ZONCARE

iMAC 120 Siūlomas modelis

Digital Twelve Channel ECG Machine

Overview

- Simultaneously 12 leads Acquisition
- Applicable people: Adult and pediatric
- Built-in protection against defibrillator
- 10.4"HD LED Full Touch Screen with standard grid background
- Sampling Modes: Real-time/Pre-sampling/Trigger sampling/ Period sampling
- Manual/Auto/Rhythm Modes
- 3x4, 3x4+1R, 3x4+3R, 6x2, 6x2+1R, 6x2+3R and 12x1 display and simultaneously printing.
- Support Multiple Languages
- Electrode Disconnection Alarm
- Automatic measurement & analysis
- Support PACE detection
- Max 60 s waveform freezing and review function.
- 1 min – 5 minutes Rhythm Analysis.
- ZQECG/PDF/PNG/XML/HL7/DICOM-WAVEFORM/DICOM-IMAGE/DICOM-PDF/GDT format report transfer.
- Support to connect with scanner, USB mouse, USB keyboard, card reader and so on peripheral products.
- Support WiFi and LAN cable connecting to the third party ECG network system, like: HIS, EMR and PACS system without ECG workstation.
- Transfer method：FTP/HTTP/Samba/DICOM etc.
- Full alphanumeric capability QWERTY keyboard.

Technique Specification

Sampling rate: 32000Hz (pcs)

Pace Sample Rate: 32000Hz

Sample frequency of signal analysis and storage: 1000 samples/second/channel

Frequency Response: 0.01～350Hz

CMRR: ≥ 130dB

Patient Leakage Current: <10μA

Input Circuit: < 50μA

RTI，peak-to-valley value: ≤ 15μV

Sensitivity valve: 20 μV

DC bias voltage range: ±950mV

Calibration Voltage: 1mV

A/D conversion: 24 bit

Input Impedance: ≥ 60 MΩ(10 Hz)

Sensitivity: 2.5, 5, 10, 20, 40, Auto mm/mV

Paper Speed: 5, 6.25, 10, 12.5, 25, 50mm/s

Recording Mode: Thermal array printer 8 dot/ mm (Vertical), 40 dot/ mm (Horizontal)

Paper Type: Z-Fold Paper

Paper Size: 210mm/216mm×140mm--20m 210mm/216mm×150mm (A4)--20m (Option)

Filter Setting: AC: off/50/60Hz.
EMG: off/25/35/45/75/100/150/250/350Hz
Baseline Drift: off/0.01/0.05/0.3/0.6Hz

Heart Rate Range: 30-350 bpm

WiFi Security Standards:

WEP

WPA/WPA2 PSK

WPA2-Enterprise / ieee802.1x

Compliant to IEEE 802.11b/g/n

Physical Specification

Dimension & weight:

Equipment: 285mm*360mm*94mm   3.7kg

Package: 345mm *195mm *430mm   6.2kg

Monitor:

10.4 inch(L*W=21.13cm*15.85cm, Diagonal: 26.42cm) HD Color LED.

Full Touch Screen

1024*768 pixel resolution

Electrical Power:

AC: 100-240V, 50Hz/60Hz, 120VA

DC: Built-in rechargeable battery

Battery Capacity: 14.52V/5200mAh

Continuous Operating: DC ≥ 10.5h

Recharge time: The battery is charged to 90% for no more than 3 hours, and charged to 100% for no more than 3.5 hours

Data Storage:

> 1500 reports(sampling time 10s, 6*2)

> 2000 reports(sapling time 2.5s, 6*2)

Environmental Conditions:

Transportation Temperature:-20℃～+55℃

Relative Humidity:10%～95%

Atmospheric Pressure:500hPa～1060hPa

Operation Temperature: +5℃～+40℃

Relative Humidity: 25%～85%

Atmospheric Pressure: 570hPa～1060hPa

System Inputs & Outputs

2*USB2.0/ LAN/ SD Interface

Standard Package

- iMAC 120 ECG Machine (with battery)
- Patient Cable
- Chest Electrodes
- Limb Electrodes
- Thermal Printing Paper
- Power Cord
- Grounding Wire
- User Manual

Optional Accessories

- Series Electrodes
- Thermal Printing Paper
- SD Memory Card
- Lithium Battery
- Workstation Software
- Trolley
- Cable Arm for trolley
- Soft bag
- Laser Printer
- Scanner
- Card Reader
- ECG Gel

Advanced Function

- External laser printer to output the A4 report
- Scanner, card reader and other patient information input devices
- Wireless WiFi function
- DICOM function (Worklist, Storage, MPPS, Storage Commit)
- QTc formula:
  Hodge, Bazett, Fridericia, Framingham
- Measurement Matrix
- Average Template
- R-R histogram, R-R chart
- Bradycardia and Tachycardia range adjustable
- Lead System: Standard, Posterior wall, Right chest, Right chest posterior wall, Prev. intercostal space, Next intercostal space, CABRERA, Custom
- GLASGOW ECG Algorithm can make precise diagnosis according to patient age, gender, racial, taking medicine history, etc., especially for AMI, Ventricular Fibrillation, Ventricular Tachycardia, quarterly Bradycardia, malignant arrhythmia, etc.

Comply with

93/42/EEC As amended by 2007/47/EC

EN ISO 13485:2016

EN ISO 14971:2012

EN ISO 15223-1:2016

EN 1041:2008

ISO 10993-1:2009

ISO 10993-5:2009

ISO10993-10:2010

IEC60601-1:2005/A1:2012

EN 60601-1-2:2015

IEC 60601-2-25:2011

EN 62304:2006/A1:2015

EN 62366-1:2015

EN 60601-1-6:2010/A1:2015

Certificates

Quality Standards

ISO9001

ISO13485

CE

NOTE:

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Dec. 2021

Product Information:

Name: **Digital Multi-Channel Electrocardiograph Machine**

Type: **iMAC 120**

Manufacturer: **Wuhan Zoncare Bio-medical Electronics Co., Ltd**

Registered Address: **#380, High-tech 2nd road, Eastlake high-tech district, Wuhan, Hubei, P. R. China**

Manufacture Address: **#380, High-tech 2nd road, Eastlake high-tech district, Wuhan, Hubei, P. R. China**

Production Date: **See the label**

Operating Life: **10 years**

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- All illustrations in this manual are provided as examples only. Depending on system configuration, screens in the manual may differ from the screens on your system.

Responsibility of the Manufacturer

Zoncare is responsible for the safety, reliability and performance of hardware supplied by Zoncare only if the following conditions are met:

- Assembly operations, expansions, readjustments, modifications or repairs are performed by persons authorized by Zoncare.

- The electrical safety of the room where the unit is installed complies with the requirements of appropriate local, state, and other government regulations.

- The unit is used in accordance with operation requirements.

Safety Conventions in this manual

A Hazard is a source of potential injury to a person, property, or the device.

This manual uses the term WARNING, CAUTION, and NOTICE to point out hazards and to designate a degree or level of seriousness. Familiarize yourself with the following definitions and their significance.

Safety Convention	Definition
⚠ **WARNING**	◆ It indicates a potential hazard or unsafe practice, which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	◆ It indicates a potential hazard or unsafe practice, which, if not avoid, could result in moderate or minor injury.
⚠ **NOTICE**	◆ It indicates a potential hazard or unsafe practice, which, if not avoided, could result in the loss or destruction of property or data. .
	◆ Mandatory to refer to this manual for equipment use.

Contents

Chapter1 Safety Information and Introduction

1.1 Safety Information

1.1.1 Hazards

This product does not involve any information of hazard level.

1.1.2 Warning

⚠ *WARNING*

- ◆ *This ECG machine can only be operated on one single patient at one time.*

- ◆ *The unit, its accompanying cables and accessories shall be checked prior to use in order to guarantee that they work normally and safely.*

- ◆ *Explosion hazard. Do not use the ECG machine in the presence of flammable anesthetics, gases or chemicals. Otherwise it will incur explosion or fire.*

- ◆ *The unit can only be connected to AC power outlet with grounding protection. If proper grounding cannot be guaranteed, you shall operate the unit on built-in rechargeable battery instead of AC power. The unit shall also be well grounded to avoid the risk of electric shock. Please place the unit where is easy for proper grounding.*

- ◆ *The ECG machine is to work in an environment free from interferences caused by high-voltage cable, X-ray machine, Ultrasound scanner, and Electrotherapeutic equipment. Do not use the unit in an environment with high static electricity. Otherwise the unit might be affected by electromagnetic interference.*

- ◆ *Do not open the unit cover, or there might be risk of electrical shock. Only service personnel trained and authorized by the manufacturer can repair or upgrade the unit.*

- ◆ *Keep the ECG machine away from water. Do not install or store the unit in the*

place where chemicals are stored or ventilation is poor. Keep the unit away from excessive humidity, temperature, dust, salt, and sulphate.

