CE

Fundus camera

SK 650A

Operation Instruction Manual

Chongqing Sunkingdom Medical Instrument Co., Ltd.

Version: EM-FCA-180611

THANKS

Thank you for choosing the fundus camera produced by our company. For you to be able to use the instrument reasonably, Please read the manual carefully before you use it.

NOTE

The power supply voltage of the equipment must meet the required voltage. If the voltage is unstable, please set the voltage regulator. Because the voltage cause equipment problems, it is not within the scope of free maintenance company.

To avoid damage to the equipment from the environment (wet, dust, liquid, direct exposure to sunlight, etc.), place it in a dry place. Please do not spill liquid or other debris into the equipment, otherwise it may cause the device internal components of the short circuit and then cause electric shock or fire.

Without the permission of the company, cannot open the equipment shell, or company is not responsible for all adverse consequences.

The instrument can only be installed in the darkroom, only operated by those who are trained by the company's engineers for use.

The instrument contact with the patient parts of the jaw with a one-time use of medical cheek paper. (See 6.4.1)

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Chapter 1 Summary

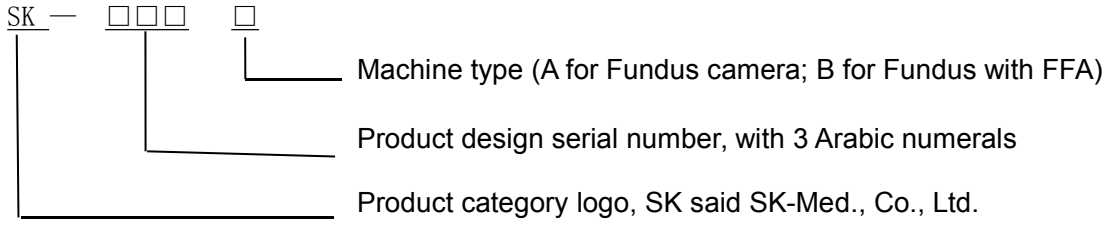
1.1Summary

1.1.1 Introduction

The device uses advanced optical electromechanical integration technology, integrated digital fundus fluorescence camera and fundus digital image acquisition and image processing system.can get Continuous, high-quality display of color fundus images. The digital image acquisition and image processing system will record the fundus color image in full digital, real-time compelrtely. Stored in the computer, and could do for image processing, inspection reports, graphic editing and production of medical records retrieval management at any time. The size of the lesion can be measured, calculated. the image can be any zoom, move, paste, stitching, but also effect on the image color adjustment. the case image data can be completely storaged with patient information. It can assist in scientific research and teaching. System compatible with a variety of fundus image acquisition equipment to support the medical network function, in line with medical imaging digital, network trends.

1.1.2 model description.

System model mark



Marking example: SK-550A means that Chongqing Sunkingdom Medical Instrument Co., Ltd. produces 550A fundus camera.

1.1.3 Differences from other models.

System model	Fundus camera host and software	System input power	Host input power
SK-650A	SLR camera optical body, sports platform, electronic control part,	500 VA	200VA

	image analysis software (without fundus angiography function)		
SK-650B	SLR camera optical body, sports platform, electronic control part, image analysis software (with fundus angiography function)	500 VA	200VA

1.2 Registration documents

Product Name: Fundus Camera

Production Company Name: Chongqing Sunkingdom Medical Instrument Co., Ltd

The production address of this product: 35-2-3 YingTianGuangDianGongGu, CaiJiaGang Industry Zone, BeiBei District, ChongQing 400070,China

Registered address of this product: 35-2-3 YingTianGuangDianGongGu, CaiJiaGang Industry Zone, BeiBei District, ChongQing 400070,China

This product production license number: Yu food and drug administration production license 20110050 (more)

This product registration number: Yu food and drug administration (quasi) word 2014 No. 2220026

This product standard number: YZ / B Yu 0025-2014

Service Name: Chongqing Sunkingdom Medical Instrument Co., Ltd

After-sales service Address: 35-2-3 YingTianGuangDianGongGu, CaiJiaGang Industry Zone, BeiBei District, ChongQing 400070,China

After-sales service Tel: 023-68102793

This device conforms to following standards: IEC60601-1: 2005 Medical Electrical Equipment-Part 1: General requirement for safety;IEC60601-1-2 Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance – Collateral standard: Electromagnetic compatibility - Requirements and tests, Edition 3:2007

1.3 Applicable scope

Suitable for retinal examination and applicable to the diagnosis of optic nerve, macula, blood vessels and other tissue lesions.

1.4 Product contraindications

[Contraindications] No

【Note】 This instrument is only used by trained ophthalmic clinicians. Do not use this instrument in the inflammable, hot and dusty environment and pay attention to keep it clean and dry; To avoid being damaged by the environment (Damp, Dusty, Liquid, under the sun and so on). Do not let the liquid or any other small objects run into the instrument, otherwise these objects may make the inner parts of the instrument short-circuit, and even make the users get an electric shock or even cause a fire hazard.

1.5 System configuration

1.5.1 Hardware

- Medical electrical device：

a) optical body

b) color image collector -DSLR

c) operation platform

d) Chin-rest

e) Joystick components

- Non-Medical electrical device

Computer (main computer, monitor, keyboard, mouse), printer and removable multi-socket.

- Medical electrical system which consists of medical electrical device and non-medical electrical device can be connected by a removable multi-socket.
- Medical electrical device is used in the patient environment; non-medical electrical device is used outside the patient environment.

1.5.2 Software composition

- Patient information registration module;
- Image processing module;

- File management module
- Printout module.

1.5.3 Computer and operating system minimum configuration requirements

- CPU: Intel Celeron 2.0G or higher;
- Memory: 2 G or more;
- Hard disk: 300 g or more;
- Display: 15 "above;
- Screen Resolution：1440*900

1.6. Technical parameter.

1.6.1 basic parameter

- **Working distance: 40mm ± 2mm**
- **Field Tolerance：Angle of view is 45°，Tolerance：±7%**
- **Min. pupil size for photography: pupil size ⩾ 3.3mm]**
- **Fixation target: external eye fixation lamp & 9 internal fixation target (LED dot matrix)**
- **Focus: Split-line aligning + alignment by two dots position**
- **Automatic recognition of the left and right eye position: automatically identify the position of eye on the image.**
- **Pedestal moving range:**
  Forward and backward: 60mm±5mm
  Left and right: 102mm±5mm
  Up and down: 30mm±3mm
- **Optical requirements:**

Standard Project		Performance	
Resolution	Angle of view≤30°	The center of the visual field.	≥80 lp/mm
		The central field of view.（r/2）	≥60 lp/mm
		At the edge of the field of view（r）	≥40 lp/mm
	Angle of view ＞ 30°	The center of the visual field.	≥60 lp/mm
		The central field of view（r/2）	≥40 lp/mm

		At the edge of the field of view（r）	≥25 lp/mm
Patient’s diopter compensation		Not less than：-15D～+15D	
CCT of camera flash		4500K≤Tc≤6700K	

1.6.2 Resolution

Standard items	Requirements	
Field of view>30°	Center of the field of view	Resolution≥60lp/mm
	Field of view（r/2）	Resolution≥40lp/mm
	The edge of the field of view（r）	Resolution≥25lp/mm

*field of view tolerance: field angle of 53 °, error: ± 7%;

*patients with refractive compensation range of focus: not less than -25D ~ +30 D;

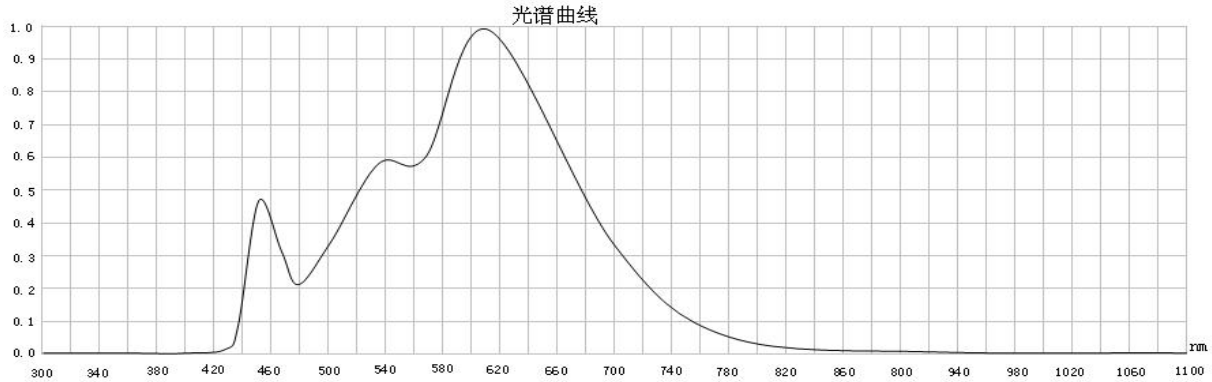
*observe the color rendering index of illumination light: Ra ≥85%;

*The relative color temperature of the camera flash: 4500 K ≤ Tc ≤ 6700 K;

*The flash indicator is adjustable from 1-100 brightness step by step;

*white light from 1-10 brightness step by step adjustable.

*When the equipment is in the maximum light intensity and the maximum hole state, the relative spectral spectrum between 305 nm and 1100 nm is shown in the following figure.



1.7 Working environment

*Environmental conditions: temperature: 5 ℃ ~ 40 ℃; relative humidity: not more than 80%; atmospheric pressure: 760 hPa ~ 1060 hPa.

*Power supply conditions: Voltage: a.c.220 V; Frequency: 50 Hz.

*Environment clean, no vibration, no strong electromagnetic interference.

1.8 Transport and storage

The instrument should pay attention to moisture transport, anti-upside down, to avoid severe vibration.

Should be stored in the temperature of -5 ℃ ~ 45 ℃, relative humidity of not more than 90%, atmospheric pressure: 760 hPa ~ 1060 hPa, ventilated, dry, non-corrosive gas clean room.

Installed equipment for short distance handling, moving, should be removed between the instruments of the connection line, placed on the cart or carried by two people. If the instrument needs long distance handling, it should be reloaded into the original packaging and then carried.

1.9 Product characteristics

◆ *anti-shock type: Type Ⅰ;

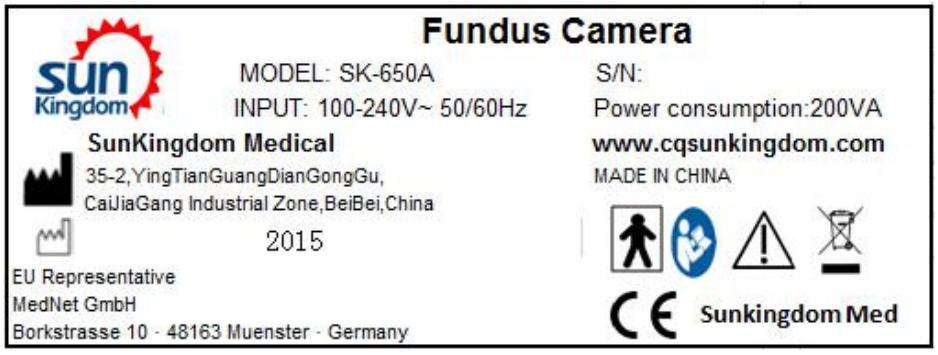
*degree of anti-shock: BF application part;

*operation mode: intermittent loading continuous operation;

*Rated voltage and frequency of the device: a.c.220 V / 50 Hz;

*Equipment input power: see Graph 1;

1.10 Label information



About <Operation Instruction> of this Instrument

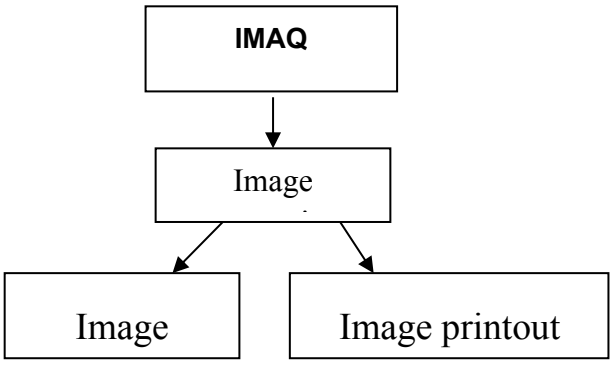
◆ The copyright of the operation instruction belongs to Chongqing SunKingdom;

- ◆ The pictures in the operation instruction is only for reference, please make the object as the standard. Contents are subject to change without prior notice.
- ◆ SunKingdom has the right of interpreting and revising this operation instruction.

