Guide to building grblHAL versions for Teensy based systems

This document is depreciated in favor of the grblHAL WIKI section entitled “Compliing GrblHAL”, located here: https://github.com/terjeio/grblHAL/wiki/Compiling-GrblHAL

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, select Download ZIP). Extract this directory structure to your development directory (on Windows it would be Documents/Arduino/). You should wind up with 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. **Using legacy G Code Senders.** If you are getting odd behavior with your G Code Sender, you may need to set the compatibility level. This is common when using Java based or older G Coder Senders.
    1. Open grbl-HALmaster/drivers/IMXRT1062/main/src/grbl/config.h. At about line 50 you will see
        #define COMPATIBILITY_LEVEL 0
    2. Change this to
        #define COMPATIBILITY_LEVEL 10
    3. Rebuild as in 5.6 and test. You could also try a level of 2.
7. **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 relevent 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).