LX Event Software Operator's Manual

for use with NorthEast Monitoring's DR200/HE and DR300 and other cardia looping event recorders

Software Version 2.11C

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NorthEast Monitoring is an FDA Registered Facility, number 1224919,
that follows all FDA CGMP Manufacturing Practices.

The LX Event software has been developed by NorthEast Monitoring, Inc.

The LX Event software has FDA 510(k) Market Approval Number K070014.

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

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1 INTRODUCTION

Welcome to NorthEast Monitoring's LX Event Recorder Software. With this software, you can receive and record 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.

System Requirements

The LX Event software can be used with NorthEast Monitoring's DR200/HE or DR300 recorder, or with any event recorder that uses direct FM modulation. To run the LX Event software, your personal computer should include:

1. Microsoft Windows 7 or Windows 10 Operating System
2. processor with a speed of 1 GHz or faster
3. at least 1 GB of working memory
4. monitor with a resolution of at least 1280 x 1024
5. disk drive of at least 10 GB
6. standard analog (POTS) phone line for receiving telephonic transmissions
7. 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.

User Specifications

The LX Event Software is designed to be used by a trained operator under the supervision of a licensed clinician for the purpose of evaluating the ECG captured as part of an automatic or manually saved recording event.

Software & Performance Specifications:

Display capability:

1. Display ECG data as a full transmission
2. Display ECG data as individual events when recorded by a NorthEast Monitoring recorder
3. Sequentially display both channels of a two channel recording.
4. Label recordings made from the NorthEast Monitoring recorders with time, date and event type.
5. Display in a full disclosure in a scale of from 0.25 to 4x normal with from 3.75 to 60 seconds of data per line of the display.
6. Measure PR, QRS, QT, ST, and HR values using cursors which can be positioned on the ECG data.

Recorder capability:

1. Data from NorthEast Monitoring DR200/HE & DR300 recorders can be displayed with all time, date and event labels.
2. Data from non-NorthEast Monitoring recorders can be displayed as unlabeled ECG if they transmit their data using a FM Acoustic system with a 1.9 KHz carrier.
3. Maximum recording length: Recorder limited.
4. Data transmission methods:
   4.1. Acoustic FM with 1.9 KHz carrier by phone (POTS line) or local microphone.
   4.2. SD card from NorthEast Monitoring Recorders
   4.3. Remote transmission via LX Remote website
   4.4. Wirelessly using the DR300 Wireless feature

Intended Use

The LX Event Software is a data management program intended to be used with DR200/HE and DR300 and/or an equivalent recorder for diagnostic evaluation of transient symptoms such as dizziness, palpitations, syncope and chest pain. The system provides single lead or multiple lead ECG morphology, which may be used to visualize arrhythmias, ST segment changes, SVT, heart block, re-entrant phenomena, and p-waves. The system may be used with pacemaker patients to assess pacemaker activity. The LX Event Software is to be used only on the order of a physician.

Indications For Use

The LX Event Software is intended to be used with the DR200/HE and the DR300 recorders. The DR200/HE and DR300 module is a patient activated device designed to record and for diagnostic evaluation of transient symptoms (such as dizziness, palpitations, syncope, and chest pain). Once data is recorded, the data is transmitted via telephone for evaluation. The device includes the auto detect feature which can be used as a looping event recorder to capture events automatically or when activated by the patient. When one or more events are captured the patient may transmit his/her recordings transtelephonically.

Updating LX Event

See the readme.txt file included with the install files for important information and guidance in updating from previous versions of LX Event.

This version of the software requires a HASP software key and a new license.ini file. Contact NorthEast Monitoring or your representative for more information.

HASP Software Key

Once installed, the HASPFinder software found under "NorthEast Monitoring" on the All Programs list, will look up and show you where the HASP software key for LX Event can be found. The HASP software key must be plugged into your computer, or a visible network, and a license.ini file must exist for the LX Event software to run.

For network applications, you will need to install Safenet's Sentinel Runtime software on your server. The install file, HASPUserSetup, can be found under Utilities on the installation disk

New Installations

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 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 -> LX Event.

You must first have a HASP software key plugged in and an installed license file for LX Event to run.

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 demonstrating the system. With the LX Event software closed, double-click on the Sample_Patients executable found on the installation disk under "Utilities". 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. Also, if you go to the toolbar and click Patient > Patient Info, you will see the demographic data for your 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 jump 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 date/time of an event from the Summary screen will take you there.