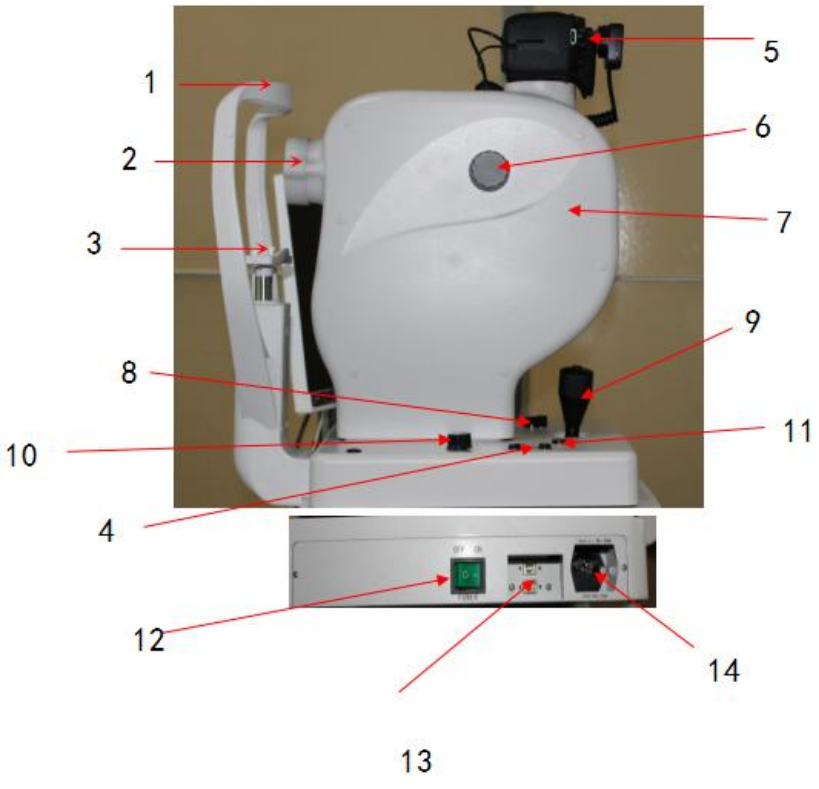
If you can not understand some of the content or clause, or if you meet technical problems when using it, please do not hesitate to contact us, our telephone number: +86 23 68643990;

Chapter 2 Installation Instructions for the Instrument

2.1 Equipment structure diagram



2.2 Instrument composition



1. Headrest
2. Objective lens cylinder: please cover the objective lens once the operation is completed.
3. Chin rest: to aid in the positioning of the patient's chin on the instrument
4. Button for controlling the chin rest up- down
5. The color image collector: DSLR
6. Focusing knob: adjust the sharpness of the image
7. Optical element body
8. Platform locking knob: it can lock the platform, so the platform cannot be moved
9. The platform mobile handle: move the platform around and take pictures.
10. Flash intensity control
11. Transfer Switch: Push this button for anterior-posterior para-position transferring
12.Power switch
13. USB socket
14. Power input socket

2.3 Instrument packaging and accessories description

The instrument container, using special carton packaging. there are special foam molding to protect the instrument .please noted gently, carrying box and can not be inverted when transporting the instrument, the instrument should be stored in a dry and clean environment.

2.4 Sort and count the inventory

All parts must be carefully took out from the shipping cartons, then sort and count the accessories according to the packing list. Make sure there is no shipping damage and the accessories are correct before the installation of equipment.

2.5 The meaning of doing fundus examination

Fundus examination is to check whether the fundus has lesion by visually check the fundus color image. The most important meaning of fundus examination is detected fundus (retina, choroid, optic nerve head) whether there is disease, such as: retinal detachment, macular degeneration, glaucoma, optic neuritis, choroidal tumors.

Many systemic diseases such as hypertension, arteriosclerosis, diabetes, various parts of the body will produce changes in small blood vessels. Because the small blood vessels in the body, only in the retina can be seen directly, so by fundus examination, can detect whether these diseases have produced vascular lesions. And to test results and treatment judged as a reference for the course.

Chapter 3 installation steps

3.1 Camera Body Installation

3.1.1 Environmental Requirements

1) Use the device in a darkroom

2) Working Environment: Environment temperature：5℃～40℃； Power: a.c.220V , 50Hz ;Relative humidity:≤85%； Atmospheric pressure: 700 hPa～1060 hPa。

3) The operation mode：Intermittent load continuous operation；

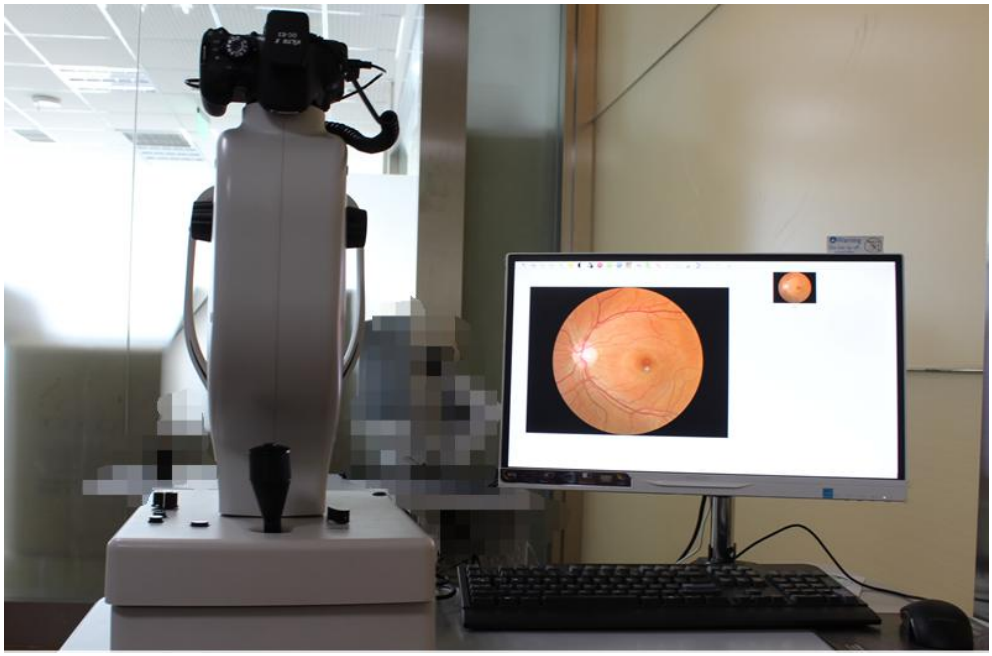
4) Type of protection against electric shock：Class Ⅰ

5) Degree of protection against electric shock：BF

6) The instrument should be installed on level ground

3.1.2 Installation of hardware

SK-650A is the all in one model fundus camera, you will not need to do installation for optical body, but just start from Installing the Chin-rest and connecting the wires and install the cable cover box (as shown below)



3.1.3 Instrument and computer connection

After the instrument has been installed, insert the USB cable connected to the computer with the USB port of the host computer.

3.1.4 Protective grounding

The source socket should be a standard three-pin power outlet, and its protective earthing point should be connected to the power supply system protection ground. If the power supply socket is unprotected or not connected to the power supply system, it must be "protected earth" (Note: the laying of the ground wire should be carried out according to the relevant standards or under the guidance of experienced electricians).

3.2 Software installation

3.2.1 Software installation

Brief:

This document describes a brief description of the installation of "fundus photography software".

applicability:

Fundamental software according to pre-configured parameters are divided into: spherical 40 degrees, 45 degrees spherical, aspheric 45 degrees.

The installation process can refer to this document.

Hardware and software requirements

Hardware Requirements

Before you install software, make sure your computer meets the following minimum requirements:

*CPU

Processor：≥1.7Ghz

multicore：Dual core，4 threaded.

* Memory minimum：≥2GB

* Hard disk

Rotational Speed：≥7200 RPM (Solid-state drives without this parameter）

Caching：≥2MB

Space：≥500GB

* Graphics card

Supporting 1440 * 900 resolution or greater，HIDM and VGA output port

System Requirements

- Windows System Requirement:

English/ Simplified Chinese Version Windows 7 32bit/ 64bit Professional

English/ Simplified Chinese Version Windows 7 32bit/ 64bit Ultimate

English/ Simplified Chinese Version Windows 10 32bit/64bit Professional

PS: Sunkingdom slit lamp software only support English/ Simplified Chinese Version Windows system, if user running others language Windows system, there will be unreadable code showed during install procedure and on software. Please use relevant system we

recommended.

Installation process:

The following is the installation program referred to as Setup program.

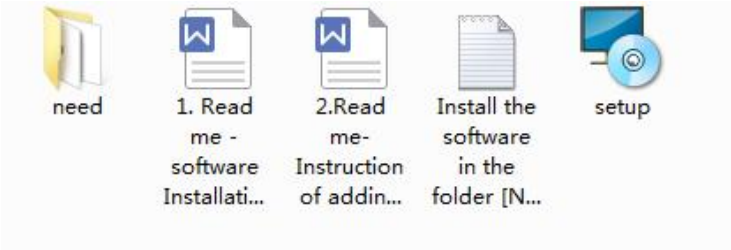
1. Install the media

The software installation media is a CD-ROM containing the Setup program for the corresponding device. You can copy the Setup program to a computer's hard drive or run it on a disc.

2. Run the installation - information collection

Run the Setup program, will get the following interface

- Open the software disk we attached, double click on the icon as below, start installing procedure:

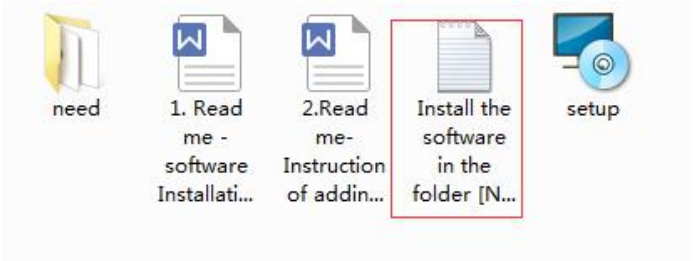


- Click on [Next] all the time, till the installation finished. A software shortcut icon will generated on desktop.

Note: If your computer have ever installed an previous version software of slit lamp or fundus camera, please unload it completely before you install the new one, and manually remove all the content in the [Sunkingdom]folder on disk C and the [Imageyedata] folder on disk D..

if you have important data and pictures, please backup to other disks first.

- Install the program in file [Need] accordingly as the instruction required.



Complete the installation of all programs

3.3 check the machine before use

Connect the power plug of the computer and the plug of the fundus camera device to the socket of the protective earth, and turn on the computer and equipment. The computer enters the "acquisition interface". The instrument should be used in the initial use of the following issues, and please follow the steps to conduct a comprehensive inspection:

3.3.1 Check the platform

When the joystick is shaken, the working platform will move slightly in the direction of the shaking.
Turn the operating handle and the working platform will move up or down.
The platform locking screw is locked and the platform can not move left and right.

3.3.2 Check the digital image collector

Through the front and rear section to switch to the fundus mode, placed the hand in front of the camera, empty observation of the lens is visible light flash, the collection interface to capture the light image.

Chapter 4 Operating Procedures

4.1 Color fundus camera operation steps

4.1.1 Replace the cheek paper

If you need to replace the patient check, you need to tear the paper which is contact with the patient's cheek.

4.1.2 Mydriasis

If the patient to be measured pupil pupil greater than 3.3 mm when the pupil can do the color fundus photography, pupil less than 3.3 mm must be dilated (according to the requirements of mydriatic medicine mydriatic syrup)

4.1.3 Power on

First open the power box power switch, and then turn on the computer host power, enter into computer desktop, double-click the desktop camera image system icon

, the system automatically enter the software interface.

4.1.4 Settings

New patient information, you can click on the relevant patient information settings.

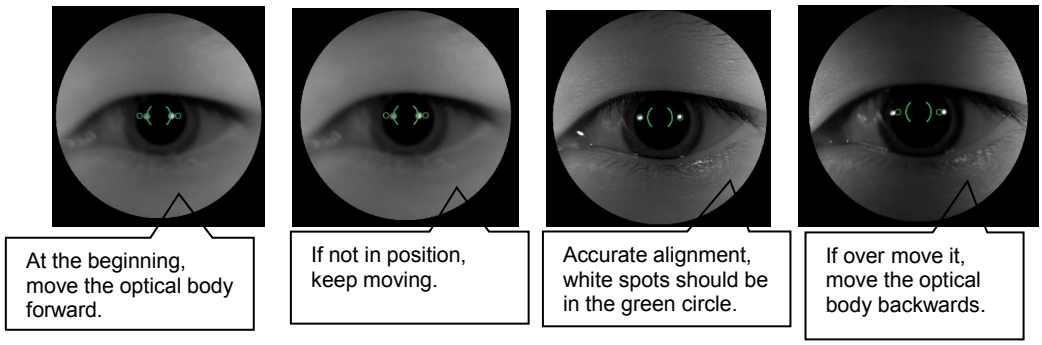
4.1.5 Image acquisition

1) Select the patient point to enter the acquisition interface.

