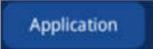


2.3.8 Application Interface

On Waveform Acquisition interface, directly touch the key  or click the F7 key on the panel to enter the Application interface.

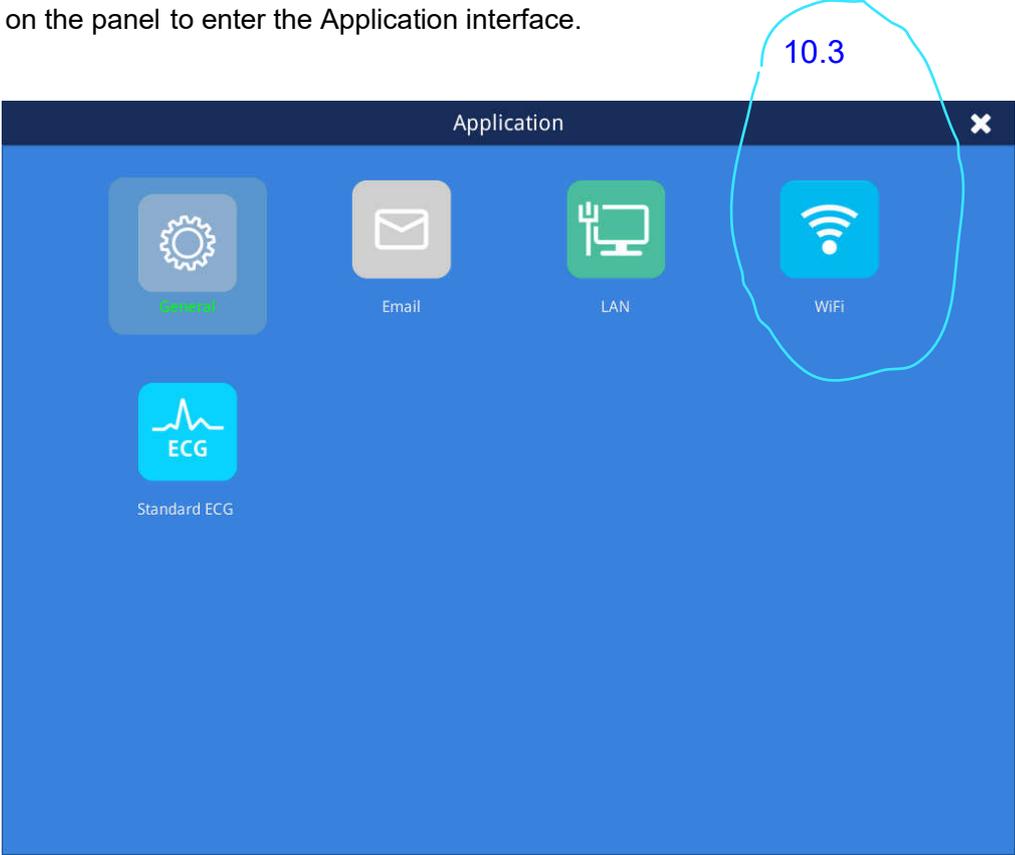


Fig. 2.18 Application Interface

Chapter 3 Installation

3.1 Preparation for Installation



CAUTION

- ◆ *This device shall be installed by the personnel authorized by the manufacturer.*
 - ◆ *Don't open the device cover. Otherwise there might be risk of electrical shock. Only the service personnel authorized and trained by the manufacturer can maintain or update the device.*
 - ◆ *This device includes software protected by copyright and international laws, all right reserved to the manufacturer, No part of the device may be modified, reproduced or transmitted in any form or by any means, without prior written permission from the manufacturer.*
 - ◆ *All the analog digital devices connected to this device must be approved by the designated standard (such as IEC60601-1 Safety of Medical Electrical Equipment). And all equipment must be connected in accordance with the valid version of the system standard IEC60601-1-1. The person who is in charge of connecting the additional devices to the input and output signal ports shall be responsible for whether the system conforms to the standard IEC60601-1-1 or not. For any questions, please contact the manufacturer.*
 - ◆ *When this device and another electrical device are connected into a conjunction with certain function, if it cannot be determined whether this conjunction is hazardous (for example, electrical shock caused by leakage current crowding) or not in terms of each device's specification, please contact the manufacturer or related experts in hospitals in order to guarantee that safety of all devices will not be breached.*
-

3.1.1 Open-package Inspection

Before opening the package box, carefully inspect it. If any damage is found, please contact the shipping company immediately.

Please open the package in a correct way. Carefully remove the device and other components from the box and check them one by one per the packing list. Check whether the device is damaged mechanically, or the goods are complete. For any questions, please contact the manufacturer immediately.



WARNING

- ◆ *Keep packaging materials out of reach of children. When dispose of the packaging materials, please follow local laws and regulations or regime of medical waste disposal in local hospitals.*
 - ◆ *The device may be contaminated by microbes during storage, transportation and usage. Please verify that the package is intact before use, especially disposable accessories. If any damage is found, please stop using.*
-



CAUTION

- ◆ *Well keep the packaging boxes and materials for future shipment or storage.*
-

3.1.2 Environment Requirements

This device must be used in an environment complying with environment specifications in this manual.



- ◆ *Reasonably avoid using the device in the presence of noise, vibration, dust, corrosive or flammable and explosive substances. If the device is installed in a box, please make sure that the front and back space is enough for operation, maintenance and service. In order to allow unimpeded air circulation for a good cooling effect, at least 5cm space should be saved around the device*
 - ◆ *During the process of device movement from one environment to another, it might cause condensation due to differences in temperature or humidity. At this moment, you can use it until the condensation disappears.*
-



WARNING

- ◆ *Please ensure that the device works under required specified environment. Otherwise it will not comply with the technical specifications alleged in this manual, which may lead to unpredictable consequences (damaging the device, etc).*
 - ◆ *Do not use the device in oxygen-rich environment, or the presence of flammable or explosive substances (anesthetics, etc) in case of fire or explosion.*
 - ◆ *Electromagnetic fields can affect the performance of this unit. Therefore other devices used in the vicinity of the unit must comply with EMC requirements. Mobile phone, X-ray or MRI equipment are potential interference sources, because they could emit electromagnetic radiation of high intensity.*
 - ◆ *Power plug is used to separate the ECG circuit from power mains. Do not put the ECG machine in a place where is difficult to handle the plug.*
 - ◆ *Be sure to connect the AC power cord to a hospital-grade three-core socket with a ground wire to guarantee reliable grounding*
 - ◆ *Before the unit is connected to the AC power, please verify that the power's voltage and frequency comply with its label or the requirements specified in this manual.*
-



CAUTION

- ◆ *If strong electromagnetic radiation exists in surroundings, it will produce different levels of interference to the ECG machine. Please make sure there are no high-voltage lines and heavy-load power cables passing-by near the unit and patient bed.*
 - ◆ *While examining the patient, prevent irrelevant individuals from contacting the machine or the patient in case that interference affects the interpretations.*
-

3.2 Power Selection

This ECG machine can work by 220V AC power or lithium-ion rechargeable battery power.

3.2.1 Connecting to the AC Power

Plug one end of accompanying three-core power cord into the power jack at the back of the machine, and the other end into the three-core socket with a grounding cable. Turn on the power switch at the back of the machine, then the AC input light is on, which indicates that AC power has been connected.



WARNING

- ◆ *Use the dedicated adapter power cord provided by the manufacturer only. If the power cord is damaged, please contact the manufacturer to buy a new one for replacement.*
 - ◆ *If proper grounding cannot be guaranteed, you shall operate the device with the built-in rechargeable battery. Otherwise it may incur electrical shock to the patient and operator.*
-

3.2.2 Battery Power

The ECG machine has a built-in rechargeable lithium battery pack that can be used to power the unit during transport or when AC power is not available. For battery use and maintenance, please refer to the related contents in *Section 9.3* of this manual.



WARNING

- ◆ *Make sure that the ECG machine is powered by dedicated rechargeable battery. Before use, please refer to the contents in Section 9.3 of this manual. Safe and proper use of the battery shall be guaranteed to prevent current leakage, heat or explosion.*
 - ◆ *Battery replacement shall be carried out by the manufacturer authorized service engineer. For battery replacement, please contact the service engineer*
-

authorized by the manufacturer.



CAUTION

- ◆ *To prevent data loss caused by accidental AC power interruption, a battery must always be installed in ECG machine.*
 - ◆ *Whenever the unit is connected to AC power and AC power is on, the battery is being charged. Therefore, it is recommended that the unit remain connected to AC power when not in use. This will ensure a fully-charged battery whenever it is needed.*
-

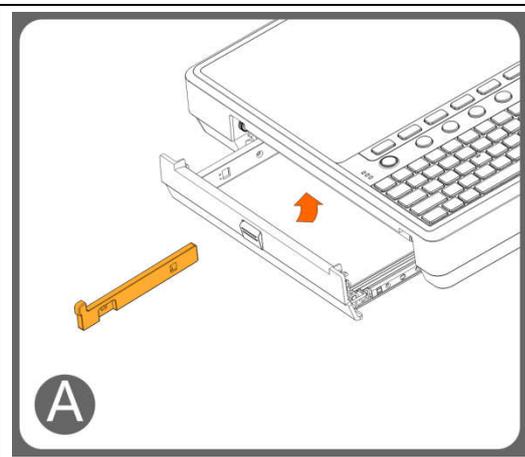
3.3 Installing the Recording Paper

This ECG machine is designed to use Zip fold thermal recording paper of 216 mm or 210 mm in width.

3.3.1 Installing the Paper Block

Prior to install the 216mm-wide paper, please install the accompanying paper block first.

