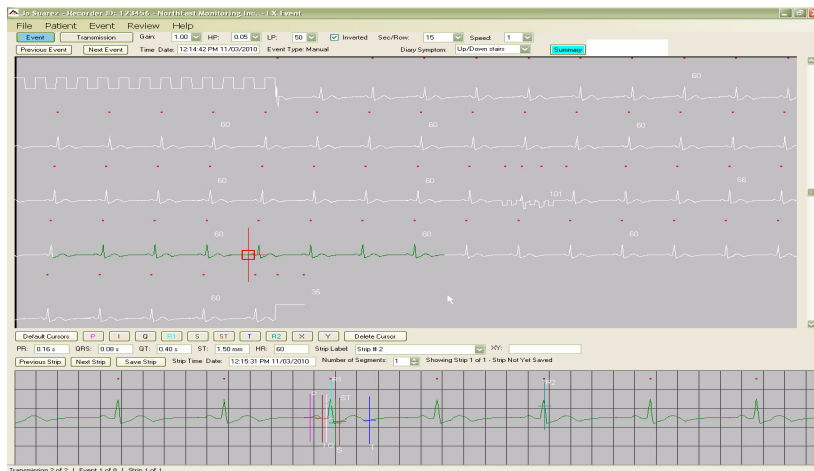

LX Event Software

for use with NorthEast Monitoring's
DR200/Tel-a-heart
and other cardiac looping event recorders

Operator's Manual



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**Special acknowledgement to Bruno Lowagie and Paulo Soares, the
authors of iText library. This open source library provided the ability
to generate Adobe Acrobat files. For more information, see
www.lowagie.com/iText.**

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1 INTRODUCTION TO LX EVENT

Welcome to NorthEast Monitoring's LX Event Recorder Software. This software is to be used in conjunction with NorthEast Monitoring's DR200/Tel-a-heart looping event recorder or any other event recorder using FM modulation.

With this software, you can receive and record telephonic or local transmissions of ECG recorded events, review the events, save particular ECG strips of interest, create transmission, procedure or a summary report. The reports may include full disclosure of patient event recordings.

If you are using NorthEast Monitoring's DR200/Tel-a-heart recorder, you are also able to quickly download events directly from the recording using an SD flashcard. This will allow you to get a clean, crisp ECG recording as you are able to bypass the telephone and other recording hardware on the computer using this method.

CAUTION: Federal law restricts this device to sale by or on the order of a physician.

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

NorthEast Monitoring is an FDA Registered Facility (1224919) that follows all FDA CGMP Manufacturing Practices. The DR200/HE, DR200/E - Tel-a-heart, and LX Event Software have FDA 510K Marketing Approval (K061293).

Package contents

Your LX Event package includes:

- NorthEast Monitoring LX Event Software DVD.
- NorthEast Monitoring License File CD.
- NorthEast Monitoring Software protection key.
- SD flashcard for DR200/Tel-a-heart file transfer.
- Memory Card Reader.
- TIU - Telephone Interface Unit with microphone (optional).

System Requirements

The LX Event software can be used with NorthEast Monitoring's DR200/Tel-a-heart Event Recorder or with any event recorder that uses direct FM modulation. To run the LX Event software, your personal computer should include:

- Microsoft Windows XP or Windows 7
- processor with a speed of 1 GHz or faster

- at least 512 MB of memory for Windows XP and 1 GB for Windows 7
- monitor with a resolution of at least 1280 x 1024
- disk drive of at least 10 GB
- standard analog (POTS) phone line for receiving telephonic transmissions
- laser printer is recommended

Operator Knowledge

To use NorthEast Monitoring LX Event software, you must have extensive ECG knowledge that allows you to properly identify sinus and paced rhythms, abnormal rhythms, supraventricular and ventricular arrhythmias, artifact, ST segment changes, and pacemaker failures. In addition, all instructions assume a working knowledge of computers and, specifically, Windows software.

Installation Instructions

Note: *Whether you are updating to a new version or installing the LX Event software for the first time, you will want to follow the steps as follows.*

Note: *See Appendix B for installation troubleshooting*

To run, the LX Event software must be installed on the hard disk of your computer. No other programs should be running when you install the LX Event software.

The LX Event software must be installed before plugging in the software key or phone interface that comes with your software.

In order to install the software on your PC, do the following steps in order:

- Insert DVD labeled LX Event 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**. Sentinel Protection software. 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_NationalInstall**. National Instruments software. This is a big installation and may take some time.
- Double-click on **4_PDFDriverInstall**. This will allow you to save reports on your computer using PDF Creator.
- Double-click on **5_LXInstall**. This is the LX Event Application itself.

The next steps only need to be followed if you are installing LX Event for the first time:

- Insert the License CD into your computer. Open the CD directory and click on the License file.
- Plug the software protection key into an available USB port on your computer and let the system install the software for it.

Continue if installing a TIU:

- Plug the USB cable from the Telephone Interface Unit (TIU) into your computer and let the system install its software. The LX Event DVD may have to be in the machine during the installation.
- Now plug the wire from your telephone network into the plug labeled “Line” in the back of the TIU. You can also plug the microphone into the front of the TIU for local recording purposes.
- You can test your TIU by clicking the “Phone Rec” button on the LX Event screen. If a line starts to appear across the

screen, it is working.

Updating the Software

For users who have been using a previous version of LX Event, you will want to copy over your patients, license and logo files from the previous version. A batch file that does this has been created for you. You can find the batch file on your LX Event installation DVD or with the install files on your desktop at C:\LX_Event_installation\LXInstallations.

With your LX Event software closed, double-click on **copyExistingPatients.bat** to begin the batch copy process.

Launching LX Event

The installation process should have installed an LX Event icon on your desktop. LX Event can also be found in the Start menu by pressing Start -> All Programs -> NorthEast Monitoring Inc -> LX Event.

To View Sample Patients

Note: Do not load the sample patient data if you already have existing patients, as the Sample Patient data will overwrite your existing patients.

For new users only, you can load a set of sample data for learning or demoing the system. You can load the patient from your LX Event installation DVD or the install files on your desktop at C:\LX_Event_installation\LXInstallations.

With the LX Event software closed, double-click on **Sample_Patients_4.exe** to load the patients. Never load the sample patients if you already have actual patients saved in your software. Also, be sure to delete the sample patients before going live with LX Event.

To view the patients, click on Patient > Patient Find. You don't have to enter any data to see a full list of patients, so just click on "Search"

when the window appears. Now you will see a list of sample patients. Select a patient by double-clicking on the line, or by clicking on the patient and then pressing "OK" or the Enter key.

You are now looking at the Event screen for this patient, and viewing the first event of the last transmission for that patient.

In Event mode you can save and view strips that have been previously saved for any event. The lower-left-hand-corner of the screen shows you the count for the number of transmissions, events and strips for your patient.

