

# NLED Aurora Control Software – v.1c

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Most NLED Controllers are compatible with the NLED Aurora Control software. The software is used to create a multitude of patterns and sequences on a computer then, upload them to the compatible controller for the device to run by itself, without a computer connection. The simple GUI makes it easy for anyone to create custom color sequences of any sort and upload them to the controller over the USB connection. Great for any LED project that requires custom color sequences. In addition to standalone sequences, it also supports USB Live Control, send packets over USB to the device for direct control of the outputs. It supports single color, RGB, or RGBW LED configurations.

*This is meant to be used in conjunction with the NLED Aurora Flowchart that was included with this download.*

## **Color Sequences:**

Are dynamic data sets that hold the patterns, colors, and effects that the software generates. Each is based on Sequence Mode(described below) and contains data specific for the Mode being created.

## **Sequence Modes:**

### **Fade:**

Color channels fade evenly from value to value(frame to frame). Start values can be adjusted to start a color channel fading from an offset position. Each color channel has an individual value/color.

### **Instant:**

Color channels change instantly from value to value(frame to frame) at the selected speed. Each color channel has an individual value/color. It allows the Slide Up or Slide Down sub-modes.

Each slide type can be Single Color, RGB or RGBW Type

- **Slide Up:** Slides channel values up from one channel to the next, based on data type.
- **Slide Down:** Slides channel values down from one channel to the next, based on data type.

### **Gradient:**

Allows color sequences with gradient/fades/offsets to be created using very little memory space. It has options to offset the start values dynamically and quickly create great looking color sequences that don't take up much memory space. The sequence shares a single color for every color channel for each frame.

### **P.O.V.(Persistence of Vision):**

Persistence of vision can utilize images to create color sequences that can be played on flow toys such as staffs, poi, and wheels, anything that moves quickly. A POV color sequence will display the image used to create it when the pixels are moved or rotated.

**P.O.V. Image Modes:** There are 4 ways an image can be loaded, the mode is dependent on the LED positions, order, and expected function of the final project. Some experimentation may be needed to find the one that will work for your project.

- **1:** First Pixel Is On The Left. Rows Are Displayed Top To Bottom
- **2:** First Pixel Is Bottom Left. Columns Are Displayed Left To Right
- **3:** First Pixel Is On The Right. Rows Are Displayed Top To Bottom.
- **4:** First Pixel Is Top Left. Columns Are Displayed Left To Right.

### **Linked:**

- Click on the grey linked slot and it will highlight red, then select one of the Color Sequence Icons from the right

side of the workspace.

- Loops/Iterations is the amount of times that linked Sequence will run before switching to the next one or starting back at slot 1.
- The Transition Types check boxes offer 2 options for transitioning from one sequence to the next. Either Fade or Instant transitions are currently options.

### **Combination:**

A Combination(Combo) Sequence has the ability to set each frame as a different Mode. In some cases this can create dynamic, interesting color patterns, but with some settings and usage, it may not be very desirable. Each Frame can have its speed individually set, the Sequence Speed is ignored.

- Fade, channels fade evenly and smoothly, from value to value.
- Instant, channels change instantly from frame to frame.
- Slide Up/Down, slides channel values up or down, wrapping to the beginning or end. Can be used to create rotating or other types of color effects. When in a Combination Sequence Mode, the Frame Speed is a big factor for it working correctly and will require some experimenting.

### **Common Frame Sub Modes:**

#### **Color Shift:**

Each Frame can have a Color Swap applied to it, meaning the order of the output colors can be modified, perfect for adding some more dynamic color changes to the Sequence. Use the drop down on the left side for options. Not recommended for Single or RGBW setups.

### **Hardware Tab:**

All the configuration settings for the hardware/device can be found here, such as memory size and hardware and firmware versions. After starting the software with the device already powered and connected to the computer over USB, open the hardware tab and select the COM/Serial port the device was assigned. If the correct COM port is opened it will respond and the software will receive its device information and display it on the upper part of the hardware tab. It will then load the device configuration file based on the device connected.

### **Device Configurations:**

Once the device is loaded, the software will generate an option module for each of the configuration options. Using the device datasheet and your project requirements, adjust the configurations using the modules. When ready open the Connection Tab to upload(see section)

### **Software Tab:**

All the settings and information for the software are found here. Such as Load or Save files, Sequence removal, Sequence Duplication, Sequence ID string input, user channel amount, and window size options Along with the options for the Graphic Layout Tab.

### **User Channel Amount:**

Each device that is compatible with the software has a different amount of output channels it supports. In some cases not all channels will be used, as they are not needed or no LEDs will be connected to them. This option allows a range of channels to be used, that saves data memory space and sets up the software for your particular usage. As an example, user requires 10 RGB channels, so the User Channel Amount would be set to 30(10 RGB channels at 3 channels per) or 10 RGBW channels would require 40 as User Channel Amount and 10 single color channels would require a User Channel Amount of 10. Either drag the slider bar then hit apply, or type in your value into the text field and press the Enter key.

