

NLED 16-Bit Manual RGBW LED Controller

A compact, low cost, and capable controller for constant voltage strips, modules, and other LED products. Supporting a wide range of PWM frequencies and resolutions allowing this device is able to produce smooth flicker free fades at high frequencies. Offered in several variations and is available for customization by request.

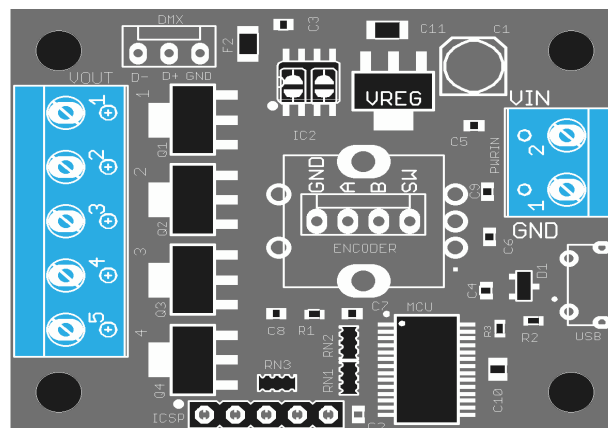
Features:

- 4 Channels of high current outputs.
- Up to 16-Bit(65,536 levels) PWM Resolution, user configured in software.
- Up to 62.5KHz PWM Frequency, user configured in software.
- Small size, easily mounted and enclosed.
- Full stand-alone color sequence support using NLED Aurora Magician
- Optional DMX-512 interface with RDM(Remote Device Management)
- Optional rotary encoder(dial) for manual user control. Board mounted or wired.
- Designed and Manufactured in the United States. Includes 3 Year Warranty and Lifetime Support.

Input Power	5 to 24 volts, maximum 15 amps
Input Connector	5.08mm pitch terminal
Quiescent Current Draw	< 25mA
Output	4 Channels, 5 amps each. Total of all channels max 15A
Output PWM	Selectable. Up to 16-bit resolution at up to 62.5KHz
Output Connectors	Unpopulated, Pluggable, Standard. 5.08mm pitch
Input	DMX-512*, TTL Serial*, Rotary Encoder, Push Button
Input Connectors	0.1"/2.54mm spaced headers
USB Connector	Micro USB – Device is not USB powered, data only
Data Memory(Aurora)	11.25KB
Board Dimensions	50mm x 40mm. Height: 4mm to 12mm

*Feature requires specific device hardware variant.

Fig. 1a



Rotary Encoder Usage

Short Press	Change Sequence , Next
Press and Hold	Turn Off/Put to Sleep
Double Press	Enter Color Select Mode, See Description
Rotate CW	Adjust Overall Intensity Up
Rotate CCW	Adjust Overall Intensity Down
Rotate CW While Pressed	Adjust Sequence Speed Up, Not Saved
Rotate CCW While Pressed	Adjust Sequence Speed Down, Not Saved

CW = Clockwise, CCW = Counter Clockwise

Fig. 2a

Note: Intensity adjustment is applied to the local output channels, it is not applied to DMX master transmission. After starting DMX reception(if enabled) the intensity value will be set to maximum, but after starting it can be used to adjust the intensity of the received DMX values.

Note: Double press timeout value is 600mS, not user adjustable, but can be by request, Contact for details.

Color Select Mode

Quickly pressing the button twice forces the device into Color Select mode. In Color Select mode the rotary encoder can be used to adjust the outputs to a chosen color. Upon entering the mode, rotating rotary encoder will alter the 1st channel(Red) value, pressing and releasing the button again will select the next color channel, and allow its value to altered using the encoder. Continue pressing to wrap back to chanel 1. Color Select mode and the selected values are saved to the device and will restore on power up if it was powered down in Color Select mode or the values will restore when the user re-enters Color Select mode.

Rotary encoder usage in Color Select Mode is as follows in Fig. 2c.

Short Press	Changes the selected channel to be altered.
Double Press	Exits Color Select Mode
Rotate CW	Increase color value, fine / small amount.
Rotate CCW	Decrease color value, fine / small amount.
Rotate CW While Pressed	Increase color value, coarse / large amount.
Rotate CCW While Pressed	Decrease color value, coarse / large amount.

User Settings and Configuration Saving

The device automatically saves any user settings adjusted using the encoder or button. When the device powers on it loads the previously saved settings so the device starts in the same state it was when it was turned off. After adjusting a setting, allow 3 seconds for the device to save before powering off or making more changes. Speed adjustments and Sleep mode do not get saved.

NLED Aurora Control Software

Visit www.NLEDshop.com/nledaurora for more documentation and download links.

Most NLED controllers are compatible with the NLED Aurora Control software. The software is used to create a multitude of patterns and color sequences on a computer, then upload them to the compatible controller for the controller 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, WiFi, bluetooth, or serial connection. Great for any LED project that requires custom color sequences and control. In addition to standalone sequences, it also supports USB Live Control, send packets over USB to the device for direct control of the outputs. In addition it offers a powerful command protocol for interfacing and controlling with the device and the color sequences. It supports single color, RGB, or RGBW LED configurations. Entirely GUI based and easily to navigated.