Physician Set-up

You may want to create physician files before you start adding patients to LX Event. By setting up physicians, you will 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.
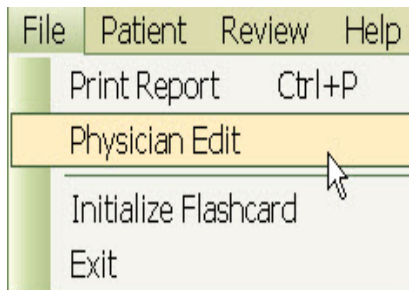
File drop-down menu

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. 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

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.

Telephone Interface Unit

The Telephone Interface Unit (TIU) is an optional piece of equipment that you can use to record event transmissions via the telephone or a local microphone. In order to use the TIU, the National Instrument Software, provided with the LX Event install files, must be first installed on your computer. See readme.txt for more information on installing the TIU.

Technical Support

In addition to the information in this manual, more information and help is available at our web site: www.nemon.com or

- Toll Free USA: 866-346-5837 option 1
- Phone: [+1] 978-461-3992 option 1
- Fax: [+1] 978-461-5991
- e-mail: support@nemon.com

The "Technical Support" page on the web-site includes Frequently Asked Questions.

The current version of this manual and our software can always be found on our web-site on the "Downloads & Documents" page.
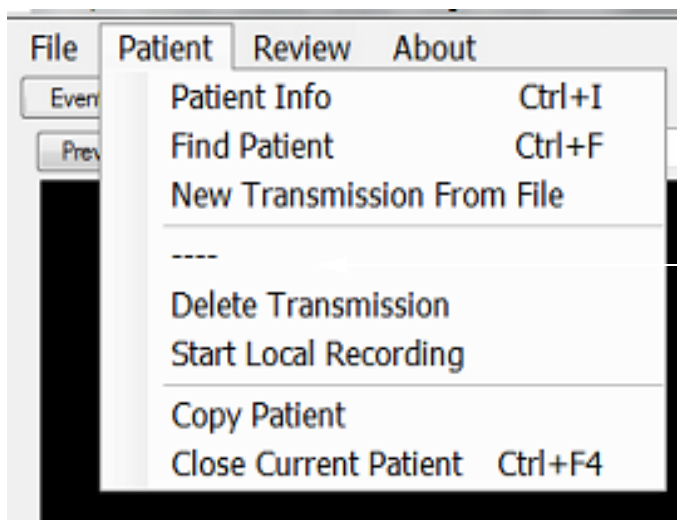
2 PATIENT INFORMATION

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 Closed 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.

These all can be seen from the Tranmission Screen:

Patient Info allows you to update the current or create a new patient.

Find Patient to search for a patient

New Transmission from file allows you to save a transmission via SD card to the currently open patient.

Delete Transmission to delete the Transmision that you currently have open. Use this very carefully.

Start Local Recording via microphone.

Copy Patient - create a new patient from currently open patient.

Close Current Patient to close the window for currently open patient.

Patient Drop-Down from Transmission Screen

Patient Information Window

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 calcu- lated. 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.

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 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.

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 Closed Date** is filled in once the recorder has been returned. Once a proce- dure has Closed Date, you can no longer record to it. You must either remove the Closed Date or start a new Patient Information record for a new procedure. You can easily do this by open- ing 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

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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/HE or DR300, this can be found inside the battery compartment when the battery is removed. For DR200/HE or DR300 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.

If the Recorder ID is already being used in an Open Procedure, you will not be able to enter the Recorder ID without closing the first procedure.

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.

Procedure Closed date and Technician

The Procedure Closed date should be entered after the procedure is finished and before the recorder is given to a new patient. Once a procedure is closed, you will not be able to assign any more transmissions to the Procedure.

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 visible 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 Closed Date will help you to decide which record is appropriate to use. If there are no open procedures - a procedure with no Closed 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.

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

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	☑	☑	☑
Juan Taylor		123-555-1234	Altman, Wayne	10/19/1986	2/12/2007	2/12/2007	☑	☑	☑
Patrice Suarez	006903	111-555-3456	Chobanian, John	10/19/1980	10/19/2010		☐	☐	☐
Sally Fields	123456	123-555-7890	Chobanian, John		2/12/2009	1/16/2009	☑	☑	☑

Found Patient List

the new patient. Click OK when finished and the new patient is now saved in the system.

