User Manual

EDAN

Smart ECG Viewer

Data Management Software

Version 2.3

CE

About this Manual

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Statement

This manual will help you understand the operation and maintenance of the product better. It is reminded that the product shall be used strictly complying with this manual. User's operation failing to comply with this manual may result in malfunction or accident for which EDAN INSTRUMENTS, INC. (hereinafter called EDAN) cannot be held liable.

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The electrical installation of the relevant room complies with national standards, and

The instrument is used in accordance with the instructions for use.

Upon request, EDAN may provide, with compensation, necessary circuit diagrams, and other information to help qualified technician to maintain and repair some parts, which EDAN may define as user serviceable.

Terms Used in this Manual

This guide is designed to give key concepts on safety precautions.

WARNING

A **WARNING** label advises against certain actions or situations that could result in personal injury or death.

CAUTION

A **CAUTION** label advises against actions or situations that could damage equipment, produce inaccurate data, or invalidate a procedure.

NOTE

A **NOTE** provides useful information regarding a function or a procedure.

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Chapter 1 Safety Guidance

This chapter provides important safety information related to the use of Smart ECG Viewer.

1.1 Indications for Use/Intended Use

The Smart ECG Viewer Data Management Software is intended to store, display, analyze and manage ECG data on a PC. The software is only intended to be used in hospitals or healthcare facilities by doctors and trained healthcare professionals. Measurements and interpretive statements provided by the software are offered to clinicians on an advisory basis only.

WARNING

1. This system is not intended for home use.
2. This system is not intended for treatment or monitoring.
3. This system is intended for use on adult and pediatric patients only.

1.2 Warnings and Cautions

To use the system safely and effectively, firstly be familiar with the operation method of Windows and read the user manual in detail to be familiar with the proper operation method for the purpose of avoiding the possibility of system failure. The following warnings and cautions must be paid more attention to during the operation of the system.

1.2.1 General Warnings

WARNING

1. The system is intended to be used by qualified physicians or personnel professionally trained. They should be familiar with the contents of this user manual before operation.
2. Only qualified service engineers can install this equipment, and only service engineers authorized by the manufacturer can open the shell.
3. **EXPLOSION HAZARD** - Do not use the system in the presence of flammable anesthetic mixtures with oxygen or other flammable agents.
4. **SHOCK HAZARD** - Don't connect non-medical electrical equipment, which has been supplied as a part of the system, directly to the wall outlet when the non-medical equipment is intended to be supplied by a multiple portable socket-outlet with an isolation transformer.
5. **SHOCK HAZARD** - Don't connect electrical equipment, which has not been supplied as a part of the system, to the multiple portable socket-outlet supplying the system.
6. Any non-medical equipment (such as the external printer) is not allowed to be used within the patient vicinity (1.5m/6ft.).
7. Do not exceed the maximum permitted load when using the multiple portable socket-outlet(s) to supply the system.
8. Multiple portable socket-outlets shall not be placed on the floor.
9. Do not use the additional multiple portable socket-outlet or extension cord in the medical electrical system, unless it's specified as part of the system by manufacturer. And the multiple portable socket-outlets provided with the system shall only be used for supplying power to equipment which is intended to form part of the system.
10. All the accessories connected to system must be installed outside the patient vicinity, if they do not meet the requirement of IEC/EN 60601-1.
11. You should purchase computer, printer, and bar code reader from the manufacturer. Otherwise, the manufacturer will not be held responsible for the maintenance of the PC hardware, operating system and other accessories.
12. Safety checks should be performed at least every 12 months.

1.2.2 General Cautions

CAUTION

1. Avoid liquid splash and excessive temperature. The temperature must be kept between 5ºC and 40ºC during operation, and it should be kept between -20ºC and 55ºC during transportation and storage.
2. Do not use the equipment in a dusty environment with bad ventilation or in the presence of corrosive.
3. The device and accessories are to be disposed of according to local regulations after their useful lives. Alternatively, they can be returned to the dealer or the manufacturer for recycling or proper disposal. Batteries are hazardous waste. Do NOT dispose of them together with house-hold garbage. At the end of their lives hand the batteries over to the applicable collection points for the recycling of waste batteries. For more detailed information about recycling of this product or battery, please contact your local Civic Office, or the shop where you purchased the product.
4. Federal (U.S.) law restricts this device to sale by or on the order of a physician.

1.3 List of Symbols

No.	Symbol	Description
1		Caution
2		Consult Instructions for Use
3		Serial Number
4		Date of Manufacture
5		Manufacturer

6		Authorized Representative in the European Community
7		CE Mark
8	**Rx only (U.S.)**	Federal (U.S.) law restricts this device to sale by or on the order of a physician.
9		It indicates that the device should be sent to the special agencies according to local regulations for separate collection after its useful life.

Chapter 2 Introduction

The Smart ECG Viewer Data Management Software can store, display, analyze and manage ECG data on a PC. It is one of the accessorial software of the electrocardiograph.

The Smart ECG Viewer Data Management Software (hereinafter called Smart ECG Viewer) realizes many functions, including receiving, exporting and importing ECG data, managing order and patient information, displaying and measuring ECG waves, comparing ECG average templates and rhythm data, displaying and editing auto measurement parameters and auto diagnosis results, printing ECG reports, rebuilding and backing up database, creating DICOM/SCP/FDA-XML/PDF/JPG/BMP files and so on. Consequently, the time spent on reading curves can be shortened, and the doctors' workload can be reduced greatly. Besides, the system manages the ECG data by using the database, and supports the search and the review of the relative history data when necessary, which can assist doctors in making decisions.

NOTE: The pictures and windows in this manual are for reference only.

WARNING

1. Use a special grounded socket to get accurate voltage and current.
2. When using a laptop with a two-prong plug, please connect a grounded printer to avoid power interference.

2.1 Installing the Software

2.1.1 Requirements of the PC

CPU	Pentium P4, Celeron D 310 or above
System Memory (RAM)	512MB or above
Main Board	Recommend the main board of Intel chipset
Hard Disk	40G or above
Printer	ink jet printer of more than 300dpi or laser printer Recommend HP2035, HP2010, CANON iP1980
Display	17" TFT (Resolution: 1280*1024, 1366*768), 19" TFT (resolution: 1440×900), 21" TFT(1920*1080)
Operating System	Windows XP SP2/SP3 (32/64 bit), Windows 7 SP1 (32/64 bit) or Windows 8 (32/64 bit)

NOTE: Ensure that there is a graphic driver installed in the PC. Otherwise, the displayed ECG waves may be abnormal.

2.1.2 About Installation Window

Insert the installation CD into CD-ROM, double-click on **Setup.exe** and then follow the directions to finish the installation.

For details on installing the Smart ECG Viewer software, please refer to *Smart ECG Viewer Data Management Software Installation Guide*.

2.2 Features

Features of Data Input:

- Support receiving ECG data through the serial port or the net port
- Support importing files or folders from the hard disk of the PC or the U disk
- Support receiving ECG data from a maximum of 10 electrocardiographs simultaneously through the net

Features of Data Management:

- Supporting designating the current order information for the uploaded examination record during data receiving
- Support creating and editing order information
- Support searching for orders through patient ID, request No., exam room, etc
- Support matching examination records with the corresponding orders through patient ID, request No. and order index

Features of Data Management:

- Great capability of database for data storage and management, and more than 100 thousand examination records can be stored
- Support editing patient information and diagnosis results
- Support searching patient information through patient ID, name, time, etc

Features of Waveform Review and Analysis:

- Support viewing, magnifying and measuring ECG average templates
- Support displaying auto measurement results and diagnosis results
- Support viewing and editing rhythm waves
- Support comparing multiple examination records of a patient

Features of Data Output:

- Support customized display and print formats
- Support exporting ECG reports in DICOM/SCP/FDA-XML/PDF/JPG/BMP format

Chapter 3 ECG Analysis

In the patient record area on the **All List** screen, double-click on a record to enter the analysis screen.

The ECG analysis screen contains the resting ECG, rhythm ECG, and pharma study ECG.

On the analaysis screen, click **Edit** and you can modify patient information.

3.1 Wave Analysis

Click **Waveform** to enter the **Waveform** screen for resting ECG. On this screen, you can configure the paper speed, gain, display format, and display order.

Figure 3-1 Resting ECG–Waveform screen

1. Click **Comparison** to analyze the comparison results of the two sampled ECG records.
2. If you find the hand electrodes or chest electrodes have been placed incorrectly after ECG sampling, you can click **Inversion** to adjust the electrode settings and therefore avoid resampling.

3. Click **Re-analyze** and the system automatically reanalyze the ECG data in the last 10s.
4. The information displayed on the right panel includes measurement information, feature description and diagnosis result.
   - Measurement information: Parameter values can be input manually. If the value is beyond range, it will turn red automatically.
   - Shortcut Keyboard: Used for quick modification on feature description or diagnosis result.
   - Smart input: In the **Feature Description** or **Diagnosis Result** area, you can input only one letter and possible phrases will be provided.
   - Glossary: Click to open the **Glossary** window and you can edit feature description or diagnosis result.
   - History: Click on **History** and you can view all the history diagnosis records of the current patient.
   - OK: Click to confirm the diagnosis results of the current record. Once clicked, the status of the current record turns to **Confirmed**.
5. Right-click on the waveform area and a shortcut menu will be displayed. Options provided are **R-R (bpm)**, **R-R (ms)** and **Refilter**.

   Select **R-R (bpm)**/ **R-R (ms)** and related data will be displayed.

   Select **Refilter** and you can modify the parameter values in the **Refilter** window.
6. Double-click on the waveform area, you can view the magnified waveform around the click point on the magnified waveform screen.
   - Click on the lead symbol in the 1mV calibration mark and you can switch leads.
   - The inverted triangles correspond to R waves. Click on an inverted triangle, 5 mark lines will appear around the corresponding R wave and related R, QRS, PR, and QT/QTC information will be displayed. Right click and you can disable the mark lines.
   - On the magnified waveform screen, drag the mouse and an electronic measurement ruler (hereinafter called ruler) and corresponding measurement data will be displayed. You can move the ruler by pressing Up/Down/Left/Right arrow keys.

   NOTE: The mark line and ruler cannot be used at the same time, please right -click to disable either of them first. To enable it, right-click again.

3.2 Average Template

Click **Template** to enter the **Average Template** window for resting ECG. In this window, you can analyze the data of waveforms on the **Average Template**.

