Gateway - FTP
Technical Manual

for use with NorthEast Monitoring's Wireless Recorders

4G Gateway & Event Decoder utility Version 1.0

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1. Introduction to Wireless Event

The NorthEast Monitoring patch-style DR400 recorders come with a Wireless feature that uses Bluetooth technology to communicate with a paired device. For event transmission, the communication occurs between the recorder and a paired NorthEast Monitoring Gateway (black box). Wireless transmission is initiated when the DR400 is in Event recording mode and there is event data to transmit.

For event recording, the patient takes home a paired Gateway and places it in a location in the home where a 4G signal is detected and the patient is often nearby. Once an event is recorded, the DR400 will attempt to locate the Gateway to transmit the event.

If the patient is away from the Gateway for an extended period of time, the recorder will continue to try to transmit at regular intervals. Once the patient is back in close proximity to the Gateway, and a transmission is successful, all events in memory will be sent at that time starting with the oldest.

During a successful wireless transmission, encrypted event data is sent via the airways through a cell phone signal to an FTP site identified on the recorder. When an event file is successfully received at the FTP site, the DR400 reads the file back, checks it, confirm it for accuracy and will delete the event(s) from its memory.

Once on the FTP site, the Event Decoder utility downloads the event file to a local temporary location and deletes the file from the FTP site. The Event Decoder will then decrypt each file and place it in a designated location for LX Event. Once the data is received, you are able to access this data via the Incoming Files screen in the LX Event utility.

2. The Gateway Transceiver

After being paired with a recorder, the Gateway is sent home with the patient for automatic wireless transmitting to the receiving location.

The Gateway Kit includes:

- Gateway (part number NEMP00458)
- Antenna (NEMP00451)
- AC Adapter (NEMP00453)

As per FCC rules section 2.1091, only the antenna supplied is to be used and that the antenna must be in a location where it will be at least 20 CM (8 inches) from locations where any person will commonly be located.

Gateway Specifications

- Voltage: 90-264 volts
- Frequency: 47 to 63 Hz.
- Maximum current: 0.31A.
- Weight: 300 gms.
- Dimensions:
  Gateway: 83 x 133 x 38 mm
  Power adapter: 34 x 72 x 59 mm
- Operating temperature: 0 to 40 C

FCC Class B digital device notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: - Reorient or relocate the receiving antenna. - Increase the separation between the equipment and receiver. - Connect the equipment into

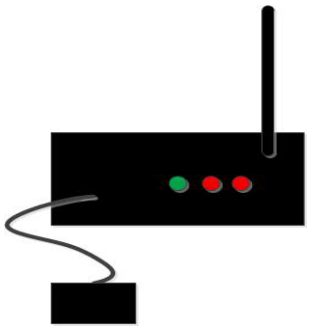
an outlet on a circuit different from that to which the receiver is connected. - Consult the dealer or an experienced radio/TV technician for help

This device complies with Part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The Gateway

The Gateway is a transceiver (transmitter + receiver) that communicates with the wireless recorder. The Gateway sends the encrypted data via a wireless phone network to the receiving location. Both the recorder and the Gateway are able to transmit and receive data to ensure that encrypted data arrives at its desired location.

The Gateway comes with a power cord and antenna that need to be attached into the front of the Gateway. The antenna should be in an upright position. When located in the patient's home, the Gateway should be located in a central location. If the patient is away from the Gateway for an extended period of time, like going to work, the transmission will take place when they return.



The Gateway has three lights. The third light (right-most), is the wireless connection indicator. When initially plugged in, this light will flash red at a very high rate. After that, if the light is blinking between 3 to 4 times in a row, there is an acceptable wireless connection. If it only blinks two times in a row, there is a questionable connection with the cellular network, and the Gateway should be moved to a better connection. If the light only does a single blink, there is no connection at all to the wireless network.

The middle light is the recorder indicator. It will turn red when the recorder is communicating with the Gateway. This may occur when pairing the recorder with the Gateway or when ECG data is being transmitted.

The green light on the left, indicates that your Gateway is getting a reply from the receiving station. This will flash very quickly when communicating externally.

Data Security

For Wireless transmission via the Gateway, data is encrypted using symmetric 256-bit encryption key on the recorder and is sent in data block. One or more blocks can be sent at a time. Once the data is received via the Event Decoder, the encryption key will be used to decrypt the data into a readable format. The Key ID is visible on the both the recorder and the Event Decoder. The two Key IDs must match in order for files to be transferred and decryption to take place.

3. Pairing DR400 with Gateway

For DR400 recorders to transmit event data, the DR400 must first be paired with a Gateway. The DR400 can only be paired with one Gateway at a time.

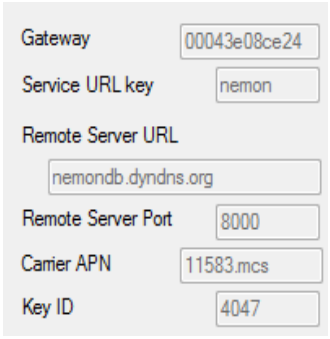
In order to pair with a Gateway, your organization must obtain a URL-KEY.dat file from NorthEast Monitoring and the URL_KEY file must be placed in the directory where the PCPatch utility exists.

The Pair Gateway button will be enabled only if the URL-KEY file exists in bin or Remote directory where the PCPatch.exe file is running.

Once the DR400 is plugged into the PC, pair as follows:

1. Plug in the Gateway and allow it to find the wireless signal
2. Start the PCPatch utility
3. Go to the Settings screen and click on Pair Gateway.
4. When successful, you should see “Pairing Complete” and the Gateway number and URL-KEY file information will now appear on the Settings screen.