The two buttons in the upper-left-hand-corner of the screen allow you to toggle between the Event and the Transmission screen. The button will be blue when you are on the screen.

The toolbar item labeled Review, lets you just between different screens for the patient. The Summary screen allows you to see all transmissions, events and strips in a list form. Clicking on an event from the Summary screen will take you there.

Go back to the toolbar and click on Patient > Patient Info to see the demographic data for your patient.

The Event Recording Procedure

The event recording procedure typically includes the following steps:

- When a procedure is requested by a medical professional, create a new patient record in LX Event. If the patient already has a record, but it has been ended, you will need to create a new patient record.
- Hook up the patient with a NorthEast Monitoring DR200/Tel-a-heart or another digital event recorder. Provide the patient with instructions that include when to press the record/event button and when to call in order to transmit an event.
- When the patient calls, close any open patient record and start recording the new

transmission.

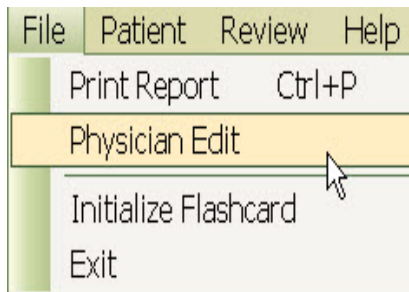
- Find the patient’s open record in LX Event. If no record exists, create one. (Don’t worry if you don’t have all of the detailed information for the patient, you can add it later.)
- Stop recording when the transmission is complete.
- After hanging up with the patient, review events, save strips and create a report.
- If patient calls again and the procedure is still open, you can save a new transmission and create a new report for the patient.
- When the patient returns the event recorder, close the procedure by assigning a Procedure End date and create a final report for the referring physician.

More detailed information about the steps outlined above appears in subsequent chapters in this manual.

Physician Set-up

You may want to create physician files before you start adding patients to LX Event. By setting up physicians, you will be able to more easily enter patients when the time comes.

First go to the Physician Edit Screen which can be found from “File” on the toolbar.

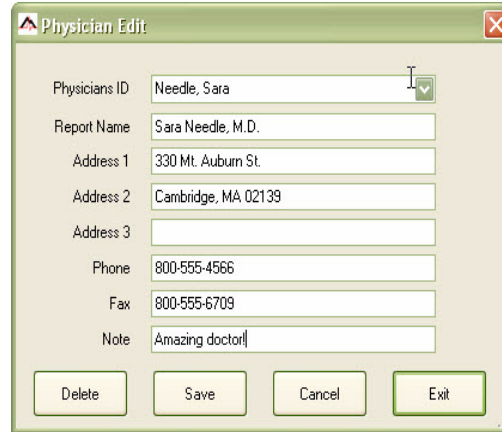


File drop-down menu

When you first open the window there is a drop-down box labeled “Physician ID”. The Physician ID will help you to find the correct physician when entering patients. Because it will not appear on reports, you may want to

enter Last name, First name as the identifier for each physician.

The Report Name on the Physician Edit screen will appear on reports, so that should appear more formal. Above is an example of how your physician record may appear. When entering Physician data on the Patient record the physician’s Report Name and Address information will be carried over to the patient record and will appear on the report.



Physician Edit Screen

Note: The Report Name is the physician’s name that will appear on the reports, so be sure to fill in for every physician.

If you have multiple physicians with the same address, you can easily copy the address information forward by opening a physician you have set up, changing the Physician ID and Report Name to the new physician, and then pressing the Save button. Both physicians will now exist in the file.

On-line Help

In addition to the information in this manual and the on-screen help messages that appear within the LX Event software, help and our current manuals are also available online at our web site - www.nemon.com.

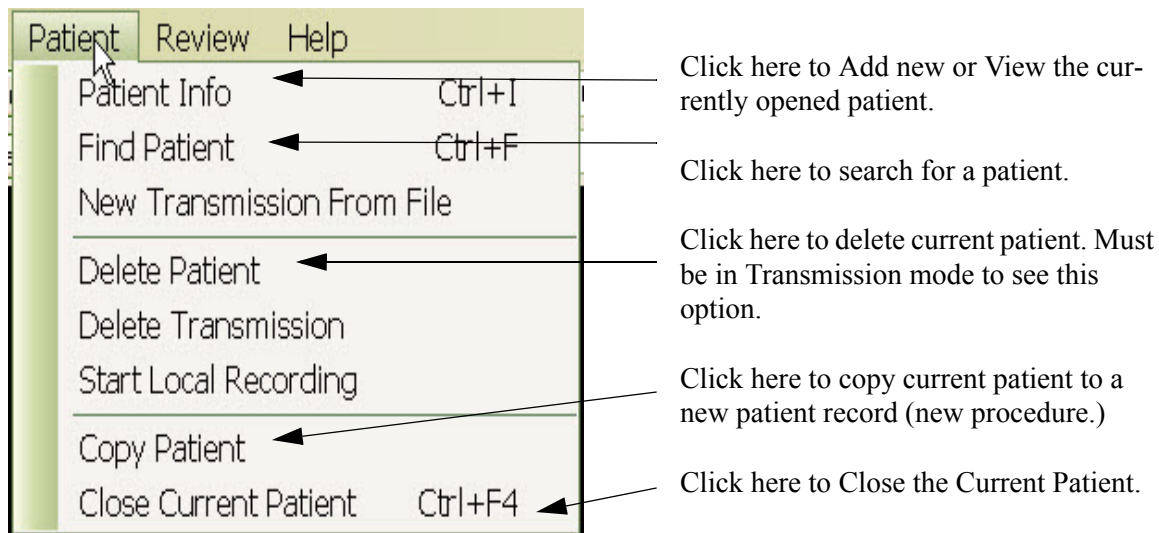
2 PATIENT INFORMATION

The LX Event software allows you to set up patients in advance of a transmission. Each patient record directly links to a single procedure. If a patient has more than one procedure, that patient will have more than one patient record. Old patient records should have a Procedure End Date before a new record is created for the same patient. The Copy feature allows for easy setup of additional procedure records for the same patient.

Add Patient

When the LX Event program first opens, it displays a blank screen with a standard toolbar. To enter a new patient, select **Patient** from the toolbar and choose **Patient Info** from the Patient drop-down menu. You will now see a blank Patient Information screen and will be able to set up a new patient. After saving, this patient will now become the current patient. If the Patient Information screen is not blank and you want to add a new patient, first select Close Current Patient from the drop-down menu.

