Assembly & Installation Guide Makerbot Rep2X and clones

The Bondtech extruder upgrade kit for Makerbot and clones uses high-quality industrial pneumatic push-fit fittings for attaching the bowden tube. It has also thread inserts to have a strong connection of the fasteners.

This new revolution in design utilizes the **Bondtech Dual Drive Technology** with precision CNC-manufactured parts which gives the markets best performance and reliability.

Thanks for your support making this project a reality!

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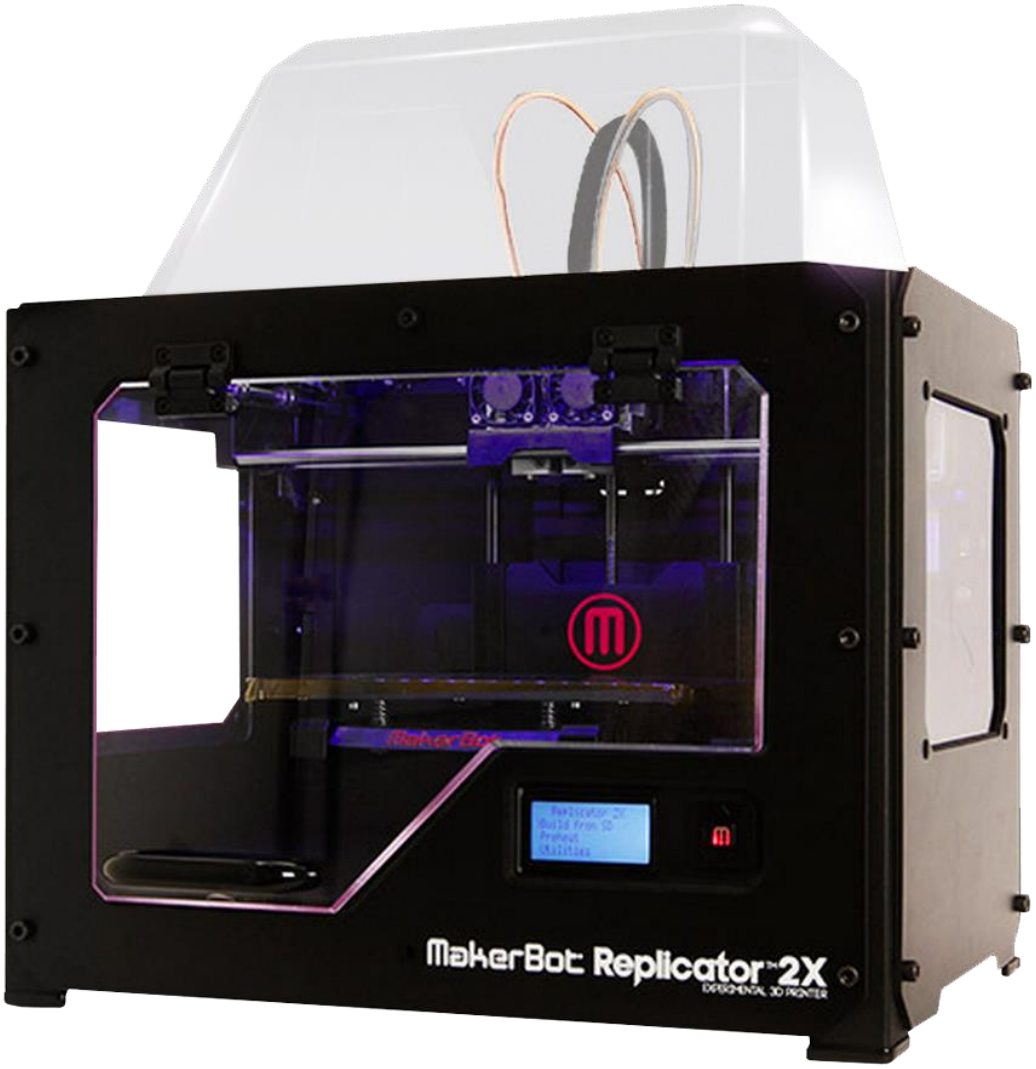
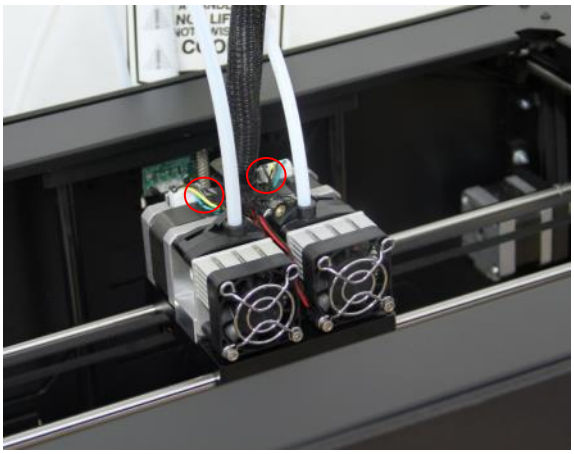
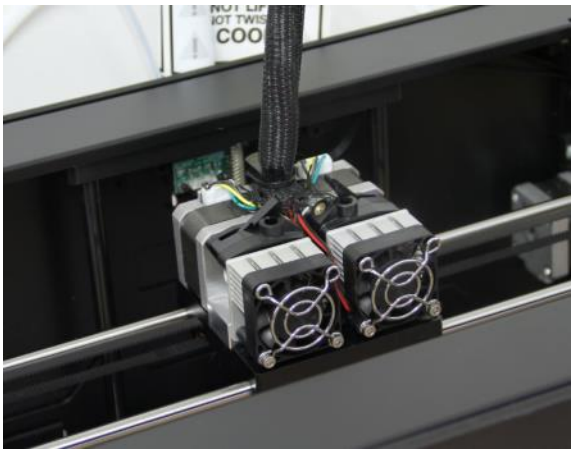

