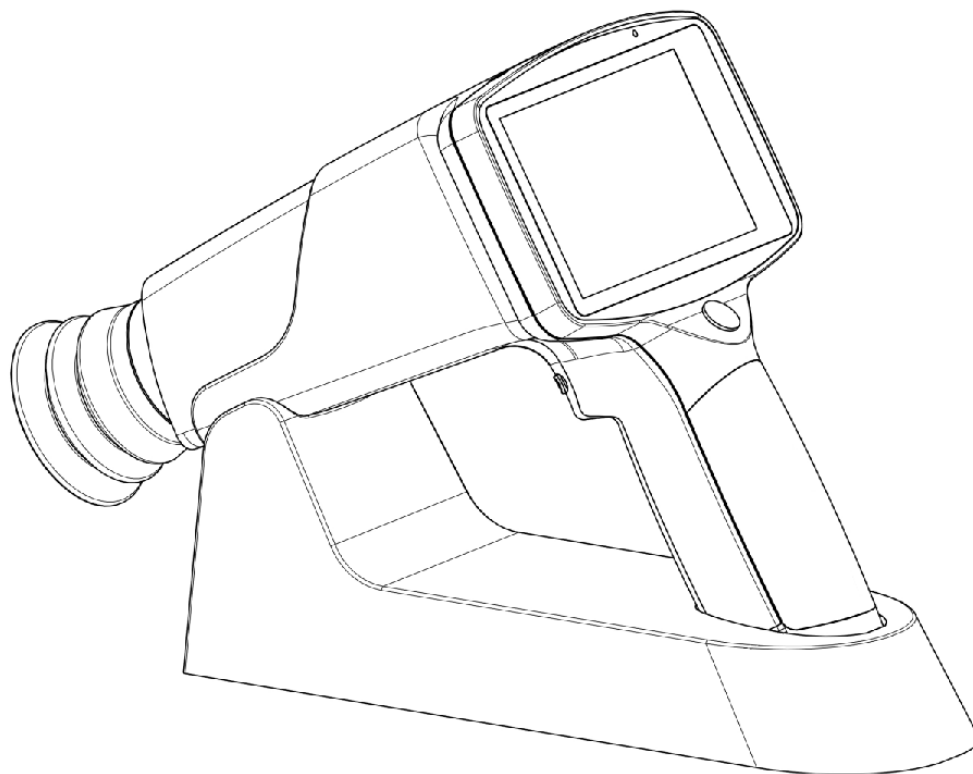


Häns Heiss



Hand-held Fundus Camera USER MANUAL

HFC-009 PLUS

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Preface

Thank you for purchasing the hand-held fundus camera . Here are some basic facts and performance parameters for the hand-held fundus camera you purchased.

Overview

- ☞ This user manual is part of the hand-held fundus camera. Instructions for use and technical descriptions are given in this manual.
- ☞ The user manual includes the device manual and technical manual. The equipment classification for the hand-held fundus camera in accordance with the requirements of IEC 60601-1 is also given in this manual.
- ☞ The markings specified in the IEC 60601-1 standard have been permanently attached to the device and been explained in the manual.
- ☞ This device is suitable for observing, photographing and obtaining retinal images for the patient's fundus without dilation.
- ☞ This device has the functions of taking photos, saving photos, and viewing images in real time.
- ☞ Light weight and portable. It can meet the carrying requirements of doctors for out-of-patient diagnosis.

■ Performance Parameters

Size:	28cm×13cm×15cm
Weight:	800g
Field of view:	45degrees
Minimum pupil diameter:	3mm
Diopter adjustment range:	-20D~+20D
Focusing mode:	manual / automatic
Camera pixel:	12 Mega Pixels
Fundus lighting mode:	Dual mode, natural white LED or infrared LED
Flash mode:	Natural white LED
LCD display:	4.3” full touch LCD
Picture format:	JPEG

Interface:	USB
External storage:	Micro SD card.
Power:	Rechargeable battery 3.7V/3400mAh, two sections
External power supply:	Power supply: 100-240V~, 0.5A, 50-60Hz
Power conversion:	DC +5V , 2.0A
The color temperature of the camera flash	4500K≤TC≤6700K
Resolution center of view	≥60 lp/mm
Resolution at the middle of the field of view	≥40 lp/mm
Resolution at the edge of the field of view	≥25 lp/mm
Near-infrared spectral range	800nm~880nm
White LED spectrum range	400nm~750nm
Service life	4 years

Operating environment	Temperature	+5℃~+40℃
	Relative humidity	≤90%
	Atmospheric pressure	860hPa~1060hPa
Storage environment	Temperature	-40℃~+55℃
	Relative humidity	≤90%
	Atmospheric pressure	860hPa~1060hPa
Transportation environment	Temperature	-40℃~+55℃
	Relative humidity	≤90%
	Atmospheric pressure	860hPa~1060hPa

Cautions






- 📁 The device can only be used by qualified medical staff.
- 📁 Please read carefully the warning signs and cautions before using the device.
- 📁 To prevent damaging the device, please operate the device according to this user manual.



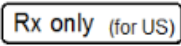

- ☞ To prevent electric shock, do not insert metal objects into the holes or slots of the device.
- ☞ Do not disassemble and repair the device by yourself.
- ☞ If the device breaks down and smells smoky, please cut off the power and take out the battery to avoid fire accident.
- ☞ The device is not water proof. To prevent fire, electric shock, short circuit and other hazards, please don't put the device near water. If the device is wet, please don't use bake, microwave, or high pressure to dry the device.
- ☞ To prevent looseness caused by vibration of the device, please place the device in the box when the device is not in use.
- ☞ The device should be put in a clean environment which must be away from fire sources.
- ☞ Please check if the device has been damaged before using.
- ☞ The battery specification is 3.7V, 3400mAh and Panasonic 3400mAh battery is recommended. If the user uses other batteries.

Contraindication

It is not clear that if the device will cause serious light radiation to the patient. But it is suggested to adjust the illumination level to the lowest level which suits the patient. The risk to infant, aphasic patient will increase. Please don't test the patient repeatedly during 24 hours with this device.

Graphic, symbol and warning signs on the product

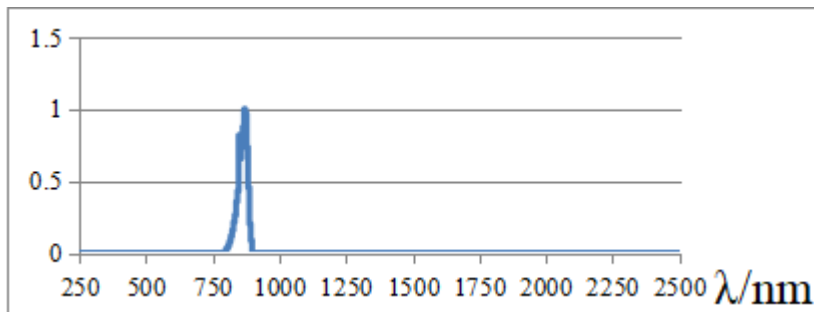
No.	Mark	Schematic Description
1		Date of manufacture
2		Manufacturer information
3		Reference instructions
4		WEEE, please dispose of the waste generated by the machine in accordance with relevant laws and regulations
5		CE Mark

6		Power switch
7		Authorized Representative in the European Community
8		USA Federal law restricts this device to sale by or on the order of a physician
9	PN:	Part Number
10	SN:	Serial Number
11		TYPE B

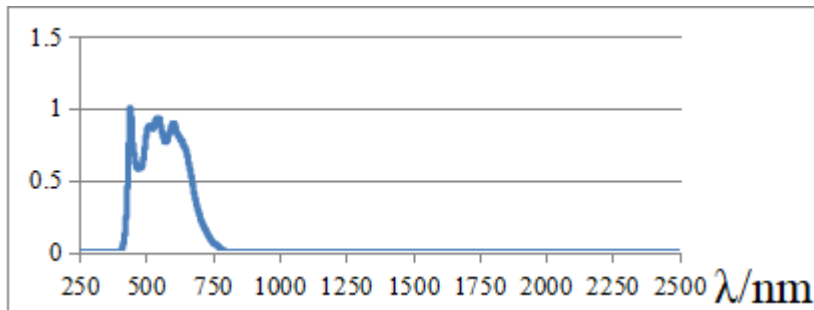
Product main safety features

- a) Device type classification: working mode: internal power supply device; charging mode: class II device;
- b) Classification according to the degree of protection against electric shock: Type B;
- c) According to the degree of protection against harmful liquid: IPX0;
- d) Classification according to the degree of safety when using flammable anesthetic gas mixed with air or flammable anesthetic gas mixed with oxygen or nitrogen oxide: not applicable, not used in the environment;
- e) Classification by operating mode: continuous operation;
- f) The spectrometer of the device is as follows:

Near-infrared Spectrum



Shooting Spectrum



■ EMC (Electromagnetic Compatibility)


HFC-009 PLUS Hand-held fundus camera (hereinafter referred HFC-009 PLUS to as complies with the International Electro technical Commission standards (IEC 60601-1-2) for electromagnetic compatibility as listed in the tables below. Follow the guidance in the tables for use of the HFC-009 PLUS in an electromagnetic environment.

