USER GUIDE

Cardiology Suite 4.0x

Resting, Stress, Holter, ABPM* and Spiromety*

*USA Customers supplied with
software from device manufacturer
and not Cardiology Suite4.0x Software*

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May 21, 2007

System Setup

QRS-Card™ Cardiology Suite 4.0 Overview

The **QRS-Card™ Cardiology Suite** is a state-of-the-art ECG device(s) which when interfaced to an IBM ® compatible personal computer converts the computer into a highly sophisticated **Cardiology Suite** (Resting ECG, Stress ECG system, Holter ECG, Ambulatory Blood Pressure Measurement and Spirometry System). Physicians can run Resting, Stress, Holter, Blood Pressure and PFT tests on patients using a standard Desktop or a notebook computer. Results of the tests can be viewed on the computer color screen and can be printed automatically (or on demand) at any time during a test. The results of the tests can be saved on the computer hard disk for future referral or report generation purposes.

The **QRS-Card™ Cardiology Suite** is programmable for treadmill and Ergometers controls. Input of blood pressure can be performed automatically (screen prompts or direct interface to BP device) at predefined intervals.

QRS-Card™ Cardiology Suite Components and Assembly:

Depending on the total number of Cardiology Suite Modules you have purchased includes the following hardware and software components:

Resting and Stress ECG System

1. **QRS-Card™** ECG device
2. ECG Patient Lead Wires
3. **QRS-Card™** data cable (USB or Serial)
4. QRS-Card Cardiology Suite Software CD
5. User's Guide
6. Quick Reference Card
7. USB Security Key with Product ID Number (PID)

* For Hardware Installation and Setup see Appendix X

Holter ECG System

1. Holter Recorder
2. Holter ECG leadwires
3. Holter Recorder Pouch
4. Holter recorder data cable (or flash memory card reader)
5. QRS-Card Cardiology Suite Software
6. User Guide
7. Quick Reference Card
8. USB Security Key with Product ID Number (PID)

* For Hardware Installation and Setup see Appendix X

Ambulatory Blood Pressure

WARNINGS

US Customers will be supplied with ONLY software supplied by the device manufacture (and not the Cardiology Suite ABMP software module).

1. Ambulatory Blood Pressure Recorder
2. Blood Pressure cuff
3. Recorder Carrying pouch
4. Data cable (serial or USB)
5. QRS-Card Cardiology Suite Software
6. User Guide (Supplied on Software CD)
7. Quick Reference Card
8. USB Security Key with Product ID Number (PID)

* For Hardware Installation and Setup see Appendix X

Spirometry

WARNINGS

US Customers will be supplied with ONLY software supplied by the device manufacture (and not the Cardiology Suite Spiromtery software module).

1. Spirometer
2. Disposable Mouth Piece
3. Data cable (Serial or USB)
4. QRS-Card Cardiology Suite Software
5. User Guide (supplied on software CD)
6. Quick Reference Card
7. USB Security Key with Product ID Number (PID)

* For Hardware Installation and Setup see Appendix X

QRS-Card™ Cardiology Suite 4.0 Software Installation

The first time you use the system, you need to install the **QRS-Card™ Cardiology Suite** software by using the Setup file on the **QRS-Card**™ Cardiology Suite software CD. Once the software is installed, you will be able to use the **QRS-Card™ Cardiology Suite** for Resting, Stress, Holter, Ambulatory BP and Spirometry. It will take approximately 3 to 5 minutes for all of the directories to be created and for all of the files to be copied to your computer hard disk.

In order to install the **QRS-Card™ Cardiology Suite** software, the following steps are required:

1. Switch on and boot up your computer with **Windows XP, Window 2000** or Windows Vista

2. Insert the **QRS-Card™ Cardiology Suite** software CD into the CD drive.

3. Follow the instructions on the screen

4. Once the installation is complete, you are ready to start using your computer for Resting ECG, Stress ECG, Holter ECG, 24 hour BP and Spirometry .

*NOTE: 1. Write down the Product ID (PID) of your **QRS-Card™** ECG device written on the USB Security Key and also on the back of your QRS-Card (or provided by dealer or distributor). For Demo software Tutorial the PID is "**0001-0001-2000-DEMOU**".*

2. For Hardware hookup and setup please see appendix XX

Product License and Registration Screen
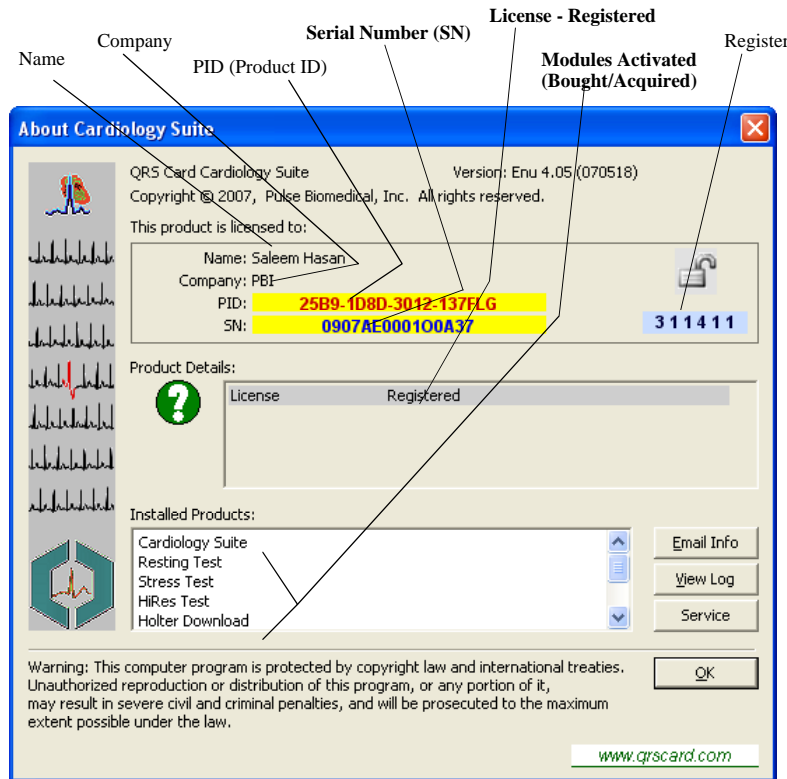
Press "**CTRL F1**"   or   Select from pulldown menu "**HELP"** then "**About"**

Quick Start ---------------- -------------------- RESTING ECG

1. Connect QRS-Card ECG machine to your computer USB port (or serial port).
    (See Appendix X for more help)
2. Start QRS-Card Cardiology Suite Software on your computer
3. *Perform one time Setup for your Resting ECG*
    ("File/Resting/Setup" or Press "CTRL F2". See Appendix "X" for more details)
4. Press Resting ECG button (or Hot key "F2") on the Main Software Screen
5. *Type in Patient demographic data*
    (if Setup screen is displayed then press OK to go to patient demographic data input)
6. Press OK button to start acquire Resting ECG
7. *ECG report will be printed manually or automatically*
    (Auto or Manual print depends upon printing preference under Resting Setup)
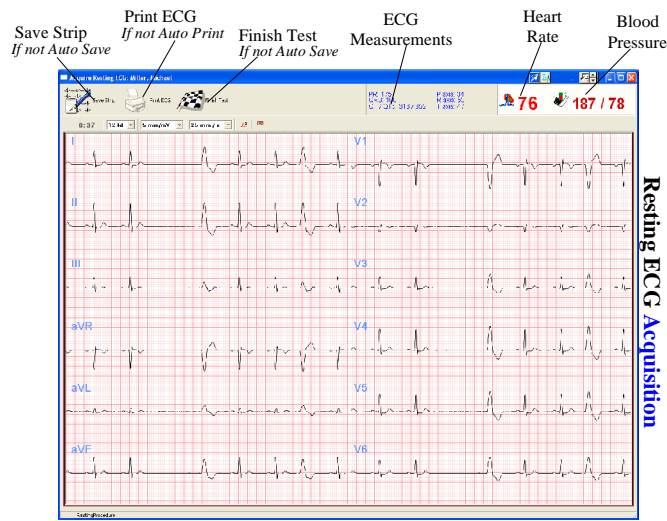
Resting ECG Acquisition
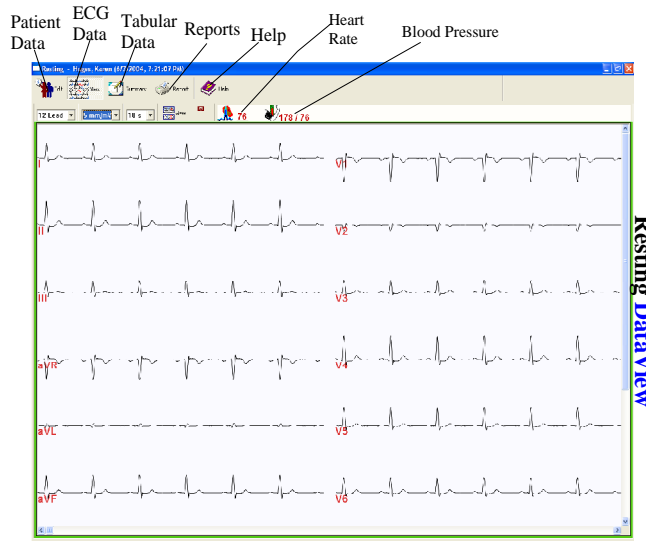
Resting DataView

**Resting ECG Flow Diagram**

Easy Steps To Perform Resting ECG

A. Press Resting Button to Start a Test

B. Enter Patient Demographic data

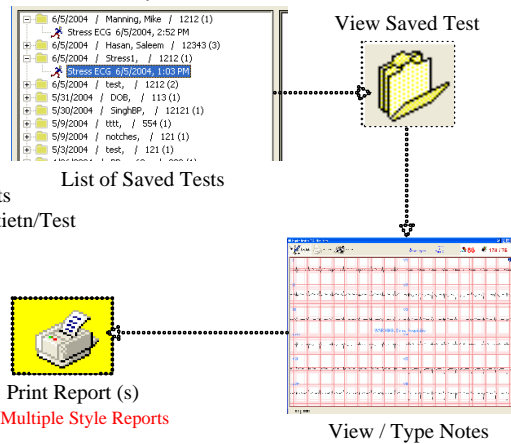C. Auto or Manual Print Test Report

SETUP FOR AUTO PRINT:
For Auto Report Print to work:
   a. Printer MUST be attached to the computer
   b. Under Resting/Restup (**CTL+F2**)
      i) Print ECG Report Must be checked off
     ii) Type of Report
      (e.g 12 Lead Standard) must be selected

A Start Resting Test

B Enter Patient Data

C **AUTO PRINT**
Must be defined
in Resting Setup

MANUAL PRINT

C
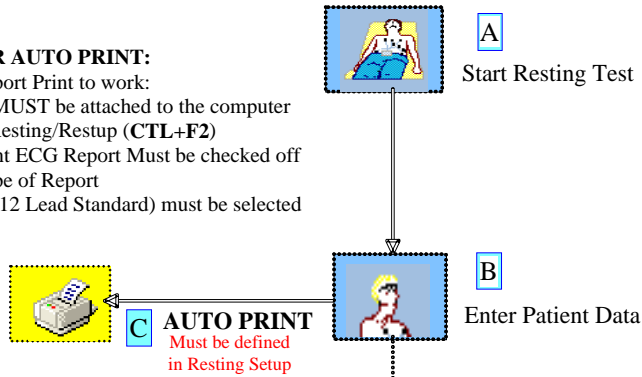
MANUAL PRINT of reports can be done:
  a. From Main Menu
    - Select a desired Patient/Test
    - Press Print Button
    - Select Type of Report (s) to Print
  b. View / Edit / Typing of Notes/comments
    - From Main menu Select a desired Patietn/Test
    - Press Open/View Test Button
    - View Test / Type Notes
   - Press Print Button
    - Select Type of Report to Print

List of Saved Tests

View Saved Test

Print Report (s)
Multiple Style Reports

View / Type Notes

Task performed during a Resting ECG

Save Strip   Print ECG   Finish Test

Save Strip
Only When No Auto Save

Print ECG
on Demand
Single Style Report

Finish
Test
If No Auto Save

Quick Start --------------------- [Stress ECG] ------------------- **STRESS ECG**
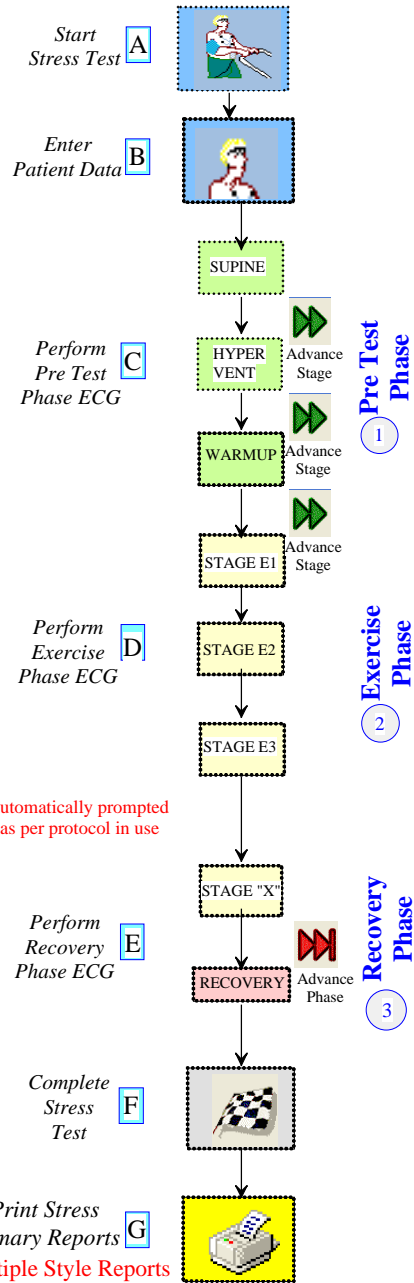
1. Connect QRS-Card ECG machine to your computer USB port (or serial port).
   (See Appendix X for more help)
2. Start your QRS-Card Cardiology Suite Software on your computer
3. *Perform one time Setup for your Stress ECG*
   ("File/Stress/Setup" or Press "CTRL F3")
   See Appendix "X" for more details
4. Press Stress ECG button (or Hot key "F3") from the Main Software Screen
5. *Type in Patient demographic data*
   (if Setup screen show then press OK to go to patient demographic data)
6. Press OK button to start acquiring Stress ECG
7. ECG report will be printed after the completion of the Stress Test
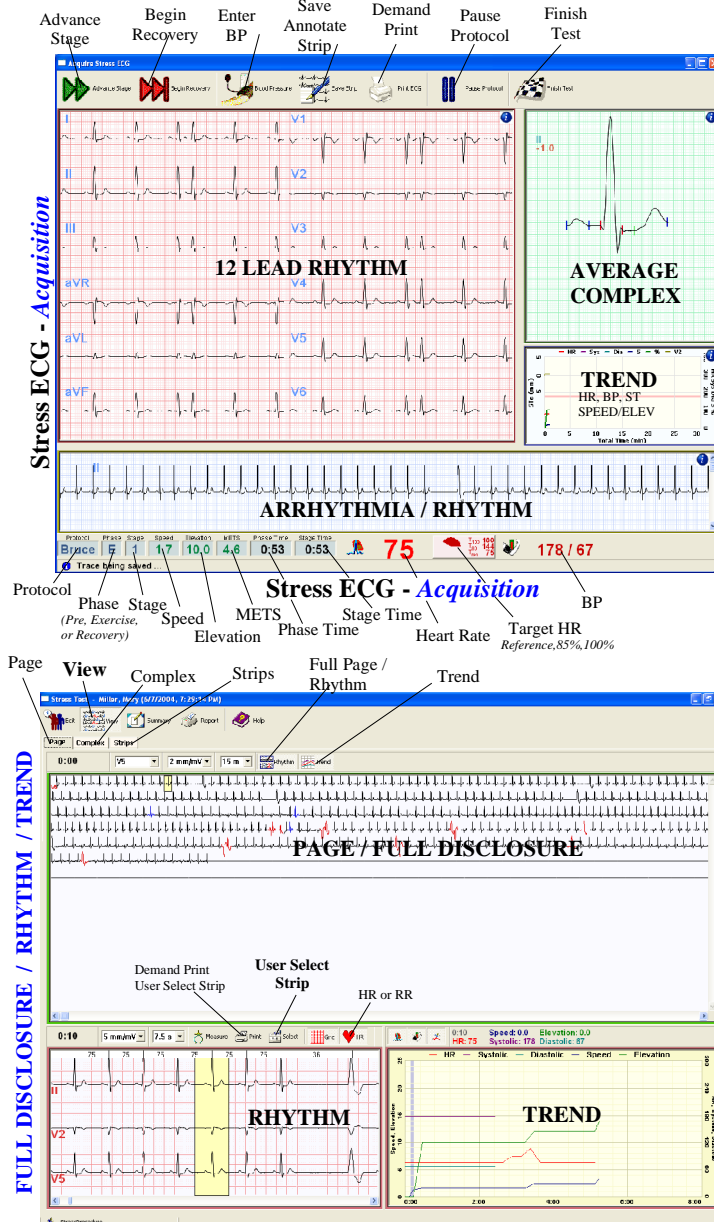
Stress ECG Flow Diagram

**Easy Steps To Perform
A Stress Test**

A. Press Stress button to Start Test

B. Input Patient Demographic Data

C. Acquire **Pre Test Phase** ECG

D. Acquire **Exercise Phase** ECG

E. Acquire **Recovery Phase** ECG

F. Complete Stress Test

G. Print **Stress Summary Reports**

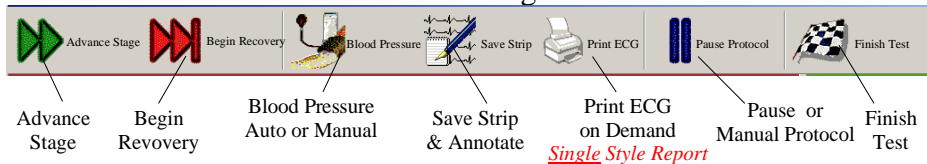*Start
Stress Test* A

*Enter
Patient Data* B

SUPINE

*Perform
Pre Test
Phase ECG* C | HYPER VENT | Advance Stage

WARMUP | Advance Stage

**Pre Test
Phase** 1

STAGE E1 | Advance Stage

*Perform
Exercise
Phase ECG* D | STAGE E2

STAGE E3

**Exercise
Phase** 2

Blood Pressure Input is automatically prompted
on the computer screen as per protocol in use

STAGE "X"

*Perform
Recovery
Phase ECG* E | RECOVERY | Advance Phase

**Recovery
Phase** 3

Note: Complete ECG for the COMPLETE Stress Test is SAVED
to computer hard disk which then can EDITED/VIEWED/
PRINTED Manually or Automatically.

*Complete
Stress
Test* F

*Print Stress
Sumary Reports* G
Multiple Style Reports

Task Performed During a Stress Test

Advance Stage	Begin Recovery	Blood Pressure	Save Strip	Print ECG	Pause Protocol	Finish Test
Advance Stage	Begin Revovery	Blood Pressure Auto or Manual	Save Strip & Annotate *Single Style Report*	Print ECG on Demand	Pause or Manual Protocol	Finish Test

Quick Start --------------------- ------------------ **HIRES ECG**

WARNINGS

Supplied for use only to outside US Customers

1. Connect QRS-Card ECG machine to your computer USB port (or serial port).
   (See Appendix X for more help)
2. Start your QRS-Card Cardiology Suite Software on your computer
3. *Perform one time Setup for your HiRes ECG*
   ("File/HiRes/Setup" or Press "CTRL F4")
   See Appendix "X" for more details
4. Press HiRes ECG button (or Hot key "F4") from Main Software Screen
5. *Type in Patient demographic data*
   (if Setup screen show then press OK to go to patient demographic data)
6. Press OK button to start acquiring HiRes ECG
7. ECG report will be printed after the completion of the Stress Test
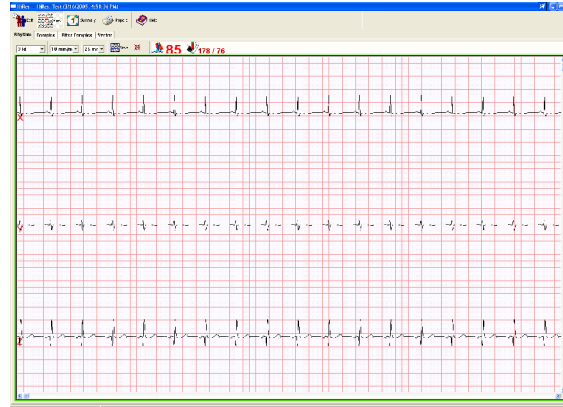
Note: In addition to placing limb leads at normal place on patient body, V1-V6 leads are places differently then in Resting or Stress ECG.

