

Makertech

Stage 05: Firmware (Marlin)

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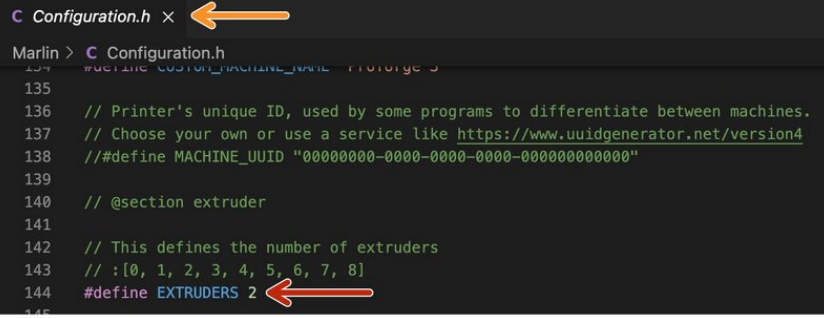


INTRODUCTION

This guide assumes that you are some what familiar with editing your firmware. The guide focuses on the latest Marlin firmware.

Step 1 — Extruder Count

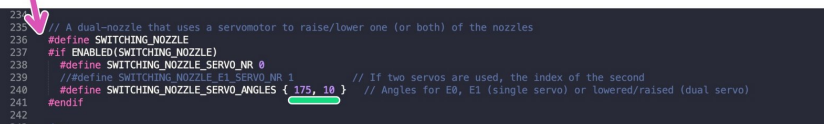
- Open the Configuration.h file.
- Set extruder count to 2.



```
Marlin > C Configuration.h
134 #define CUSTOM_MACHINE_NAME "ProForge J
135
136 // Printer's unique ID, used by some programs to differentiate between machines.
137 // Choose your own or use a service like https://www.uuidgenerator.net/version4
138 // #define MACHINE_UUID "00000000-0000-0000-0000-000000000000"
139
140 // @section extruder
141
142 // This defines the number of extruders
143 // :[0, 1, 2, 3, 4, 5, 6, 7, 8]
144 #define EXTRUDERS 2
145
```

Step 2 — Servo Angles

- Uncomment SWITCHING_NOZZLE
- Set SWITCHING_NOZZLE_SERVO_ANGLES to 175 and 10. You may need to adjust this later on when fine-tuning your setup.



```
235 // A dual-nozzle that uses a servomotor to raise/lower one (or both) of the nozzles
236 #define SWITCHING_NOZZLE
237 #if ENABLED(SWITCHING_NOZZLE)
238 #define SWITCHING_NOZZLE_SERVO_NR 0
239 // #define SWITCHING_NOZZLE_E1_SERVO_NR 1 // If two servos are used, the index of the second
240 #define SWITCHING_NOZZLE_SERVO_ANGLES { 175, 10 } // Angles for E0, E1 (single servo) or lowered/raised (dual servo)
241 #endif
242
243
```

Step 3 — Nozzle Offset

```
C Configuration.h
Marlin > C Configuration.h
309 // #define GRADIENT_VT00L // Add M166 T to use a V-tool index as a Gradient alias
310 #endif
311 #endif
312
313 // Offset of the extruders (uncomment if using more than one and relying on firmware to position when changing).
314 // The offset has to be X=0, Y=0 for the extruder 0 hotend (default extruder).
315 // For the other hotends it is their distance from the extruder 0 hotend.
316 #define HOTEND_OFFSET_X { 0.0, 28.00 } // (mm) relative X-offset for each nozzle
317 #define HOTEND_OFFSET_Y { 0.0, 0.00 } // (mm) relative Y-offset for each nozzle
318 // #define HOTEND_OFFSET_Z { 0.0, 0.00 } // (mm) relative Z-offset for each nozzle
319
```

- Set the nozzle offset for the switching hotends.
- ★ `HOTEND_OFFSET_X { 0.0, 28.00 }`

Step 4 — Thermistors

```
* !!! Use these for Testing or Development purposes. NEVER for production machine. !!!
* 998 : Dummy Table that ALWAYS reads 25°C or the temperature defined below.
* 999 : Dummy Table that ALWAYS reads 100°C or the temperature defined below.
*
*/
#define TEMP_SENSOR_0 1
#define TEMP_SENSOR_1 560
#define TEMP_SENSOR_2 0
#define TEMP_SENSOR_3 0
#define TEMP_SENSOR_4 0
#define TEMP_SENSOR_5 0
#define TEMP_SENSOR_6 0
#define TEMP_SENSOR_7 0
```

