

Software Manual
for

**Ultrasound Bio-microscope (UBM)
Image Workstation**

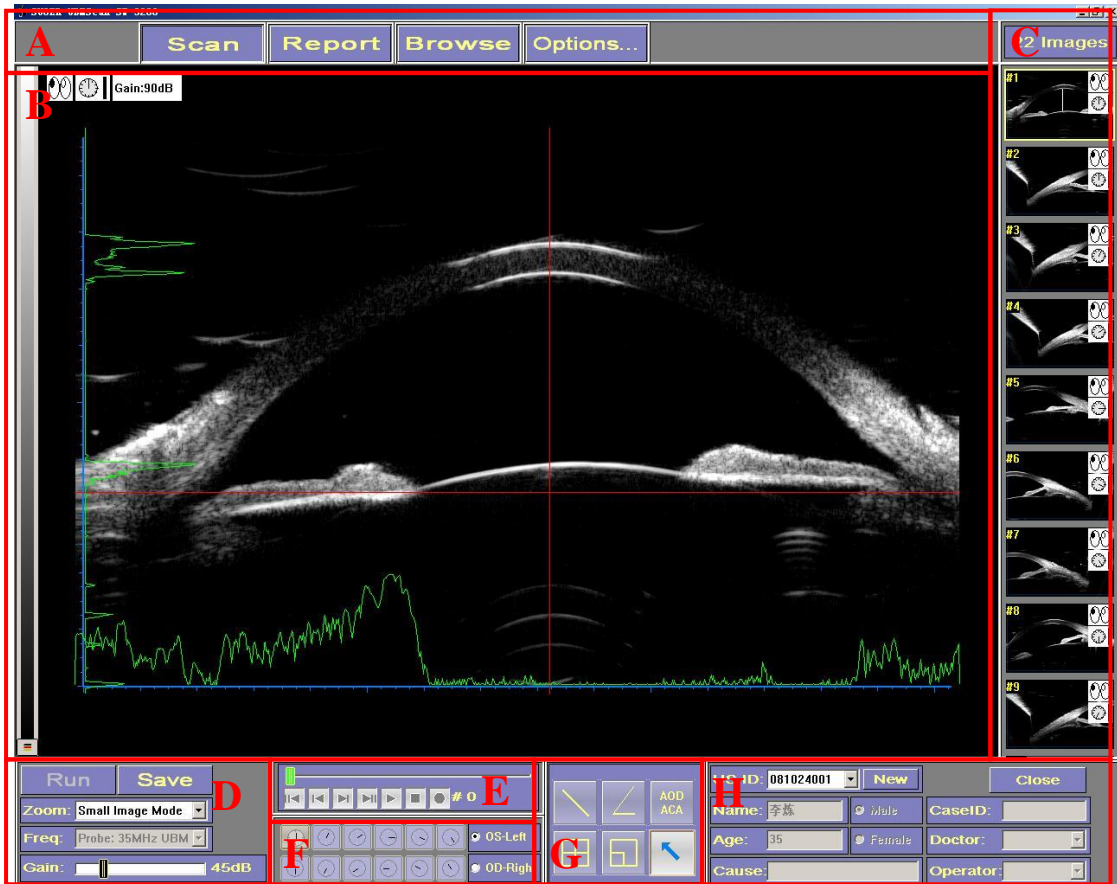
sUbmMate for Windows

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1. Introduction

Enter the software you will find the following window:



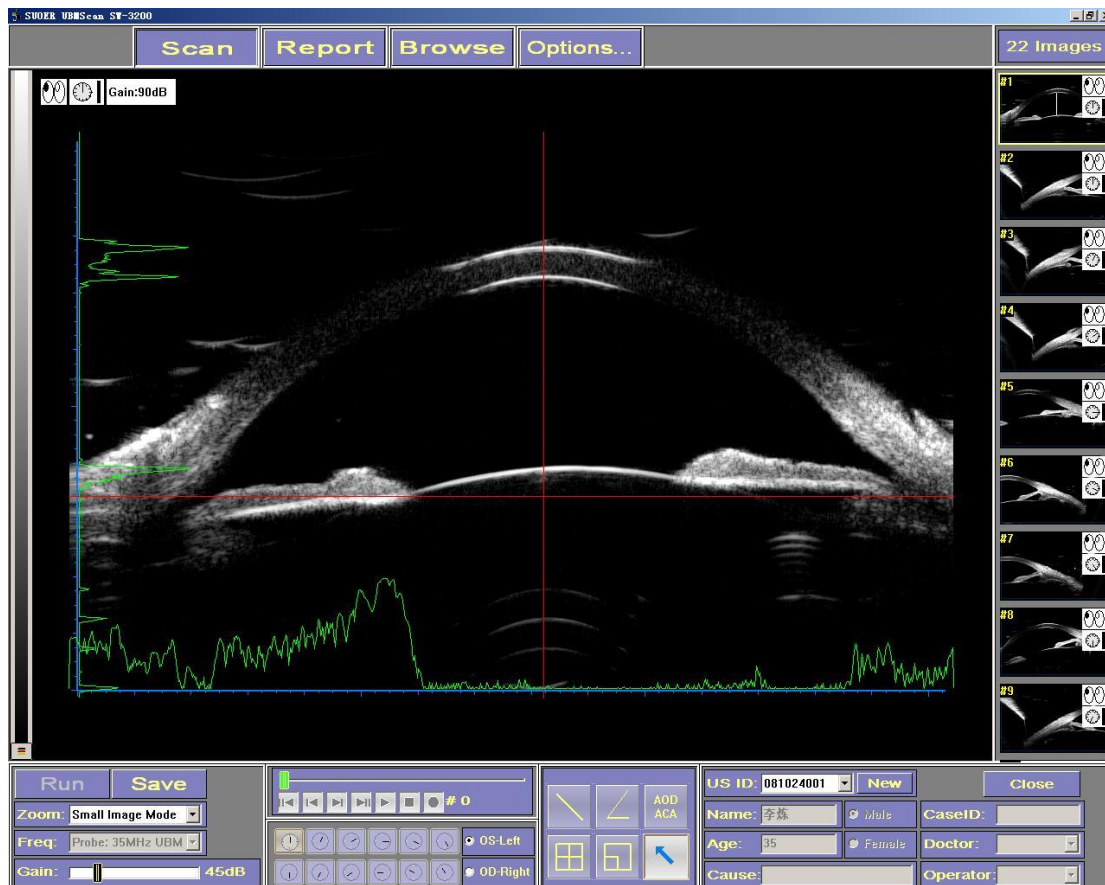
- A. Modules Area B. Image Area C. Sub-image Area D. Scanning Modules
E. Cine Loop F. Eye Position G. Measurement Modules H. Patient Data

