

Prusa Mini+ Stacklight

 **rahix**[VIEW IN BROWSER](#)

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Summary

A stacklight for the Prusa Mini+ 3D-Printer, to indicate printer status.



6.38 hrs



1 pcs



0.20 mm



0.40 mm



PET



154 g

Prusa MINI /
MINI+

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About

In the industry, most machines have a stacklight so machine status is easily visible from afar. Let's do the same with a 3D-printer: This is a stacklight for the Prusa Mini+. It should be possible to adapt this to other 3D-printers.

Accompanying this project, I have also written a blog post with a bit more details about stack light usage in the industry: [Stack Lights — blog.rahix.de](#)

Details

The stacklight connects to the printer via the I2C bus on its expansion header (J23). A small PCB is needed which houses an I2C port expander and some relays for the 24V stacklight signals. All design files are included.

To control the stack light, M260 G-Codes are inserted into the print files which set the appropriate stacklight colors (needs firmware $\geq 6.1.2$). This has the advantage that no firmware modification is needed. However, there are some limitations: The stack light cannot be updated in certain abnormal situations as shown below.

Situation	Stack Light Signal	Recommended Color
Power On/After Power Interruption	FAULT	ORANGE
Print Started/Running	OPERATE	WHITE
Print Completed/Ready to remove	READY	BLUE
Print Paused on Color Change	READY	
Print Paused on Slicer Pause	READY	
Print Aborted	not possible via G-Code	
Print Paused Manually	not possible via G-Code	

Additional Parts

In addition to the printed parts, you will need:

Amount	Part	Link
2x	M5x8 countersunk screw (e.g. DIN 7991/ISO 10642)	
2x	Slot nut/Hammer nut for 8mm slots (alternatively, you can print one)	
4x	M3x8 cylinderhead screw (e.g. DIN 912/ISO 4762)	
2x	M3x8 countersunk screw (e.g. DIN 7991/ISO 10642)	
6x	M3 L5.7 threaded inserts	CNC Kitchen
4x	M5x16 cylinderhead screw (e.g. DIN 912/ISO 4762)	

Amount	Part	Link
4x	M5 nuts (e.g. ISO 4032)	
1x	Molex 0513821000 Connector Housing (for the J23 expansion connector)	DigiKey
10x	Molex 0561349100 Crimp Socket (for the J23 expansion connector)	DigiKey
1x	Automotive Add-On Circuit (for stealing the 24V DC from the heater fuse)	Details on the Prusa Forum
1x	Dupont Pin (either bare or pre-crimped to a wire, ideally with a cross-section $\geq 0.34\text{mm}^2$)	
1x	Stacklight Controller PCB (check the included design files)	
1x	3-color stacklight 24V DC, NPN	

Recommended Printing Parameters

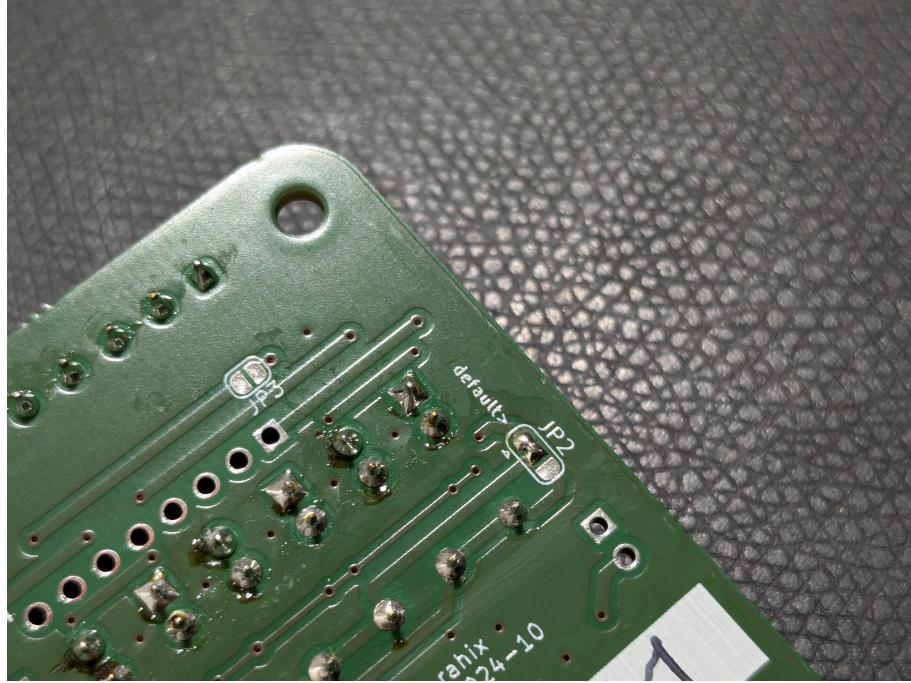
Orientation	Print in the provided orientation of the STL file
Support Material	Print without support material
Layer Height	0.2 mm
Nozzle Diameter	0.4 mm
Material	PETG

