

CardioVista

ECG Viewer


Operator's Manual

Intellectual Property Statement

SHENZHEN MINDRAY BIO-MEDICAL ELECTRONICS CO., LTD. (hereinafter called Mindray) owns the intellectual property rights to this Mindray product and this manual. This manual may refer to information protected by copyrights or patents and does not convey any license under the patent rights of Mindray, nor the rights of others.

Mindray intends to maintain the contents of this manual as confidential information. Disclosure of the information in this manual in any manner whatsoever without the written permission of Mindray is strictly forbidden.

Release, amendment, reproduction, distribution, rental, adaption and translation of this manual in any manner whatsoever without the written permission of Mindray is strictly forbidden.

mindray, , **迈瑞**, **MINDRAY** and **BeneHeart** are the registered trademarks or trademarks owned by Mindray in China and other countries. All other trademarks that appear in this manual are used only for editorial purposes without the intention of improperly using them. They are the property of their respective owners.

Version information

The version number of this manual may be updated due to changes of software or technical specifications at any time without notice. Version information of this instruction is as follows:

- Version No.: 1.0
- Issue time: 2015-04

Customer Service Department

Manufacturer: Shenzhen Mindray Bio-Medical Electronics Co., Ltd.
Address: Mindray Building, Keji 12th Road South, Hi-tech industrial
park, Nanshan, Shenzhen 518057, P.R. China
Website: www.mindray.com
E-mail Address: service@mindray.com
Tel: +86 755 81888998
Fax: +86 755 26582680
24H service hotline 4007005652

Preface

Manual Purpose

This manual contains the instructions necessary to operate the product safely and in accordance with its function and intended use. Observance of this manual is a prerequisite for proper product performance and correct operation and ensures patient and operator safety.

This manual is based on the maximum configuration and therefore some contents may not apply to your product. If you have any question, please contact us.

This manual is an integral part of the product. It should always be kept close to the equipment so that it can be obtained conveniently when needed.

Intended Audience

This manual is geared for clinical professionals who are expected to have a working knowledge of medical procedures, practices and terminology as required for monitoring of critically ill patients.

Illustrations

All illustrations in this manual serve as examples only. They may not necessarily reflect the setup or data displayed on your patient monitor.

Conventions

- *Italic text* is used in this manual to quote the referenced chapters or sections.
- [] is used to enclose screen texts.
- → is used to indicate operational procedures.

FOR YOUR NOTES

Contents

1 The Basics	1-1
1.1 Intended use	1-1
1.2 Major functions	1-1
 2 Installation and uninstallation	 2-1
2.1 Installation environment.....	2-1
2.2 Install dongle drive.....	2-2
2.3 Install CardioVista.....	2-3
2.4 Uninstallation	2-5
 3 Interface Display	 3-1
3.1 Patient Record interface	3-1
3.2 Report browsing interface	3-2
 4 Managing Patients.....	 4-1
4.1 Patient Record	4-1
4.2 Add a Patient	4-2
4.2.1 Automatically add a patient when importing report	4-2
4.2.2 Manually add a patient	4-2
4.3 Delete patient	4-3
4.4 Modify patient.....	4-3
4.5 Search patient.....	4-4
 5 Managing Report	 5-1
5.1 ECG Report List.....	5-1
5.1.1 Report Status	5-1
5.2 Import Report.....	5-2
5.2.1 Automatically imported through network	5-2
5.2.2 Batch import folders.....	5-3
5.3 Export Report.....	5-4
5.4 Delete report.....	5-5
5.5 View Report	5-5
5.5.1 Show/hide patient demographics	5-5
5.5.2 10's ECG	5-6
5.5.3 Average template	5-9
5.5.4 Measurement matrix.....	5-10
5.5.5 Report Comparison	5-11
5.6 Modify report	5-13
5.6.1 Matching patient.....	5-13
5.6.2 Modify patient basic information.....	5-15

5.6.3 Modify global measurement.....	5-15
5.6.4 Modify diagnostic result.....	5-15
5.6.5 Confirm and save the modification	5-19
5.6.6 Undo modification	5-20
5.7 Print report	5-20
5.7.1 Quick print	5-20
5.7.2 Common Print.....	5-21
6 Managing Data	6-1
6.1 Storage Management.....	6-1
6.1.1 Storage Path Setting	6-1
6.1.2 Storage Space Management	6-1
6.2 Data Backup.....	6-2
6.2.1 Manual Backup	6-2
6.2.2 Automatic backup.....	6-2
6.3 Data Recovery	6-2
6.4 Data Statistics.....	6-3
7 System Settings.....	7-1
7.1 Enter system settings.....	7-1
7.2 Basic settings.....	7-2
7.3 Print settings.....	7-3
7.4 Export settings.....	7-4
7.5 Data Maintenance.....	7-5
7.6 Other Settings.....	7-6

1 The Basics

1.1 Intended use

CardioVista PC Browser Software (Hereafter referred as 'CardioVista') is a PC client software used with the BeneHeart R3/R3A/R12/R12A Electrocardiograph from Mindray (Hereafter referred as the 'Electrocardiograph') for browsing, analyzing and printing out ECG data and ECG reports exported from the Electrocardiograph.

1.2 Major functions

CardioVista provides the following major functions:

- Patient management: includes creating, deleting, modifying and searching patients.
- Report management: includes importing, exporting, deleting, browsing, modifying and printing patient reports.
- Data management: includes the storage management, backup, restoration and statistics of data.
- System settings: includes basic settings, printing settings, exporting settings, data maintenance and other settings.

FOR YOUR NOTES

2 Installation and uninstallation

2.1 Installation environment

Users can install CardioVista directly with a disc. The installation disc is provided by the manufacturer for users, and the computer used by the user should meet following requirements:

- Operating system: Microsoft Windows XP/Windows7
- CPU: Intel Pentium, with clock speed over 1GHz (If using Windows7, as per requirements of Windows7)
- Display: recommend to use 17"LCD
- Display resolution: support 1024×768, 1280×1024
- Memory: over 1G (If using Windows7, as per requirements of Windows7).
- Hard disk space: at least 1G space available for software installation, and at least another 10G space for importing patient data documents.
- CD driver: CD-ROM.

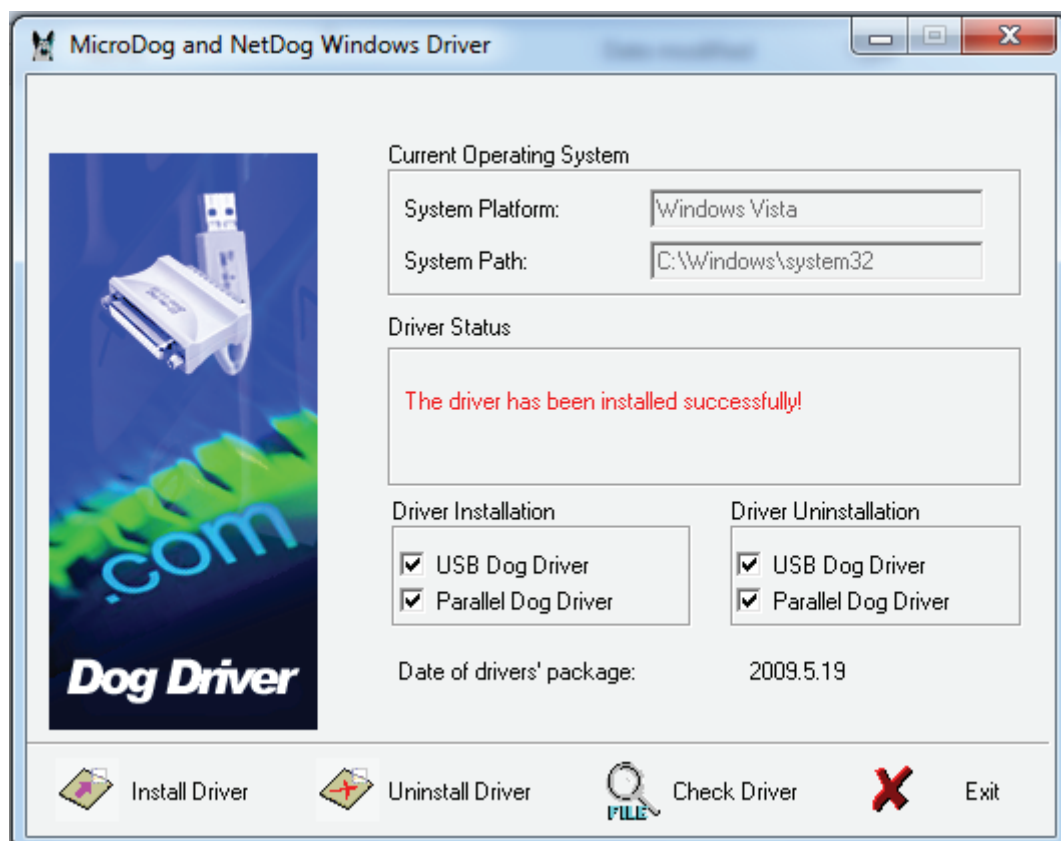
NOTES

- **CardioVista can automatically adjust display interface according to display resolution, and resolution of 1280*1024 is recommended to achieve optimum display result.**
 - **To install CardioVista, an administrator-level user name must be used to log into Windows.**
-

2.2 Install dongle drive

Install dongle drive with the following steps:

1. Insert CardioVista installation disk into the CD-ROM.
2. After CD-ROM is prepared, select [My Computer]→[CD-ROM Icon] →[USB Dog Driver] directory, and double-click the dongle drive installation program [MicroDogInstdrv.exe], then click [Install Driver] to start installing dongle drive when the following interface pops out.