The **Image Area** will appear in the middle of the interface. **Modules Area** is on the top of the interface, including **Scan**, **Report**, **Browse**, **Options** modules. The software will enter the corresponding window when select one module. The **Sub-Image Area** will list all the images captured. The **Scanning Modules** is used for managing the scanning. Use the **Cine loop** to play the dynamic scanning images got before the freezing. Use the **Eye**

Position to select the eye and the corresponding position. Use the **Measurement Modules** to do measurements for the captured images. Use the **Patient Data** to input the corresponding information of the patient, and the software possesses the **New** and **Store** functions.

2. Scan

The scanning window is as following:



2.1. Functions of the Scanning modules.

Run The software will automatically enter the scan interface. It means that the system has already been to exam when the icon

turned bright. Then one could click the icon or use the left pedal to start scanning. The icon will automatically change into **Freeze** icon after the scan beginning, then one could select the icon or the left pedal to freeze the image. **Capture** Select the icon or the right pedal to capture images during the scan or after the freezing. The captured images will list on the sub-image area. If select a captured image after the scan, it will be displayed in the center of interface (image area). Then the **Capture** will turn into **Save** icon, after doing some measurements on the image, select the icon could keep the measurements to the image.

Zoom There are two image modes: Big image mode and Small image mode. The frequency of probe will appear in the **Freq**, the scanning range for Big image mode theoretically is $10 \times 6.3\text{mm}$, and for Small image mode theoretically is $15.6 \times 10\text{mm}$.

Gain Use the icon to adjust the gain, the value will appear on the left of the icon.

2.2. The Cine Loop


It is made up of a loop and seven buttons.



The functions of seven buttons in turn are: To display the first image; to display the last image; to display the next image; to

display the end image; to play film; to stop; to video.

If select the icon of Video, the following indication will come out:

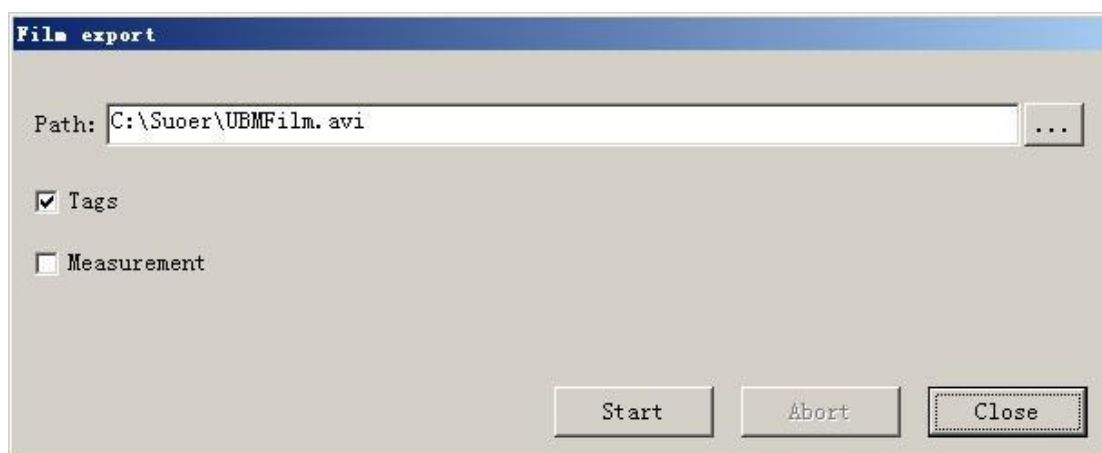
Path: to export. One could input or select  to choose path.

Tags: if to keep the eye position and gain on the image when selecting the video.

Measurement: if to keep the measurements on the image when selecting the video.

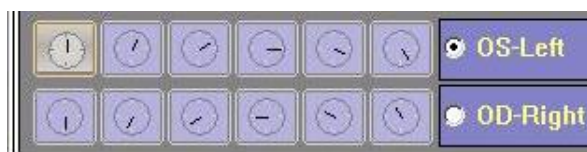
Start: to begin to make video.

Close



The software at most could save 100 images between the last and this freezing. The Scanning time for the images is about 20 seconds.