V1	-	*+X*
V2	-	*-X*
V3	-	*+Y*
V4	-	*-Y*
V5	-	*+Z*
V6	-	*-Z*

HiRes Acquisition Screen
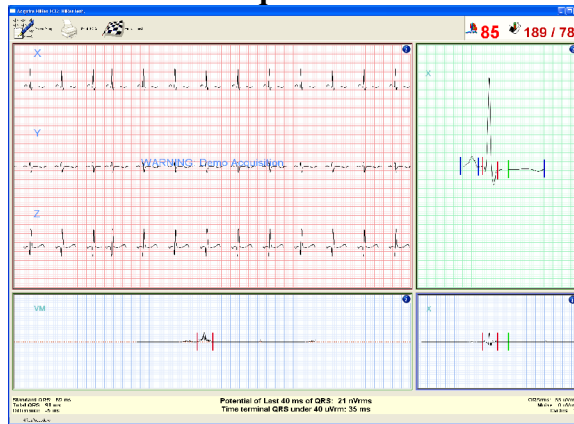
HiRes DataView Screen

Holter ECG

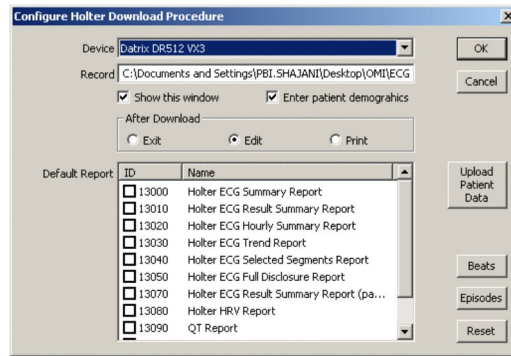## Quick Start   --------------------   ---------------------- HOLTER ECG

1. Record 24 or 48 hours patient's Holter ECG data
    (For using/setup the recorder see recorder Operator guide)
2. Connect Holter recorder (or flash card) to the computer
    (See Appendix for hardware setup)
3. Start QRS-Card Cardiology Suite Software
4. Perform one time Holter Setup
    (File/Holter/Setup or Press CTRL F5)
    See Appendix XX for more details
5. Press HiRes Button or Hot Key F5 from Main Software Screen to start Holter ECG procedure
6. Press OK button to start downloading and Analysis of the Holter ECG
7. Enter Patient demographic data while Holter data is being downloaded
8. Highlight patient from database listing then double click to View, Edit and Print reports
9. Edit any Bins, Episodes and Strips (if necessary)
10. Print Reports

**Quick Start** ----------------------   [ABPM]   ----------------------- **ABPM**

WARNINGS

US Customers will be supplied with ONLY software supplied by the device manufacture (and not the Cardiology Suite ABMP software module).

1. Record 24 hours patient's Ambulatory Blood Pressure (ABPM) data
   (For Using/Setup the ABPM Recorder see Recorder Operator Guide)
2. Connect Blood Pressure recorder to the computer via serial or USB Port
   (See Appendix for hardware setup)
3. Start QRS-Card Cardiology Suite Software
4. Perform one time Ambulatory BP Setup
   (File/Ambulatory BP /Setup or Press CTRL F6)
   See Appendix XX for more details
5. Press ABPM Button or Hot Key F6 to start Ambulatory BP data download
6. Press OK button to start downloading Ambulatory BP data
7. Type in the Patient demographic data
8. Highlight the patient test from database listing then double click to view ABPM data
9. Print Summary Report
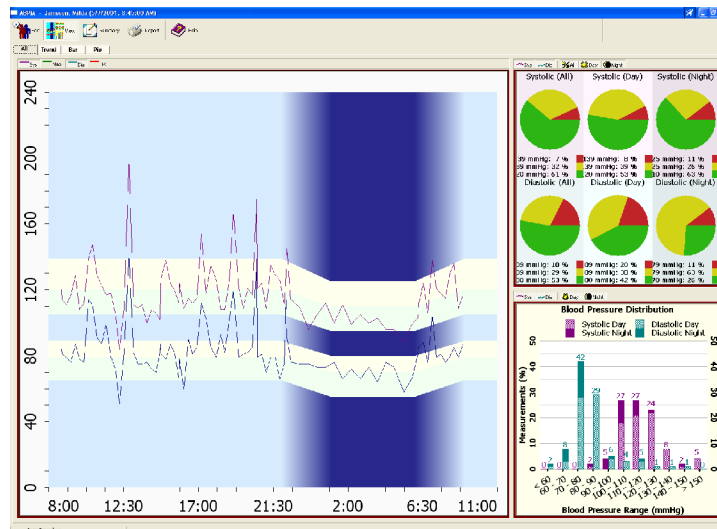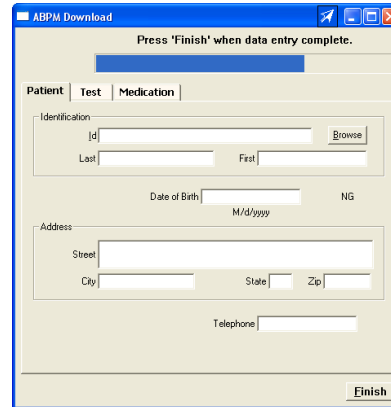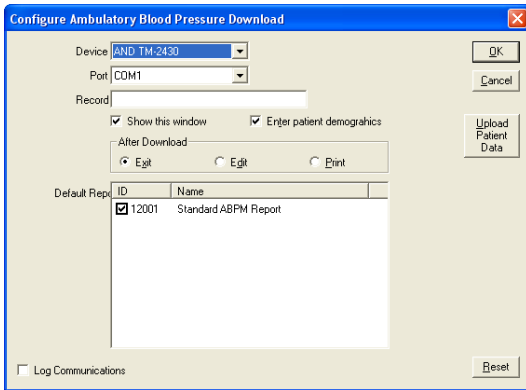
MAIN SOFTWARE SCREEN
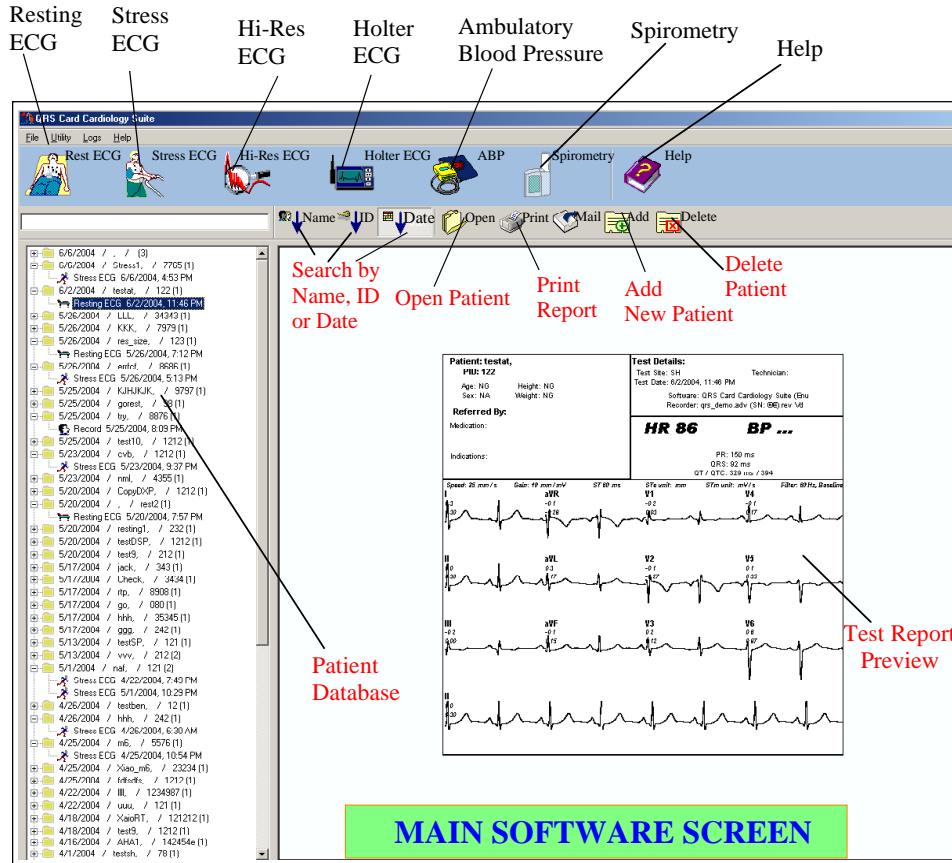
QRS-Card Cardiology Suit Software Master screen is divided into following sections:

1. Pull Down Menu Selection for various items *(File, Utility, Logs and Help)*

2. Buttons to QUICKLY access Test or to obtain Help *(Resting, Stress, HiRes, Holter, AMPB, Spriometry & Help)*

3. Folders for Patient Names and Test Database

4. Patient Database tools (*Search, Open, Print, Email, Add New Patient, Delete Patient)*

5. Test Report Preview

Database Tools:

Sort Test
The ECG Tests can be **sorted** by "name", "patient ID" or "date acquired" by clicking on the respective buttons (Partial name or date sort can be typed in the empty space between the database listing and the tool bar buttons)

• To sort Tests by Name, from the *toolbar* press.

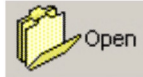- To sort Tests by patient ID, from the *toolbar* press.

- To sort Tests by Date, from the *toolbar* press.

Open Test
Use the *Open Test* command to retrieve a previously saved Test from the QRS database. After selecting test, The Open Test command can be executed as follows:

- From the *toolbar* press.

Print Test
Use the *Print Test* command to save and print the selected ECG Test to the QRS database and local printer. The Print Test command can be executed as follows:

- From the *toolbar* press.

Mail Test
The Mail Out option allows the user to E-mail ECG *Test*.

- From the *toolbar* press.

ADD NEW PATIENT
To Add a Patient ahead of time and before patient test is started execute following command:

- From tool bar press

Delete a Patient
Highlight the patient or the test to be deleted from the database the execute the following command:

- From tool bar press

Note: To quickly search for a Name, ID or Date in a large patient database, type partial name, ID or data to jump to the closet match.

RESTING ECG

Topics
Modes of Operation
Starting a Resting ECG   (Acquisition Mode)
Viewing a Resting ECG   (Dataview Mode)
Resting ECG Setup

==

Modes of Operation
During normal operation of the QRS-Card ECG the system performs in either of three modes:

Standby Mode
Standby Mode is while QRS-Card Cardiology Suite Master screen is open and no selection of a test (new ore review) has been made.
During this mode certain operation like patient search, adding a new patient or delete a patient can be performed.
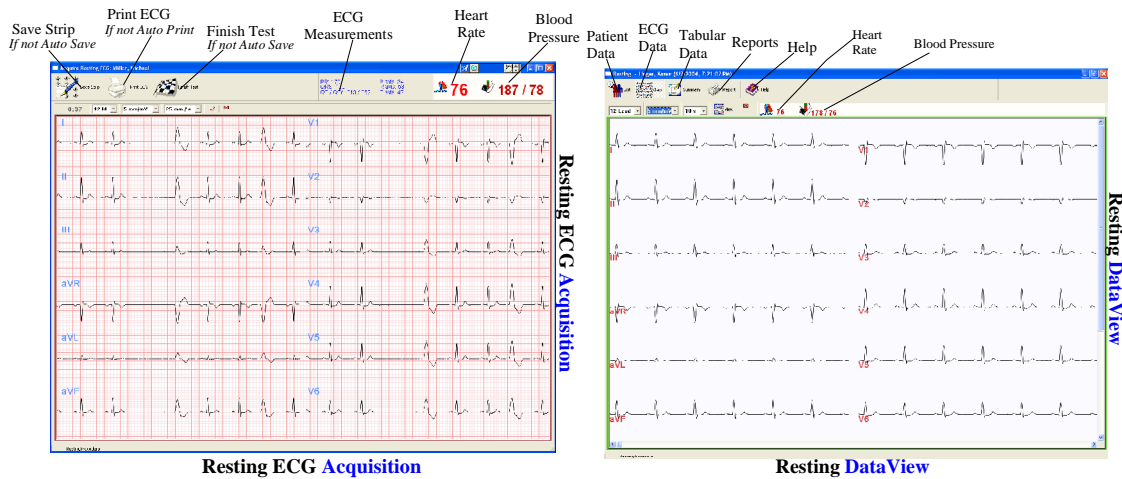
Acquisition Mode
The Acquisition Mode supplies the functionality to acquire Resting ECG data. The monitor mode displays

an icon, , in the left hand corner of the title bar.

During this mode patient is attached to the QRS-Card and the ECG data is seen in real-time on the computer screen.

Dataview Mode

The Dataview mode supplies the functionality to view previously acquired ECG data. Open a patient record to access the Dataview Screen. For more details see Open Test Record.

Resting ECG Acquisition   **Resting DataView**

STARTING A RESTING ECG TEST

A Resting Test can be executed by the following methods:

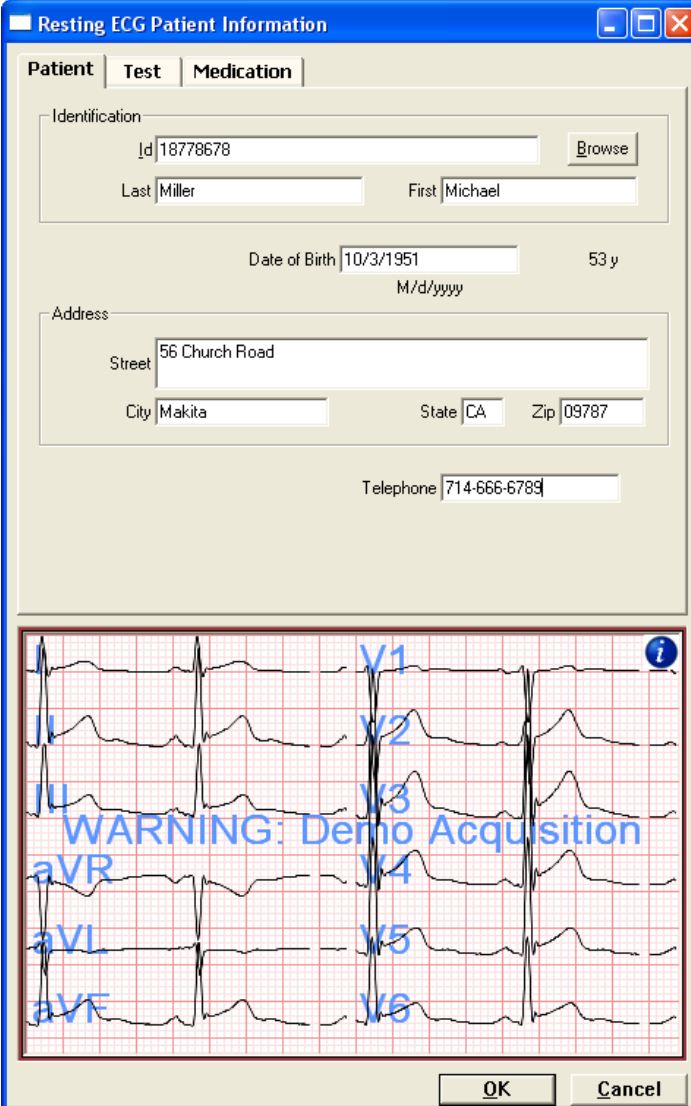**-** From the <u>Acquisition Screen</u> select *File > Resting > Perform Test*   OR

- From the toolbar select the Resting ECG icon   OR

        Use the Hot Key <u>F2</u>

Executing the Resting Test by one of the above methods will cause the Resting Setup dialog box to be displayed (<u>IF</u> the Show This Window box has been checked in the Resting Setup. See <u>Resting Setup</u>.) After the Resting Setup dialog box the Resting ECG Patient Information property box will appear.

Fill in the appropriate Information in the <u>Patient</u>, <u>Test Information</u> and <u>Medication</u>.

Click "OK" to start the Resting ECG.
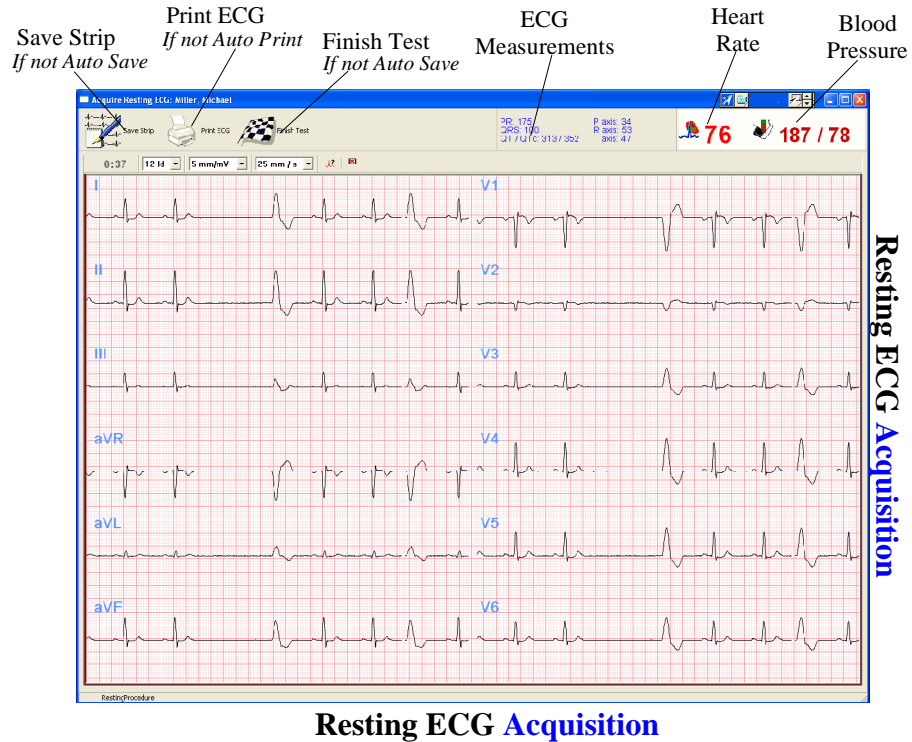
Resting ECG Acquisition

Save Strip:

> Pressing this button Saves a 10 second ECG Strip.
> During normal Resting ECG Test, selection of this button is not necessary as 10 Seconds ECG trace is automatically saved.
>
> Save Strip option is only applicable when selection under Resting setup:
> > "Exit when all task completed" is unchecked.
> > *Note: Multiple Resting ECG traces can be saved under this setup.*

Print ECG:

> During normal Resting ECG this options is not necessary as 10 Seconds ECG trace is automatically saved and can be printed automatically (or manually)
>
> This Print button is applicable when selection under Resting Setup:
> > "Exit when all task completed" is unchecked.
>
> > *Note: Only one kind of report can be printed with this option and it requires a HP PCL5 printer attached to computer for printing this report*

Finish Test:

> During normal Resting ECG this options is not necessary as after 10 Seconds ECG trace Resting ECG acquisition is automatically terminated.
>
> This Print button is only applicable when selection under Resting Setup:
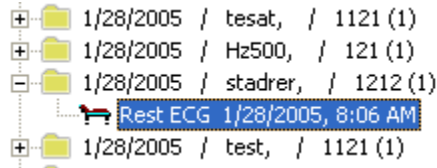> > "Exit when all task completed" is unchecked.

