Spool3D PCB Heat Bed

Installation Instructions

Ender 3/3s/3 Pro/3 v2

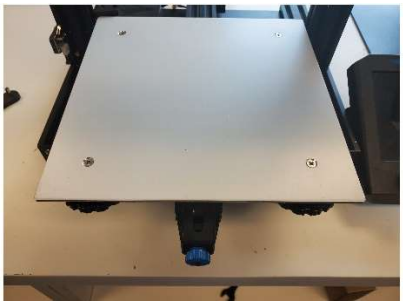
This bed installation requires firmware with mesh bed leveling or auto bed leveling to be installed on your 3D printer.

Tools Required:

- Small flat blade screw driver
- 2 mm hex key
- 2.5 mm hex key
- 3 mm hex key
- 8mm spanner wrench
- 10mm spanner wrench

Steps:

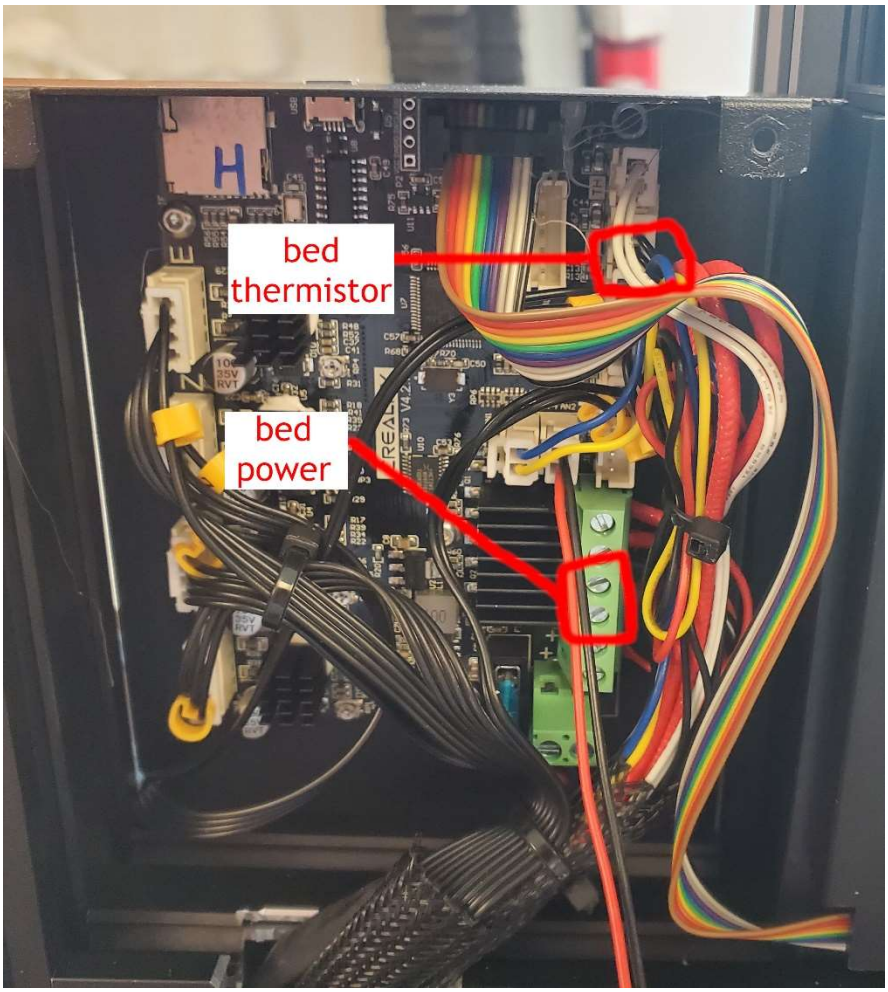
1. **Turn off and unplug your printer.**
2. **Remove bed assembly from printer.**
    a. Remove glass plate, print bed or other installed print surface.