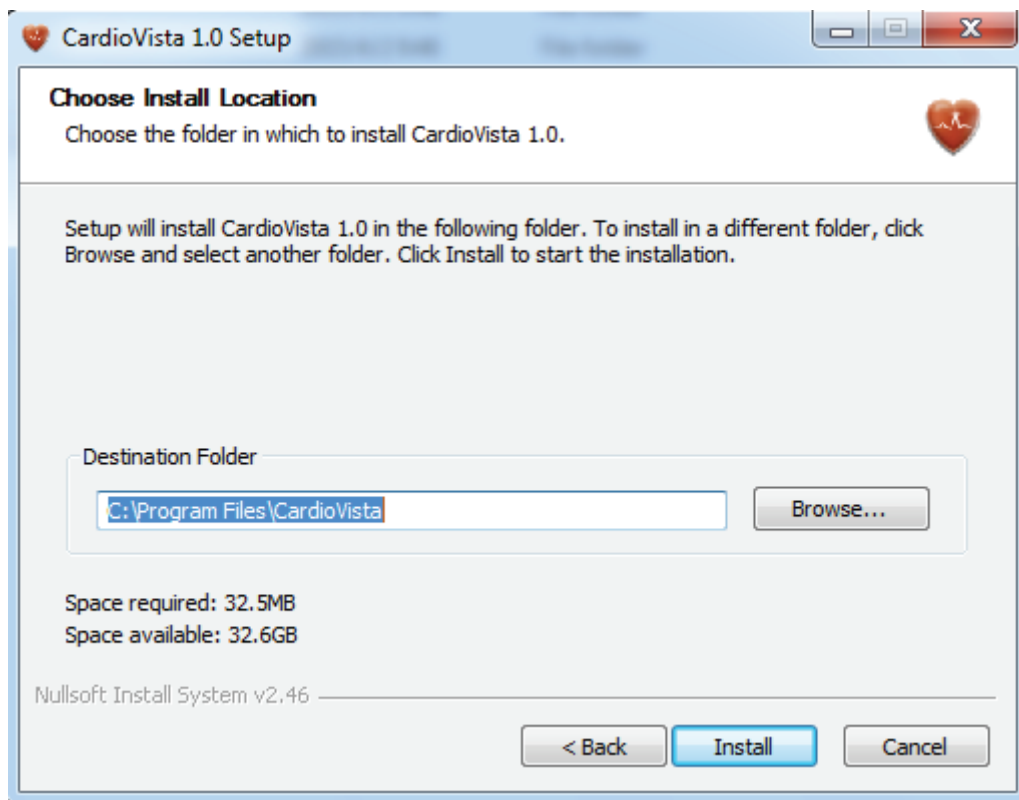


3. After [The driver has been installed successfully!] prompted in [Driver Status] click the [Exit] to complete the drive installation.

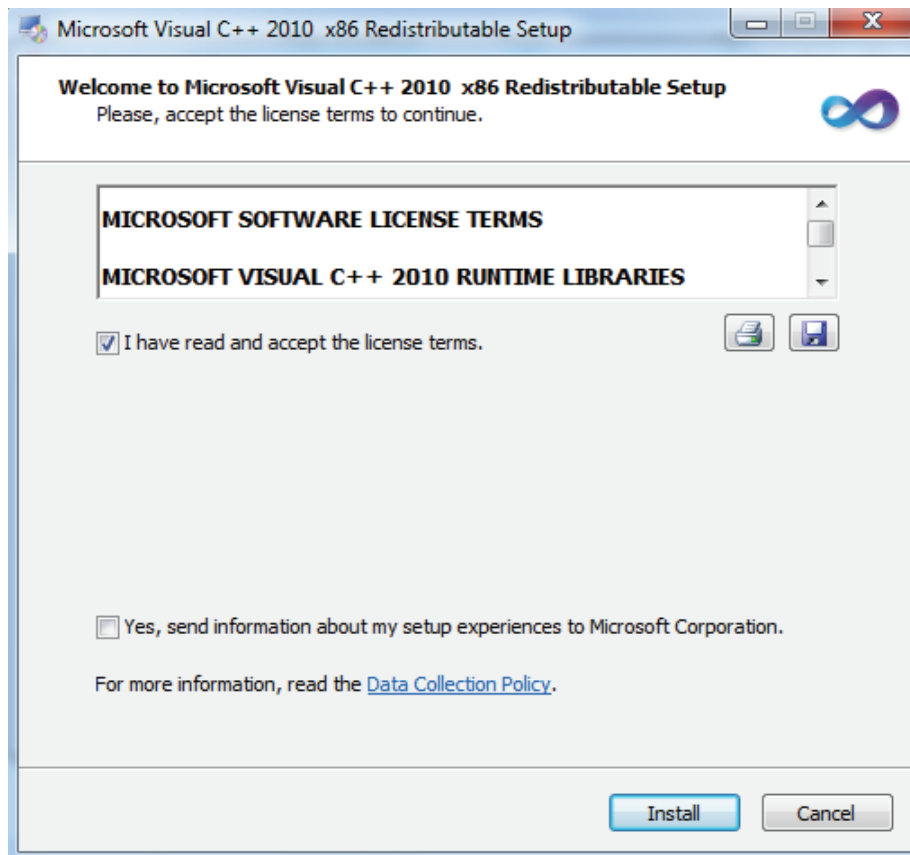
2.3 Install CardioVista

Install CardioVista with the following steps:

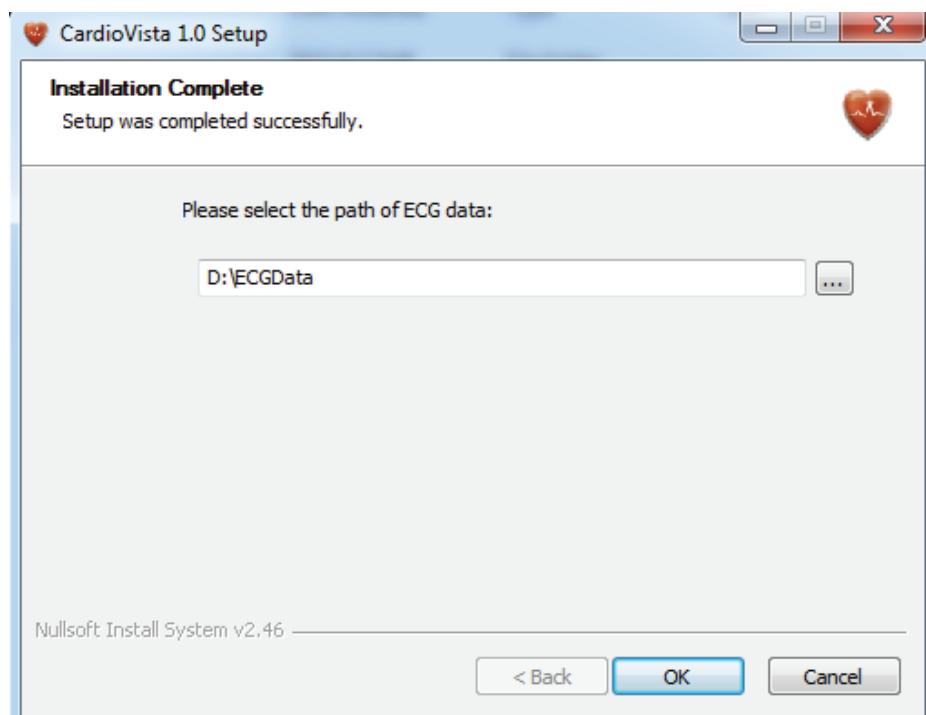
1. Insert CardioVista installation disk into the CD-ROM.
2. After CD-ROM is prepared, select [**My Computer**]→[**CD-ROM Icon**], and double-click the installation program [**Setup.exe**], then click [**Browse...**] to select the installation path when the following interface pops out, and click [**Install**] to start installing the CardioVista.



3. In the interface [**Welcome to Microsoft Visual C++ 2010 X64 Redistributable Setup**], select [**I have read and accept the license terms**], as shown below, and click [**Install**] to continue installing CardioVista.



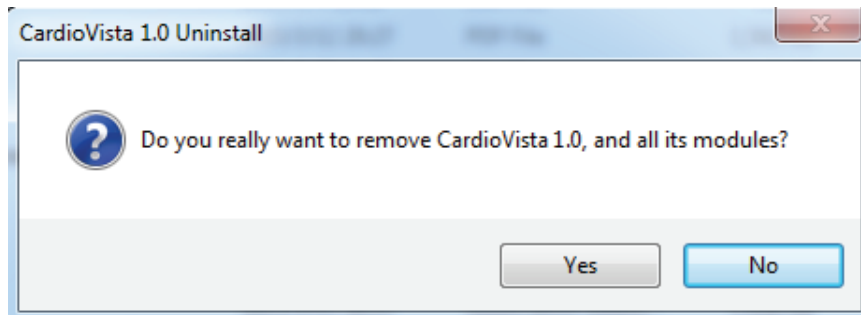
4. When installation is complete, a storage path for database documents must be set. As shown below, please ensure that there is enough storage space in the disk the database documents are located in. Click **[OK]** to complete the installation of CardioVista.



2.4 Uninstallation

Uninstall CardioVista in Windows 7 operating system with the following steps:

1. Click [Start] → [All programs] → [Control panel] → [Programs] → [Uninstall program].
2. Select [CardioVista1.0] in the [Uninstall/change program] list, and a menu summary will pop out by right-clicking, then select [Uninstall/change(U)].
3. In the interface that pops out as follows, select [Yes] to uninstall CardioVista.



