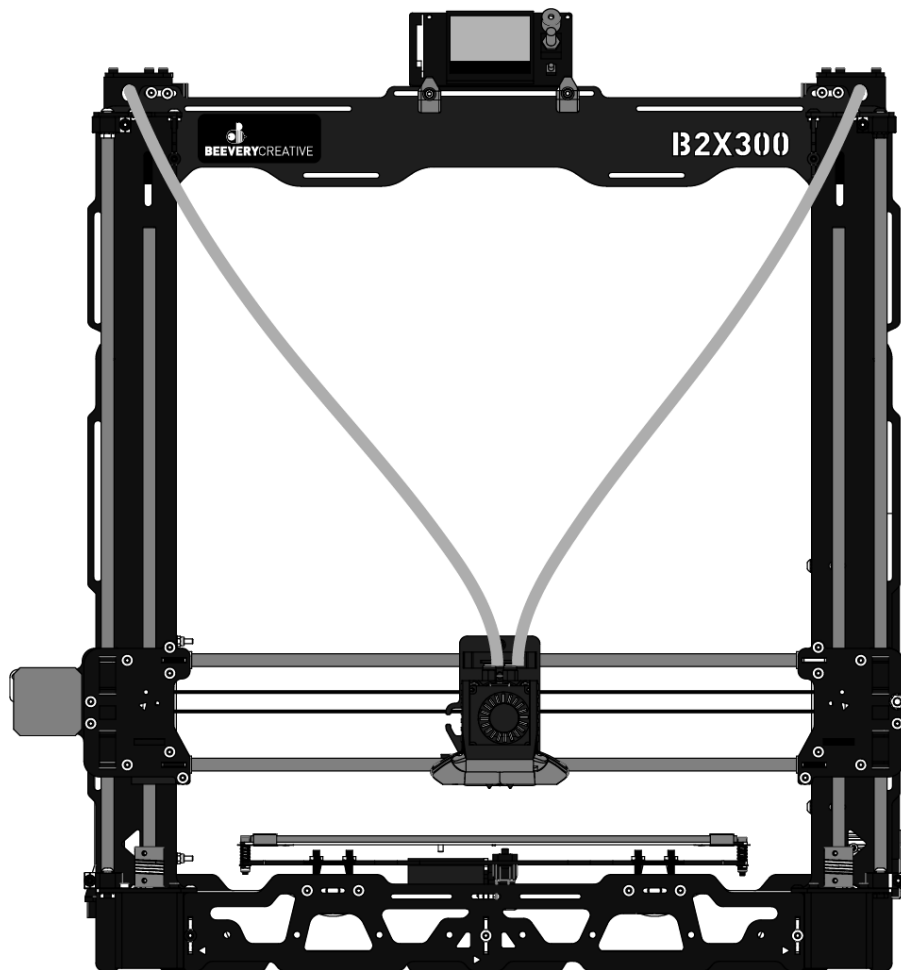


B2X300



USER MANUAL

DIY 3D PRINTER KIT



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1. VERSIONS

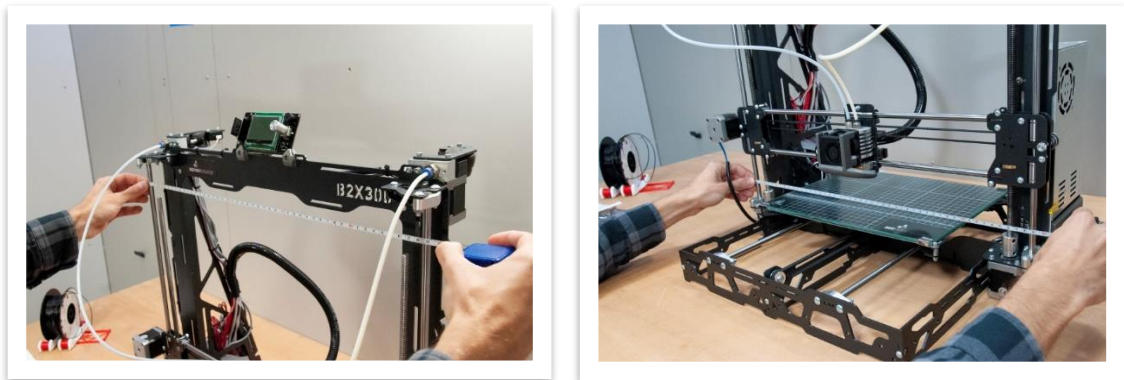
VERSION	DATE	DESCRIPTION	PART NUMBERS
V1.20181126	26 th November 2018	Launch Version	1212300001 to -----
V2.20181221	21 st December 2018	Changes in chapter 5.2	1212300001 to -----
V3.20190107	7 th January 2019	Changes in chap: 3,5,6	1212300001 to -----
V4.20190123	23 rd January 2019	New chapter 6	1212300001 to -----
V5.20190201	01 st February 2019	Changes in chap: 6, 9	1212300001 to -----

2. FIRST CHECKS BEFORE TURNING B2X300 ON

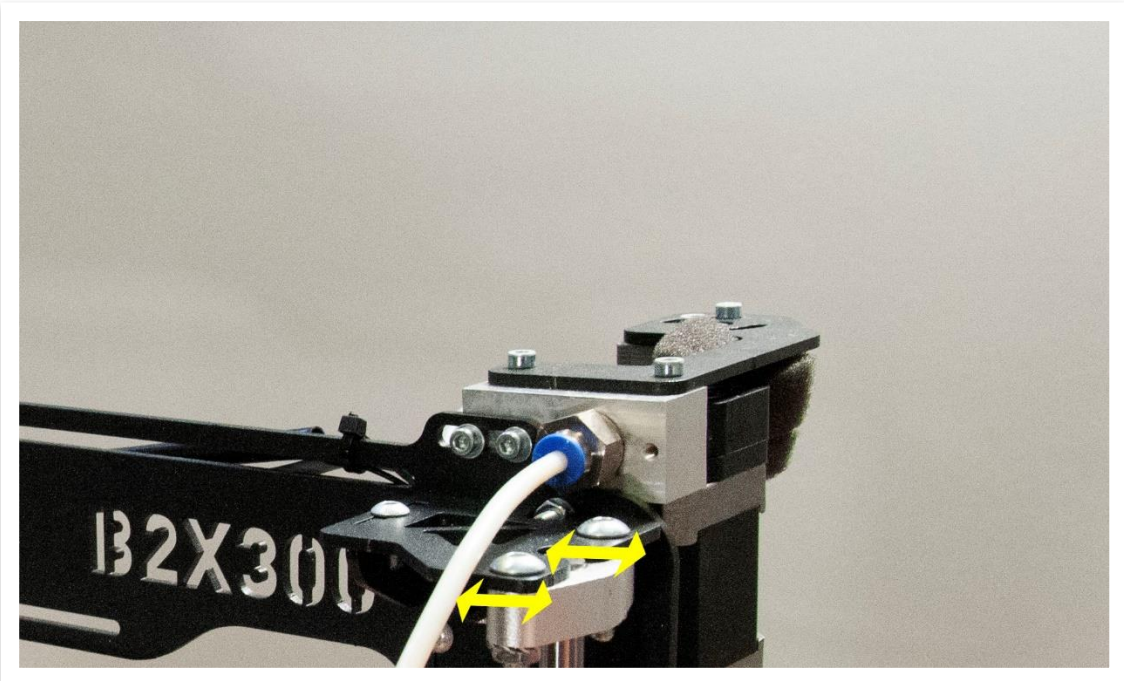
2.1 Parallelism between linear guides in Z

Procedure
[watch video](#)

- 1) Measure the distance between both positions with a measuring tape, at the top and at the bottom.