◆ *The ECG machine should be placed gently on a stable platform and be protected from tilting, excessive vibration, and/or shocking in the process of transportation.*

◆ *Since excessive leakage current in total will harm the patient, only IEC 60601-1 class I equipment is allowed to be connected to the ECG machine. Therefore, the manufacturer of connected equipment shall hold relevant responsibility for leak current monitoring. When the unit is being used together with other instruments, attention shall be paid to good connections so as to avoid incorrect diagnosis. If necessary, you shall consult a professional technician for advice.*

◆ *Electrodes and connectors can only be in touch with the patient, but shall not be in touch with other conductor parts, including the earth.*

◆ *The operators shall not leave the exam room when the ECG machine is in operation. They shall keep careful observation on the patient and, if necessary, turn off the power or disconnect the electrodes to assure patient safety. If an accident happens during operation, please power off the unit immediately and check it*

◆ *Chemicals from a broken LCD display panel are toxic when ingested. Be cautious when handling an ECG machine with a broken display panel.'*

◆ *According to Standard IEC 60601-1, this ECG machine belongs to type CF defibrillation-proof equipment, therefore its applied part can be connected conductively to human heart.*

◆ *Used together with a defibrillator, the unit's defibrillator protection is only guaranteed with the manufacturer recommended defibrillator protected electrodes and cables (for specifications, see chapter 11-Accessories). If the defibrillation takes more than 5 seconds or the unit is used with the high*

⚠ *WARNING*

frequency equipment, please use standard disposable electrodes so as to prevent metal electrodes from burning the patient's skin. While used together with other electrical stimulator, the unit shall be operated under instructions from professionals at present.

◆ *Do not touch the patient during defibrillation. Otherwise it will incur serious injury or death.*

◆ *ECG signal acquisition may be affected by special environment, incorrect operation of ECG machine and patient condition. For safety information, please refer to the corresponding chapter in this manual.*

◆ *Using unspecified patient cable, limb clamp, and suction bulb may degrade anti-interference performance of ECG machine. Connectivity of patient cable should be checked periodically, at least once a month.*

◆ *It is advised to use the unit with paper suggested by the manufacturer, as this is the only way the printer head life time and clear ECG waveform can be guaranteed.*

◆ *The ECG machine is intended only as an adjunct in patient assessment. It must be used in conjunction with clinical signs and symptoms. Physiological waveform and parameters displayed in this ECG machine are for the doctors' reference only, and cannot be used as the basis for clinical treatment.*

1.1.3 Cautions

⚠ *CAUTION*

◆ *Please used the accessories specified in this manual.*

◆ *When the unit and accompanying will exceed their life time, dispose of them in accordance with relevant local laws and regulations or the regime of local hospitals.*

◆ *Electromagnetic field will affect the performance of this unit. Therefore other equipment used in the vicinity of this unit must comply with relevant EMC requirements.*

◆ *Before connecting the unit to an AC power outlet, please verify its power voltage and frequency comply with the label on the unit or the requirements specified in this manual.*

◆ *Please properly install and carry this unit to prevent it from dropping, collision, strong oscillation or damage by other external mechanical forces.*

◆ *Please install the unit in the place available to observe, operate and maintain.*

◆ *Place this manual near the unit so that it is available when necessary.*

◆ *In order to describe and record electrocardiographs more accurately, the ECG machine should be placed and used in a quiet and comfortable environment.*

1.2 Device Symbols

The following table describes symbols or icons that may be on your device and its packaging.

Symbol	Description	Symbol	Description
⚠	Attention! Consult accompanying documentation	⊙/Ò	On/Off
	DC power supply		AC power supply
	Charging battery	SD	SD card
	Type CF equipment equipped with protector against defibrillation.		Equipotential terminal
	Ethernet port		USB port
	Manufacturing date	SN	Serial number
MC	China Metrology Accreditation	EC REP	EU authorized representative
	Indoor use	CE 2460	CE Certification
	Refer to this manual for equipment use	20	Environment-friendly use period
	It indicates this device contains electronic or electrical components that must not be disposed of as unsorted municipal waste but collected separately. Contact an authorized representative of the manufacturer for information concerning the decommissioning of your device.		

⚠ *CAUTION*

- *Do not damage any label on the unit.*

- *These labels provide important information for the safety and operation of the unit. Damaging or moving the labels may lead to disoperation.*

1.3 Introduction

1.3.1 Precautions

You are required to read through the operating instructions before use the ECG machine so as to ensure proper operation of the unit.

1.3.2 Product Performance

Power voltage: AC100V-240V；

Power frequency: 50/60Hz±1Hz，75VA；

Continuous operation time: more than 10.5 h；

Front-end acquisition mode: A/D sampling. A/D digits are not less than 24 digits. The effective sampling is not less than 32000 samples per second (or 32000 Hz/channel); Gain: the equipment is available in 40mm/mV, 20mm/mV, 10mm/mV, 5mm/mV and 2.5mm/mV and automatic six gears.; Gain accuracy is ±3%；

Paper speed: the equipment is available in 5mm/s, 6.25mm/s, 10mm/s, 12.5mm/s, 25mm/s, and 50mm/s. Accuracy is ±3%；

General safety for the product should conform to IEC 60601-1-2:2012 standard.

Particular safety for the product should conform to IEC 60601-2-25:2011 standard.

1.3.3 Product Composition

The ECG machine is mainly composed of the host, patient cable, limb electrodes, and chest electrodes.

1.3.4 Intended Application

The unit is intended to extract ECG wave group from human body for its morphological and rhythm analysis.

1.3.5 Applicable people

Adult and Children

1.3.6 Contraindication

None

1.3.7 Side effects

No side effects.

1.3.8 Theory of Operation

Schematics:

Only qualified field service engineer will be provided schematics and spare parts list for the ECG machine.

Theory of Operation:

The ECG machine acquires a microvolt level signal from human body surface via patient cable and electrodes. It amplifies the signal by the Amplification Module before Analog to Digital (A/D) converting. Following A/D conversion, the signal is processed by the CPU of the Keyboard Control Module. The CPU outputs the signal to the thermal printer. Precision control program from the Keyboard Control Module is used to drive the stepping motor so as to make the recording paper run at a constant speed. By controlling temperature of the above mentioned thermal emitting components, relevant ECG trace and character could be printed out on the thermal recording paper. In addition, the Keyboard Control Module also processes the keyboard signal, and controls the trace display, the real time clock, and etc. The Power Supply Module provides other modules of the ECG machine with power sources, of which AC power is of priority to the rechargeable battery. When the

ECG machine is powered by AC power, battery is charged provided there is no operation of the unit.

1.3.9 Main Features

- It adopts high-resolution thermal array printout system, uses thermal Zip fold paper of 216mm or 210mm in width, and records clear accurate ECG waveform and information about lead marks, gain(sensitivity), time reference (or paper speed), filter status etc.

- It adopts a unique high-precision digital filter to prevent baseline drift and other interference without causing waveform distortion. It enhances the ability of anti-baseline drift, which is convenient to interpret the waveform.

- It has man-machine interaction interface, independent full alphanumeric keyboard and full touchscreen. Also it can be connected with mouse and keyboard externally. It operates flexibly and easily, reduces workload, and improves working efficiency.

- Support English input with more complete information;

- Support various file output formats, and meet the needs of clinical information.

- Color LCD display, which can record 12-channel ECG waveform and information.

- Real-time waveform freezing；

- Age grading function;

- External USB disk and SD card are supported to store as many patient reports as possible;

- Standby mode, reduces power consumption and extends LCD life；

- It is designed according to the safety standard of IEC class I type CF. ECG amplifier is fully floated and has good safety performance.

- It has both AC and DC power supply modes. Rechargeable environmentally-friendly lithium-ion battery is installed in the machine and is easy to replace. And it has a dedicated battery charging circuit and a perfect battery management and protection system.

1.3.10 Intended Places and Users

● It can be used as measuring instrument in relevant hospital sections or patient rooms.

● It can be used for mass exam.

● ECG signal measurement is intended for users of different ages, but for the children under 2 years old, the interpretations may have deviation.

● When use the unit on a pacemaker patient, please activate the PACE Detection with reference to *Section 2.3.2.2*.

⚠ *WARNING*

◆ *Wherever the ECG machine is used, you must verify that it is connected with reliable dedicated grounding wire.*

1.3.11 Safety Standards and Requirements

● Strictly in accordance with IEC 60601-1:2012 Medical electrical equipment - Part 1: General requirements for basic safety and essential performance; IEC60601-2-25 Medical electrical equipment-Part1-2:General requirements for basic safety and essential performance - Collateralstandard: Electromagnetic compatibility-Requirements and tests. The security type is type I CF.