Note: Some devices require an even amount of channels and the software will automatically alter the value to make it even.

## Sequences Editing:

- **Clear Sequences:** deletes all sequences from list.
- **Duplicate Sequence:** makes a copy of the sequence and adds it to the end of the list. Click the button first(it highlights) then click on the sequences you want to copy.
- **Delete Sequence:** removes a sequence from the list. Click button first then sequence to delete.
- **Edit User ID Text:** Edit the user ID string for a sequence, press the button first, then type in the new string, then click on the sequence you want to apply the change to.

## Graphic Layout Options:

The dropdown has several shape options, the shape option will be used to arrange the LED icons on the Graphic Layout tab.

- **Shape Dropdown:** select a shape, custom, or image option.
  - **Round, Square, Line** shape options will position the LED icons to form the selected shape.
  - **Spiral** will create an Archimedes spiral, the size of the LED icon will probably need to be reduced for this shape to work correctly.
  - **Custom/Patch** allows a patch file to be loaded and used for the LED icon positions. Currently the patch software is available separately with the NLED Matrix download. The patch data is saved along with the color sequence data.
  - **Image** option allows an image file to be loaded and manually have LED icons placed on it by the user. This allows visualization of the project on the graphic layout tab. There are no image options, an external image editing app must be used to format the image correctly.
- **LEDs Per Channel:** The software can display more than 1 LED icon for each of the available hardware channels. Almost always leave this at 1 unless your project has LEDs that share the same output channels or address. And you would like a visual representation of them on the Graphic Layout. Option does not affect hardware, and is only for viewing on the Graphic Layout tab.
- **Load File Button:** if you chose a custom or image as your shape option you will need to load a patch file or image file. Selecting 'Image' as your shape and an image file is loaded, it will display the image on the Graphic Layout tab and clicking on the workspace will place an LED icon, very helpful for certain projects. If you selected Custom as your shape, you will need to load a patch file created by NLED Matrix Patcher software, which allows icons to be placed on a grid.

## Load/Save/Edit Sequences and Load Device File:

- **Save Sequences:** Save the current sequences and software settings to a file. Can be anywhere or have any name, but must remain a TXT file.
- **Load Sequences:** Load a sequence file from the computer.
- **Clear Sequences:** Deletes all color sequences currently loaded.
- **Duplicate Sequence:** Duplicates a color sequence, adding it to the last slot on the right side. Click the button then click the sequence icon, then click yes to the prompt to duplicate.
- **Delete Sequence:** Deletes a single color sequence. Click the button then click the sequence icon on the right to delete.
- **Edit User ID Text:** Edits the user text for a color sequence, the user text can be used to help manage and navigate your loaded color sequences. Click the button, then click the sequence icon the right, the textfiled will highlight red, then type in the new text. Press the “Enter” key to apply the change.
- **Load Device File:** If you want to create Sequences for a particular device, but don't have it connected to the computer, you can load the device's device file from the /devices folder. Once loaded you can create sequences as if the device was connected.

## Window Size:

NLED Aurora Control software is fully re sizable, either grab the window edge and drag or press either of the resolution size buttons on the Software Config tab.

## **Graphic Layout Tab:**

Using the Software Tab, the user can select a shape, LED amount, and shape layout that matches their project to get a graphic representation of the colors and patterns being created that will be displayed on the Graphic Layout Tab.

### **Usage:**

After setting up the desired options on the Software Tab, the frame buttons on the bottom left and along the bottom can be used to add or remove a frame, reset the Sequence, and change the Frame being displayed on the layout. Clicking any of the LED Icons will open the color picker to alter the color of that channel. Or use the Color All button on the lower left to select a color for all channels in that frame at once.

Note: Each LED Icon is numbered and the interior color is the selected color and the outer color(outer ring) is the starting color for that color channel(each LED icon is a color channel). Starting colors can be adjusted on the Timeline Tab, see Start Value Indicators section.

*The NLED Aurora Flowchart has information on selecting colors and using the tool functions.*

## **Timeline Tab:**

Another way to view and make changes to the Color Sequence. Each Color Channel is displayed as a row, the rows are divided into Frames, indicated with the labeled buttons.

### **Usage:**

Click on the blue Frame buttons above the previews to change the Frame or use the frame buttons along the bottom. When a Frame is selected, it's Frame Mode and other settings are shown on the left side of the screen. Clicking the Frame button again on the timeline will open the color picker and allow the color to be selected for that channel and frame. Use the Color All button the Graphic Layout Tab if needed.

For Gradient Modes, the bottom Frame buttons are replaced with square color icons, a Gradient Step control slider, forward, and reverse selection buttons. To create a Gradient Sequence, use the Add/Remove/Reset buttons on the left to select how many frames are needed. Then click the the square color icon and select a color, repeat with all the color icons. Then adjust the Gradient Steps slider, a value equal to the amount of Color Channels will create a gradient that is seamless end-to-end(if first channel and last channel LEDs are physically next to each other). Otherwise drag it up or down to create non-seamless gradients. Then select Forward or Reverse(< or >) and click Generate. The Start Value Indicators will move and indicate the starting values.

