

About This Manual

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Product Model: HD-500, HD-500S, HD-330Plus

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- the electrical installation of the relevant room complies with the applicable national and local requirements; and
- the product is used in accordance with the instructions for use.

Signal Words

Signal words in this manual are defined as follows. Please understand their meanings clearly before reading this manual.

Signal Word	Meaning
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in malfunction or damage of the device.
NOTE	Indicates precautions or recommendations that should be used in operating the device.
Boldfaced Word	Indicates keys and controls located on the product.

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Contents

Chapter 1 Safety	1
1.1 Intended Use	2
1.2 Device Compatibility.....	2
1.3 Safety Precautions.....	2
1.4 Safety Symbols	3
Chapter 2 Overview	5
2.1 System Configuration	6
2.1.1 System Composition	6
2.1.2 Accessory List.....	6
2.2 Part Introduction	6
2.2.1 Front Panel.....	6
2.2.2 Rear Panel	8
2.2.3 Side Panel	9
2.2.4 Keyboard.....	10
2.2.5 Endoscope Cable.....	12
Chapter 3 Preparations	13
3.1 Placing the Device	14
3.2 Installing Accessories	15
3.2.1 Installing Endoscope Cable Holder	15
3.2.2 Installing White Balance Cap Holder	16
3.3 Connecting the System	17
3.3.1 Connecting Light Source	17
3.3.2 Connecting Monitor.....	18
3.3.3 Connecting Keyboard	19
3.3.4 Connecting Endoscope	19
3.3.5 Connecting Footswitch	21
3.3.6 Connecting Video Printer.....	21
3.3.7 Connecting the Network Device.....	22
3.3.8 Connecting Power Supply	22
3.4 Inspecting the Device.....	22
3.4.1 Inspecting Connection	22

3.4.2 Inspecting Power Supply	22
3.4.3 Inspecting Illumination	23
3.4.4 Inspecting Image	23
3.4.5 Inspecting Freezing Feature	24
Chapter 4 Operations	25
4.1 Powering on the Device	26
4.2 Setting User Information	26
4.3 Setting Work Mode	27
4.4 Creating/Editing/Retrieving Work Order Information	31
4.4.1 Creating a Work Order	31
4.4.2 Editing Work Order Information	33
4.4.3 Retrieving Work Order Information	33
4.4.4 Deleting Work Order(s)	33
4.5 Replacing the Endoscope	34
4.6 Adjusting White Balance	34
4.7 Optimizing the Image	35
4.7.1 Work Mode	35
4.7.2 Zoom	35
4.7.3 Color Enhancement	36
4.7.4 Image Enhancement	36
4.7.5 Contrast	36
4.7.6 Variable Intelligent Staining	36
4.8 Saving and Viewing Image/Video	36
4.8.1 Saving an Image	37
4.8.2 Saving a Video	38
4.8.3 Viewing a Video	38
4.9 Viewing Patient Record List	40
4.9.1 Searching for a Record	40
4.9.2 Viewing a Record	41
4.9.3 Backing up Data	42
4.9.4 Deleting Record(s)	42
4.10 Editing and Printing a Report	42
4.10.1 Adding a Body Mark	43
4.10.2 Glossary	44

4.10.3 Setting Report Template	46
4.10.4 Printing a Report	47
4.11 Powering off the Device	47
Chapter 5 Settings.....	49
5.1 Customizing the System	50
5.1.1 Video Parameter Settings.....	50
5.1.2 General Settings.....	51
5.1.3 Contextual Model Settings.....	53
5.2 Resetting the System.....	54
Chapter 6 Maintenance and Storage	55
6.1 Cleaning the Device.....	56
6.2 Replacing the Fuse.....	56
6.3 Storing the Device	57
6.4 Troubleshooting	57
6.5 Device Disposal	58
6.6 Customer Service.....	59
Appendix A Specifications.....	61
Appendix B EMC Guidance and Manufacturer’s Declaration	63
B. 1 Electromagnetic Emissions.....	63
B. 2 Electromagnetic Immunity.....	64
B. 3 Recommended Separation Distances between Portable and Mobile and RF Communications Equipment and the Equipment.....	66

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Chapter 1 Safety

This chapter describes important information for operating this device. To ensure the safety of both operator and patient, please read relevant details in this chapter carefully before use.

You should be completely familiar with the precautions provided in this manual. Otherwise, the manufacturer is not responsible for the effects on safety, reliability and performance of the device.

1.1 Intended Use

The device is intended to provide the image processing functions for endoscopic image in clinic.

It can be used with the endoscope manufactured or approved by the manufacturer and to provide power for endoscope.

NOTE:

- Do not use this device other than its intended use.
- The device should be used with BF-type endoscope.

1.2 Device Compatibility

The device can be used with EG-500/EC-500 series endoscope and HDL-550X/HDL-550E/HDL-550P light source provided by the manufacturer.

1.3 Safety Precautions

Read and understand all precautions in this manual before attempting to use the device. Keep this manual with the device at all times. Periodically review the procedures for operation and safety precautions.










WARNING










- Only the personnel authorized or trained by the manufacturer can maintain the device. Any unauthorized personnel should not assemble or disassemble the device.
- Do not operate this device in an atmosphere containing flammable gases such as anesthetic gases, hydrogen, or ethanol, because there is a danger of explosion.
- Do not use this device around strong electric field, electromagnetic field or any mobile wireless communication devices. Using the device in improper environment may result in malfunction or damage.
- Connect grounding terminal only before powering on the device. Disconnect the grounding cable only after powering off the device. Otherwise, there is a danger of electric shock.
- Ensure that the potential-equalization lead wire is connected before inserting device power plug.
- The AC power connector plug for the device is a three-prong grounded plug and should never be adapted to any two-prong outlet or by using an adapter.
- Select qualified multi-socket outlet with protective grounding, and ensure that its maximum output power exceeds the required one of this device.
- Multi-socket outlet can only be used to provide power to the recommended peripherals of this system.
- Do not place multi-socket outlet on the floor.
- Do not connect other devices to multi-socket outlet; otherwise, it may result in interference and overload.

- In the environment that patient is 1.8 meters (6 feet) around, connect peripherals to auxiliary power outlet which is capable of isolation protection, or power the peripherals by the auxiliary output cable or isolation transformer complied with IEC 60601-1-1 or the power input of the same safety level.
- Do not pour any fluid onto device surfaces, as fluid seepage into electrical circuitry may cause excessive leakage current or system failure. If carelessly pour any water onto the device, immediately stop using the device and contact the sales representative immediately.
- To avoid electrical shock and damage, power off and disconnect the device from the AC power outlet before cleaning.
- Accessory equipment connected to analog and digital interfaces must be certified according to the respective EN/IEC standards (for example, EN/IEC 60950 for data processing equipment and EN/IEC 60601-1 for medical equipment). Furthermore, all configurations shall comply with EN/IEC 60601-1.
- Only the peripherals (such as endoscope, light source, etc.) provided or recommended by the manufacturer can be used. Using other devices may increase RF radiation and degrade device performance of anti-electromagnetic interference.
- Only the accessories provided or approved by the manufacturer can be used. Using other accessories may damage the device and cannot achieve the expected performance described in this manual.
- The device should be maintained and stored as described in user manual after use. Improper maintenance and storage may cause cross infection, product damage or performance degradation.

1.4 Safety Symbols

The following table is provided for your identification of important symbols in labels on the device.

Symbol	Meaning
	Follow instructions for use
	Caution
	Date of manufacture
	Manufacturer
	Serial Number
	Non-ionizing electromagnetic radiation.
	Alternating current

Symbol	Meaning
	OFF (Main Power Source)
	ON (Main Power Source)
	Power on/Stand-by button
	This product is provided with a CE marking in accordance with the regulations stated in Council Directive 93/42/EEC.
	Authorized representative in the European community
	Type BF Applied Part
	Equipotentiality
	Fuse
	This symbol indicates that waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

Chapter 2 Overview

To ensure the performance and availability of the device, you should be completely familiar with the operations and functions of the device.

2.1 System Configuration

2.1.1 System Composition

The device consists of the following parts.

- Processing circuit
- Control circuit
- Power supply
- Electrical interface for endoscope

2.1.2 Accessory List

The accessory list of the device is as follows.

- Keyboard
- Power cable
- Endoscope cable
- RS232 Light control cable
- White balance cap
- White balance cap holder
- Others: See the Packing List in the packaging box.

2.2 Part Introduction

2.2.1 Front Panel

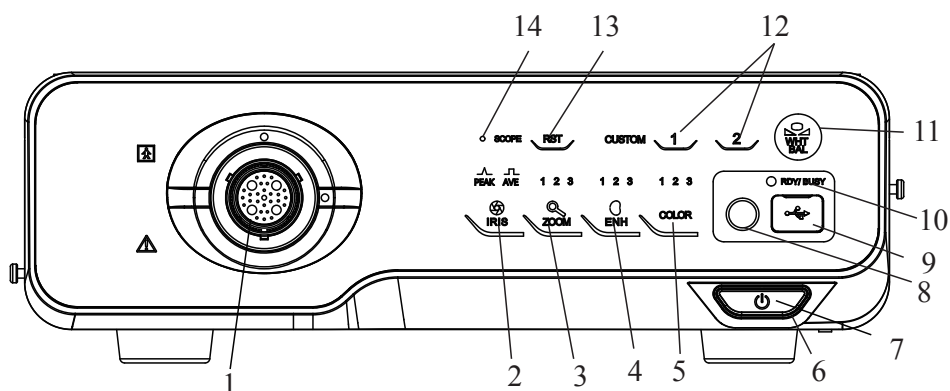





Figure 2-1 Front View

No.	Part Name	Descriptions
1	Connector port	Used for connecting the endoscope through endoscope cable.
2	IRIS button and indicator	Select PEAK, AVE or Auto photometry mode, and corresponding indicator illuminates. In auto photometry mode, PEAK and AVE illuminate together.
3	ZOOM button and indicator	Select magnification level 1, 2 or 3, and corresponding indicator illuminates.
4	ENH button and indicator	Select image enhancement level 1, 2 or 3, and corresponding indicator illuminates.
5	COLOR button and indicator	Select CHb color enhancement level 1, 2 or 3, and corresponding indicator illuminates.
6	Power indicator	Illuminates after the device is powered on.
7	 Power button	Press it to power on the device; press and hold it to power off the device.
8	 USB stop button	Used to stop the data transmission between USB drive and the device.
9	 USB port	Used for connecting to a USB drive to back up and load data.
10	RDY/BUSY indicator	Indicates the operating states of USB drive.
11	WHT BAL button	Used for adjusting white balance automatically.
12	CUSTOM button	Used for loading the settings of Custom1 or Custom2 .
13	RST button	Used for restoring the parameter settings of all public modes (Custom1-Custom10) to default settings.
14	SCOPE indicator	Indicates the state of the connection between endoscope and the device.

2.2.2 Rear Panel

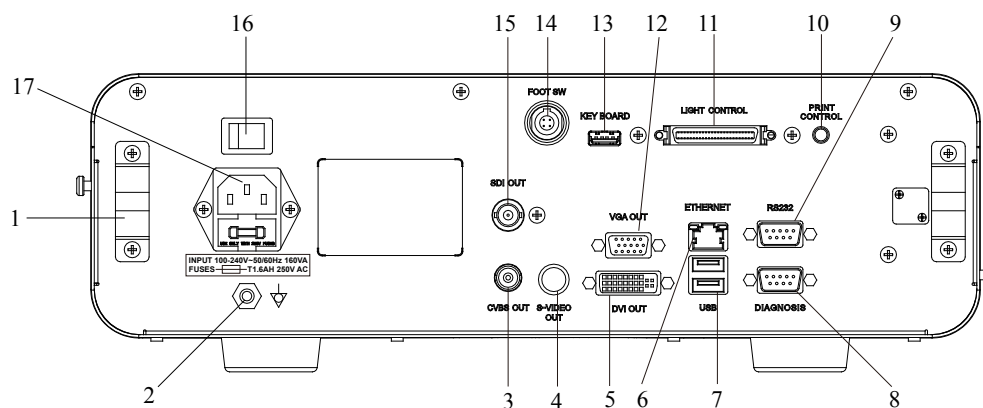


Figure 2-2 Rear View

No.	Part Name	Descriptions
1	Anti-collision plate	Used for protecting connection cables.
2	Equipotential terminal	Used for equipotential connection, balancing the protective earth potentials between the device and other electric equipment.
3	CVBS OUT port	Connected to CVBS port through a BNC video cable.
4	S-VIDEO OUT port	Uses S-video cable to output S-video signal.
5	DVI OUT port	Uses DVI cable to output DVI signal.
6	ETHERNET port	Used for connecting to DICOM server or network.
7	USB port	Used for connecting to a USB drive.
8	DIAGNOSIS port	Used for debugging the device only.
9	RS232 port	Used for debugging the device only.
10	PRINT CONTROL port	Used for connecting video printer.
11	LIGHT CONTROL port	Used for controlling signal transmission from light source.
12	VGA OUT port	Uses VGA cable to output VGA signal.
13	KEY BOARD port	Used for connecting keyboard.
14	FOOT SW port	Used for connecting footswitch.
15	SDI OUT port	Uses SDI cable to output SDI signal.
16	Main power switch	Used for powering on/off the device.
17	Power input port and fuse box	Used for connecting power cable. Two fuses are available inside the fuse box.

