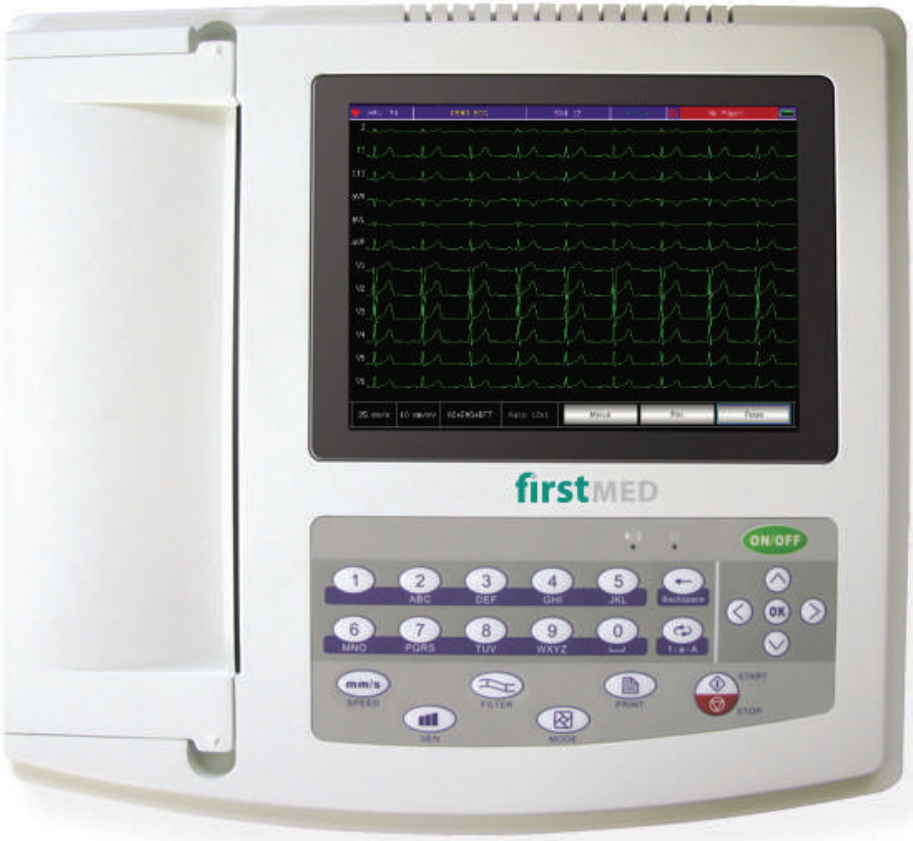
firstMED



Model: **ECG-1200**

ELECTROCARDIOGRAPH

EKG CİHAZI

ELECTROCARDIOGRAPHIE

ЭЛЕКТРОКАРДИОГРАФ

AMÊRA EKG'YÊ

جهاز تخطيط القلب

الکتروکاردوگرافی

EN Instruction Manual

www.firstmed-health.com

Symbols

CE 0123	CE mark		Keep the carton straight.
	Read the instructions carefully before using this device.		Fragile, handle with care.
	Waste Electrical and Electronic Equipment Directive		Storage temperature limit.
	Manufacturer		Type CF equipment
	Caution-Consult accompanying documents.		Class I equipment
	Keep away from sunlight.		Manufacturing date
	Keep dry.	SN	Serial number

Instructions to User

Dear User, thank you very much for purchasing our product.

This Manual is written and compiled in accordance with the council directive 93/42/EEC for medical devices and harmonized standards. The Manual is written for the current ECG-1200 Electrocardiograph. In case of modifications and software upgrades, the information contained in this document is subject to change without notice.

The Manual describes, in accordance with the ECG-1200 Electrocardiograph's features and requirements, main structure, functions, specifications, correct methods for transportation, installation, usage, operation, repair, maintenance and storage, etc. as well as the safety procedures to protect both the user and equipment. Refer to the respective chapters for details.

Please read the Manual very carefully before using this equipment. These instructions describe the operating procedures to be followed strictly, Failure to follow these instructions can cause measuring abnormality, equipment damage and personal injury. The manufacturer is NOT responsible for the safety, reliability and performance issues and any monitoring abnormality, personal injury and equipment damage due to user's negligence of the operation instructions. The manufacturer's warranty service does not cover such faults.

WARNING:

- **All the electrodes connected to the patients directly must be correct and tried.**
- **Make sure the battery voltage is normal when choosing the UPS**
- **The AC power cable and the patient cable could not be enlaced.**
- **Please peruse the relative content about the clinical restrictions and caution.**
- **This device is not intended for treatment.**

Contents

1 Main Technical Specifications

1.1 Environment conditions

Operation

a) Environment temperature: +5℃~+35℃

b) Relative humidity: ≤80%

c) Power supply: AC:220V, 50Hz（110V ,60 Hz）

DC:14.8V, 3700 mAh rechargeable lithium battery

d) Atmospheric pressure: 86kPa~106kPa

Transportation and Storage

a) Environment temperature: -10℃~55℃

b) Relative humidity: ≤95%

c) Atmospheric pressure: 50kPa~106kPa

1.2 Input way: Floating and defibrillation protection

1.3 Lead: Standard 12 leads

1.4 Patient leak current: <10μA

1.5 Input impedance: ≥50MΩ

1.6 Frequency response: 0.05Hz~150Hz（-3dB）

1.7 Time constant: Time constant>3.2s

1.8 CMRR: ＞60dB, ＞100dB(Adding filter)

1.9 EMG interference filter: 35Hz(-3dB)

1.10 Recording way: Thermal printing system

1.11 Specification of recording paper: 210mm（W)×20m(L) high-speed thermal paper

1.12 Paper speed:

Auto record: 25mm/s, 50mm/s, error:±5%

Rhythm record: 25mm/s, 50mm/s, error:±5%

Manual record:5mm/s, 10mm/s, 12.5mm/s, 25mm/s, 50mm/s, error:±5%

1.13 Sensitivity selections: 5,10,20mm/mV, error:±5%. Standard sensitivity is 10mm/mV±0.2mm/mV.

1.14 Auto record: Record setup according to auto record format and mode, automatically changing leads, measuring and analysing.

1.15 Rhythm record: record setup according to rhythm record format and mode, automatically measuring and analysing.

1.16 Manual record: record setup according to manual record format, manually changing leads.

1.17 Measurement parameters: HR, P-R interval, P Duration, QRS Duration, T Duration, Q-T interval, Q-Tc, P Axis, QRS Axis, T Axis, R(V5) , S(V1) , R(V5)+S(V1)

1.18 Product safety type: Class I CF applied part; there is defibrillation and pacing protection circuit in it.

1.19 Enduring polarization voltage: ±300mV

1.20 Noise level: ≤15μVp-p

1.21 Fuse specification: 2 pcs φ5×20mm AC time lag; T1.6A/250V(Power supply 220V)

1.22 Size: 334mm(L)×320mm(W)×85mm(H)

1.23 Net Weight: 5.1Kg

2 Security Notice

2.1 The power supply should be grounded properly before operation.

2.2 If the ground cable is not integrated, the device must run with built-in power supply.

2.3 Please pull out power supply plug before changing the fuse.

2.4 This device must be operated and preserved by professional personnel.

2.5 The operator must read this user manual carefully before operation, and operate the device according to operation regulation strictly.

2.6 The design of this device has fully considered security, but operators should never neglect to device state and patient's situation.

