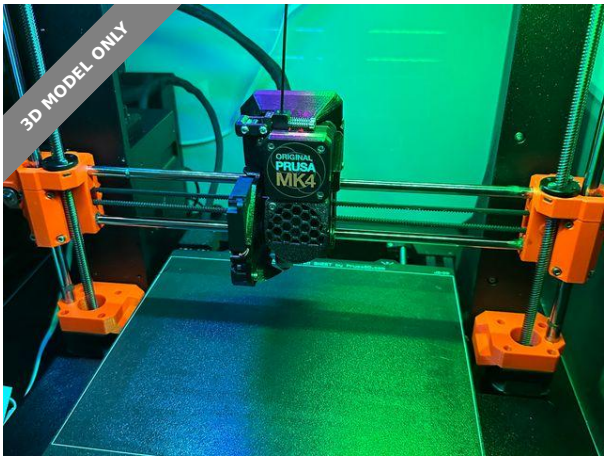

D1 Mini WLED Case for Prusa MK3/MK4 Frame

db

VIEW IN BROWSER

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Summary

Make your enclosure extra fancy with WLED

3D Printers > Prusa Parts & Upgrades

Tags: mk3 led mk3s lights d1 wemosd1mini d1mini wled mk4 mk3splus ledlightbar

This is a small box to hold a Wemos D1 Mini, a DC Buck Converter and the wiring for indivually addressable LED strips. This is meant to complement the fantastic designs by In3DSpace, allowing use of addressable LEDs controlled by WLED. This does require a small amount of soldering. The base design for the D1 Mini Mount is from the linked design by Murdoc.

Hardware

WEMOS D1 Mini
5V LED Light Strip (I used aSK6812 RGBW RGB+Natural White strip with 60 pixels/meter)
DC Buck Converter set to a little over 5 volts
Shrink Tubing
Flexible Cable Sleeve
Closed Crimp Connectors
20 AWG Wires

JST SM Connectors
Zip Ties
Soldering equipment
(2) M3x8 flat screws
(4) M3x8 flat screws
(4) 6mm M3 brass inserts
(2) Fork Spade Crimp Connectors
A light bar design of some sort, I recommend these MK3 LED Light Bar or MK4 LED Light Bar
Links are for reference and are not necessarily the exact components I used.

Setup

For the dual light bar configuration 18 pixels was adequate for each side, giving a total of 36 pixels. When bench testing all lights (white and RGB) at full brightness, the total power consumption for the setup is less than 400 mA. It is unlikely that you will use all of the LEDs at full brightness at the same time, therefore the current draw will be much less. I elected to not use a logic level converter for this setup to save space. No signal degradation is observed.

Print all necessary files for the light bar kit you are using and obtain all hardware as directed with the exception of the LED light strip as this will be replaced with the addressable LED strip. Use filament appropriate for your application, especially if using in an enclosure.

Print the case and a lid.

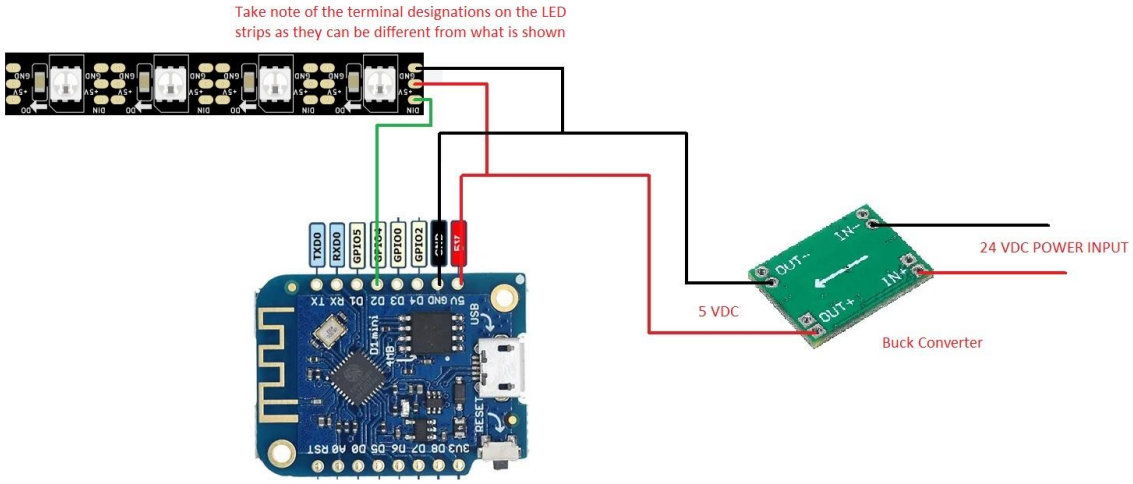
Install WLED onto the D1 Mini and connect it to your network. Disconnect the power/USB cable once completed.