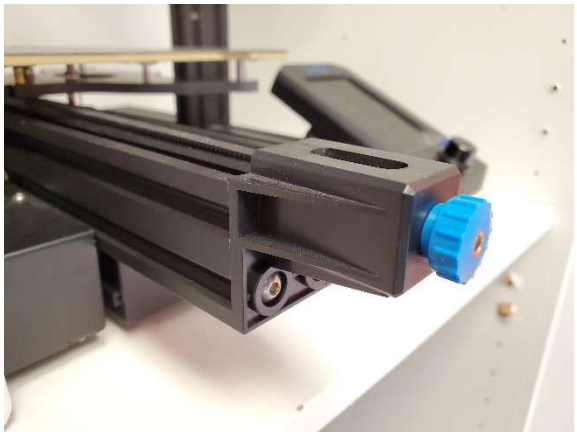
b. Remove the heated bed from the y-axis plate by loosening the bed level adjustment screws. Lift the heated bed up off the y-axis plate and set in a position behind the printer. Collect the 4 springs and leveling nuts. You will not require these anymore.

c. Turn the printer on its side to remove the main control panel cover. There will be screws on both the top side and bottom side of the main control board enclosure. The number of screws on each side will depend on the version of printer you have. Use the 2mm hex key to remove the required screws.

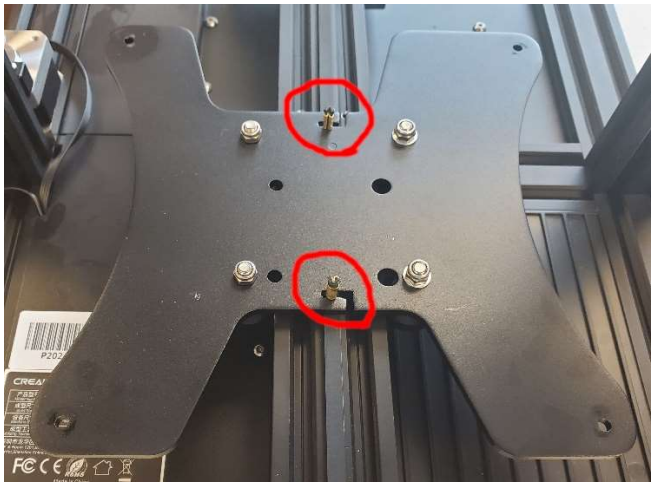
d. Unplug the bed thermistor and power connections. Carefully cut any zip ties that are bundling these cables to the printer or other wires. The thermistor connection pulls out, and you require the small flat blade screw driver for the power connections. Pull the wiring for the heat bed out of the enclosure and set the heat bed assembly aside. You will not require the heat bed assembly.



3. **Remove y-axis plate.**
    a. Using the 3mm hex key, loosen or remove screws fixing y-axis idler or tensioner to the printer frame and slide to the rear of the printer to loosen tension on y-axis timing belt. If your printer has a belt tensioner, like the Ender 3 v2, loosen the tension by fully loosening the knurled nut.

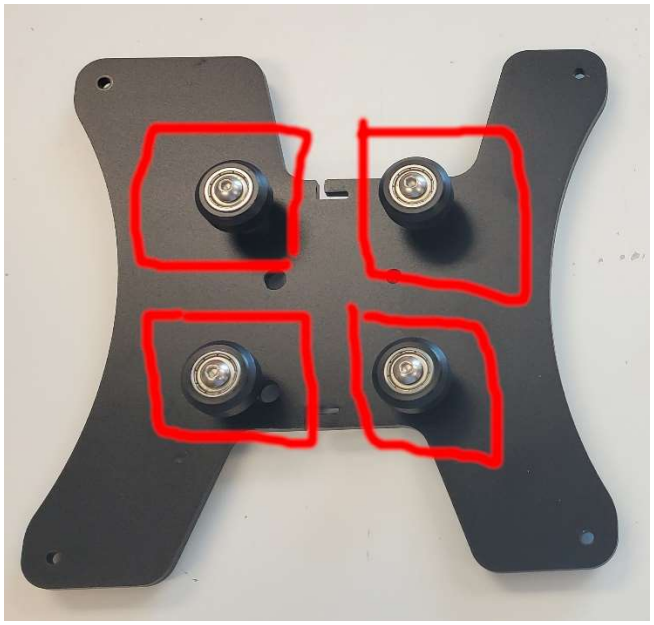


b. Slide y-axis timing belt crimped ends off y-axis plate. Feed front portion of y-axis timing belt out of front idler assembly.



c. Pull y-axis plate assembly forward to remove from printer.

d. Remove idler wheels, screws, spacers, and nuts from the y-axis plate assembly using the 8mm spanner wrench and 3mm hex key. You will need these upon reassembly.



e.

