TMC2209_StallGuard_Tuning_ESP32

Ensure that the pin numbers match your setup.

```
#define EN_PIN              14 // Enable
#define DIR_PIN             32 // Direction
#define STEP_PIN            33 // Step
#define DIAG_PIN             4 // DIAG (hpsw)
```

Upload the firmware to the controller and open the Serial Plotter (CTRL-SHIFT-L).

You will see several lines.

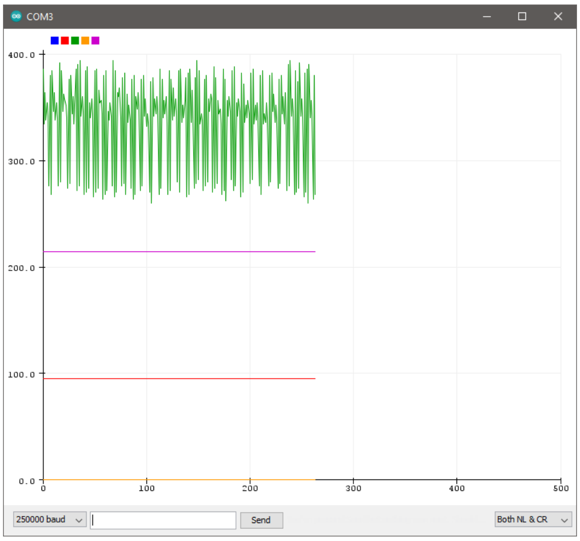
The wavy **Green** line is SG_RESULT, it will be higher as the speed increases.

The **Purple** line is the current.

The **Red** line is SGTHRS, the STALL_VALUE.

The **Orange** line is the DIAG_PIN output (hpsw).

When the stepper detects a resistance, the driver will increase the current in an effort to overcome the resistance.



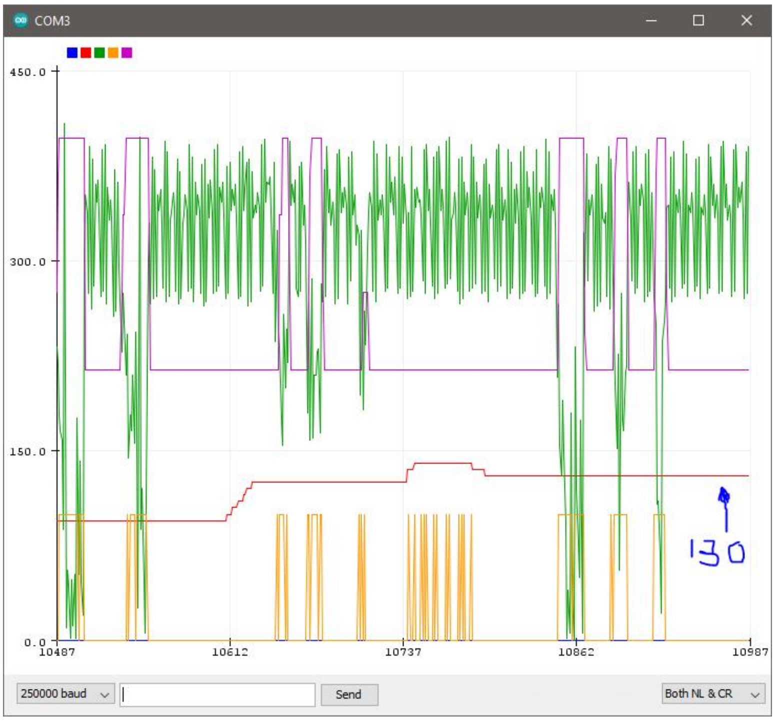
When the resistance is high enough (focuser is in full inward position), the driver sets DIAG_PIN HIGH. In myFP2ESP, this will stop the motor and set the position to 0.

