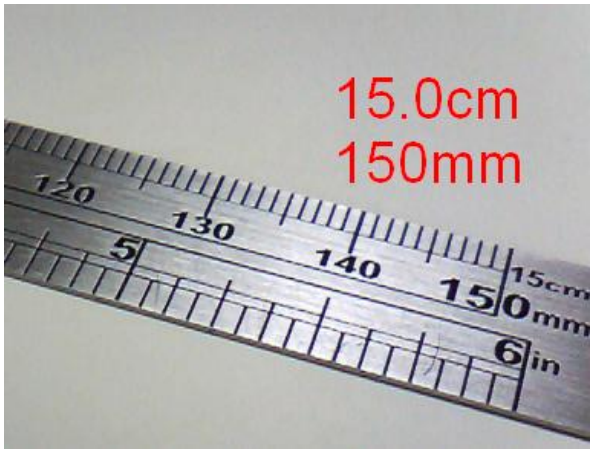



Fig. 5-30 Metal ruler

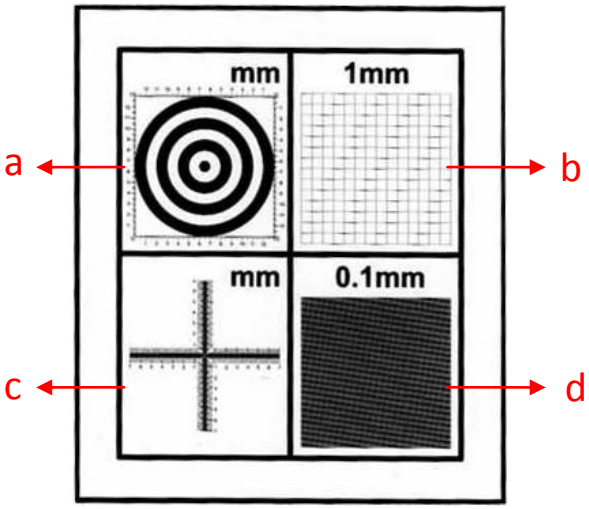



Fig. 5-31 Calibrator

“Calibrator” is designed for calibration. Fig.5-31. There are three types of the ruler and 4 kinds of pictures, (a) Concentric Circles, (b) Low Magnification Grid, (c) Cross, and (d) High Magnification Grid. Please make sure to place the calibrator in correct position due to different side of front and back will cause measurement value incorrect or inaccuracy.

a. Concentric Circles: To measure a round hole. Place the Concentric Circles (See above chart a) directly onto PCB drilling hole, the diameter can be measured from the concentric circle scale. Diameter: 3.00mm. See Fig. 5-32.

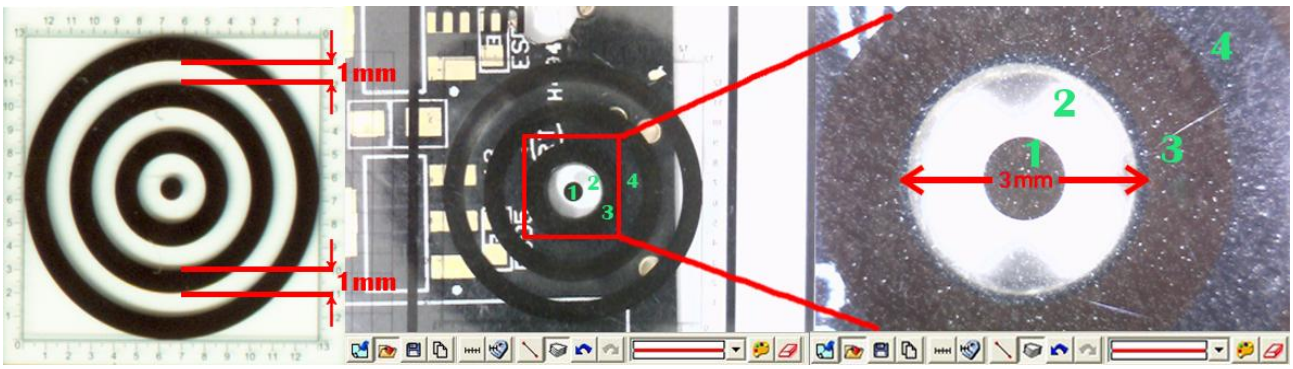



Fig.5-32 Concentric Circles

b. 1mm Low Magnification Grid: To place the grid (See above chart b) on the object as the bill Fig.5-33, the length for each square is 1mm.


Fig.5-33 Low Magnification Grid

c. Cross: The main purpose for the Cross is to calibrate the program and also as a measurement. The Cross (See above chart c) has 3 kinds of units as 0.05mm, 0.1mm and 1mm scale. It will measure 0.05mm, 0.1mm at high magnification and 0.1mm, 1mm at low magnification. The Cross can measure the Length and Width accurately, ie.: Fig.5-34, Measure the length of the onion cell as the red rectangle which is approximate 0.400mm.

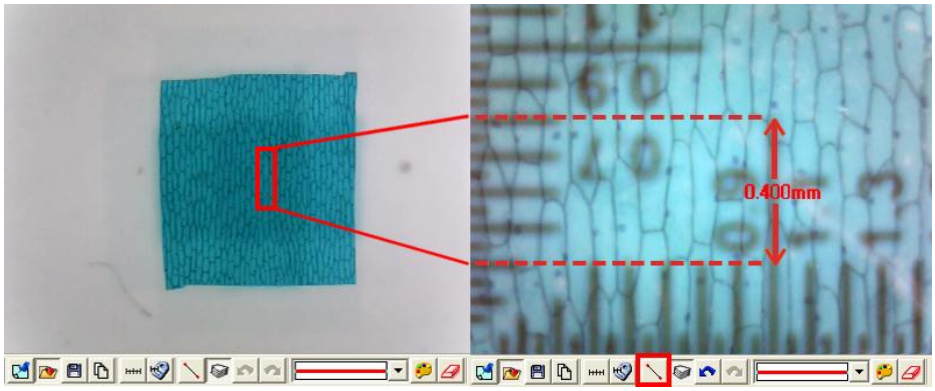



Fig.5-34 The Cross

d. 0.1mm High Magnification Grid: See Fig.5-35, put the 0.1mm scale (See above chart d) on "M" microdot. The Length of M in a square i.e. 0.100mm.

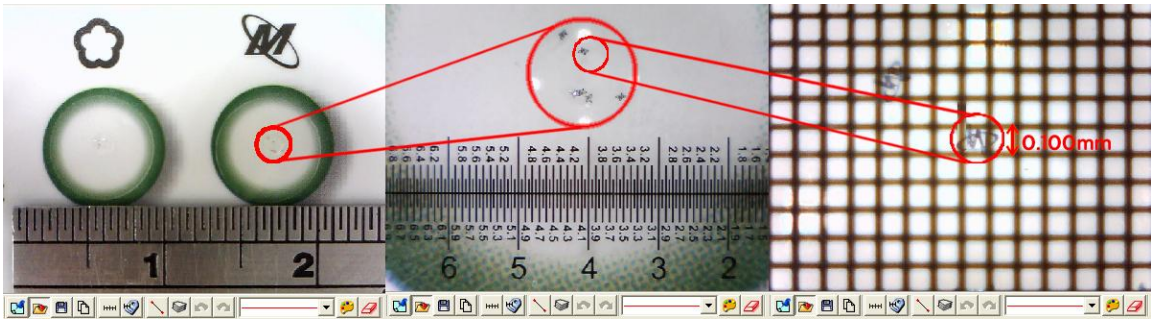



Fig.5-35 High Magnification Grid

4 kinds of applicable method is same. Because the calibrator is transparent, simply place it onto the object, then put the machine onto the calibrator for observing.

The use "metal ruler" and "calibrator" the biggest difference is as follows:

- When the magnification is high, use the calibrator can easily and accurately knows the scale range.
- When the magnification is high, metal ruler is less accurately than a calibrator.
- When the magnification is low, a metal ruler can be suitable.

