NorthEast Monitoring, Inc.
Holter LX Analysis -
REMOTE Software

Operator's Manual

advancing Holter technology

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For more information, see www.lowagie.com/iText.

1 Introduction to Holter LX Analysis - Remote

Welcome to NorthEast Monitoring's Holter LX Analysis - Remote Software. Used in conjunction with a NorthEast Monitoring Digital Holter Recorder (either the DR180+, the DR180+Oxy, the DR200/HE, or the SD360), LX Analysis - Remote allows you to save and send the ECG recorded data to a different (remote) site for analysis. The remote site must use either Holter LX Analysis - Pro or Enhanced Plus in order to receive this data.

Note: This product, like all Holter monitoring products, should be used only under the direct supervision of a licensed physician.

NorthEast Monitoring - FDA Registered Establishment #1224919.

The Holter LX Analysis software - FDA 510K Market Approval Number K930564.

Package contents

Your Holter LX Analysis - Remote package includes:

- NorthEast Monitoring Holter LX Analysis Software CD
- NorthEast Monitoring License CD
- NorthEast Monitoring Software Protection Key
- NorthEast Monitoring Holter LX Analysis - Remote Operator's Manual

System requirements

This software can only be used in conjunction with a NorthEast Monitoring digital recorder - the DR180+/DR80+Oxy, the DR200/HE or the SD360. It is not compatible with the Holter monitor of any other manufacturer. To run the Holter LX Analysis software, your personal computer must include:

- Microsoft Windows XP or Windows Vista operating systems
- a processor with a speed of 1 GHz or faster
- at least 512 MB of memory is required with Windows XP; and 1 GB with Windows Vista
- at least 10 GB of free space on your hard drive
- a monitor with a resolution of at least 1024 by 768
- a USB flashcard reader or a laptop PC card slot
- a laser printer is recommended.

Operator knowledge

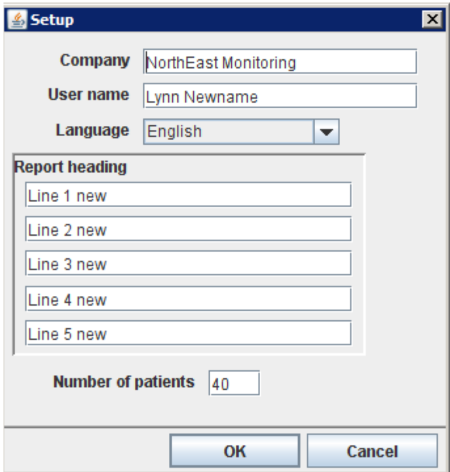
All instructions assume a working knowledge of computers and, specifically, Windows XP or Vista software.

Installation instructions

To run, Holter LX Analysis software must be installed on your hard disk. We recommend that no other programs be running when you install the software. To install, follow these steps:

- Insert CD labeled Holter LX Analysis into your computer. Open "My Computer," click on the drive, and you will now see a list of files that should be installed in the following order. Click on prompts where appropriate and let the system default during the installation and rebooting anytime it requests.
- Double-click on **1_SentinelInstall.** This is the software that allows the system to recognize your software key.
- Double-click on **2_AdobeReader.** (If Adobe Reader already exists on your computer, you may want to skip this step.)
- Double-click on **3_Java_Install.** If you are asked to reboot after Java installation, please reboot and continue with the next step.
- Double-click on **4_LXInstall**. This is the Holter LX Analysis application. Each time you are prompted to go to the Next instruction window, press the Enter key to do so. On the last screen, make sure that the "Launch Holter LX Analysis" box is checked for installation to complete. When you are prompted to select Finish, press the Enter key to do so.
- After a short delay, the Setup window opens If you cannot see the

Setup window, you should close the CD window for it to appear.



Setup window

- In the Setup window, type appropriate information in each of the fields, including your name and the name of your facility. In the five fields for the Report Heading, type the five lines you want to appear at the top of the front page of each Holter report. Update the Number of Patients as required (see Utilities for updating this number in the future). When the information is complete, click OK to close the Setup window.
- Now remove the software CD and insert the License CD into your computer. Open the CD directory and click on the License file. Follow the steps as prompted.
- Next, plug the software key into an available USB port on your computer and let the system install the software for it.

Launching LX Analysis

Once the programs are installed, you start the LX Analysis software by selecting Programs > Holter LX Analysis > LX Analysis from the Start menu.

If you use the software often enough, Windows XP may add LX Analysis to the Start menu, and you can then start the software by selecting Start > LX Analysis.

Online help

In addition to the information in this manual and the on-screen help messages that appear within the LX Analysis software, more information and help is available online at our web site at www.nemon.com under Technical Support.

Inserting a flashcard

ECG data recorded during the Holter period is saved on a removable flashcard. The DR180+/DR180+Oxy recorder uses a compact flashcard, while the DR200/HE and SD360 recorders use an SD flashcard. To input the data from the card to the computer system, first remove the flashcard from the recorder, and then insert it into your computer system's card reader.

Into a USB SD flashcard reader

To insert an SD flashcard into the drive, hold the card right-side up, with the missing corner away from you and to the right. Insert the opposite edge into the opening of the SD card reader. Push the card in gently until it is fully plugged in. Some card readers have a light indicating when a flashcard is properly inserted; if yours does, make sure the light comes on.

Depending on your computer and your card reader, a window may appear acknowledging that a card has been newly inserted and listing what files are present on the card. A recording saved by a NorthEast Monitoring Recorder is named “flash.dat.” If the window appears, close it.

Into a USB compact flashcard reader

To insert the compact flashcard into the reader, hold onto the card by the edge with the ridge and insert the opposite edge into the opening of the flashcard slot. Push the card in gently until it is fully plugged in. Some card readers have a light indicating when a flashcard is properly inserted; if yours does, make sure the light comes on.

Into a laptop PC card slot

First insert the flashcard into a flashcard adaptor; to do so, hold onto the card by the edge with the ridge and insert the opposite edge into the adapter. Then insert the adaptor, right side up into the laptop's card slot. If a window appears listing what files are on the flashcard, close it.

Formatting a flashcard for the first time

To use a flashcard with a NorthEast Monitoring recorder, it must be formatted properly. Flashcards that come with the recorder are already formatted properly and need only to be initialized before first use. A card from a different source, though, must first be formatted using the FAT file system (not FAT 32) and then initialized using NorthEast's software.

To format a flashcard, insert the card into your computer's card reader, then select My Computer or with Vista select Programs > Accessories > System Tools > Computer. In the (My) Computer window, click on the icon designating your card reader, then select File > Format. When the window opens, set the File system to FAT, then click Start. Click Close when formatting is complete.

First determine that the correct drive has been selected for your card. The check box should be populated. If drive has not been found, check to be sure that a card is in the slot and the reader is attached to the reader. You will need to Exit and return to this screen to refresh the Drive list.

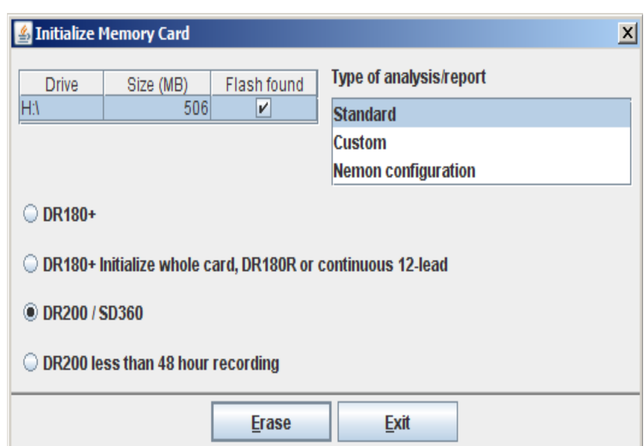
Once your drive has been found with the card, you should now select the appropriate analysis/report type that corresponds to the patient to be hooked up.

Lastly, check to make sure that the correct card format option is selected - the corrected recorder should be selected and the appropriate format should be chosen. If you are sure that your DR200/HE or SD360 recording will be less than 48 hours, you can select that option.

Now press Erase and your card will be initialized for its next use.

Initializing a flash card

To use a flashcard with a NorthEast Monitoring recorder, it must first be initialized using the LX Analysis software. To do so, insert the card into the card reader, close the Explorer window that opens, and using the Holter software, select Patient > Flashcard > Initialize. The Initialize Memory Card window opens.



Initialize Memory Card Window

Note: If you insert a card into the recorder and get a message that the "Memory card is missing," the card is not formatted or erased properly.

NorthEast Monitoring Holter LX Analysis software is used in conjunction with data from the NorthEast Monitoring DR180+/DR180+Oxy, DR200/HE, and the SD360 Digital Recorders. After a patient has worn the recorder, you should remove the card from the recorder and insert the card in your computer system's card reader and the Holter signal will be loaded onto your system.

2 Patient Information

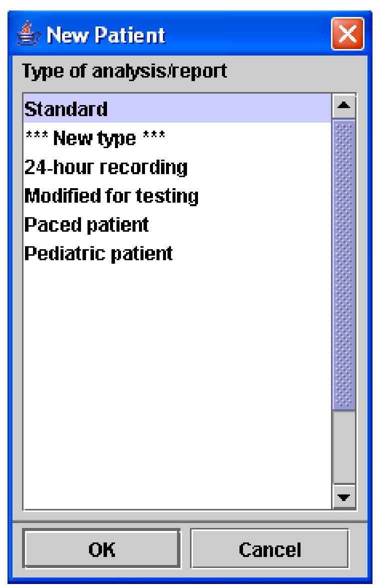
The Patient Information window contains information about the patient who wore the Holter recorder. The Holter LX Analysis software automatically retrieves recording data from the recorder's flashcard, along with the Holter signal, but you are responsible for entering the remaining data. The data saved by the recorder includes an identification number, the recorder number, the date, the start time, and whenever the patient pressed the Event button.

