



NemaMetrix

# NemAcquire Software User Guide

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## Computer Requirements

1. Windows 10 64-bit OS or Mac OS X 10.11
2. Bluetooth (2.1EDR)

## Installation

1. Download the NemAcquire software installation file to your computer. You can find this at the following website: <http://www.nemamatrix.com/downloads/> For Windows this will be an .msi file. For Mac OS X this will be a .dmg file.
2. Double-click on the file and follow the on-screen directions to complete installation.
3. For Mac Users:

After opening the downloaded .dmg file, a new Finder window with the NemaAcquire icon will open. Do not double-click this icon to run the program. Instead, drag the icon to either your desktop or to your Applications folder. This will install the program. To run the program, double-click on the new NemaAcquire icon.

## Quick Start

1. Setup the screen chip system according to the quick assembly guide.
2. Turn on the amplifier. Ensure that your computer has Bluetooth enabled. Pair with the amplifier through the OS settings.
3. Open the NemAcquire software by double-clicking on the Desktop shortcut.
3. In the NemAcquire main window press the "Connect" button.
4. In the new dialog, select the amplifier that you paired with in Step 2.
5. NemAcquire will connect to the device you select and start displaying the signal on the Waveform Display, as well as attributes about the waveform.
6. Use the 'Record' button in the upper-right Button Panel to start recording data to a file.
7. Select the 'Stop Recording' button in the Button Panel to complete the recording.

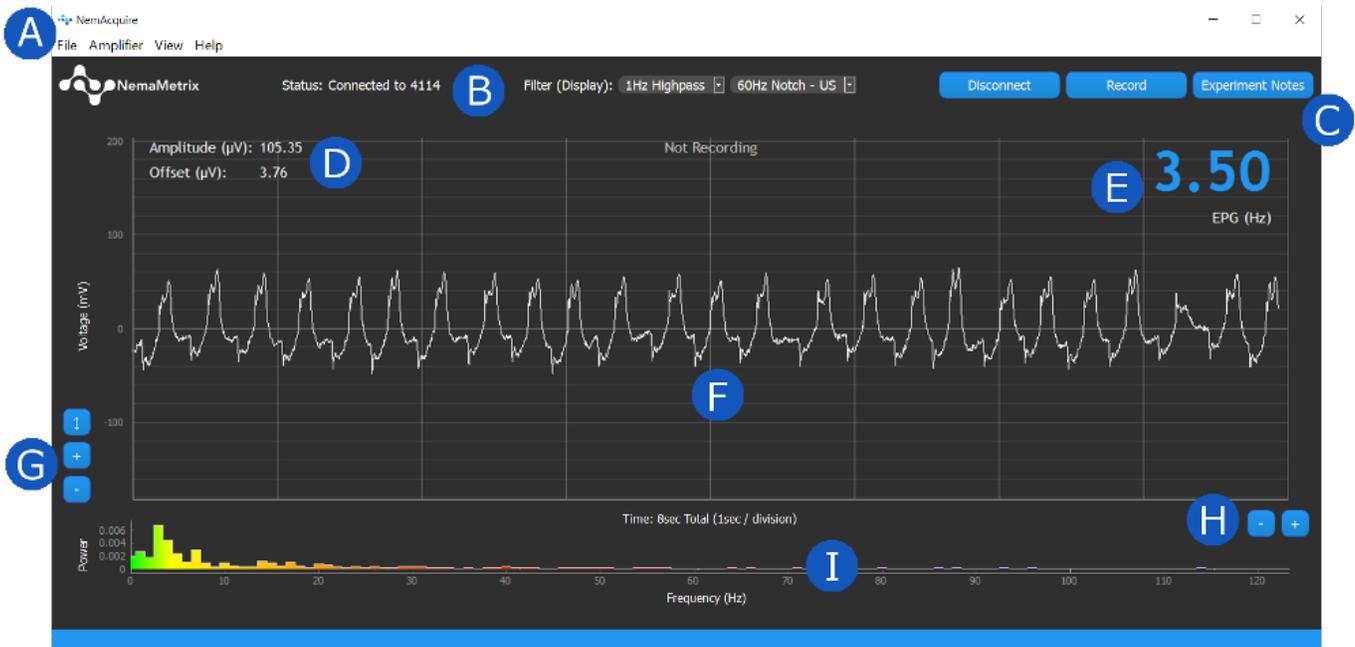


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- An Experiment Notes dialog is shown once the recording is finished and this allows the user to customize special information that is then packaged with the recording for future reference.
- In order to finalize the file with the added notes, select 'Save' in the bottom left corner of the Experiment Notes Dialog.
- Congratulations! You have now recorded and saved your first ScreenChip file!