MakerBot Replicator 2X

Mechanical & Electrical Installation

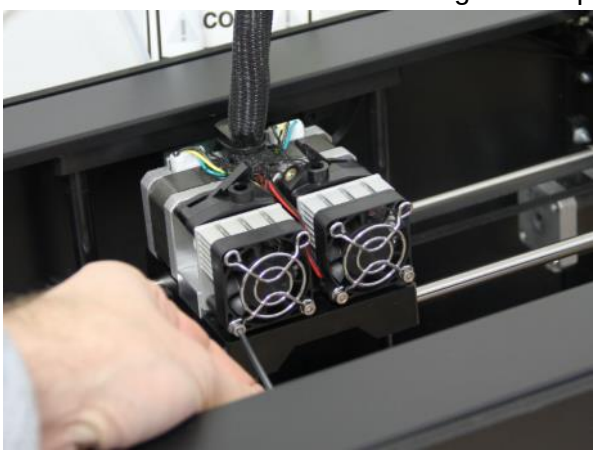
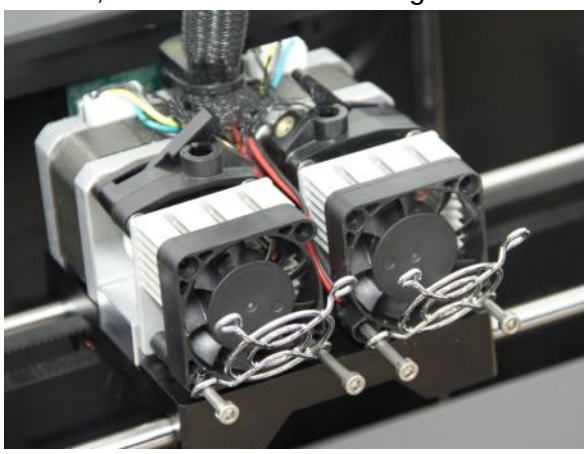
This guide shows the installation on a Makerbot Replicator 2X, this guide can also be used for installing the Bondtech kit on Replicator 2, Flashforge and CTC clones as they are almost identical clones.

1. Start by unloading the material from your printer using the LCD-menu, please refer to Makerbot manual of how to do it. After the filament is removed, power off the printer.

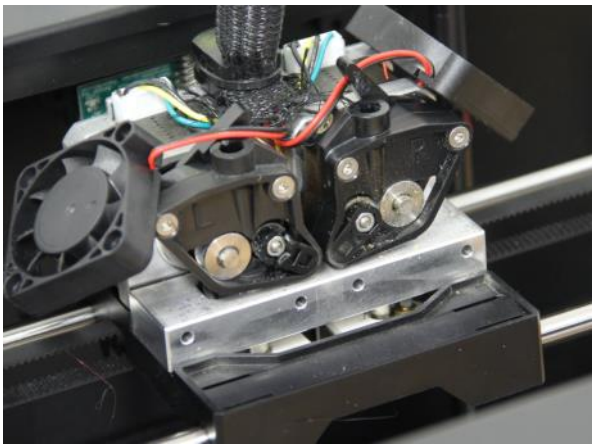
2. Disconnect the PTFE guiding tubes to the printhead by pulling them off.

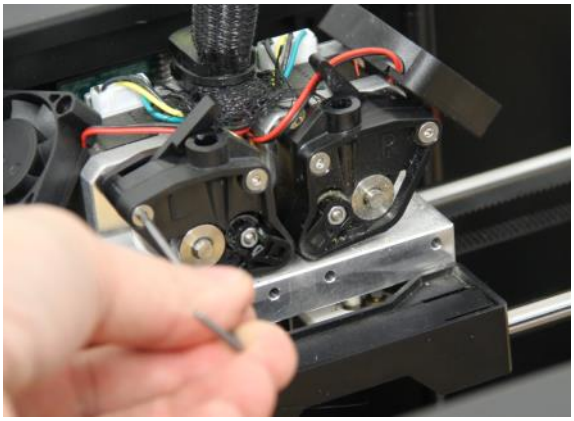
3. Loosen the front M3 bolts holding the fan protector, heatsink and motors together

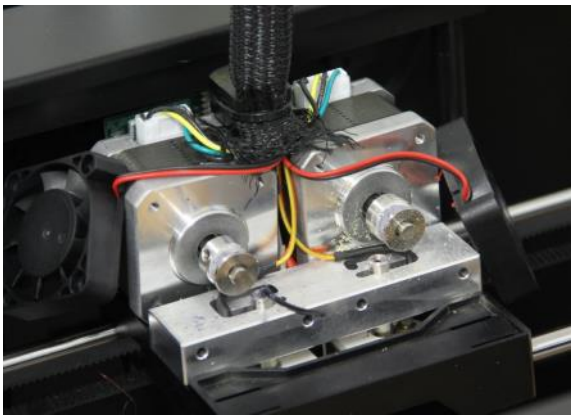



4. Carefully pull the screws out and please make sure that you do not loose any parts. The black plastic spacer comes loose after the bolts are removed. Place all removed parts besides the printer. Manually place the cooling fans towards the back so they are out of the way, keep a track which one is for the right and left side by adding a sticker or something.

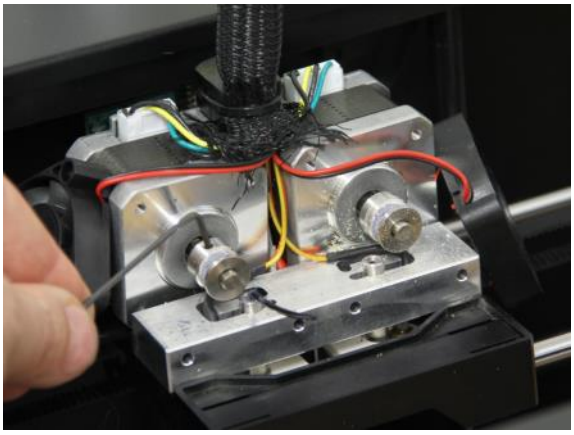


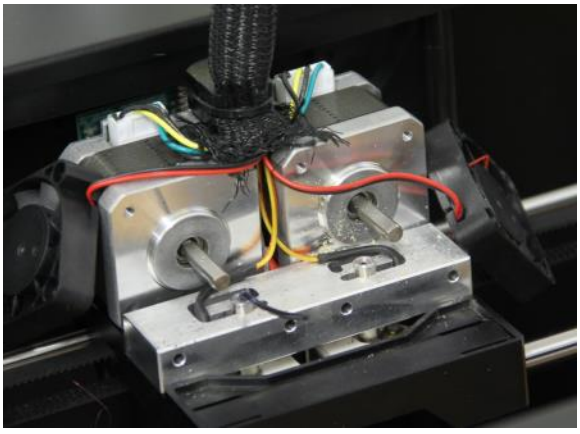
5. Remove the M3 bolts holding the extruder assembly onto the motors and remove the parts





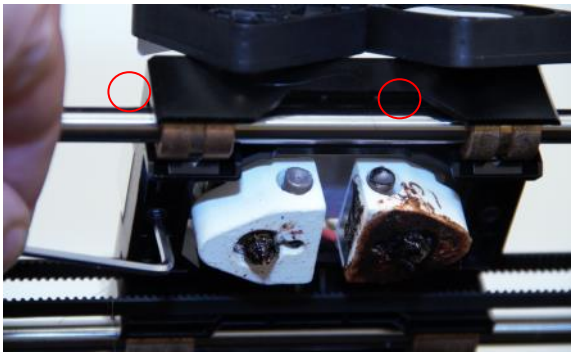
6. Loosen the set-screw holding the extruder gear onto the motor shaft and remove the gear.