● Power supply conditions for the room where the ECG machine is to work shall be suitable for standard three-plug socket with the grounding plug properly grounded. Otherwise, you are required to ground the unit using the accompanying grounding cable, with one end connected to the grounding post and the other end to the ground.

⚠*WARNING*

◆ *Grounding shall be performed in accordance with relevant standards or under the guidance of experienced electricians.*

- When the unit is used in combination with other medical devices, you are required to connect the grounding cable together with that of the others so as to protect the patient from possible shock.

- Connect one end of the grounding cable to the equipotential post of the ECG machine and other end to the ground. Avoid using water piping or other piping as a grounding conductor, otherwise the precautions for grounding protection of the unit shall lose effectiveness and the patient may has the risk of electrical shock.

- The ECG machine is an instrument of continuous operation and ordinary equipment. Avoid ingress of liquids into the unit. Explosion hazard. Do not use the unit in the presence of flammable anesthetics or gases.

Classification :

Type of protection against electrical shock	Class I internally powered equipment
Degree of protection against electrical shock	Type CF defibrillation-proof applied part
Degree of protection against harmful ingress of liquids	Ordinary equipment (enclosed equipment without protection against ingress of liquids).
Degree of safety of application in the presence of flammable gas	Equipment is not appropriate for use in the presence of flammable gas.
Signal input and output：	With input and output parts
Mode of operation	Continuous operation

Chapter 2 Structure Identification

2.1 Identification of Front Panel, Buttons, Symbols and Expansion Slot
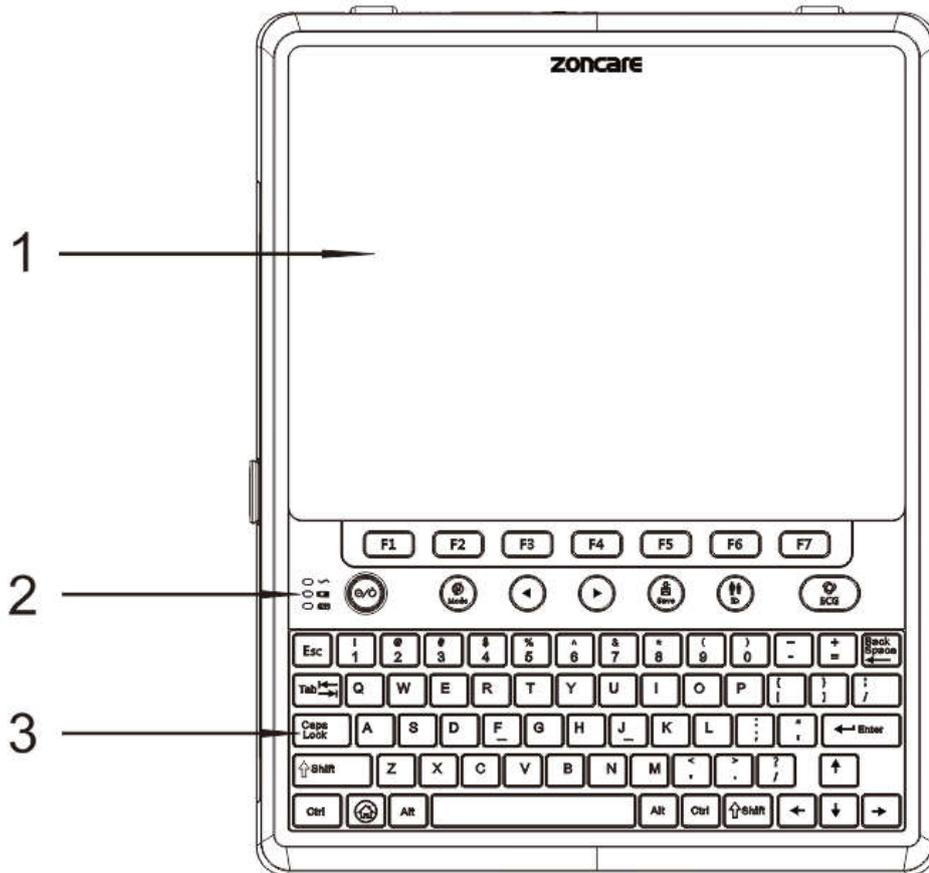
2.1.1 Top View

Fig. 2.1 Top View

1. Touch Screen: Displaying ECG parameters and waveforms, patient and system information; for more interface information, please see *Section 2.3*.

2. Indicator Light: Indicating power supply status and battery charge status; for details, see the table below.

3. Operation Panel: Operation keys; for details, see the table below.

Identification of Front Panel Keys	
Key	**Function**
⊙/⟳	"ON/OFF": Provided the unit is powered on, key "ON/OFF" could be used to change its condition between "ON" and "OFF".

Identification of Front Panel Keys	
Key	**Function**
F1~F7	Real-time function keys, which correspond to the hotkeys displayed at the bottom of the screen
(Mode)	"Mode": For switch over the unit's operation mode between Automatic and Manual.
(◄)	Switching leads in manual mode
(►)	Switching leads in manual mode
(Save)	Quickly save the ECG
(ID)	"Patient ID": Provided on Waveform Acquisition interface, key "Patient ID" could be used to quick enter into Patient Info interface.
(ECG)	"ECG" could be used to print the ECG trace.
Keyboard	Composite keyboard for information input and some function keys

| Identification of Front Panel Buttons	
Indicator Light	**Function**
∿	AC power indicator light On: AC power connected Off: AC power disconnected
▭	DC power indicator light On: power supplied by battery Off: power not supplied by battery, or no battery installed
▭	Charging status indicator light On: Battery being charged Off: No battery installed or battery fully charged

2.1.2 Side View
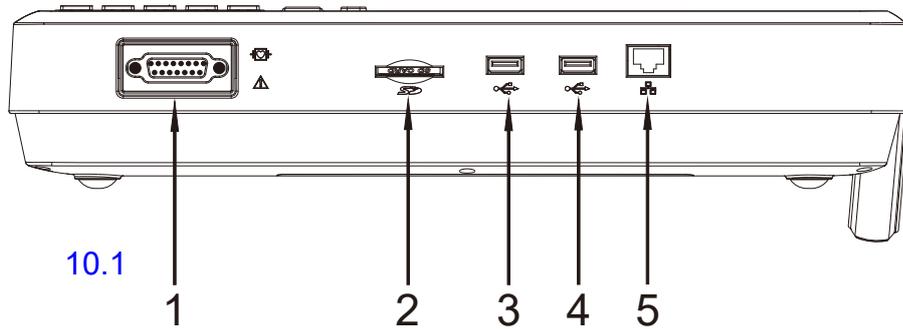
Fig. 2.2 Right Side View

1. Patient Cable Connector: For connection with the patient cable.

2. SD Card Slot: External SD storage.

3. USB Port: To connect external USB devices.

4. USB Port: To connect external USB devices.

5. LAN Connector: For Network connection.

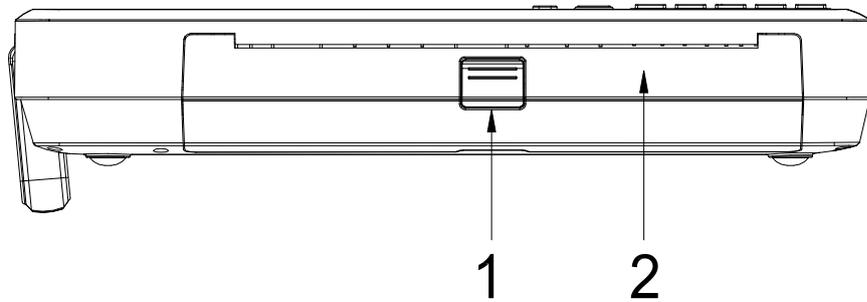
Fig. 2.3 Left Side View

1. Printer Door Switch: Toggle the printer door upwards to open it.

2. Printer Door: To close the printer.

2.1.3 Back View

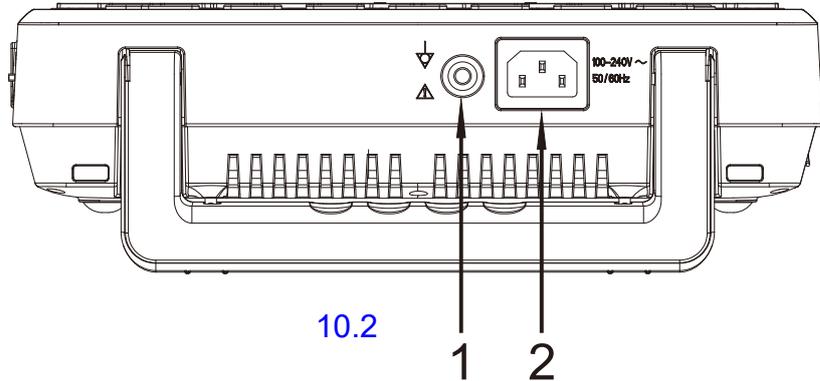
Fig. 2.4 Back View

1Equipotential terminal: When other equipment is used together with the electrocardiograph, the other equipment and the equipotential terminal of the electrocardiograph should be connected by wires to eliminate the potential difference between different devices to ensure safety.