A: Push the printer door switch, and pull out the door, then put in the paper block as shown.



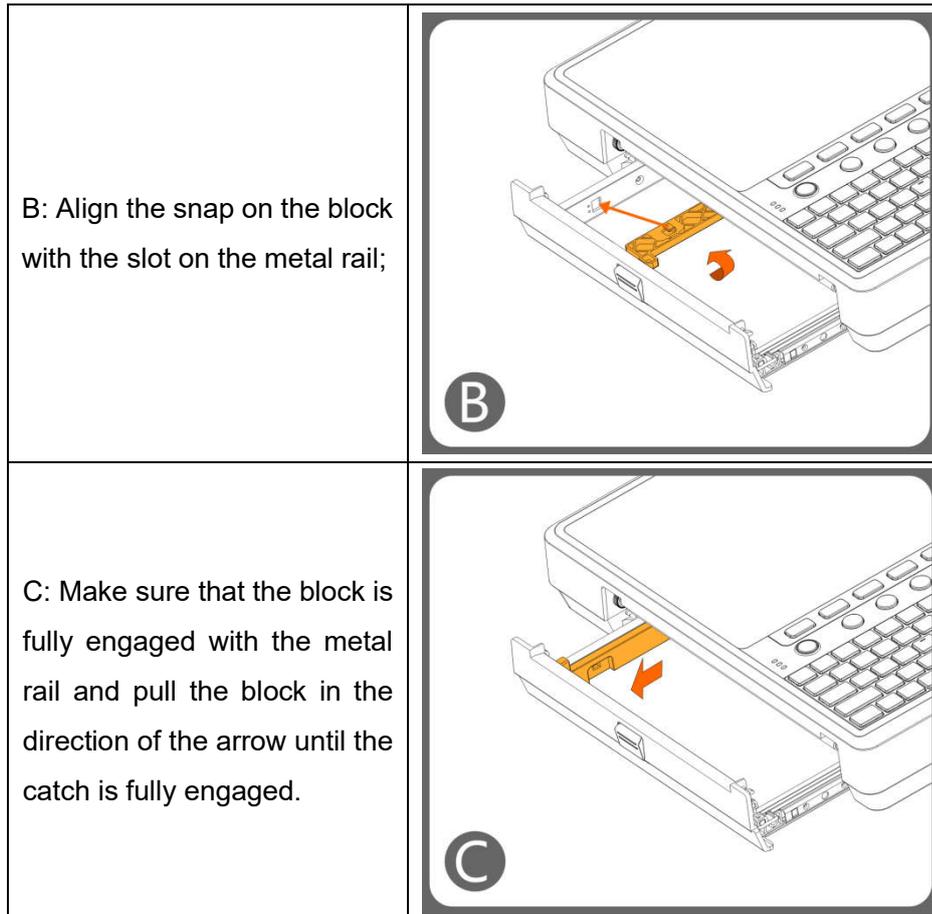


Fig. 3.1 Sketch of Installing the Recording Paper

3.3.2 Installation of recording paper

The method of installing the 216mm and 210mm wide Z-fold thermal recording paper is the same as the following figure:

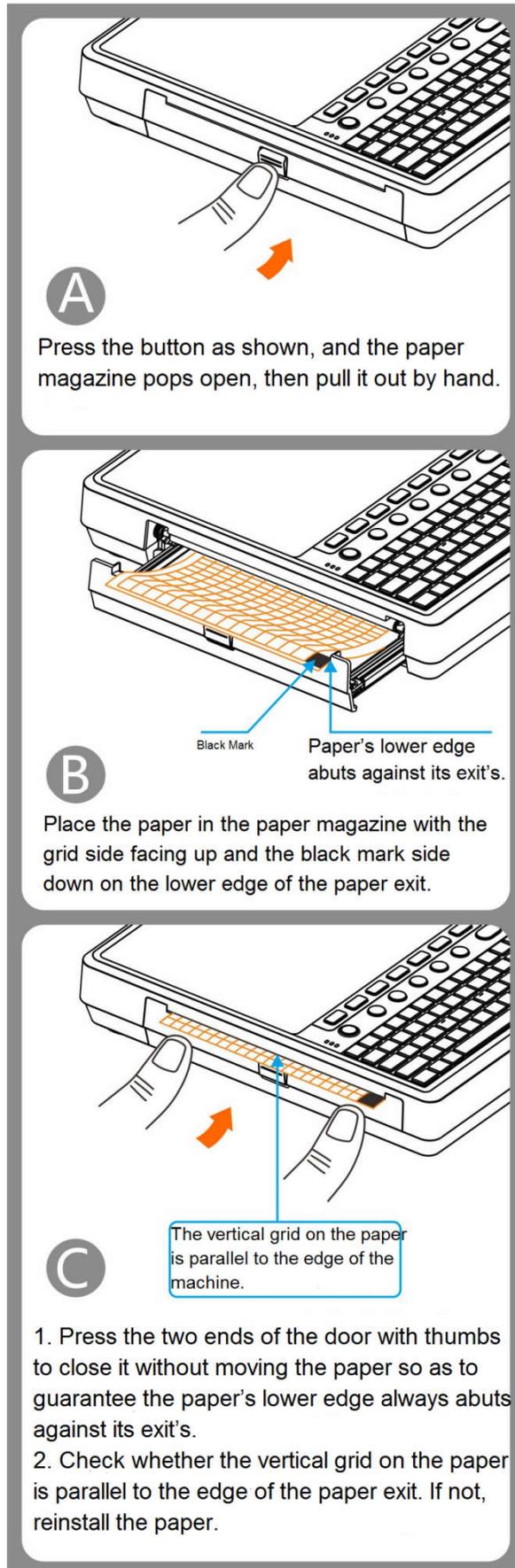


Fig 3.2 Schematic of Installing the Recording Paper



- ◆ The black-marked end of recording paper should stay close to the black-marked detecting end of the recorder.
 - ◆ The grid side of recording paper should face up to the printer head.
 - ◆ The end page of recording paper is marked red. Make sure it is placed on the bottom.
 - ◆ Recording paper should be placed above the plastic pull tab.
 - ◆ Place the recording paper naturally while installing. Keep the lower edge of recording paper close to that of the printer door. Don't center it deliberately.
 - ◆ When close the printer door, parallel the vertical grid line of recording paper to the tearing margin as possible in case of the paper jam caused by huge placement deviation while printing.
 - ◆ Please use the paper recommended by the manufacturer.
-

3.4 Connecting the Patient Cable

Properly connect the patient cable to the lead connector at the right side of the machine.

Tighten the screws on patient cable connector and attach the cable to the ECG machine.

The other end of the cable shall be connected to the patient via electrodes. For more details, please refer to *Chapter 5*.



CAUTION

- ◆ *Please use the dedicated patient cable configured by the manufacturer. If the cable is damaged, please contact the manufacturer in time to replace or purchase a new one.*
-

3.5 Power on

3.5.1 Checks before Power on

In order to ensure safe exam and stable printout of ECG, you are required to make the above-mentioned checks before operating of the ECG machine.

- **Checks on Operation Environment**

Verify that the ground wire is well connected, the ground bolt is tight, and ground wire connector and grounding wire are properly connected.

Operation environment of the machine should be free of X-ray equipment, short-wave devices, and the like, which may impose interference on the ECG machine.

The machine shall be operated in warm indoors (room temperature should be no less than 18°C) in order to avoid myoelectric interference caused by coldness.

Verify that the power cord is properly connected, and disentangled with other cables.

- **Checks on Power Supply**

When the machine is to operate on AC power, please check whether the power voltage is the same as local voltage used and whether the power cord is firmly connected with the machine. Please use a properly grounded AC outlet. If a battery is used, please inspect whether it is fully charged.

- **Checks on Patient Cable**

Check whether the patient cable is firmly connected with the ECG machine.

Verify that the patient cable plugs are correctly and reliable connected with the related electrodes.

- **Checks on Recording Paper**

Verify that recording paper is sufficient and properly installed.

3.5.2 Power on

After installation and checks, connect the power cable and turn on the ECG machine, then start to acquire and record the patient's ECG.



CAUTION

- ◆ *If the device is damaged or does not work, it cannot be used to acquire and record the patient ECG. Please contact the service personnel or the manufacturer immediately.*
-

3.6 ECG Machine Setting

There are some settings need to be done for the first time use, such as time, report storage ways etc. During ECG waveform acquisition and measurement, you need to set such parameters as recording modes, sampling time, gain, paper speed, filter etc. For more details, please refer to *Section 2.3* and *Chapter 4*.

3.7 Power off

Please follow the steps below to power off the ECG machine:

- 1) Verify that the patient ECG acquisition and recording can be ended.
- 2) Disconnecting all the ECG electrodes with the patient.
- 3) Press the power switch, a dialog appears with three options, then select "Power Off".



CAUTION

- ◆ *If you cannot shut down the machine normally, or special circumstances arise, please long press the power switch for 10 seconds to force a shutdown. Forced shutdown may incur ECG data loss, thus usually not recommended except in special circumstances.*
-

Chapter 4 System Applications

4.1 Entering Main Menu

In the waveform acquisition interface, click the  button on the touch screen or **F7** key on panel to enter into the system application interface. The system application interface layout is described in Section 2.3.8. The touch screen allows you to directly click on the item you want to view.

Key operation mode:

- Tab key to make the focus switch to the next control, Shift+Tab to make the focus switch to the next control;
- In the control options, you can press the "↑" and "↓" direction keys to switch vertically. The "←" "→" direction keys switch horizontally, and the space bar confirms the selection;
- You can touch the screen to select; or connect an external USB mouse and left click to select.