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. See controller specifications for information on how many channels each NLED device supports.

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. See Manual for details.

Index: Contains an ordered list 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)

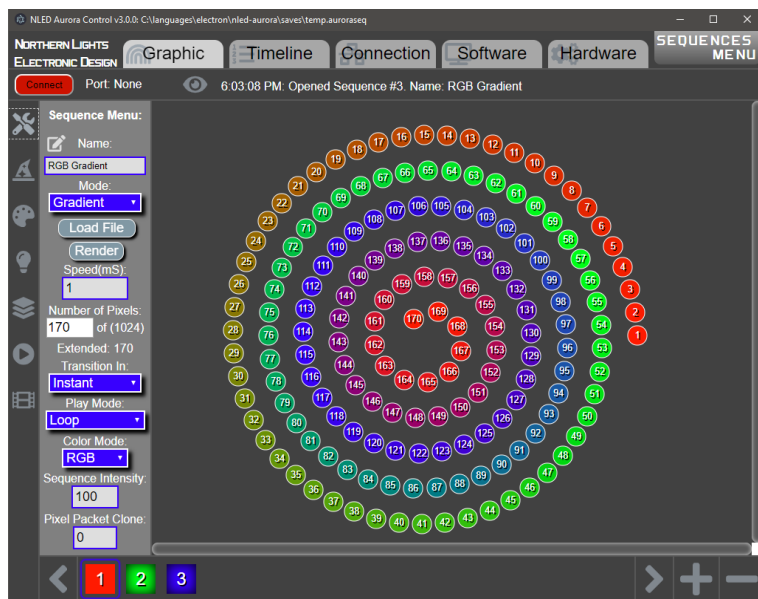


Fig. 3a

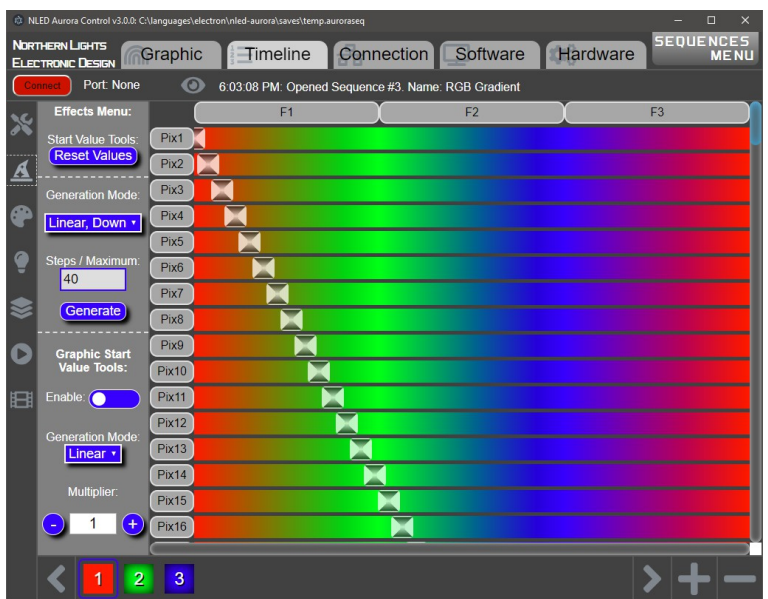


Fig. 3b

NLED Aurora Protocol

Aurora compatible controllers have a specialized command set that is used to control and command the controller from the Aurora software or from user created software applications. Almost every function and feature of the Aurora stack is available through commands. Such as play/pause, output color selection, device status, upload, download commands, and numerous others. Any software language that can communicate with serial ports can interface with Aurora controllers. The command protocol is also so simple that commands can be issued manually from a serial terminal like RealTerm or HyperTerm. The protocol involves simple character exchanges based on ASCII and 8-bit numbers.

Commands can be issued over a USB interface if available, or through the serial interfaces that all NLED controllers offer. This device when connected over USB is an Emulated Serial Port or VCP. This allows computers to see the device as a regular serial port.

Visit www.NLEDshop.com/nledaurora to find the link to the 'NLED Aurora Command Manual' for protocol documentation and more information.

Live Control - USB or Serial

Live control allows data sent from a computer or other external device to control the pixel colors and intensities. Many languages provide communication with serial devices, which allows many options for a user to create custom software to control the connected pixels over USB. Similar to using DMX or serial reception, this allows for live updates of the controller's connected LEDs and pixels. It utilizes the Aurora Protocol to initiate and transmit the data values from the computer software to device.

This feature is similar but distinctly different from the 'Serial Reception' feature. This option does not frame the data in anyway, lost or mis-sent bytes can result in the data becoming out of frame. For USB this is not an issue, but could become an issue with serial based.