***Note:** Before you add your first patient, you will probably want to set up your physicians. More information on adding Physician data can be found at the end of the previous chapter.*



Patient Drop-Down

Patient Info

Patient Name: Patrice Suarez

Patient ID: 12345678 Phone: 111-555-3456

Address: 42 Nice St.
Nicetown, MA 01111

Patient Type: Routine Paced: No

Patient DOB: 10/19/1980 Age: 30 Sex: Female

Indications: Dizziness

Medications: Cordarone

Enrolled Date: 10/19/2010 Date Due Back: 11/19/2010

Enrolling Technician: Ellen Recorder ID: 006903

Referring Physician: Chobanian, John
Name: John Chobanian, M.D.
Address: 330 Mt. Auburn St.
Cambridge, MA 02139

Copies To Physician: Hague, Larry
Name: Larry Hague, M.D.
Address: 25 Highland Ave.
Somerville, Ma, 02145

Interpreting Physician: Zooker, Laura

Procedure End Date: 10/19/2010

Edited Reported Verified

Patient Information Window

Patient Information

LX Event only requires a patient to have a name, but it is highly recommended that you enter the Patient Name, DOB, Phone, Recorder ID and Referring Physician at a minimum. That way you will be able to easily find the patient when a transmission is received.

Once you are finished entering a new patient, press **OK** to accept/save or **Cancel** to exit without saving.

Patient Dates

On the Patient Info Screen, the check-box next to the date must be checked for the date to be utilized.

If you know the patient's Date of Birth - **DOB** - you can enter it and the age will automatically be calculated. You can just enter the age if the date of birth is unknown.

The **Enrolled Date** is the start date of the procedure - when the patient is instructed to begin wearing the event recorder.

The **Due Back Date** is the entered when the procedure has started. It is the date that you expect the procedure to end.

The **Procedure End Date** is filled in once the recorder has been returned. Once a procedure has an End Date, you can no longer record to it. You must either remove the End Date or start a new Patient Information record for a new pro-

cedure. You can easily do this by opening the patient and select Copy Patient from the Patient drop-down menu.

Dates - Entering and adjusting

By clicking on the drop-down, you will see a calendar that allows you to easily update the dates. Just click on the component of the date that you want to change and update as required. Alternatively, you can click on any piece of the date to easily edit to what you want.

Indications and Medications

Each field has a drop-down box where you can select one or more entries. You can also edit the field directly and add or modify what you have entered.

The Recorder ID

Enter the SN number that is found on your recorder. For the NorthEast Monitoring DR200, this can be found inside the battery compartment when the battery is removed. For DR200 recordings, the SN is also transmitted with the recording, so this will help you to ensure that you are saving the correct recording to the correct patient when the time comes.

Physician Data

The Referring, Copies to, and Interpreting Physician data will appear on the report. Click on the drop-down box to select a physician that has been set up in the Physician file. Once a physician has been selected, the address information will be automatically populated and you can edit any of the information on the screen, if you like.

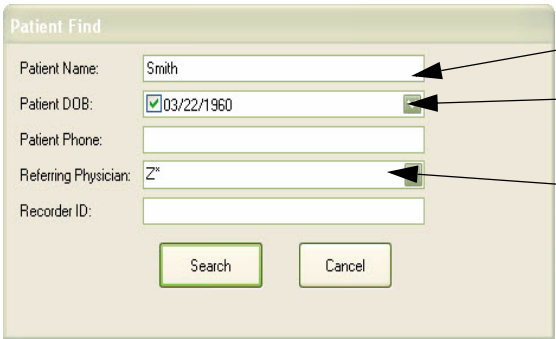
If physician data is inaccurate in the physician file, you should go directly to the physician's record to correct so that it will be correct moving forward. Any changes on the physician file will not automatically update patient records and vice versa.

Be sure that each physician has a Report Name in the physician file, as this is the name that will appear on reports.

More on editing the physician record at the end of the previous chapter.

Status

At the bottom of the Patient Information window, you can update the patient's status by clicking on the Edited, Reported, or Verified buttons. The status fields are also visible and editable from the Report window and can be viewed from the Patient Found List.



Begins with "Smith"

Patient DOB checked to search

Contains the value Z anywhere w/ "*"

Implied "And" - All three conditions need to be met for the patient to be selected.

Patient Find

Find Patient

Select Patient Find from the Patient drop-down menu to:

- find a patient record for a new transmission
- ensure that the patient does not already have an open procedure before adding anew
- find and copy past patient data for a new procedure.

Patient Find Logic

To find your patient, you can enter data in one or more boxes at a time. Use the following logic when searching:

Begins with. The default search logic is "begins with", so you should enter at least the first few characters or numbers of the field to search.

Contains *. If you need to search within a field, you need to enter an asterisk * before the search criteria. For example, if you know the last 4 digits of the phone number is "1234", then you need to enter "*1234" in the Patient Phone field and all phone numbers that contain 1234, will be selected.

Patient DOB. Check the Patient DOB box to search and uncheck to ignore. Use either the

calendar or click on each part of the date to update with the patient's birth date.

Implied "And". If more than one item is entered in the search criteria, it is an implied AND. For Example, if you enter both a Patient Name and Patient DOB, both criteria will need to be met for a patient to be selected.

Found Patient List

After a search (Find Patient), all selected patients are presented in a scrollable list.

If you see the patient you are looking for, you can either select the line and press OK, or double-click on the patient line. You will then be taken to the last transmission for that patient's procedure. Once a patient is selected, you can click on **Patient Info** from the toolbar to see the details for that record. You can edit the information at this time.

If a patient has more than one entry, the Date Enrolled and Procedure End Date will help you to decide which record is appropriate to use. If there are no open procedures - a procedure with no End Date - you may want to select patient and then select **Copy** from the Patient drop-down box. You will now see a new Patient Info record that you can edit as required.

Found Patient List									
Name	Recorder ID	Phone	Referring Physician	DOB	Date Enrolled	Procedure End Date	Edited	Verified	Reported
Gerard Neem		123-555-6756	Dr. Needle	2/15/1922	2/12/2010	1/16/2010	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Juan Taylor		123-555-1234	Altman, Wayne	10/19/1986	2/12/2007	2/12/2007	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Patrice Suarez	006903	111-555-3456	Chobanian, John	10/19/1980	10/19/2010		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sally Fields	123456	123-555-7890	Chobanian, John		2/12/2009	1/16/2009	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Found Patient List

If you do not see the patient on the list, simply cancel out of (or Close the patient that is open) and click on Patient Info. You will now see a blank Patient Information screen for entering the new patient. Click OK when finished and the new patient is now saved in the system.

Delete Patient

When you delete a patient, all patient data, transmissions and events will also be deleted. This should only be done after the data are saved elsewhere or is no longer needed by your organization. The system will ask you to type in the word "YES" to confirm, just to make sure you really want to delete and didn't click the option accidentally.

Note: You must be in Transmission mode to delete a patient or a transmission.

Copy Patient

The Copy Patient function will copy the current patient's data into a new patient record. This should be used when you are opening a new procedure for a patient who has a closed procedure. The copy function does not copy ECG data, just the Patient Info record.