The settings made in the system settings interface will be saved as default user settings and will remain active the next time you turn the phone on.

The general setting interface has a locking function. Pressing the key combination "CTRL+ALT+L" will pop up the lock dialog box, which can lock the machine settings, report settings, recorder settings, filter settings and heartbeat warning settings. After locking, the option button is grayed out; if you need to change the option settings, press the key combination "CTRL+ALT+L" again to unlock the option.

4.2 Application Interface

4.2.1 General–Machine Setting

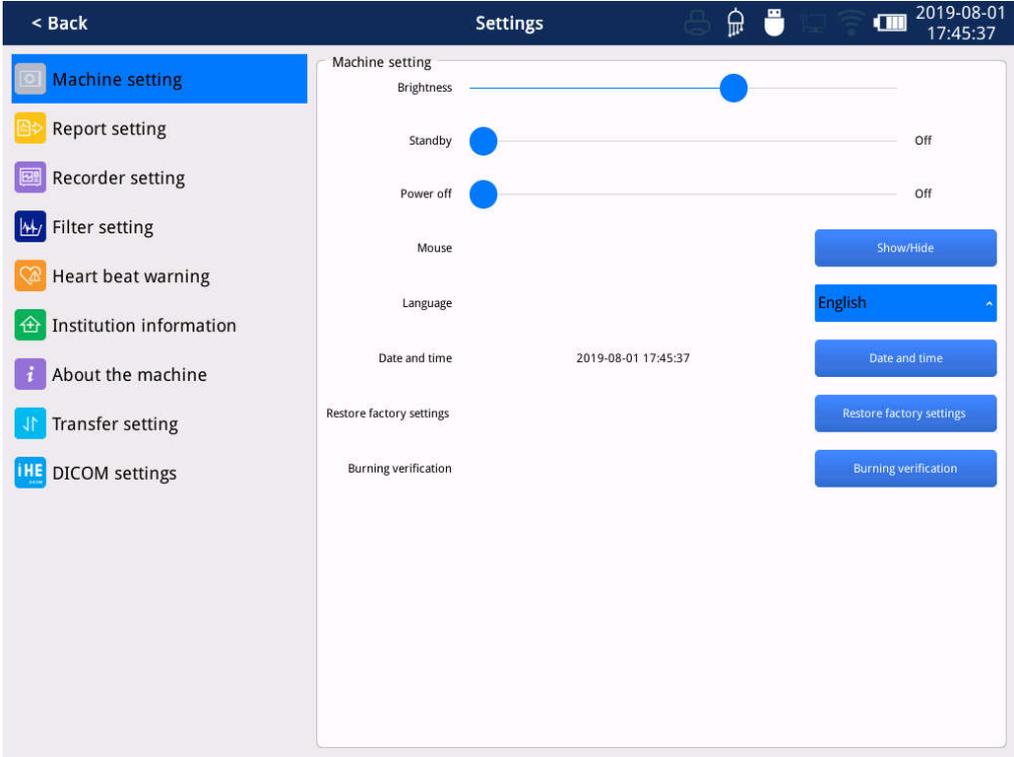


Fig. 4.1 Machine Setting Interface

Machine Setting			
Menu Item	Option	Defaults	Illustration
Brightness	/	/	Adjust the backlight intensity of the display.

Standby	Off, 5 min, 10 min, 15 min, 20 min, 25 min, 30 min	Off	Set the time when the ECG machine automatically enters standby mode. If there is no user operation within the set standby time, the ECG machine enters the standby state. When entering standby mode, the screen is turned off. The standby time you set cannot be longer than the automatic shutdown time.
Shut down	Off, 5 min, 10 min, 15 min, 20 min, 25 min, 30 min	Off	Set the auto power off time. If the user does not perform any operation during the set auto power off time, the ECG will automatically shut down.
Mouse	Show/Hide	Hide	When "Display" is turned on, the screen displays the current position of the mouse.
Language	Simplified Chinese, English,etc.	Chinese	Select the interface language.
Date and time	/	/	Set the date and time of the machine.
Factory settings	Restore factory settings	/	To restore factory settings
Burn verification	Burn verification (MD5 file) / system upgrade	/	Burn verification is used to verify that the current version is successfully burned.



CAUTION

◆ *The factory settings will be restored and the machine will restart automatically.*

4.2.2 General-Report Setting

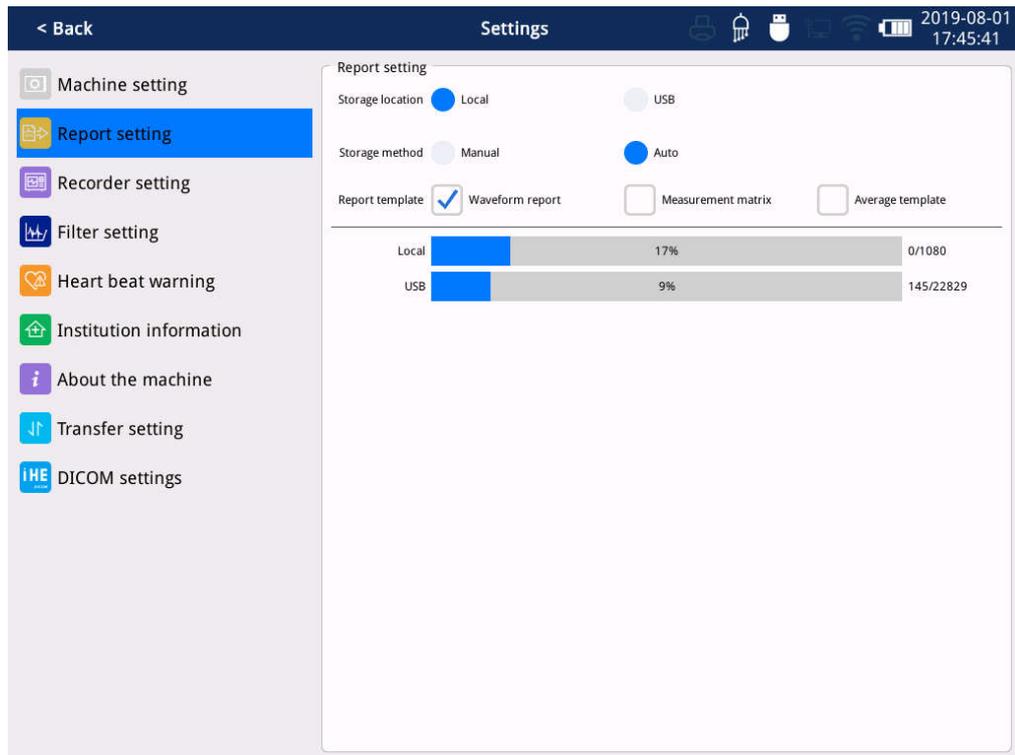


Fig. 4.2 General-Report setting

Report setting			
Menu Item	Option	Defaults	Illustration
Storage location	Local/ SD / USB	Local	See section 6.4.1 for details.
Storage method	Auto/Manual	Auto	See section 6.4.2 for details.
Report template	Waveform report / Measurement matrix / Average template	Waveform report	<p>Check the waveform and display the ECG waveform on the printed report.</p> <p>Check the measurement matrix and display the ECG measurement matrix on the printed report (when printing, multiple periodic waveform of each lead will be combined into a single cycle waveform.)</p> <p>Check the average template and display the ECG average template on the printed report (when</p>

			<p>printing, the horizontal display shows 12 leads; the vertical display shows the parameters of each lead, such as P, QRST wave start and end points, P, QRS, T wave group period, etc.)</p> <p>Built-in print report in real-time sampling mode, only supports waveform report; other sampling mode built-in printing or ECG preview interface printing regular ECG report can support all report templates, you can select multiple or single.</p> <p>The report template for regular ECG external printing supports single or multiple selection by printer model. (See 4.2.3 General Settings - Recorder Settings)</p>
Local/USB/SD Card	/	/	Display storage capacity

