

ECG Viewer Manager

User Manual

Introductions to User

Dear Users,

Thank you very much for purchasing our Easy ECG Monitor series products. This manual is intended to assist the user in uploading ECG Data from Easy ECG Monitor to computer in a safe and effective manner. Please read this manual carefully before running the system, and follow it to operate.

The Manual is published in English and we have the ultimate right to explain the Manual. No part of this manual may be photocopied or modified without the prior written consent. We reserve the right to improve and amend it at any time without prior notice.

ECG Viewer Manager is application software running on a personal computer with Microsoft Windows operating system, so the user should be acquainted with some knowledge to operate computer.

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ECG Viewer Manager Software version: V5.4.0.0 or higher

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The version of this user manual is applicable to the computer software “ECG Viewer Manager” with version V5.1.0.1 or higher which can be used to connect the “Easy ECG Monitor” device with version V4.0 or higher (for model PC-80B/Prince-180B), or version V1.2 or higher (for model PC-80D/Prince-180D).

Information for Operation

- Please make sure the well connection of the data cable between computer and Easy ECG Monitor before uploading data, do not pull out the data cable arbitrarily during the data upload.
 - Data transmission may be interrupted during uploading the data in case of low battery voltage for Easy ECG monitor.
 - Do not do the key operation on Easy ECG Monitor during the data upload.
 - While installing printer driver on computer, please quit “ECG Viewer Manager” software firstly if it's running.
-

Notes:

- 1. Connect/Disconnect the data cable to Easy ECG Monitor gently and carefully, do not bring or shake the data cable plug with force to insert into or unplug from data interface port.
- 2. Before updating the software “ECG Viewer Manager”, please uninstall the previous version if there is and manually delete all the files in the default installation folder (“C: \ECG Viewer Manager\”) or your customized installation folder.

For example: “ECG Viewer Manager” is installed under the file folder of “C:\ECG Viewer Manager”. At first, uninstall the “ECG Viewer Manager” software from “Control Panel → Add/Uninstall Programs”, and then manually delete the all files under the directory “C:\ECG Viewer Manager”. Next, install the new version of “ECG Viewer Manager”.

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1 Overview

1.1 Features

The waveforms and data saved in Easy ECG Monitor which have been uploaded to computer through ECG data cable can be archived and reviewed by ECG Viewer Manager. It is convenient for user to browse the stored data records, review the ECG waveforms and back up the uploaded data.

1.2 Operating Condition

Computer Hardware Requirement:

Computer with Intel Pentium III CPU, 800MHz speed or higher; 256MB or higher memory; CD-ROM drive; at least 1GB space available in the hard disk to install “ECG Viewer Manager” software.

Requirement for Operating System:

Microsoft Windows XP, Windows 2000, Windows Vista, Windows 7 and Windows 10.

1.3 Procedure of Data Uploading

1. Install “ECG Viewer Manager” software and “USB Driver”.
2. Set the resolution of screen display as “1280×768” pixel or higher.
3. Connecting the Easy ECG monitor to computer with the data cable provided. (As shown in the figure 2-8);
4. Double-click the icon “” on desktop to start running “ECG Viewer Manager” Software and click “” (button for user info) on the main menu screen to add a new user.
5. Click “” (button for data import) on the main menu screen to preview the ECG records to be uploaded, select the record needed to upload, click the “” button to load the data into computer. After that the user can do further review and analysis on those records dumped into computer.

Notes: The software “ECG Viewer Manager” described in this manual supports wireless transmission function. More information about the operation refers to the following sections in detail.

2 Installation, Connection and Settings

2.1 Installation of ECG Viewer Manager

Insert the CD-ROM which contains the installation software into CD-ROM drive, the software installation will be automatically running or directly running the program "setup.exe" in the root directory of CD-ROM drive, then the window of "ECG Viewer Manager Setup" will be prompted on the screen as shown in Figure 2-1A.

Note: This ECG Viewer Manager is applicable to the device "Easy ECG Monitor" with model of PC-80B, Prince 180B with hardware version is V4.0 or higher, and PC-80D, Prince 180D with hardware version is V1.2 or higher.

(Checking the hardware version of the device: power on the device and enter into main menu→" Setting"→"Version")

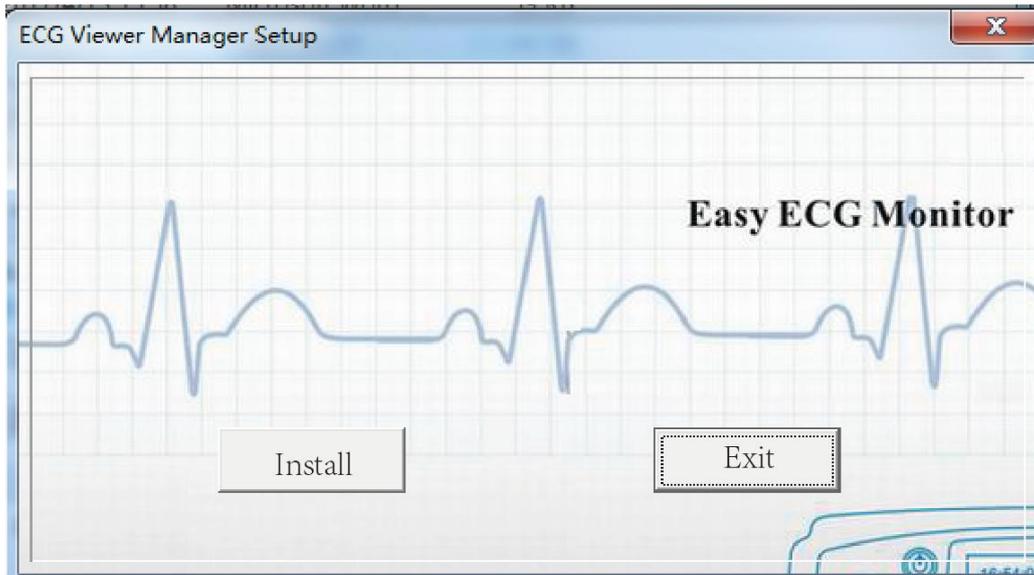


Figure 2-1A ECG Viewer Manager Setup Screen

On "ECG Viewer Manager Setup" screen, unlike the previous version, it's unnecessary to select the display language because the installing program will use the language same as the current operating system language to complete the installation (Note: Only three languages English, Simplified Chinese and Traditional Chinese are supported currently). The initializing screen is as shown in figure 2.1B.



Figure 2-1B ECG Viewer Manager Setup Screen

According to the prompts of installation of ECG Viewer Manager to operation, as shown in figure 2-2—figure 2-6;