VIEWING A RESTING ECG – "DATAVIEW SCREEN"

To view (or edit) a Resting ECG test, highlight from Main Screen the ECG Test desired then click on the
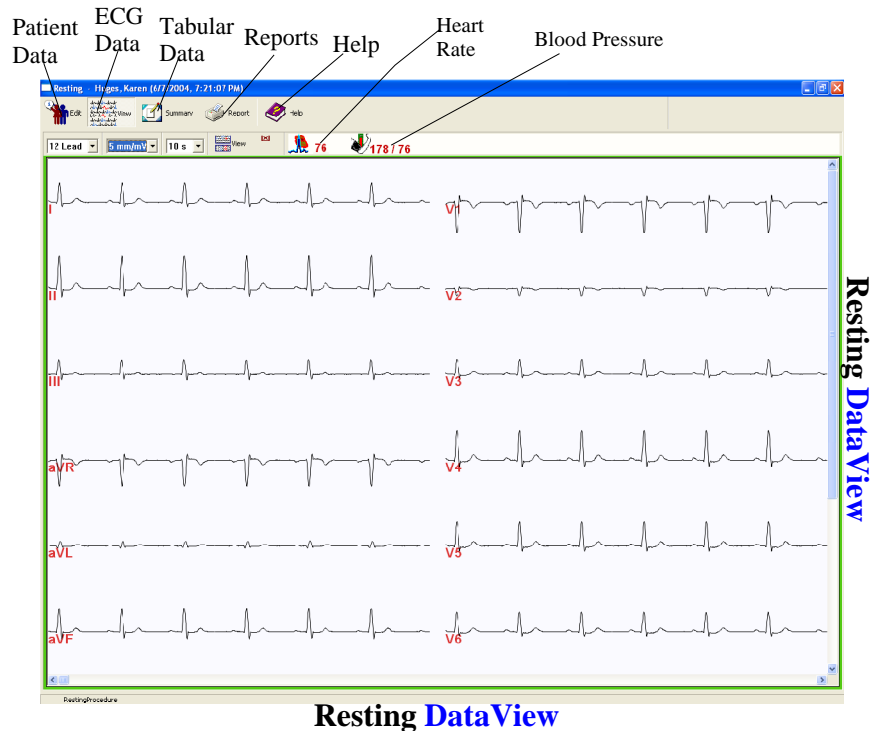[Open] button on the toolbar.   OR

Double click on the Test to be reviewed.

When a Resting test record is opened, the Resting Dataview screen is displayed. Information about the
patient can be viewed and/or edited, data from the test viewed and reports printed. An outline of the
features and options displayed on the Resting Dataview screen is given below, along with any available
links to other relevant topics.

Resting DataView

 Edit

Use the   Edit option to view or edit information about the patient and trace recalled from the database. The Edit
option can be executed by the following methods:

Patient and Test Property Sheets

Information about the patient is present in these two property sheets. If necessary, the information can be
edited.

Medication

Information about Patient medication is contained is contained in this property sheet.

<u>Signal</u>

Parameters on how the ECG was obtained, such as the sampling rate and use of filters, are contained on this property sheet.
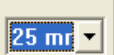
 View

Page Window

Clicking on the blue in the upper right hand corner or the window will cause the toolbar to be displayed. Clicking on the crossed out will hide the toolbar.

Lead View -   Select to change number of leads to be displayed.

Available options are: 1, 3, 6 or 12 Lds

Gain -   Select to change gain for ECG data

Available options are: 5, 10, 20 and 50 mm/mV
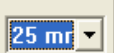
Speed -   Select to change the Speed of ECG Data display

Available Options are: 10, 25 and 40 mm/sec

View -   If depressed the Rhythm data will be displayed on the bottom of the screen along with Page View on the top of the screen. Pressing this button second time will hide the Rhythm data window.

Rhythm Window

Gain   Select to change gain for ECG data

Speed   Select to change the Speed of ECG Data display

Measure   Select to measure ECG Measurement

This option can be used to measure the distance in time between two points. Click on measure. Click on the first point and drag to the second point. The bottom number is time in sec. It can also measure the differential in height of two points. The top right number is this differential in mV.

Print   Select to print the segment **displayed** in the "Rhythm window".

Grid   If pressed, the grid will be displayed in the Rhythm window.

Pressing this button second time will remove the ECG Grid

HR   If pressed, the HR will be displayed for annotations.

Pressing this button second time will show RR time in second.

Summary

Pressing summary button provides summarized data for ECG measurements and automatic ECG Interpretation.

Table

This table provides different amplitude measurements from all 12 ECG leaads

General

This selection provides ECG Complex measurements. Moving measurements marker (using left mouse button) user can manually over ride the automatic ECG measurements

P Wave

This provides P wave measurement markers. Left mouse button can be used to move the marker to over ride automatic P wave measurements.

QRS Wave

This provides QRS Complex measurement markers. Left mouse button can be used to move the individual marker to over ride automatic QRS Complex measurements.

T Wave

This provides T wave measurement markers. Left mouse button can be used to move the marker to over ride automatic T wave measurements.

Hypertrophy

Provides Hypertrophy scores for Sokolow Lyon, Cornell and Estes.

Interpretation

Provides Computer generated Automatic ECG Interpretation. Typing free text or accepting Statements from the Statement Libarary can over ride this Automatic ECG Interpretation box.

Note: For the Automatic Computer Interpretation to work in the Resting test this option has to be selected in the Resting Setup.

The Interpretation property sheet shows the computer-generated interpretation. The user can also enter their own interpretation.

Click on the arrow from the computer interpretation box to enter that into the Physician's Interpretation box. Other interpretations are available in the Statement Library on the right of the screen. Select the statement desired and click on the arrow to transfer it over to the Physician's Interpretation box.

If the computer interpretation is not appropriate and no statements from the library can be found to describe the test record, the physician can add his own interpretation by simply clicking in the Physician Interpretation box and starting to type.
In a view-only box at the bottom of the screen, the date and time of the computer-generated interpretation is displayed. If the computer interpretation is not used, the name of the analyst who overread the interpretation and the physician that confirmed it, along with the date and time, can be entered.

Report

Report

Checked Off reports can be printed (automatically or manually) to printer attached to the computer.
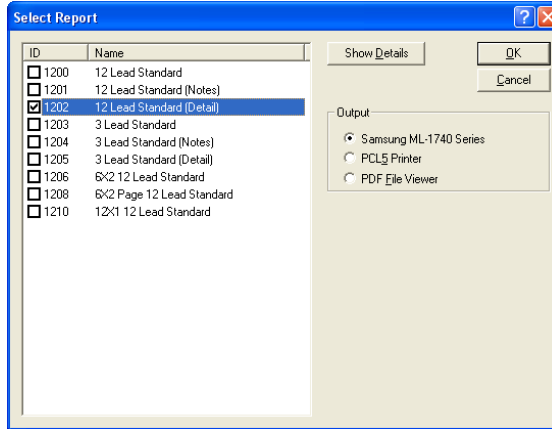
If selection is made for PDF File Viewer then report will print as PDF file to the computer screen. Save option button from Adobe Acrobat reader will make the report saved in PDF format, which can be printed or emailed, if required by the user.

Note: In order to print PDF File Viewer to computer screen, installation of Adobe Acrobat Reader 6.0 or higher on user computer is required (also make sure that correct version of Acrobat Reader is selected under "\Utility\Configuration\Option\PDF". To make sure select "Detect")

RESTING ECG SETUP

Resting ECG Setup is used to select various options for ECG saving and printing purposes. Resting Setup can be accessed two ways:

☐ From the <u>Acquisition Screen</u> select File > Resting > Setup and the Resting dialog box will appear   OR

Click on the Rest ECG icon. If the "Show This Window" in the Resting Setup has been previously checked, the Resting Setup dialog box will automatically be displayed.

Executing Stress causes the system to display the Resting dialog box.
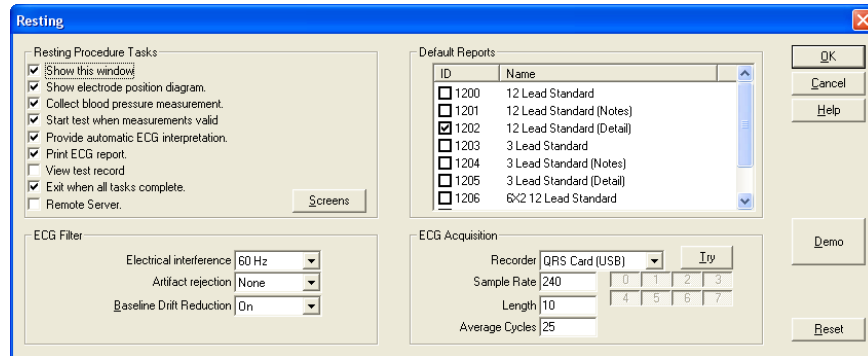
Show This Window

If checked, the Resting dialog box will appear when accessing the Resting Test (File > Resting > Perform Test or clicking on the Resting ECG icon). If not checked, the Resting ECG Patient Information dialog box will appear first when accessing the Resting Test.

Show Electrode Position Diagram

If checked, the electrode positioning diagram will be displayed after the Resting ECG Patient Information dialog box and before the Resting Test starts.

Collect Blood Pressure Measurement

If checked, the Blood Pressure dialog box will be displayed after the Resting patient information has been entered. Enter the patient's blood pressure and click OK to continue.

Start Test When Measurements Valid

If checked, the test will automatically started once it is determined that the measurements are valid. If unchecked, the ECG will begin, but the test will not start until the Save Strip icon is clicked on the Resting ECG toolbar.

Provide Automatic ECG Interpretation

If checked, automatic ECG interpretations will be supplied.

Print ECG Report

If checked, an ECG Test report will be printed automatically after collection of the Resting ECG and will be saved to the computer hard drive.

If the print ECG report option is checked, check the type(s) of reports desired.

View Test Record

If checked, the ECG record will be displayed right after the data is collected.

Exit When All Tasks Complete

If checked, the program will return to the Standby mode when all the tasks selected for the Resting ECG test are completed. (**NOTE:** This feature, unchecked, can be used to save multiple Resting ECGs of the same

patient.)

ECG Filter

Electrical Interference

Allows the user to apply a 50Hz or 60Hz filter to smooth out the signal. If desired**,** the filter can also be turned off.

Artifact Rejection

If the Artifact Rejection option is chosen, artifacts, like those caused by muscle twitches, will not be assigned as peaks.

Baseline Drift Reduction

Drift of the baseline will be minimized.

Default Reports:

Checked Off reports can be printed (automatically or manually) as default reports to printer attached to the computer.

ECG Acquisition

Recorder

Defines if the signal is coming from a QRS Card, a simulated device (QRS demo) or a remote QRS Card.

Sample Rate

Defines the sampling rate, per second.

Length

Defines the length of the ECG trace, in seconds, that is saved.

Average Cycles

Defines the number of beats averaged to make a complex ECG.

Screens

Defines "Default" parameters for Screen display values e.g. Gain, Speed, Lead Display etc for Acquisition and Dataview Screens. See Appendix X" for more help and details.

Reset Button

Selecting the Reset button will reset all parameters to their default positions.

STRESS ECG

Topics
Modes of Operation
Starting a Stress ECG   *(Acquisition)*
Viewing a Stress ECG   *(Dataview)*
Stress ECG Setup

===

Modes of Operation:

During normal operation of the QRS-Card ECG the system performs in either of three modes:

Standby Mode

Standby Mode is while QRS-Card Cardiology Suite Master screen is open and no selection of a test (new ore review) has been made.

During this mode certain operation like patient search, adding a new patient or delete a patient can be performed.

Acquisition Mode

The Acquisition Mode supply functionality to <u>acquire</u> Stress ECG data (in real-time). The monitor mode displays an icon, [icon], in the left hand corner of the title bar.

During this mode patient is attached to the QRS-Card and the ECG data is seen in real-time on the computer screen.

Dataview Mode

The Dataview mode supplies the functionality to view previously acquired Stress ECG data. Open a patient record to access the Dataview Screen. For more details see <u>Open Test Record</u>.

Stress DataView - *Page/Rhythm/Trend*
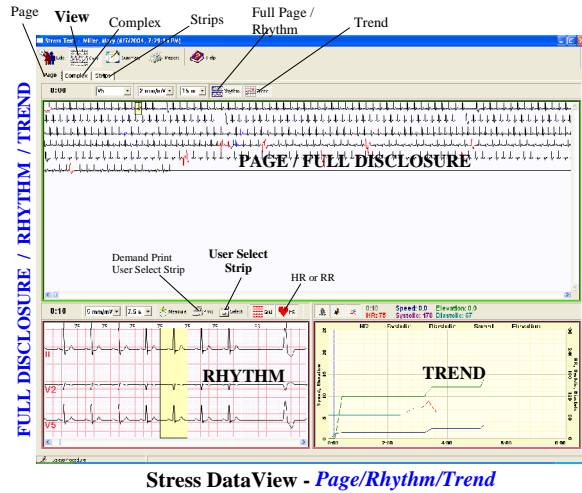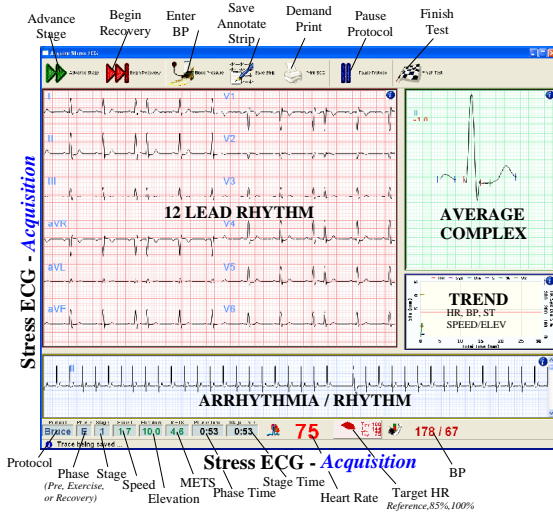
STARTING A STRESS ECG TEST

A Stress Test can be started by the following methods:

- From the Acquisition Screen select File > Stress > Perform Test   OR

- From the toolba**r** select the Stress ECG icon [Stress ECG] OR

    Use the Hot Key F3.

Starting a Stress Test by one of these methods will cause the Stress Setup dialog box to be displayed (IF the Show This Window box has been checked in the Stress Setup. See Stress Setup). After the Stress Setup dialog box the Stress ECG Patient Information property box will be displayed. Fill in the appropriate information in the Patient, Encounter, and Medication property sheets. If the patient has been tested previously the Browse option can be utilized.

Press Cancel to discontinue the Stress Test or OK to start the test . Successful commencement of the Stress test can be verified by observing the appearance of the Acquire Stress ECG screen and the start of the ECG trace.
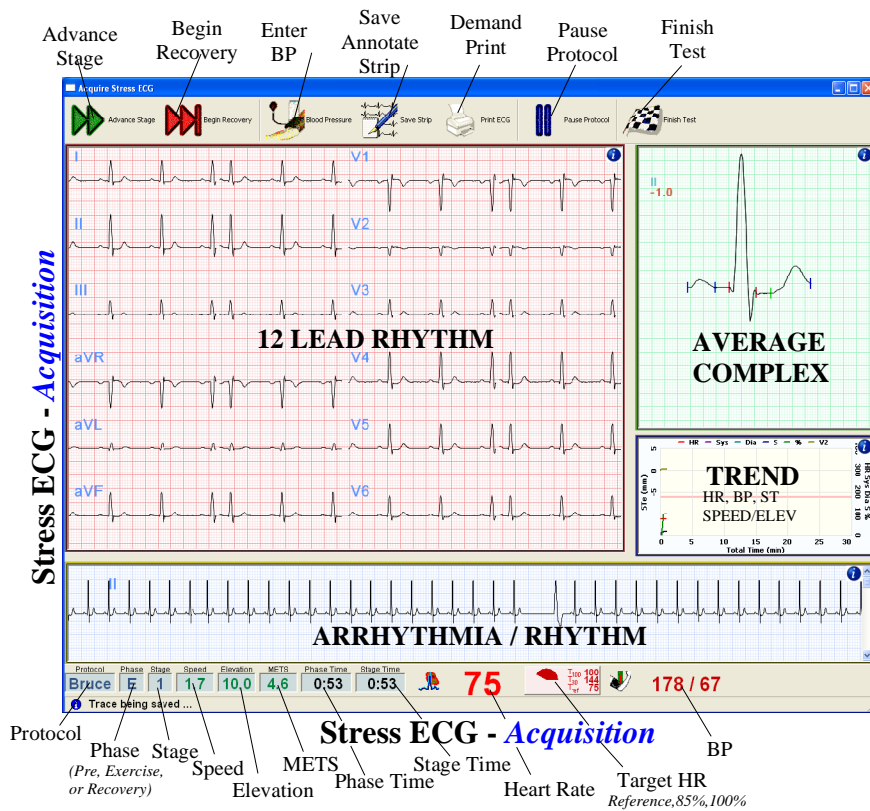
Clicking on the blue [i] in the upper right hand corner or the window will cause the toolbar to be displayed. Clicking on the crossed out [icon] will hide the toolbar. (see page X under Resting ECG for more details)

Tasks Performed During a Stress Test:
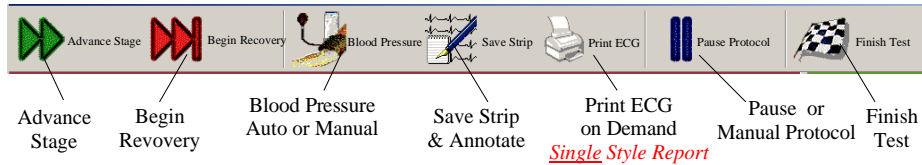
Stress ECG Test comprises of various Phases and Stages.

In general QRS-Card Stress ECG Test has three phases. These Phases are:

1. Pre-Test Phase
2. Exercise Phase
3. Recovery Phase

Note: User Intervention is required in moving during Stages while in Pre-Test mode. While Exercise and Recovery stages are timed e.g Each Exercise Stage in Bruce protocol is 3 minutes each.

Each Phase can have multiple stages:

Pre-Test Phase *(User intervention is needed to complete/forward Pre-Test Stages)*
      Supine
      Hyperventilation
      Warm-up
Exercise Phase
      Stage E1
      Stage E2
      Stage Ex
Recovery Phase
      Stage R1
      Stage Rx

Note: The Advance Stage command can only be accessed when a Stress Test is running.

Use the Advance Stage command to advance the Stress Test to the next Stage. The Advance Stage command can be accessed the following way:

- Press the Advance Stage button on the Stress Status Bar.

Selecting the Advance Stage command causes the system to advance the Stress Test to the next Stage as defined by the protocol.
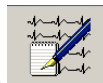
This button can be used to acquire Pre-Test Stage ECG's. This button can also be used to advance Stages while in Exercise Phase or in Recovery Phase.

- Begin Recovery by Pressing button on the Stress Status Bar.

- To manually enter Blood Pressure Press button on the Stress Status Bar.

- To annotate or mark a Strip to print during final reports press button on the Stress Status Bar

- To print a real-time ECG Report press [printer icon] button on the Stress Status Bar.

    Note: 1. Number of pages (or continuous print) to print under "Stress/Setup"
    *   2. HP PCL5 Printer is REQUIRED to perform real-time print*

- To pause (and manually control) the exercise stage and the protocol press [pause icon] button on the Stress Status Bar.

    Note: Pressing this Pause Protocol Button will display four additional buttons on the Stress Status bur. This additional buttons are then used to manually control the Exercise Device (treadmill or Ergometer)

- To complete the test (or Stop a test) press [checkered flag icon] button on the Stress Status Bar.
This button is usually pressed while in RECOVERY phase. However this button can be pressed anytime during a test to FINISH a test or to STOP a Test.

   *NOTE: In order to Stop a Test in an EMERGENCY SITUATION use TREADMILL EMERGENCY STOP BUTTON.*

REPORTS:
Checked Off reports can be printed (automatically or manually) to printer attached to the computer.

If selection is made for PDF File Viewer then report will print as PDF file to the computer screen (Installation of Adobe Acrobat 6.0 or higher on computer is required). Save button from Adobe Acrobat reader will make the report saved in PDF format, which can be printed or emailed, if required.
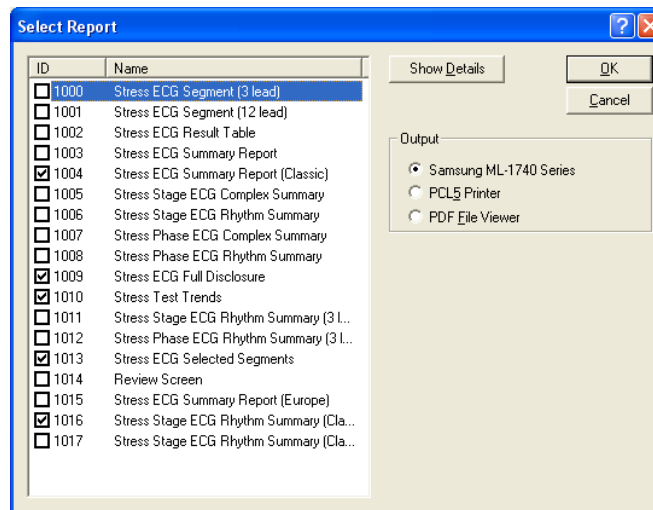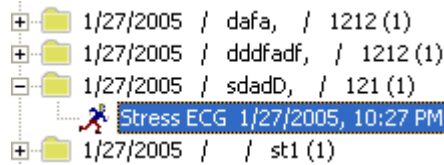
Stress Test DataView

To view (or edit) a stress test highlight from Master Screen a Stress ECG Test desired from the patient test list and click on the [icon] button on the toolbar

    OR

    Double click on the test to be viewed.