2. 3. The Eye Position

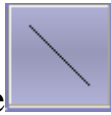


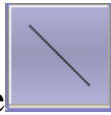
Before or during the scan, the operator could select the eye and the position; the setup will influence the corresponding scanning and

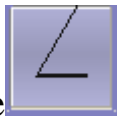
images.

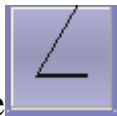
2. 4. Measurement

Use the measurement icons to do some measurements when freezing the images.




Use  icon to test the length, click the icon and select a position on the image with the left mouse button as the starting point, then release the button and move the cursor to the position you want, click the position to select the ending point, then the measurement will be finished and the result will appear near the middle of the line.



Use  icon to test angle, click the icon and select a position on the image with mouse as the vertex, release the button and move the cursor to the position you want, click the left mouse button to set a side of the angle, then release the mouse button and move to another direction to set the other side, then the measurement will be finished and the result will appear near the vertex, the result will never more than 180° .




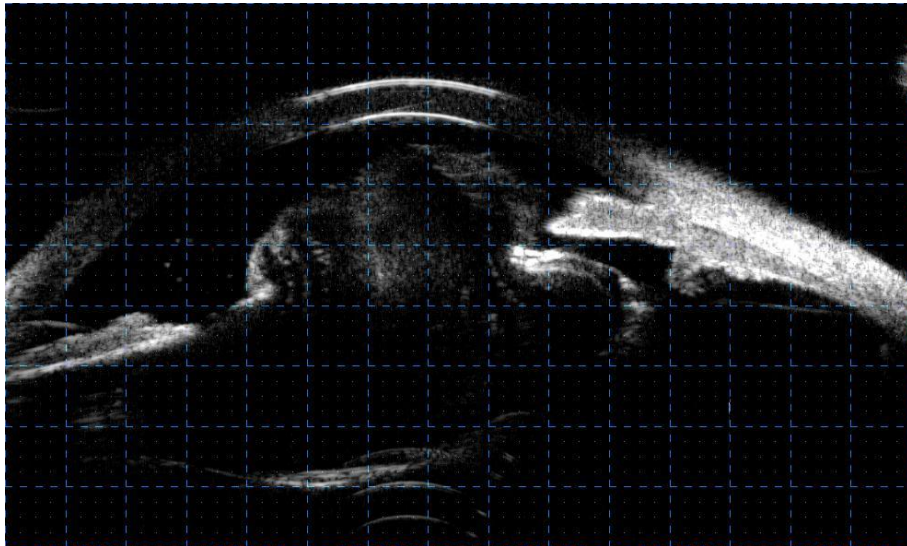
Use  to test the anterior chamber angle (ACA) and angle open distance(AOD).


Theory: Centering on the vertex of sclera spur and make a circle with the radius of 500 micron, and cross the sclera at a point, make the perpendicular line from the point to iris and meet the iris at one

point, then the angle made by the vertex of anterior chamber angle and the two points could be the ACA, and the distance between the two points become the AOD.


Method: Choose the vertex of sclera spur as the first point, then a default 500 micron-line will come out, choose the intersection point on the sclera as the second point, then the perpendicular line of the line will appear, choose the intersection point on the iris as the third point, and choose the vertex of the anterior chamber angle as the fourth point. Then the ACA and the AOD will come out.

Use  to evaluate the size of image when closed the software, refer to the following picture, the least distance between the two point in one grid is 0.25mm, the size of grid is 1mm* 1mm.



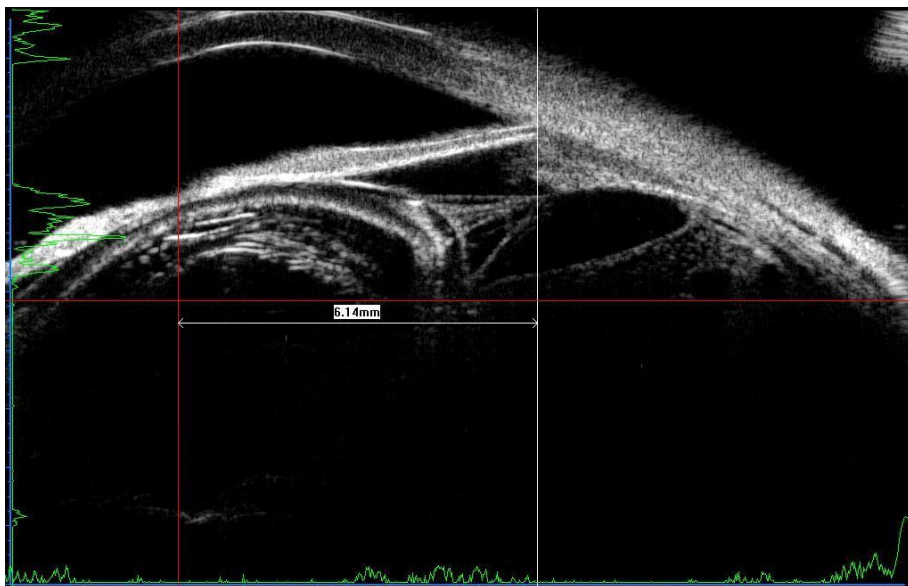
Use  to magnify the part of image.



Use  icon to revise or delete measurement. Click the icon and select a measurement that have been finished, the cursor will turn into a shape of hand, then select the measurement and click the endpoint to adjust it, when the cursor turns into the shape of hand, choosing the measurement and clicking the right mouse button could delete it.