Guidance and manufacturer's declaration electromagnetic emissions		
The HFC-009 PLUS is intended for use in the electromagnetic environment specified below. The customer or the user of the HFC-009 PLUS should assure that it is used in such an environment.		
Emissions test	Compliance level	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The HFC-009 PLUS uses RF energy only for its internal function. Therefore, the RF emissions are extremely low and not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The HFC-009 PLUS is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	N/A	
Voltage fluctuations/ Flicker emissions IEC 61000-3-3	N/A	

Guidance and manufacturer's declaration electromagnetic immunity			
The HFC-009 PLUS is intended for use in the electromagnetic environment specified below. The customer or the user of the HFC-009 PLUS should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floor should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/ burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV	±2 kV for power supply lines ±1 kV	Mains power quality should be that of a typical commercial or hospital environment.

	for input/ output lines	for input/output lines	
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage, dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U _T (>95% dip in U _T) for 0.5 cycle 40% U _T (60% dip in U _T) for 5 cycles 70% U _T (30% dip in U _T) for 25 cycles < 5% U _T (> 95% dip in U _T) for 5 sec	<5% U _T (>95% dip in U _T) for 0.5 cycle 40% U _T (60% dip in U _T) for 5 cycles 70% U _T (30% dip in U _T) for 25 cycles < 5% U _T (> 95% dip in U _T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the HFC-009 PLUS requires continued operation during power mains interruptions, it is recommended that the HFC-009 PLUS be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U _T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration electromagnetic immunity			
The HFC-009 PLUS is intended for use in the electromagnetic environment specified below. The customer or the user of the HFC-009 PLUS should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms (V1=3)	Portable and mobile RF communications equipment should be used no closer to any part of the HFC-009 PLUS, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2\sqrt{P}$ 150 kHz to 80 MHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m (E1=3)	$d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).

			<p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey^a should be less than the compliance level in each frequency range^b.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
--	--	--	---

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

a: Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the HFC-009 PLUS is used exceeds the applicable RF compliance level above, HFC-009 PLUS should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the HFC-009 PLUS.

b: Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the HFC-009 PLUS			
The HFC-009 PLUS is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the HFC-009 PLUS can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the HFC-009 PLUS as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter/m		
	150 kHz to 80 MHz $d=1.2\sqrt{P}$	80 MHz to 800 MHz $d=1.2\sqrt{P}$	800 MHz to 2.5 GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation			

distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

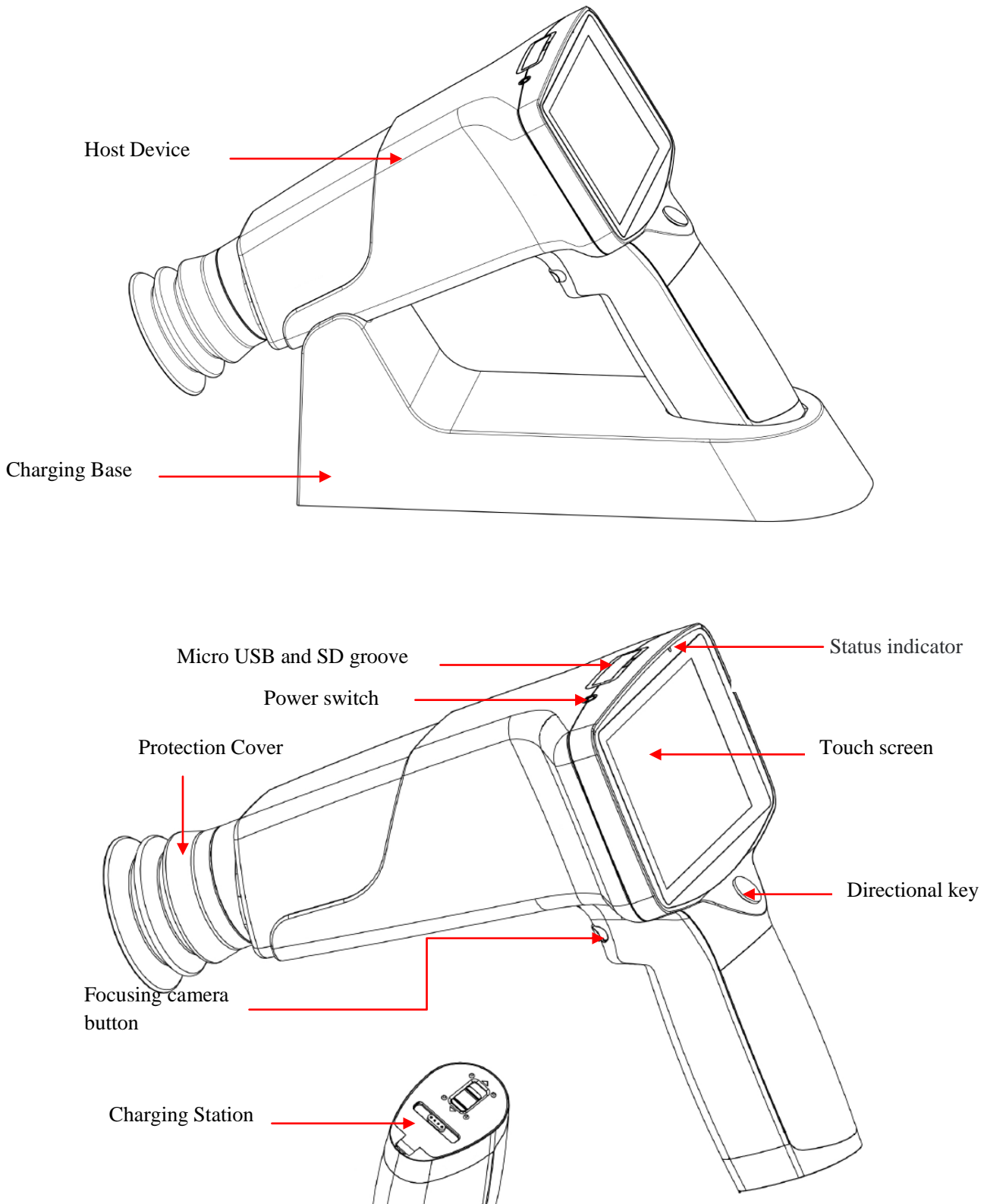
1 Installation

1.1 Product List

Before you start using it, check that all of the following items are included in the product packaging. If there is any missing, please contact us.

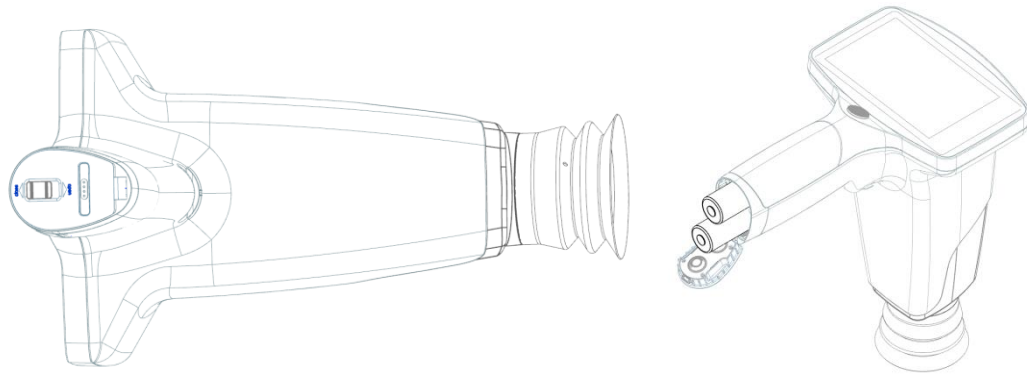
No.	Part Name	Quantity
1	HFC-009 Hand-held Fundus Camera	1
2	Charging Station	1
3	Power Adaptor	1
4	USB Cable	1
5	Protection Cover	1
6	Dust Cover	1
7	32 GB Micro SD Card	1