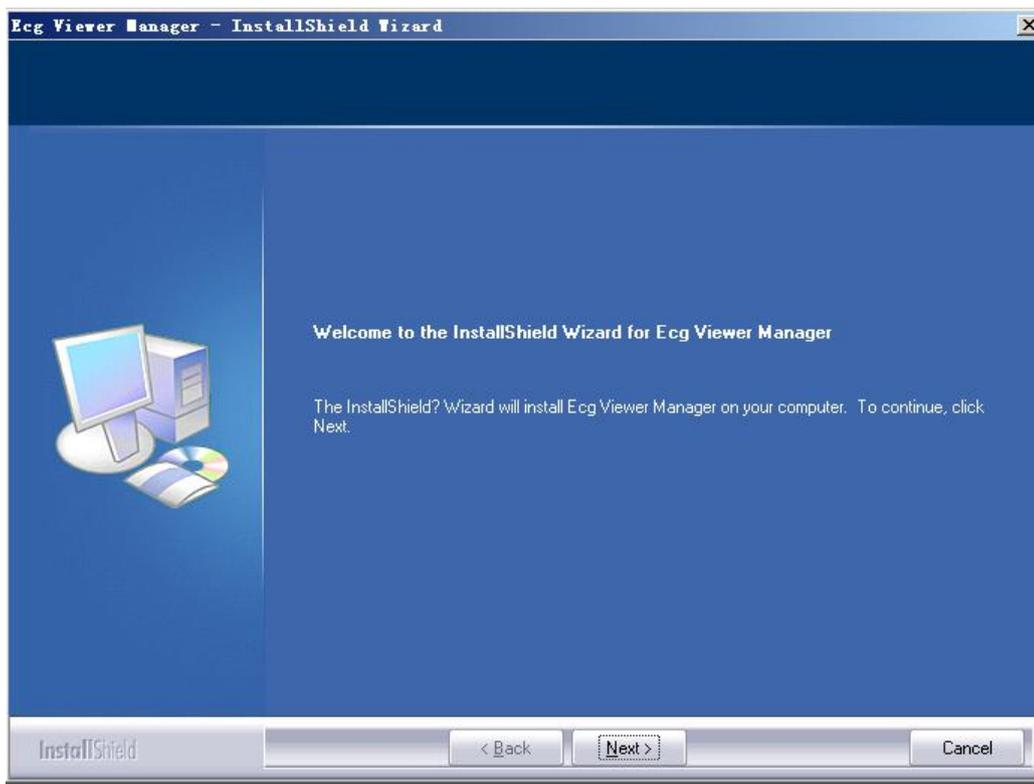


Figure 2-2

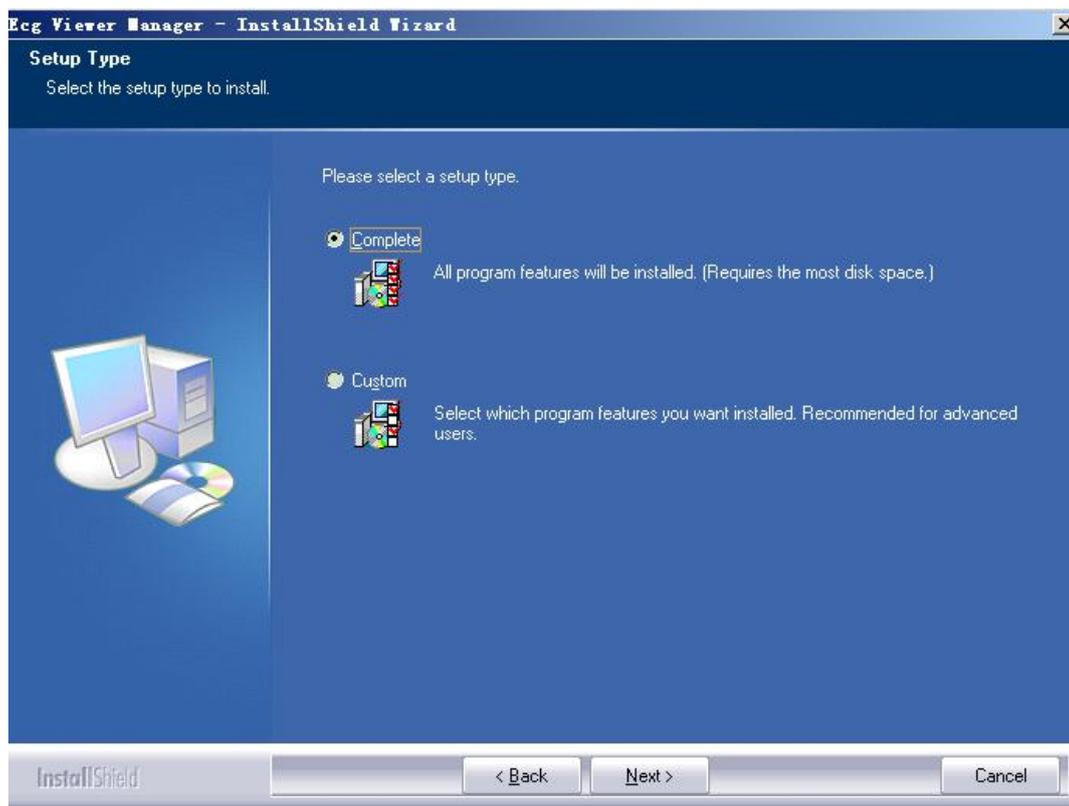


Figure 2-3

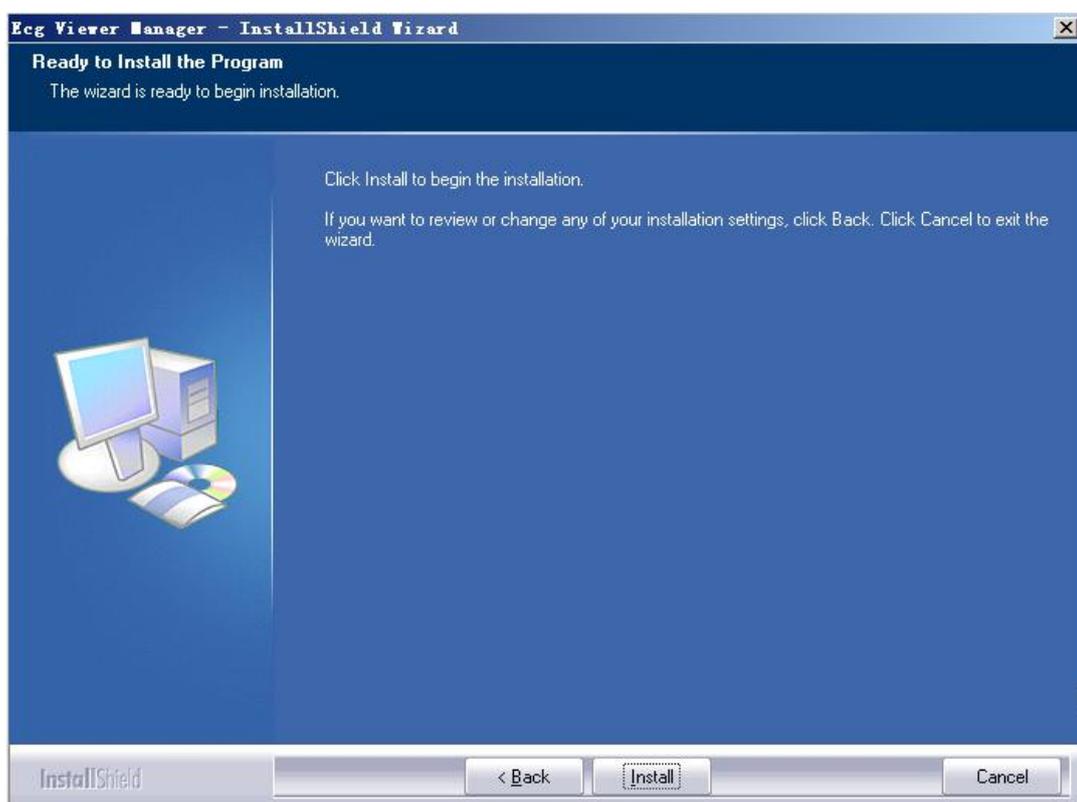


Figure 2-4

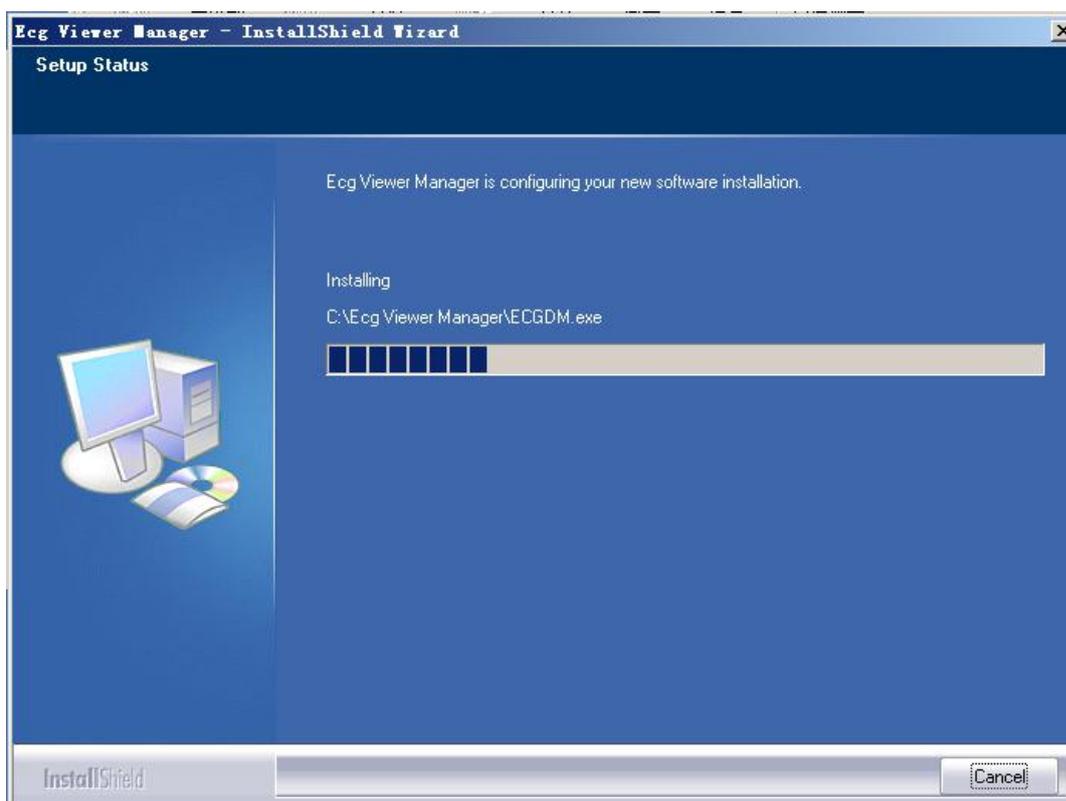


Figure 2-5

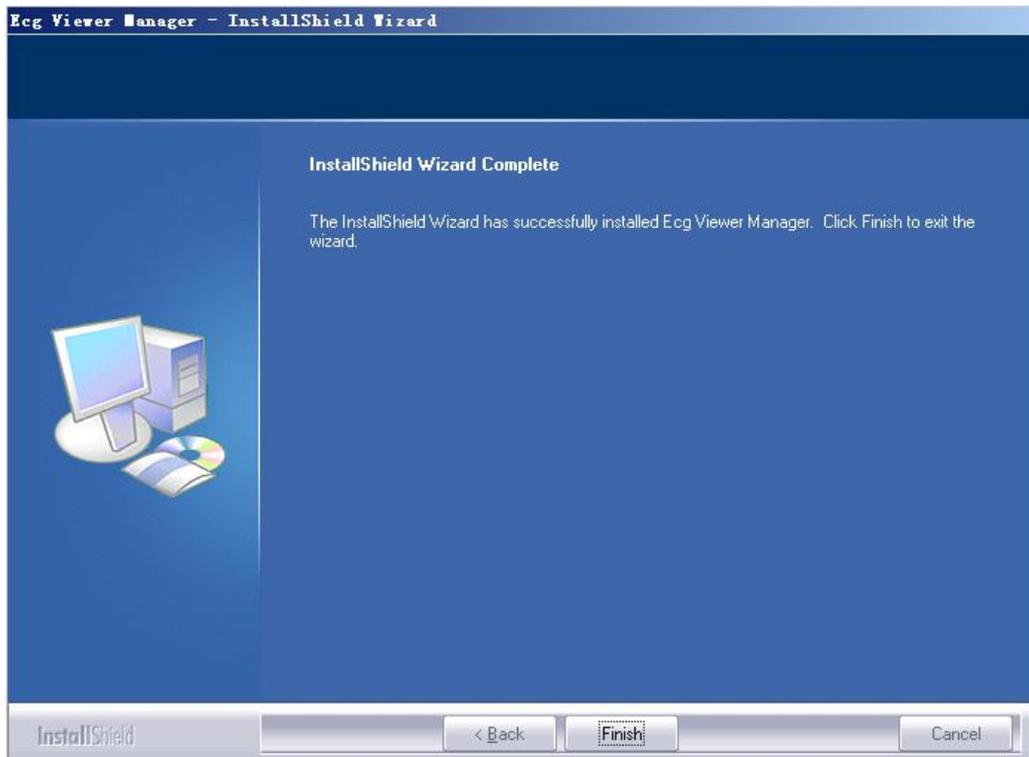


Figure 2-6

Note: If “Complete” (default) installation is selected, the installed program files will be located in the disk path “C: \ECG Viewer Manager”. If user doesn’t want to use default installation, please select "Custom" and click "Next" to choose the root directory for locating the program files as shown in Figure 2-3.

2.2 Display Setting for Computer

1. Setting Display Properties

On desktop screen of Windows operating system, click the right button of the mouse, it will bring up a quick menu, then move the cursor to select "Properties". Choose "Settings" on the "Display Properties" window, then set the "Screen resolution" option as "1280 by 768 pixels", and set the "Color quality" option as 16bit or higher, as shown in Figure 2-7.

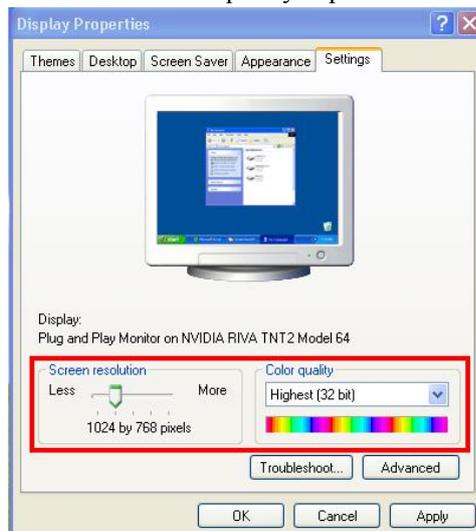


Figure 2-7 Display Properties Setup

2.3 Device Connection

After “ECG Viewer Manager” software is installed, refer to Figure 2-11 to perform cable connection:

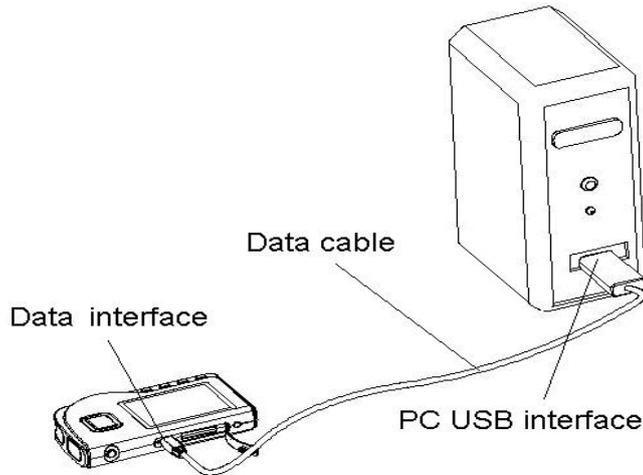


Figure 2-8A Connection with PC-80B/Prince-180B

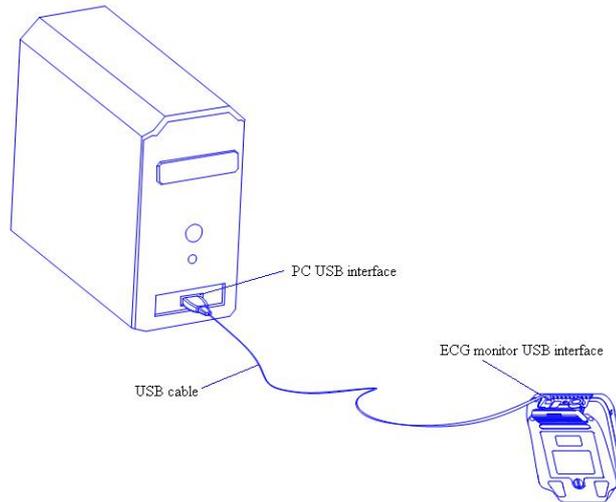


Figure 2-8B Connection with PC-80D/Prince-180D

Note: connect the device at first time, the system prompts that “Found New Hardware Your new hardware is installed and ready to use.” on the right side of task bar, as shown in Figure 2-12, it means that USB Driver is installed successfully.



Figure 2-9

2.4 Easy ECG Monitor Setting

Please power on the Easy ECG Monitor before uploading data.

3 Operations

3.1 Main Menu

Double-click the icon “” of “ECG Viewer Manager” on the desktop with the Mouse, then ECG Viewer Manager will run automatically and the main menu screen pops up on the desktop, as shown in Figure 3-1.

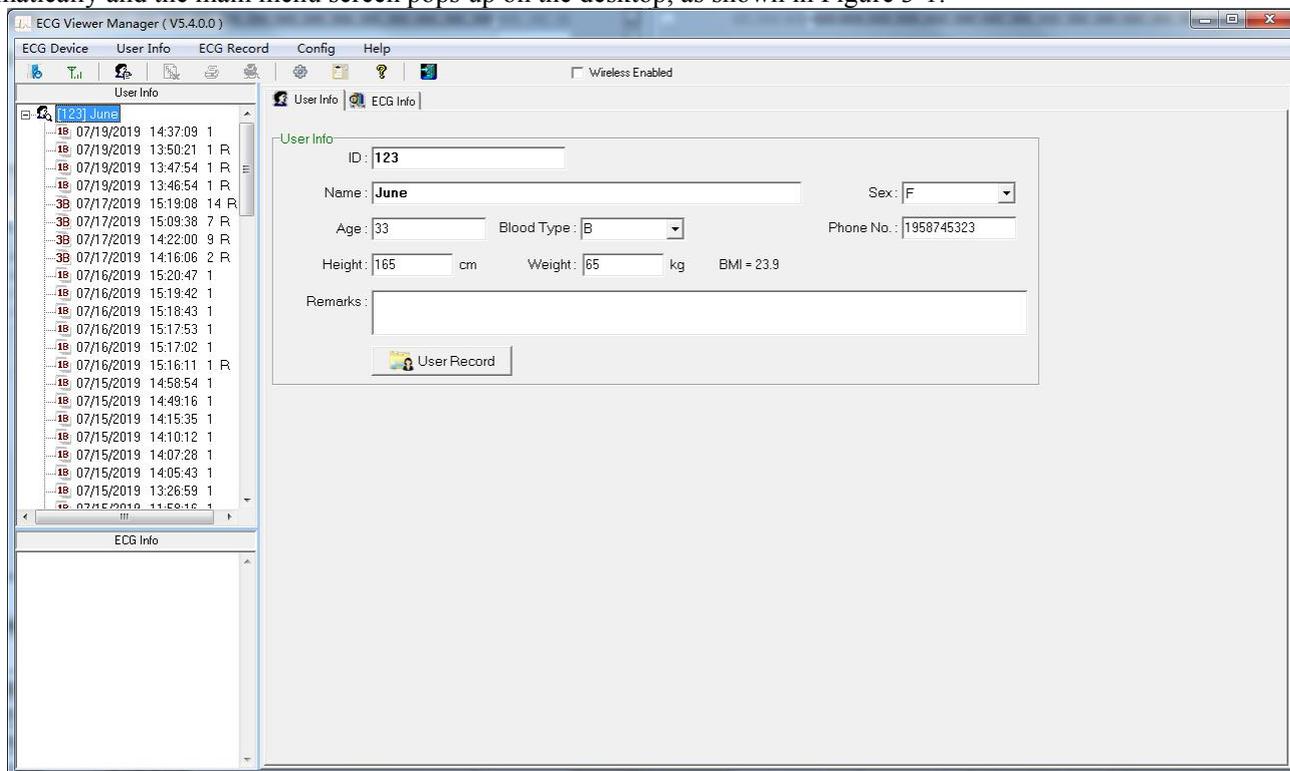


Figure 3-1 Main Menu Screen

Description of menu bar:



◆ Menu items

Menu name	Pull-down menu	Function description
ECG Device	Import device data	Directly upload the data to computer from the device through provided USB data cable.
	Wireless data	Upload or transmit the data to computer by wireless.
	Exit	Exit the manager system
User info	User record	Create a new user archive, delete or modify user archive
ECG record	Delete ECG info	For deleting the ECG records
	Print	Print the ECG records, statistical result and irregular rhythm event plot.
	Print all ECG	Print all ECG waveforms
Config.	System configuration	Set the system date format and language
	Event setup	Set the condition for triggering PE and SE

Help	Online update	Update the software to the latest version
	User Manual	Click it to read the User Manual for this ECG Viewer Manager
	About system	Display the ECG Viewer Manager version, the disk space information and so on.

❖ **Menu operations:**

Select the functional buttons from the pull-down menu to enter the corresponding operation screen.

Description of tool bar:



❖ The Tool bar contains shortcuts for menu selection, the user can operate from the menu bar or shortcut keys for quick operation. Click “Exit” to exit the manager system.

3.2 User Archive Management

On user archive management screen, the operations: adding new user ID, modifying, finding and deleting archive can be performed. On the left of screen is the list of user name.

3.2.1 Create New User

Click the submenu “User record” in the pull-down menu of the "User info" button, or click the Tool bar icon “”, and then the window appears on the desktop, as shown in the figure 3-2.