2.5. Image Area

It is in the middle of the window. If **U+A MODE enabled** is selected in the **Options**, the A scan-indication lines (Red) and the corresponding waveform (Green) will appear, one could adjust the position of the indication lines with the left button of mouse, and make parallels of the indication lines with the right button of mouse, and display the distance to the indication line.

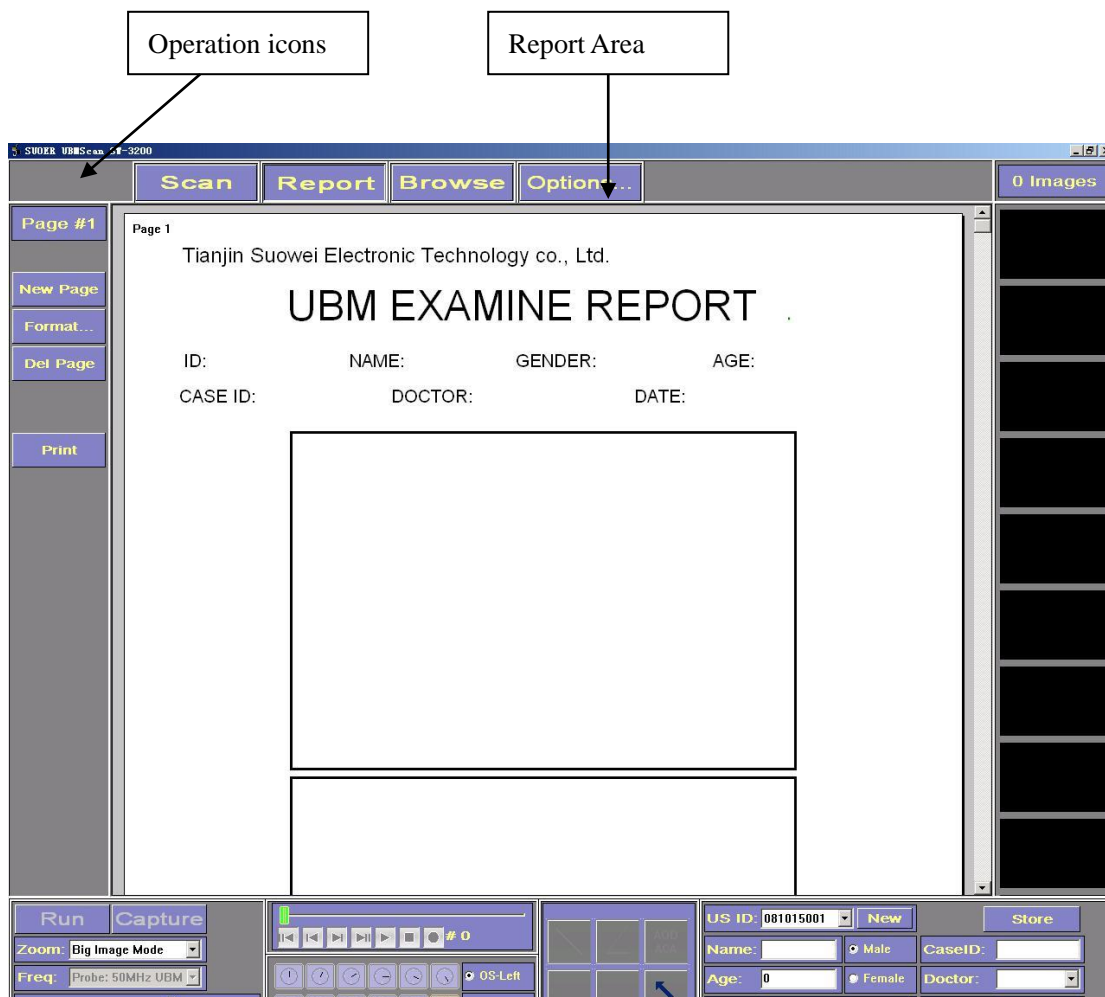


In the Scan window, the image displayed in the image area is captured during the scanning; In the Browse window, the image

displayed in the image area is selected image. The left of the image area is false-color area, click the icon at the bottom of the area to select the false colors, there are 12 false colors in total. During the scanning, a scroll bar will appear in the false-color area, hold the scroll bar to adjust the focus of probe in the image.

3. Report

Select **Report** icon to enter the Report window after capturing images.

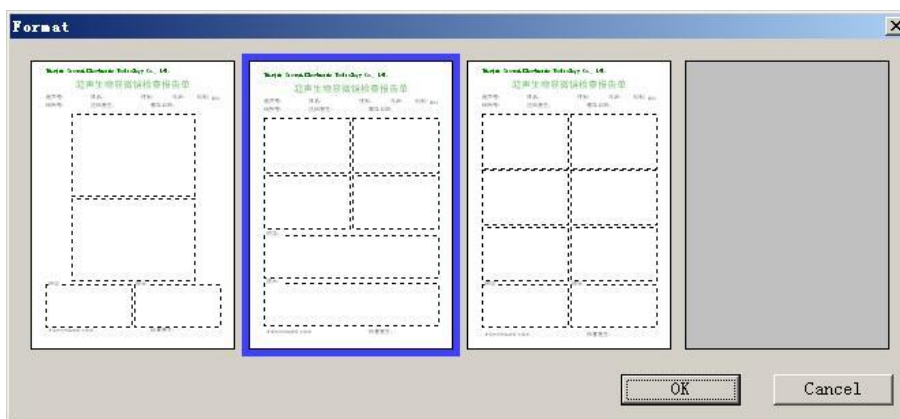


Enter the window, the **Operation icons** will appear on the left of

the interface, in the middle is the main window (**Report area**), adjust the scroll bar on the right of the area or turn the scroll of mouse to look up the report.