2.2.3 Side Panel

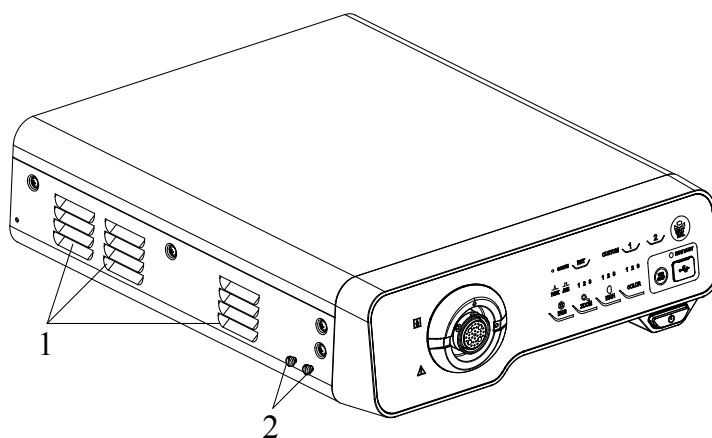


Figure 2-3 Left Side View

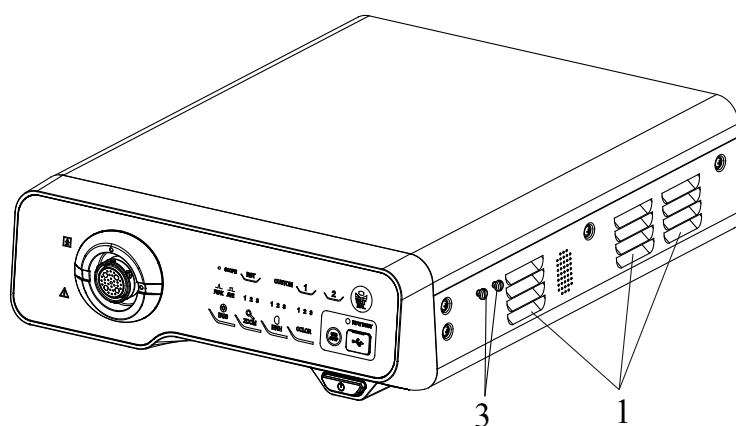


Figure 2-4 Right Side View

No.	Part Name	Descriptions
1	Ventilation port	Used for dissipating internal heat of the device.
2	Screws for endoscope cable holder	Used for hanging endoscope cable holder.
3	Screws for white balance cap holder	Used for hanging white balance cap holder.

2.2.4 Keyboard

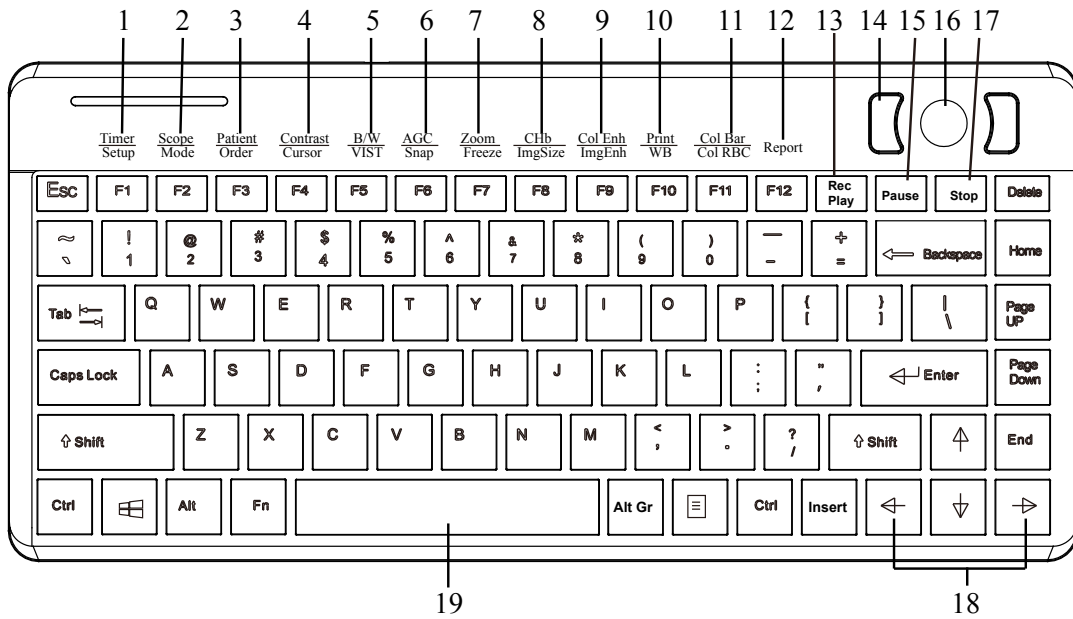


Figure 2-5 Keyboard

No.	Name	Descriptions
1	F1: Timer/Setup key	<ul style="list-style-type: none"> ■ Select it and Alt together to start the timer. After that, select the space key repeatedly to pause/continue time keeping or select Alt+F1 to terminate time keeping. ■ Select it to access the Set interface.
2	F2: Scope/Mode key	<ul style="list-style-type: none"> ■ Select it and Alt together to display the details of the endoscope. ■ Select it to enter the Mode Settings interface.
3	F3: Patient/Order key	<ul style="list-style-type: none"> ■ Select it and Alt together to enter the Record table interface. ■ Select it to enter the Order List interface.
4	F4: Contrast/Cursor key	<ul style="list-style-type: none"> ■ Select it and Alt together to adjust the image contrast. ■ Select it to display/hide the cursor.

No.	Name	Descriptions
5	F5: B/W/VIST key	Select it to enter or exit the variable intelligent staining mode.
6	F6: AGC/Snap key	<ul style="list-style-type: none"> ■ Select it and Alt together to enable/disable automatic gain control. ■ During examination, select it to capture and save endoscopic images in real time.
7	F7: Zoom/Freeze key	<ul style="list-style-type: none"> ■ Select it and Alt together to zoom in/out an image. ■ During examination, select it to freeze the image and select it again to continue the examination.
8	F8: CHb/ImgSize key	<ul style="list-style-type: none"> ■ Select it and Alt together to enter or exit CHb imaging mode. ■ Select it to switch the imaging area to full-screen state and select it again to exit full-screen state.
9	F9: Col Enh/ImgEnh key	<ul style="list-style-type: none"> ■ Select it and Alt together to adjust the color enhancement level. ■ Select it to adjust the image enhancement level.
10	F10: Print/WB key	<ul style="list-style-type: none"> ■ Select it and Alt together to start video printing. ■ Select it to adjust white balance automatically.
11	F11: Col Bar/Col RBC key	<ul style="list-style-type: none"> ■ Select it and Alt together repeatedly to switch the image according to the following sequence: Image with color bars-->Gray image-->Endoscopic image ■ Select it to adjust the image color tone.
12	F12: Report key	<ul style="list-style-type: none"> ■ Select it and Alt together to log out. ■ Select it to enter the Edit report interface.
13	Rec/Play key	Record or play a video.
14	Confirm key	Confirm the current operation.

No.	Name	Descriptions
15	Pause key	Pause recording or pause playing.
16	Trackball	Move the cursor.
17	Stop key	Stop recording or stop playing.
18	Left/right arrow key	After a video is paused, select the left arrow key to display the previous frame and select the right arrow key to display the next frame.
19	Space key	<ul style="list-style-type: none"> ■ During time keeping of the timer, select it to pause/continue time keeping. ■ During video playing, select it to pause/continue video playing. ■ During video recording, select it to pause/continue video recording. ■ During time keeping and video recording, select it to pause/continue time keeping and video recording simultaneously.

2.2.5 Endoscope Cable

Connect the two connectors of endoscope cable to image processor and endoscope respectively. The following figure shows an endoscope cable.

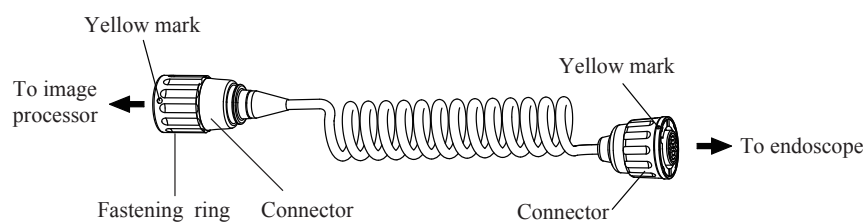


Figure 2-6 Endoscope cable

Chapter 3 Preparations

Preparation is necessarily performed before use. It should include device installation, connection and inspection.

For other devices used with this device, please inspect them according to relevant user manuals. If any malfunction is found, do not use the device.



WARNING Read about this chapter carefully before using the device to ensure that installation and connection are correct. Otherwise, it may cause device damage or personal injury.

NOTE:

- Please place the device on the medical trolley provided by the manufacturer before using it. For details of trolley installation, please refer to trolley user manual.
- Do not cover this device with any object. Otherwise, it may damage the device.
- Power off the device and all peripherals before system connection. Otherwise, it may result in device damage and data loss.
- Only use the cables provided by the manufacturer for connection. Otherwise, it may result in damage or malfunction.
- Do not block the ventilation ports of the device and place the device in a location with adequate ventilation. Otherwise internal heat may cause damage or malfunction.

3.1 Placing the Device

Lock the foot brakes of trolley (sold separately), place the light source on the trolley, and then place the device on the light source, as shown in Figure 3-1. It is recommended that four anti-slip mats be pasted under the 4 feet of the device to avoid accidental slide of the device.

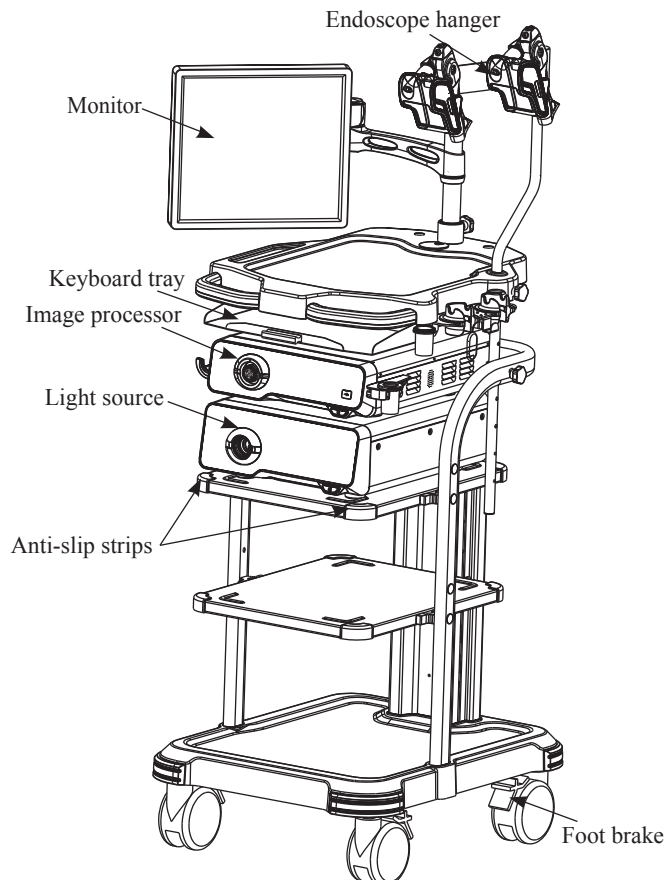


Figure 3-1 Medical trolley

NOTE:

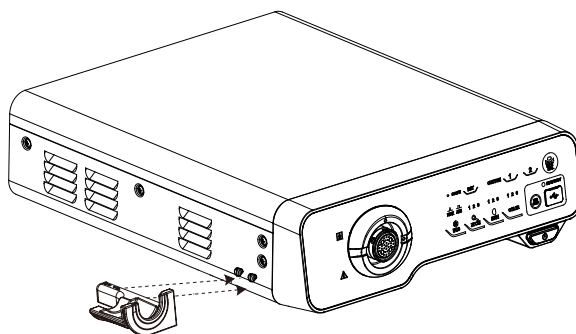
Ensure that the device is placed on the trolley firmly.

3.2 Installing Accessories

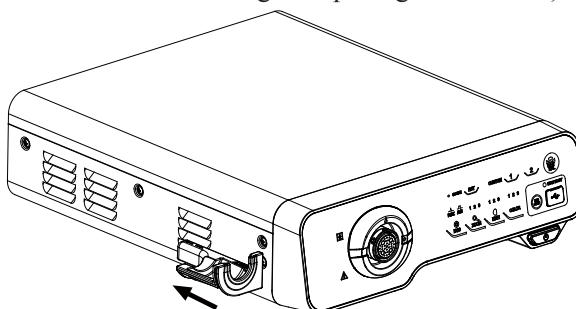
3.2.1 Installing Endoscope Cable Holder

Perform the following steps to install endoscope cable holder.