Visit www.NLEDshop.com/nledaurora to find details in the 'NLED Aurora Command Manual'

Serial Command Mode Communication

All NLED devices with serial(UART) interfaces are capable of communicating with NLED Aurora Control and other serial devices using a TTL serial interface. The serial interface can communicate in a similar way to the USB interface, all Aurora Protocol commands and uploads function similarly. The serial interface can be a standard USB to serial adapters(FTDI or similar). Or more advanced devices that offer a 'transparent bridge'/'transparent serial' features such as bluetooth modules(RN4871 or similar), WiFi modules(ESP8266 or similar), Arduinos, and other serial devices.

Some NLED controllers have separate serial ports for communicating with external serial devices. Some devices share ports with other data features such as DMX-512. See Device Configurations for details specific to the NLED device. The baud rate and other configurations settings must be configured and correct in order for this feature to function correctly.

DMX-512 Reception

This device supports multiple DMX-512 profiles(also called personalities), a reception mode can be selected through the Device Configurations.

In order for the device to properly receive DMX data, the device configurations *Communication Mode* must be set to 'DMX Reception' and *Auto-Detect Communication Reception Mode* should be enabled.

4 Output, 8-bit: Direct control of the outputs, 8-bit values Fig. 5a

Channel	Function	Value	Description
1	Value for channel#1	0 - 255	0 is 0%, 255 is 100%
2	Value for channel#2	0 - 255	0 is 0%, 255 is 100%
3	Value for channel#3	0 - 255	0 is 0%, 255 is 100%
4	Value for channel#4	0 - 255	0 is 0%, 255 is 100%

4 Output, 16-bit: Direct control of the outputs, 16-bit values Fig. 5b

Channel	Function	Value	Description
1	MSB value for channel#1	0 - 255	Combined with LSB to create 16-bit value
2	LSB value for channel#1	0 - 255	Combined with MSB to create 16-bit value
3	MSB value for channel#2	0 - 255	Combined with LSB to create 16-bit value
4	LSB value for channel#2	0 - 255	Combined with MSB to create 16-bit value
5	MSB value for channel#3	0 - 255	Combined with LSB to create 16-bit value
6	LSB value for channel#3	0 - 255	Combined with MSB to create 16-bit value
7	MSB value for channel#4	0 - 255	Combined with LSB to create 16-bit value
8	LSB value for channel#4	0 - 255	Combined with MSB to create 16-bit value

4 Output, 8-bit, with Intensity: Direct control of the outputs, 8-bit values Fig. 5c

Channel	Function	Value	Description
1	Value for channel#1	0 - 255	0 is 0%, 255 is 100%
2	Value for channel#2	0 - 255	0 is 0%, 255 is 100%
3	Value for channel#3	0 - 255	0 is 0%, 255 is 100%
4	Value for channel#4	0 - 255	0 is 0%, 255 is 100%
5	Intensity	0 - 255	Intensity adjustment to all channels

4 Output, 16-bit, with Intensity: Direct control of the outputs, 16-bit values Fig. 5a

Channel	Function	Value	Description
1	MSB value for channel#1	0 - 255	Combined with LSB to create 16-bit value
2	LSB value for channel#1	0 - 255	Combined with MSB to create 16-bit value
3	MSB value for channel#2	0 - 255	Combined with LSB to create 16-bit value
4	LSB value for channel#2	0 - 255	Combined with MSB to create 16-bit value
5	MSB value for channel#3	0 - 255	Combined with LSB to create 16-bit value
6	LSB value for channel#3	0 - 255	Combined with MSB to create 16-bit value
7	MSB value for channel#4	0 - 255	Combined with LSB to create 16-bit value
8	LSB value for channel#4	0 - 255	Combined with MSB to create 16-bit value
9	Intensity MSB	0 - 255	Combined with LSB, intensity applied to all channels
10	Intensity LSB	0 - 255	Combined with MSB, intensity applied to all channels

Sequence Control: Stand-alone color sequences control with DMX.

Fig. 6b

Channel	Function	Value	Description
1	Sequence Number	0 - 255	0 Blanks the All Outputs, 1-32 maps to indexed sequences
2	Speed	0 - 255	0 is Pause, 1 - 255 is the speed used for sequence
3	Position/Fade	0 - 255	See Note 1

Sequence Control with 8-bit Direct Control: Stand-alone color sequences or direct DMX control.

Fig.6b

Channel	Function	Value	Description
1	Sequence Number	0 - 255	0 Blanks the All Outputs, 1-32 maps to indexed sequences
2	Speed	0 - 255	0 is Pause, 1 - 255 is the speed used for sequence
3	Position/Fade	0 - 255	See Note 1
4	Value for channel#1	0 - 255	0 is 0%, 255 is 100%
5	Value for channel#2	0 - 255	0 is 0%, 255 is 100%
6	Value for channel#3	0 - 255	0 is 0%, 255 is 100%
7	Value for channel#4	0 - 255	0 is 0%, 255 is 100%

Sequence Control with 8-bit Direct Control: Stand-alone color sequences or direct DMX control.