While running the LX Analysis software, you have the choice of opening the Patient Information window for (1) the last patient whose Holter test was accessed (that is, the "current" patient), (2) a previous patient whose Holter data has already been saved, or (3) a new patient whose Holter test has not yet been saved. In the first two cases, a patient record has already been created for the patient and the Holter data for the patient has already been downloaded from the flashcard onto the hard disk of your computer. In the case of a new patient, a new Patient Information record must be created and the Holter information downloaded from the flashcard. This chapter covers creating a new patient record first.

Entering information for a new patient

To start a new patient, first insert the patient's flashcard into the card reader and then select Patient > New. (If you select Patient > New before inserting the card, you will see a Confirm window that explains that there is no flashcard in the drive. If this happens, insert the flashcard into the drive and click Retry.)

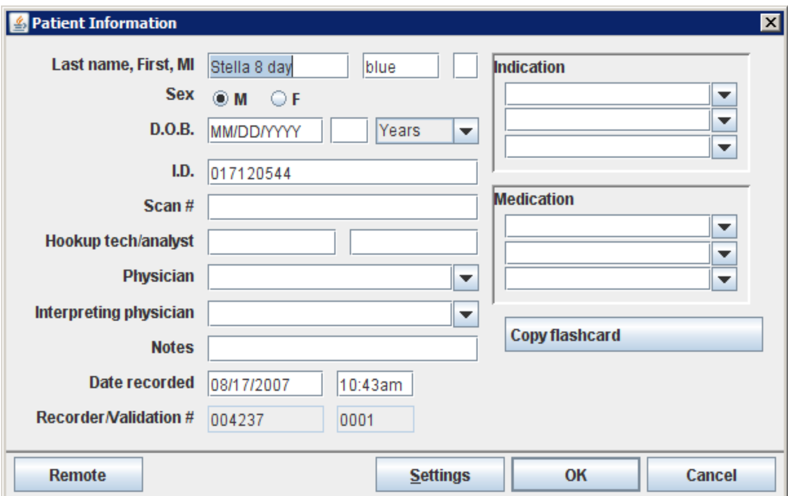
After you select Patient > New, a New Patient window opens, with a Type of analysis/report listing. Select the appropriate type from the list and click OK.



Type of analysis/report window

Note: For more information about types of analysis/report, see Chapter 4: Preferences.

If you see a message that says, “There are no empty patient...” instead of the New Patient window, see “Making room for new patients” at the end of this chapter.



New Patient Information window

When the Patient Information window opens for a new patient, the data on the flashcard is immediately read from the card reader. As the Holter data from the card loads onto your computer hard drive, you can start entering or editing patient information.

Once the flash.dat has loaded, the “Copy flashcard” button in the Patient Information window changes to “Copy different flashcard.” If the patient information displayed does not match the correct patient, remove the card, insert the correct one and click “Copy different flashcard.”

1. Type the patient name using the Last name, First name, and Middle initial (MI) fields appropriately. Use your cursor or the Tab key move to the next field. The name in the printed report appears as entered in this window.

2. Using your cursor or Tab key to move around the screen, to fill in the remaining data.

D.O.B and Age Fields

The D.O.B. and Age fields work together. If you know the patient’s date of birth, enter it, and the software automatically calculates the patient’s age based on the D.O.B. and the recording date. If you do not know the date of birth, but know the age, type a numeric entry in the Age field, and select the appropriate unit (e.g., years) in the Age Unit field. If you know neither, leave the fields blank. The software does not allow an inconsistent D.O.B. and age; if you enter inconsistent data, it will leave the age and remove the D.O.B.

Example of radio button

Notes Field

The Notes field allows an alphanumeric entry that can be used to record information that might be helpful about the Holter test or the patient. It is not printed in the final report. To enter notes to be printed in the final report, use the Comments section of the Report summary.

Diary information

While wearing the Holter recorder, the patient can identify symptoms and activities in two ways:

(1) by pressing the Event button on the recorder and, possibly, entering a pre-coded symptom or activity, or

(2) by keeping a written record of times and symptoms or activities.

The software reads the Event button information directly from the flash-card and enters it automatically. Any significant information from a written diary will need to be manually entered at the facility analyzing the patient Holter.

Save and Close the Patient Information window

- To save your data and close the Patient Information window, click OK.
- To close it without saving any changes, click Cancel.

Open a Patient

You can keep multiple patient Holter recordings and reports on your computer system. All of the patients currently saved in the software appear when you select Patient > Open from the toolbar. You will see the Open Patient window.

To change the current patient to a different one, either click on the appropriate name on the list and click Open, or double-click on the appropriate line. The Patient Information window for the selected patient will appear on the screen.

You can now edit that patient information or press the Remote button to send the patient data remotely. You must always press OK in order to save any patient information you have updated.

When a patient is open, at any time you can open the Patient Information window by clicking on Patient > Patient Information.

Previewing the data on the flashcard

If you would like to review the clerical information on a flashcard before creating a new patient record, you can insert the card into the drive and then select Patient > Preview from the main toolbar. This opens the Preview window, which displays the identification and recorder numbers, along with the date recorded and the start time, directly off the card without loading the information onto your computer's hard disk. Use this feature to verify which flashcard contains a particular patient's Holter data.

Making room for new patients

When the software has saved the maximum number of patients allowed by your system, you must delete old patients to make room for new ones. If you want to archive an electronic version of each patient record, make sure you back up a patient before you delete it.

To delete a patient from the patient list, go to Patient > Open to display the list of patient records currently in LX Analysis. In the Open Patient window, click on a patient name to highlight it and click the Delete button. When the Confirmation window appears, click Yes. That slot in the list will now be available the next time you select Patient > New.

To delete multiple sequential patients in the Open Patient window, click on the first patient to be deleted, then drag down to the last one you want deleted. With multiple patient names highlighted, click the Delete button. When the Confirmation window appears, click Yes.

To close the Confirmation window without deleting any patients, click No.

3 REMOTE SEND

LX Analysis - Remote allows you to send Holter data to another site for analysis. You can either use 1) MagicVortex, 2) FTP or 3) Direct Copy to send files.

Note: You can only set up one methodology at a time.

To Set Up - MagicVortex

To send files - Become a MagicVortex Subscriber

You should use MagicVortex to send a patient's Holter data to another site for analysis. In order to do this, you must be a MagicVortex subscriber. To sign up for MagicVortex, visit their web-site at www.MagicVortex.com and select Sign up from the menu on the home page. Once you are a MagicVortex subscriber, you can follow these instructions to send out the patient data to a receiving site that has agreed to analyze it and to receive a completed report back.

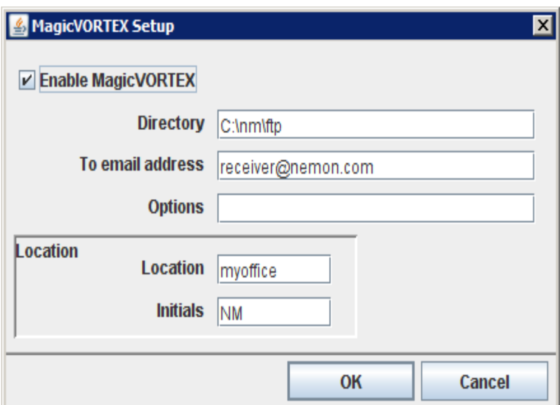
Once you are set up, the MagicVortex icon on your desktop should contain a blue center indicating that you are currently connected to the MagicVortex. If the center of the MagicVortex icon is gray, you are not currently connected to MagicVortex via the Internet and you will not be able to send patient data until the connection is established.

Set up MagicVortex in LX Analysis for Sending files

Once you are a MagicVortex subscriber, you will need to set up the MagicVortex settings within LX Analysis. Do this as follows:

1. From the Start menu, select Programs > Holter LX Analysis > Remote (or LX Analysis) to start the Remote software.
2. Go to Patient > Patient Information and click on the Remote button that now appears in the bottom left-hand corner of the window.

3. You will now see the Remote Screen. In the upper-left hand of the screen click on File > MagicVortex set. The MagicVortex Setup window will now appear.
4. Within the window the Enable MagicVortex field should have a check mark and the FTP directory field should read c:\nm\ftp. If they do not, click on that field and correct now.
5. Click on the Destination email field and type the e-mail address where you are sending the Holter data for analysis. Leave the Options field blank.



MagicVortex Setup example

6. Click on the Location field. This entry will be used to rename the patient files you send so that there is a unique filename at the receiving site. If you have been assigned a location name by the receiving site, type that. If not, type something to identify your location.
7. Click on the Initials field. Type your initials.
8. Click OK when you are finished setting up MagicVortex in LX Analysis.

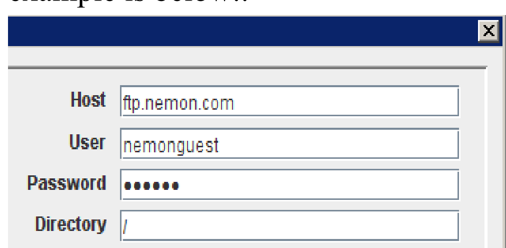
To Set up FTP

FTP stands for File Transfer Protocol and is a commonly used methodology for exchanging files over any network that supports the TCP/IP protocol (such as the Internet or an intranet). You will need an in-house technical professional to assist you in setting up your infrastructure. Below is an explanation of the set up in the Remote software only.

Set up FTP in Remote

Go to Patient > Patient Information and click on the Remote button in the bottom left-hand side of the screen. In the remote screen press on File >Settings.

When you click on Settings, the Settings screen will appear. On the Settings screen you should fill in all of the fields in the FTP section at the top. An example is below:.



FTP Setup example

Location - Click on the Location field. This entry will be used to rename the patient files you send so that there is a unique filename at the receiving site. If you have been assigned a location name by the receiving site, type that. If not, type something to identify your location.

