



Titan Aqua Repetier Configuration

Set up your Repetier Firmware to support your new Titan Aero.

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Repetier

Step 1 — Download Marlin



- First things first: you're going to need a copy of Repetier.
 - If you are upgrading an existing 3D printer to use a Titan, 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 Repetier, download it at <https://www.repetier.com/download-now/>
- ⚠ If you download a fresh version of Repetier 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 Repetier in Arduino

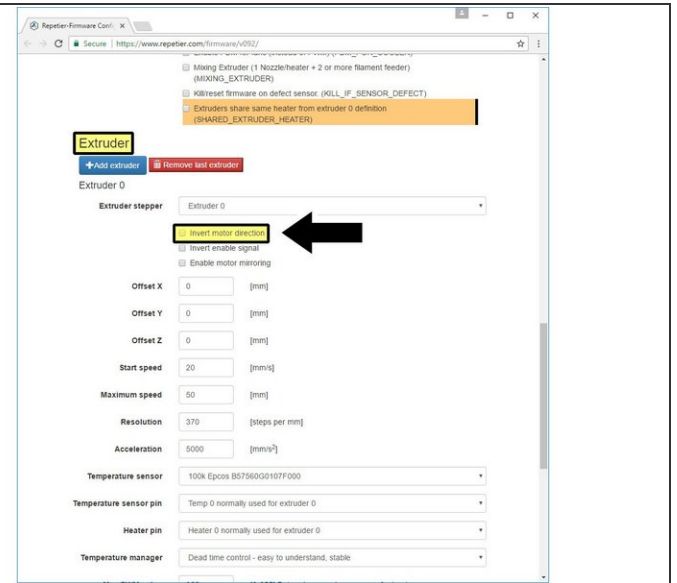


- Unzip Repetier from the zip file you downloaded and put the resulting folder anywhere on your computer for safe keeping.
- Inside this folder, navigate to the Repetier sub-folder, and open the Repetier.ino file. This should open every file in Marlin.
- Find the Configuration.h file
- ① Rather than manually editing the configuration file, you can also upload it to the [online configurator](#).

Step 4 — Extruder Direction

```

#define DRIVE_SYSTEM 0
#define X_AXIS_STEPS_PER_MM 80
#define Y_AXIS_STEPS_PER_MM 80
#define Z_AXIS_STEPS_PER_MM 80
#define EXTRUDER_PAN_COOL_TEMP 50
#define PAN_FOR_EXTRUDER 0
#define PAN_FOR_COOLER 0
#define DECOUPLING_TEST_MAX_HOLD_VARIANCE 20
#define DECOUPLING_TEST_MAX_HOLD_TIME 1
#define KILL_IF_SENSOR_DEFECT 0
#define RETRACT_ON_PAUSE 2
#define PAUSE_FEED_COMMANDS ""
#define PAUSE_END_COMMANDS ""
#define RESUME_EXTRUDER_HEATER 0
#define EXT0_OFFSET 0
#define EXT0_1_OFFSET 0
#define EXT0_2_OFFSET 0
#define EXT0_STEPS_PER_MM 370
#define EXT0_THERMISTOR_TYPE 1
#define EXT0_THERMISTOR_PIN TEMP_0_PIN
#define EXT0_HEATER_PIN HEATER_0_PIN
#define EXT0_STEP_PIN ORIG_E0_STEP_PIN
#define EXT0_DIR_PIN ORIG_E0_DIR_PIN
#define EXT0_ENABLE_PIN ORIG_E0_ENABLE_PIN
#define EXT0_DISABLE_ON 0
#define EXT0_HEATER_STEPPER 0
#define EXT0_STEPS_PER_ORIG_E0_STEP_PIN
#define EXT0_DIR_PIN ORIG_E0_DIR_PIN
#define EXT0_INVERSE 1
#define EXT0_ENABLE_PIN ORIG_E0_ENABLE_PIN
#define EXT0_MAX_FEEDRATE 50
#define EXT0_MAX_START_FEEDRATE 20
#define EXT0_MAX_ACCELERATION 5000
#define EXT0_HEAT_JANUARY 3
#define EXT0_RETRYPERIOD 3
#define EXT0_PID_INTERNAL_DRIVE_MAX 200
#define EXT0_PID_INTERNAL_DRIVE_MIN 40
#define EXT0_PID_MIN_ON_ORIG_TIME 1
#define EXT0_PID_1 2
#define EXT0_PID_2 40
#define EXT0_PID_MAX 255
#define EXT0_ADVANCE 0
#define EXT0_ADVANCE_2 0
  
```



- If your old extruder was ungeared, you'll notice that your new Titan extrudes backwards!
- Flip the following line in the Configuration.h file from 0 to 1, or vice versa: `EXT0_INVERSE`
- If you're using the online configuration tool, navigate to the Tools tab and toggle the box labelled Invert Motor Direction.