Fig. 6b

Channel	Function	Value	Description
1	Sequence Number	0 - 255	0 Blanks the All Outputs, 1-32 maps to indexed sequences
2	Speed	0 - 255	0 is Pause, 1 - 255 is the speed used for sequence
3	Position/Fade	0 - 255	See Note 1
4	MSB value for channel#1	0 - 255	Combined with LSB to create 16-bit value
5	LSB value for channel#1	0 - 255	Combined with MSB to create 16-bit value
6	MSB value for channel#2	0 - 255	Combined with LSB to create 16-bit value
7	LSB value for channel#2	0 - 255	Combined with MSB to create 16-bit value
8	MSB value for channel#3	0 - 255	Combined with LSB to create 16-bit value
9	LSB value for channel#3	0 - 255	Combined with MSB to create 16-bit value
10	MSB value for channel#4	0 - 255	Combined with LSB to create 16-bit value
11	LSB value for channel#4	0 - 255	Combined with MSB to create 16-bit value

Note 1: Position/Fade Control: If the Speed is 0, it allows the position of Instant Sequences to be set by the Position value. As calculated: $(\text{Position} / 255) \times \text{Amount of Data Frames}$. For Fade and Gradient Sequences, it allows the Sequence to run normally for Position value amount of times, which for 8-bit sequences, a value of 255 will run all output channels 1 frame. For Fades and Gradient sequences, the Position value used is the difference between the previous Position value and the current Position value.

R.D.M (Remote Device Management)

Allows the device's configurations, DMX settings, and other parameters to be configured over the DMX-512 network. Requires compatible DMX with RDM transmitter, console, and/or software.

- ANSI E1.20 2010 compatible.
- Additional Supported Parameters:
 - E120_DEVICE_INFO, E120_PRODUCT_DETAIL_ID_LIST, E120_DEVICE_MODEL_DESCRIPTION, E120_MANUFACTURER_LABEL, E120_DEVICE_LABEL, E120_DMX_PERSONALITY_DESCRIPTION, E120_SLOT_INFO, E120_DISPLAY_LEVEL, E120_FACTORY_DEFAULTS
- Identify pattern is a Red->Blue flash at 1hz.

Serial Reception

Serial reception can directly control the device's outputs or pixels using a serial transmission device. Such as a standard COM port with TTL translation, an FTDI adapter, Arduino, PIC UART, wireless XBee, ESP8266, or similar. Serial reception is different from 'Serial Command Communication' and the Aurora protocol. This reception mode is a very basic time framed packet reception. There is a maximum of 5mS between bytes and a minimum of 5mS between packets(end-of-frame), to allow the data to latch. A delay between received data bytes of more than 5mS will reset the buffer pointer, framing the data. Partial packets will latch after the 5mS delay, or latching will occur immediately after receiving the last byte of the maximum packet size, which is the is how many channels the device supports.

The device receives data in packets, the size(in bytes) of the packet corresponds to how many channels will be controlled. Example: Sending a packet of 90 bytes will control 30 RGB pixels, sending 510 bytes would control 170 RGB pixels. The controller accepts the data in regular RGB order and will reformat it to the required output order(to GRB, BRG etc), if the device supports color re-ordering, which is standard for pixel controllers.

Serial reception can be enabled through the NLED Aurora Control software by adding the tile to the index, or by configuring the device *Configuration Settings*. The device can take several packets to detect and validate the data before starting reception. The default baud rate is 19,200, but the user can set the utilized baud rate using the device *Configuration Settings*. The byte formatting is the standard 8-N-1(8-bits, no parity, 1 stop bit).

Note: This is a different feature from "Serial Command Mode". But they both may use the same baud rate and pin connections.

ID#	Actual Device Baud	Closest Common Baud Rate	8-N-1 Error %
0	9,615	9,600	0.16%
1	19,230	19,200	0.16%
2	38,461	38,400	0.16%
3	57,142	57,600	0.64%
4	117,647	115,200	-0.79%
5	222,222	230,400	2.12%*
6	250,000		
7	444,444	460,800	-3.55%*
8	500,000		
9	1,000,000	921,600	8.51%

*Note: Percentage of error is within usable limits. Matching of exact value is not required.