(2) Calculate scale rang

First, the scale setting must calculate the horizontal and vertical scale range, the following has several steps to decide the scale range, suggested that the windows size adjust 640*480 the single windows：

- To decide measure distance between machine and observation objects.
- To adjust the focus to see the image as clear as it can.
- Calculate the observation video image of horizontal and vertical scale. Calculate the range shown in Fig.5-36.
  After setup the horizontal and vertical scales, the machine, the observation distance and focus are not allow to readjustment.

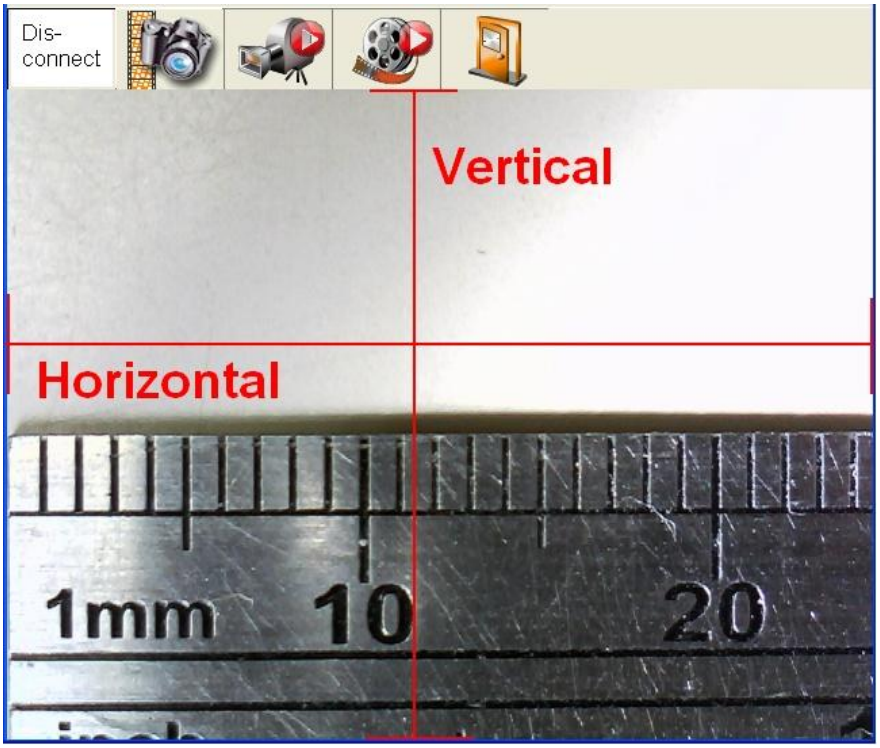
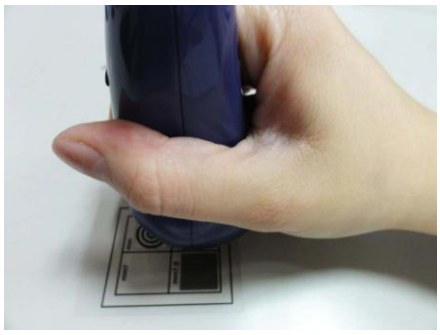



Fig.5-36 Horizontal and vertical measurement range

(3) Calibrate “contacted” and “non-contacted” scale

- Contacted scale: Put the machine onto the calibrator for small field of view , it can apply for a focus point at Low or High magnification.
- Non-contacted scale: To hold the machine by the supporter, fix the machine overhead a ruler for a certain distance, it can observe a wider field of view.
- Non-contacted scale is only for low magnification. See Fig.5-37.

| Contacted | Non-Contacted |
|---|---|
|  |  |
| Fig.5-37 Contacted and Non-Contacted | |

According to the above steps it can measure horizontal and vertical scale. Several examples as follows:

EX1: Measurement for non-contact object.

Use the “metal ruler” as a measurement base, the machine and the observation object of distance is 2.6 cm, the focus of the video image is clear. Image shown in Fig.5-38 and Fig.5-39 is the result after measurement, horizontal and vertical scale range is 24.2mm and 18.1mm.

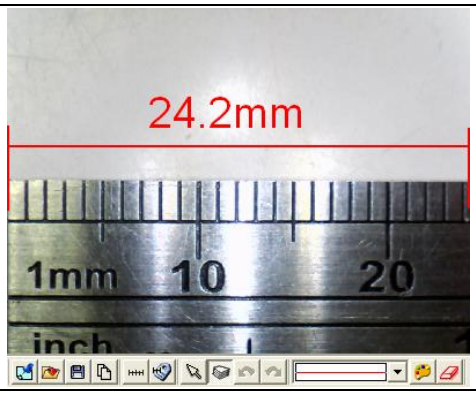



Fig 5-38Horizontal scale range is 24.2mm

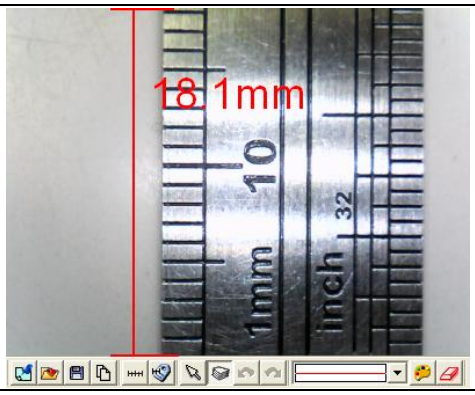



Fig 5-39Vertical scale range is 18.1mm

EX2: Measurement for contacted object in low mag.

Use the “metal ruler” for measurement of the base, the machine and the observation object of distance is close, the focus of the video image is clear. Image shown in Fig.5-40 and Fig.5-41 is the result after measurement, horizontal and vertical scale range is 5.60mm and 4.20mm.

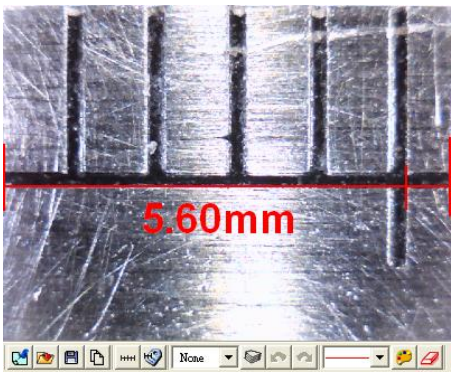



Fig.5-40 Horizontal scale range is 5.60mm

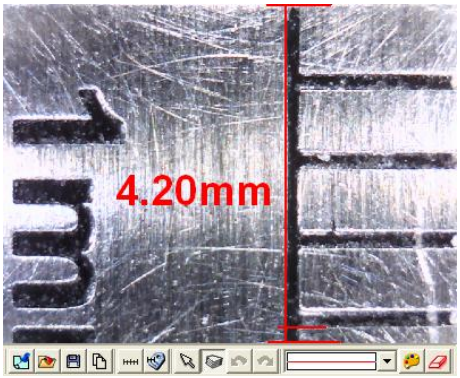
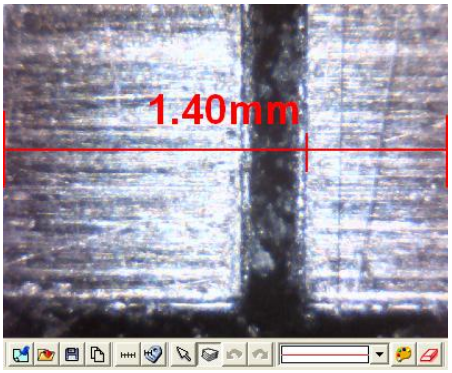
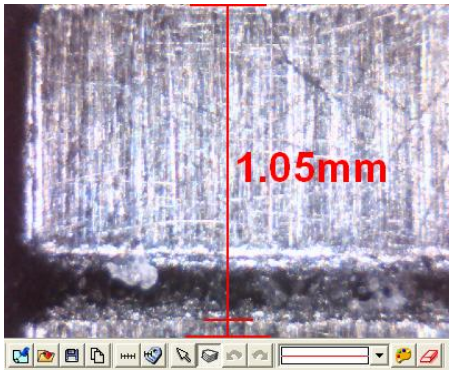