1.2 Product Composition



1.3 Installation of Battery

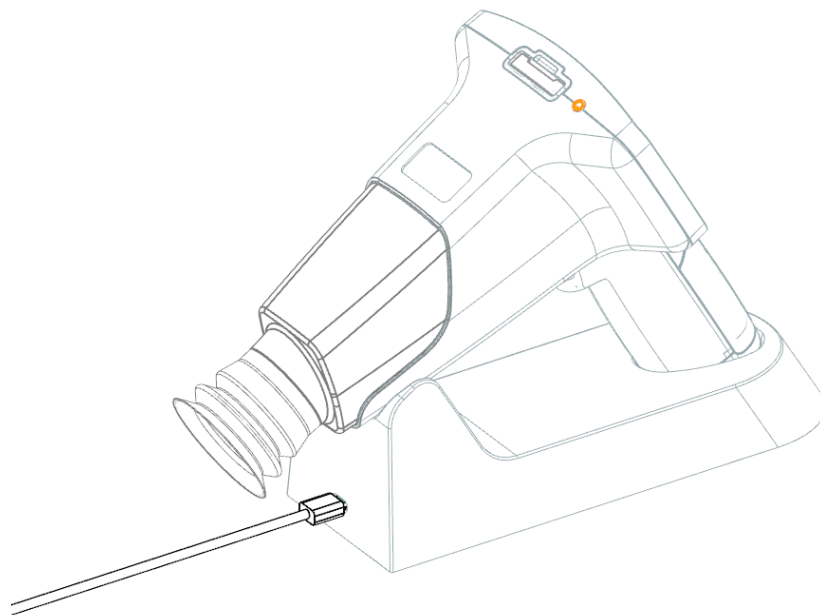
Open the battery compartment and insert the battery. Note that the two batteries are in the same direction. The + poles of the two batteries face the battery cover as shown in the figure below. If the direction is reversed, it will result in an inability to turn on the device.



Battery installation diagram

1.4 Charging Mode Indication

Place the device on the charging station and connect the charging station with power by source. Insert the USB cable into the interface of the charging station. Plug the other end of the USB cable into the power adapter and plug the adapter into the power outlet. Fundus camera automatically enters charging state.

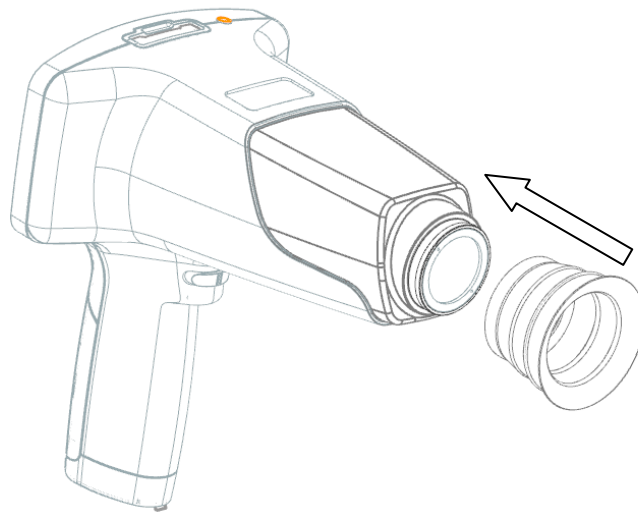


USB interface diagram charging mode indication

Power indication	Status
The blue light is always on.	The device is working, standby, or the battery is fully charged.
Flashing green light	The device charger is connected to the power source, but the battery is incorrectly installed.
Green light is always on	Device is charging.
No light	The device is off.

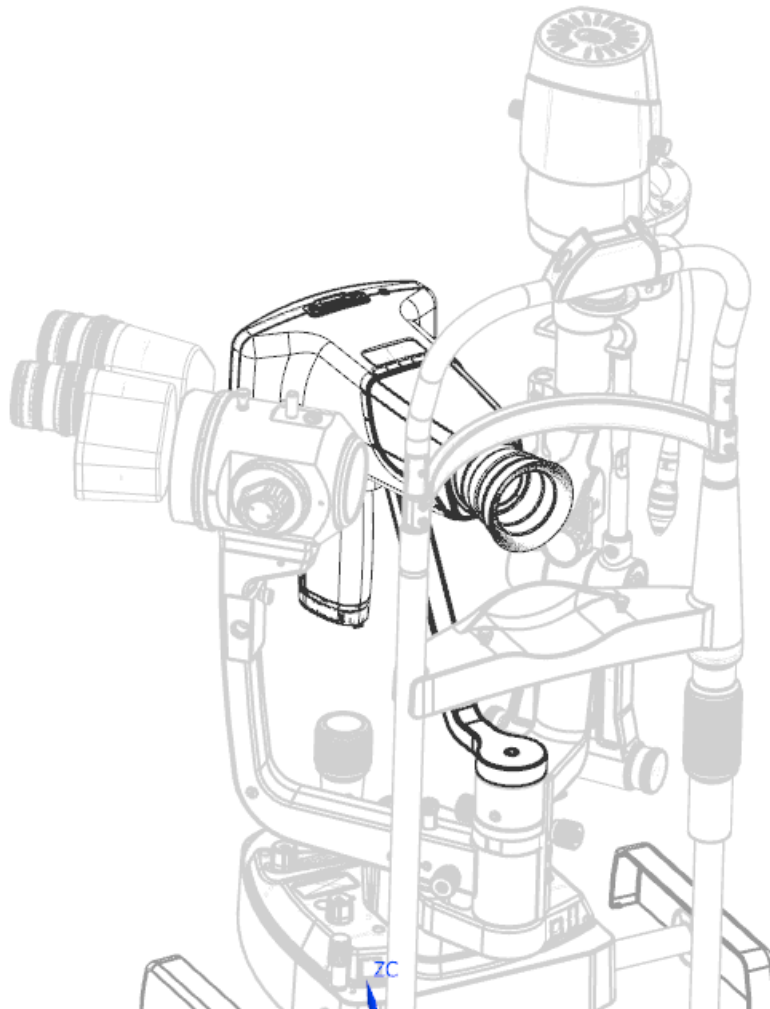
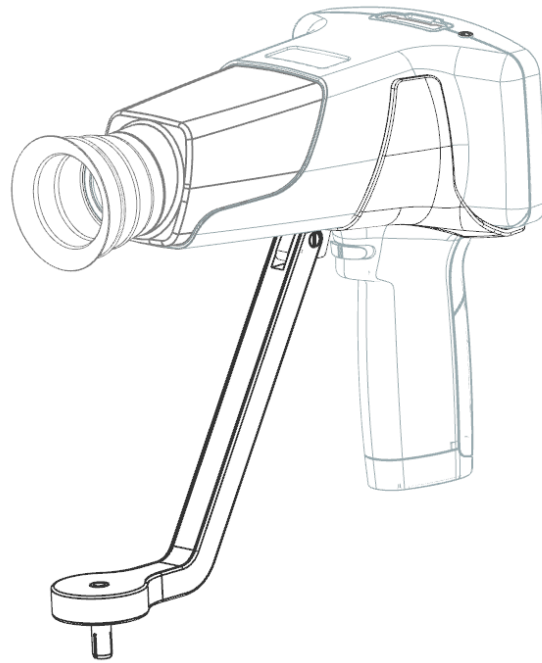
1.5 Installation of Protection Cover

Install the protection cover on the device as shown below.



1.6 Installation of Slit Lamp Attachment (Optional)

The HFC-009 PLUS hand-held fundus camera can be hanged on slit lamps with the slit lamp attachment, as shown below.



1.7 Operation Procedures

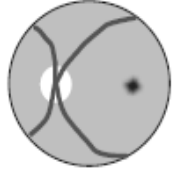
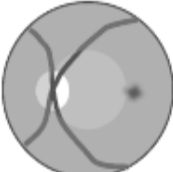
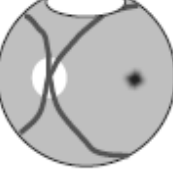

Step 1: Hold the device between thumb and index finger of one hand.


Step 2: Fix the fingers on patient's forehead and keep the Lens in horizontal level as showed below.



Step 3: Carefully move the device back and forth until the whole fundus is displayed on the screen.

