How to use TMC drivers on BIGTREETECH SKR

UPDATED: 5th June 2021

Note: The information in this guide refers to the case where a user decides to go ahead and use the SKR2 Rev A board with TMC divers and is provided as supplementary to the other solutions made in the formal announcement.

Note: The information in this guide only applies to the SKR 2 Rev A. The SKR 2 Rev B can be used with TMC drivers without these modifications.

Note: Please refer to the main announcement document here to identify whether you have a Rev A or a Rev B board.

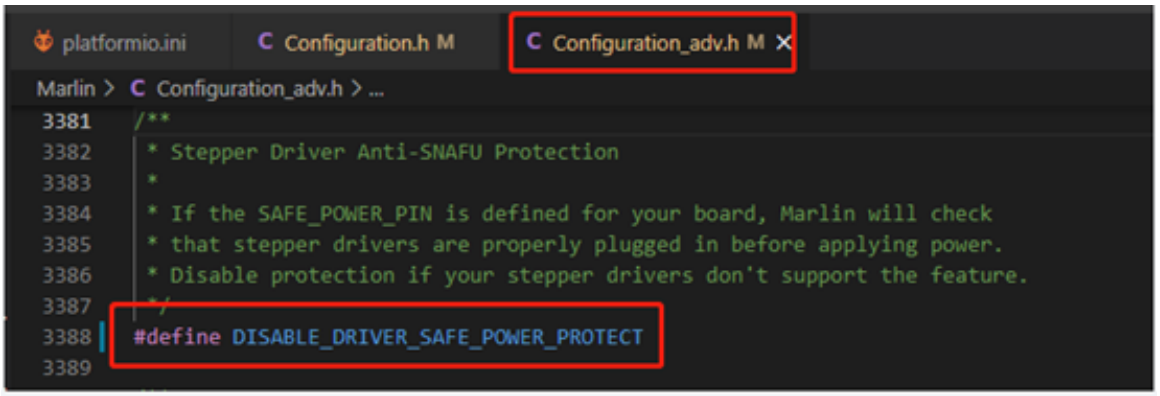
Due to an interaction between TMC drivers and a MOSFET that was used on the Rev A board, the Marlin driver anti-reverse function is not available Rev A board when using TMC drivers. If you insert TMC drivers onto an SKR2 Rev A board and do not disable the anti-reverse function – as mentioned in this guide – then your drivers may be damaged. If, however, you follow the steps in this guide to disable the anti-reverse function for each axis that you want to use a TMC driver on then you can safely use these drivers on the SKR 2 Rev A.

The steps involve both hardware and firmware. Since the firmware component is common to both hardware options (mentioned below) it is covered first.

Note: Regardless of what hardware option you select, you MUST follow the firmware guide below!!!

Firmware modification:

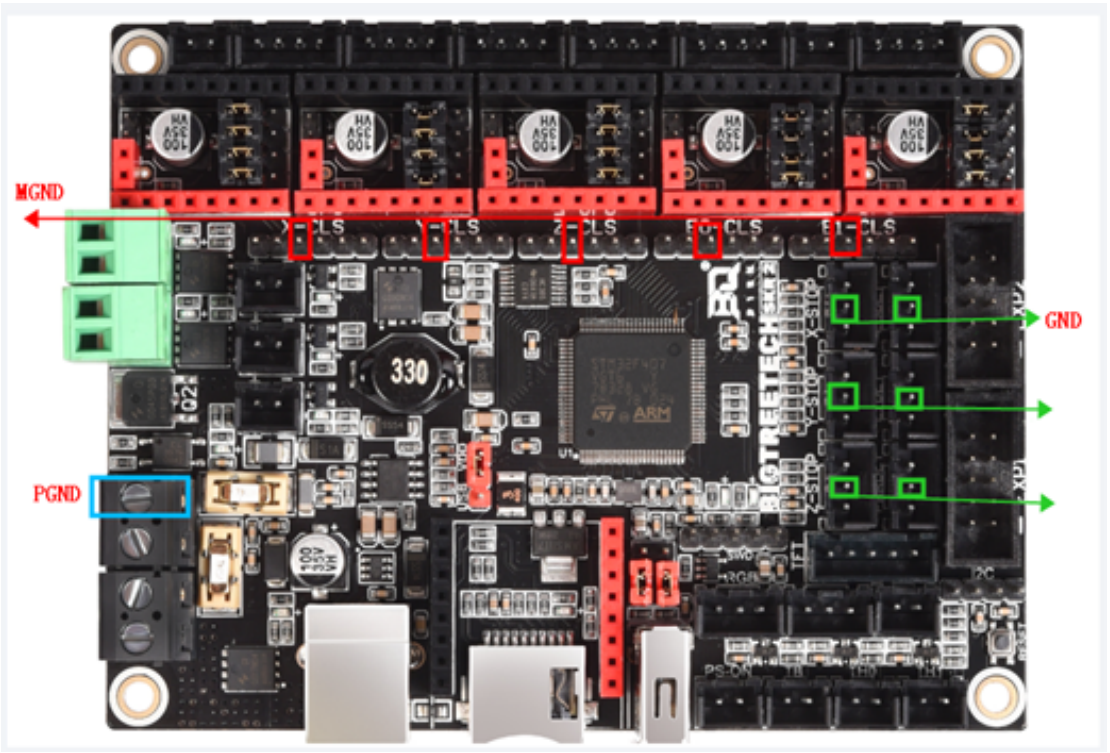
Disable the driver safe power protection feature by **uncommenting** the line shown below in configuration_adv.h.



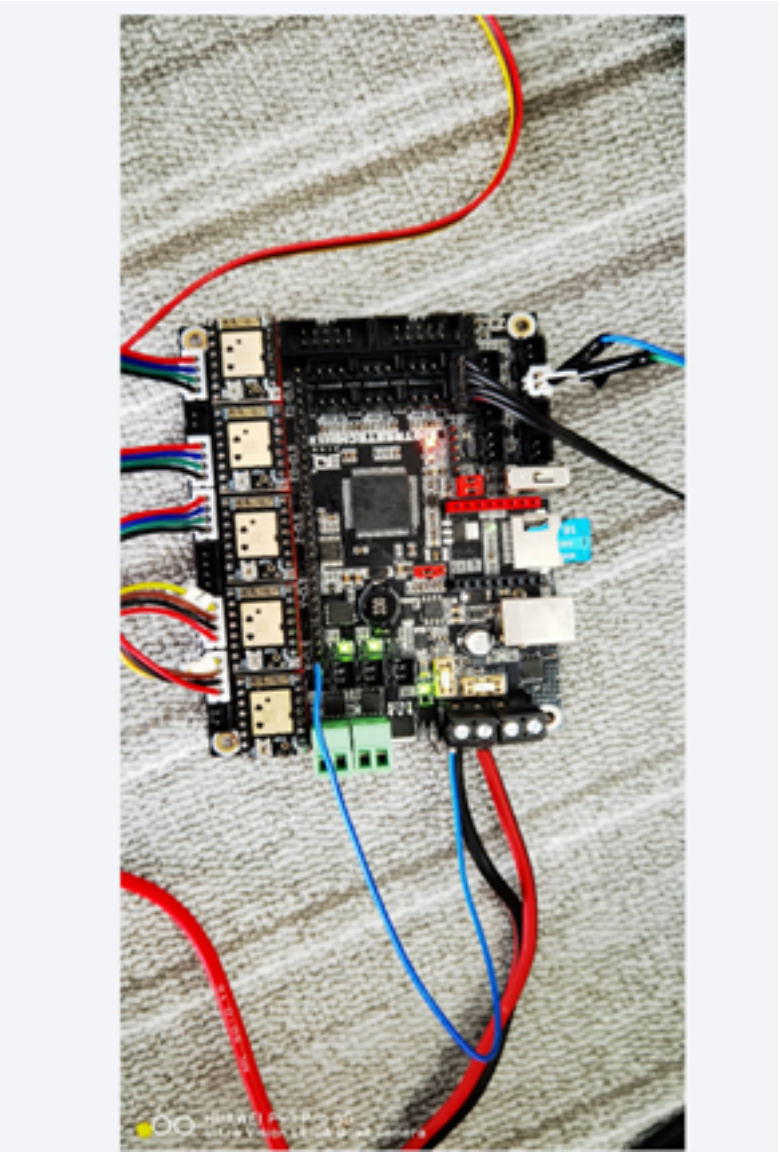
Hardware connection:

Option 1:

Use 1 or 2 Dupont jumper wires (two jumper wires are recommended since they will be able to carry higher currents but 1 is the minimum) to connect MGND (shown in red below) on the driver with PGND (shown in blue below) on the POWER. Alternately, you can connect connect MGND and GND (shown in green below). *Again, note: The driver anti-reverse function must be disabled in the firmware!!!*



The figure below shows one dupont cable going from MGND to PGND. Note that only two cables need to be used at most. Not a cable for each driver.

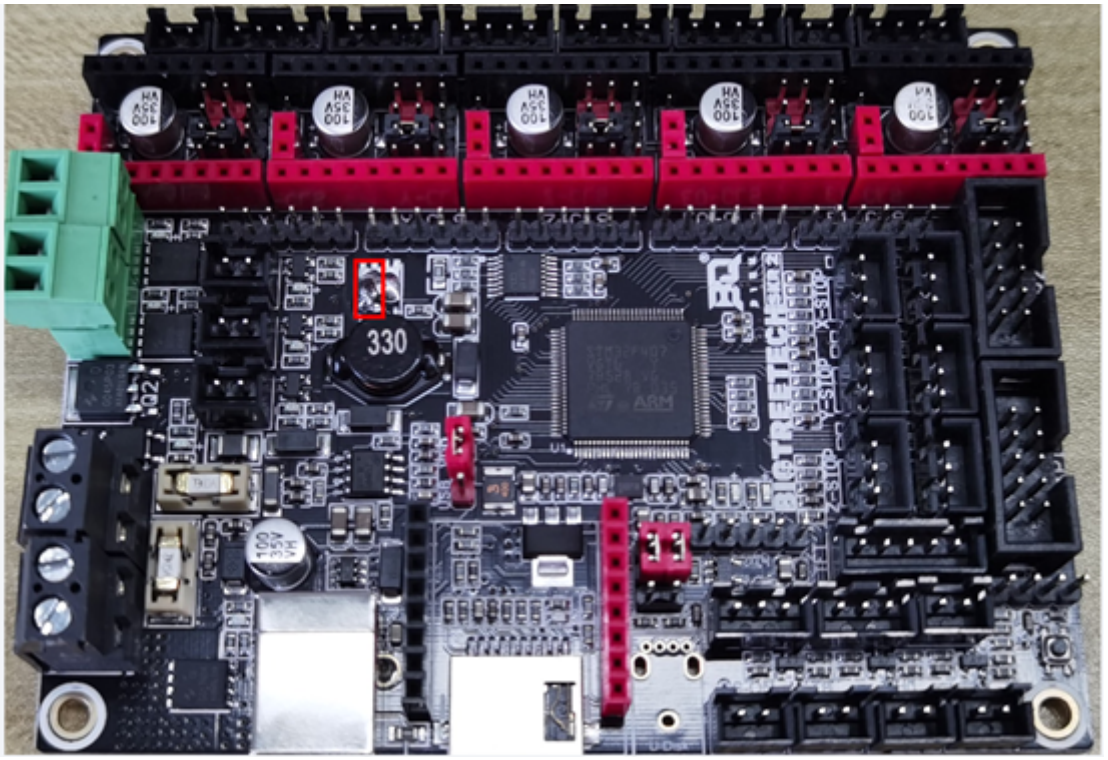


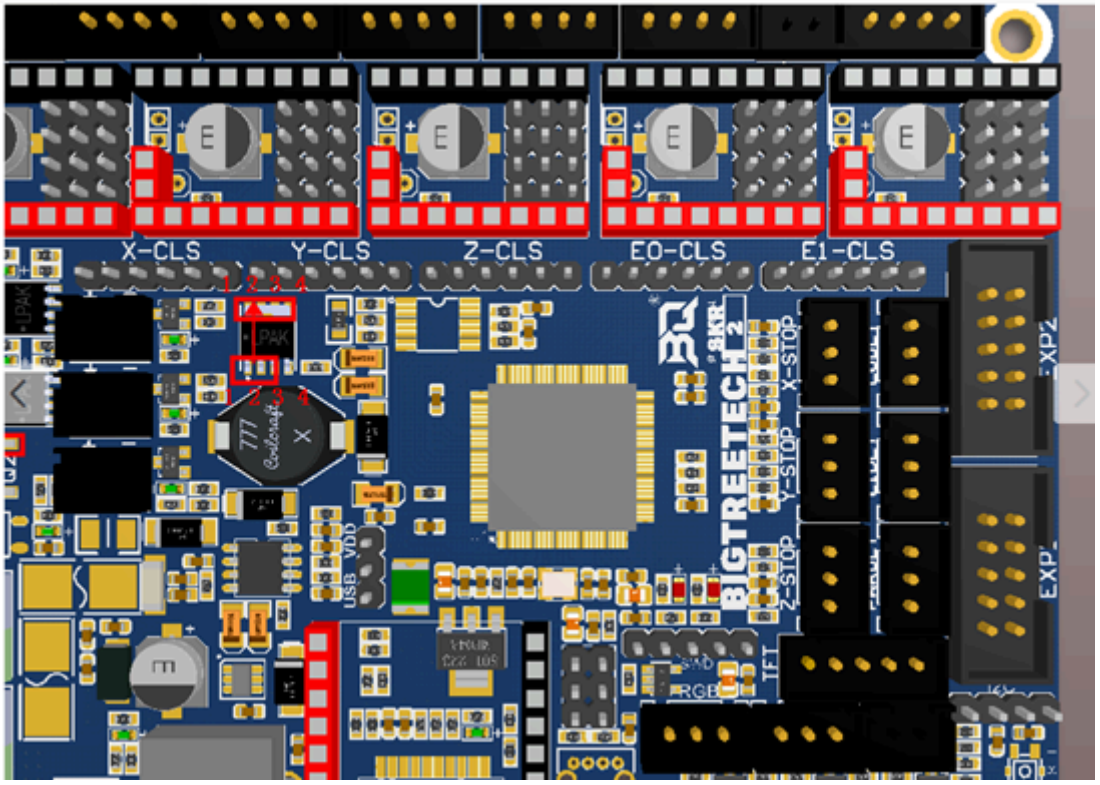
The figure below shows how to use the alternate method of connecting MGND to GND using a jumper wire. Again, note that only two jumpers need to be connected between MGND and GND and not one for each driver.

NOTE: The advantage of using either of the above methods is that when you want to use one or more TMC drivers, you can simply apply the hardware jumpers and the firmware modification. If, however, you decide to use a full set of drivers that do not include a TMC then you can simply disconnect the hardware jumpers and re-enable the driver anti reverse feature in the firmware.

Option 2:

Pro users can remove the MOSFET that controls the driver anti-reverse feature, and then use 0R resistor (or 10A fuse, or directly use tin) to solder the connection together. *(Note: the upper four pins should be soldered together with the first three lower pins. The fourth pin on the bottom row cannot be connected with any other pins!!!)*





Disadvantages of the second method: Removing the MOSFET will permanently disable the driver anti reverse protection function.

Advantages of the second method: No external Dupont jumper wires are needed.

Option 3:

You can also contact our support team for a replacement MOSFET. They will guide you on how to solder it onto the board.