Fig.5-41 Vertical scale range is 4.20mm

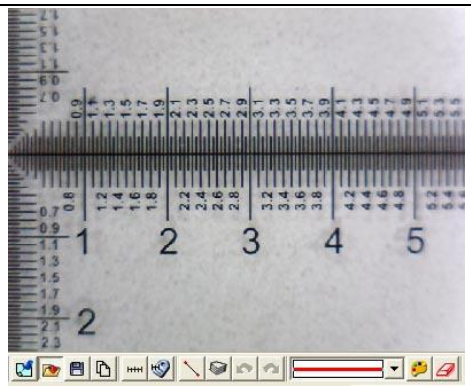
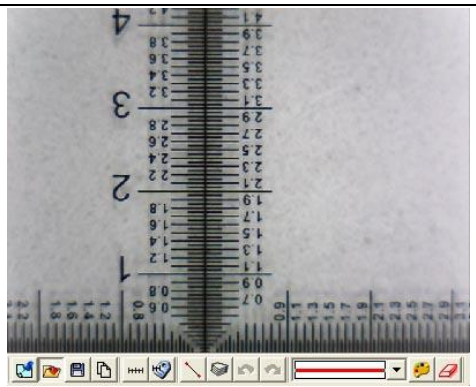
EX3: Measurement for contacted object in high mag.

Use the “metal ruler” for measurement of the base, the machine and the observation object of distance is close, the focus of the video image is clear. Image shown in Fig.5-42 and Fig.5-43 is the result after measurement, horizontal and vertical scale range is 1.40mm and 1.05mm.

| | |
|---|---|
|   |   |
| Fig.5-42 Horizontal scale range is 1.40mm | Fig.5-43 Vertical scale range is 1.05mm |

EX4: Calibrate the scale for contacted in low mag.

Use the “calibrator” for measurement of the base, the machine and the observation object of distance is close, the focus of the video image is clear. Image shown in Fig.5-44 and Fig.5-45 is the result after measurement, horizontal and vertical scale range is 5.60mm and 4.20mm. Using “calibrator” can be easier and accurate to get scale range.

| | |
|---|---|
|  |  |
| Fig.5-44 Horizontal scale range is 5.60mm | Fig.5-45 Vertical scale range is 4.20mm |

EX5: Calibrate the scale for Contacted in high mag.

Use the “calibrator” as a measurement base, flatly put the machine on the observing object, adjust the focus to find the clearest image. See Fig.5-46 and Fig.5-47 the result from measurement. Horizontal and vertical scale range is 1.40mm and 1.05mm. Using a calibrator is more easily and accurately to get scale range.

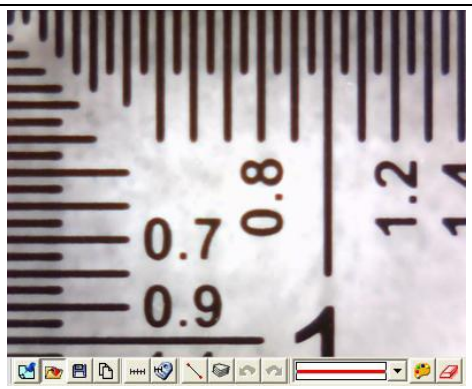



Fig.5-46 Horizontal scale range is 1.40mm

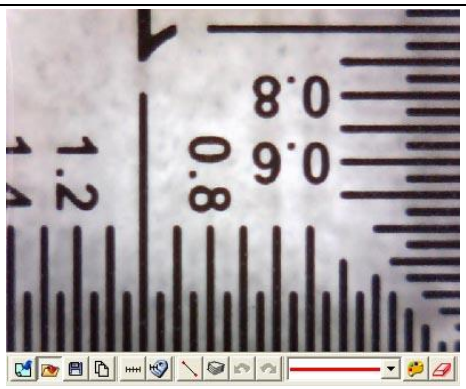



Fig.5-47 Vrtical scale range is 1.05mm

(4) Factors cause the inaccurate on the measurement

There are few factors could cause the inaccurate on the measured figures.

- The used ruler is not exactly accurate, for example, a metal ruler is not accurate than a calibrator.
- Because of the discrepancy, it is unable to know the accurate horizontal and vertical scale range, too.
- The resolution is not the same with the Windows size.

Why is the resolution not the same with the Windows size? For example the present resolution (original video image of output size) is 640*480 the measurement of the Windows's for general is 400*300 sizes. When the original video image size is 640*480 by reducing to 400*300, the measurements will have caused error. Therefore, the measurement is to adjust the resolution size and windows size to become the same. To chooses the application toolbar. “Setting”-> video format will pop up shown in Figure Fig.5-48, to change “output size” value then, this output size expression video source resolution.

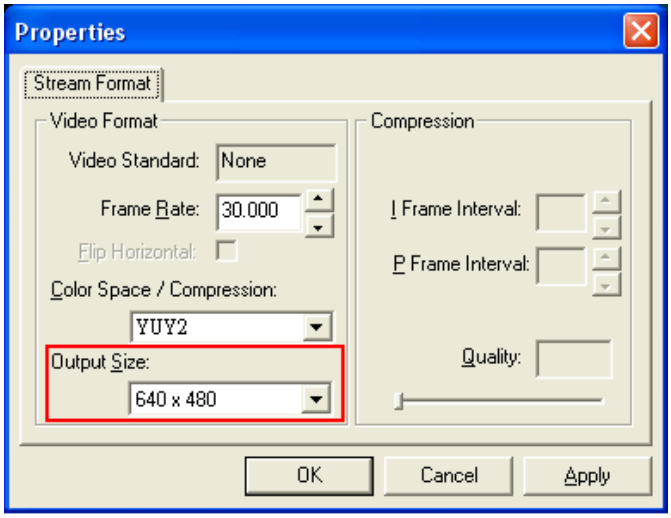



Fig.5-48 Resolution adjustment

Another window adjusts as shown Fig.5-49 below.

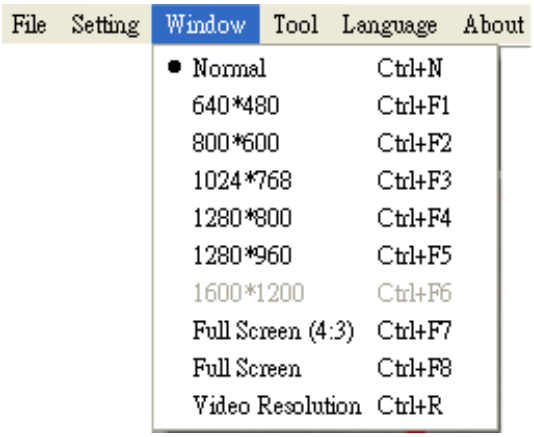



Fig.5-49 Window size adjustment

(5) Setting scale

The setting scale dialog box show in Fig.5-50. The following several to explain operation