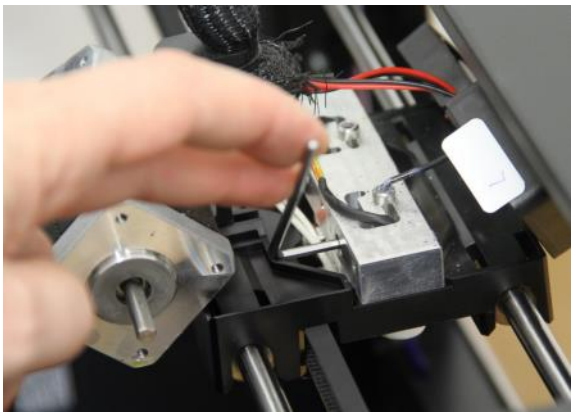


7. Clean the extruder carriage and motors from previous grinded filament waste.

8. From the underside of the carriage, loosen and remove the two M3 bolts holding the cold-block to the carriage.



9. Move the motor out of the way so you can reach the setscrew securing the heatbreak, undo the setscrew so the heat break and hotend assembly come loose. Repeat this for the right nozzle.

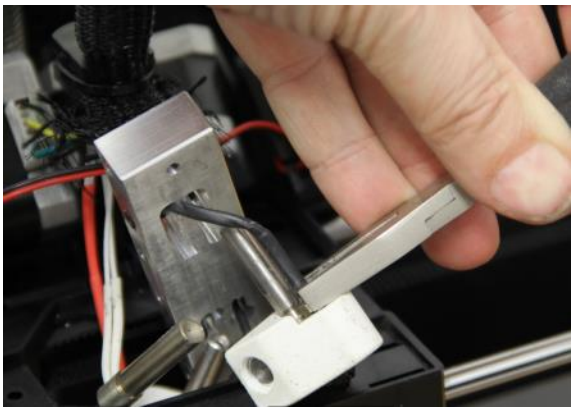


IMPORTANT !!!

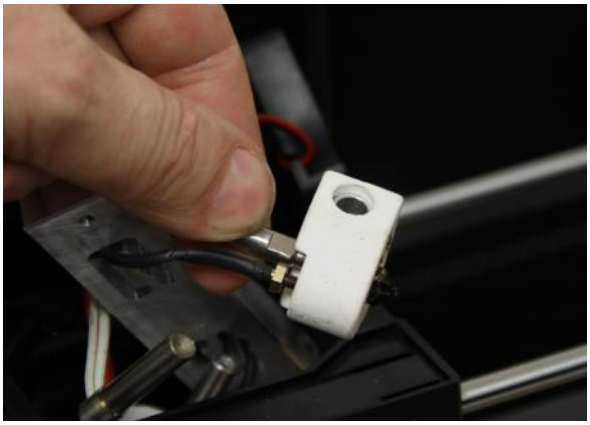
The thermocouples are very delicate and breaks easily so take care not to twist or bend them as they will break with too much handling. Please follow the below instructions to remove them safely.

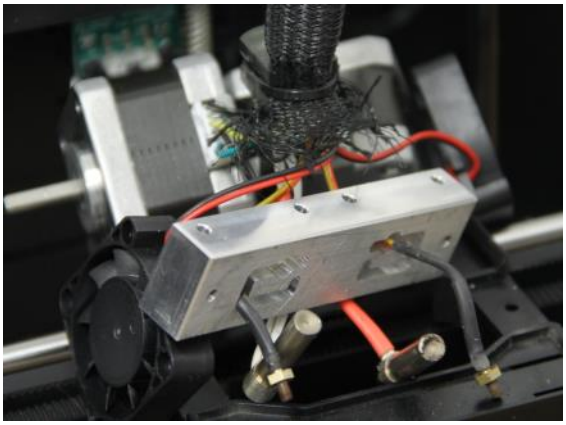
10. Lift the cold-block out of the carriage gently so the cables are not damaged. Loosen the set-screw holding the heat cartridge and slide the cartridge out of the heatblock. Repeat for both left and right hotends.

11. Untighten the thermocouple from the heatblock just so it can move, DO NOT TURN IT MORE THAN ½ TURN !

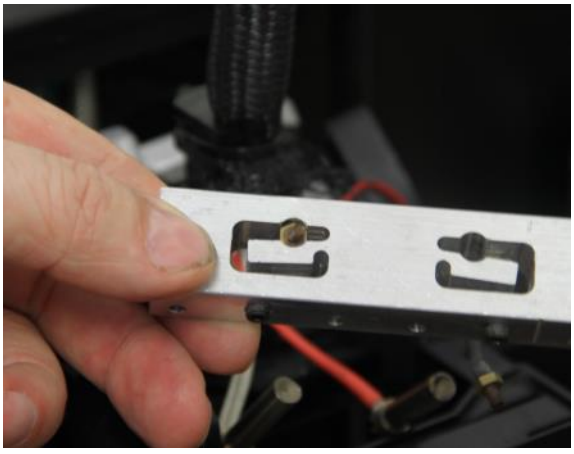


12. Rotate the heatblock with the heatbreak around the thermocouple carefully so it is fully loose. Repeat this for both hotends.



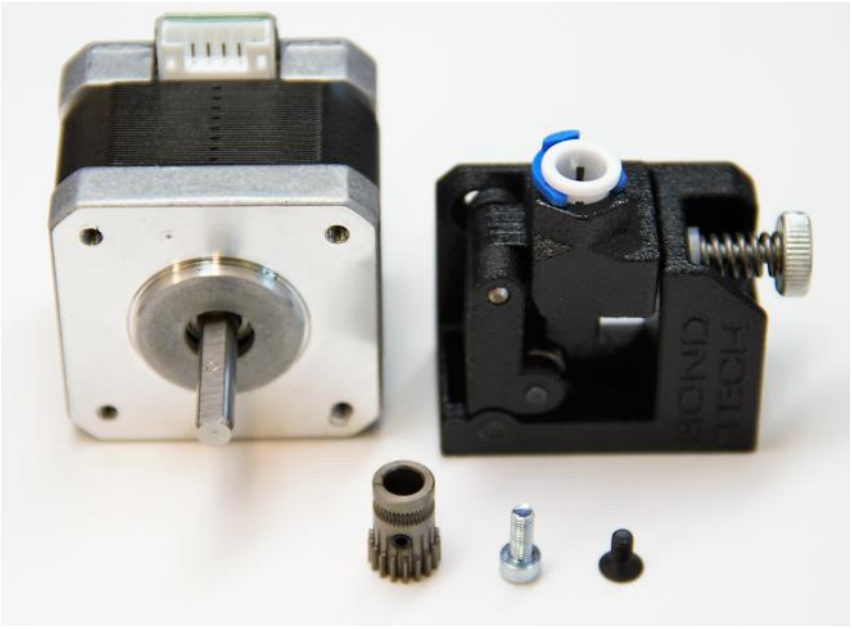


13. Guide the thermocouple sensors gently out of the cold-block, if it is too tight you can bend the tab that holds the hotend so it will create more room for the thermocouple sensor to slide out of the block.