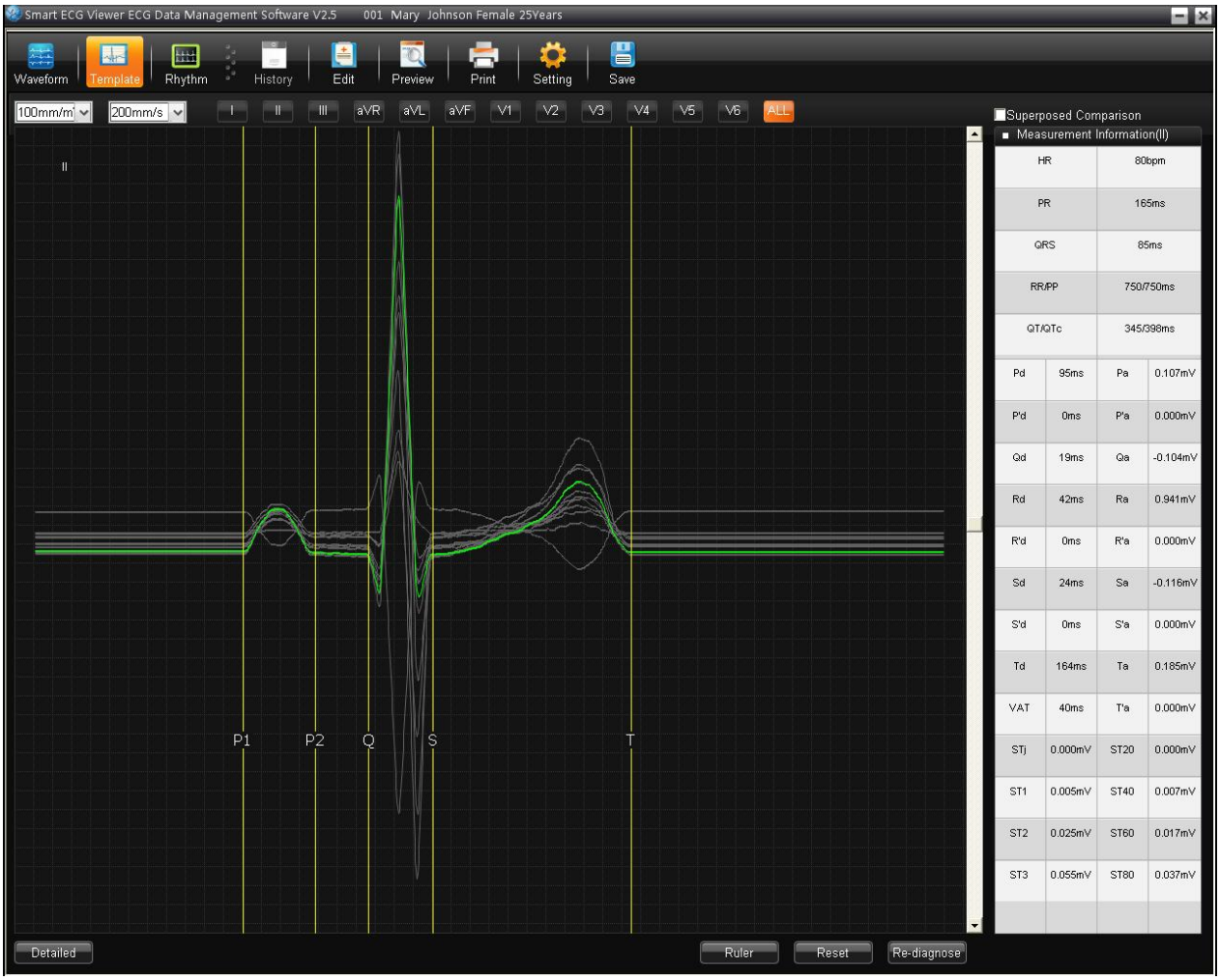


Figure 3-2 Resting ECG – Average Template window

- When you press **ALL**, magnified average templates of all leads will be overlapped with the same central axis.
- You can set the speed and the gain of average templates.
- You can drag marker lines of P1, P2, Q, S and T on average templates.

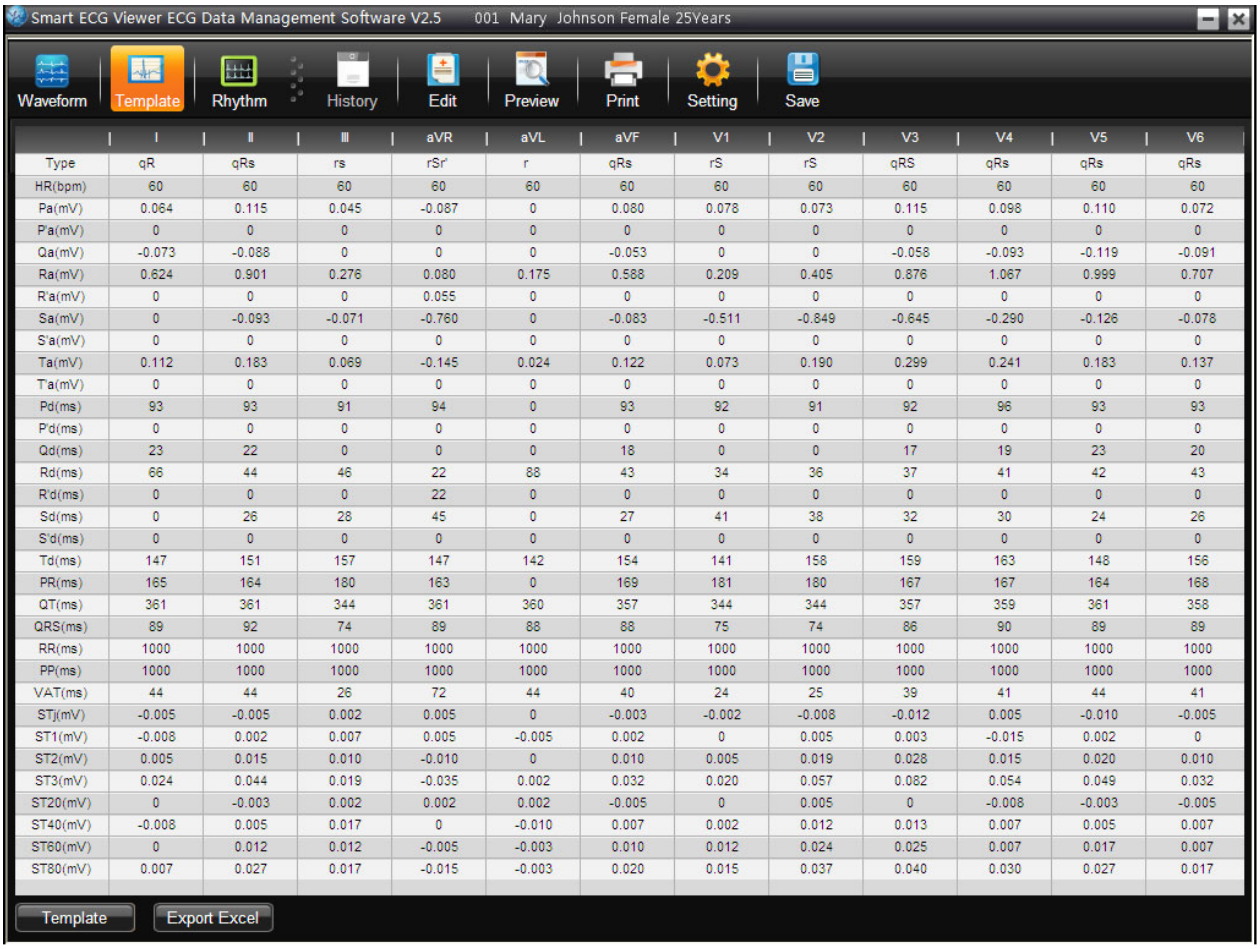
  P1 is the onset of P wave, P2 is the offset of P wave, Q marks the onset of the QRS wave, S marks the offset of the QRS wave, and T is the offset of the T wave. You can move these lines by dragging on the mouse and the corresponding parameter values will change. You can also use the arrows key on the keyboard to move these marks.
- Reset

  After you manually modify the position of a marker line, you can click **Reset** to restore it to the initial position. The ST and ST slope will be automatically updated at the same time.
- Re-diagnose

  After you manually modify the position of a marker line, the diagnosis result which is based on the marker line position and corresponding measurement information will not update automatically, you have to click **Re-diagnose** to update to update the diagnosis result.

3.3 About the Detail Information Window

On the **Average Template** window for resting ECG, click on **Detail Information** at the bottom left corner to enter the **Detail Information** screen.



	I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
Type	qR	qRs	rs	rSr'	r	qRs	rS	rS	qRS	qRs	qRs	qRs
HR(bpm)	60	60	60	60	60	60	60	60	60	60	60	60
Pa(mV)	0.064	0.115	0.045	-0.087	0	0.080	0.078	0.073	0.115	0.098	0.110	0.072
P'a(mV)	0	0	0	0	0	0	0	0	0	0	0	0
Qa(mV)	-0.073	-0.088	0	0	0	-0.053	0	0	-0.058	-0.093	-0.119	-0.091
Ra(mV)	0.624	0.901	0.276	0.080	0.175	0.588	0.209	0.405	0.876	1.067	0.999	0.707
R'a(mV)	0	0	0	0.055	0	0	0	0	0	0	0	0
Sa(mV)	0	-0.093	-0.071	-0.760	0	-0.083	-0.511	-0.849	-0.645	-0.290	-0.126	-0.078
S'a(mV)	0	0	0	0	0	0	0	0	0	0	0	0
Ta(mV)	0.112	0.183	0.069	-0.145	0.024	0.122	0.073	0.190	0.299	0.241	0.183	0.137
T'a(mV)	0	0	0	0	0	0	0	0	0	0	0	0
Pd(ms)	93	93	91	94	0	93	92	91	92	96	93	93
P'd(ms)	0	0	0	0	0	0	0	0	0	0	0	0
Qd(ms)	23	22	0	0	0	18	0	0	17	19	23	20
Rd(ms)	66	44	46	22	88	43	34	36	37	41	42	43
R'd(ms)	0	0	0	22	0	0	0	0	0	0	0	0
Sd(ms)	0	26	28	45	0	27	41	38	32	30	24	26
S'd(ms)	0	0	0	0	0	0	0	0	0	0	0	0
Td(ms)	147	151	157	147	142	154	141	158	159	163	148	156
PR(ms)	165	164	180	163	0	169	181	180	167	167	164	168
QT(ms)	361	361	344	361	360	357	344	344	357	359	361	358
QRS(ms)	89	92	74	89	88	88	75	74	86	90	89	89
RR(ms)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
PP(ms)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
VAT(ms)	44	44	26	72	44	40	24	25	39	41	44	41
STj(mV)	-0.005	-0.005	0.002	0.005	0	-0.003	-0.002	-0.008	-0.012	0.005	-0.010	-0.005
ST1(mV)	-0.008	0.002	0.007	0.005	-0.005	0.002	0	0.005	0.003	-0.015	0.002	0
ST2(mV)	0.005	0.015	0.010	-0.010	0	0.010	0.005	0.019	0.028	0.015	0.020	0.010
ST3(mV)	0.024	0.044	0.019	-0.035	0.002	0.032	0.020	0.057	0.082	0.054	0.049	0.032
ST20(mV)	0	-0.003	0.002	0.002	0.002	-0.005	0	0.005	0	-0.008	-0.003	-0.005
ST40(mV)	-0.008	0.005	0.017	0	-0.010	0.007	0.002	0.012	0.013	0.007	0.005	0.007
ST60(mV)	0	0.012	0.012	-0.005	-0.003	0.010	0.012	0.024	0.025	0.007	0.017	0.007
ST80(mV)	0.007	0.027	0.017	-0.015	-0.003	0.020	0.015	0.037	0.040	0.030	0.027	0.017

Figure 3-3 Resting ECG – Detail Information window

You can click **Export Excel** to export an Excel file.

3.4 About the Rhythm Wave Window

Click on **Rhythm** to enter the **Rhythm** screen. On this screen, you can view the rhythm waves.