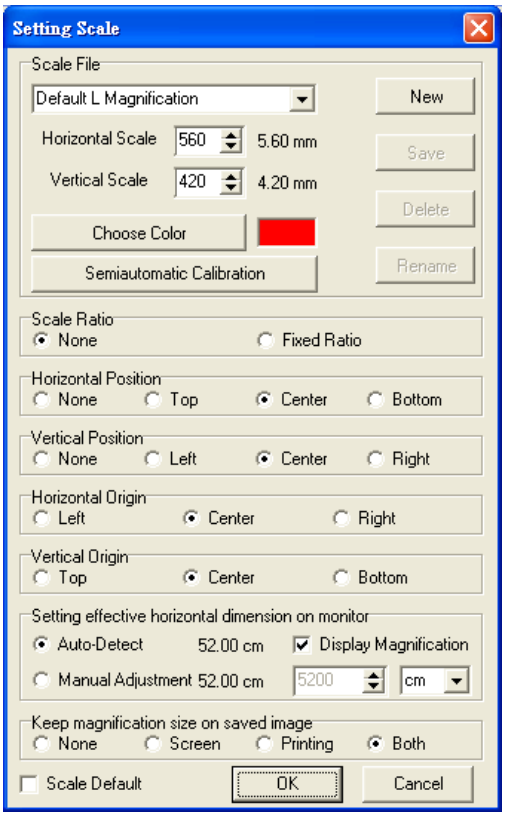



Fig.5-50 Setting scale dialog

- Scale default file

Scale default files have two types “Default Low Magnification” and “Default High Magnification” shown in Fig.5-51


Fig.5-51Scale default File

When the microscope is observing object with contacted distance, it has two focus points. Thus, it will have two kinds of scale value which are for low and high mag. When in low mag, the horizontal and vertical scale is 5.6 mm and 4.2mm. And when in high mag., the horizontal and vertical scale is 1.4mm and 1.05mm. If the default value is not right for the user, the scale value can reset or create a file for new value by calibrate the horizontal and vertical scale according to the user’s preferences.

If want to return to the default file, check “Scale default” box than it will return back to two default files and the other files will be deleted.

- Create a new scale file

  Click “new” button than it will pop up shown in Fig.5-52 a dialog box and input new scale name.

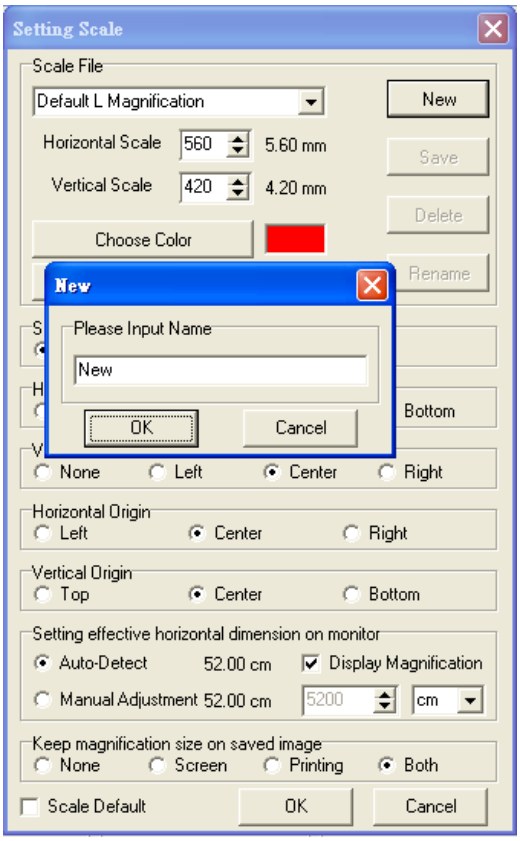



Fig.5-52 New scale name file dialog

After creating new file, input vertical and horizontal’s scale value shown in Fig.5-53 and if want to change scale color, select on “choose color” button to change color.

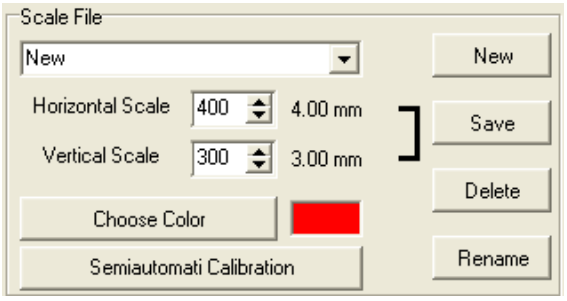



Fig.5-53 Input vertical and horizontal scale value

- Scale ratio

  The machine’s Sensor of image ratio is 4:3, if checked fixed ratio, then the horizontal and vertical scale will make the adjustment by 4:3 ratio, shown in

Fig.5-54. For example, input in the horizontal scale value to 410, the vertical scale value will automatically adjust to 307.

On the other hand, due to the AP will automatically calculate the scale range for horizontal or vertical scale, thus, the user just need to measure and enter one of the horizontal or vertical scale. i.e., while only measure and enter the horizontal scale range, it can calculate the vertical scale range automatically.

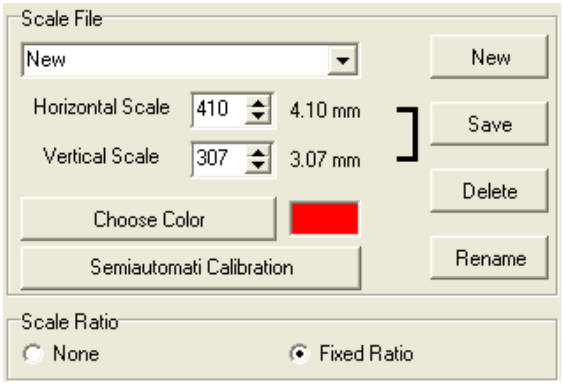



Fig.5-54 Fixed ratio adjustment

- Set ruler position & show (0,0) position

  Ruler can display at Horizontal or Vertical position as per example per below Fig.5-55 options. The image results in Fig.5-56.

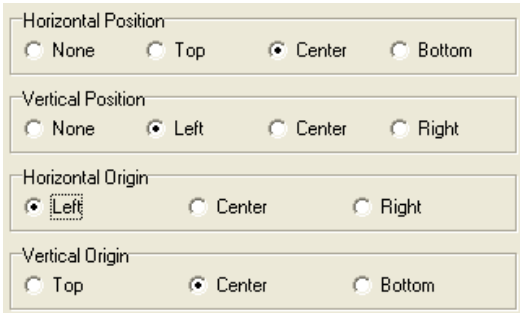



Fig.5-55 Ruler vertical and horizontal position setting

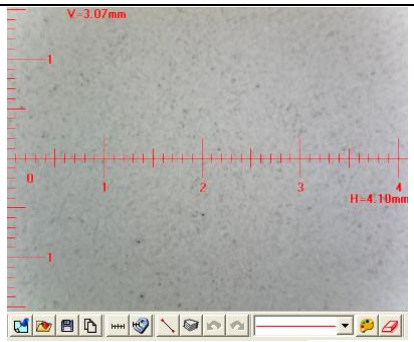



Fig.5-56 Ruler vertical and horizontal Display

- Set effective horizontal dimension on monitor

  The default value is Auto-Detect, which helps to detect the effective horizontal dimension on the monitor automatically. If the defected value is 0 or needed to adjust by manually, click on “manual adjustment”. The unit is cm and inch. See Fig 5-57.

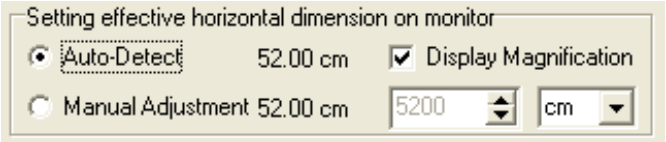



Fig 5-57 setting effective horizontal dimension on monitor

The “Display Magnification” (See Fig 5-57) on the right top corner is to show the magnification on the preview window. The magnification will change according to the screen size, window output size and image resolution. The magnification is calculated based on the “Field of View”, which already calibrated the horizontal and vertical scale. Users can put metal ruler on the screen to measure the size. See example Fig 5-59. The 1.0mm on the screen = metal ruler 16.2mm, so the magnification is 16.2times.