Build Instructions

1 - Stacklight Controller PCB



1. Check the included KiCAD project archive for the PCB and BOM. There is also an iBOM (HTML) for easy assembly.
2. Don't be confused by the empty footprints on the right — these can be used for one more controllable 24V output, but are not needed for the standard stack light usage.
3. Make sure to close the three-way jumper on the back into the direction that's marked "default".



2 - Installation

1. Install 6 M3 threaded inserts into the printed enclosure. 4 into the standoffs where the PCB is mounted and 2 into the appropriate holes

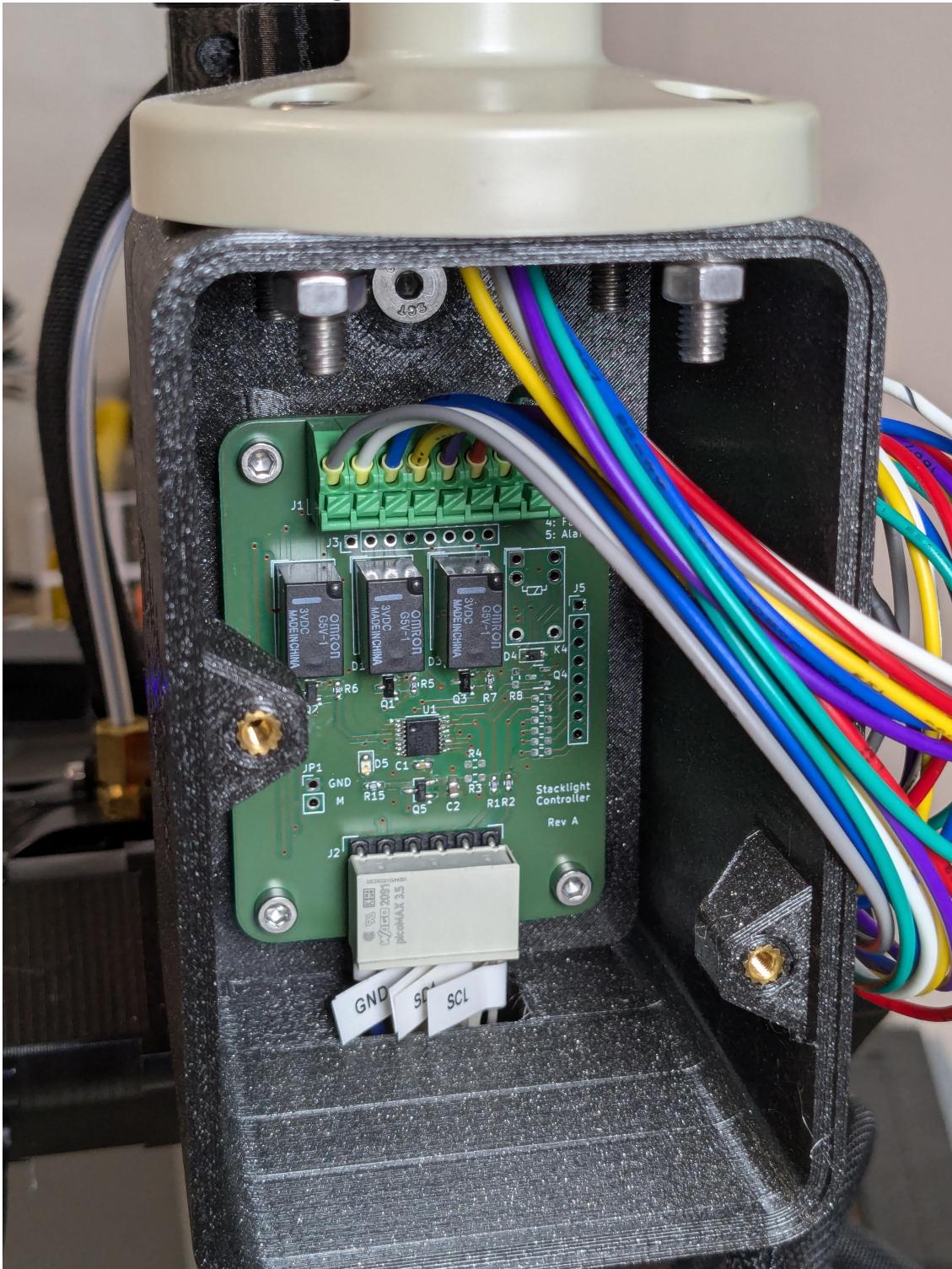
for the lid.