Close Current Patient

If a patient is already open and you would like to enter another, you should first close the current patient. Do this by selecting Close Current Patient from the drop-down box. When you see "No Procedure Loaded" at the top of the

screen, this means that no patient is currently selected. You can now enter a new patient by clicking on Patient Info.

Back-up Patient Data

It is highly recommended that you back-up and save your patient files separately from your computer on a regular basis.

A batch file has been included in your software that allows you to save a copy of the patient event files. This file can be found in c:\nm\Lxevent\patientbackup.bat. This batch file will copy all of your patient files into a zip file on your D: drive. If you wish to backup to a different location, you will need to edit the batch file to point to your desired location.

The directory name that is created is LX_EVENT_PATIENT_BACKUP_999.zip, with 999 being an arbitrarily assigned number. The date of the backup is the Modified Date of the zip file. If you wish to save this file on a CD, you will first need to save it locally and then copy it to the CD.

3 TRANSMISSIONS, EVENTS AND STRIPS

A transmission occurs when a patient calls in after one or more events has been recorded onto the event recorder. When the patient calls, you can begin recording the transmission before or after you have identified the patient in the system. If you cannot find the patient or the patient does not have an open procedure, you can set up new patient information during or after you finish recording the transmission. A patient can have multiple transmissions applied to a single procedure. If a procedure is ended, you will need to create a new record for the patient with a new Enrolled Date.

Note: *Always be sure to Close the current patient before you begin recording a transmission for a different patient.*

Patient Info Record

A patient must have an open Patient Info record - a record with no Procedure End Date - in order to receive a new transmission. If a procedure is end dated and a new transmission has arrived, you can either:

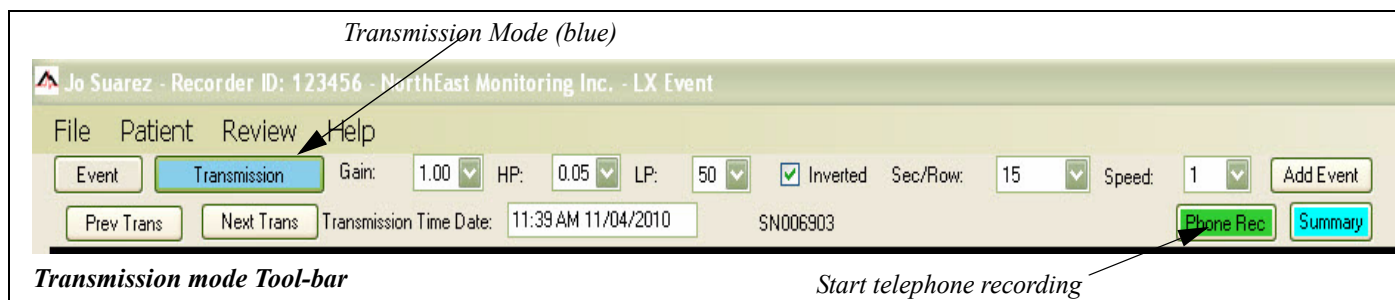
- Open a new Patient Info record for the patient by copying the existing patient information to a new blank record, or
- Remove the **Procedure End Date** from the patient's last record in order to re-open it. (This should only be done if the last procedure should not have been ended.)

Three Ways to Receive a new Transmission

LX Event allows you to record transmissions to an open procedure in three different ways:



1. Telephone,
2. Local recording via microphone, and
3. SD Flashcard when using NorthEast Monitoring's DR200/HE or DR200E/Tel-a-heart.

In all cases, you can select the patient before, during or after the transmission has taken place, a procedure may consist of one or more transmissions and you can continue receiving transmissions for a patient until a Procedure End Date is entered onto the Patient's record.



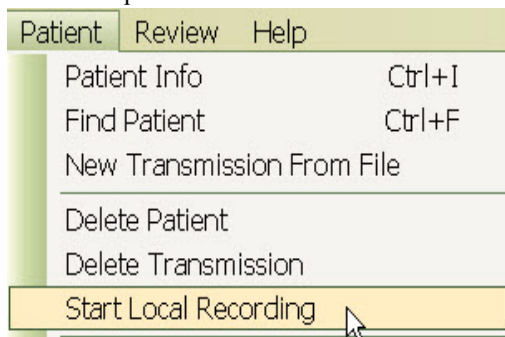
1. Telephone Transmission

You can begin recording a transmission after answering the phone. In order to do this:

- Save any information that is on your desktop that you want to keep
- If another patient is open, go to the toolbar and select **Patient > Close**
- Find and/or enter the new **Patient Information**
- Press the green **Phone Rec** button to begin recording 
- Instruct patient to press Send button on recorder
- The Phone Rec button that was once green is now red and reads Stop Rec.  Once you are finished receiving the transmission, press the red **Stop Rec** button at the top of the screen to stop recording

2. Local Recording

The process for recording on your desktop via a microphone is similar to a telephone transmission, however, you will need choose **Start Local Recording** from the Transmission mode Patient drop-down box.

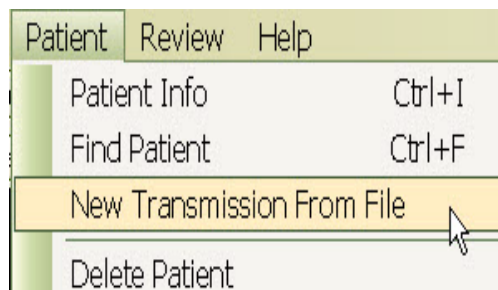


3. SD flashcard Recording

If you are using a NorthEast Monitoring DR200/HE or Tel-a-heart for Event monitoring, you have an additional feature of saving event data onto an SD flashcard and then loading the ECG recordings directly onto the computer.

Once events are saved on an SD flashcard, you should follow the same steps as above, however you will need to:

- Insert SD flashcard into card reader supplied with LX Event software.
- Start the upload process by choosing **New Transmission From File** from the Patient drop-down box.



If no card is found, you will see the message, “No event.dat file found”. This means that LX Event cannot find the file. Make sure that the card reader is plugged in and the flashcard is inserted into the reader properly. If this is not the issue, sometimes removing the card reader’s USB plug from the computer and inserting it into a new location solves the problem.

Note: *The first time you try this you may get a screen that asks you if you want to Quit or Continue as it cannot find the*

file. Keep pressing Continue until you find the card and then you should not see this screen again.

For more information on saving DR200/Tel-a-heart event data on an SD flashcard, refer to Appendix A - Saving Events on SD Flashcard.

Transmission Screen

Transmission Colors

When the transmission is recording onto LX Event, the ECG signal is white. Once the transmission is finished and you press the Stop Rec button, the transmission may now appear in two colors:

- White - identified as being part of an event.
- Yellow - not identified as being part of an event.

After recording stops, LX Event goes into Event mode and the first event will appear on the screen. If LX Event was unable to identify unique events, the entire transmission will be identified as a single event. To review the entire transmission, you will need to click the Transmission button to return to Transmission mode.