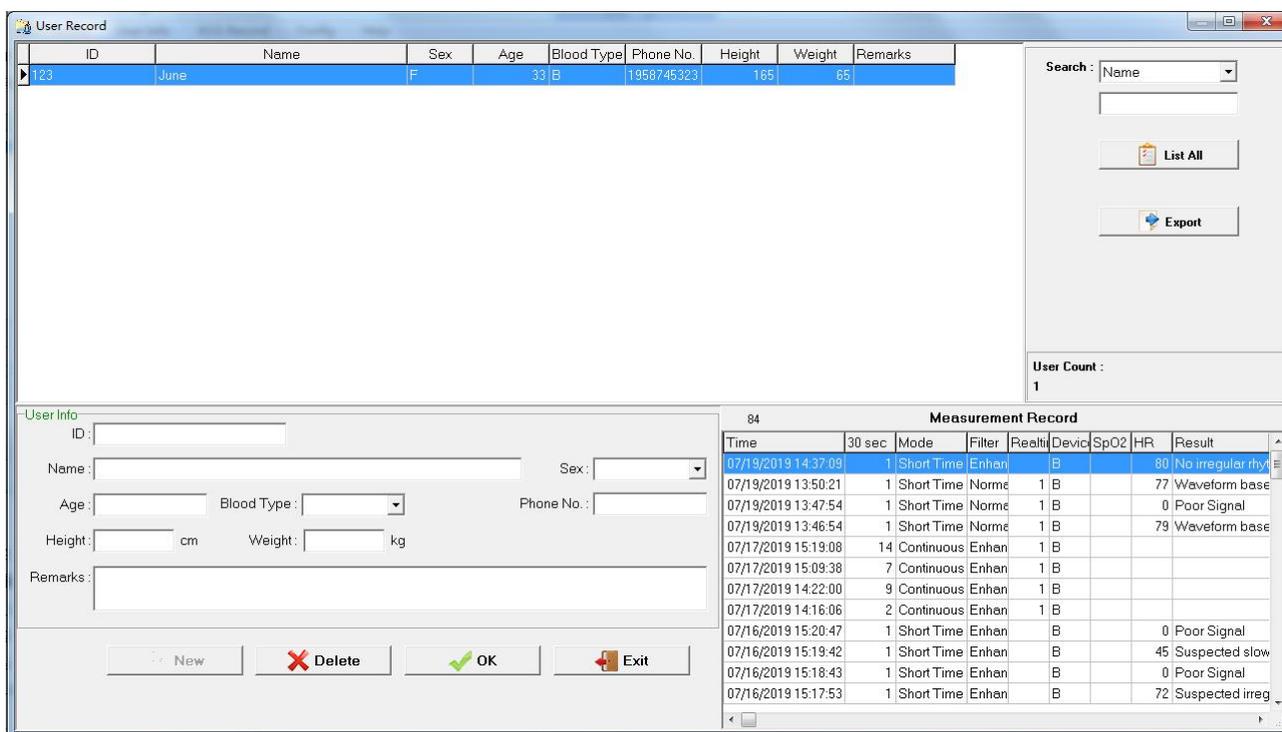


Figure 3-2 Create a new user

Screen Description:

❖ **Name:** User name; display or enter user name; length of name is less than 30 bytes or 15 characters.

❖ **ID:** Identification number; display or enter ID number; length of ID is less than 30 bytes.

❖ **Sex:** Choose Male/Female in submenu “▼”

- ✧ **Age:** display or enter user’s age. Please enter Arabic numerals.
- ✧ **Blood type:** Display or enter user’s blood type in the submenu “▼”, you can also enter manually.
- ✧ **Telephone:** Display or enter User’s telephone number.
- ✧ **Height:** User’s height; display or enter user’s height. Please enter Arabic numerals.
- ✧ **Weight:** User’s weight; display or enter user’s weight. Please enter Arabic numerals.
- ✧ **Remark:** Display or enter the contents of the note; the length of the contents is less than 160 bytes or 80 characters.

Functional button:

- ✧ **New:** create new patient account; if user needs to add a new account, please click this button and then fill the blank line with the patient’s detailed data in blank.
- ✧ **Delete:** delete the selected file in archive list.
- ✧ **OK:** confirm and save the new file or modification about patient’s information.
- ✧ **Exit:** Exit from Patient Record screen.

Notes:

- ① Patient ID and Name can not be modified for the existed patient account.
- ② If the selected patient account is deleted, all data records bond to it will be deleted and can not be recovered.
- ③ Enter into the patient’s weight and height, and click “OK” button, then the corresponding BMI will be displayed on the patient account.

3.2.2 Modify the User Info

After enter the information of the selected user, click the “OK” button. The user name list is on the upper side of window, the detail of User Info and ECG Info is on the lower side of window, as shown in figure 3-3, in this screen, you can modify the user information, finally click the “OK” buttons.

Note: ID and name cannot be modified.

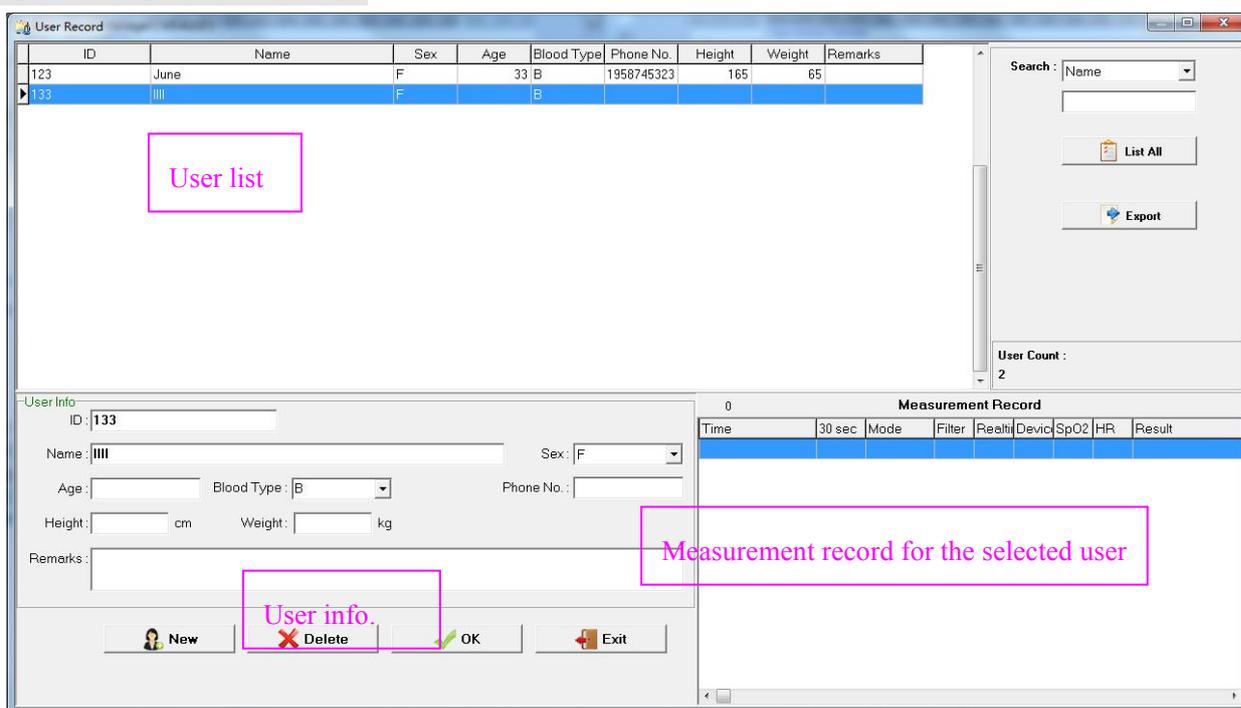


Figure 3-3 User info

3.2.3 Search User

On the upper right corner of the User Record screen, select “Name” or “ID” to search user archive, and enter the key word on the input field, then the searching result will be displayed on the left of the screen.

The user can type a character, number or word on input field to search user archive. If no key word is typed in the searching field, then all user archive will be displayed.

After entering the searching condition, if the user archive exists, then it will be displayed on the left of the screen. Otherwise, no list will be displayed.

✧ List all: click it to list all user archives.

✧ Export: click it to export the user information list to a data file, the file name will be ""xxx.csv" which can be opened by software "Excel".

3.3 Device Management

3.3.1 Read Device Data

Ensure correct connection between the device and computer via USB data cable, select the ECG records you want to upload from the user name list, click the submenu “Read device data” in the pull-down menu of the “ECG device” or click the Tool

bar icon “”, then a window appears on the desktop, as shown in the figure 3-4.

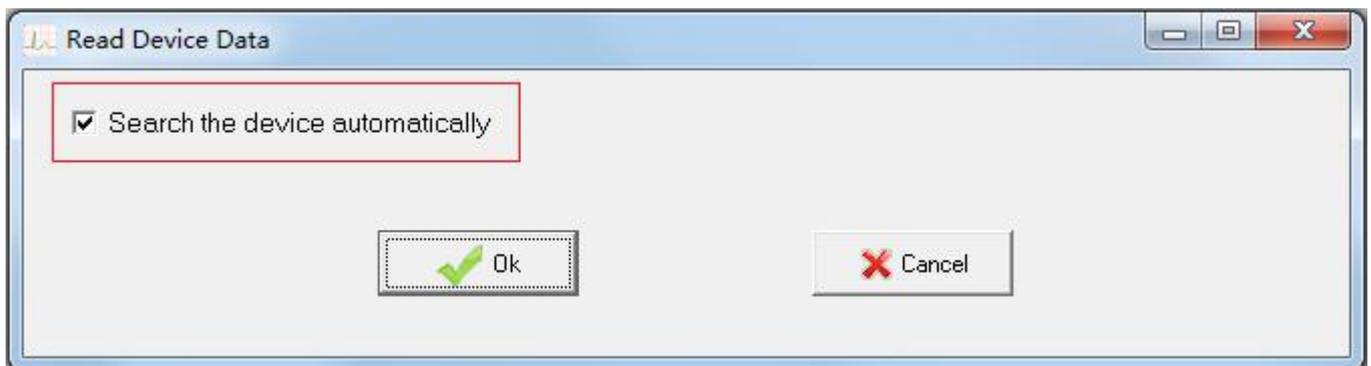


Figure 3.4

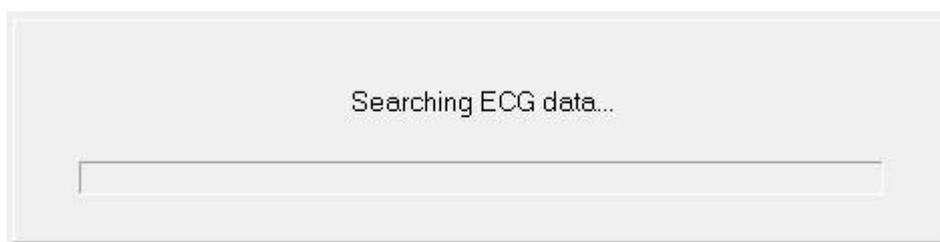


Figure 3.5

① On figure 3.4, the user can select “Search the device automatically”, then the software will search the connected device automatically, the searching screen is as shown in figure 3.7.

Notes: The scanning time of for ECG device will be different from the data storage and computer speed. Please wait for a moment! If ECG device has not been searched in 2 or 5 minutes, then the system will exit from data importing.

② The user can also read data via uploading it from device, that’s to say, unselect “Search the device automatically”, and click “OK” to find the nominated root directory. Double click this disk name, you will find there four file folders and one text file: ECG0, ECG1, ECG2, ECG3 and README.TXT”, as shown in figure 3.6. Click “README.txt” and click “OK”

button, the system will enter into searching data screen (as shown in figure 3.6), and then enter into screen as shown in figure 3.7.

The data stored in the device can be copied to computer directly. After uploading, the data memory can be cleared at device side, meanwhile, the user can use software “ECG Viewer Manager” to review and analyze the imported data records while the device isn’t connected to computer.

Note: if the connected device is PC-80B/Prince-180B, then the disk volume is “EASY ECG”, and if the connected device is PC-80D/Prince-180D, then the disk volume is “Movable disk”.

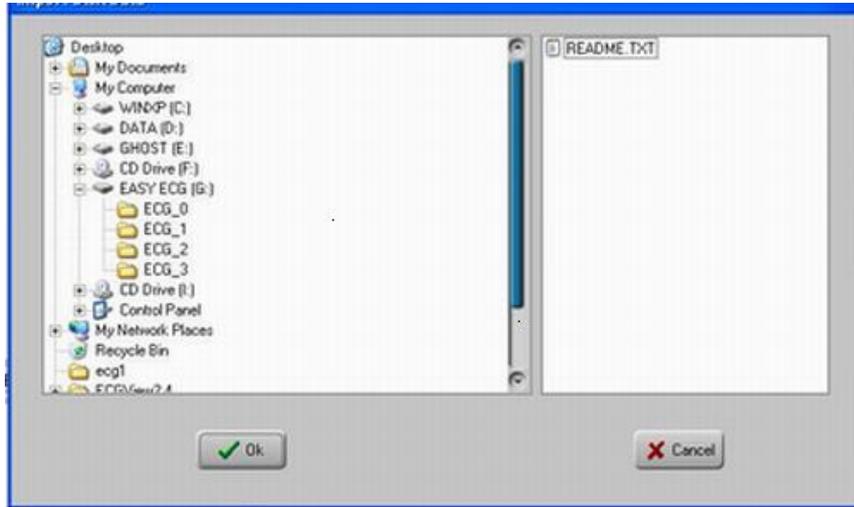
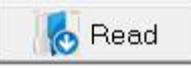


Figure 3-6 Read

On figure 3-7, select the records needed to upload, click the “ Read” button to load the data into computer. After that the user can review the records in the user name list.