2. Install the enclosure to the side of the Prusa Mini+ using 2x hammer nuts and 2x M5x8 countersunk screws.
3. Install the stacklight controller PCB into the enclosure with 4x M3x8 cylinderhead screws.
4. Attach the stacklight to the mounting hole pattern on the top, with 4x M5x16 screws and nuts. The wires from the stacklight should enter the enclosure through the center hole.

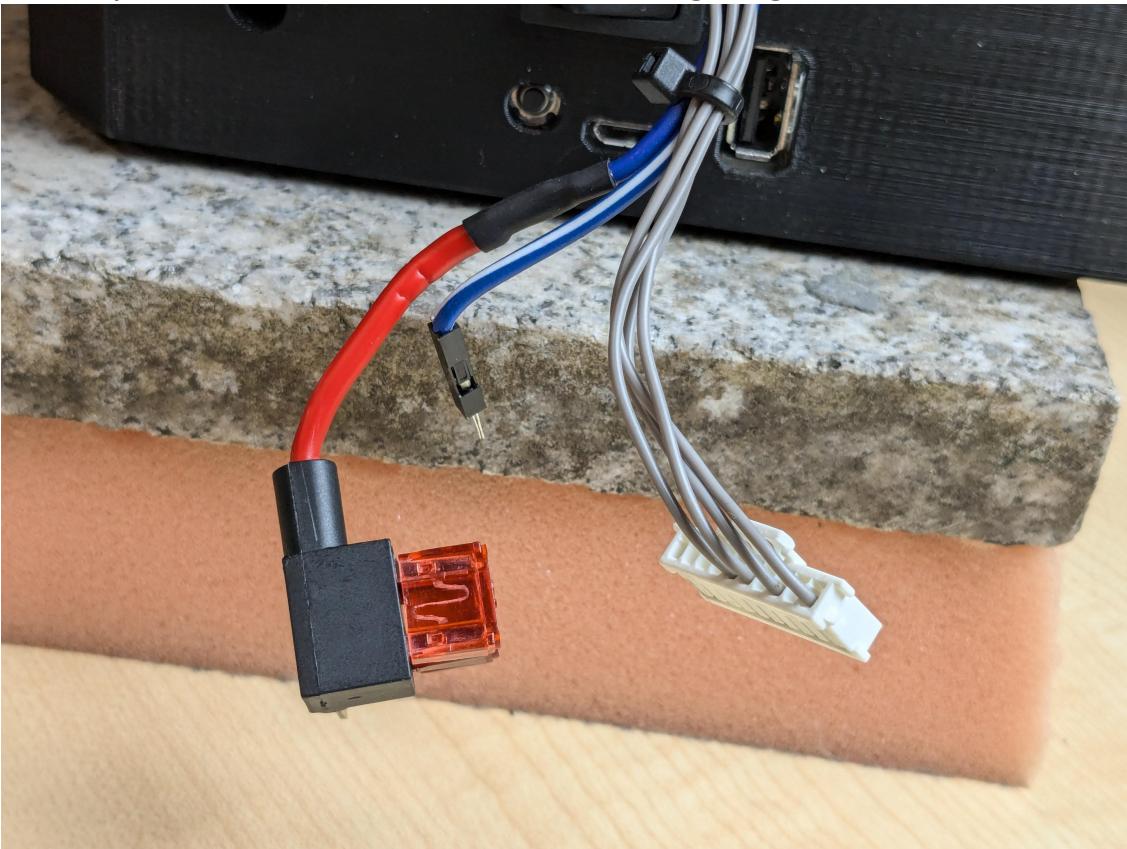
3 - Wiring Harness

1. Terminate the stacklight wires to the top connector of the PCB (J1) as detailed in the wiring diagram. You can use the zip tie mounts in the enclosure for wire management.