2 AC power connector: Connect the power cable to provide AC power to the ECG.
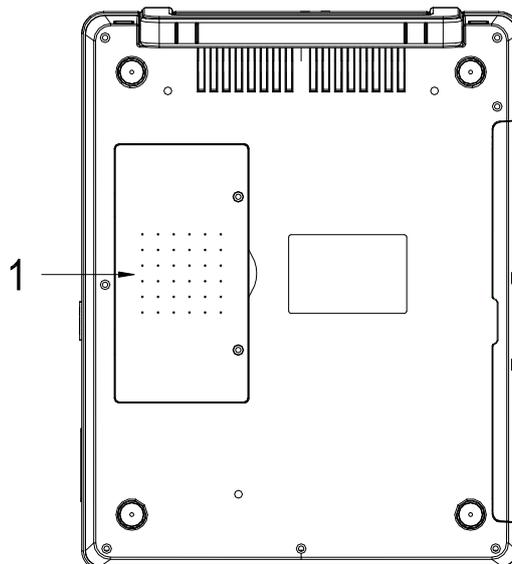
2.1.4 Bottom View

Fig.2.5 Bottom View

Battery Compartment: To contain the battery.

2.2 Operation Mode

2.2.1 Standard Mode

Automatically enters the standard ECG mode after power on. In this mode you can perform ECG measurements, record waveform and measured value results. You can also perform system setup, export data and perform configuration management.

2.2.2 Standby Mode

If the user does not have any operation within the set time, the ECG machine automatically enters the standby state.

Follow the steps below to set the time to automatically enter standby mode:

1. Directly click " Application " on Waveform Acquisition interface to enter into Application interface;

2. Click " ⚙ " to enter the general interface;

3. Select "machine setting";

4. The display turns off in standby mode, which reduces power consumption and extends display life. Click the " < Back " button in the upper left corner of the screen to return to the system application interface, and continue to click the " ✖ " button to return to the normal mode.

2.2.3 Demo Mode

In this mode, the ECG can demonstrate features of the machine without connecting the patient cable and accessories. Click the " ▤ " button in the upper left corner to enter [Record Analyze] → [Demo Mode] →[ON], click the " ✖ " button to return to enter the demo mode.
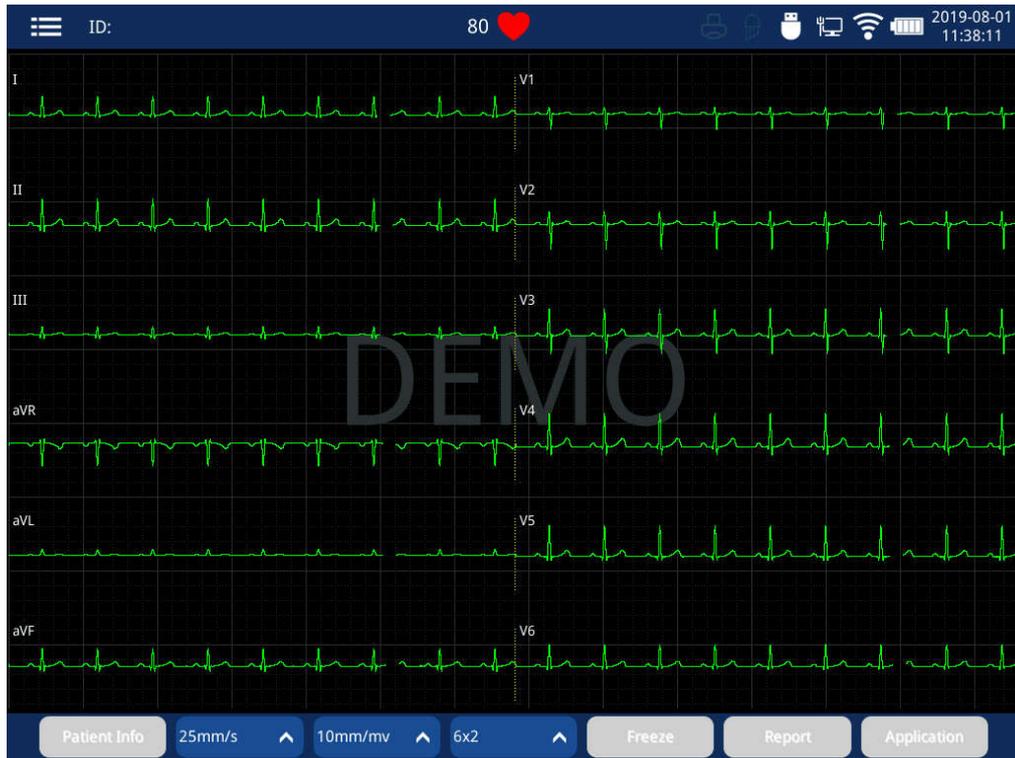

Fig. 2.6 Demo mode

In the demo mode, there are demonstration waveforms for demonstration, which can be printed. Click the " ▤ " button in the upper left corner to enter [Record Analyze] →*Demo Mode → Off*. Click the " ✖ " button to exit the demo mode.

⚠ *WARNING*

◆ *Demo function is mainly used to display the machine performance and provide training for users. When the machine is connected to the patient in clinical practice, it's prohibited to use the Demo function in case that the medical staff shall mistake the demo waveform as the patient's, thus affecting the patient's measurement and delaying his or her treatment. Before use, the user must check the unit, its cables and accessories in order to make sure that all of them*

will work safely and properly.

⚠ *CAUTION*

◆ *Once entering into the Demo Mode, the system cannot exit automatically. Even the ECG machine is Reboot after shutdown, it is still in demo mode.You need to click the "☰" button in the upper left corner to enter [Record Analyze] to close the demo mode.*

2.3 Interface Display

2.3.1 Waveform Acquisition Interface

There is locking function in this interface. After pressing the keyboard, press the key combination"CTRL+ALT+L". A lock dialog box will pop up, which can lock the paper feed speed, gain, layout and report printing functions. After locking, the option button is gray; if you need to change the option settings, press the key combination "CTRL+ALT+L" again to unlock the option.
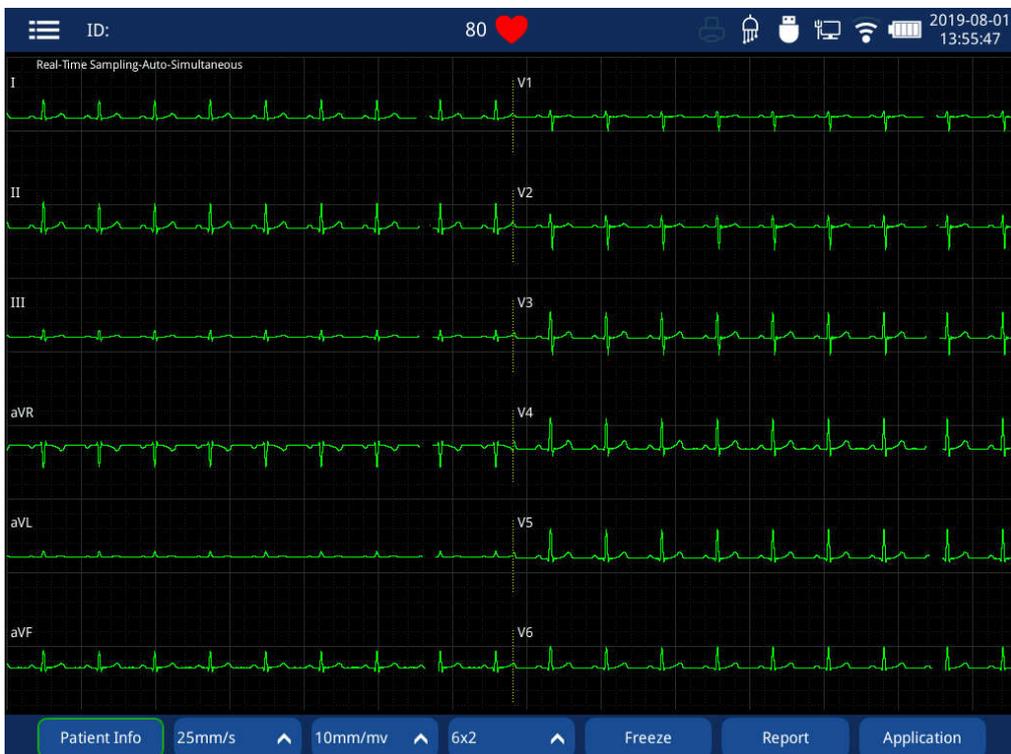