- ⓘ Set the thermistors (OLD):
 - Low temp (white cable) - set as 1
 - High temp (blue or white cable) - set as 66
 - ⚠ Ignore 560 in the image.
- ⓘ NEW 2024 Thermistor:
 - ★ As of 2024, both sides are high temp 300C sides with the same type of thermistor. If you received your kit in 2024 then set the thermistor value to 5

Step 5 — Probe Setting

```
850
851 // Force the use of the probe for Z-axis homing
852 #define USE_PROBE_FOR_Z_HOMING
853
854 /**
855  * Z_MIN_PROBE_PIN
856  *
```

```
C Configuration.h
Marlin > C Configuration.h
978 * Some examples:
979 * #define NOZZLE_TO_PROBE_OFFSET { 10, 10, -1 } // Example "1"
980 * #define NOZZLE_TO_PROBE_OFFSET { -10, 5, -1 } // Example "2"
981 * #define NOZZLE_TO_PROBE_OFFSET { 5, -5, -1 } // Example "3"
982 * #define NOZZLE_TO_PROBE_OFFSET { -15, -10, -1 } // Example "4"
983 *
984 * ← BACK →
985 * | | [+ ] |
986 * L | 1 | R ← Example "1" (right, back)
987 * E | 2 | I ← Example "2" (left, back)
988 * F |[-] N |[-] S ← Nozzle
989 * T | 3 | H ← Example "3" (right, front)
990 * | 4 | | T ← Example "4" (left, front)
991 * | [-] |
992 * 0 ← FRONT →
993 */
994 #define NOZZLE_TO_PROBE_OFFSET { 39.5, 32, 0 }
995
```

```
91 //
92 // Z Probe (when not Z_MIN_PIN)
93 //
94 #ifndef Z_MIN_PROBE_PIN
95 #define Z_MIN_PROBE_PIN PB_04
96 #endif
```


- Set z-probe for homing.
- Define nozzle/probe offset.
 - ① {39.5, 32, 0}


① Probe Pins:

- ① As mentioned before, in the wiring diagram, the probe's black cable needs to be connected to a digital signal pin on your control board. You can set this pin number by entering the following into either your configuration.h file or directly into your boards pins.h file.
- In lib/src/pins/...your control board
- Here, the Z_MIN_PROBE_PIN is pointing to pin 4.

Step 6 — Servo Settings

```
38
39 //
40 // Servos
41 //
42 #define SERVO0_PIN          P0_05
43
```

 Similarly, in the wiring diagram, the servos orange cable needs to be connected to a digital signal pin on your control board. You can set this pin number by entering the following into either your configuration.h file or directly into your boards pins.h file.

 In lib/src/pins/...your control board

- Here, the SERVO0_PIN is pointing to pin 5.

Step 7 — Servo Settings

```
2954
2955 /**
2956  * Number of servos
2957  *
2958  * For some servo-related options NUM_SERVOS will be set automatically.
2959  * Set this manually if there are extra servos needing manual control.
2960  * Set to 0 to turn off servo support.
2961  */
2962 #define NUM_SERVOS 1 // Note: Servo index starts with 0 for M280-M282 commands
2963
2964 // (ms) Delay before the next move will start, to give the servo time to reach its target angle.
2965 // 300ms is a good value but you can try less delay.
2966 // If the servo can't reach the requested position, increase it.
2967 #define SERVO_DELAY { 300 }
2968
2969 // Only power servos during movement, otherwise leave off to prevent jitter
2970 #define DEACTIVATE_SERVOS_AFTER_MOVE
2971
2972 // Edit servo angles with M281 and save to EEPROM with M500
2973 #define EDITABLE_SERVO_ANGLES
2974
2975 // Disable servo with M282 to reduce power consumption, noise, and heat when not in use
2976 // #define SERVO_DETACH_GCODE
2977
```

- Set NUM_SERVOS 1
- Set servo delay to 300.
- Make sure that DEACTIVATE_SERVOS_AFTER_MOVE is activated (has the two dashes in front of it removed).
- Also activate EDITABLE_SERVO_ANGLES