The test record will be displayed in the Dataview screen.

Information about the patient can be viewed and/or edited, data from the test viewed and reports printed. An outline of the features and options displayed on the Resting Dataview screen is given below, along with any available links to other relevant topics.
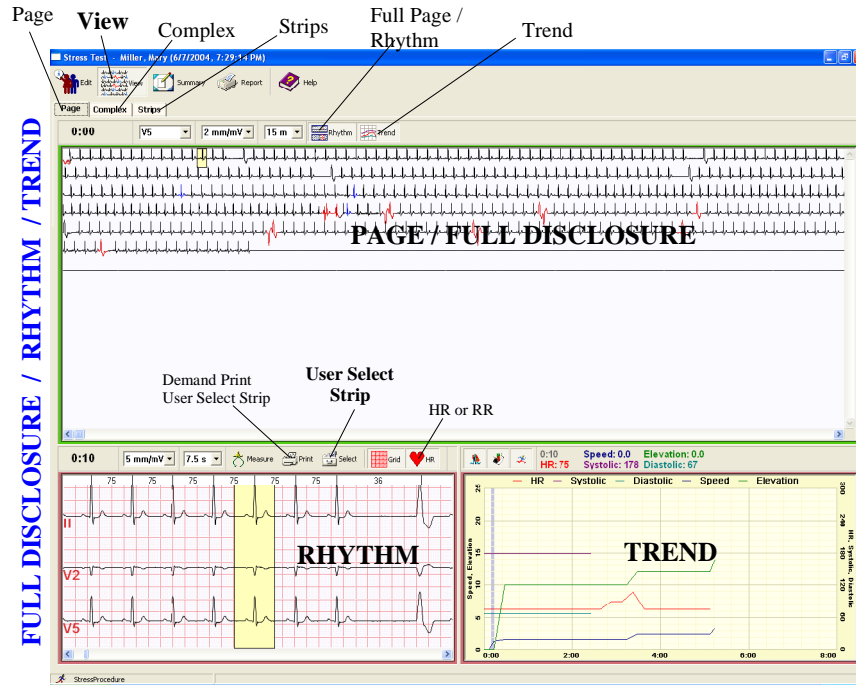

Edit Selection

This selection is used to review (and edit) any patient demographics information and ECG device information. Information is subdivided into:

    Patient
    Test
    Medication
    Signal

Note: To see more about "Editing" and "Viewing" of Patient demographics information see Appendix "X" page number "Y"

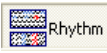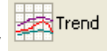**View Selection**

> This selection is used to review (and edit) acquired Stress Test ECG data in various formats.

Stress DataView - *Page/Rhythm/Trend*

Page tab:

> This selection shows full disclosure view of the complete stress test.
>
> By Pressing or button under "Page" Rhythm data and Trend Data can also be reviewed in conjunction with the page/full disclosure ECG data.
>
> Rhythm ECG data is synchronized by clicking left mouse button anywhere on the Full Disclosure ECG Page or on Trend graph.

Complex tab:

> This selection shows average complexes during different stages of the Stress Test.
>
> By Pressing or button under "Complex" Rhythm data and Trend Data can also be reviewed in conjunction with the Average ECG Complex data
>
> Rhythm ECG data is synchronized by clicking left mouse button anywhere on the Complex ECG Page or on Trend graph.

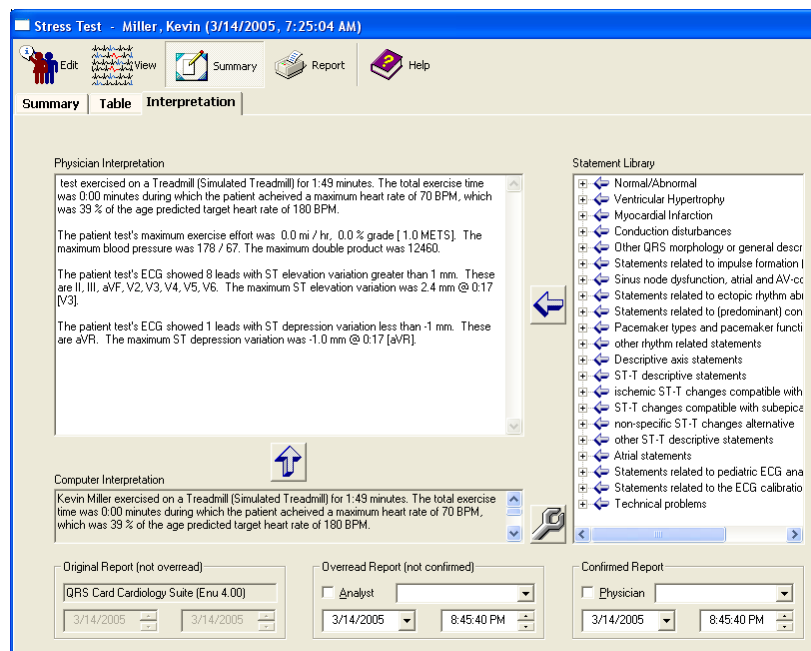**Strips Tab:** Strips

This selection shows:
  a. Auto Selected Arrhythmia Strips
  b. Stress Event Strip (e.g every minute save for Bruce protocol)
  c. Custom Save/Annotated Strips.

Strip shown with time stamp marked in "YELLOW" are the one, which are ready to print. These strips can be marked and unmarked by using the tool bar buttons for marking/unmarking.

Note: "SPACE BAR" keyboard key can also be used as a HOT Key to quickly toggle Mark or Unmark a strip for printing.

Summary Selection

This selection is used to review Stress Test Summary Data. This data include Stress Summary, tabular data for Stress Test and Summarized Stress Test Interpretation.

Summary Tab Summary
This selection shows Summary of Stress test and the reason for the termination of the Stress Test (user has the option to overwrite their comments for the Test termination).

Table Tab Table
This selection shows Stress Test Summary in a tabular format

Interpretation Tab Interpretation
This selection shows summary of computerize Interpretation of the Stress Test. User has the option to overwrite the final Stress Test Interpretation with their own interpretation.

Report Selection

Checked Off reports can be printed (automatically or manually) to printer attached to the computer.
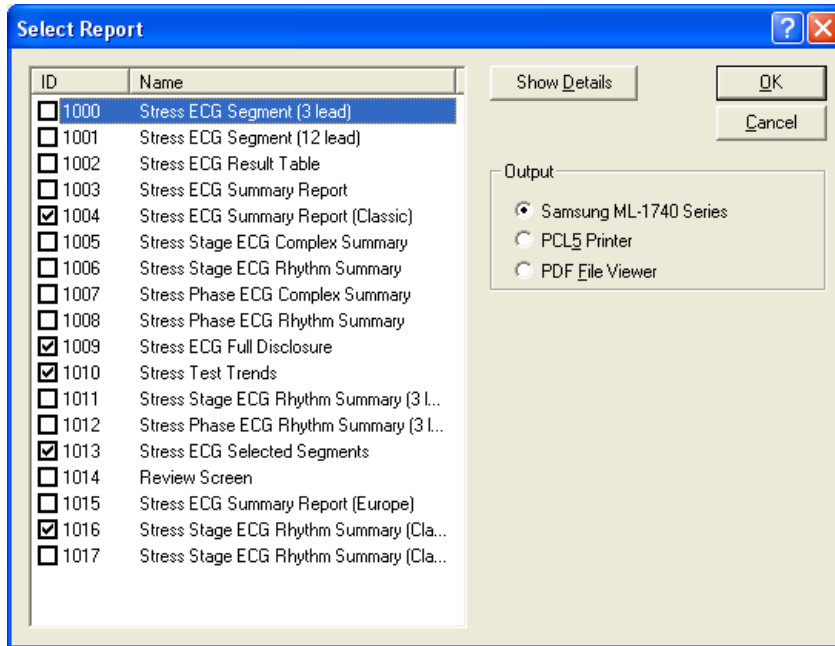
If selection is made for PDF File Viewer then report will print as PDF file to the computer screen. Save button from Adobe Acrobat reader will make the report saved in PDF format, which can be printed or emailed, if required.

Note: In order to print PDF File Viewer to computer screen, installation of Adobe Acrobat Reader 6.0 or higher on user computer is required (also make sure that correct version of Acrobat Reader is selected under "\ Utility \ Configuration \ Option \ PDF". To make sure select "Detect")

STRESS ECG SETUP

The Setup command is used to define various parameters for running a Stress Test. The Setup command can be accessed by the following method:

- From the <u>Acquisition Screen</u> select File > Stress > Setup   OR

    Click on the Stress ECG icon. If the "Show This Window" in the Stress Setup has been previously checked, the Stress Setup dialog box will automatically be displayed. See below.

Executing Setup causes the system to display the Stress dialog box.

Stress Property Sheet

Protocol:

Defines the Stress Test Protocol to be used in the Stress Test.

Controlled Device:

Defines the Stress Test Exercise device.

Test:

Tests the functionality and the connection between the computer and the Exercise device.

To test a device, first select it under the Device option described above.

- Test Property Sheet:

    In testing a Treadmill Device, clicking on the arrows under Speed should increase and decrease the speed of the Treadmill. Using the arrows under Treadmill should increase and decrease the elevation of the device.

    In testing an Ergometer Device, using the arrows under Ergometer should increase or decrease the load. The Blood Pressure can also be measured to verify the BP aspect of the test is functioning properly.

- Limits Property Sheet

    Lists the limits of the driver.

Metric:

If checked, Exercise device measurements in will be given in Metric units.

Blood Pressure

Defines whether or not a Blood Pressure reading will be used and if it is, whether it will by taken automatically by the machine or whether the program will prompt the user to enter the BP manually.

If NO BP is selected, the user will NOT be prompted for BP input unless the BP tool button is manually executed.

Display Options

Show This Window

If checked, the Stress dialog box will appear when accessing the Stress Test (File > Stress > Perform Test or clicking on the Stress ECG icon). If not checked, the Stress ECG Patient Information dialog box will appear first when accessing the Stress Test.

Show Electrode Position Diagram

If checked, the electrode positioning diagram will be displayed after the Stress ECG Patient Information dialog box and before the Stress Test starts.

Arrhythmia Screen

If checked, the Arrhythmia screen will be displayed during the Stress test.

Trend Screen

If checked, the Trend screen will be displayed during the Stress Test.

ST Segment Display

This option selects the display lead for the ST Trend Window. Selecting Normal provides the display of ST for the user selected lead.

The Maximum ST Elevation or Depression Lead option automatically displays the ST values for the lead that has either the maximum elevation or the maximum depression.

The Maximum ST Elevation Lead option automatically displays the ST values for the lead which has the maximum ST elevation.

The Maximum ST Depression Lead option automatically displays the ST value for the lead which has the maximum ST depression.

ECG Filter

Electrical Interference

Allows the user to apply a 50Hz or 60Hz filter to smooth out the signal. If desired**,** the filter can also be turned off.

Artifact Rejection

If the Artifact Rejection option is chosen, artifacts, like those caused by muscle twitches, will not be assigned as peaks.

Baseline Drift Reduction

Drift of the baseline will be minimized.

Reports

Demand

If desired, a printout of the ECG trace can be obtained while the test is running. Chose the number of pages to be printed (1 to 6 pages or a continuous printout). Start the Stress test. Click on the Print ECG icon and the printout will start from that point. If Continuous is chosen, the printout will continue until the Print ECG icon is clicked again.

Protocol

If checked, an ECG trace will be printed for each time specified by the protocol.

Final

Specifies the type(s) of final reports.

Target Heart Rate

Defines whether the Target Heart Rate is to be calculated from the patient's age or be manually assigned.

ECG Acquisition

Recorder

Defines if the signal is coming from a QRS Card, a simulated device (QRS demo) or a remote QRS Card.

Sample Rate

Defines the sampling rate, per second.

Length

Defines the length of the ECG trace, in seconds, that is saved.

Average Cycles

Defines the number of beats averaged to make a complex ECG.

Screens

Defines "Default" parameters for Screen display e.g. Gain, Speed, Lead Display etc for Acquisition and Dataview Screens. See Appendix X" for more help and details.

Protocol Editor

See Protocol Editor

Defining a New Protocol

Protocol Information

Updating a Protocol

HiRes ECG

✋⚡ WARNINGS

Usage of HiRes ECG Software is ONLY customer Outside of US

Topics
Modes of Operation
Starting a Resting ECG   (Acquisition Mode)
Viewing a Resting ECG   (Dataview Mode)
HiRes ECG Setup

==
Start a Hi-Res Test by one of the following methods:

• From the Acquisition Screen select File > Hi-Res > Perform Test.   OR

• From the toolbar select the Hi-Res ECG icon 🐾 Hi-Res ECG OR

   Use the Hot Key F4.

Starting a Hi-Res Test by one of these methods will cause the Hi-Res Setup dialog box to be displayed. (IF the Show This Window box has been checked in the Hi-Res Setup. See Hi-Res Setup.) After confirming/editing the Setup information, click OK.

Next, the Hi-Res ECG Patient Information property box will be displayed. Fill in the appropriate patient Information in the Patient, Test and Medication property sheets. If the patient has been tested previously the Browse option can be utilized. When done with the patient information, click OK.

The XYZ Electrode Placement Diagram will be displayed next - IF the Show Electrode Position Diagram box has been checking in the Hi-Res Setup.

Click OK to start the Hi-Res test.

i - Clicking on the blue *i* in the upper right hand corner or the window will cause the toolbar to be displayed. Clicking on the crossed out *i* will hide the toolbar.
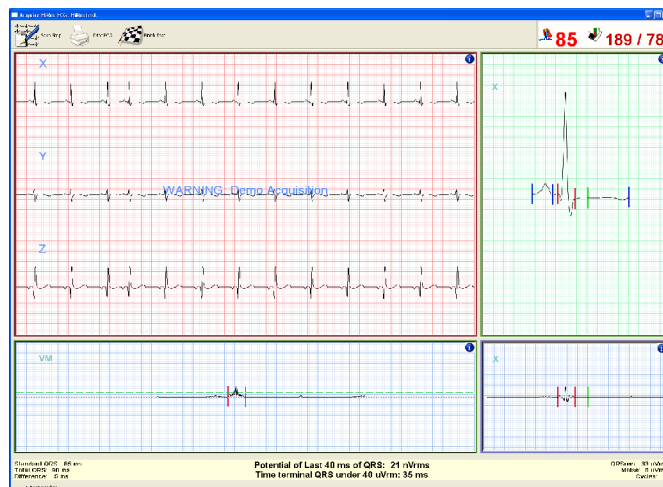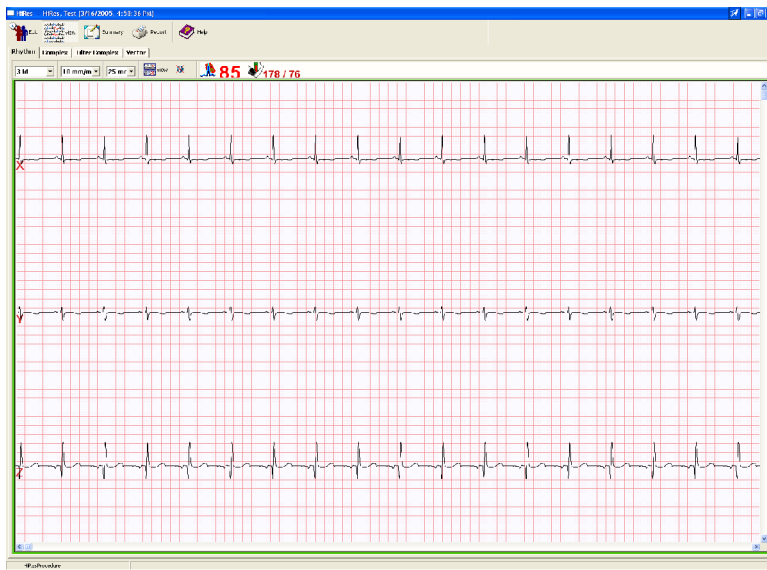
HiRes ECG Dataview

To view (or edit) a HiRes ECG test, highlight from Main Screen the ECG Test desired then click on the [Open] button on the toolbar.   OR

Double click on the Test to be reviewed.
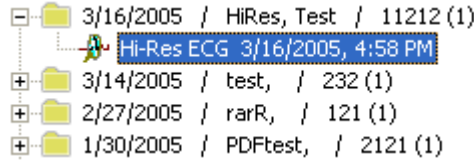
When a Resting test record is opened, the HiRes Dataview screen is displayed. Information about the patient can be viewed and/or edited, data from the test viewed and reports printed. An outline of the features and options displayed on the Resting Dataview screen is given below, along with any available links to other relevant topics.

 Edit

Use the   Edit option to view or edit information about the patient and trace recalled from the database. The Edit option can be executed by the following methods:

> Patient and Test Property Sheets
>
> Information about the patient is present in these two property sheets. If necessary, the information can be edited.
>
> Medication
>
> Information about Patient medication is contained is contained in this property sheet.
>
> Signal
>
> Parameters on how the ECG was obtained, such as the sampling rate and use of filters, are contained on this property sheet.

 View

> Pressing View button provides ECG data in various formats. These views are:

         Rhythm View

         Complex View

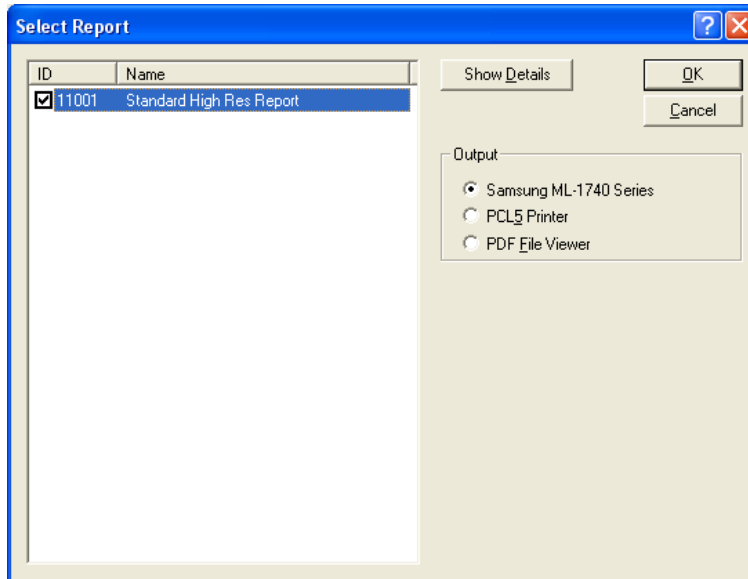   Filtered Complex View

         Vector Magnitude view

Summary

       Pressing summary button provides summarized data for ECG measurements and automatic ECG Interpretation.

Report

       Checked Off reports can be printed (automatically or manually) to printer attached to the computer.

HI-RES SETUP

The Setup command is used to define various parameters for running a Hi-Res Test. The Setup command can be accessed by two methods:

- From the <u>Acquisition Screen</u> select File > Hi-Res > Setup   OR

   Click on the Hi-Res ECG icon. If the "Show This Window" in the Hi-Res Setup has been previously checked, the Hi-Res Setup dialog box will automatically be displayed.

Executing Setup causes the system to display the dialog box.
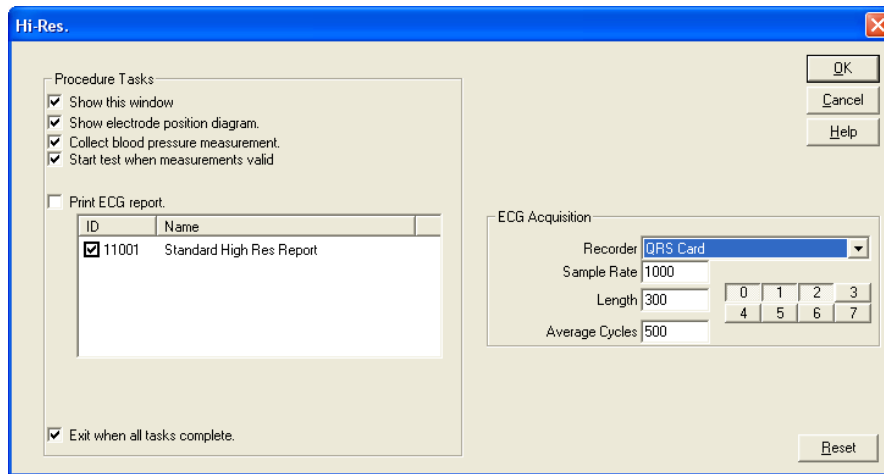
Show This Window

If checked, the Hi-Res dialog box will appear when accessing the Hi-Res Test (File > Hi-Res > Perform Test or clicking on the Hi-Res ECG icon). If not checked, the Hi-Res ECG Patient Information dialog box will appear first when accessing the Hi-Res Test.