- 2) Adjust until you reach the same distance on both.



2.2 Parallelism between linear guides in Z and trapezoidal threaded rods

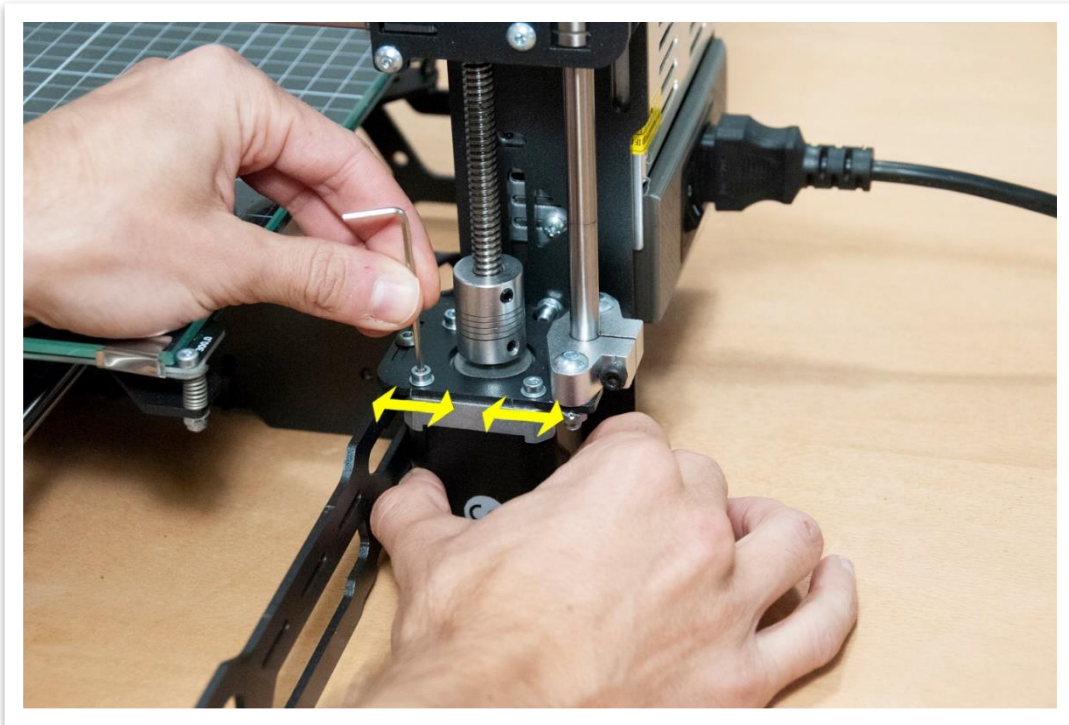
Procedure

[watch video](#)

- 1) Using a measuring tape, check the distance between the nuts and the left linear guide in both positions, at the top and at the bottom.



- 2) Adjust until they are at the same distance.

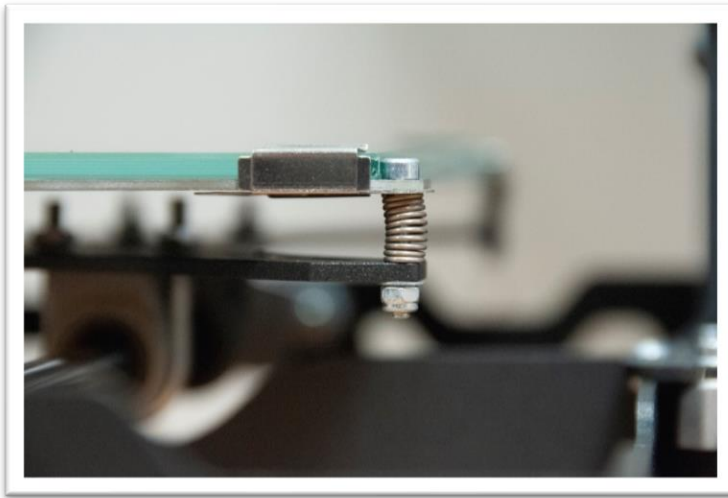


- 3) Repeat the procedure for the left side.

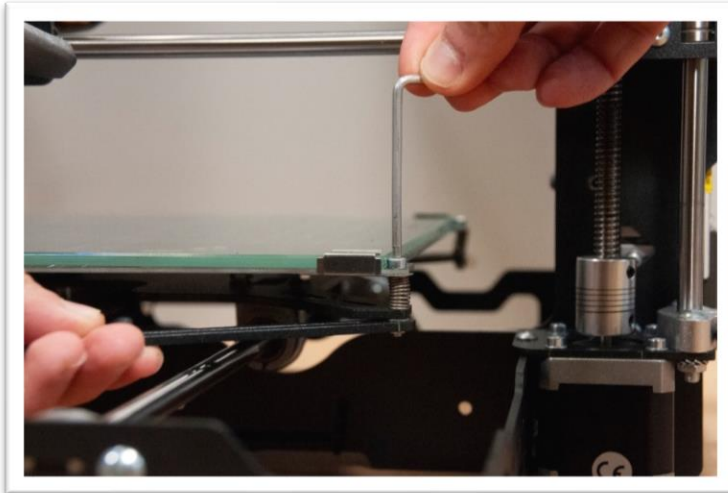
2.3 Heated Bed Horizontality

Procedure
[watch video](#)

- 1) Make sure that the screw length after the nut is the same on both four corners.
You can even use a measuring device to check the distance between the PCB heated bed and the structure that holds the table to the bearings and make sure it is at the same distance on all four corners.