2.7 Please turn off the instrument and pull out power supply plug before cleaning and disinfection .

2.8 Please don't operate this device in environment which contains flammable anaesthesia gas.

2.9 If this device is used with cardiac defibrillator or other electric stimulate devices at the same time, please choose Ag/AgCl chloride chest electrode and ECG lead with prevent-fibrillation function. To prevent the metal electrode burn patients' skin, the disposable chest electrode should be used if the defibrillation time is over 55 seconds. It is better that do not use this device with other electric stimulate devices at the same time. If it must be used at the same time, there must be professional technician guide on the scene.

2.10 When other devices are connected with this ECG instrument, they must be Type I devices which accord with IEC60601-1. Because the total amount of leakage current may hurt patients, the monitoring of leakage current is carried out and taken charge by connect devices.

2.11 Following descriptions concern special attentions in ECG measurement and interpretation.

(1) P wave and Q wave are not always reliable in the archive of intensive muscle artifact or AC interference. So are the ST segment and T wave.

(2) Winding and unclear ends of S wave and T wave may lead to tolerance in measurement.

(3) In archive R wave is left out due to the low voltage of QRS wave or any leads falling off, the measured heart rate may deviate greatly from the correct one.

(4) Axis calculation and identify the QRS borderline are not always reliable in the archive of the low voltage of QRS wave.

(5) Occasionally, frequent ventricular premature complexes may be identified as dominant beat.

(6) Merging of versatile arrhythmia may result in untrustworthy measurement because of the difficulty in distinguishing P wave in such situation.

(7) This device is designed to carry on ECG trace interpretation immediately after the measurement. It is this interpretation that does not give report on all possible heart problems and may sometimes not comply with the doctor's diagnosis. Therefore, the final conclusion concerning each patient is up to the doctor basing on patient symptom, the unit 's interpretation and other examination.

3 Device Characteristics

3.1 TFT colour screen is 800*600,touch screen and function key control at the same time, more convenient and shortcut.

3.2 It is high resolution thermo sensitive printer and thermal-array (8 dots/mm), you should not adjust anything Frequency Response is up to 150Hz.

3.3 The device can record real time clear and exact six channel ECG waveform and remark continually. The remark includes: lead sign, sensitivity, paper speed, filter state, etc.

3.4 Full digital filter for resisting the baseline drift, AC and interference.

3.5 Adjust the baseline automatically, optimize the print setting and choose the rhythm leads.

3.6 Under automatic mode, just press the button once, it starts record procedure, which can enhance your work efficiency.

3.7 Soft keyboard and touch screen control at the same time, more convenient for operation. TFT screen shows the working status, more clear for observation.

3.8 The power supply includes both AC/DC. This device includes built-in lithium rechargeable battery, automatic protection circuit and it will shut automatically, if there is no operation for 5 minutes.

3.9 This instrument can record 150 pieces of ECG waveform and print 90 minutes continually under the best DC state.

3.10 This instrument can store more than 1000 pieces patient's data, more convenient for data review and statistic.

3.11 The figure of whole device is elegant and gliding.

3.12 One key to operate and one key to print and store.

3.13 Digital signal processor for effective inhibition of baseline drift, interference, and the like.

3.14 The instrument has function with regular auto-measurement of ECG waveform parameter, auto-analyze and auto-diagnostic, it will help to reduce doctor's burden and

improve working efficiency.

3.15 The device gathers 12-channel ECG signals synchronously and then analyses record modes of such channels as 12×1, 6×2+1, 6×2, rhythm row12, row10, row8, row6,etc, with multiply report formats.

3.16 Multi-lead styles for observing the real-time wave of three leads, six leads or twelve leads and displaying Lead Off and Lacking of paper.it can test the ECG parameter and analyze the report, register the wave with automatic or manual mode, it also can store the patients' information by data storeroom.

3.17 Safety Class: Class I, Type CF applied part. There is defibrillation circuit.

3.18 According to defense degree of deleterious fluid: IPX0

3.19 According to the safe degree used under the condition with flammable anesthesia gas mixed with air (or oxygen, nitrous oxide), this device belongs to the device which can't be used under the condition with flammable anaesthesia gas mixed with air(or oxygen, nitrous oxide) .

3.20 According to the working mode class, this device belongs to uncontinuous working device.

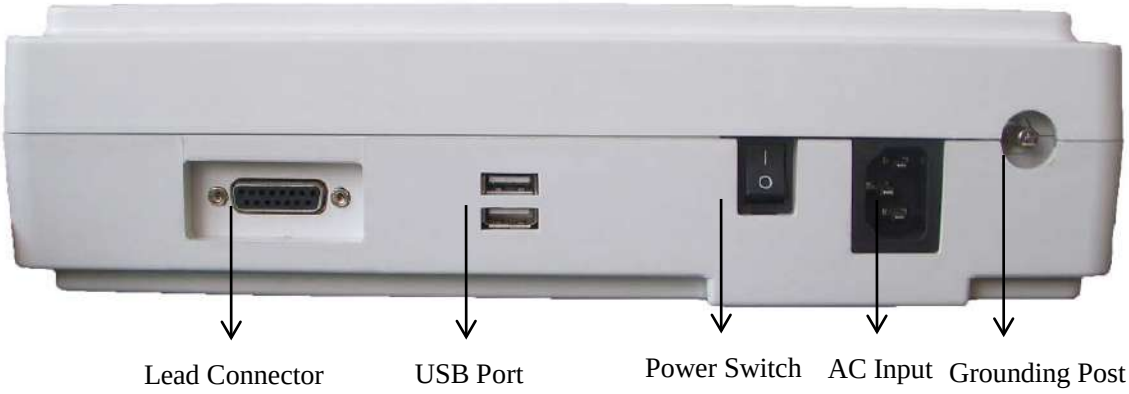
3.21 Explanation of some symbols in this device:

~**AC**	AC work mode
OFF	Power supply is disconnected
ON	Power supply is connected
	Equipotential point
	Places need to be noticed, please refer to user manual
	Device type is CF, which has defibrillation protection function
	USB connector
 **PATIENT**	Lead connector

4 ECG-1200 View

4.1 Device View

Front view



Side view

Bottom view

4.2 Key Definition

Function key: This key is used to turn the device on or off.

Function key: This key is used to begin or stop sampling.

Function key: This key is used to select filter function.

Function key: This key is used to adjust paper speed.

Function key: This key is used to adjust gain.

Function key: This key is used to switch printing modes.

Function key: This key is used to start printing.

Function key: This key is used to confirm the operation you have done.

Function key: This key is backspace.

Function key: This key is used to switch input methods.

Direction key: Up

Direction key: Down

Direction key: Left

Direction key: Right

Number/Capital and Small letter/Character key: 0/Space/,

Number/Capital and Small letter/Character key: 1/.

Number/Capital and Small letter/Character key: 2/abc/ABC/:

Number/Capital and Small letter/Character key: 3/def/DEF/;

Number/Capital and Small letter/Character key: 4/ghi/GHI/*

Number/Capital and Small letter/Character key: 5/jkl/JKL/%

Number/Capital and Small letter/Character key: 6/mno/MNO/"

Number/Capital and Small letter/Character key: 7/pqrs/PQRS/#

Number/Capital and Small letter/Character key: 8/tuv/TUV/(

Number/Capital and Small letter/Character key: 9/wxyz/WXYZ/)

4.3 Indicator definition

 When green, the light indicates that the device is powered by AC supply; while red and green, it indicates the battery is charging.