Important: All fields in the Direct Copy and Proxy sections of the window should be left blank. If any of these fields are populated, the FTP transfer may not work.

As stated earlier, you will need an in-house technical professional to assist you in setting up this screen and the required infrastructure. We recommend that you use MagicVortex if this support does not exist in your organization.

Once you are finished entering the data, press OK. Press Cancel to not save the changes.

To Set up Direct Copy

You can also send patient data via an internal network to another computer.

Set up Direct Copy

Go to Patient > Patient Information and click on the Remote button in the bottom left-hand side of the screen. In the remote screen press on File >Settings.

When you click on Settings, the Settings screen will appear. On the Settings screen you should fill in the following fields in the Direct Copy section of the window:

- Enable Direct Copy should be checked on
- Directory should be filled in with

Direct Copy Setup example

  the location to where you want to send the file.

Important: All fields in the FTP and Proxy sections of the window should be left blank. If any of these fields are populated, the file transfer may not work.

Sending patient data

For a new patient

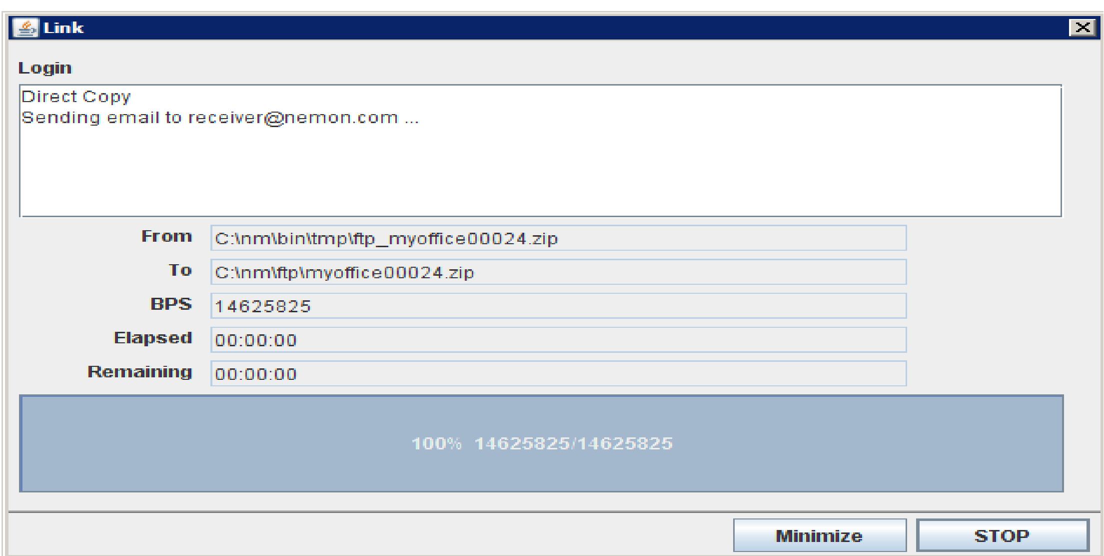
1. First insert the patient's flashcard into the card reader
2. Then select Patient > New.

Note: If you select Patient > New before inserting the card, you will see a Confirm window that explains that there is no flashcard in the drive. If this happens, insert the flashcard into the drive and click Retry.)

3. When the New Patient window opens, select an appropriate Type of analysis/report, then click OK. The Patient Information window opens.

Note: If no empty slot is available, the Open Patient window opens and you must delete one of the patients on the list; then close the Open Patient window and select New again.

4. The Holter data will automatically start copying from the flashcard onto your computer's hard drive. Some of that data appears in the Patient window; verify that the data from the flashcard is for the correct patient. If the data is for another patient you can click Copy Different flashcard if you have it or Cancel to not save the data.
5. Enter as much additional patient information as you want included in the final Holter report, including any written diary entries, indications and medications. See Chapter 2: Patient Information, for details about entering patient information.
6. When you have completed the fields, click Remote.
7. The Remote Screen will now open.
8. The New Patient that you set up should be highlighted. You can highlight any other patients at this time by pressing the Ctrl key while clicking on additional patient records.
9. Once you have selected the patients you want to transfer, Click Link at the top of the screen. (To exit without sending the data now, but saving your entries, click OK. To exit without sending or saving, click Cancel.)
10. When the transfer is initiated, the Link status window will appear and give you an update on the transfer. If it is a large transfer, you can minimize the screen by clicking on the button. You will also see a small Message window with the status of the transfer.
11. Once the transfer is complete, the STOP button will read Success and a new window with the transferred file name will be displayed.
12. Note that the Link screen will now show the time and date at the top of



Link Window in Remote

the screen of the transfer. The list of transferred patient records for this session will also be displayed. Close this screen and you will now be returned to main screen in Remote.

13. Close the Remote window and you will return to the Patient Information window.
14. Be sure to click on OK on the Patient Information window so that all of the data will be saved

Note: If you are saving New Patient data, you must click OK when you return to the Patient Information screen. If you do not click OK and close the screen, the New Patient Information will not be saved on your system.

For an existing patient with a new Holter recording

You may choose to set up your patients at the beginning of their procedure and then copy the Holter data when the procedure is complete. If the patient is already set up in LX Analysis, do the following steps to store and send their Holter data:

1. Go to Patient > Open
2. Select Patient from list and Patient Information window will open
3. Press Copy flashcard button.
4. Continue with Step 5 on the previous page.
5. Be sure to click on OK on the Patient Information window when you return so that all of the data will be saved.

For one or more existing patients

You can go directly to the remote screen and select multiple patients with Holter data to transfer at one time. Do this by:

1. For any existing patient, Select Patient> Patient Information > Remote.
2. You will now see the Remote Patient Window with the current patient highlighted. You can now select additional patients by holding the Ctrl key while highlighting additional patient records.
3. Once you have selected the patients you want to transfer, Click Link at the top of the screen.
4. Now continue with Step 10. above.

Additional Features

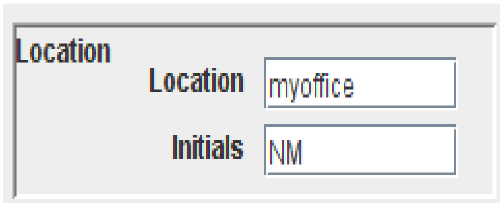
EMail

You can send an email when remote sending. To do this fill in the Mail section of the Setup screen.

Email example

Location

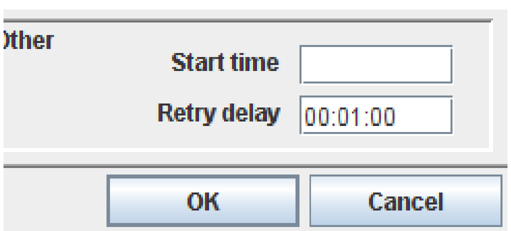
You should denote your business location and initials in this section of the screen. This will assist the receiver in knowing where the file is coming from.



Location example

Link Delay (Other)

In this section you can set up the Link Delay functionality. This enables you to delay sending the files when you are using a dial-up transfer. Enter a Start time for when you want the transfer to take place. When you press Link Delay on the Link screen you will see the countdown based upon your entry on this screen.



Link Delay

More about Magic Vortex

To receive files - Become a MagicVortex Registered-User

We strongly recommend that you become a registered-user with MagicVortex in order to pick up or receive files. There is no charge for this service. In order to do this, you will need to sign up for a MagicVortex account, download and install the application, and then receive the file via the MagicVortex application. You can do this by accessing MagicVortex.com and clicking on Intro Offer button.

After the 30-day introductory period ends, you'll have the choice of upgrading to a paid subscription of this service or letting your plan expire. You can still use MagicVortex with an expired plan, but it will only allow you to receive files. You can cancel your subscription via the web site at any time.

Receiving a patient report

After the analysis site has sent you a Holter report via MagicVortex, the report automatically downloads to your computer. To retrieve the report, open the MagicVortex window (using the icon that looks like the eye of a storm) and it displays the file and its status. Once the download is complete, the status reads “Ready to save.” To save the file, select File > Save from the toolbar, and use the Browser to indicate what folder you’d like to save the report in and what filename to use; then click Save.

To print the report, open the file in the folder where you saved it, and use File > Print to print the report.

4 PREFERENCES

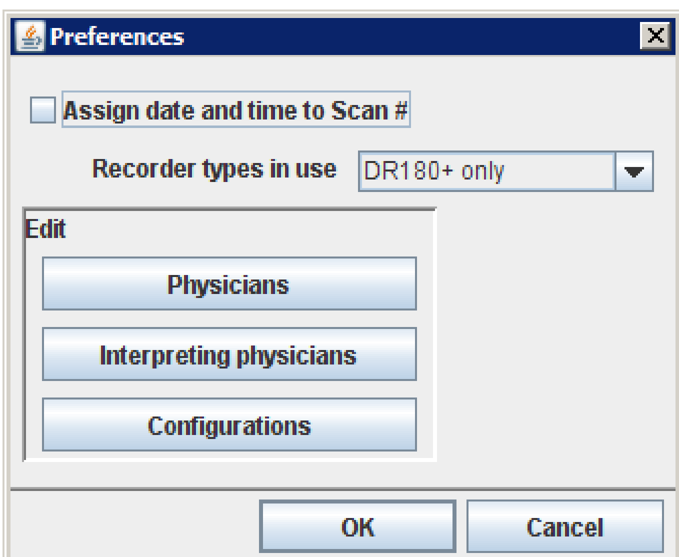
Preferences and the Configuration program (also called the Configurator) allow you to customize certain aspects of the screen displays, analysis and reports. With careful attention to detail, you can establish report formats that are specific to a physician or automatically change dozens of analysis settings for a particular patient type (e.g., patients with pacemakers). Each separate customized format is called a configuration.

