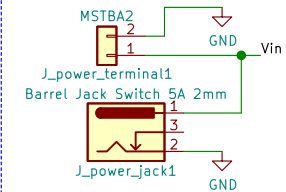


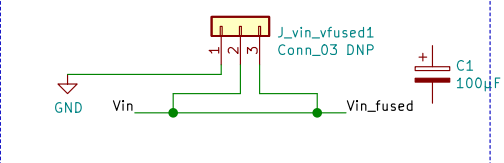
Input Connectors

Make sure to feed Vin with voltage that the LED strip can handle.
Two connector options for power:
• Phoenix Contact MSTBA
• Barrel Jack 2x6.4mm



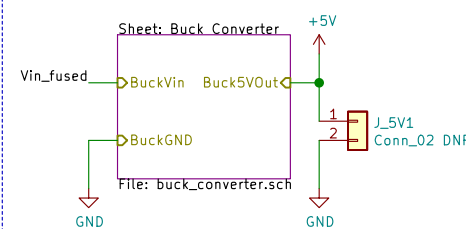
Input Protection

- P-Fet fuse here
 - Polarity protection
 - Add Power LED
 - Test pads
- <https://www.mouser.se/ProductDetail/Infineon-IR/AUIR3315STRG/>
<https://www.mouser.se/datasheet/2/196/aur3315-1225292.pdf>



5V Buck

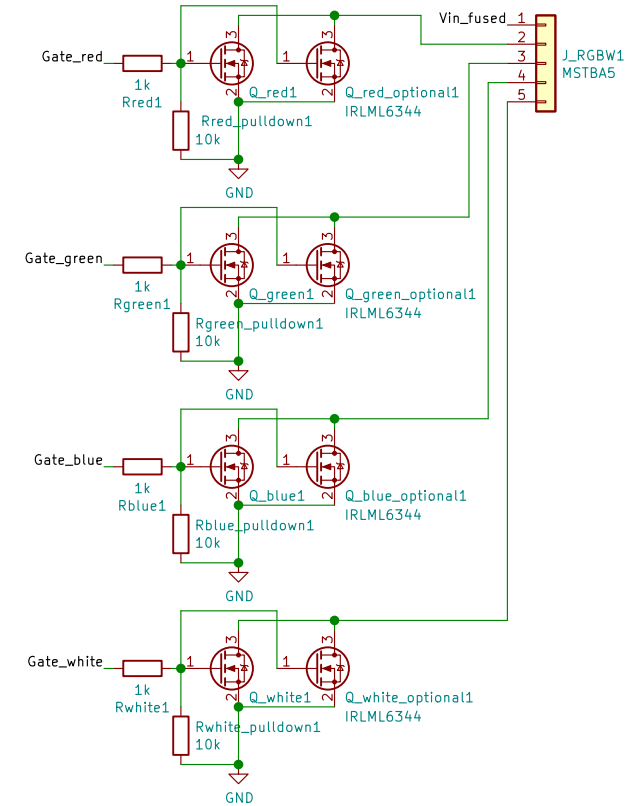
The 5V buck converter will feed the micro controllers with 5V DC.



RGBW LED Driver (CV-mode)

LED driver is made for LED strip that have red, green, blue and white channels that have a common positive rail like +12V.

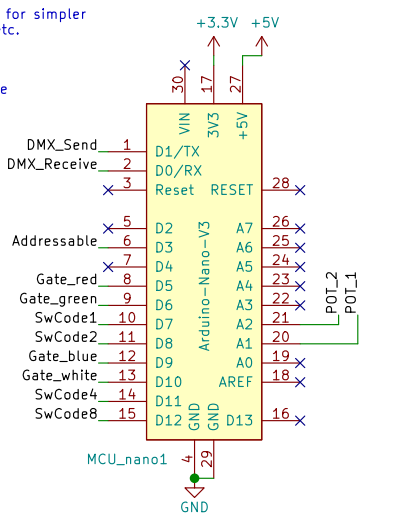
The LED driver can drive 4 output channels in constant voltage mode at 5A each. The channel can drive up to 10A current if an optional IRLML6344 is mounted. A 5m LED strip consisting of 300 LEDs will draw 6A (20mAx300) when fully lit. A full RGB strip 18A, and a RGBW strip 24A.



MCU Option Nano

Populate the Arduino Nano for simpler jobs like DMX controlling etc.

