

# 24 Channel High Current USB LED Controller v.3

This device is designed to be a versatile high-current LED controller, with the ability to sink or/and source currents up to 1A per channel with dissipation of up to 2.5w per channel. The various jumpers and transistor placement allow the device to control many different types of LED configurations with LED voltages of up to 36v.

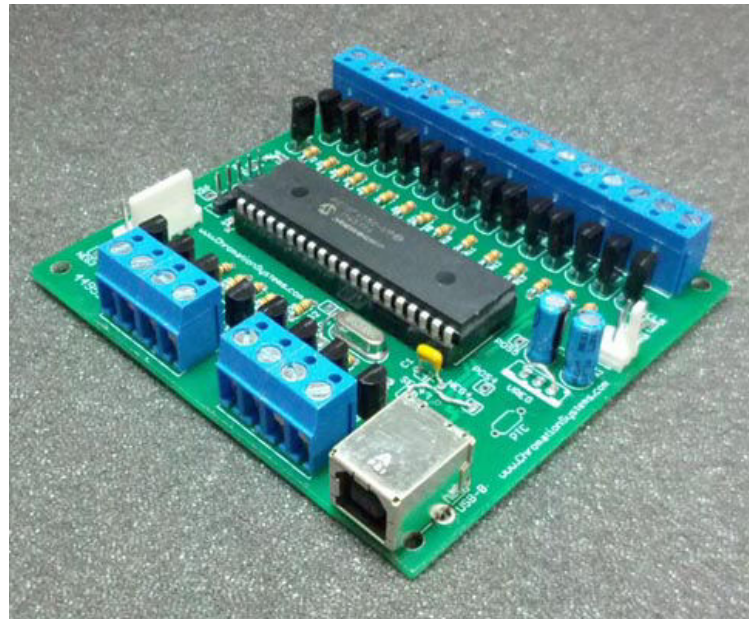
Easily controls 5mm , 1w, 3w, 3w RGB, 5w RGB, 12v RGB LED lightstrip, 12v solid color light strip, common anode RGB LEDs, common cathode RGB LEDs. Any combination of LEDs in parallel/series. Whatever kind/wattage/configuration can be made to work, to a max of 1A per channel or 1w dissipation.

A PIC18F4550 controls 24 high-current darlington transistors. The PIC is ready for USB communication and using Microchip's Library there is a multitude of USB connected devices can be made. From an emulated serial port, keyboard, mouse, HID, MIDI Devices, Audio Devices, and more. The available premium firmware allows the device to interact with the ColorMotion computer software, to create and upload patterns and settings to the device.

There are 4 I/O pins left for other purposes, such as Switches, AdC(potentiometer), more transistors/MOSFETS, shift register whatever is required. Accessed via the 6-pin polarized header, pinout see pg. 2

## Features:

- 24 high current outputs
- Outputs configurable to sink or source.
- USB Connected, create an emulated COM port, HID Device, and more.
- Up to 1A per channel or 1w transistor dissipation.
- Output/Input voltage configurable, 5v - 48v.
- 8-bit PWM, 256 brightness levels, that is 16 million colors in RGB mode.
- Outputs are in sections of 8 and can have their sink/source configured independently, easy to multiplex for more channels.
- Multiple configurations of LEDs, with various voltages, wattage, and types. See pg. 5
- Fast PWM Speeds, *Default: 114 hz, or Variable*
- Versatile configurations