Step 5 — Extruder Steps-per-mm 1

$$\text{E-Steps-per-MM} = \frac{\text{Motor Steps} * \text{Micro-stepping} * \text{Gear Ratio}}{(\text{Hobb Diameter} * \pi)}$$

- Standard motor steps / rev = 400
- Standard micro-stepping = 16x
- Gear Ratio = 3
- Hobb Diameter (Effective) = 7.3

$$400 * 16 * 3 / (7.3 * 3.142) = \mathbf{837 \text{ E-steps-per-mm}}$$

(For the motor sold with the Titan)

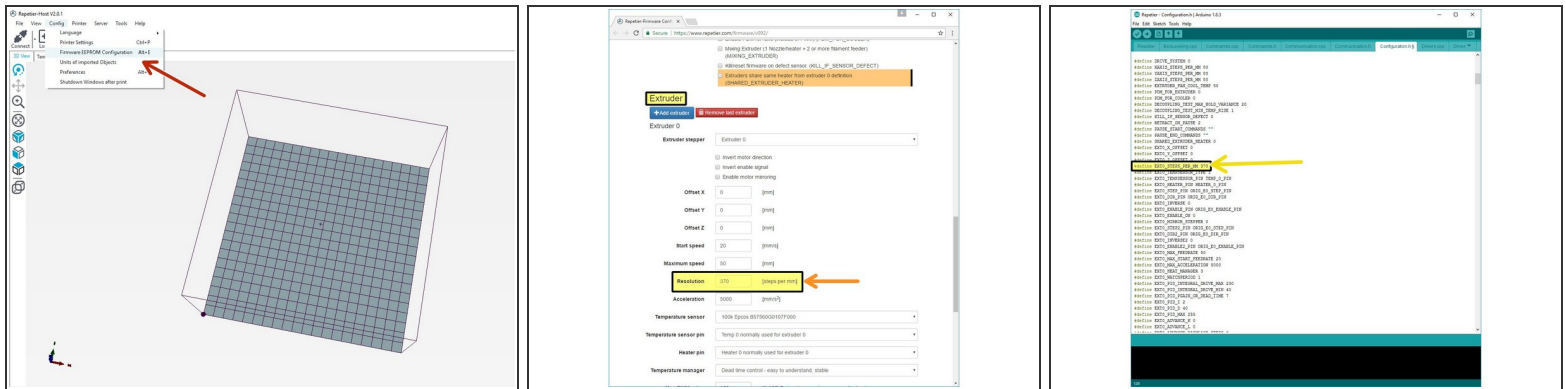
- The next thing we'll have to update is your printer's E-steps-per-mm.
- ⓘ Your slicer will generate G-Code for your printer, which will tell it to extrude a certain length (in millimeters) of filament. Your printer takes those lengths of filament and calculates how much it should rotate your Titan's stepper motor to push out the expected amount filament. This number is used to make that conversion
- First, we'll start with a ball-park estimate of your E-steps-per-mm, and then we'll fine-tune it.
- If you're using the standard Titan Slimline motor, start with 837 Steps-per-mm