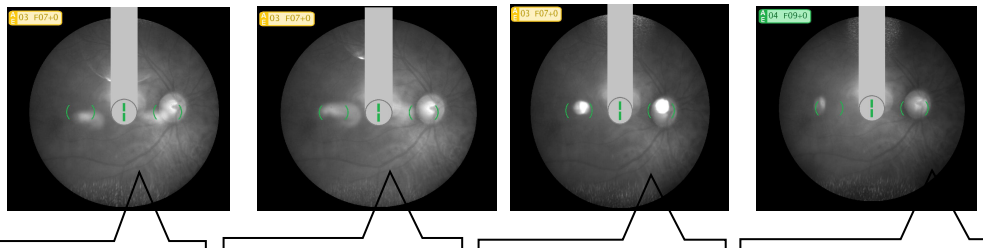
2) adjust the height of the lifting platform, so that patients can be in a comfortable position. And then adjust the cheek bracket adjustment knob up and down, so that the patient's eyes can align with cheek bracket marking line.

3) Move the optical support frame to the rear face and open the lens cover (when the lens cover is opened, shoot close immediately, open the lens cover after the patient asked not to speak, so as not to contaminate the lens).

4) with the first section of the switch button to switch to the external eye, eye alignment, as shown below. (Note: the handle remains vertical when moving the optics)



5）After accurate alignment, switch to the fundus .



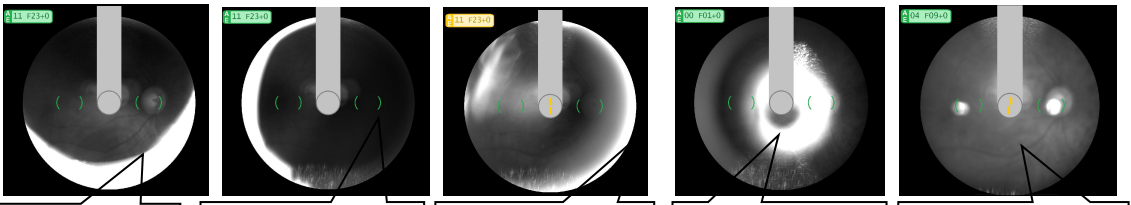
When you switch to the fundus, move the handle forward so that the two white spots are in brackets.

Try to move the dots in brackets, if the dots diverge, continue to adjust the joystick forward.

When the Dots are the most round and the brightest, it means accurate alignment.

If the Dot scattered, that means you have pushed too forward, adjust the joystick back to make it to brightest and most round.

Image up and down light leakage or image not clear adjustment method.



If the bottom light leakage, clockwise rotation of the handle, that makes the eye image uniform; the other side of the light leakage handle counterclockwise rotation

If Left light leakage, move the handle right, that make eye image evenly; if right side light leakage handle to the left

If the surrounding is white circles, that means pushed over, adjust handle back slightly to make the fundus image evenly.

This means not in position, push forward the handle slightly to make the fundus image evenly.

The fundus image is not clear, the curve is not aligned up and down, turn the focus knob, until that the alignment up and down turn the green.

Note: After shooting, tighten the platform and cover the lens cover Immediately

4.1.6 Image view

After shooting, you can directly double-click the thumbnail on the right to view the image, or return to the main page to select the patient for image browsing

4.1.7 Report Output

Select the picture click to make the image diagnosis input, click

to print the color report card (see 5.8.4 for detailed operation).

4.1.8 Power off

If the inspection is completed, and then cover the objective lens cover; if need turn off the machine ,first to turn off the software, then turn off the power switch.

Chapter 5 Introduction of fundus camera software

5.1 Software name

Sunkingdom fundus camera system software V1.0.0

5.2 Version number and date

Software version number: V1.0.0 Date：2018.6.11

5.3 Software provider

Operating software provider：Chongqing Sun Kingdom Medical Instrument Co.,Ltd

Software provider address： 35-2.YingTian GuangDianGongGu,CaiJiaGang Industry Zone,BeiBei,ChongQing,PRC

The software is expected to be used with the fundus camera, installed on the computer system.

5.4 Software support

Chongqing Sun Kingdom Medical Instrument Co.,Ltd provides technical support for software users, and provides software operation training, while continuing to optimize the software and upgrade.

5.5 Software application backup

Note: The software will be installed in “D:”

After Software collected the image, the image data needs to be backed up, all the data are stored in the software installation folder, only need backup Data, Thumb folder and eye.exe content is OK.

Note: The system software is installed in the "D: \" directory default.

5.6 Software maintenance

After the software configuration is complete, normally no need for maintenance, when the software needs to be upgraded, you can re-install; virus, serious misuse or hardware system failure may damage the software system. If the software system is severely damaged, please follow the steps below to reinstall the software system

(1) To install the operating system for the computer, we recommend using Windows 7 or Win10 Flagship version.

（2）If the installation process can not be automatically identified, you can manually install the drivers.

（3）Open the Software CD which sent with the machine, and then to install it.

5.7 Software Installation

When the instrument is shipped, all the special software is included in CD-ROM, if you need to re-install the camera software, as following:

A)Insert the software disc into the CD-ROM, the system will automatically install the camera software in the D: \ folder, according to the users needs, it can be installed in a different location, according to the above operation steps ,the installation is complete. After the installation is complete, double-click the picture

on the desktop, then it will enter to operate.

If there is a problem during the use of the software, it can be uninstalled and re-install. About uninstall, You can right click on the control panel or click on the desktop camera, and click "Uninstall the software".

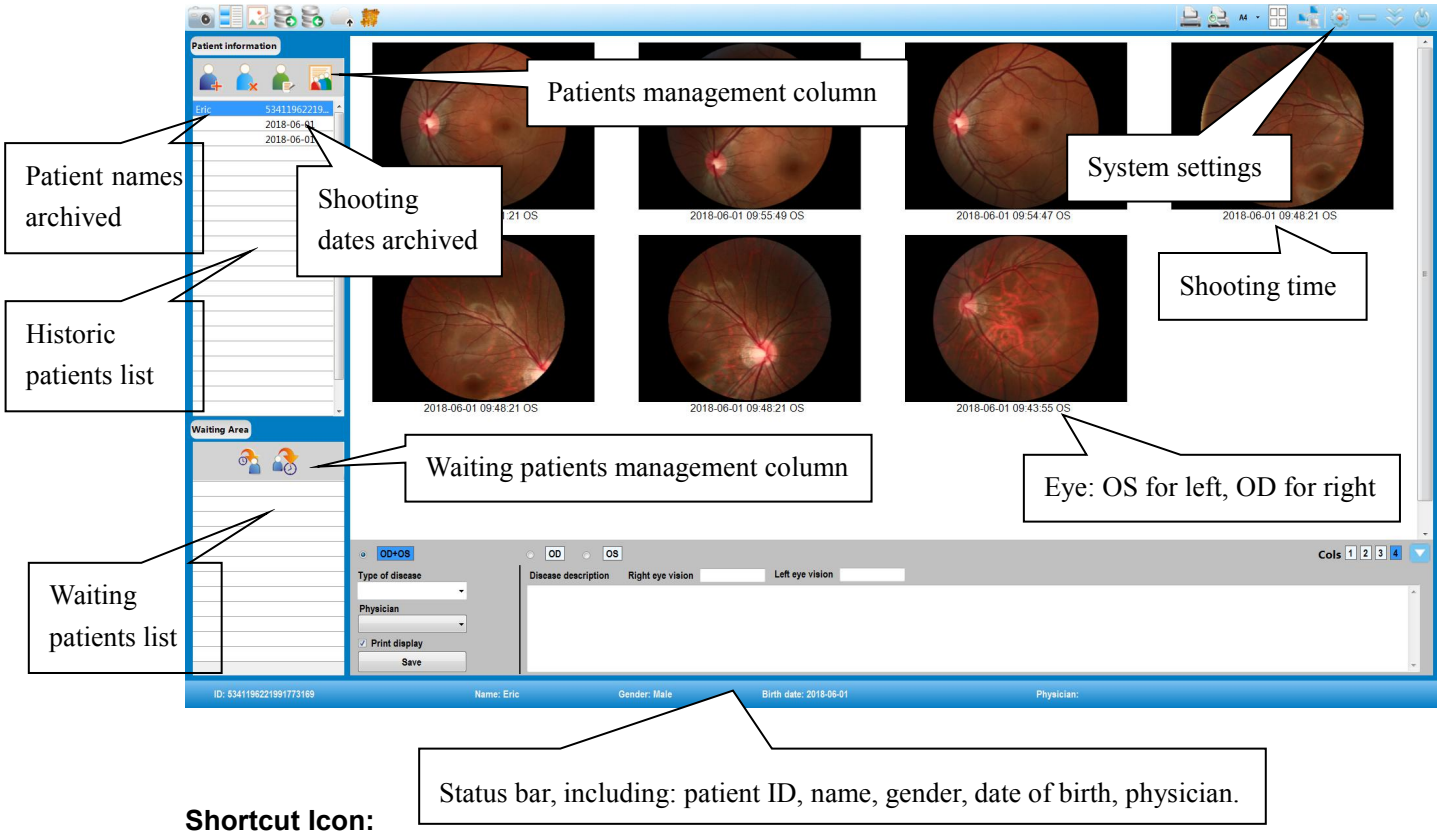
B) If an old version of this software was installed before, please uninstall it from ‘Uninstall Program’ at control panel first. If need to reserve the past data files and images, copy ‘SKMedEye.db’ of the old installation directory and paste to cover the same after new version software installation completed.

5.8 Software Use

5.8.1 Software main interfaceDouble-click the

icon on the desktop to run the software

The main interface of the software is as follows:



Shortcut Icon:

Image Capture. Select patient from the waiting list or historic list for image capturing.

Image Contrast. Select two or more thumbnails of a single patient for contrast.

Image Edit. To process the image after clicking in.

Image Export. Select single patient with a specific date from the historic patients list, then select one or more thumbnails from the main interface, click ‘image export’, afterwards a window pops out as below, choose a save path, and input a file name to the dialog box, click ‘Save’.

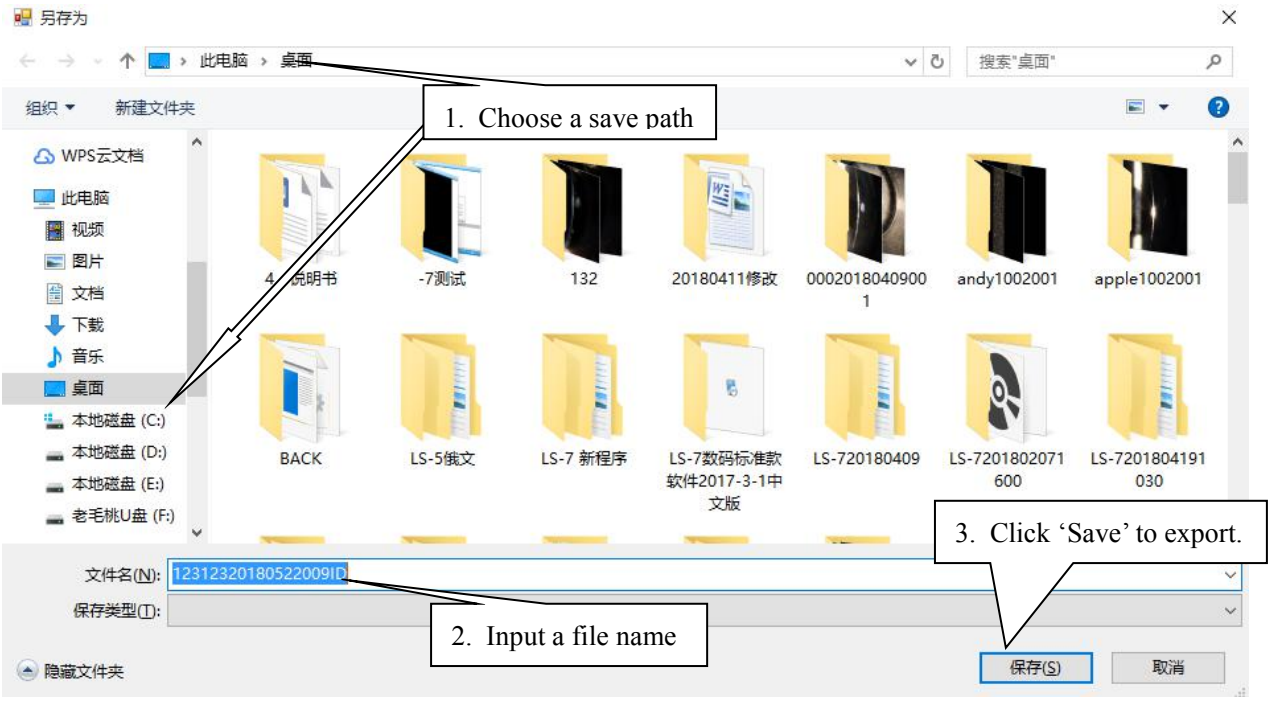
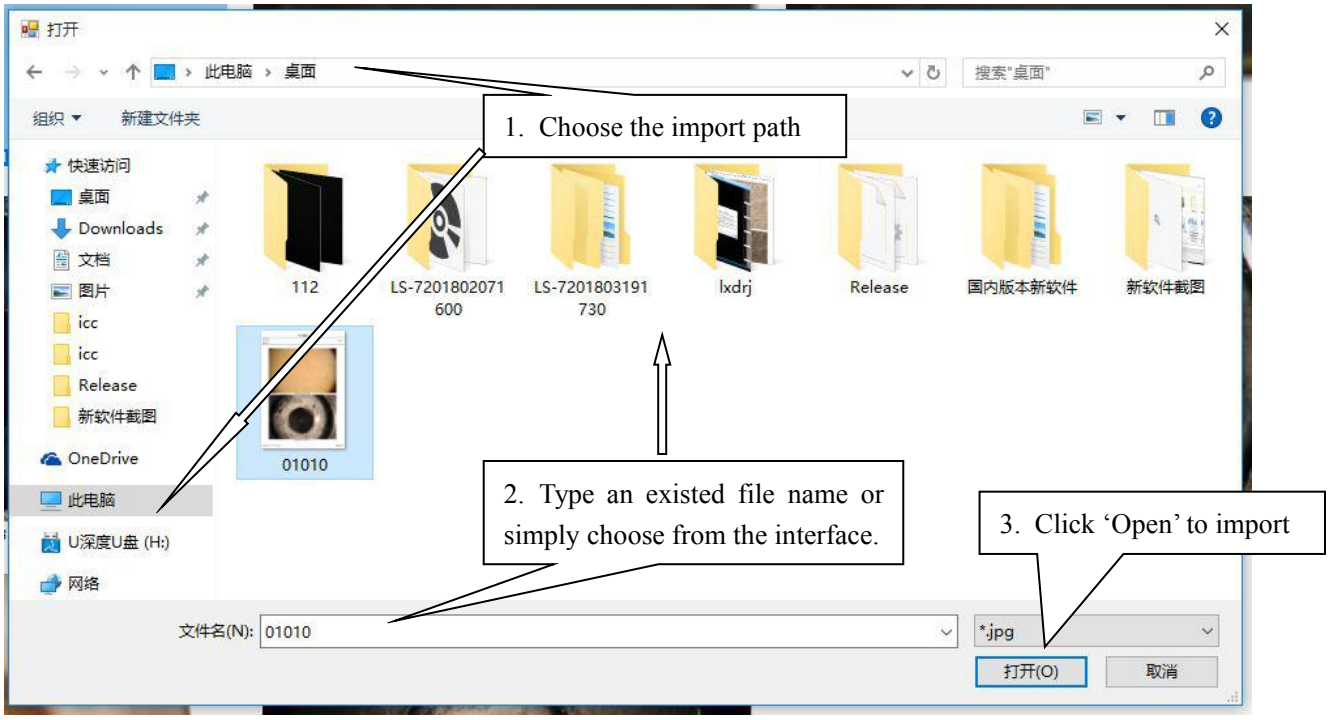


