Z-Probe Offset

Z-offset calibration procedure for Marlin firmware.

2021-11-27

GCode	Description
M851 Z0	Set Z-probe offset to 0.
M500	Save all configurable settings to EEPROM.
M501	Load all saved settings from EEPROM.
M503	Print all runtime-configurable settings to the host console.
G28	Auto home.
G1 F60 Z0	Move to Z0.
M211 S0	Unlock software endstops to enable movement below Z0.
M109 S190	Set nozzle temperature to 220 °C.
G1 F60 Z-0.2	Move extruder to Z-0.2. Adjust the value in the previous step until you can just barely move a piece of paper placed between the nozzle and print bed. Subtract another 0.1 from this value. This will be your new Z-probe offset value.
M851 Z-2.2	Set Z-probe offset to -2.2. This value should be whatever you measured in the previous step.
M211 S0	Lock software endstops to prevent movement below Z0.
M500	Save all configurable settings to EEPROM.
M501	Load all saved settings from EEPROM.
M503	Print all runtime-configurable settings to the host console.
G28	Auto home.
G1 F60 Z0	Move to Z0 to confirm.
M109 S0	Set nozzle temperature to 0 °C.

start.gcode

```
; Set Heat Bed temperature
M140 S{material_bed_temperature_layer_0}

; Set Extruder temperature
```

```
M104 S{material_print_temperature_layer_0}

; Home all axes
G28

; Level bed
G29

; Reset Extruder
G92 E0

; Move to start position
G1 X0.1 Y20 Z0.3 F5000.0

; Wait for Heat Bed temperature
M190 S{material_bed_temperature_layer_0}

; Wait for Extruder temperature
M109 S{material_print_temperature_layer_0}

; Draw the first line
G1 X5.5 Y200.0 Z0.3 F1500.0 E15

; Move to side a little
G1 X5.9 Y200.0 Z0.3 F5000.0

; Draw the second line
G1 X5.9 Y20 Z0.3 F1500.0 E30

; Reset Extruder
G92 E0

; Move Z Axis up little to prevent scratching of Heat Bed
G1 Z2.0 F3000
```

end.gcode

```
; Relative positioning
G91

; Retract
G1 E-2 F2700

; Retract and raise Z
G1 E-2 Z0.2 F2400

; Wipe out
G1 X5 Y5 F3000

; Raise Z more
G1 Z10

; Absolute positionning
G90
```

```
; Present
G1 X0 Y{machine_depth}

; Turn-off fan
M106 S0

; Turn-off hotend
M104 S0

; Turn-off bed
M140 S0

; Disable all steppers but Z
M84 X Y E
```