Preferences

The Preferences window allows you to customize your system. You can get to the Preferences window by going to Patient > Preferences. You will need to open a Patient Information window in order for the Preferences window to be accessible.

Physicians

You can enter Referring Physicians and Interpreting Physicians by clicking on either of the buttons. Once the respective Physician window opens, you can add, delete or edit existing physicians.



Assign date and time to Scan#

Click on this button to have the system automatically assign the date and time from the Holter recording onto your patient record.

Running the Configuration program

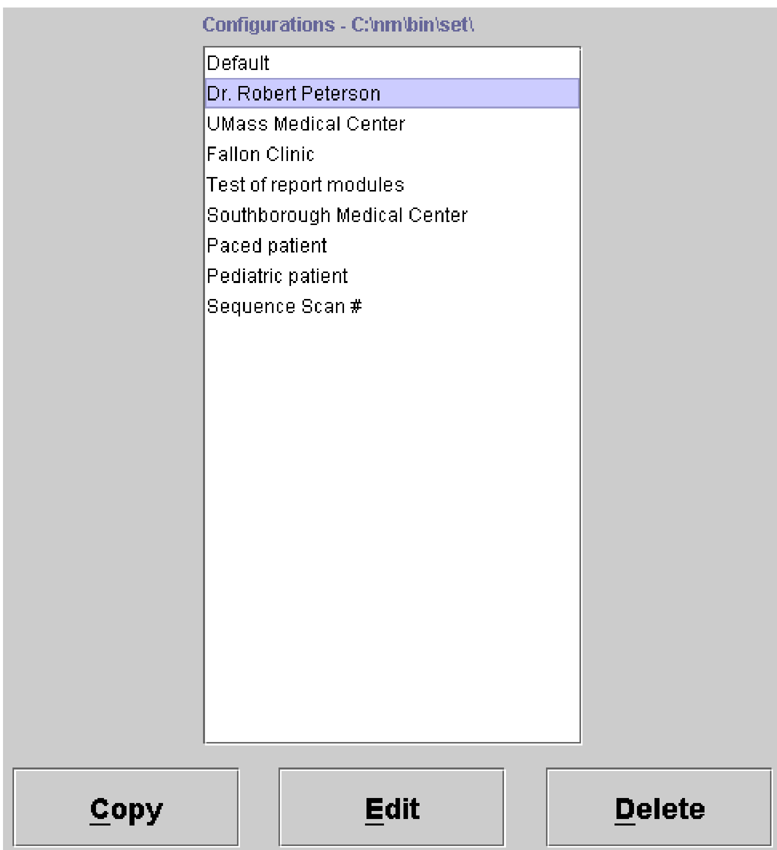
You access the Configurator by going to Patient > Preferences. At the bottom of the Preferences window, click the Configurations button. The main Configurations window opens.

Configuration window

The main Configuration window opens with a listing of all current configurations of your software. Each should have a unique name. To make changes, you can either edit an existing configuration or create a new one. You can also delete a configuration if you no longer need it.

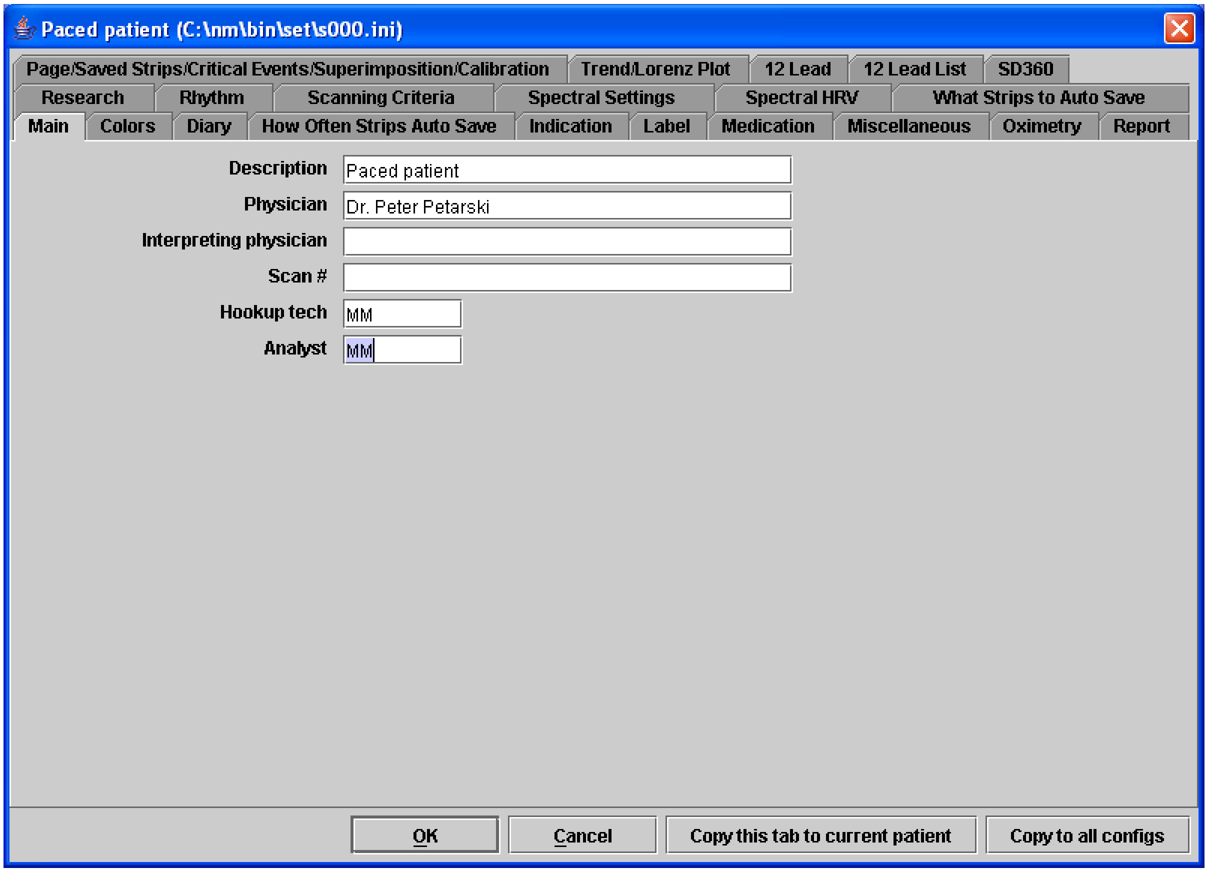
Note: The configurations appear as choices in the Type of analysis/report field when you select Patient > New. In addition, they appear when you are initializing a flashcard.

To edit an existing configuration, click on the name associated with the configuration you want to change, and then click the Edit button.



Main Configuration window

To create a new configuration, click on the name associated with a configuration similar to the one you want to create, and then click the Copy button. When you create a new configuration by using the Copy button, the Description field in the Main folder reads ***New***. Be sure to type a new name for the configuration in the Description



Configuration folders

field to differentiate it from others you create.

To delete a configuration, click on the name associated with the configuration you want to eliminate, and then click the Delete button.

Configuration folders

The window for a specific configuration consists of a pile of folders with tabs. Each folder contains the controls for a particular window or portion of the Holter LX software. Within the folders for a configuration, any entry in any of the fields automatically appears whenever you create a new patient using that configuration.

To display the fields in a particular folder, click on the tab for that folder. Below is a list of folders that you may want to update for Remote purposes:

- **Main** - This includes fields indicating the name (description) of the configuration, which appears in the list whenever you start a new patient; the physician's and interpreting physician's names associated with the configuration; the scan number; hookup technician; and analyst.

Note: The Main folder contains the Scan # field which controls the auto-sequencing of the Scan number in the Patient Information window. To have the system automatically increment the scan number for each patient, enter $seq in the Scan # field; to include the date and/or time-of-day in the Scan # field, enter $date or $time, respectively. Use whatever order you want the scan number to follow. Also, be sure to turn on the "Assign date and time to Scan #" feature in the Preferences window.

- **Indication** - Different indications can be added, and current indications can be replaced with other text or deleted. The Indication choices appear in the Indication area of the Patient Information window.
- **Label** - Strip labels can be changed from their present text to whatever text you use to replace them. Strip labels appear in the Saved Strips window, the Keep window, and in the final report.

Note: Changes in labels must be made carefully because the meaning of the label MUST NOT change. For example, when the system calls a beat ventricular, it uses the VPB label when saving strips for the report; you can change the text to read VE instead, but not SVPB or BBB, or your report will be incorrect.

- **Medication** - Different medications can be added, and current medications can be replaced with other text or deleted. The Medication choices appear in the Medication area of the Patient Information window.
- **Report** - This allows you to have a configuration with a different report heading, a different selection of report modules, along with different settings for the strip annotation, full disclosure, report summary, and saved strips fields in the Reports window. You can also change the registration name and address.

Saving a configuration

For each configuration you create or edit, make changes in as many folders as you need to. When all folders reflect what you want to associate with that configuration, click the OK button at the bottom of the window. Your new configuration will be saved and the window closed; the main Configurator window then appears.

Canceling a configuration

To exit without saving the new configuration, click Cancel. The window closes and the main Configurator window appears.

To create or edit another configuration, use the Copy or Edit button again.

Copying to a current patient

The Copy this tab to current patient button allows you to make changes to the displayed fields within the record of the current patient. If this button is dim, those changes cannot be made because they might cause inconsistencies.

Copying changes to all configurations

To copy any changes associated with a tab/folder to all other configurations, instead of having to make them to every configuration separately, use the Copy to all configs button. That applies the settings of the displayed fields to all other configurations.

Exiting from the Configuration program

To exit from the Configuration program, click on the red Close button in the upper right corner of the window.