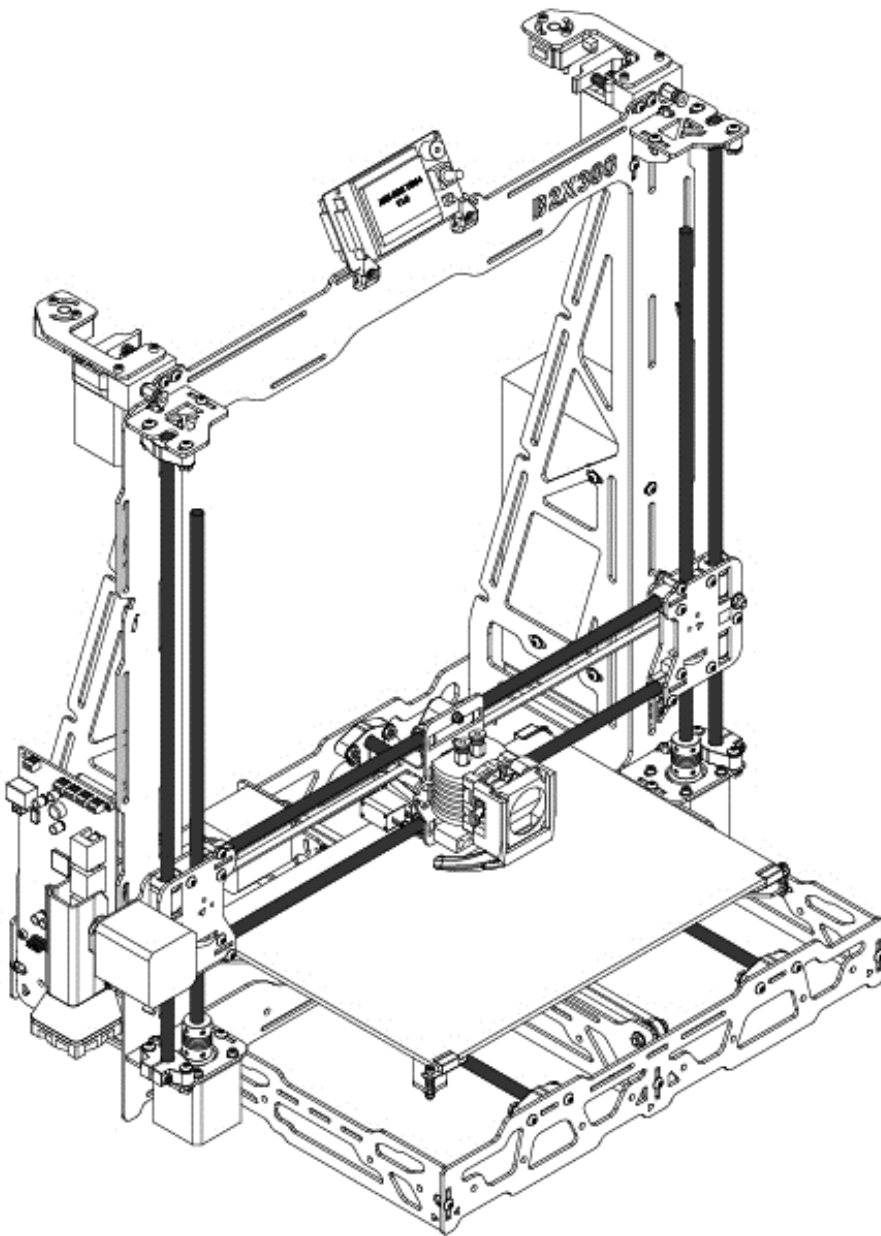


- 2) Adjust if necessary.

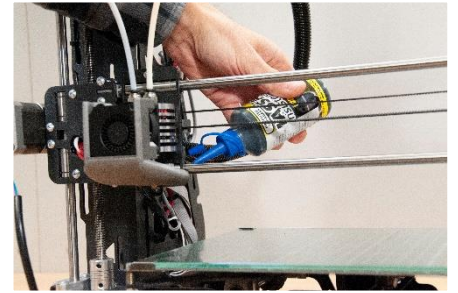


2.4 Lubrication

Procedure
[watch video](#)



Add a small amount of lubricant:



On X Axis bearings.



On Y Axis bearings.



On the top of the copper nut in
each one of the Z threaded rod.

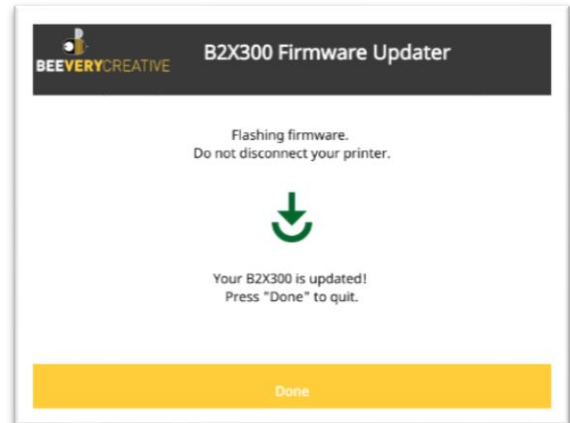
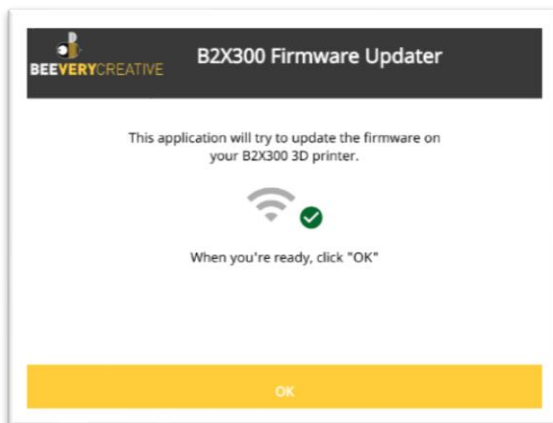
3. B2X300 FIRST USE

3.1 Firmware Update

It is necessary to update the firmware after its first use, ensuring it has the latest firmware version.

Procedure

- 1) Download the *firmware's* B2X300 updater at folder *B2X300_Firmware Updater* in [B2X300 repository](#).
- 2) Install this software.
- 3) Connect the 3D printer to your computer through the USB cable.
- 4) Turn on your 3D printer.
- 5) Start the B2X300 updater software and follow the instructions given.



3.2 Initial Z offset calibration

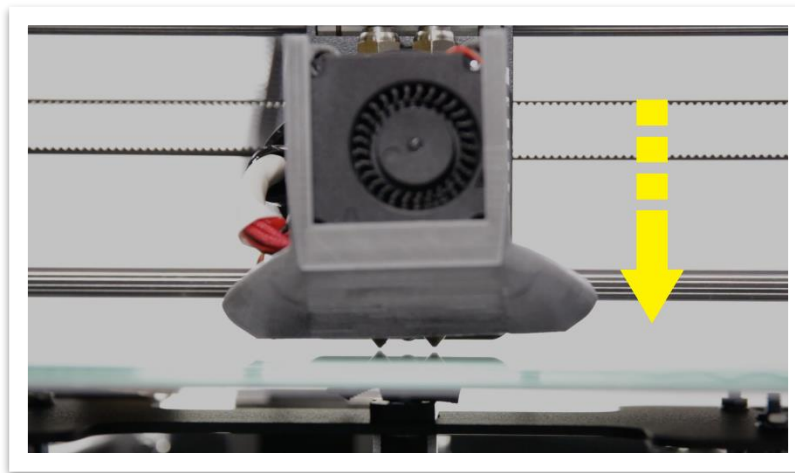
It is necessary to confirm that both nozzles are at the same height. This ensures the inactive nozzle won't collide with the parts already printed.