Image Import. Click 'Import', choose the import path and select one or more images, then click 'Open'.



Patient Management Icon

Register. Register a new patient with information to line up in the waiting patients list.

Delete. You can delete one patient's entire archives or those under a specific date. (Remarks:

All the images under a specific patient/date will be deleted once executed)

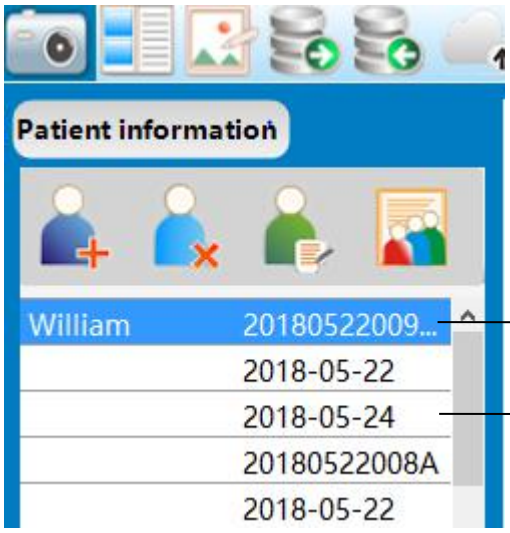
Edit. To edit a patient's information by selecting any date under this patient and clicking 'Edit'.

Data base. Click in and by moving the scroll bar up and down, all the registered patients' information could be seen from the list displayed.

Waiting Patients Management Icon

Add-in. To add patients into the waiting list from the historic list.

Remove. To remove patients from the waiting list.



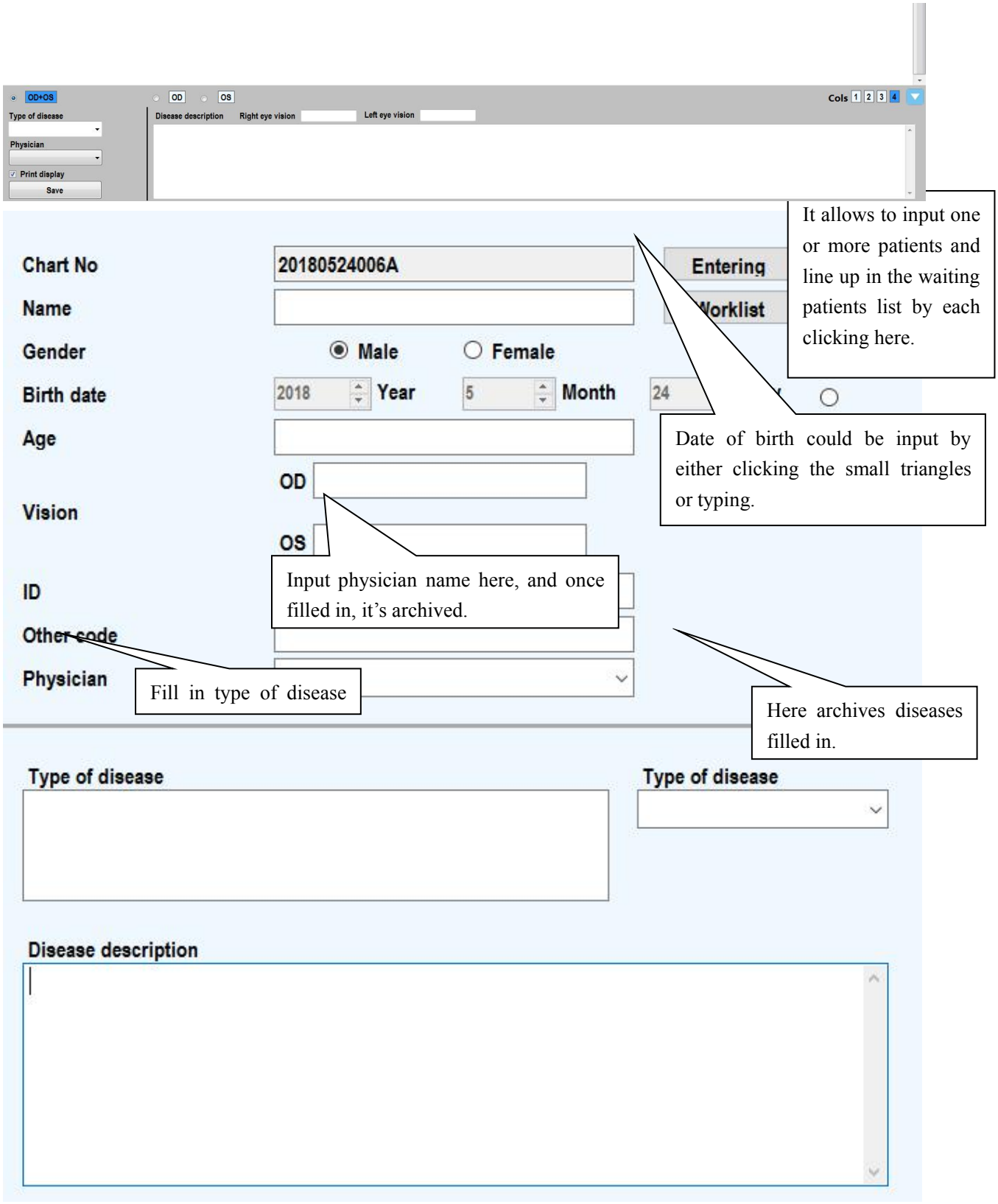
Patient name (The latter Arabic numbers is ID): By a single click, it shows all captured images of him/her so far at the right side.

Capture date: By a single click, it shows all the captured images on this date of the corresponding patient at the right side.

Thumbnails: For selecting you could use mouse to either drag or left-click. Double-click for edit.

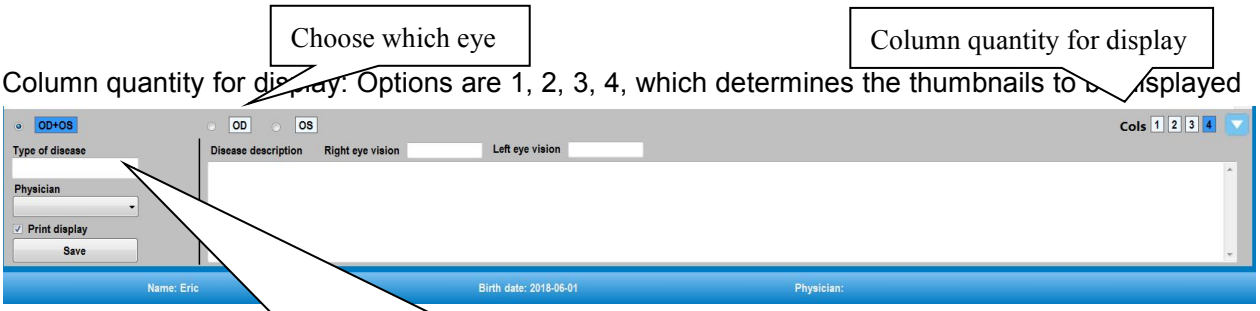
Delete thumbnails: Select one or more images you want to delete, and then right-click.

(1) Register a new patient. Click , a dialog box pops out as below,



Remarks: A newly registered patient is put in the waiting patients list, from where could be selected for image capturing.

Diagnosis module



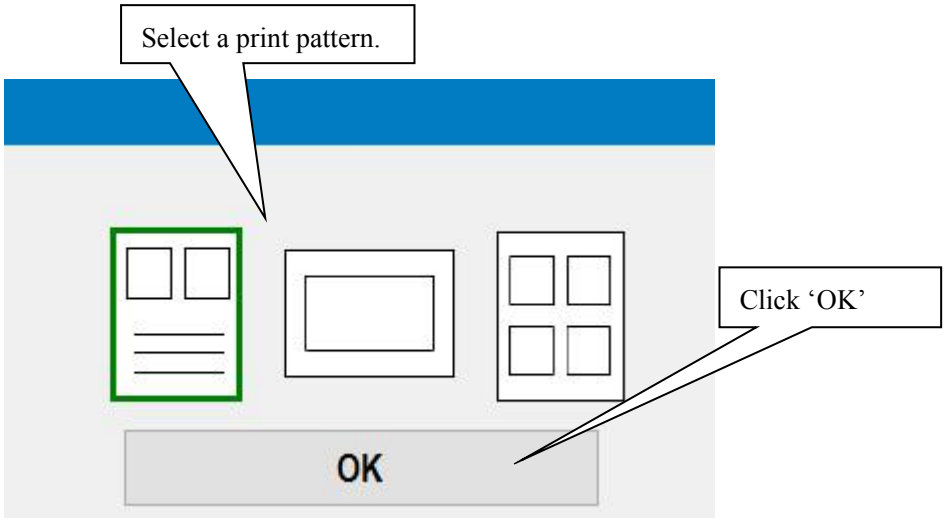
Column quantity for display: Options are 1, 2, 3, 4, which determines the thumbnails to be displayed in how many

System Setti

Print. To print the images captured.

Print preview. To preview before printing.

A5 Select printing paper size. It could be selected from the drop-down list(A4, A5, A6 optional). If choose a different paper size from the previous one, a dialog box will pop out as below, for selecting a print pattern. Select one and click 'OK'. At the right side of paper size icon, it shows current print pattern.



LAN. Click here for network settings if needed.