Step 6



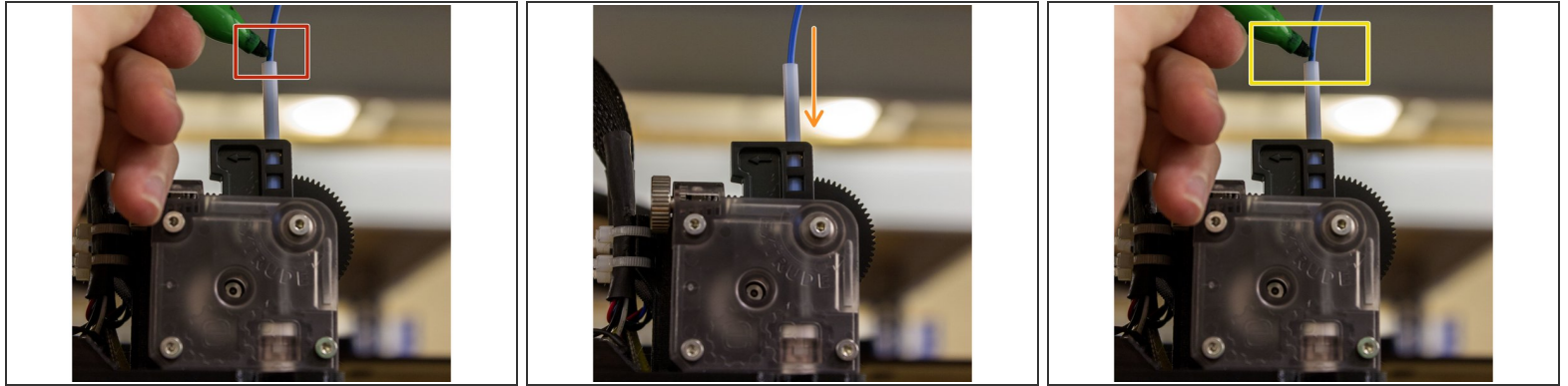
- i** To set your new E-steps-per-mm you need to edit your firmware and EEPROM
- i** EEPROM are special settings that can be changed without re-uploading new firmware to your printer. Steps-per-mm settings for each axis are included in the EEPROM. If you update your firmware, your EEPROM will overwrite any changes your firmware might have tried to make.
- i** Not all printers have EEPROM settings, so if you can't update them, just update your firmware instead.

Step 7 — Update E-Steps



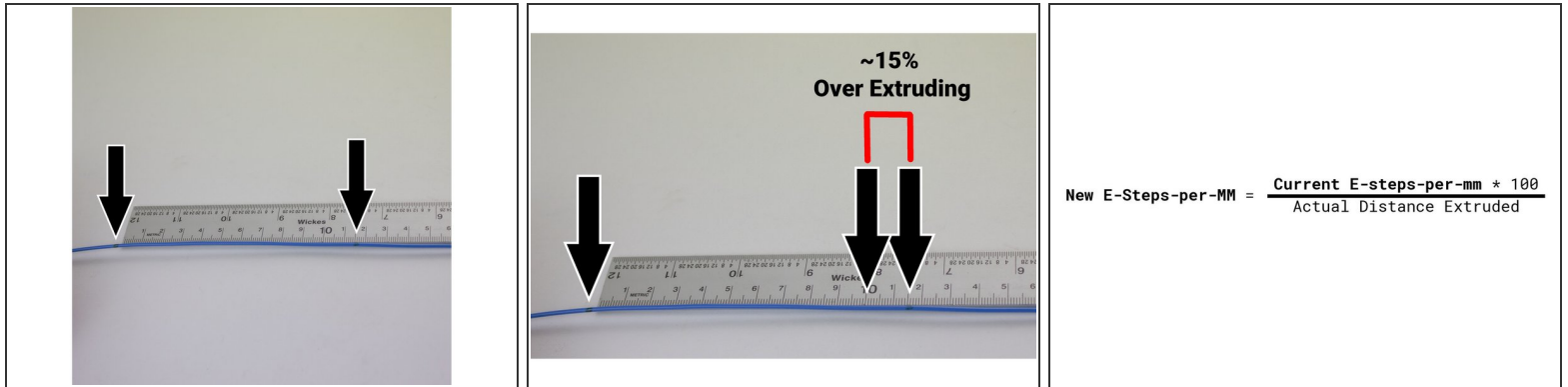
- With Repetier Host:
 - Connect to your printer and go to Config → Firmware EEPROM Configuration and edit the E-steps setting. Make sure to save afterwards.
- Over USB Connection without Repetier Host:
 - Use a printer control software to connect to your printer. Send the command M92 E<your number here> to your printer. Then, send M500 to store your settings
- In the Online Configuration tool:
 - In the Tools tab, scroll down to Extruder and update the Resolution number. If you have EEPROM, go to the General tab and switch the EEPROM usage to a different EEPROM Set to overwrite your printer's settings.
- If you don't have EEPROM, or want your firmware to be consistent with your EEPROM:
 - Update the following line with your new value: `#define EXT0_STEPS_PER_MM <your number here>`. Upload your firmware as normal.

