# Automatic Leveling Debug Guide

1st step: preparation

1. Confirm the correct connect cable again

2. Connecting the PS to mainboard*(fig1).*
3. Turn on the power, ensure that LCD display & keypad (or Knob) operating properly.
4. Let PS close to the printing platform, the light on the PS lighting when the distance about 3~5mm.*(fig2) .*
5. Before debugging,please make clear about the LCD operate Menu and the keypad (or Knob) using*(LCD operate Menu: Marlin LCD Menu Tree.pdf)* .
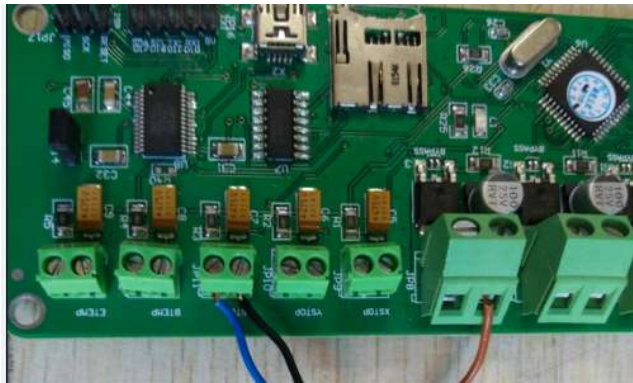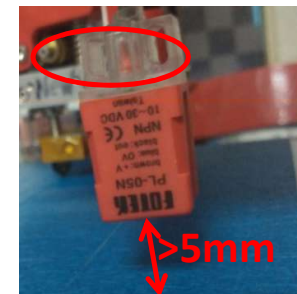

Melzi board
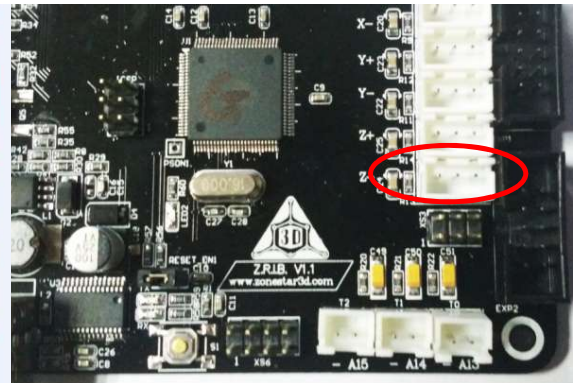

ZRIB board

Fig 1: Connect PS to Control board


>5mm

<4mm

Fig 2: PS Trigger Height

Note: :
1、 Please leveling by hand when the first time assembly finished.
2、 Please leveling by hand when the automatic leveling function be fail to level Z-Axial platform.
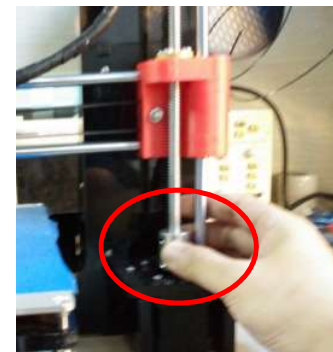
2nd Step: preliminary Leveling

1. Turn off power supply.
2. Adjust the 4pcs nuts from the platform, keep them leveling *(fig3).*
3. Measure the height of X-slide, ensure the right and the left distance almost same. *(fig4)*,If the height (>1mm) Turn the Z-coupling ensure them almost leveling.
4. Adjust the extruder to Middle position , then turn the right and left Z-coupling synchronously, until the distance about 0.5mm between the platform and the extruder*(fig5)* .
5. Move extruder left and right, be attention to the distance between extruder and platform, adjust the lower Z-coupling ensure them almost leveling.
6. Turn the right and left Z-coupling synchronously, adjust the distance almost 0.2mm between the extruder and platform.
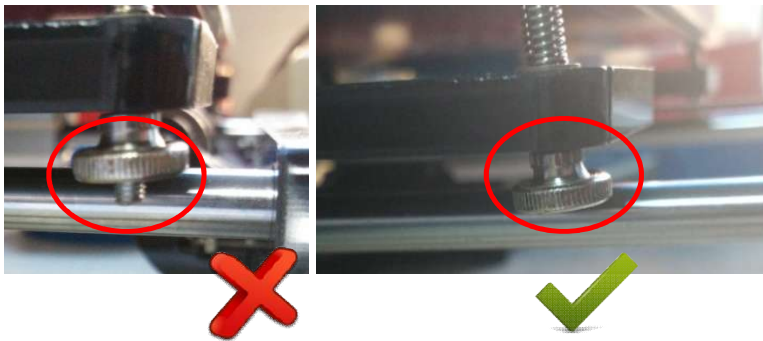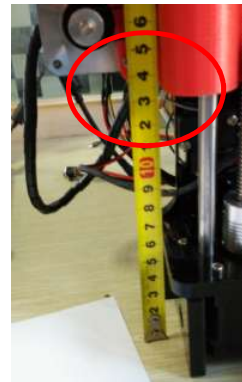
Fig 3: set nut height   *Fig 4: measure height of X-slide*   *Fig 5:Adjust X-slide height*