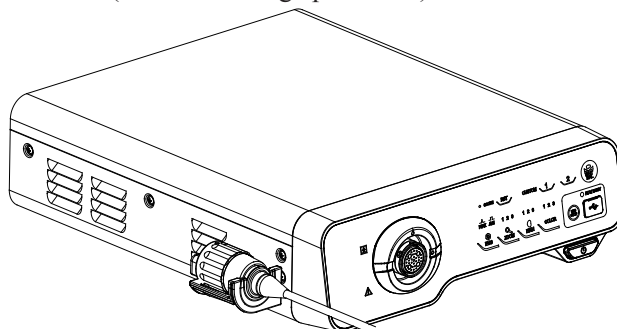
1. Align the notches on the holder with the screws on the device.



2. Push the holder towards the back of device until it stops. (When disassembling, pull the holder to the opposite direction and take it down along the openings of notches.)



3. Place the connector of cable (the one to image processor) on the holder.

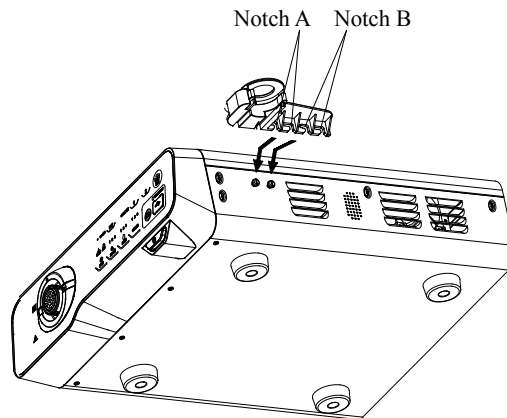
**NOTE:**

Do not hang object other than endoscope cable on the holder.

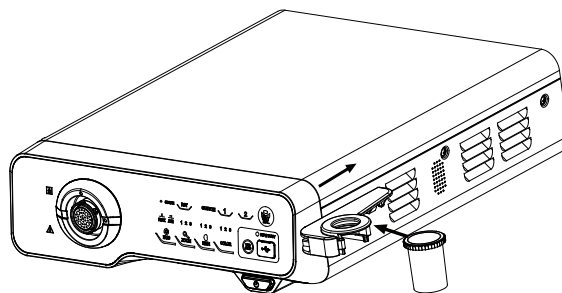
3.2.2 Installing White Balance Cap Holder

Perform following steps to install the white balance cap holder.

1. Align notch A or B on white balance cap holder with the two screws on the right side of the device.



2. Push the holder towards the back of the device until it stops. (When disassembling, pull it to the opposite direction and take it down along openings of notches.)



3. Put white balance cap into the holder. Align the head of the cap with the opening of the holder and insert the cap into the holder until it is in position. (When disassembling, pull it to the opposite direction.)

NOTE:

Do not hang object other than white balance cap on the holder.

3.3 Connecting the System

Connect the endoscopy system, as shown in Figure 3-2.

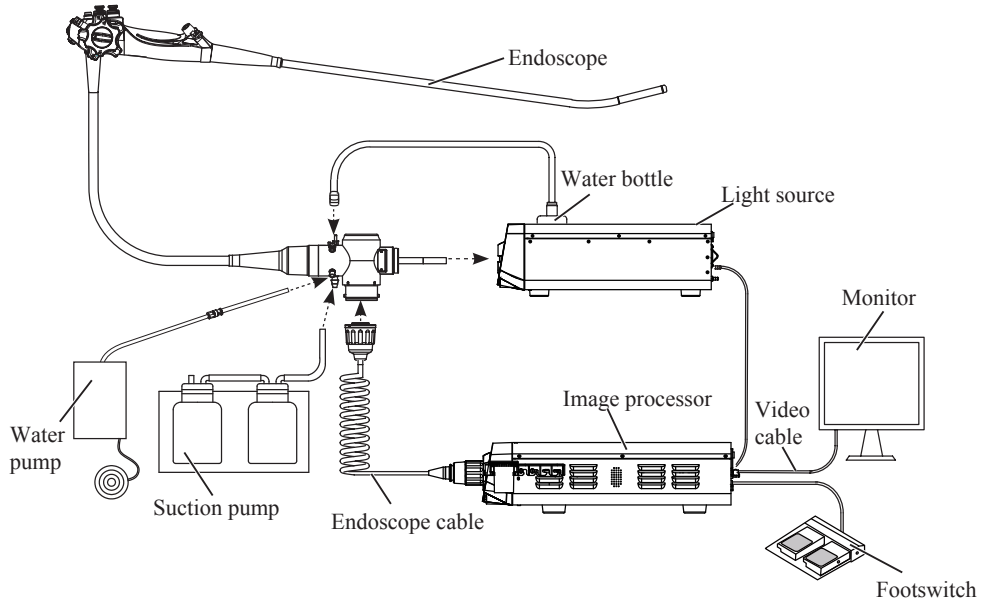
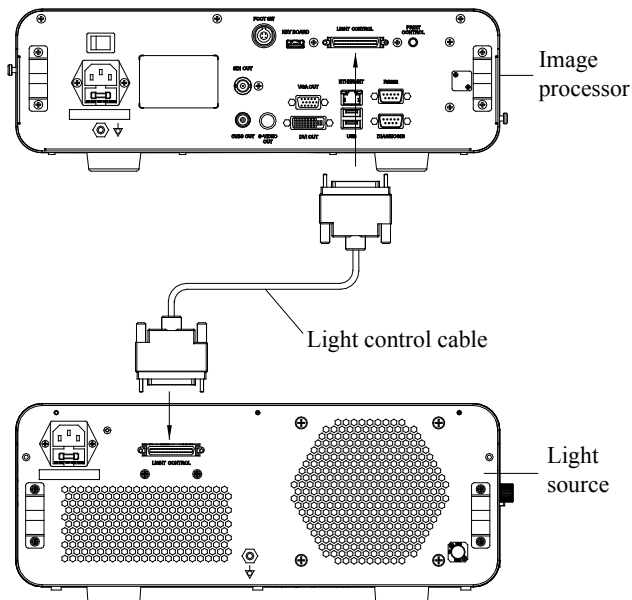


Figure 3-2 Connection of the endoscopy system

3.3.1 Connecting Light Source

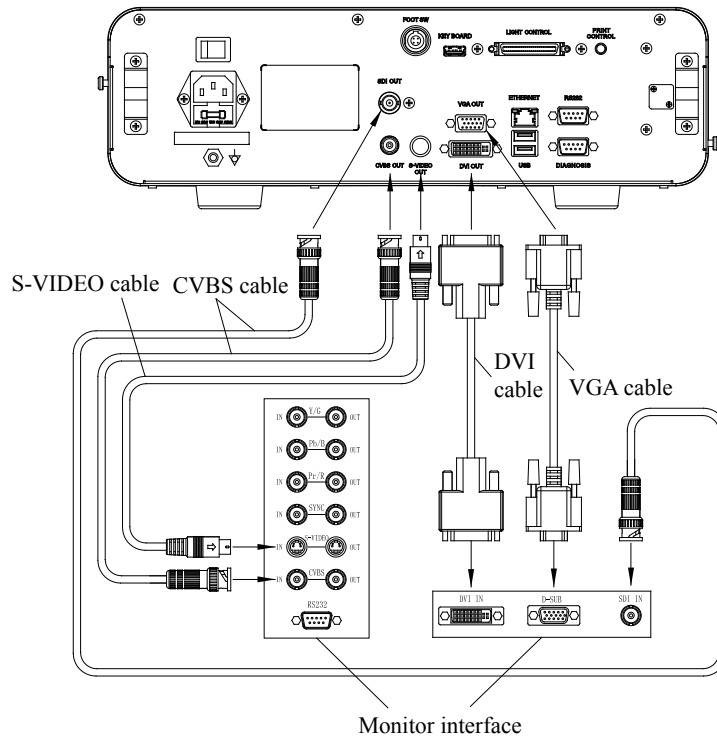
Connect the light source to the device using the light control cable. You can operate the device to adjust light intensity directly.



3.3.2 Connecting Monitor

Perform following steps to connect monitor.

1. Select an appropriate video cable.
2. Connect the two ends of the cable to the device and monitor respectively.



■ Video interface standards supported by the device

- DVI (high definition)
- VGA (high definition)
- CVBS (standard definition)
- S-Video (standard definition)

Standard-definition video supports two systems: PAL and NTSC.

■ Simultaneous output of multiple signals

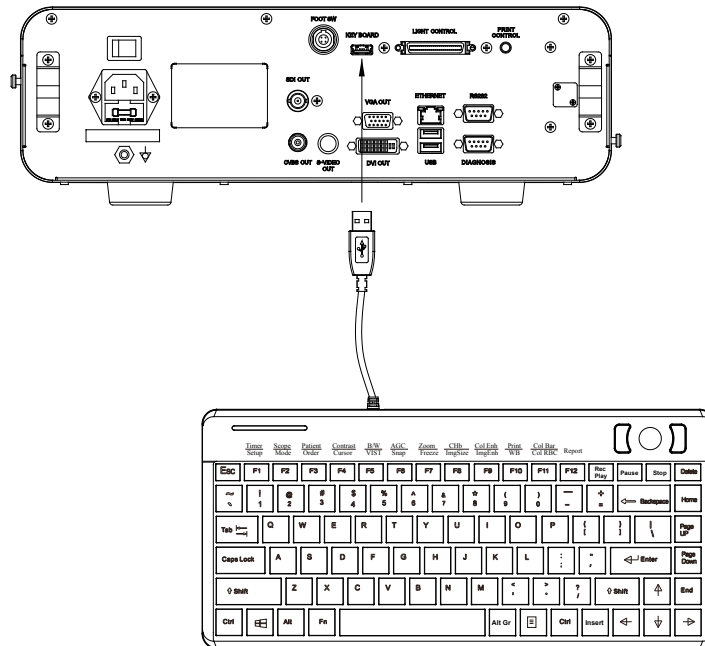
Both high-definition and standard-definition interfaces support simultaneous output of multiple video signals. You can choose DVI or VGA interface to display the main screen. You can also choose CVBS or S-Video interface to connect to a standard-definition display or workstation.

3.3.3 Connecting Keyboard

NOTE:

- Ensure that keyboard is placed on the keyboard tray of trolley properly.
- Do not pour any fluid onto the keyboard. Otherwise, it may cause keyboard damage or malfunction.

Connect the keyboard to the device.



3.3.4 Connecting Endoscope

NOTE:

- Power off the device before connection. Otherwise, it may cause damage or malfunction and data loss.
- Do not excessively pull or twist endoscope cable to avoid malfunction.
- Do not directly touch the pins inside endoscope cable connector by hand. Otherwise, it may cause the cable and device damage.

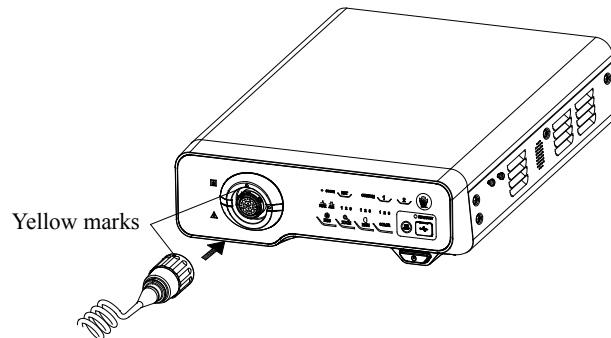
- To connect the endoscope cable

NOTE:

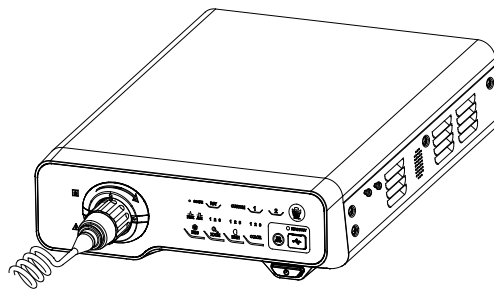
You should connect endoscope cable to the device before connecting it to endoscope.

Perform following steps to connect endoscope cable to the device.

1. Rotate fastening ring to align the yellow mark on the ring with the other yellow mark on the edge of this connector. Insert the connector of endoscope cable into the device firmly.



2. Rotate the fastening ring clockwise until the yellow mark on endoscope cable is aligned with the other yellow mark on the connector port and you will hear a click.

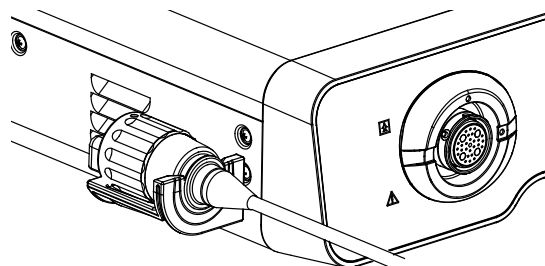


3. Connect the other connector of endoscope cable to the endoscope.

- To disconnect endoscope cable

Perform the following steps to disconnect endoscope cable from the device.