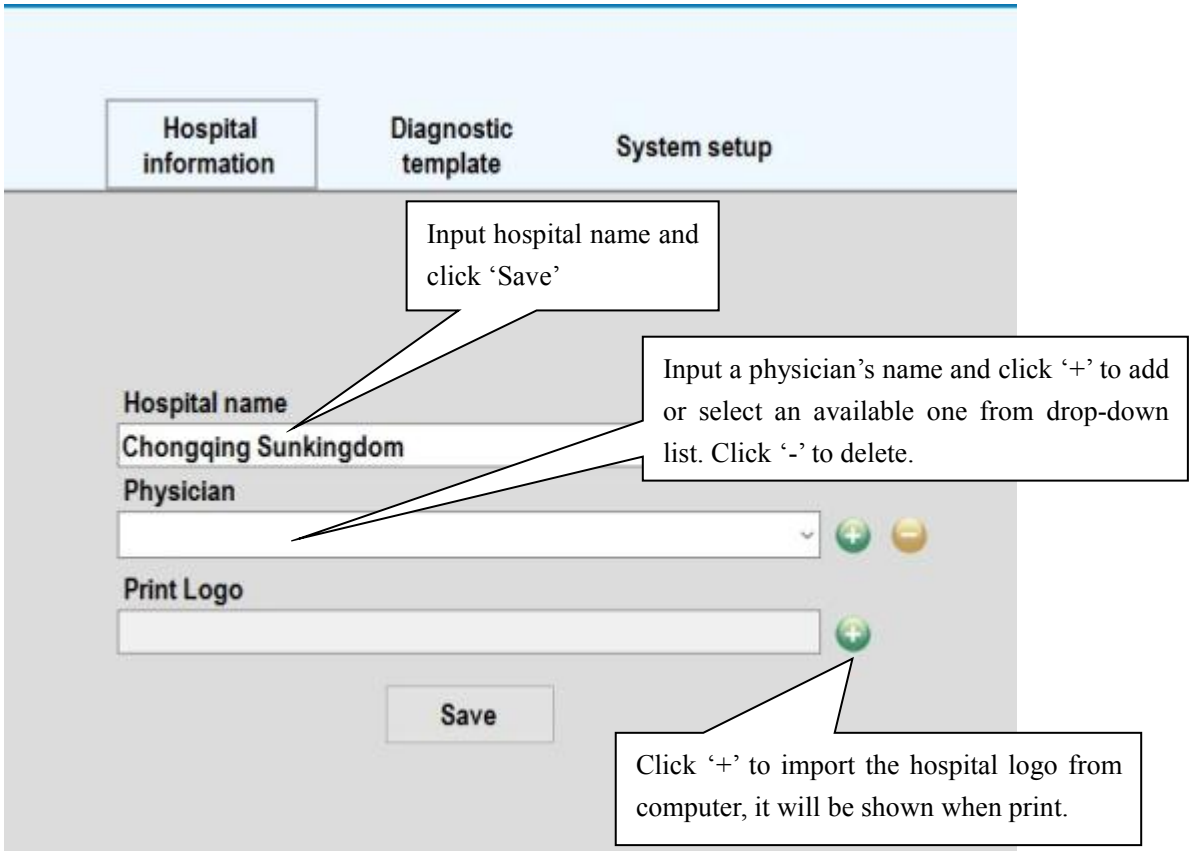
System setup. After clicking in, you could input or alter hospital name, type of disease, diagnosis description, language etc.

Minimize. To minimize the software interface.

Exit. Click here to exit the software.

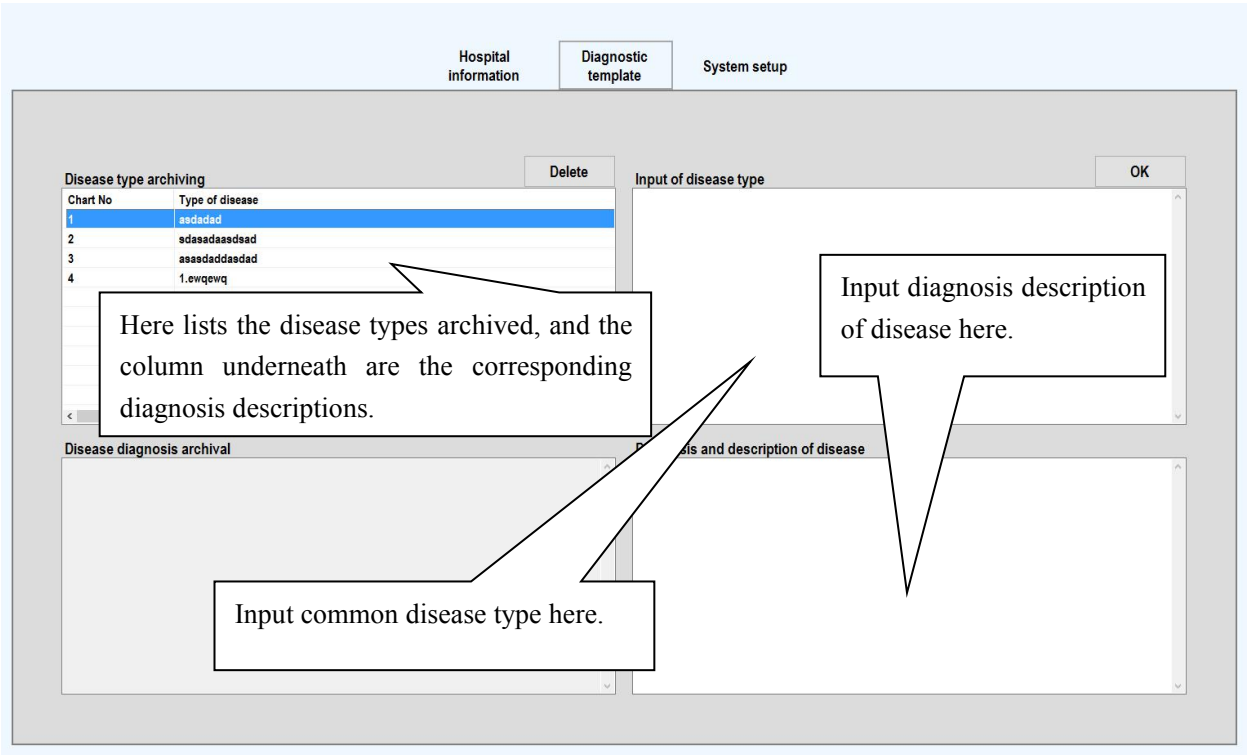
(2)Save hospital name and add/delete physician information.

Click for system settings, enter hospital information interface as below,



(3)Diagnostic template

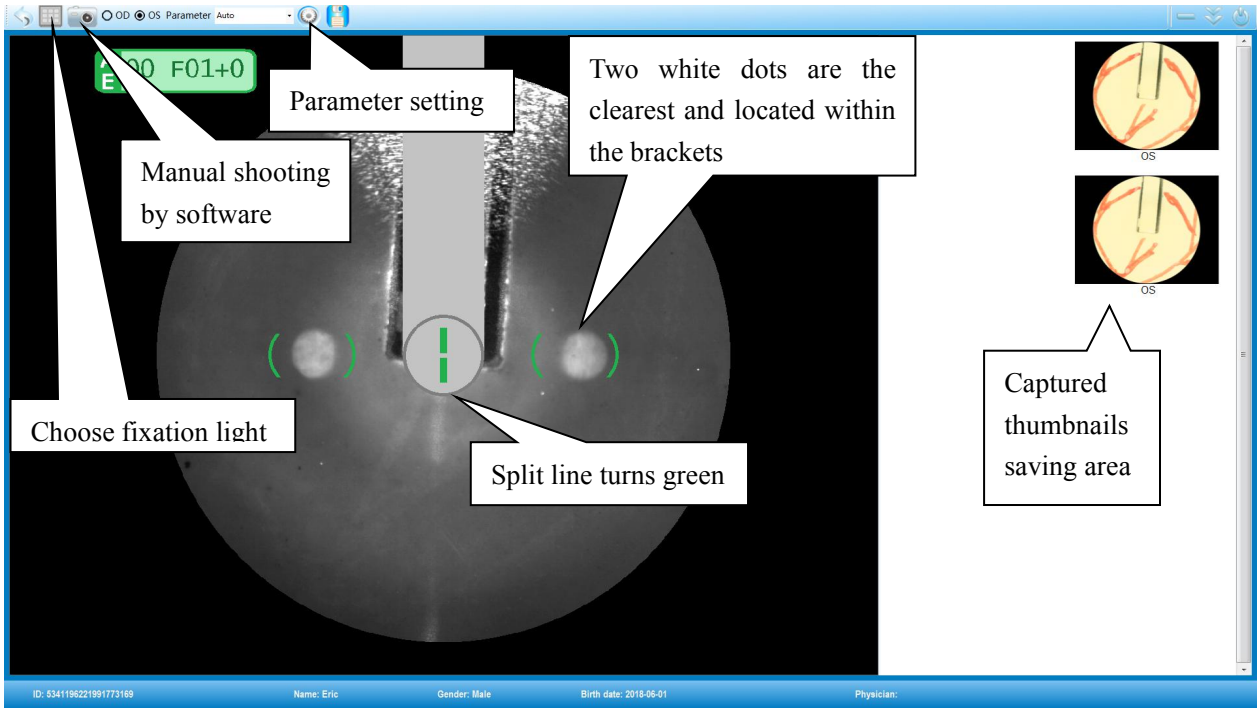
Click for system setup, and enter diagnostic template interface as below,



In diagnostic template, physician can preset common disease type and the corresponding

description. The preset information could be added/altered/deleted if needed.

5.8.2 The capturing interface is as follows：

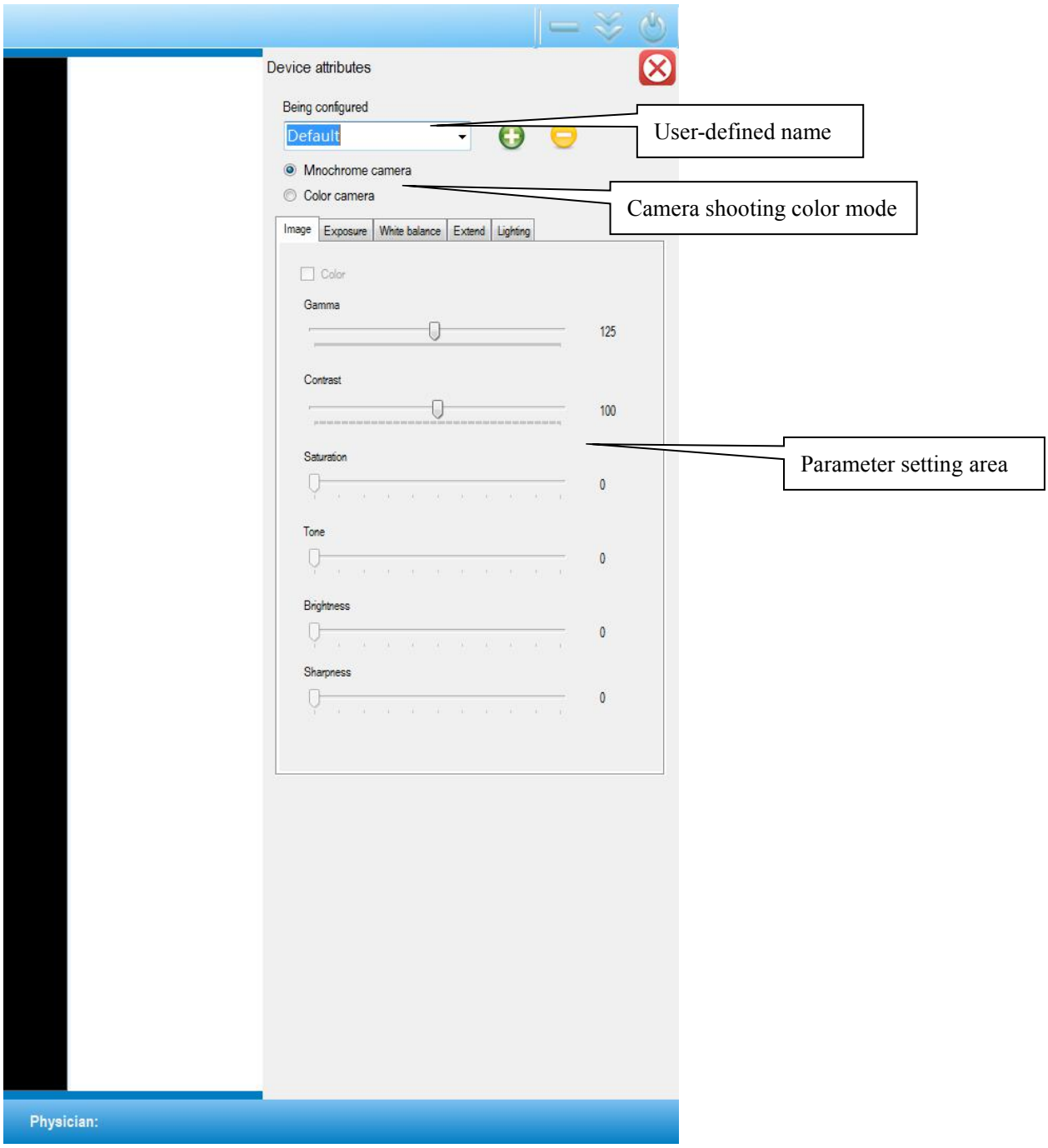


Mode: Color Camera and no red light Camera

Parameter: The default value of the fundus camera ‘AUTO’ (automatically set the flash intensity according to the patient's pupil size), or you can manually select other parameters as user-defined.