If a patient name is preceded by an asterisk *, this means that the patient is already opened by you or another user and cannot be opened again at this time.

Deleting Patients

For this release, Patient Delete has been disabled. For the short-term, users should just close the Procedure if they choose to no longer have a patient Active.

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 Patient

If a patient is already open and you would like to enter another, you should first close the current patient. Do this by clicking on the Close Patient button or 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 is a recording with one or more events. When a patient calls with events, 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

Each patient must have an open Patient Info record - a record with no Procedure Closed Date - in order to receive a new transmission. If a procedure is closed 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 Closed 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 closed.)

Five Ways to Receive a new Transmission

LX Event allows you to record and/or save transmissions to an open procedure in six different ways. A Telephone Interface Unit (TIU) is required for the first two.

1. Telephone
2. Local recording via microphone
3. SD Flashcard with DR200/HE or DR300 recorder
4. Remote transmission via LX Remote with DR200/HE or DR300 recorder
5. Wirelessly using a DR300 recorder

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 Closed Date is entered onto the Patient's record.

Transmission Mode (blue)

Transmission mode Tool-bar　　　　　　　　　*Start telephone recording*

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.
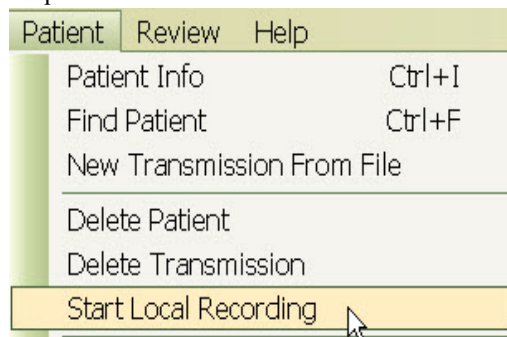
3. SD flashcard Recording

If you are using a NorthEast Monitoring DR200/HE or DR300 recorder 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.

Initialize SD flashcard. In order to save data on the flashcard, the card must first be formatted with an event.dat file. Do this by placing the flashcard in your PC card reader and click 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.

Once the flashcard is formatted with an event.dat file, remove the battery from the recorder, insert the card into the recorder, reinsert the battery and you will see that the events are being copies and when it is finished.

Next, insert the 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.
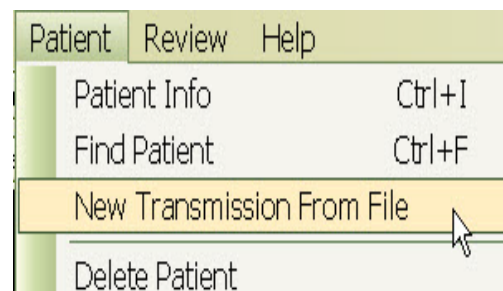
If no card is found, you will see the message, "No event.dat file found". This means that LX Event cannot find the file. Make sure that the card reader

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.

4. Remote Transmissions

You will able to receive event files from other locations when you set up a Remote account with NorthEast Monitoring's LX Remote web-site. The sender of the event files only needs a DR200/HE or DR300 recorder and does not need to have LX Event installed on their computer to send the event.dat files.

For more information on this topic, see Chapter 5 - Remote Transmissions.

5. Wireless

The DR300 recorder also has the capability to send files via the cellphone network using a Gateway. In order to receive these files you must have NorthEast Monitoring's Wireless software installed on at least one desktop.

Information on how to set up and receive transmissions wirelessly can be found in the DR300 manual.

Once wireless transmissions are received, they can be viewed and saved using the LX Remote feature of the LX Event software.
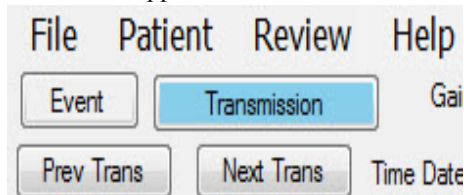
Transmission Screen

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.


Transmission-mode selected

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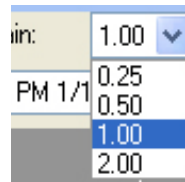
To change the amplitude of the displayed signal, click on the Gain field and select a different size from the list.

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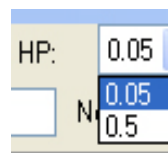
To adjust the High Pass filter, click on the drop-down box labeled **HP**. This filter will allow you to reduce baseline wander.