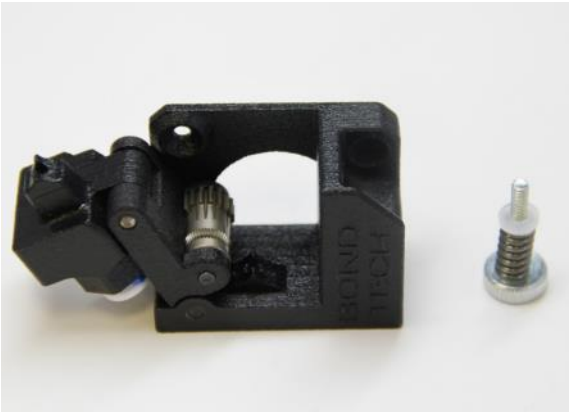
14. Now is a good time to clean the hotends from old burn plastic. Now we are ready for the installation of the new components.

15. These are the components in the kit with the original motor from the printer.
The one on the photo below is for the right extruder, for the left extruder the extruder parts are mirrored.



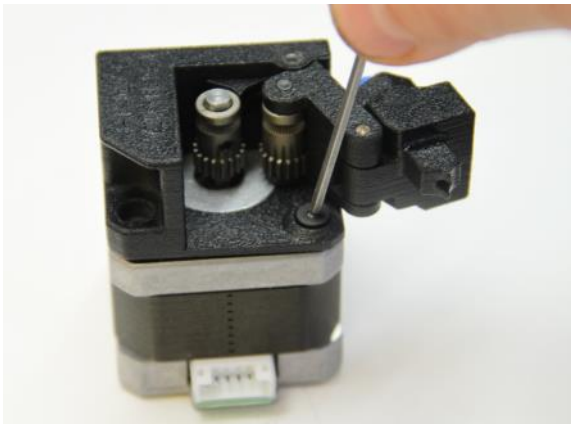
16. Start with installing the primary gear onto the shaft of the steppermotor.
Do not tighten the setscrew yet since it needs to be aligned with the secondary gear.

17. Loosen and remove the thumbscrew assembly.



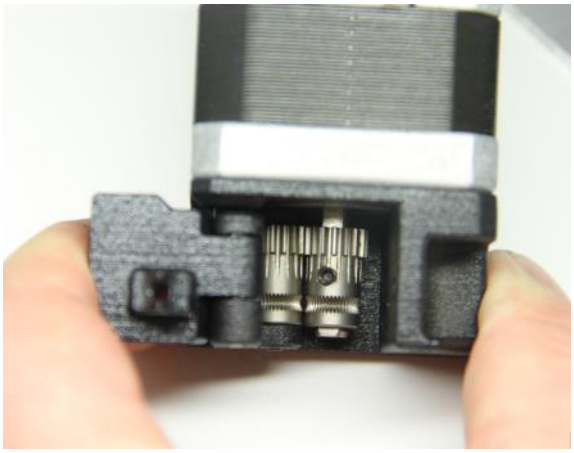
18. Place the extruder onto the motor oriented like the photo.

19. Insert the countersunk M3x8 screw in the countersunk hole of the extruderbody and tighten, do not overtighten!



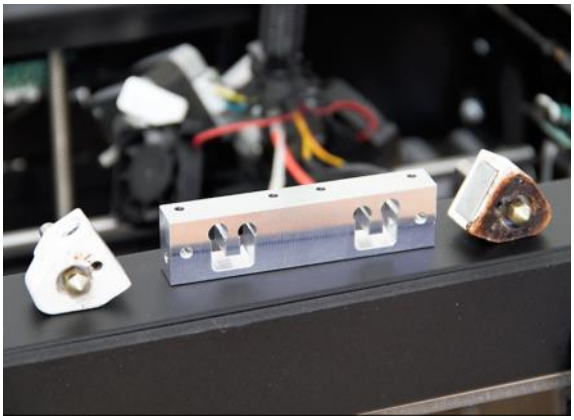
20. Insert the M3x8 Socket head bolt into the other hole of the extruderbody, tighten but do not overtighten.

21. Align the primary gear with the secondary gear and tighten the setscrew.

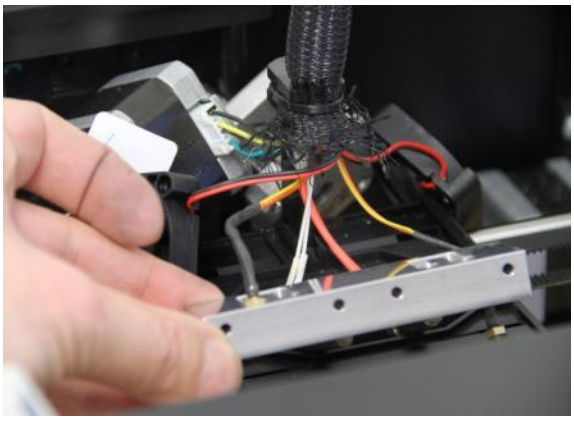


Repeat the steps 16-21 for the left extruder.

22. Installing the new cold block onto the printer

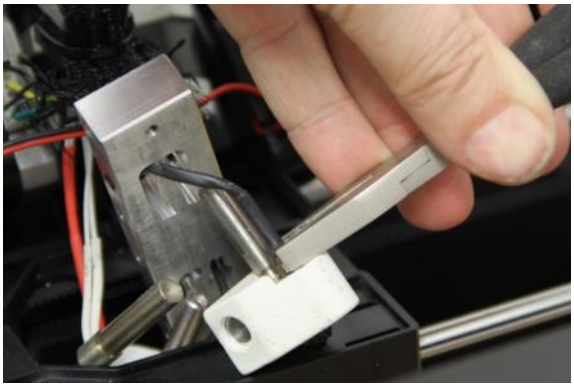


23. Start by guiding the thermocouples gently through the coldblock, please not the orientation of the coldblock. In the new coldblock there is enough room for the thermocouple to easily pass through the coldblock.