4.2.3 General-Recorder Setting

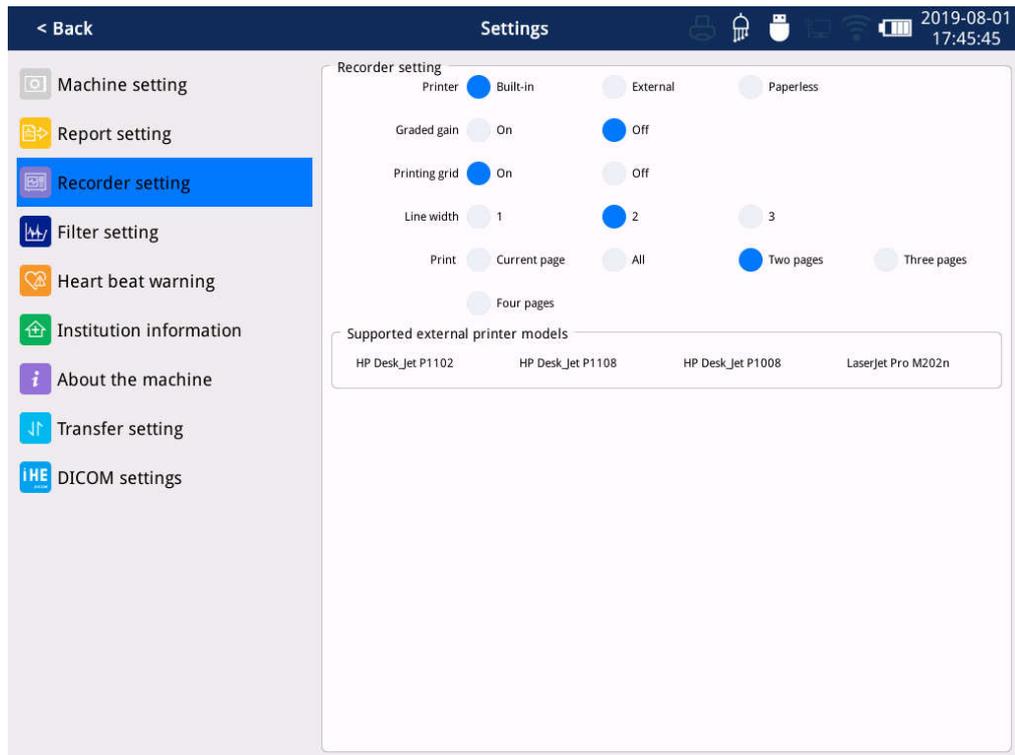


Fig. 4.3 General-Recorder setting

Recorder Setting			
Menu Item	Options	Default Value	Illustration
Printer	Built-in/external/paperless	Built-in	 <p>In paperless mode, click key, the system will acquire and save ECG waveforms. No matter there is recording paper in the printer or not, it will not print the waveforms.</p>
Graded gain	Off/On	Off	<p>When set to On, the gain amplitude of the first six leads is twice the gain of the last lead. For example, when the gain amplitude is set to 20 mm/mv, the first six-lead gain amplitude is 20 mm/mv, and the last lead amplitude is 10 mm/mv.</p>

Recorder Setting			
Menu Item	Options	Default Value	Illustration
			If the waveform acquisition interface selects automatic gain, the gain amplitude of each lead is automatically assigned.
Printing Grid	Off/On	On	Set the grid when export PDF reports. When it is set "On", the waveform zone and footer zone will display grid background; When set "Off", no grid will appear on the report. Printing grid is only available for an External printer.
Line width	1/2/3	2	The width of the waveform line displayed on the thermal paper.
Printing	Current page / all / two pages / three pages / four pages	Two pages	Preview the contents of the print when the it is in built-in printer.

Recorder Setting			
Menu Item	Options	Default Value	Illustration
Supported external printer models	/	/	<p>Supported printer models:</p> <p>HP Dest_Jet P1102 (only report template radio is supported)</p> <p>HP Dest_Jet P1108 (only report template radio is supported)</p> <p>HP Dest_Jet P1008 (only report template radio is supported)</p> <p>LaserJet Pro M202n (supports report template multiple selection and single selection)</p> <p>If the report template is multi-selected, the connection only supports external printers that report single-selection, and the waveform report is printed by default.</p>

4.2.4 General-Filter Setting

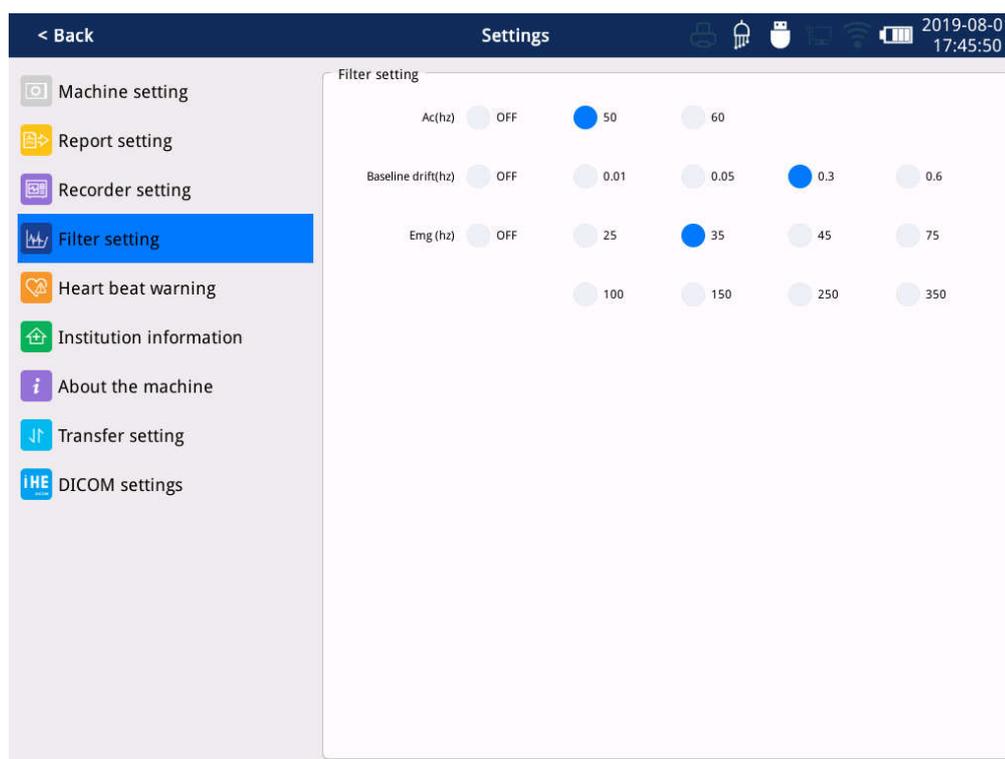


Fig. 4.4 General-filter setting

Filter setting			
Menu Item	Options	Default Value	Illustration
AC Filter (Hz)	OFF、 50、 60	50	Select whether to turn on the AC filter to filter out AC power interference. AC Filter should always be turned on, unless it is necessary to turn it off.
Baseline drift (Hz)	OFF、 0.01、 0.05、 0.3、 0.6	0.6	Select the baseline drift filter (BDR) frequency. Baseline drift filter rejects most of the baseline drift interference and makes the ST segment undistorted. Baseline drift filtering is not performed when set to [Off]. (This filter is high-pass filtering)

EMG (Hz)	OFF、 25、 35、 45、 75、 100、 150、 250、 350	35	Set the frequency of EMG. Turning on the EMG filter can filter out EMG interference, but it may reduce the bandwidth and cause the ECG waveform shape to change. The EMG filter is low-pass filtering. signals with a frequency higher than the set value will be filtered out. When set to 35 Hz, the system only displays signals below 35 Hz and below 35 Hz, and signals beyond 35 Hz will be filtered out.
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CAUTION

- ◆ *The settings of the baseline drift filter and the EMG filter affect the frequency response range of the electrocardiograph. If the baseline drift filter setting value is too high and the EMG filter setting value is too low, it will affect the accuracy of the ECG machine for waveform restoration. For example, when the baseline drift filter frequency is set to 0.6 Hz and the EMG filter frequency is set to 25 Hz, the system frequency response range is 0.6 Hz to 25 Hz.*
-

4.2.5 General-Heartbeat Warning

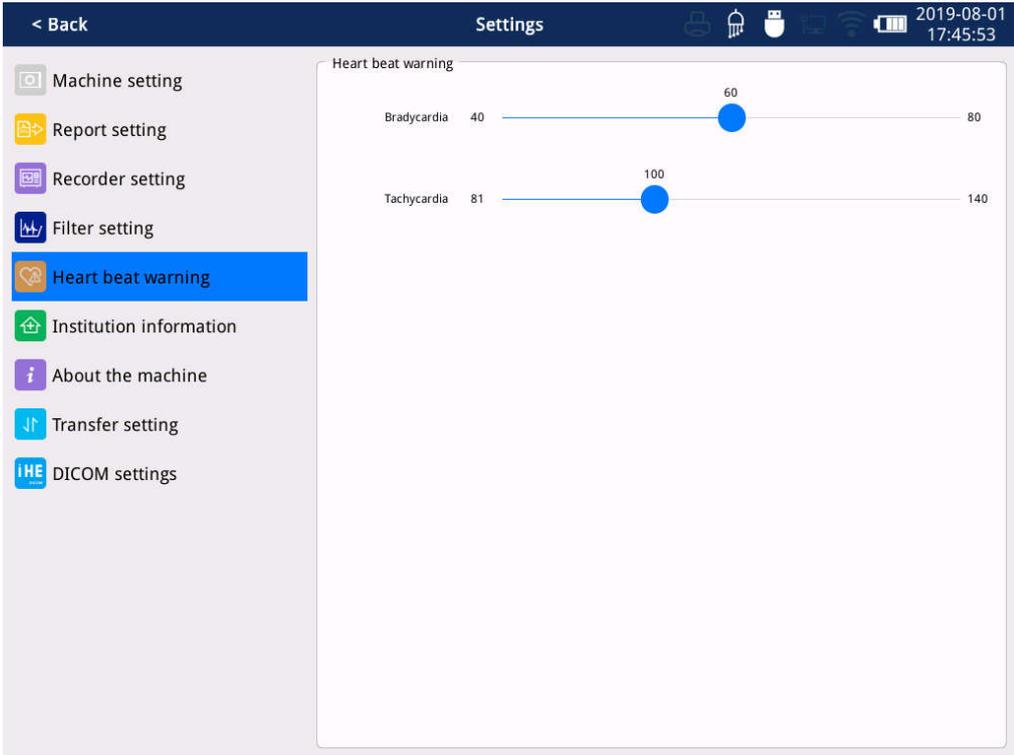


Fig. 4.5 Heartbeat Warning Interface

Heartbeat Warning			
Menu Item	Options	Default Value	Illustration
Bradycardia	40-80	60	Set the bradycardia threshold.
Tachycardia	81-140	100	Set the tachycardia threshold.