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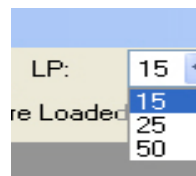
To adjust the Low Pass filter, click on the drop-down box labeled **LP**. This filter will allow you to reduce muscle noise and electrical artifact.

Invert ECG and Sec/Row:
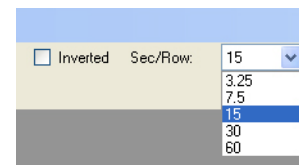
To invert the ECG signal, check or uncheck the **Inverted** box.

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

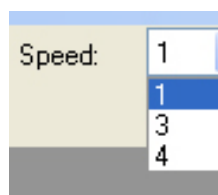To set the Transmission Speed, click on the drop-down box next to the field and select the speed that is on the recorder.
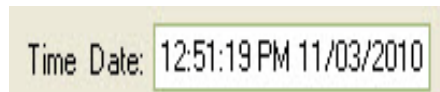
If a DR200/HE or DR300 recorder was used, the speed may be set for you and therefore cannot be overridden.

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.

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.

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.

Re-import a Transmission

Immediately after recording a transmission, you can re-import it. This feature should be used if you accidently 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
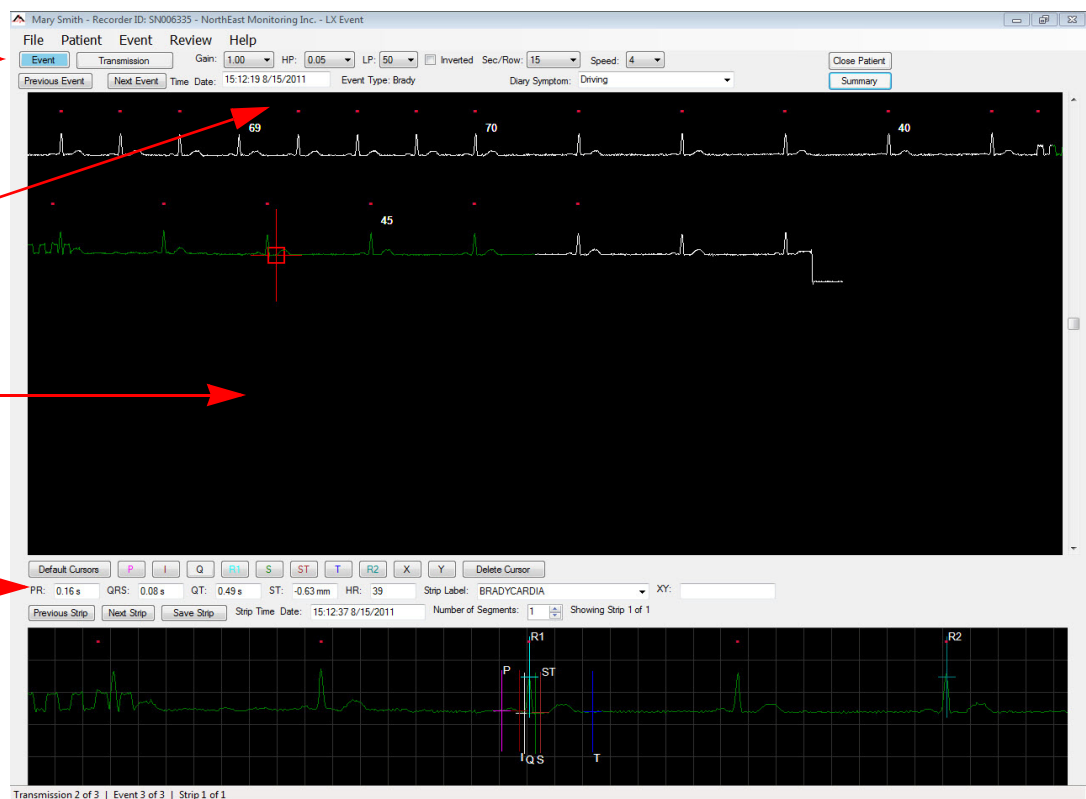
Event-mode Screen

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/ HE and DR300 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 NorthEast 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.
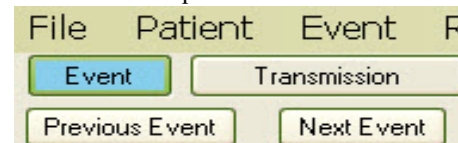
Note: If you get to the end of one Transmission and click on Previous or Next Event, LX Event will take you to the previous or next transmission.