Using a configuration

The configurations created or edited using the Configurator appear when you start a new Holter test and when you initialize an SD card. When you select Patient > New to open the Patient Information window for a new Holter test, a list of the Configuration descriptions appears in the Type of analysis/report field; select your choice from that list. When you initialize an SD card before a recording, the list of DR200/HE Configurations appears in the DR200/HE settings field of the Setup DR200/HE settings window; select your choice from that list.

Of course, if you use an inappropriate configuration for a patient, after analysis, the user can always go to the appropriate Settings windows and make necessary changes; the system will automatically update or re-analyze as needed.

5 Managing Patients

Making room for new patients

When the software has saved the maximum number of patients allowed by your system, you must delete old patients to make room for new ones. If you want to archive an electronic version of each patient record, make sure you back up a patient before you delete it.

To delete a patient from the patient list, go to Patient > Open to display the list of patient records currently in LX Analysis. In the Open Patient window, click on a patient name to highlight it and click the Delete button. When the Confirmation window appears, click Yes. That slot in the list will now be available the next time you select Patient > New.

To delete multiple sequential patients in the Open Patient window, click on the first patient to be deleted, then drag down to the last one you want deleted. With multiple patient names highlighted, click the Delete button. When the Confirmation window appears, click Yes.

To close the Confirmation window without deleting any patients, click No.

Backing up patients

To back up patients in the directory before deleting them to make room for new patient reports, go to Patient > Open and click the Backup button to open the Backup window, which displays the Backup tab.

From the list of patients in the top half of the Backup window, click on the patient you want to back up; if your patient list is longer than the window display, use the scroll bar to display additional patients. To back up multiple sequential patients, click on the first record to be backed up, then drag down to the last one you want backed up. With the appropriate patient(s) selected (that is, highlighted), click Backup again. A condensed version of the patient is created and saved.

What gets saved

To determine how much of the patient data is saved in the back up, the program refers to the entry in the Save field of Backup > File > Settings.

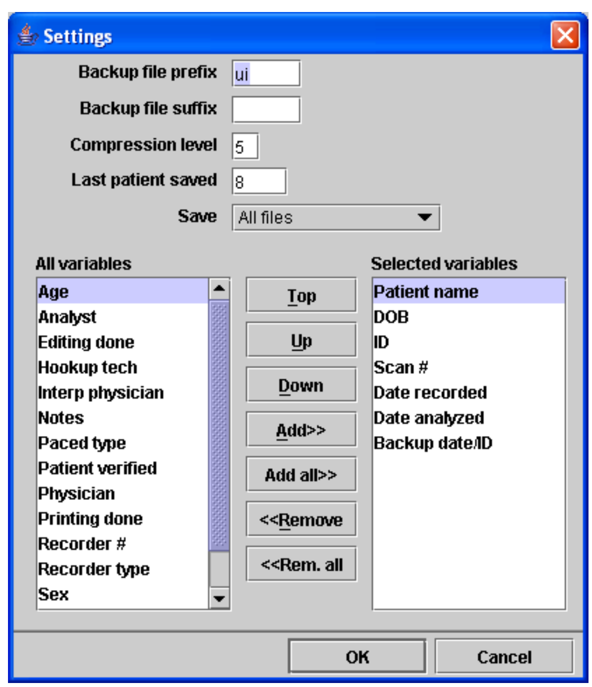
For your purposes, the Save field in the Backup Settings window should read "All files". By doing an "All files" (full) backup, the patient's Holter data will be saved and can be accessed at a later date.

Once a patient has been backed up, the type of backup is indicated in both the Open Patient window and in the Status window within the Patient Information window.

Automatic file name

The file name of the backed up record is automatically assigned as a number followed by the "zip" extension. The assigned number is the one following the entry in the Last patient saved field of the Backup Settings window. The software automatically keeps track of the numbers it assigns and updates this field, but you can override it by entering a different number and clicking OK.

Note: Make changes here carefully. If you enter a new number that is smaller than the number listed, the backup process with reuse a file name and over-write the previously saved patient record. Unless you have backed up that patient record elsewhere, it will be permanently lost.



Settings window in Backup

Assigning a backup file name

The Settings window in the Backup program allows you to include a prefix or suffix on the numeric file name given to a backup record. If you assign a prefix or suffix to a particular patient group (for example, all the patients of a particular physician) this feature means that later you can easily identify which reports are in that group.

To include a prefix or suffix to the backup file name, enter up to four characters in the appropriate field of the Settings window before saving the patient record. If no prefix or suffix is specified in the Settings window, the backup file name will be the next sequential number in the backup series, with the extension “zip.”

The size of a backup file

The Compression level field of the Settings window in Backup allows you to control the amount of compression performed when saving the backup file. The range is from 1 to 9, with 1 being the least compressed and 9 the most compressed. That makes 1 the quickest backup process, and 9 the longest.

Customizing the Backup directory

The Backup patient directory (on the Backup tab of the Backup program) can be customized to include only those fields you need to track your patients’ backed up records. Use the fields and buttons in the bottom half of the Backup > File > Settings window to establish which fields appear as column headings in the Backup directory. Those variables (headings) in the left-hand column will not be included; those in the right-hand column will be included. Use the buttons in the center - Add, Add all, Remove, and Remove all - to move variables (headings) from one column to the other. Rearrange those in the right-hand column using the other buttons in the center - Top, Up, and Down.

Note: We recommend that if you customize the Backup directory, you do so only before backing up any patient records. Inconsistencies will result if you back up some reports using one set of headings and other reports with a different set of headings.

Where the backup file is saved

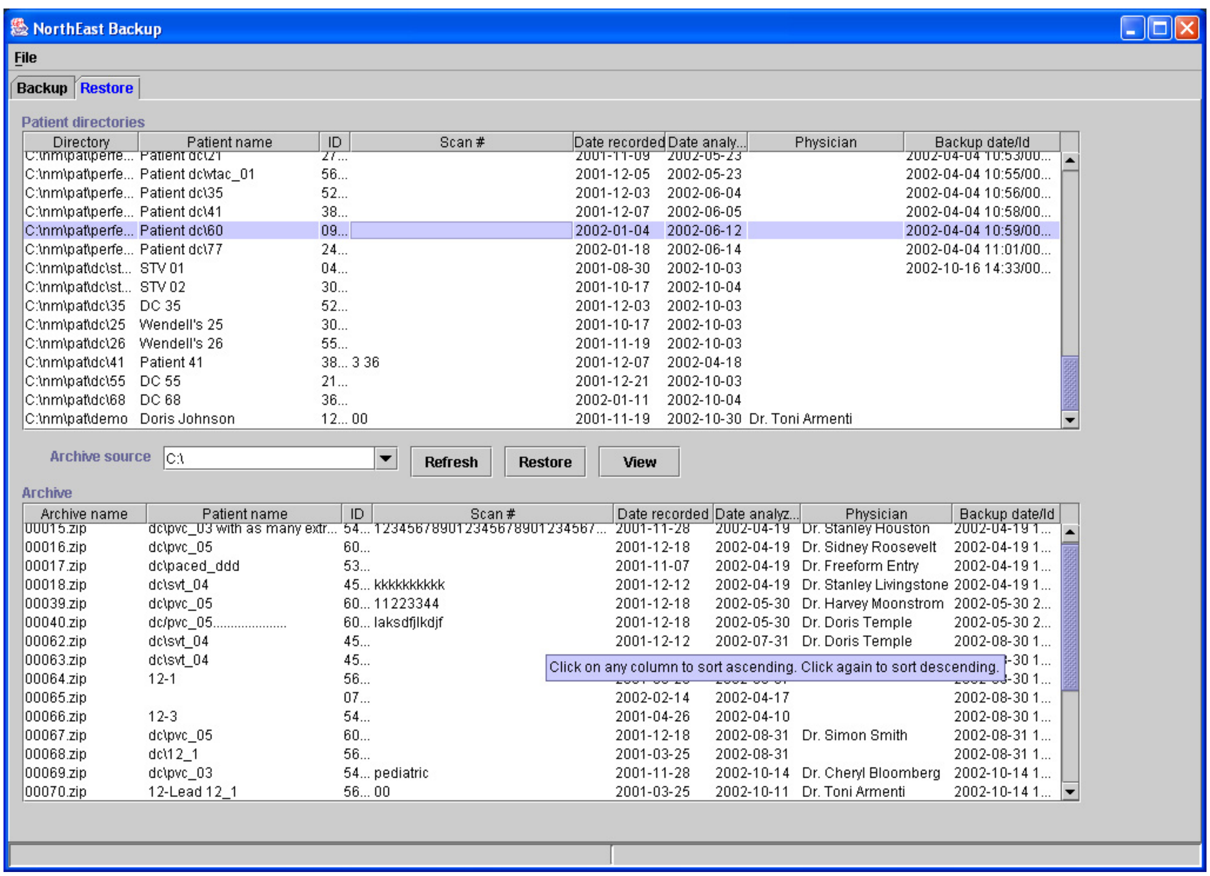
In the Backup window, the Archive destination directory field indicates what device and directory will store the backup file. The setting defaults to \nm\backup on your hard drive. To save the backed up record elsewhere, select a device from the list associated with the Archive destination directory field and type in the appropriate directory name before clicking on the Backup button.

See the sections about archiving reports on CD using Roxio Easy CD Creator later in this chapter for details about moving the files in the backup directory to permanent storage.

Retrieving a backed up patient record

To retrieve a patient record that has been backed up, go to Patient > Open, then click on the Backup button. The Backup window opens, with two tabs at the top. Click on the Restore tab to open the Restore window.

In the Archive source field, select the drive on which the patient reports are backed up. Any reports the software finds on that drive will be listed in the bottom portion of the window. In that bottom portion, click on the patient record you want to retrieve; in the top portion, click on the patient slot where you want the retrieved patient to go. The patient record in that slot will be over-written, so be sure to select the slot carefully. Then click Restore. When the Confirmation window appears, click Yes to retrieve the backed up patient. Click No to close the Confirmation window without retrieving the record.