Fig. 2.7 Waveform Acquisition Interface

1   Patient and system information zone：

a   [icon]   Mode setting, press it to quickly enter the mode setting dialog window;

b   [ID: icon]   Patient ID;

c   [80 heart icon]   Heart Rate Indication (tachycardia/bradycardia); Click it to quick enter into Heart Rate Indication menu;

d   [printer icon]   External printer indication. The icon being dark indicates that it is not connected;

e   [lead icon]   Lead indication: light-on icon indicates that the patient cable is wellconnected. Click it to quick enter into Lead Indication menu;

f   [USB icon]   Storage information; Click it to quick check the storage device;

g   [LAN icon]   LAN connection state; Dark icon indicates network disconnection, click it to set LAN connection;

h   [WIFI icon]   WIFI connection state; Dark icon indicates network disconnection, click it to set WIFI connection;

i   [battery icon]   Battery Information. The white bar indicates the battery level; Click it to enter Power Management menu;

j   [2019-08-01 13:55:47 icon]   Time display; Click it and quick set the date and time;

2 Waveform zone: Displaying ECG waveforms. Red lead indicates the lead falls off, while white indicates the lead is well connected;

3 Hot keys zone: Displaying real-time function keys, which respectively correspond to F1~F7 keys. Each key's function is listed in the table below:

Name	Key	Function Illustration
F1	Patient Info	Enter into Patient Info interface
F2	25mm/s ∧	Change the paper speed
F3	10mm/mv ∧	Change the gain amplitude
F4	6x2 ∧	Change the lead layout
F5	Freeze	Freeze to generate the report (for details, please see *Chapter 6*)
F6	Report	Enter into Report Management interface
F7	Application	Enter into Application interface

2.3.2 "Standard ECG", "Record Analyze", "Lead System" Interface

On Waveform Acquisition interface, click " ![icon] " at upper left of screen to quick enter into "Standard ECG", "Record Analyze", or "Lead System" interface.

2.3.2.1 Standard ECG

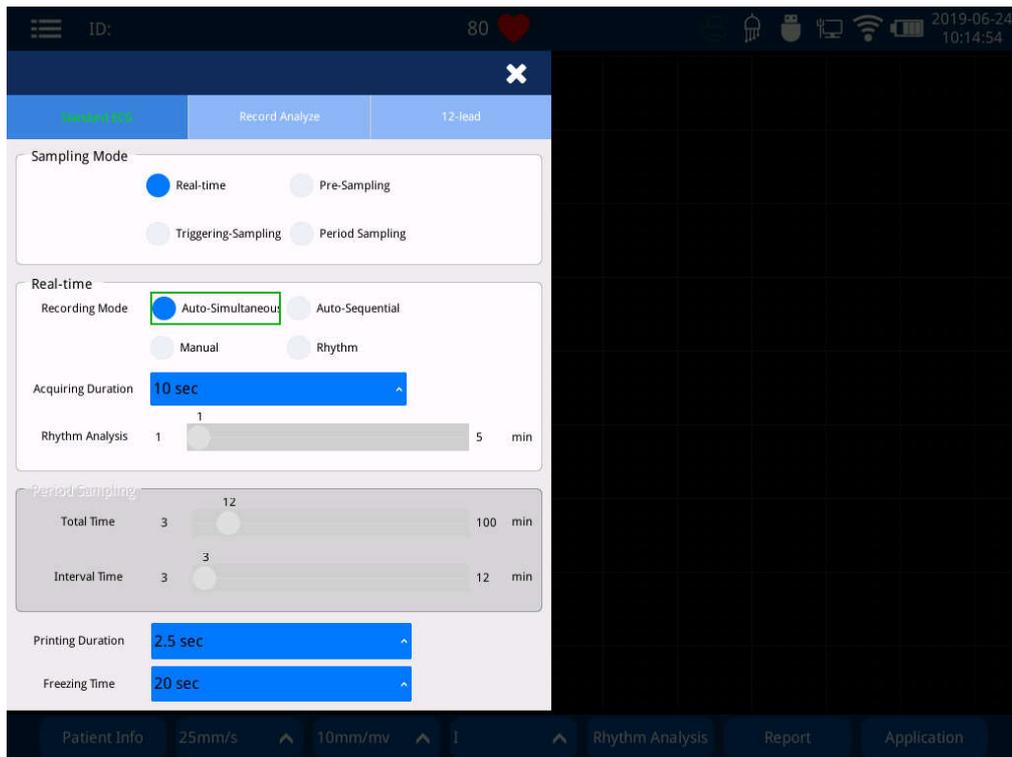Fig. 2.8 Standard ECG Interface

Standard ECG			
Menu	**Drop-down Menu**	**Defaults**	**Illustration**
Sampling mode	Real-time Pre-sampling Trigger Sampling Period Sampling	Real-time	Real-time: real-time acquisition and measurement of ECG signals; Pre-sampling: Start acquisition several seconds before you decide the start point of recording. If the time of recording signals before the start point is insufficient, the signals can be supplemented by those acquired after the start point. Trigger sampling: Once triggered by preset

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Standard ECG			
Menu	**Drop-down Menu**	**Defaults**	**Illustration**
			conditions, start acquisition 2 seconds before the start point. Period sampling: sampling in periodic intervals
Real-time sampling	Auto-simultaneous Auto-sequential Manual Rhythm	Auto-simultaneous	Auto: When recording the ECG waveform, the system automatically records each lead according to the sampling time and automatically switches the record; Simultaneous: record the ECG waveform of the 12-lead at the same time; Sequential: The 12-lead is divided into 4 averaging periods according to the record format layout (such as 3×4), and recorded in the lead sequence. The lead recording time of each column is set by the "printing duration" item; Manual: Manually change the recording when recording ECG waveform. Manual recording is only available in real time sampling; External printer is not supported in manual mode.; Only sequential recording is available in manual mode; Rhythm: Record a single rhythm lead waveform.
Real-time rhythm analysis	1-5 min	1min	Set the single rhythm lead sampling time.
Periodic sampling	3-100min	12min	Set the total sampling time.

Standard ECG			
Menu	**Drop-down Menu**	**Defaults**	**Illustration**
total time			
Periodic sampling interval	3-100min	3min	Set the sampling time for each cycle
Printing duration	2.5 sec、5 sec 、7 sec、10 sec, Two pages, Three pages, Four pages	Two pages	The time of each lead being recorded when the recording mode is auto-simultaneous, auto-sequential
Freezing time	20 sec、30 sec、60 sec	20 sec	The ECG signal waveform is frozen 20 seconds before the button is pressed to observe the measurement result. If the time is not enough, only take the effective time.

⚠ *CAUTION*

◆ *When the sampling mode is pre-sampling, triggering sampling or periodic sampling, the recording mode defaults to auto-simultaneous with no auto-sequential option.*
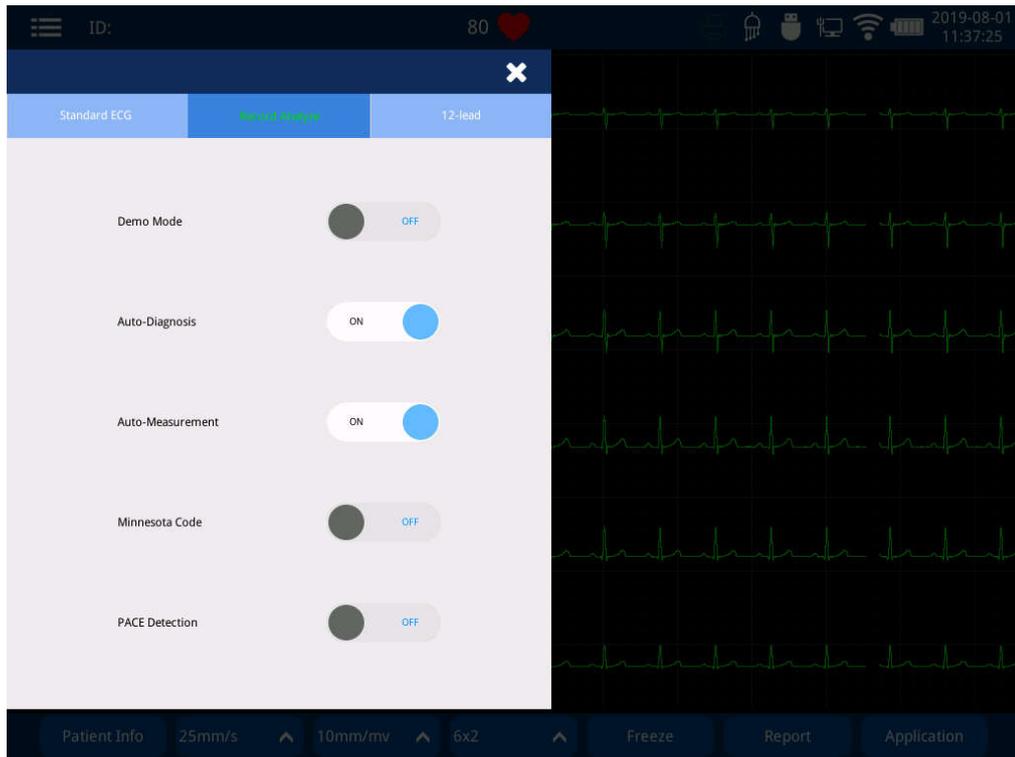
2.3.2.2 Record Analyze

