



# Lite6 Marlin Configuration

Set up your Marlin Firmware to support your new E3D HotEnd

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## Step 1 — Download Marlin



- First things first: you're going to need a copy of Marlin.
  - If you are upgrading an existing 3D printer to use a V6 HotEnd, you should try to get a copy of your current firmware from your printer's manufacturer.
  - If you're building a new printer, or simply want to upgrade to the latest version of Marlin, download it at <http://marlinfw.org/meta/download/>
- ⚠ If you download a fresh version of Marlin you'll have to configure more settings than the ones mentioned in this guide so that it will work well with your printer.

## Step 2 — Download Arduino



- Almost all printers use Arduino IDE to upload fresh firmware, so download it at <https://www.arduino.cc/en/Main/Software>

### Step 3 — Open Marlin in Arduino



- Unzip Marlin from the zip file you downloaded and put the resulting folder anywhere on your computer for safe keeping.
- Inside this folder, navigate to the Marlin sub-folder, and open the Marlin.ino file. This should open every file in Marlin.
- Find the Configuration.h file

## Step 4 — Thermistor Settings

```

// Section temperature

//===== Thermal Settings =====
//=====

//-----NORMAL 10 4.7kOhm PT1000----- (same pullup can be used on hotend sensor, using correct resistor and table)
// Temperature sensor availability:
// *
// * 0 = thermocouple with MAX31865 (only for sensor 0)
// * 1 = thermocouple with MAX6675 (only for sensor 1)
// * -1 = thermocouple with AD595
// * 0 = not used
// * 1 = 100K thermistor - best choice for EPCOS 100K (4.7k pullup)
// * 2 = 200K thermistor - ATC Semitec 2040T-2 (4.7k pullup)
// * 3 = Mendel-parts thermistor (4.7k pullup)
// *
// * 100K thermistor - ATC Semitec 1040T-3 (used in Printrbot & 3-Head) (4.7k pullup)
// *
// * 75 = 100K Rosewill thermistor 130-01-1040-201 (4.7k pullup)
// * 70 = 100K Rosewill thermistor 130-01-1040-201 (4.7k pullup)
// * 8 = 100K 9609 2ND Yubay WTC0609E0104FE1 (4.7k pullup)
// * 9 = 100K 9609 2ND Yubay WTC0609E0104FE1 (4.7k pullup)
// * 10 = 100K 9609 2ND Yubay WTC0609E0104FE1 (4.7k pullup)
// * 11 = 100K beta 3950 1K thermistor (4.7k pullup)
// * 12 = 100K 9609 2ND Yubay WTC0609E0104FE1 (4.7k pullup) (calibrated for Heihsien hot bed)
// * 13 = 100K Klauzer 3950 1K up to 200°C for hotend "Simple ONE" & "Rascal "All in One"
// * 20 = the PT100 sensor found in the Ultimaker 2 XL
// * 60 = 100K Maker's Tool Works Kapton Bed Thermistor beta=3950
// * 46 = 4.7k High Temperature thermistor from Digi-Partz
// * 70 = the 100K thermistor found in the bq Hephaestus 2
// * 75 = 100K Generic Silicon Heat Pad with WTC 100K M0815-1049305012 thermistor
// *
// * 1k ohm pullup tables - This is optional, and requires changing out the 4.7k pullup for 1k.
// *      (but gives greater accuracy and more stable PID)
// *
// * 81 = 100k thermistor - EPCOS (1k pullup)
// * 82 = 200k thermistor - ATC Semitec 2040T-2 (1k pullup)
// * 83 = 100k thermistor - ATC Semitec 1040T-3 (used in Printrbot & 3-Head) (1k pullup)
// *
// * 1047 = PT1000 with 4k7 pullup
// * 1018 = PT1000 with 1k pullup (non standard)
// * 147 = PT100 with 4k7 pullup
// * 110 = PT100 with 1k pullup (non standard)
// *
// * Use these for Testing or Development purposes, NEVER for production machine.
// * 998 = Dummy Table that ALWAYS reads 20°C on the temperature defined below.
// * 999 = Dummy Table that ALWAYS reads 100°C on the temperature defined below.
// *
// * 101 = "0": "Not used", "1": "100K / 4.7k - EPCOS", "2": "100K / 4.7k - ATC Semitec 2040T-2", "3": "Mendel-parts / 4.7k", "4": "100K / 4.7k"

#define TEMP_SENSOR_0 1
#define TEMP_SENSOR_1 0
#define TEMP_SENSOR_2 0
#define TEMP_SENSOR_3 0
#define TEMP_SENSOR_4 0
//=====

// Dummy thermistor constant temperature readings, for use with 998 and 999
#define DUMMY_THERMISTOR_998_VALUE 25
#define DUMMY_THERMISTOR_999_VALUE 100

// Use temp sensor 1 as a redundant sensor with sensor 0, if the readings
// from the two sensors differ too much the print will be aborted.
// #define TEMP_SENSOR_1_AS_REDUNDANT
// #define MAX_REDUNDANT_TEMP_SENSOR_DIFF 10

// Extruder temperature must be close to target for this long before M109 returns success
// #define TEMP_RESISTOR_TIME 10 // (seconds)
// #define TEMP_HISTESIS 3 // (degC) range of +/- temperatures considered "close" to the target one
// #define TEMP_HISTESIS 1 // (degC) hysteresis around target to start the residency timer a degC early.

// Bed temperature must be close to target for this long before M90 returns success
// #define BED_TEMP 0 //=====