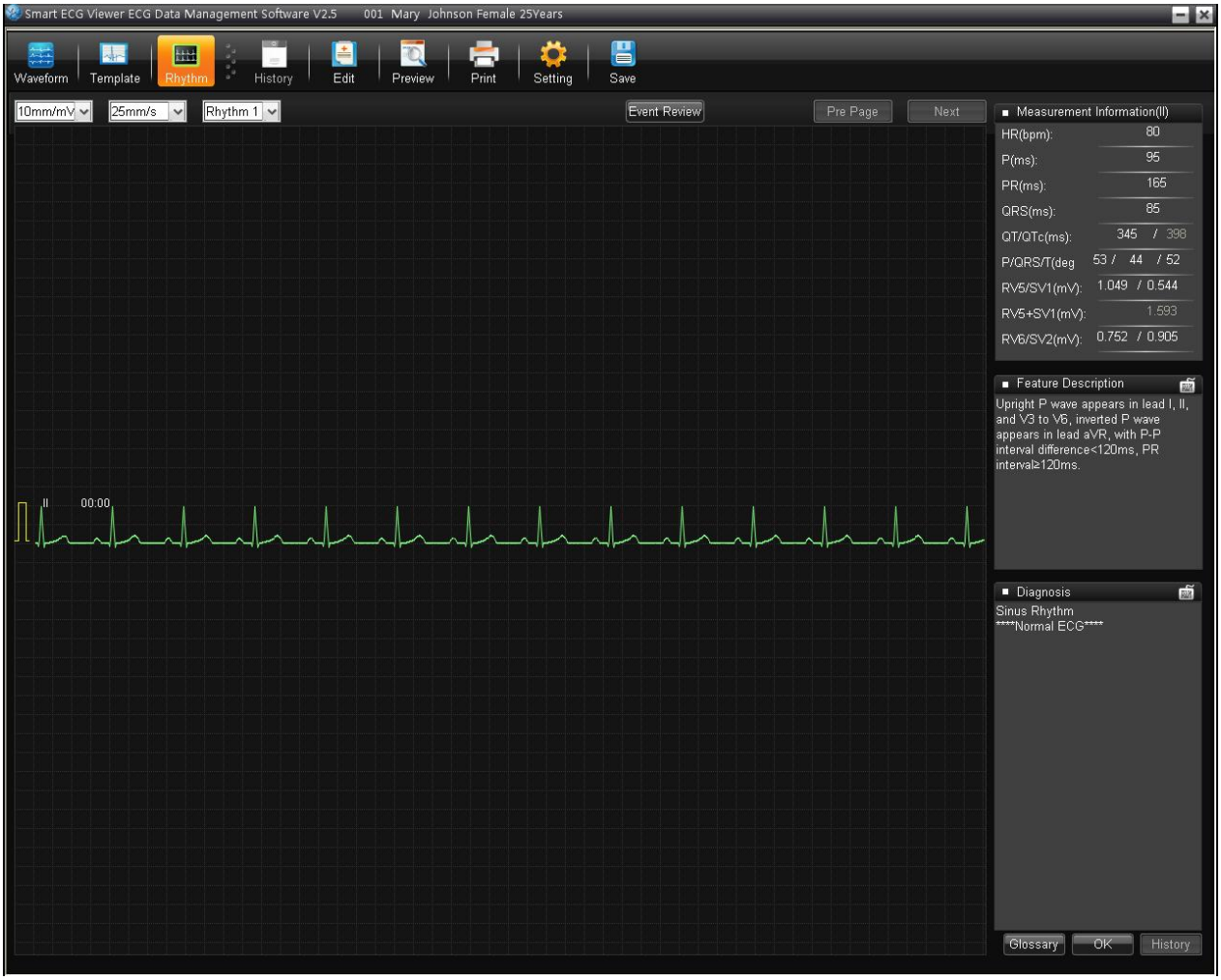


Figure 3-4 Resting ECG - Rhythm Wave Window

Event Review	Click to view the strips about arrhythmia and strips saved when marking an event.

3.5 History Record

On the analysis screen for resting ECG, click **History** and the **History Record** window will be displayed. You can view all the history records of the current user.

Information displayed on the History Record window includes **Exam. ID**, **Exam. Time**, **Exam. Type**, **Exam. Status,** and **Diagnosis Result**. Click on a record and you can view the related information on the analysis screen displayed.

3.6 About the Parameters

On the analysis screen for resting ECG, if you made any modifications to the parameters, click **Save** to save the modifications.

Common parameters used are listed in the following table:

Designation	Description
HR	Heart Rate
P	P-wave duration
PR	P-R interval
QRS	QRS complex duration
QT/QTc	Q-T interval/Corrected QT interval
P/QRS/T	The electric axis of P/QRS/T wave.
RV5/SV1	The amplitude of R wave of V5 lead/the amplitude of S wave of V1 lead
RV5+SV1	The amplitude of R wave of V5 lead plus the amplitude of S wave of V1 lead
RV6/SV2	The amplitude of R wave of V6 lead/the amplitude of S wave of V2 lead

3.7 Report Previewing

Click **Preview** on a screen and you can open the corresponding preview screen. The following operations can also be performed:

1. Click **Previous Page/Next Page** to move into the previous/next preview screen.
2. Click to zoom in/out the preview area.
3. Click **Print** to print a report using the default printer.
4. Click **Exit** to close the print preview screen and return to its upper-level screen.

3.8 Report Printing

Click **Print** on the ECG analysis screen or print preview screen, and the default printer will print the report.

For resting ECG, click on **Print** on the **Event Review** screen, only the ECG strip report will be printed. On other screens, the report configured in the settings window will be printed.

NOTE: The printer type is configured in the **Printers and Faxes** by the operating system. You can set **Print Setting** in **System Settings** to **Color**. However, if a black and white printer is used, only black and white reports can be printed.

3.9 Settings

3.9.1 Print Setup

Item	Description
Report Setting	You can configure the information to be displayed on the print preview screen and the report to be printed. The options provided are: **Normal ECG Report**, **Detailed Report**, **Template Report**, and **Rhythm Wave Report**. If **Template Report** is selected, the **Feature Point Location** option will be displayed. When Feature Point Location is selected, 5 measurement lines will appear on the average template waveforms. However, this only applies to the average template report for resting ECG.
Current Template	Three templates are provided by default and cannot be deleted. However, you can edit the default templates and save them as new templates.
Rhythm Lead	You can set **Rhythm 1**, **Rhythm 2**, and **Rhythm 3** to any one of the leads in the current lead mode.
Wave Width, Grid Width	• You can set **grid (1mm)** and **grid (5mm)**to 1, 2, 3, 4, 5, or No respectively. A larger value means that the grid printed is wider. When **No** is selected, no grid will be printed. • The wave width can be set to 1, 2, 3, 4, or 5. A larger value means that the waveforms printed are wider. **NOTE**: This parameter affects the printing only, the waveforms displayed on the screen remains the same.

Print Setting

- **Sequence** can be set to **sequential** or **synchronous.**
  - If **sequential** is selected, the lead group will be sampled group by group.
  - If **synchronous** is selected, all the leads will be sampled at the same time.
- **Paper Orientation** can be set to **Landscape** or **Portrait**.
- **Paper Size** can be set to **A4** or **Letter.**
- **Baseline Adjustment** can be set to **OFF**, **Auto**, or **Horizontal**.
  - If it is set to **Horizontal**, the baseline for leads on the same level is in the same line.
  - If it is set to **Auto**, the system automatically adjusts the baseline for each lead group.
  - If it is set to **OFF**, the system adjusts the baseline for each lead group to an average value.
- If Auto Gain Control (AGC**)** is selected, the gain will be adjusted automatically, and the **Baseline Adjustment** is set to **Horizontal** automatically.
- If the printing color is set to color, the background grid will be printed in color.

  NOTE: If the printing color is set to color, but a black-and-white printer is used, the report printed will be illegible.
- If **Print after diagnosis** is selected, the system automatically prints the report after the diagnosis is complete.

3.9.2 Function/Algorithm Setup

Click on **Setting** on the resting ECG sampling screen, and the **System Setting** window will be displayed. In the **System Setting** window, click **Function/Algorithm Setting** to enter the **Function/Algorithm Setting** screen.

Parameter	Description
Parameter Setting	• **Axis Calculation Method** can be set to **Area Method** or **Amplitude Method**. • **Tachycardia Criterion (greater than)**: Manual input, default: **100 bpm**. When the patient's heart rate exceeds the Tachycardia Criterion, a Tachycardia hint will appear in the diagnosis result, and the HR information will be stressed with red. • **Bradycardia Criterion (less than)** : Manual input, default: **60 bpm**
ECG key	Options provided are **Start** and **Forbidden.** When **Start** is selected, the ECG key on the DE15 sampling box functions as the **Start** button on the ECG sampling Screen. When **Forbidden** is selected, there will be no response when pressing the ECG key.

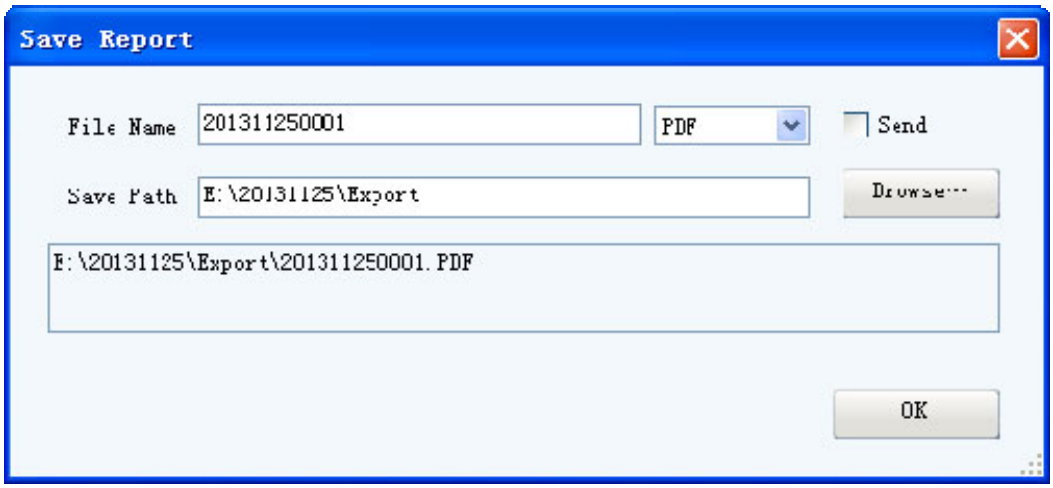
3.9.3 Other Setup

Click on **Setting** on the resting ECG sampling screen, and the **System Setting** window will be displayed. In the **System Setting** window, click **Others** to enter the **Others** screen.

Item	Description
Display	• When **Anti-aliasing** is selected, the waveforms displayed or printed will be smoother. • When **1mV marker** is enabled, the 1mV calibration mark will be displayed at the start of a line of waveforms in the sampling screen or analysis screen. • **Grid View** can be set to: ➢ **5mm**: Only the 5mm grid is dispplayed on the waveform screens. The 1mm grid will not be displayed. ➢ **1mm**: Both 5mm grid and 1mm grid will be displayed on the waveform screens. ➢ **1s/1mV**: On the waveform screens, 1s is regarded as a grid (5mm) horizontally, and 1mV is regarded as a grid (5mm) vertically. ➢ **No**: No grid will be displayed on the waveform screens. • **Arrhythmia hint**, can be set to **On** or **OFF**. If it is set to **On**, when arrhthmia data is sampled during the sampling process, the system will highlight the related waveforms and provides the arrhthmia type.
Printer type	You can select a type of printers in the operating system.
Comment when marking an event	When this function is selected, you can add a mark on an event.

3.10 Saving ECG Reports

You can click on the **Report Save** button to save ECG reports.



The report format includes **PDF**, **WORD**, **JPG** and **BMP**. Click on the **Browse** button to choose the save path and click on **OK** to save the sampled data to the designated directory. During the saving course, the system will give the hint information.

If you select **Send**, the sampled data will be sent by Window Live Mail (Windows 7/Vista) when it is saved to the designated directory. During the saving and sending course, the system will give the hint information.

NOTE: In Windows 7/Vista, only if Window Live Mail is installed, can the report be sent by Email.

