

FT5 Dual Endstop/Dual Z Stepper Guide

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Special thanks to marvinmartian on the Folger Forum for inspiring this mod. This mod is basically that, with a little more mods to firmware to work correctly. Check out the Folger Forum post for the original idea.

<http://folgerforum.com/t/trouble-getting-dual-z-end-stops-dual-z-steppers-working/889/>

Mechanical

You can use whatever endstop holder you want, I just really like the linked part made by Chris Sorrows. It works a lot better than most.

Resources

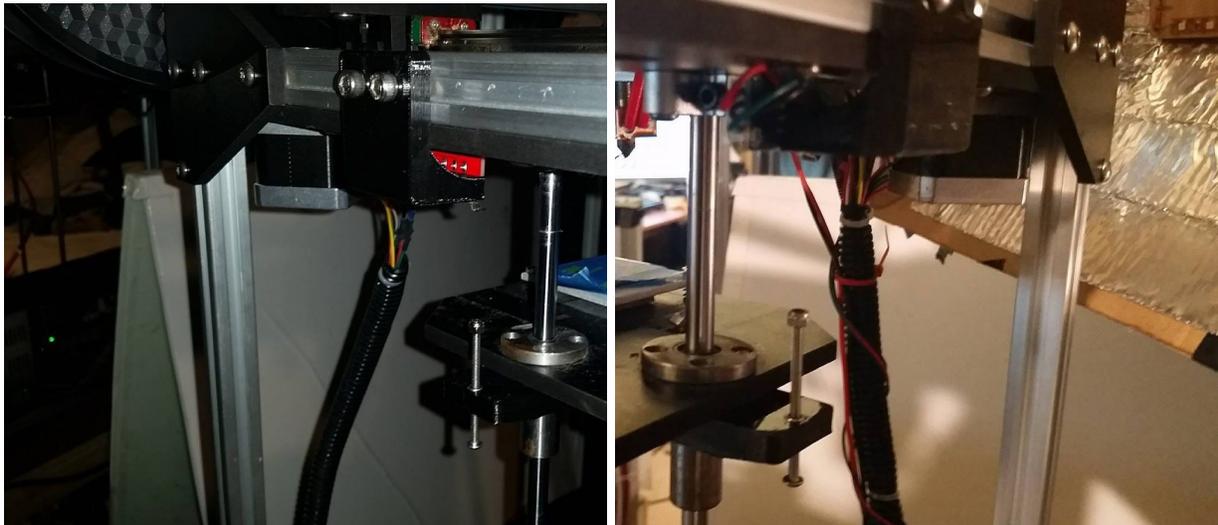
<http://www.thingiverse.com/thing:2070617> - You need two of each part.

You will need

- Two pair of the above endstop holders
- M5x10mm bolt x4
- M5 T-nut x4
- M3x(10-16mm) bolt x4
- M3x(30-45mm) bolt x2
- M3 Lock Nut x4
- Endstop and wires x2

Print and assemble the endstop assembly as noted in the link above. You will do this on both rear smooth rods.

For the adjustment screw, I like to use longer bolts (45mm) because it allows me to use different length hot ends. 45mm is needed for volcano extruders as well.



Electrical

Since we are now using two endstops, we need to agree on some terms. When looking at the front of the printer, **the left side stepper/endstop will be Z2**, and **the right side stepper/endstop will be Z**.

You will need

- Extra motor wire (JST-XH or Dupont ends will both work on the MKS)
- Everything you already have

Unplug the motor wire from the Z2 stepper, and plug in/ wire manage the new motor wire from the motor to The Hatch. Plug this new motor wire into E1 (unused extruder position).

Run the Z2 endstop into the Hatch, and plug it into Z+ endstop position.

The Z stepper remains on the Z position, and the Z endstop remains on Z-.

Firmware

I have attached a working firmware that was modded to work. It is also the firmware I use for the FT5 CNC attachment. The Folger Forum post on the first page has more information on what exactly is changed in the firmware.

Open and upload the firmware.

Open your favorite control software and connect.

Send command M119 and you should see the following:

```
READ: x_min: open  
READ: y_min: open  
READ: z_min: open  
READ: z_max: open  
READ: z2_max: open
```

Trigger Z2 endstop manually, you should see:

```
READ: x_min: open  
READ: y_min: open  
READ: z_min: open  
READ: z_max: TRIGGERED  
READ: z2_max: TRIGGERED
```

Trigger Z endstop manually, You should see:

```
READ: x_min: open  
READ: y_min: open  
READ: z_min: TRIGGERED  
READ: z_max: open  
READ: z2_max: open
```

Adjust the endstop adjustment screw a little higher than needed so that the bed will not impact the nozzle, make sure the screw and the endstop will contact, then send command G28 or hit Home Z (Home All will also work), and test the homing. If one side contacts the endstop before the other, it should automatically stop and wait til the other side hits its endstop, then both will back off, then finish homing. Be prepared to turn off power in case everything explodes.

If it properly homes, adjust both adjustment screws until the nozzles moves flat across the entire bed when the Z is homed, and is the proper distance from the bed. Enjoy.