Step 8 — Extruder Steps-per-mm Tune



- ① To get a more exact value for your E-steps-per-mm, measure the exact amount of filament that is pushed out of your extruder.
 - Load filament into your extruder, just until it is gripped by the drive shaft (you can't pull it out without moving the large gear turning)
 - Mark your filament at the top of the idler arm or PTFE tubing with a pen or permanent marker .
 - Tell your printer to extrude 100mm of filament. Use your printer's LCD screen, or send it: `G92 E0`, then `G1 E100` via your printer control software.
- ① You may need to heat your HotEnd before your printer allows you to extrude filament. You can use [M302](#) command to get around that.
 - Mark your filament again at the top of your idler arm or PTFE tubing
 - Eject your filament.

Step 9 — Extruder Steps-per-mm Tune 2



$$\text{New E-Steps-per-MM} = \frac{\text{Current E-steps-per-mm} * 100}{\text{Actual Distance Extruded}}$$

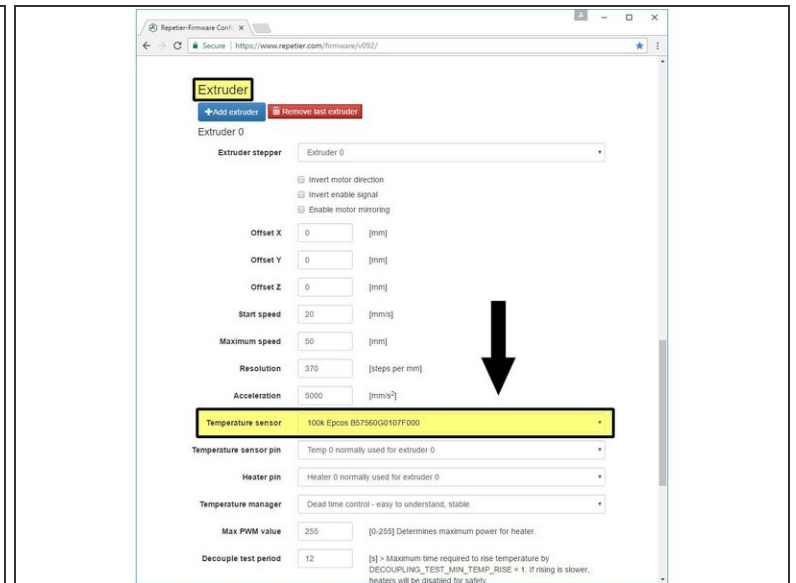
- With a ruler or calipers, measure the distance between the two marks on your filament.
- If the distance wasn't exactly 100mm, use a proportion to calculate a more precise E-steps-per-mm value.
- Enter that new value into your firmware or EEPROM as you did before.

Step 10 — Thermistor Settings

```

#define RAISE_START_COMMANDS ""
#define RAISE_END_COMMANDS ""
#define SHARED_EXTRUDER_HEATER 0
#define EXT0_OFFSET 0
#define EXT1_OFFSET 0
#define EXT2_OFFSET 0
#define EXT0_TEMPSENSOR_TYPE 8
#define EXT0_HEATER_PIN 10
#define EXT0_STEP_PIN 10
#define EXT0_DIR_PIN 10
#define EXT0_INVERSE 0
#define EXT0_ENABLE_PIN 10
#define EXT0_DISABLE_PIN 0
#define EXT0_MOTOR_STEPPER 0
#define EXT0_STEP2_PIN 10
#define EXT0_INVERSE2 0
#define EXT0_ENABLE2_PIN 10
#define EXT0_DISABLE2_PIN 0
#define EXT0_MAX_FEEDRATE 50
#define EXT0_MAX_START_FEEDRATE 20
#define EXT0_MAX_ACCELERATION 5000
#define EXT0_HEAT_MANAGER 3
#define EXT0_FEED_INTEGRAL_DRIVE_MAX 200
#define EXT0_FEED_INTEGRAL_DRIVE_MIN 40
#define EXT0_FEED_HOLD_ON_DELAY_TIME 1
#define EXT0_FEED_I 2
#define EXT0_FEED_I_0 60
#define EXT0_FEED_I_MAX 255
#define EXT0_ADVANCE_I 0
#define EXT0_ADVANCE_I_0 0
#define EXT0_ADVANCE_BACKLASH_STEPS 0
#define EXT0_WAIT_RETRACT_TIME 10
#define EXT0_WAIT_RETRACT_UNITS 0
#define EXT0_SELECT_COMMANDS ""
#define EXT0_DESELECT_COMMANDS ""
#define EXT0_EXTRUDER_COOLER_PIN -1
#define EXT0_EXTRUDER_COOLER_SPEED 255
#define EXT0_DECOUPLE_TEST_PERIOD 1000
#define EXT0_IUM_FILIP 0
#define FEATURE_RETRACTION 1