Transmission vs. Event mode

The main screen will be in one of two modes at all times - Transmission or Event. You can tell what mode you are in as the corresponding button will be blue in the upper left-hand corner of the screen.

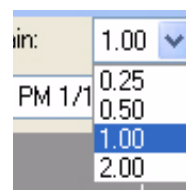
In **Transmission mode**, you can view all transmissions for a given patient/procedure, record a new transmission for the patient, and delete and/or add events to an existing transmission. You can also delete the Patient or transmission that you currently have opened.

In **Event mode**, you can review each event that was created either automatically or manually for the selected transmission, by scrolling through the events. You can also review and/or create strips for the events in event mode. You can also delete events and strips.

Review the Transmission

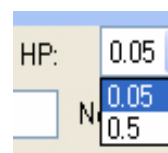
Once you finish receiving a transmission, you may want to adjust filters and settings. You should do this prior to saving any strips for the transmission. Whether you are in Transmission or Event mode, all filter and setting changes will be applied to the entire transmission.

Gain



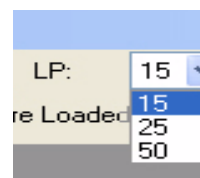
To change the amplitude of the displayed signal, click on the Gain field and select a different size from the list.

High Pass Filter



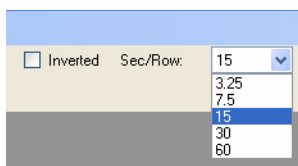
To adjust the High Pass filter, click on the drop-down box labeled **HP**. This filter will allow you to reduce baseline wander.

Low Pass Filter



To adjust the Low Pass filter, click on the drop-down box labeled **LP**. This filter will allow you to reduce muscle noise and electrical artifact.

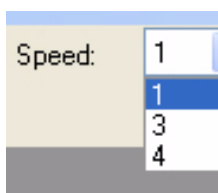
Invert ECG and Sec/Row:



To invert the ECG signal, check or uncheck the **Inverted** box.

To adjust the amount of time in each row of the ECG, click on the drop-down box labeled **Sec/Row** and choose the amount of seconds in each row.

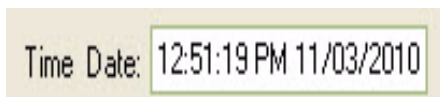
Speed



To set the Transmission Speed, click on the drop-down box next to the field and select the speed that is on the recorder. If a DR200/Tel-a-heart recorder was used, the

speed may be set for you and therefore cannot be overridden.

Transmission Time Date



To update the time and date of the transmission, click within the field and edit as desired. Press the **TAB** key when you are finished and the changes will be saved. You may want to do this if the actual transmission time was different from when it was recorded in LX Event.

Previous/Next Transmissions

While in Transmission mode, you can view previous transmissions for the patient by clicking on the **Previous** and **Next** buttons on the upper-right side of the screen.

You can also tell how many transmissions exist for a patient by looking in the lower left-hand side of the screen for the transmission.

R-Wave Markers and HR

The LX Event software attempts to label each R-wave with a red dot and then calculates the HR based on the RR-intervals. The HR calculation has a limit of 180 HR.

Re-import a Transmission

Immediately after recording a transmission, you can re-import it. This feature should be used if you accidentally recorded a transmission to the wrong patient or the patient did not exist in the system while recording. First, identify and open or create the patient to whom the transmission should apply. Second, go to **Help > Utilities > Re-import Last Saved Transmission**. Respond **“Yes”** and the transmission will be saved for current patient. After re-importing, be sure to delete the same transmission from the patient record where it did not belong.

Delete a Transmission

You can delete the transmission that is currently on the screen by selecting Delete Transmission from the Patient drop-down box while in Transmission mode. You can delete any transmission at any time, but you can only re-import the last received transmission.

Event Mode -
Event button is blue

Event Time and Date. Can be edited by updating and pressing Tab.

Strip that is currently in edit bar below denoted by red bull's-eye

Strip Edit Bar - for marking, measuring and labeling strips for reports

Event-mode Screen

Event Screen

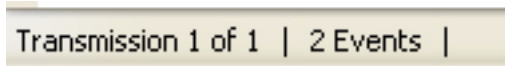
A transmission is composed of one or more events. An event is when the patient experienced a cardiac symptom and either pressed the button or the event was sensed automatically.

LX Event attempts to identify events as the transmission is being recorded onto the desktop. For DR200 recordings, the event may also be saved with the time/date of the event and type of the event - Manual, AF_Event, Brady, Tachy, Pause or with an entry that the patient selected. This will not occur, however, if the signal is too weak, the signal has too much phone line or microphone noise, or you are not using a North-East Monitoring event recorder

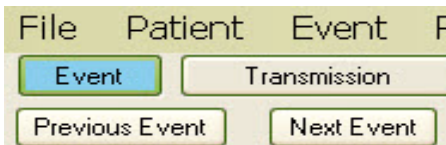
View Events

If events have been identified by LX Event, you will be able to tell as a portion or all of the ECG is white (included in event) and by the tally at

the bottom left-hand side of the screen. In this example, you can see that there are two events for this transmission:



You can now toggle between each event that was identified during the transmission by clicking on the Event button on the top-left of the screen.



Add Events

If a transmission is received with multiple events, but the system has not identified them all, you can identify the events manually. In order to do this, you must first be in Transmission mode. If you are not in Transmission mode,

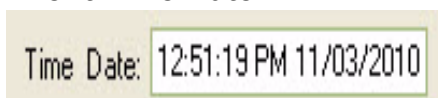
click the **Transmission** button and it will turn blue. You may want to increase the Sec/Row value at the top of the screen so that you are able to see the entire transmission while determining where events begin and end.

First, click on the **Add Event** button on the top-right of the screen and then carefully click on the ECG at the beginning and then at the end of the new event. The event will turn white. Continue to do this until all events are identified, and then click on the **Event** button to begin identifying strips.

If you make an error adding an event, you can easily delete it by going into Event mode, viewing the incorrect Event, and then pressing **Delete Event** from the Event drop-down.

You will not be able to add an event if one already exists on that piece of the ECG. If an event has been previously identified incorrectly, you will need first delete it and then add the new event.

Event Time Date



If you have created an event or LX Event was not able to determine the time or date of the event, you can update them if you like. To update the time and date of the event, click within the field and edit as desired. Press the TAB key when you are finished and the changes will be saved.

Event Type

If your recording was saved using NorthEast Monitoring's DR200, the event type that was saved during the recording will appear here. If the event was recorded automatically by the recorder, you will see either Tachy, Brady, AF_Event or Pause. If the patient had pressed the button in order to record an event, then either

Manual, Skipped Beat, Short of Breath, Rapid Heart, Chest Pressure, Dizziness, or Chest Pain will appear, depending on what your patient had chosen at the time of the event.