 Powering on indicator light.

5 Operation Direction

5.1 You are required to read this operation manual carefully before operating so as to ensure taking safe and effective operation of the instrument.

5.2 Installation and maintenance of the instrument should be carried out as the following

5.2.1 There should be no high voltage cable, X radial instrument, ultrasound instrument and electrotherapeutics instrument, etc around the ECG instrument.

5.2.2 Do not use or reserve the instrument in the place where the air pressure is too high, temperature and humidity are over the common standard, the ventilation is not good, dust is too much, there is gas containing salt and alkali and chemical medicine.

5.3 The instrument should be put on flat place. Take and put it lightly when move it. Avoid too strong vibration and shock.

5.4 AC frequency and voltage value should accord with requirement ,and has enough current
capacity.

5.5 Please put the device at the place where is easy to be grounded. Do not connect the patients and the patients connecting cables with other conductors including ground or beds which can be conducted well with ground.

6 Preparation Before Operation

6.1 Check that the instrument properly grounded and that cable connections safe or not.

6.2 Make sure all electrodes directly connected with patient are properly and firm.

6.3 Check the output voltage when choose the DC UPS.

6.4 Smear the gel separately, avoiding the short circuit caused by the chest electrode touch one another.

6.5 AC power cable can not be enlaced with ECG cable.

7 Attention Points of during Operation

7.1 Pay attention to the patient and instrument condition constantly.

7.2 Patient and instrument can only be connected ECG cables.

7.3 Keep close observation of the patient and instrument, to make sure they are not moved during operation.

7.4 Turn off the instrument after using.

7.5 Turn off the power, and remove the ECG cables slightly without force.

7.6 Properly keep the instrument and spare parts for operation next time.

7.7 Paper Loading

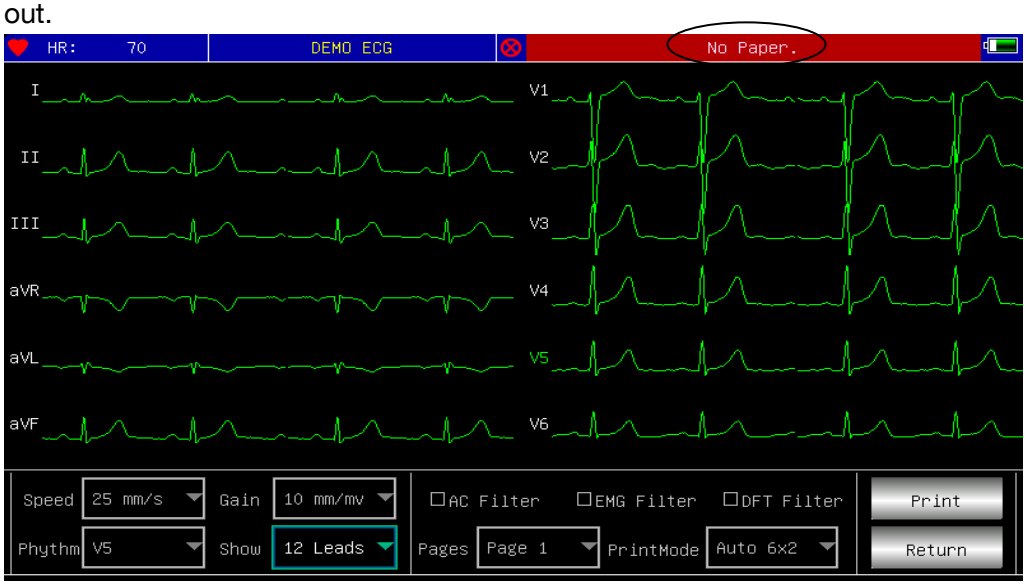
7.7.1 Dimension of the high-speed thermal Recording paper used in this instrument is: 210mm(W)*20m(L)

7.7.2 Open the cover of paper cabinet, take out the paper axis and install recording paper according to the figure into the proper position inside.

7.7.3 Close the cover of paper cabinet. It's recommended to leave 2 cm of recording paper outside.

8 Paper Loading

8.1 Message "No Paper." will be displayed on the LCD whenever recording paper is run out.



8.2 Specified paper of high sensitivity is recommended for high-quality prints. Other kind of paper may not render a clear permanent trace and may damage the printing mechanism. Please consult distributor or manufacture for detail of how to purchase the paper.

8.3 Failure of the recording paper might be affected by high temperature, bad humidity or direct sunlight. For long storage, the recording paper should be placed in dry, dark and cool area.

8.4 Substance may caused stain of the recording paper:

Gel, glue, and wet diazo compound paper including their organic solvent.

8.5 Substance may caused the waves fade away:

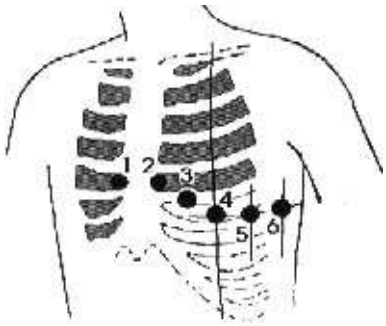
File folders made of soft PVC material, plastic etc; eraser and magnetic tape contains plasticizer; fluorescence, and stamp-pad ink.

9 Electrode Placement

Advice: Set the chest electrode first, then the limb electrode.

9.1 Chest Electrode

See Figure 10-1.



Attach the chest electrodes to the locations as following:

V1: Fourth inter-costal space at right border of sternum.

V2: Fourth inter-costal space at left border of sternum.

V3: Midway between V2 and V4.

V4: Fifth inter-costal space at left mid-clavicular line.

V5: Left anterior axillary line at the horizontal lever of V4.

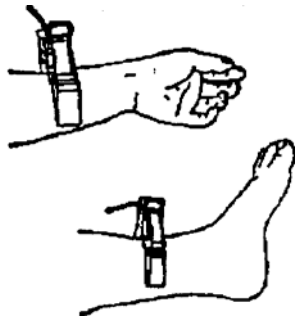
V6: Left mid-axillary line at the horizontal lever of V4.

Clean the skin where chest electrodes are to be attached with alcohol, then apply ECG cream to here around 25mm in diameter and to the edge of chest electrodes, and press and attach the electrodes to the positions from V1-V6.

Note:Keep in mind that the electrodes' coming into contact with each other or cream's overlap from one position to another is not allowed.

9.2 Limb Electrode

Electrodes should be placed on the soft skin of hands and feet. Clean all the limb electrodes and the positions around to which limb electrodes are to be attached with alcohol before applying ECG cream to them, then firmly attach the electrodes to the positions.(See Figure 10-2)



Caution: Screw tightly the knob of ECG cable's plug after it inserted to the instrument.

9.3 Check-List for Electrode Connection and ECG cable

Electrode Location	Electrode Code	Socket Number
Right arm	RA/R	9
Left arm	LA/L	I0
Left Leg	LL/F	11
Right Leg	RL/N	14
Chest 1	VI/CI	12
Chest 2	V2/C2	1
Chest 3	V3/C3	2
Chest 4	V4/C4	3
Chest 5	V5/C5	4
Chest 6	V6/C6	5

10 Grounding and Power Connection of Instrument

Make sure the status of the instrument is power off, and then make the instrument be properly grounded through a 3-prong outlet. When the outlet, a grounding cable may be utilized to connect the grounding terminal of the instrument. Do not use other pipeline. Properly grounding could guarantee the safety and prevent from the interference of AC power and electromagnetic wave.