Chapter 4 Archives

4.1 All List

Click **Archives** and then click **All List**, the following window will be displayed:

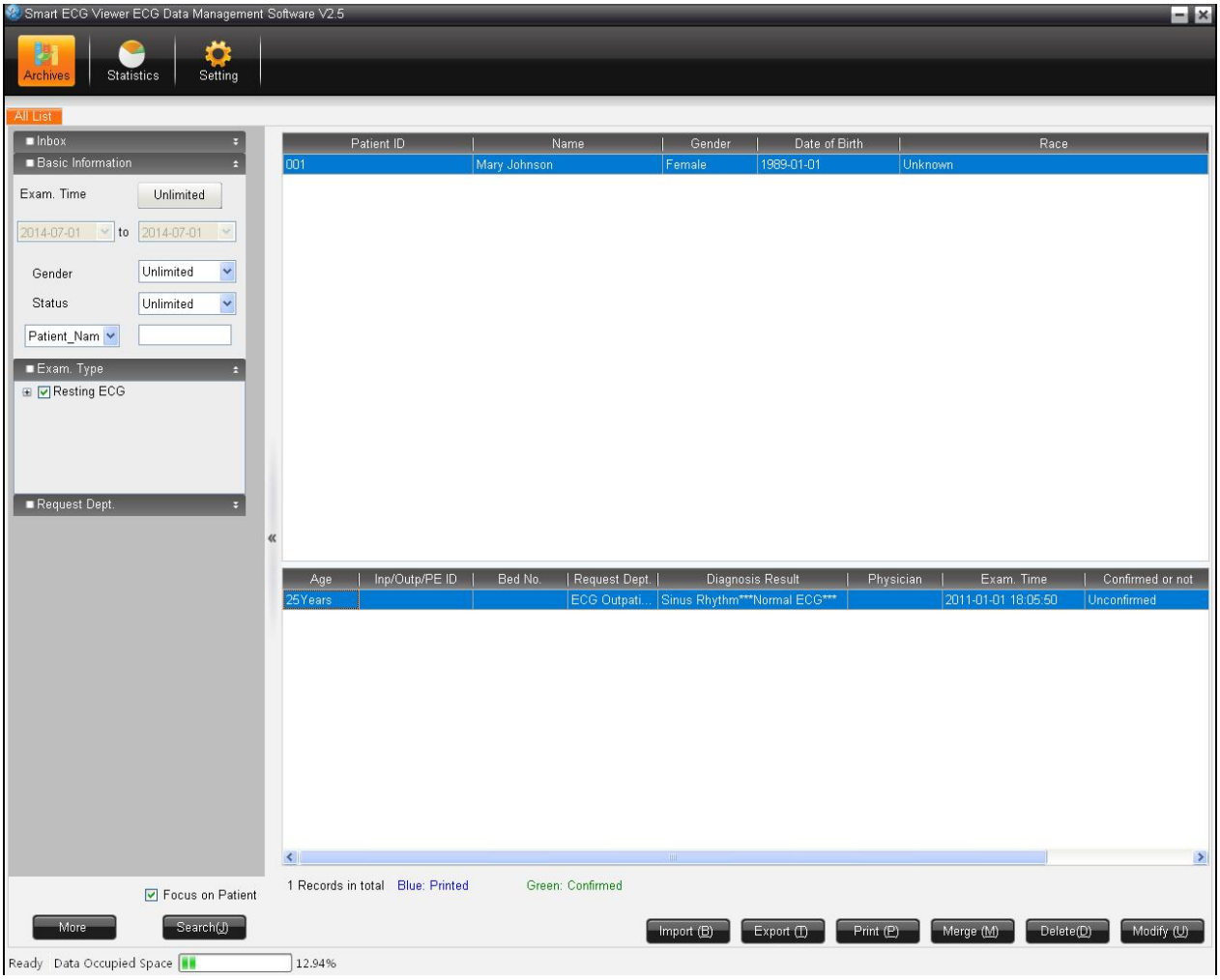


Figure 4-1 Archives window

4.1.1 Record Display

The **All List** screen can be displayed in two ways: focus on examination and focus on patient, which can be configured by selecting or deselecting **Focus on patient**.

4.1.2 Modifying Patient Information

Select a patient record in the patient list and click **Modify**, the **Modify** window will be displayed. In the displayed window, you can modify the patient information. In this case, modifications are made to all the patient's examination records at the same time.

Select an examination record in the examination record list and click **Modify**, the **Modify** window will be displayed. In the displayed window, you can modify the patient information. In this case, the modifications are made only to the current examination record and other examination records remain the same.

4.1.3 Viewing Examination Records

Double-click on an examination record in the examination record list to open the ECG analysis screen.

You can determine whether the examination record is confirmed by the doctor by checking the examination status in the examination record list.

Unconfirmed:

The physician has not confirmed the diagnosis result, that is, the physician did not click on **OK** on the analysis screen to confirm the diagnosis result.

Confirmed:

The physician has confirmed the diagnosis result, that is, the physician has clicked on **OK** on the analysis screen to confirm the diagnosis result.

4.1.4 Deleting Examination Records

NOTE: Data cannot be recovered after being deleted. Be careful when deleting examination records.

Select one or multiple patient records in the patient list and click **Delete** to delete the selected patient records.

Select one or multiple examination records in the examination record list and click **Delete** to delete the selected examination records.

4.1.5 Merging Examination Records

Select one or multiple examination records in the examination record list and click **Merge**, the **Modify** window will be displayed. In the displayed window, fill out the patient ID and click **OK**, the selected examination records will be allocated to the patient.

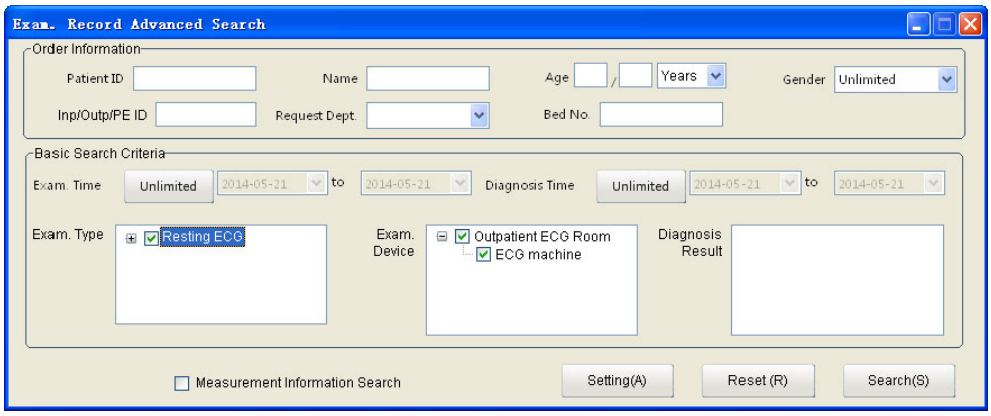
4.1.6 Searching Patient Records

4.1.6.1 Searching Examination Records

Configure the search criteria and click **Search**, all the examination records which meet the search criteria will be displayed on the **Archives** screen.

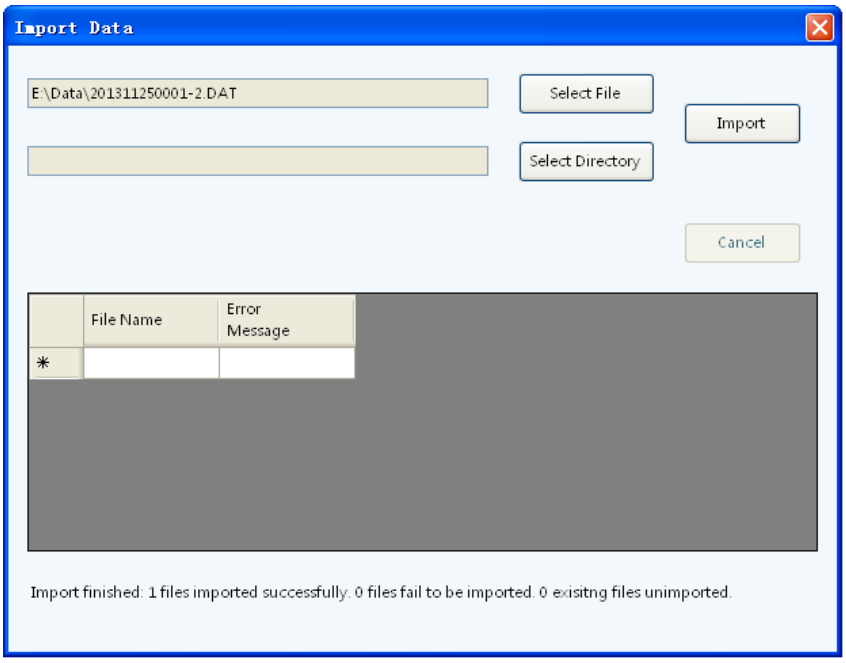
4.1.6.2 Advanced Search

Click **More** and the **Exam. Record Advanced Search** window will be displayed as follows:



4.1.7 Import

Click **Select File**, select the right directory and the patient data to be imported, and click **Import** to import the patient data to the **Archives** screen.



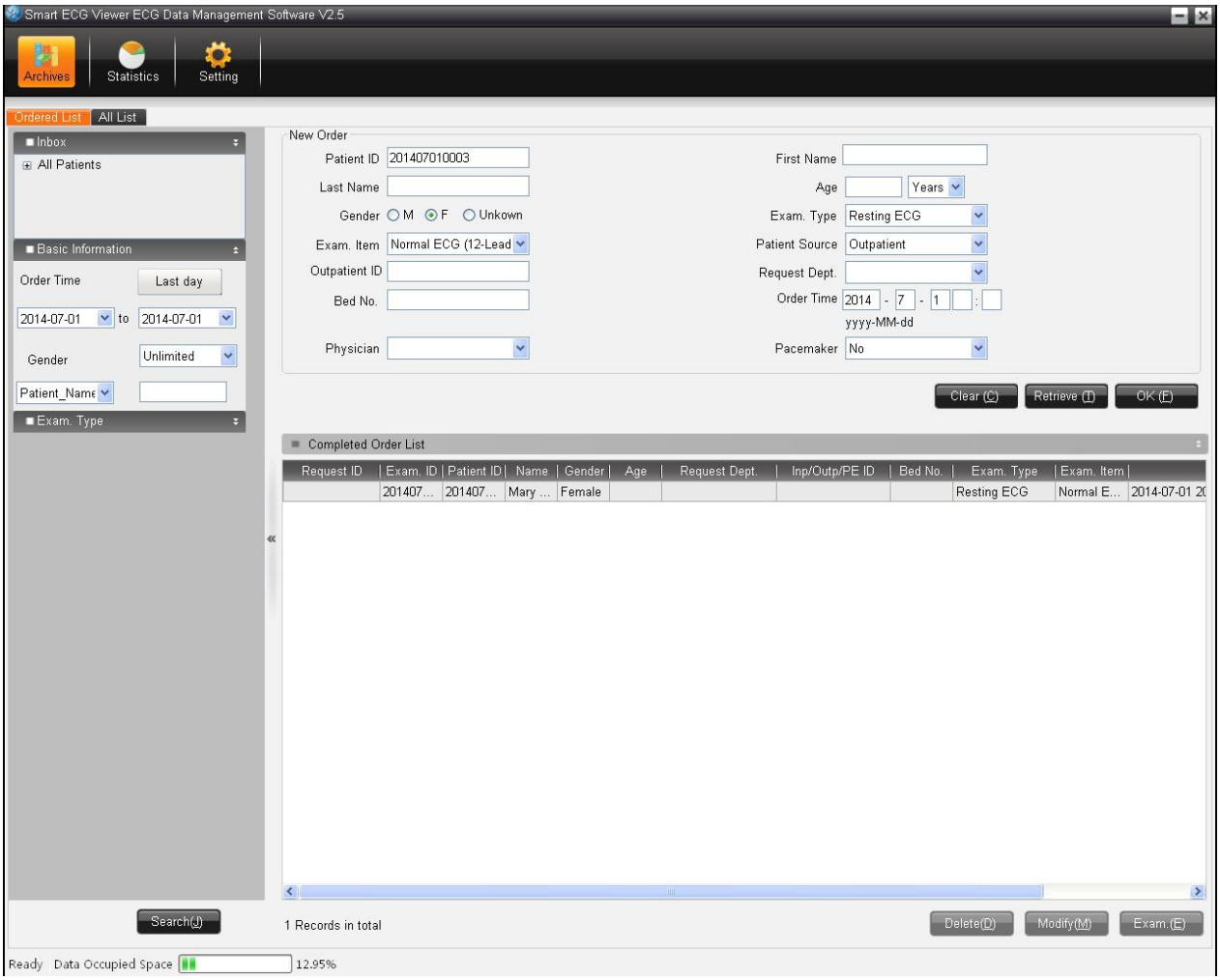
NOTE: Only ECG data in DAT format can be imported.