There might be several situations happening during the process as showed in the table below:

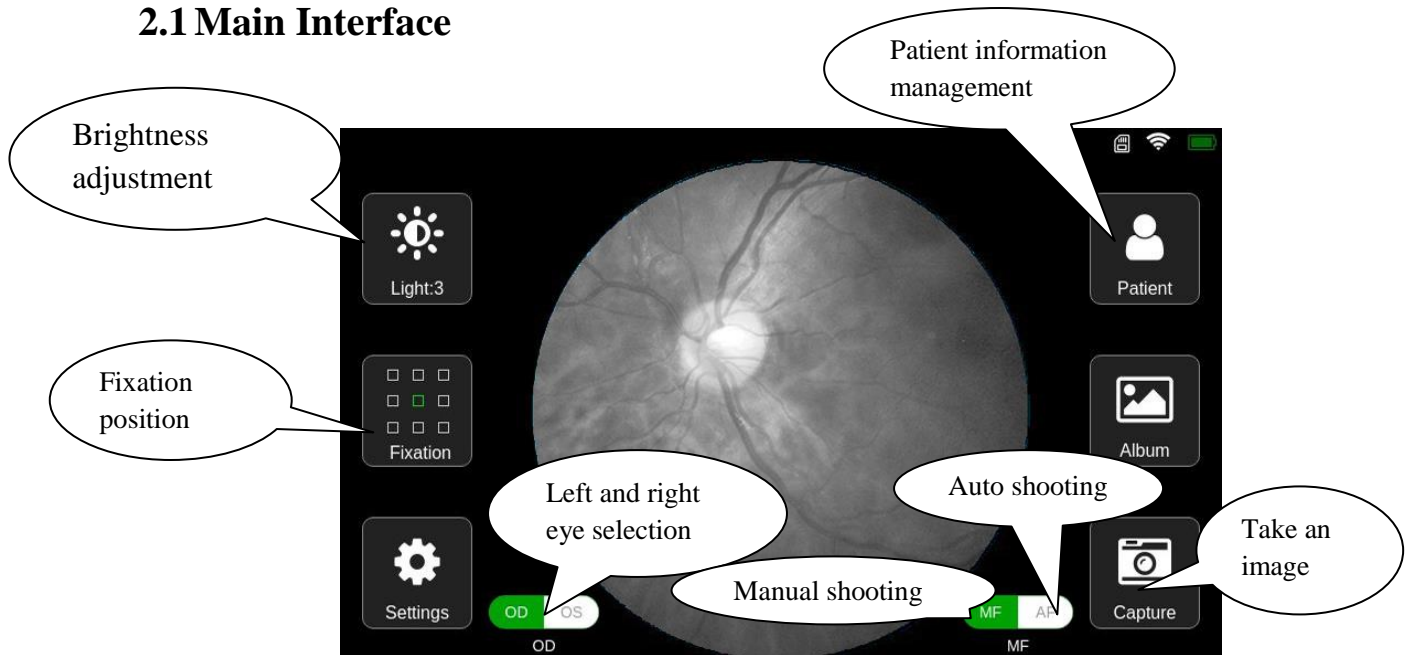
Infrared display image	Cause	Schematic
The image brightness is even and full of pupil	Normal images.	
The retina image is small and does not fill the screen	The lens is too far from the eye being checked.	
There is large white reflections spot on the top of the image	The lens is too close to the eye.	
There is dark shadow on the top of the image	The lens is above the visual axis.	

There is dark shadow on the bottom of the image	The lens is below the visual axis.	
---	------------------------------------	---

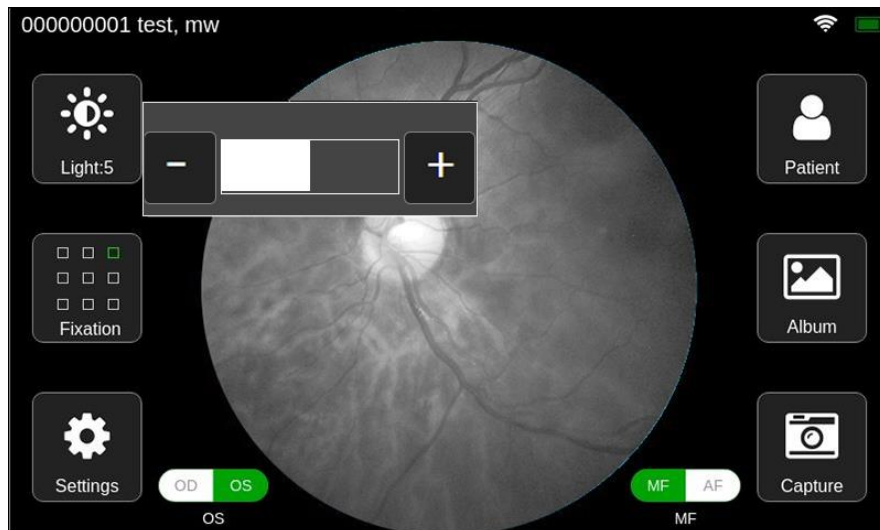
Step 4: Rotate the focus dial to the left or right to observe the blood vessels near the optic disc. After the infrared image is clear, press the camera button to obtain a clear fundus image.

2 Operation Interface Introduction

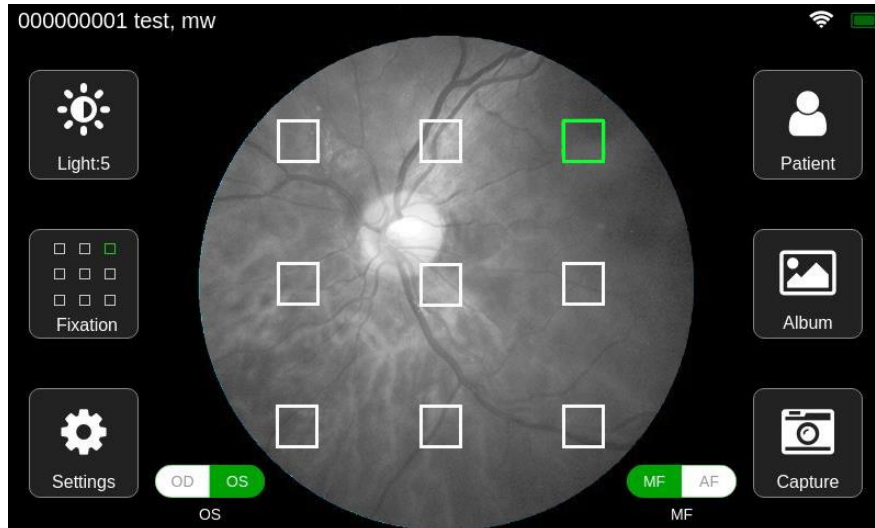
2.1 Main Interface



1. Brightness adjustment: Click the [Light] button, and the images brightness setting scroll bar appears on the interface as shown below:



- Adjust the sensor gain by click the button '+' and '-'.
 - After completing the settings, click on the non-scroll bar area and the scroll bar will hide.
2. Fixation position: Click the [Fixation] button to display the fixation targets setting box, as shown below.

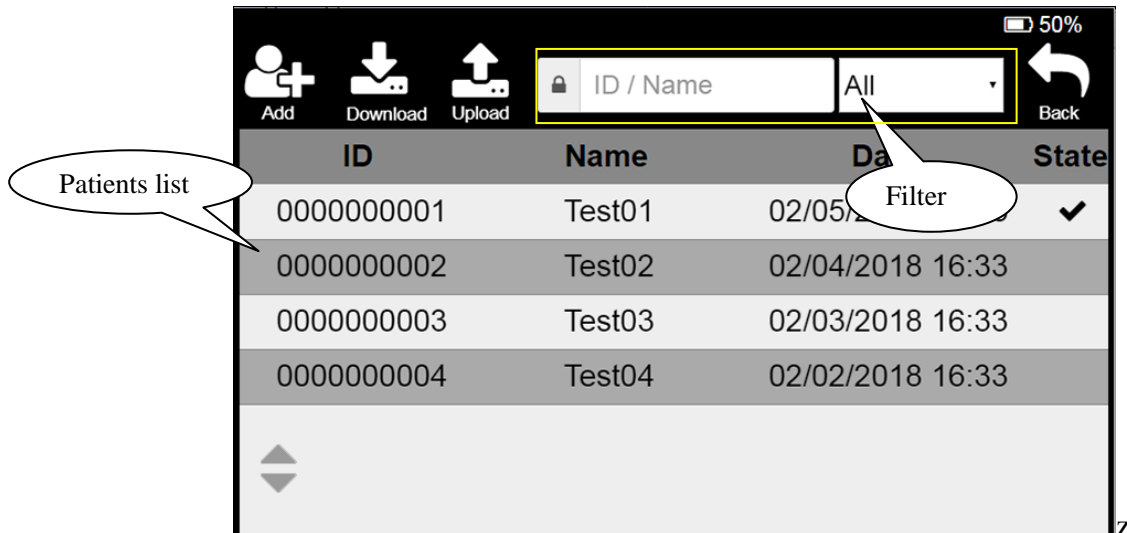


- Click any square box to select the location of the fixation target. After clicking, the selection box will disappear automatically.
 - Click on the non-selection area to discard this setting and the selection box will disappear.
3. System Settings: Click the [Settings] button to enter the system setting interface (for details, please refer to Section 2.6 of this chapter).
 4. Patient Information Management: Click the [Patient] button to enter the patient information management interface (for details, please refer to Section 2.2 of this chapter).
 5. Album management: Click the [Album] button to enter the album interface (for details, please refer to section 2.4 of this chapter).
 6. Obtain pictures: Align the lens with patient's eye, let the patient stare at the internal fixation targets, adjust the camera's focal length to the appropriate position, and click the [Capture] button or the device's physical camera button to take the photo.
 7. Left and right eye selection: Click the [OD/OS] selection button to select the left or right eye.
 8. Auto shooting: Click the [AF] switch to turn on the AF mode. After aligning the eyes, the device will automatically focus to take best pictures.
 9. Manual shooting: Click the [MF/AF] switch to turn on the MF mode. After aligning the eyes, manually adjust the focusing button until the image is clear by observing the sharpness of the preview image. Click the [Capture] button or the device's physical camera button to take the photo.

