**FFCP Auto Leveler Installation Instructions**

You must have the latest FFCP Sailfish 7.8. Not tested with any earlier versions.

**Step 1**

Print induction probe holder. Two that you can choose from, one that mounts via lower two fan screws, one that mounts from the upper two fan screws. You may need longer screws. Auto-level you plate manually as best you can before continuing to step 2.

**Step 2**

Attach the probe holder and run the induction probe through to the mainboard (located on the bottom – you can find videos around the 4 screws that need to be removed to access). You will need to attach brown to +5 (pin 1), blue to Gnd (pin 2 or 3), and black to signal (pin 4) of the Z\_MIN connector (unless using custom firmware supporting Z\_MAX). Pin 1 is closest to the right side of the machine. Route it through the flex cabling (good idea to do this before attaching the connector), you may need to clip some of the cable ties and replace.

**Step 3**

Adjust the auto-level variance and Max Z Probe Hits using ReplicatorG (<http://replicat.org/>). Do this from Machine -> Onboard Preferences -> Accelerator (Misc) tab. You will find the settings at the bottom. The FFCP appears to have 200 and 0.01 as the default, set this to something more reasonable such as the Sailfish default of 20 and 0.5 or you will get errors about too far out of level no matter how flat you manually level the bed. 0 hits will disable the hit detection. Commit your changes.

**Step 4**

Determine the height of the default Z probe in relation to your nozzle height. For your initial setup, adjust the height of the probe so that it triggers as close to 0.2mm as you can reasonably make it. Go for larger than 0.2mm distance, not less, as this will minimize your chance of hitting the nozzle before detecting the platform. ***Remember:*** *when jogging to give yourself some Z room by moving Z+ at least 1mm.*

Here’s the hard part – [setting the Z offset](https://www.sailfishfirmware.com/doc/details-auto-leveling.html) correctly (note the probe assumes 0.4mm detection for your calculations). Read the instructions around how the firmware works. Be forewarned, I found this not to work exactly as specified and had to play around with the values to get something that worked correctly. I actually made special firmware based on Sailfish 7.8.0 to allow for the probe being on Z\_MAX and activating upon demand for autoprobing:

* Activating the induction probe with: M300 S1 P0
* Disabling the induction probe with: M300 S0 P0
* Run auto calculation of ZHome offset between probe and switch sensor: M300 S2 P0

*Try to get close to your target when setting the probe height – this may end up being your minimum print height depending on the software you use due to probe hit settings. Recommend disabling the probe hit settings in this particular configuration, the Z\_MIN stop will address any major collisions.*

**Step 5**

Update your slicer profile to leverage auto-leveling. You can set 3 auto leveling points using M131 A, M131 B, and M131 AB. Then you commit them by calling M123 AB. Below is the starting script that can be used for a FFCP in Simplify3D (**I assume no liability! You must make sure this works for your own machine!**).

; \*\*\*\* Flashforge Creator Pro Auto Level Start.gcode \*\*\*\*  
M73 P0 ; enable build progress  
G90; set positioning to absolute (default)  
G162 X Y F3000 ; home XY maximum  
G161 Z F1200 ; home Z minimum (to switch)  
G92 X112.5 Y72.5 Z0 A0 B0  
G1 Z5 ; move Z to 5  
; \*\*\*\* Auto Bed Leveling \*\*\*  
M300 S2 P0 ; Set Probe Z-Home Offset  
G1 Z5  
G1 X112.5 Y72.5 Z5 ; Move Home  
G4 P2000 ; Wait 2s  
M300 S1 P0 ; Enable induction probe  
G161 Z F100 ; home Z minimum (to probe)  
; Measure probe distance from desired nozzle position  
; Probe is offset is (-61 X -55 Y) [mm] in firmware  
; --- Point 1 ---  
G1 X112.5 Y72.5 Z5 F3000 ; move to first probing point  
G161 Z F100 ; home Z slowly  
M131 A ; store surface calibration point 1  
G1 Z5 F200 ; move Z down 5; --- Point 2 ---  
G1 X-75.5 Y72.5 Z5 F3000 ; move to second probing point  
G161 Z F100 ; home Z slowly  
M131 B ; store surface calibration point 2  
G1 Z5 F200 ; move Z down 5; --- Point 3 ---  
G1 X28.0 Y-20.0 Z5 F3000 ; move to third probing point  
G161 Z F100 ; home Z slowly  
M131 AB ; store surface calibration point 3; --- Activate Auto Leveling and Rehome ---  
M300 S0 P0 ; Disable induction probe  
M132 AB ; Activate Auto Leveling  
G1 Z5 F200 ; move Z down 5  
G1 X112.5 Y72.5 Z5 F3000 ; move home  
G162 X Y F3000 ; home XY axes maximum again for accuracy  
G161 Z F100 ; home Z axis minimum slowly again for accuracy  
G1 Z5 F1200   
; \*\*\*\* End Auto Bed Leveling \*\*\*\*  
; M132 XY ; recall home offsets  
M135 T0 ; load right extruder offsets  
G1 X150 Y-70 Z30 F9000 ; move to wait position right hand side of the table  
G130 X20 Y20 Z20 A20 B20 ; lower stepper Vrefs while heating  
M126 S[fan\_speed\_pwm]  
M140 S[bed0\_temperature] T0  
M134 T0 ; stabilize bed temperature  
M104 S[extruder0\_temperature] T0  
M133 T0 ; stabilize right extruder temperature  
G130 X127 Y127 Z40 A127 B127 ; default stepper Vrefs  
G1 Z0.4 ; position nozzle  
G1 X110 Y-70 E25 F300 ; purge nozzle  
G1 X120 Y-70 Z0.15 F1200 ; slow wipe  
G1 X110 Y-70 Z0.5 F1200 ; lift  
M73 P1 ;@body (notify GPX body has started)  
; \*\*\*\* end of start.gcode \*\*\*\*

**Step 6**

Test print something. If all goes well, you should have it probe three point, heat, and auto compensate for any small bed leveling issues on the plate.