Diary Symptoms

If your patient kept a diary, you may want to enter any symptoms they were experiencing or what they were doing at the time of the Event. You can either select from the drop-down box or add one of your own.

Delete Events

You may want to delete events if they are not actually events or you want to create a new event. In order to delete an event, you must be in Event mode on the event that you want to delete. When you delete an event, you are not deleting the ECG from the transmission, just removing its designation as an event. When you delete an event, however, any strips associated with the event no longer exist, and you will need to recreate them, if desired.

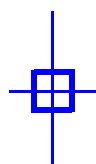


Cursor Buttons

The screenshot shows the 'Cursor Buttons' interface. At the top, there are buttons for 'Default Cursors', 'P', 'I', 'Q', 'R1', 'S', 'ST', 'T', 'R2', 'X', 'Y', and 'Delete Cursor'. Below these are input fields for PR: 0.16 s, QRS: 0.08 s, QT: 0.40 s, ST: 1.50 mm, HR: 60, Strip Label: Strip # 2, and XY: . Below that are buttons for 'Previous Strip', 'Next Strip', and 'Save Strip', along with 'Strip Time Date: 12:15:31 PM 11/03/2010', 'Number of Segments: 1', and 'Showing Strip 1 of 1 - Strip Not Yet Saved'. The main area is a grid with an ECG strip. Labels 'Strip Buttons', 'Strip Time/Date', and 'Segments' are positioned above the grid. The grid shows a green ECG trace with several vertical cursors (P, I, Q, R1, S, ST, T, R2) and horizontal lines indicating measurements. At the bottom of the grid, there are blue and red bull's-eye markers. Below the grid, it says 'Transmission 2 of 2 | Event 1 of 8 | Strip 1 of 1'.

Strip at the bottom of the Event Screen

Saving Strips



In Event mode, click on the ECG to identify strips. The blue bull's-eye shows where strips have already been saved. A red bull's-eye appears when the corresponding strip appears at the bottom of the screen.

Once the strip appears on the bottom of the screen, you can place cursors, label and save the strip. Use the Previous and Next Strip buttons to switch between and view or edit saved strips.

Note: *Be sure to save any strips before you move to another event and/or strip.*

Cursors

The **Default Cursors** button at the top-left of the strip allows you to place all of the cursors at once in a location determined by LX Event. After pressing Default Cursors, you can move any of the single cursors by pressing the button for that cursor and then clicking on the screen where you want it to go.

Apply single cursors by first clicking on the appropriate cursor button. LX Event will then place the cursor in the default location, and you are able to move it by clicking elsewhere on the screen. Once the cursor is where you want it, select another button to continue.

In order to remove a cursor, click on the button and then click on the **Delete Cursor** button. If you want to remove all cursors, the easiest way to do this is to not save the strip and just click on the transmission again. This way you can start over easily.

Strip Measurements

The second row of boxes shows the resulting measurements from cursor placement:

PR: Time difference between Q and P.

QRS: Time difference between S and Q.

QT: Time difference between Q and T.

ST: The vertical difference between the values of the I and ST cursors.

HR: The heart rate is calculated based on R1 and R2 being 2 RR intervals apart.

XY: X and Y allow you to measure between any two points on a strip. They are for screen use only and will not appear on the strip when reporting.

Strip Time Date

Strip time and date is derived from the time of the actual event. You cannot change the time or date at the strip level. If you need to adjust the time or date, do so at the event level.

Number of Segments

You can extend the length of a strip by increasing the number of segments. This will allow more of the strip to appear on the report. Use the up/down arrows to increase or decrease the number of segments before you save the strip.

Save Strip

Once you assign all of the cursors, you can enter a **Strip Label** and save the strip by pressing the **Save Strip** button.

Edit Strip

To select a previously saved strip, either click on the bull's-eye of the strip or use the **Previous** and **Next Strip** buttons till the strip you want to edit appears on the bottom of the screen. Once the strip appears, you can edit it and save the changes by pressing the **Save Strip** button.

Note: If a strip needs to be extensively edited, you may want to delete it and then start over.

Delete Strip

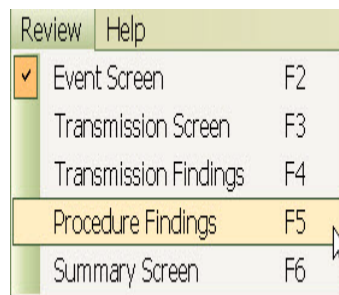
To delete a strip, select the strip so that it appears at the bottom of the screen and click on **Event > Delete Strip**.

Event No.	Date/Time	Event Type	Diary Symptom	Strips
1	07/20/2016 2:30:29 PM	Tachy	Driving	
2	07/20/2016 2:34:14 PM	AF_Event	Sitting	
3	07/20/2016 2:35:38 PM	Pause	Sitting	
4	07/20/2016 2:37:39 PM	Tachy	Up/Down stairs	
5	07/20/2016 2:39:19 PM	Brady		BRADYCARDIA
6	07/20/2016 2:41:25 PM	AF_Event	Chest pressure	
7	07/20/2016 2:42:56 PM	Pause	Skipped beat	PAUSE
8	07/20/2016 3:08:17 PM	AF_Event		SINUS ARRHYTH.
9	07/20/2016 3:09:45 PM	Pause		PAUSE
10	07/20/2016 3:11:49 PM	Tachy	Standing	TACHYCARDIA
11	07/20/2016 3:13:30 PM	Brady	Standing	
12	07/20/2016 3:15:42 PM	AF_Event		
13	07/20/2016 3:17:12 PM	Pause		

Summary Screen

Reviewing

The Review drop-down menu allows you to quickly jump from one screen to another. Get to it by clicking on



Review on the toolbar. Go to the appropriate screen by either clicking on it or by selecting the appropriate function key.

Findings

The Transmission and Procedure Findings screens are accessible via the Review toolbar or the appropriate function key. On these screens, you are able to enter up to 12 lines of text that will appear on the reports. The Procedure Findings that you enter here will apply to all transmissions that exist for this procedure.

Summary Screen

The Summary Screen allows you to see a list of all transmissions, events and strips in one location. After a transmission has been saved, go to the Summary Screen by pressing the Summary button on the Patient Info or Main screen or by pressing F6. Once you are on the screen, click on the Transmission box to see how many transmissions a patient has. Select the one you want to review. Double-click on any populated field to be taken directly to the event and/or strip you have chosen.

Note: *The name on the summary screen may not be accurate. We apologize for any confusion this causes.*

Note: *Since only one strip can be listed for each event, an asterisk will appear next to the strip label, to denote that more than one strip exists.*

Note: *Because new data is not completely saved until you close a patient, the Summary Screen may appear out of sync while you are saving new strips. If this occurs, just close and reopen the patient, and all Saved Strips will appear on the Summary Screen.*

4 REPORTING

LX Event has three reports for the user to choose from:

- 1) Transmission Report for a single transmission which includes all saved strips and an optional full disclosure, and
- 2) Procedure Report that includes all transmissions for a procedure. It also includes all saved strips and has an optional full disclosure.
- 3) A Summary Report that includes a list with counts of transmissions, events and strips, along with findings. Strips and full disclosure do not appear on this report.