Note: Both the [album] and [capture] functions need to be operated after selecting or creating new patient information.

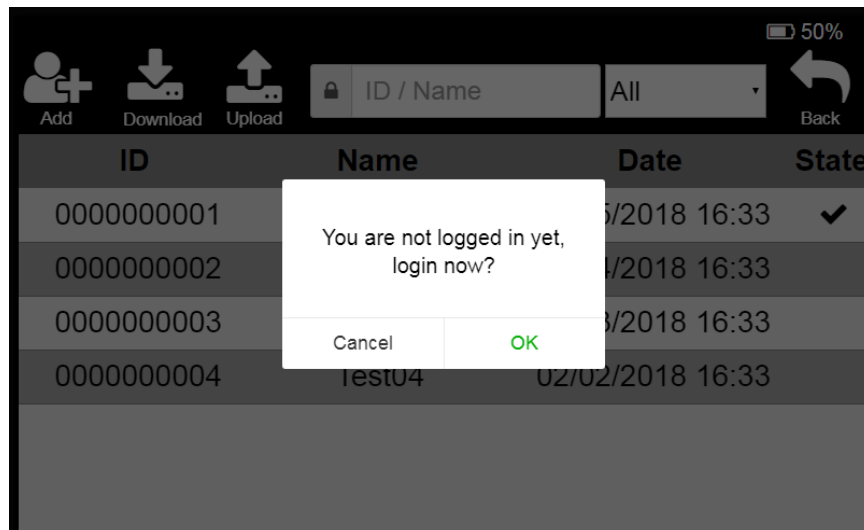
2.2 Patient Information Management Interface

Click the [Patient] button in the main interface to enter the patient information management interface, as shown below.

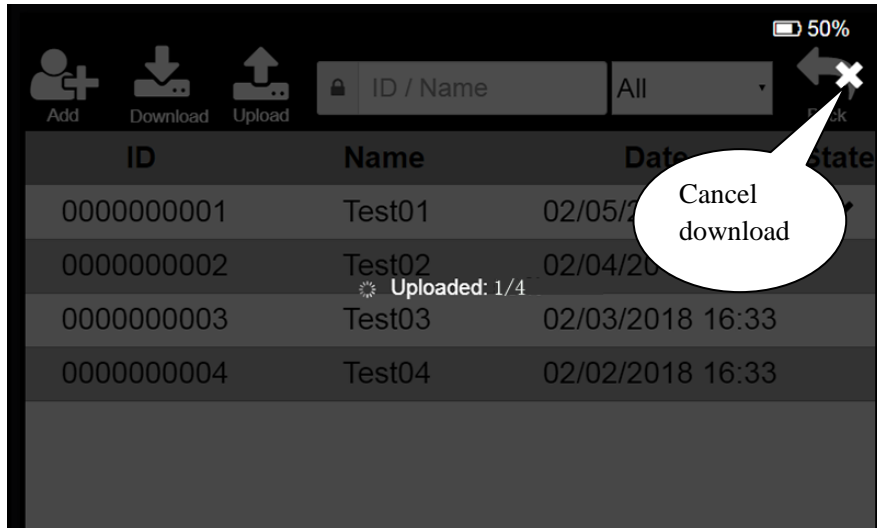


1. Add: Click on the [Add] button or any item in the patients list to enter the patient information editing interface for patient information addition (see section 2.3 of this chapter for specific operations).
2. Download: This operation downloads the test records that have been created in the Mediview software, which is convenient for users to create test records in batches.

- Click the [Download] button. If the server is not successfully logged in, a login prompt box will pop up, as shown in the figure below. Click the [OK] button in the prompt box to enter the login interface (for details, please refer to Section 2.6.3 of this chapter). If you abandon the download operation, click the [Cancel] button.



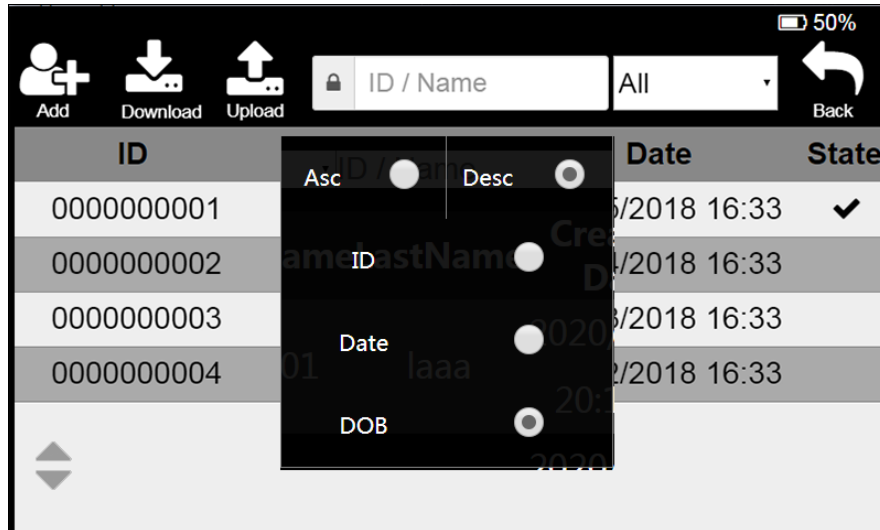
- If you have successfully logged in to the server, click [Download] and you will automatically download the patient information that has been created in the Mediview software, that contains the HFC-009 PLUS medical record to be tested, and pop up the download progress prompt, as shown below.



- The patients list is automatically updated when the download is complete.
 - If the user wants to stop downloading during the download process, click the [X] button in the upper right corner of the interface.
3. Patient information filter: The filter condition includes ID, name and test status. After entering the patient information and test status to be filtered, the patient information lists will be updated to the patient information who meet the filter condition.
 4. Operation of patients list: Operations include selecting all, deleting, and uploading.
 - Long press any item in the patients list, the operation button area and check box will appear on the interface, as shown below:



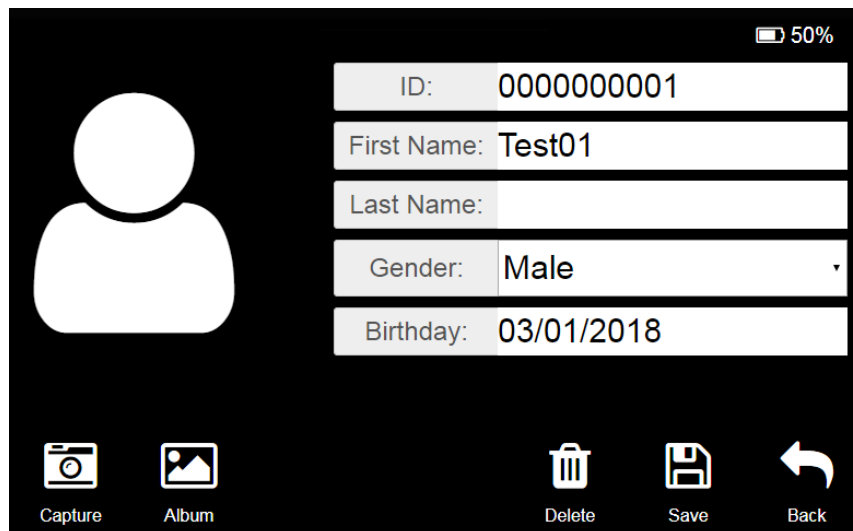
- After the checkbox appears, click any item to select or deselect.
 - Click the [Select all] button to select all patients in the list.
 - Click the [Delete] button to delete all selected patient information.
 - Click the [Upload] button to upload all the patient information that has been tested in the selected patient information and all un-uploaded pictures of this patient information.
 - Click the [Cancel] button and the operation button area and checkbox will be hidden.
5. Patient record sorting.