1. Disconnect endoscope cable from the endoscope, and place the connector (the one to image processor) on endoscope cable holder.



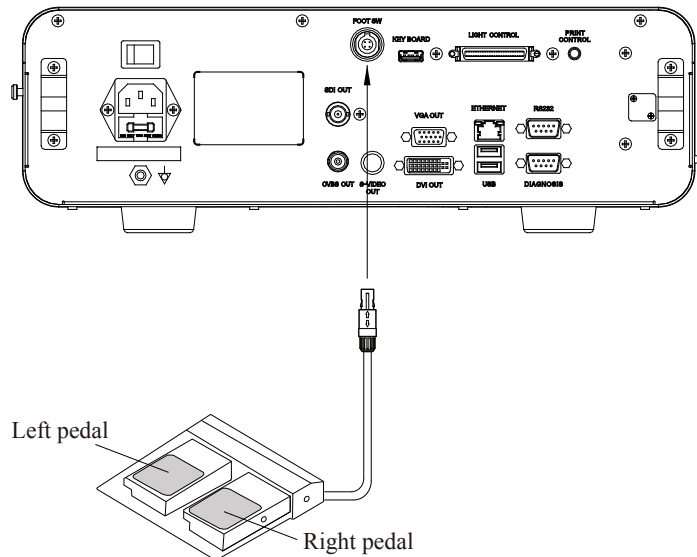
2. Rotate the fastening ring of cable anticlockwise and pull it out straightly from the device.
3. Store the cable in a safe place.

3.3.5 Connecting Footswitch



- WARNING**
- Use the footswitch provided by the manufacturer only. Otherwise, it may result in device or footswitch damage.
 - Do not place the footswitch on the device.

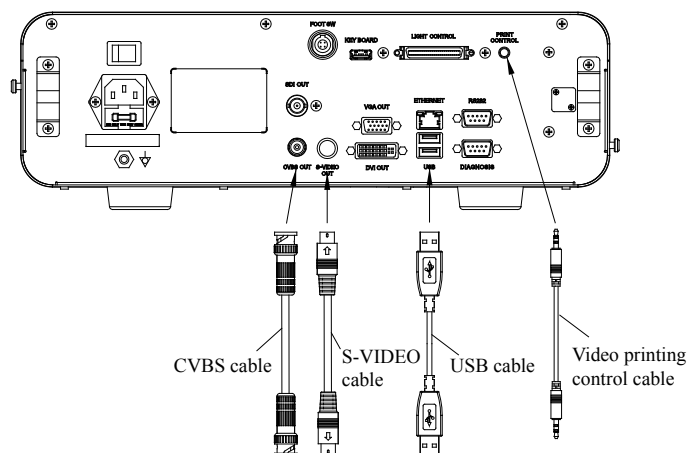
Connect footswitch to **FOOT SW.** port of the device, as shown in the following figure.



Functions of left and right pedals can be preset through the device.

3.3.6 Connecting Video Printer

Connect the printer to the device using BNC video cable and print control cable.

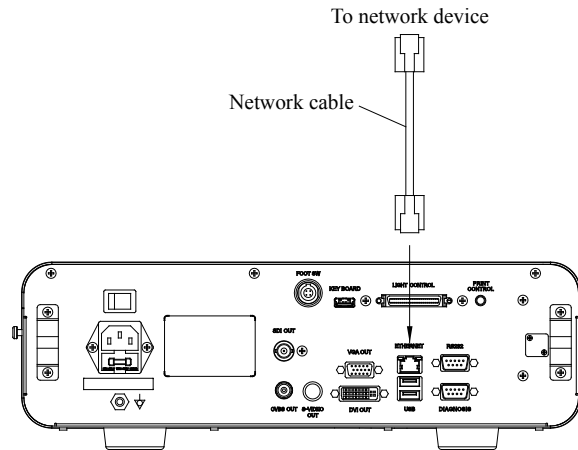


To video printer

You can use the printer immediately without any configurations after a successful connection.

3.3.7 Connecting the Network Device

Connect the device to the local network of DICOM server using a network cable.



3.3.8 Connecting Power Supply



- WARNING**
- Do not excessively bend, pull or twist power cable. Otherwise it may result in broken plug or short circuit, which cause electric shock or fire.
 - Ensure that power cable is connected firmly. Otherwise, it may result in malfunction.

Perform following steps to connect power supply.

1. Connect the grounding terminal at rear panel of the device with protective earth using grounding cable.
2. Connect one end of the power cable to the device and the other end to AC power outlet.
Ensure that the two ends are connected in position.


3.4 Inspecting the Device

3.4.1 Inspecting Connection

Ensure that all peripherals are connected to the device properly and firmly.

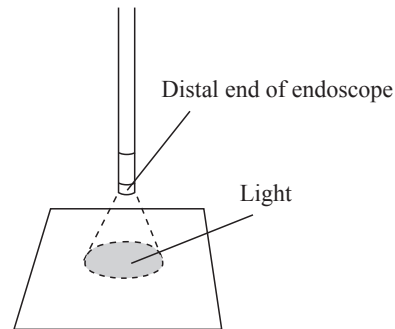
3.4.2 Inspecting Power Supply

Perform the following steps to inspect power supply.

1. Set the main power switch on rear panel to **I** position.
2. Select  on front panel to power on the device.
3. Ensure that power indicator illuminates. If the power indicator cannot illuminate, refer to 6.4 Troubleshooting to solve the problem.

3.4.3 Inspecting Illumination

Power on light source and ensure that light is emitted from the distal end of endoscope. Refer to relevant light source user manual for details.



3.4.4 Inspecting Image

Perform the following steps to inspect image on main screen.

1. After the initialization, the patient examination screen, namely the main screen is displayed as follows.

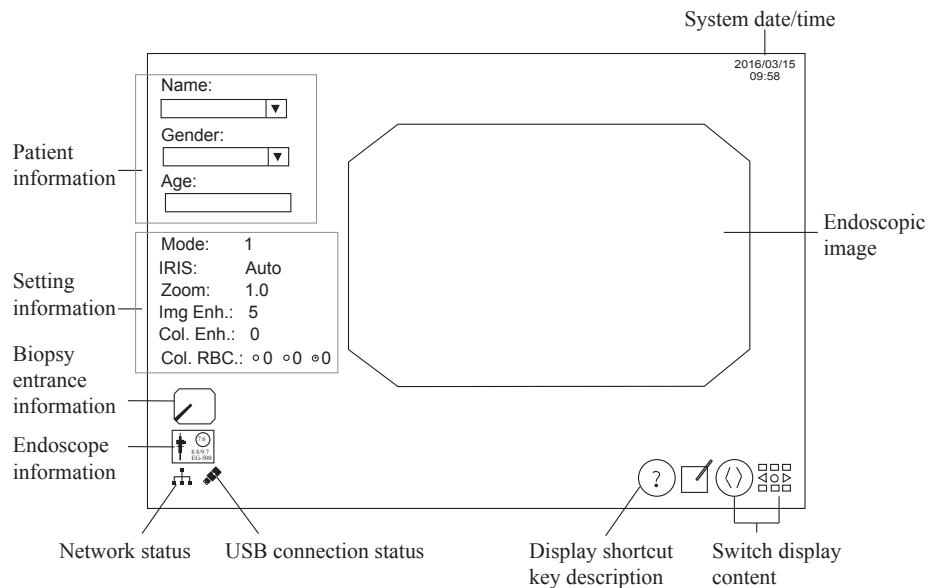
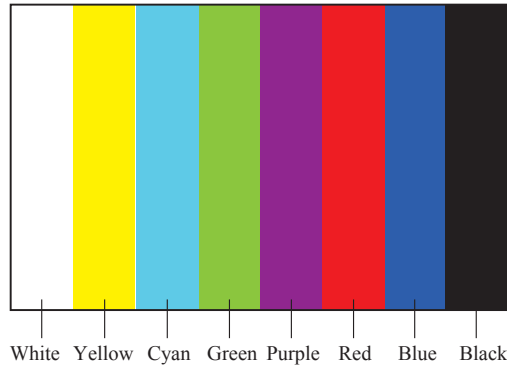


Figure 3-3 Main screen

2. Ensure that the displayed image is normal by observing an object (such as your palm).

3. Select **Alt+F11** to display color bar. Ensure that the color bar is displayed normally. Adjust monitor according to the color bar if necessary.



4. Select **Esc** to exit the color bar image.

3.4.5 Inspecting Freezing Feature

Select **F7** to ensure that real-time image is frozen, and select **F7** again to restore the real time exam.



WARNING If frozen image cannot be restored to real-time image, refer to 6.4 Troubleshooting to solve the problem.

Chapter 4 Operations

The user must be a physician or medical person who operates the device under supervision of a physician. They must have received sufficient training in clinical endoscopic technique. This manual, therefore, does not involve any explanation or discussion about clinical endoscopic technique. It only describes basic operations and precautions related to the device.


This chapter describes basic settings and operations of the device. The settings take effect when the device is powered on.



- Do not operate the device around strong electromagnetic field. Otherwise, electromagnetic radiation may interfere with normal operation of the device.

4.1 Powering on the Device

Perform the following steps to power on the device.

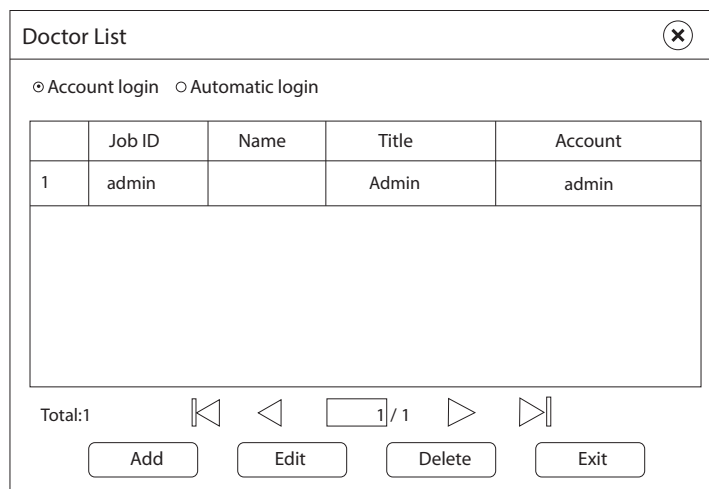
1. Set the main power switch on rear panel to **I** position.
2. Select  to power on the device. Power indicator illuminates.
3. Power on all peripherals connected with the device (such as monitor and light source). For detailed operations, refer to relevant user manual of the peripherals.

4.2 Setting User Information

For securing patient data and facilitating data management, the system assigns two account levels: admin account and common account.

Perform the following steps to set user information.

1. Log in to the system with the admin account (admin) and password (admin) provided by the manufacturer.
2. Select **Ctrl+D** to display the **Doctor List** interface.



	Job ID	Name	Title	Account
1	admin		Admin	admin

Figure 4-1 Doctor List interface

3. Select **Add** to display the **Add** interface.

The screenshot shows a dialog box titled "Add" with a close button (X) in the top right corner. The dialog is divided into two columns: "Doctor info" and "Account info".

- Doctor info:**
 - Job ID:
 - Name:
 - Title: (dropdown menu)
- Account info:**
 - Account:
 - Password:
 - Confirm:

Below the input fields, there is a "Private mode" button. At the bottom of the dialog, there are "Save" and "Cancel" buttons.

Figure 4-2 Add interface

The administrator can also select the information of a user, and select **Edit** or **Delete** to edit or delete it.

4. Set the basic information of the new user.
5. Select **Save**, and then select **OK** in the displayed dialog box to save the settings.

NOTE:

- Only the administrator has the rights to set the user information and system login mode.
- The system at most supports 100 accounts.
- If the initial password of the admin account is not changed, the system will prompt you to change the password when you log in with the admin account.

4.3 Setting Work Mode

Each user can set a private mode according to actual needs. In addition, the system provides 10 public modes (Custom1-Custom10) for users to select, and the parameters of each public mode can only be set by the administrator.

Perform the following steps to set work mode.

1. Select **F2** on the keyboard or **Private mode** on the **Add** interface (as shown in Figure 4-2) to display the **Mode Settings** interface.

Mode Settings

Private Mode

Enhance

	Img	Col.
L1	E1	2
L2	E5	5
L3	E8	8

Type: Edge

Color

R: 0

B: 0

C: 0

Zoom

L1	1.0
L2	1.5
L3	1.8

VIST display

Model: Mode1

>

Save Load

Default Cancel

Figure 4-3 Mode settings interface

2. Select a user mode from the first drop-down list on the interface.
3. Set the parameters on the interface.
Select the > button on the interface to display remaining parameters on this interface.
The following figure describes the settings of these parameters.