```

- In the configuration.h file, find the Thermal Settings section. Below the comments you'll find the settings for the types of thermistors your printer uses. (Typically there will be one per hotend and one more if you have a heated bed.)
- If you're installing your Lite6 as your only HotEnd, change the first highlighted line to: `#define TEMP_SENSOR_0 5`
- If you're replacing an existing HotEnd or have multiple HotEnds, adjust whichever line corresponds to the tool number that you're changing (they start counting from 0)

## Step 5 — Set Maximum Temperature

```

Marlin - Configuration.h [Arduino 1.8.3]
File Edit Sketch Tools Help
Main Configuration.h Conditionals_LCD.h Conditionals_post.h Configuration.h Configuration_adv.h GCode_Mesh_Visualizer_Tools.h
// Bed temperature must be close to target for this long before M190 returns success
#define TEMP_RESIDENCY_TIME 10 // (seconds)
#define TEMP_HYSTERESIS 3 // (degC) range of +/- temperatures considered "close" to the target one
#define TEMP_WINDOW 1 // (degC) Window around target to start the residency timer x degC early.

// The minimal temperature defines the temperature below which the heater will not be enabled It is used
// to check that the wiring to the thermistor is not broken.
// Otherwise this would lead to the heater being powered on all the time.
#define HEATER_0_MINTEMP 5
#define HEATER_1_MINTEMP 5
#define HEATER_2_MINTEMP 5
#define HEATER_3_MINTEMP 5
#define BED_MINTEMP 5

// When temperature exceeds max temp, your heater will be switched off.
// This feature works to protect your filament from overheating accidentally, but "M0" from thermistor short/failure!
// See: https://reprap.org/wiki/Thermistor_short_failure_protection.
#define HEATER_0_MAXTEMP 275
#define HEATER_1_MAXTEMP 275
#define HEATER_2_MAXTEMP 275
#define HEATER_3_MAXTEMP 275
#define BED_MAXTEMP 150

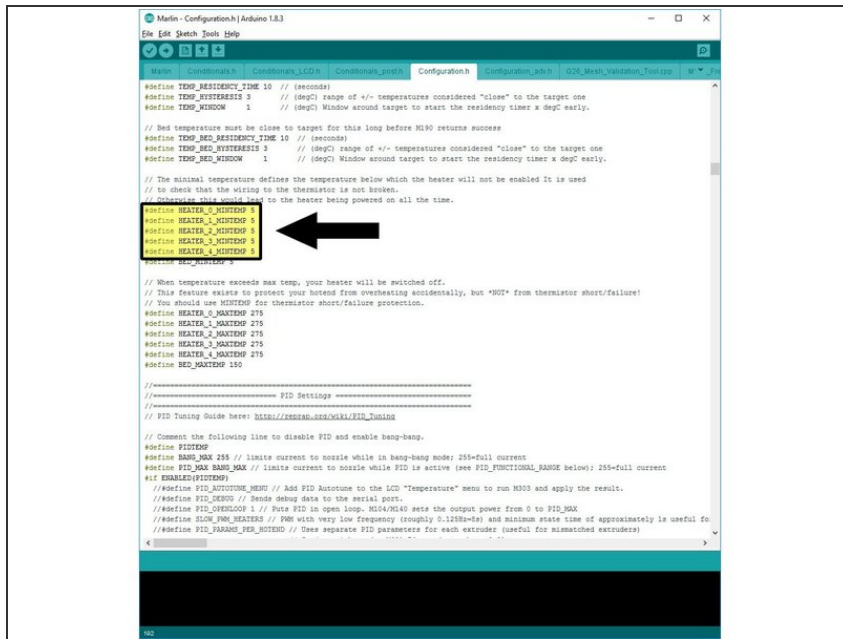
//===== PID Settings =====
//===== PID Tuning Guide here: https://reprap.org/wiki/PID_tuning =====

// Comment the following line to disable PID and enable bang-bang.
#define PIDTEMP
#define BANG_MAX 255 // limits current to max while in bang-bang mode; 255=full current
#define PID_MAX_BANG_MAX // limits current to max while PID is active (see PID_FUNCTIONAL_RANGE below); 255=full current
#define ENABLE_PIDTEMP
//#define PID_AUTOTUNE_MENU // Add PID Autotune to the LCD "Temperature" menu to run M303 and apply the result.
//#define PID_DEBUG // Sends debug data to the serial port.
//#define PID_OPENLOOP 1 // Puts PID in open loop. M304/M340 sets the output power from 0 to PID_MAX
//#define SLOW_PWM_HEATERS // PWM with very low frequency (roughly 0.128Hz) and minimum state time of approximately 1s is useful fo
//#define PID_PARAMS_PER_HOTEND // Uses separate PID parameters for each extruder (useful for mismatched extruders)