4. Carbon fiber y-axis plate assembly.

a. Place the carbon fiber plate in front of you with the wider opening towards the rear and the counter sunk holes on the bottom side. Further instructions will be referring to this orientation of the plate. The rear of the plate opening is wider for y-axis stepper motor clearance.

b. There are 4 holes to install the idler wheels, spacers, screws, and nuts from the old y-axis plate. Wheels should be installed on the underside of the plate with the eccentric spacers located on the right-hand side according to the model you are installing on. Please use the 3mm hex key and 8mm spanner wrench. Do NOT over tighten. The holes used are numbered in the photo as follows:

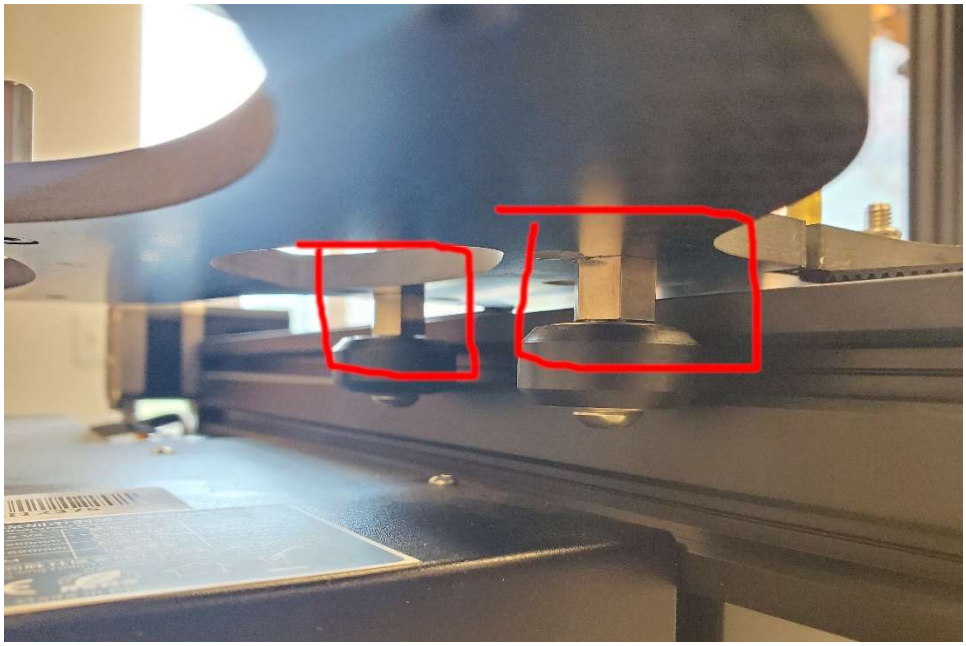
- #1 holes are for Ender 3/3s models.
- #2 holes are for Ender 3 Pro and Ender 3 v2 models.
- #3 holes are for installation on printers with y-axis frames using a 2060 v-slot extrusion profile.

c. For the Ender 3 series we will be installing seven metal standoffs for the heat bed assembly. Install the M3 x 10mm flat head screws through from the bottom and thread a metal standoff onto the screw. Hold the screw with the 2mm hex key and hand tighten the standoff. Do NOT overtighten. Install the seven standoffs in this manner.

5. Install the carbon fiber y-axis plate.

a. Roll the new plate assembly onto the y-axis aluminum extrusion. You may need to adjust the eccentric spacers to ease installation.

b. With the y-plate now on the y-axis, adjust eccentric spacers with a 10mm wrench for proper idler wheel tension. Too tight will cause premature wear of the idler wheels and too loose will cause print bed wobble.