Fig. 2.9 Record Analyze Interface

Record Analyze			
Menu Item	**Drop-down Menu**	**Defaults**	**Illustration**
Demo Mode	Off / On	Off	Turn on/off the Demo mode.
Auto Diagnosis	Off / On	On	Turn on/off the Auto Diagnosis After turning off, the ECG report does not show the diagnosis conclusion
Auto Measurement	Off / On	On	Turn on/off the Auto Measurement. After turning off, the ECG report does not show the diagnosis parameters.
Minnesota Code	Off / On	On	Turn on/off the Minnesota Code. If it is turned off or can not acquire the code, the ECG report does not show the Minnesota Code
PACE Detection	Off / On	On	Turn Off / On the PACE Detection

2.3.2.3 Lead System

Lead system can freely change among Standard, Posterior Wall, Right Chest, Right Chest Posterior Wall, Previous Intercostal Space, Next Intercostal Space, CABRERA, and Custom.
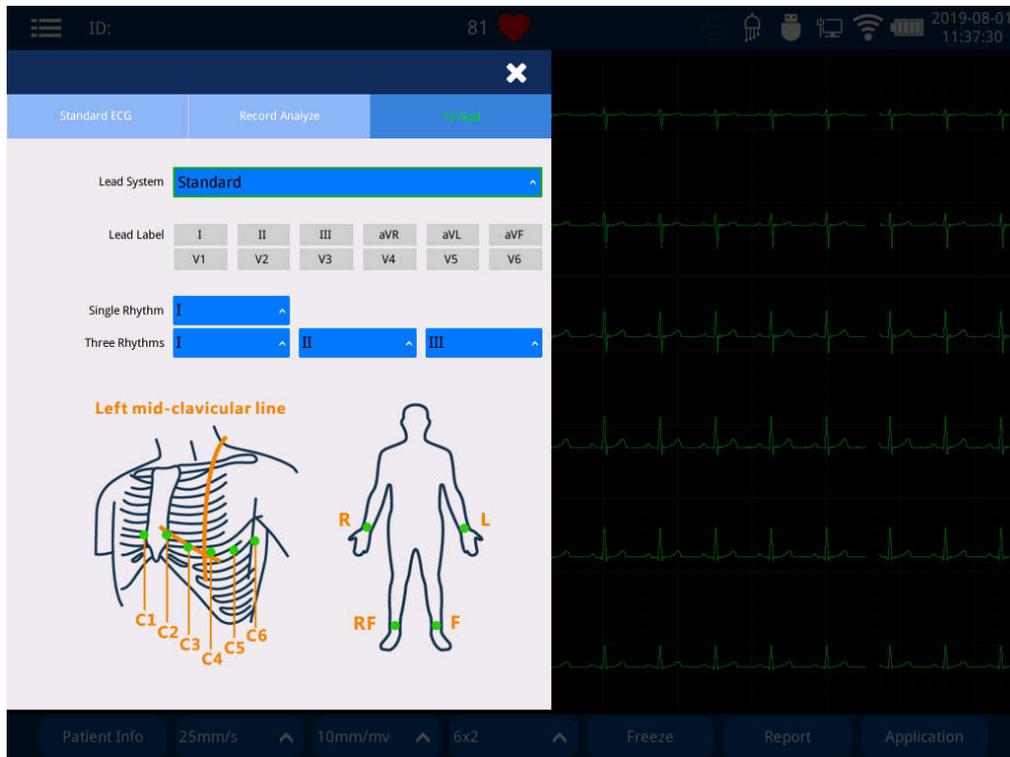

Fig. 2.10 Lead System Interface

Lead System	
Menu Item	**Lead Label**
Standard	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6
Posterior Wall	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V1, V2, V3, V7, V8, V9
Right Chest	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V1, V2, V3, V3R, V4R, V5R
Right Chest Posterior Wall	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V3R, V4R, V5R, V7, V8, V9
Previous Intercostal Space	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V`1, V`2, V`3, V`4, V`5, V`6
Next Intercostal Space	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V.1, V.2, V.3, V.4, V.5, V.6
CABRERA	aVL, Ⅰ, -aVR, Ⅱ, aVF, Ⅲ, V1, V2, V3, V4, V5, V6
Custom	Ⅰ, Ⅱ, Ⅲ, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6

2.3.3 Patient Info Interface

In the waveform acquisition interface, you can click **F1** key on panel or the " Patient Info "
or " ID " button at the bottom of the touch screen to enter the patient information
interface and then enter the information by keyboard. After the input is completed, click
the " Confirm " button to save and return. Click the " Previous " button to automatically
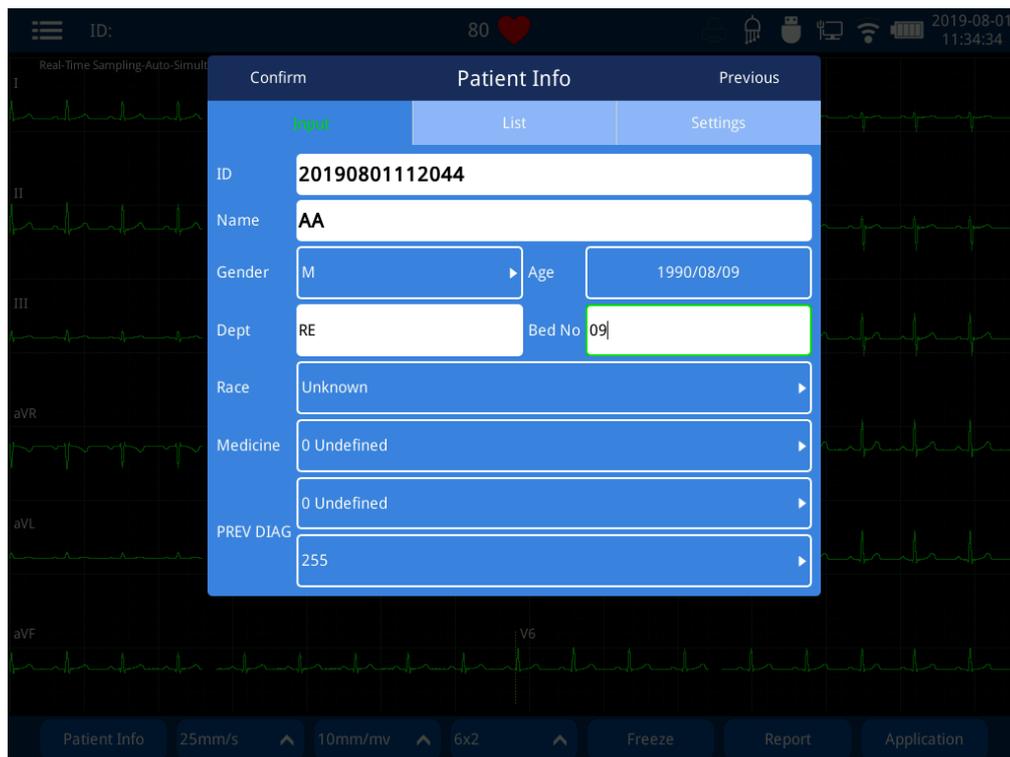generate the last patient information.

Fig. 2.11 Patient Info Interface

Click the " Settings " button in the Patient information interface, enter the server's IP
address, port and path (for details, please consult your network administrator). You can
synchronize the patient information data in the server, and directly import the patient
information into the list. Click on one of the patients to automatically generate patient
information. Before importing data, please test whether it can be connected. After the test
is successful, click the "Save" button, and then click the "Sync" button.