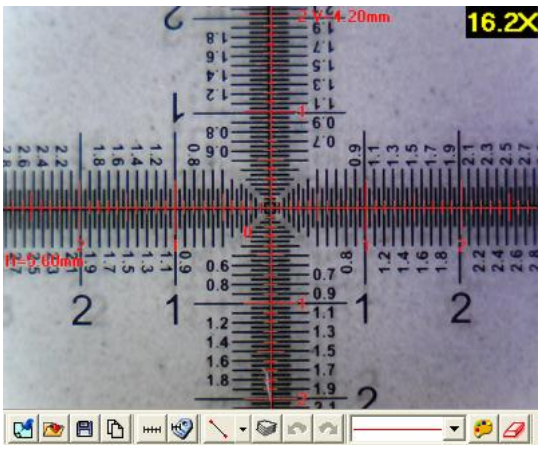



Fig 5-58 magnification on the right top corner of preview window.

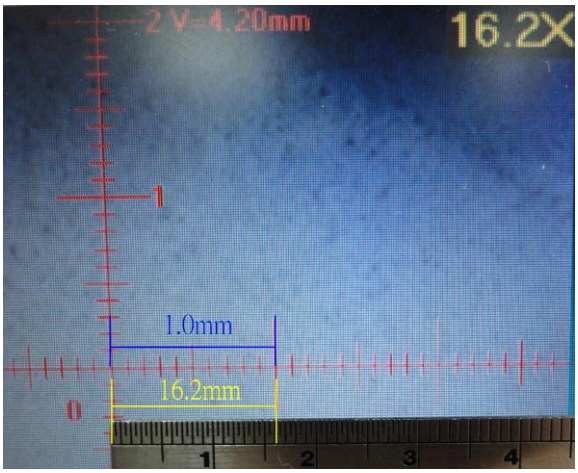



Fig 5-59 Use a metal ruler to measure the magnification.

- Magnification figure shown on saved image.

To select the magnification on image, then click on “Save image”, the magnification will be saved on the right top corner of the image. Or to click “copy “ to copy the preview image to right sub-window. Refer to Fig 5-60, if select “Screen”, the magnification will be calculated based on Field of View and currently window output size; the correct magnification will show on the saved image. Same as Screen, if select “Printing”, it will calculate into correct size for printing. The magnification will show on the right top corner. If select both Screen and Printing, the right top corner will show 2 magnification.
(S ) represents Screen and ( P) represents Printing.


Fig 5-60 magnification setting

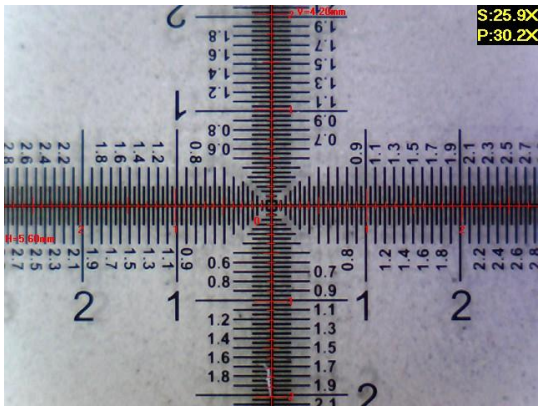



Fig 5-61 magnification saved on the right top corner of the image.

- To delete and rename scale file

  Choose delete or rename the file from the drop down menu, see Fig.5-62

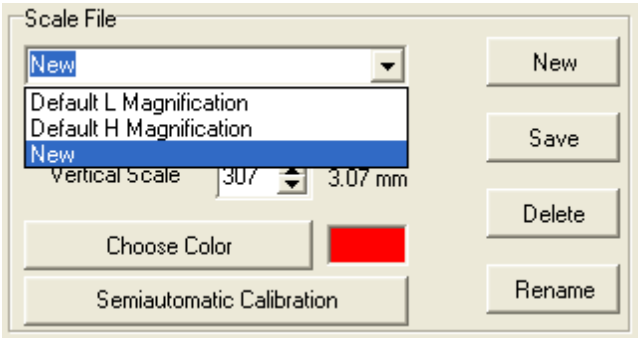



Fig.5-57 Drop down menu choose file

- Semi-Auto Calibration

  Set up a customized semi-auto Calibration. See Fig.5-63. “Input Measurement Length” means the real length. For example, enter 400 means 4.00mm, enter 50 means 0.5mm. The Display Scale check-box is to decide to show the Display Scale or not. If click the Horizontal Fixed, only a horizontal axis can draw on the image; on the contrary, if click the Vertical fixed, only a vertical axis can draw on the image. If choose “None”, axis can draw from any direction. A horizontal or vertical axis can be draw by pressing ‘shift’ button on your keyboard together with clicking mouse left. After it is completed, please click “Finished” for saving the new scale.

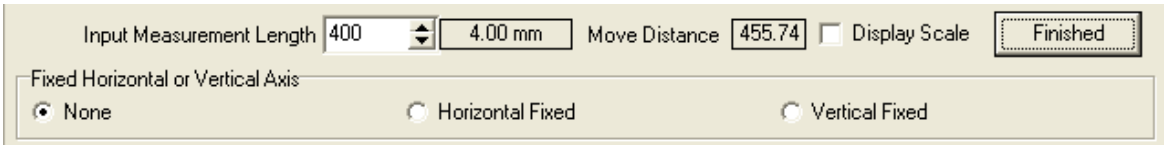



Fig.5-63 Input the actual measurement length

The calibration frame can be freezed by pressing the right button on the mouse. The freezed frame helps for calibrating in a stable condition.

(1) Put the calibrator under the machine and adjust focus to clearly see the scale.

(2) Key in “400” length in the check-box of “Input Measurement Length”.

(3) Use mouse to draw a yellow line for 4.00mm.

(4) Click “Finished” to complete and save the new calibration figure.

The new setting scale (Calibration Scale [New]) show on the frame. See Fig.5-64.

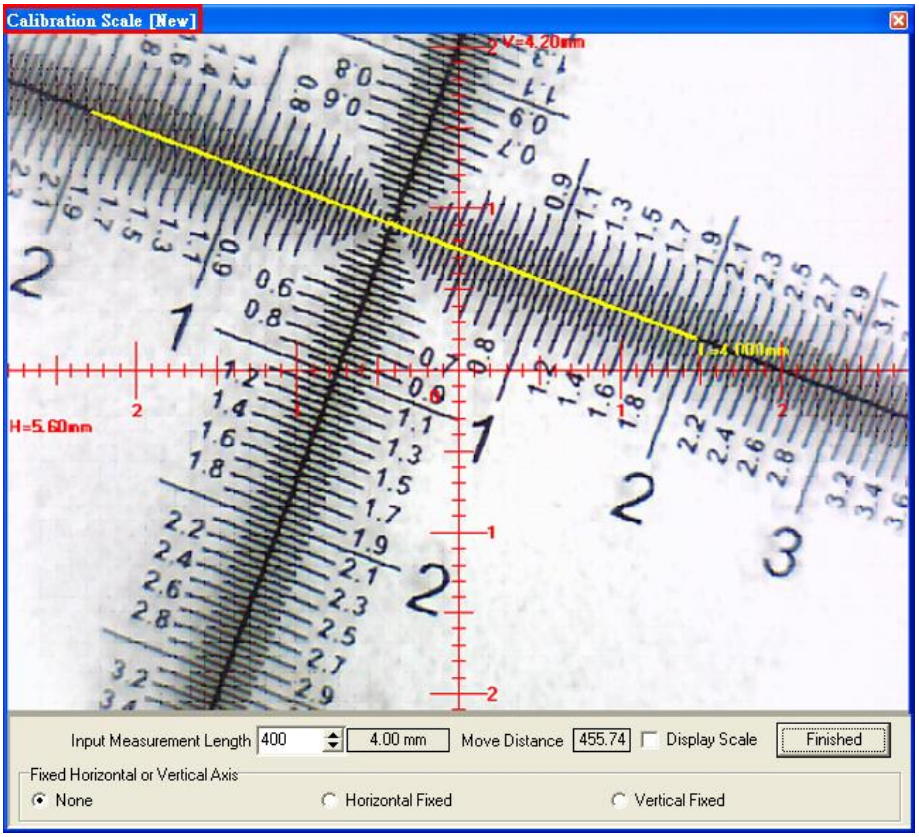



Fig.5-64 Draw a line in actual length

### 4.4.6 Scale information setting “ ”

This setup screen indicates to set whether to show the unit value or not, see Fig.5-65. Choose “length” means to display the length of the line, by capital letter “L” expression, if length is 2.33mm, it will show L=2.33mm besides the line. If choose “none”, no value will show on the dialogue. If show “P” means “perimeter”, “A” means “Area”, “C” means “Circumference, and “R” means ”radius”.