Fig. 8a

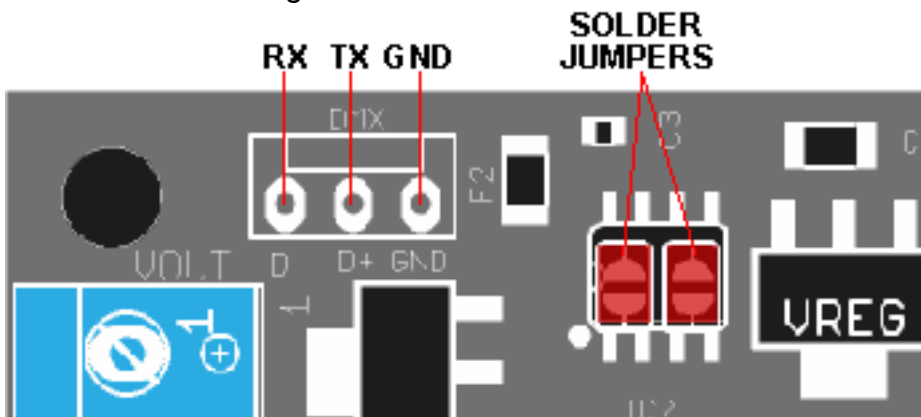


Fig. 8b

RX-TX-GND Header

Connection

- RX ← TX
- TX → RX
- GND ↔ GND
- VSEL ↔ Optional

Fig. 8c

More details and information can be found at

<https://www.nledshop.com/downloads/manuals/nled-serial-reception-manual.pdf>

Firmware Updates Using The Bootloader

This device includes a bootloader feature, which allows the firmware on the device to be upgraded with new features and bug fixes using only an USB cable and a small computer program. Firmware updates are encrypted and protected with special code that prevents other devices from being programmed with the update firmware images. And prevents non-NLED firmwares from being programmed onto the devices. Contact Us for help restoring your device to original condition if your microcontroller was damaged, erased, 'bricked', or otherwise not working correctly.

Full instructions, software, and firmware downloads can be found at www.NLEDshop.com/bootloader

If the NLED device has a USB port it uses the 'USB HID Bootloader', otherwise it supports the 'Serial Bootloader'.

To Enter Device Into Bootloader Mode - Button Method: (see last page for access details)

1. With the device powered off, while holding down the button(s), or after making the jumper connection. For device specific details, please see the wiring and pinout section.
2. Power up the device. Either by connecting the device to the computer with a USB cable, if power over USB is supported. Or by connecting the device to an external power supply.
3. Wait a second or two. If the device has an activity LED, it will start blinking or be turned on.
4. Device will then enter bootloader mode. Follow the instructions found on the manual included with the bootloader software download.

To Enter Device Into Bootloader Mode - NLED Aurora Control Software:

In the NLED Aurora Control software the button on the upper right on the Hardware Tab can be used to enter the device into bootloader mode. Note: Not all devices and firmware versions are compatible

To Enter Device Into Bootloader Mode - Aurora Command Protocol:

Note: Not all devices and firmware versions are compatible

1. Open the correct COM port assigned to your device to be updated. Supports USB or serial.
2. Select any baud rate, if using USB the baud rate is ignored, choose any of the options.
3. Send as ASCII "NLED11"
4. Device will respond as ASCII "a9"
5. Send as ASCII "nled99"
6. Device will respond as ASCII "f0"
7. Send as numbers "140 0 0 0 0" - see the Aurora Command Manual for command details.
8. Device will then enter bootloader mode. Follow the instructions on www.NLEDshop.com/bootloader

More details on the 'Enter Bootloader' Aurora Command, and other commands:

<https://www.nledshop.com/nledaurora>

Device Configuration Settings

Communication Options: This device has a header that can be used for addition of hardware for communicating or other uses. Only one of these can be enabled at a time, and may require additional configuration settings.

Disabled: Does not receive or transmit any data.

DMX Reception: Enables DMX-512 reception. Also enables RDM. Requires a DMX variant of the controller hardware.

DMX Master: Enables the controller to output a DMX-512 universe. The currently displayed stand-alone color sequence data is transmitted. Requires a DMX variant of the controller hardware.

Serial Command Mode: As described in a previous section, this enables Serial Command Mode. Allows Aurora Protocol commands to be issued to the controller from a serial device. Requires the Serial Baud Rate also be set correctly to match the connected serial devices baud rate. This feature does not function if the DMX transceiver is populated on the controller.

Serial Reception: As described in a previous section, this enables the expansion header to receive(on TX pin) serial data from a connected serial device for direct control of the output. The baud rate and Auto-Detect option should also be set for this to work correctly. This feature can function through the DMX transceiver or through the TTL serial header.

Expansion Header: This device has a header that can be used for addition of hardware for communicating or other uses.

Disabled: No function.

I.R. Addon Card 19200: Enables interface for infrared remote control addon card, set to 19200 baud.

I.R. Addon Card 250k: Enables interface for infrared remote control addon card, set to 250,000 baud.

Serial Baud Rate: Sets the expected baud rate used for serial reception and serial command mode communication. The controllers baud must match the baud rate of the connected serial device.

Serial Reception Options: Only used with Serial Reception *Communication Mode*.

- 8-bit values are expanded to 16-bit before latching to the output channels
- 16-bit values are expected MSB first
- RS485 enables reception through the differential/DMX transceiver and connector.

DMX Reception Mode: Options for DMX profiles/personalities. See DMX-512 Reception section.

DMX Address: The starting address for DMX reception.

DMX Reception Timeout: Sets the option to detect loss of DMX signal and returns to playing stand-alone color sequences. If a valid DMX packet is not received for 3 seconds, a timeout will occur.

- **Disabled:** DMX timeouts are ignored, output channels will hold the values last received.
- **Timeout & Continue:** Once a DMX timeout has been detected, controller will resume playing the currently selected stand-alone color sequence.
- **Timeout & Idle:** Once a DMX timeout has been detected, the user specified Idle color sequence will begin playing.

Device Configuration Settings(continued)

DMX Master Mode: Only used with DMX Master *Communication Mode*. Full packets will send the DMX-512 standard of 512 channels, regardless if data is populated on all addresses. Partial packets will send only the the data that is available, specified by the stand-alone sequence that is playing. Either 8-bit values or 16-bit values can be transmitted.