11 Battery Operation Direction

11.1 This instrument is designed with the built-in sealed maintenance-free rechargeable lithium battery,and has automatic charge and discharge monitoring system. The instrument recharges the battery automatically when connect to AC power supply. The LCD screen will show the current power state at the top right corner when the instrument turns on. It needs about 4 hours for battery charge after discharge absolutely.

11.2 The device can continuously print 90 minutes and work 4 hours without printing after the battery fully charged. When it working, the LCD screen displays the signal of the battery status in 5 degree. When the power of battery is too low to operate, the instrument will turn off automatically to avoid damage to the battery.

11.3 The battery should be recharged in time after exhausted using. For long storage, the battery is to be recharged every 3 months. The battery life can be extended by doing so.

11.4 Seven status of the battery power displayed on LCD as following:

No.	mark	description
a		Unknown status, normally displayed while the instrument being turned on within 1 minute
b		Using AC power
c		Using battery, and full power
d		Using battery, volume : 3/4
e		Using battery, volume: 1/2
f		Using battery, volume : 1/4
g		Using battery, but lower power, suggest to recharge the battery or use AC power supply

Note: When charging,the battery icon shift from f to c.

11.5 When the battery can not be recharged or works no more than 10 minutes after fully charged, please change the battery.

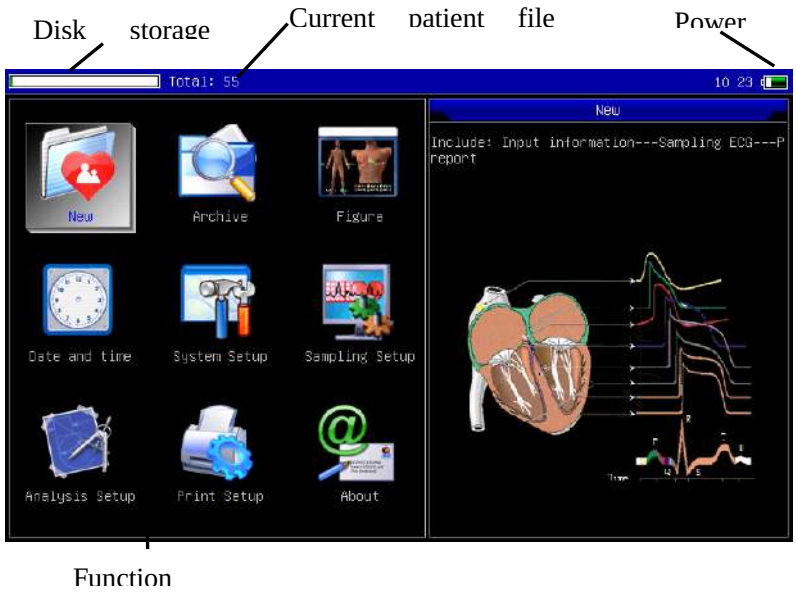
Attention ! ! !

- Do not directly connect both "+" and "-" polars of battery with wire, otherwise it might cause fire hazard.
- Possible explosion hazard if it kept nearby the ablaze area.
- You should not open or disassemble the battery .

12 Control Panel and Key Instruction

12.1 Main Interface

Show as following:



Power status:Please refer to 12.4

Keypad:

 Enter sampling interface. when the instrument is powered on, it will automatically start this operation.

 Enter Archive management interface, query , modify or delete archive information

 See sketch map for electrodes placement

 Date and time settings

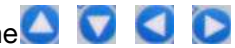
 System settings

 Sampling settings

 Analysis parameters settings. settings for each parameter using for automatic analysis

Printing settings,set printing mode, style and content.

About us, display information about our company and software version

Switch rapidly:switch each functions rapidly by using the  on the keyboard,and set the relative functions by pressing  .

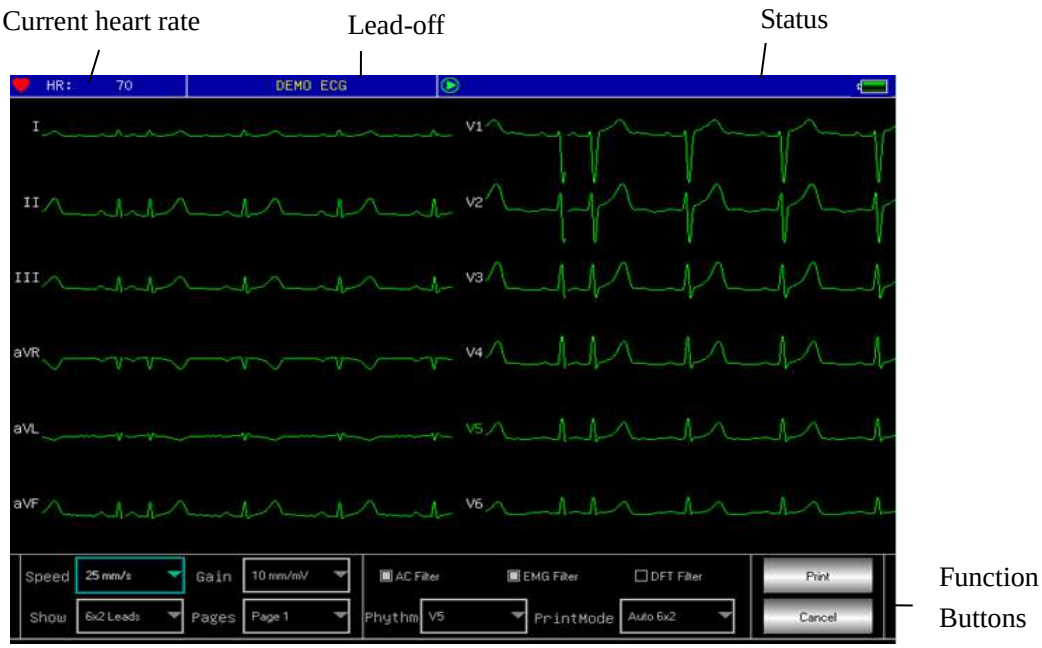
Quick setup: press each function module to complete the relevant function setup.

12.2 Sampling Interface

Select  on the main menu or choose shortcut key  to enter sampling interface.

Attention: Because of the "setting", Patient information may be input before sampling signal, rest with the option : inputting archive information.

It displays multiform lead waves, including 3 Leads per screen, 6 Leads per screen, 12 Leads per screen.Sampling interface of 12 leads style can be displayed as following:



Stop sampling: when the device is sampling, you can click the menu button  on the keyboard panel to stop and return to the main interface.

Switch lead: Adjust "Rhythm" option in function control area to switch the current lead waveform and the current lead is set up to the one printed in manual record.

Switch lead display way: Adjust "Show" option in function control area to switch among 3 leads ,6 leads, 6×2 leads and 12 leads.

Lead-off information: In Demo mode, it displays "DEMO ECG", while in sampling mode, it displays lead-off information detected.

Switch printing mode: With the button  on the keyboard, you can change the printing mode among manual, auto 12×1, auto 6×2+1, auto 6×2, rhythm 12, rhythm 10, rhythm 8, rhythm 6 and Freeze.

Adjust gain (Sensitivity): With the gain adjusting button  on the keyboard, you can switch among 2.5mm/mV , 5mm/mV , 10mm/mV , 20mm/mV, 40mm/mV .

Adjust paper speed:With the key of speed adjusting button  on the keyboard ,you can adjust paper speed among 5mm/s,6.25mm/s,10mm/s, 12.5mm/s, 25mm/s, 50mm/s.

