



The Juice Box - XL4015 Buck Converter Housing Printer Upgrade



JuicyLegend

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Summary

A nice box for the XL4015 Buck Converter. Can house up to 3 converters. Use M3 nuts and bolts to secure to the printer.

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I was looking for a box that could house the buck converters, because I was making the noctua fan upgrade on my Ender 3 Max and these were readily available to me. Unfortunately there wasn't a housing in existence for the XL4015 Buck Converter that could house more than 1 converter. So when you want to have something done the way you like, you should make it yourself. So the Juice Box was born, which was heavily inspired by the housing made by @HD_Creator.

The total project just took a couple hours. The print in the picture was made with a 0.4 mm nozzle at 0.16 mm dynamic printing quality. They can be printed simultaneously, but I found it better to print them separately to preserve the lettering better and to make sure the cover doesn't curl up. A brim can be used, but is not mandatory. The honeycomb pattern on the side provides enough airflow for the converters to stay cool. There are .stl and .3mf files, of which two different designs are featured. The files named ..._ROUNDED feature rounded corners on the front of the box, that is all that's different. Also don't forget to set the potentiometers on the converters to 12V and make sure to turn the cover upside down in your slicer ! !

This design uses 2 of these things: <https://www.thingiverse.com/thing:3050607> made by DaVinci2000 ,to secure the box to the printer. Although the bolts are quite difficult to get in. You can use standard M3 nuts and bolts to secure. I placed the box under the printbed so it is protected by the beams of the printer, but it has a nice glow to it when you look at it from the side so that's also possible.

The converters can be secured to the board with fine threaded 5mm long M3 computer screws or self threading screws (haven't tested the latter). The radius of the holes are exactly 2.9 mm so it has 0.1 mm for the screw to dig into the plastic and therefore I don't recommend to take the screws out often otherwise you risk stripping the hole (like I did).

I couldn't find any 3-pin 2.54 mm xh JST connectors on the internet that fit the fan connectors, so I did something very sacrilegious and sacrificed the low noise adapters that came with the fans and 1 ultra low noise adapter as I didn't want to use them anyway because you risk the fans not spinning fast enough to cool the components. I only used 1 low noise adapter for the 60mm fan on the PSU because I screwed something up in the PSU. Just a fair warning here for anyone that wants to change the fan on a Meanwell PSU, check the polarity between the fan that comes with the PSU and the noctua fans because the positive and negative cable are switched around in the JST connector! The only way you can fix this is by taking out the pins from the connector that comes with the 2-3 pin noctua adapter and switch them around. Since I broke something on my board I stayed safe and used one of the buck converters to power the 60 mm with a low noise adapter inbetween to reduce the noise, since the 60mm is relatively noisy compared to the 40 mm fans. By the way, the 40x10 mm noctua fan works just fine for cooling the extruder. Maybe if you were to print at temperatures above 250 degrees Celsius all the time, but for PLA and alike it's no problem at all.

The adapters I cut in half were used to stick through the side of the board with the labelling and I soldered the wires while the wires stuck through the ports. It is a bit of a hassle but once you're done it is truly worth it.

Please use shrinking tube instead of insulation tape (I used tape at first), because those might wear off over time due to the heat from the converters and can create some nasty shorts, sending your printer (and your house probably) straight to the shadow realm. I left the yellow wires intact in case I want to read out the rpm of the fans in the future and give it a nice LCD, but probably not so it will be easier to just cut them off.

I wish you the best of luck making this project and would love your feedback and makes!

P.s. the picture features the old design with round extrusions to fit the screws, but I kept accidentally screwing them of the bottom plate so I increased the surface area immensely and it should be much stronger now.

Print instructions

Printer Brand: Creality

Printer: Ender 3 Max

Rafts: Not necessary, but a brim prevents curling.

Supports: Not necessary, but you can make port covers if you don't want to use all slots

Resolution: 0.16 mm, 0.12 mm

Infill: 20%

Filament: PLA, PLA+, PETG

This remix is based on

Housing
for 3x
buck
converters
for Raspi
and fan
supply
on 3D
printer

Housing for 3x buck converters for Raspi and fan supply on 3D printer

by HD_Creator

Model files

juicebox_buck_converter_cover_xl4015.stl

juicebox_buck_converter_housing_xl4015.stl

t-nut_m3_x1.stl

juicebox_buck_converter_cover_xl4015.3mf

juicebox_buck_converter_housing_xl4015.3mf

juicebox_buck_converter_cover_xl4015_rounded.stl

juicebox_buck_converter_housing_xl4015_rounded.stl

juicebox_buck_converter_cover_xl4015_rounded.3mf

juicebox_buck_converter_housing_xl4015_rounded.3mf

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