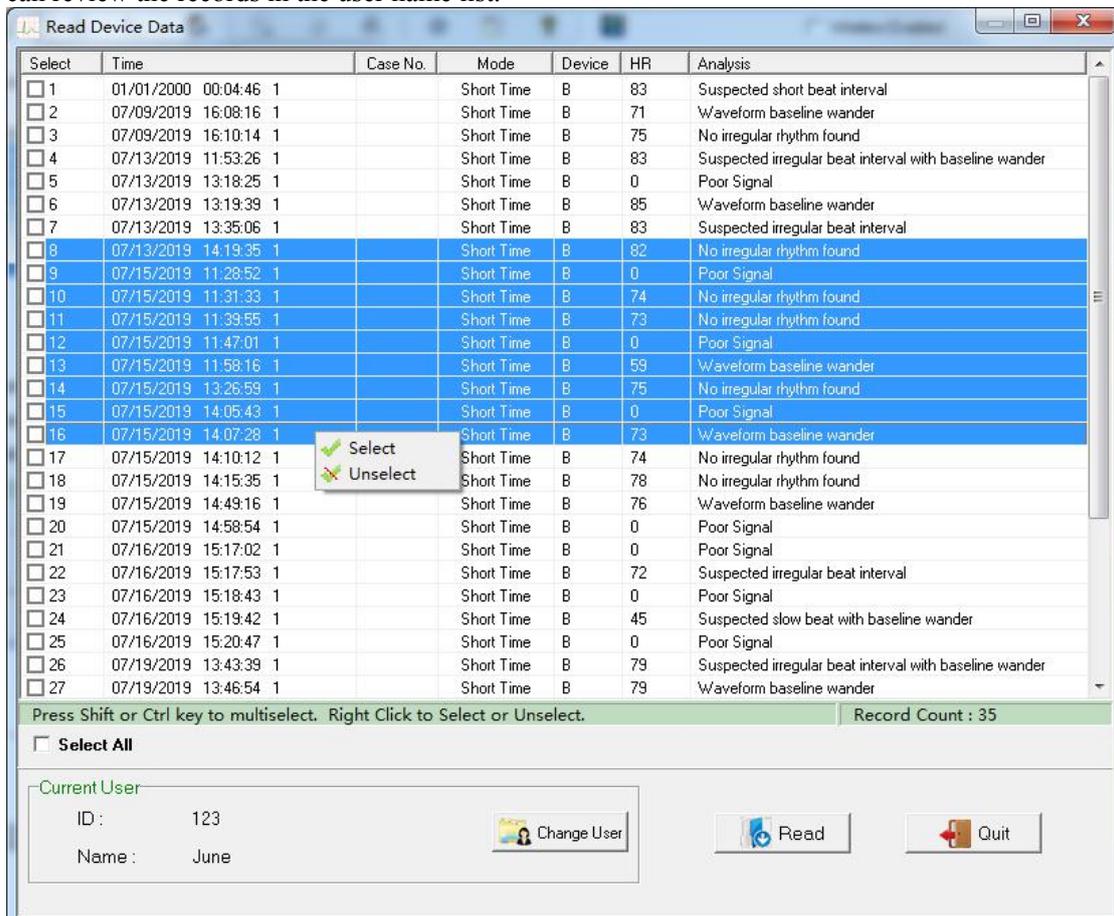


Figure 3.7 Extract the summary of data records within device



Figure 3.8 The prompt after reading data records

If you want to upload data for another user account, you can change user first and then perform data uploading as with the

following steps. Step1: click on "  "icon, an edit box pops up on the screen, as shown in figure 3.9, then you can select the user in user information list (if there is no the user you want, then you can create a new user account in figure 3.9.), click on "  " icon to close the current window. Step 2: go back to window shown in figure 3.7, select the data you

want to upload, then click on "  " icon to read data. The user can perform data uploading (step 2) firstly, and change user (step 1) later.

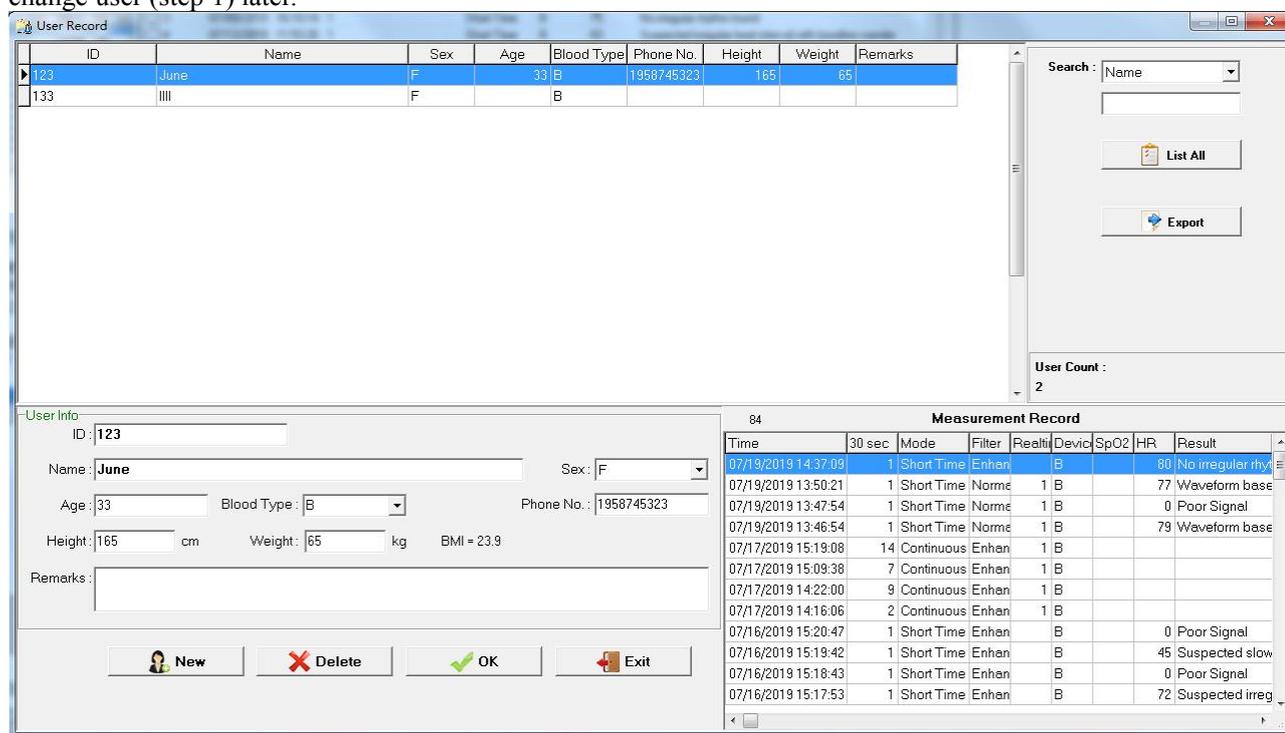


Figure 3.9 Change user

3.3.2 Wireless Reception

If real time data transmission by wireless is used, please set the "Wireless" function to "On" in the "Easy ECG Monitor", then "  " icon and message "Found New Hardware. Your new hardware is installed and ready to use" will prompt on the lower right of the computer(as shown in Figure 3-10), which indicates that the wireless device is found and being connected to the computer. The icon "  " reminds the user of a successful connection, and the gray icon "  " and "  " will change into "  " and "  " Wireless Enabled".

Note 1: If the computer is not bluetooth enabled, you need to install a bluetooth module (normally a bluetooth dongle with USB interface) to your computer and install the necessary driver before using its bluetooth data transmission function.



Figure 3-10

Note 2: When message "Allow the device connecting" and "Found new hardware" appear, no user intervention needs to be done for wireless connection, because the wireless device will be searched and matched automatically.

Note 3: if the icons " " and " " fail to turn to " " and " ", it means the ECG Viewer Manager can not perform wireless transmission, in this case, the user should re-open this software, and the software will reconnect the wireless transmission function automatically.

3.3.2.1. Real-time wireless transmission

When the device is in continuous measurement mode, after click the icon " " or " ", the screen of real-time wireless reception displays on the interface, meanwhile, it displays the real-time ECG waveform (As shown in Figure 3-11). The real-time ECG waveform will be saved in a new record every 30 seconds, and the data record will be displayed on the left lower list, if you select one piece of the record on the left lower list, you can also view the snapshot of this record on the right lower column (as shown in Figure 3-11).



Figure 3-12 Display screen during measurement (short period ECG record)



Figure 3-12 Display screen during measurement (long period ECG record)

3.3.2.2 Non-real-time wireless uploading

When the ECG monitor is under “Review” → “Measurement result” status, press the “■ OK” button, the device will display “Sending.....” Click the icon “” or “ Wireless Enabled” on PC side, the non-real-time wireless reception screen appears on the interface with a display of “user (sb) is receiving the wireless data” as shown in Figure 3-13. The appearance of Figure 3-14 means the data record has been received and saved in computer successfully. The user can review it later in the user name list.

NOTE: 1. After the device is switched off, the window “Receiving wireless data...” should be closed, or the next operation of non-real-time wireless transmission cannot be performed.

2. If the Bluetooth driver is damaged or the simplified GOHOST Bluetooth driver is being used, it may result in inoperable wireless reception.

3. Click Wireless Enabled to search the serial port of real-time ECG data.

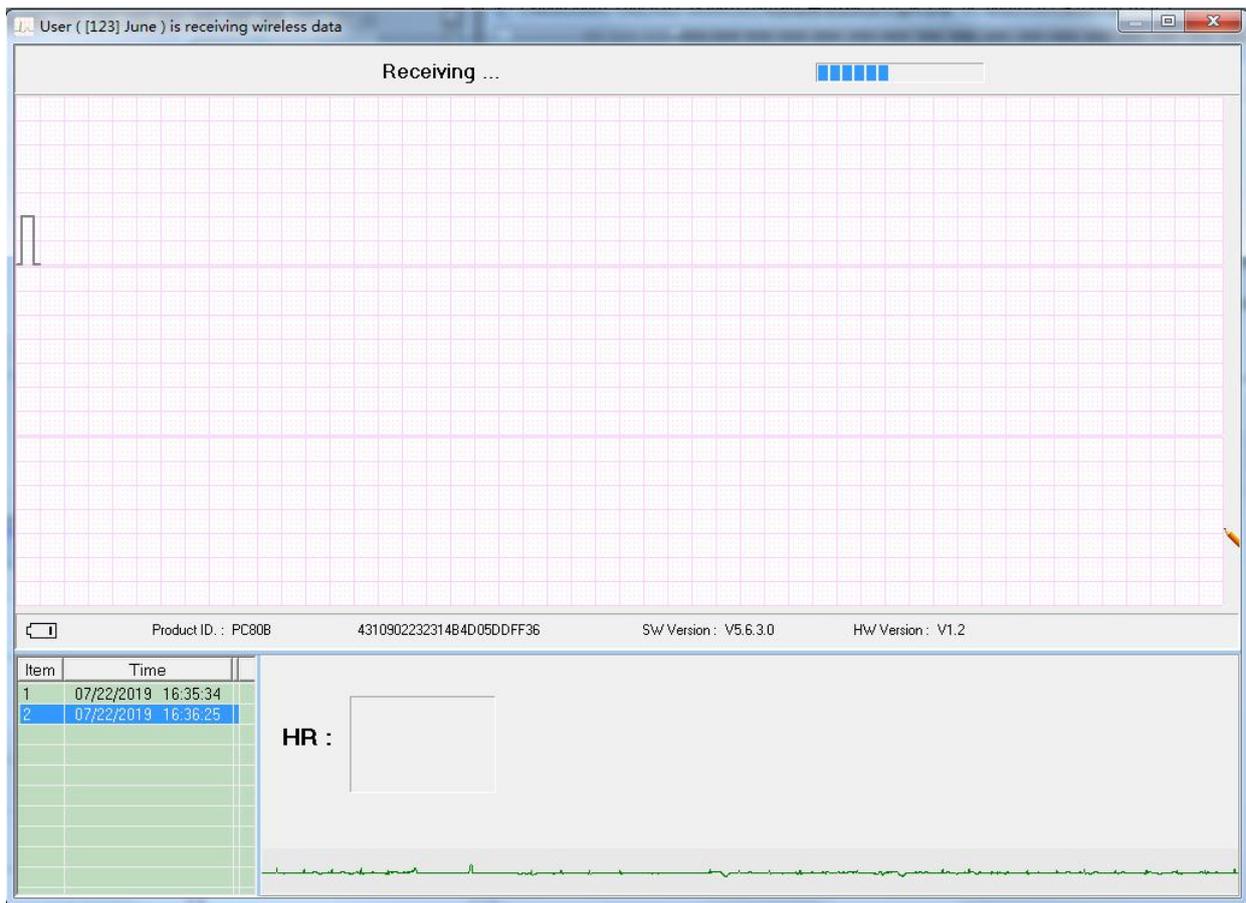


Figure 3-13 Receiving ECG records wirelessly

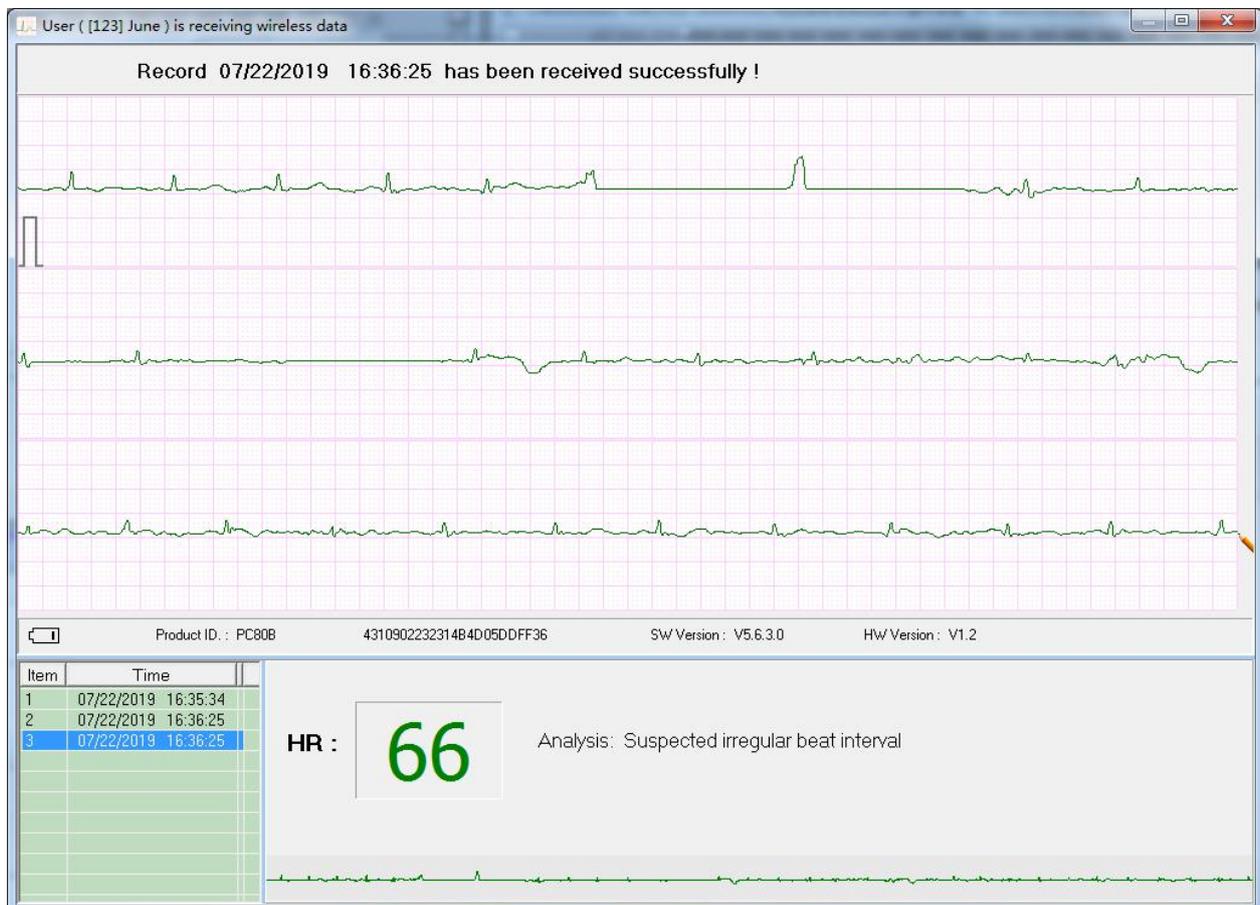
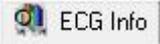


Figure 3-14 Successful received ECG records wirelessly

3.3.3 Backup, Restore and Delete the ECG Records

Select the corresponding user account in the user name list and click the “ ECG Info” icon to review the ECG record list, you can delete the selected records, backup multiple data records to a single data file and restore a given data file as shown in Figure 3-15.