If the automatic list synchronization function is enabled, the system will automatically
synchronize the server data each time you enter the list interface;

If the function of the ID card module is enabled, and the resident ID card reading machine can be connected to the electrocardiograph through the USB interface, the patient ID is automatically generated by brushing the patient ID card.
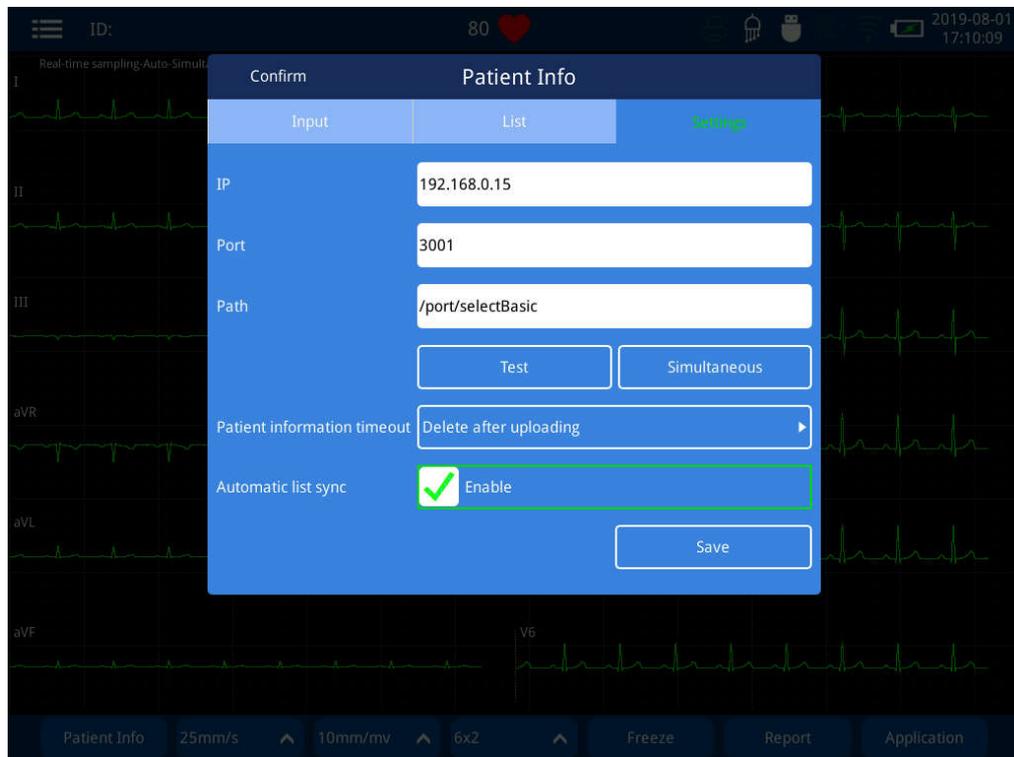

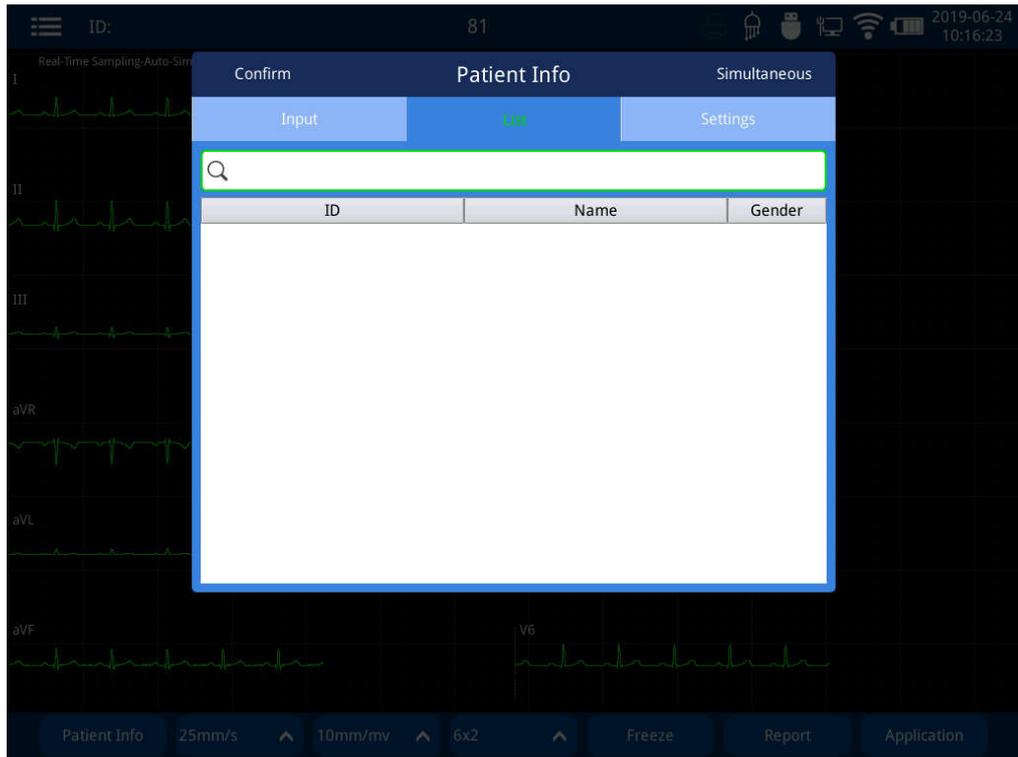Fig 2.12 Patient Information Interface - Settings

Fig 2.13 Patient Information Interface - List

2.3.4 Paper Speed Interface

On Waveform Acquisition interface, touch the key [25mm/s] or click the F2 key on the

panel to change the paper speed. Paper speed can be selected among 5mm/s，
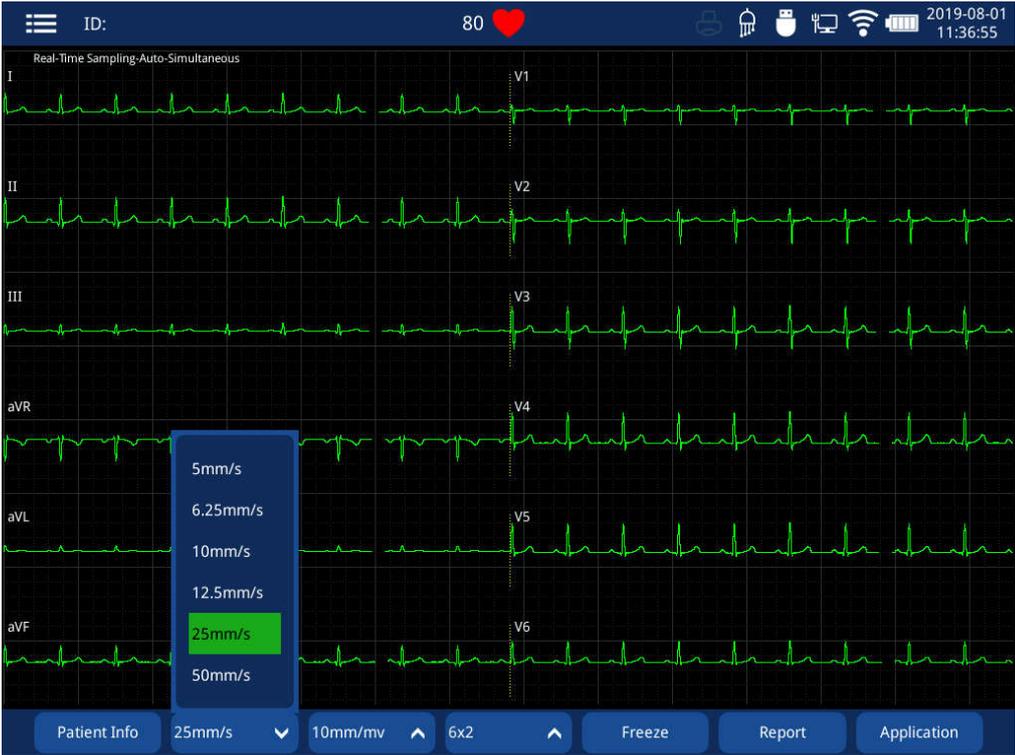
6.25mm/s，10 mm/s，12.5mm/s，25mm/s，50mm/s.