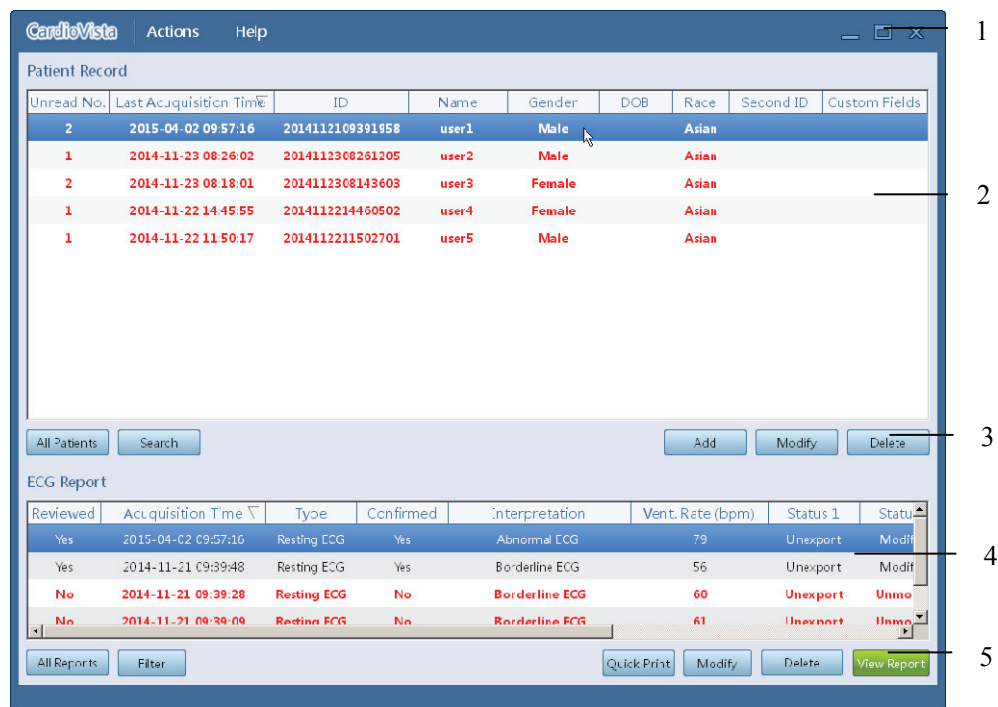
NOTE

-
- In different operating systems, such as Windows XP and Windows 7, the operating procedures or prompt text for program uninstallation may slightly differ, and operating procedures and text in this chapter are only for reference.
-

FOR YOUR NOTES

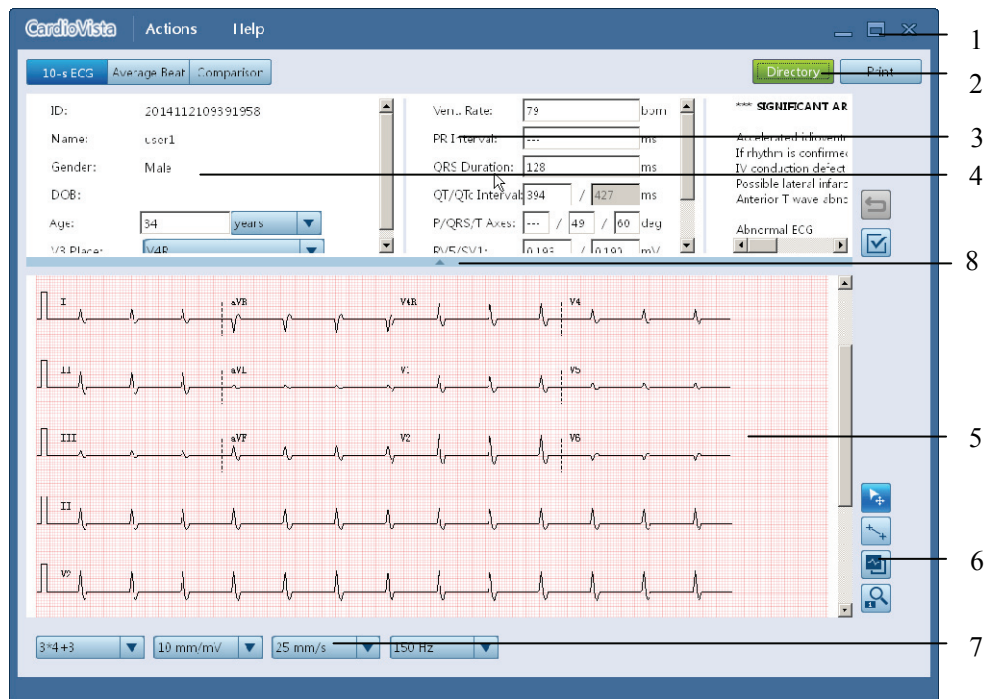
3 Interface Display

3.1 Patient Record interface



1. Title bar: menu and windows operating buttons
2. Patient Record: to show patient record of all reports stored in the database
3. Patient record operating buttons
4. ECG Report: report list for the patient selected in the patient record
5. ECG Report operating buttons

3.2 Report browsing interface



1. Toggle button for major functions
2. Diagnostic result
3. Global measurement
4. Patient basic information
5. ECG waveform display area
6. ECG waveform setting button
7. Setting for browsing content and layout
8. HideInfo/showInfo button

4 Managing Patients

Since information input is easier than that of the Electrocardiograph, managing patients in CardioVista can improve ECG examination efficiency. For example, all patient demographics is input before ECG examination, so when performing ECG examination, one only needs to quickly input necessary patient demographics. After ECG examination is completed and report is imported, CardioVista can automatically match patient demographics input in advance into patient reports.

4.1 Patient Record

The patient record area of [**Patient Record**] shows the information of multiple patients in the form of a list, see *3.1 Patient Record interface*.

The patient record is sorted according to [**Last Acquisition Time**], with the latest acquired report on the top. Reordering can be achieved by clicking list tiles in the patient record

When a patient is selected, all report lists of this patient will be shown synchronously in the [**ECG Report**].

Text in red represents that this patient has unread reports. After all reports are viewed, relevant text will be shown in black.

4.2 Add a Patient

4.2.1 Automatically add a patient when importing report

CardioVista will automatically admit a patient when importing report of the new patient.

For importing method, see *5.2 Import Report*.

4.2.2 Manually add a patient

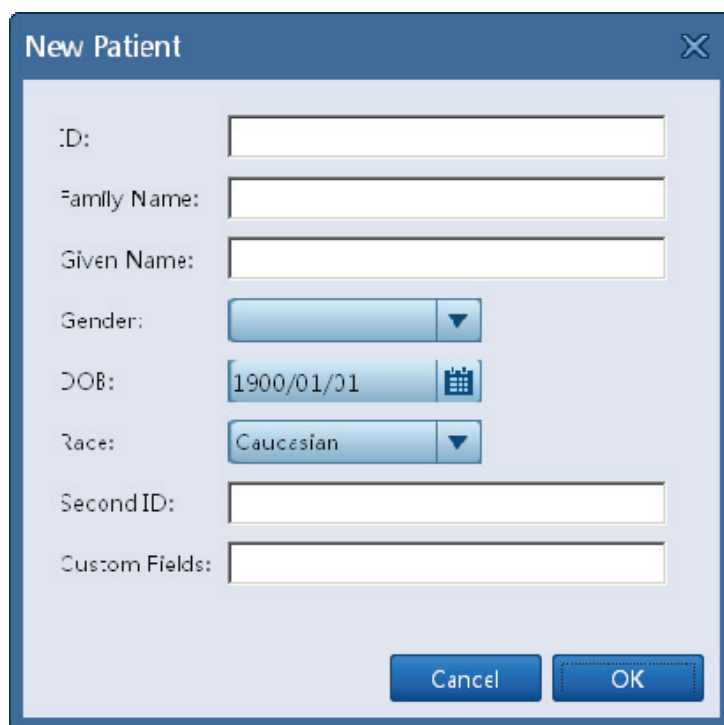
Add a patient manually through the following steps:

1. Enter the **[Patient Record]** interface.

When CardioVista starting, the default working interface is **[Patient Record]** interface.

If the current interface is **[View Report]**, click the **[Patient Record]** to enter the patient record interface.

2. Click **[Add]** in the patient record operating buttons area to access the following window.



- ◆ Where field **[ID]** is mandatory, and different IDs for different patients must be ensured.

Since different medical institutions have different **[ID]** management methods, please require the input of a correct and complete **[ID]** to ensure one-to-one correspondence between **[ID]** and patient.

3. Click **[OK]** to complete new patient creation.

4.3 Delete patient

Delete patient through the following steps:

1. Enter the [**Patient Record**] interface. As same as *4.1 Patient* Step 1.
2. Select one or multiple patients in the [**Patient Record**] area.

Press the [**Ctrl**] key on the keyboard and click on every line in the patient record for several times at the same time, or press and hold the [**Shift**] key on the keyboard and click on the starting line and ending line in the patient record at the same time to select multiple patients.

3. Click [**Delete**] in the patient record operating buttons area.

Perform 'Delete patient' operation after selected multiple patients, and CardioVista will delete selected patients one by one.