Steps:

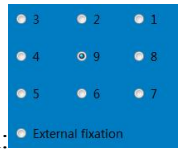
1. Choose ‘Default’ from the drop-down list.
2. Click ‘ Parameter setting’ icon.
3. A parameter setting box is shown at the right side of interface, see below,



Select an available user defined name from the drop-down list here

or input a new name, click to add. Click to delete.

After setting all parameters, click to save and return for capturing.

click icon and see the fixation light as shown: 

There are nine internal fixation lights and one external fixation light. Capturing position

corresponding to each internal fixation light is referred as below,

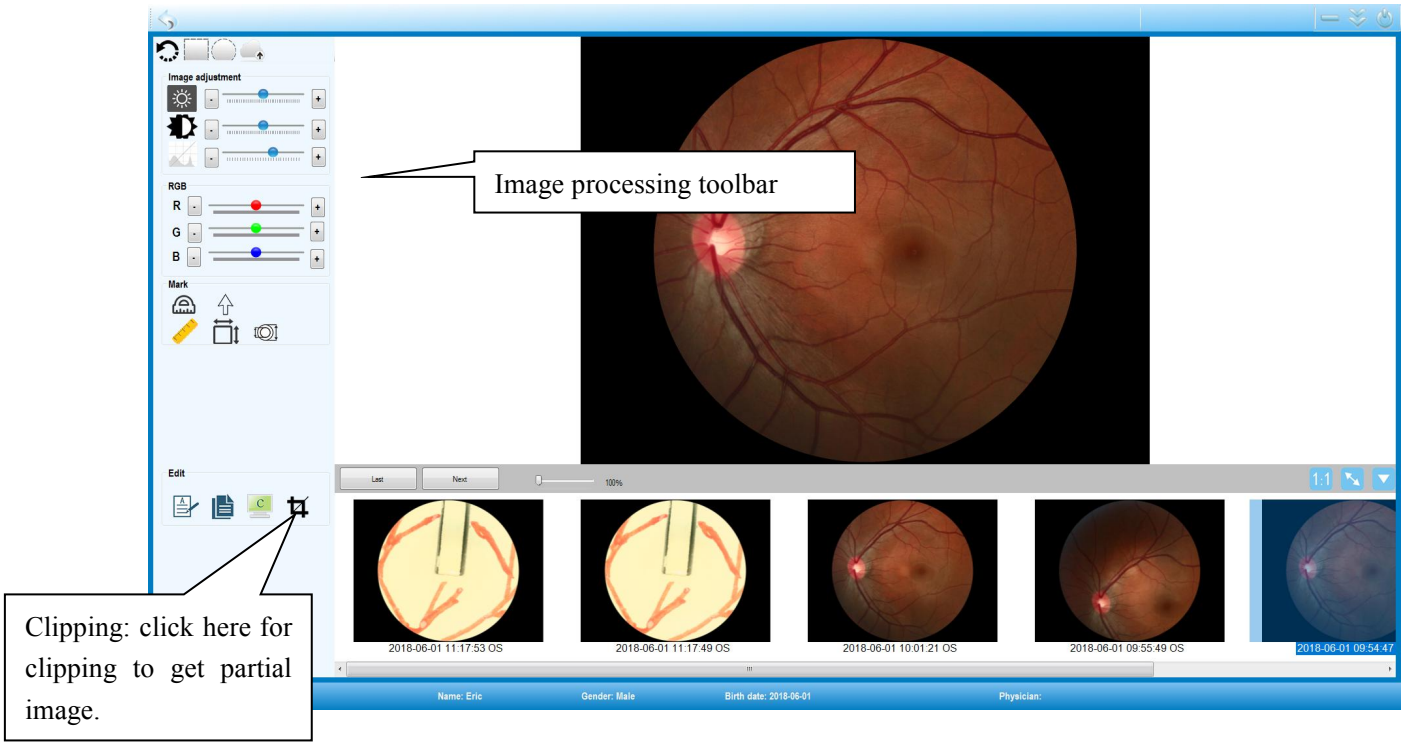
OS	OD
9: posterior pole	9: posterior pole
8: optic nerve head centered	8: temple
7: lower fundus	7: lower temple surroundings
6: lower temple	6: lower temple
5: lower temple surroundings	5: lower fundus
4: temple	4: optic nerve head centered
3: upper temple surroundings	3: upper fundus
2: upper temple	2: upper temple
1: upper fundus	1: upper temple surroundings

Eye: automatically identify the eye position, according to the location of the platform, and automatically identify which eye it is.

Camera: It's default "camera" mode when click into capturing mode.

5.8.3 Image Processing

(1)Double-click any thumbnail in the main interface or capturing interface, you can enter image processing interface as below,



Note: After each image processing step, right-click to complete.

Revoke. Revoke all the processing on current image at one time, and recover to original.

Square selection. Could select a square area from the image, and process the portion within.

Round selection. Could select a round area from the image, and process the portion within.

Upload. If it's accessible to network, the image could be uploaded.

Brightness. Drag the bar to the right side for adding brightness, and to the left side for reducing it.

Contrast. Drag the bar to the right side for adding contrast, and to the left side for reducing it.

 Gamma. Drag the bar to the right side for adding gamma, and to the left side for reducing it.

Red. Drag the red icon to the right side for enhancement, and to the left side for reduce.

Green. Drag the green icon to the right side for enhancement, and to the left side for reduce.

Blue. Drag the blue icon to the right side for enhancement, and to the left side for reduce.

Angle measurement. Left-click, move mouse to draw a line, release, move & click to draw another, an angle is formed with corresponding degrees.

Nidus marking. Left-click and move mouse to adjust the direction, click again and done.

C/D, a.k.a Cup Disk ratio. Left-click at both ends of the cup diameter to form a line segment, then do the same at disk diameter. Locate the value by another left-click, and right-click to complete.

Length measurement. Draw a line segment which to be measured by clicking at its both ends, then left-click to locate the length value.

Area measurement. Encompass the area which to be measured with several clicks, make sure it's sealed and right-click to get the area, left-click to locate the value. (Remarks: To acquire an accurate value, it's essential to seal the area well)

Adding text. When use, input texts with the size and color needed, click OK and locate it with left-click, then right-click to complete.

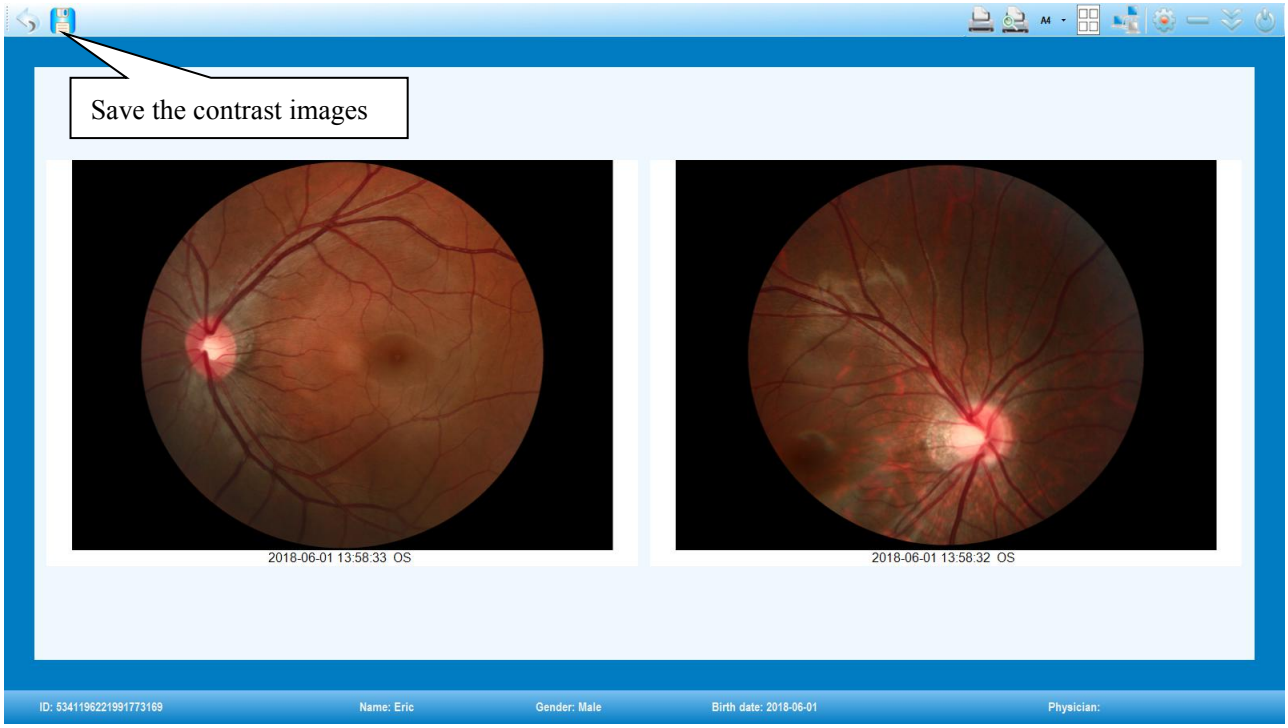
Adding texts with arrow. When use, input texts with the size and color needed, click OK and locate

arrow & texts respectively with left-click., during which the arrow direction and length could be adjusted by moving the mouse. Right-click to complete.

Copy. To copy and save a duplicate of the current image.

Clipping. When use, press & hold the left button of mouse, then drag to draw a square portion for clipping, right-click to save.

(2) Image comparing is as below,



(1) Choose two or more thumbnails from the main interface to contrast, press up & down direction key on the keyboard to switch if the quantity is over two.

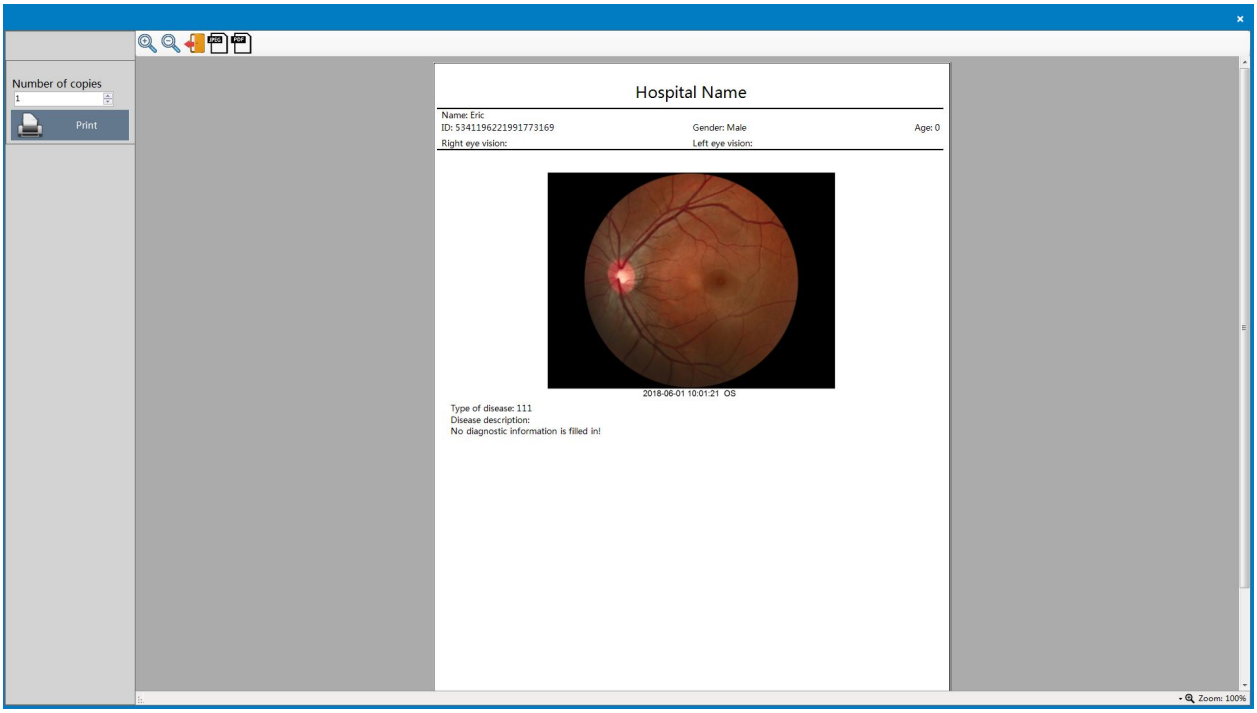
(2) Click 'Print' in the contrast interface for printing if needed.

5.8.4. Print preview：

(1)Choose three types print paper mode：A4，A5，A6

Note: A4 & A5 allow maximum 12 pcs images printed on one paper, while A6 allows maximum 6 pcs only.

(2)Single image print



The report print preview is in PDF format. After clicking, you could input a file name and choose save path from dialog box.