3.1. Operation Icons

Select **Page #1** to display the corresponding page of the report on the interface. Select **New Page** to create new page of the report; Select **Del Page** to delete the page; Select **Print** to print report; Select **Format** to choose the format of the report, there are 3 default formats in total:



3.2. Data Input

The data displayed in the report area is in accordance with the data in the patient's data area. To revise the data in the report area just need to revise the data in the Patient's data area.

For example, select **Name** to input patient's name, then click **Tab** on the keyboard or click the left mouse button on the other place could revise the name in the corresponding report. The ways of other

items revision is the same method with the above mentioned.

One can select data from the drop-down list or input oneself for the items of **Doctor** and **Operator**. The input information that didn't exist in the drop-down list before will automatically appear in it for operator use.

3.3. Build the New Case and Store

After finishing the examination, click the **Store** icon to store the case to the database for future browse.

Note: Both in scanning window and report window could store the case. If hope to check the image in the report when browse the case, you are suggested to finish the report first and then store the case.

Select **New** icon to conduct the new examines. The new ID number will automatically appear in the **US ID** icon, the drop-down list will appear all the cases that create on the day but haven't been stored to the database, and the cases download from the database.

Use **US ID** drop-down list to switch the case, if the case is downloaded from the database the **Store** icon will automatically turn into the **Close** to turn off the case and delete the case from the drop-down list. If the case is created on the day, click the **Store** icon to store the case to the database and delete it from the drop-down list.

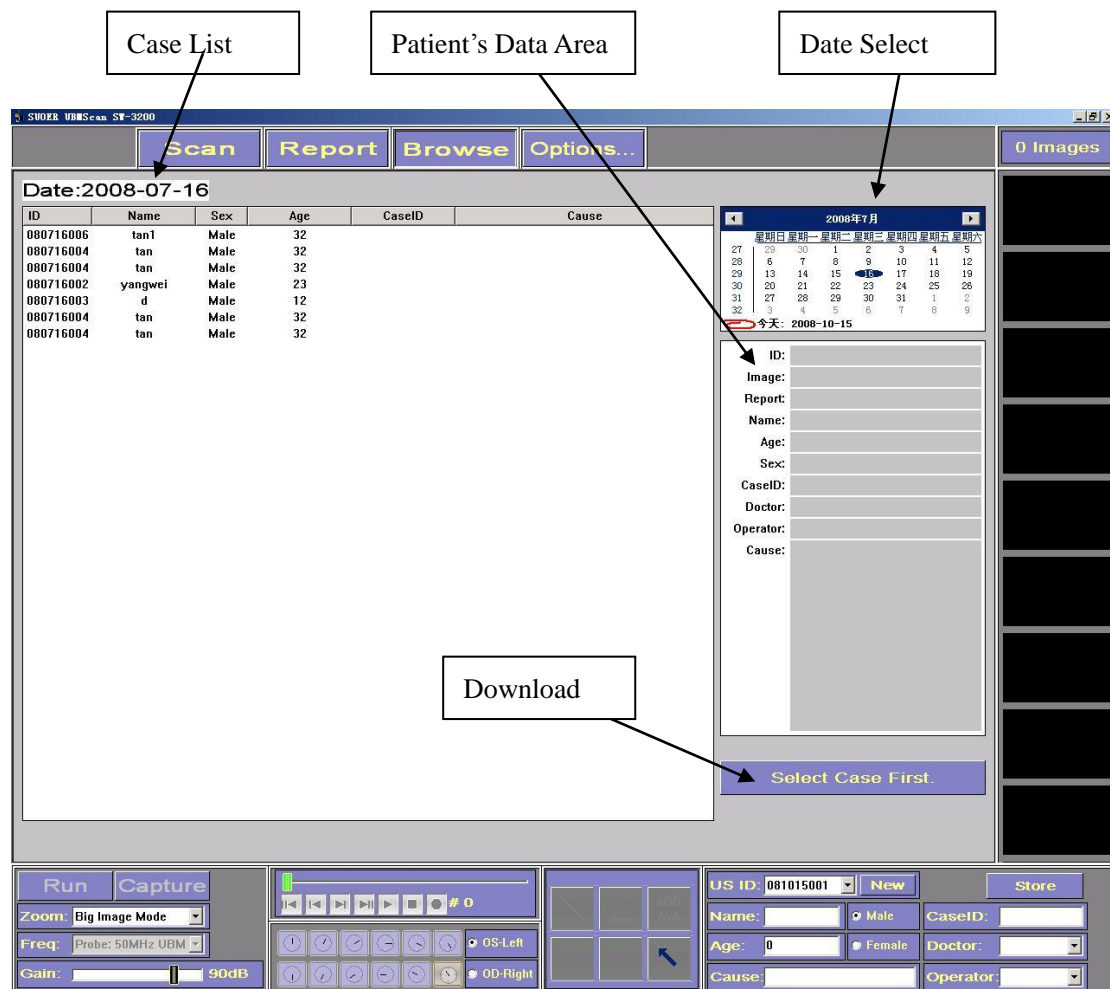
3.4. Image Select

The method to select the images from sub-image area to the Report Area is:

Click the left mouse button on the image position of the report area, the frame will turn into light blue and become bright, then select a image from the sub-image area, the image will be added to the report.