Switch filter:With the key of filter selection button  on the keyboard ,you can switch filter among no filter, .AC, EMG, DFT, AC+EMG, AC+DFT, EMG+DFT, AC+EMG+DFT.

AC: AC Filter
EMG: EMG Filter
DFT: Baseline Filter

Print/Finish Printing: With the printing button  on the keyboard, you can begin or finish the printing operation.

Auto Mode: After starting printing, automatically the system prints and stores synchronous 12 leads waveforms, of which the length is according to related setup in printing settings, and also according to this to print analysis data and conclusion, then finish printing automatically.

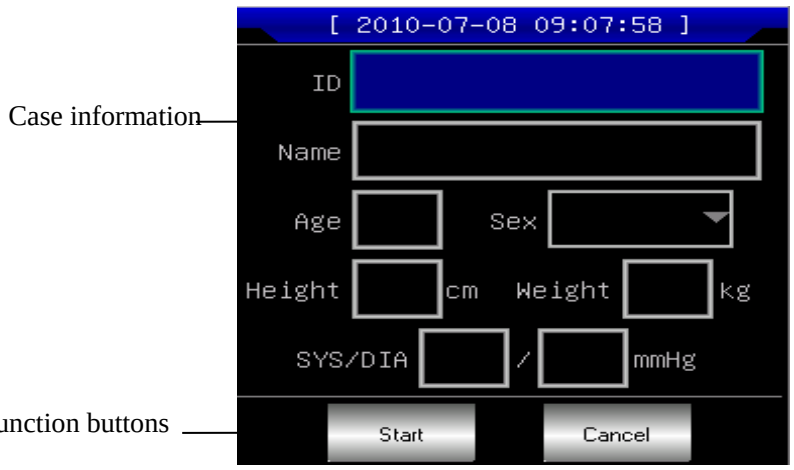
Manual Mode: After starting printing, the user can print different lead instant waveforms by switching the lead displayed, namely the ECG printed in manual mode is not synchronous and the data will not be saved. You need to stop printing by pressing  again.

During printing process, the printing state and display content mainly include:

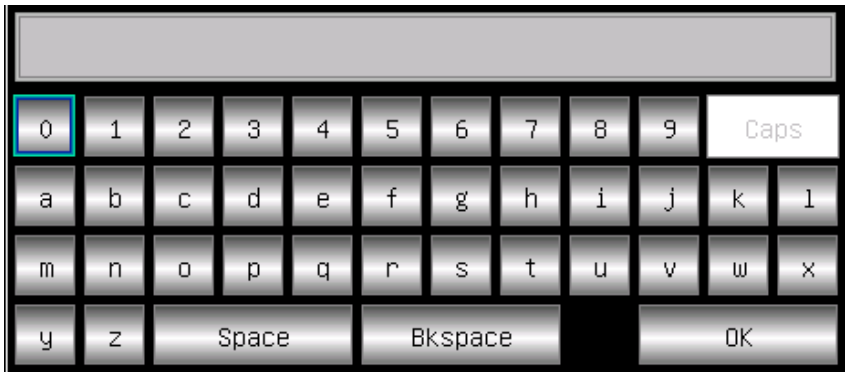
Display content	Explanation
Process…	It is printing.
Waiting…	It is finishing printing.
No Paper.	Paper lack, the user should restart printing after loading paper.
Print Timeout	Communication failure between this system and printing sub-system.
ECGTimeout	Communication failure between this system and sampling sub-system.
Low Power	Low power, it cannot start printing

12.3 Inputing Archive Information

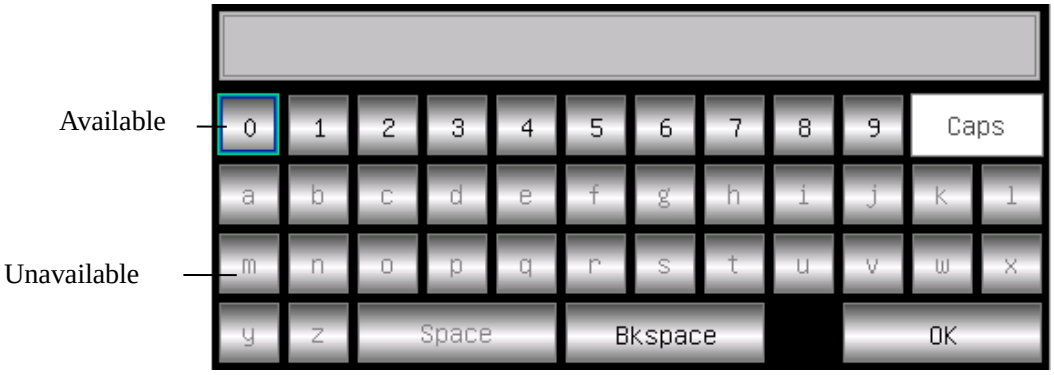
According to different system settings, the operator can input case information before or after sampling or input nothing. The dialog box for inputting case information is shown as the figure below.



Choose any item, by pressing key, the screen keyboard will pop up as follows. Here click【Caps】button to switch between number/capital letter and number/small letter; press 【Space】 to input a space; press 【Bkspace】 to delete the character input last; press 【OK】 to confirm input and exit this interface.



According to the limits of information, the screen keyboard has some character input limits, which will be showed in gray and are unavailable, as shown in the figure below:



Besides, you can select the numbers in control panel to edit, press 

to switch among numbers, small and capital letters or character input methods, and press 

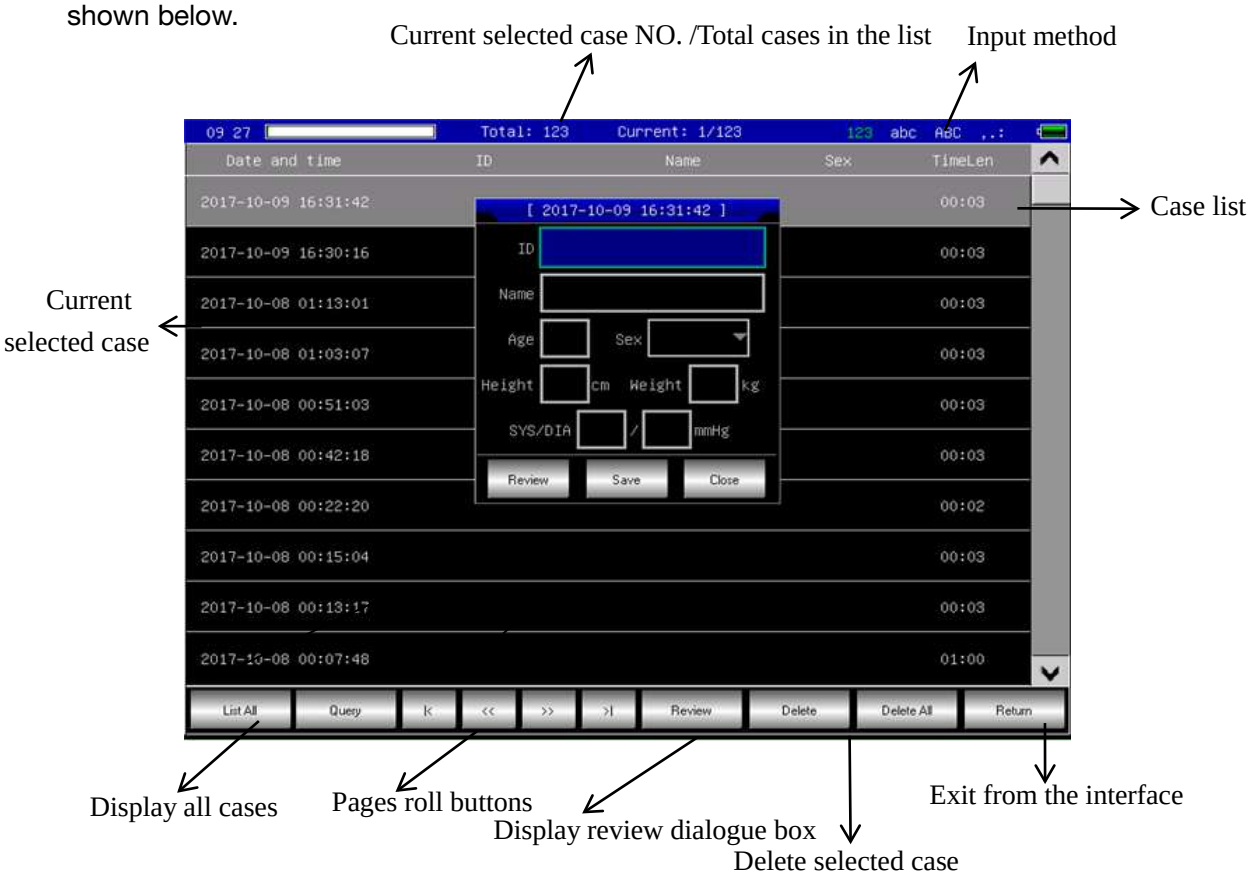
to delete the character last input. According to the limits to some information,