4.1.8 Export

On the **Archives** screen, click **Export** and select the file format (SCP, FDA-XML, DICOM, and DAT) and directory, and then click **OK** to export the patient data to the specified directory.

4.2 Completed Order List

Choose **System Setting** > **Basic Setting**, select **Display Completed Order List**, and restart the system, the **Completed Order List** will be displayed in the **Archives** screen.



4.2.1 New Order

Fill out the patient information based on the patient and click **OK**. If the order is successful, the patient record will be displayed in the **Order List** below.

4.2.2 Inbox

In the inbox, the doctor can quickly locate all the orders that are related to him/her.

4.2.3 Searching Information

After configuring the search criteria, click **Search** and all the related order information will be displayed on the right.

Chapter 5 Statistics

On the toolbar of the main screen, click **Statistics** to enter the **Statistics** window.

The **Statistics** window contains the following categories: Examination Department Workload Count, Request Department Workload Count, Ref-Physician Count, Staff Workload Count, Operating Device Count, Cost Count, and Measurement Analysis Count. You can calculate the workload of the department, staff and operating devices, and calculate the cost of each department or doctors, and calculate the patient data. Click **Export Excel** and the calculation results will be exported as an Excel file.

NOTE: The exam records disabled and deleted will not be calculated to workload.

1. Statistic criteria

   If you want to select a department, tick it in the checkbox before it.

   Appoint exam date: You can specify a time range by clicking **Assign** and choose a time.

   Or, you can choose the starting date and the ending date in the time selection region.

   The default time is Last month.

   On the **Measurement Analysis Count** screen, after configuring the statistic criteria about examination time, HR, PR interval, QRS duration, diagnosis result, etc, on the left area of the window, you can calculate the cost of each examination room, department, technician or ref-physician. Click **Export Excel** and the calculation results will be exported as an Excel file. If you want to cancel the configured conditions, select the condition to be canceled, and press **Delete**.

2. Statistic results

After configuring the statistic criteria, click **Statistics** and the results will be displayed in the list.

Right-click on the title of the Result List, and you can set the item to be displayed or hidden by the pop-up menu. The item with a tick on the left will be displayed. Cancel the tick and the item will not be displayed.

You can change the item sequence by dragging the item to the place you want.

Next time you log on to the system, you will find the item sequence is the same as you set last time.

Chapter 6 System Setup

Click on the **System Setting** button on the main screen to open the **System Setting** window.

There are eight tabs in the **System Setting** window: Basic Information, Display Setting, Transmission Setting, File Output Setting, GDT Setting, DicomWorklist Setting, Barcode Setting, and Other Setting.

After you modify some information in the **System Setting** window, you can click on **OK** to save these modifications and exit or click on **Cancel** to cancel these modifications and exit.

6.1 Basic Setup

6.1.1 Basic Information

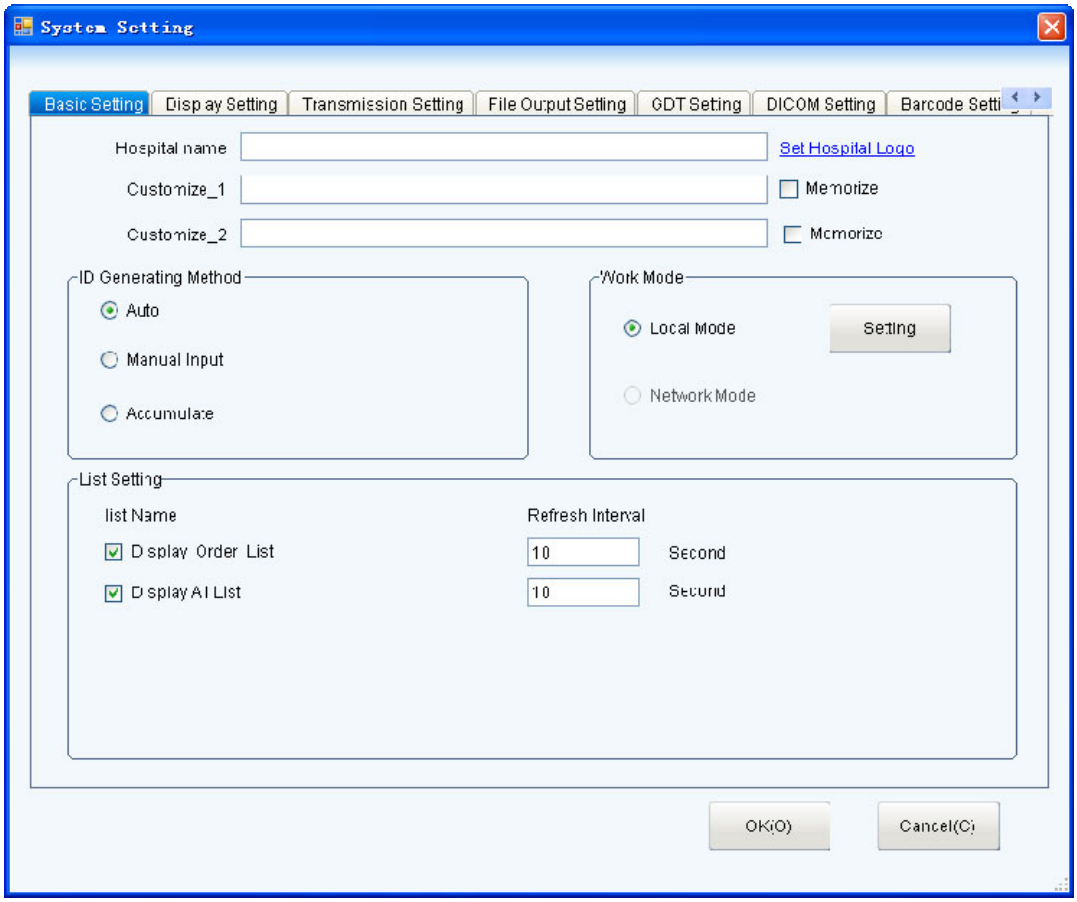


Figure 6-1 Basic Information setup window

Item	Description
Hospital Name and Logo	Enter a hospital name in the Hospital Name textbox and it will be printed on the report.

	Click **Set Hospital Logo** and you can upload the hospital's logo.
User-Defined 1/2	When you fill in the **User-Defined 1/2** textbox, the corresponding items in the **Modify** window will change into what is filled.
Memory	Select **Memory** in **Basic Information** window, the content of **User-Defined 1** in the **Modify** window will be saved If **Memory** is not selected, the content of **User-Defined 1** in the **Modify** window will be empty.
Patient ID Generating Method	When the generating method is set to **Auto**, the patient ID can be automatically generated according to the examination date. When the generating method is set to **Manual Input**, you should enter the patient ID manually in the **Modify** window. When the generating method is set to **Accumulate**, the patient ID can be increased by one automatically. You need to set the format and the starting number for ID.
Display Ordered List	When selected, the **Ordered List** will be displayed on the **Archives** screen.
Refresh Interval	The refresh interval can be configured between 5 and 600s.
Work Mode	The Work Mode can be set to **Local Mode** or **Network Mode**.

6.1.2 Work Mode

The work mode of the Smart ECG Viewer software includes the local mode and network mode.

Select **Local Mode** in the **Basic Information** window and click **Setting**, a window will be displayed. In the displayed window, you can configure the window based on the actual requirements.

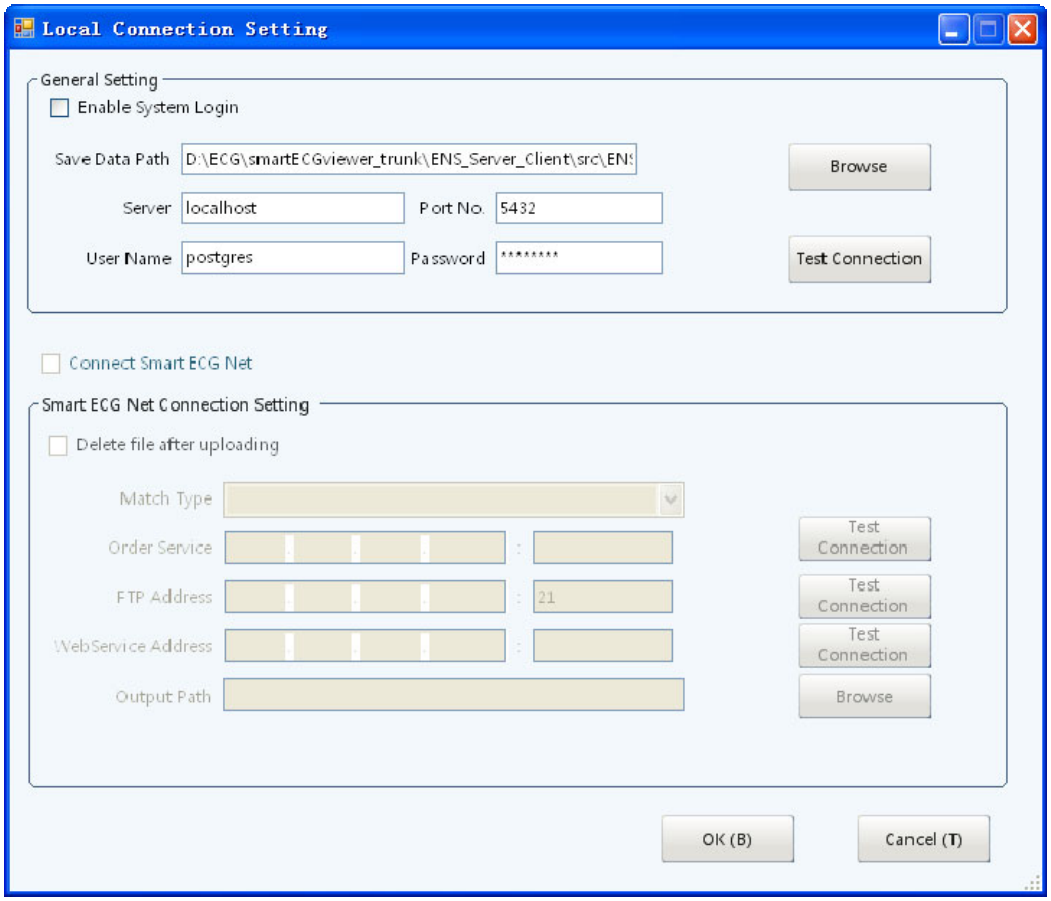


Figure 6-2 Local Mode setup window

NOTE: Network Mode is not available in this edition.