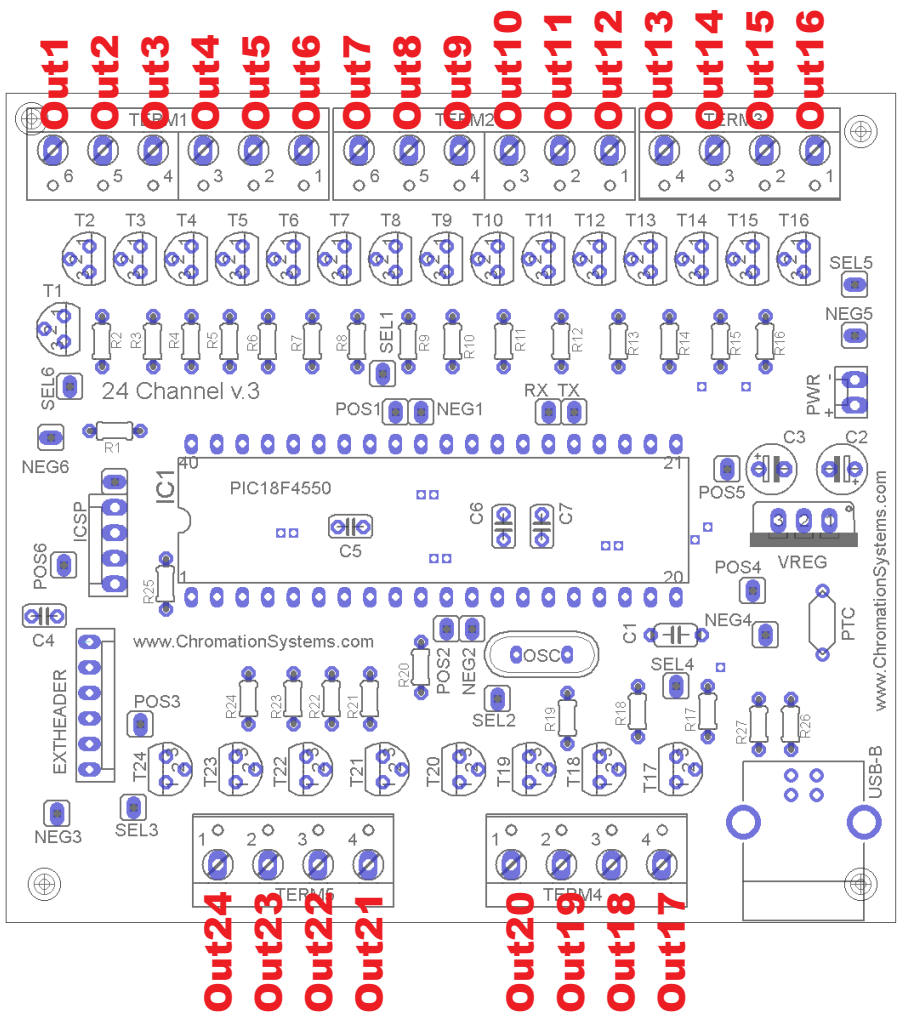


## Specification:

|                |                                      |
|----------------|--------------------------------------|
| Device Voltage | 5v*                                  |
| Output Voltage | 5v - 48v**                           |
| Current        | up to 1A sink or source              |
| Output         | 24 channels, various voltage/current |
| Connectors     | Screw Terminals                      |
| Dimension      | 3.5" x 3" x 1"                       |

\* Device requires a 5v to function.

\*\*Each of the 24 channels can handle this much voltage when sinking or sourcing.



## Terminal Pinout - RGB Mode:

|                 |                 |
|-----------------|-----------------|
| Out1 - Red 1    | Out13 - Red 5   |
| Out2 - Green 1  | Out14 - Green 5 |
| Out3 - Blue 1   | Out15 - Blue 5  |
| Out4 - Red 2    | Out16 - Red 6   |
| Out5 - Green 2  | Out17 - Green 6 |
| Out6 - Blue 2   | Out18 - Blue 6  |
| Out7 - Red 3    | Out19 - Red 7   |
| Out8 - Green 3  | Out20 - Green 7 |
| Out9 - Blue 3   | Out21 - Blue 7  |
| Out10 - Red 4   | Out22 - Red 8   |
| Out11 - Green 4 | Out23 - Green 8 |
| Out12 - Blue 4  | Out24 - Blue 8  |

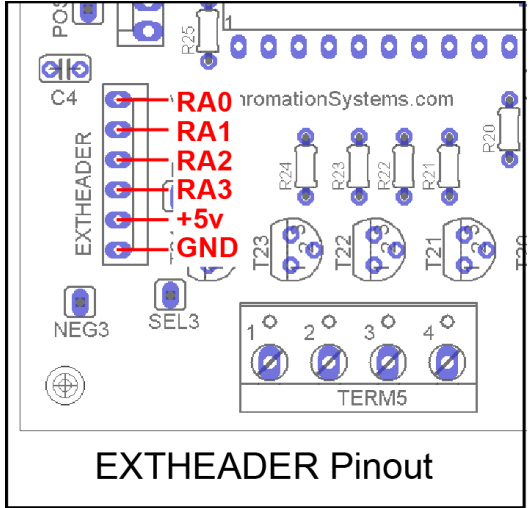
\*In Mono Mode(single color LEDs) the outputs are in order.