Area	Item	Description
Enhance	L1/L2/L3 (corresponding to Img)	Set the values corresponding to the three image enhancement levels. The value range of L1/L2/L3 is relevant to the setting of Type . When Type is set to Edge , the value range of L1/L2/L3 is E0-E8 and the default values of them are respectively E1/E5/E8 . When Type is set to Struct A , the value range of L1/L2/L3 is A0-A8 and the default values of them are respectively A1/A5/A8 . When Type is set to Struct B , the value range of L1/L2/L3 is B0-B8 and the default values of them are respectively B1/B5/B8 .
	L1/L2/L3 (corresponding to Col.)	Set the values corresponding to the three color enhancement levels. The value range of L1/L2/L3 is 0-8 and the default values of them are respectively 0/1/3 .
	Type	Options: Edge , Struct A and Struct B . <ul style="list-style-type: none"> ● Edge: Enhance edge sharpness of image. ● Struct A: Enhance contrast of image details. ● Struct B: Enhance resolution of image details.
Color	R	Set the value of R (red) during color tone adjustment. The value range of R is -8 to +8, and the default value is 0 .
	B	Set the value of B (blue) during color tone adjustment. The value range of B is -8 to +8, and the default value is 0 .
	C	Set the value of C (chroma) during color tone adjustment. The value range of C is -8 to +8, and the default value is 0 .
Zoom	L1/L2/L3	Set the values corresponding to the three zoom levels. <ul style="list-style-type: none"> ● L1: The default value is 1.0 and cannot be changed. ● L2: The value range is 1.1-4.0, and the default value is 1.2. ● L3: The value range is 1.1-4.0, and the default value is 1.4.
VIST display	Model	Mode 1 : Add variable intelligent staining effect to the original video directly.

Area	Item	Description
Remote buttons	Freeze	Select it to freeze endoscopic image; select it again to return to real-time mode.
	Zoom	Select it to switch among three image magnification levels.
	VIST	Select it to enter or exit the variable intelligent staining mode
	IRIS	Select it to switch among AVE , PEAK and Auto photometry modes.
	Img Enh	Select it to switch among edge enhancement levels 1 to 3. It is determined by Type , including Edge (E0~E8), Struct A (A0~A8), and Struct B (B0~B8).
	Col. Enh	Select it to switch among color enhancement levels 1 to 3.
	CHB Image	Select it to display pseudo color/real time image.
	Transparent	Select it to emit strong light (lasts for 7s); select it again to disable this feature.
	Contrast	Select it to switch among levels Low, Medium and High.
	AGC	Select it to enable/disable gain value adjustment.
	ImgSize	Select it to display large image/normal size image.
	Save Image	Select it to save current image.
	Video Print	Select it to print image.
	Video	Select it to start/stop recording.
	StopWatch	Select it to start/pause time keeping.
Footswitch	PIP	After the endoscopic image is frozen, select it to enable/disable the picture in picture (PIP) feature.
	Content display	Select it repeatedly to change the display state on the main screen according to the following sequence: Display all the content on the main screen-->Hide the content on the right of the main screen-->Hide the content on both the left and right of the main screen
	Click to export	Select it to directly export the image or video saved currently on the main screen.
Other	Left/Right pedal	Similar to remote buttons on the endoscope.
Other	IRIS	Options: Average , Peak , and Auto <ul style="list-style-type: none"> ● Average: Used for routine examination. The system sets the brightness of current image based on average image brightness. ● Peak: Used for light-reflecting image. The system uses peak photometry to eliminate light-reflecting phenomenon. ● Auto: No reflection in the central part of the image. The image does not turn dark even when biopsy forceps are used.

NOTE:

If **Save automatically** is selected, the value of **IRIS** and levels of **ZOOM**, **ENH**, and **COLOR** on the front panel of the device are automatically saved for the current mode during shutdown or logout.

4. Select **Save**, and then select **OK** in the displayed dialog box to save the current settings.
 Select **Load** to save the current settings and load them to the main screen.
 Select **Default**, and then select **OK** in the displayed dialog box to restore factory settings.
 Select **Cancel** to exit the **Mode Settings** interface and return to the main screen.
 You can select a public mode directly on the **Mode Settings** interface and select **Load** to load the parameter settings of this mode.
 After setting is completed, you can select **CUSTOM 1** or **CUSTOM 2** on the front panel of the device to call the parameter settings of public mode **Custom1** or **Custom2**.

4.4 Creating/Editing/Retrieving Work Order Information

It is recommended that a work order be created for each patient before the exam to facilitate management of patient data.

4.4.1 Creating a Work Order

1. Select **F3** to display the **Order List** interface.

Order List

All

F8 F10 F11

	Name	Gender	Age	Applicant	Application Time	Pre-exam Time	Status
1	Totti	F	18	Digestive Dep.	10/03/2016	11/03/2016	Not examined
2	Jerry	F	25	Digestive Dep.	12/03/2016	13/03/2016	Not examined
3	Lily	M	32	Digestive Dep.	15/03/2016	16/03/2016	Not examined

Total: 3

Navigation: ⏪ ⏩ 1/1

Buttons: Exam(F1) Add(F2) Edit(F3) Select all(F5) Del(Delete) Exit(Esc)

Figure 4-4 Order list interface

2. Select  or **F10** to display the **Settings** interface.

Figure 4-5 Settings interface

3. Select the information items to be displayed in the work order from the **Order Display** area on the **Settings** interface as required.

NOTE:

You can select **User-defined field** and enter an information item to be displayed on the work order in the text box beside it.

4. Select **Save**, and then select **OK** in the displayed dialog box to return to the **Order List** interface.
5. Select **Add** or **F2** to display the **Work Order** interface.

Figure 4-6 Work order interface

6. Enter patient information and exam information.

NOTE:

System automatically calculates the age of patient after date of birth is entered.

7. Select **Save**, and then select **OK** in the displayed dialog box to save the information.

4.4.2 Editing Work Order Information

Perform the following steps to edit the information of a work order.

1. Select **F3** to display the **Order List** interface.
2. Select a work order and select **Edit** or **F3** to enter the editing interface.
3. Edit the work order information on the displayed interface.
4. Select **Save**, and then select **OK** in the displayed dialog box to save the information.

4.4.3 Retrieving Work Order Information

You can retrieve work order information on the main screen.

1. Select **F3** to display the **Order List** interface.
2. Select a work order and select **Exam** or **F1** to retrieve the work order information.

The retrieved work order information is displayed on the main screen.

4.4.4 Deleting Work Order(s)

You can delete the work order already created when necessary.

- To delete one work order

On the **Order List** interface, select the work order to be deleted, select **Del** on the interface or **Delete** on the keyboard, and then select **OK** in the displayed dialog box to delete the selected work order.

- To delete multiple work orders

After entering the **Order List** interface, press and hold **Ctrl** and select the work orders to be deleted, select **Del** on the interface or **Delete** on the keyboard, and then select **OK** in the displayed dialog box to delete the selected work orders.

You can select **Ctrl+A** to select all the work orders on the current page.

- To delete all the work orders

On the **Order List** interface, select **Select all** or **F5**, select **Del** on the interface or **Delete** on the keyboard, and then select **OK** in the displayed dialog box to delete all the work orders.

NOTE:

A work order cannot be restored once it is deleted. Perform this operation with caution.

4.5 Replacing the Endoscope

The device supports hot plugging of the endoscope, facilitating endoscope replacement for different types of exams.

NOTE:

It takes several seconds to initialize endoscope information after the replacement.

4.6 Adjusting White Balance

Adjust image white balance to produce an image with accurate colors.



WARNING

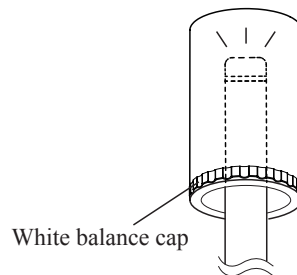
- Ensure that the distal end of endoscope and white balance cap are clean before adjusting white balance. Otherwise it may cause cross-contamination.
- Adjust the white balance of image according to observed object. Improper adjustment may cause wrong diagnosis or inaccurate observation.

NOTE:

- Power on light source before adjustment and ensure that the light emitted from the distal end of endoscope is not interfered by other light.
- Adjust white balance again after replacement of the light source or main lamp.

Perform the following steps to adjust white balance.

1. Select **LAMP** on the light source to turn on the main lamp, and ensure that light is emitted from the distal end of endoscope.
2. Wipe the inner of the white balance cap using a lint-free soft cloth dampened with 75% ethyl or isopropyl alcohol.
3. Insert the distal end into the white balance cap to avoid reflection on image.



4. Press and hold **WHT BAL** on the device or select **WB** on the keyboard to activate white balance function.

After white balance adjustment is completed, the **WHT BAL** indicator is solid on.

4.7 Optimizing the Image

You can optimize endoscopic image by adjusting the parameters on the main screen.

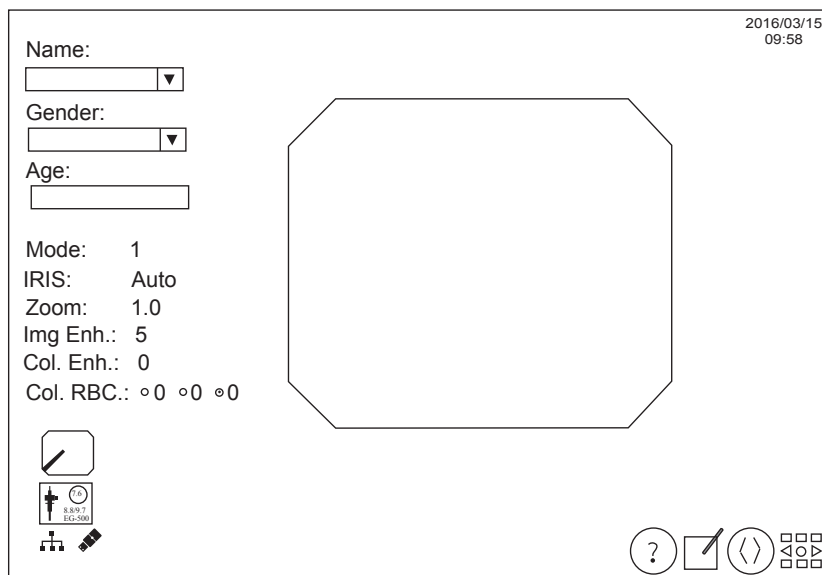


Figure 4-7 Main screen

All parameters displayed on the main screen can be adjusted by the buttons on the device, keyboard, endoscope remote buttons and footswitch.

4.7.1 Work Mode

Description: Indicates current work mode.

Operation: Select **CUSTOM 1** or **CUSTOM 2** on the device to select the corresponding work mode directly, or select **F2** to enter the **Mode Settings** interface, select a public mode or the private mode, and select **Load** to load the selected work mode. Parameters related to the selected work mode will be displayed on the main screen.

4.7.2 Zoom

Description: Indicates current image magnification. You can view image details by zooming in the image.

Operation: Each time selecting **ZOOM** of the device or **Alt+F7** on the keyboard, the magnification level will be changed, and corresponding indicator illuminates.

4.7.3 Color Enhancement

Description: Indicates current CHb color level. Set the level (0-8) to adjust the contrast of hemoglobin concentration imaging region, lesion will be emphasized.

Operation: Each time selecting **COLOR** on the device or **Alt+F9** on the keyboard, the CHb color level will be changed, and corresponding indicator illuminates.

4.7.4 Image Enhancement

Description: Indicates current image enhancement level. It includes three modes: **Edge**, **Struct A** and **Struct B**. See Section 4.3 for details.

Operation: Each time selecting **EHN** on the device or **F9** on the keyboard, the image enhancement level will be changed, and corresponding indicator illuminates.

4.7.5 Contrast

Description: Indicates the difference between the black of dark part and the white of light part of the image.

Operation: Select **Alt+F4** on the keyboard to switch the contrast among normal, high and low mode. The relevant information will be displayed on screen.

NOTE:

The contrast restores to normal level after the device is restarted.

4.7.6 Variable Intelligent Staining

Description: Simulates the imaging at a specific spectrum to make image detail boundaries more obvious and make the image clearer.

Operation: Select **F5** on the keyboard to enable the variable intelligent staining function.

4.8 Saving and Viewing Image/Video

Endoscopic image and video are saved in the system by default. If necessary, you can export the saved image and video to a storage device like a USB drive for review and management.

4.8.1 Saving an Image

Perform the following steps to save an image.

1. Enter the main screen.
2. Select the save button to save an image.

The thumbnail of the saved image is displayed on the right of the screen.