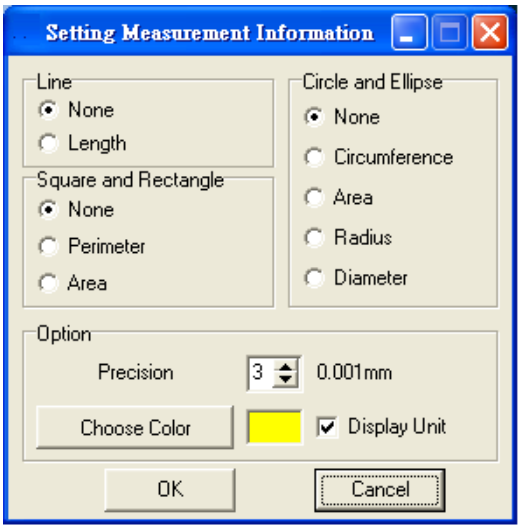



Fig.5-65 Scale information setting dialog

The “precision” is refers to under the decimal point of effective number of digits. The effective number of digits can be adjusted. “Choose color” may choose the text color. “Display unit” does not check its unit “mm” did not display. Attention, after setting option, and also choose the “measuring means style”.

### 4.4.7 Measurement tool styles

The measuring include optional Line, 2 Points Circle, 3 Points Circle, Ellipse, Square, Rectangle, 3 Points Angle, 3 Points Chamfer, 4 Points Angle for variable demand.

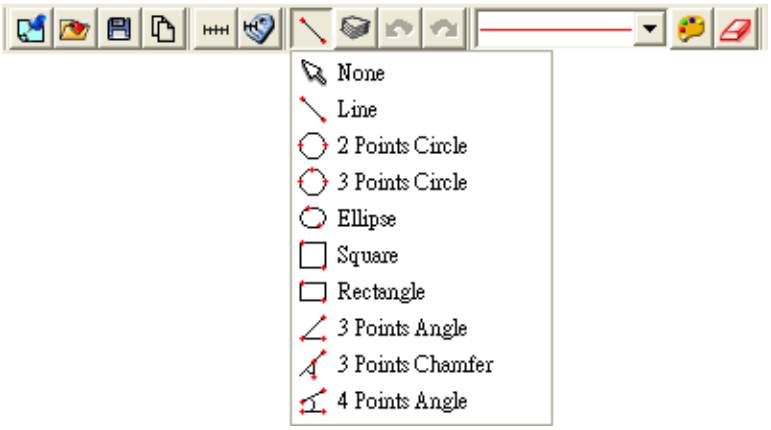



Fig. 5-66 Measurement Tool Styles

(1) Line: Measure the Length and use . See Fig.5-62.Firstly choose Fig.5-66 Scale information setting dialog. Measure the Length on the PCB rectangle, choose the "line" icon, then draw a line, the "L" means Length. Ex: L=5.510mm. See Fig 5-67.

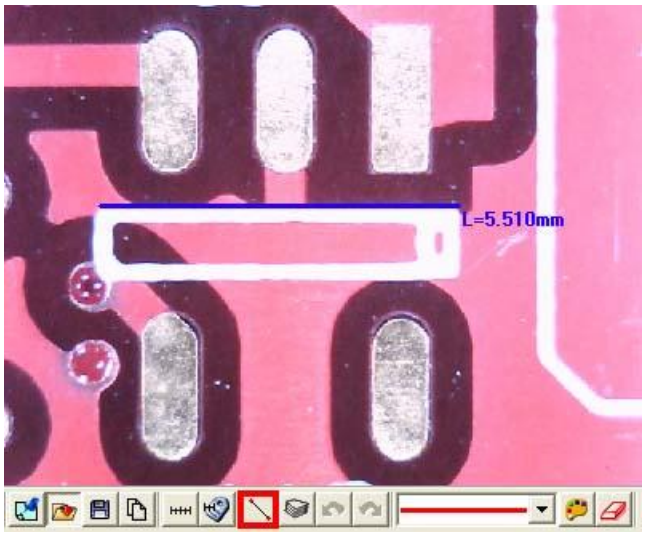



Fig.5-67 Length measurement

(2) 2 Points Circle: Measure the round object can use. Firstly choose Fig. 5-66 Scale information setting dialog. To point any dot on the circle, pressing the left button of the mouse and drag the line to another point on the circle. It should automatically calculate C: Circumference, A: Area, R: Radius, D: Diameter. See 1st circle: C=2.276mm, 2nd circle: =0.412mm2, 3rd circle R=0.716mm, and 4th circle D=1.467mm. See Fig 5-68.

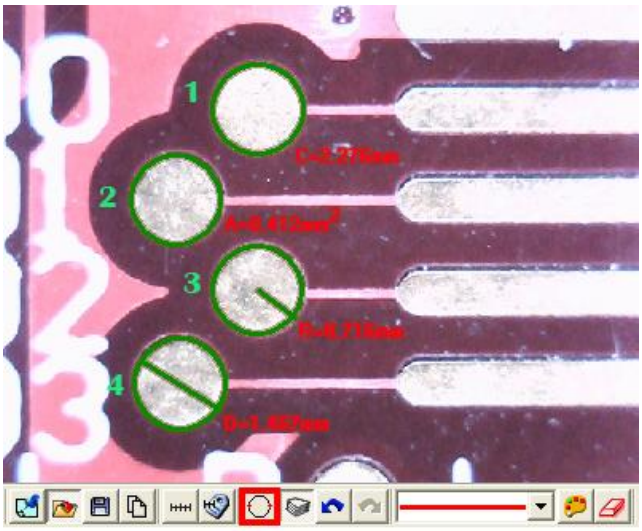



Fig. 5-68 2 Points Circle Measurement

(3) 3 Points Circle: See an arc or a circle shows on the observation only and need measure the circle, it can use. Firstly choose Fig.5-66 Scale information setting dialog. To point any point on the edge of an arc, draw a line to second point, then drag the line to the third point on the same arc, to automatically calculate a correct circle.The said 3 points on the arc to be necessary a triangle. See Fig.5-69, the figure can be measure as 2 Point Circle. 1st circle: Circumferences C=2.409mm, 2nd circle Area A=0.450 mm$^2$, 3rd circle: R=0.727mm, 4th circle: D=1.480mm.