6.2 Display Setup

In the Display Setting window, you can select the items to be displayed on the **Modify** and order window. You can also select **Automatically print the Return Receipt after order.**

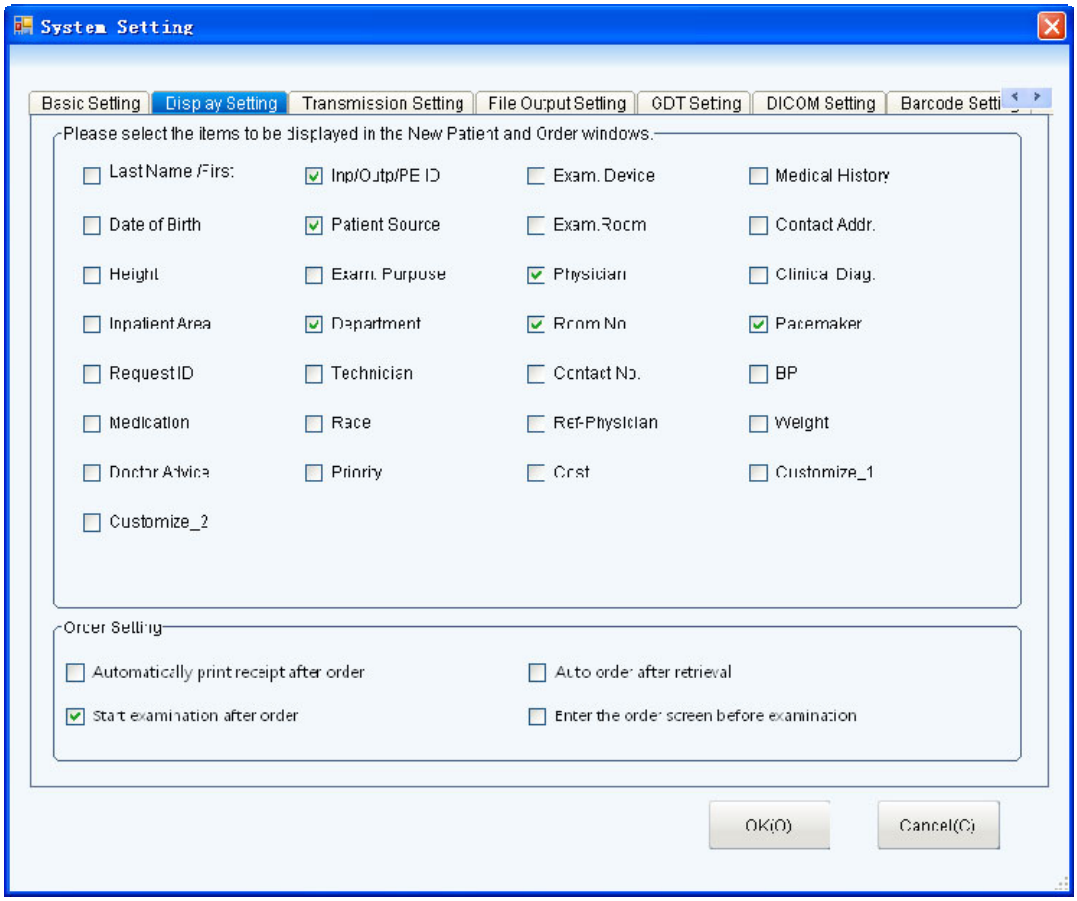


Figure 6-3 Display Setting window

6.3 Transmission Setup

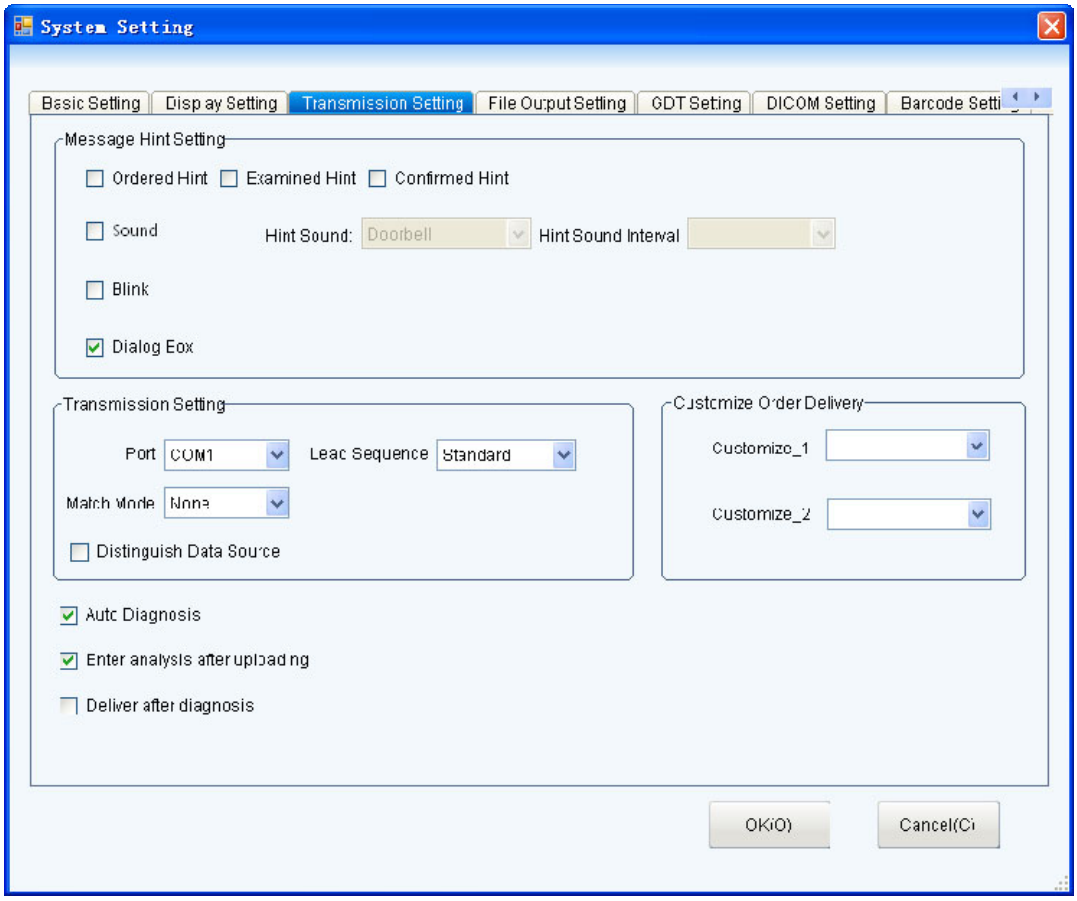


Figure 6-4 Transmission Setting window

Item	Description
Port Name	You can configure the COM ports used for serial transmission.
Match Mode	Options provided are: **Request ID., Exam. ID., Patient ID**,**Inp/Outp/PE ID**, and **None**. • **None:** When examination records are uploaded from the ECG machine, the records will not be matched with the order information. • **Request ID., Exam. ID., Patient ID**,**Inp/Outp/PE ID** When downloading order information to the ECG machine, the patient ID in the ECG machine must be the same as the Request No./Exam. ID./Patient ID/Outpatient /Inpatient No. of the patient. When uploading examination records from the ECG machine, the system checks whether there is an order record with the same request ID, exam. ID, patient ID, or inpatient/outpatient ID as that in the examination record to be uploaded. If yes, a new examination record will be generated in the examined list.

Hint Mode	Options provided are **Sound**, **Blink**, and **Diaglog Box** If **Sound** or **Blink** is selected, the system uses the sound or blinking to remind the user after an order creation, examination or diagnosis completion.
Hint Sound	The **Hint Sound** can be configured only when **Hint Mode** is set to **Sound**. Options provided are **Doorbell**, **Beat**, **Music**, **Phone**, **QQ**, **Type**, and **Water.**
HintSound Interval	The **Hint Sound Interval** can be configured only when **Hint Mode** is set to **Sound**. Options provided are **Hint once**, **Hint every 30s**, **Hint every 60s**, **Hint every 120s** and **Continuous Hint**. When **Hint once** is selected, the system reminds the user only when data is received.
Auto Diagnosis	When this function is selected, the diagnosis results automatically displays on the analysis window after the data has been received.
Enter analysis after uploading	When this function is selected, the system automatically switches to the analysis screen after the data has been uploaded.

6.4 Output File Setup

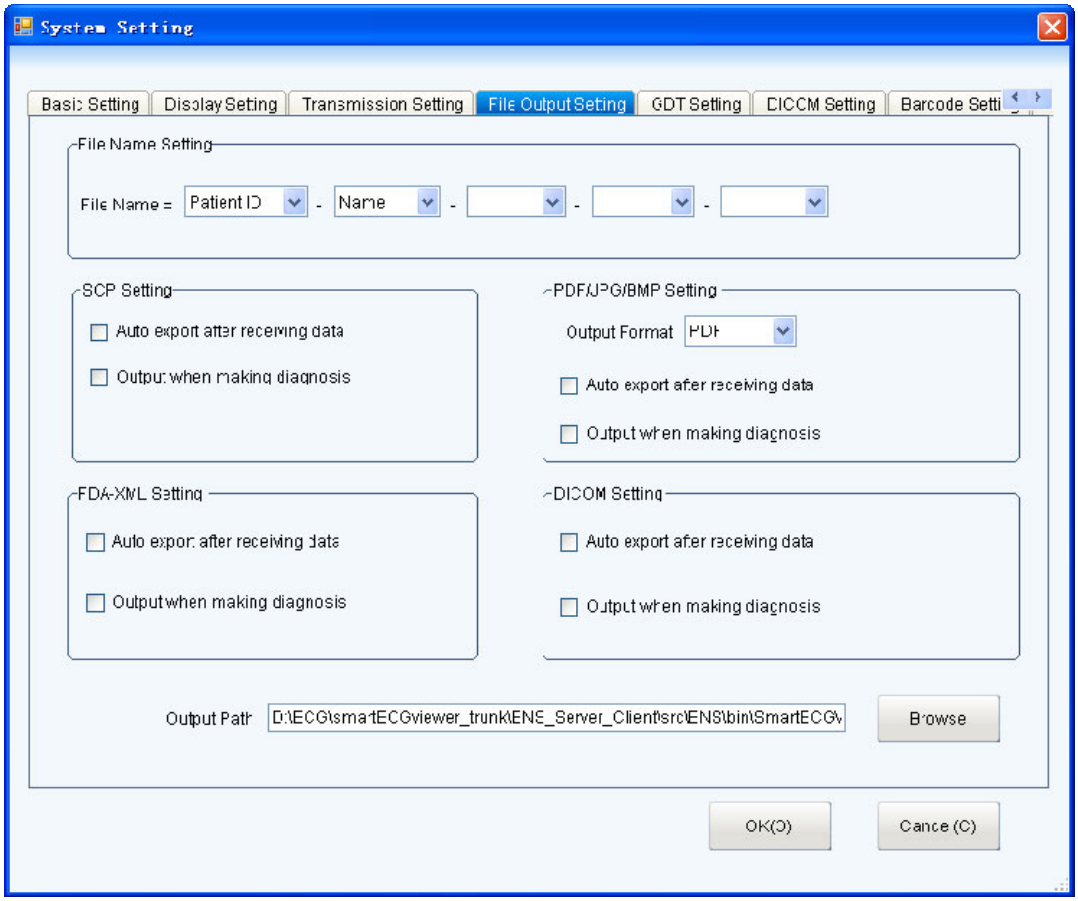


Figure 6-5 File Output window

Item	Description
File name Setting	The file name consists of the ID, name, exam time, age, and gender. The default file name is: Patient ID-Name. **NOTE**: The file name you configured cannot be empty and at least one item has to be selected or set.
SCP Setting	Select **Auto export after receiving data,** the system will automatically output files in SCP format after receiving data. Select **Output when making diagnosis,** the system will automatically output files in SCP format when making diagnoses.
PDF/JPG/BMP Setting	Select **Auto export after receiving data,** the system will automatically output files in PDF/JPG/BMP format after receiving data. Select **Output when making diagnosis,** the system will automatically output files in PDF/JPG/BMPformat when making diagnosis.
FDA-XML	Select **Auto export after receiving data,** the system will automatically

Setting	output files in FDA-XML format after receiving data. Select **Output when making diagnosis,** the system will automatically output files in FDA-XML format when making diagnoses.
DICOM Setting	Select **Auto output after receiving data,** the system will automatically output files in DICOM format after receiving data. Select **Output when making diagnosis,** the system will automatically output files in DICOM format when making diagnoses.
Output path	Click on **Browse** to specify the output path.