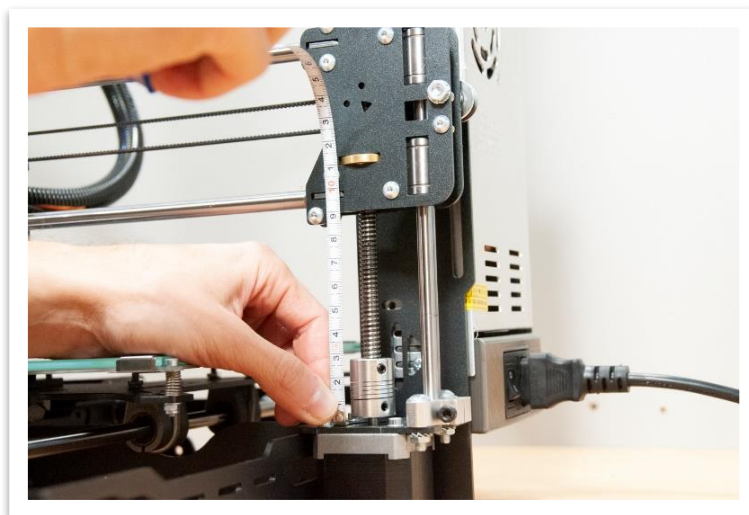
This procedure is essential both for the dual extrusion but also for the single nozzle extrusion.

Procedure

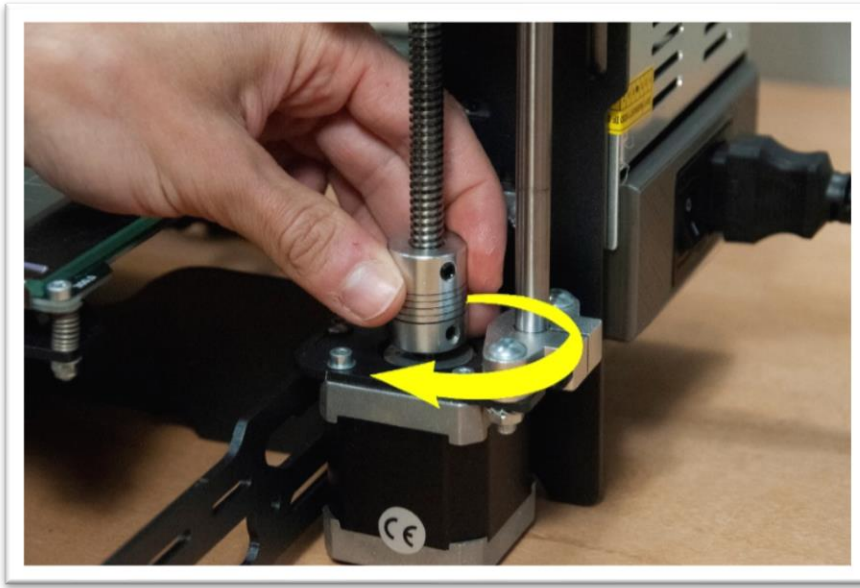
- 1) Lower the X axis, rotating both the Z axis screws at the same time, until the nozzles are close to the hotbed, then center the carriage.



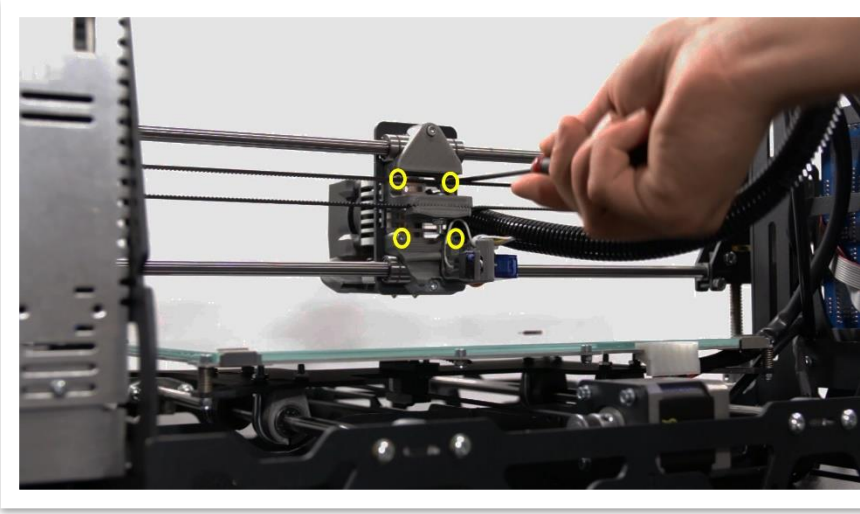
- 2) Measure the distances between both the Z axis motors (left and right) and the X axis.



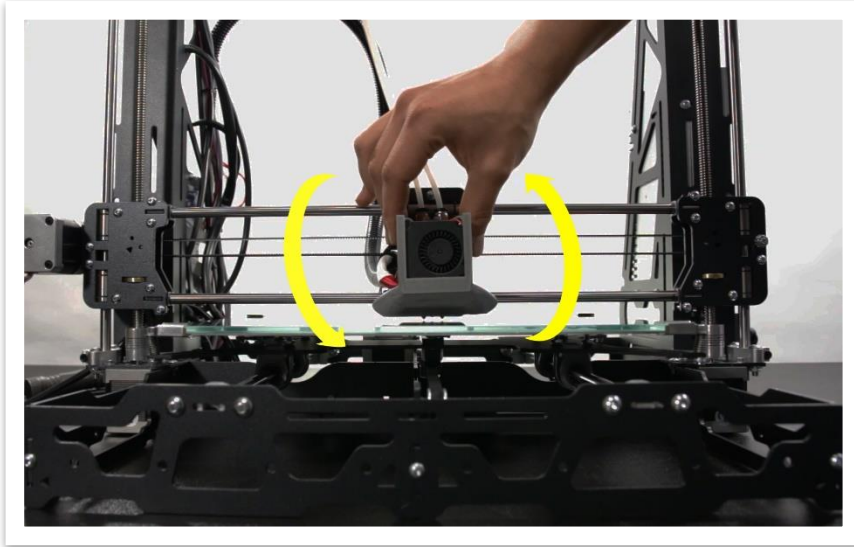
3) Adjust both until the distance is the same.