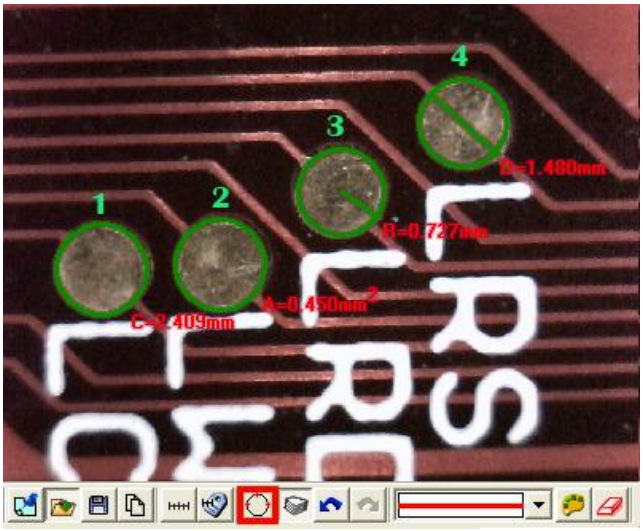



Fig.5-69 3 Points Circle

(4) Ellipse: Measure an ellipse circle and use. Firstly choose Fig.5-66 Scale information setting dialog. To point any dot on an ellipse, pressing the left mouse button, and drag to fit the ellipse on an observation object. Same methods as Circle to be measured for 2 Points Circle and 3 Points Circle, 1st ellipse C=6.703m, 2nd ellipse A=2.947mm$^2$, 3rd ellipse: lR=1.328mm, sR=0.714mm, 4th ellipse lD=2.826mm, sD=1.428mm. See Fig 5-70

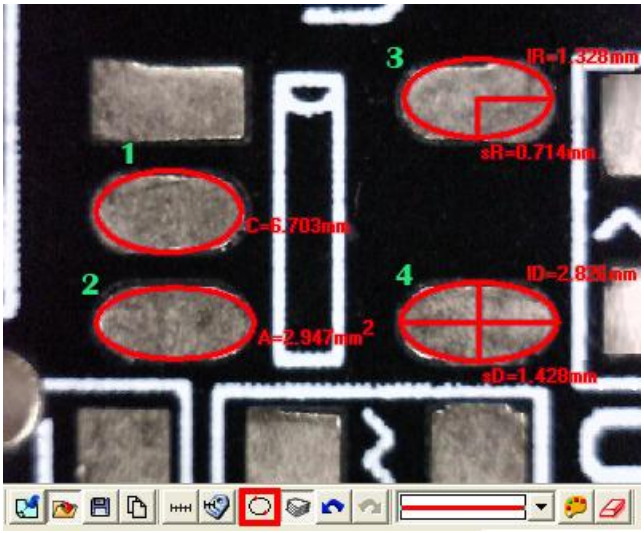



Fig.5-70 Ellipse

(5) Square: To measure the object is a parallelogram, it can use. Firstly choose Fig.5-66 Scale information setting dialog. To point one dot on the angle pressing the left mouse button, and drag the diagonal to make a square and fit the observed object. See Fig.5-71 , P：Perimeter, A: Area, see Fig.5-66, the top square on left P=7.295mm, the bottom square on left A=3.587 $mm^2$.

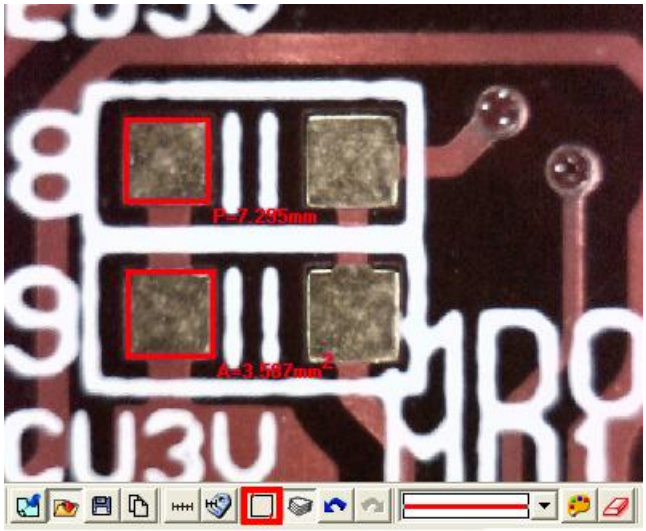



Fig.5-71 Square

(6) Rectangle: Measure a rectangle and use. Firstly choose Fig.5-66 Scale information setting dialog. To point one dot on the corner, press the left mouse button, and drag the diagonal to make a rectangle to fit the observed object. See Fig.5-72, P：Perimeter, A: Area, see Fig.5-67, the top rectangle on left P=10.308mm, the bottom rectangle in the middle A=1.940 $mm^2$.

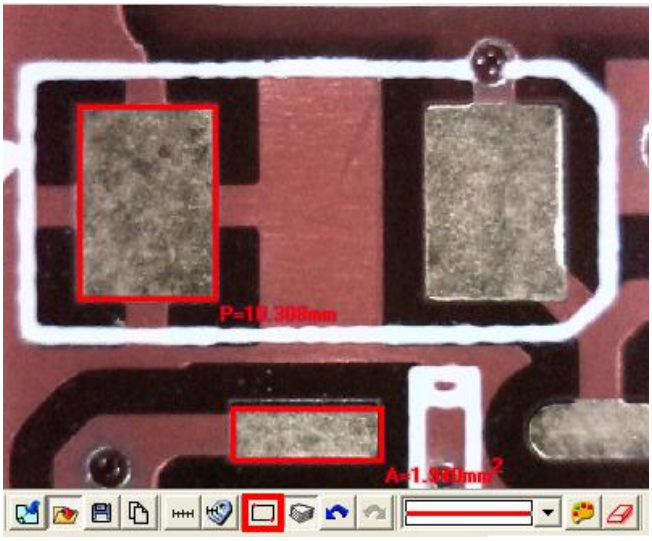


Fig.5-72 Rectangle

(7) 3 Points Angle: Measure the angle on the object and use. It can see an angle on the object, draw a line and stop at the corner of angle, and then draw the other line from the angle; the angle can be automatically calculated. See Fig.5-73, a dot shows the measured angle, it is 135.5 °.

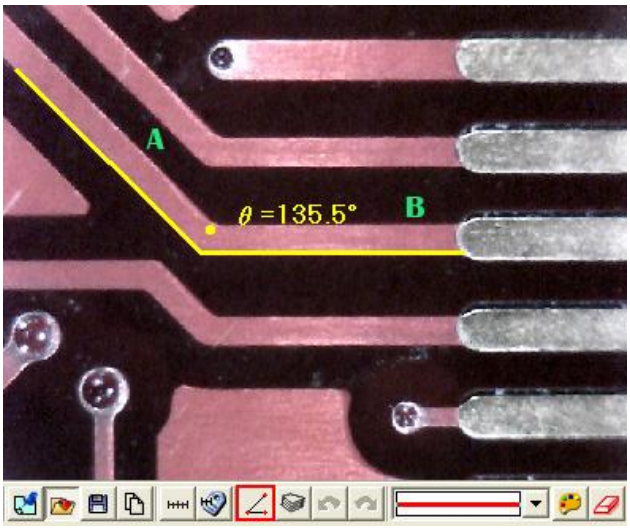



Fig.5-73 3 Points Angle

(8) 3 Points Chamfer: Measure charm and use. Draw first line on the angle (see line A) and press the left mouse button to drag a line on the other side of the angle (See line B) to calculate the chamfer. See Fig.5-74. There is a small dot inside the chamfer and shows 45.8° .

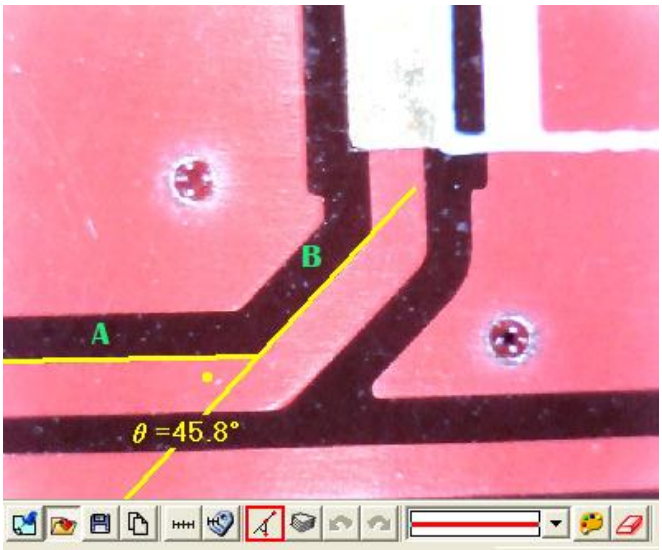



Fig.5-74 3 Points Chamfer

(9) 4 Points Angle: Use to measure an angle but only see 2 unparallel lines shown on the object. See Fig.5-74, to draw a 1st line from the object (see line A), and to draw the other unparallel line (see line B), the angle can be automatically calculated. See Fig.5-75. There is a small dot show 45.3° .

