

Chapter 3 Preparation before Recording

3.1 Location Selection

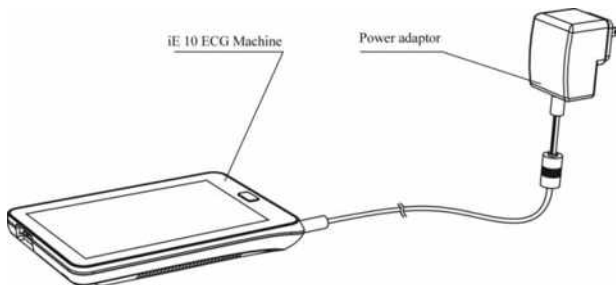
iE 10 is not limited to be used in hospitals or clinics. It is also applicable for use outdoors in group examination.

The following aspects should be considered when selecting the location to install this ECG machine to recording the electrocardiogram accurately.

- Keep the ECG machine and the bed away from the high voltage cable. The substantial radiation source around may interfere this ECG machine.
- Keep this ECG machine away from X-ray device, ultrasound device, radio machines and fluorescence light. They are probably the substantial radiation sources.
- Please use this ECG machine with the ambient temperature of 0°C~40°C.
- Please use this ECG machine with the ambient humidity of $\leq 95\%$ (No condensation).

3.2 Recharging the Battery

iE 10 is equipped with build-in rechargeable battery. It recommends charging the battery to full capacity prior to the first use.








◆ **Charging**

- Please turn off the ECG machine before charging.
- The charging indicator turns on green when the battery is fully charged.
- Recharge the battery every three months (discharge the battery until the ECG machine turns off automatically, and then fully charge the battery).

◆ **Capacity Indication**

When iE 10 is powered by battery, there will be a symbol of battery capacity indication displayed on the touch screen.

The following symbols indicate the battery operating time left:

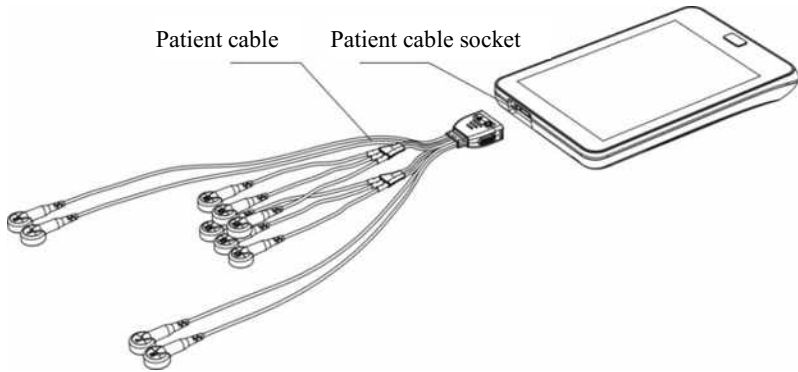
Symbols	Operating time left
	4 hours or more
	2 hours or more
	1 hours or more
	10 minutes or more
	Run out battery, recharge the battery immediately.

 **CAUTION**

Do not charge the battery when recording. It may cause noise.

3.3 Connecting a Patient Cable


Connect the patient cable into the ECG machine. The patient cable is composed of acquisition module and lead wires.

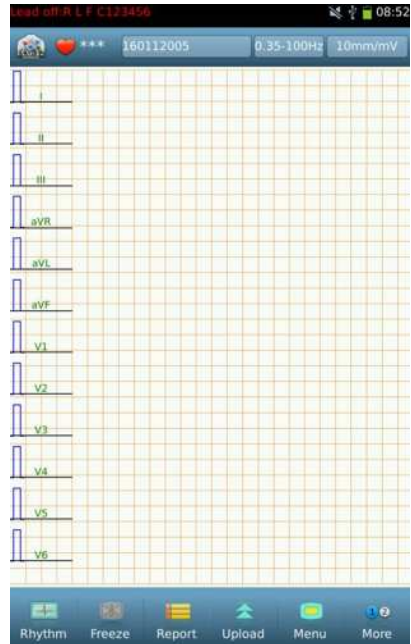


 **CAUTION**

Do not use any other type of patient cable except the supplied one. The patient cable socket is exclusively used for connecting the patient cable and do not use it for other purposes.