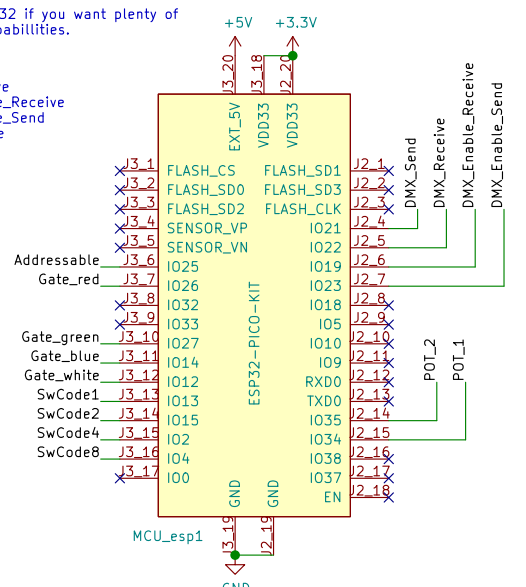
- Ports:
- D1 PD0 (TX) DMX_Send
 - D0 PD1 (RX) DMX_Receive
 - D3 PD3 addressable
 - D5 PD5 red
 - D6 PD6 green
 - D9 PB1 blue
 - D10 PB2 white
 - A1 PC1 POT_1
 - A2 PC2 POT_2
 - D7 PD7 SwCode1
 - D8 PB0 SwCode2
 - D11 PB3 SwCode4
 - D12 PB4 SwCode8



MCU Option ESP32

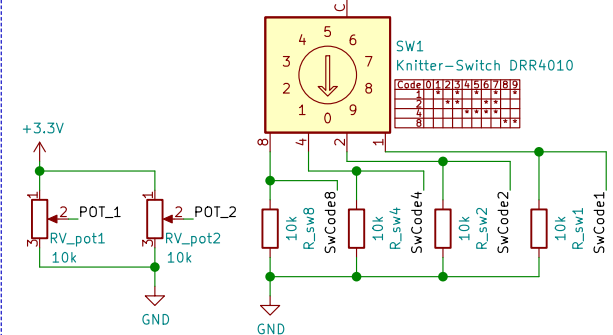
Populate the ESP32 if you want plenty of power or WiFi capabilities.

- Ports:
- I021 DMX_Send
 - I022 DMX_Receive
 - I019 DMX_Enable_Receive
 - I023 DMX_Enable_Send
 - I025 addressable
 - I026 red
 - I027 green
 - I014 blue
 - I012 white
 - I034 POT_1
 - I035 POT_2
 - I013 SwCode1
 - I015 SwCode2
 - I02 SwCode4
 - I04 SwCode8



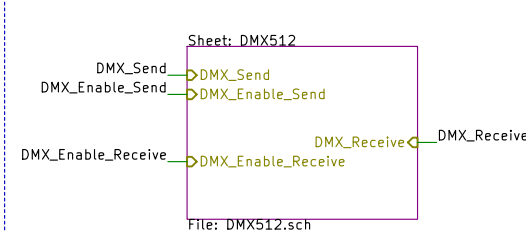
User Interface

2 potentiometers can be utilized to hue and brightness for example. The pot's give out max 3.3V. There is also a 10 position rotary code switch that can be used for modes.



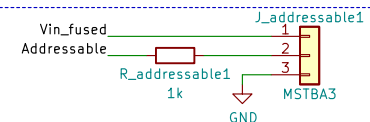
DMX512 Isolated

A RS-485 transceiver can optionally be mounted for sending and receiving DMX512. See sheet DMX512 for configuration.



Addressable LED

Make sure to feed Vin with the right voltage for the LED strip. Usually 5V for addressable LED strip.



<http://tim.gremalm.se/>
<https://github.com/TimGremalm/LightBoxNano>

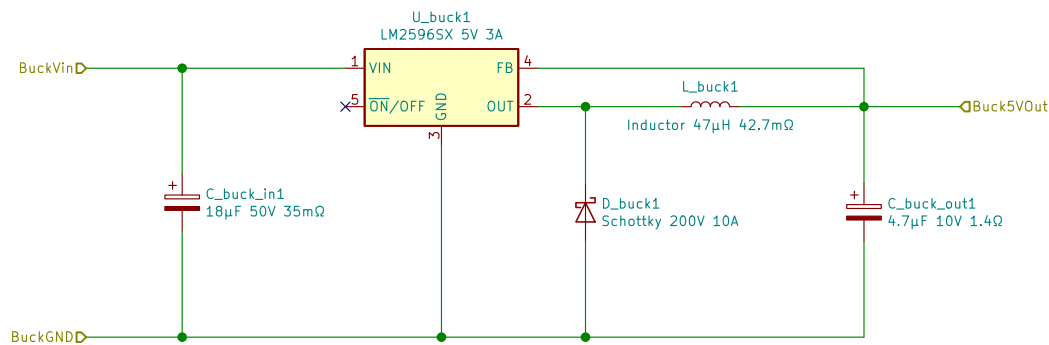
a generic PCB for controlling LED's both LED strip and WS2812
Tim Gremalm