```

- i While the metal of your new V6 hotend can withstand very high temperatures, the PTFE lining of your Lite6 can only go up to ~245°C for extended periods.
- Set that as your maximum temperature by changing the first highlighted line to: **#define HEATER\_0\_MAXTEMP 245** (or adjust the line corresponding to the hotend you're changing.)

## Step 6 — Set Minimum Temperature



```

// Bed temperature must be close to target for this long before M190 returns success
#define TEMP_BED_RESIDENCY_TIME 10 // (seconds)
#define TEMP_BED_STEPPERIS 5 // (degC) range of +/- temperatures considered "close" to the target one
#define TEMP_WINDOW 1 // (degC) Window around target to start the residency timer a degC early.

// When temperature exceeds max temp, your heater will be switched off.
// This feature exists to protect your heater from overheating accidentally, but "M0" from thermistor short/failure!
// You should use MINTEMP for thermistor short/failure protection.
#define HEATER_0_MAXTEMP 275
#define HEATER_1_MAXTEMP 275
#define HEATER_2_MAXTEMP 275
#define HEATER_3_MAXTEMP 275
#define HEATER_4_MAXTEMP 275
#define HEATER_5_MAXTEMP 275
#define HEATER_6_MAXTEMP 275
#define HEATER_7_MAXTEMP 275
#define HEATER_8_MAXTEMP 275
#define HEATER_9_MAXTEMP 275
#define HEATER_10_MAXTEMP 275
#define HEATER_11_MAXTEMP 275
#define HEATER_12_MAXTEMP 275
#define HEATER_13_MAXTEMP 275
#define HEATER_14_MAXTEMP 275
#define HEATER_15_MAXTEMP 275
#define HEATER_16_MAXTEMP 275
#define HEATER_17_MAXTEMP 275
#define HEATER_18_MAXTEMP 275
#define HEATER_19_MAXTEMP 275
#define HEATER_20_MAXTEMP 275
#define HEATER_21_MAXTEMP 275
#define HEATER_22_MAXTEMP 275
#define HEATER_23_MAXTEMP 275
#define HEATER_24_MAXTEMP 275
#define HEATER_25_MAXTEMP 275
#define HEATER_26_MAXTEMP 275
#define HEATER_27_MAXTEMP 275
#define HEATER_28_MAXTEMP 275
#define HEATER_29_MAXTEMP 275
#define HEATER_30_MAXTEMP 275
#define HEATER_31_MAXTEMP 275
#define HEATER_32_MAXTEMP 275
#define HEATER_33_MAXTEMP 275
#define HEATER_34_MAXTEMP 275
#define HEATER_35_MAXTEMP 275
#define HEATER_36_MAXTEMP 275
#define HEATER_37_MAXTEMP 275
#define HEATER_38_MAXTEMP 275
#define HEATER_39_MAXTEMP 275
#define HEATER_40_MAXTEMP 275
#define HEATER_41_MAXTEMP 275
#define HEATER_42_MAXTEMP 275
#define HEATER_43_MAXTEMP 275
#define HEATER_44_MAXTEMP 275
#define HEATER_45_MAXTEMP 275
#define HEATER_46_MAXTEMP 275
#define HEATER_47_MAXTEMP 275
#define HEATER_48_MAXTEMP 275