NOTE

-
- When deleting patient, the currently selected patient and all reports of this patient will be deleted and be unable to be restored.
-

4.4 Modify patient

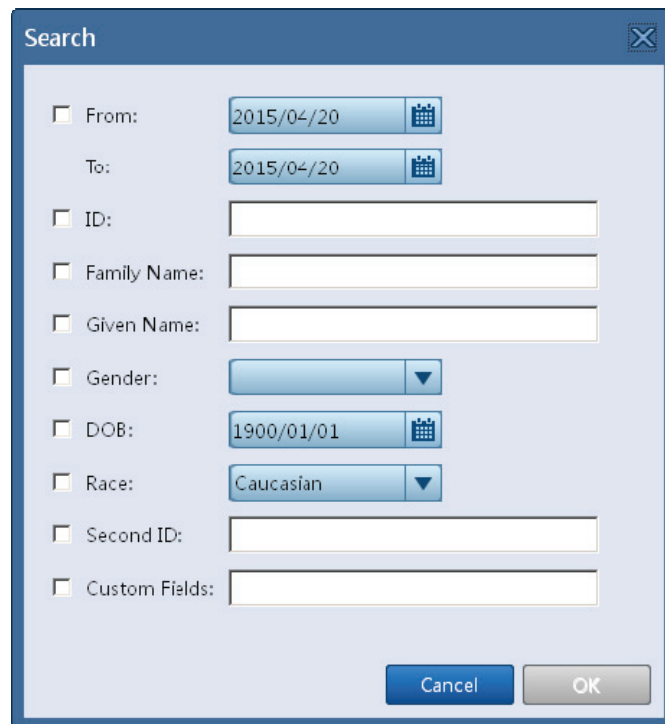
Modify patient through the following steps:

1. Enter the [**Patient Record**] interface. As same as *4.1 Patient* Step 1.
2. Select one patient in the patient record area.
3. Click [**Modify**] in the patient record operating buttons area.

4.5 Search patient

Search patient through the following steps:

1. Enter the [**Patient Record**] interface. As same as *4.1 Patient* Step 1.
2. Click [**Search**] in the patient record operating buttons area to access the following window.

A screenshot of a 'Search' dialog box with a blue title bar and a close button (X) in the top right corner. The dialog contains several search criteria, each with a checkbox and a corresponding input field. The criteria are: 'From:' with a date field set to '2015/04/20' and a calendar icon; 'To:' with a date field set to '2015/04/20' and a calendar icon; 'ID:' with a text input field; 'Family Name:' with a text input field; 'Given Name:' with a text input field; 'Gender:' with a dropdown menu; 'DOB:' with a date field set to '1900/01/01' and a calendar icon; 'Race:' with a dropdown menu set to 'Caucasian'; 'Second ID:' with a text input field; and 'Custom Fields:' with a text input field. At the bottom right, there are 'Cancel' and 'OK' buttons.

Select one or multiple criteria such as Starting/ending Date, ID, Name, Gender, Date of Birth, Race, Second ID and Custom Fields to search patients looked for. Select box(es) in front of search criterion (criteria) and click [**OK**] to start searching.

After searched patient, the [**Patient Record**] interface will show patients met search criteria.

Click [**All Patients**] in the patient record interface to refresh and show all patients in the database currently.

5 Managing Report

5.1 ECG Report List


The ECG report of the currently selected patient is shown in the [ECG Report] area of the [Patient Record] interface in the form of a list.

The ECG report is sorted according to [Acquisition Time] as a default, with the latest acquired report on the top. Reordering can be achieved by clicking list tiles in the [ECG Report]

Text in red represents that this report remains unread. Relevant text will be shown in black after the report is viewed.

5.1.1 Report Status

Description of report Status is as follows:

Type	Status	Description
Reviewed	Yes/ No	<p>Represents whether the patient report has been browsed. Text in red represents that this report remains unbrowsed. Relevant text will be shown in black after the report is browsed.</p> <p>The report status is [No] when imported from Electrocardiograph to CardioVista for the first time. For the way to browse reports, see 5.5 View Report.</p> <p>When patient demographics in the patient report is not consistent with that in CardioVista, the column [Reviewed] in the corresponding report will show [?]. Otherwise unshown.</p> <p>Modify the patient demographics in the patient report and in CardioVista as the same according to 5.6.1 Matching patient.</p>
Confirmed	Yes/ No	<p>Represents whether the patient report has been confirmed. The report status is [No] when imported from Electrocardiograph to CardioVista for the first time.</p> <p>In the report browsing interface, after patient report is browsed and analyzed and diagnostic results and diagnosis summary are added, click  and the report status can</p>

		be switched to [Yes] . For the way to browse reports, see 5.5 View Report . For the way to modify report diagnostic results, see 0 Modify diagnostic result.
Status 1	Unexported/ Exported	Represents whether the patient report has been exported. The report status is [Unexported] when imported from Electrocardiograph to CardioVista for the first time. For report exporting method, see 5.3 Export Report .
Status 2	Unmodify/Modified	Represents whether the patient report has been modified. The report status is [Unmodify] when imported from Electrocardiograph to CardioVista for the first time. For the way to modify ECG reports, see 5.6 Modify report .

5.2 Import Report

There are two ways to import patient reports:

- Automatically imported through network
- Batch import folders

5.2.1 Automatically imported through network

Import reports from Electrocardiograph through the following steps:

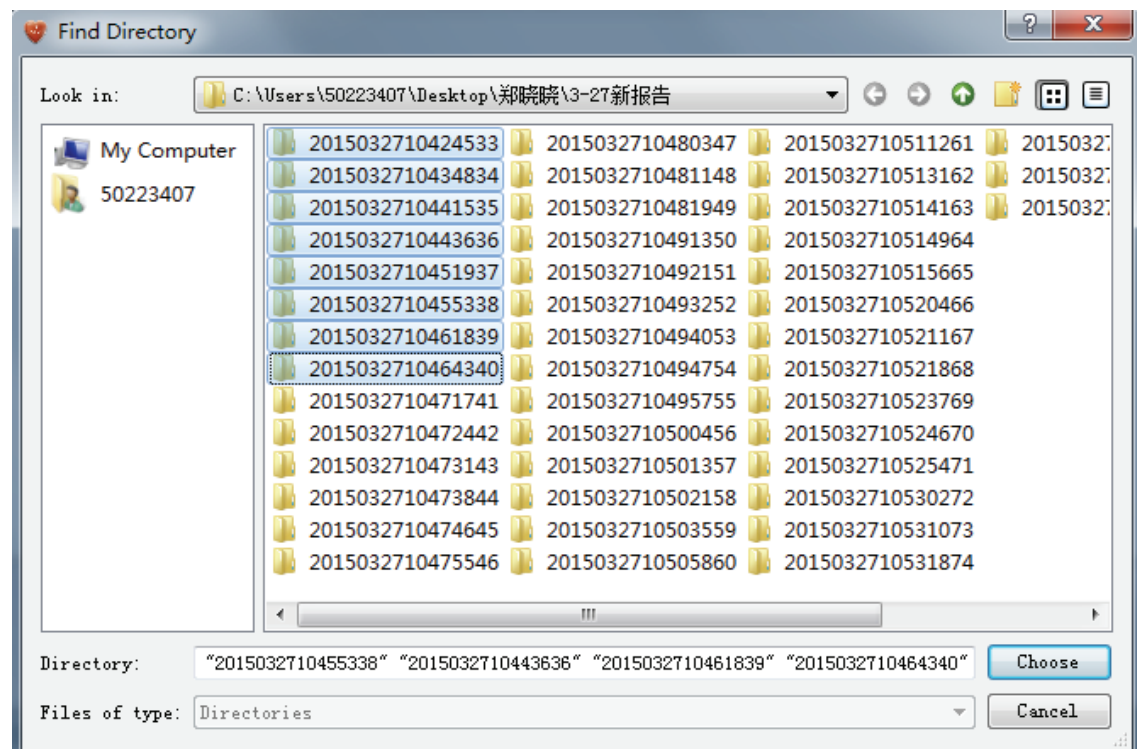
1. Set up network IP address and port number for CardioVista on the Electrocardiograph.
2. Confirm that the network connection between CardioVista and Electrocardiograph is normal.
3. Send patient report to CardioVista when completing ECG examination for patient or when browsing historical reports.

For details please refer to the Operator's manual of **BeneHeart R3/R3A/R12/R12A Electrocardiograph**.

5.2.2 Batch import folders

Batch import folders through the following steps:

1. Select [Actions] → [Import Report] → [Find Directory] to access the following window.



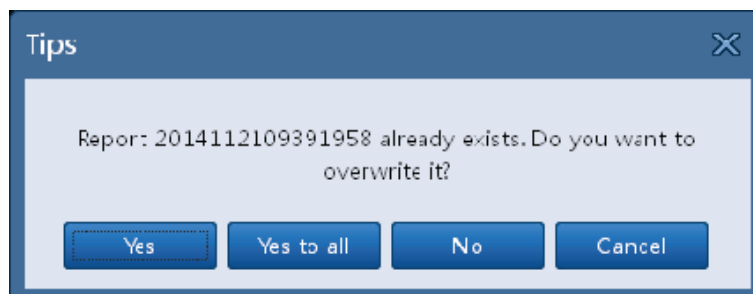
2. Find the directory or disk the patient reports of [Mindray] format located in, and select one or multiple directory(ies), then click the [Choose] button.


NOTES

- When importing patient reports, the format of reports should all be [Mindray], otherwise CardioVista may report Errors or even delete documents in wrong formats, causing data loss.
- When importing patient reports, CardioVista will only import patient reports under the current directory, patient reports or other documents under its subdirectory(ies) will be abandoned.

When importing patient data, the following situations may occur:

- When importing patient data, if the name of patient data document to be imported is the same as that of a document in the storage location, then prompt box as followed will pop up:



- ◆ If selecting [**Yes**], then rewrite original reports with new reports.
 - ◆ If selecting [**Yes to all**], then once patient reports with same name occur, rewrite them all with new reports.
 - ◆ If selecting [**No**], then continue to import reports other than this one.
 - ◆ If selecting [**Cancel**] or clicking the  button in the top right corner of the prompt box, then close the prompt box and stop importing patient reports.
- When copying documents, CardioVista does not support any other operation until the data import completed and interface operations are restored.
 - If the residual space is not enough during importing, the system will stop the report importing and an error prompt box will pop out. Re-import reports after deleting some patient reports and making enough residual space.