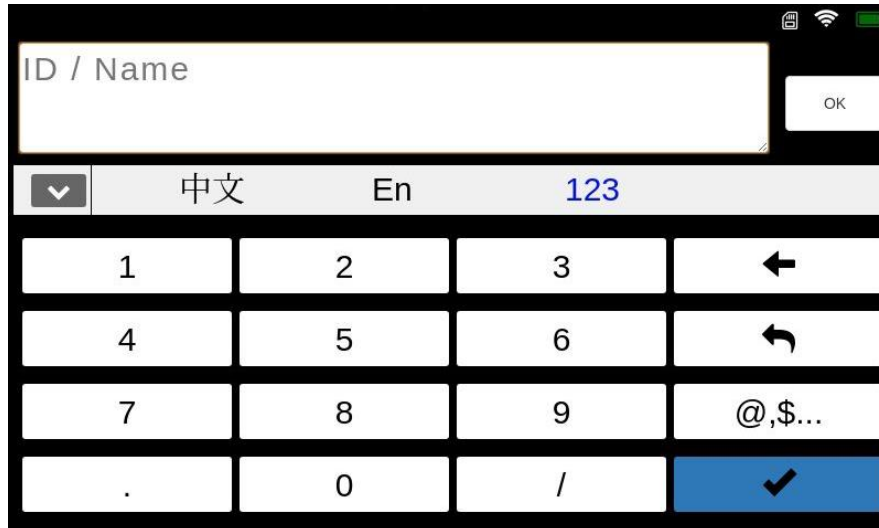
Patient record sorting can be displayed in ascending or descending order according to ID, creation date or date of birth.

2.3 Patient Information Editing Interface

Click the [Add] button in the ‘Patient Information Management’ interface or any item in the patients list to enter the ‘Patient Information Edit’ interface, as shown below.



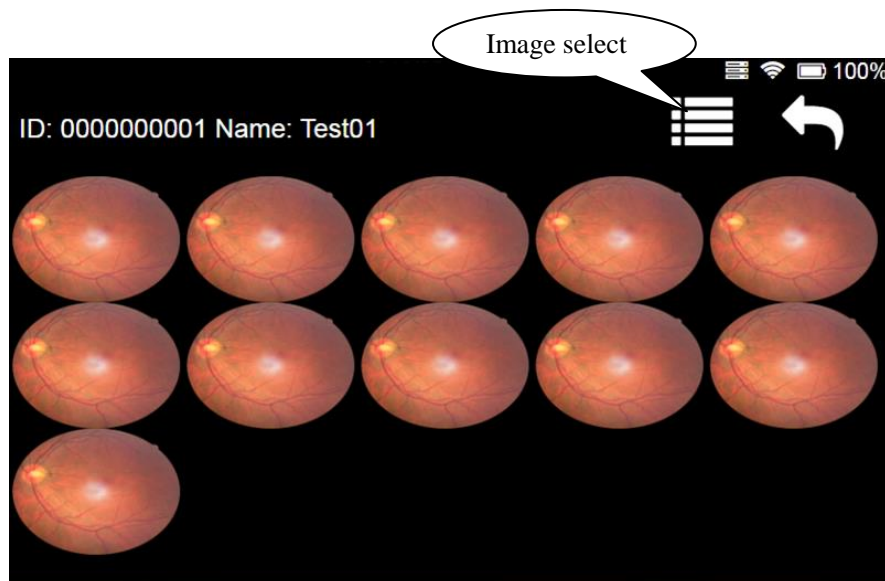
ID or name: Click the ID or name input box to pop up the ‘keyboard’, as shown below. After entering the correct information, click the [✓] button to return to the ‘Patient Information Editing ’interface.



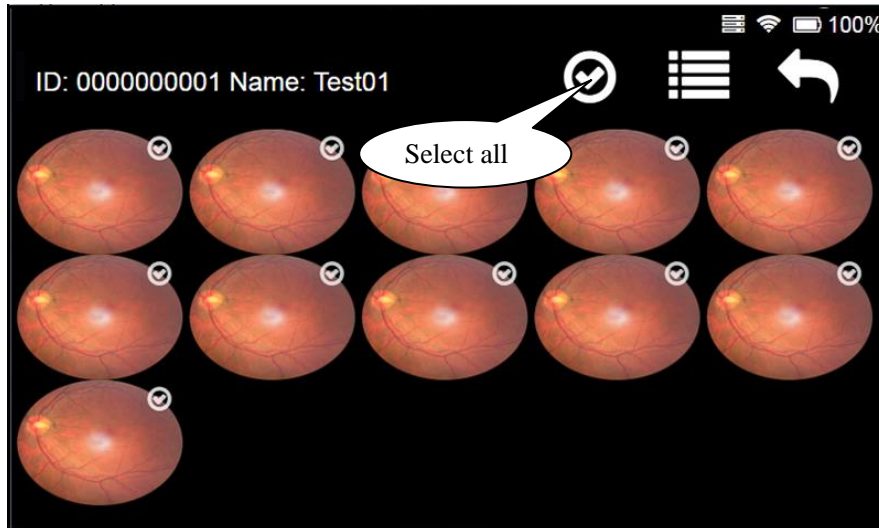
1. Gender: Click on the gender drop-down list and select gender.
2. Birthday: Click the birthday input box to pop up the birthday selection box. After selecting the birthday, click 'OK' on the left to complete the selection.

2.4 Album Management Interface

The album management interface is as shown below.



1. View image details: Click any image to view the larger image (see section 2.5 of this chapter for details).
2. Image Delete: This function is used to delete one or more images.
 - Click the [Image Select] button or long press on an image, the check box appears in the interface, as shown below.

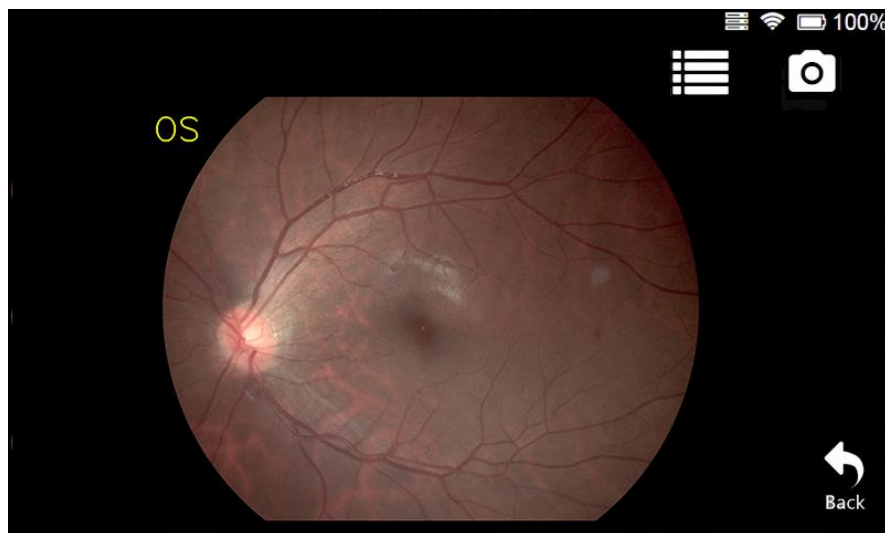


- Select one or several images (click [Select All], select all images, and click again to cancel all selection), the [delete] button will appear at the top of the interface.
- Click the [Delete] button and click OK in the confirmation prompt box that pops up to delete the selected image.
- If the user needs to cancel the selection, click the [Image select] button again.

Note: The above images are for reference only, not actual pictures.

2.5 Large Image Viewing Interface

The large image viewing interface is shown below:

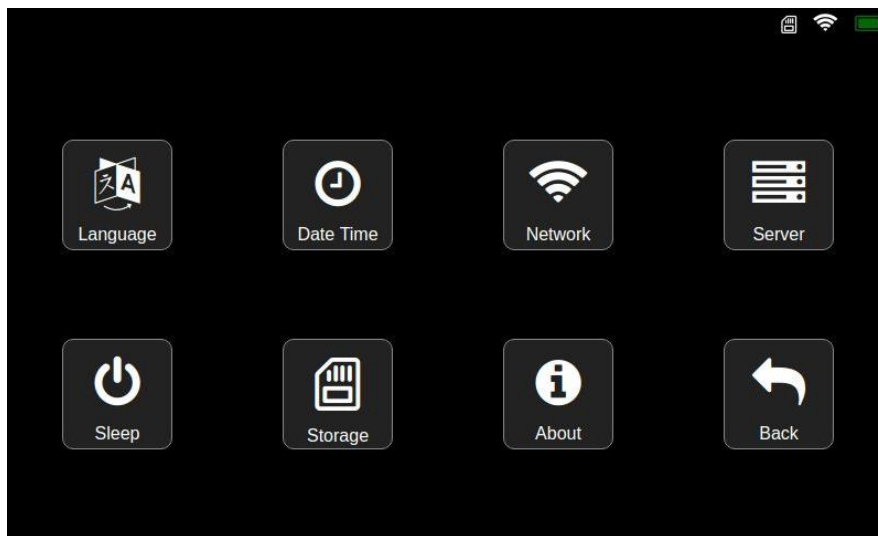


1. Image deletion: Click the [Delete] button and click OK in the confirmation dialog box that pops up to delete the image.
2. Return to shooting: Click the [Capture] button to enter the shooting interface.
3. Return to the album: Click the [Back] button to return to the album interface.
4. Image expansion: Double-click the image or double-finger to hold the image and zoom in and out.