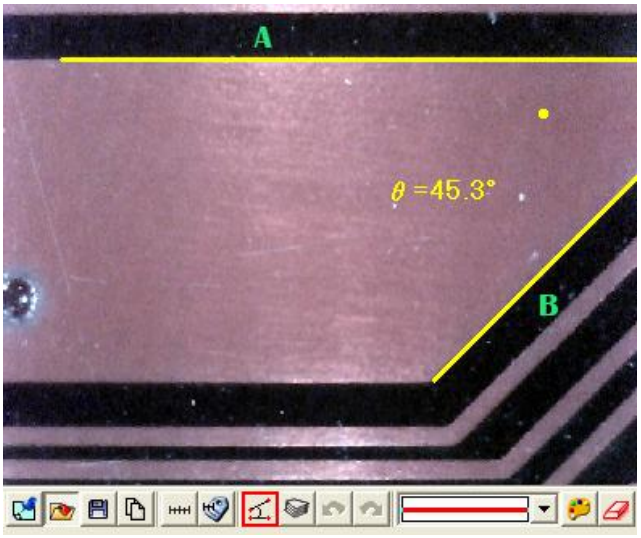



Fig.5-75 4 Points Chamfer

4.4.8 Draw overlap line "" 

While selecting this function, it can be drawn many times in the fame. After clicking "draw overlap line" undo or redo can be used show in Fig.5-76, if not selected it only can repeat drawings.

4.4.1 Fig.5-76 Overlap tool

4.4.2

4.4.9 Undo ""

Undo function that can go back to the movement.

4.4.10 Redo ""

Redo function can also go to the next movement.

4.4.11 Line styles

There are lines styles shown in Fig.5-77 and can choose different lines.

Fig.5-77 Line styles

4.4.12 Choose color “  ”

The tool can select colors to become different color. The line and background color can’t be similar.

4.4.13 Clear frame “  ”

Clear all things that are drawn on the fame. “Undo” and “Redo” record will be erasing.

4.5 Far distance control mode

This mode is to control the machine from AP directly without touching the machine. This function allows to do photograpy, video record, zooming in/out, brightness control…etc.

When connect AP with device, the default setting is operating microscope, thus all buttons appears white. (unclickable) See Fig 5-78 the default far distance control mode, Fig 5-79 far distance control mode toolbar.

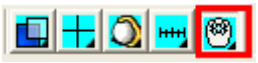


Fig 5-78 default far distance control mode

Fig 5-79 device control toolbar

4.5.1 Start using Far Distant Control "  "

Click the icon  , to start using far distance control function. When connect this control mode, it allows to operate the microscope without touching the device. Use this mode to do snapshot, focusing, zooming in/out or adjust LED brightness…etc.

Fig 5-80 far distance control mode toolbar

4.5.2 End up using Far Distance Control Mode "  "

Click the icon  , to end up using far distance control mode, to operate microscope device function manually.

4.5.3 2M Snapshot "  "

The 2M Snapshot means the photo resolution taken by this icon is only 2M Pixel. The taken photo will appear in the right sub-window, click save image to save photo.

4.5.4 Auto Focus "  "

There are three focus way. Users can select their preference focus way based on different observing situation and needs. Moreover, no matter which focus way has been selected, users need to choose Long shot  , Low mag  or High mag  again. For example, select Auto focus single and Low mag, the microscope will only search for clearest image in the range of low mag for one time, and can not zooming in/out manually.

(1) Single Autofocus  : This mode only focus one time when it finds clearest image. Even if the focus or object changes and image become blurred, it won't focus again.

(2) Continuous Autofocus  : This mode will continuous focusing until it finds the clearest image.

(3) Manual Focus  : This mode requires users to operate zoom in/out manually.

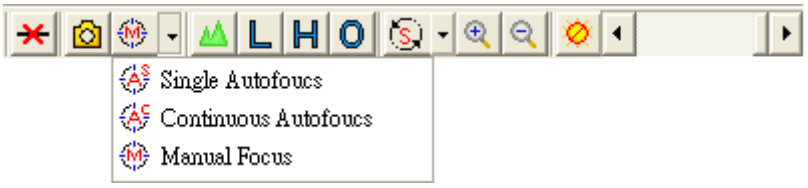



Fig 5-81 Three way of focusing

4.5.5 Long Shot "  "

When click  , it is for general webcam function. It will adjust the focus to find the clearest image when in long shot distance; if the image is not clear enough, slightly adjust the zoom in/out to find the clearest image. Please refer to 4.5.9, 4.5.10 and 4.5.11.

4.5.6 Low magnification "  "

When observing under Low mag, please flatly put microscope device onto the object. Then click  , it will search the focus range in low mag to find it's clearest image. If the image is not clear enough, slightly adjust the zoom in/out to find the clearest image. Please refer to 4.5.9, 4.5.10 and 4.5.11.

4.5.7 High magnification "  "

When observing under high mag, please flatly put microscope device on the object. Then click  , it will search the focus range in high mag to find it's clearest image. If the image is not clear enough, slightly adjust the zoom in/out to find the clearest image. Please refer to 4.5.9, 4.5.10 and 4.5.11

4.5.8 Return "  "

This action is to return the focus point back to the high mag, no matter where it is.

4.5.9 Moving Speed "  "

The moving speed is to control the focus moving speed. Please refer to Fig 5-82. There are 6 ways to control the speed, it is more easy to find the clear image step by step. The zoom in/out function can refer to 4.5.10 and 4.5.11.

(1) Slow Speed Zoom  : keep pressing zoom in/out button, it will slowly zoom in/out to find the clear image. The action stops while release pressing button.

(2) Middle Speed Zoom  : keep pressing zoom in/out button, it will find the clear image in middle speed. The action stops when release pressing button.

(3) Quick Speed Zoom  : keep pressing zoom in/out button, it will find the clear

image in quick speed. The action stops when release pressing button.

(4) One Step Zoom: Clicking the button to help adjusting focus per one step.

(5) Two Step Zoom: Clicking the button to help adjusting focus per two steps. Three Step Zoom: Clicking the button to help adjusting focus per three steps.

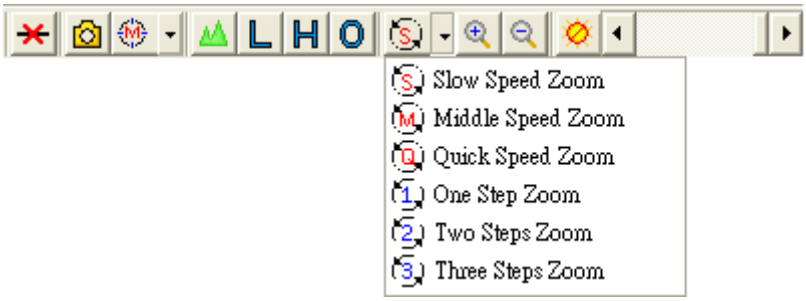



Fig 5-82 six type of Moving Speed

4.5.10 Zoom in "" 

To enlarge the image; which means the focus moves to high mag position. Please refer to 4.5.9.

4.5.11 Zoom out "" 

To shrink the image, which means the focus moves to low mag or long shot position. Please refer to 4.5.9.

4.5.12 Turn off LEDs "" 

When connect with far distance control mode, the default LED luminous is at the brightness level, to adjust the LED luminous, please use Scroll bar . Click "" to turn off all LEDs.

4.5.13 Turn on LEDs "" 

While turn off the LEDs, the scroll bar appears white, means can't adjust brightness. By turn on the LED "", the LED on device and scrollbar will be turn on again.