when switching the input methods, the selected turns to be green and the limited gray and unavailable.

12.4 History Archive Management

Select the button 

in main interface to enter the case management interface, as shown below.



This interface displays all cases stored in the device. The user can select the case needed using the querying function; using editing function to edit and delete any case informations; besides, you can review the case informations stored.

|<: Select it , and the case list will turn to the first page .

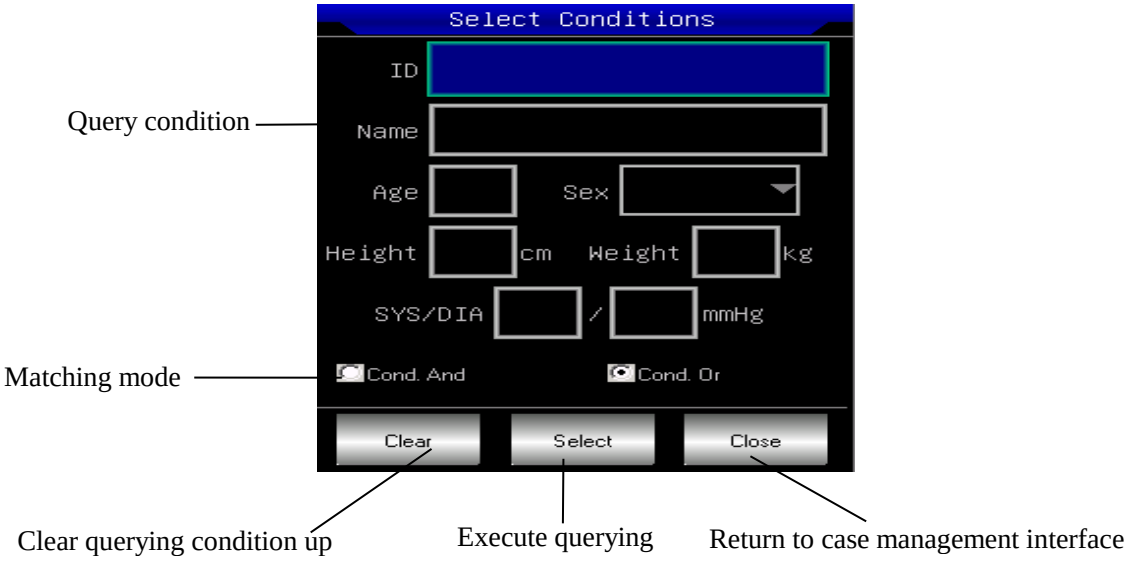
>|: Select it , and the case list will turn to the last page .

<<: Select it , and the case list will turn to the former page .

>>: Select it , and the case list will turn to the later page .

12.5 Case Querying

Select 【Query】 and the case querying dialogue box shown below will pop up. Input the query condition, click 【Query】, and the expected results will occur. Click 【Clear】, and the system will delete all the querying conditions input.

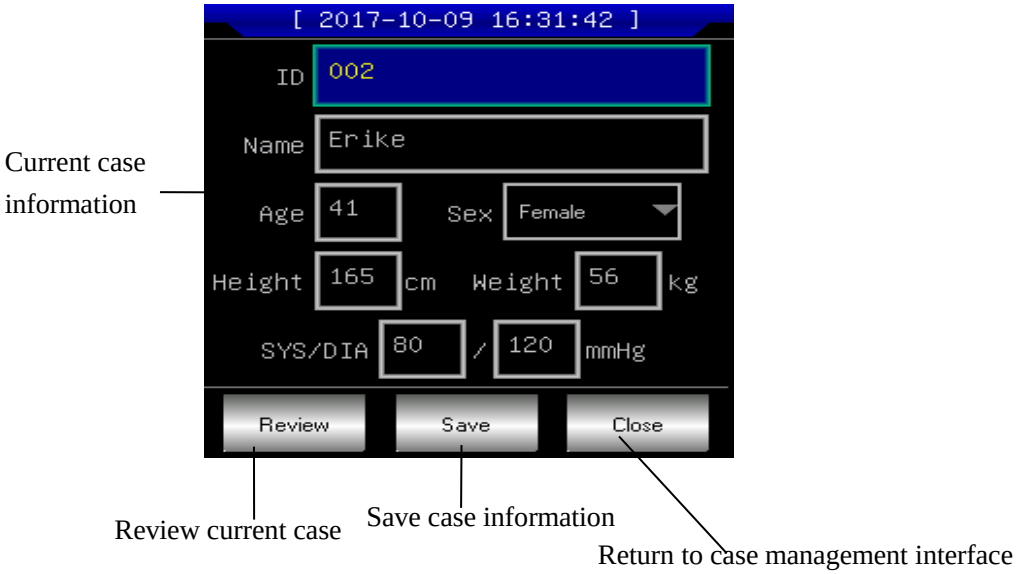


Here, 【Cond.And】 and 【Cond.Or】 are matching modes for querying condition ,and only one can be selected. If you select【Cond.And】,the displayed querying results have to satisfy all the conditions input; while for【Cond.Or】, they only need to satisfy any conditions input.