Event Time Date

Time Date: 12:51:19 PM 11/03/2010

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 a NorthEast Monitoring's DR200/HE or DR300 recorder, 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.

Channels

If a recording was done in 2-channel, you will see a CH2 above the Diary Symptom. Otherwise that field will also show CH1.

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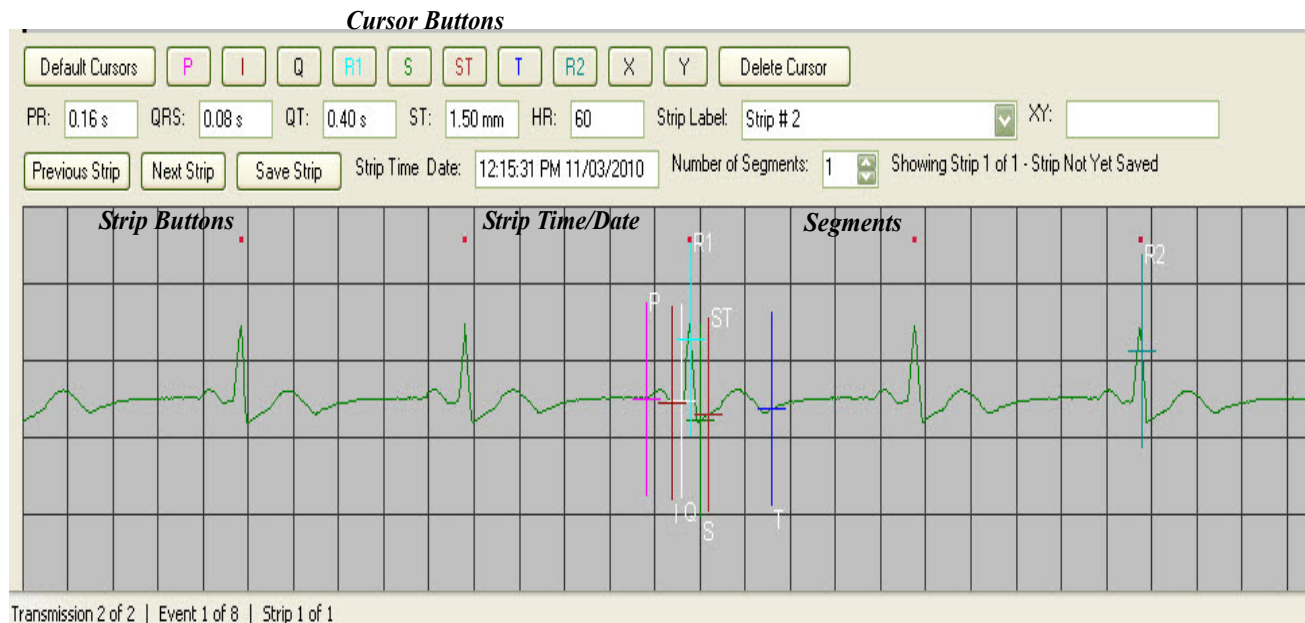
You will not be able to add an event if one already exists on that piece of the ECG. If an event has been previously identified incorrectly, you will need first delete it and then add the new event.

Note: For any recording in which you have to create or "Add Event"s, for example, acoustic recordings from Non-northeast recorders, the summary reports cannot be produced. Instead, the Procedure and Transmission reports should be used.

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.

Event	Review	Help	
	Delete Event		Ctrl+E
	Delete Strip		Ctrl+S

Cursor Buttons

Strip Buttons   ***Strip Time/Date***   ***Segments***

Strip at the bottom of the Event Screen

Saving Strips
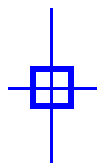
In Event mode, click on the ECG to identify strips. The blue bull's-eye shows where strips have already been saved. A red bull's-eye appears when the corresponding strip appears at the bottom of the screen. Once the strip appears on the bottom of the screen, you can place cursors, label and save the strip.   Use the Previous and Next Strip buttons to switch between and view or edit saved strips.

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 the 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. For screen use only and will not appear on the strip when reporting.

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.

Notes

Once a strip is saved, a gray Notes button will appear. Notes entered here will not be printed on any reports. When Notes exist for a strip, the button will appear blue.

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. 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**.