Show Electrode Position Diagram

If checked, the electrode positioning diagram will be displayed after the Hi-Res ECG Patient Information dialog box and before the Hi-Res Test starts.

Collect Blood Pressure Measurement

If checked, the Blood Pressure Entry dialog box will be displayed after the Hi-Res Patient information has been entered. Enter the patient's blood pressure and click OK to continue.

Start Test When Measurements Valid-

If checked, the test will automatically started once it is determined that the measurements are valid. If unchecked, the ECG will begin, but the test will not start until the Begin icon is clicked on the Acquire Hi-Res ECG toolbar.

Print ECG Report

If checked, the report selected will be printed out at the end of the test.

Exit When All Tasks Complete

If checked, the program will return to the Standby mode when all the tasks selected for the Hi-Res ECG test are completed.

ECG Acquisition

Recorder

Defines if the signal is coming from a QRS Card, a simulated device (QRS demo) or a remote QRS Card.

Sample Rate

Defines the sampling rate, per second.

Length

Defines the length of the ECG trace, in seconds, that is saved.

Average Cycles

Defines the number of beats averaged to make a complex ECG.

Reset

Selecting the Reset button will reset all parameters to their default positions.

| ➤ | **QRS-Card™ Holter System Software Installation** |

The first time you use the PBI Holter system, you need to install the **QRS-Card™ Cardiology Suite** software by using the Setup file on the **PBI** software CD. Once the software is installed, you will be able to use the **QRS-Card™ Cardiology Suite** software for Holter ECG analysis and report printing. It will take approximately 1 to 3 minutes for all of the directories to be created and for all of the files to be copied to your computer hard disk.

In order to install the **QRS-Card™ Holter** System software, the following steps are required:

1. Switch on and boot up your computer with **Windows XP**, 2000 or Vista

2. Insert the **QRS-Card™ Cardiology Suite** software CD into the CD drive.

3. Follow the installation instructions on the screen.

5. Once the installation is complete, you are ready to start using your computer to perform Holter ECG analysis and report printing

✋ *NOTE: Write down the Product ID (PID) of your* **QRS-Card™ Cardiology Suite** *software as the PID and security key provided are required to use the system. For Demo software Tutorial the PID is "**0001-0001-2000-DEMOU**".*

Welcome to QRS-Card™ Cardiology Suite this software offers advanced Holter technology with many standard features in one package making it forefront of the industry. The advanced analysis techniques used provide accurate results that can be systematically reviewed with minimal technician involvement.
Standard features include:
- Accurate arrhythmia analysis
- Preset artifact detection
- Simple user interface
- Fast load and analysis
- Color coded beats and trends
- Full disclosure (24 or 48 hours)
- 3-channel ST analysis
- Split-screen superimposition
- Multiple report formats
- Multiple format page mode
- Network compatibility

Optional features include:
- HRV (Heart Rate Variability) analysis
- 12-lead ECG analysis
- Pacemaker function analysis
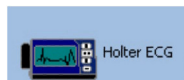- QT analysis

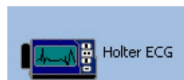Click Download Holter Data button to start Holter download procedure
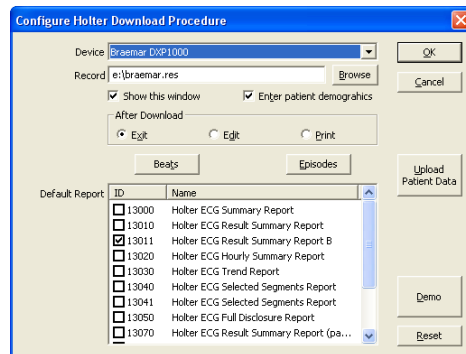
Download Holter Data
Use the *Download Holter data* command to start or finish a Holter Test. The Begin Test command can be executed by the following methods:

- From the File Menu select Holter > Download (F5).

- From the *toolbar* press   to download Holter ECG data.

- Press **Hot Key Ctrl+F5** to perform **Holter ECG**

Device:

Defines the recorder type to download from.

Record:

Defines the path for the Holter data file.

QRS-Card™ Holter System » Download Holter data

Show This Window

If checked, the Holter dialog box will appear when accessing the Holter Test (File > Holter > Perform Test or clicking on the Holter ECG icon). If not checked, the Holter ECG Download dialog box will appear first when accessing the Holter Test.

Enter patient demographics

If checked the Holter ECG Patient Information dialog box will appear during Holter ECG download.

After Download

Exit: If selected main software screen will be displayed after download.

Edit: If selected the Holter test will open for editing after download.

Print: If selected default reports will be printed after download.

Default Report

The reports that will print after Holter ECG data is analysed.

Upload Patient Data

Patiend data can be uploaded to the recorder. (Note: Only if recorder supports this option)

Beats

Opens the Configure Beat Detection dialog box.

Episodes

Opens the Configure Episode Detection dialog box.

Reset

Set all options to factory defaults.

➤ **Screen Overview** » **Introduction**

In Holter ECG data view mode click View button   to view downloaded
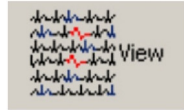
Holter ECG data and access the following options:

Beats

Episodes

Page

Strips

The view Holter ECG module has been divided into the above parts to allow for easy navigation and reclassification of the Holter ECG data.

> **Trace Information Dialog Box**

Tools option toolbar press

Use the Demographics option to view or edit information about the patient and trace recalled from the database.

Demographics
From the Dataview Screen select File > Demographics

When the Demographics option is executed; the Test Information dialog box will be displayed. This is used to enter patient details.

Patient Property Sheets
Information about the patient is present in this property sheet. If necessary, the information can be edited.

Medication Property Sheet
Information about the prescribed medication can be entered in this dialog box.

Test Property Sheet
More detailed information about the patient can be entered on this property sheet.

Signal Property Sheet
Parameters on how the ECG was obtained, such as the sampling rate and use of filters, are contained on this property sheet.
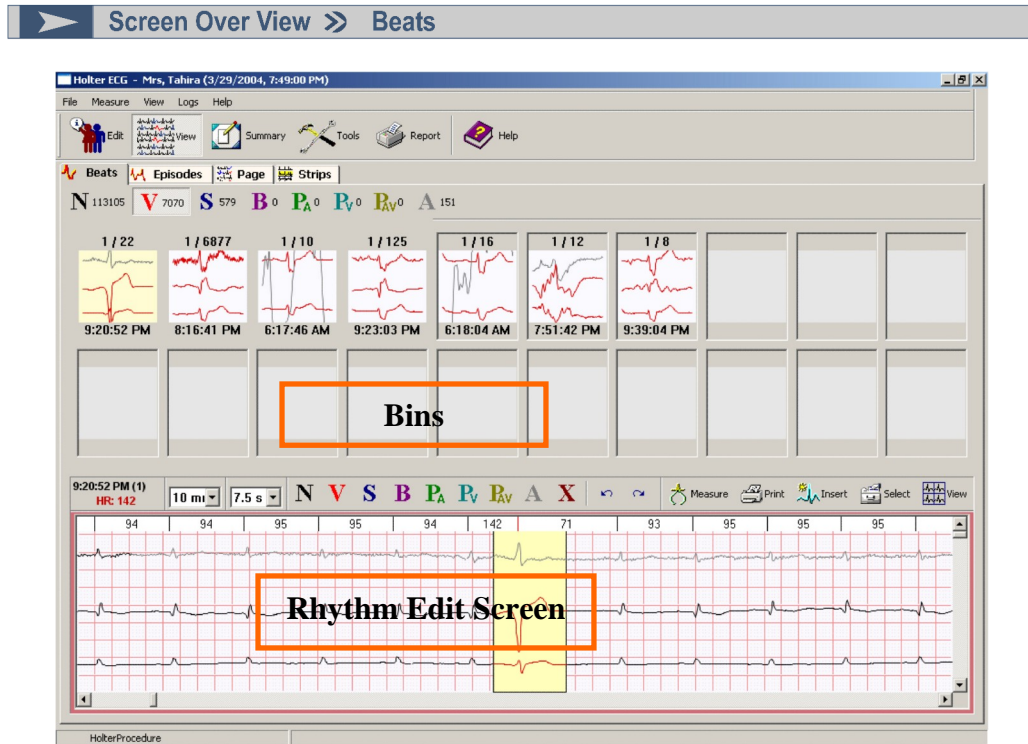
·From the View option toolbar press   [Beats]

·From the Dataview Screen select View > Beats.

·Use the Hot Key F2.

All Beats are classified into Beats according to the software's algorithm.

The Beats that match a particular template can be viewed by selecting the desired tab displayed above the template view window.

The Beats defined in the algorithm are as follows:
- Normal
- VE (Ventricular Extrasystole)
- SVE (Superventricular Extrasystole)
- Paced
- Aberrant
- Noise

The Beats Screen displays Bins, this allows the user to view all similar beats within a single template as a group and the beats from the selected Bin are displayed in the Rhythm Edit Screen.

Screen Over View ≫ Episodes
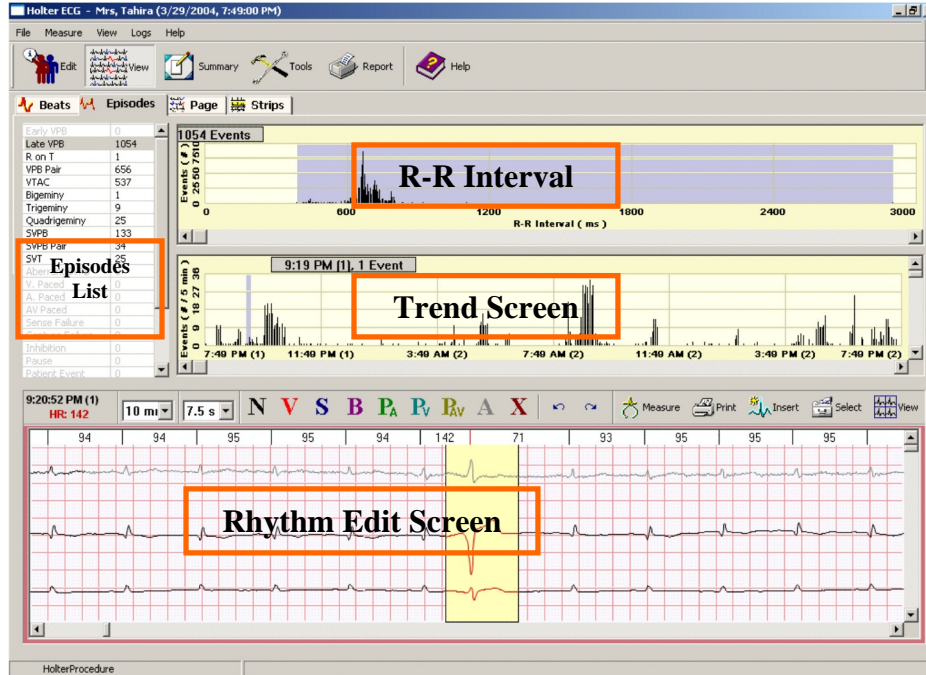
·From the View option toolbar press **Episodes**

·From the Dataview Screen select View > Episodes.

·Use the Hot Key F3.

The Episodes Screen enables the user to review ECG data through the R-R interval window and the trend window. Data in both windows is synchronized with the Rhythm Edit Screen as the user highlights the data.

As the ECG data is analyzed the Episodes are evaluated against predefined criteria and are stored in the following categories:

- Fastest Rates
- Slowest Rates
- Bradycardia
- Pause
- Isolated VEB
- VEB Pair
- VEB Run
- Bigemny
- SVEB Pair
- SVEB Run
- Recorder Episode
- STe Abnormalities

·From the View option toolbar press **Strips**

The Strips screen allows the user to review and select which Episodes should be printed in the selected report.

Strips are displayed in the following categories:

- VPB
- VPB Pairs
- Bigeminy
- SVPB
- SVPB Pair
- SVT
- Pause/Asystole
- Patient Episodes
- Selected Strips
- ST Episodes
- Tachy/Brady
- Fast rate
- Slow rate

Screen Over View » ST Table
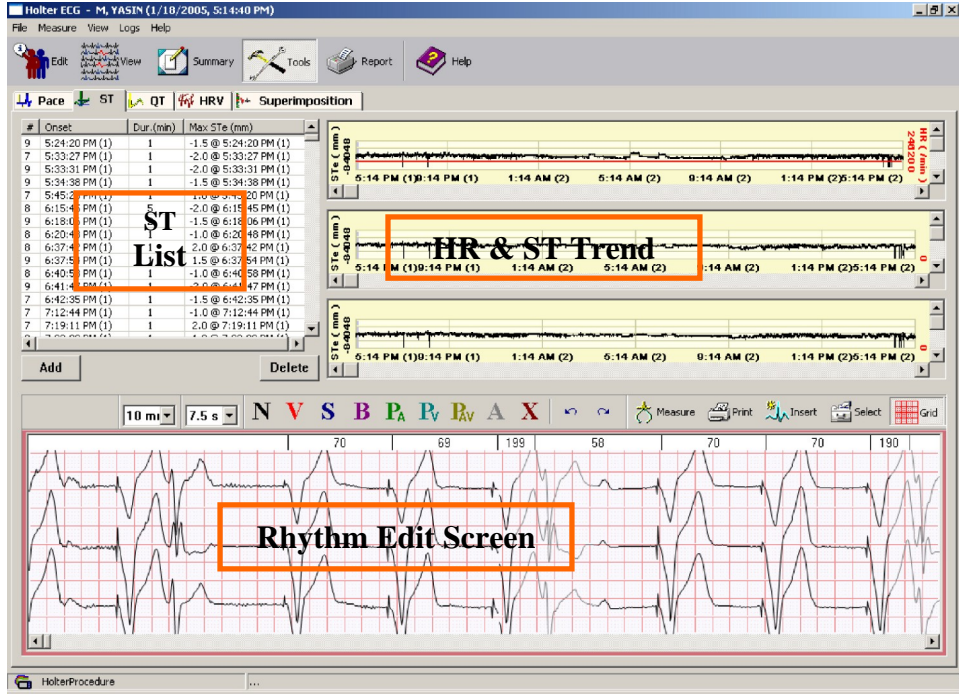
·From the Tools option toolbar press   [ST]

The ST Table screen displays data from the 3 ST channels individually as well as summarized data in the form of the ST List. The user can synchronize this data with the Rhythm Edit Screen.

Screen Over View » Rhythm

·From the Tools option toolbar press **Page**

·From the Dataview Screen select View > Page.

·Use the Hot Key F1.

The Page view Screen displays the ECG data between the duration of 1 - 30 minutes. The Page view Screen and Rhythm Edit Screen are synchronized according to user selection of ECG data in Page view screen.

The Rhythm Edit Screen allows easy editing/reclassification of beats.

Page view can be toggle between Full Page View or combination of Page and Rhythm Edit Screen.
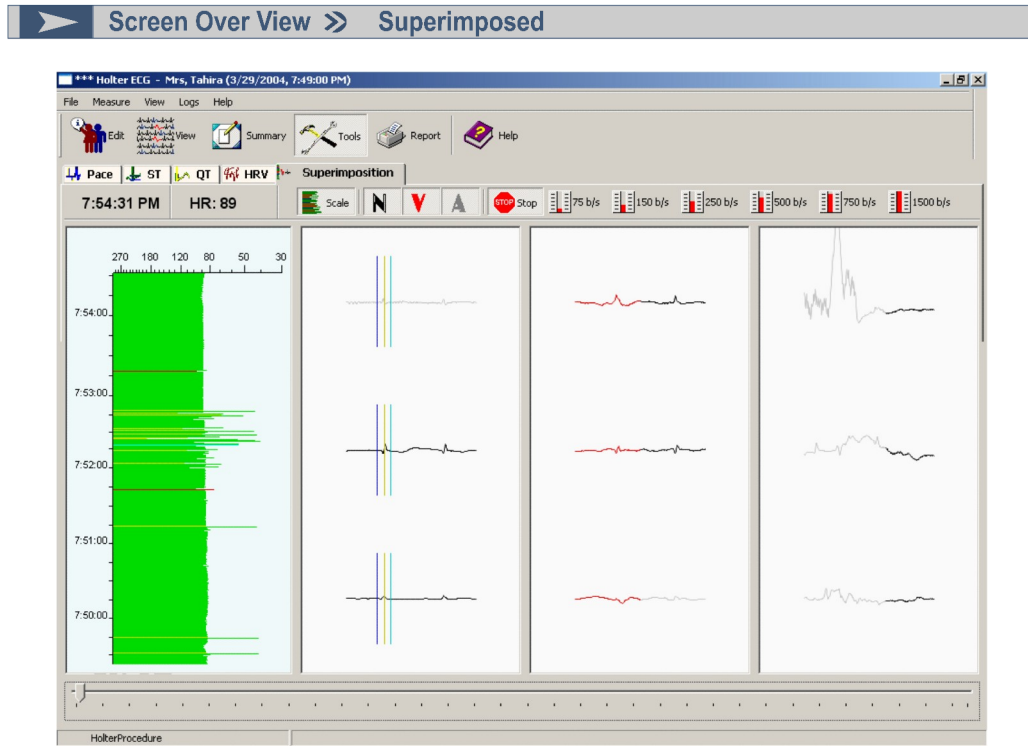
·From the Tools option toolbar press

This screen allows the user to easily identify many kinds of ECG abnormalities such as changes in P-R interval, Q-waves, QRS conduction, and ST elevation, by rapidly displaying QRS complexes on top of the preceding complex against a scale. Therefore the user can use the Superimpose mode to quickly determine if beats have been classified correctly as any major fluctuations can be identified easily with the help of the scale.

Screen Over View ≫ Summary

·From the Main toolbar press Summary

·Use the Hot Key Shift+F2.

Summary Screen displays useful quantitative data about individual parameters.

The Summary Screen includes the following tables:

- General
- Supraventricular
- Ventricular
- Supraventricular Runs
- Ventricular Runs
- Bigeminy
- Tachy/Brady
- Interval Summary
- Paced

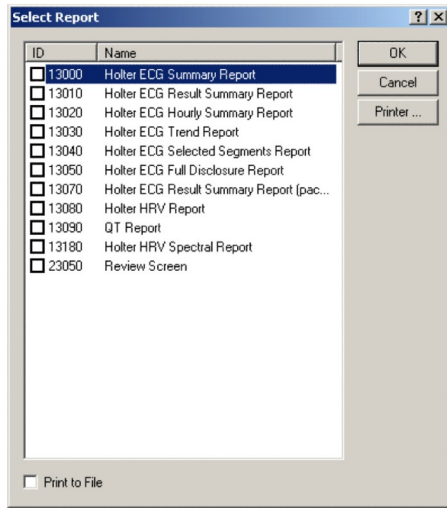   Each table contains hourly results for each measurement and summary information for the entire record.