## Reference Guide

### I. Main Features

A: Main Menu

B: Status and Filter Panel

C: Button Panel

D: Waveform Attribute Display

E: EPG Frequency

F: Waveform Display

G: Y Axis Scaling Buttons

H: X Axis Scaling Buttons

I: Frequency Distribution Plot



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### Button Panel

#### 1. Connect/Disconnect

Select this button to connect to an amplifier device. If an amplifier device has not been previously connected, this button will open the Select Amplifier dialog. If an amplifier has been previously connected, this button will display the serial number of the amplifier it will attempt to connect to. Once an amplifier has successfully connected, this button will read "Disconnect". Select the Disconnect button to disconnect from the amplifier.

#### 2. Record/Stop Recording

This button is only enabled once the amplifier has connected to NemAcquire. Select this button to begin a recording. The waveform will be red over the duration of the recording, and the elapsed time of the recording will be shown in the top-center of the Waveform Display. Once ready to end the recording, select the same button, now named "Stop Recording". This will bring up the Experiment Notes Field before saving the file.

#### 3. Experiment Notes

Selecting this button opens the Experiment Notes dialog. In this window, the user can enter experiment notes about the recording. These notes are then attached to the next recording. This window can be opened anytime, both during and between recordings. The fields that appear in this window can be customized using the File > Experiment Note Fields menu option. The "Worm Number" Field will automatically increment by one in between recordings, although this can be edited by the user. After a recording has concluded, the Experiment Notes dialog is shown once more. This is a final time to review or change data before that data is attached to the recording.

- a. **Clear All:** Pressing this button will remove all data from the note fields.
- b. **Revert:** Selecting this button will restore previously saved data to the note fields. The Experiment Notes data is saved each time the window is closed.
- c. **Discard Recording:** This button only appears after a recording has been completed. It erases the latest recording. This decision must be confirmed by a warning before it occurs.
- d. **Save:** Once the Experiment Notes data has been reviewed, select this button to save the file and attach the data.





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### Scaling Buttons

#### 1. Y Axis Scaling Buttons

*Use these buttons to change the scaling of the Y Axis.*

- a. **Zoom In (+):** Halves the height of the Waveform Display, so the waveform appears larger.
- b. **Zoom Out (-):** Doubles the height of the Waveform Display, so the waveform appears smaller.
- c. **Fit:** Aligns the Y Axis to frame the waveform based on the largest amplitude shown in the Waveform Display.

#### 2. X Axis Scaling Buttons

*Use these buttons to change the scaling of the X Axis, changing the displayed duration of the waveform.*

- a. **Zoom In (+):** Halves the width of the Waveform Display, so the waveform appears over a shorter duration.
- b. **Zoom Out (-):** Doubles the width of the Waveform Display, so the waveform appears over twice as long a duration.

### Status and Filter Panel

#### 1. Status

*The status text displays the Connection Status.*

- "Disconnected" is displayed by default, and is shown if no Amplifier is connected and the Demo mode is off.
- "Demo Mode" is displayed if Offline Demo Mode is selected from the Amplifier Menu.
- "Connected to [SERIAL #]" is displayed once the software has connected to an Amplifier. This text displays the serial number associated with the connected Amplifier.

#### 2. Filter (Display Only)

*There are two display filters that are available. It is important to note that these filters only affect the displayed waveform and do not change the recorded data. These filters can be applied using the drop-down menus in the Filter Panel (See B in the graphic on page 2)*





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### Highpass

A 1 Hz second-order Butterworth Highpass filter can be applied to the visual output of the data. *This filter does not change the values recorded to the file.* To enable the filter, simply select the 1Hz Highpass option from the first drop-down menu.

### Notch Filter:

Due to power grid frequency standards, 60Hz noise is typical in North America, whereas 50Hz noise is typical in Europe.