Save Events as Strips

If you would like an entire event to be saved as strips, use the Save Event as Strips button. Enter the Strip Label first, and that label will be applied to all of the strips. You can then go back and edit each strip if desired.

Review on toolbar

The Review drop-down menu on the toolbar allows you to quickly jump from one screen to another. Go to the appropriate screen by either clicking on it or by selecting the appropriate function key.

Review	Help	
✓	Event Screen	F2
	Transmission Screen	F3
	Transmission Findings	F4
	Procedure Findings	F5
	Summary Screen	F6

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. On the Transmission Findings screen, you can denote whether a Transmission has been Edited and/or Reported. These items will also appear on the Summary Screen depicted below.

Summary Screen

The Summary Screen allows you to see all of the patient's transmissions, events and strips in one location. After at least one transmission has been recorded, go to the Summary Screen by pressing the Summary button on the Patient Find screen, on the main screen, or by pressing F6. Once you are on the Summary Screen, double-click on the appropriate line to be taken directly to the exact event and/or strip you have chosen.

| E	P	Transmission	Event	Date/Time	Event Type	Diary Symptom	Strips	HR
☑	☑	1	1	2/7/2017 12:54:14	Chest Pain	Lying down	Strip 1	75
☑	☑	1	2	2/7/2017 12:55:09	Brady	Short of breath		0
☐	☐	2	1	4/14/2017 14:35:37	Tachy		TACHYCARDIA	138
☐	☐	2	2	4/14/2017 14:35:37	Tachy			
☐	☐	2	3	4/14/2017 14:37:14	Brady	Sitting	Brady	39
☐	☐	2	4	4/14/2017 14:37:14	Brady			
☐	☐	2	5	4/14/2017 14:39:28	AF_Event	Up/Down stairs	A. FIB.	0
☐	☐	2	6	4/14/2017 14:39:28	AF_Event			
☐	☐	2	7	4/14/2017 14:40:55	Pause	Went to bed	PAUSE	0
☐	☐	2	8	4/14/2017 14:40:55	Pause			
☐	☐	2	9	4/14/2017 14:42:58	Tachy			

4 REPORTING

LX Event has four 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 procedure level 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.

4) A Summary with Strips Report that consists of a Summary Report, above, and all strips for the procedure.

To Create a Report

Reports can be produced or reviewed at any time. In order to create a report:

1. Find and open the patient and procedure or transmission you want to create the report for.
2. Save strips and enter findings for transmission and/or procedure.
3. Go to File on the tool bar and click on Print Report,
4. Next you will see the Print Settings window.
5. Click the appropriate button to select either a Transmission, Procedure, Summary or Summary with Strips report.
6. Choose Full Disclosure, if desired.
7. Click Print Report when you are ready to create the report.
8. An Adobe window will now appear with your report. The report will also be saved in the patient file for reviewing and printing later, if you choose.
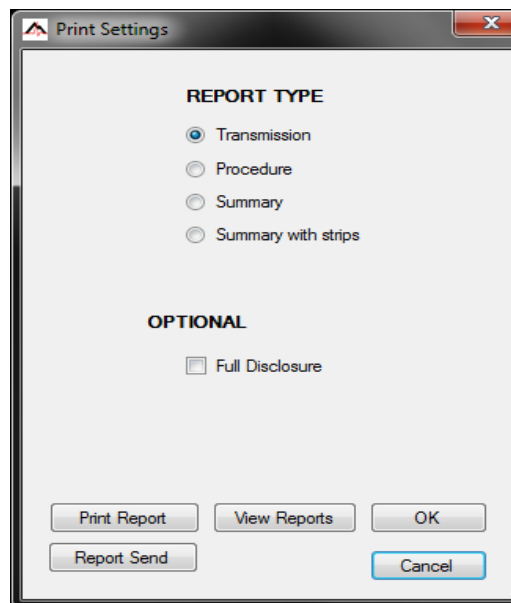
*Note: For any recording in which you have to create or "Add Event"s, for example, acoustic recordings from Non-northeast recorders, the summary reports cannot be produced. Instead, the Procedure and Transmission reports should be used.*