Sheet: /
File: LightBoxNano.sch

Title: LightBoxNano - Main

Size: A4 Date:
KiCad E.D.A. kicad (5.1.5)-2

Rev:
Id: 1/3



Using TI's LM2596 guide:

Vin: 30V

Vout: 5V

Iout: 3A

Efficiency: 77.1%

Duty Cycle: 19.95%

Frequency: 150kHz

Vout p-p: 945.86mV

<https://webench.ti.com/power-designer/switching-regulator/select>

<https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=572687AF787DDED1>

<http://tim.gremalm.se/>

<https://github.com/TimGremalm/LightBoxNano>

a generic PCB for controlling LED's both LED strip and WS2812

Tim Gremalm

Sheet: /Buck Converter/

File: buck_converter.sch

Title: LightBoxNano – Buck Converter

Size: A4

Date:

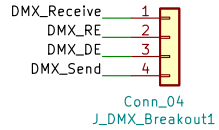
KiCad E.D.A. kicad (5.1.5)–2

Rev:

Id: 2/3

MCU Interface

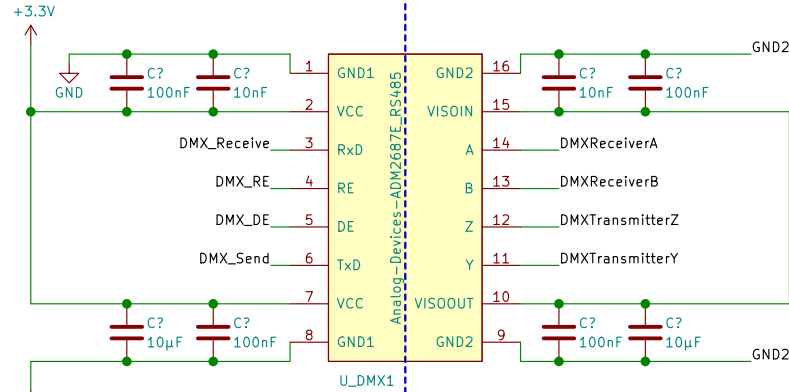
DMX_Send \rightarrow DMX_Send
DMX_Enable_Send \rightarrow DMX_DE
DMX_Receive \rightarrow DMX_Receive
DMX_Enable_Receive \rightarrow DMX_RE



RS-485 Transceiver

For sending and receiving DMX512 a Analog Devices ADM2687E is used which isolates the RS-485 bus from the low voltage micro controller side.

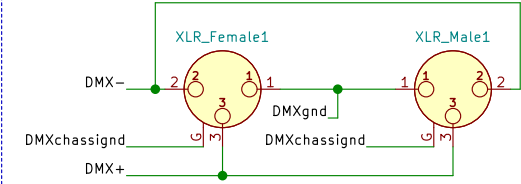
ADM2687E also isolates the power on the bus side by a built in DC to DC converter.



- * DMX Terminator resistor is 1206 for isolation.
- * Place capacitors as close to ADM2687E for noise suppression.

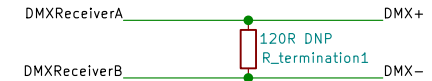
DMX Connectors

Neutrik female (NC3FAAH2) and male (NC3MAAH) 3 pin XLR connector is used for DMX512.



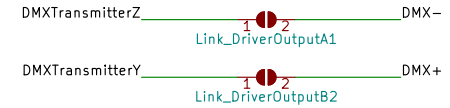
Terminator

A RS-485 bus is terminated by a 120 ohm resistor. This can be mounted here if needed.



Link Tx to Rx (Optional)

For enabling sending on the DMX bus, these two jumper links must be soldered.



Link Ground (Optional)

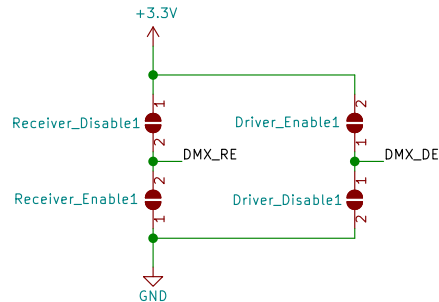
Options for linking ground and shield of XLR connectors with RS-485 side of the transceiver.



Configure Transceiver (Rx & Tx)

To receive data on the DMX bus; RE (Receiver Enable) must be pulled low, or high for disable.
For sending data; Tx to Rx link must be enabled, and DE (Driver Enable) must be pulled high, or low to disable.

RE and De can be controlled from the MCU, or hard coded via these jumper links.



Sheet: /DMX512/
File: DMX512.sch

Title:

Size: A4

Date:

KiCad E.D.A. kicad (5.1.5)-2

Rev:

Id: 3/3