Screen Over View ≫   HRV
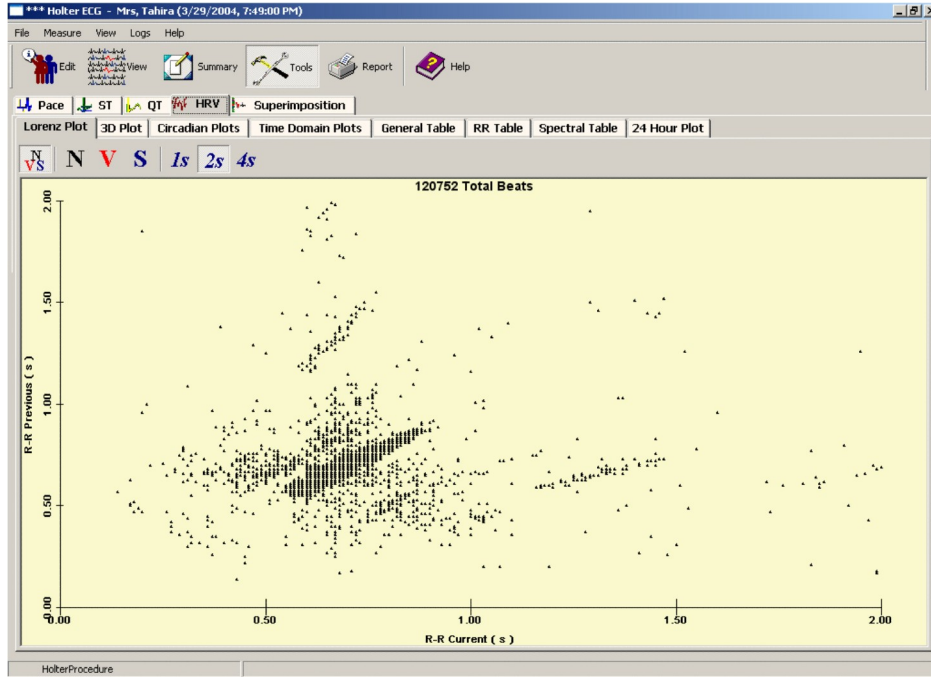
·From the toolbar press

The HRV Screen gives the user graphical display of the ECG data through different parameters. This tool assists the user to get an overview and analyze the ECG data at first glance.

Report Selection Dialog Box

Select Report

ID	Name
13000	Holter ECG Summary Report
13010	Holter ECG Result Summary Report
13020	Holter ECG Hourly Summary Report
13030	Holter ECG Trend Report
13040	Holter ECG Selected Segments Report
13050	Holter ECG Full Disclosure Report
13070	Holter ECG Result Summary Report (pac...
13080	Holter HRV Report
13090	QT Report
13180	Holter HRV Spectral Report
23050	Review Screen

OK Cancel Printer ...

☐ Print to File

Reports Dialog Box
The reports dialog box is used to generate printed Holter reports.

From the Dataview Screen select File > Print reports

Use the Hot Key Shift+F4

When the Print command is executed, the Print Report dialog box will be displayed. The type of report desired can be selected here. The system will then print the selected ECG Report. Report format can also be customized. For details on customized report formats please contact a member of the PBI sales team.
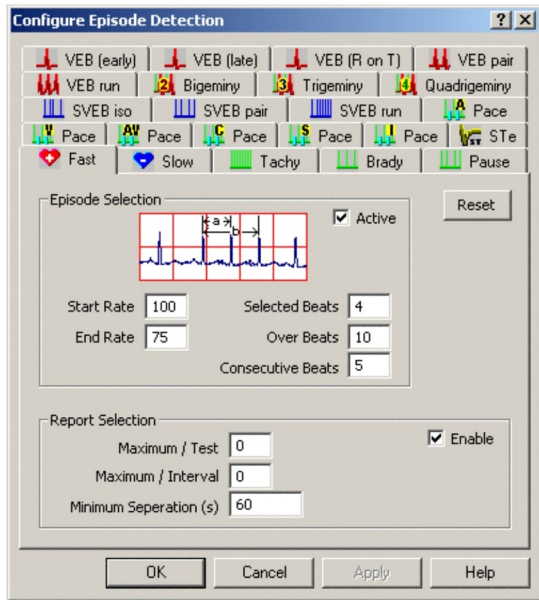
⮞ Configure Templates
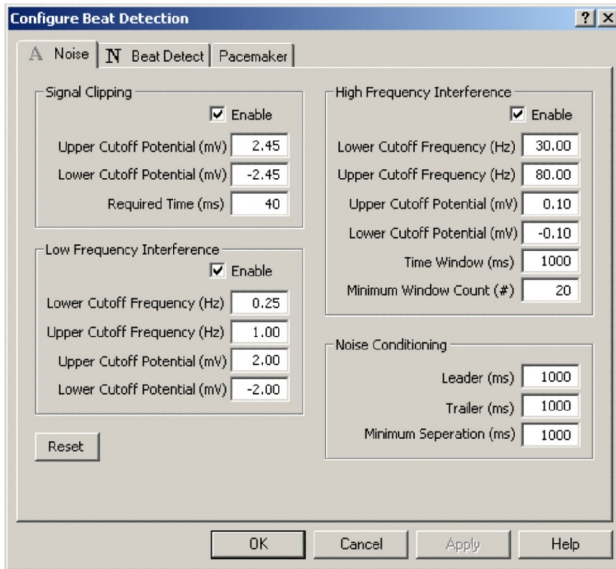
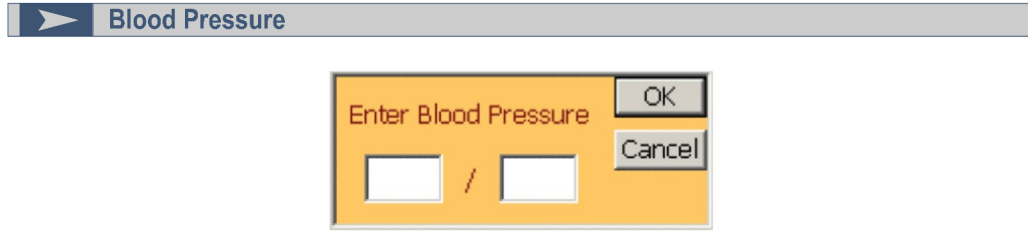From the Dataview Screen select Measure > Configure Beat Detection

This option allows the user to edit beat template parameters. Switch between tabs to set parameters for desired beat type.

➤ Configure Episode Parameters

Configure Episode Detection

Tabs:
- VEB (early) | VEB (late) | VEB (R on T) | VEB pair
- VEB run | Bigeminy | Trigeminy | Quadrigeminy
- SVEB iso | SVEB pair | SVEB run | Pace
- Pace | Pace | Pace | Pace | Pace | STe
- Fast | Slow | Tachy | Brady | Pause

Episode Selection

☑ Active   Reset

Start Rate	100
End Rate	75
Selected Beats	4
Over Beats	10
Consecutive Beats	5

Report Selection

☑ Enable

Maximum / Test	0
Maximum / Interval	0
Minimum Seperation (s)	60

OK   Cancel   Apply   Help

From the Dataview Screen select measure > Configure Episode Detection

This option allows the user to edit episode detection parameters. Switch between tabs to set parameters for desired episode type.

➤ Blood Pressure

Enter Blood Pressure

OK

Cancel

[ ] / [ ]

From the Dataview Screen select Measure > Blood Pressure

Use the *Blood Pressure* command to enter patient blood pressure values data.

The system displays the Blood Pressure Entry Dialog Box when the Blood Pressure command is executed. Enter the patient blood pressure using this screen. Once entered, the system updates the blood pressure values.

> **Lessons » Reclassify Single Beats**

The Rhythm Edit Screen allows the user to edit ECG data and reclassify beats. Beats classification are indicated as follows:

- **N**   Changes the label to **N**ormal.
- **V**   Changes the label to **V**entricular.
- **P**   Changes the label to **P**aced.
- **A**   Changes the label to **A**rtifact and the beat(s) are not included in the results.
- **S**   Changes the label to **S**upraventricular.
- **B**   Changes the label to a**B**errant. (Supraventricular)
- **X**   **Deletes the Beat** and the beat(s) are not included in the results.

> **Lessons » Reclassify Single Beats**

To reclassify beats

1. Select the beat(s) from the Bins that you want to reclassify in the Rhythm Edit Screen.

    To select a single beat click on the R-wave. To select multiple beats drag the R-waves that you want to include.

2. Click the desired reclassify button that you want the beat to be reclassified to.

3   The Selected beat(s) will be reclassified (or deleted if you clicked on **A** or **X**)
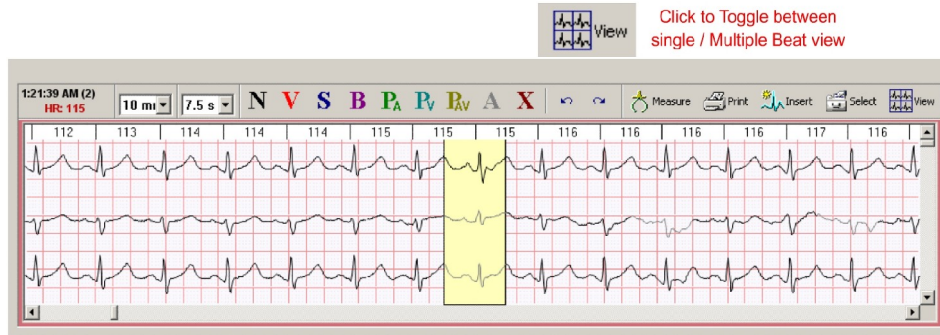
Lessons » Reclassify Multiple Beats

The beats can be viewed in *multiple view mode* also.

To reclassify multiple beats

1. Select the template class (VE, Normal, SVE, etc.).
2. Select the desired bin.
3. Click view button to **Toggle** view single/multiple template beats in the Rhythm Edit Screen.
4. Select the template beats you want the edit by clicking on multiple beats or clicking **Mark Row**, **Mark Page**, **Mark All**.
5. Click **N**, **V**, **P**, **A**, **S**, **B**, or **X** to reclassify the beats.
   The selected beats will be reclassified and the Rhythm Edit Screen will be updated with the remaining template beats in the selected Template pane.
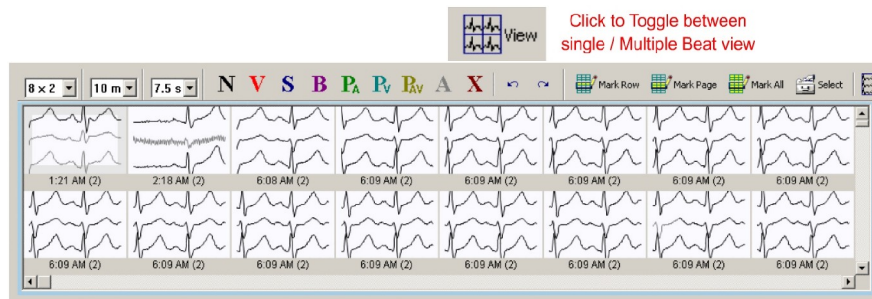
Lessons ≫ Reclassify Single Episodes

The Episodes Edit window allows the user to edit Episode data and reclassify Episodes. Episodes classifications are indicated as follows:

N Changes the label to **N**ormal.

V Changes the label to **V**entricular.

P Changes the label to **P**aced.

A Changes the label to **A**rtifact and the Episode(s) are not included in the results.

S Changes the label to **S**upraventricular.

B Changes the label to a**B**errant. (Supraventricular)

**X** **Deletes the Beat** and the Episode(s) are not included in the results.

> ➤ **Lessons » Reclassify Single Episodes**

To reclassify Episodes

1.   Select the Episode(s) from the Episodes list that you want to reclassify in Rhythm Edit Screen

     To select a single Episode click on the R-wave. To select multiple Episodes drag the R-waves that you want to include.

2.   Click the desired reclassify button that you want the Episode to be reclassified to.

     The Episode(s) will be reclassified (or deleted if you clicked on **A** or **X**)
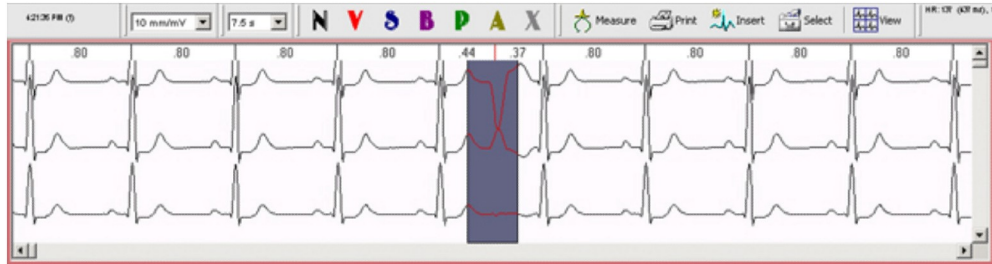
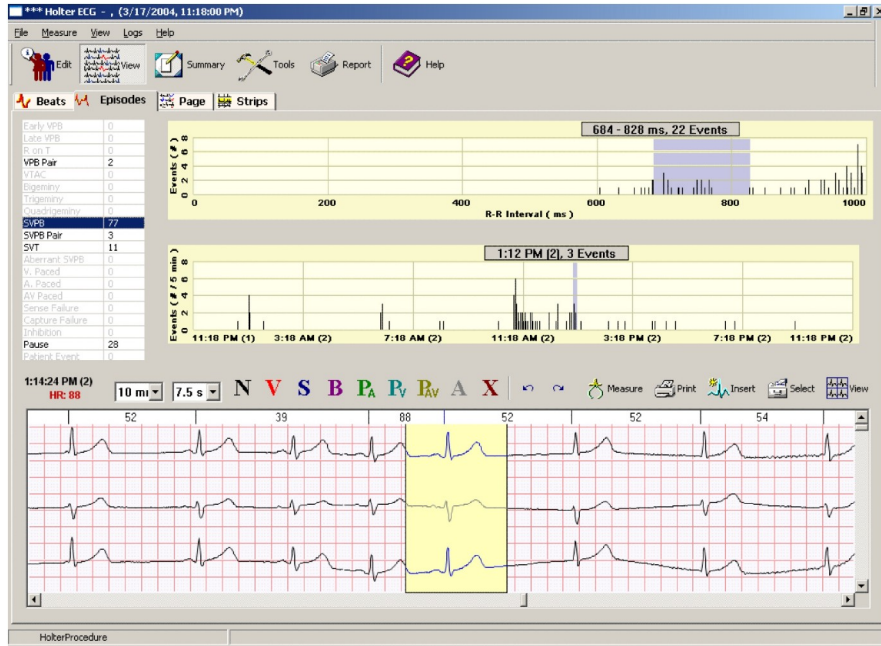> ➤ **Lessons** ≫ **Reclassify Multiple Episodes using the R-R Interval Histogram**

To edit multiple Episodes using the Episode R-R Interval Histogram
1. In the Episode List box select the Episode type that you want to edit.
2. Drag the Episodes in the Episode R-R Interval Histogram to select the range of R-R intervals to edit.
3. Click **Toggle** to view multiple Episodes in the Rhythm Edit Screen if it isn't already.
4. Select the Episodes you want the edit by clicking on multiple Episodes or click **Mark Row**, **Mark Page**, or **Mark All**.
5. Click **N**, **V**, **P, A**, **S**, **B**, or **X** reclassify button to edit the Episodes

    The selected Episodes will be reclassified and the ECG Edit window will be updated

Lessons ≫   Reclassify Multiple Episodes using the R-R Interval Histogram

➤ **Lessons** » **Reclassify Multiple Episodes using the Trend Screen**

To edit multiple Episodes using the Event Trend
1. In the Episode List box select the Episode type that you want to edit.
2. Drag the episodes in the Episode Trend to select the time period that you want edit.
3. Click **Toggle** to view episodes in the Rhythm Edit Screen if it isn't already.
4. Select the template beats you want the edit by clicking on multiple episodes or click **Mark Row**, **Mark Page**, or **Mark All**.
5. Click **N**, **V**, **P, A**, **S**, **B**, or **X** reclassify button to edit the episodes.

     The selected episodes will be reclassified and the ECG Edit window will be updated

> > > **Lessons >> Reclassify Multiple Episodes using the Trend Screen**

➤ **Lessons ≫ To delete all Episodes of one Event type**

To delete all Episodes of one Episode type
1. In the Episode List box select the Episode type that you want to delete.
2. Drag all of the Episodes in the Episodes R-R Interval Histogram or Episode Trend.
3. Click **Toggle** to view multiple Episodes in the Rhythm Edit Screen if it isn't already.
4. Click **Mark All**.
5. Click **X** to delete beats and the template
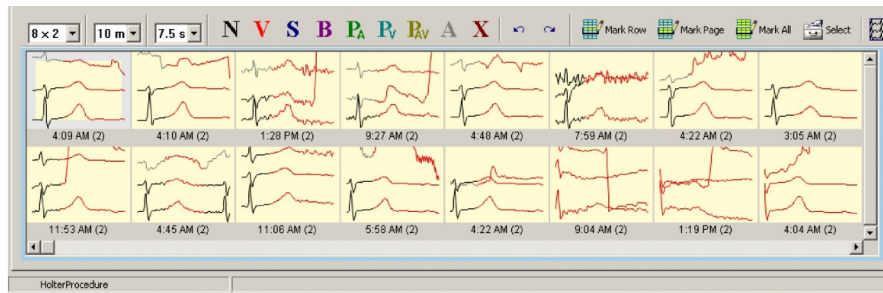
> **Lessons** ≫ **Strips Screen Functions**

The Strips window contains the following controls:

Event	Total	Marked
Early VPB	0	0
Late VPB	1054	10
R on T	1	1
VPB Pair	656	0
VTAC	537	0
Bigeminy	1	0
Trigeminy	9	0
Quadrigeminy	25	0
SVPB	133	0
SVPB Pair	34	0
SVT	25	0
Aberrant SVPB	0	0
V. Paced	0	0
A. Paced	0	0
AV Paced	0	0
Sense Failure	0	0
Capture Failure	0	0
Inhibition	0	0
Pause / Asystole	0	0
Brady	2	2
Tachy	48	10
Minimum HR	95	1
Maximum HR	95	1
STe deviation	0	0
Patient Event	0	0
Selected Strips	0	0

Strip category List Box
The Strips list box is located above the ECG Data View window. The list box displays ECG strips from the following categories:
VPB, VPB Pair, VTAC, SVPB, SVPB Pair, SVT, Pause/Asystole, Patient event, Selected strips, STe deviation, Tachy/Brady, Fast rate, Slow rate.

Display Strips
These control which ECG strips are displayed in the Strips mode.
· **All** - Use to display all strips for a category.
· **Marked** -Used to display all marked strips from a category.
· **Unmarked** - Used to display all unmarked strips from a category.

Mark All   Clear All   Toggle   Show All   Show Marked   Show Unmarked   Add Strip   Update Strip   Delete Strip

Lessons ≫ Strips Screen Functions

Mark All · Clear All · Toggle · Show All · Show Marked · Show Unmarked · Add Strip · Update Strip · Delete Strip

Mark / Unmark Strips

These control which ECG strips are marked or unmarked. Marked strips are included the Holter report. When a strip is selected (marked) it's start time is highlighted in yellow.

· **Mark All** - Used to mark all strips in a category.
· **Unmark All** - Used to unmark all strips in a category.
· **Toggle** - Used to Mark or Unmark the current highlighted strip. Click on a strip to highlight it.

Strip sorting criteria

These controls are located above the top-most ECG strip. These are used to control the order that strips are displayed in the window.

· **Time** - Used to sort the strips in chronological order.
· **Prematurity (%)** - Used to sort the strips according to the degree of prematurity.
· **Duration (seconds)** - Used to sort the strips according to the strip duration.

Lessons ≫ ECG Edit Window Functions

The Rhythm Edit Screen contains the following controls along the top of the window:

- **Relabel buttons** (**N**,**V**,**P**,**A**,**S**,**B**,**X**) - Used to reclassify beats.
- **Gain** - Used to select the ECG gain. Choices range from 1- 50mm/mV.
- **Speed** - Used to select the ECG time interval displayed in each pane. Choices range from 7.5 - 60 seconds.
- **Measure** - Used to activate on-screen calipers for interval and amplitude measurements.
- **Print** - Used to print one-page review screens.
- **Insert** - Enables you to insert new beats by clicking in the Edit pane.
- **Select** - Used to manually select ECG strips to be included in the Holter report.
- **View -** Switches the edit window between single and multiple Edit panes on the Beats and Episodes tabs.

The multi-edit pane mode also contains the following additional controls:

· **View** - Used to select the number of panes displayed when the window is toggled to the multi-pane mode Choices include 2x2, 4x2, 8x2, and 12x3 panes.
· **Mark Row, Mark Page, Mark All** - In the Beats and Episodes mode you can use these buttons to select multiple Edit panes during the editing process.

Tip:

· Double-click in the ECG Edit window to toggle between single and multiple Edit panes.