## Parts List:

|             |                        |
|-------------|------------------------|
| R1 - R24    | 1k ohm                 |
| R25         | 10k ohm                |
| R26 & 27*** | 22 ohm                 |
| C1          | 220 nF                 |
| C2          | 1 uF                   |
| C3          | 1 uF                   |
| C4          | 0.1 uF                 |
| C5          | 0.1 uF                 |
| C6 & C7     | 22 pF                  |
| VREG        | 7805*                  |
| IC1         | 18F4550                |
| OSC         | 20mhz Series           |
| PTC         | Fuse**                 |
| USB-B       | USB Type-B Jack        |
| T1 - T24    | MPSW45AG<br>or similar |

## EXTHEADER:

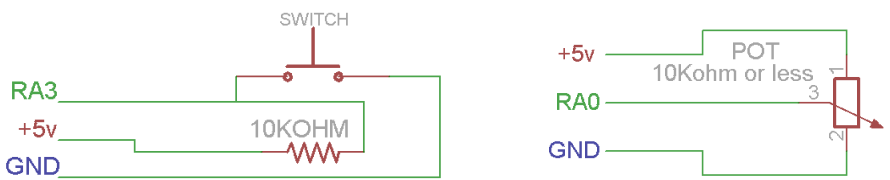
The EXTHEADER can be used to connect inputs such as switches, and potetioemeters, or additional outputs such as a shift register, MOSFETs or additional transistors.