3.4 Power On/Off

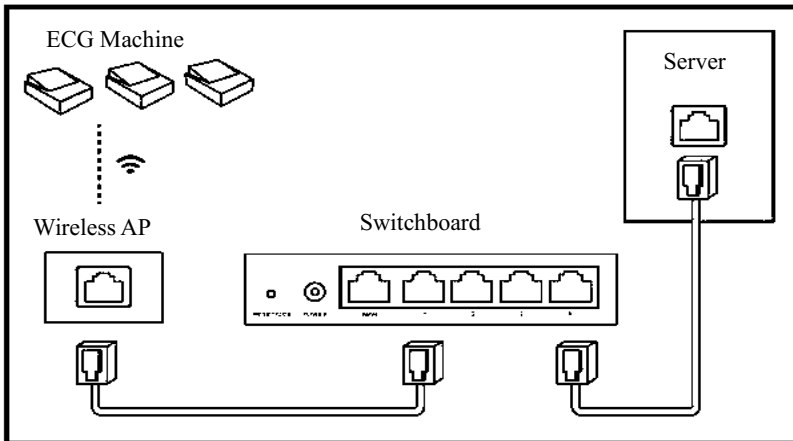
Press and hold  for 4 seconds to power on/off the ECG machine. The ECG machine enters into the Home screen after a few seconds. Home screen display as shown below.



3.5 Connecting to Network

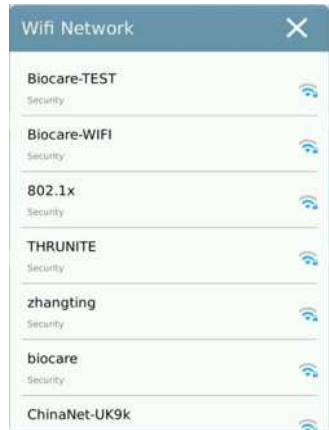
Set TCP, FTP or HL7 according to the protocol of the server and set the IP address and port number in the menu **[Server Setting]** as the IP address and port number of the server.

There are two ways of network connections: WiFi and 3G. You can select according to actual situation. After the ECG machine is connected to the ECG workstation, you can upload and download ECG data.



1) **WiFi setting**

1. On the Home screen, select **[Menu]** > **[System Setting]** > **[Wifi Network]**.
2. Swipe to switch on **Wifi Network**.
3. Tap **[Wifi network]**. The ECG machine will list the Wifi signals in range.



Wifi network menu contains the following information:

- ◆ Network name
- ◆ Security
- ◆ Signal strength
- ◆ Password

Tap the desired network, the ECG machine will connect to network. If there is a pop-up menu ask



for password, input the correct password and tap **[Connect]**. If no password is needed, the ECG machine will connect to network automatically.

2) **4G network setting**

On the Home screen, select [**Menu**] > [**System Setting**] > [**4G Network**].

- 1) Swipe to switch on **4G Network**.
- 2) Tap [**4G Network**]. The ECG machine will pop-up the 4G setting menu.

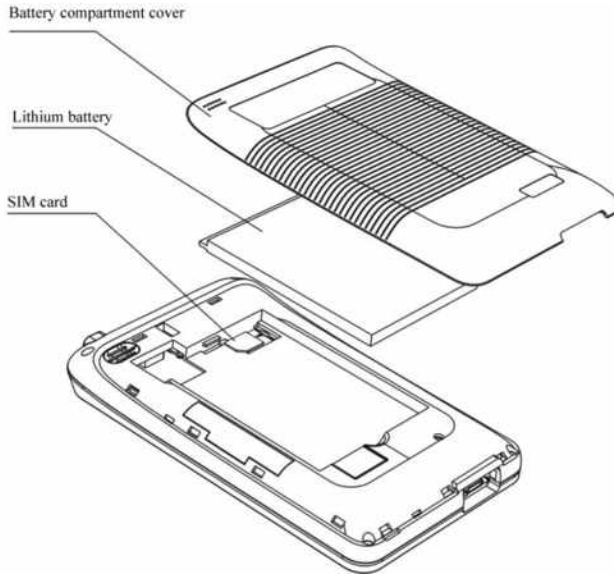
4G setting menu contains the following information:

- ◆ 4G network
- ◆ Server
- ◆ Network operator
- ◆ My phone number

Tap [**Server**] to enter the setting menu. Input the correct “Server IP” and “Port” to connect to 4G network.