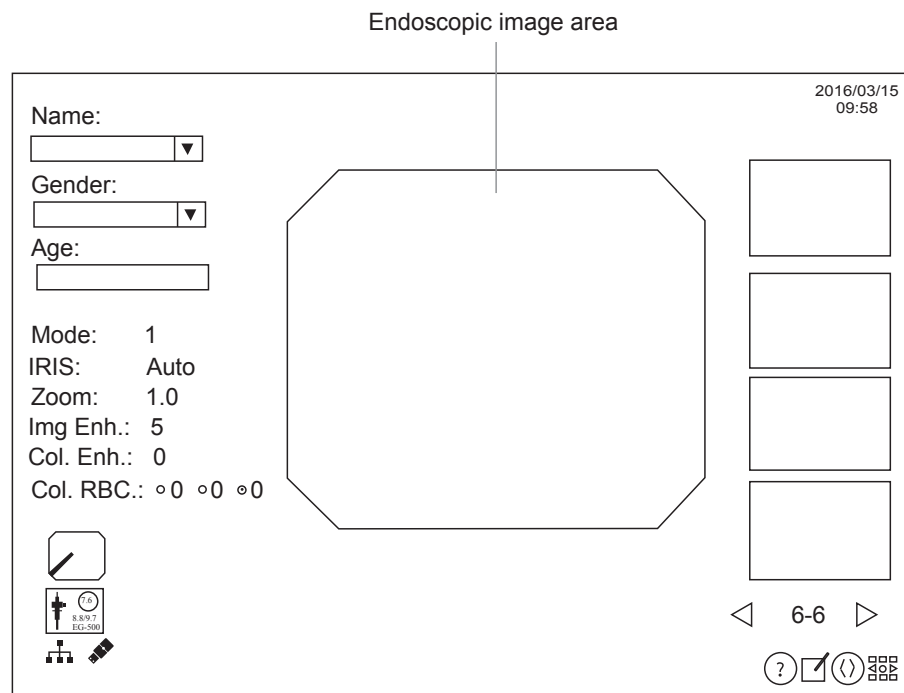


Figure 4-8 Main screen

3. Select a thumbnail using the trackball on the keyboard, and select the confirm key.
The image corresponding to the selected thumbnail is displayed in the endoscopic image area.

NOTE:

- A maximum of four thumbnails can be displayed on the main screen. The thumbnail of the latest image will replace that of the earliest image on the main screen.
- The image formats supported include JPG and BMP.

4.8.2 Saving a Video

Perform the following steps to save a video.

1. Enter the main screen.
2. Select **Rec/Play** on the keyboard to start recording. Select **Stop** to stop recording and save a video.

The thumbnail of the video is displayed on the right of the screen.

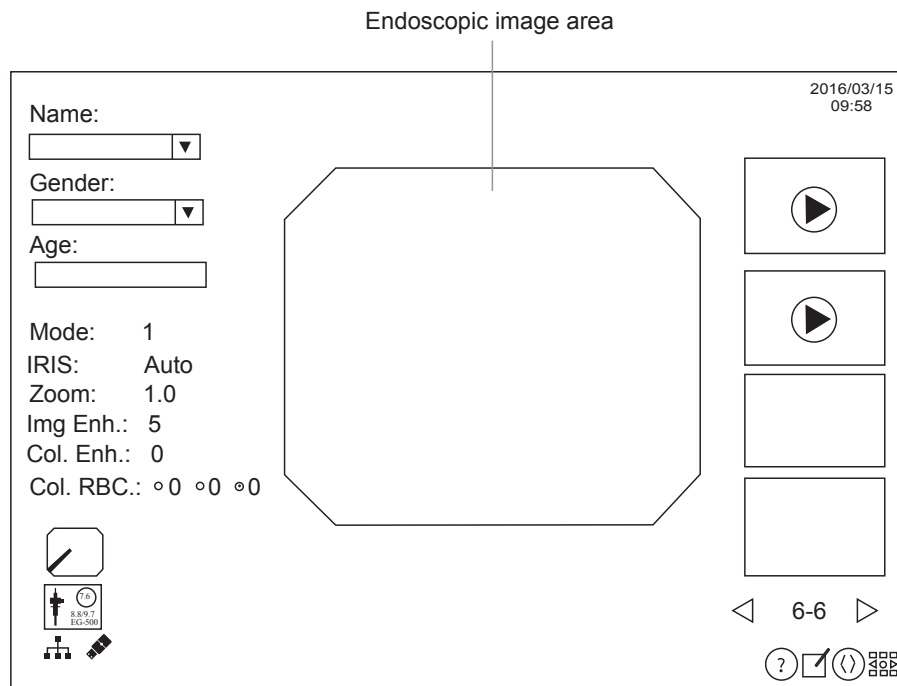


Figure 4-9 Saving video

NOTE:

The video formats supported include mkv and flv.

4.8.3 Viewing a Video

Select a video thumbnail using the trackball. Double-click the confirm key, or select the confirm key and then select **Enter** or **Rec/Play**. The video corresponding to the selected thumbnail is played through the media player.

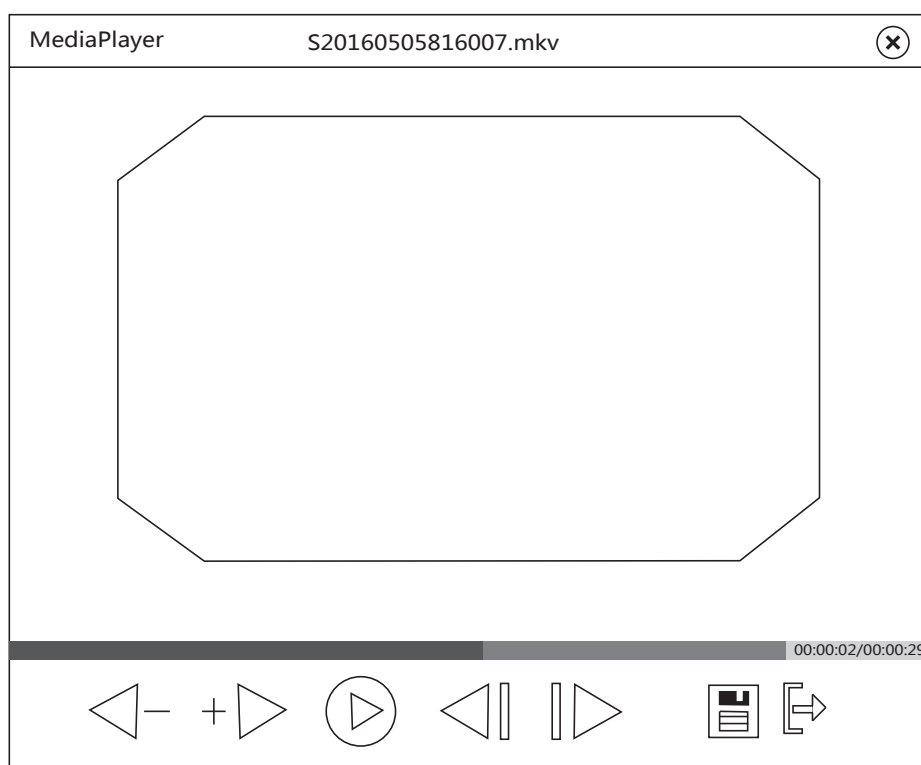


Figure 4-10 Media player

NOTE:


Image/video can be reviewed by viewing patient record.

Operate the media player using the trackball and confirm key on the keyboard.

Button	Function
	Start or pause video playback.
	Switch video playback speed: $\times 1/2 \rightarrow \times 1/4 \rightarrow \times 1/8 \rightarrow$ normal speed
	Switch video playback speed: $\times 1.2 \rightarrow \times 1.5 \rightarrow \times 2 \rightarrow$ normal speed
	View the previous frame from a paused video.
	View the next frame from a paused video.
	Save a desired image from a paused video. The storage path is displayed on the upper part of the screen for several seconds.
	Exit the media player.

4.9 Viewing Patient Record List

Patient records can be stored, reviewed and retrieved. They can also be exported to a USB drive or DICOM server for backup.

Select **F3** on the keyboard to display the **Order List** interface (as shown in Figure 4-4) and then select  on this interface or **F11** on the keyboard to enter the **Record table** interface, or select **Alt+F3** on the keyboard directly to enter the **Record table** interface.

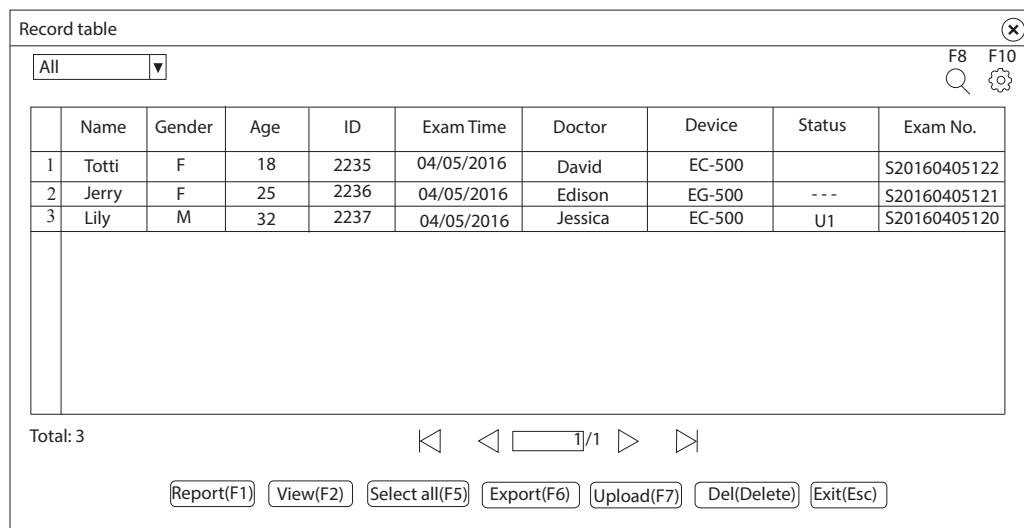



Figure 4-11 Record table interface

In the status column on the **Record table** interface:


- The examined status is displayed as ---.
- The concluded status is displayed as a space.
- The printed status is displayed as PX.
- The uploaded status is displayed as UX.
- The printed and uploaded status is displayed as PX UX.

X indicates the number of times, for example, PX indicates the number of times the report is printed, and UX indicates the number of times the report is uploaded. When the number of times exceeds 9, + is displayed directly.

You can select  on the **Record table** interface or **F10** on the keyboard, and then select the columns to be displayed on the **Record table** interface.

You can select the type of the records to be displayed on the **Record table** interface from the drop-down list in the upper left corner.

4.9.1 Searching for a Record

On the **Record table** interface, select  or press **F8** on the keyboard to enter the **Search** interface. On the **Search** interface, select a search criterion, select or input a keyword in the corresponding editable drop-down list, and then select **Search**. All the records meeting the criterion are displayed on the **Record table** interface.

4.9.2 Viewing a Record

Select a record on the **Record table** interface, and then select **View** or press **F2** on the keyboard to enter the **Record details** interface. The user can view the exam report of the patient and the images and videos saved during the exam on the **Record details** interface.

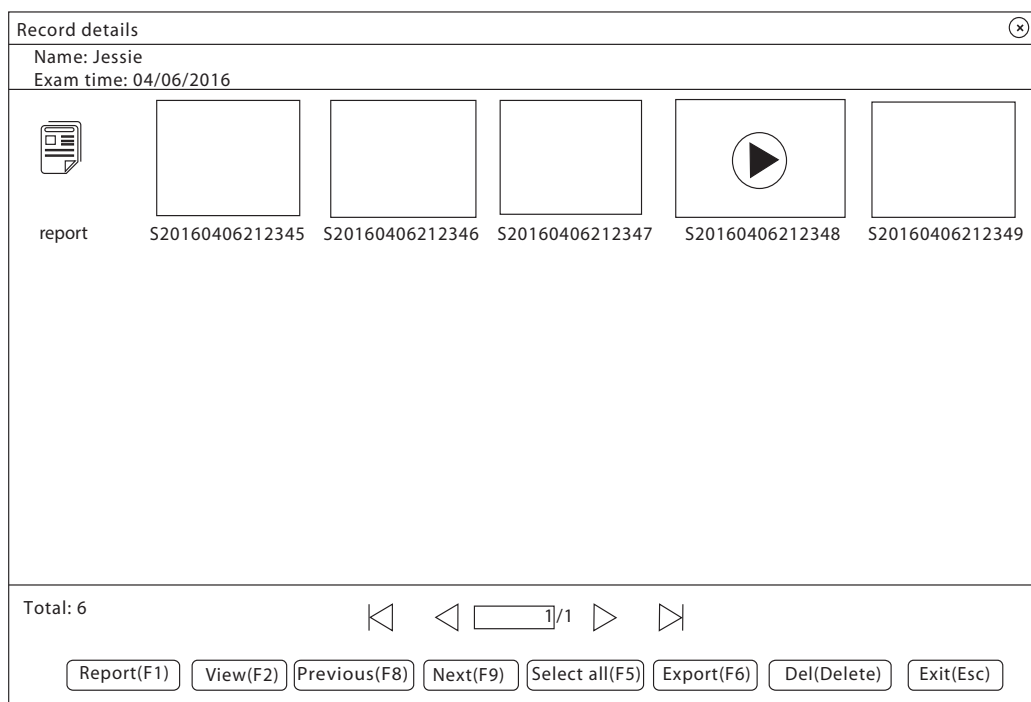




Figure 4-12 Record details interface

- Endoscopic image/video
 - Select an image/video using the trackball and perform the following operations:
 - Select **View** or press **F2** on the keyboard to view the selected image/video.
 - Select **Del** or press **Delete** on the keyboard to delete the selected image/video, and the image is also removed from the patient report.
- Report
 - Select the report icon using the trackball and perform the following operations:
 - Select **View** or press **F2** on the keyboard to view the patient report.
 - Select **Del** or press **Delete** on the keyboard to delete the patient report.