EXTHEADER Pinout

### Pinout:

- RA0
- RA1
- RA2
- RA3
- +5v(logic)
- GND



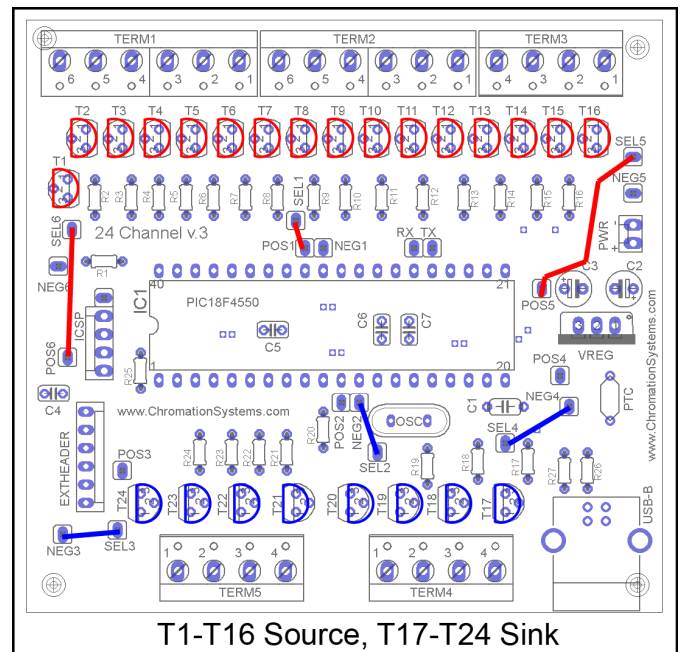
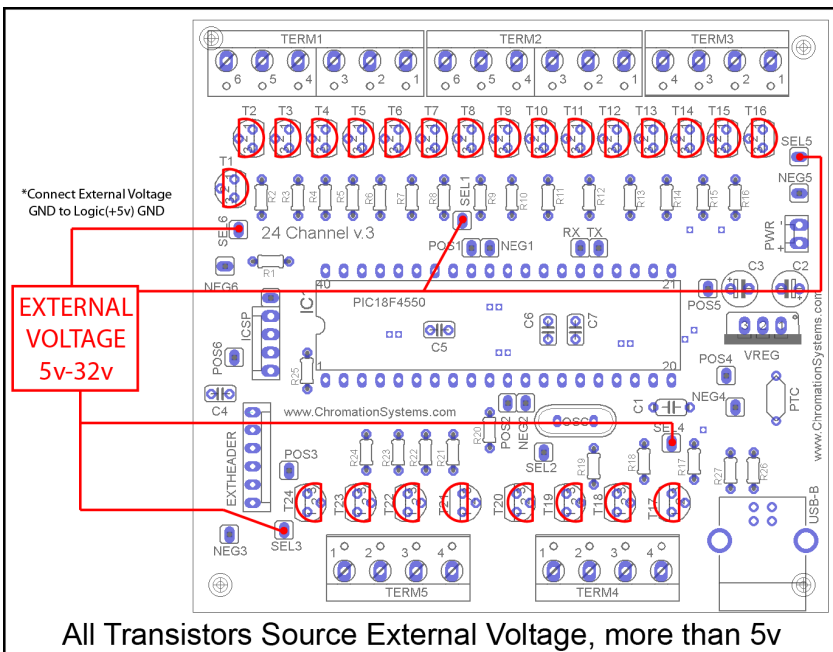
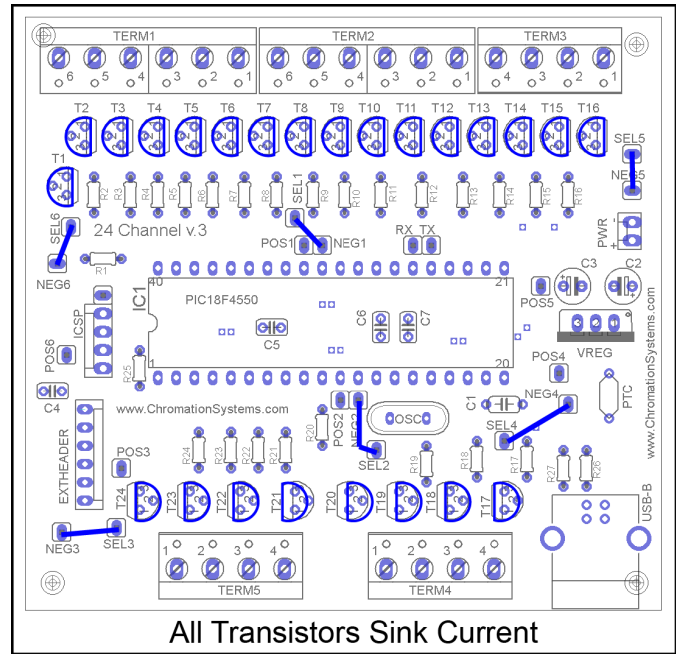
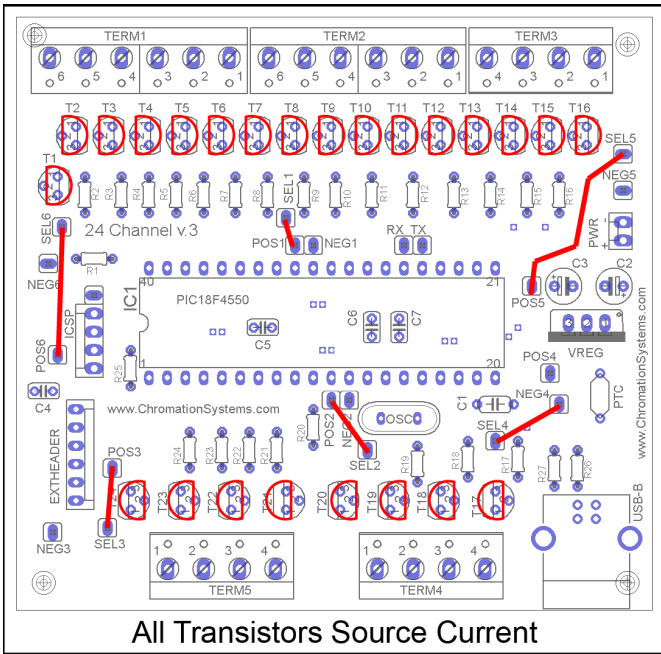
\*Part is optional, the 7805 needs a good heatsink.

\*\*PTC fuse is not needed, as the device draws to much current to be powered from USB.