Fig. 2.14 Paper Speed Interface

2.3.5 Gain Amplitude Interface

On Waveform Acquisition interface, touch the key 10mm/mv or click the F3 key on the panel to change the gain amplitude. Gain amplitude can be selected among 2.5mm/mv, 5mm/mv, 10mm/mv, 20 mm/mv, 40 mm/mv and Auto.
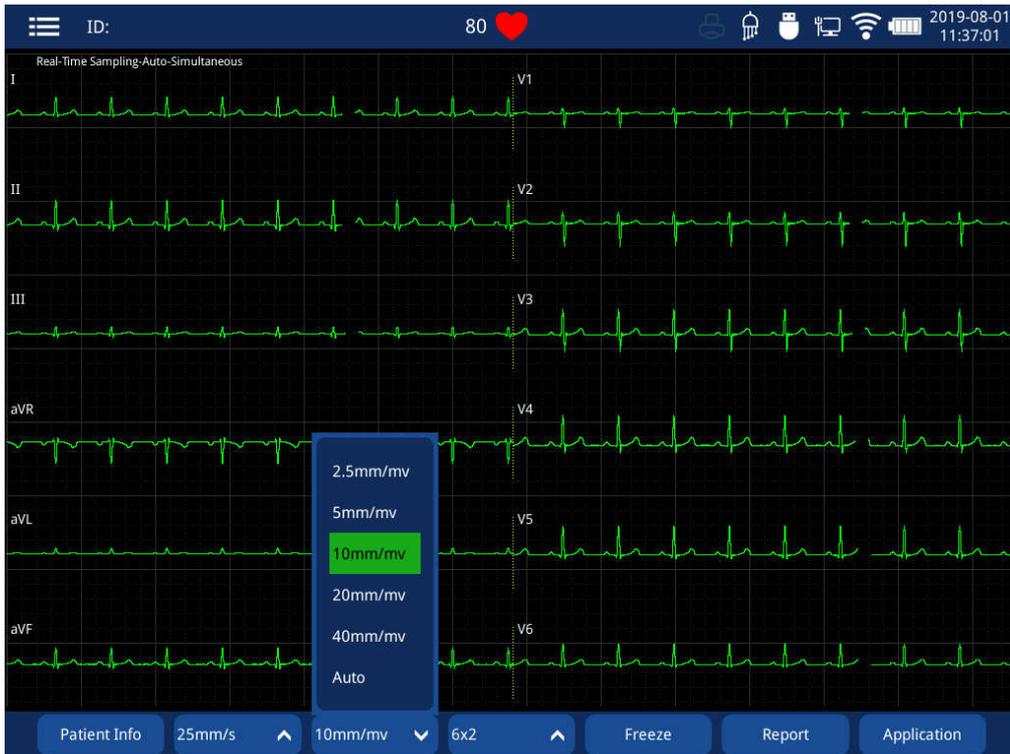

Fig. 2.15 Gain Amplitude Interface

2.3.6 Lead Layout Interface

In the waveform acquisition interface, you can directly click the "[6x2]" button on the touch screen or click the F4 key on the panel to switch the lead layout. Lead layout options are: 3×4，3×4+1，3×4+3，6×2，6×2+1，12×1，6×2+3. Take 3×4+1 for example, When printing, the 12-lead ECG waveform is arranged in a 3-row, 4-column format with a rhythm lead below when printing. (The lead layout will be saved after shutdown.)
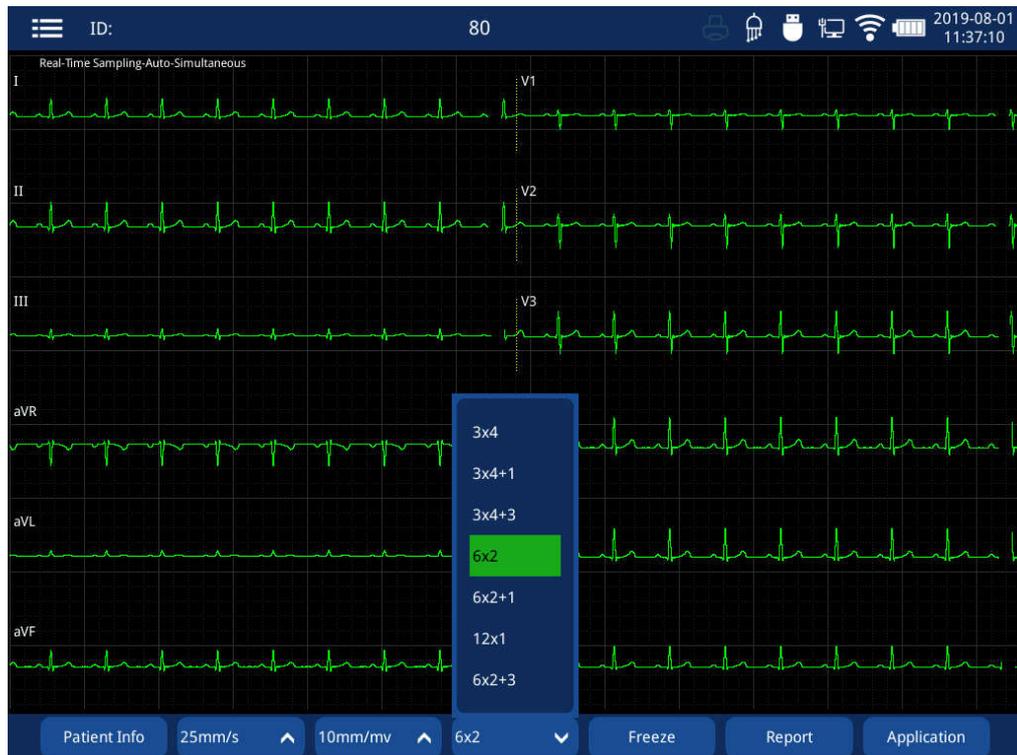

Fig. 2.16 Lead Layout Interface

2.3.7 Report Management Interface

In the waveform acquisition interface directly clicks the "Report" button on the touch screen or click the F6 key on the panel to enter the report management interface. See Chapter 7, Report Management for details. This interface has locking function. After the external keyboard is pressed, press the key combination "CTRL+ALT+L", a lock dialog box will pop up, and the report printing, report transmission and report deletion functions can be locked. 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.
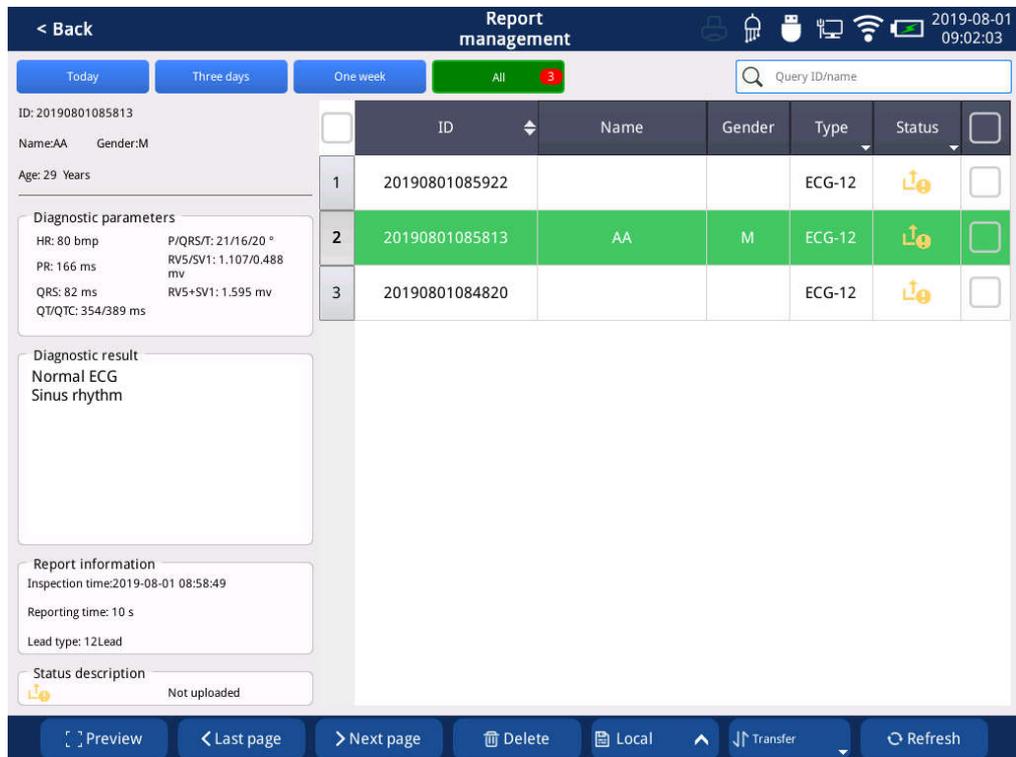

Fig. 2.17 Report Management Interface