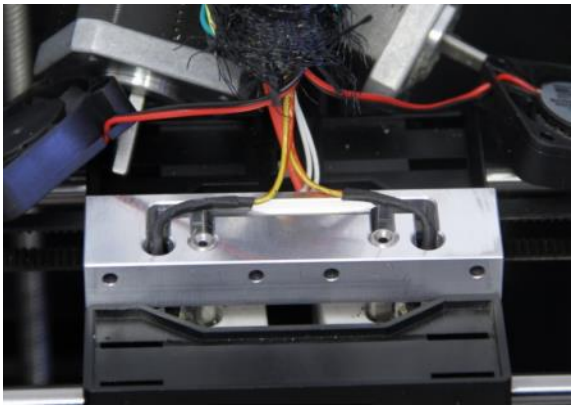


24. Thread the thermocouple into the heatblock by turning the heatblock, NOT the thermocouple. Finish off by tightening the thermocouple onto the block with a plier or similar.

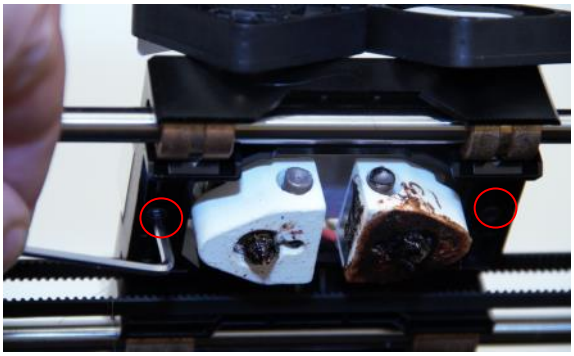
Repeat for both hotends.



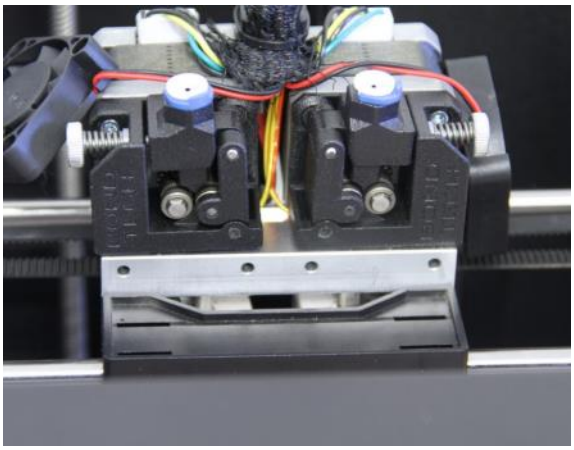
25. Place the cold block assembly onto the carriage. And carefully guide the thermocouple cables into the milled groove of the cold-block so it will not be pinched by the extruders.



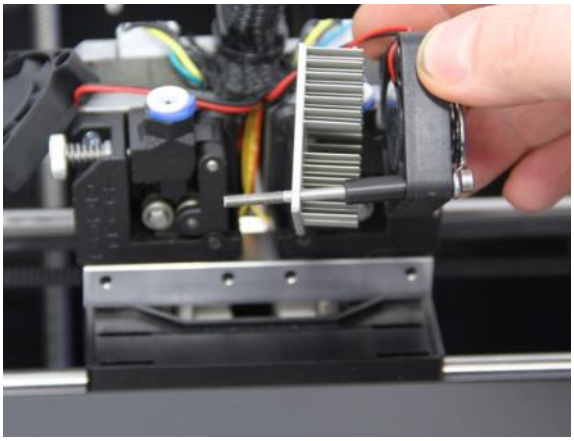
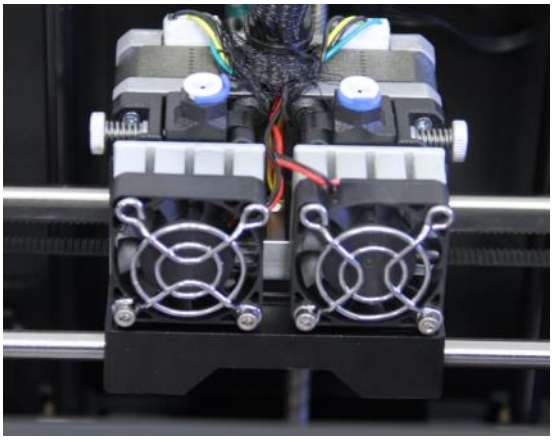
26. Remount the M3 screws from the bottom of the carriage securing the cold block.



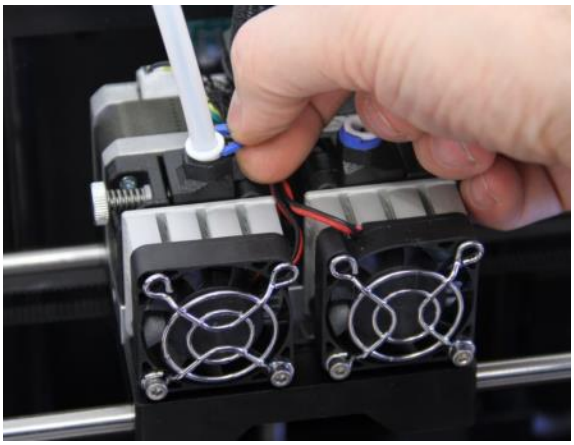
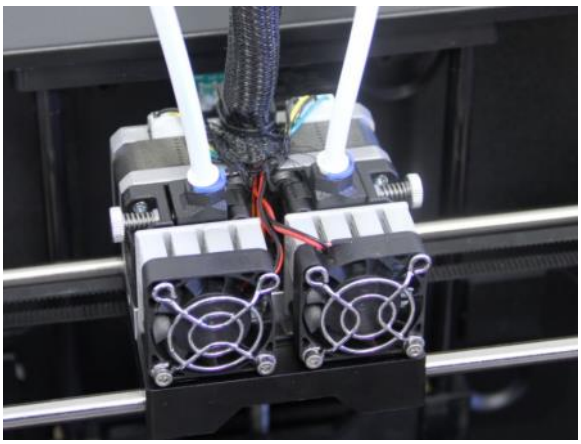
27. Place the motors with the extruders onto the carriage and align it with the coldblock assembly.



28. Remount the fan guide, fan, spacers and heatsink with the bolts.

29. Remove the blue plastic clip from the pushfit connector and push the guide tube into the connector, when the guide tube is in place refit the blue plastic clip.