Insert the brass inserts into the case.

Follow the installation guide for one of the above mentioned LED Light Bars and add a third wire (green) for the data signal to the wire runs. Do not connect any wires the light strips at this point.

Connect the buck converter to 24V and set the output to a little over 5 volts. Solder the supply positive and negate wires to the input side of the buck converter, ensuring they are long enough to reach back to your power supply (you will terminate these in a later step). Solder a short length of wire to the output side of the buck converter. Cover the entire assembly in heat shrink tubing for protection. Slide the supply wires through the small opening in the case (on the end with the extra space) and secure the wires with a zip tie through the openings. Cut the excess zip tie.

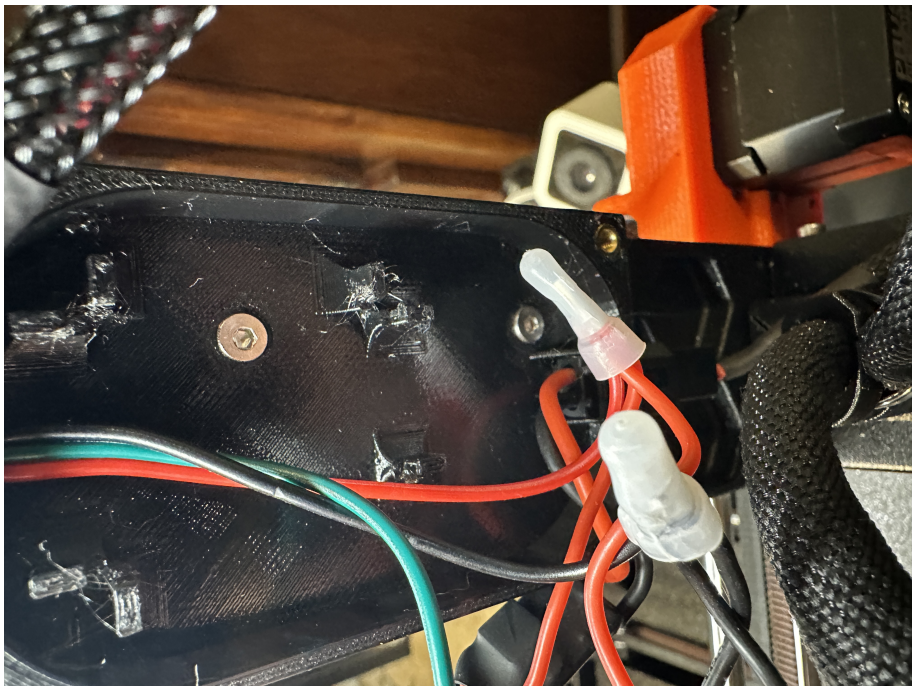
Solder a short length of wire (approximately 5cm) to each the 5V (red) and G (black) to the D1 Mini. If desired, size, cut, and slide a flexible cable sleeve over the wires of a JST SM male connector assembly only covering the wires about half the length. Insert the bare wire ends of the JST SM male connector assembly into the hole on the opposite end of the case and secure it with a zip tie through the openings. Cut the excess zip tie. Separate the wires on the JSM SM male connector assembly and solder the data wire (green) to one of the D1 Mini GPIO Pins (I used D2 which is GPIO 4). Do not snap the D1 mini into the case yet. Splice all of the positive (red) wires together using a closed crimp connector. Repeat with the negative wires (black).