\*\*\*Version 3 PCBs require these be crossed, see instructions

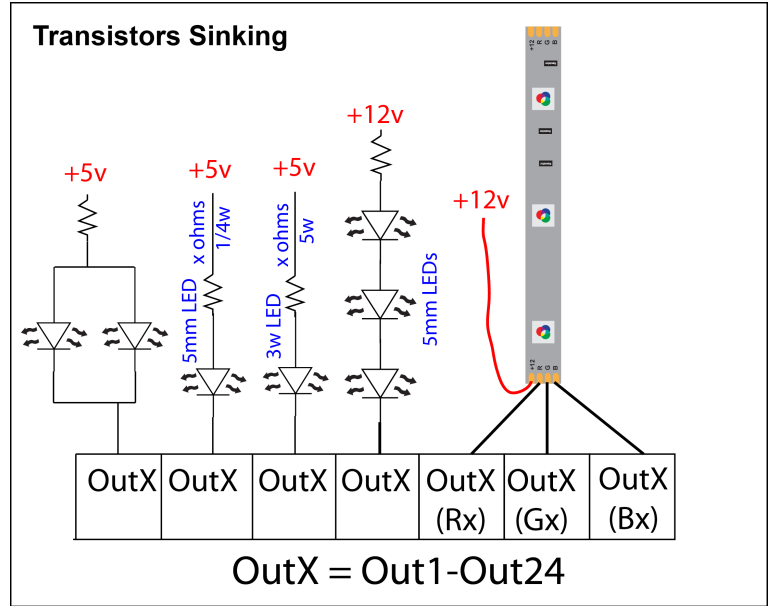
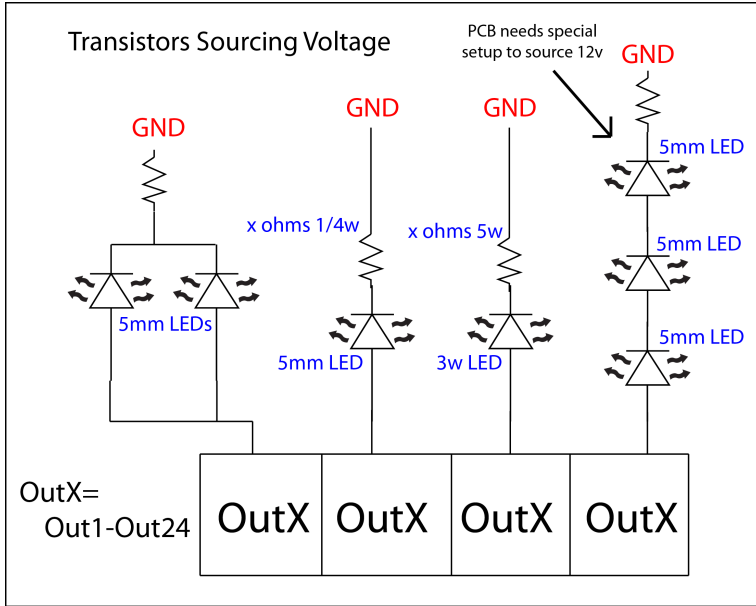
## Jumper Configurations:

The jumpers are configured in various ways to allow the outputs more versatility. The outputs are divided into two sections, one with 16 outputs the other with 8 outputs. Each side can be configured to sink or source current independently from the other. A few examples are shown below.





## LED Configurations Options:



All LEDs require a resistor to limit the current when connecting to this device.  
Many more configurations are possible, contact for details or help.

## Firmware Options:

### ColorMotion Compatible:

The full version of the ColorMotion Compatible firmware can take advantage of all ColorMotion's features. Create and upload user created settings and patterns to the device. The device can hold 8 cycling patterns with up to 16 colors per. And 4 flash patterns, choose the color for each LED channel for each frame, each Flash pattern contains 8 frames. Flash patterns can also be set to slide the colors from one channel to the next, up or down. Or the LEDs can be controlled through live communication with a computer through a USB port.

Please visit [www.ChromotionSystems.com/ColorMotion](http://www.ChromotionSystems.com/ColorMotion) for details.

### Demo ColorMotion:

All features of the full ColorMotion firmware are functional except for the uploading to the device of user created patterns and settings. Patterns can still be created and previewed(Demo Button) and will run till the device is powered down. Live communication from a computer to device is fully functional.

### Open-Source Project:

Check the website for the most up-to-date information and files.

The device can use Microchip Solution's Code Examples, many to options choose from. Use and modify the PICDEM Development Kit source files.

### MonoMotion Compatible:

Functions much like ColorMotion, but is for single color(Mono) LEDs, it allows custom patterns, animations, and other settings to be created by the user with the software and uploaded to the device

### Bootloader:

Based on Microchip Solutions HID Bootloader. Usage: Open HIDBootloader executable, Hold RA1 low(to GND) during startup to enter device into bootloader mode, the software will acknowledge the device connection, Select the new HEX file and click the program button.