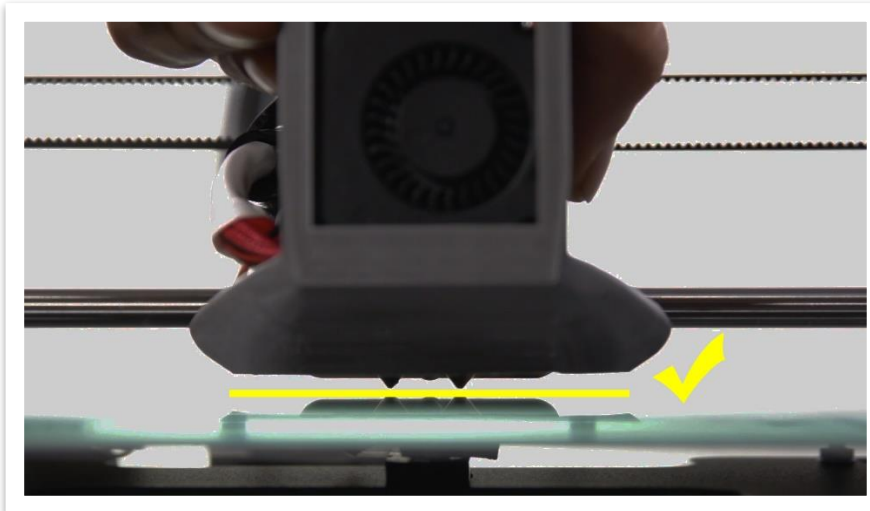
4) Untighten the 4 screws that hold the extruder heatsink.



- 5) Rotate the extruder heatsink until both nozzles have the same distance from the hotbed.



- 6) Maintaining that position, re-tighten the 4 screws.



3.3 Self-test Wizard

To ensure the proper functionality of the 3D printer, after you turn on your 3D printer, a Self-test Wizard will be executed. This procedure will validate and calibrate the main parameters.

This procedure is not optional on the first use but it can be repeated if necessary, accessible at LCD menu: *Machine Settings/ Self-test Wizard*.

Just follow the instructions shown on the LCD display.

The following tests will be conducted during the procedure:

- 1) Extruder heating test.
- 2) Heated bed heating test.
- 3) Blower test.
- 4) Stepper drivers Trinamic test.
- 5) Power loss detection test.
- 6) Sensorless homing Calibration test.
- 7) Nozzle height calibration test.

3.4 Z offset fine-tuning

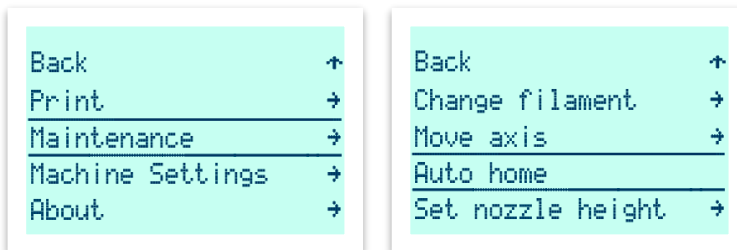
It is necessary to confirm that both nozzle are at the same height. This ensures the inactive nozzle won't collide with the parts already printed.



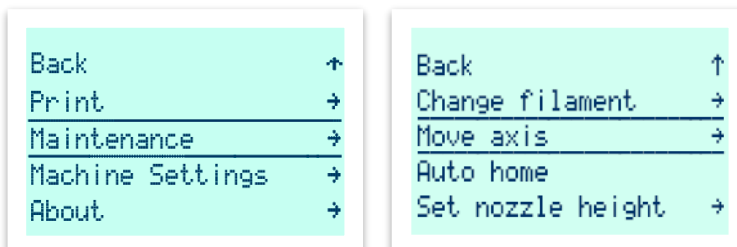
This procedure is essential both for the dual extrusion but also for the single nozzle extrusion.

Procedure

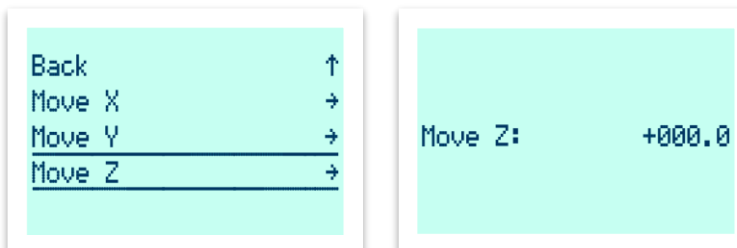
- 1) Turn on your 3D printer.
- 2) Go to the menu and select: *Maintenance* → *Auto home*.



- 3) Wait for the procedure to end.
- 4) Go to the menu and select: *Maintenance* → *Move axis* → *Move Z*.

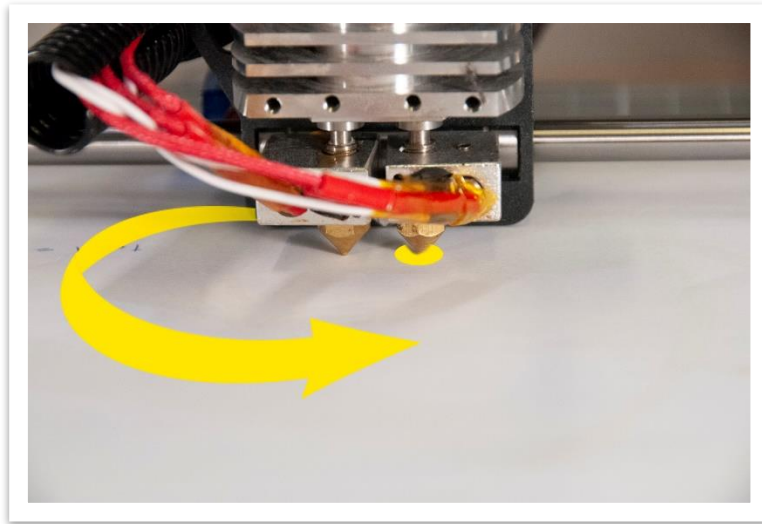


- 5) Place a sheet of paper on top of the middle of the bed, under the nozzles.
- 6) Rotate the LCD button so that it reaches Z: 000.0.

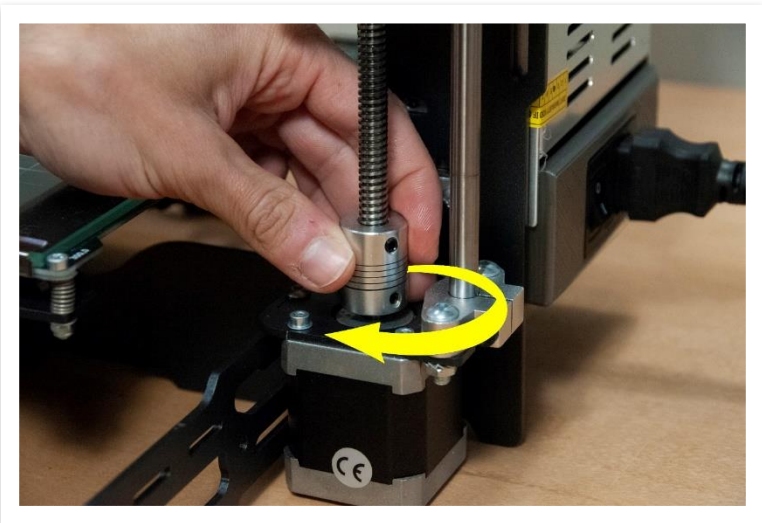


- 7) Turn off your 3D printer.

- 8) Rotate the sheet of paper and pay attention to which nozzle is the paper rotating under.



