

# NLED Matrix

by Northern Lights Electronic Design, LLC

[www.NLEDshop.com/nledmatrix](http://www.NLEDshop.com/nledmatrix)

Updated: 1/18/2013

NLED Matrix is a Java based application used for mixing and controlling video content to output to a custom DIY LED Matrix or matrices, which can be of any shape and size. NLED Matrix supports pixel patching, which allows the user to create the order in which the software outputs the data to the LED Pixels. That means any shape of LED matrix, any layout, any color order, with any type of control scheme can be made to work with the software. It allows two feeds of video data, either from a file such as .MOV, from an image, from an external video feed, or from any of the numerous generated content. The mixed video feed can be sent over Serial(USB Adapter, or RS-485 adapter), TCP, or UDP.

Written in Processing([www.Processing.org](http://www.Processing.org)) to be free, open source, and easy for anyone to modify to suit their needs. It supports all types of RGB(any order) pixels, single color LED pixels, and RGBW pixels.(RGBW may or may not be implemented in current version, check change log)

This is the initial release, and is still pretty rough and documentation isn't completed. Please contact [Jnygaard@NLEDshop.com](mailto:Jnygaard@NLEDshop.com) with any questions, bug reports, feature requests, critiques, anything at all, I want to hear about it. All information I receive will be used to make the software and documentation better and more extensive, so please contact me.

The software is optimized to hopefully use as little system resources as possible, all objects should be properly disposed of and GUI refreshes are kept to a bare minimum. If it appears to error, try press the r key to refresh it manually.

## Configuration Files and Device Files

### **config.ini**

Holds a file path to the currently selected device configuration file. Each device configuration file holds all the information that describes the LED matrix and directs it to the required patch and thumbnail files.

### **Device Configuration Files:**

File can be any name, ID tags don't matter but must be separated from the value by a single tab, no spaces. Currently any changes in software won't be saved to the device configuration file. So it is best to edit it with a text editor.

**Frame Rate:** Rate of refresh of onscreen previews and rate of data packets. Any number could be attempted but hardware or data transfer rates won't allow much over 30 or 40.

**COM Port 1 or 2:** Which COM port data is directed to, system automatically assigns number. Numbers start at 0. Currently only one COM port is supported, but more can be added with some coding.

**Transmission Baud:** For use with COM ports only, any supported baud rate may be used, but hardware may round to the nearest standard rate, check hardware descriptions.

**MIDI Port and Enable:** Identifier numbers for the input MIDI port, may be enabled(true) for MIDI input usage or disabled(false) for better performance.

**Serial Control Port and Enable:** Used for external DMX or serial control of the software, not fully implemented.

**Enable Video Feed:** Current Windows version uses Dshow input, such as a screen grab or webcam feed and can be assigned to a Quick Feed.

**Enable Thumbnails:** Enables thumbnails for QuickFeed button backgrounds. Disable for better performance.

**Preview Enable:** Enables or disables full size previews in the mixed preview window when a QuickFeed is pressed

once, so it can be previewed then clicking again will start the QuickFeed.

**GUI Width and Height:** Width is overall what is used to scale the window, so keep height and width proportional to 4:3.

**Matrix H and W:** The width and height of the LED matrix used in pixels. For odd shaped matrices, factor it as if it were a square or rectangle.

**Pixel Data Type:** Identifier for pixel type. RGB(0), RGBW(1), GRB(2), BRG (3), GBR (4), RBG (5), BGR(6), Single Color Using Red(7), Single Color Using Green(8), Single Color Using Blue(9), or if you have a different requirement, an new ID could be used and coded into the software.

**Patch File Name:** File path to the matrix patch(map) file that was created using the NLED Matrix Patcher software. A patch file directs the order the data will be sent out to the controllers. Which is required for out-of-order or non-rectangular matrices.

**Quick Feed File Name:** File path to the QuickFeeds file for that matrix. Each matrix will need its own QuickFeeds file in most cases.

**Automatic File Name:** Automatic control of the software is possible by creating or editing a text document. Described elsewhere. Using Automatic control a QuickFeeds, blending modes, and mixing can done on its own. Example: A QuickFeed is triggered on A -> it runs for X amount of iterations → QuickFeed B is loaded with a new feed -> a blend mode is selected → the two feeds are mixed over X amount of seconds → that QuickFeed runs for X amount of iterations and repeats. So an endless sequence of feeds can be mixed without human interaction.

**Absolute Footage Path:** Where the software should look for movies, images, and other feed files. Last character should be a backslash(\)

**Communication Type:** 0 is Off, 1 is Serial/COM, 2 is UDP Client, 3 is TCP Client. In both client modes the LED matrix would have to be running before the software is started. Was easiest over server mode.

**Server IP:** The IP Address used for TCP/UDP communication

**Server Port:** Port number for TCP/UDP communication

### Hot Keys:

- **Arrow Keys** – Use the Up/Down/Left/Right Arrows to adjust a slider after it has been selected by clicking on it.
- **r** – Forces a full refresh of the screen.
- **x** – Works with method 123, which is Step Through for testing patches, moves a single pixel through the pixels in the order that they are patched.