3rd step: Assemble PS and setting Z offset

1. Turn off power supply.
2. Assemble PS to Extruder platform, don't lock hard screws **(fig 6).**
3. Turn Z-coupling synchronously(right & left), ensure the distance almost 0.2mm between extruder and platform.
4. Turn on power supply.
5. Adjust PS position up to down, rise down almost 1mm when the PS LED lighting, then lock hard PS screws, be notice to the height almost 2mm between PS and platform.
6. Operate keypad(or Knob)enter:Prepare->Move axis->Move 0.1mm->Move Z->Enter,Written the figure Z0 **(fig 7).**
7. Operate keypad (or Knob) rise up Z-axial, stop adjusting when the PS light off**(fig 8).** Let LCD display Z figure@ reduce Z0 and 0.3(For example:1.5-Z0-0.3=1.0= *Z offset*).
8. Operate keypad (or Knob) enter control->Motion->*Z Offset,*adjust *Z offset* to Z figure@*(fig 9).*
9. Operate keypad (or Knob) enter control->*Store memory* save done setting figure**(fig 10).**
10. Operate keypad (or Knob) enter Prepear->Auto Home->confirm,then enter Prepear->Bed Leveling Test->confirm
11. Check the height between extruder and platform, Increase *Z offset* when the height too large.Otherwise, Decrease *Z offset* if the height too small (repeat 8 & 9) .

Fig 6: Install PS

Fig 7 : Z Height of step6

Fig 8 : Z Height of step7

Fig 9 : Set Z Offset

Fig 10 : Store Setting

4th step: Confirm.

1. Turn off power supplpy,insert SD card,then turn on power supply.
2. Select **level_test.gcode** from SD card, start to print.Observe the distance between extruder and platform,level again if it is not leveling.
3. During printing process suitably, adjust screws (**fig 11**) Let the first lay same distance between extruder and printing platform.(0.2mm~0.3mm)
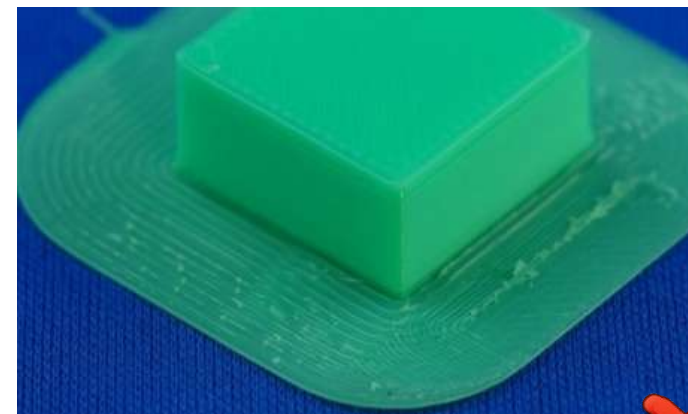

Fig 11: Adjust Print Platform Height

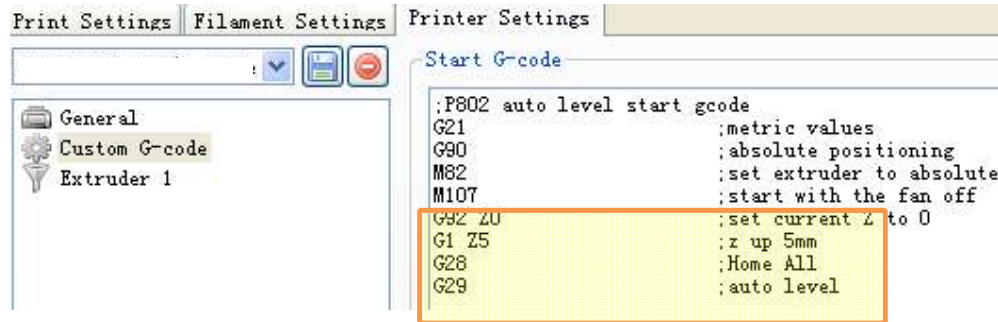**Z offset is too high**

Perfect Z offset

Z offset is too low

5th step: Set the slicer software to add automatic leveling

In order to start an automatic level before printing , you need put the command **G29** behind file **G28** for each printing file, please set the *start g-code* of the slicer software as below:

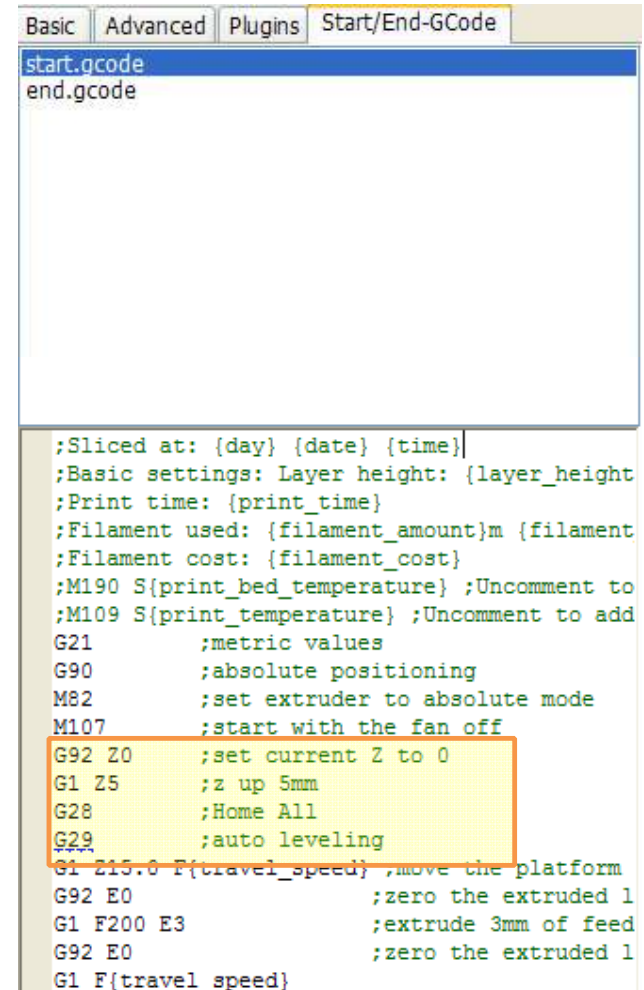## Slic3r

Print Settings | Filament Settings | Printer Settings

Start G-code

General
Custom G-code
Extruder 1

```
;P802 auto level start gcode
G21                    ;metric values
G90                    ;absolute positioning
M82                    ;set extruder to absolute
M107                   ;start with the fan off
G92 Z0                 ;set current Z to 0
G1 Z5                  ;z up 5mm
G28                    ;Home All
G29                    ;auto level
```
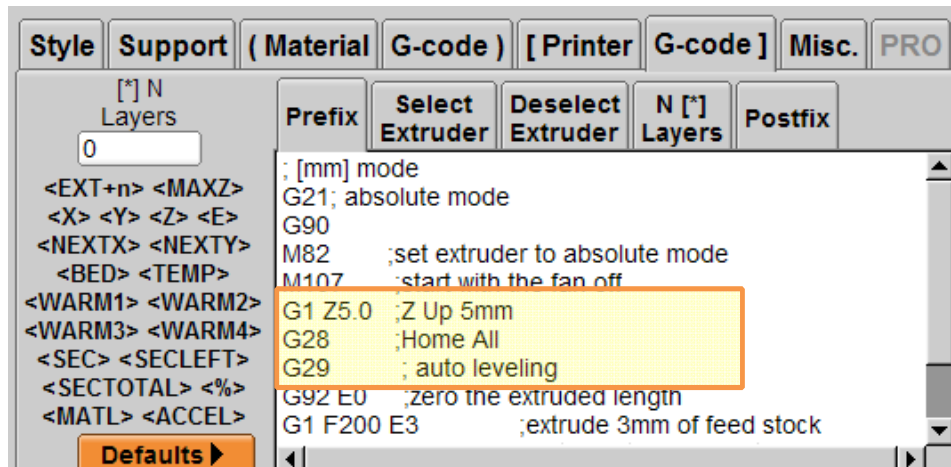
Kisslicer

Style | Support | (Material | G-code) | [Printer | G-code] | Misc. | PRO

[*] N
Layers
0

<EXT+n> <MAXZ>
<X> <Y> <Z> <E>
<NEXTX> <NEXTY>
<BED> <TEMP>
<WARM1> <WARM2>
<WARM3> <WARM4>
<SEC> <SECLEFT>
<SECTOTAL> <%>
<MATL> <ACCEL>

Defaults ▶

Prefix | Select Extruder | Deselect Extruder | N [*] Layers | Postfix

```
; [mm] mode
G21; absolute mode
G90
M82       ;set extruder to absolute mode
M107      ;start with the fan off
G1 Z5.0   ;Z Up 5mm
G28       ;Home All
G29       ; auto leveling
G92 E0    ;zero the extruded length
G1 F200 E3          ;extrude 3mm of feed stock
```

Cura

Basic | Advanced | Plugins | Start/End-GCode

start.gcode
end.gcode

```
;Sliced at: {day} {date} {time}
;Basic settings: Layer height: {layer_height
;Print time: {print_time}
;Filament used: {filament_amount}m {filament
;Filament cost: {filament_cost}
;M190 S{print_bed_temperature} ;Uncomment to
;M109 S{print_temperature} ;Uncomment to add
G21            ;metric values
G90            ;absolute positioning
M82            ;set extruder to absolute mode
M107           ;start with the fan off
G92 Z0         ;set current Z to 0
G1 Z5          ;z up 5mm
G28            ;Home All
G29            ;auto leveling
G1 Z15.0 F{travel_speed} ;move the platform
G92 E0                    ;zero the extruded l
G1 F200 E3               ;extrude 3mm of feed
G92 E0                    ;zero the extruded l
G1 F{travel_speed}
```