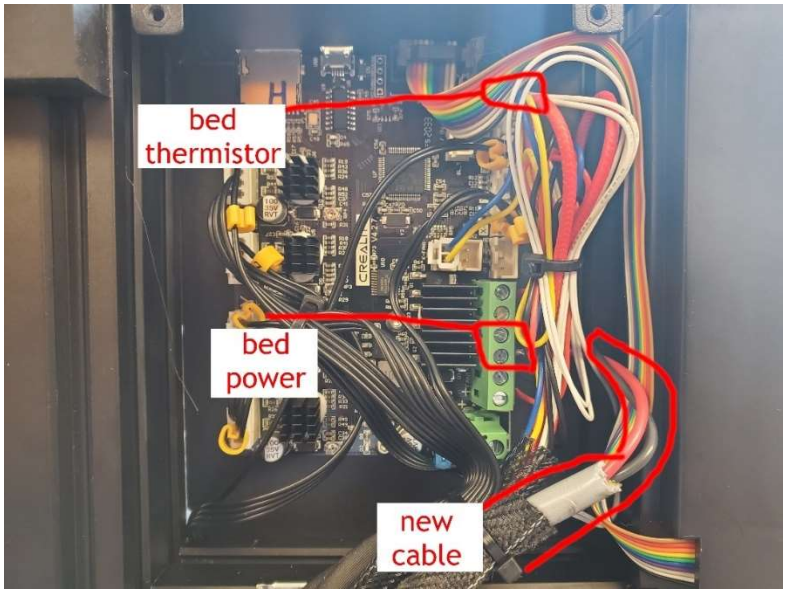


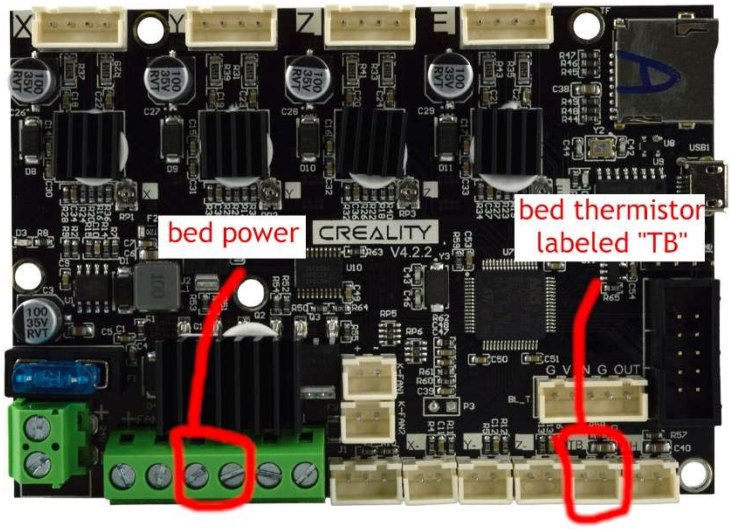
c. Reinstall the y-axis idler or tensioner, but do not tighten. Reinstall the y-axis timing belt through the y-axis idler or tensioner. Slide crimped ends of timing belt into the slots on the front and back of the carbon fiber plate. Pull the y-axis idler forward to tighten the belt and tighten the screws. If you have a tensioner, install the tensioner in the proper position and adjust tension on the belt.

6. **Install the PCB heat bed.**
    a. Using seven of the M3 x 10mm flat head screws, install the PCB heat bed onto the y-axis plate standoffs with the 2mm hex key. Do NOT overtighten.

    b. Turn the printer on its side to access the control board enclosure if required. Some printer models will allow access from the top.
    c. Feed the thermistor connection and power cables for the heat bed into the main board enclosure.
    d. Install the thermistor connection into the TB connection on the control board.

e. Install the heat bed power cables into the head bed power connectors on the control board using the flat blade screw driver. The red wire is installed in the positive (Vbb) terminal. The black wire is intalled in the negative (GND/PB#) terminal.





f. Use zip ties to fasten wiring to other cables and printer chassis.

g. Reinstall main board enclosure cover and place printer upright again.

7. Finishing touches.

a. Install the flexible spring steel sheet on the PCB heat bed. The front of the sheet has two tabs for ease of removal. Rear of the sheet has one tab to place between the locating pins.

b. The PCB heater can perform using the basic bang-bang heating algorithm for PLA temperatures (up to 60c). For better performance and for temperatures above 60c, please use PID bed heating by enabling it in your firmware. A manual bed PID tune can be performed if you have PID tune enabled for your bed in your firmware. Starting at room temperature use the following gcode command, where S# is the temperature:

   - M303 E-1 S100 C8
   - M500 (after PID tune is complete)

   If you do not run a PID tune, the following PID parameters can be used if you have PID tune enabled in your firmware, by entering the following gcode command through terminal connection or through an SD card gcode file containing the following:

   - M304 P462.10 I 85.47 D 624.59
   - M500

c. There will be a blue LED light visible when power is being applied to the heat bed for heating. If a blue light is not visible, the red and black power wires are connected backwards. This will not affect heating of the bed, but will not allow the blue LED to light as a visual indicator. Please reinstall the power wires in the correct orientation.