4. Browse Result

Select **Browse** icon to enter the Browse interface.



Use **Date Select** module to select date, the corresponding cases made on the date will list on the **Case List**, if select a case, the corresponding data will automatically appear in the **Patient's Data Area**, and the corresponding images will appear in the sub-image area.

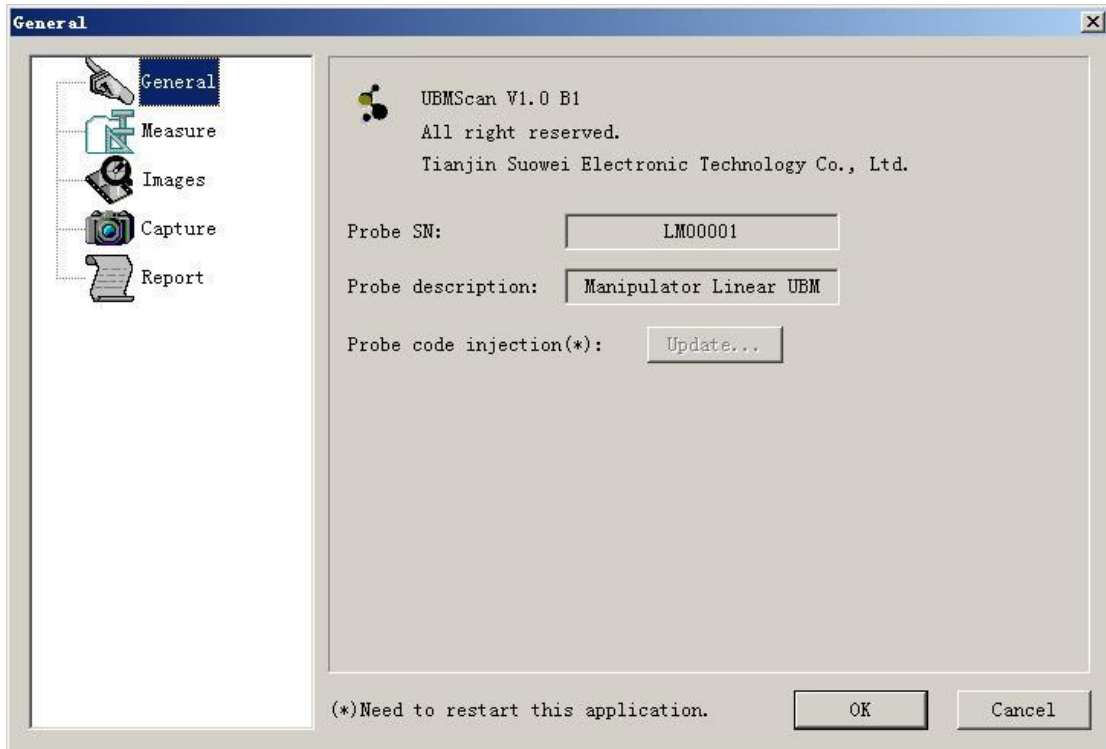
Use **Download** icon to download the case and to review the report and revise the measurement of the image, select a case and click the **Download** icon, the corresponding data will automatically appear in the **Patient's Data Area**, and the window will automatically switch to the Report interface, the corresponding case will appear in the report interface. The downloaded case could be browsed, the images could be measured, and the report could be printed. But the change could not be stored.

5. Options

Select the **Options** to set up the software. It is included **General, Measure, Image, Capture, and Report.**

5.1 General

The interface displays some items of the software, and no items to set up.

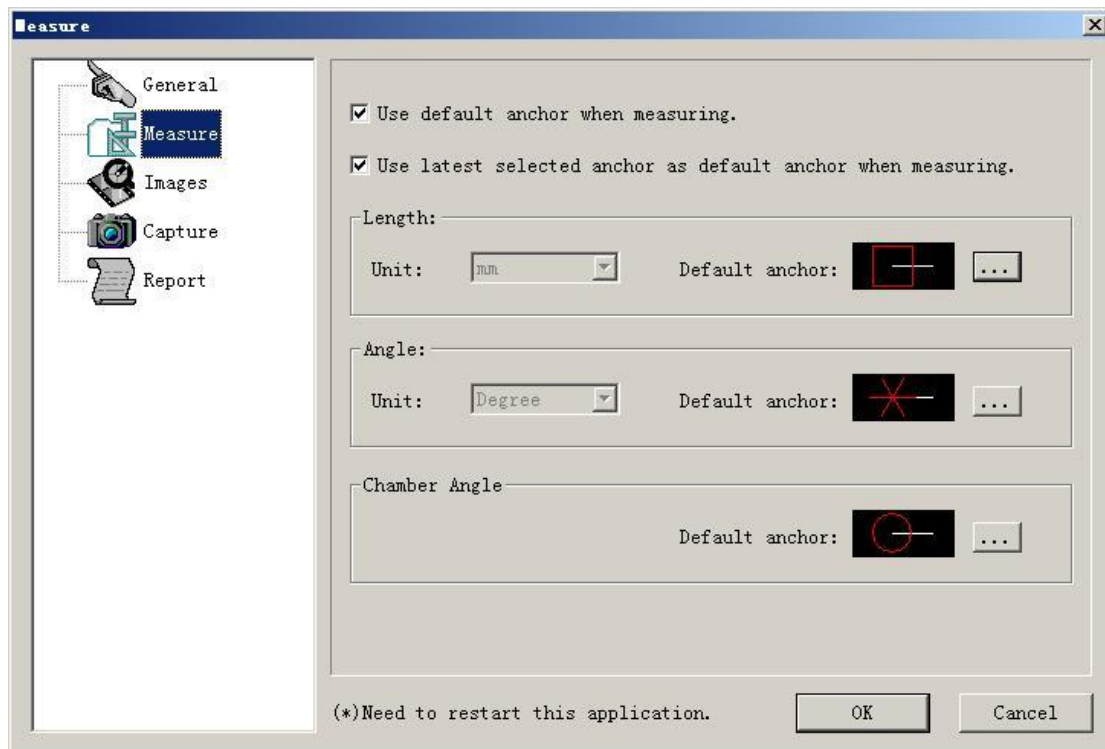


5.2. Measure

In the interface user could to set up the measurements.