- Specify the file folder to be backed up on the left side, click the “ ECG Backup” to back up the selected records to the corresponding file folder within the computer. The name of the backed file including device model, user ID, recording time, the pieces of 30-second, data type (SpO₂ data or real-time data), and lead type.

For example:  devB_123_20190717_151908_14_R.ESK

- ✧ devB: it means the records is from device PC-80B/Prince-180B;
 - ✧ 123: the user ID;
 - ✧ 20190717_151908: the recording time;
 - ✧ 14: it means the record contains ECG waveform with length of 14 * 30 seconds;
 - ✧ R: it is a real-time record;
 - ✧ ESK: it means the ECG record via single lead (built-in metal electrode) measurement;
 - ✧ EMK: it means the ECG record via limb lead (external lead wire) measurement.
- Click “ Delete” to delete the selected record(s).
 - Select data file in the backup file list, click the “ Restore ECG” to restore that data file into the current user account.
 - The user can right click the mouse to “Select”, “Unselect” or “Delete” the selected records.

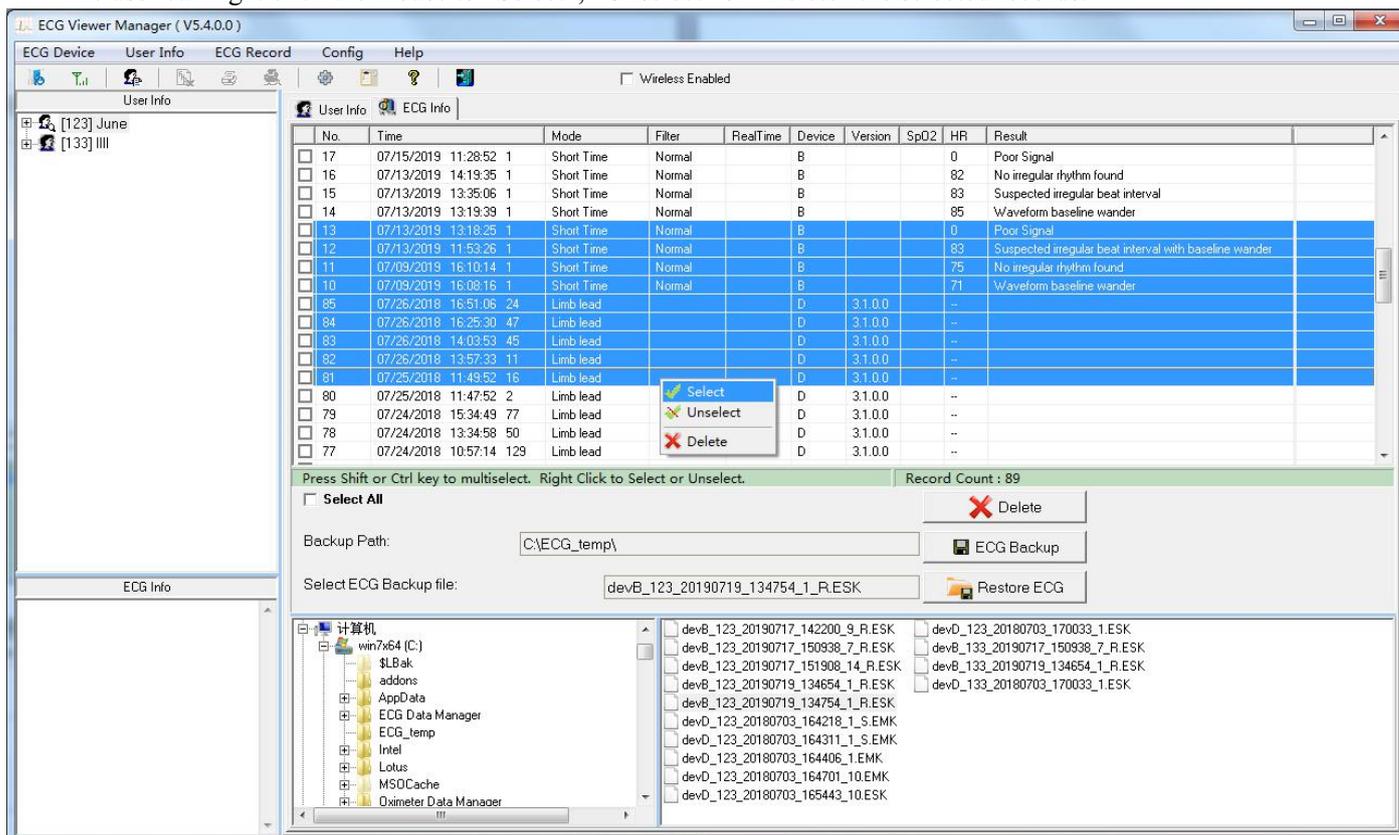


Figure 3-15 ECG data records manipulation

3.4 Review ECG Waveforms and Statistical Result, Plot Trend Graphs for Irregular Heart Beats

Select the ECG record you want to review in user name list on the left of main menu, and then you can not only review this record in detail, but also enter some remarks and store them. On the left of main menu is user name list and the detail of ECG record information. The information such as ECG waveform record, all ECG waveforms, statistical result, irregular rhythm heart beats, trend graphs for SpO₂ & PR and zoom of QRS complex etc. is displayed on the right of the main menu.

Notes:

1. In ECG record list,

- ✧ "1B" in front of each ECG record means it is a short period ECG record;
- ✧ "3B" means a long period (multiple pieces) of ECG record via continuous measurement;
- ✧ "B" means the record(s) is from device model PC-80B/Prince-180B;
- ✧ "1D" means a 30 seconds of ECG record via built-in metal electrode measurement (signal channel);
- ✧ "3D" means a long period (multiple pieces) of ECG record via built-in metal electrode measurement (signal channel);
- ✧ "4D" means ECG record via external leadwire measurement (3 channels);
- ✧ "D" means the record(s) is from device model PC-80D/Prince-180D;
- ✧ The record name with suffixing letter "S" means the record includes SpO₂ data, and suffix "R" means it's real-time record. The number suffixed to each record name means the total quantity of 30s-piece of ECG waveform that the given record contains. For example, "3B 2018/01/06 23:15:02 1194" means this record contains ECG waveform with length of 1194 * 30 seconds.

2. For the short measurement/single lead measurement ECG record and real-time ECG record, only "ECG Wave" and "All ECG Wave" can be review. While for the long period (non real-time) ECG record, "ECG Wave", "All ECG Wave", "ECG Analysis", "Irregular Rhythm Trend" and "SpO₂ and PR Trend" can be reviewed. The dash box on the waveform interlinks with the other tabs. (Only for the device with SpO₂ measuring function, like PC-80D/Prince-180D, "SpO₂ and PR Trend" can be reviewed).

3.4.1 ECG Waveform Review (Page by Page)

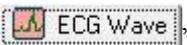
Click the icon  to view the ECG waveform as shown in Figure 3-16



Figure 3-16 the ECG Waveform Screen

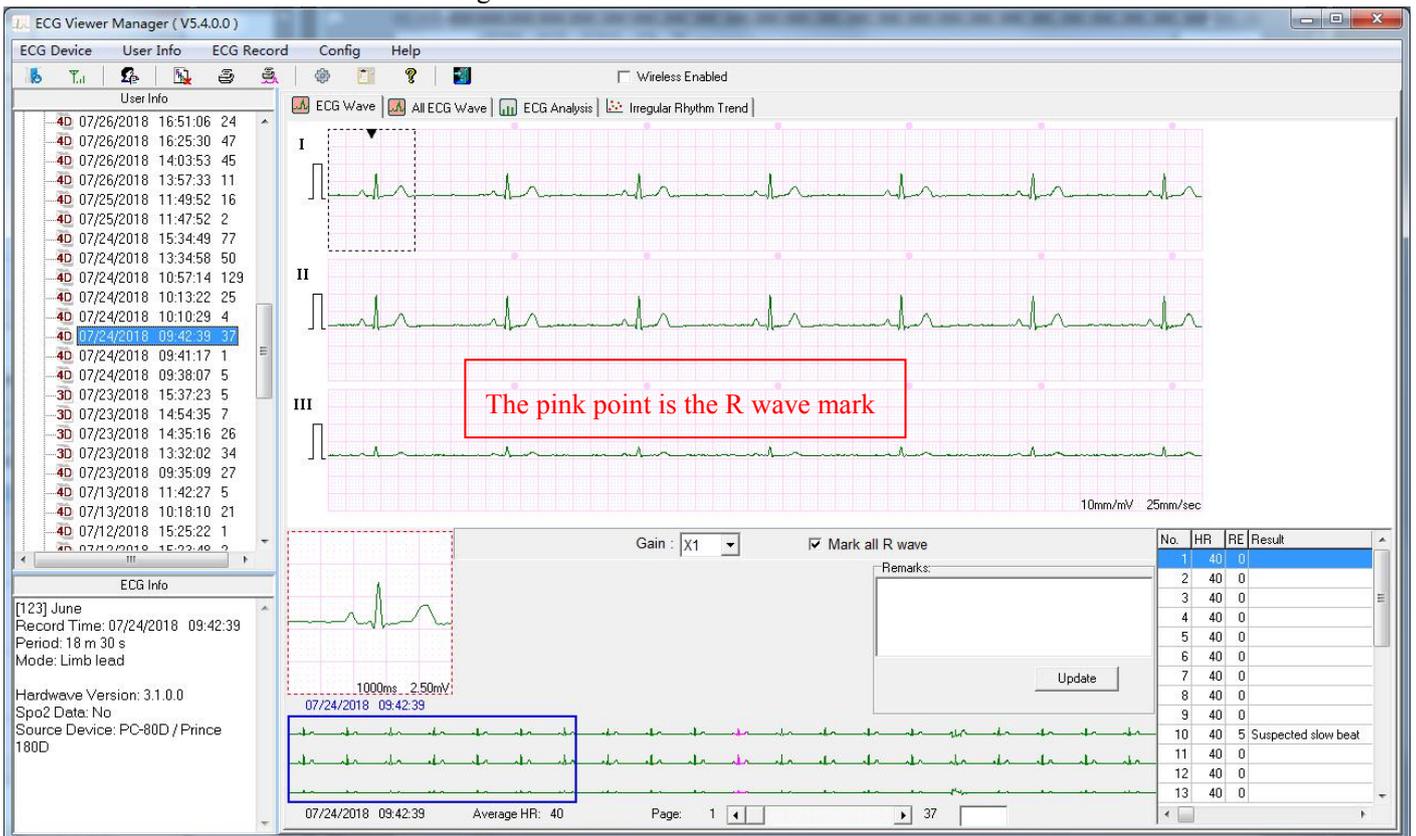


Figure 3-17 the ECG Waveform Screen---with R wave marked

According to different measurement modes, there are two display modes for ECG waveform record: Quick measurement by built-in electrodes and continuous measurement by lead wire. Corresponding specifications are as follows:

- ① Select the waveform gain through the pull-down submenu “Gain X1” above the right corner of waveform area.

- ② **Mark all R wave** : for the continuous records uploaded from device, click it to select or unselect to mark all R wave. The R wave (QRS complex) list will be displayed on the right lower corner of the screen if the QRS complex is detected.
- ③ Click any point within the ECG waveform area, a dashed box will display on waveform area, and the zoomed signal within this box will show on the waveform zooming area. Right click this dashed box, the waveform within it can be fixedly displayed on a new movable window. The doctor or professionals can observe the detail of the ECG waveform by moving the dashed box.



The heart rate value will be displayed for the records of continuous measurement;

HR: the average heart rate value of ECG waveform in waveform zooming area.

Irregular Rhythm List: the type of irregular rhythm of ECG waveform in waveform zooming area.

If the waveform on this dashed box is identified with any irregularity, Irregular Rhythm List will show the type of irregularity. The segment of irregular ECG waveform will be displayed in striking red and marked by an upside-down triangle above it. If you want to cancel this mark, click the button “Cancel”, then a dialog box pops up on the screen and reminds you that “Are you sure to cancel the irregular rhythm mark?”, finally, click the “OK” button to cancel this mark and corresponding event. After that a normal triangle will be shown beside the upside-down triangle, and the statistical result and irregular rhythm event plot will skip this event. If you want to re-mark the canceled irregular rhythm event, click the “Cancel” button, then a dialog box pops up on the screen and reminds you that “Are you sure to restore this irregular rhythm mark?”, finally, click the “OK” button to remark this event. After that the normal triangle will disappear, and this irregular rhythm event will be taken into account in the statistical result and irregular rhythm event plot again.

If the waveform is normal, only the heart rate value will be shown and the display area of Irregular Rhythm List is blank.

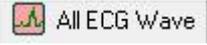
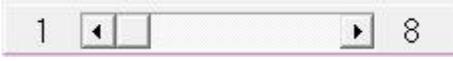
④ Enter remarks on the remark area, click “update” to save.

⑤ On the lower left corner of the ECG info screen displays the record time, period, measurement mode, filter mode and device type. (No HR calculation and measurement interpretation during real-time wireless ECG data transmission)

⑥ Below the ECG waveform record screen, display the record time, average HR value, total pages and the current page

number. Click the “ ” button can turn the page up and down. One page contains 30-second ECG waveform.

3.4.2 ECG Waveforms Review (Record by Record)

Click the icon “ All ECG Wave” to browse all signal waveforms for this ECG record as shown in figure 3-18. Each page contains 15 segments of ECG waveform. If there are more than 15 segments for display, you can review other segments on the next page by moving the slider “” to turn the page up and down. The number “1” on this bar indicates the first page, and the “8” is the number of total pages. Double click any segment of ECG waveform on this screen to return to its corresponding ECG waveform screen for a particular review.