30. The new BTI/Bondtech cold block makes it possible to adjust the height of the hotends from the outside making it much easier than the original coldblock that required a disassembly in order to adjust the nozzle height. The hotend is held securely in place by a set-screw that presses a tab that clamps the hotend.
To adjust the height of the hotend simply loosen the setscrew and when the correct height is

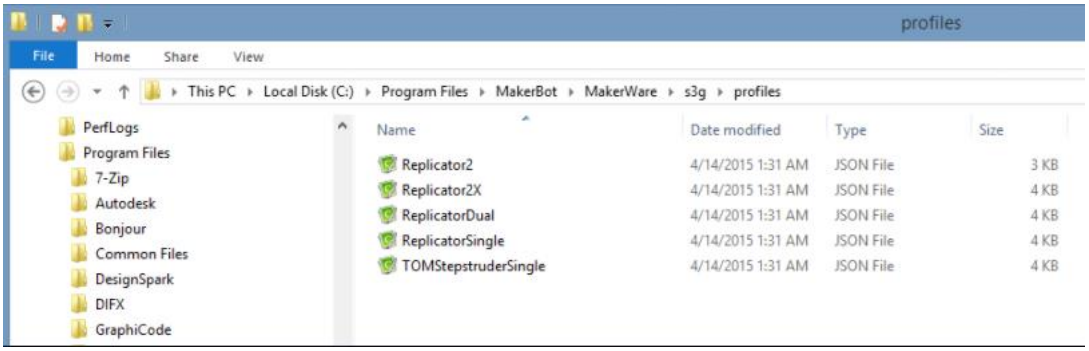
adjusted tighten the setscrew to secure the hotend.

31. Adjust both hotends to the correct height according to the manual.

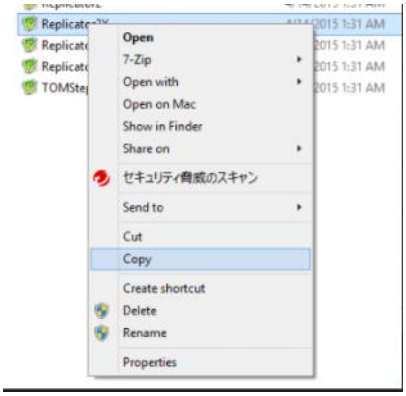
Software Configuration

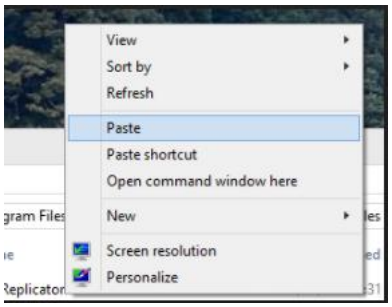
Makerware

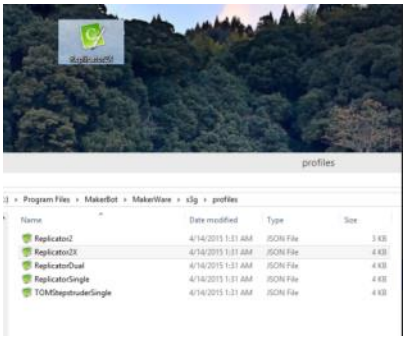
Browse to the folder containing the profiles for the printer.



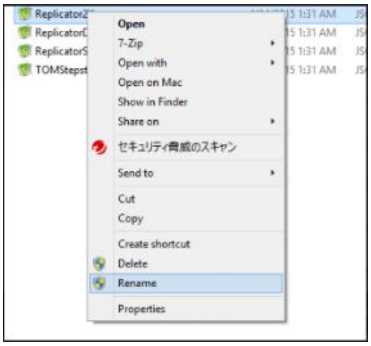
Select the file Replicator2X and make a copy of the file and save it to another place on your computer like your desktop.

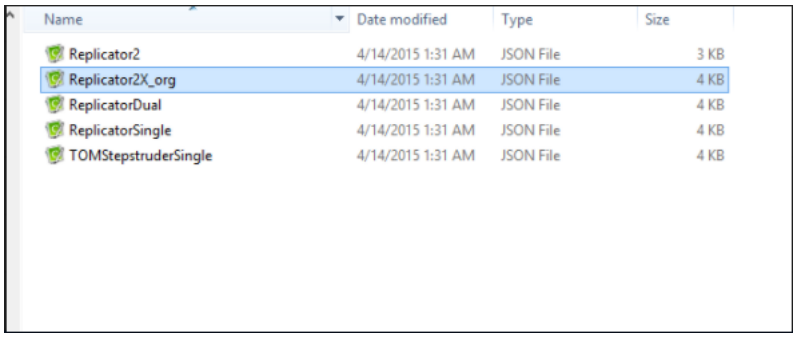






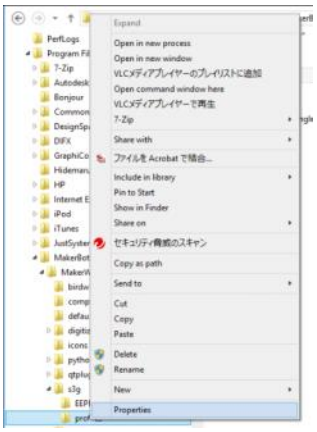
Rename the original file so you can restore it if needed.



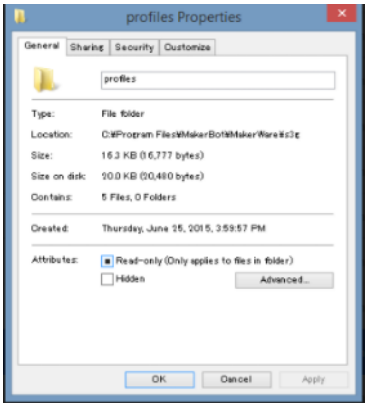


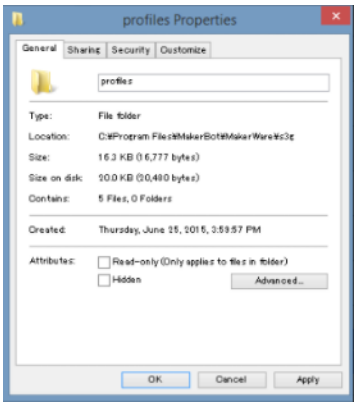
Edit the file you copied and saved. Change the value for e-steps for extruder A & B
Original value: -96,275
New value: -147,773

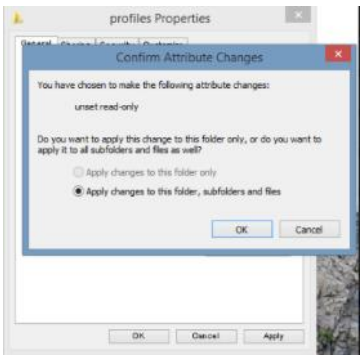
Select the folder containing the profiles and choose Properties