Select **Previous/Next** or press **F8/F9** on the keyboard to switch between the records of different patients, select \triangleleft and \triangleright for page turning of the current record, select $\triangleleft\triangleleft$ to turn to the first page of the current record, and select $\triangleright\triangleright$ to turn to the last page of the current record.

4.9.3 Backing up Data

Perform the following steps to back up patient records in a USB drive.

1. Open the protective cover  of the USB port on the device, and connect a USB drive to the device.
2. Enter the **Record table** interface.
3. Select **Export** or press **F6** on the keyboard to export the data to the USB drive for backup.
4. After export is completed, press  on the device to stop data transmission, and remove the USB drive from the device.

4.9.4 Deleting Record(s)

Perform the following steps to delete record(s).

1. Select the record(s) to be deleted on the **Record table** interface (as shown in Figure 4-11).
 - Select one record using the trackball and confirm key.
 - Press **Ctrl+A** on the keyboard to select all the records on the current page.
 - Select **Select all** or press **F5** on the keyboard to select all the records.
2. Select **Del** or press **Delete** on the keyboard and then select **OK** in the displayed dialog box to delete the selected record.

4.10 Editing and Printing a Report

On the **Record table** interface (as shown in Figure 4-11), select a record and then select **Report** or press **F1** on the keyboard to enter the **Edit report** interface.


You can also select  in the lower right corner of the main screen or press **F12** on the keyboard to enter the **Edit report** interface for the current patient directly.

Figure 4-13 Edit report interface

Select the **Select Image** button or press **F1** on the keyboard to view the endoscopic image.

Select the images to be inserted into the report using the trackball and confirm key. The selected images are displayed in the **Diagnostic image** area.

4.10.1 Adding a Body Mark

Body marks can be added to distinguish the endoscopic images of different exam types.

Perform the following steps to add a body mark.

1. Select an image from the **Diagnostic image** area on the **Edit report** interface.
2. Select **Add Bodymark** or press **F3** on the keyboard.

The organ names, body marks, and indicating diagram are displayed on the lower part of the interface.

The screenshot shows the 'Edit report' window with the following details:

- Exam No.:** S20160406531
- Exam time:** 04/06/2016
- Model:** EG-500
- Applicant:** David
- ID:** 9527
- Name:** Jim
- Gender:** F
- Age:** 35
- Tel.:** [Empty]
- Bed No.:** [Empty]
- User-defined:** [Empty]

Diagnostic image: [Select Image(F1)] [Diagnose(F2)] [Add Bodymark(F3)]

Organ name table:

	Pharynx
	Esophagus
Vocal cords	Gastric body
Cardia	Gastric angle
Gastric fundus	Antrum
Gastric antrum	Descending duodenum
Duodenal bulb	

Organ position: [Arrow/point mark icons] [Indicating diagram] [Clear]

Buttons: [Template(F5)] [Save(F6)] [Upload(F7)] [Preview(F8)] [Print(F9)] [Glossary(F10)] [Exit(Esc)]

Figure 4-14 Adding body mark

3. Select the organ name as required.
The selected organ name is displayed below the selected image.
4. Select an arrow mark or the point mark.
5. Move the body mark to a proper place on the indicating diagram using the trackball, and press the confirm key to add the mark to the diagram.
An indicating diagram with a body mark is displayed on the right of the selected image.
You can select **Clear** to clear the body mark in the indicating diagram.
6. Select **Save** or press **F6** on the keyboard, and then select **OK** in the displayed dialog box to save the added body mark and return to the **Record table** interface.

4.10.2 Glossary

On the **Edit report** interface (as shown in Figure 4-13), you can select the **Glossary** button or press **F10** on the keyboard to hide/display the **Glossary** area. This area displays the disease information added by users, and users can select required information from this area and add it to the report directly.

Select **More** to enter the **Glossary** interface.

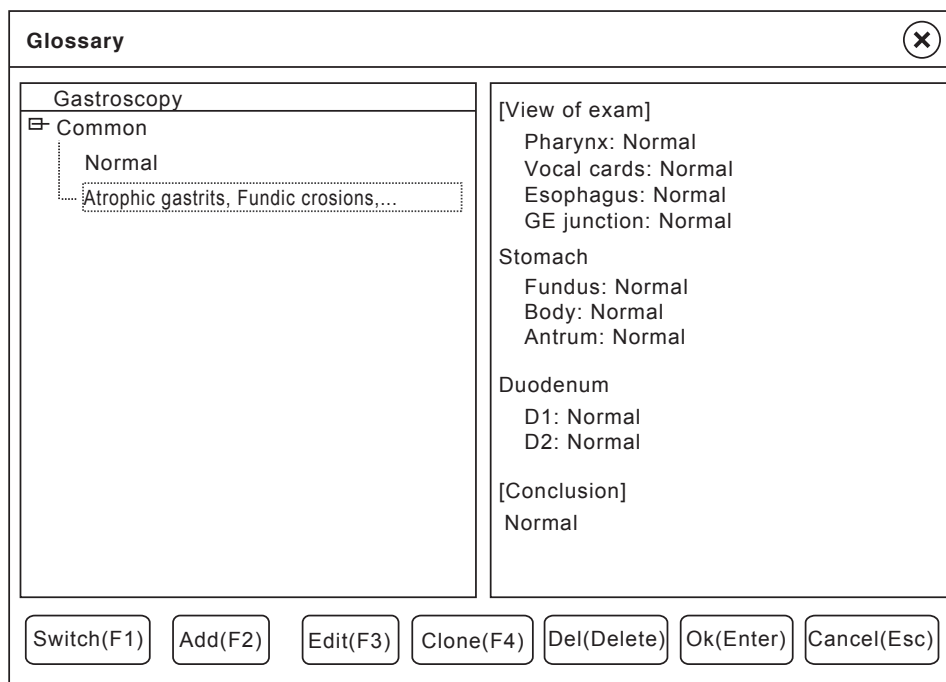


Figure 4-15 Glossary interface

On the **Glossary** interface:

- **Switch(F1)**: Switch to the disease information for the selected endoscope.
- **Add(F2)**: Add disease information to the glossary.
- **Edit(F3)**: Edit selected disease information in the glossary.
- **Clone(F4)**: Copy selected disease information in the glossary.
- **Del(Delete)**: Delete selected disease information from the glossary.
- **OK(Enter)**: Exit the **Glossary** interface and add the selected disease information to corresponding input boxes on the **Edit report** interface.
- **Cancel(Esc)**: Exit the **Glossary** interface and return to the **Edit report** interface.

4.10.3 Setting Report Template

On the **Edit report** interface, select **Template** or press **F5** on the keyboard to enter the **Template** interface for setting of the report template.

The screenshot shows the 'Template' dialog box with the following components:

- Setting area:** Contains a 'Layout' dropdown menu set to 'Conventional', a 'Preview' button, and two sections for title settings. The first section, 'Classical title', has radio buttons for 'Classical title' (selected) and 'Personalized title', and checkboxes for 'Logo', 'Caption 1', and 'Caption 2'. The second section, 'Personalized title', has a text input field containing 'Video Gastroscope Report' and a 'Load' button.
- Check box area:** A grid of checkboxes for report fields: Exam No., Model, Name, ID, User-defined, Gender, Applicant, User-defined, Age, Tel., Biopsy entrance position, Exam time, and Bed No. All are checked.
- Functional button area:** Contains a 'Declaration' checkbox (checked) and a text input field with the text 'This report is only for reference.'. Below this are three buttons: 'Default', 'Save', and 'Exit'.

Figure 4-16 Template interface

■ Setting area

Template: The options include **Conventional**, **Asymmetric**, and **On the right**, and **Conventional** is selected by default. After selecting an option, you can select **Preview** to preview the report layout.

Classical title/Personalized title: **Classical title** is selected by default. Classical title refers to the default title generated by the system, which consists of a hospital logo and two captions. Users can decide whether to display these three parts by selecting/deselecting them and set the specific content of them. Personalized title refers to a title that is designed by a user on a PC and then imported to the system directly.

■ Check box area

Select the items in this area to display corresponding items in the report.

■ Functional button area

Select **Default**, and then select **OK** in the displayed dialog box to restore default report template settings.

Select **Save**, and then select **OK** in the displayed dialog box to save the current report template settings.

Select **Exit** to exit the **Template** interface and return to the **Edit report** interface.



4.10.4 Printing a Report

Perform the following steps to print a report.

1. Perform print settings (for details, see 5.1.3 Contextual Model Settings).
2. Enter the **Edit report** interface.
3. Select **Print** or press **F9** on the keyboard, and then select **OK** in the displayed dialog box to start printing.

Before the printing, you can select Preview or press F8 on the keyboard to preview the report. If necessary, you can adjust the report.

4.11 Powering off the Device

1. When the main screen or login screen is displayed, press and hold  on the front panel of the device to power off the device, and the power indicator is off.
2. Set the main power switch on the rear panel of device to  position.
3. Power off all the peripherals (such as the monitor and light source) connected to the device as instructed in relevant user manuals.

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Chapter 5 Settings

System settings are used for setting the startup status of the device.

All the customized settings can be saved in the system and applied each time you perform an exam.

5.1 Customizing the System

5.1.1 Video Parameter Settings

Perform the following steps to conduct video parameter settings.

1. Select **F1** on the keyboard to enter the **Set** interface.

Three tab pages are available on this interface, and the **Video parameters** page is displayed by default. You can select **F1/F2/F3** on the keyboard to switch between these three tab pages.

The screenshot shows a window titled 'Set' with three tabs: 'Video parameters (F1)', 'General settings (F2)', and 'Contextual model (F3)'. The 'Video parameters (F1)' tab is active. It contains the following settings:

- Primary video**
 - Output: DVI+VGA
 - *Resolution: 1920x1080
- Secondary video**
 - Video standard: PAL
- Other**
 - White Balance Memory
 - Corner shape: Octangle
 - Video printer: Close
- Freeze**
 - Release time: Inf
 - PIP: open
 - PIP Position: RightTop
 - PIP Size: Big
- Save**
 - Image format: jpg
- Recording**
 - Format: mkv

(The item marked with * takes effect after restart.)

Buttons: Default, Save, Exit

Figure 5-1 Video parameters tab page

2. Set the parameters on the **Video parameters** tab page.

Area	Item	Function
Primary video	Output	Options: DVI+VGA
	*Resolution	Options: 1920x1080 and 1920x1200 NOTE: <ul style="list-style-type: none"> • If 1920x1080 is selected, the monitor connected to the device through a DVI or VGA cable must at least support the resolution of 1920x1080. • If 1920x1200 is selected, the monitor connected to the device through a DVI or VGA cable must at least support the resolution of 1920x1200.
Secondary video	Video standard	Options: PAL and NTSC . By default, PAL is selected.

Area	Item	Function
Other	White balance memory	If this item is selected, after white balance adjustment is completed, the endoscope automatically saves the white balance parameters, and you do not need to adjust white balance again before next use.
	Corner shape	Options: Octangle and Round
	Video printer	Options: Close , USB , and GPIO+Video . By default, Close is selected.
Freeze	Release time	Set the display time of a frozen endoscopic image on the screen. The unit is second. Options: 0.5 , 1~9 , and Inf . If Inf is selected, the image is displayed on the screen all the time.
	PIP	Options: open and close . By default, open is selected. If open is selected, a small video window appears on the main screen after an image is frozen.
	PIP Position	Set the display position of the small video window on the main screen. Options: LeftTop , RightTop , LeftBottom , and RightBottom . By default, RightTop is selected.
	PIP Size	Options: Big and Small . By default, Big is selected.
Save	Image format	Set the default image storage format. Options: jpg and bmp . By default, jpg is selected.
Recording	Format	Set the default video storage format. Options: mkv and flv . By default, mkv is selected.

3. Select **Save**, and then select **OK** in the displayed dialog box to save the current settings.
Select **Default**, and then select **OK** in the displayed dialog box to restore default video parameter settings.
Select **Exit** to exit the current interface and return to the main screen.

5.1.2 General Settings

Perform the following steps to conduct general settings.

1. Enter the **Set** interface, and then select **F2** on the keyboard to enter the **General settings** tab page.

Figure 5-2 General settings tab page

2. Set the parameters on the **General settings** tab page.

Area	Item	Function
-	Hospital name	Set the hospital name.
-	Logo	Load the hospital logo to the report.
Time	Type	Set the system time format. Options: YYYY/MM/DD , MM/DD/YYYY , DD/MM/YYYY , and YYYY-MM-DD .
	Date	The default date is the current day. Use the left and right arrow keys to select the value of year, month, or day, and then use the up/down arrow key to increase/decrease the selected value.
	Time	The default time is the current time. Use the left and right arrow keys to select the value of hour, minute, or second, and then use the up/down arrow key to increase/decrease the selected value.
Other	Language	Set the system language.