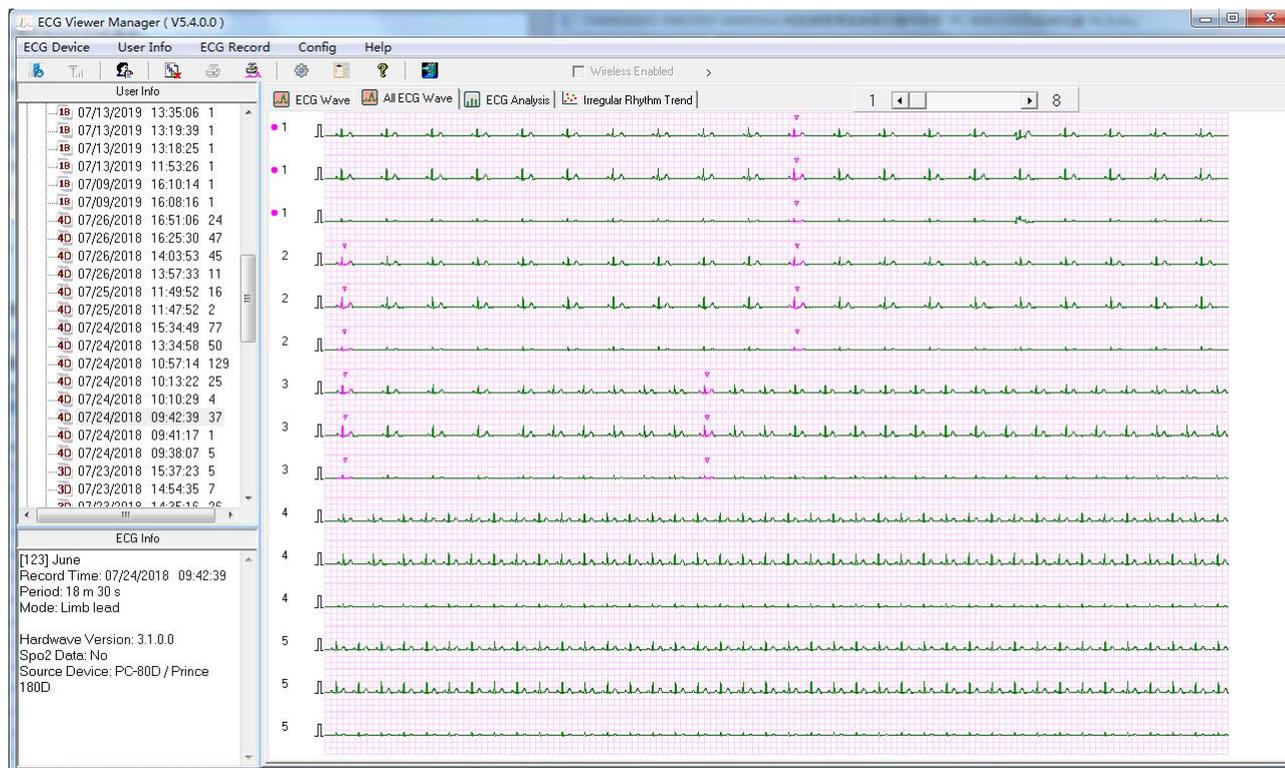
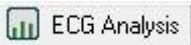


Figure 3-18 View All ECG Waveforms for One Record

3.4.3 Statistical Result

The statistical result is for ECG records which are uploaded by the method of non-real-time wireless reception and measured by mode of continuous measurement. Click the icon “ ECG Analysis” to get the statistical result for this ECG record as shown in Figure 3-19.

In the statistical result screen, you can not only browse the HR trend graph and the irregular rhythm event list, but also read the maximal, minimal and average heart rate value which is displayed within the time in current trend graph.

Move the blue line to browse the HR value measured in different time. The number “87” is the current HR value. Right click the mouse at this time to shift the screen to the corresponding ECG waveform screen. Click the pull-down button of “Scale” to select the time scale of horizontal coordinate, or click “”/“” button to zoom in/zoom out the statistical trend graph, move the slide “” or click “” to turn the page up and down so as to view the HR trend graph.

The irregular rhythm event list displays all irregular rhythm events and whether the listed events occur or not.

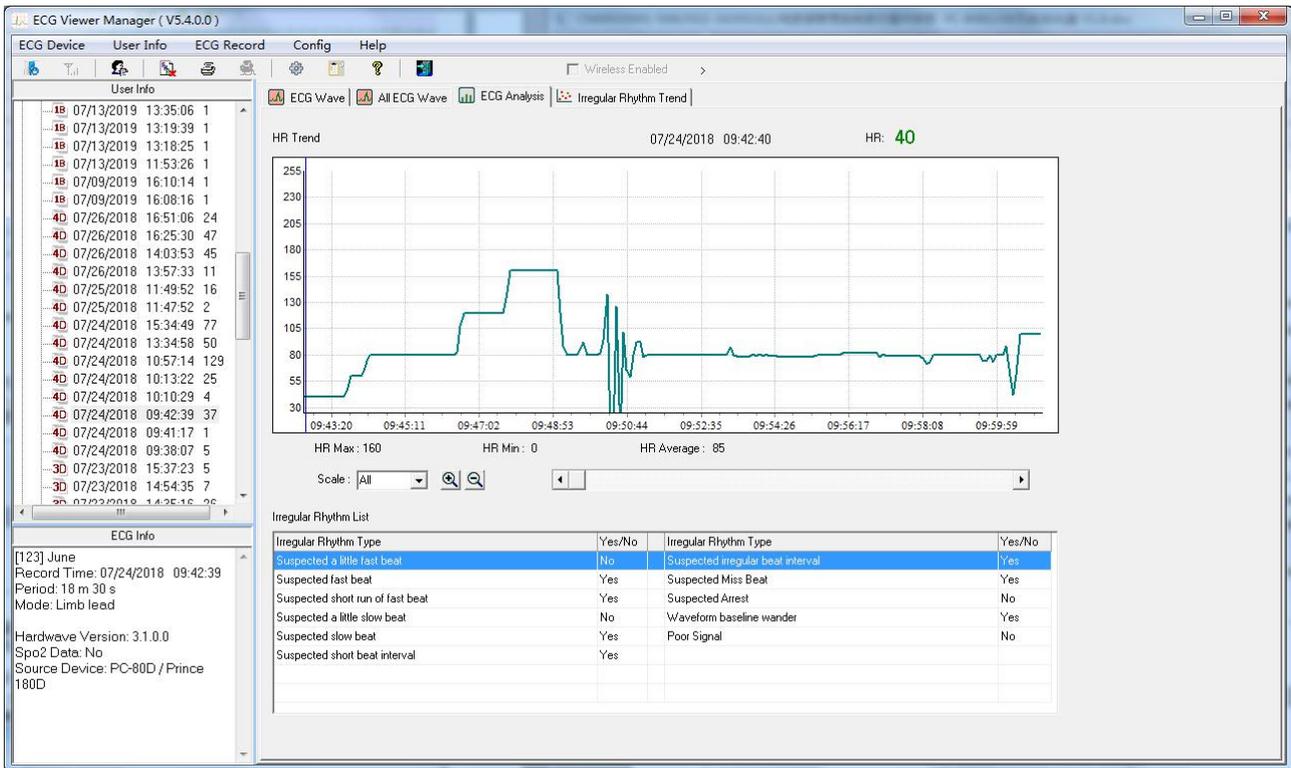
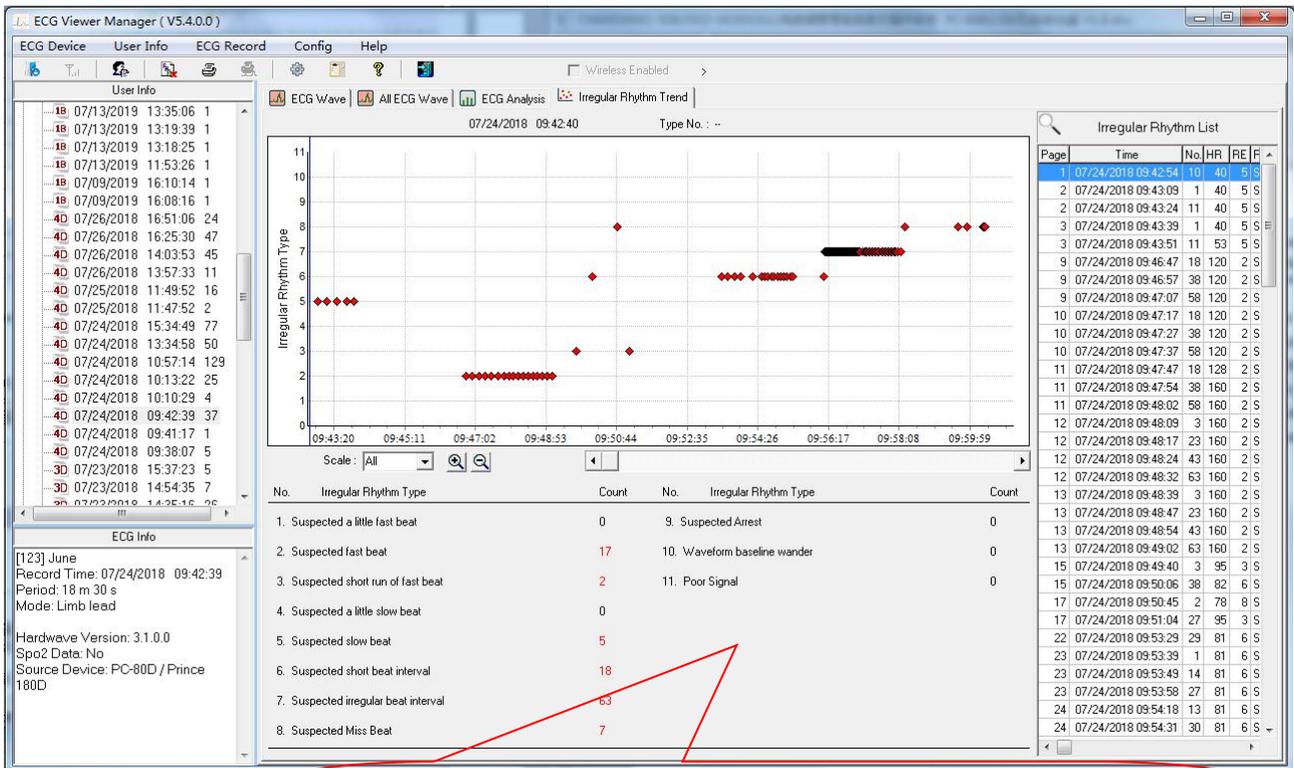


Figure 3-19 View Statistical Result

3.4.4 Irregular Rhythm Event Plot

Irregular Rhythm Trend function is available if the waveform records are received by continuous measurement method via non-real-time wireless transmission. Click the icon “ Irregular Rhythm Trend ” to enter the irregular rhythm event plot screen where the distribution and types of irregular rhythm event can be reviewed as shown in Figure 3-20.

Move the blue line to browse the irregular rhythm event occurring in different time, “Type No: 14” in the screen indicates the irregular rhythm type “Suspected short beat interval with baseline wander” which is displayed with yellow background in the list. Right click any point in the event plot at this time, the screen will be shifted to ECG waveform screen whose measuring time is corresponded with that the blue line pointed. Meanwhile, click the pull-down button of “Scale” to select the time scale of horizontal coordinate, or click “ ”/“ ” button to zoom in/zoom out the trend graph, move the slide “ ” or click “ ”/“ ” to turn the page up and down so as to view the HR trend graph.



For device PC-80B/Prince-180B, there are 16 irregular rhythm types in total, while for PC-80D/Prince-180D, there are 11 types in total.

Figure 3-20 Irregular Rhythm Trend Graph Screen

3.4.5 SpO2 and PR Trend Graph

If the device has the optional accessory to measure SpO₂ and the SpO₂ data has been uploaded to the PC, the user can review the trend graph of SpO₂ and pulse rate as well as detailed information of SpO₂ event and pulse rate event in the screen shown in figure 3-21A.

In the SpO₂ and PR trend graph screen, the value of SpO₂ and pulse rate measured in different time can be viewed by moving the blue line. The number “97” in the screen shows the current value of SpO₂, and the “84” is the current value of pulse rate. Meanwhile, the user can click the pull-down button of “Scale” to select the time scale of horizontal coordinate, move the slide “” to turn the page up and down so as to view the SpO₂ and PR trend graph. Besides, some information such as the maximal, minimal and average value of SpO₂ and pulse rate, the occurring times of SpO₂ event and pulse rate event and so on, can be displayed in this screen.

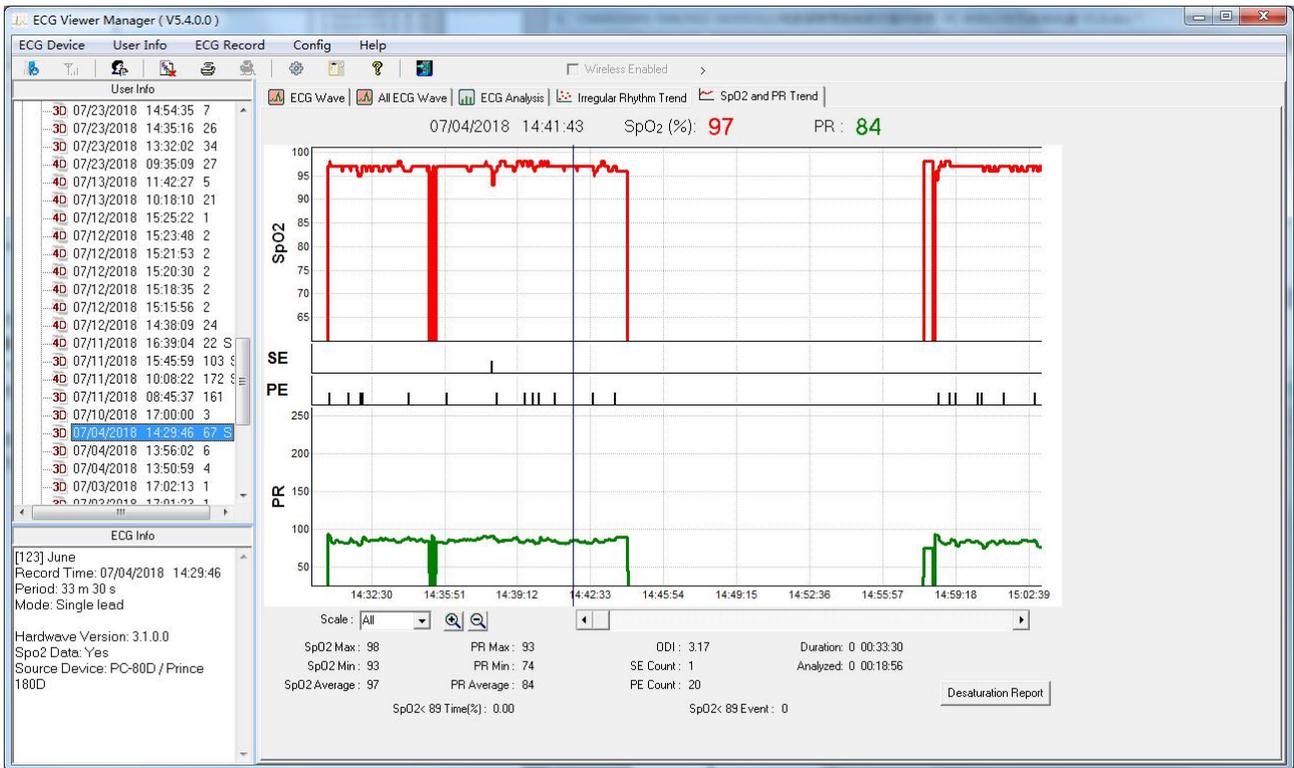
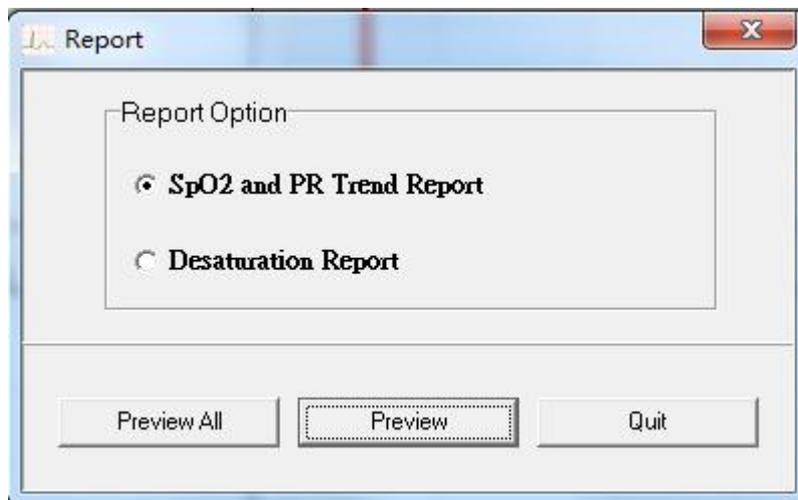


Figure 3-21A SpO₂ and PR trend graph

If the SpO₂ Event occurred, the icon “” would be activated. Click this icon to preview the oxygen desaturation report as shown in figure 3.24.