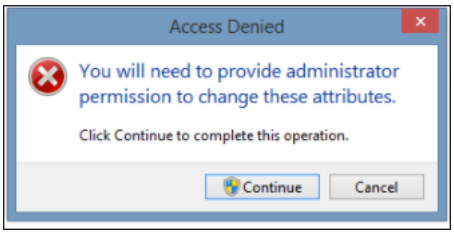
The folder is Read-only as default and we need to change it in order to copy our edited file to this folder, deselect the Read-Only and select OK and then Apply changes to this folder&files



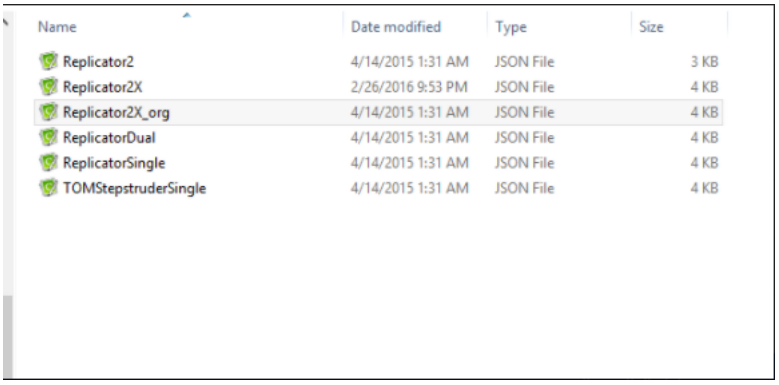




Confirm the changes in the next dialoguebox

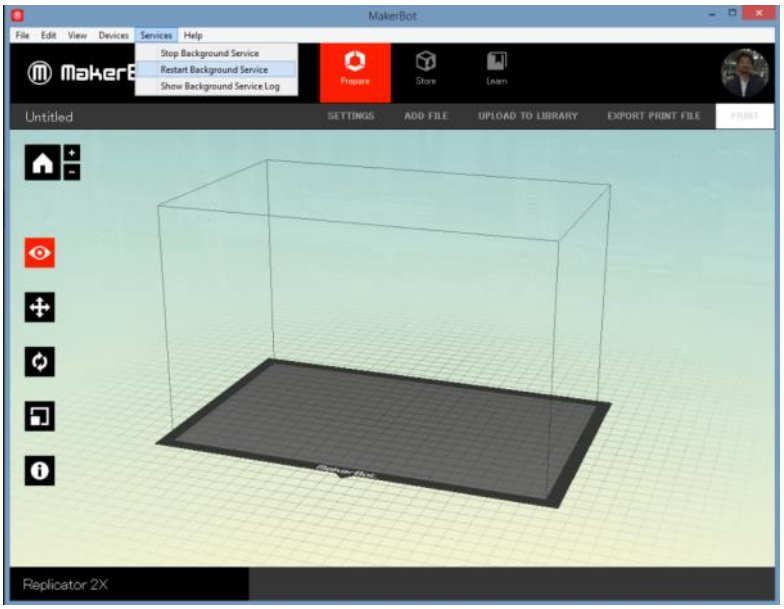


Copy the file you edited to this folder

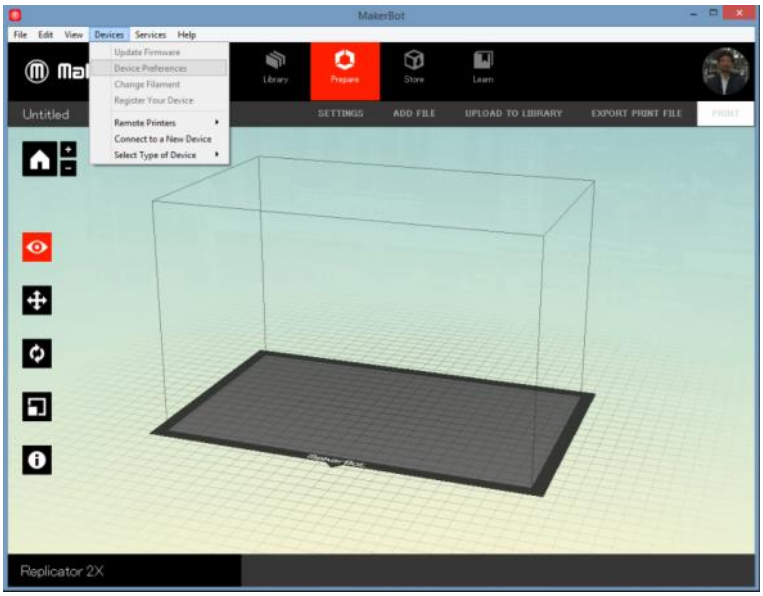


Changes in Makerware, connect your printer with the USB cable before doing the following changes.