### **Start Value Indicators:**

Each color channel preview has a Triangle Start Value Indicator. They can be adjusted(by clicking and dragging) to alter the starting position for that color channel. Bad start values can mess up a Color Sequence, if bad start values are found, the triangle start value indicator will turn purple(from red) and at the top of the previews a notice will be in red that the start values are bad and need to be reset, regenerated, or adjusted manually.(by clicking and dragging) Only on the Timeline Tab can the start values be adjusted, but the Graphic Layout Tab will indicate the starting color with the outer color.

*The NLED Aurora Flowchart has information on selecting colors and using the tool functions.*

## **Connection Tab:**

Here the created Sequences, configuration settings, and the Sequence Index can be sent to the device. It is also where Hardware Previews can be sent to the device for easy viewing without a full upload. In addition to accessing the Live Control and Stand-Alone Control features.

## **Sequence Index:**

Drag and drop Sequence icons(from the right side scroll area) into the Index area over the “Drag and Drop Sequence Here to Add It” icon to add the Sequence to the Index. Or drag and drop the “DMX Reception” or “Serial Reception” icons into the Index to utilize either of those communication methods.(device must be compatible, see datasheet) The Index is used to map the Sequences on the hardware. The order of the Index is the order the Sequences will be selected by the device's button(s)

## **Hardware Preview:**

Drag and Drop a Sequence icon(from the right side scroll area) onto the Hardware Preview Icon to instantly upload the Sequence to the device, the user can then evaluate it and make any changes in the software. Only one Hardware Preview Sequence can be stored on the device, and Linked sequences can NOT be previewed this way.

## **USB Live Control:**

USB Live Control allows the output channels PWM to be controlled over a USB connection. The device is seen as an emulated COM/Serial Port, which many languages support communication with. Data is sent in packets, with a byte for each output channel in 8-bit mode(0-255), or 2 bytes per channel in 16-bit mode(0-65,535), in 16-bit mode the MSB is first. There are two methods in the software, either with a slider for each channel or using the color picker for each color channel. If you would like to write custom software to utilize USB Live Control, please see NLED Aurora command chart.

## **USB Standalone Control:**

In addition to direct control of the outputs the standalone sequences that are already uploaded to the controller can also be controlled through various means. Such as stepping, speed control, sequence selection. Experiment through the software or see the command chart for details.

## **Upload Configurations:**

The configuration options that are selected on the Hardware Tab are uploaded to the device using this button. Such as DMX address, DMX Mode, baud rates, LED indicator function, etc.

## **Upload Sequences & Index:**

Uploads Sequence Index and all the indexed Sequences to the device. The Sequence Index must be created before uploading. All previous sequence data on the device will be erased, allow several seconds for this to complete. The progress will be displayed on the screen.

## Notes:

Maximum Frames: 256

Maximum Channels: 512

Maximum USB Live Control: 121 channels

Maximum Index Sequences: 32

Maximum Sequences In Software: 32(as of v.1c, future release will be 64)

## Hot Keys:

**S:** Quick save, creates a save file using the time and date as the file name.

**M:** send dummy command to test if connected/alive.

**Escape:** Close the software.

**Left and Right Arrows:** - Adjust previously selected slider

While Dragging a Sequence Icon - right click to stop dragging an icon

Right Click on an Indexed Sequence Icon to Remove

Left Click on a LED Icon or timeline button to open the color picker

Mouse wheel over the timeline, index, color sequence index(right side) to scroll the slider.

## Definitions:

**Color Sequence:** A color pattern, contains all the data to control the LEDs. Or dataset(how the color data is stored) that creates colors, patterns, and sequences. Can be single color, RGB or RGBW, all are still color sequences.

**Channels:** A channel represents a single output on a controller or a single color of a pixel.

**Color Channel:** Represents a single LED or pixel. That could be either single color, RGB, or RGBW(or RGB+U.V.) A Color Channel is seen as 1 or more Channels. A sequence set to RGB Pixel Data Type will use 3 Channels Color Channel. A LED Icon(on the Graphic Layout tab) or a row on the Timeline tab represent a Color Channel.

**Frame:** The data stored in each Frame will be displayed on the outputs/pixels sequentially. A Frame can be thought of as a single frame of a video, it holds all the data to create those colors. The next frame will hold new colors. For fades, gradients, and combos, the start value can be adjusted to start different output channels in different frames, creating multicolor sequences with less creation effort and data space.

**DMX Reception:** Receive and utilize a DMX-512 signal

**Serial Reception:** Receive and utilize a standard 8-N-1 serial signal. At the selectable baud rate.

**Index:** Contains a directory or order of the color sequences that will be uploaded to the controller.

**Pixel Data Type:** Tells the software and controller the LEDs that will be controlled are either a single color LED(like just blue), RGB, or RGBW(Any 4 colors)