> **Lessons** ≫ **Editing Rhythm Data**

You can reclassify individual beats displayed in the Page window using the procedure described in Lessons: Reclassifying beats.
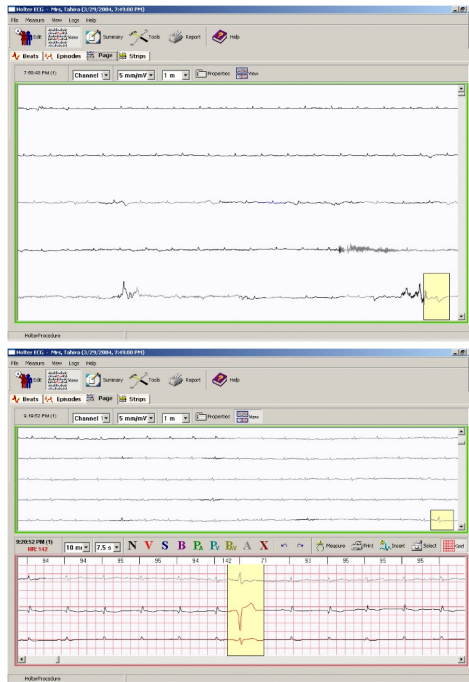
To edit multiple beats on Page screen
1. Drag the beats on the page window that you want to edit.
2. Click **N**, **V**, **P, A**, **S**, **B**, or **X** to reclassify the beats.

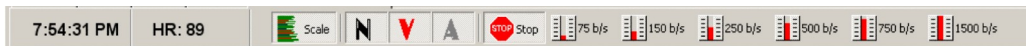The selected beats will be reclassified and the Rhythm window will be updated.
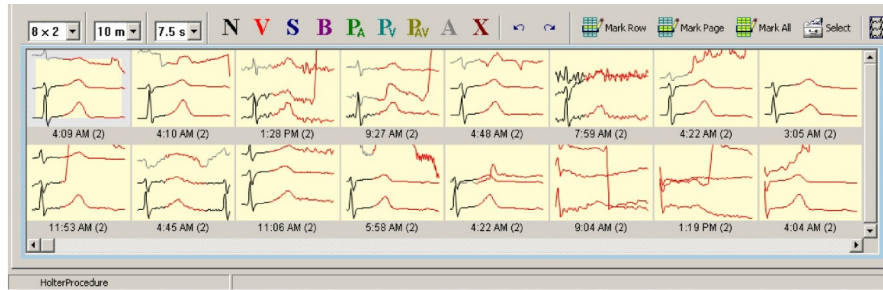
Lessons » View / Hide Rhythm Edit Screen

To toggle view/hide Rhythm Edit Screen

press

Lessons » Superimpose Screen Functions

| 7:54:31 PM | HR: 89 | Scale | N | V | A | Stop | 75 b/s | 150 b/s | 250 b/s | 500 b/s | 750 b/s | 1500 b/s |

Scanning ECG data

· Click **Scan** to start scanning ECG data.

The current time in the record and heart rate are displayed in the top left corner of the Superimpose window. The ST markers are displayed as vertical lines in the Normal Beats pane. During scanning the position of the slider at the bottom of the display is continuously updated to reflect the relative position in the ECG record.

· Click **Scan** to stop scanning.

Tips:

· Use the slider to jump to different times in the record.

· To quickly re-scan a section of ECG while scanning, move the slider back the desired amount.

Changing the superimpose settings

You can change the scan rate and enable or disable individual panes in the Superimpose mode.

To change the scan rate

· Move the Scan Rate slider up to increase the number of beats/second (bt/s) or down to decrease the number of beats/second

The new rate is displayed above the slider. Note that with the scan rate set to 250 bt/s and an average heart rate of 70 BPM it would take 6 minutes to scan an entire 24-hour record.

To hide individual superimpose panes

· Click the appropriate toggle button to hide/unhide individual panes

To view a table

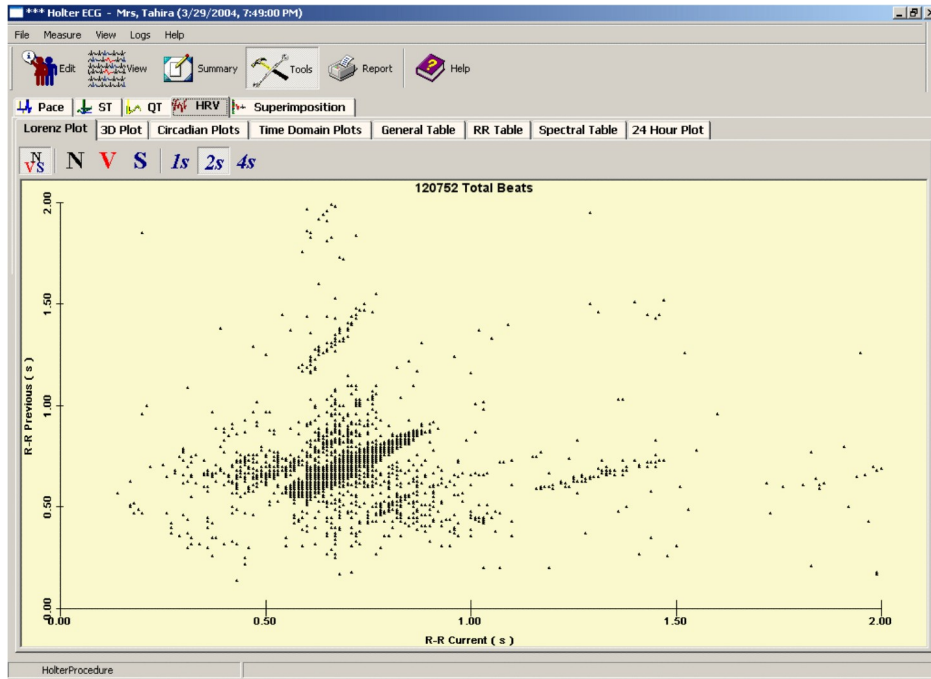· Click the table tab you want to display.

To zero table values

1. Select the hour in the table that has values you want to zero.

2. Click **Zero**

3. Click the check boxes for the values you want to zero.

4. Click **OK**

To edit table values

1. Select the hour in the table that has values you want to edit.

2. Click **Edit**

3. Edit the values.

4. Click **OK**

Lessons » HRV Screen Functions

➤ | Lessons ≫ HRV Screen Functions

The HRV Screen functions give the user several options to view and analyze the ECG data with the help of several graphical and statistical data views.

The lists of available options are:
- Lorenz plots
- 3D plots
- Circadian plots
- Time domain plots
- General Tables
- RR Tables
- Spectral Tables
- 24-hour plot

Ambulatory Blood Pressure Measurement (ABPM)

WARNINGS

US Customers will be supplied with ONLY software supplied by the device manufacture (and not the Cardiology Suite ABMP software module).

Topics
Downloading ABMP data
Viewing and Printing ABPM Data

===

DOWNLOAD ABPM data:

Use the Configure Ambulatory Blood Pressure Download property sheet to transfer the ABPM data from the device to the QRS-Card program. This dialog box can be accessed by the following methods:

> From the Acquisition Screen select Procedures > Ambulatory BP > Download OR

> From the toolbar, click on the ABPM icon   OR
> Use the hot key F6.

> The Configure Ambulatory Blood Pressure Download dialog box primarily allows the user to specify the device used and the data file location.
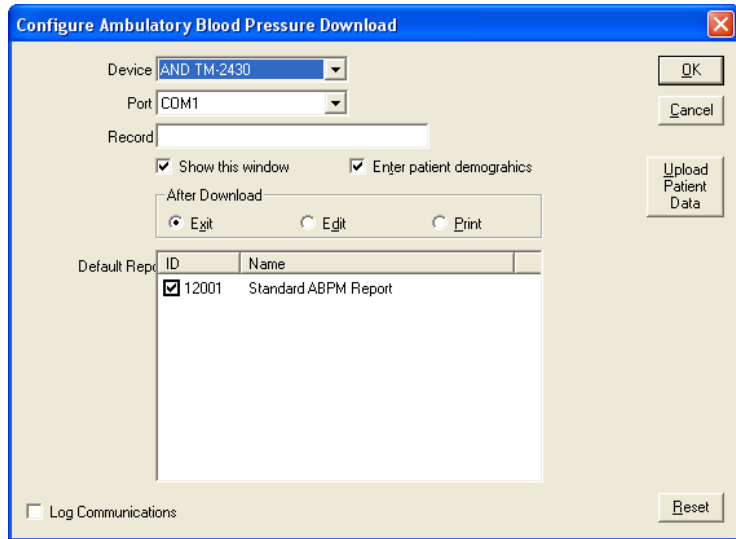
Device

> Specify the ABPM device used.

Port

> Defines which empty com port the device will be using or if a file is being downloaded.

Record

> Specifies the location of the data file to be downloaded, including the drive.

Show this Window

> If this box is checked the Setup dialog box will appear before each ABPM download. If the box is unchecked the Setup dialog box will not appear before each download. The download will proceed in the predesignated fashion.

May 21, 2007

Enter Patient Demographics

Checking this box will allow for the entering of patient demographics while the ABPM data is being downloaded. Click on the Finish button when data entry is completed.

After Download

Exit   If the Exit option is selected, the program will wait in standby in the Acquisition Screen after the ABPM file is downloaded.

Edit   If Edit is selected, the ABPM file will be downloaded and then the Dataview screen will appear to allow review and editing of the data.

Print   The Print option will download the ABPM file and proceed with printing the report selected.

Default Report

Allows for selection of a default report at the time of download. The type of report can be changed after the download by opening the ABPM test and selecting File > Print Report in the ABPM Dataview screen.

Upload Patient Data

The Upload Patient Data button allows the upload of ABPM data from the QRS system to the ABPM Device.

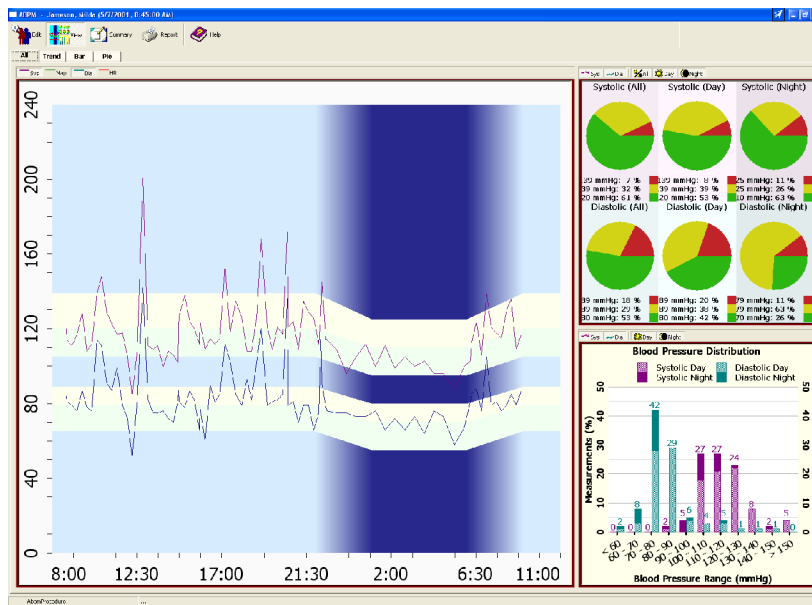**VIEWING A RESTING ECG Test – "DATAVIEW SCREEN"**

To view (or edit) a ABPM test, highlight from Main Screen the ECG Test desired then click on the [Open] button on the toolbar.   OR

Double click on the Test to be reviewed.

When a ABPM test record is opened, the ABPM Dataview screen is displayed. Information about the patient can be viewed and/or edited, data from the test viewed and reports printed. An outline of the features and options displayed on the ABPM Dataview screen is given below, along with any available links to other relevant topics.

Edit

Use the   Edit option to view or edit information about the patient and trace recalled from the database. The Edit option can be executed by the following methods:

Patient and Test Property Sheets

Information about the patient is present in these two property sheets. If necessary, the information can be edited.

Medication

Information about Patient medication is contained is contained in this property sheet.

Signal

Parameters on how the ECG was obtained, such as the sampling rate and use of filters, are contained on this property sheet.

VIEW

Use View option to see ABPM data in four different ways:

ALL views seen simultaneously
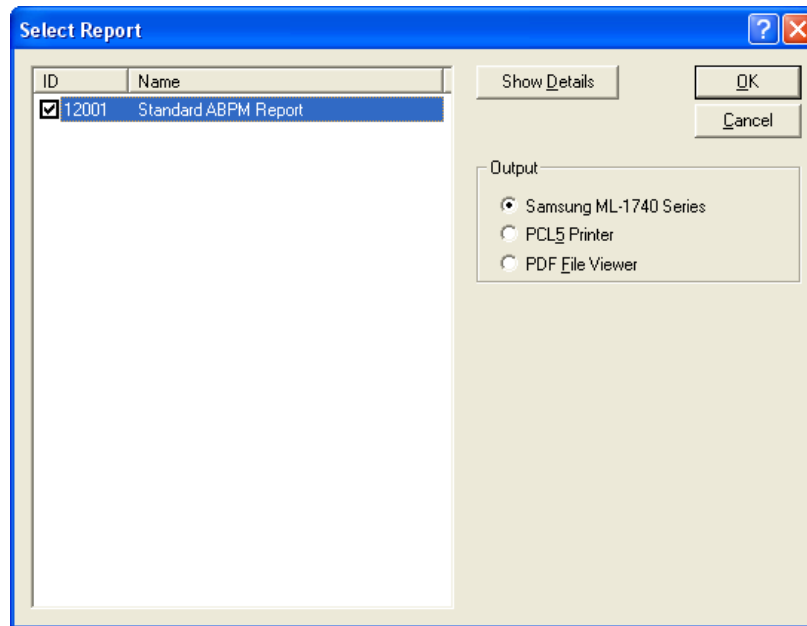
Trend data only

Pie data only

Bar data only

Summary

Pressing summary button provides summarized data for ABPM measurements (Summary, Hourly, Actual Measurements) and location to type physician Interpretation.

Report

Checked Off reports can be printed (automatically or manually) to printer attached to the computer.

UTILITY

Topics

Configuration
Physicians
Clinics
Technicians
Import Reports
Queue System
Rebuild

CONFIGURATOIN:

Configuration Section is used to setup various default parameters of using QRS-Card Cardiology Suite Software. These options include:

Reporting
Database
Measurements
Options
GDT Interface
Real-Time Print
Email

REPORTING

Use the Reporting Configuration Property Sheet to set the default values for reporting ECG results. Access the property sheet by the following method:

Select Utility > Configuration and click on the Reporting tab in the Configuration Setup property box.

Complex

Gain

Defines the Gain for ECG complexes to be printed on the Stress or Hi-Res ECG reports. Options are 5, 10, 20 or 40 mm/mV.

Speed

Defines the Speed for ECG complexes to be printed on the Stress or Hi-Res ECG reports. Options are 25, 50 or 100 mm/sec.

Lead 1

Defines the 1st complex lead to be printed on the Stress or Hi-Res ECG reports.

Lead 2

Defines the 2nd complex lead to be printed on the Stress or Hi-Res ECG reports.

Lead 3

Defines the 3rd complex lead to be printed on the Stress or Hi-Res ECG reports.

Rhythm

Gain

Defines the Gain for the ECG to be printed on the ECG reports. Options are 5, 10 or 20 mm/mV.

Speed

Defines the Speed for the ECG to be printed on the ECG reports. Options are 5, 10, 25 or 50 mm/sec.

Lead 1

Defines the 1st ECG Lead for the three lead ECG reports**.**

Lead 2

Defines the 2nd ECG Lead for the three lead ECG reports.

Lead 3

Defines the 3rd ECG Lead for the three lead ECG reports.

Hi-Res Complex/Vector Magnitude

Gain

Defines the Gain to be printed on Hi-Res reports. Options are 50, 100, 500 or 1000 mm/mV.

Speed
Defines the Speed to be printed on Hi-Res reports. Options are 50, 100 or 200 mm/sec

DATABASE

        The Database property sheet allows the user to select the location of ECG data files and the names of the individual files. This property sheet can be accessed by the following method:

Select Utility > Configuration and select the Database tab in the Configuration Setup property box.

Root:

        Description: Defines the default root directory for all ECG data files.

                          Below the Root are all the default database file names.

Browse

        The Browse button allows change of the root directory.

Reset

        The Reset button sets all parameters back to their factory-set defaults.

Logging

        Customer support may ask for this to be checked in order to pinpoint a problem.

Note: ECG database is in published "SCP" format. Each test is a separate file. These files are stored in "qrsdb4/files" folder. It is important the user backup these individual SCP file for data security purposes.

MEASUREMENTS:

Select Utility > Configuration and select the Measurements tab in the Configuration Setup property box.

The options contained in the Measurements Configuration property sheet are advanced settings to adapt the system to special needs.
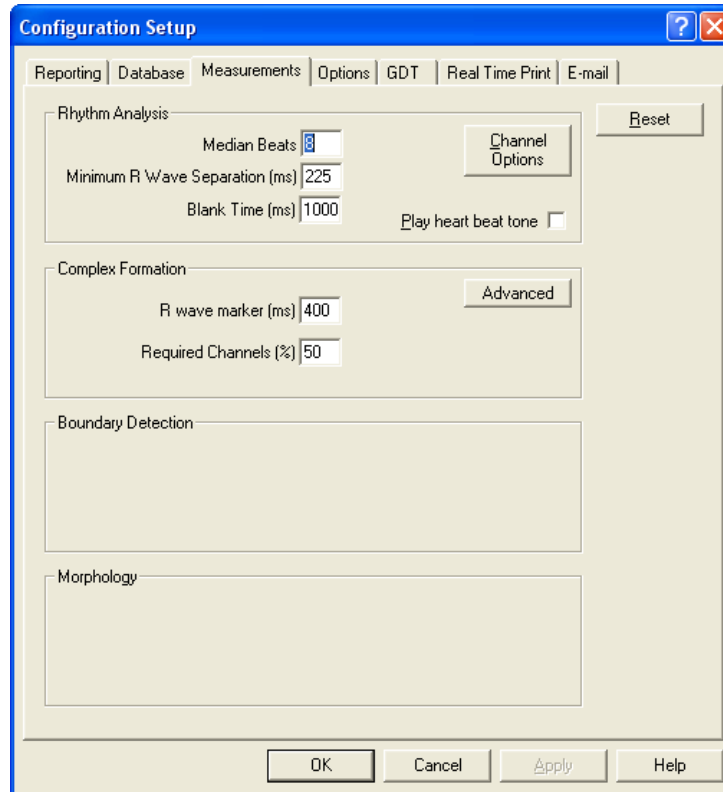
Reset

The Reset button sets all parameters back to their factory-set defaults.