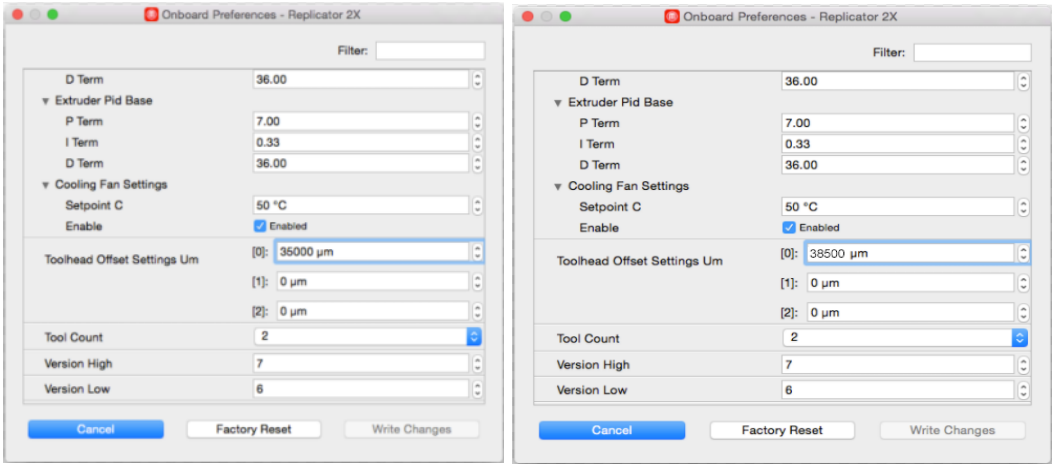
Restart Background service



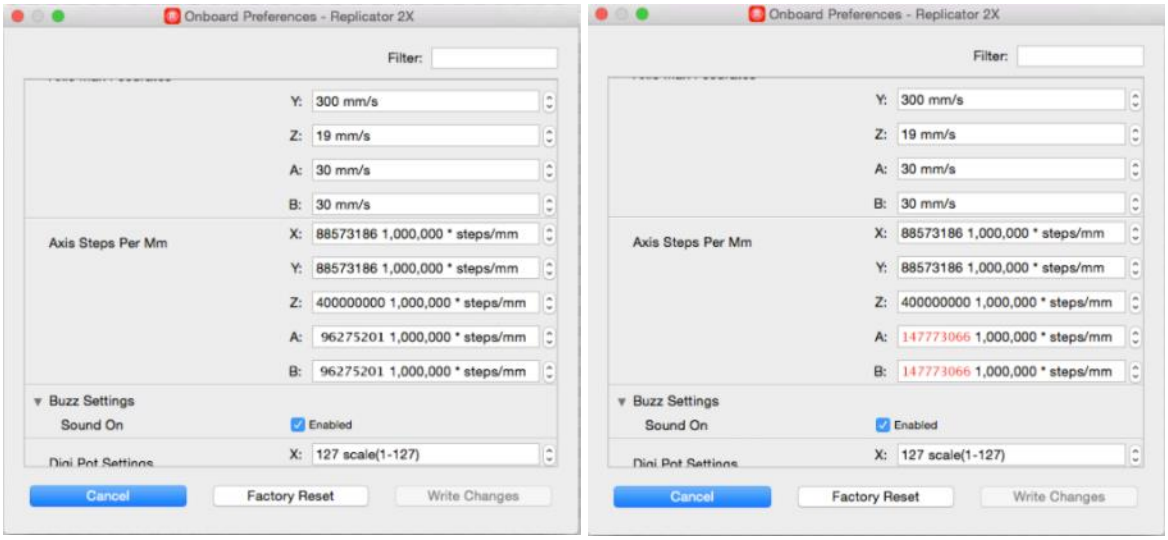
Select Device Preferences



Since the gear diameter is smaller on the Bondtech kit the c-c distance between the nozzles is also bigger than original. In the dialogue box change the value for Toolhead Offset Settings from 35000 um to 38500 um



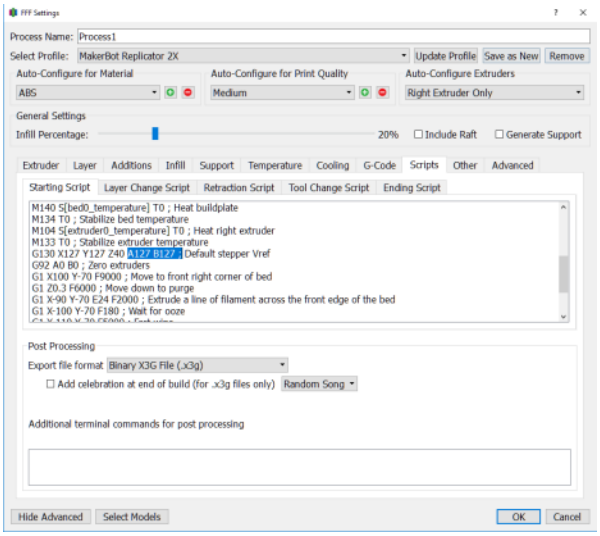
Goto the section with Axis Steps Per Mm and change the value for A & B from 96275201 to 147773066 for both extruders.



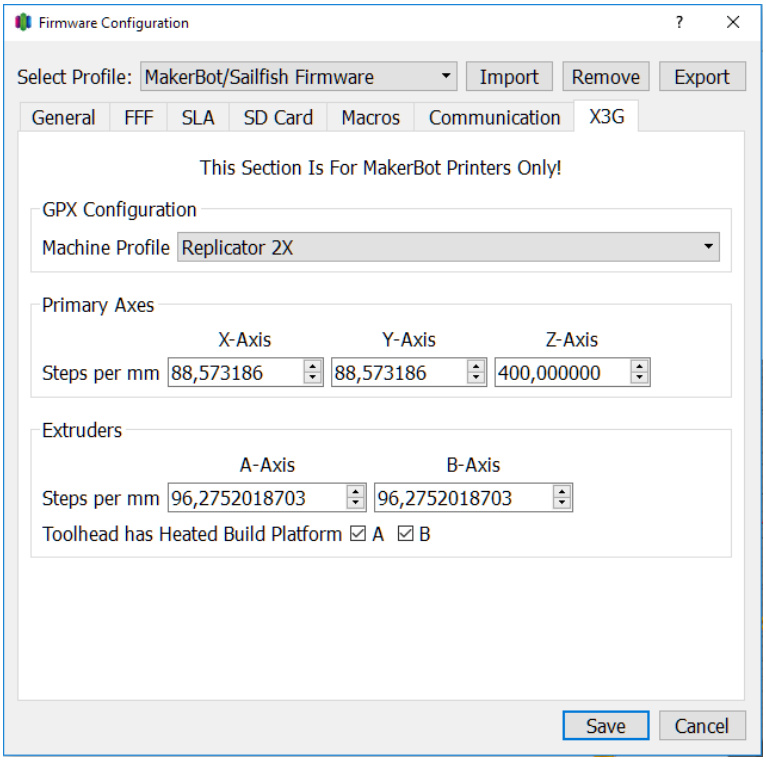
Then select to Write Changes to update the controller in the printer.

Simplify 3D

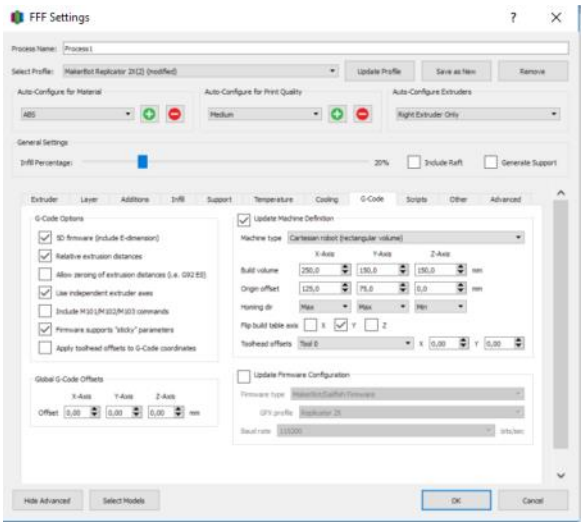
In some cases the motors are getting too hot, in order to change this the startscript section can be changed. As default the current is set to 127 which is the maximum value. This can be decreased in order to lower the temperature of the motors.
You will have to test what works best for you, good results have been obtained with value as low as 84,6



Then goto the Firmware configuration and select the X3G tab, change the default E-step from 96.2752018703 to 140 for both A and B axis (extruders)



Also remember to untick the checkbox Update firmware configuration in the tab G-code.



Good luck with your Bondtech Extruder!

If you have any questions please contact us by email or telephone.

Västbovägen 60
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