## **QuickFeeds File: Standard Text File(.txt)**

Numbered in order left to right, with a tab(no spaces) between each value.

- 1 – User String ID, can be whatever. Displayed on large previews and used as the text for text method.
- 2 – Method ID, see included spreadsheet with Method ID information.
- 3 – File Name for video files, leave blank or anything if not used. File name Only, no Path.
- 4 – Speed, -10.0 to 10.0, it could be more but the speed slider would be messed up.
- 5 – Color Slider Value for Red, 0 - 255
- 6 – Color Slider Value for Green, 0 - 255
- 7 – Color Slider Value for Blue, 0 - 255
- 8 – Offset X, offsets feed left or right
- 9 – Offset Y, offsets feed up or down
- 10 – Color State value, Tint, scale, etc. Values are not easy to follow, so best modified in software.
- 11 – Control State value, paused/play/stop. Again, not easy to decode, modify in software.
- 12 – Effect State value, invert, contrast, etc. Again, not easy to decode, modify in software.
- 13 – Contrast Slider Value, 0 – 255, when enabled, the sets the minimum value to display.
- 14 – Generation Slider 1, 0 – 255. Value different for each generated content
- 15 – Generation Slider 2, 0 – 255. Value different for each generated content
- 16 – Generation Slider 3, 0 – 255. Value different for each generated content
- 17 – Generation Slider 4, 0 – 255. Value different for each generated content

## **QuickFeeds Generator Web App:**

First version of the application is very basic. It can be used while NLED Matrix is running, so changes can be made on the fly.

### **If editing a QuickFeed File:**

- Optionally, press the Save button on the bottom of the NLED Matrix window to save the current QuickFeeds to the designated file.
- In the QuickFeedGenerator App, Click the Browse button to select the QuickFeed file to be edited. Then Press the “Load QuickFeed File” button to load it. All the fields should fill in.
- Go through and edit any of the fields.
- When finished or ready to test it out, enter the file name into the text field.
- Press the “Save QuickFeed File” button and a download will be prompted or start automatically.
- Find the file in your downloads folder or where ever you saved it to and place it in the NLED Matrix folder, overwriting the current one if desired.
- Either start NLED Matrix or if it is running, press the “Load” button on the bottom of the window.

### **If Creating a New QuickFeed File:**

- Start the QuickFeedGenerator App
- Fill in all the information using the dropdown and text fields
- Enter a file name into the Save As box.
- Press the “Save QuickFeed File” button and a download will be prompted or start automatically.
- Find the file in your downloads folder or where ever you saved it to and place it in the NLED Matrix folder, overwriting the current one if desired.
- Either start NLED Matrix or if it is running, press the “Load” button on the bottom of the window.

## Starting/Setup Guide:

- Start by updating Java, check the internet.
- Start by designing the layout of your LED Matrix, how the LEDs will be ordered and how it will snake or have to be patched.
- Open up Matrix Patcher software, and follow the instructions included with it for using the software to layout your matrix patch file. Save it and transfer to the NLED Matrix /patches folder.
- Open one of the sample device configuration files from /devices
- Save it with a unique file name to the same folder /devices
- Start at the top and use the descriptions above and fill out all the values. Some may not apply, such as transmission bad if using UDP/TCP connection, so set to 0 or leave them as they are. It is very important that there is a tag, with a single tab character between the value.
- Look it all over make sure its right, especially the file paths to footage and patch file.
- Look for the config.ini file in the program directory. Open it.
- Line 2 should have the file path to the device configuration file that was just made. Should be /configs/your-device-file.txt but an absolute path can be used as well. C:\SomeFolder\.....
- With both those files completed and saved. Start the software.
- It should start up and begin working as normal.

If it doesn't freeze but isn't transmitting, check the transmission indicator on the bottom, it should be blinking. If it is red there was something wrong with communication setup in the device configuration, maybe the COM port is wrong or in use, the server isn't ready, or similar.

If it freezes or stalls during loading, something is substantially wrong. Start with rechecking all the configuration files and ensure your patch has all points placed, as difference between the constants (MatrixHeight \* MatrixWidth) and the pixel amount listed in the patch file will cause a complete freeze.

**Method Info:** (Check Included Spreadsheet for full info)

<u>Method ID</u>	<u>Method Name</u>	<u>Reversable</u>
0	Video Files	Yes
1	Dshow Capture	No
2	Image	No
3	.dat video files	Yes
4	Text Mode	Yes
100	Audio Ripples	No
101	Star Field	Yes
102	Spinning Cube	Yes
110	Ripples	Yes
104	Metaballs	No
105	Plasma	No
106	Spiral	Yes
107	Audio Sine Wave	
108	Audio Bars	No
109	Falling Blocks	Yes
123	Test Step Through	No