- 9) Adjust the threaded rod, rotate clockwise to move up the nozzle that is holding the sheet of paper, until you feel the paper is looser.



- 10) Adjust the threaded rod opposite from the one you already adjusted on step 9, rotating it counterclockwise to lower the nozzle. Initially this nozzle did not touch the sheet of paper, it should now slightly scratch the sheet.
- 11) If you have exceeded more than one complete rotation of the couplers, please repeat process Initial Z offset calibration.
- 12) Repeat step 9 and 10 until both nozzles slightly scratch the sheet.



From this moment on, your 3D printer is ready to be used for single nozzle extrusion.

4. FIRST PRINT AND SLICER

Next, you will learn how to set up your computer for operating the 3D printer.

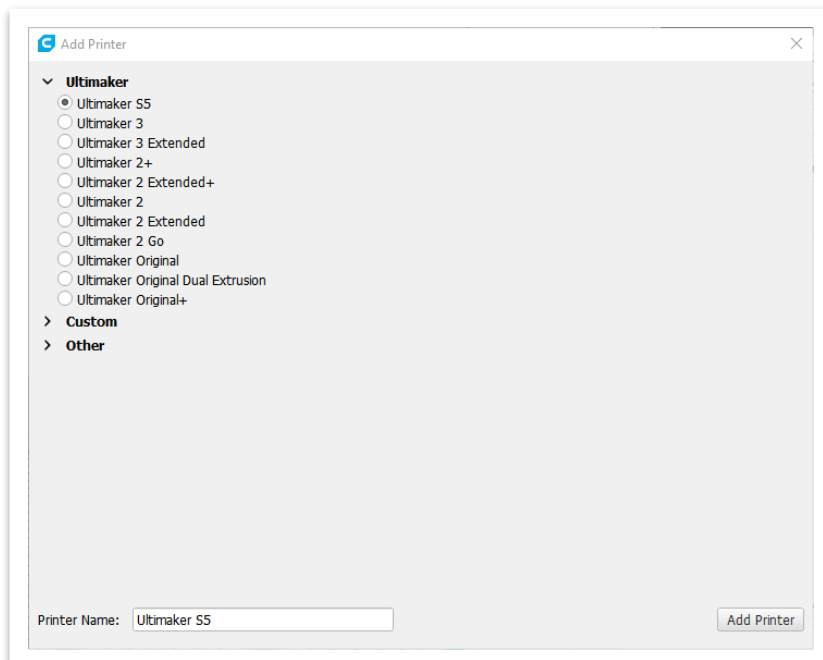
The recommended slicer software for operating this 3D printer is Cura 3, for which there is a project file (.3mf) for. This file is already set up for B2X300 and includes an optimized profile for PLA for this 3D printer.

Download the latest profile in the *Printing_Profiles* folder in the [B2X300 repository](#). If you do not have internet access, use the profile available on the SD card (not recommended).

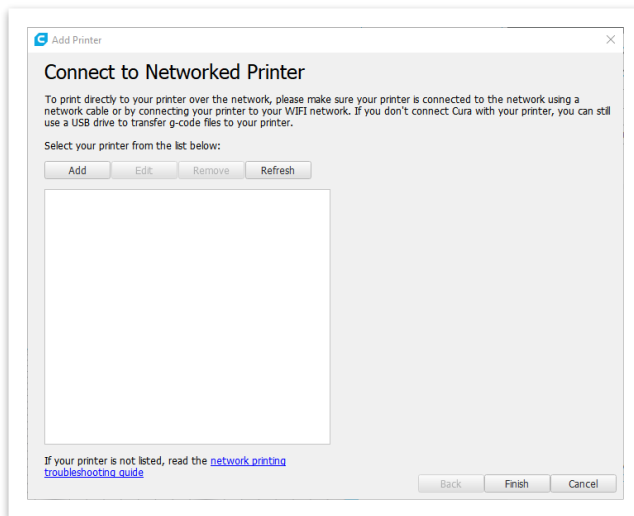
4.1 How to install and set up Cura Slicer

Procedure:

- 1) Install Cura 3, which you can find on the SD card or you can download it [online](#) (we recommend the version 3.5.1).
- 2) After installing, open Cura.
- 3) On the *Add Printer* menu, leave the pre-selected 3D printer and press the button *Add Printer*



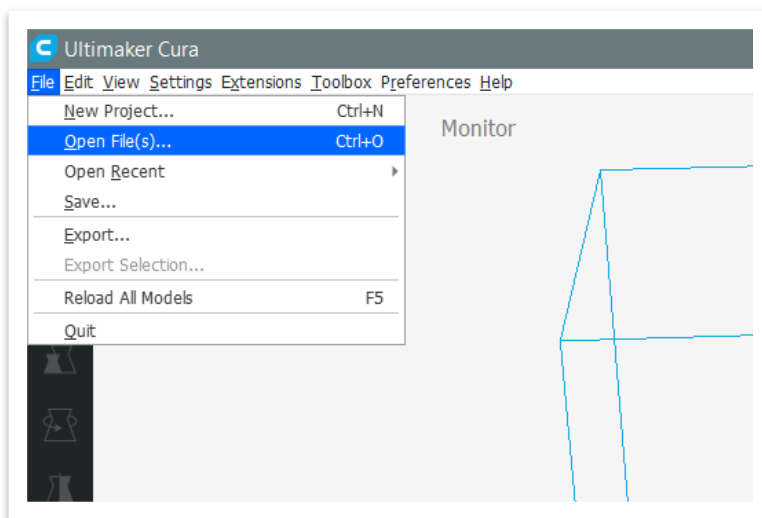
4) On the next screen, click the *Finish*.



4.2 How to import a file into Cura Slicer (.3mf)

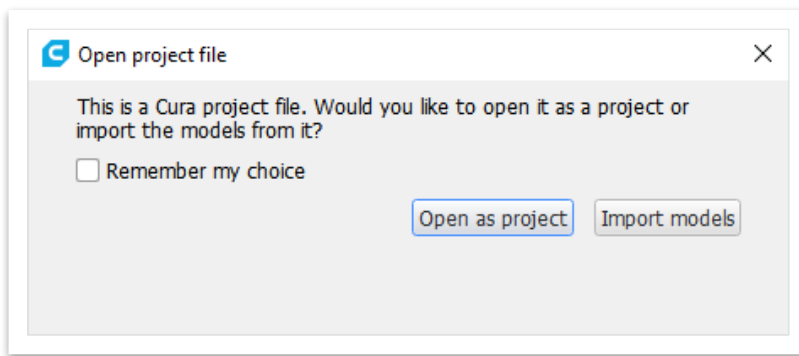
Procedure:

1) Open Cura.