STEPS TO DETERMINE THE STALL_VALUE

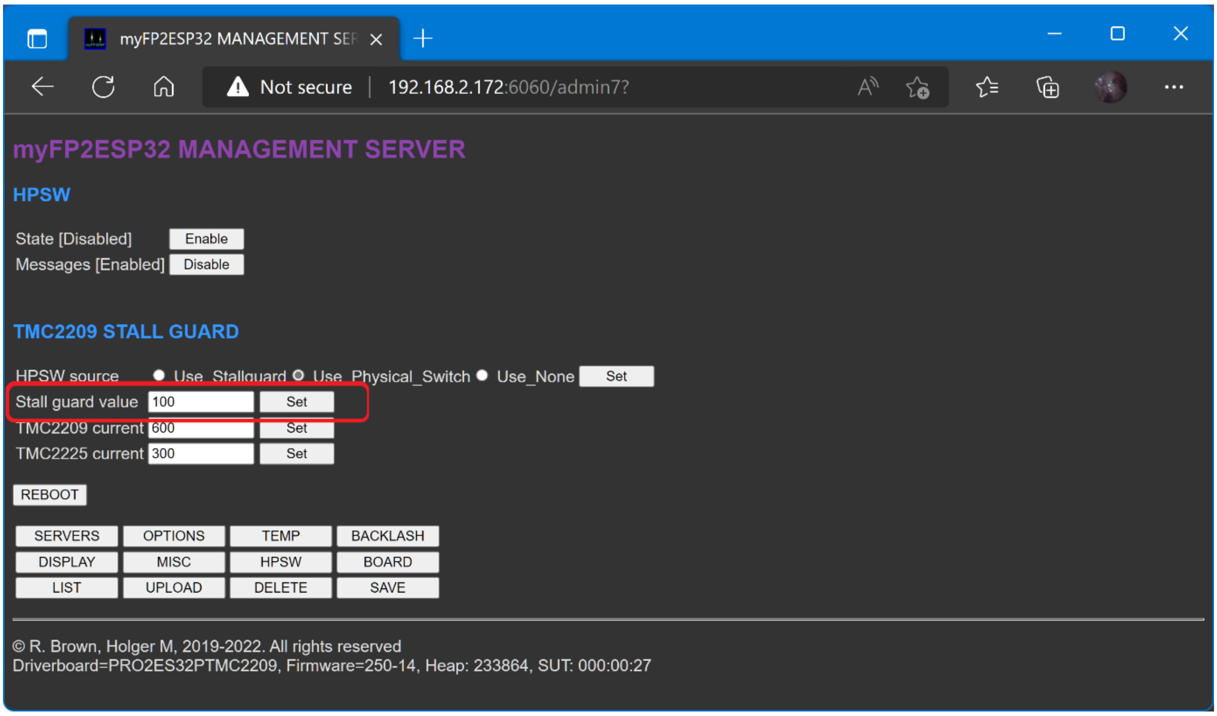
1. De-couple the motor from your focuser.
2. Start the Arduino IDE and load the firmware file TMC2209_StallGuard_Tuning_ESP32.ino
3. Make sure the pin numbers are correct for your board
4. Compile and upload the firmware to your controller
5. Open the serial port monitor window of the Arduino IDE (you may need adjust the baud rate setting of the serial monitor)
6. Set the motorspeed to about the same speed that will be used in myFP2ESP32
   a. This can be done with entering '+' and SEND in the Serial plotter to increase speed, '-' and send to decrease speed.
7. The **Orange** line should remain at 0, if it isn't, the STALL_VALUE is to high
   a. press 'd' and click SEND to decrease the value.
   b. Repeat until the **orange** line stays at 0.
8. Apply resistance to the motor, if all is well, you'll see the current rising and eventually the **orange** line rising to 100.

9. Determine the value at which the **red** line now is, this is your STALL_VALUE.

In the example below the **red** line value is 130.



Use the stall value you have found to replace the **stall guard** setting in myFP2ESP32 firmware. This can be done using the Management Server HPSW page.



myFP2ESP32 MANAGEMENT SERVER

HPSW

State [Disabled] Enable

Messages [Enabled] Disable

TMC2209 STALL GUARD

HPSW source ● Use_Stallguard ○ Use_Physical_Switch ● Use_None Set

Stall guard value 100 Set

TMC2209 current 600 Set

TMC2225 current 300 Set

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Driverboard=PRO2ES32PTMC2209, Firmware=250-14, Heap: 233864, SUT: 000:00:27