4.2.6 General-Institution Information

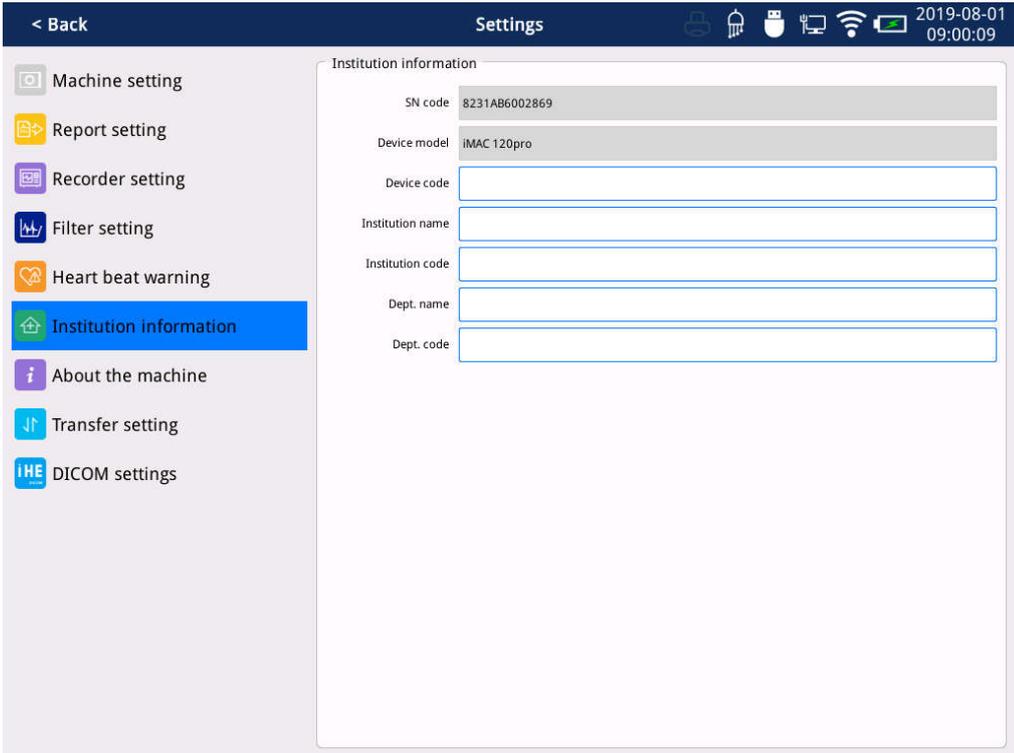


Fig. 4.6 Institution Information Interface

4.2.7 General-About the Machine

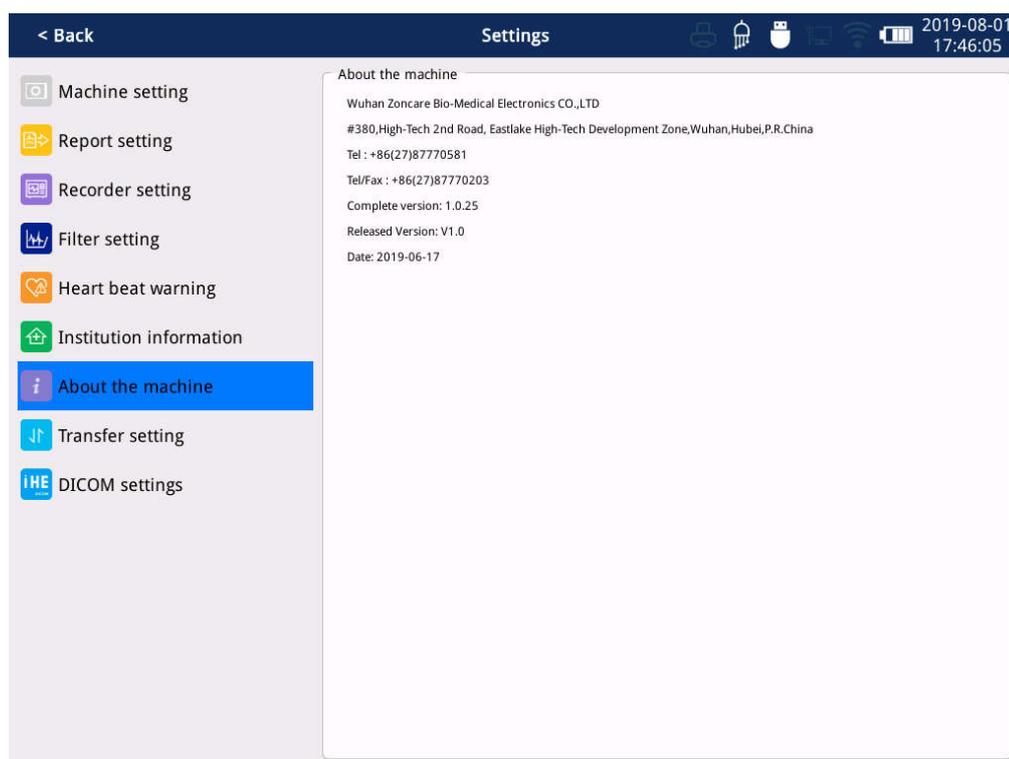


Fig. 4.7 About the Machine Interface

4.2.8 General-Transfer Setting

Enter the transfer setting interface. Enter the unlock password according to the prompt. The password defaults to 4000400499.

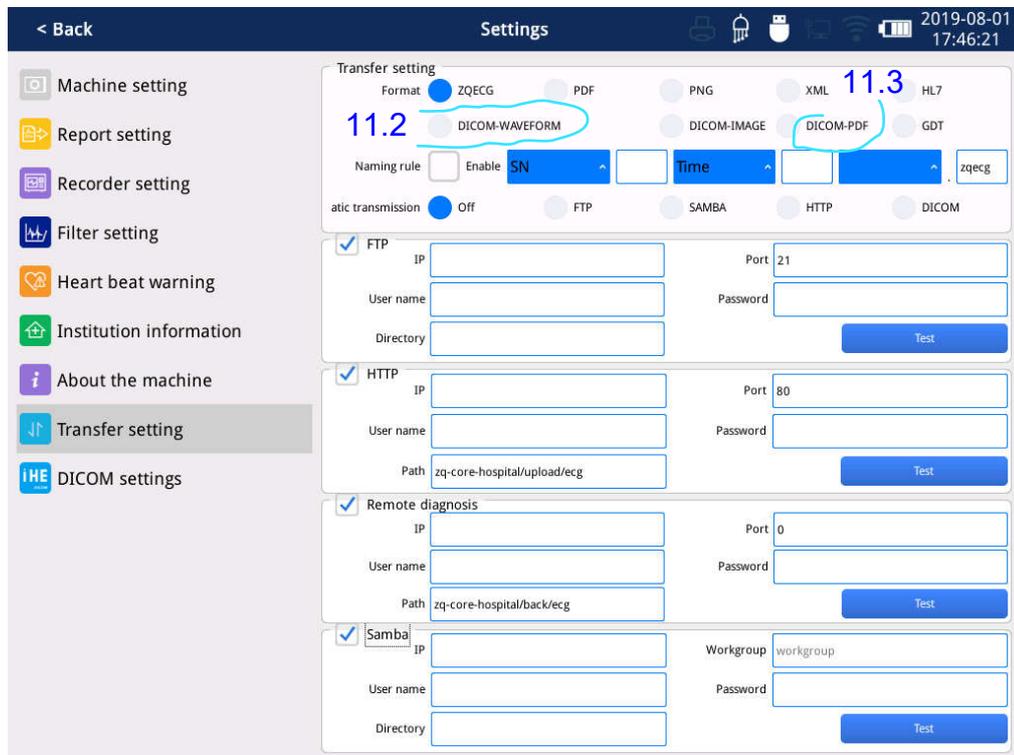


Fig. 4.8 Transfer Setting Setting Interface

Transfer Setting			
Menu Item	Options	Default Value	Illustration
Report transmission format	ZQECG、PDF、PNG、XML、HL7、DICOM-WAVEFORM、DICOM-IMAGE、DICOM-PDF、GDT	ZQECG	The transmission format of the ECG file.
Naming rule	SN/PID/StudyID/Time + XXX + SN/PID/StudyID /Time + XXX + SN/PID/StudyID	SN+ Time. ZQECG	The naming rules can be a combination of SN, PID, StudyID, Time, or can be named separately. The file name suffix is automatically generated based

	/Time .		on the selected report transfer format.
Auto transfer	OFF/FTP/SAMBA /HTTP/DICOM	OFF	<p>When it is OFF, you can manually select the ECG report transmission on the [Report Management] interface.</p> <p>When it is on, the report can be transmitted in real time in the FTP/SAMBA/HTTP/DICOM transmission mode when the ECG report is printed and frozen. (You should ensure that the network is properly connected and the FTP/SAMBA/HTTP/DICOM transmission mode is successfully enabled)</p> <p>Note: The corresponding button will only be highlighted if the FTP/SAMBA/HTTP/DICOM transfer mode is enabled, otherwise it will be grayed out.</p>
FTP setting	IP address, port number, username, password, directory	/	<p>1) The FTP username and password that you set must be the username and password that can be logged into the FTP server.</p> <p>2) The FTP path that you set must be a subdirectory that already exists in the root directory of the FTP server.</p> <p>Note: For more information about the FTP server, please consult your network administrator.</p> <p>3) After setting, you can click the “” button to check if</p>

			<p>it can be connected.</p> <p>4) After the test is passed, check the “62</p>
--	--	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