Restore tab in Backup window

Click on the X in the red button at the top right of the Backup window to close it.

Note: You can retrieve only the same type of record you backed up. If you backed up a Full record, all the Holter data is there for you to re-analyze, if necessary. If you backed up a Report, only an electronic version of the printed report is available, and re-analysis is not possible.

Additional features in the Backup window

The Backup and the Restore tabs of the Backup window also include these buttons, which function as indicated:

Refresh: Redisplays patient lists, reflecting any changes.

View: Allows you to select a backed up record and view it on-screen without restoring it onto the current Patient List. Once it's displayed, you can also print the report.

Copy to clipboard: Allows you to export a patient's backed up record to a spreadsheet. For details, see the section "Using a spreadsheet to keep track of archived data," later in this chapter.

Using Roxio software to archive records on CD

The Backup program built into LX Analysis can be used to archive patient reports onto a compact disk using Roxio Easy CD Creator software. During the procedure, the patient files are copied from the system's hard disk, compressed, and saved to CD. There are two requirements: (1) the Roxio software must be installed on your system's hard disk and (2) your system must have CD drive that can write to CD.

As a general rule, each 700-MB CD can hold about 10 to 15 full patient reports (called "Full" in the Backup Settings), including 24 hours of editable ECG, or between 200 and 300 partial records (called "Reports" in the Backup Settings) that include the entire Holter report, but not the full editable ECG.

You have two options for backing up:

- copying a group of zipped patient files at a single session onto a CD, using a format that is more likely to be accessible by any computer system; or
- copying zipped patient files at multiple sessions to a CD that is considered a direct device, using a format that perhaps will not be supported in the future.

Note: We recommend that the former approach be used when backing up patient reports for permanent archival. That approach is described first in the following documentation.

Backing up a record on CD - single session

The procedure consists of three steps:

1. using the Holter LX Backup software to compress patient files and save them in a temporary location

(this step was already covered in a previous section, but is also included in the following instructions),

2. using Roxio software to copy the compressed files to CD, and
3. deleting the compressed patient files from the temporary location.

Compressing Holter data for backup

To start the backup procedure:

1. Launch LX Analysis.
2. Select Patient >Open.
3. Click Backup to open the Backup window, which displays the Backup tab.
4. In the Destination field, enter the device and directory in which backed-up files will be stored temporarily. Use c:\nm\backup.

5. In the list of patients, click on the patient record you want to back up; if your patient list is longer than the window display, use the scroll bar to display additional patient reports. To back up multiple sequential patient reports, click on the first record to be backed up, then drag down to the last one you want backed up.
6. With the appropriate patient(s) selected (that is, highlighted), click Backup again. A small Backup status window opens, displaying the current compression step.
7. When compression is complete and the files have been transferred to the \nm\backup directory, the status window closes. You can continue with formatting the CD.

Note: For details about what files get compressed and assigned file names,

Archive destination field in Backup window

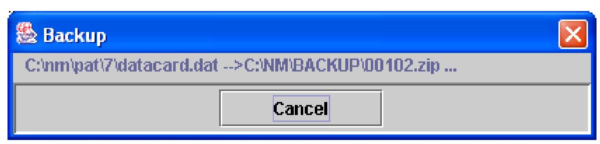
refer to the "Backing Up Patient Reports" section earlier in this manual.

Copying to CD

To copy the zipped files produced by the backup program onto CD:

1. Insert a blank, writable CD-R (not CD-RW) into the drive. Explorer opens a CD Drive window asking how to proceed.

Note: Although it is possible to use a CD-RW for backup, it requires a prolonged formatting period and is more



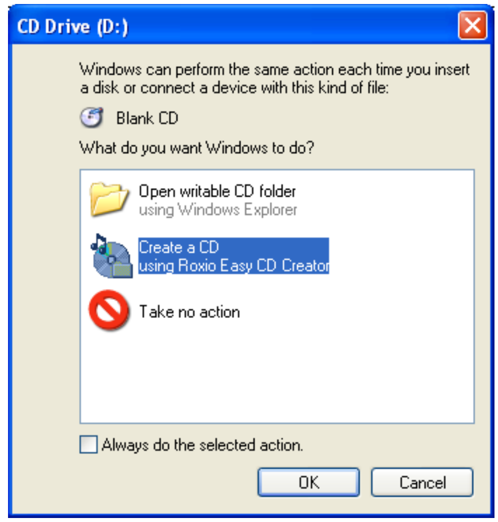
Backup window displayed during compression

expensive. Because the backup procedure is intended to be permanent storage of patient records, there is no advantage to using CD-RWs.

2. If an Explorer window opens asking how to proceed, select the choice "Create a CD using Roxio Easy CD Creator" to launch the Roxio Easy CD Creator software. If an Explorer window does not open, launch the

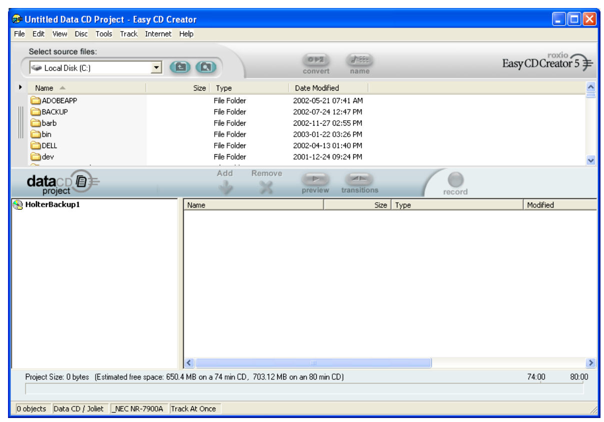
Roxio Easy CD Creator from your Start > Programs menu.

3. The Roxio main menu appears. Place the cursor over the button labeled “make a data CD” so that additional menu choices appear as shown to the right.
4. The middle menu choice is “data CD project.” Click that. The Data CD Project window opens.

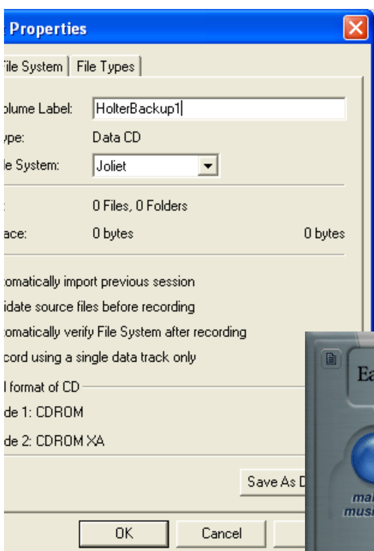


Explorer’s CD Drive window

5. Select File > CD Project Properties to open the properties window as shown below. Type the label you want for the CD in the Volume Label field.

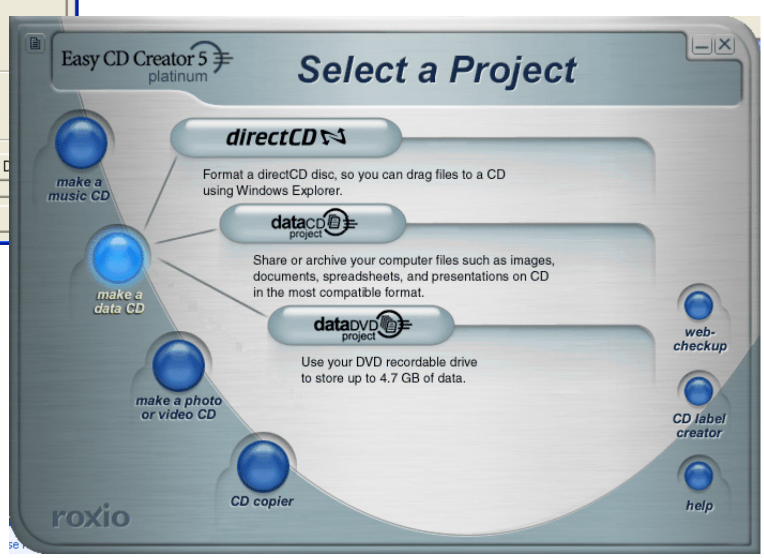


Data CD Project window



iect Properties window

6. Make sure that “Joliet” is listed in the File System field. If it is not, select it from the list of choices.



Main menu of Roxio Easy CD Creator

7. Click the radio button labeled "Mode 1: CDROM."
8. Press OK to close the window.
9. Within the Data CD Project window, the "Select source files" field should read "Local Disk (C:)" and should list directories/folders below it. One of the directories is named "nm" - for NorthEast Monitoring. Double-click that folder so that "nm" appears in the Select source files field and additional directories are listed below it. In that list of directories, double-click on "backup" to select it; "backup" appears in the Select source files field, and the compressed files (named *.zip) are listed below that.
10. From the list, select the patient records to be backed up, which will typically be all the files listed. Click on a file name to select it; to select multiple sequential files, click on the file name, press the Shift key and drag to the last file name. To select all files, hold down the Ctrl key and press A.
11. With the files you want highlighted, click the Add arrow near the center of the window. The selected file names appear below the Add arrow. You can also choose to drag the highlighted file names from the top of the window to the space below the Add arrow. Files can also be selected individually and added to the Add list one at a time.
12. When all of the files you want copied to the CD appear in the Add list, press the red record button. The Record CD Setup window opens.

Note: If the record button is dim, you have not yet moved files to the Add list. You must have selected at least one file and moved it to the Add list for the record button to turn red.