Print Settings window

To 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 that includes all reports that were ever created for the current patient. Transmission Reports will be labeled with the number of the transmission that is reported. If full disclosure is chosen, FD will appear in the name of the report.You can view any of the existing reports by clicking on them.
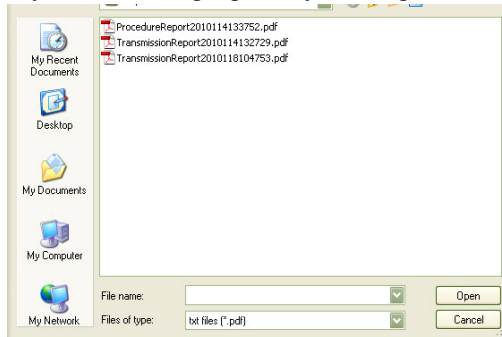
View Existing Reports

Report Send

To copy and save a report in another location and/or to send a report via LX Remote, use the Report Send button to save an existing report in a location of your choice. For LX Remote, you should place the report in a directory labeled specifically for the user that you want to send the report to. See Chapter 5 - LX Remote for more information.

To 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.

Admin Export option

An executable, decodeevendatabase.exe, has been provided with your install. This file enables you to create a complete download of the administrative information for all transmissions in the system. The output is a csv file in c:\nm\reports which can be read as is or pulled into Excel. This file is for administrative use only.

5 REMOTE TRANSMISSIONS

You will be able to receive DR200/HE and DR300 event files from other locations when you set up a Remote account with NorthEast Monitoring LX Remote software. The sender of the event files only needs a DR200/HE or DR300 recorder and does not need to have LX Event installed on their computer to send the event.dat files.

In order to set up a Remote account for you and your remote locations, contact your channel partner or NorthEast Monitoring. Complete setup instructions and more information can be found by reviewing the LX Remote manual on our web-site.

LX Remote

NorthEast's Automated Remote Process (NARP)

NorthEast's Automated Remote Process (NARP), must be running on your computer or a computer/server in your facility that you have access to. The NARP will do the following:

1. Go to the web-site, download and decrypt event.dat files that are uploaded by your customers.
2. Delete the files from the web-site once you load them into your LX Event patient data base.
3. Upload reports back to the web-site for delivery to your customers.

Technical Set up for LX Remote to work with LX Event

You will need to turn on the LX Event Remote feature by updating the LX event.ini file that is found in the c:\nm\lxevent directory, or wherever the software was loaded onto your system. The items in the LX event.ini file that are used to process Remote files are listed below with their default locations. The first time it is run, the NARP process creates a narp.ini in c:\nm\narp and the first three pointers need to point to the same locations. You will need to close, update the ini files, and restart the applications in order for the updated pointers to work.

"NARP_Running" in LX Event.ini must be set to "true" for the Remote screen to be accessible in LX Event.

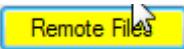| Notes	lxevent.ini	narp.ini
Should be changed to "true" if NARP is running	[NARP_Running]= true	
Where the downloaded event.dat files are saved	[RemoteEventDataDirectory]= "c:\nm\ftp\Event\"	DownloadDirectory = c:\nm\ftp (NARP creates "Event" directory automatically)
Where the reports should be placed	[RemoteEventReportDirectory]= "c:\nm\reports\"	UploadDirectory = c:\nm\reports

Patient Information for matching

The system will automatically identify patients for remote records coming in, if you input the Serial number from the DR200/HE or DR300 recorder into the Recorder ID on the Patient Information window. The Serial number can be found in the recorder inside the battery compartment.

Recorder ID: 006903

In order for matching to work correctly, only one patient at a time can have an open procedure with the same recorder ID. To close a procedure, you must assign a Procedure Closed Date on the patient's record where they no longer have a recorder. After a procedure is closed, you can continue to report on it, you just cannot save any additional transmissions for that procedure.

Remote button

If LX Event has been set up to show Remote files, you will see a button on the top right of the screen.

Remote Files - A yellow button tells you that Remote files are available to be assigned.

No Files - A green button tells you that there are no files to assign at this time.

Remote Window

When you click on the Remote button, you will open the Remote window. On the window you will see a list of current Remote or Wireless files.