3. Select **Save**, and then select **OK** in the displayed dialog box to save the current settings.
Select **Exit** to exit the current interface and return to the main screen.

5.1.3 Contextual Model Settings

Perform the following steps to conduct contextual model settings.

1. Enter the **Set** interface, and then select **F3** on the keyboard to enter the **Contextual model** tab page.

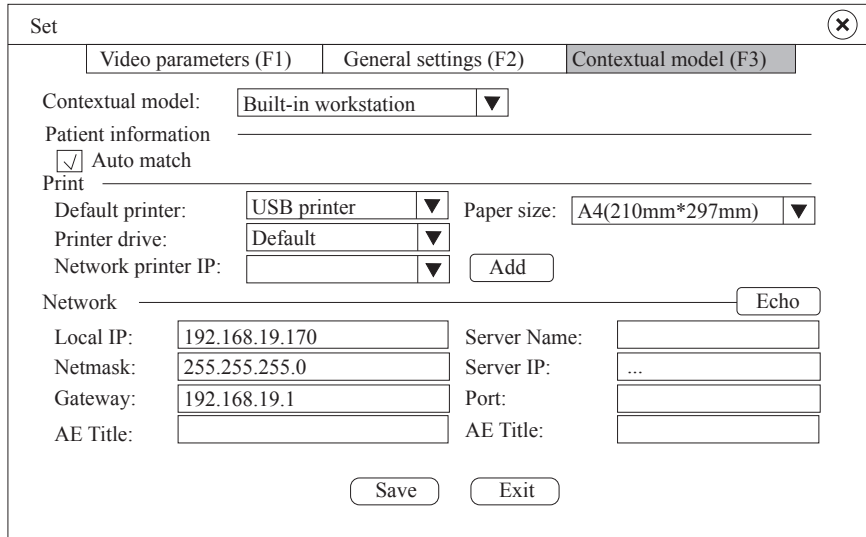


Figure 5-3 Contextual model tab page

2. Set the parameters on the **Contextual model** tab page.

Area	Item	Function
-	Contextual model	Options: Built-in workstation and External workstation . By default, Built-in workstation is selected. If External workstation is selected, the system does not provide the work order function, snap function, record table function, recording function, and printing function. In addition, all the setting items on the Contextual model tab page are not available. NOTE: Only the administrator has the rights to set this item.
Patient information	Auto match	If this item is selected, after a user inputs a patient name or ID on the main screen, Work Order interface, or Edit report interface, the system automatically loads patient information to the corresponding screen/interface.

Area	Item	Function
Print	Default printer	Options: USB printer and Network printer
	Paper size	Options: A4(210mm*297mm) and Carta(216mm*279mm)
	Printer drive	Options: Default , Deskjet D730 , HP Lase...r M251n (HP LaserJet 200 color M251n), HP Colo...CP1525N (HP Color LaserJet CP1525N), Desk , Color , and Laser . By default, Default is selected. If Default is selected, the system automatically matches an appropriate drive.
	Network printer IP	Set the IP address of the network printer.
	Add	After setting the IP address of the network printer, select Add and then select an appropriate printer from the displayed network printer list.
Network	Local IP	Set the local IP address.
	Server Name	Set the name of the storage server.
	Netmask	Set the netmask.
	Server IP	Set the IP address of the storage server.
	Gateway	Set the gateway.
	Port	Set the port number of the storage server.
	AE Title	Set the entity title of the storage server.
	Echo	Test the network connection.

3. Select **Save**, and then select **OK** in the displayed dialog box to save the current settings.
Select **Exit** to exit the current interface and return to the main screen.

5.2 Resetting the System

Press and hold **RST** on the device until you hear a beep to restore the parameter settings of all public modes (Custom1-Custom10) to default settings.

Chapter 6 Maintenance and Storage

You should maintain and store the device as described in this chapter.

6.1 Cleaning the Device

If the device is contaminated, you should perform the following cleaning procedures immediately after use. If cleaning is delayed, residual debris will be solidified, and it may be difficult to effectively clean the device. The device should be cleaned periodically.



- **WARNING** The device should be completely dried after being wiped with damp cloth. Otherwise, electric shock may occur.
- You should wear personnel protective barrier when cleaning the device. Otherwise, blood, mucous membrane and other potential source of infection adhered to the device may cause infection.
- Do not wipe light guide/air pump connector, other ports of the device and AC power outlet. Otherwise, it may cause damage.

■ To clean the surface and keyboard

Perform the following steps.

1. Power off the device and disconnect power cable from power outlet.
2. Dampen a lint-free soft cloth with 75% ethanol.
3. Use this lint-free soft cloth to clean the surfaces of device, keyboard and endoscope cable. Take special care and avoid to contact the pins inside the connector of endoscope cable.
4. Use a cotton swab to remove solids from between keys.

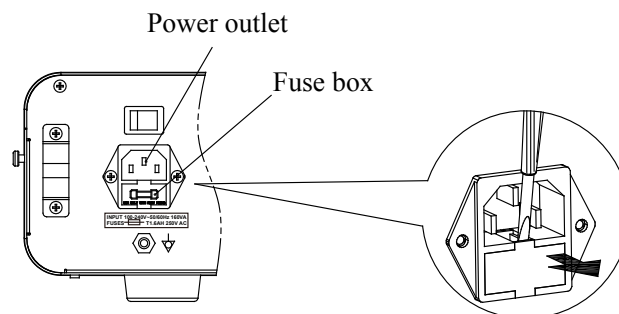
6.2 Replacing the Fuse



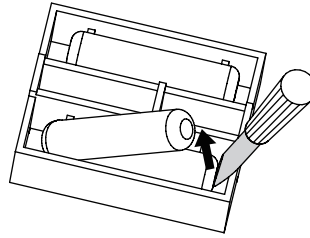
- **WARNING** Disconnect power cable before replacing the fuse. Otherwise, it may result in electric leakage.
- Please use the rated fuse of T1.6AH 250V. Otherwise, electric leakage may occur.

Perform the following steps to replace the fuse.

1. Power off the device and disconnect power cable from power outlet.
2. Take out the fuse box on rear panel with a slotted screwdriver.



3. Replace the burnt fuse.



4. Push the fuse box back to the original place until it is in position.
5. Connect the power cable and turn on the main power switch of the device.
6. Press the power button and ensure that the power indicator illuminates in blue. If the power indicator still cannot be illuminated, please contact the sales representative of the manufacturer.

6.3 Storing the Device

Perform the following steps to store the device.

1. Power off the device and disconnect the power cable from the power outlet.
2. Disconnect all the peripherals from the device.
3. Place the device on a clean and level surface at room temperature.

NOTE:

- If the device is not used for a long time, you should power on the device to ensure that the device is functioning before performing an exam.
- To avoid malfunction, do not excessively bend, pull, twist or squeeze power cable during storage.

6.4 Troubleshooting

In case of device problems, the device should be serviced by qualified technical personnel. If the problems still exist after servicing according to the following methods, stop using the device immediately and return it to the sales representative of the manufacturer for repair.

Descriptions	Inspection Items	Solutions
Power indicator does not illuminate.	Power cable	Ensure that the power cable is connected firmly and the power voltage of outlet is appropriate.
	Fuse	Take off the fuse box to change a new one.

Descriptions	Inspection Items	Solutions
Power indicator illuminates, but there is no image on the screen.	Connection between the device and endoscope	Ensure that the endoscope is connected to the device properly.
	Connection between the device and monitor	Ensure that the monitor is connected to the device properly.
	Orientation of distal end of the endoscope	Ensure that the distal end of the endoscope points at a bright area (such as fluorescent light) and normal image is displayed on the screen.
	Illumination	Enable the illumination function.
Image cannot be released after being frozen.	Relevant buttons on the endoscope	Check if the button set to freeze image on the endoscope can release image.
	FREEZE on the keyboard	Select FREEZE to check if it can release image.
	Footswitch	Check if the pedal set to freeze image of the footswitch can release image.
Image too bright or too dark.	Whether there are foreign objects on the lens of the endoscope	Refer to the relevant manual to remove foreign objects.
	Illumination	Enable the illumination function.
	Light intensity	Adjust the light intensity to an suitable level.
	Brightness parameter value	Adjust the brightness parameters of the device and monitor to appropriate values.

6.5 Device Disposal

The service life of the device is about 5 years.

You should dispose of the device or other accessories in accordance with local laws or regulations.

For detailed disposal information, consult the manufacturer or local distribution. The manufacturer is not responsible for any device content or accessories that have been discarded improperly.

6.6 Customer Service

Only the service personnel of or authorized by the manufacturer can service the endoscopic device.

Any feedbacks or inquires concerning our product or service should be directed to the following address.

Address: 4/F, 5/F, 8/F, 9/F & 10/F Yizhe Building, Yuquan Road, Nanshan, Shenzhen, 518051, Guangdong, China

Zip Code: 518051

Tel: +86-400-678-8019

Fax: +86-0755-26722850

E-mail: sonoscape@sonoscape.net

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Appendix A Specifications

Items	Specifications
Type of protection against electric shock	Class I
Degree of protection against electric shock	Type-BF applied part
Degrees of protection against harmful liquid	Non-waterproof enclosed equipment
According to the degree of safety of application	The equipment is not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
Work mode	Continuous
White balance	Auto
AGC (Automatic gain control)	On/Off
Color tone adjustment	Red: -8 to +8, Blue: -8 to +8
Image enhancement	Levels 1, 2 and 3. Level: 0 - 8
HGB CHb	Level: 0 - 8
Auto photometry	Peak mode: -9 - +9 Average mode: -9 - +9
Zoom	1.0~4.0 times
Image freeze/storage	Perform by endoscope, keyboard and footswitch
Display mode	Full screen
CHb color display:	On/Off
Input power	160VA
Fuse	T1.6AH 250V
Storage capacity	500GB

Items		Specifications
Operation	Temperature environment	0°C ~ 40°C
	Relative humidity	30% ~ 80% (non-condensing)
	Atmosphere pressure	700hPa ~ 1060hPa
Storage	Temperature environment	-5°C ~ 40°C
	Relative humidity	30% ~ 80% (non-condensing)
	Atmosphere pressure	700hPa ~ 1060hPa
Transport	Temperature environment	-20°C ~ 55°C
	Relative humidity	20% ~ 90% (non-condensing)
	Atmosphere pressure	700hPa ~ 1060hPa

Appendix B EMC Guidance and Manufacturer's Declaration

B.1 Electromagnetic Emissions

The equipment is intended for use in the electromagnetic environment specified below. The customer or the user of the EQUIPMENT should assure that it is used in such an environment.


Emissions Test	Compliance	Electromagnetic Environment and Guidance
RF emissions CISPR 11	Group 1	The equipment uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The equipment is suitable for use in all establishments other than domestic 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	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

B. 2 Electromagnetic Immunity

The equipment is intended for use in the electromagnetic environment specified below. The customer or the user of the equipment should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment and Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV Contact ±8 kV Air	±6 kV Contact ±8 kV Air	Floors 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 for input/output lines	±2 kV for power supply lines; ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to earth	±1 kV line to line ±2 kV line to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips and Short interruptions IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0.5 period 40 % U_T (60 % dip in U_T) for 5 periods 70 % U_T (30 % dip in U_T) for 25 periods <5 % U_T (>95 % dip in U_T) for 250 periods	<5 % U_T (>95 % dip in U_T) for 0.5 period 40 % U_T (60 % dip in U_T) for 5 periods 70 % U_T (30 % dip in U_T) for 25 periods <5 % U_T (>95 % dip in U_T) for 250 periods	Mains power quality should be that of a typical commercial or hospital environment. If the user of the equipment requires continued operation during power mains interruptions, it is recommended for the equipment to be powered from an uninterrupted power supply.
Power frequency (50/60Hz) 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 AC mains voltage prior to application of the test level.			

The equipment is intended for use in the electromagnetic environment specified below. The customer or the user of the equipment should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment and Guidance
Conducted RF IEC 61000-4-6	3Vrms 150kHz-80 MHz	1 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the EQUIPMENT, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3	3V/m 80 MHz-2.5GHz	3 Vrms	<p>Recommended separation distance:</p> $d=3.5\sqrt{P}$ $d=1.2\sqrt{P} \quad 80\text{MHz}-800 \text{ MHz}$ $d=2.3\sqrt{P} \quad 80 \text{ MHz}-2.5\text{GHz}$ <p>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). 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 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.			
<p>^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 EQUIPMENT is used exceeds the applicable RF compliance level above, the EQUIPMENT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the EQUIPMENT.</p>			
<p>^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

B. 3 Recommended Separation Distances between Portable and Mobile and RF Communications Equipment and the Equipment

The equipment is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the equipment can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the equipment 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	80 MHz to 800 MHz	800 MHz to 2.5 GHz
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.