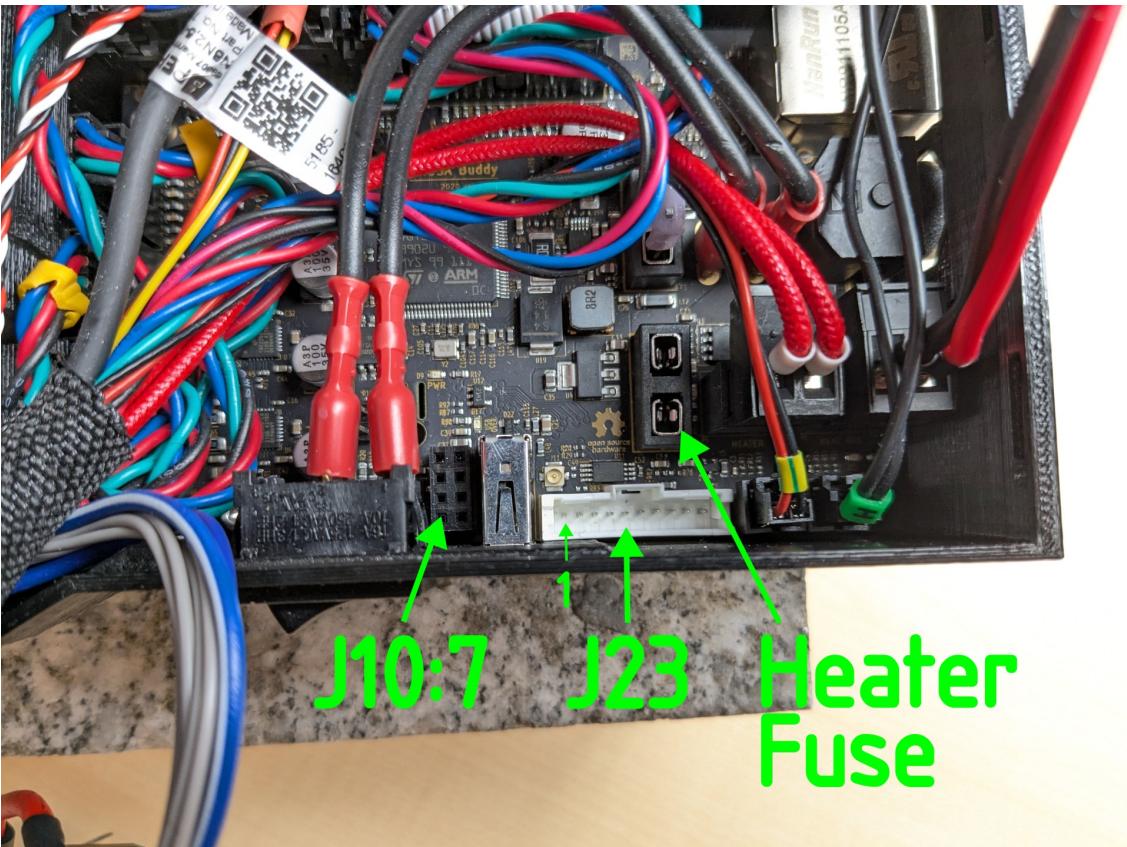


2. Prepare the printer-side wiring with the Molex connector for the expansion port, the add-on-circuit for the 24V and the dupont pin for the GND. On the stacklight controller side, the wires terminate in the