In SpO₂ and PR trend graph screen, click icon “”, then the report option pops up on the screen, as shown in following figure .



- ✧ Preview all: click “Preview all” button to preview all reports, as shown in figure 3.22.
- ✧ Preview: click “Preview” button to preview the SpO₂ and PR Trend Report (figure 3.23) and Desaturation Report (figure 3.24).
- ✧ Quit: exit from report option screen.

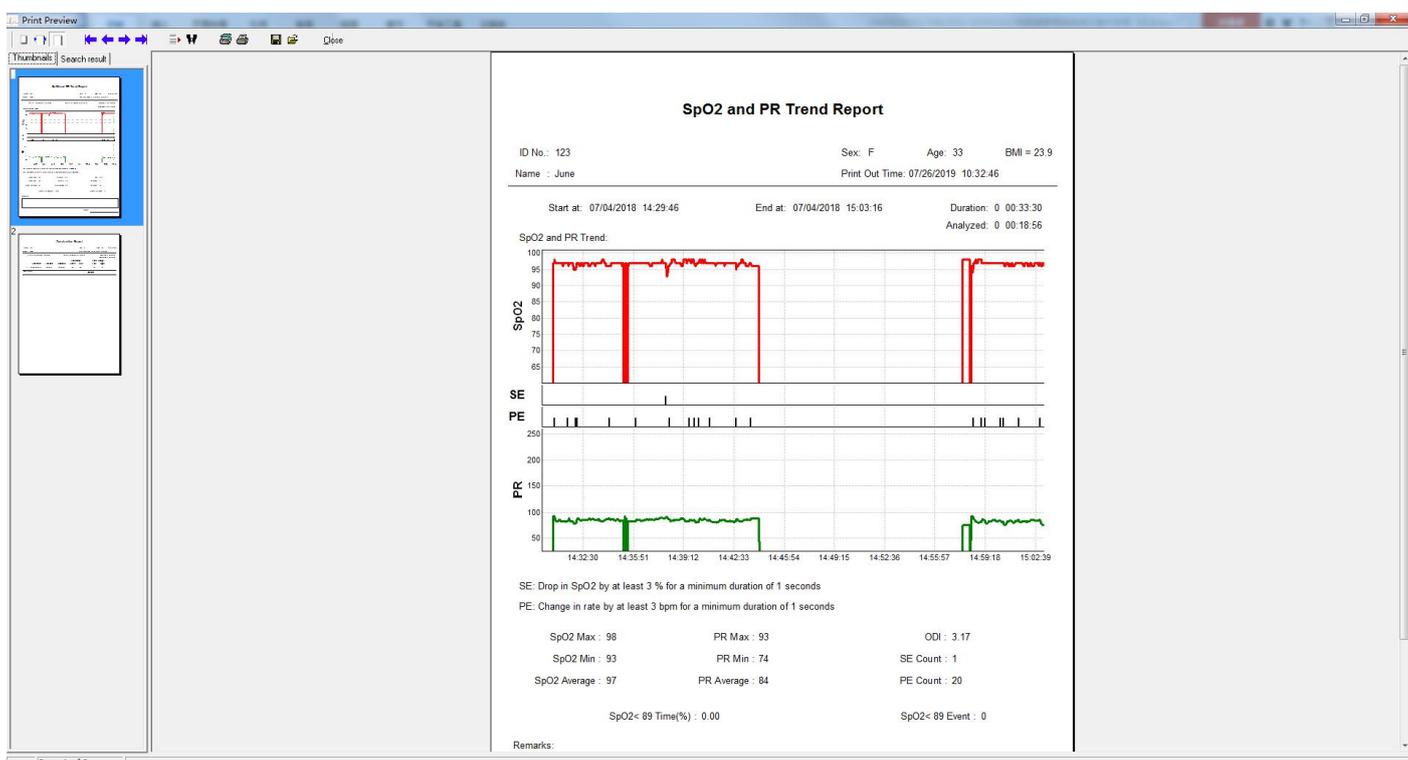


Figure 3.22 Preview all

3.5 Delete and Print ECG Waveform Records

3.5.1 Delete the ECG Waveform Records

Select the corresponding record, click the submenu “Delete” in the pull-down menu of the “ECG record” or click the Tool bar icon “”, then a window appears on the desktop, as shown in the Figure 3-25. Please follow the prompts to operate.



Figure 3-25 Delete the Records

3.5.2 Print the ECG Waveform Records and Statistical Analysis

At first, select a record, then if you want to print the ECG waveform record, statistical result or irregular rhythm event plot, the next step you should take is clicking the submenu “print record” in the pull-down menu of “ECG record” or click the Tool bar icon “”. But if your choice is to print the all ECG waveforms for this record, the next step is clicking the submenu “Print all ECG” in the pull-down menu of “ECG record” or click the Tool bar icon “”, finally, their preview screen windows will appear on the desktop, as shown in the Figure 3-26A, Figure 3-26B, Figure 3-27 and Figure 3-28.

Operation Description:

"" Fit to width: Preview the report in proper width.

"" Fit to page: Full screen preview the report in proper proportion.

"" Zoom in: Click it to zoom in the report.

"" Zoom out: Click it to zoom out the report.

"103%" Zooming proportion: Displays the zooming proportion for the current report preview.

"": Print the current report displayed. If the content of records is more than one page, click this button to set the start, end page and the printing copies according to your need.

"": Save. Click this button can save the ECG records in picture format on computer.

"": If the content of records is more than one page, click this button to turn the page up and down so as to preview all records.

"": Close. Close the current preview.

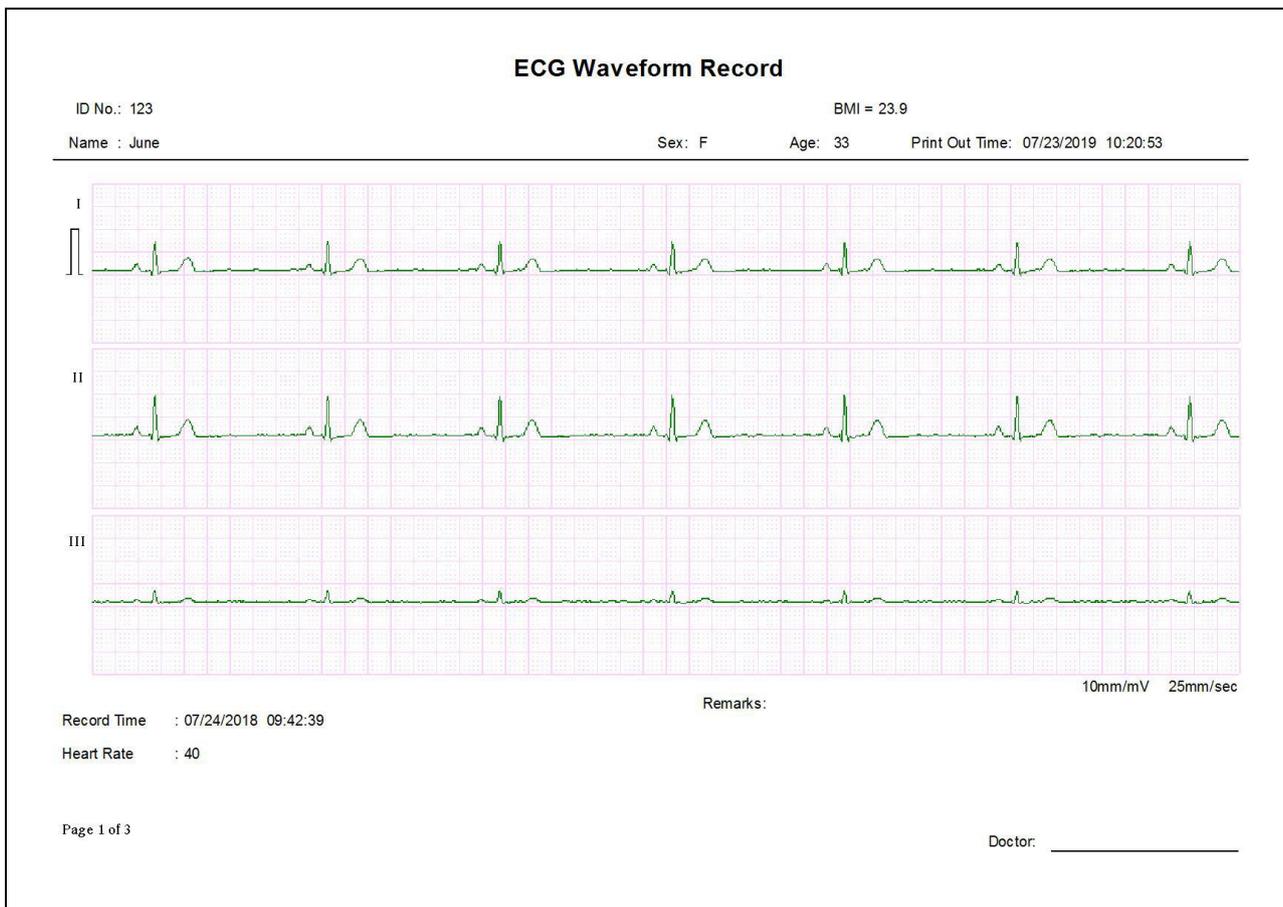


Figure 3-26A Print Preview (single ECG Waveform)

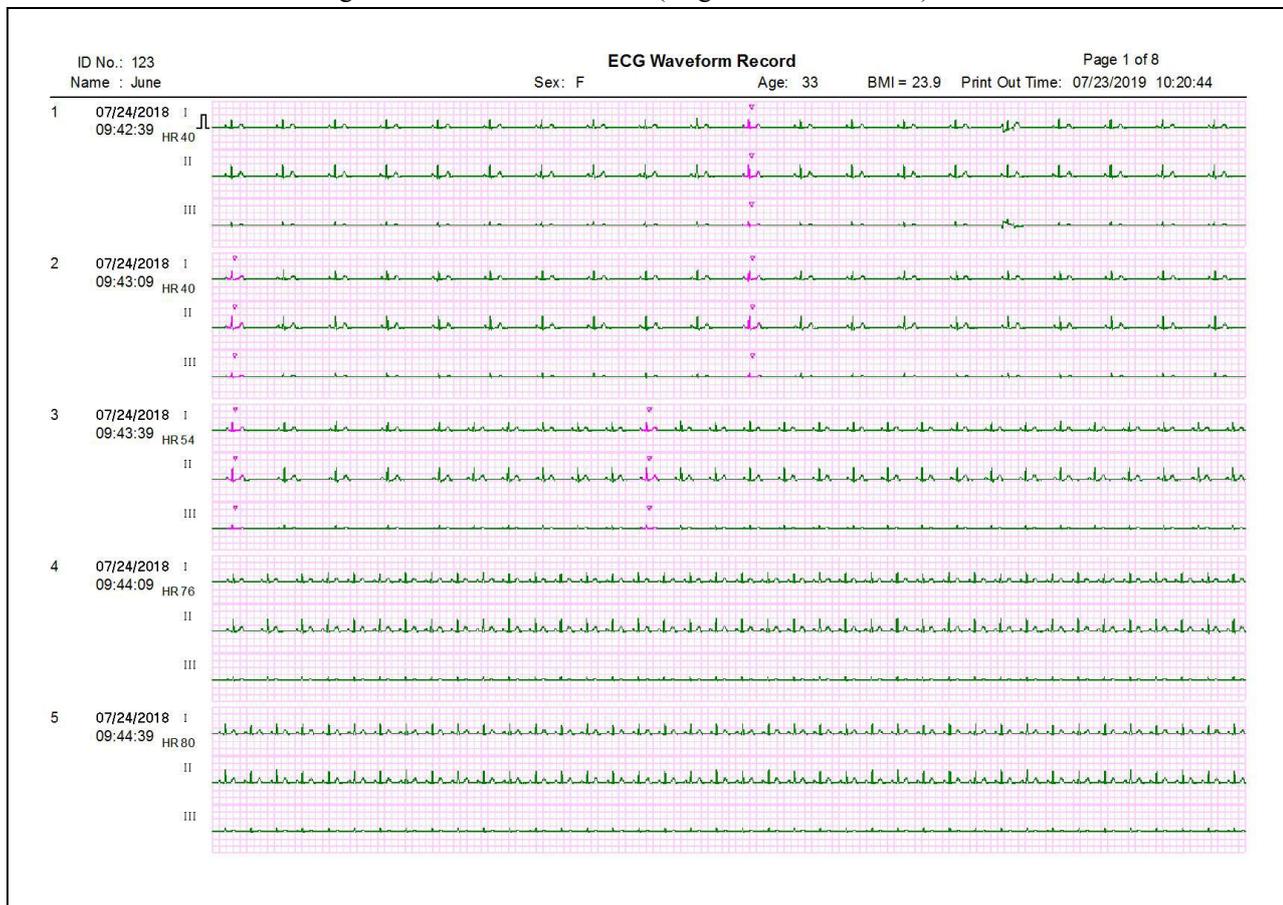


Figure 3-26B Print Preview (all ECG Waveforms)