Once paired with a Gateway, the wireless settings that are programmed into your site’s URL-KEY, are visible on the PCPatch utility Settings screen.



All of these settings must match the settings in the FTP receiving location in order for wireless transmission to take place.

- Service URL key - Your unique identifier
- Remote Server URL- FTP Server’s fixed IP-address or domain name.
- Remote Server Port - defaults to 21 or whatever is required
- Carrier APN
- KEY ID - The receiving center identifier, which is an ID for the actual unique 256-bit encryption key for files sent via the Gateway/FTP.

If your URLKEYdat is incorrect or you do not have a URLKEYdat file, contact NorthEast Monitoring or your distributor for assistance.

4. Receiving Events via FTP

System Requirements

The computer at the Service/institute where the events are to be received, must have the following minimal capabilities:

- Windows 10 Operating System;
- Eight (8) GB of RAM memory;
- Twenty (20) GB of available disk storage;
- Broadband Internet connection
- Access to Port 21
- FTP server capability - Internal or commercially hosted FTP site

The Event Decoder Utility

The Event Decoder utility must be installed on the local PC. The Event Decoder will download the event files from the FTP site, decrypt them using your unique URL-key, and will place them into the Incoming Files folder for LX Event to retrieve.

Setting up Event Decoder Utility

Contact Northeast Monitoring Support to get a copy of the Event Decoder utility. Install the utility on a PC where the LX Event software resides. By default, the Event Decoder will create and be installed in the C:\nm\eventpgm directory.

The installer will put a shortcut in the startup list so it will start on booting the computer. It assumes that xx\ftp\event is the location where the "incoming files" go and that the program will be in xx\eventpgm. Further one has to put the urlkey.dat file in xx\eventpgm. xx\ is by default c:\nm\

Note: You must put a copy of your url-key file into the directory with the Event Decoder Utility in order for it to run

WinSCP - FTP client

The Event Decoder installer will also load WinSCP onto your PC. This utility will be called by the Decoder Utility to download the files from the FTP site.

FTP user name and password

Once the url-key file is in the directory, run eventcode with the argument “user password” to identify your FTP site’s logon credentials. You will then need to use these to set up the FTP site that you will be using to transmit event.

To do this, open the Command prompt, go to c:\nm\evenpgm and run:

```
c:\nm\eventpgm>eventdecode user password
```

Your response will look something like this:

```
 NorthEast Monitoring EventDecode version 1.00 Jul 12 2021
service url: ABCDE
urlkey Key ID 1234
ftp server ftp.ftpnemon.com port 21
user ufr2xrnd@ftpabcde.com
password AfRSD9eZ
```

The user name that you use to access your FTP site may will incorporate the user identified by the decoder utility. They may not be the same exact string.

5. Set up and test the Process

Before your first event procedure, you will want to test to ensure that everything is working correctly.

Set up the system as follows:

1. Get a URL-key from NorthEast Monitoring.
2. Determine your password and user name
3. Set up your FTP site using the user name and password supplied by Event Decoder.
4. Install the PCPatch and place the URL-key in its directory. The default location is c:\nm\bin.
5. Install LX Event. The default location is c:\nm|bin.
6. Install the Event Decoder (and WinSCP) and place the URL-key in its directory. The default location is c:\nm\eventpgm. Do not run the Decoder at this time.

Test a DR400 to ensure it is working:

1. Use the PCPatch to erase the DR400, pair the DR400 with a Gateway, change the DR400 recording mode to Event and enter a new patient ID.
2. Start the DR400 via the PCPatch and remove it from the docking station. When the DR400 begins to flash green, it is starting to record.
3. Plug the paired Gateway into a location where the right-most light is flashing 2 or more at a time.
4. Record an event on the DR400 by pressing the button
5. After the event has finished recording, hold the button down on the DR400 until it starts to flash orange very quickly (about 10 seconds). It is now transmitting to the Gateway. You should be able to observe other lights on the Gateway while it communicates with the DR400.

   If the Gateway does not respond with flashing lights, your Gateway and DR400 are either not paired or your DR400 is not recording in Event mode.
6. Login to your FTP site and look for the event files. There will be 2 files for each event. One files ends in “dat” and the other “cmd”.

   If you do not see the files, try transmitting again. If the second time does not work, there may be a problem with the way your FTP site is set up or your login information.
7. If the files are on the FTP site, you should now run the Event Decoder to download the files to your local system. You may need to refresh your FTP site view to see if the files are deleted after being downloaded.
8. After a few minutes, the Event Decoder should have decrypted and moved a single event file to the LX Event folder. Open the LX Event utility and go to the Incoming Files window to view the file.

   If you do not see a file in the Incoming Files window, Go to c:\nm\ftp\event to see the event file is there. If it is there, the LX Event may be looking for incoming files in a different location.

7. Instructions for the Patient

An abbreviated version of these instructions has been included on the label on the top of the Gateway.

1. The Gateway should be placed in a location that the patient will be near (within 10 meters) frequently.
2. The Gateway's power adapter should be plugged into the Gateway, and plugged into an outlet which has power all the time (is not controlled by a wall switch)
3. The Gateway's antenna should be in an upright position.
4. The Gateway has three lights. The third light (rightmost), is the wireless connection indicator. Once plugged in, this light will flash red.The more the better, but if the light is blinking between 2 to 4 times in a row, there is an acceptable wireless connection. If the light only does a single blink, there is no connection at all to the wireless network.

The recorder and Gateway will automatically transmit any new, previously un-transmitted data when the two are in sufficiently close proximity.

9. Event Wireless Process Flow-chart