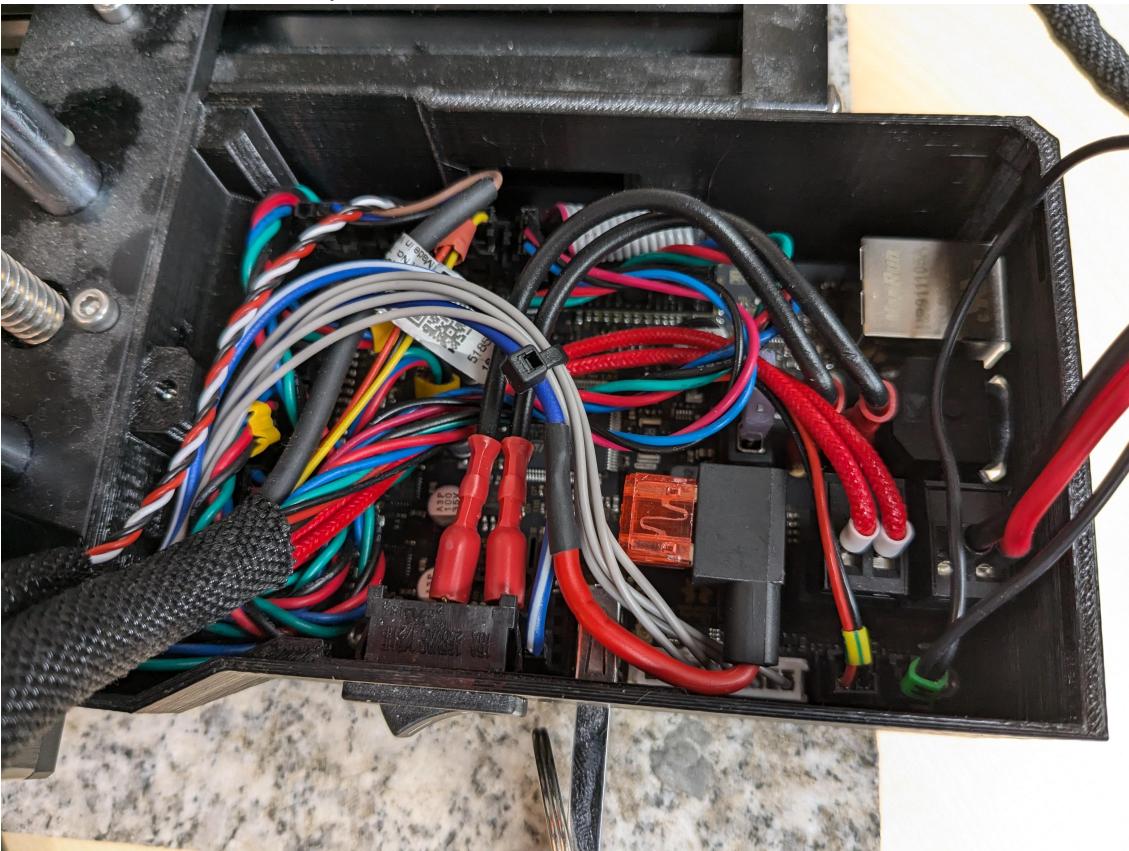
WAGO picoMAX connector. Check the wiring diagram for details.



3. Plug the connectors into the appropriate locations on the Prusa Mini+ board. Again, check the wiring diagram. Pull the heater fuse and place it into the add-on circuit plug. Here is an overview of the connector locations:



4. With all the wires in place, it looks like this:



5. Run the wires in the slot profile next to the existing stepper wires.
Plug the picoMAX connector into the stacklight controller.



4 - Configuration

You are now ready to turn on the system. You will need to modify your printer profile a bit so the g-codes to control the stacklight are emitted. Here are the lines that need to be added (and some of the context lines that are there by default):

Start G-Code

```
G90 ; use absolute coordinates M83 ; extruder relative mode ; Stack Light  
Init M260 A32 M260 B1 ; Output Register M260 B1 ; Fault Off M260 S M260  
B3 ; Configuration Register M260 B0 ; All outputs M260 S M104 S170 ; set  
extruder temp for bed leveling M140 S[first_layer_bed_temperature] ; set  
bed temp
```

End G-Code

```
G4 ; wait M104 S0 ; turn off temperature M190 R50 ; Wait for cooldown to  
a touchable temperature ; Stack Light Color Change M260 A32 M260 B1 ;  
Output Register M260 B3 ; Fault Off & Ready M260 S M140 S0 ; turn off  
heatbed
```

Color Change G-Code

```
; Stack Light Color Change M260 A32 M260 B1 ; Output Register M260 B3  
; Fault Off & Ready M260 S M600 ; Stack Light Color Change M260 A32  
M260 B1 ; Output Register M260 B1 ; Fault Off & Operate M260 S
```

Pause Print G-Code

```
; Stack Light Color Change M260 A32 M260 B1 ; Output Register M260 B3  
; Fault Off & Ready M260 S M601 ; Stack Light Color Change M260 A32  
M260 B1 ; Output Register M260 B1 ; Fault Off & Operate M260 S
```

Model files



stacklight-mount-enclosure.stl

stacklight-mount-lid.stl



stacklight-mount-enclosure.step

Editable CAD Model

stacklight-mount-lid.step

Editable CAD Model

Print files

20241020_stacklight-mount_petg_04n_02mm.bgcode



PET 0.40 mm 0.20 mm 6.38 hrs 154 g Prusa MINI / MINI+

Other files

stacklight-wiring.pdf

Wiring diagram for connecting the stack light to the Prusa MINI+

stacklight-controller.pdf

Schematic of the Stacklight-Controller PCB

stacklight-controller.zip

KiCAD project for the Stacklight-Controller PCB

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