Gamma Correction: Enables or disables the use of the internal gamma correction formula applied to the output channels. The formula is static and can not be adjusted. The formula expects the output channels are ordered R-G-B-W, as the calculations are based on the color being corrected.

Auto-Detect Communication Reception Mode: Options allow the device to detect and automatically switch from stand-alone to the selected communication mode when a valid signal is received.

Always Start on Sequence #1 at Power Up: Normally when the device powers on it will resume playing the color sequence it had been when it was previously powered off. When this configuration is enabled the device will instead play the first color sequence on the index when it powers up.

PWM Profile: Set the PWM frequency and resolution for the outputs. Higher frequencies produces smoother light with less flicker, but has lower resolution. Resolution is the number of 'steps' of light levels, expressed in bits. 16-bits has 65,536. 12-bits has 4096. 8-bits has 256.

Note: The PWM resolution does not affect the data values used to set the output colors, data values are internally down converted to match lower resolutions if required.

Values are shown as: Resolution - Frequency

- 16-Bit, 488Hz
- 15-Bit, 976Hz
- 12-Bit, 7.8Khz
- 10-bit, 31.2Khz
- 9-bit, 62.5Khz

Controller Pinout

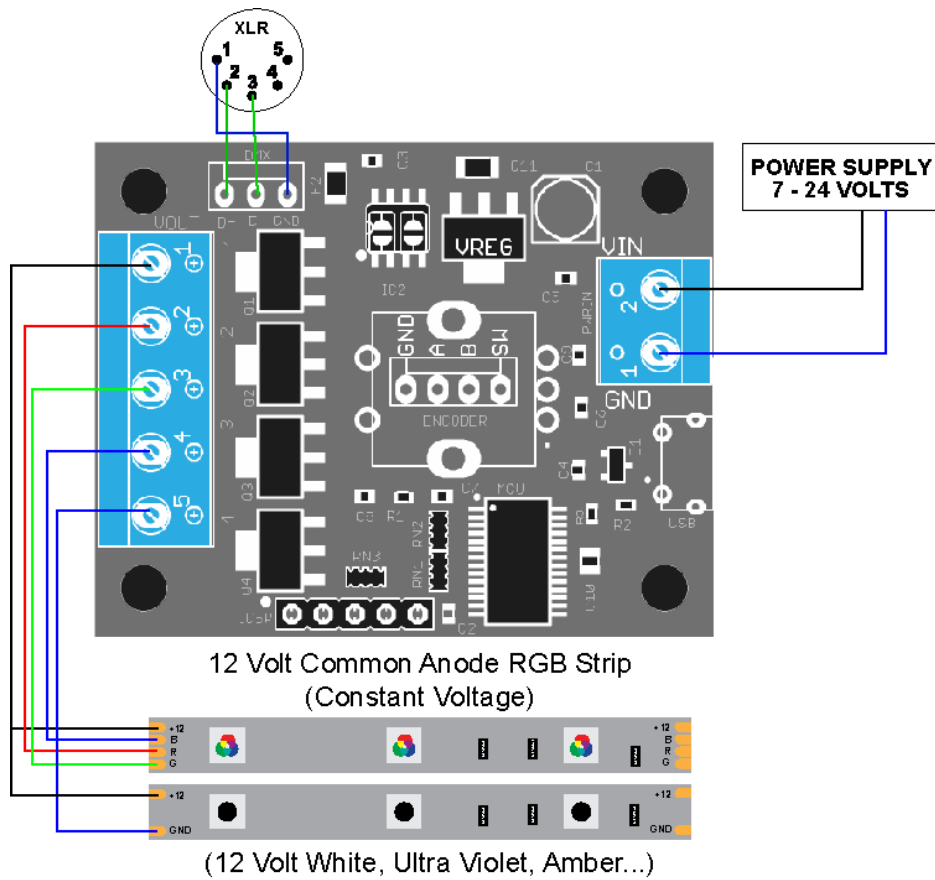


Fig. 12a

LED Connections

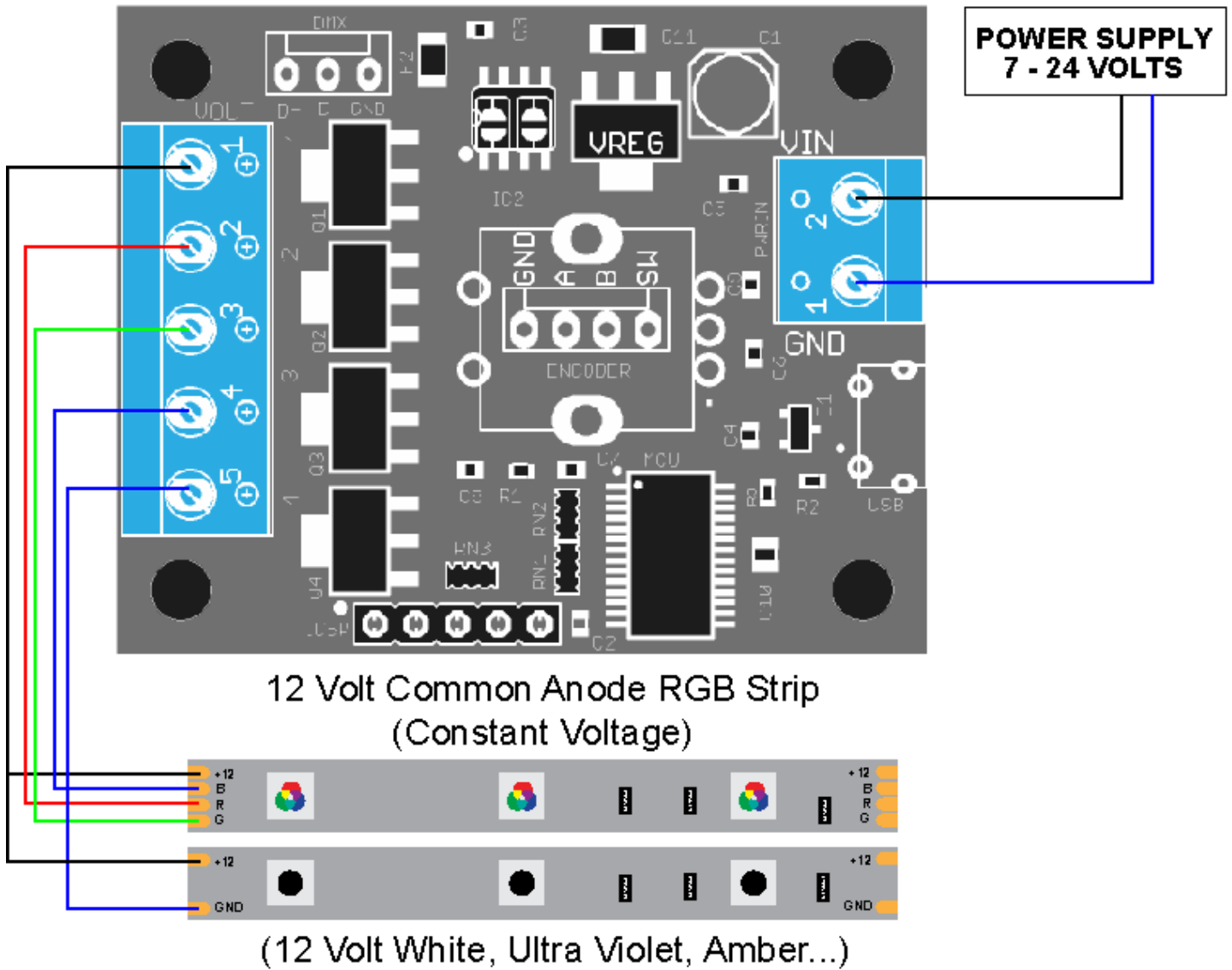


Fig. 13a

Power Considerations

The micro USB connector does not supply power to the controller, it only provides data. An external power supply must be used.

Connector Options

Pluggable Screw Terminal: . These plug terminals accept wire between 12AWG and 24AWG, depending on the wire gauge, multiple wires can be connected to the same terminal. Requires a small flat/slot screw driver. A receptacle overhangs the board edge, which allows it to protrude from an enclosure. And a removable(pluggable) terminal block is plugged into the receptacle. Green colored.

Bare/Unpopulated: No Input or output connectors. Bare solder pads can be used to directly attach wires or other types of connectors.

Standard Screw Down: Regular screw down terminals that supports 14-22 AWG wire. Requires slot/flat screw driver to install. Blue colored.

Dimensions and Mounting

3D .step models can be found on the device's webpage. Connector option drawings are not yet provided.