6.5 GDT Setup

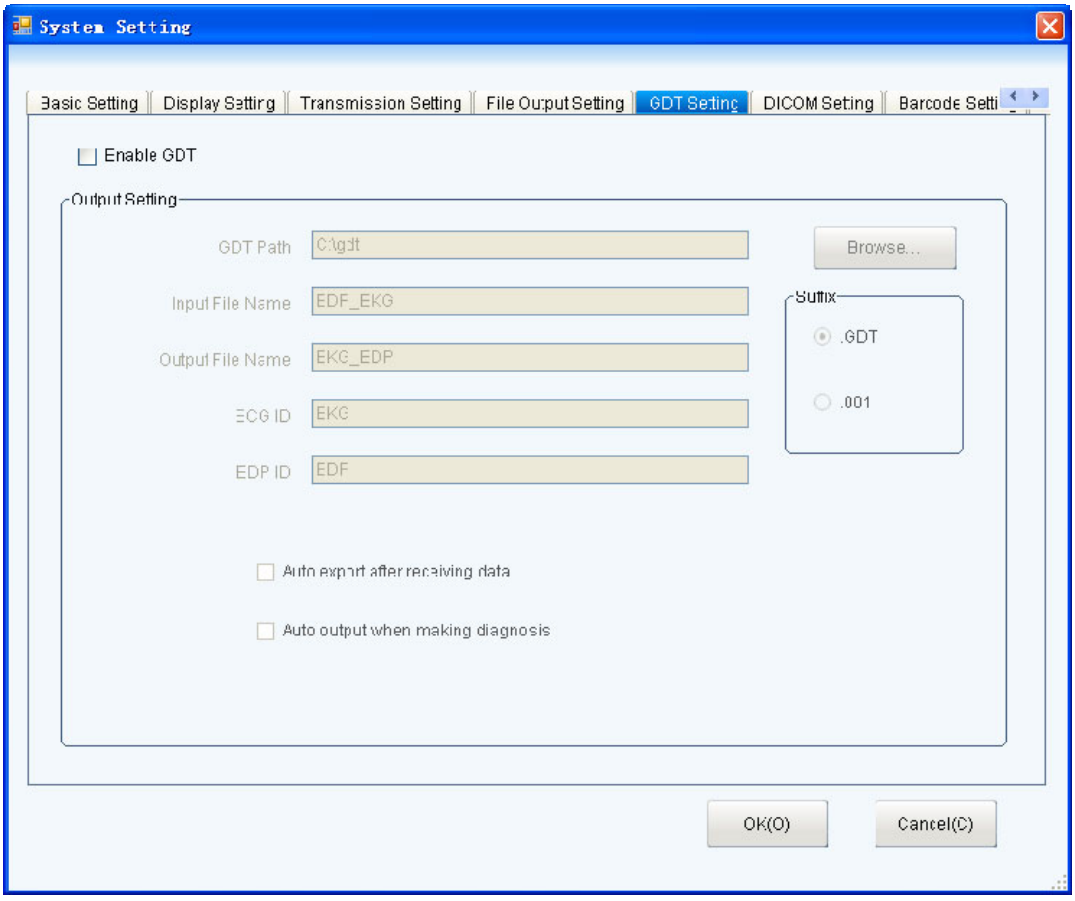


Figure 6-6 GDT setup window

Item	Description
Enable GDT	Select **Enable GDT** and then select **.GDT** or **.001** according to the actual work stream.
GDT Path	Click on **Browse** to specify a path to exchange files with the EDP.
Input File Name	The command file name sent to the software from the EDP.

Output File Name	The data file name sent to the EDP from the software.
ECG ID	The name allocated to the software by the EDP.
EDP ID	8315 or 8316 in the GDT protocol.
Auto export after receiving data	When selected, the system automatically outputs a GDT file after receiving data.
Auto output when making diagnosis	When selected, the system automatically outputs a GDT file after the diagnosis is complete.

6.6 DICOM Setup

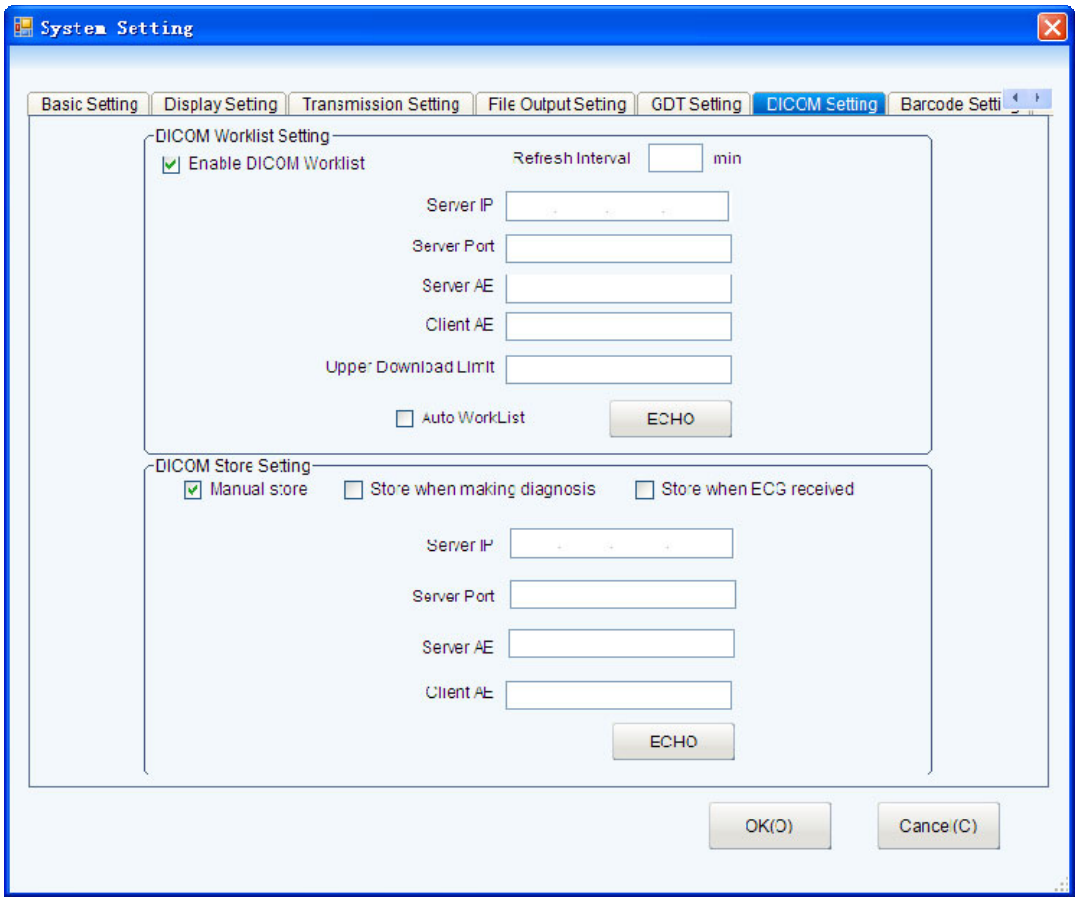


Figure 6-7 DICOM setup window

Item	Description
Enable DICOM Worklist	When selected, the DICOM Worklist function will be activated.
Refresh Interval	Set the refresh interval for automatic worklist download.
Upper Download Limit	Set the upper limit of patient records during an automatic download.

Auto Worklist	When selected, the system automatically downloads worklists from the server in batch.
ECHO	Click to test whether DICOM connection is successful.
Server IP/Server Port/Server AE/Client AE	Set Server IP/Server Port/Server AE/Client AE to the server IP/server port/server AE/client AE used for the DICOM Worklist system.
DICOM Store Setting	If **Manual store** is selected, DICOM files will be stored to the server when being exported. If **Store when making diagnosis** is selected, DICOM files will be stored to the server when making diagnosis. If **Store when ECG received** is selected, DICOM files will be stored to the server when receiving ECG data.

6.7 Bar Code Setup

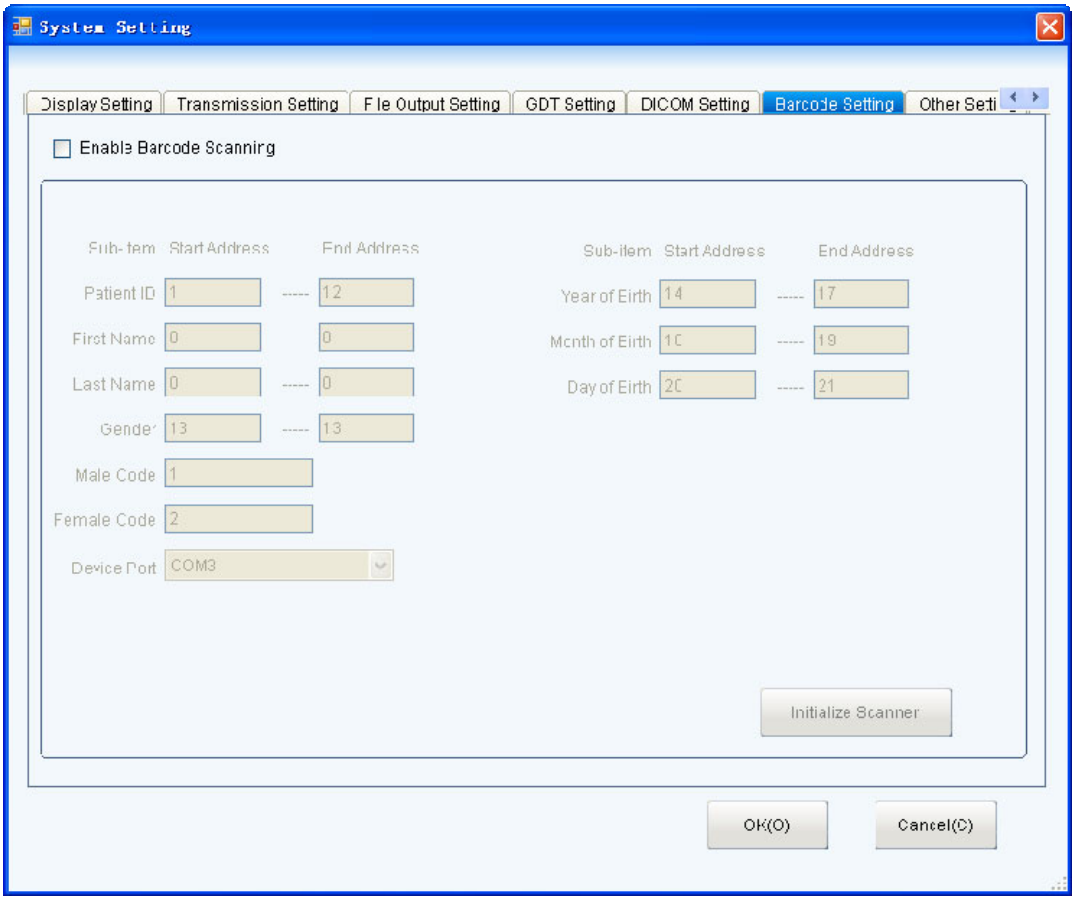
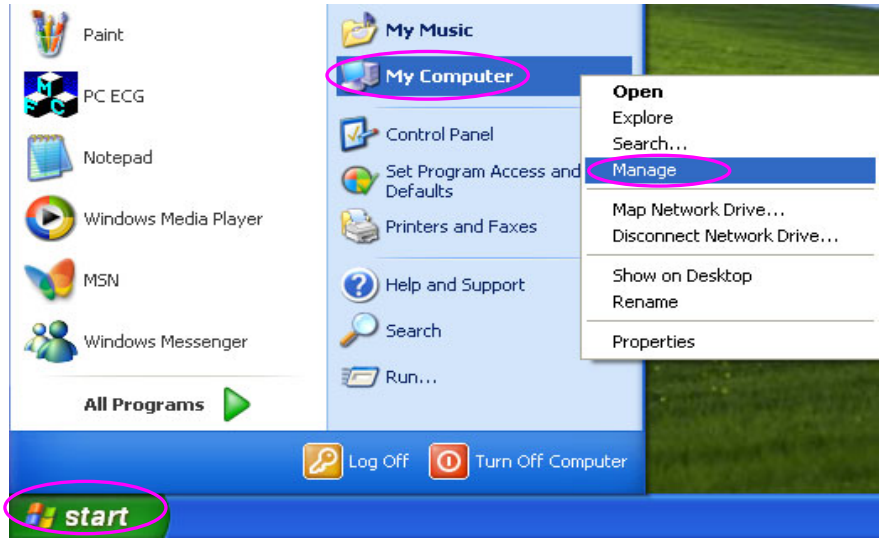