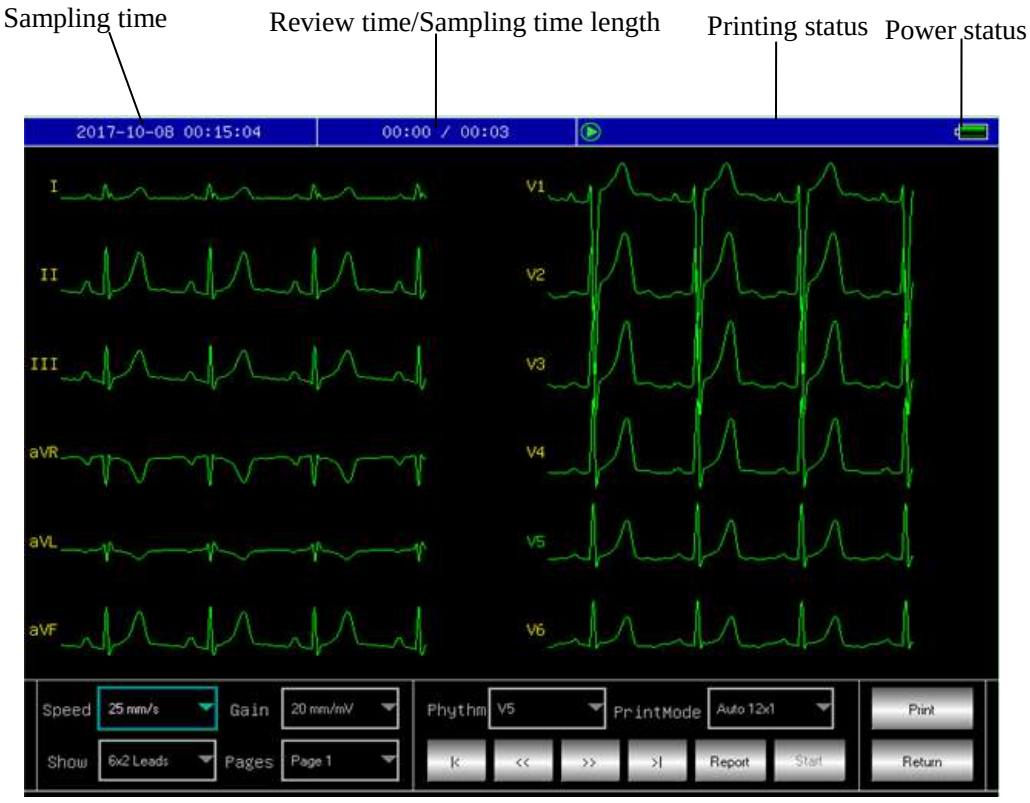
Suggestion: In case of multiply cases, it is better to input all decided querying conditions , select 【Cond.And】 to find the corresponding case quickly.

12.6 Archive Review

In case management interface, select the case you want to review, click 【Review】 to pop up the dialogue box shown below ,which displays case information , here you can edit content, click 【Save】 to confirm modification and note it is not reversible.



After ensure the selection, click 【Review】 to enter the review interface shown below, which is similar to the gathering interface.



In this interface, user can switch printing modes by the button  ; click  to begin printing.

12.7 Time and data settings

In the main interface, select 

button, and data and time setting dialogue box shown below will pop up.

In this interface, user can switch options through , and use to edit option content.

12.8 System Settings

In the main interface, select button, and system settings dialogue box shown below will pop up.

Here, click the button【Default】, and the system settings will back to default.

Each item, its options and explanation are shown in the table below.

Item	Options	Explanation
ScreenSaver	30Seconds/1Minute/2Minutes/5Minutes/10Minutes/None	If there is no operation for the time selected, screen saver will be active; and select "None" not to use the function.
Back-light	30Seconds/1Minute/ 2Minutes/5Minutes/ 10Minutes/Always On	If there is no operation for the time selected, screen backlight will be turned off. Select "Always On" to keep screen backlight on.
Light-degree	[90%degree]/[80%degree]/ [70% degree]/[50% degree]	After setting light degree, the screen will display different backlight strength.
Auto off	[1 minute]/[3 minutes]/ [5 minutes]/[10 minutes]/ [15 minutes]/[30 minutes]/ [60 minutes]/[None]	If there is no operation for the time selected, the system will power off automatically. Select "None" and the system will not power off automatically.
Low Power	[Always]/[Only once]/[None]	When in low power, this can decide the alarm method.

Filter Freq	[50Hz/35Hz]/[50Hz/25Hz] /[60Hz/25Hz]/[60Hz/35Hz]	Set up the parameter compounding of AC Filter and EMG Filter.
Info input	[Before]/[After]/[None]	Set up when to input patient information.
Language	[English]/[Chinese]	Set up the language displayed.
K-B Sound	On/Off	Select to activate key-press sound, and not select to dumb it.
Demo Mode	On/Off	Select to make the system operate in demo mode, or in sampling mode.

12.9 Sampling Settings

Select  in the main interface, the sampling setting dialogue box will pop up shown below.

Here, select the button【Default】, the sampling settings will go back to the default.

Each item, its options and explanation are shown in the table below.

Item	Options	Explanation
AC Filter	[ON]/[OFF]	Set up whether to use AC Filter or not.
EMG Filter	[ON]/[OFF]	Set up whether to use EMG Filter or not.
DFT Filter	[ON]/[OFF]	Set up whether to use DFT Filter or not.
Rhythm Lead	[I] / [II] / [III] / [avR] / [avL] / [avF] / [v1] / [v2] / [v3] / [v4] / [v5] / [v6]	Set up rhythm lead to use for printing in rhythm mode.
Show Style	[3 leads]/[6 leads]/[6×2 leads]/[12 leads]	Set up the ECG display mode in screen.
Show Gain	[2.5mm/mV]/[5mm/mV]/[10mm/mV]/[20mm/mV] /[40mm/mV]	Set up the ECG gain in screen.
Show Speed	[5mm/s]/[6.25mm/s]/[10mm/s]/[12.5mm/s]/[25mm/s]/[50mm/s]	Set up ECG sweep speed in screen, but when printing in auto and rhythm mode , it does not support 5mm/s, 10mm/s, 12.5mm/s.
Premature(%)	0 ~ 100	The system will use the input value as a

		standard of judging premature beat.
Pause Time(ms)	1200 ~ 3000	The system will use the input value as a standard of judging beat pause.
Tachycardia(bpm)	0 ~ 250	The system will use the input value as a standard of judging tachycardia.
Bradycardia(bpm)	0~99	The system will use the input value as a standard of judging bradycardia.

12.10 Analysing Parameter Settings.

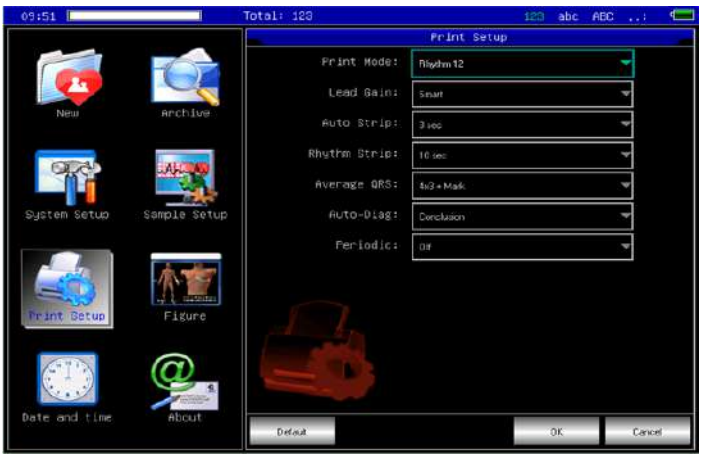
Select the  button in the main interface can start the following analysing parameter setting dialogue box:

The settings here will affect the diagnose hint of the real-time analysis, archive review and print report during sampling(See Figure 13-15).

12.11 Print Settings

Select the 

button in the main interface, the printing setting dialogue box will pop up shown below.



Click the button【Default】, the print settings will go back to the default.

Each item, its options and explanation are shown in the table below.