3) **Insert SIM card**

Before connecting to 4G network, you should install SIM card into the ECG machine first. SIM card slot is located beneath the battery.



1. Power off the ECG machine.
2. Open the battery compartment.
3. Unplug the buckle connected the battery and main board, and then remove the battery.
4. Insert the SIM card into the slot until a “click” sound. (with direction that marked above the slot).

The SIM card is installed properly.

3.6 HL7 Configuration

 **CAUTION**

HL7 function should be rightly configured before use. The ECG machine should be able to communicate with HIS via HL7 interface protocol. Follow the two methods below to configure HL7 function.

1. Adjust HIS's HL7 interface and make sure HIS can communicate with the ECG machine via HL7 interface.
 2. The hospital provides its HL7 interface to the company; the company adjusts the HL7 interface of the ECG machine and make sure the ECG machine can communicate with HIS via HL7 interface.
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To configure HL7 network connection:

Set the transfer protocol in the menu **[System Setting]** as HL7 and set the IP address and port number in the menu **[Server Setting]** as the IP address and port number of the HL7 transit server (please refer to Anysafe HL7Pro Server Installation&Deployment Guide for the method of HL7 transit server's installation and deployment.). And finally refer to ***Connecting to Network*** to connect the ECG machine with the Internet.

3.7 Applying the Electrodes

The connection of electrodes is critical for the accuracy of electrocardiogram recording. So, please make sure the electrodes connections are properly. Do not mix the new electrodes, old electrodes, reusable electrodes and disposable electrodes in use. If mixed, the recorded ECGs may be affected to a large extent.

Electrodes connection onto limbs

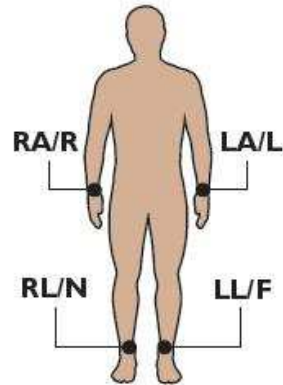
The electrodes for limb should be connected onto the soft skin of the limbs. Clean the skin for electrodes connection with the medical alcohol first, then coat it with a little electrodes cream. The electrodes for limbs should be connected as follows (see the following picture):

R (RA): Inside right arm between wrist and elbow;

L (LA): Inside left arm between wrist and elbow;

N (RL): Inside right calf between knee and ankle;

F (LL): Inside left calf between knee and ankle.



Electrodes connection onto chest

Clean the skin of chest for electrodes connection with

the medical alcohol. Coat the electrode cream on these sites in a diameter of about 25 mm as well as the edge of adhesive plates of the electrodes. Compress the suction bulb of the chest electrodes to make the chest electrodes adhere to the V1~V6 sites. The chest electrodes should be connected as following picture:

C1 (V1): 4th intercostal space at the right margin of the sternum.

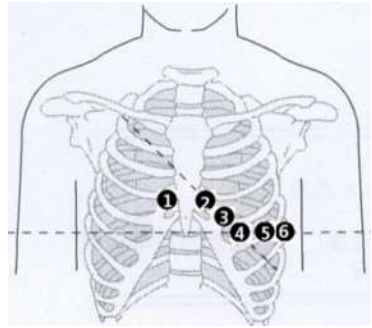
C2 (V2): 4th intercostal space at the left margin of the sternum.

C3 (V3): Midway between C2 and C4.

C4 (V4): 5th intercostal space at the left mid-clavicular line.

C5 (V5): At the same horizontal level of C4, at the left anterior axillary line.

C6 (V6): At the same horizontal level of C4, at the left mid-axillary line.