```



- Manual Editing:
 - In the configuration.h file, find the highlighted line and update it to: `#define EXT0_TEMPSENSOR_TYPE 8`.
 - If you are installing multiple hotends, or installing this Lite6 as a second hotend, adjust the setting for the proper extruder instead (EXT1, EXT2, etc).
- Online Tool:
 - Navigate to the Tools tab, and scroll down to the Extruder Section.
 - Select ATC Semitec 104-GT2 from the list of temperature sensors.

Step 11 — Update Safety Settings

```

// ***** Heated bed configuration *****

#define HEATED_BED 0
#define HEATED_BED_MAX_TEMP 120
#define HEATED_BED_SENSOR_PIN 1
#define HEATED_BED_SENSOR_TYPE 1
#define HEATED_BED_SENSOR_PIN_TEMP_1_PIN
#define HEATED_BED_SENSOR_PIN_TEMP_2_PIN
#define HEATED_BED_SENSOR_INTERVAL 5000
#define HEATED_BED_SENSOR_INTERVAL_0
#define HEATED_BED_SENSOR_INTERVAL_1 255
#define HEATED_BED_SENSOR_INTERVAL_2 80
#define HEATED_BED_SENSOR_INTERVAL_3 196
#define HEATED_BED_SENSOR_INTERVAL_4 33
#define HEATED_BED_SENSOR_INTERVAL_5 255
#define HEATED_BED_SENSOR_INTERVAL_6 30000

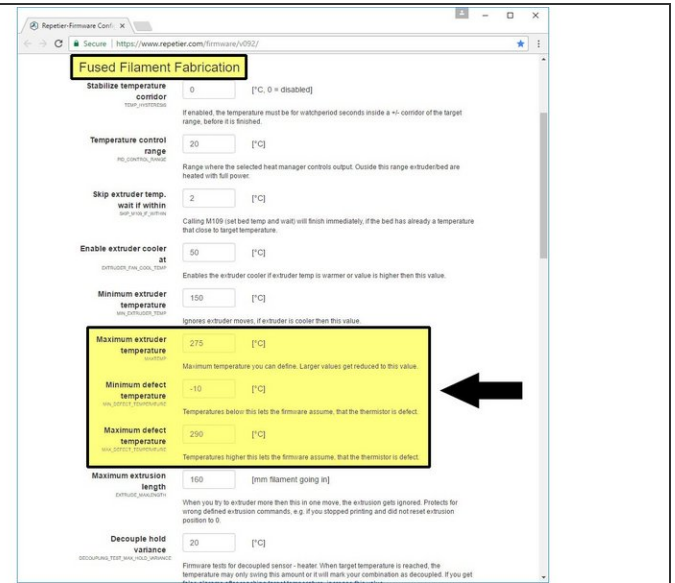
// ***** Laser driver *****
#define LASER_DRIVER 0
#define MIN_DEFECT_TEMPERATURE 5
#define MAX_TEMP 285
#define MAX_DEFECT_TEMPERATURE 290

// ***** Laser driver *****
// ***** Laser driver *****

If the firmware is in laser mode, it can control a laser output to cut or engrave materials.
Please use this feature only if you know about safety and required protection. Lasers are
dangerous and can burn or melt you blind!!

The default laser driver only supports laser on and off. Note you control the electricity with
your feet, for exchangeable diode lasers this is normally enough. If you need more control

```



- Manual editing:
 - Change: `#define MIN_DEFECT_TEMPERATURE 5` To detect a detached thermistor
 - Change: `#define MAX_TEMP 285` To prevents your hotend from overheating.
 - Change: `#define MAX_DEFECT_TEMPERATURE 290` To shut off your printer if overheated.
- Online Editing:
 - Change: Maximum extruder temperature 285 to prevent your HotEnd from overheating.
 - Change: Minimum defect temperature 5 To detect if thermistor is detached.
 - Change: Maximum defect temperature 290 To shut off your printer if overheated.

Step 12 — 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.

You're all done. Enjoy your new Titan!

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