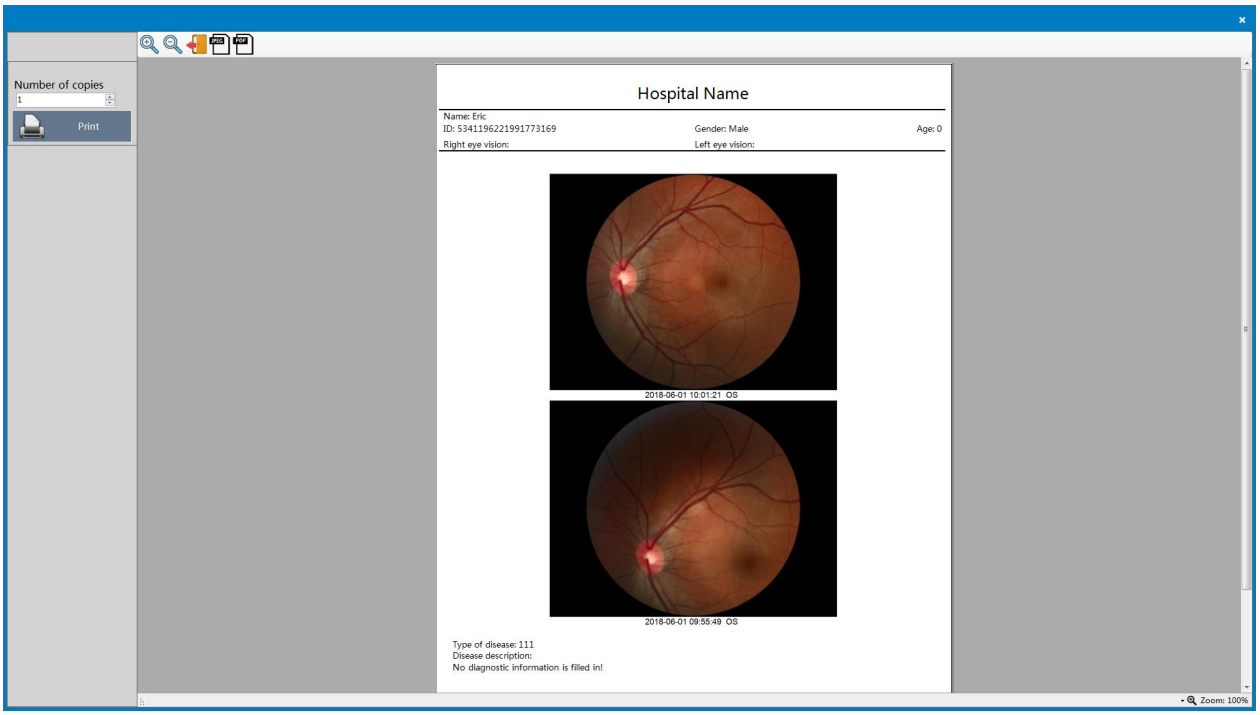
The report print preview is in JPEG format. After clicking, you could input a file name and choose save path from dialog box.

Exit. To exit from printing interface to main interface.

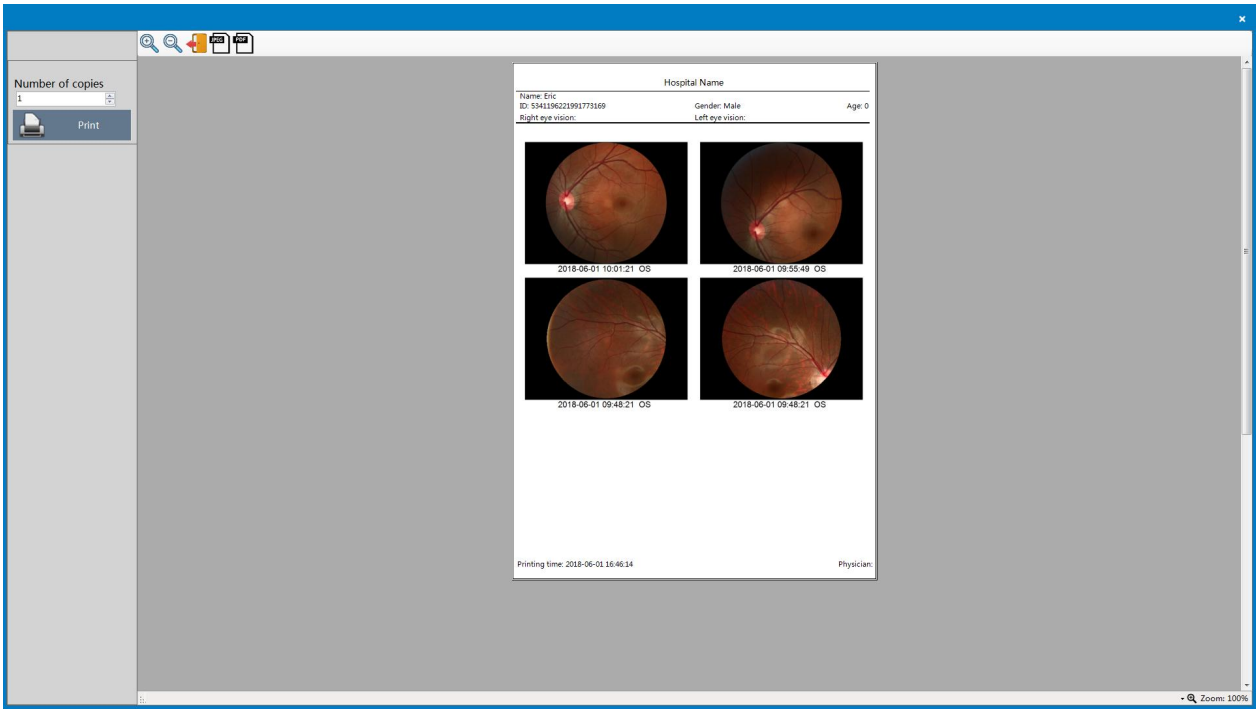
Zoom out. To zoom out the print review area.

Zoom in. To zoom in the print review area.

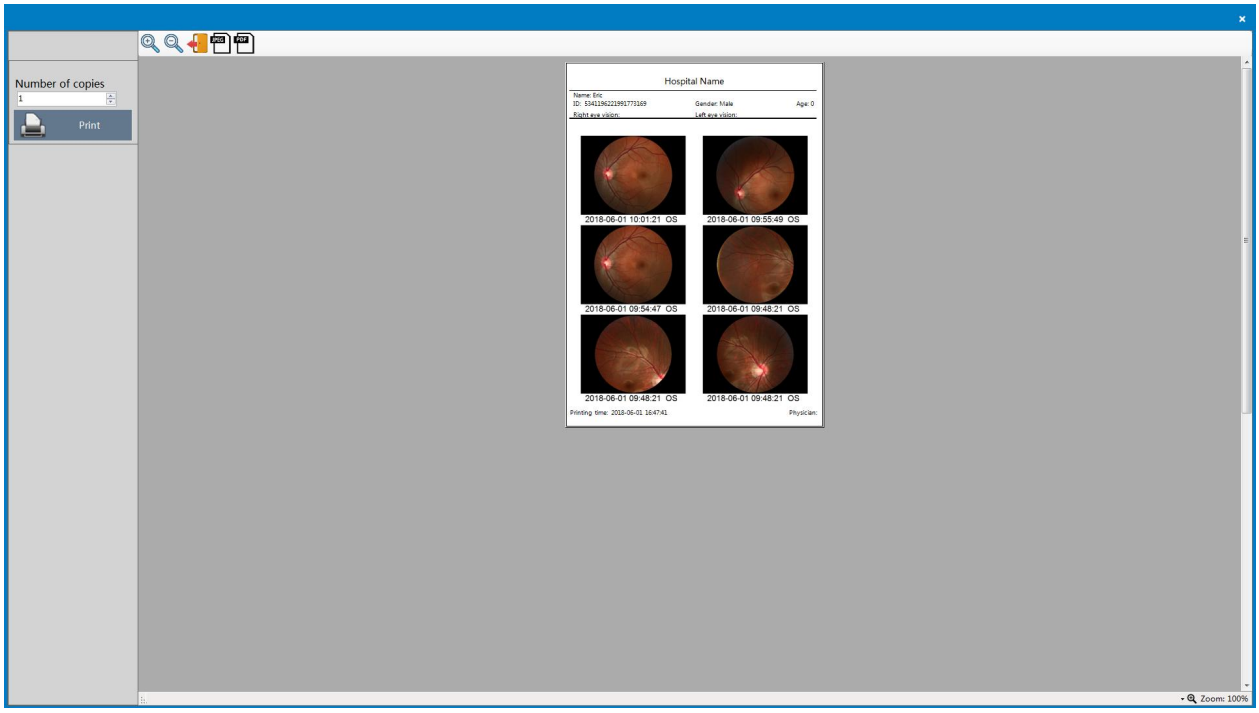
(3) Two-image print,



(4) Four-image print,

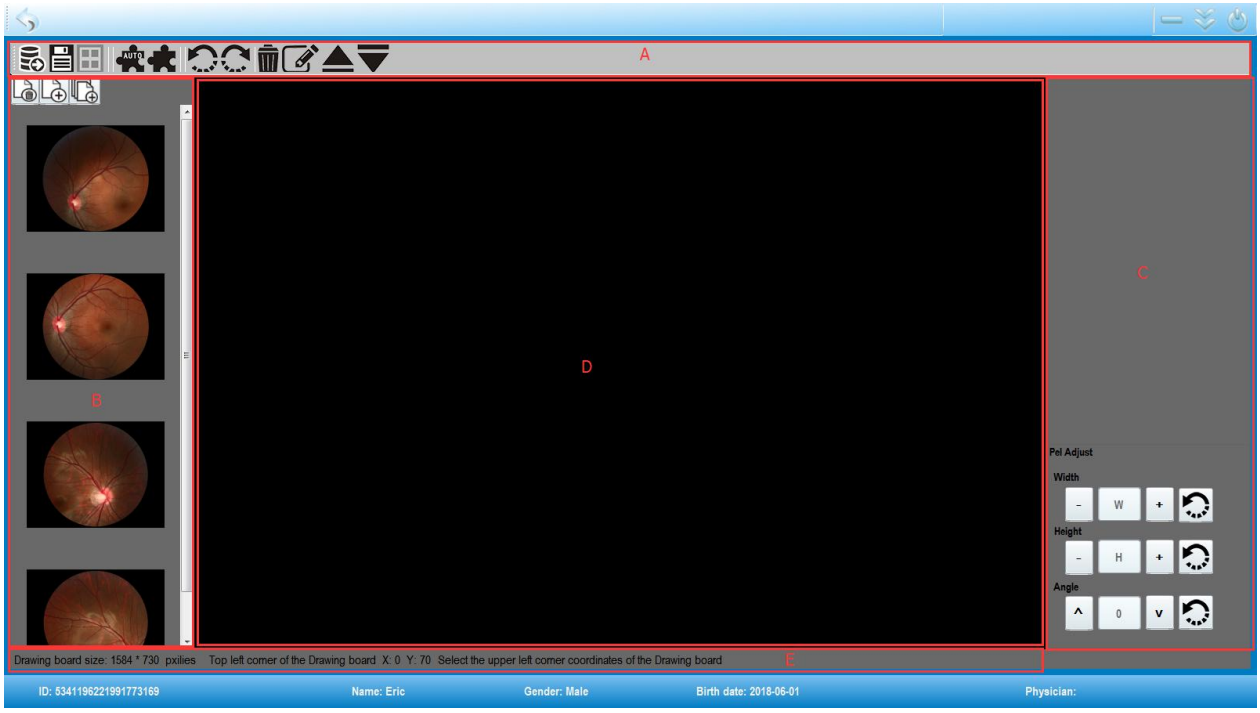


(5) Six-image print,



5.9 Mosaic instructions

1. Select two or more images of the same patient's same eye, then click to enter mosaic interface, as below,



（1）Area A: Mosaic Toolbar

Import. To import a whole folder's images from external path.

Save. To save the mosaic image after completed.

Auto mosaic.

Manual mosaic.

