

## Rigid MPU-9250/6500 mount for Ender-5 S1



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### Summary

Securely mount an MPU sensor to your Ender-5 S1 print head to automatically calibrate Klipper input shaping.

[3D Printers](#) > [Creality Parts & Upgrades](#)

Tags: [klipper](#) [shaping](#) [resonance](#) [mpu](#) [ender5s1](#)  
[mpu9250](#) [mpu6500](#)

A secure mount for your MPU sensor on the Ender-5 S1 print head. This is a ground-up redesign of [my previous mount](#); slightly harder to print and find materials for, but much better in every way.

**Secure fit:** Priority was given to ensuring that the mount is secure; the official Creality mount for their Sonic Pad sensor has 1.5 axes of contact at best, with no contact on the Y axis and a large overhang on the Z axis, whereas this mount has 4-corner mount points and should stay perfectly still during calibration.

**Location:** This mount is screwed into the spare threads on the extruder stepper motor, therefore doesn't extend the print head's bounding box at all. Creality's mount extends out on the x-stepper side of the print head

and for a larger sensor like the MPU would come very close to colliding with the stepper at its endstop.

**Permanence:** This is designed to be permanently mounted and connected, so recalibration can be as simple as activating it in the Klipper menu. Therefore it had to be minimal and aesthetically pleasing, and this informed the design of the mount parts that follow the contours of the printer's head.

## Print and assembly

The extruder stepper doesn't get very warm, so printing in PLA should be fine. There's an air gap to prevent the majority of heat transfer. The fit is intentionally very tight, so I suggest [calibrating Pressure Advance](#) for your filament first.

This can be a challenging print to get tidy. Print as-per the orientation in the STL, and if needed slow it down especially in your outer perimeters. If you'd like something simpler, but not as pretty or minimal, you can try [the previous version of this mount](#).

Non-printable parts:

- 6x M3 screws; 4mm length, no longer (3mm might also work)
- 2x M3 hex nuts

Begin by inserting the hex nuts into their holes in the base, then use 2x screws to mount the MPU. Now put the lid on: it's a friction fit, which is fine on my tuned printer but if you can't get it in let me know and I can provide one with more clearance. Again, [pressure advance](#) is great for getting fitment right.

Next, screw the base into the extruder motor. Take this one easy: screw the screws into the mount first until they're flush with the inside, then place it in position on the motor and gently screw each screw in about 1-2 turns, jiggling it around to ensure they've found their threads. Some may need a bit of force but make sure they're perfectly aligned before you do this: the metal you're screwing into is fairly soft and easy to strip.

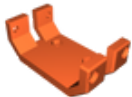
You can mount your MPU either way: header to the front or to the back. I personally prefer it to the front as it feels more aesthetically balanced between the bowden tube and the rear ribbon. I have also clipped all three together using 5 of [these cable clips](#).

## Configuration

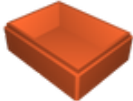
It's probably not necessary as Klipper doesn't really care about the vibration direction, but as the sensor axes don't match the printer axes I added an axes\_map to my [printer.cfg configuration](#) to correct this:

```
[mpu9250] i2c_mcu: rpi i2c_bus: i2c.1 axes_map: -y, x, z # header to the front  
axes_map: y, -x, z # header to the rear
```

## Model files



**ender-5-s1-mpu-mount-base.stl**



**ender-5-s1-mpu-mount-lid.stl**

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