			<p>2) The remote diagnosis path that you set must be a subdirectory that already exists in the root directory of the remote diagnosis server.</p> <p>Note: For more information about the remote diagnosis server, please consult your network administrator.</p> <p>3) After setting, you can click the  button to check if it can be connected.</p> <p>4) After the test is passed, check the  button to enable it.</p> <p>(Note: It can only be used in the transmission of the [Naming Rule] interface after it is enabled.)</p>
SAMBA setting	IP address, port number, username, password, directory	/	<p>1) The SAMBA username and password that you set must be the username and password that can be logged into the FTP server.</p> <p>2) The SAMBA path that you set must be a subdirectory that already exists in the root directory of the SAMBA server.</p> <p>Note: For more information about the SAMBA server, please consult your network administrator.</p> <p>3) After setting, you can click the  button to check if it can be connected.</p> <p>4) After the test is passed, check</p>

			<p>the “” button to enable it. (Note: It can only be used in the transmission of the [Report Management] interface after it is enabled.)</p>
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4.2.9 General-DICOM Setting

Enter the transfer setting interface. Enter the unlock password according to the prompt. The password defaults to **4000400499**. [11.5 Duomenys perduodami tiesiai iš ECG aparato](#)

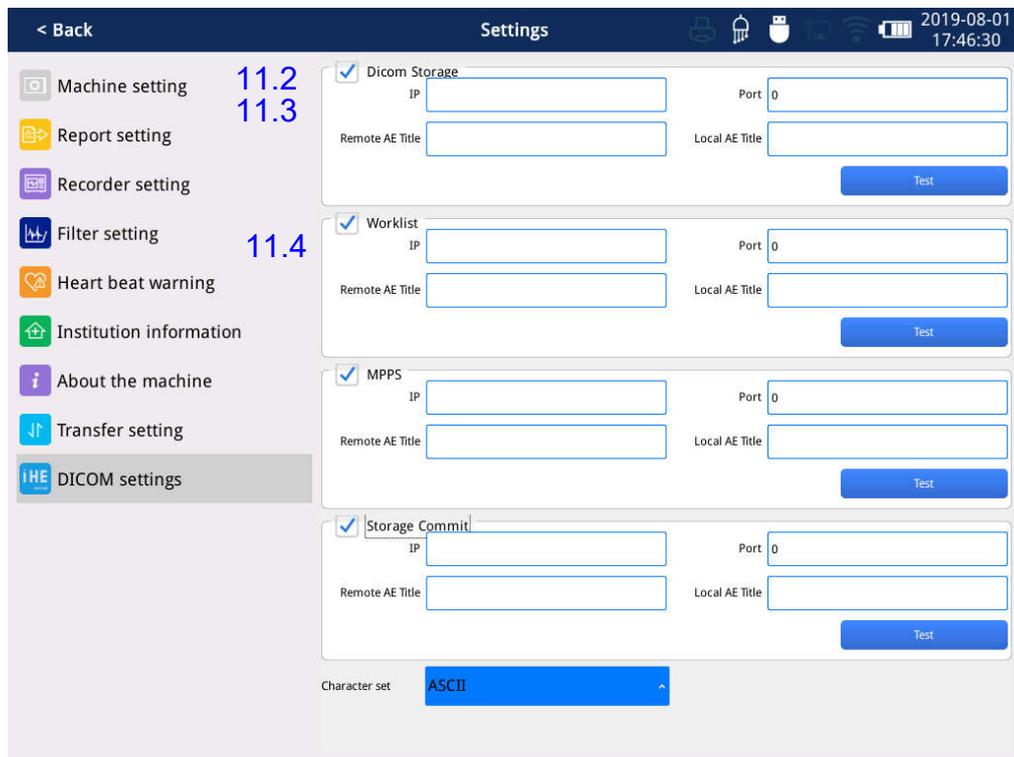


Fig. 4.9 DICOM Setting Interface

DICOM SETTING			
Menu Item	Options	Default Value	Illustration
Dicom Storage	IP address, remote port number, remote AE	/	The ECG file is uploaded to this server in the "dicom" transfer

(upload configuration)	directory, local AE directory		format. 1) After setting, you can click the “  ” button to check if it can be connected. 2) After the test is passed, check the “  ” button to enable it. (Note: It can only be used in the transmission of the [Report Management] interface after it is enabled.)
Worklist (Server settings)	IP address, remote port number, remote AE directory, local AE directory	/	The ECG machine imports patient information data from this server. 1) After setting, you can click the “  ” button to check if it can be connected. 2) After the test is passed, check the “  ” button to enable it.
MPPS (Server settings)	IP address, remote port number, remote AE directory, local AE directory	/	The ECG machine will send three states of acquisition, start to collect, complete the acquisition, and cancel the acquisition, to this server. 1) After setting, you can click the “  ” button to check if it can be connected. 2) After the test is passed, check the “  ” button to enable it.
Storage Commit (Storage server)	IP address, remote port number, remote AE directory, local AE directory	/	A server that confirms whether the ECG file has been uploaded. 1) After setting, you can click the “  ” button to check if it can be connected.

configuration n)			2) After the test is passed, check the " <input type="checkbox"/> " button to enable it.
Character set	ASCII/GB1 8030/ISO-8859-1~ ISO-8859-9/ UTF-8	ASCII	Select the appropriate character set to avoid garbled characters in the transmitted ECG file.

4.2.10 E-Mail setting



1. Click the "Email" button to open the mail dialog. Note: For more information on configuring your network and interfaces, please consult your network administrator. Use wired Ethernet or WIFI transmission:

- 1) Manually add the sender, recipient's account number, server address and port number.
- 2) Select and confirm the appropriate sender, recipient.

3) Click the "Attachment" button to check the files you want to upload. The system will automatically fill in the email subject.

4) Click the "Send" button to send the mail.

2. The recipient can browse the png format ECG file through the mailbox.

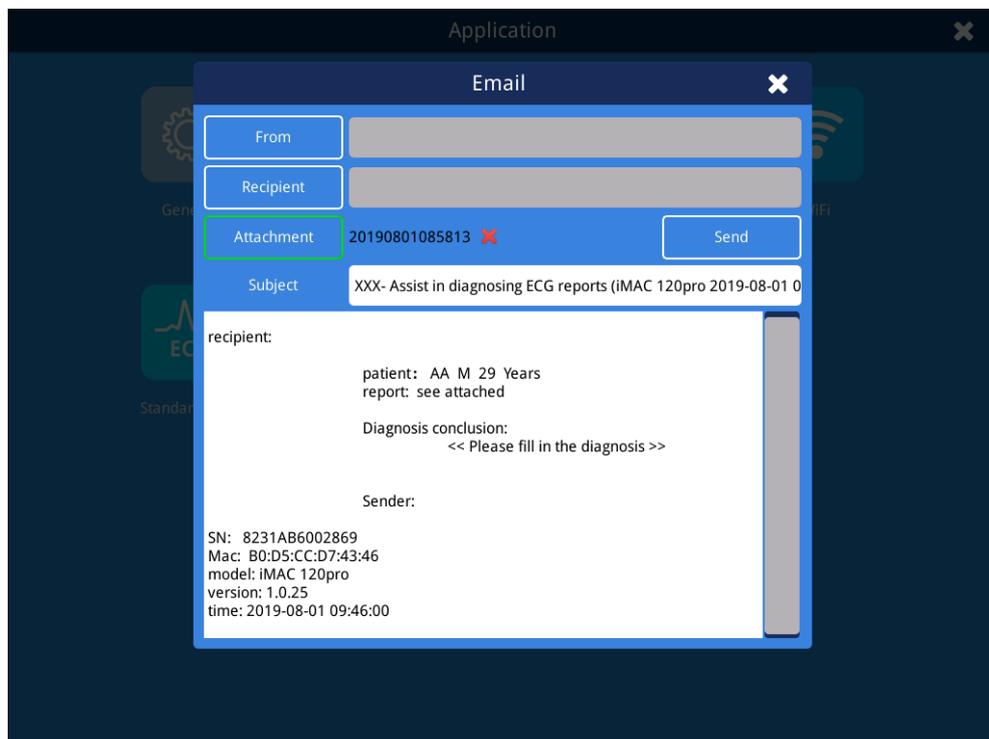


Fig 4.10 Email Interface

4.2.11 LAN setting



Click the "LAN" button to open the Wired Settings dialog box to make the appropriate network settings. (Note: For details on configuring the network, please consult your network administrator.) After setting, click the "Save" button to save and take effect. You can automatically obtain the local IP address or manually enter the local IP address.