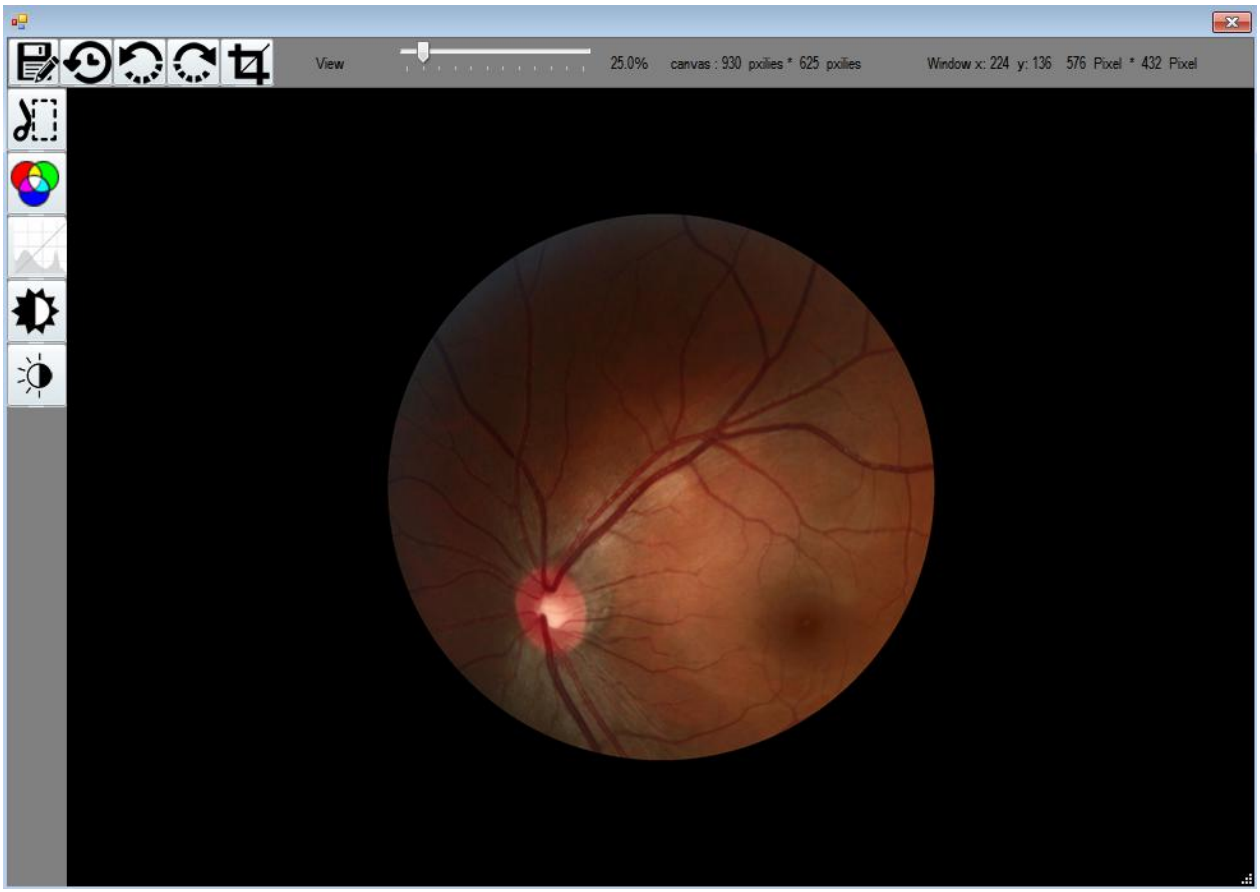
Revoke. To revoke the previous step.

Redo. To redo the previous step.

Delete. To delete the selected image in the mosaic area.

Upper & lower layer. To move the selected image to the upper or lower layer.

Edit. To edit single image. Click one image and click, below interface pops out,



Save. To save the edited image.

Reset. To reset all the edits and back to the original.

Revoke. To revoke the previous step.

Redo. To redo the previous step.

Cut. To clip an area within the image by left-clicking and holding to draw a closed loop in any shape.

Cutting effect. After cutting, click this icon to reserve the clipped area.

Respectively RGB balance, Gamma, Contrast and Brightness adjustment.

(2) Area B: Imported images shown by thumbnails.

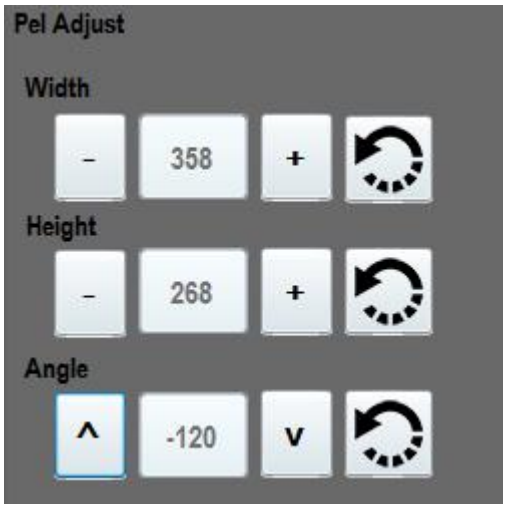
Delete. To remove image from this area.

Add. To add any image into mosaic area.

Add all. To add all the images into mosaic area.

(3) Area C: Mosaic area.

(4) Area D: Image size and angle adjustment. To adjust the width, height and angel of selected image.



(5) Area E: Drawing board status display area.

Chapter 6 Maintenance and care

6.1 General precautions

◆ The device should be careful to push and pull, away from the source, and should be placed in a cool dry and ventilated place.

◆ Do not store with toxic, corrosive, flammable, explosive items mixed together.

◆ Check the appearance of the equipment before use.

◆ Check the power cord for damage, if Replace before using.

◆ The power cord should be plugged into a well-grounded outlet.

◆ Do not disassemble any parts of the device after power is applied.

◆ If the machine is not used for a long time, please unplug the power plug and the treatment head. The host is placed in a dry and ventilated environment.

◆ prohibit the use of USB on the computer and install other unrelated software.

6.2 Equipment cleaning, maintenance

◆ After the equipment is inspected, the surface dust should be removed with a cleaning cloth every day and covered with a dust cover.

◆ The stains on the outer surface of the equipment are wiped with a small amount of the central cleanser and wiped with a dry cloth. Disinfect the chinrest, frontlet, the operating handle with 75% medical alcohol.

◆ Maintenance of objective lens

The objective lens must be in a dry, clean state, usually check the patient, the patient out of the gas can not be out on the objective lens, can not use hard objects or fingers to contact the objective lens, to avoid damage to the objective; if the objective lens is dirty, you can use ether alcohol , Clean method must be strictly in accordance with the company's training methods to teach people to clean.

◆ normal use before the proposed 10 minutes ahead of the boot warm-up to ensure that the equipment work properly.

6.3 Preventive inspection and maintenance

◆ When the equipment is used, turn off the power switch, unplug the power plug; if it hasn't been used for long time, should be charged power once a month, about 10 minutes each time.

◆ Computer, printer inspection and maintenance, refer to the device manual or random file.

CAUTION: Disconnect the power supply of the main unit and the removable porous socket when cutting.

6.4 Parts replacement

6.4.1 Replacement method of medical cheek paper on cheek and bracelet

A Remove the cheek paper directly which touched by patient.

6.4.2 Fuse parts replacement method

Fuse model on the host of fundus camera T2AL 250V.

Turn off the power supply, unplug the power plug, use a screwdriver to unscrew the fuse cover, put on a new good fuse, pay attention to the model T2AL 250V, then the fuse can be restored, the use of other models of the fuse will reduce the minimum safety of the equipment.

6.5 Common faults

Common faults

Breakdown	Possible cause	Treating ways
Illuminating bulb dose not work	Power cord is not properly connected or the power cable is loose; main power supply or connection panel is switched off; bulb is burnt out; fuse is fused. The dysfunction of brightness adjustment knob.	Connect the power cord correctly; switch on the main power supply and connection panel; Change the bulb; Change the knob
The fixation light does not work	The wire of fixation lamp loose or lamp broken	Tighten the loose connections，change the fixation light.
Turn on software, image does not show	Computer system error, computer poisoning, wiring loose	Reinstall the system, antivirus, check wiring, and re-plug the cable

If there is any change of design or specifications, NO updated notice!

Note: This computer system operates laptop, please refer to the computer maintenance manual. When the computer appears that user can not repair the fault, please call the the service phone on the manual; For assistance from company, please call the company after-sales service phone.

6.6 Waste disposal

The waste gripping paper used for examination should be placed in the medical waste disposal box;

In the process of maintenance of this equipment, the replacement of components or other waste should be dealed with properly in accordance with the requirements of local laws and regulations, can not be arbitrarily discarded. At the end of equipment's life, should be recycled in accordance with the requirements of local laws and regulations. So as to avoid environmental

pollution.

6.7 Electromagnetic compatibility requirements

A This equipment can not be placed in a strong electromagnetic field environment;
B This device can not be used to dial the phone when in use.

6.8 Manufacturer's responsibility

It is only in the following circumstances that the manufacturer is responsible for the safety and reliability of the equipment:

- Assembly, addition, commission, alteration or repair are carried out by authorized personnel;
- The electrical facilities in the room are in compliance with the relevant requirements;
- The equipment is required for use according to the instruction manual.

6.9 Instructions of jaw security factor

Jumbo rated load: 5 kg
Jaw security load: 5 kg
Jaw fracture load:> 20 kg
Metal member breaking load:> 20 kg

Chapter 7 Warnings of Removable Porous Socket

1 The fundus camera host and the computer system are used in the patient environment.

2 Removable Porous Socket should not be placed on the ground.

3 Other additional Removable Porous Socket or extension cables should not be accessible to the system.

4 removable Removable Porous Socket can only supply power to the electrical equipment (computer system, fundus camera host) in the system components. Other non-system components can not access the system.

5 The maximum allowable load of the Removable Porous Socket with isolation transformer is 500 VA.

6 Removable Porous Socket provided by the system can only be used for power supply in the system.

7 Electrical equipment with Non-system components connect Removable Porous Socket may cause malfunction or excessive leakage current, causing a risk of electric shock. And if the power is too large, may cause a fire.

8 During the installation of the system, make sure that the parts are stable and reliable. Make sure that the network power supply voltage meets the requirements of this manual and check whether the grounding is safe or not. Take care and put down carefully while handling the equipment,

9 During the preventive maintenance of this equipment, make sure that the equipment is powered off and each part is stable and reliable.

10 The computer, monitor, and printer that make up the system can only be connected to the system-equipped Porous Socket, and are strictly connected to the wall outlet.

11 You must turn off the device before pluging the device, y.

12 The device is only connected to the non-medical electrical equipment of the system through the input / output jacks and is not allowed to be connected to other non-medical electrical equipment in order to get rid of leakage.

13 If you want to move the equipment, should carry the equipment by at least two people (remove other objects on the main unit, such as computers, monitors, printers, keyboards, etc.. disconnect camera host and other equipment, such as USB cable, etc.). When the device is placed in the

specified position, it should be debugged smoothly to prevent the device from sliding.

14 Only for use in a clean, dry indoor environment.

15 To prevent a fire or electric shock, the host is not allowed to be exposed in a humid environment.

16 The environmental conditions of using : 5 ℃ ~ 40 ℃; relative humidity: ≤ 80%; atmospheric pressure: 760hPa ~ 1060hPa. Do not use or store near heat sources or air conditioners.

17 System should be used before the correct cleaning and disinfection, the medical alcohol with 75% concentration can be used to wipe the equipment parts of the shell, jaw and the amount of care. Do not touch non-medical electrical equipment and patients at the same time.

18 Please use the manufacturer's accessories and supplies. Components that are not specified and authorized are forbidden to be used in the system.

19 It is forbidden to install system-independent software and operation configured by the system.

20 Please consult your company representative for all after-sales or technical questions.

21 It is strictly prohibited to install, debug and change the equipment and accessories in the system without the manufacturer's training and permission.

22 During system installation, ensure that the guards of the camera body are well protected.

Chapter 8 Symbolic interpretation

8.1 Symbolic interpretation

 Power on

Power off

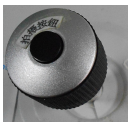
BF

a.c. Alternating current

Notes！Look through the file

Earth wire

Focus and lock knob

 Shoot button, click to shoot

Locking knob, fix position

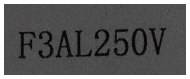
Power input and fuse marking

Power switch 1 and ON symbolize power on 0 and OFF symbolize power off

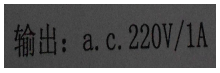
Control interface

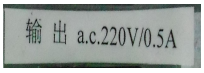
Extended output interface

Power indicator light



Isolated transformer fuses





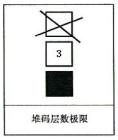
Isolated transformer output mark

8.2 Packaging Symbols

The transport package containing fragile items, please handle it with care.

Handle the package that it must be stored the right way up. The arrows point towards the top of the package.

Handle the package to keep out of the rain and not to store it in damp conditions.



The packing items can stack up to three layers.

Warranty statement

Commitment: The factory may provide the necessary information to specify the repairable parts of the equipment.

1. Our company will provide life-time equipment maintenance and free consultation.

2. Date from purchase of the product, our company provide a free warranty for one year in compliance with the specific instructions

3. During the warranty period, the following conditions will be charged:

● Failure to follow the instructions, destruction caused during operation, maintenance and storage;

● Without the permission of personnel from Chongqing Sunkingdom Medical Instruments Co., Ltd., caused damage to the equipment through unauthorized demolition / modification ;

● Damage caused by accident, or misuse, or irresistible natural factors.

EU Representative

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