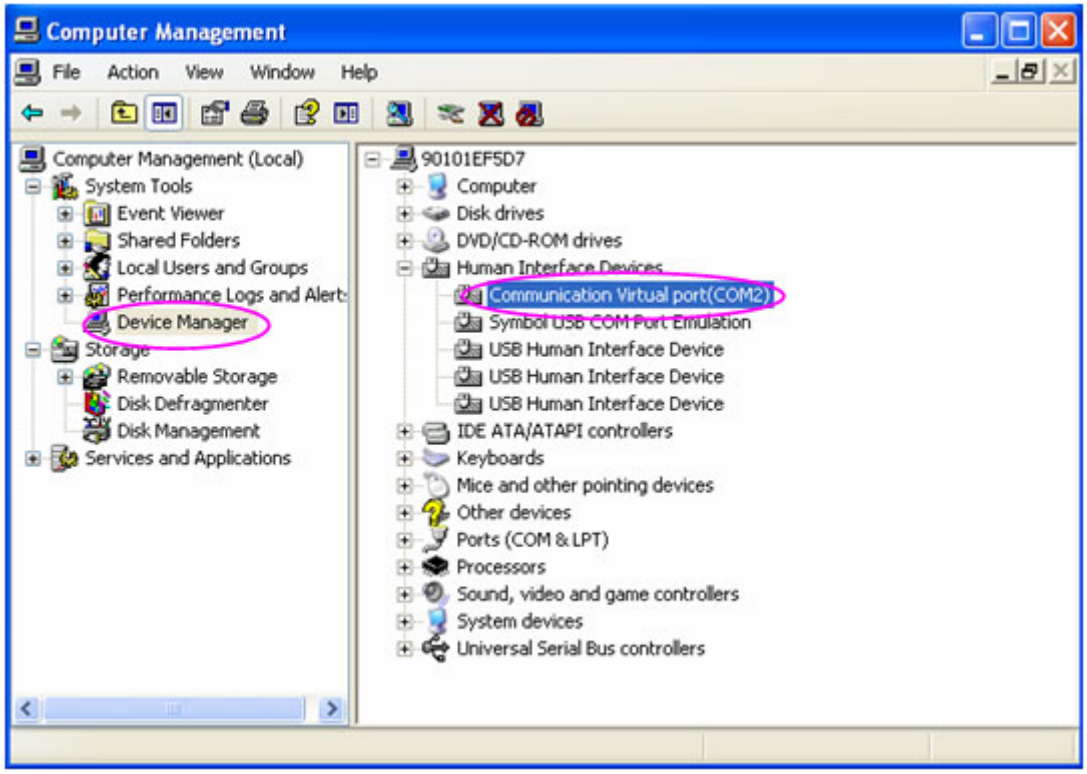
Figure 6-8 Bar code setup window

Item	Description
Barcode Setting	Configure the **Start Address, End Address, Male Code/Female Code,** and **Device Port** for each sub-item based on the actual situation. **NOTE**: Only the USB bar code reader recommended by the manufacturer can be used.

1. If the bar code reader is connected before starting the software, the software automatically detects the reader. In this case, you can use it without port configuration or initialization.
2. If the bar code reader is connected after starting the software, you have to initialize the bar code reader in **System Setting.**
3. If the initialization fails, you have to manually configure the port by performing the following operations:
   1) Connect the USB bar code reader to the computer.
   2) On the computer, click **Start** and right-click on **My Computer,** and then choose **Manage.**



   3) In the **Computer Management** window, click **Device Manager** and select **Human Interface Devices** to view the ports.



4) After setting the device port to the viewed port on the **Barcode Setting** window, click **Yes** to restart the Smart ECG Viewer software.

6.8 Other Setup

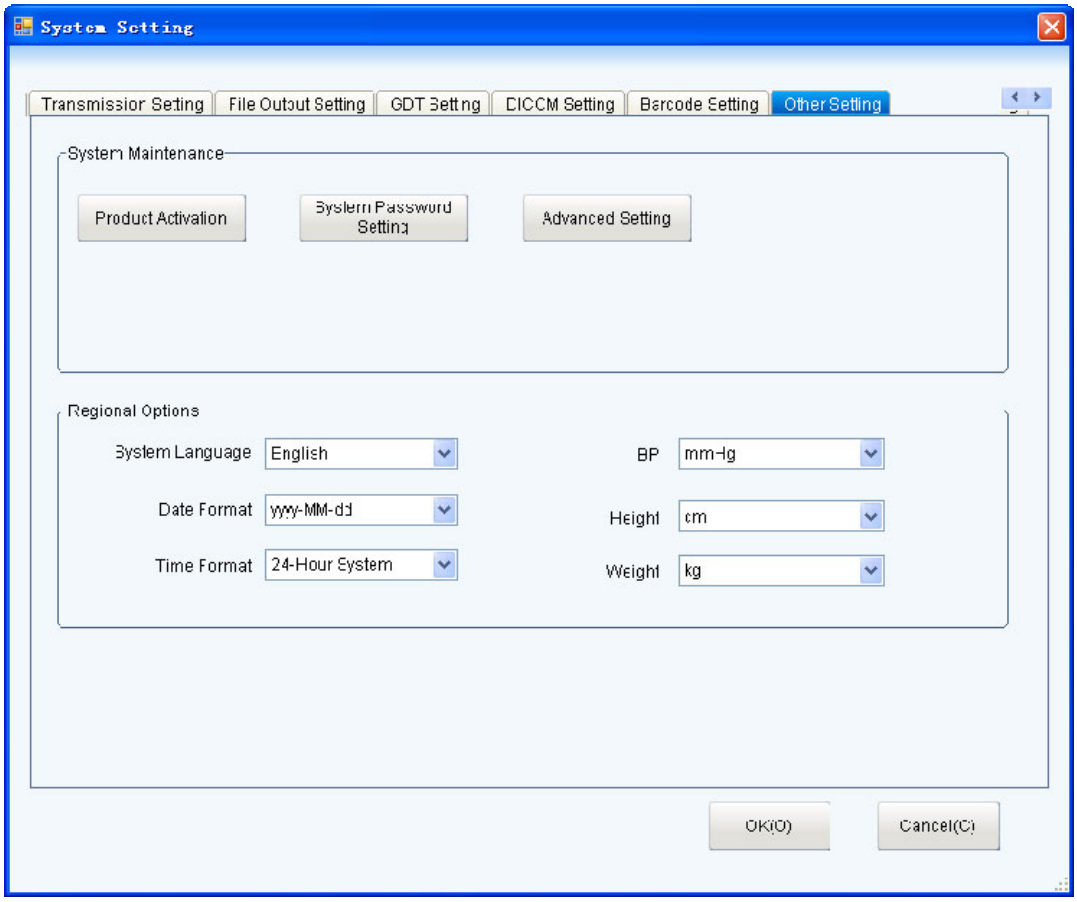


Figure 6-9 Others setup window

Item	Description
System Maintenance	• Advanced Settings: Click **Advanced Settings** and you can configure the **Advanced Settings** window. • System Password Setting After the password has been changed successfully, you have to enter the new password to enter the **System Settings** window.
Regional Options	The system language, date format, time format, and the unit of blood pressure, height and weight can be configured.

6.8.1 Product Authorization

Communication Authorization

When the **Product Authorization** window is displayed, the system automatically obtains the **Sampling Box Serial Number** and fills it in the corresponding textbox. Send the **Sampling Box Serial Number** to the manufacturer or distributor. If the **Customer ID** is also obtained, send it to the manufacturer or distributor at the same time.
After the manufacturer or distributer returns the registration code, fill it in the corresponding textbox and then click **Register**.

6.8.2 Advanced Setting

- Examination Department and Device Management

  On the **Exam. Department and Device Management** window, fill the device ID to the Device ID column and configure the **Parent Department** and **Device Name**. Click **Save (S)** to save the configuration.

- Examination Type and Item Management

  Click on **Exam. Type and Item Management**, you can modify the value and unit of the cost.

- User Management

  Click on **User Management** and you can search the list by user ID or user name.

  Under **User List**, you can click **Add (A)** to add new users and set their rights; click **Modify (M)** to modify basic user information.

- Data Maintenance

  Click on **Data Maintenance**, you can perform data backup and recovery settings.

  NOTE: Data maintenance is a reserved function, which is unavailable for this edition.

- Request Department Management

  Click on **Request Dept. Management**, you can modify the department name, add or delete department data.

Chapter 7 Hint Information

Hint information and the corresponding causes provided by the system are listed as follows:

Table 7-1 Hint Information and Causes

Hint Information	Causes
No sentinel detected!	The sentinel is not inserted.
Fail to create database!	The system fails to create database.

Chapter 8 Accessories

WARNING

Only accessories supplied by the manufacturer can be used. Or else, the performance can not be guaranteed.

Table 8-1 Standard Accessory List

Part number	Accessory
02.01.047227	Softdog/USB
01.18.047228	Softdog/LPT
11.13.20096	Net Cable
11.13.20117	Serial Cable

Table 8-2 Optional Accessory List

Part number	Accessory
01.23.068023	Bar Code Reader (One-Dimension)
21.18.052311	Bar Code Reader (Two-Dimension)

Chapter 9 Warranty & Service

9.1 Warranty

EDAN warrants that EDAN's products meet the labeled specifications of the products and will be free from defects in materials and workmanship that occur within warranty period.

The warranty is void in cases of:

1. damage caused by mishandling during shipping.
2. subsequent damage caused by improper use or maintenance.
3. damage caused by alteration or repair by anyone not authorized by EDAN.
4. damage caused by accidents.
5. replacement or removal of serial number label and manufacture label.

If a product covered by this warranty is determined to be defective because of defective materials, components, or workmanship, and the warranty claim is made within the warranty period, EDAN will, at its discretion, repair or replace the defective part(s) free of charge. EDAN will not provide a substitute product for use when the defective product is being repaired.

9.2 Contact information

If you have any question about maintenance, technical specifications or malfunctions of devices, contact your local distributor.

Alternatively, you can send an email to EDAN service department at: support@edan.com.cn.

P/N: 01.54.20161-23

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