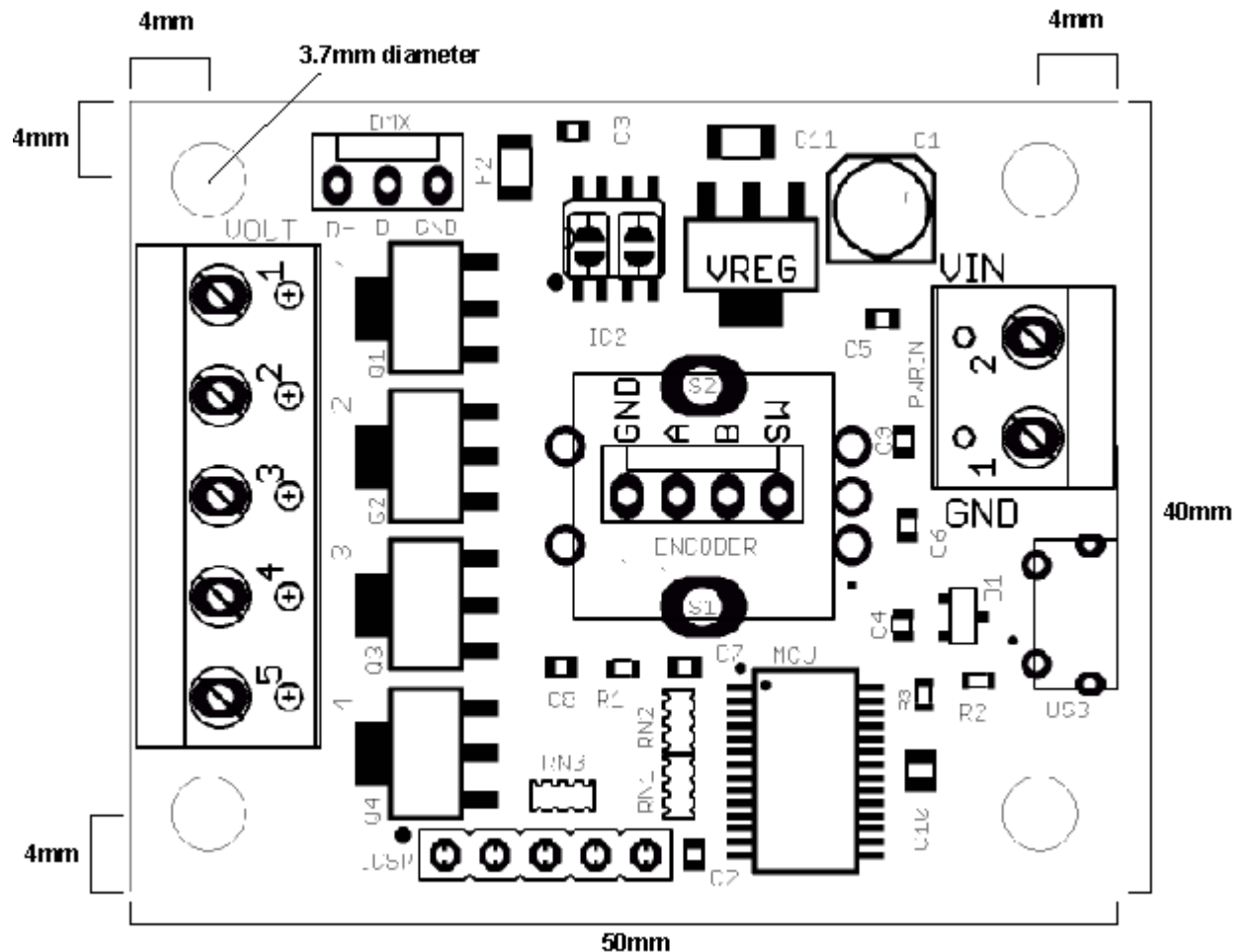


Fig. 15a

Mounting Notes:

Do not allow the PCB to touch anything conductive.

Do not allow foreign material to fall onto or accumulate on the device.

The device should be kept dry and clean. If the device becomes wet or dirty, do not use until it is cleaned and dried. Contact Us for assistance.

Device Setup

Setup: It is recommended you also read the NLED Aurora Manual found in the download folder.

1. Connect the controller to a computer using a micro USB cable.
2. The controller is bus powered and should power up. Wait for the computer to load the driver (most systems should not need to install the driver or check the INF driver folder in the software folder).
3. Start the software, navigate to the hardware tab, on the left side select the controller's COM port.
4. The device should identify itself, and the Connect button should turn from red to green. The hardware configuration setting controls will also be displayed.
5. Adjust the configuration setting controls on the Hardware Tab to suit your project see the Device Configurations section for details.
6. Once the configuration settings are adjusted, navigate to the Connection Tab, and click the "Upload Configurations" button, you will be notified of a successful upload.
7. Connect your LED pixels of choice as described in the LED Connections section
8. Apply suitable power to the controller and pixels, see the Controller Pinout section. The controller and pixels should start running a stand-alone color sequence, if not press the button or load new sequences.

Common Issues and Troubleshooting

Most issues can be resolved by power off the device, waiting a few seconds, and powering it back up.

Problem: Device with connected LEDs does not produce any light.

First ensure the LEDs are properly powered and wired to the controller and power source. Try to cycle through the Sequences or modes using the button. And ensure you have selected the correct pixel chipset.

Problem: Device connected, LEDs are strobing or not working

Ensure you have selected then uploaded the correct Pixel Chipset configuration setting.

Problem: Device appears to be “bricked”, unresponsive to user inputs and/or communication(USB etc)

Attempt to upload a new firmware image via the Bootloader, see page 9 for details.

Problem: USB connection is not being established.

Check to make sure the USB cable is plugged and seated correctly. Check for connection via NLED Control or your operating systems device manager, it should be listed as a COM port.

Problem: Operating systems indicates the driver can not be found.

The driver can be found possibly through Windows, or by locating and directing the operating system to the INF driver file found in the NLED Aurora Control folder.

Have Any Ideas For Future Updates?

Northern Lights Electronic Design, LLC is constantly looking to make our products better and improve upon our designs. If you have any ideas for future products, updates to current products, or features that you would find useful, please Contact Us at Sales@NLEDshop.com. There is a good chance your ideas could be utilized, you could also receive coupons or free items for your feedback.

NLED is available to create new designs and derivatives of current designs customized to the clients requirements, please Contact Us with your specifications.