

Guide to building grblHAL versions for Teensy based systems

Though it may at first look complex, building grblHAL from source code is not hard. To build grblHAL for a Teensy 4.x, follow these steps:

1. **Get Arduino.** Download and install the Arduino development environment for your PC (<https://www.arduino.cc/en/main/software>). Consider donating, it is a worthy cause.
2. **Get Teensyduino.** Download and install Teensyduino (<https://www.pjrc.com/teensy/teensyduino.html>).
3. **Get the grblHAL code.** Download the grblHAL zip file. (under Code on <https://github.com/terjeio/grblHAL>). Extract this directory structure to your development directory (on Windows it would be Documents/Arduino/). You should wind up with a directory named grbl-HALmaster.
4. **Configure grblHAL for the Teensy 4.x.** Copy the grbl files to the IMXRT1062 directory. All files in grbl-HALmaster/grbl should be copied into grbl-HALmaster/drivers/IMXRT1062/main/src/grbl. Windows File Explorer users be careful to copy and not move (which is the default).
5. **Build the Default Version.** To build the default 3 Axis version: (You can skip this step if you want an enhanced version.)
 1. Using the Arduino application File/Open to open the main.ino file in grbl-HALmaster/drivers/IMXRT1062/main.
 2. In the Arduino application, go to Tools/Board/Teensyduino and select Teensy 4.1. (note earlier versions of Arduino just has a long list of boards to select from – find Teensy 4.1 on that list.)
 3. Connect your Teensy 4.1 to your PC via a USB cable.
 4. In the Arduino application, go to Tools/USB Type. It should say Serial, if not, select Serial.
 5. In the Arduino application, go to Tools/Port. You should see an entry that says “ComXX Serial: Teensy 4.1”, select it.
 6. Press the upload button in the upper left corner directly below the top menu bar. This will take a while as Arduino needs to compile a large number of files. Eventually the status bar at the bottom left of the screen should say “upload complete”.
 7. Your board should be ready to test!
6. **Build an Enhanced Version.** If you need 4 or 5 Axis support (or additional features), download configurations.zip (<https://github.com/phil-barrett/grbl-teensy-4/blob/master/configurations.zip>) and copy the relevant driver.c and driver.h files to the grbl-HALmaster/drivers/IMXRT1062/main directory and rebuild (Arduino app, Download button). The zip file contains prebuilt versions that you can just load into the Teensy 4.x – see Readme.txt in the .zip file for details. To change to a 4 or 5 Axis version you will also need to edit the config.h in the grbl-HALmaster/drivers/IMXRT1062/main/src/grbl directory. At approximately line 150, you will find:

```
// Number of axes supported: minimum 3, maximum 6
// If more than 3 axes are required a compliant driver must be provided
#define N_AXIS 3 // Number of axes
```

Change this to 4 or 5, depending on your machine setup, save the file and rebuild (Arduino app, Download button).