2.6 Setting Interface

The setting interface mainly includes [Language] and [Date & Time], [Network], [Server], [Sleep],

[Storage] and [About], as shown in the following figure:



2.6.1 Language Settings

Click the [Language] button in the setting interface to enter the language and date format setting interface. The language includes both Chinese and English languages, as shown in the figure below:



- Slide the language scroll bar to select the language.
- Slide the date format scroll bar to select the date format.
- Click the [OK] button to save the settings.
- Click the [Back] button to discard this setting and return to the settings interface.

2.6.2 Date Time Setting

Click the [Date Time] button in the setting interface to enter the system time setting interface, as shown in the figure below:

Cancel					OK				
2016		16	00	22					
2017		17	01	23					
2018		18	02	24					
2019	01	19	03	25					
2020	02	20	04	26					
2021	03	21	05	27					
2022	04	22	06	28					

- Swipe up and down in the system time selection box to select the time to be modified.
- Click the [OK] button to complete the time selection.
- Click the [Cancel] button to discard this setting and return to the settings interface.

2.6.3 Server Login

Click the [Server] button in the setting interface to enter the server login interface, as shown below.

The login operation needs to be performed under the condition that the WIFI connection is successful.

The screenshot shows a 'Login' screen with the following fields and values:

username:	Admin
password:	
ip:	127.0.0.1
port:	8080
Upload Type:	Manual
	New Photo

At the bottom, there are two buttons: 'OK' (with a checkmark icon) and 'Back' (with a curved arrow icon).

- Enter the correct login information in the login information input box.
- Username and password: The username and password must be the same as the username and password created on the Mediview server.
- IP: The user must know the IP address and port of the server. If the server is in the LAN, the IP address is the IP address of the computer where the server is located. If the server is on the Internet, you need to add the corresponding IP address.
 - WiFi: check the IP address of the WiFi connected to the computer.
 - USB : Ceck the ethernet ip address (192.168.2.XXX) on the computer, where XXX is automatically assigned by the computer, such as (192.168.2.11).
- Port: The server port defaults to 8080. If the server modifies this port, you must fill in the modified port number.

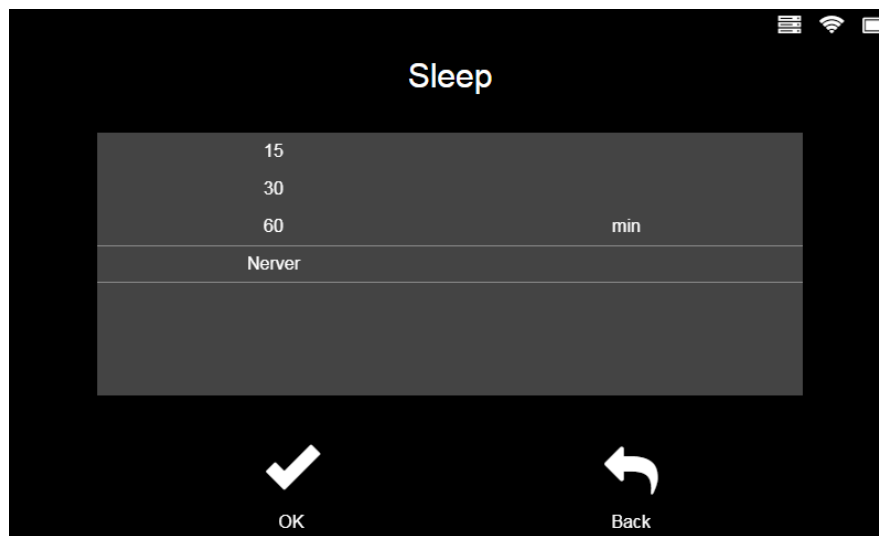
- Auto: select auto upload mode from the drop-down list.
 1. New Photo: After logging in successfully, only the new photo will be uploaded to the server.
 2. All: After successful login, all the photos not uploaded on the device will be uploaded to the server.
- Manual: Select the manual upload mode from the drop-down list. After logging in, select the patients to be uploaded from the patient list and upload them to the server.

During uploading photo, the title bar at the top of the interface will display the upload progress and speed of each photo.

- After completing the above process, click the [OK] button to log in. After successful login, it will automatically return to the previous interface, and the ‘Logged In’ icon will appear at the top of the interface. “Login failed” prompt is displayed after login failure.

2.6.4 ‘Sleep’ Mode Setting

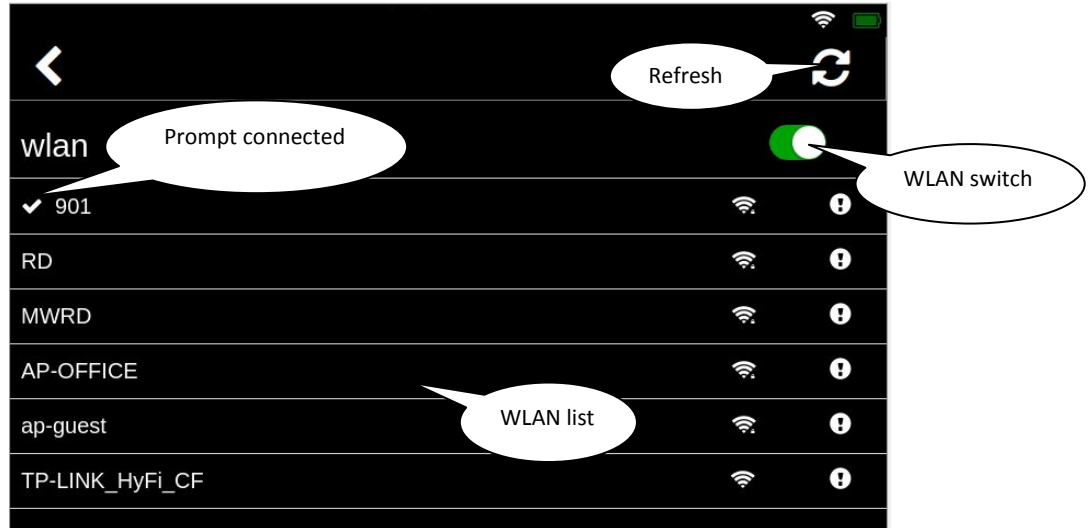
Click the [Sleep] button in the setting interface to enter the standby time setting interface, as shown in the figure below.



- Slide the standby time scroll bar to select the standby time.
- After completing the selection, click the [OK] button to complete the standby time setting and return to the setting interface.
- Click the [Back] button to discard this setting and return to the setting interface.

2.6.5 Network Setting

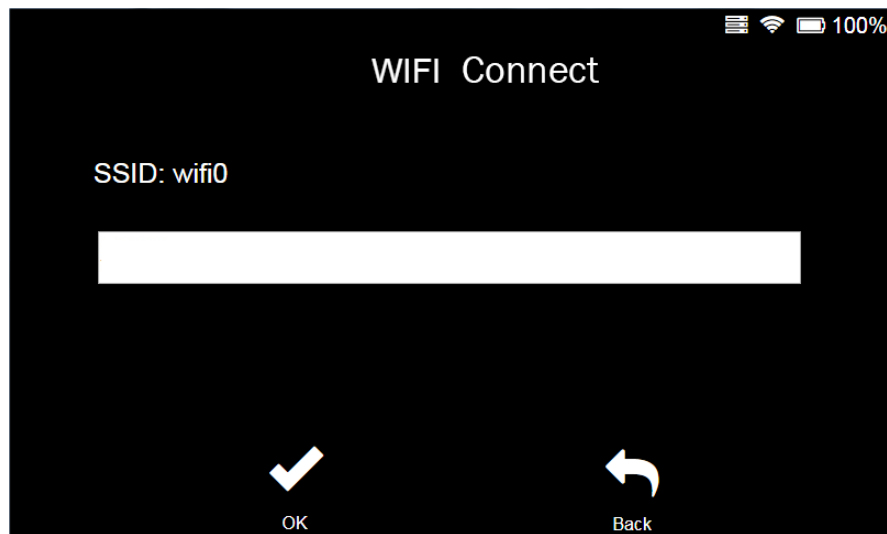
Click the [Network] button in the setting interface to enter the wireless LAN interface. The list shows all the wireless LANs that have been searched, as shown in the figure below:



- Click the [Refresh] button, the list will be refreshed, and the searched WLANs will be redisplayed.
- Click [WLAN Switch] to turn off or restart the WLAN function.
- Click [Back] icon to return to the setting interface.