Use default anchor when measuring: if this is selected, the **Default anchor** when measuring the image will be the anchor.

Use latest selected anchor as default anchor when measuring:
If select the item, then the anchor changed in the measuring will be stored into **Default anchor**.



5.3 Image

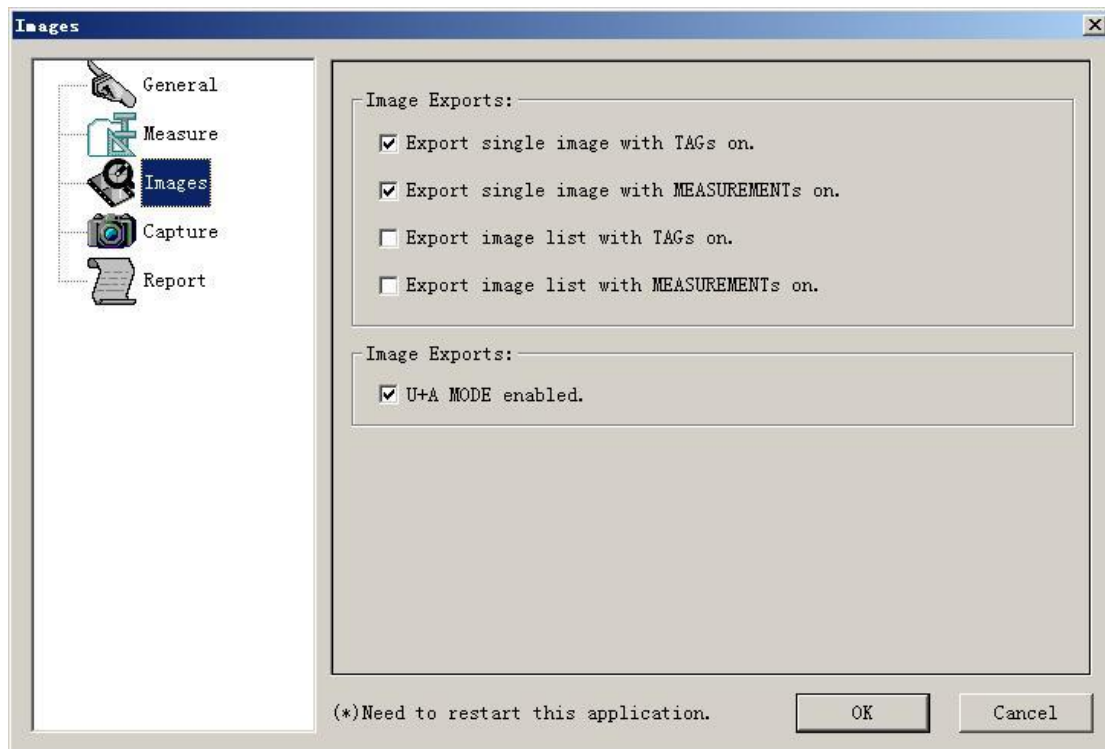
In the interface user could to set up the display and the export of image.

Choose **U+A MODE enabled**, the A scan indication-line (red) will appear in the scanning window, meanwhile the corresponding waveform (green) will appear on the left and the underneath of the image.

Note:

TAGs: includes gain, eye position, etc.

MEASUREMENT: measurement results.



5.4 Capture

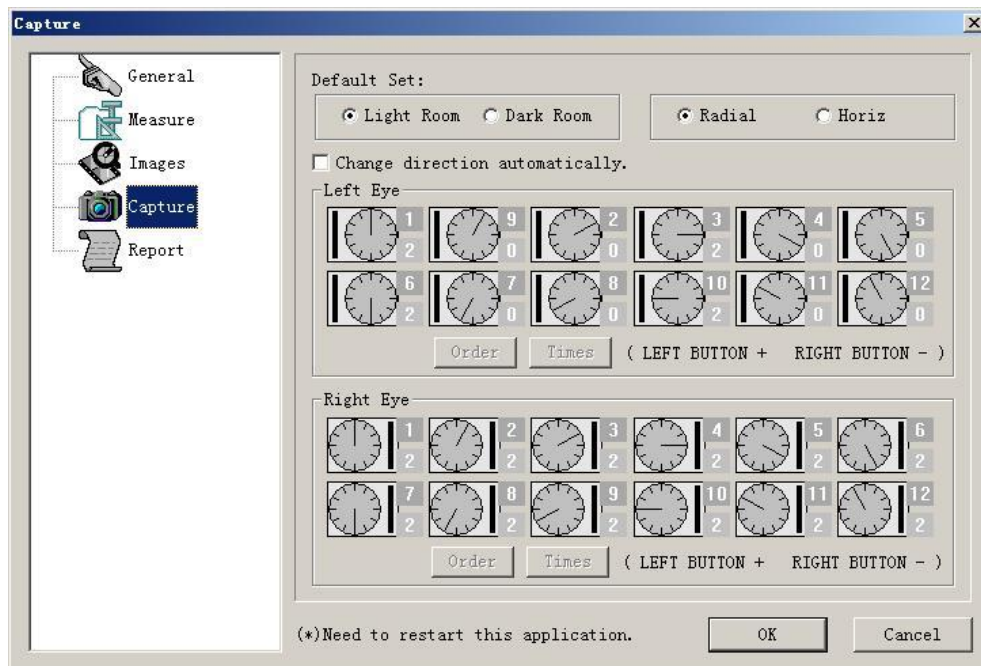
In the interface user could to set up the examining surrounding (light/ dark room), scanning (radial, horiz), the order of eye position, etc.