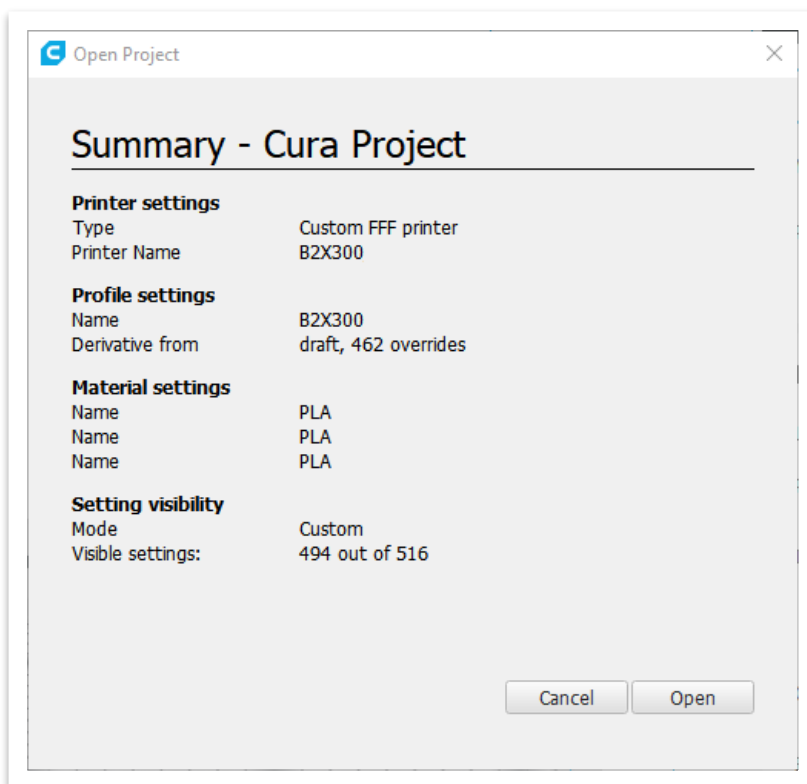


2) Open the file .3mf in the SD card or download it in folder *Printing_Profiles\B2X300_Cura_Projects* on [B2X300 repository](#).

3) Select *the Open as project* option.



4) Select *Open* for the B2X300 profile to be imported.



5) Change option *Print Setup* to *Custom*.

B2X300

Extruder 1

Extruder 2

Material

PLA

[Check compatibility](#)

Print Setup

Recommended

Custom

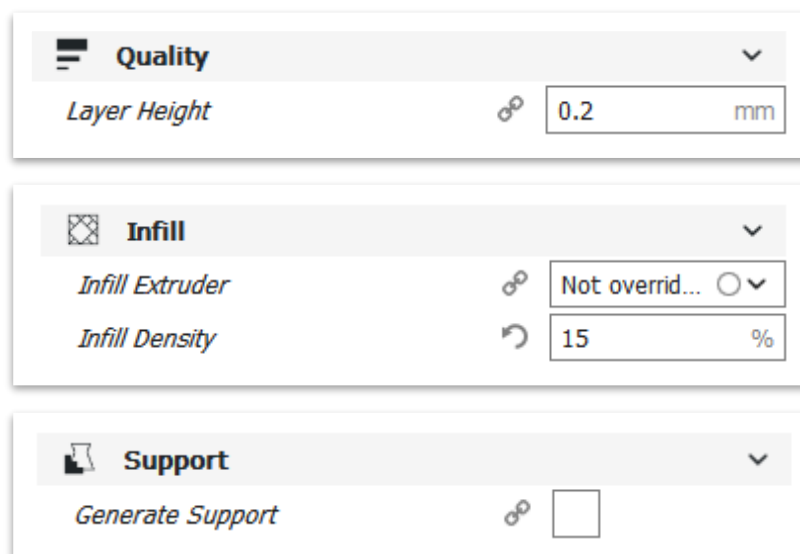
Profile:

B2X300_PLA

4.3 How to generate a Gcode file on Cura Slicer

Procedure

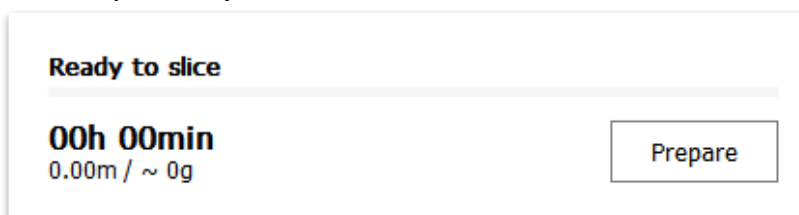
- 1) Open the STL file in Cura, in alternative you can drag the file to the printer's table in Cura. By default, with the 3D printer profile, an STL file of a bee will appear when the profile is imported. You can print it as a first test.
- 2) Ensure the profile selected is the correct one as well as the material.
- 3) Adjust 3D Printing parameters: *Layer height, Infill e Support*.
By default, the set up for medium resolution is:
Layer height: 0.2mm
Infill: 15%
Support: deactivated



The image shows three panels of settings in Cura Slicer. The first panel is titled 'Quality' and contains a 'Layer Height' setting with a value of 0.2 mm. The second panel is titled 'Infill' and contains two settings: 'Infill Extruder' set to 'Not overridden' and 'Infill Density' set to 15%. The third panel is titled 'Support' and contains a 'Generate Support' setting which is currently unchecked.

Category	Parameter	Value	Unit
Quality	Layer Height	0.2	mm
Infill	Infill Extruder	Not overridden	
	Infill Density	15	%
Support	Generate Support	<input type="checkbox"/>	

- 4) Press *Prepare* on the lower right corner of Cura.
This will process your 3D model.

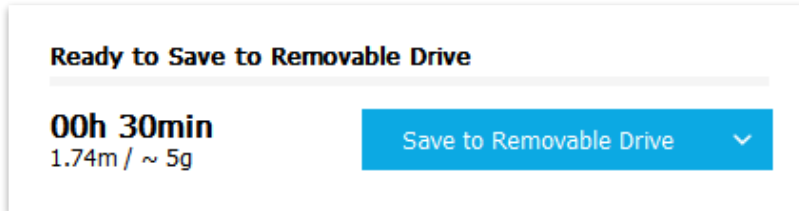


The image shows the 'Ready to slice' status bar in Cura Slicer. It displays a progress bar at 0%, a time estimate of 00h 00min, and a weight estimate of 0.00m / ~ 0g. A 'Prepare' button is located on the right side of the bar.

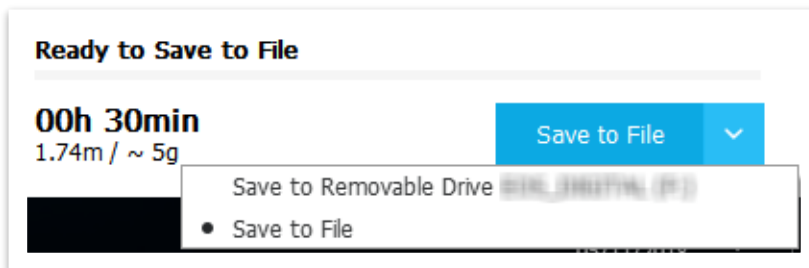
Status	Time	Weight	Action
Ready to slice	00h 00min	0.00m / ~ 0g	Prepare

5) Insert the SD card on your computer.