Reports can be produced any time after strips are saved. The Transmission and Procedure reports consist of the following:

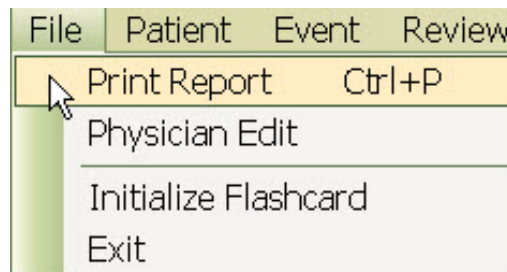
- **Header page** - Company, Patient, Physician and Transmission or Procedure information. This page has a section for you to document findings for the report.
- **Saved strips** - Saved strips with cursors, labels and measurements. Strips will appear in time/date order.
- **Full Disclosure** - if selected. Full disclosure will show the entire ECG for either the transmission or procedure that was recorded in LX Event.

You should enter Transmission and/or Procedure Findings before creating a report. The findings will appear on the first page of the report. The Transmission findings will appear on both types of reports.

Create Report

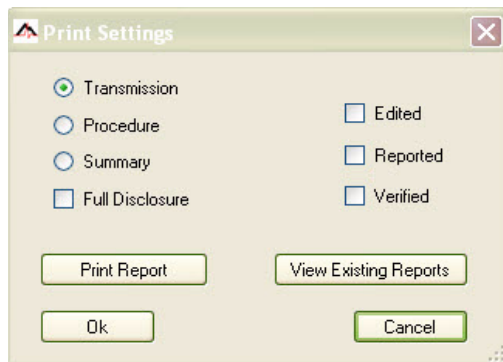
In order to create a report:

- Find and open the patient and procedure or transmission you want to report on, then
- Go to File on the tool bar and click on Print Report.



File drop-down

- Next you will see the Print Settings window.



Print Settings window

- Click the appropriate button to select either a Transmission, Procedure or Summary Report.
- For the Transmission or Procedure report, choose Full Disclosure, if desired,
- Click Print Report when you are ready to print.
- Click Cancel if you do not want to create a report at this time.

Transmission Report

The Transmission report will include information from the transmission that you currently have open. It will include patient demographic data, Transmission Findings, all saved strips and full disclosure, if you choose it.

Procedure Report

The Procedure report includes a Transmission report for each transmissions for the current patient, plus an additional header page that includes the Procedure Findings and counts for the procedure.

Summary Report

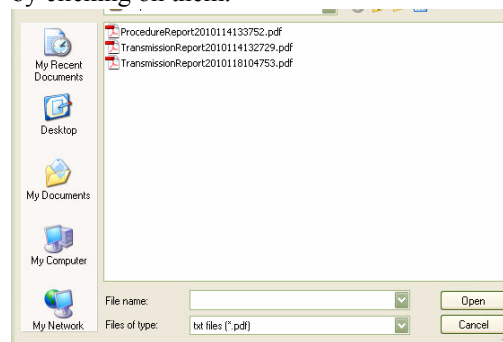
The Summary report will not include any strips or ECG data, instead it will include the Findings for the procedure and a list of all transmissions including event and strip labels.

Statuses

From the Print Settings Window you can also update the Status of the current patient by checking off Edited, Reported or Verified and clicking OK or Print Report. The status also appears on the Found Patient List and the Patient Information Screen, where you can also edit it.

View Existing Reports

All reports that you created previously have been saved in a directory for each patient. When you click on View Existing Reports, you will be taken to the directory for the current patient. You can then view the existing reports by clicking on them.



View Existing Reports

Delete Reports

If you create a new version of report and want to delete an older version, you can do it from this window also. You can also copy and paste reports from this folder to another. You should never change the directory name or path, however, as the system will not know where to look for the reports moving forward.

Customizing Reports

Two files in the Programs Directory can be updated so that your reports can include your company's logo, name and address.

Report Logo

You can include your organizations's logo on the report. Do this by saving a jpg file of your company logo in `c:/nm/Lxevent/PrintSpec` with the name `logo.jpg`.

Report Name and Address

Your organization's name and address and/or phone can also be added to the report. In order to do this, you will need to edit a file that comes with LX Event with the information that should appear with the report. The file is limited to five lines of text.

You should edit the file with Notepad only. Notepad can be found under All Programs-> Accessories. The file you need to edit is

`c:/nm/Lxevent/ServiceAddressHeader.ini`.

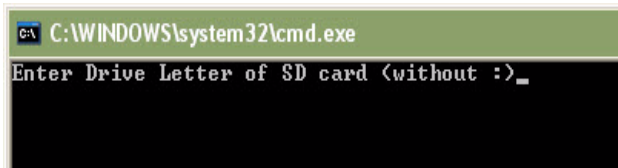
If for some reason you do not want to your organization's name to appear at the top of the report, you should save the file, but it should be an empty file with all blank lines.

Appendix A: Saving Events on SD Flashcard

Initialize flashcard

If you are using a DR200 recorder for event recording, you can use an SD flashcard to save your recording more easily. By using a flashcard, you will get cleaner data and will not have to record the events via the telephone or microphone.

In order to save data on the flashcard for the first time, it will have to be formatted with an empty event.dat file. Do this by placing the flashcard in your memory card reader and clicking on Initialize Flashcard from the File drop-down menu. A screen will appear and you will need to enter the driver letter where your flashcard is located and press Enter.



Initialize Flashcard

Once the flashcard is formatted with an event.dat file, follow the instructions below, and all recorded events will automatically be loaded onto the flashcard. You do not have to initialize the flashcard again.

For more information on the SD flashcard and other ways to transmit event data, go to Chapter 3 - Transmissions.

Saving Events on SD flashcard

To record the events from a DR200/Tel-a-heart recorder onto a pre-formatted SD flashcard, refer to the following steps:

1. Remove the battery cover from the back of the recorder. The battery compartment and the flashcard slot are now exposed.

2. With the recorder front facing up and away from you, insert the flashcard into the slot. The flashcard should have the connector contacts down and toward the recorder as you gently push it in. If the flashcard pops out slightly when you push it in, try again. Pushing gently on the flashcard both inserts it and allows you to remove it.

Note: *The flashcard should slide in easily. Make sure you do not force the flashcard in; if you force the flashcard in upside-down, it can damage the connector inside the recorder.*

3. Re-insert the battery into the recorder, being sure to orient it as indicated in the diagram inside the compartment.
4. A message on the LCD screen will now appear - "COPYING EVENTS." When all of the events are copied to the flashcard, you will see the message "FINISHED REMOVE CARD." To remove the flashcard, **gently press down** onto the flashcard and it should pop out easily.