Irregular Rhythm Analysis Report

ID No.: 123

Sex: F

Age: 33

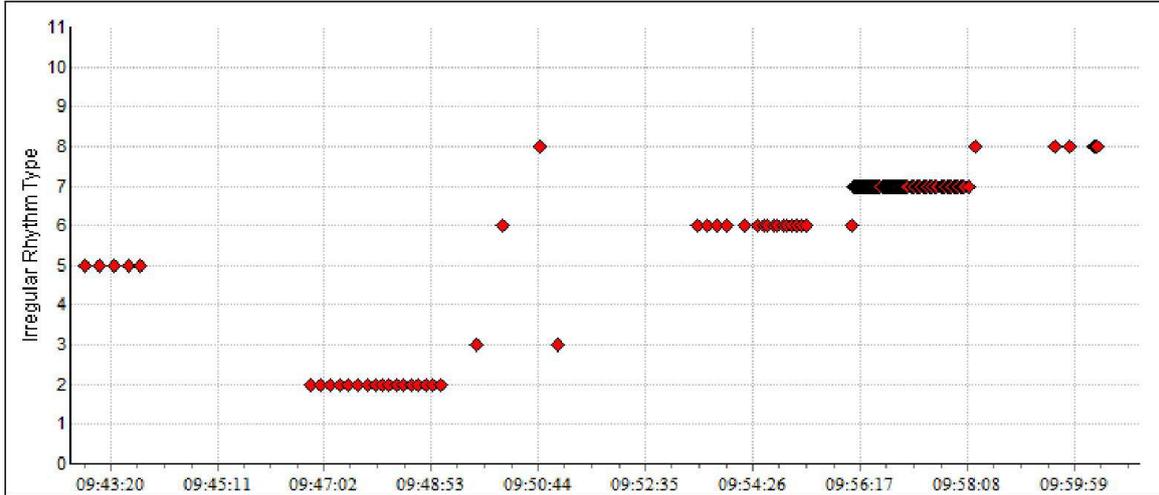
BMI = 23.9

Name : June

Print Out Time: 07/23/2019 10:20:18

Irregular Rhythm Trend: Start at: 07/24/2018 09:42:39

End at: 07/24/2018 10:01:09



Irregular Rhythm List:

Start at: 07/24/2018 09:42:39

End at: 07/24/2018 10:01:09

No.	Irregular Rhythm Type	Count
1.	Suspected a little fast beat	0
2.	Suspected fast beat	17
3.	Suspected short run of fast beat	2
4.	Suspected a little slow beat	0
5.	Suspected slow beat	5
6.	Suspected short beat interval	18
7.	Suspected irregular beat interval	63
8.	Suspected Miss Beat	7
9.	Suspected Arrest	0
10.	Waveform baseline wander	0
11.	Poor Signal	0

Remarks:

Doctor: _____

Figure 3-28 Print Preview (Irregular Rhythm Event Plot)

3.6 Configuration

Configuration includes System configuration and Event setup.

Click the submenu “System Config.” in the pull-down menu of the “Configuration”, or click the Tool bar icon "⚙️" and select “System Config.”, to bring up the system configuration screen, as shown in figure 3-29. There are two tabs, click on the tab to shift to the relevant page.

➤ System parameter

Date Format: select the date format. The “mm/dd/yyyy”, “yyyy/mm/dd” and “dd/mm/yyyy” format are optional

➤ Language

The operator can change the display language of the ECG Viewer Manager, English, Traditional Chinese, and Simplified Chinese for optional.



Figure 3-29A Date Format



Figure 3-29B Language Setting

Click the submenu “Event setup” in the pull-down menu of the “Configuration”, or click the Tool bar icon "⚙️" and select “Event setup”, to enter the event setup screen which include three tabs: SpO₂ Event (SE), Pulse Rate Event (PE) and SpO₂ Comparing Rule. Click the tab to shift page to its relevant page as shown in Figure 3-30A, Figure 3-30B and Figure 3-30C.

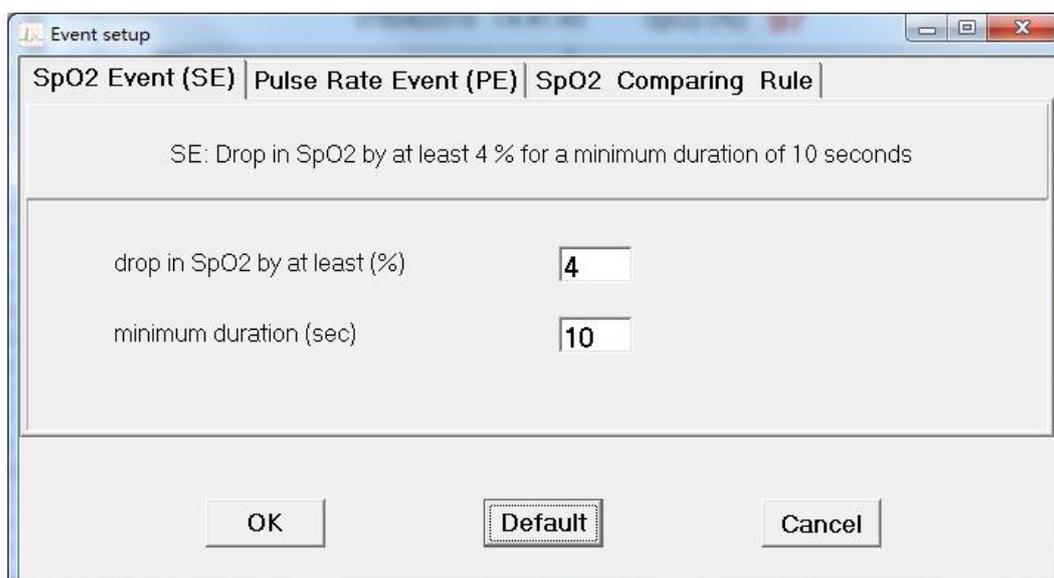


Figure 3-30A SpO₂ Event Screen

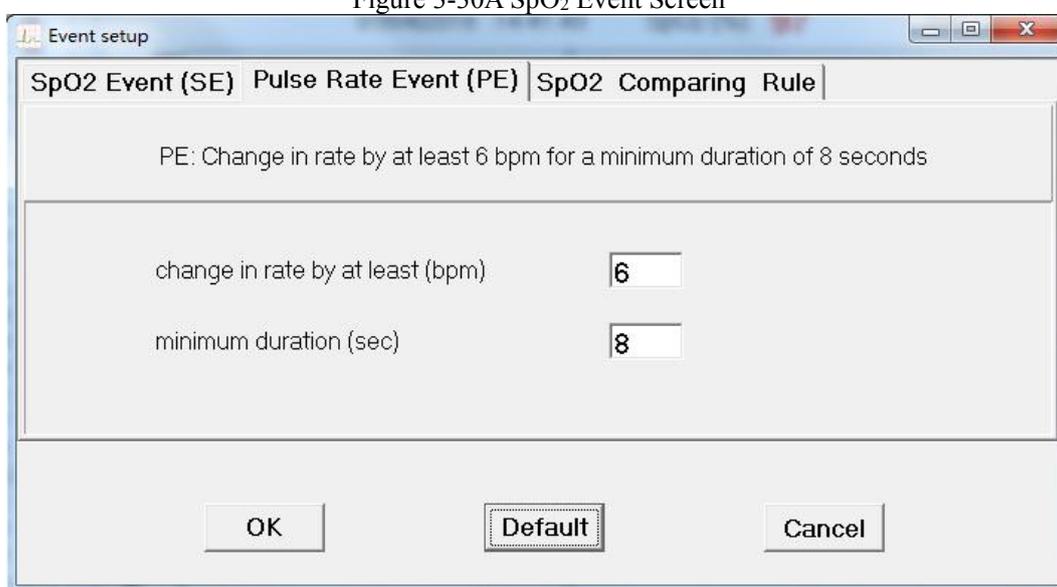


Figure 3-30B Pulse Rate Event Screen

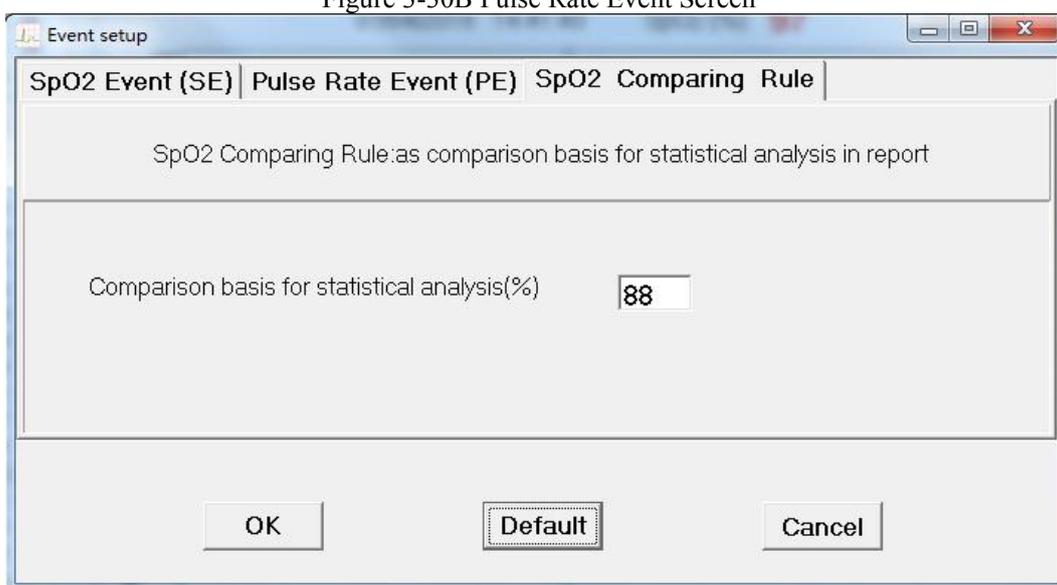


Figure 3-30C SpO₂ Comparing Rule Screen

➤ **SpO₂ Event (SE)**

If the SpO₂ value exceeds the preset “drop in SpO₂ by at least (%)” and this status lasts not less than the preset “minimum duration (sec)”, it will be recorded as a SpO₂ event. For example, set “drop in SpO₂ by at least (%)” as “4” and set “minimum duration (sec)” as “10”, when drop in SpO₂ by at least 4% for a minimum duration of 10 seconds, SpO₂ event will be triggered and recorded as a SpO₂ event.

➤ **Pulse Rate Event**

If the PR value exceeds the preset “change in rate by at least (bpm)” and this status lasts not less than the preset “minimum duration (sec)”, it will be recorded as a Pulse Rate event. For example, set “change in rate by at least (bpm)” as “6” and set minimum duration as “8”, when change in PR rate by at least 6bpm for a minimum duration of 8 seconds, PR event will be triggered and recorded as a PR event.

➤ **SpO₂ Comparing Rule**

You can define a SpO₂ value as a comparison base for statistical analysis according to your own needs. For example, if you set “Comparison basis for statistical analysis (%)” as “88”, you can know how many times the SpO₂ event occur (SpO₂ <88% Event Count: 4) and the time percentage below 88% in measuring time.

3.7 Help

On main menu window, select "Help" to enter into the sub-menu, as shown in figure 3-31. Click the sub-menu to bring up the corresponding window.



Figure 3-31 Help menu

◆ **Online Update**

If the internet is accessible, then clicking "Online Update" will check if the current software is the latest version. If it's checked as the latest version software, then figure 3.32 pops up. If not, then software update information pops up on the screen, click “OK” to update to the latest version.

Note: do not operate the ECG Viewer Manager when updating the software, please wait for about 2 minutes.

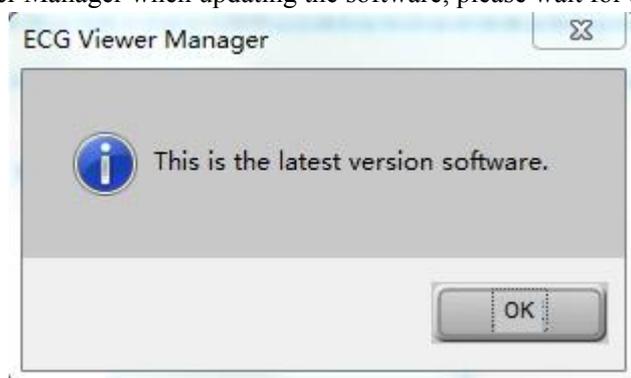


Figure 3-32

If the internet is not accessible, then clicking "Online Update" will show connection failure.

Note: When downloading the updated file (ECGVM_files.exe), if the antivirus program (eg. 360 antivirus program) shows it

as the computer virus, then choose "Trust in" and re-click "Online Update".

◆ **User Manual**

On sub-menu, click on "User Manual", then the User Manual for ECG Viewer Manager pops up, which is a document with ".pdf" format.

Note: your computer should install PDF reader, or the User Manual can not be opened.

◆ **About System**

Click it to view software information, including software version, disk space and so on.

3.8 Exit the System

Click the submenu "Exit" in the pull-down menu of the "ECG device", or click the Tool bar icon "", and then the dialog box about the system appears, as shown in the figure 3-33.



Figure 3-33 Exit the System

3.9 Troubleshooting

No.	Misinformation	Possible Reason	Solution
1	Failing to search the device!	1. The ECG monitor and the PC USB interface dose not contact well! 2. The device isn't switched on! 3. The PC USB interface is damaged. 4. The provided PC USB cable is damaged! 5. The device is in trouble.	1. Please try again to check whether the USB cable is well contacted with the PC and the unit. 2. Please switch on the device. 3. Please upload the data again after replacing a USB interface 4. Please contact the local dealer in case of any problems. 5. Please contact the local dealer in case of any problems.
2	No searched ECG information!	No ECG waveform record is detected in the device.	Please upload the data after the device detects the ECG waveforms.
3	No searched the ECG device!	1. The USB cable is damaged. 2. The device is in trouble! 3. The PC USB interface is damaged.	1. Please contact the local dealer in case of any problems. 2. Please contact the local dealer in case of any problems. 3. Please upload the data again after replacing the USB in interface.
4	No found printer in the system, please try again after installing!	The system does not install the printer.	Please install a printer.
5 (for wireless reception)	Please check whether the device is in communication status	1. The device is not switched on 2. Plug or unplug the wireless adapter while the software "ECG Viewer Manager" is being used. 3. The USB interface is damaged	1. Please switch on the device 2. Please restart the computer 3. Please restart the computer after replacing the interface.