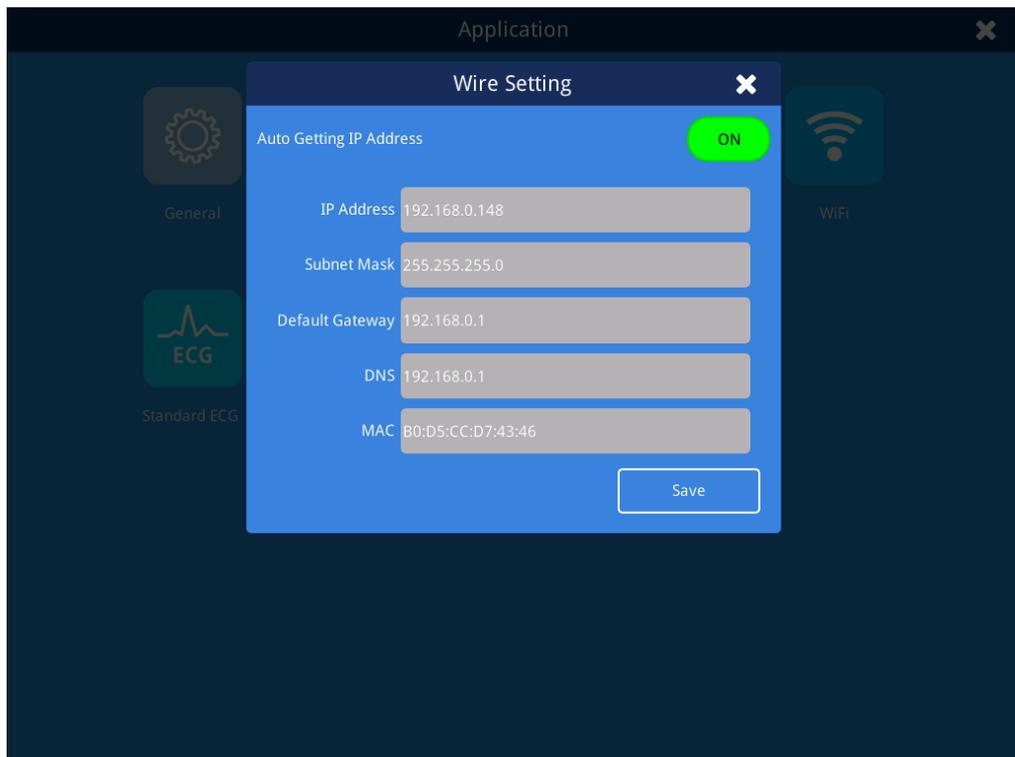


Fig. 4.11 LAN Interface

4.2.12 WIFI setting



Click the "WiFi" button to open the Wireless Settings dialog box, you can choose to turn WiFi on or off. Click the "Add internet" button to manually connect hidden WiFi and support WEP encryption type hotspots.

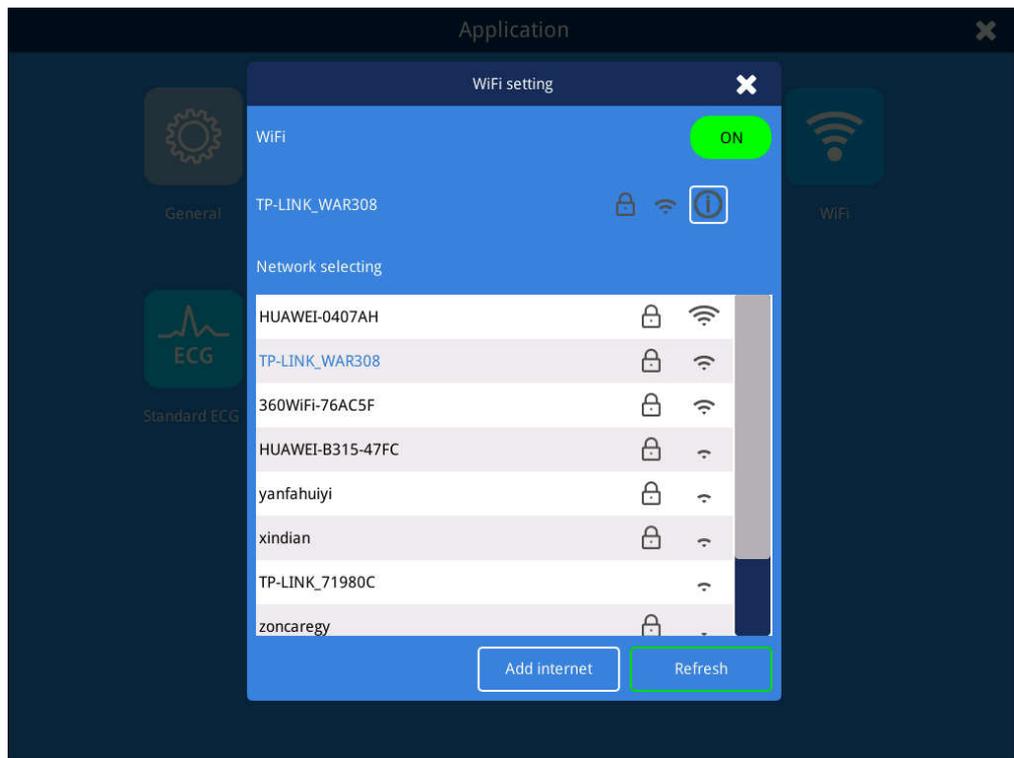


Fig. 4.12 WIFI Interface

4.2.13 Standard ECG setting



Click the "Standard ECG" button to enter the waveform acquisition interface.

4.2.13.1 Auto mode

The automatic mode refers to the automatic acquisition and printing of waveforms by the electrocardiograph. It is a common mode of the electrocardiograph and is used for routine electrocardiogram examination. The user simply presses the "ECG" button to automatically capture and print the waveform. (Does not include pre-sampling mode).



Specific operation method:

1. In the waveform acquisition interface, set the layout, gain, and paper speed according to actual needs;
2. Click the  button in the upper left corner of the waveform acquisition interface to enter the [Standard ECG] setting interface, select the auto-simultaneous or auto-sequential recording mode, set the sampling mode, acquisition duration, and printing duration;
3. Enter the [12-lead] interface and select the lead system and the single or three-rhythm lead label;
4. According to your own needs, set other parameters, and exit the [Standard ECG] interface after the setting is completed.
5. Click the  button on the panel to print the automatic mode ECG report.



CAUTION

- ◆ *When the ECG signal is just connected or the device receives the overload noise, the waveform will be disordered, the baseline drift is serious, and the signal waveform amplitude may exceed the maximum display width. At this time, wait for the device connection and the patient as well as the waveform to stabilize. Then start measuring and recording.*
 - ◆ *When the ECG is overloaded or any part of the amplifier is saturated, the ECG machine is in an abnormal working state. At this time, the interface only displays the baseline. In order to obtain accurate measurement results, wait for the device connection and the patient as well as the waveform to stabilize. Then start measuring and recording.*
 - ◆ *If the waveform becomes cluttered or unstable during the patient's ECG signal acquisition, see Chapter 8.*
-

4.2.13.2 Manual mode

Manual mode means that the user can manually control the duration of the ECG machine to collect and print the ECG. It is generally used by the user to collect and print ECG waveforms of any length according to clinical needs.

Specific operation method:

1. Click the “” button in the upper left corner of the waveform acquisition interface to enter the [Standard ECG] setting interface, select the real-time sampling mode and manual recording mode;
2. Enter the [12-lead] interface and select the lead system and the single the single or three-rhythm lead label;
3. In the waveform acquisition interface, set the layout, gain, and paper speed according to actual needs;
4. According to your needs, set other parameters, and exit the [Standard ECG] setting interface after the setting is completed.
5. Click the “” button on the panel to print the manual mode ECG report.
6. The built-in /paperless can be switched through the floating button in the lower left corner of the interface. Note: External printer is not supported in manual mode.

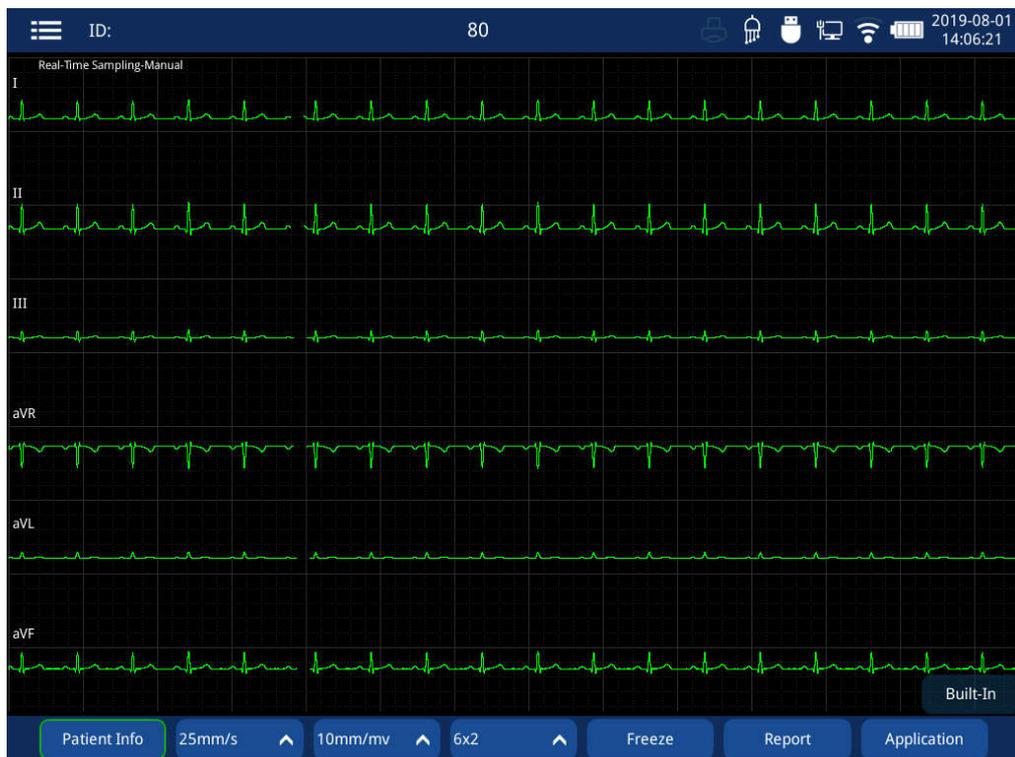


Fig. 4.13 Manual mode waveform acquisition Interface

4.2.13.3 Rhythm mode

The rhythm mode is for user to collect and print a single lead for a long time to observe and capture sporadic or frequent arrhythmia.