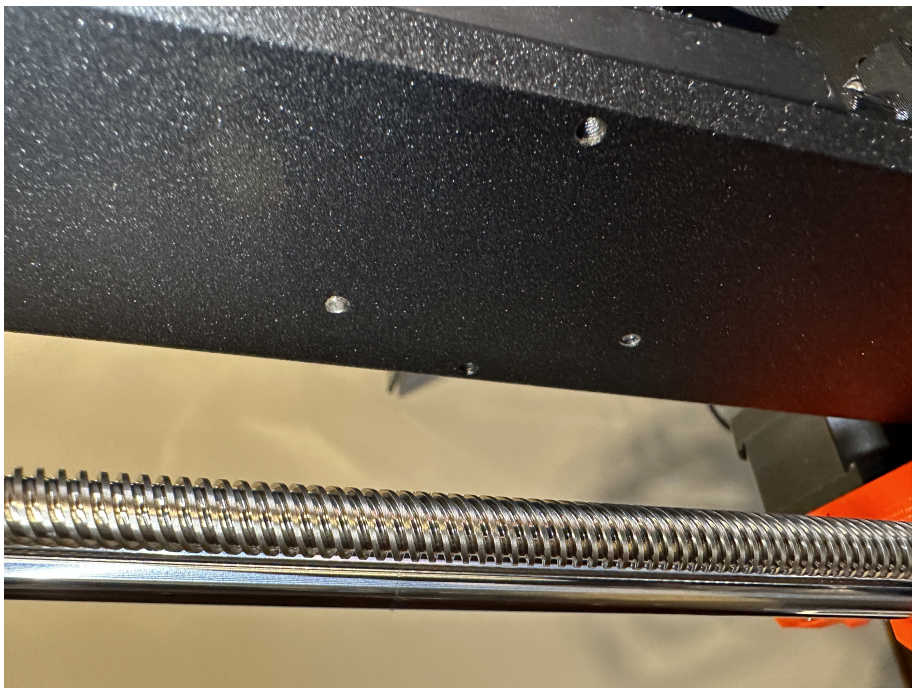


Assemble the light bar and solder the wires to the LED strips, being mindful of the arrows on the strip that indicate the data direction and the positive and negative terminals. Ensure the arrows to point away from the D1 Mini and continue that direction through all connection points. Reversing the direction will prevent the lights from operating! You will likely need to extend the wires for JST SM female connector on the LED strip. I found it easier to remove the factory installed JST SM female connector from the light strip, extend the wires, feed them through the Light Bar assembly, and then reconnect the wires to the LED strip. Cover any splices with heat shrink tubing. Use a flexible cable sleeve if you prefer for a neater look.

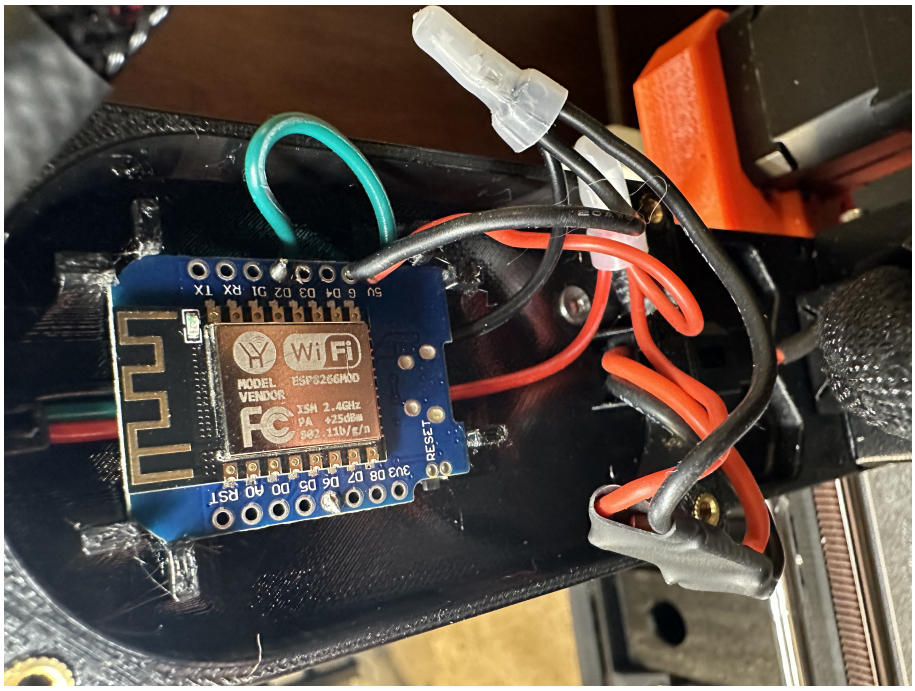
At this point you should have a light bar assembly and the case with the D1 Mini and wires. Install the Light Bar per the instructions for whatever light bar you choose to use. Secure the case to the back of the frame above the box with the main board using two M3x8 flat screws through the holes provided into the threaded holes on the frame. The holes are in the same place on the MK3 and MK4 frame (I have this same setup on both of my printers). I had to run the screws through the hols first to clear the

threads as there was some paint debris inside them. When installing the case, ensure the screws are flush with the other side of the frame as any protruding screws can interfere with the Z Axis movement.