Choose **Change direction automatically** will enter the mode of automatically switch-eye position.



Each eye-position has two numbers. The number in blue represents the order of eye position; and the green one means the quantity of the captured images on the position before automatically switching to the next position. If to revise, select **Order** or **Times** icon, and then select the position to revise it with the left and right buttons of mouse (select left button to increase and right button to

decrease).

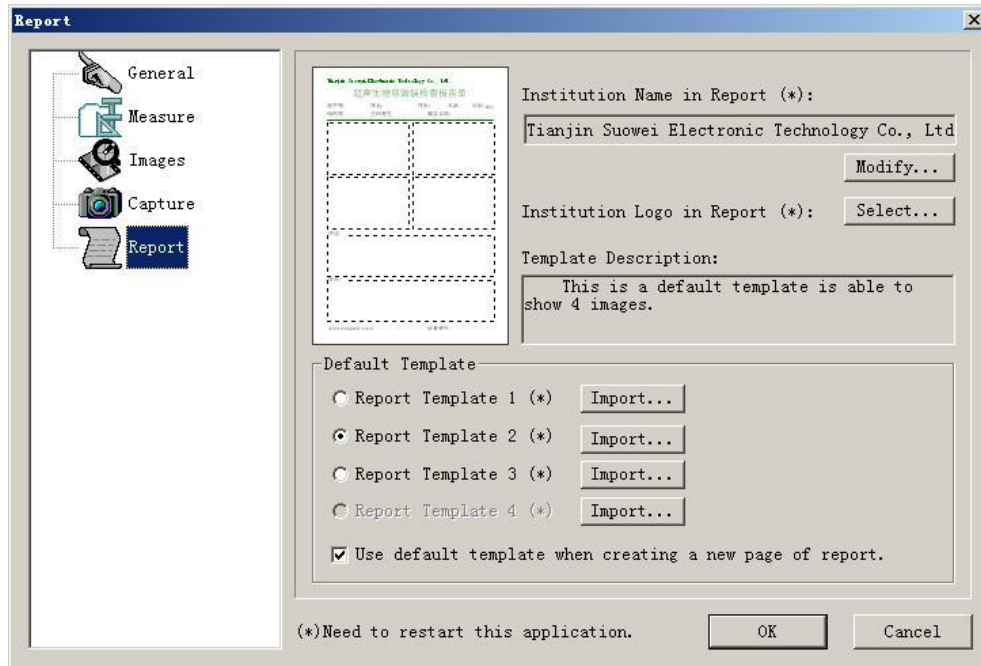


5.5 Report

In the interface user could to set up the report.

Modify: use the icon to revise the institution name of the report.

Default Template: the selected template will be the default template.



Note: the setup of Items marked by “(*)” will only tack effect after restarting the software.

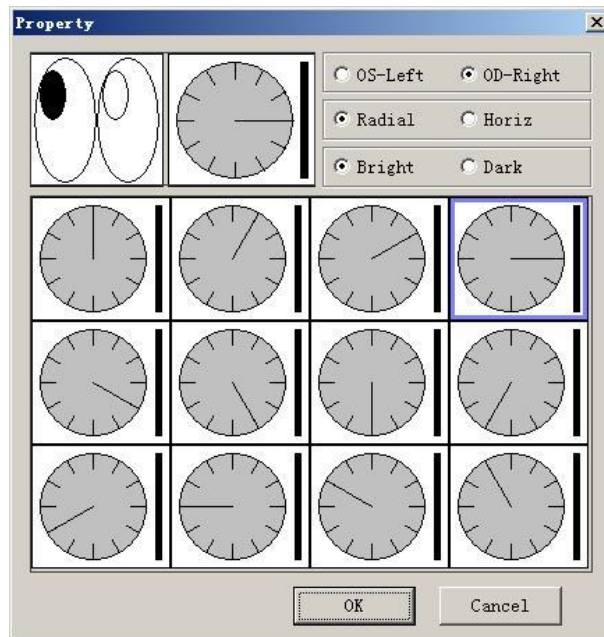
6. Sub-image Area

Use **Sub-image Area** to list the images captured from the scanning or downloaded from the case. The textbox on top of the area displays the total number of the images, each image has a serial number, turn the scroll of the mouse to check the image list, select image with left mouse button, and the frame will turn into blue, then click the right mouse button will appear a menu with some indications:

Export: to export the single image.

Export all: to export all the images.

Property: in the item one could change the eye and the position.



Reform to film: send all the images of the image list to the cine loop, and play the film in the cine loop.

Image viewer: use to switch to the Windows browser.

Delete

The image list at most could display 50 images.