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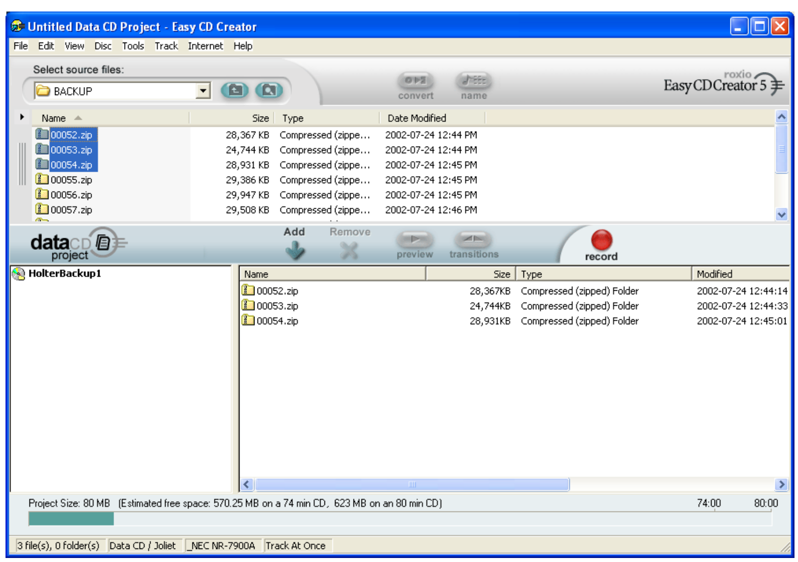
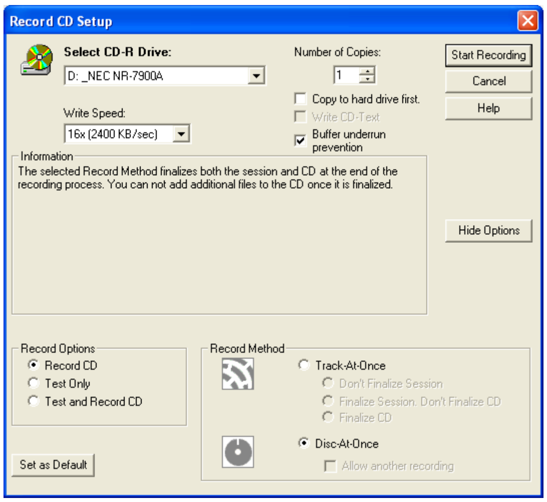
13. When the Record CD Setup window opens, if the Options button appears, click it to include the record options at the bottom of the window, as shown in the figure above. If the Hide Options button appears when the Record CD Setup window opens, the options are already displayed.
14. In the Record Options area, "Record CD" should be selected. In the Record Method area, click on



Data CD Project window with selected files in Add list

"Disc-At-Once." This will allow you to copy files to the CD and then close the session to future additions.

15. Click the Start Recording button.
16. The Record CD Progress window shown below appears as the files are copied to CD.



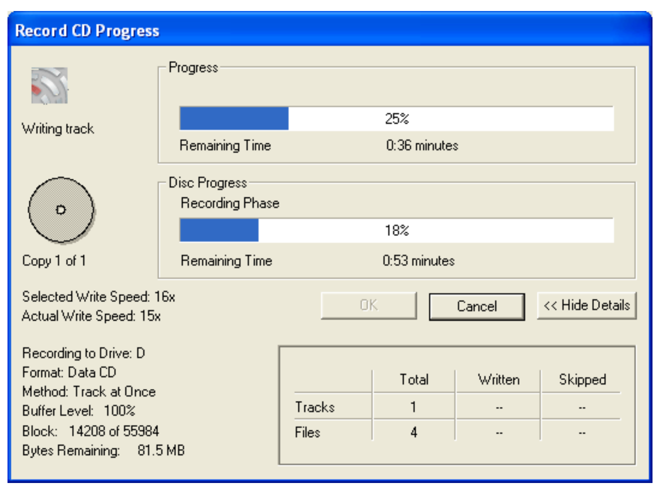
Record CD Setup window

17. When copying is complete, a query about launching CD Label Creator opens. To Close the current CD session, click Close.
18. In the Record CD Progress window, click OK.
19. If a query window appears asking you whether you should save the project, click Yes.
20. The Explorer window for the CD drive appears with the compressed files listed as "Files Currently on the CD." Close the window.
21. Eject the CD from the drive and label it appropriately, with a unique name that will distinguish this CD from other backup CD.

Note: Do not remove the CD from the drive while it is still being written to. Wait for the spinning sound to stop before removing the CD.

Deleting compressed files

22. To delete the compressed files from their temporary location, go to My Computer and double-click Local Disk.
23. Double-click the nm folder to open it.
24. Double-click the backup folder to open it, displaying the compressed files (*.zip) currently in the folder.
25. To delete the files one-by-one, right-click on each file you have backed up and select Delete. To delete all files, select one of them, then hold down the Ctrl key and press A to select all, then press Delete.



Record CD Progress window

Note: If you do not delete files from the \nm\backup directory, they will accumulate and you will have to keep track of which ones have been copied to CD and which ones have not. Instead, we

recommend that you routinely delete all files after copying to CD so that when you are backing up, you know that any files in the \nm\backup directory have not yet been copied to CD.

Backing up a Holter test on “direct” CD

The procedure consists of three steps:

1. properly formatting the CD,
2. using the Holter LX Backup software, and
3. closing the CD session.

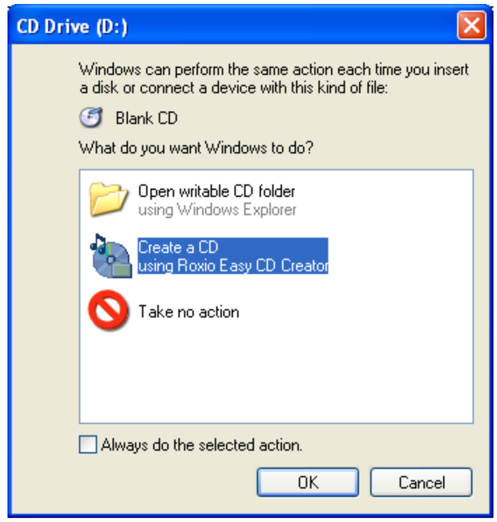
Formatting the CD

To format the CD to accept the zipped files produced by the backup program:

1. Insert a blank, writable CD-R (not CD-RW) into the drive.

Note: Although it is possible to use a CD-RW for backup, it requires a prolonged formatting period and is more expensive. Because this procedure allows you to periodically copy patient records to the same CD until it is full and because the backup procedure is intended to be permanent storage of patient records, there is no advantage to using CD-RWs.

2. If an Explorer window opens asking how to proceed, select the choice “Create a CD using Roxio Easy CD Creator” to launch the Roxio Easy CD Creator software. If an Explorer



CD Drive window with Roxio selection

window does not open, launch the Roxio Easy CD Creator from your Start > Programs menu.

3. The Roxio main menu appears.
4. Place the cursor over the button labeled “make a data CD” so that additional menu choices appear as shown at right.
5. The top menu choice is “direct CD.” Click that. The Roxio format utility opens.
6. Make sure the correct drive name is listed in the select CD field as shown in the figure above. Then click the Format CD button in the

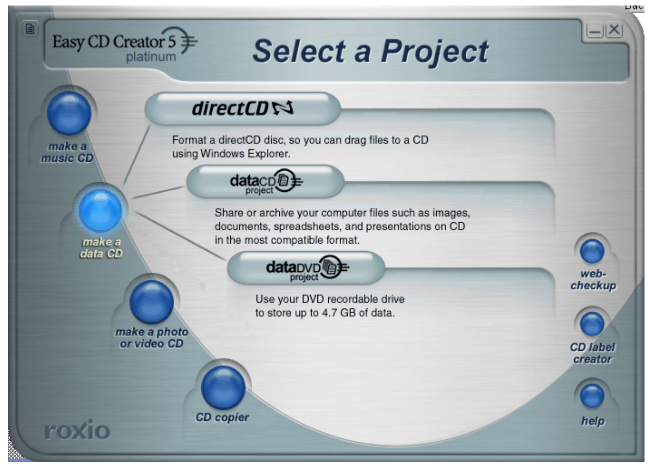
center of the display. The Format window opens.

Roxio format utility

7. Type a label name for the CD (choose a unique name that will distinguish this CD from other backup CDs) in the field indicated in the Format window. If you have inserted a new blank CD-R, the Quick Format and Full Format selections will be dim; the Quick Format will be done.

Note: If the Quick Format selection is dim and the Full Format selected, and you cannot click the Quick Format radio button on, you probably have a CD-RW in the drive. We recommend that you use a CD-R instead.

8. Click the Start Format button. Several windows open in sequence. When formatting is complete,



Roxio main menu with “make a data CD” choices

Explorer opens an empty window for the indicated drive.

9. Close the Explorer window to reveal a CD Ready window; click OK to close that; and then close the Roxio format utility display.

10. Launch LX Analysis and continue with the steps in the next section.

Using the Holter LX Backup software

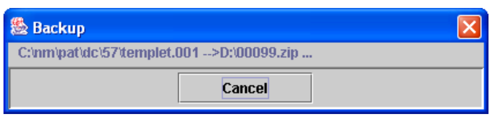
11. After launching the Holter LX program, go to Patient > Open, then click the Backup button.

12. In the Backup window, the Backup tab should be displayed. From the list of patients in the Backup window, click on the patient record you want to back up. To back up multiple sequential patient reports at one time, click on the first one to be backed up, then drag down to the last one you want backed up. Or click on the patient record you want to back up and then press the Shift key and click on additional patients.

13. In the Archive destination field under the patient list, select the appropriate drive name for your system's CD drive. Click on the arrow at the right of the field to display the drive choices; click on your choice to change the setting.

Archive destination field in Backup window

14. With the appropriate patient(s) selected (that is, highlighted), click Backup again. The record for each patient is compressed into a zip file and transferred to the CD.



Backup window displayed during compression

15. When the procedure is complete, the Backup window reappears, with the list of backed up patients in the bottom half of it.