Two Butterworth Notch filters are available in the Notch Filter drop-down Menu: one at 50Hz and another at 60Hz. These are second-order bandstop filters with corners at 59Hz and 61Hz for the 60Hz notch filter and 49Hz and 51Hz for the 50Hz Notch. Simply select either the 50Hz or 60Hz option from the second drop-down menu to apply the respective filters. Note that only one Notch filter can be applied at once, and these filters *will not change the recorded data*, they only change the displayed waveform and the displayed Frequency Distribution Plot.

## II. Menu Contents

### File Menu

#### 1. Recording Options

*This menu allows the user to customize the data that is saved in the recorded file. The timestamp data can be added or removed from the next recorded file by using this menu. Select this menu item to add it to the next recording. This option cannot be changed during a recording.*

**Timestamp:** *the number of seconds since Jan 1, 1970 UTC ignoring leap seconds.*

#### 2. Experiment Notes Fields

*An Experiment Notes dialog will be shown after ending a recording or clicking on the "Experiment Notes" button. Using this menu, a user can customize what fields appear in this dialog, removing fields not frequently used or adding fields as required.*



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### 3. Select Recording Folder

*Selecting this menu option opens a new file system window where a user can select a default folder location for storing recordings.*

### 4. Show Recording Folder

*The user can open a file explorer window showing where recordings are stored simply by selecting this option from the File menu.*

## **Amplifier Menu**

### 1. Select Amplifier

*Use this menu to select a specific amplifier device. Amplifier devices may be listed even if they are not powered on or connected. Ensure your amplifier is on and connected to your computer before clicking 'OK'. After selecting a device and clicking 'OK', the amplifier will automatically connect. This menu item is only enabled when not connected to an amplifier.*

### 2. Connection Information

*Selecting this menu option will display important information about the connection status with the amplifier. This includes:*

- a. Connection Status: Connected, Disconnected, or Demo
- b. Total Frames Received from the Amplifier
- c. Frames Lost (a warning will appear if any data is lost)
- d. The time on the amplifier. It will be synchronized with the computer time. This time will also be seen in the saved file names.

### 3. Offline Demo Mode

*A waveform can be generated if no amplifier is currently connected. The main component of this waveform is a 5Hz, 150uV amplitude sine wave with a 60 Hz, 20uV sine wave superimposed.*





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### 4. Enable Test Signal On Amplifier

*The amplifier devices can emit a test signal in order to check the connection of the device before recording data. Simply select this menu option to have the amplifier generate the test signal, or un-check this menu item to return the amplifier to the normal data collection mode. The amplifier test signal is a 1Hz, 3.75mV amplitude square wave.*

### **View Menu**

#### 1. Show....

*Several waveform attributes are gathered and displayed alongside the live data, including:*

- a. *Show EPG Hz: The dominant frequency of the waveform*
- b. *Show Amplitude: The peak-to-peak amplitude of the waveform*
- c. *Show Offset: The voltage offset of the waveform*

*All of these attributes can be displayed on the chart and update once every second. The display for each property can be toggled on or off simply by selecting the menu option corresponding to the attribute.*

#### 2. Show Frequency Distribution Plot

*The power spectrum (distribution of frequencies) can be visualized using the Frequency Distribution Plot. This plot is displayed under the Waveform Display and updates every second. Each section of frequencies is color-coded for easy recognition. The Frequency Distribution Plot can be toggled on and off by checking this menu item.*

#### 3. Show Grid

*The grid placed behind the signal can be turned off so that the signal can be seen more clearly. Checking this menu item will turn the grid back on, so that values associated with the waveform are more easily defined.*





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## Help Menu

1. About NemAcquire

*This window displays information about the software version, build date and copyright.*

2. NemAcquire User Guide

*This opens a document that contains a Quick Start User's Guide and more detailed information about the NemAcquire software; it opens this document.*

3. Amplifier User Guide

Additional documentation about the amplifier device can be found by selecting this menu option.

## III. Troubleshooting

Problem	Solution
Choppy Display	For some older or lower-performing Windows computers, optimize the performance of the waveform display by changing the priority setting for NemAcquire: Open NemAcquire. While it is running, right-click on the Windows Start icon and select "Task Manager". Once Task Manager opens, click on the Details tab at the top of the window. Find NemAcquire within the list and right-click on it. In the drop-down menu, highlight "Set priority" and select "Realtime". This will improve the appearance of live data on older Windows computers.



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