Note: *Do not pull on the flashcard or it may damage the recorder. Gently pressing down on the flashcard should cause it to pop out and be removed easily.*

5. You should now insert the flashcard into your reader and save the data on your computer using the LX Event software.

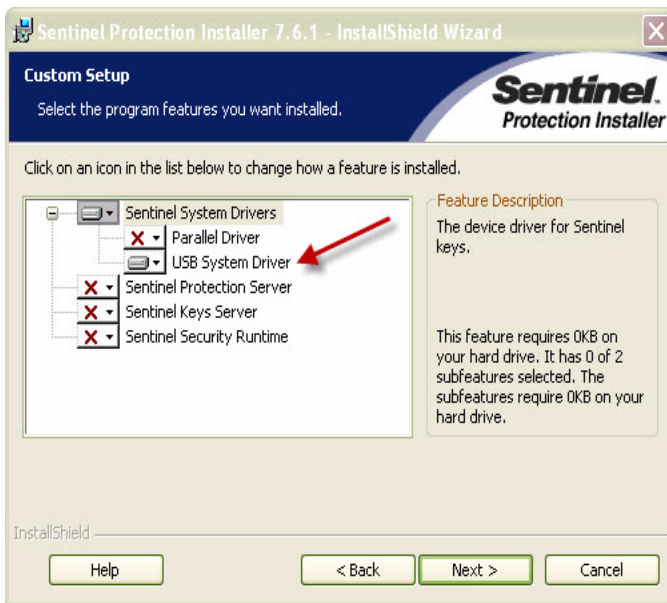
Note: *If you use the flashcard again before saving on your computer, the data will be lost.*

6. Once the events are saved on your computer, re-insert the battery into the DR200/Tel-a-heart and you should see the word "Sent" on the screen above the Event tally. You should now erase the events from the recorder by pressing either green arrow for 3 seconds.

Appendix B: Software Troubleshooting

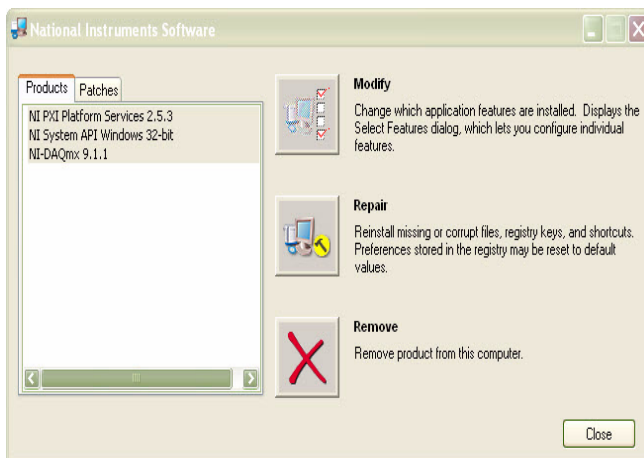
Sentinel Protection install

If you get an error installing the Sentinel software, you will need to do a Custom install. When given the option, select only the “USB System Driver” option, turning all other options off.



National Instruments uninstall

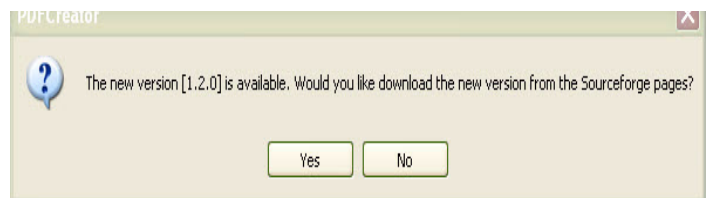
You may want to uninstall the previous version of the National Instruments software before



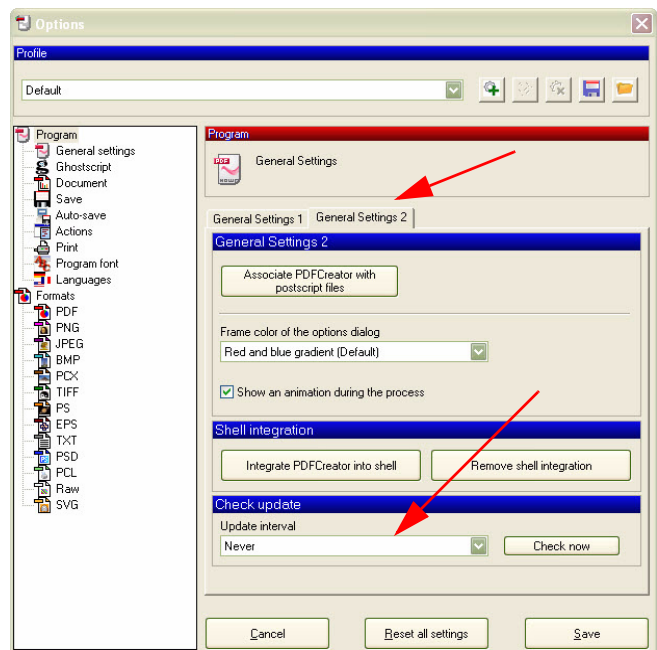
loading the new. If you choose to do this, be sure to select all of the options on the left by highlighting them before you click “Remove” This is not always necessary, but sometimes is required.

PDF Creator Version Control

We highly recommend that you not update PDF Creator software and always use version 1.0.0.2 that is included with your LX Event software. So if you see this message, be sure to respond with “No”.



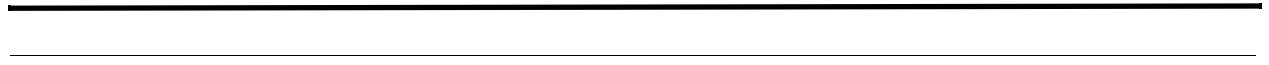
You can choose to turn off the check for updates function, but doing the following. Go to Start > All Programs > NorthEast Monitoring Inc > LX Event > PDF Creator > PDF Creator. From the toolbar select Printer > Options > go to General Settings2, and update the “Update Interval” to read “Never”. Be sure to Save so you don’t have to do this again!



Appendix C: Anomalies

The following anomalies were identified in the 2.09 release. These findings are not clinically significant. Some of the anomalies will be corrected in a future release:

1. Report Strips - Markers on inverted strips need to invert with the strip. Currently they do not.
2. Strip screen - Markers on inverted strips need to invert with the strip. Currently they do not.
3. Strip Screen - Sometimes the strip labels are hard to select from the list.
4. Summary screen does not always update in a timely manner. If you close the patient and then reopen, all items should then be present.
5. Summary Screen Patient Name - sometimes the patient name on the summary screen reflects that of another patient, although the data will be that of the current patient. If you close the patient and reopen, this may fix the problem. This will be corrected in the next release.
6. Naming of Transmission reports with FD do not include the transmission number.



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