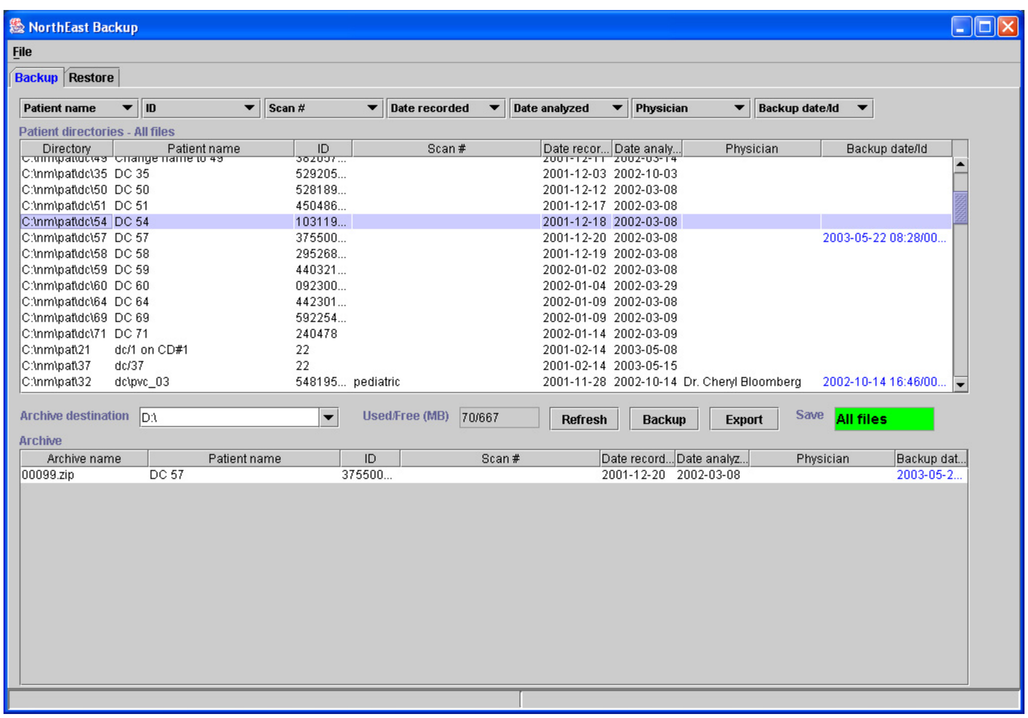
16. Click the red close button in the upper right corner to exit the Backup window and return to the Open patient window.

17. To remove the CD from the drive, follow the directions in the next section.

Note: Details of what gets saved for each patient record and how to retrieve a patient record from archived files are covered in the early sections of this chapter.

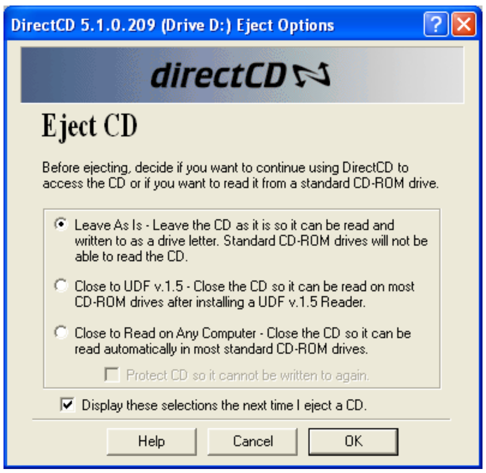
Closing the CD session

18. Once you have backed up patient files on CD, to remove the CD, you must first indicate how to save the CD. To do so, select the Roxio soft-



Backup window with Backup tab displayed ware so that the format utility is displayed.

19. Click the Eject button in the center of the display. The Eject Options window opens with the following choices:



Eject Options window

- **Leave As Is** - This leaves the CD in a state so that you can continue to add patient reports to it. In this state it is only readable by a system running Roxio Easy CD Creator Software.
- **Close to UDF v.1.5** - This saves the information on CD, but will not allow additional patients to be added. It can only be read by a system running UDF v.1.5.
- **Close to Read on Any Computer** - This saves the information on CD, but will not allow additional patients to be added. It can be read on most standard CD-ROM drives, without Roxio software.

20. To save to the CD, but allow additional patients to be added in the future (up to the storage limit of the CD), click "Leave As Is" to select it, then click OK. The CD drive opens and the following window appears.

Ejected CD window

21. Click OK.
22. Remove the CD and label it appropriately.
23. If the Roxio format utility is still displayed, click the close button in the upper right corner to close it.

Adding patient reports to CD

To copy additional patient reports onto a directCD that already contains some:

1. Insert the CD into the drive. If a window opens displaying what is on the CD, close it.
2. Launch LX Analysis and follow steps 10 through 19 listed above.
3. If the CD is not yet full, you can proceed with steps 20 and 21, and then remove the CD from the drive. If the CD is full, (1) select the "Close to Read on Any Computer" choice in the Eject Options window in step 20 so that the information is permanently archived in a format that is accessible by most CD-ROM

drives without Roxio software and (2) click to turn on “Protect CD so it cannot be written to again;” then click OK and remove the CD from the drive.

Keeping track of archived data

Once you have backed up patient reports (either Full reports including all the recorded ECG or Reports including just the information in the printed report) onto CD, you need to keep track of which CD holds which patient reports. You can do this using either (1) the Backup Log in LX Analysis or (2) a spreadsheet program like Microsoft Works Spreadsheet.

Using the Backup log

To view a list of the patient reports you have backed up using LX Analysis:

1. Select Patient > Open.
2. Click the Backup button.
3. Select File > Backup log.

The Backup log lists the archived names of the backed up files, then any column headings (variables) you selected in the Backup Settings window.

Note: Be sure to customize what column headings you want in the log before backing up any patients because inconsistencies will result if you customize after some of the patients have been entered into the log.

To add the name you gave to the CD on which reports were backed up:

1. Click on the individual patients you backed up. To select multiple sequential patients, hold down the Shift key as you click.
2. Click the Set volume name button.
3. Type the unique name you gave to the CD holding the backed-up reports. Then click OK.

The Backup log now contains the name of the CD on which the backup file is saved. It appears in the Backup Date/ I.D. field.

To print the Backup log, select the rows to be printed, then click the Copy to clipboard button. Using a spreadsheet program, paste the information into a new spreadsheet and print as instructed by the spreadsheet program. For details about using the MicroSoft Works Spreadsheet to track patient data, see the instructions in the following section.

Using a simple spreadsheet list

The simplest way to use a spreadsheet program is to create a spreadsheet that lists all the patients on a particular CD and print that list to archive with the CD. Alternatively, you can create one large spreadsheet listing all archived patients and the CD label on which they are saved; this spreadsheet can later be used to locate a patient name and then obtain the CD label.

To create a printout listing the patient reports on a particular CD:

1. Launch the Holter LX program.
2. Select Patient > Open.
3. In the Open Patient window, click Backup.
4. In the Backup window, in the bottom half of the window, select the Archive destination where the patient records were stored. If you backed up using the detach method described earlier, the Archive destination was c:\nm\backup\. If you used the directCD method, the Archive destination was originally your CD drive (often d:); make sure you have the CD in the drive when you select the drive. The patient records you just backed up will appear in the bottom half of the Backup window.
5. Press the Copy to clipboard button.
6. Launch the Microsoft Works Spreadsheet. An empty spreadsheet opens.
7. Select Edit > Paste. The data selected in the Backup program is entered in the data fields of the spreadsheet.
8. Select File > Save As. Select an appropriate folder/directory in which to save the document and type an appropriate name (for example, the Volume Label you assigned the CD).
9. To print the spreadsheet to keep with the CD or to file, use File > Print.
10. Use File > Exit to close the spreadsheet program.

Creating a spreadsheet listing all archived patient names

If you create a single spreadsheet listing all archived patient names, you can more easily locate the particular CD on which a patient record is archived. To create the spreadsheet:

1. Follow steps 1 through 8 above.
2. Create a new column by clicking in the spreadsheet in the field to the right of “Volume” and selecting Insert > Insert column.
3. Type a label for the column; call it “CD Label.”
4. Click on the first field below CD Label and type the label of the CD on which the patients were archived.
5. Drag across the label you have typed to select it and select Edit > Copy to make a copy of the text. Paste the copy into each of the CD Label fields of the other patients backed up on that CD.
6. Follow steps 9 through 11 above.
7. Whenever you want to add patients to the spreadsheet, launch the Holter Backup program, select the appropriate archive destination and click Copy to clipboard. Then open the spreadsheet file, click on the row below the last used row and select Edit > Paste.
8. To eliminate the extra row of labels at the top of the new list, use Insert > Delete row.

9. Add the appropriate CD label in the CD Label column.
10. Select File > Save, then File > Exit.

Locating a patient record in the spreadsheet

To find a particular patient in the spreadsheet, sort (using Tools > Sort...) by the name or scan number column, locate the match, then refer to the CD Label field to see which backup CD holds that patient record.

APPENDIX A - ANOMALIES

The following is a list of issues that have been identified in this version of the software.

1. Hot keys do not always work.
2. If no dongle is present, incorrect error message is invoked, “Invalid Registration for Remote”. Instead, this means that the software is unable to find a dongle and therefore cannot run.
3. Not all terms have been translated in all languages.
4. Patient Open Screen missing fields. Some fields were dropped in release 5.3. They will be returned in a subsequent release.
5. If the Print button is pressed too quickly, it may hang the system. You will need to abort and restart the software to solve this problem.
6. If you are using a foreign language with Unicode or have a logo on your report, you cannot use the “Print” buttons. Instead, you will need to “Review” and print reports using Adobe.
7. If you have an email client that requires a password, you cannot use the Remote Send feature that sends email notices.
8. Remote Send initials do not currently work.