Marlin user guide

Author   Bart Meijer

Date   26th of March 2014

Document version 1.0

RRW ReprapWorld.com

Marlin is one of the more popular firmwares available. A firmware is the software which converts machine instructions (gcodes) into actual movements. It resides on the electronics board, so you need to upload it to your electronics using Arduino. See the Arduino guide for more information how to upload the firmware.

This document will explain on how to configure Marlin for your printer.

Version 1.0

- Initial release

You can find the latest build of Marlin on Github
https://github.com/ErikZalm/Marlin. But if you are using ReprapWorld.com
electronics, you are probably better of using a pre configured Marlin version from
our software downloads page http://reprapworld.com/?software.

We provide an adjusted version for Megatronics and one for Minitronics. Once
downloaded, just extract the zip file to a location of your choice and open it in
Arduino. Once opened, Arduino will show a lot of tabs. Each tab represents a file,
containing code. For this manual, only the tabs configuration.h (configuration) and
pins.h (pin definitions) are relevant.

By default the firmware will probably not work for you, you need to adjust it to your specific needs. Because every 3D printer is different, we cannot provide a 100% pre-configure version. So this chapter will help you get the basics right. All settings are located in configuration.h, so you should find this tab first.

BAUDRATE

Baudrate is the speed of the serial connection, by default 115200 or 250000. Higher speed means information can be transferred faster between PC and electronics, but also has a higher fault change. 115200 is probably a good choice here.

Locate the line

#define BAUDRATE <baudrate>

you can set the baudrate by replacing the number at <baudrate> by another number.

Temperature sensors

Marlin has support for four temperature sensors (three extruders, one heated bed). Locate the lines

#define TEMP_SENSOR_N

where N = number of the extruder (0-2) or BED for heated bed. You can set the value of the parameter to 0 (not used), 1 (RRW thermistor 100K) or -1 (RRW thermo couple). Make sure you hardware has support for a thermo couple before trying.

Endstops

These are more difficult. By default the settings are OK for mechanical endstops. But if you want opto endstops you need to comment the line (place // before the text) of the corresponding parameter

#define ENDSTOPPULLUP_...

aslo you need to change ..._ENDSTOP_INVERTING = true; to false.

So for example, if you have a machanical end stop on the X axis you need to replace

#define ENDSTOPPULLUP_XMIN

with

//#define ENDSTOPPULLUP_XMIN

and

const bool X_MIN_ENDSTOP_INVERTING = true;

with

const bool X_MIN_ENDSTOP_INVERTING = false;

Homing feedrate

The homing feedrate is the speed at which the axis home, by default it's set to

#define HOMING_FEEDRATE {50*60, 50*60, 5*60, 0} // set the homing speeds (mm/min)

Between the {} are the axis x,y,z,extruder, where extruder never needs homing. The feedrate is in mm per minute.

Steps per mm

This setting defines the number of steps the stepper motor needs to take, before an axis moved 1 mm. By default it's set to

#define DEFAULT_AXIS_STEPS_PER_UNIT   {78.7402*2,78.7402*2,5120.00, (200*32) * (1/1) / (10.56*3.14159) } // default steps per unit for ultimaker

 The values depend on the type of pulley, leadscrew, gearing and step resolution. The prusa calculator may help you determine the correct values here: http://calculator.josefprusa.cz/

Max feedrate

This is an important setting, it limits the seed of an axis. If the speed is to high, the stepper motor will 'loose' steps, and your print will fail. The default is:

#define DEFAULT_MAX_FEEDRATE   {1000, 1000, 500, 500}   // (mm/sec)

For most printer the value 500 for the z axis is much to high, 5 is probably a better choice.

SD support

This setting enables SD card support

#define SDSUPPORT

By default it's on, but it generates a lot of overhead. If you don't need it, turn it off by commenting the line

//#define SDSUPPORT

Number of extruder

By default only one extruder is used. Adjust the parameter

#define EXTRUDERS <num_extruders>

to have more than one. Remember to also enable the temperature sensor.