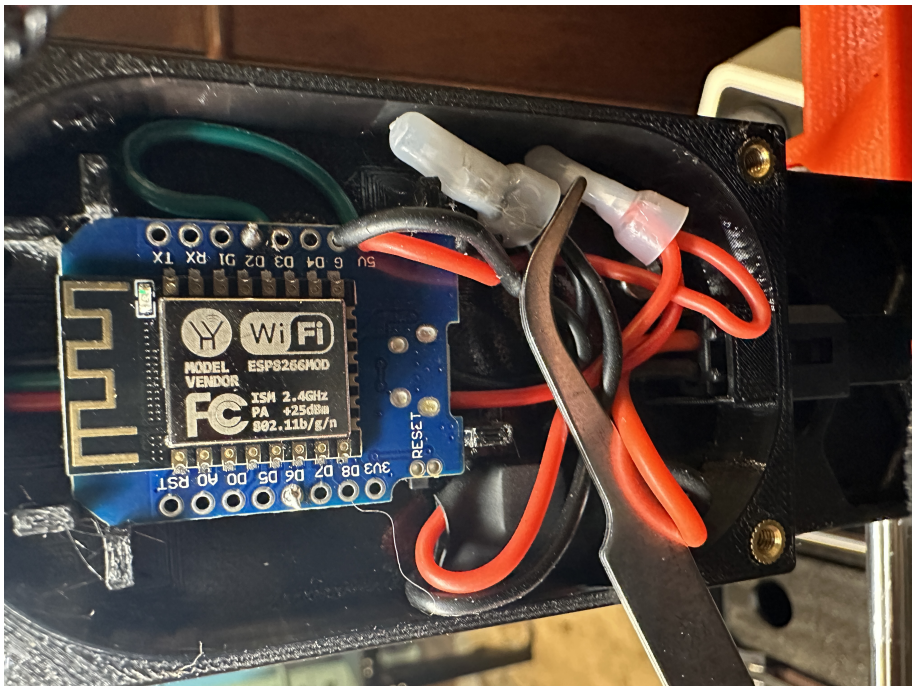
Snap the D1 Mini into the mount.



Connect the JST SM wires together.

Follow the instructions provided in the Light Bar you elected to use to connect the power wires. I terminated each of the power wires with fork spade connectors and connected them directly to the power supply terminals, being mindful of the positive (red) and negative (black). Some installations suggest connecting them to the main power input terminals of the main board. Either option is fine. Do not connect the wires to the bed heater terminals!! Don't forget to use a flexible cable sleeve for neater look.

Tidy the wires inside the case and attach the cover using 4 M3x6 screws. Power on your printer and allow for WLED to boot. The lights may turn on but the behavior at this point will not be as expected as WLED needs to be configured to work with the setup.


5V G D4 D3 D2 D1 RX TX
WiFi
MODEL ESP8266MOD
VENDOR
ISM 2.4GHz
PA +25dBm
802.11b/g/n
RESET
3V3 D8 D7 D6 D5 D0 A0 RST

Navigate to the WLED interface for the device. Navigate to CONFIG > LED PREFERENCES.

- Ensure ENABLE AUTOMATIC BRIGHTNESS LIMITER is enabled. Set the MAX CURRENT to limit to 850 mA. I set the LED voltage to CUSTOM and set the CURRENT PER LED to 25 mA based off of what I found in bench testing. Feel free to leave this at the defaults if you do not feel comfortable changing it.
- Under LED OUTPUTS change the drop down box to match the chipset of the LED strip you are using. If using the one linked, select SK6812 RGBW.
- Set the length to 36 if using the dual light bar, otherwise 18 (or however may pixels you used for your light setup.
- Set the GPIO to 4, or whatever GPIO Pin you soldered the data wire to.
- Scroll to the bottom and click save.
- Click BACK to return to the WLED interface.

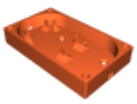
Play around with WLED and ensure the colors match up to what you select. If they do not, you may have to navigate back to the LED preferences and change the section marked color order. Keep trying this until Red, Green, and Blue all display correctly. There are many tutorials available for how to deep dive into WLED. There is also an Octoprint plugin for WLED.

This remix is based on

WeMos D1 mini case

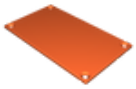
by Murdoc

Model files



case.stl

cover-vented.stl



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