5.3 Export Report

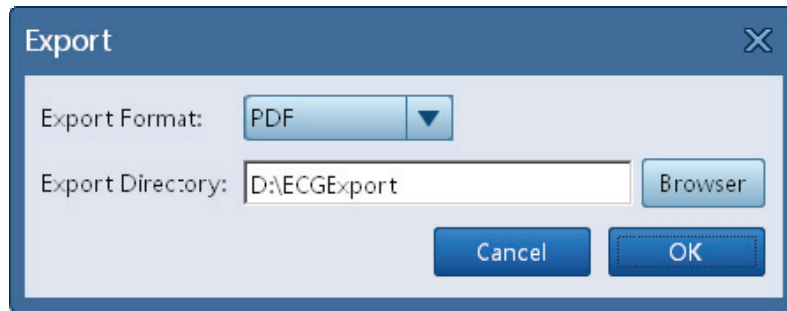
Patient reports can be backed up to other folders, other storage disks in the network, mobile storage media, etc. through report export, in this way patient reports for the long-term can be stored, and they can be imported again when needed for review.

Complete report export through the following steps:

1. Select the report to be exported

There are two ways to select the report to be exported:

- ◆ Select one or multiple ECG report(s) in the [**ECG Report**] of the [**Patient record**] interface.
 - ◆ In the [**View Report**] interface, default select the report browsed currently.
2. Select [**Action**] → [**Export Report**] to access the [**Export**] window.



3. Select format for documents to be exported.
There are three document formats, [**Mindray**], [**XML**] and [**PDF**] can be selected.
4. Click [**Browser**] to choose storage path.
5. Click [**OK**] to complete report export.

5.4 Delete report

Delete patient report through the following steps:

1. Enter the [**Patient Record**] interface. As same as *4.1 Patient* Step 1.
2. Select one or multiple patient report(s) in the [**ECG Report**] area.
Press the [**Ctrl**] key on the keyboard and click on every line in the [**ECG Report**] for several times at the same time, or press and hold the [**Shift**] key on the keyboard and click on the starting line and ending line in the [**ECG Report**] at the same time to select multiple patients.
3. Click [**Delete**] in the ECG report operating buttons area.
Perform delete ECG report operation after selected multiple reports, and CardioVista will delete selected reports one by one.

NOTE

-
- Deleted reports cannot be restored, so report export or data backup before deleting are recommended. For the report export method, please refer to *5.3 Export Report*, and for data backup method please refer to *6.2 Data Backup*.
-

5.5 View Report

5.5.1 Show/hide patient demographics

1. Select a patient report from the ECG report area.



2. Double-click the mouse or click the **[View Report]** to enter the report browsing interface.
3. Patient demographics is shown as default, and **[Patient Basic Information]**, **[Global Measurement]** and **[Diagnostic Result]** can be hidden by clicking **[HideInfo/ShowInfo]** button.
4. Restore **[Patient Basic Information]**, **[Global Measurement]** and **[Diagnostic Result]** display by clicking **[HideInfo/ShowInfo]** button.



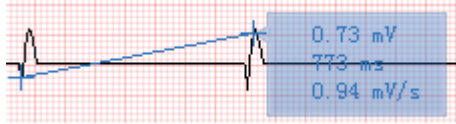






5.5.2 10's ECG

Browse 10's original ECG waveform through the following steps:

1. Select a patient report from the ECG report area
2. Double-click the mouse or click the **[View Report]** to enter the report browsing interface.
3. Select **[10's ECG]**.

5.5.2.1 Waveform browsing and analysis

Button	Function	Description
	Drag	Click the  button and move the cursor into the waveform area, move the mouse after pressing and holding the left key of the mouse to drag the ECG waveform to a suitable location for browsing and viewing.

	Measurement	<p>Add Measured Values</p> <p>Click the  button and move the cursor into the waveform area, left click the mouse at location 1, and left click the mouse again at location 2 again after moving the mouse, and the software will calculate the voltage difference value, time interval and slope between location 1 and location 2, and show calculated results near the location 2. As shown below:</p>  <p>Repeat operations above several times, and multiple sets of measured values between two locations can be shown.</p> <p>Clear Measured Values</p> <p>Right-click the mouse in the waveform area to delete all measured values, and the prompt box for measured values display will also disappear.</p> <p>NOTE</p> <hr/> <ul style="list-style-type: none"> ● The measured values above won't be stored permanently, and will be deleted when switching to browsing other patient's report or clicking the  button. <hr/>
	Copy	Copy all contents displayed in the ECG waveform area to the operating system clipboard, which can be pasted into other documents through the operating system command [Paste].
	Single-lead Mode	<p>Click the  button, the tool bar for different lead waveforms selection will pop out, and the user can select a waveform then click the  button to zoom in, or click the  button to zoom out.</p>

5.5.2.2 10's ECG Browsing and Analysis

Setting items	Option	Default	Description
ECG waveform format	3×4, 3×4+1, 3×4+3, 6×2, 6×2+1, 6×1, 3×1, 12×1	3×4+3	Select the waveform format shown in ECG waveform display area. [3×4+3]: 12 -lead ECG waveforms are arranged as 3 lines x 4 columns,

			<p>while the first rhythm lead waveform will be shown after these four waveforms.</p> <p>Other ECG waveform formats can be done in the same manner.</p>
Gain	2.5mm/mV, 5mm/mV, 10mm/mV, 20mm/mV, L=10 C=5, L=20 C=10	10mm/mV	<p>Select the gain for waveform display, i.e., the 1mV scale height of ECG waveform. The greater the gain, the greater the amplitude of the waveform, but the ECG signal strength is not influenced by gain settings.</p> <p>When L = 10 C = 5 is selected, the limb lead waveforms are drawn with the scale of 10mm/mv, and the precordial lead waveforms 5mm/mV.</p> <p>When L = 20 C = 10 is selected, the limb lead waveforms are drawn with the scale of 20 mm/mv, and the precordial lead waveforms 10 mm/mV.</p>
Wave speed	5mm/s, 12.5mm/s, 25mm/s, 50mm/s	25mm/s	Set the speed for waveform display
EMG filtering	150Hz, 20Hz filtering, 30Hz filtering	150Hz	<p>Set the frequency for EMG filter.</p> <p>Opening the EMG filtering can filter EMG interference, but may reduce band width and lead to shape changes to the ECG waveform.</p> <p>EMG filtering is lowpass filtering, and the signal with a frequency higher than the set value will be filtered out.</p> <p>When set as [35 Hz filtering], the system only show signals equal to or less than 35Hz, signals over 35Hz will be neglected.</p> <p>Other ECG filterings are done in the same manner.</p>
Lead switching	/	/	Display ECG waveforms of different leads in turn.

			<p>Only when the ECG waveform arrangement method set in the [Waveform Display Layout] cannot show ECG waveforms of all leads will the [Switch Lead] be shown.</p> <p>For example, there are 12 ECG waveforms in all, respectively I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, and V6. When the ECG waveform format is 6×1, only 6 ECG waveforms can be shown in the ECG waveform area, which are assumed as I, II, III, aVR, aVL, aVF; click the [Switch Lead] button to switch and show left 6 ECG waveforms, V1, V2, V3, V4, V5, V6.</p>
--	--	--	--

5.5.3 Average template

Browse the average template of patient report through the following steps:

1. Select a patient report from the ECG Report area.
2. Double-click the mouse or click the **[View Report]** button.
3. Select **[Average Beat]** → **[Average]**.

5.5.3.1 Waveform browsing and analysis

As same as *5.5.2.1 Waveform browsing and analysis*.

5.5.3.2 Average template browsing and analysis

Setting items	Option	Default	Description
Gain	2.5mm/mV, 5mm/mV, 10mm/mV, 20mm/mV, 40mm/mV	20mm/mV	Select the gain for average template display, i.e., the 1mV scale height of ECG waveform. The greater the gain, the greater the amplitude of the waveform, but the ECG signal strength is not influenced by gain settings.
Wave speed	25mm/s, 50mm/s	50mm/s	Set the speed for average template display.
Fiducial Point	Checked, unchecked	unchecked	When [Fiducial Point] is selected, fiducial points, including the starting point and ending point of the global P wave, starting point and ending point of the global QRS wave, and the ending point of the global T wave, are marked with dotted lines in the average waveform display area. If P wave is not detected, then the starting point and ending point of the global P wave will not be marked.

5.5.4 Measurement matrix

The measurement matrix gives out 32 measured values of each lead in the form of list, including:

Pon (ms), Pdur (ms), QRSon (ms), QRSdur (ms), Qdur (ms), Rdur (ms), Sdur (ms), R'dur (ms), S'dur (ms), P+dur(ms), QRSdef (ms), P+amp (μV), P-amp (μV), QRS_{p2p} (μV), Qamp (μV), Ramp (μV), Samp (μV), R'amp (μV), S'amp (μV), STamp (μV), 2/8STT (μV), 3/8STT (μV), T+amp (μV), T-amp (μV), QRSarea (μV*ms), Rnotch, DWconf (%), STslope (deg), Ton (ms), Tdur (ms), T+dur (ms), QTint (ms).

Browse the measurement matrix of patient report through the following steps:

1. Select a patient report from the ECG report area.
2. Double-click the mouse or click the [**View Report**].
3. Select [**Average Beat**] → [**Matrix**].

5.5.5 Report Comparison

The report comparison will show the same patient's examination reports of different times at the same time and contrast them for analysis to learn the development trend of the patient's condition.

Perform contrastive analysis of patient reports through the following steps:

1. Select a patient report from the ECG Report area.,
2. Double-click the mouse or click the **[View Report]**.
3. Select **[Comparison]**.

5.5.5.1 Add contrasted report

Click the **[Add Procedure]** button, and add different reports of the same patient into the current interface for contrast display.