Item	Options	Explanation
Print Mode	[Auto 12×1]/[Auto 6×2+1] /[Auto6×2]/[Rhythm 12] /[Rhythm 10]/[Rhythm 8] /[Rhythm 6]/[Manual]/ Freeze/USB	The selection will be used as the default printing mode.
Lead Gain	Smart/Current	The option selected will be used as printing gain mode. "Smart" means the system will adjust gain automatically to fit paper height; "Current" means it will use screen waveform gain as that of printing.
Auto Strip	3Sec/4Sec/5Sec /6Sec/8Sec/10Sec/ 15Sec/20Sec/25Sec	The selection will be used as the time for printing each strip.
Rhythm Strip	10Sec/15Sec/20Sec /25Sec/30Sec	In printing mode, when selecting rhythm 12, rhythm 10, rhythm 8, or rhythm 6, the system will use the time selected as the time for printing each row waveform.
Average QRS	[4×3+Mark]/[4×3]/ [3×4+Mark]/[3×4]/ [2×6+Mark]/[2×6]/[None]	In printing mode, when selecting "Rhythm" Or "Auto", the system will use the format selected to print average QRS waveform.
Auto-Diag	All/Data /Conclusion/None	Printing diagnosis includes data and conclusion, you can select as your need.
Periodic	[per1Min]/[per 2 Min]/[per3Min] /[per5Min]/[per10Min]/[per20Min] /[per30Min]/[per 60 Min]/[off]	When gathering ECG, the system will activate printing according to the duration selected. When printing mode is manual, it will print in "Auto 12×1" mode, or in the mode currently set .

Note: "Auto Strip", "Rhythm Strip", "Average QRS" , "Auto-Diag" , "Periodic" are only available in auto and rhythm printing mode.

12.12 Checking Electrodes Placement

Select the 

button in the main interface to view the sketch map of electrodes placement shown below.

Click  to exit this interface.

12.13 About Us

Select the 

button in the main interface, the interface shown below will pop up, which contains information related to this device.

This interface shows the device name, version number, company name, copyright and our contact details.

13 Troubleshooting

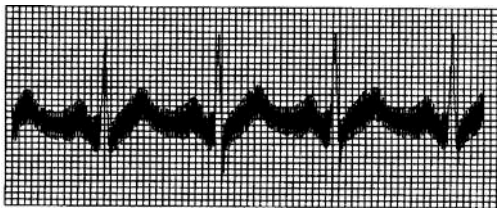
13.1 Turn off Automatically

① Please check whether the power of battery is used up. Over discharge control circuit of the battery acts.

② Please check whether the alternating current voltage is too high.Overvoltage control circuit acts.

③ Please check whether the alternating current disturb is too high, whether the fix knob of lead plug is too tight. Shut automatically is for protecting circuit when overload.

13.2 AC Interference



① Is the ECG device ground cable proper?

② Are the electrodes and leads connected properly?

③ Is the electrode and skin covered with enough Gel?

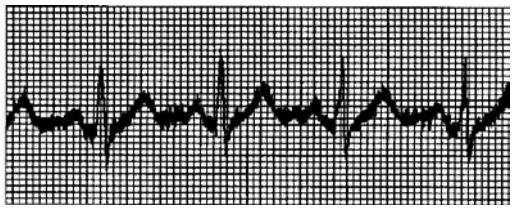
④ Is the metal bed grounding proper?

⑤ Does the patient touch the wall or metal sickbed?

⑥ Does other people touch the patient?

⑦ Whether there is powerful electric device working beside ECG device? For example: X radial device or B-Ultrasound devices.

13.3 EMG Interference

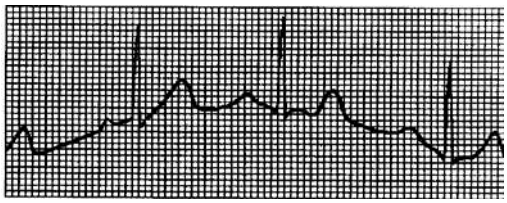


① Whether the patient room is comfortable.

② Is the patient nervous?

③ Is the sickbed too narrow?

13.4 Baseline Drift



① Verify the electrode attachment and lead wire performance.
② Check the connection between patient cable and electrodes.
③ Check the cleaning of electrode and patient skin. Is the electrode and skin covered with enough Gel?
④ Keep the patient from motion or hyperventilation.
⑤ Is the connection between lead and electrode proper?

Please use filter if still having above-mentioned interference.

13.5 Troubleshooting List

Phenomenon	Reason	Resolve method
Disturbance too big, the waveform is in disorder	1.Whether the ground cable proper. 2.The connection of leads is not stable. 3.Whether there is disturbance from alternating current. 4.Patient is nervous	1.Please check the lead, ground cable and power supply. 2.Please dispose the patient in proper state.
Baseline is rough	1.Disturbance from alternating current is too fierce. 2.Patient is nervous and the disturbance of EMG too strong	1.Change a comfortable environment for patient 2.If the sickbed is metal, please change it 3.The power line and lead is not parallel or too close.
Wave form is not regular, with too great wave or beeline	1.The conductivity of electrode is not well. 2.Power of battery is used up 3.Contact between electrode and skin is not proper. 4.The plug between lead and main unit is not tight. 5.The contact between lead and electrode is not proper.	1.Use alcohol of high quality. ① Clean the electrode and patient's skin where touch the electrode. ② Charge the battery
Baseline drift	1.Power of battery is used up 2.Patient is moving	1.Charge the battery 2.Keep patient hold still
Waveform is not clear.	1.The printer head is dirty 2.The paper is not right	1.Clean the printer head with alcohol when the power is off, use the printer head after the alcohol is volatiled. 2.Use the appointed thermal print paper.

14 Maintenance and Storage

Maintenance

14.1 Customer is not permitted to open the instrument, in archive of any electronic shock.Any maintenance or update should execute by the trained and authorised professionals from our company.The maintenance should be done with the original accessories from our company..

14.2 Please pull out the power supply plug when power off. If the device is out of use for a long time, please put the device in a shady cool dry place, and the device should be charged once every three months.

14.3 Under the condition of normal use according to the user manual and operation notice, if this instrument has any problem, please contact with our customer service department. Our company has the sales record and customer archives for each instrument. The customer has two year's warranty service from the beginning of shipping date according to the below time and condition. To supply all-around and fast maintenance service to our customers, please mail the maintenance card to us in time.

14.4 Our company may adopt the ways of instruction, mailing to company by courier, visiting customers' company, etc to carry out the maintenance promise.

14.5 Even in the period of free maintenance, we charge for reparation in the following archives:

14.5.1 Faults or damnification caused by misuse because not operate according to user manual and operation notice.

14.5.2 Faults or damnification caused by dropping accidently when users move after purchasing.

14.5.3 Faults or damnification caused by preparation, reconstruction, decomposition, etc outside of our company.

14.5.4 Faults or damnification caused by natural disasters such as fire, flood, earthquake, etc.

14.5.5 Faults or damnification caused by unapt thermal recording paper.

14.6 The free maintenance period for spare parts and fray parts is half a year.Power cable, recording paper, operation manual and packing material are excluded.

14.7 Our company is not responsible for the faults of other connecting instruments cause by the faults of this device directly or indirectly.

14.8 The free maintenance service will be canceled if we find the protection label has been destroyed.

Storage

- The temperature of preservation should be -10℃～+55℃，the relative humidity should less than 95%, The room for preservation should be ventilative and without causticity gas.

firstMED

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Read the instructions carefully
before using this device.

CE 0123

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