#define HEATER_49_MAXTEMP 275
#define HEATER_50_MAXTEMP 275
#define HEATER_51_MAXTEMP 275
#define HEATER_52_MAXTEMP 275
#define HEATER_53_MAXTEMP 275
#define HEATER_54_MAXTEMP 275
#define HEATER_55_MAXTEMP 275
#define HEATER_56_MAXTEMP 275
#define HEATER_57_MAXTEMP 275
#define HEATER_58_MAXTEMP 275
#define HEATER_59_MAXTEMP 275
#define HEATER_60_MAXTEMP 275
#define HEATER_61_MAXTEMP 275
#define HEATER_62_MAXTEMP 275
#define HEATER_63_MAXTEMP 275
#define HEATER_64_MAXTEMP 275
#define HEATER_65_MAXTEMP 275
#define HEATER_66_MAXTEMP 275
#define HEATER_67_MAXTEMP 275
#define HEATER_68_MAXTEMP 275
#define HEATER_69_MAXTEMP 275
#define HEATER_70_MAXTEMP 275
#define HEATER_71_MAXTEMP 275
#define HEATER_72_MAXTEMP 275
#define HEATER_73_MAXTEMP 275
#define HEATER_74_MAXTEMP 275
#define HEATER_75_MAXTEMP 275
#define HEATER_76_MAXTEMP 275
#define HEATER_77_MAXTEMP 275
#define HEATER_78_MAXTEMP 275
#define HEATER_79_MAXTEMP 275
#define HEATER_80_MAXTEMP 275
#define HEATER_81_MAXTEMP 275
#define HEATER_82_MAXTEMP 275
#define HEATER_83_MAXTEMP 275
#define HEATER_84_MAXTEMP 275
#define HEATER_85_MAXTEMP 275
#define HEATER_86_MAXTEMP 275
#define HEATER_87_MAXTEMP 275
#define HEATER_88_MAXTEMP 275
#define HEATER_89_MAXTEMP 275
#define HEATER_90_MAXTEMP 275
#define HEATER_91_MAXTEMP 275
#define HEATER_92_MAXTEMP 275
#define HEATER_93_MAXTEMP 275
#define HEATER_94_MAXTEMP 275
#define HEATER_95_MAXTEMP 275
#define HEATER_96_MAXTEMP 275
#define HEATER_97_MAXTEMP 275
#define HEATER_98_MAXTEMP 275
#define HEATER_99_MAXTEMP 275

```

- For safety it is strongly recommended to make sure that your printer detects if the thermistor stops sending correct temperatures for any reason.
- Set the first highlighted line to: `#define HEATER_0_MINTEMP 5` (or adjust the line corresponding to the hotend you're changing.)
- In newer versions of Marlin there are other features such as Thermal Runaway Protection that might be useful as well, though they are typically on by default.

## Step 7 — Upload Firmware



- Upload the new firmware to your electronics as you normally would. Typically this means plugging in your printer to your computer, selecting the correct COM port and board type, and pressing the upload button.
- If you're unsure of how to update your printer's firmware, check with its manufacturer.

Head back to the [Lite6 Assembly](#) page to finish the last few steps before you start printing.