In the **[Select Procedure]** popping out after clicking the **[Add Procedure]** button, click each line in the **[Select Procedure]** several times while pressing and holding the **[Ctrl]** key in the keyboard, or press and hold the **[Shift]** key on the keyboard and click on the starting line and ending line in the **[Select Procedure]** at the same time to select and add multiple contrasted reports.

A maximum of 5 contrasted reports can be added.

If the patient of the current report has no other contrasted reports that can be added, or the current contrasted report number has reached the upper limit of 5, then the **[Add Procedure]** button will be in the unavailable status.

5.5.5.2 Reduce contrasted report

After successfully adding contrasted reports, a gray rectangular block will also be added to the area in the left of the **[Add Procedure]** button, and the text in the rectangular block

shows the times of contrasted reports. Click the  button on the left of the rectangular block to delete the corresponding contrasted reports.

5.5.5.3 Waveform browsing and analysis

As same as *5.5.2.1 Waveform browsing and analysis*.

5.5.5.4 Report contrast browsing and analysis

Setting items	Option	Default	Description
Contrasted contents	ECG/Average	ECG waveform	Switch contents of contrast analysis.
Comparison method	Vertical/Horizontal	Vertical comparison	Set the location relationship for contrasted content display, When [Vertical Compare] is selected, all contrasted report contents are arranged from top to bottom. When [Horizontal Compare] is selected, all contrasted report contents are arranged from left to right.
Superposition method	No Overlaying/ Inner Report Overlaying / Reports Overlaying	No Overlaying	Set superposition method for average template. When [No Overlaying] is selected, the average templates of all contrasted reports will be arranged and shown according to the [Comparison Method]. When [Inner Report Overlaying] is selected, the templates of different leads in a report will be added together to display. When [Reports Overlaying] is selected, the average templates of same leads from different reports will be added together to display.
Gain	ECG: 2.5mm/mV, 5mm/mV, 10mm/mV, 20mm/mV, L=10 C=5, L=20 C=10 Average template: 2.5mm/mV, 5mm/mV, 10mm/mV, 20mm/mV, 40mm/mV	ECG: 10mm/mV Average template: 20mm/mV	Select the grain for waveform display, i.e., the 1mV scale height of ECG waveform. The greater the gain, the greater the amplitude of the waveform, but the ECG signal strength is not influenced by grain settings. When L=10 C=5 is selected, the limb lead waveforms are drawn with the scale of 10mm/mv, and the precordial lead waveforms 5mm/mV. When L=20 C=10 is selected, the limb lead waveforms are drawn with the scale of 20 mm/mv, and the precordial lead waveforms 10

			mm/mV.
Wave speed	ECG: 5mm/s, 12.5mm/s, 25mm/s, 50mm/s Average template: 25mm/s, 50mm/s	Origin waveform: 25mm/s Average template: 50mm/s	Set the speed for waveform display
Fiducial Point	Checked, Unchecked	Checked	When [Fiducial Point] is selected, fiducial points, including the starting point and ending point of the global P wave, starting point and ending point of the global QRS wave, and the ending point of the global T wave, are marked with dotted lines in the average waveform display area. If P wave is not detected, then the starting point and ending point of the global P wave will not be marked.

5.6 Modify report

5.6.1 Matching patient

CardioVista will automatically match the patient demographics extant in the software with the report ID in the imported report. If patient demographics in the patient report is not consistent with that in CardioVista, the column [**Read**] in the corresponding report will show [?].

Since patient demographics input on the Electrocardiograph is inconvenient, the patient report modification and patient demographics supplement can be done after the report is uploaded to CardioVista, even changing the patient the report belonged to.

There are four ways to modify the patient demographics of the report:

■ Drag

Select one or multiple report(s) in the ECG report area, then drag it to the line the corresponding patient located in the [**Patient Record**] to modify patient demographics of the report

■ Cover the report patient with local patient

1. Enter the [**Patient Record**] interface.
2. Select one patient report from the ECG Report area.
3. Click [**Modify**] to access the following window.

Where, **[Patient Demographics]** on the left is patient basic information in CardioVista, and **[Information From Current Report]** on the right is patient basic information in the patient report imported.

4. Click **[Copy]** to cover the information of **[Information From Current Report]** with the corresponding information listed in **[Patient Demographics]**.

■ Rewrite the report with another local patient

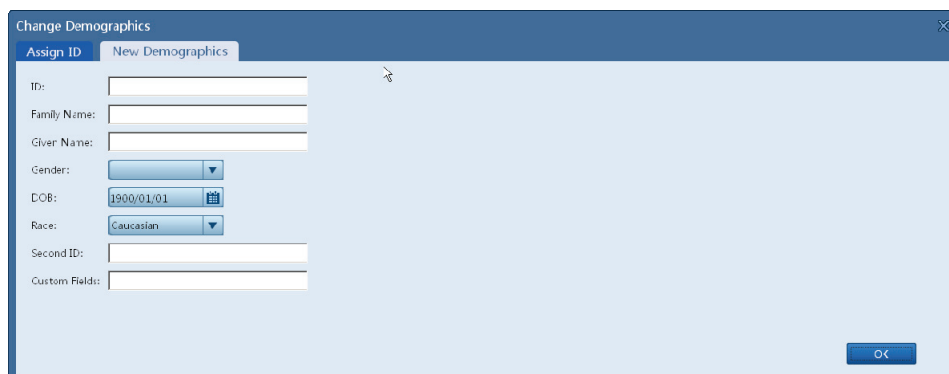
If the **[Patient demographics]** in **[Modify]** interface is not yet the corresponding information of the current report, click **[Change]** → **[Assign ID]** in **[Modify]** interface to re-select a patient, as shown below:

1. Patient List
2. Select Patient Demographics of the patient
3. Information from Current Report

Click **[Copy]** to rewrite the information of **[Information From Current Report]** with the corresponding information listed in **[Patient Demographics]**.

■ Create new patient to rewrite the report patient

If there is also no patient basic information corresponded to the current patient report in the patient list of [Assign ID], then click [New Demographics] to access the following window.



After correct patient basic information is input, click [OK], and CardioVista will create a new patient, while the patient demographics of this patient will rewrite that in the current report.

5.6.2 Modify patient basic information

Modify patient basic information through the following steps:

1. Select a patient report from the ECG Report area.
2. Double-click the mouse or click [View Report] to browse report details.
3. Select [10's ECG] or [Average Beat].

In the upper left area of the reporting browsing interface is the [Patient Basic Information] area, where corresponding information can be viewed or modified.

5.6.3 Modify global measurement

Modify global measurement values through the following steps:

1. Select a patient report from the ECG report area.
2. Double-click the mouse or click [View Report] to browse report details.
3. Select [10's ECG] or [Average Beat].

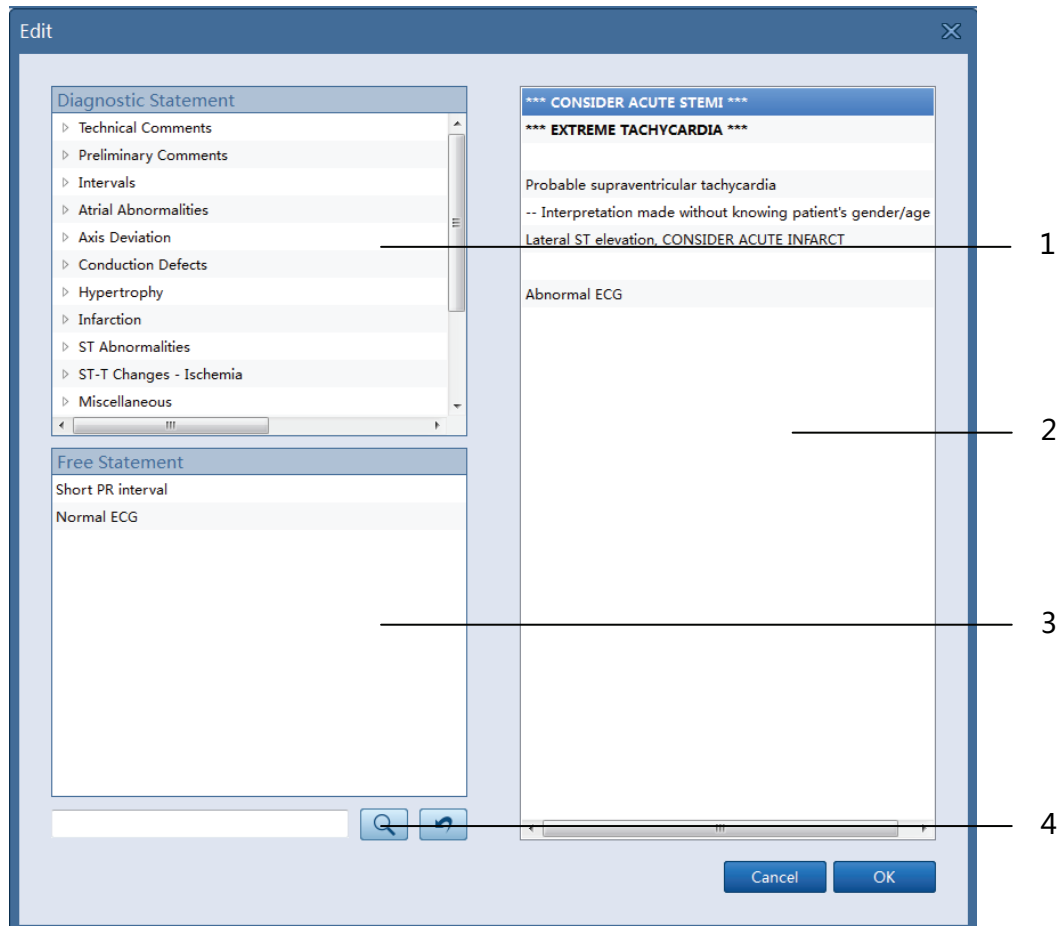
In the upper middle area of the reporting browsing interface is the [Global Measurement] area, where corresponding measured values can be viewed or modified.