Specific operation method:

1. Click the  button in the upper left corner of the waveform acquisition interface to enter the [Standard ECG] setting interface, and select the real-time sampling mode, rhythm recording mode and rhythm analysis time;
2. In the waveform acquisition interface directly touche the screen to select the rhythm lead label.
3. After setting, click the  button on the screen, the sampling time countdown will appear. A complete rhythm waveform will be recorded after the countdown ends. During the recording process, press the  button to stop recording if necessary.
4. Click the  button on the panel, and the sampling time countdown will appear. A complete rhythm waveform will be printed after the countdown ends. During the recording process, press the  button to stop recording or stop printing the rhythm analysis report if necessary.

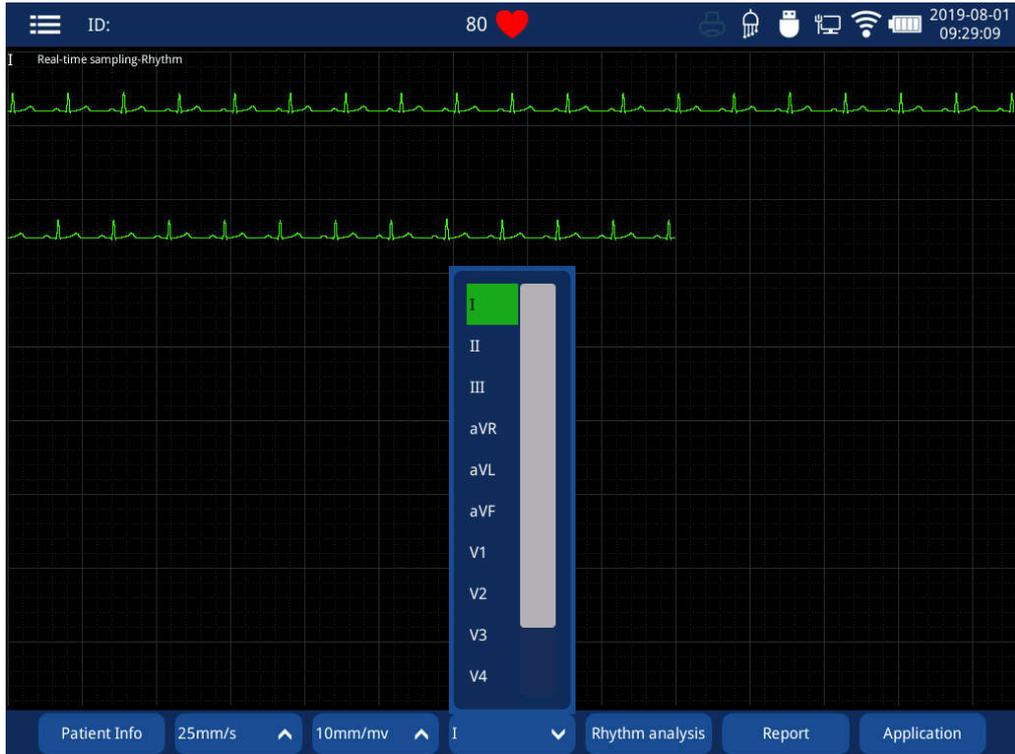


Fig. 4.14 Rhythm Analysis waveform acquisition Interface

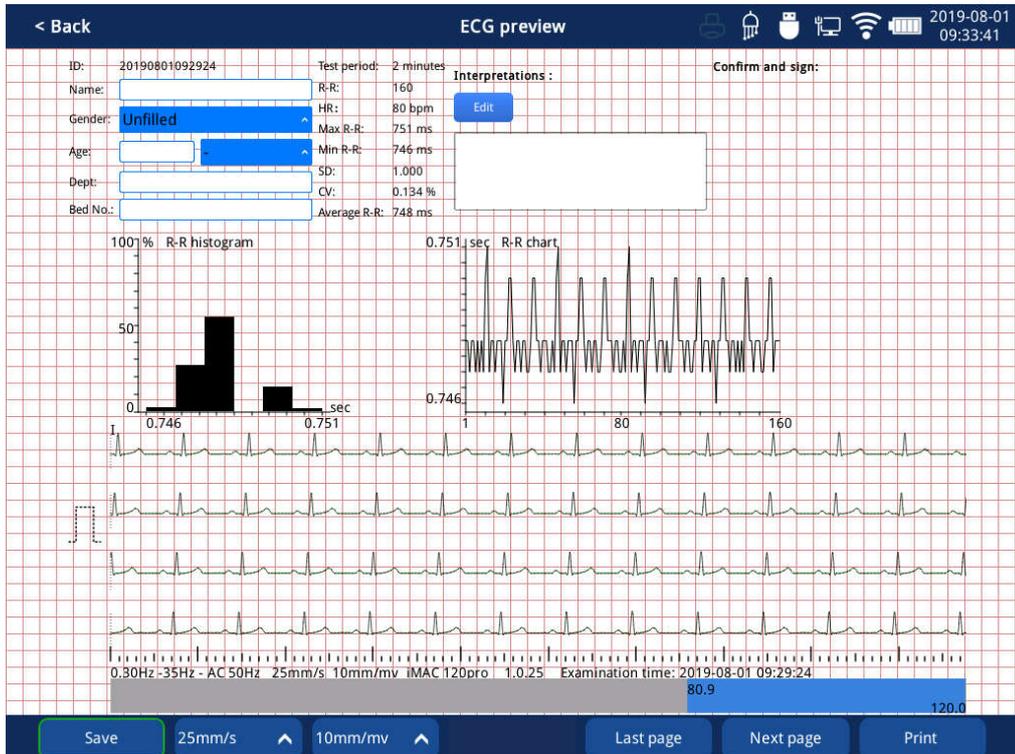


Fig. 4.15 2 minute rhythm analysis report Interface

4.3 Machine Setting

4.3.1 First time setup

When using the ECG for the first time or use it after repair or update, be sure to check and improve the following settings:

Fill in the relevant device information in [Institution Information] for the convenience of centralized management and maintenance.

Set the date and time in [Machine Settings] to ensure accurate date and time for the convenience of patient number generation and report management.

Set the backlight brightness in [Machine Setting].

Set the standby time in [Machine Setting]

Set the language type in [Machine Setting].

Set the report save location and save mode in [Report Setting].



CAUTION

- ◆ *When the equipment is repaired or upgraded, the equipment settings will usually be restored to the factory values and need to be reset at that time.*
-

4.3.2 Setup before Use

When using the ECG for the first time or use it after repair or update, be sure to check and improve the following settings:

In the [12-lead] interface , select the lead system and the single or three rhythm lead label;

In the [General-Filter Setting] setting interface, set the filter frequency;

In the waveform acquisition interface, set the layout, gain, and paper speed according to actual needs;

In the [Standard ECG] setting interface, select sampling mode, printing time, freezing time and other parameters according to actual needs.



CAUTION

- ◆ *In the measurement, the paper speed, gain, layout, etc. can be quickly set by the real-time shortcut key. For details, see section 2.3.*
-

Chapter 5 Connecting ECG Cable



- ◆ *During defibrillation, don't touch the patient, electrodes, patient cable and lead terminals. Otherwise it may result in serious injury or death.*
 - ◆ *For a pacemaker patient, ECG machine may interpret and record the pacemaker pulse as the QRS complex wave. Please carefully inspect the ECG waveform recorded by ECG machine.*
 - ◆ *For a pacemaker patient, pacemaker detection should be activated when set the machine. Please refer to Section 2.3.2.2 for details.*
 - ◆ *Please verify that all electrodes are connected to the correct sites on patient body. Avoid electrodes (including neutral electrodes) and the patient contacting the ground or any other electric conductors.*
 - ◆ *As with all medical equipment, carefully route patient cabling to reduce the possibility of patient entanglement or strangulation.*
 - ◆ *Suction ball of chest electrodes contains natural rubber, which may cause allergy. Please pay close attention to the skin placed with electrodes, if allergy occurs, please change other types of electrodes.*
 - ◆ *Automatic measurement and diagnosis are for the doctors' reference only, and cannot be directly used as the basis for clinical treatment.*
-

5.1 Environmental Requirements

- It is required to keep warm indoors in winter, and the room temperature is no lower than 18 °C so as to avoid EMG interference caused by coldness. In summer, open the air conditioner to control room temperature and to prevent insecure placement of electrodes cause by the patient's sweating.
- AC power outlet must be connected with dedicated and reliable ground wire. .
- When place the ECG machine, try to keep its power cord away from the patient's bed and patient cable. Do not place other appliances or power cord near the bed.

- The patient's bed should be of suitable size to ensure that the patient can naturally lie down, with hands and feet stretching naturally.

5.2 Preparation

To acquire accurate ECG signals, the patient should be explained about the following information.

- Before ECG examination, the patient should not do strenuous exercise, drink alcohol, smoke, have full meal, have tea, have uncooked and cold food.
- Inform the patient of preparation for ECG examination, and make a good explanation to him or her so as to eliminate his or her mental nervousness.
- Before examination, the patient should have a good rest and stay calm.
- During examination, the patient should lie down naturally, relax, and breathe calmly and evenly.
- During examination, the patient should not move or turn over casually, with hands and feet no touching metal objects, such as metals at the bed edges.
- Open the ECG machine to warm it up, and then set its parameters. For startup and system setup, please refer to *Chapter 3* and *Chapter 4*. Power off the ECG machine when connecting the patient cable and electrodes.

5.3 Electrode Selection and Usage

5.3.1 Examinee's Skin Preparation

When environmental factors are correct and the examinee is ready for the exam, place electrodes on examinee body. To obtain accurate ECG signals, properly prepare the examinee's skin to be placed with electrodes.

Remove body hair on intended sites.

Wipe the intended sites with alcohol to degrease and remove dead skin cells.

Dry each site with a dry cotton ball.