 **CAUTION**

- Make sure the disposable electrodes are in the period of validity.
- Use the disposable electrodes as soon as possible after opening the package (generally within 7 days).
- Do not reuse disposable electrodes.
- Electrodes or conducting point of patient cable shall not be in contacting with any other metal part or conductive objects.
- Avoid the electrodes to be dragged by the lead wires.
- Electrodes shall be properly stored. When electrodes have been used for a certain period, they may become corroded and oxidized at the surface. Whenever this happens, the electrodes must be replaced.
- Do not mix electrodes of different types and manufacturers in use. Replace electrodes all together.

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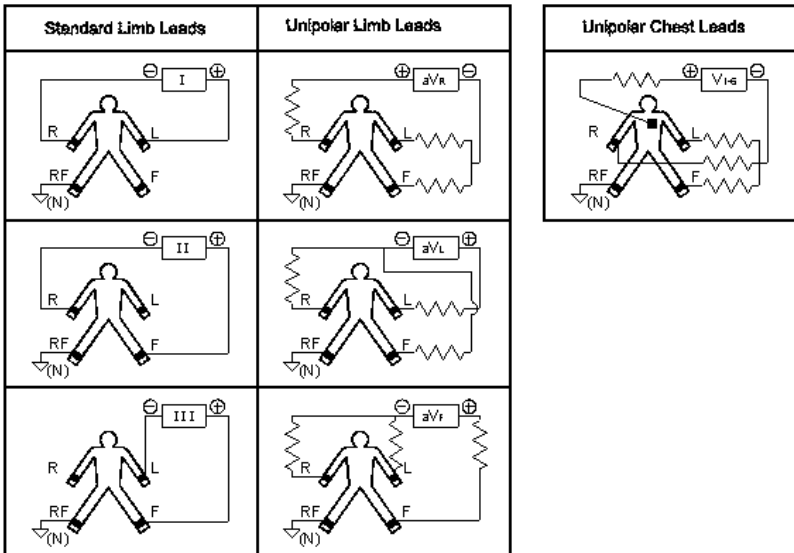
- Please use our company's or authorized electrodes to make sure clear ECG
 - Make sure adjacent electrodes and ECG gel, especially chest ones, are not contacted with each other.
 - If the examination involves a short period of time, if ECG gel is unavailable, please wipe the skin with medical alcohol to keep the skin clean and moist, and then attach the electrodes quickly.
 - It is not allowed to use saline water as substitute to ECG gel. The saline water will cause corrosion on the electrodes.
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Comparison table between the line color and the corresponding electrodes

Electrodes	European standards		American Standard	
	Symbol for electrode	Color code for electrode	Symbol for electrode	Color code for electrode
Limb electrodes	R	Red	RA	White
	L	Yellow	LA	Black
	N	Black	RL	Green
	F	Green	LL	Red

Electrodes	European standards		American Standard	
	Symbol for electrode	Color code for electrode	Symbol for electrode	Color code for electrode
Chest electrodes	C1	White / Red	V1	Brown / Red
	C2	White / Yellow	V2	Brown / Yellow
	C3	White / Green	V3	Brown / Green
	C4	White / Brown	V4	Brown / Blue
	C5	White /Black	V5	Brown / Orange
	C6	White / Purple	V6	Brown / Purple

Lead modes and system diagram



3.8 Indication for Leads Off

This ECG machine will check the lead connection all along. When lead off is detected, the relevant patient cable code will displays at the upper right conner of the Home screen. The interface display as shown below:



When the leads are off, the waveforms display as a straight line. Connect the relevant electrodes or electrode leads according to the indication.

 **CAUTION**

- When the patient cable connects unreliably with the patient or the ECG machine, and the ECG signal cannot be transferred, the screen displays “Lead off: *”, and “*” refer to the lead that disconnected.
 - When the screen displays lead off alarm is displayed to warn the interface, you should double-check the reliability of the connection between the corresponding electrode and the patient; the connection between the corresponding electrodes and the patient cable or ECG machine. When the above connections are secured, the state of alert is released.
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