5.6.4 Modify diagnostic result

Modify diagnostic result through the following steps:

1. Select a patient report from the ECG report area.
2. Double-click the mouse or click [View Report] to browse report details.

3. Select [10's ECG] or [Average Beat].
4. In the upper right area of the reporting browsing interface is the [Diagnostic Result] area, where current diagnostic result can be viewed.
5. Double-click the mouse in the Diagnostic Result area, and the following interface will pop out for modifying diagnostic results.



1. Diagnostic Statement list
2. Diagnostic result list
3. Free Statement list
4. Diagnostic statement search area

5.6.4.1 Diagnostic statement

Diagnostic statement refers to sentence template for assisting diagnostic result modification, including two kinds of diagnostic statements: diagnostic statement and free statements.

The [Diagnostic Statement] provides all factory default optional Diagnostic statement lists, to which it is not possible to add, delete or modify.

The **[Free Statement]** provides customized sentence templates, which can be added, deleted or modified based upon user needs.

■ Add

There are two ways to add diagnostic statements:

◆ Method 1

1. Right-click in the **[Free Statement]** and select **[Add]**, then a new editable line will be added in the **[Free Statement]** for text input.
2. Input customized Diagnostic statement template.
3. Input **[Enter]** key.

◆ Method 2:

1. Right-click in the **[Diagnostic Result]** and select **[Add]**, then a new editable line will be added in the **[Diagnostic Result]** for text input.
2. Input customized diagnostic results.
3. Input **[Enter]** key.
4. Select the new added customized diagnostic result in the **[Diagnostic Result]** and right-click, then select **[Save]**.

■ Delete

Delete diagnostic statements through the following steps:

1. Select a diagnostic statement from the **[Free Statement]**.
2. Right-click and select **[Delete]**.


■ Modification


Modify diagnostic statement through the following steps:

1. Select a Diagnostic statement from the **[Free Statement]**.
2. The currently selected diagnostic statement will be editable with a click.
3. Input new customized diagnostic statement template.
4. Input **[Enter]** key.

■ Search

Search diagnostic statements through the following steps:

1. Input search keywords in the edit box of **[Diagnostic statement search area]**.
2. Click the  button. At the moment only diagnostic statements containing keywords are shown in the **[Diagnostic Statement]** and **[Free Statement]**.

3. Click the  button, the [**Diagnostic Statement**] and the [**Free Statement**] will be restored to show all diagnostic statements.

5.6.4.2 Diagnostic Result

■ Add

There are two ways to add diagnostic result:

◆ Method 1

1. Select a line from the [**Diagnostic Result**], and select the inserting position for the new added diagnostic result.
2. Select a diagnostic statement from the [**Diagnostic Statement**] or [**Free Statement**].
3. Double-click the selected diagnostic statement to add it into the [**Diagnostic Result**].

◆ Method 2:

1. Select a line from the [**Diagnostic Result**], and select the inserting position for the new added diagnostic result.
2. Right-click and select [**Add**], then a new editable line will be added in the [**Diagnostic Result**] for text input.
3. Input customized diagnostic results.
4. Input [**Enter**] key.

■ Delete

Delete diagnostic statements through the following steps:

1. Select a diagnostic result from the [**Diagnostic Result**].
2. Right-click and select [**Delete**].

■ **Modification**

Modify diagnostic result through the following steps:


- 1 Select a diagnostic result from the [**Diagnostic Result**].
- 2 The currently selected diagnostic statement will be editable with double-click.
- 3 Input new diagnostic result.
- 4 Input [**Enter**] key.

NOTE

-
- **Diagnostic results selected from the [Diagnostic Statement List] and added into the [Diagnostic Result List] are not allowed to be modified.**
-

5.6.5 Confirm and save the modification

Confirm and save the modification through the following steps:


- 1 Select a patient report from the ECG report area in the [**Patient Record**] interface.
- 2 Double-click the mouse or click [**View Report**] to browse report details.
- 3 For patient report modification, please refer to chapters such as *5.6.2 Modify patient basic information*, *5.6.3 Modify global measurement*, *5.6.34 Modify global measurement*.
- 4 Click the  button to confirm and save the modification from Step 3.

NOTE

-
- **When browsing other reports or restarting CardioVista, the latest confirmed and saved data will be restored, and any information concerning modification performed after the latest data confirmation and saving will be lost. Please confirm and save your modification in time.**
-

5.6.6 Undo modification

Undo modifications through the following steps:

1. Select a patient report from the ECG report area in the [**Patient Record**] interface.
3. Double-click the mouse or click [**View report**] to browse report details.
4. For patient report modification, please refer to chapters such as *5.6.2Modify patient basic information*, *5.6.3Modify global measurement*, *0Modify diagnostic result*.
5. Click the  button to undo the modification from Step 3, and the patient report will be restored to the data confirmed and saved last time.

5.7 Print report

There are two ways to print reports:

- Quick print
- Common print

5.7.1 Quick print

Quickly print reports through the following steps:

1. Enter the [**Patient Record**] interface.
2. Select one or multiple patient report(s) in the ECG report area.

Press the [**Ctrl**] key on the keyboard and click on every line in the [**ECG Report**] for several times at the same time, or press the [**Shift**] key on the keyboard and click on the starting line and ending line in the [**ECG Report**] at the same time to select multiple reports.

3. Click [**Quick Print**].

Perform 'Quick print' operation after selecting multiple patient reports, and CardioVista will print out selected reports one by one.

5.7.2 Common Print

Common print reports through the following steps:

1. Select a patient report from the ECG report area.
2. Double-click the mouse or click the **[View Report]**.
3. Click **[Print]** to access the following window.

4. Click **[Print Preview]** to preview printing result in a WYSIWYG way, then click **[OK]** to start printing.

Instructions for use of each setting item in **[Print]** interface are as followed:

Setting items	Option	Default	Description
Report Format	Classic, RR Internal, Portrait, Handwriting	Classic	Select major content and layout style for printing. [RR Internal]: print measurement results related to RR internal in the measurement results area. [Portrait]: measurement results are printed below the ECG waveform. [Handwriting]: measurement results and diagnostic results are not printed out, and the blank area is reserved for manual filling.
ECG	3×4+1, 3×4+3,	Layout 1:	Select waveform format for report printing.

waveform format	6×2, 6×2+1, 12×1	3×4+3 Layout 2: 12×1 Layout 3: 6×2+1	<p>[3×4+1]: 12 -lead ECG waveforms are arranged as 3 lines x 4 columns, while the first rhythm lead waveform will be shown after these four waveforms.</p> <p>Other report formats are done in the same manner.</p> <p>Three formats at most can be selected for the current report, and multiple copies can be printed for each format.</p>
Rhythm lead	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6	Rhythm lead 1: II Rhythm lead 2: V2 Rhythm lead 3: V5	Select rhythm lead for printing.
Gain	2.5mm/mV, 5mm/mV, 10mm/mV, 20mm/mV	10mm/mV	Select the gain for waveform printing, i.e., the 1mV scale height of ECG waveform. The greater the gain, the greater the amplitude of the waveform, but the ECG signal strength is not influenced by gain settings.
Wave speed	25mm/s, 50mm/s	25mm/s	Set speed for waveform printing
Global measurement	Checked, Unchecked	Checked	Select if the printed report contains measurement results.
Diagnostic result	Checked, Unchecked	Checked	Select if the printed report contains diagnostic results.
Diagnosis summary	Checked, Unchecked	Checked	Select if the printed report contains diagnosis summary. Note: if [Diagnostic Result] is not checked, then the printed report will not contain diagnosis summary even if the [Diagnosis Summary] is checked.
RV5//SV1	Checked, Unchecked	Checked	Select if the printed report contains RV5//SV1
Fiducial Point marking	Checked, Unchecked	Checked	Select if the printed report contains fiducial point marking. Note: if [Average] is not checked, then the printed report will not contain fiducial

			point marking even if [Fiducial Point] is checked.
Average template	Checked, Unchecked	Unchecked	<p>Select if the printed report contains average template.</p> <p>The average template contains the average template waveform for each of the 12 leads and a complete II-lead waveform (10s).</p> <p>Average template</p> <p>Arranged according to the format 3x4+1.</p>
Measurement matrix	Checked, Unchecked	Unchecked	Select if the printed report contains measurement matrix.

FOR YOUR NOTES

6 Managing Data

6.1 Storage Management

6.1.1 Storage Path Setting

The storage path of ECG data can only be set during installation. For setting method, see *2.3Install CardioVista*.

To facilitate data management and sharing, the storage path can be set as local disk, removable disk or shared server on the LAN.

NOTE

- When uninstalling CardioVista, then uninstallation program will automatically delete the installation directory and all documents and folders under the directory. To avoid the loss of patient ECG data, please do not save ECG data under the installation directory of CardioVista.
-

6.1.2 Storage Space Management

Select [Actions] → [System Setting] → [Maintenance], to check the residual space of the disk partition the storage path is located in, and to set the space size for [Threshold].

If the residual space of the disk partition the data storage path is located in is less than that of the space warning, CardioVista will give the prompt [**There is insufficient space on this device.**]. To eliminate this prompt, the user can delete some patient reports or delete these patient reports after they are backed up to other storage media.

6.2 Data Backup

6.2.1 Manual Backup

1. Select [**Operation**] → [**System Setting**] → [**Maintenance**].
2. Set starting date, ending date and backup path for data backup.
3. Click the [**Start Backup**] button to start data backup, and set the time 00:00:00 of the starting date as the starting point, the time 24:00:00 of the ending date as the ending point, and backup all patient reports acquired during this period to the backup path.