2.6.6 WLAN Connection

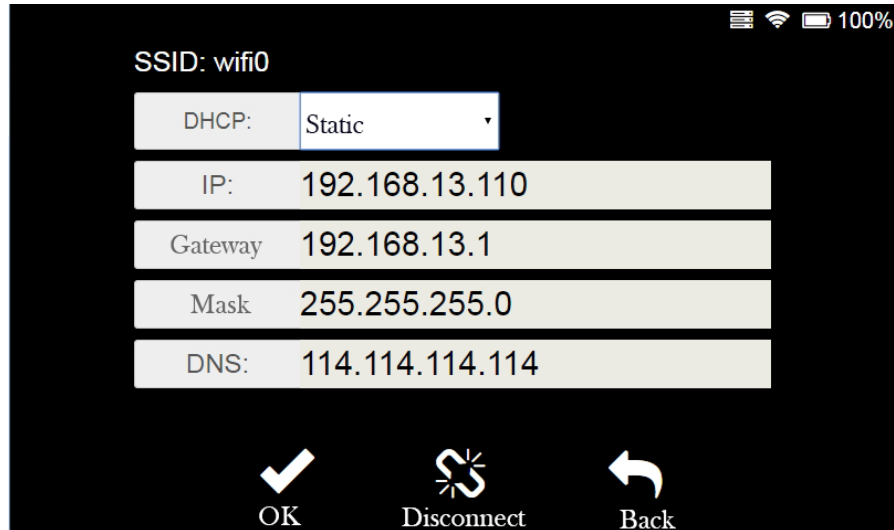
Click the WIFI to be connected in the WIFI list, enter the password input interface, as shown in the figure below.



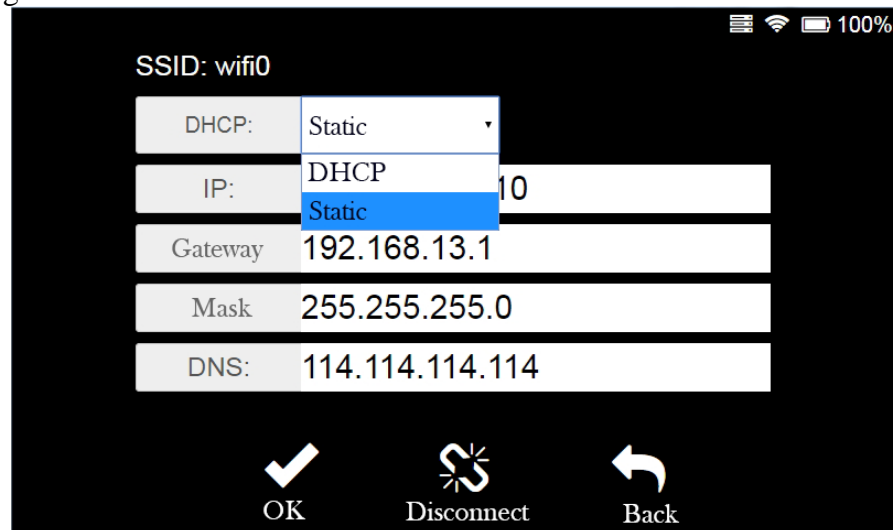
- Click the password input box to enter the password.
- After completing the input, click the [OK] button and wait for the connection.
- After the connection is successful, enter the WIFI list interface.
- Click the [Back] button to discard this connection.

2.6.7 WIFI Configuration

The WIFI configuration is mainly used for the configuration of the WIFI has been connected. Click the connected WIFI in the WIFI list to enter the WIFI settings interface, as shown below.



- Click the [Disconnect] button to disconnect the connected WIFI.
- Select [Static] in the DHCP drop-down list and the edit box will become editable, as shown in the figure below.



- Enter the correct configuration information in the “WIFI Configuration Input Area” and click the [OK] button to complete the configuration.
- Click the [Back] button to discard this modification and return to the WIFI list.

Note: 1. If WIFI has not set a password, click the WIFI and connect directly.

2. The input information in the figure is only an example and has nothing to do with the actual input.

2.6.8 About

Click the [About] button in the setting interface to enter the ‘about’ interface, as shown below.



- Click the [Back] button to return to the setting interface.

3 Cleaning, Maintenance and Protection

Cleaning, protection and maintenance in a correct and regular way can help extend the life of hand-held fundus camera. The maintenance period of the hand-held fundus camera is 3 months. Maintenance should be performed every 3 months.

Hand-held fundus cameras are precise optical devices, so be sure to handle them gently.

3.1 Cleaning

1. Cleaning the outer surface of the lens: If the outer surface of the lens is exposed to the air or in a non-clean environment for a long time, and the surface of the lens is dusty, gently wipe it with soft cotton moistened with anhydrous alcohol, or use a special lens cleaner and cleaning cloth to clean it.

Note: When the device is not in use, please cover the lens cap to prevent dust on the lens surface.

2. Clean the screen: If dust sticks to the screen, gently wipe it with soft cotton moistened with anhydrous alcohol, or use a special screen cleaner and cleaning cloth to clean it.

Note: Do not wipe with hard objects.

3. Clean plastic parts: To clean plastic parts such as the main unit, use a soft cloth dipped in soluble detergent or water to clean the dirt, and then wipe it with medical alcohol.

Note: Do not use any abrasive cleaning agents to wipe, as it may damage the surface.

4. Clean the protection cover: The protection cover is a component that comes in frequent contact with the patient. Cleaning and disinfection should be performed before each patient is examined. Clean the dirt with a soft cloth dampened with a soluble cleaner or water, then wipe with medical alcohol.

Note: Since the protection cover is made of silicone, please do not wipe it with any corrosive cleaning agents or organic solvents, so as not to damage the protection cover.

3.2 Maintenance

The hand-held fundus camera should be used in a relatively clean environment. The main parts that need to be cleaned are described in Chapter 3.1. In order to ensure the normal use of the hand-held fundus camera, it is recommended to perform cleaning operations every 3 months. After cleaning, wait until the equipment is dry before using it.

Because the surface of the lens and reflector is coated with an antireflection coating and a reflective film, although the coating is strong enough, frequent wiping tends to cause damage to the film, which affects the optical effect of observation. This cycle is only a suggestion. If the lens has a

particularly large amount of dust that has affected the quality of observation, it is recommended to clean it immediately according to the prescribed method.

3.3 Protection

1. When the hand-held fundus camera is not in use, the lens cap should be covered, and the lens cap should be removed when in use.
2. After use, place the device in the carrying case to avoid bumps.

3.4 Battery Care

1. After the battery is fully charged, unplug the power cord to avoid overcharging or danger.
2. When the device is not used for a long time, the batteries should be removed and placed in the corresponding position in the carrying case.
3. When the device is not used for a long time, the batteries should be charged every 3 months.

3.5 Product Life Cycle

The life cycle of the hand-held fundus camera is 4 years. Since the date of delivery, Mercoframes., Ltd. provides 1 year warranty on the host and the standard SD card.

■ Troubleshooting

If a fault occurs, please check it according to the following table for guidance. If the fault is still not rectified, please contact mercoframes.

Fault	Possible Cause	Solution
It will be dark after booting	The battery is exhausted	Fully charge the battery before use
Cannot turn on the device	Battery reverse	Install the battery correctly according to the instructions

■ Exceptions

1. Mercoframes., Ltd. is not responsible for damage caused by fire, earthquake, third party behavior, other accidents, and carelessness of the user, misuse, or use under abnormal conditions.
2. Mercoframes, Ltd. is not responsible for the deficit, bankrupt,

and any loss due to unable to use this device.

3. Mercoframes., Ltd. is not liable for any damage to the operation not described in the instruction.

4. Diagnosis is the responsibility of the doctors, and Mercoframes. is not responsible for the results of those diagnoses.

5. The hand-held fundus camera provides about 10G of space for data storage. Please back up the data in time. Mercoframes., Ltd. is not responsible for the personal data stored in the product.

6. The SD card is used as a storage medium, please back up the data in time.

Mercoframes will not be responsible for the SD card data security and data damage, as well as data loss due to SD card damage.

When you contact us, please tell us the following information:

Model:	HFC-009 PLUS
Serial Number:	See it on the product nameplate.
Date of purchase:	Please tell us the date you purchased the device.
Fault:	Please tell us as much as possible about the fault.

Version1.0

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