The first set of columns, reflects the data from the incoming file:

- Date/Time - when the file was downloaded
- Remote User - the customer who sent the file to you
- Name - patient name on incoming file
- DOB- Patient date of birth
- Physician - the patient's physician
- Recorder SN from the file

For Wireless DR300 files, only the Recorder SN comes through on the files and the Remote User and Name are set to "DR300 Holter" and "event", respectively

The Remote window will automatically match an incoming event file with a currently existing patient in LX Event using Recorder SN and open procedures only. When matched, the next

Date/Time	Remote User	Name	DOB	Physician	Recorder SN	LX Name	LX DOB	LX Physician
17-Aug-2016 12:42:39	remote2	Both 15072			15072			
13-Apr-2017 15:53:07	DR300 Holter	event			20738	Marcus Lewis	1/19/1935	Richard Lee, MD
13-Apr-2017 15:01:57	DR300 Holter	event			20738	Marcus Lewis	1/19/1935	Richard Lee, MD
13-Apr-2017 15:27:24	DR300 Holter	event			20738	Marcus Lewis	1/19/1935	Richard Lee, MD
16-Aug-2016 14:14:30	Remote site	Mary L. Smith	12/13/1956		21027	Mary Smith	12/13/1956	First Doc

Assign   Delete   Exit

Remote window

three columns will be populated with LX Event patient information:

• LX Name - patient name
• LX DOB - patient date of birth
• LX Physician

These columns are populated to allow you to be sure that the files have matched to the patient you expect.

The Assign button

Click on one or more Remote transmissions and then the Assign button to copy the transmission(s) to a Patient in LX Event.

Once the Assign button is pressed, LX Event will ask if you want to assign the file to the patient identified, answer "Yes" if so, but answer "No" if you would like to find the patient yourself. However, if a remote file does
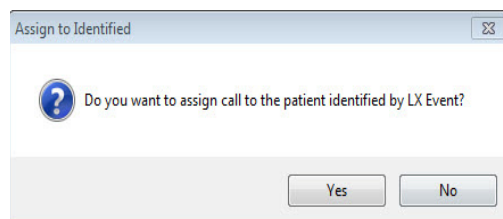
not match to a patient, you will probably want to check the patient files first to ensure that you have an open procedure for that recorder SN. If the procedure has been closed, you will need to reopen it in order to assign a transmission.

The Delete button

Once a record is assigned, it will automatically be deleted from the window, so you may never need to use this button. Use this button carefully, if at all.

DR300 Wireless Transmissions

The DR300 recorder is able to transmit recordings wirelessly using Bluetooth and the cell phone network. The Remote screen allows you to retrieve your wireless transmissions, whether you are using the Remote feature or not. If you are also using the Remote feature, many of the directories that you are pointing to, must be the same for wireless.

The Socket program that comes with the DR300 recorders must be running to receive the wireless records. Similar to the remote setup discussed earlier in this chapter, the pointers in both lxevent.ini and wireless.ini must be set up in order for the wireless records to be received. See table below.

Please refer to the DR300 Recorder and the DR300 Gateway and Socket Manuals for instructions on running the Wireless feature on the recorder and running the Socket program. Both manuals can be found at www.nemon.comon the Downloads & Documents page.

Notes	lxevent.ini	wireless.ini
Should be changed to "true" if Wireless is running	[Wireless_Running]= true	
Where the downloaded event.dat files are saved. Must be the same as narp.ini if Remote is running.	[RemoteEventDataDirectory]= "c:\nm\ftp\Event\"	event_destination_path = c:\nm\ftp\Event\ (narp creates "Event" directory automatically)

6 KNOWN SOFTWARE ISSUES

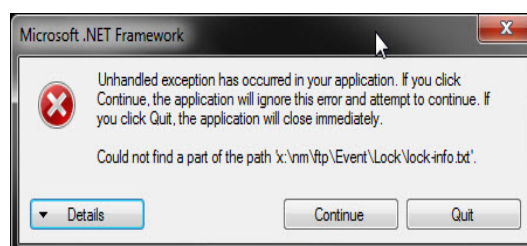The following is a list of issues that have been identified in this version of the software:

Bug #	Description
1210	On the remote screen, for remote files, the physician from the remote file does not appear on the screen
1212	Delete patient does not work in this release
1213	The automatic link between LX Event and HE/LX Analysis for Both mode recording does not work in this release. It will work in the next release of HE/LX Analysis.
1214	If two users are assigning Remote files at the same time, sometimes the network is slow in closing one file and deleting the Lock file. When this occurs, the second user will see the following error message. If this ever occurs, the user should just click Continue and try again. as this error will result in no changes to the patient data or remote files.

Bug #	Description
1215	For any recording in which you have to create or "Add Event"s, for example, acoustic recordings from Non-northeast recorders, the summary reports cannot be produced. Instead, the Procedure and Transmission reports should be used.