6.2.2 Automatic backup

1. Select [**Operation**] → [**System Setting**] → [**Maintenance**].
2. Set data backup path.
3. Select [**Auto Backup**].
4. Set number of days for automatic backup.
5. Click the [**OK**] to make the setting effective.

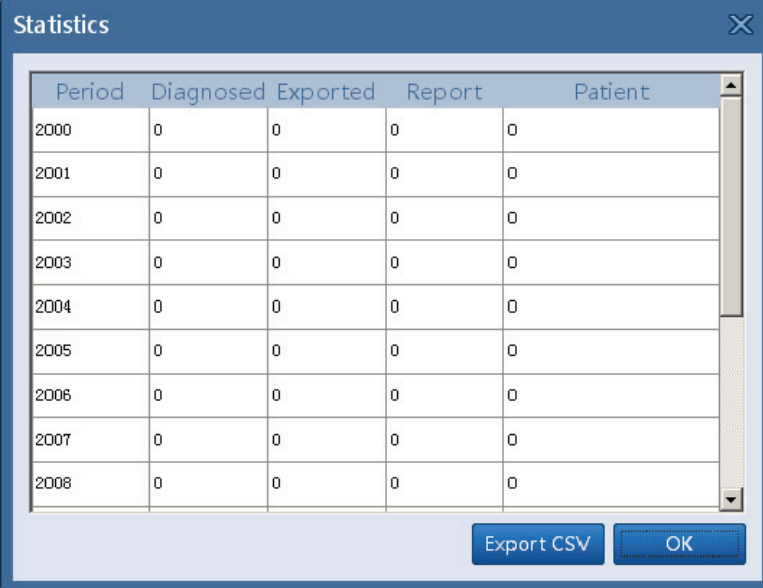
CardioVista will backup the latest patient reports to the set backup path automatically with fixed time cycle.

6.3 Data Recovery

1. Select [**Operation**] → [**System Settings**] → [**Maintenance**].
2. Set data recovery path.
3. Click the [**Start Recovery**] to recover all patient reports under the recovery path to the current database.

6.4 Data Statistics

1. Select [**Operation**] → [**System Setting**] → [**Maintenance**].
2. Set starting date, ending date and cycle for statistics for data backup.
3. Click the [**Statistics**] to perform statistic operation for patient reports between the starting date and ending date, with statistic results including total amount of ECG reports, amount of confirmed reports, amount of exported reports, and patient number.
As shown below:



Period	Diagnosed	Exported	Report	Patient
2000	0	0	0	0
2001	0	0	0	0
2002	0	0	0	0
2003	0	0	0	0
2004	0	0	0	0
2005	0	0	0	0
2006	0	0	0	0
2007	0	0	0	0
2008	0	0	0	0

Export CSV OK

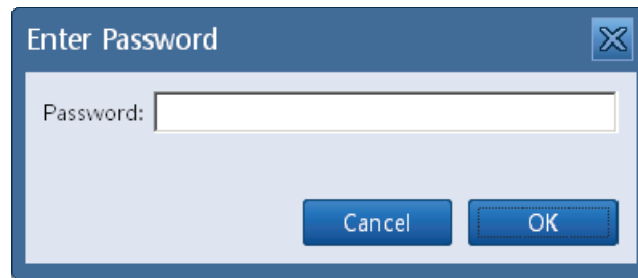
Click [**Export CSV**] to export the statistical report as a document in the csv format supported by Microsoft Excel for later use.

FOR YOUR NOTES

7 System Settings

7.1 Enter system settings

1. Select [**Operation**] → [**System Setting**], and enter the required password.



2. Click [**OK**] to enter [**System Setting**] window.

The initial password is: 888888.

Modify Password

1. Select [**Operation**] → [**System Setting**], and enter the required password.
2. Select [**Others**] in system setting interface.
3. Click [**Reset Password**] to modify the password for entering system settings.


NOTE

- Please keep in mind the new changed password, or else the System Setting interface cannot be entered.


7.2 Basic settings

Setting items	Option	Default	Description
Institution	/	/	Input name of medical institution, no more than 40 characters. This institution name is shown in the printed report.
Physician & technician	/	/	Manage physicians and technicians of medical institution. 100 physicians and 100 technicians at most can be added.
Patient information settings	Checked, Unchecked	Checked: ID, name, gender, age. Others are unchecked	Set items displayed in Patient Basic Information.
Lead order	Standard, Cabrera	Standard	Select display and recording orders for ECG waveform. The lead order of standard format ECG waveform is I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6. The lead order of Cabrera format ECG waveform is aVL, I, aVR, II, aVF, III, V1, V2, V3, V4, V5, V6.
QTc calculation formula	Hodges, Bazett, Fridericia, Framingham	Hodges	Select QTc calculation formula. Hodges: $QTc = QT + 1.75 \times (HeartRate - 60)$ Bazett: $QTc = QT \times \left(\frac{HeartRate}{60} \right)^{\frac{1}{2}}$ Fridericia: $QTc = QT \times \left(\frac{HeartRate}{60} \right)^{\frac{1}{3}}$ Framingham: $QTc = QT + 154 \times \left(1 - \frac{60}{HeartRate} \right)$

7.3 Print settings

Setting items	Option	Default	Description
UnAcknowledge Diagnose	/	The unconfirmed report needs to be confirmed by a doctor	<p>Set the text automatically added into diagnostic result when printing unconfirmed report.</p> <p>The patient report is in 'unconfirmed' status when imported for the first time.</p> <p>The status of this report can be set as 'confirmed' by clicking the  button in the Browsing patient Report interface.</p>
Paper size	A4, Letter	A4	<p>Set the paper type for report printing output.</p> <p>A4 paper: 295 mm × 210 mm</p> <p>Letter: 8.5"× 11"</p>
Grid	Checked, unchecked	Checked	<p>Select if the waveform area of the report printed out by an external printer contains background grid.</p> <p>If checked, then the background of the waveform area in the printed report is a grid.</p> <p>Background grid is helpful for reading.</p>
Color print	Checked, unchecked	Unchecked	<p>Select if the waveform area of the report printed out by an external printer is color-printed.</p> <p>The background color, grid color and waveform color of the waveform area can be set in [Other Settings].</p> <p>If color-printing is checked, then the printer connected must support color printing, otherwise the report output will still be in black and white.</p>

7.4 Export settings

Setting items	Option	Default	Description
Filename Settings	Checked, unchecked	Checked: examination date and time Other items are unchecked	<p>Set naming method for the document name automatically generated when exporting report.</p> <p>Check corresponding options and corresponding information will be added in to the name of exported document, or otherwise be un-added.</p> <p>If the exported document name is '99997_2015011911270900_1989-03-07_bb_男.pdf', then it represents the pdf document exported from the report of the examination of the patient with ID as 9997, birth date as '7th March, 1989', name as 'bbb', gender as 'male', which is done at "11:27:09 on January 19, 2015".</p> <p>Only when the format of the exported document is [PDF] or [XML] can the exported document name be named as the above method. When exporting patient reports in [Mindray] format, the document name will remain as before, with no need to rename.</p>
Default Directory	/	D:\ECGExport	Set the default path for exported document storage of automatic patient report export.
File format	Mindray, XML, PDF	PDF	Select the format of the exported document for patient report export.
Export when received	Checked, unchecked	Unchecked	If the setting option is checked, CardioVista will automatically export the received report after it is successfully received from the Electrocardiograph.
Export when confirmed	Checked, unchecked	Unchecked	<p>If the setting option is checked, the final report will be automatically exported when clicking the  button in the Patient Report Browsing interface.</p>

7.5 Data Maintenance

Setting items	Option	Default	Description
Space warning	/	200MB	<p>Set the size for the residual space warning of the database.</p> <p>If the residual space of the disk partition the data storage path is located in is less than that of space warning, CardioVista will display the prompt [There is insufficient space on this device.].</p> <p>To eliminate this prompt, you can delete some patient reports or delete these patient reports after backup.</p>
Automatic Backup	Checked, unchecked	Unchecked	Set whether the automatic backup function is to be enabled.
Automatic Backup Cycle	/	/	<p>Input automatic backup cycle.</p> <p>CardioVista will backup the latest patient reports to the set backup path automatically with fixed time cycle.</p>

7.6 Other Settings

Setting items	Option	Default	Description
Date format	Year-Month-Day, Month-Day-Year, Day-Month-Year	Year-Month-Day	Select date format used in CardioVista.
Time format	24 hours, 12 hours	24 hours	Select time format used in CardioVista.
Height	cm, inch	cm	Select unit for body height.
Weight	kg, lb	kg	Select unit for body weight.
Systolic pressure / diastolic pressure	mmHg, kPa	mmHg	Select the unit for systolic pressure / diastolic pressure.
Language	Simplified Chinese, English	English	Set language type for all text in CardioVista.
Background color	/	White	Set background color for ECG waveform drawing area.
Grid color	/	Red	Set background grid color for ECG waveform drawing area.
Trace color	/	Black	Set color for ECG waveform drawing.
Trace line	thin, middle, thick	thin	Set line type for ECG waveform drawing.

www.mindray.com

Customer Calling Center: 4007005652 (24H service hotline)

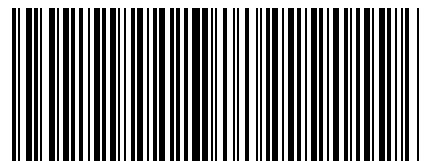
Shenzhen Mindray Bio-Medical Electronics Co., Ltd.

Mindray Building, Science South 12th Road, High Technology Industry Park, Nanshan District, Shenzhen

Zip code: 518057

Tel: +86 755 81888998

Fax: +86 755 26582680



046-007738-00(1.0)