OPTIONS:

Select Utility > Configuration and select the "Option" tab in the Configuration Setup property box

This option selects St Value's parameters, Multitask message display and PDF File Viewer Setup.
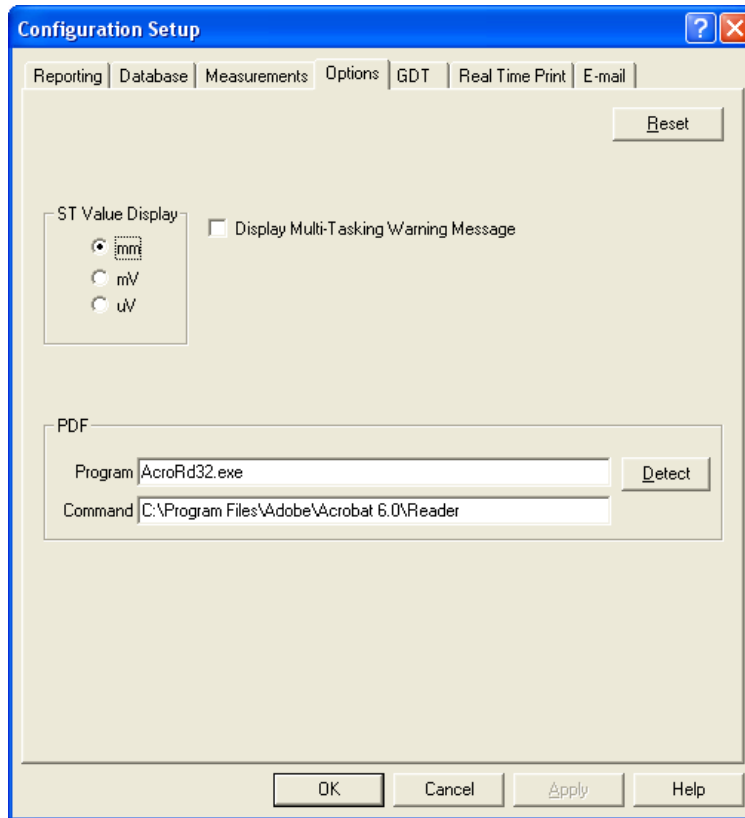
GDT:

Select Utility > Configuration and select the "GDT" tab in the Configuration Setup property box

This option is Only for German Medical Office EMR software Interface.
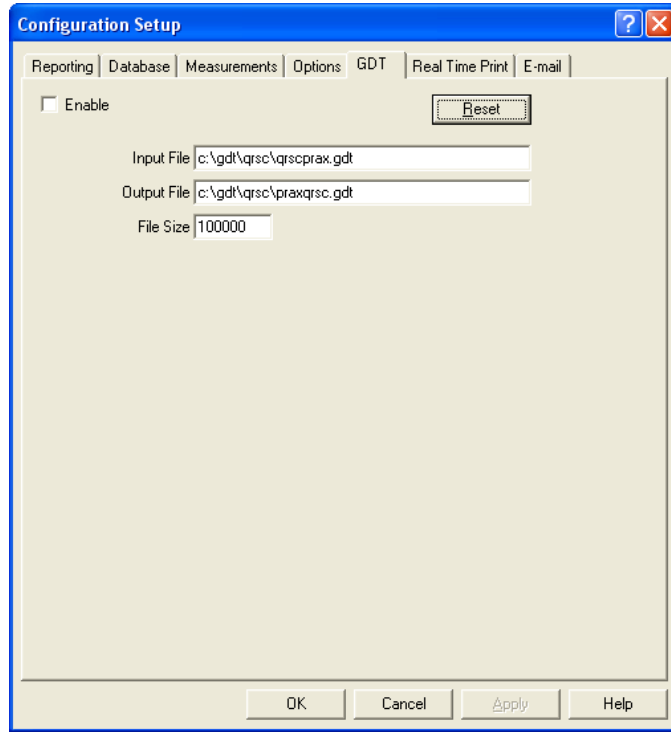
REALTIME PRINT
Select Utility > Configuration and select the "Real Time Print" tab in the Configuration Setup property box

This option is used to Enable or Disable Real Time Printer and to Setup Real Time Report Parameters.
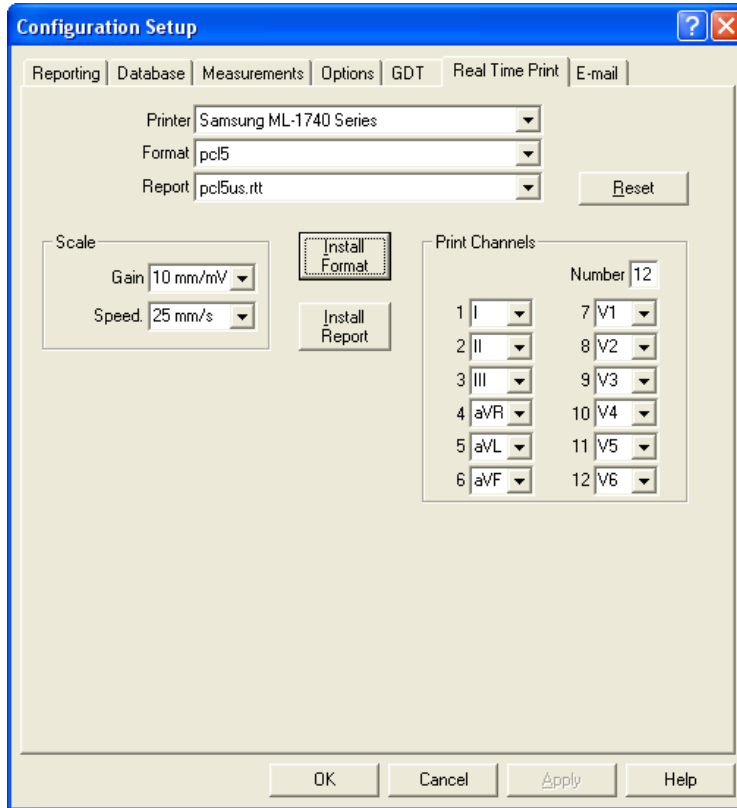
EMAIL
Select Utility > Configuration and select the "EMAIL" tab in the Configuration Setup property box

This option is used to Setup Server Parameter for Sending and Receiving ECG's via Email.
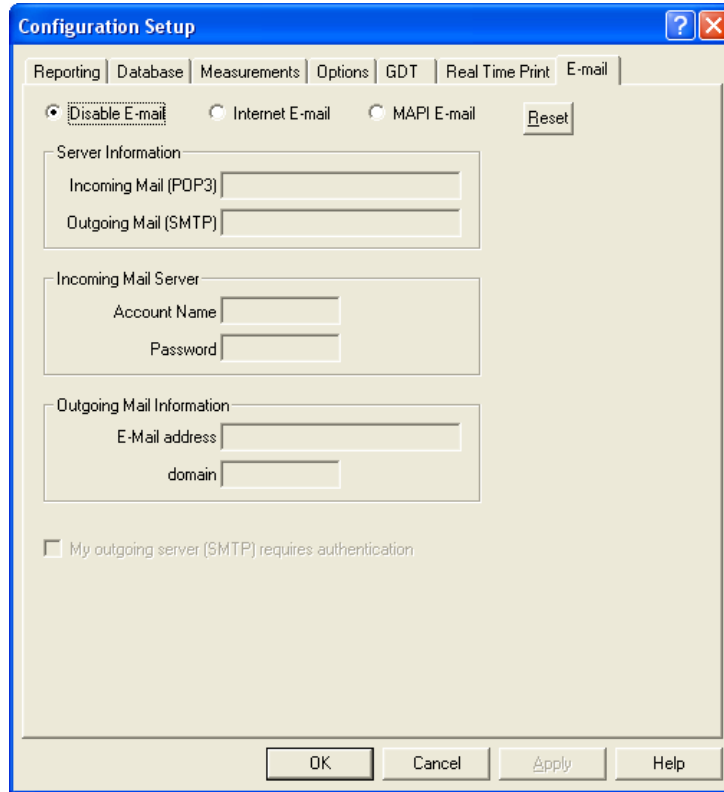
PHYSICIAN

Select Utility > Physician then property box will appear

Names of attending and referring Physicians database are stored using this option.
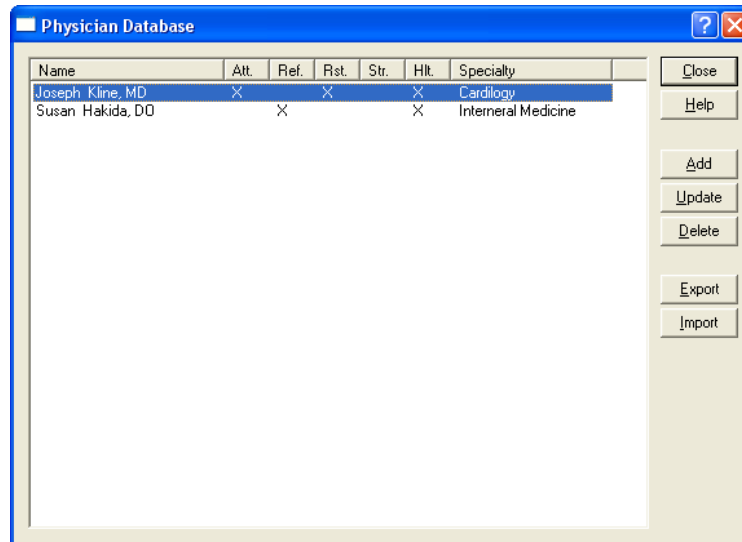
Add:

Select to enter new Physician or Referring Physician name

Update:

Select to update on an existing entry in Physician database

Delete:

Select to delete an entry in Physician database

Export:

Select to Export a listing of an existing Physician database in text format

Import:

Select to Import an existing text format Physician list into Physician database

Clinics

Select Utility > "Clinics" then property box will appear

This option is use to Enter Clinics Names for a multi-practice medical office.

Add:
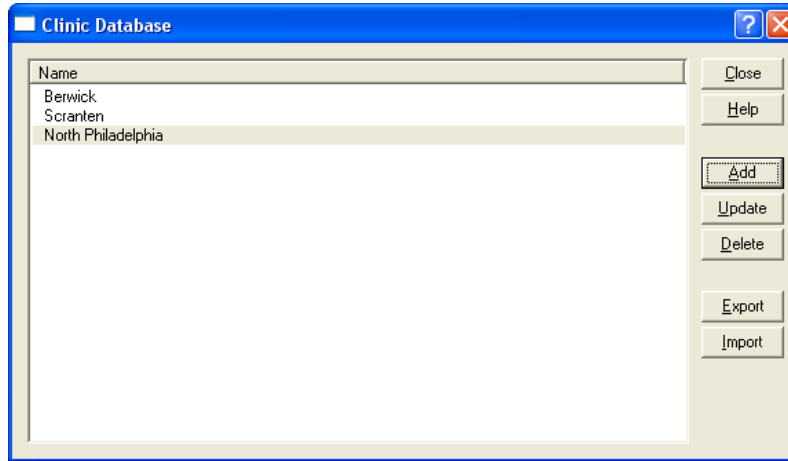
Select to Add a new Clinic name in the Clinic database

Update:

Select to update an existing Clinic name and address

Delete:

Select to Delete an existing Clinic name in the database

Export:

Select to Export an existing Clinic database to text format

Import:

Select to Import a text format Clinics names into Clinics database

Technician

Select "Utility > Technician" then property box will appear

This option is used to input Technician's name acquiring the ECG data

Add:

Select to Add a new Technician Name in the database

Update:

Select to Update an existing Technician name in the technician database

Delete:

Select to Delete an existing technician name from the database

Export:

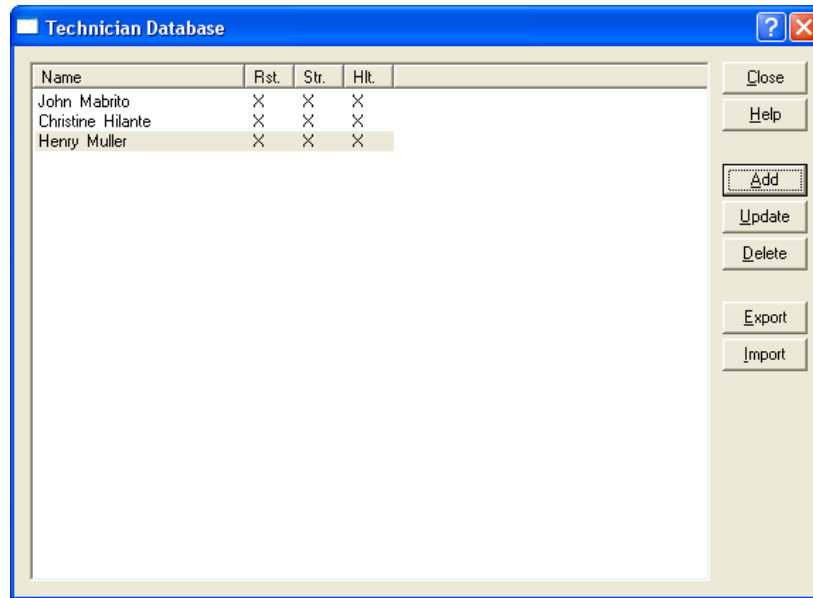Select to Export an existing technician database to text format

Import:

Select to Import a text format technician names into technician database

Import Reports

Select "Utility > Import Reports" then property box will appear

The Import Report option is used to import any new ECG report formats supplied by Pulse Biomedical or to import any changes made to already existing report formats. The Import Report command can be accessed by the following method:

Executing the Import Report command will cause the system to display the Import QRS Report dialog box.

To import a report format, highlight the desired report and click on Open. The new report is now ready for use. To make changes to the format of an existing report go to Windows Explorer. In the directory containing the QrsCard software, click on the report to be modified with the right mouse button. Select Open. The existing report format will open on the Notepad. Make the desired changes and save them. Return to the QrsCard software and the Import Report option. Highlight the modified report and click on Open. The modified report is now ready for use.
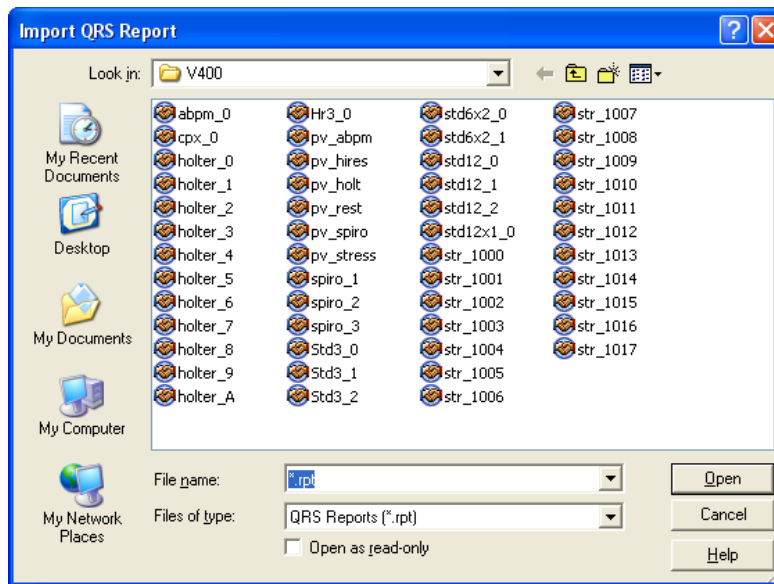

Open

Highlight one or all reports then select this option to import report(s) into report database

Queue System

Select "Utility > Queue System" then property box will appear

The Queue System places the ECG traces from the patient Tests database in the queue system. At a later time, the user can dump the queue to a printer, E-mail the traces, or export the traces to an external file (one not connected to the QRS databases). Using the Queue system, the user can also receive ECG traces via E-mail or import a trace from an external file.

After the test is complete, the Queue System command can be executed by the following method:
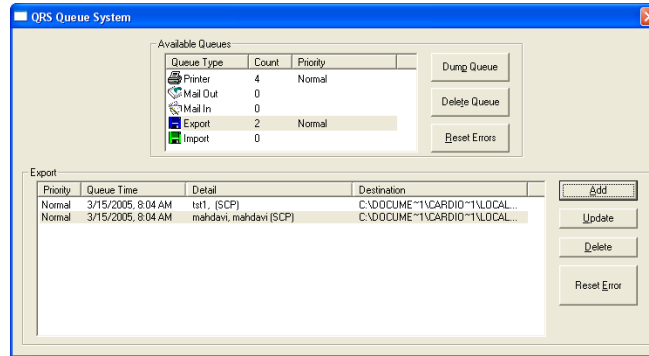
The system will display the QRS Queue System dialog box.

Dump Queue

Clicking on Dump Queue will dump the entire selected queue to the appropriate output device and the Queue Dump dialog box appears. The Queue Dump dialog box shows the status of the queue dump. Any errors that occurred will be listed.

Delete Queue

Clicking on Delete Queue will delete all items in the type of queue selected.

Reset Errors

Clicking on Reset Errors will reset any errors that occurred when dumping a queue.

Add

Clicking on Add will cause the system to display the appropriate Add dialog box for the selected output device. See the Available Queues below for more information.

Update

Clicking on Update will bring up the Update QRS Queue Entry dialog box.

Details of the selected item can be edited in this dialog box. In particular, the type of report selected for a particular queue item can be edited using this option.

Delete

Clicking on Delete in the bottom section of the dialog box allows the user to delete individual items from a particular queue.
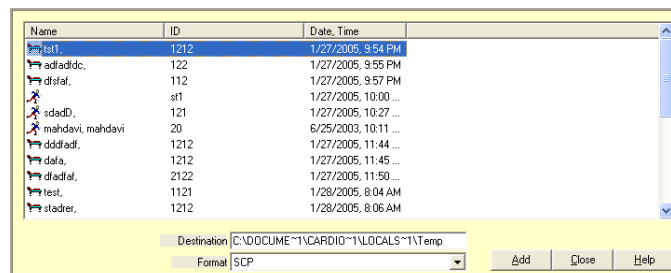
Available Queue Options

Print Queue

To add to the Print Queue, double-click on Printer under Available Queues in the Queue Detail Dialog Box or highlight Printer and click on the Add button. The Add Entries to QRS Print Queue Dialog Box will be displayed.

Select the test and the type of report desired, add any comments necessary and click on Add. Click on the Close button to exit this dialog box. The selected traces will be copied to the Print Queue. Select Dump and the traces will be printed.

To aid in finding an encounter, the user may sort the database by name, ID or date/time the encounter was obtained by clicking on the appropriate heading name.

Mail In

The Mail In option allows the user to receive ECG traces via E-mail.

Note: For best results, connect to the Internet before entering the Queue System.

As the Queue System is accessed, a message "Retrieving message X or X" will appear if E-mail has been sent to you since you last logged onto the Internet. The Mail In option in the Available Queue box will show the number of messages.

Highlight Mail In and click on Dump Queue. The messages will be dumped directly into your database.

Note: Be aware that the time on the encounter is when the test was taken not when it was e-mailed or dumped into the database.

Mail Out

The Mail Out option allows the user to E-mail ECG traces.

Note: For best results, connect to the Internet before entering the Queue System.

To add to the Mail Out Queue, double-click on the Mail Out option under Available Queues or highlight Mail Out and click on the Add button. The Add Entries to QRS Mail Out Box Queue Dialog Box will appear.

Highlight the encounter to be E-mailed and using the directory option, enter the recipient E-mail address. Click on Add to the queue. Click on Close to exit the dialog box. Click on Dump Queue to start the E-mail process.

Queue Import

Selecting the Import Queue option will allow the user to import ECG trances from an external file.

To add to the Import Queue, double-click on Import under Available Queues or highlight Import and click on the Add button. The Add Entries to QRS Import Queue Dialog Box will be displayed.

Select the file to be imported and the format to be used and click Apply.

Queue Export

Selecting the Export Queue option will allow the user to export ECG traces to an external file.

To export a file(S) double click on Export under Available Queues or highlight Export and click on the Add button. The Add Entries to QRS Export Queue Dialog Box will be displayed.

Select the file(S) to be exported and click on Add Encounter. Click on the Close button to exit this dialog box. The files will be copied to the Export Queue. Select Dump. The selected files will be exported into the Windows Temporary (TAMP) Directory.

Rebuild

Select Utility > Rebuild then property box will appear

This selection is used to rebuild (Re-Index) a corrupted, bad database or merging of the database.

This selection can also be used if two or more database needs to be combined together into one database (e.g copy both database *.SCP files into qrsdb4\files folder the select Rebuild command)

LOGS MENU

Log files are created each time the STWIN program is run. This file keep track of all operation performed by the user. More importantly this files keep logs of any errors occur during the usage of the program.

Viewing of the file can very helpful in finding any user problems with the program.

Status
Use the *Status* command to display the status log. The Status command can be executed by the following method:

- From the "Logs" Menu select "Status".

When the Status command is executed the system displays the Log View Dialog Box. This log file shows the most recent events the system executed.
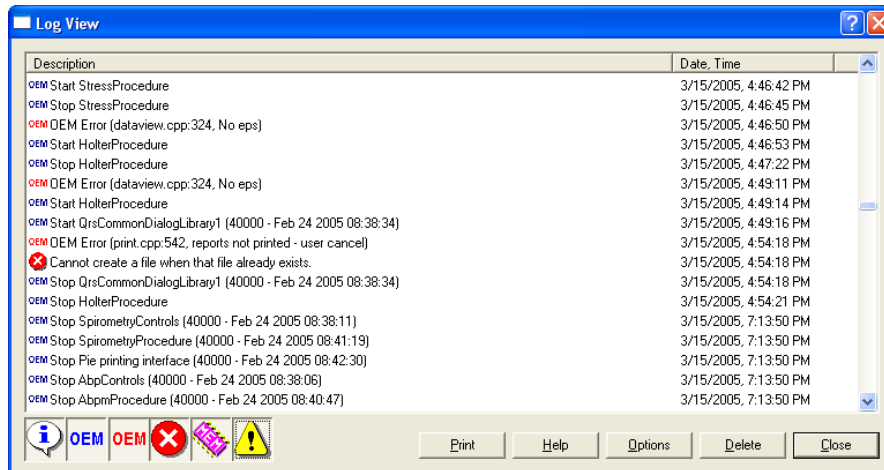
Error
Use the *Error* command to display the error log. The Error command can be executed by the following method:

- From the Logs Menu select Error.

Executing the *Error* command causes The system displays the Log View Dialog Box when the Error command is executed. This log file shows the most recent errors that the system encountered.

Note: Error Log file *is the **MOST IMPORTANT** file for trouble shooting the* **QRS-Card™** *Hardware and software. During technical support call to PBI the information contain in this file will assist PBI the most information to solve or diagnose the problem over telephone.*