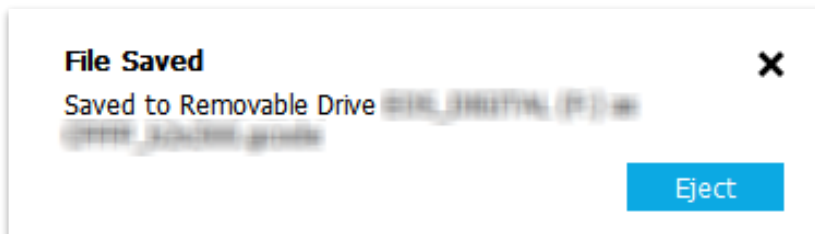
6) Press *Save to Removable Drive* on the lower right corner of Cura, it will save the Gcode onto your SD card. You will also find an estimated print time as well as the material consumption.



7) Alternatively, you can press the arrow next to the *Save to Removable Drive* and select *Save to file* option to export the Gcode to another location.



8) Wait until the File Saved message shows up on the lower corner of the screen. Then, press Eject to remove the SD card safel.



9) Remove SD card from your computer.

4.4 How to load filament

Procedure

- 1) Make sure the 3D printer is turned on.
- 2) Press the LCD button and select: *Maintenance*→*Change filament*.

Back	↑
Print	→
Maintenance	→
Machine Settings	→
About	→

Back	↑
Change filament	→
Move axis	→
Auto home	
Set nozzle height	→

- 3) Select the correct options according to the extruder and filament you wish to use. Usually *Extruder 1* is used for single nozzle extrusion and *Extruder 2* is only used for dual extrusion or if you selected *Extruder 2* on slicer.

Back	↑
Extruder 1	→
Extruder 2	→

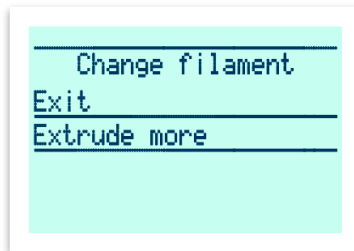
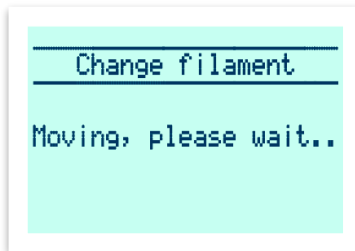
Back	↑
PLA	210C →
PETG	230C →
ABS	240C →
PC	260C →

- 4) Select the *Auto Load* option, insert filament through the filament sensor at the top until it reaches the driver. Then, wait until the 3D printer finishes moving and heating. After that, press the LCD button.

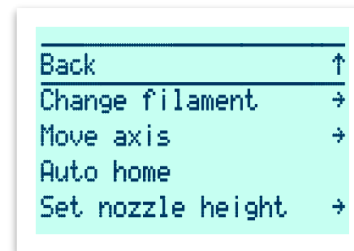
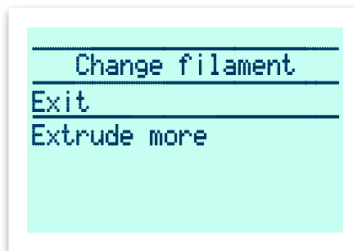
Back	↑
Auto load	
Auto unload	
Manual extrusion	

Change filament
Press to continue...

- 5) Wait until the filament is extruded by the nozzle. In case no filament comes out of the nozzle or the color of the filament coming out is different from the filament being loaded, wait until the extrusion is over and then select the *Extrude more* option.



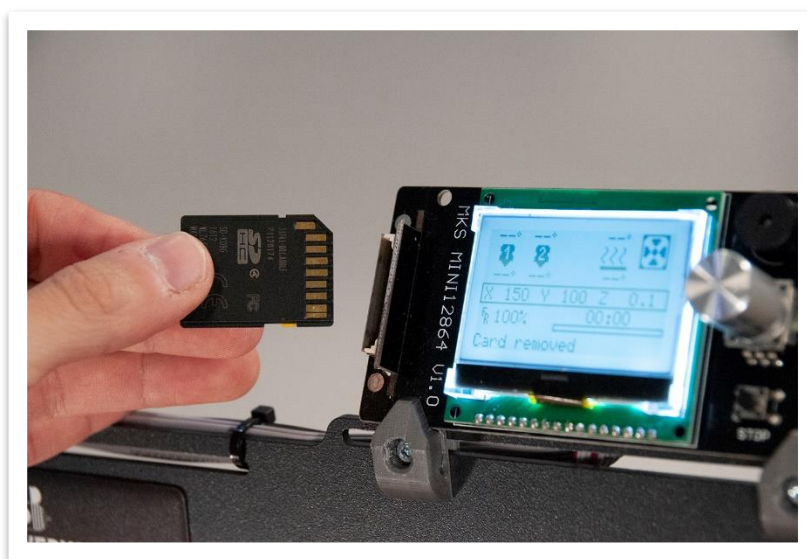
Select the *Exit* option and press *Back* until you are back to the initial screen.



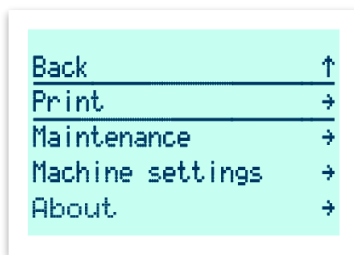
4.5 How to start printing

Procedure

- 1) Insert the SD card on your B2X300 LCD screen.

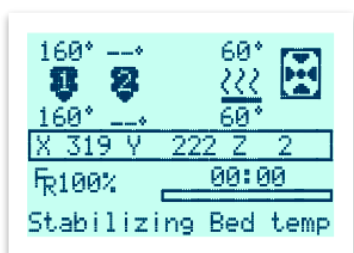


- 2) Press the LCD button and select the *Print* option.

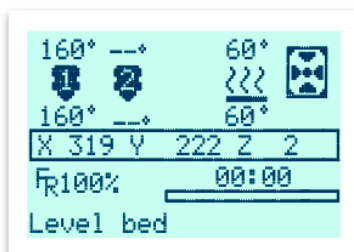


- 3) Select the Gcode you want to print from the list that will show up on the screen.

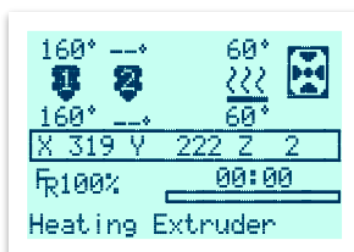
- 4) Wait until the 3D printer heats up and stabilizes the temperature of the heated bed.



- 5) Wait until the 3D printer executes the *Level Bed* procedure, where it will measure the heated bed curvature in relation to the nozzles so that there is a uniform adhesion to the all surface.



- 6) Wait until the extrusion temperature is reached. After this operation the printer will start printing.



5. DUAL EXTRUSION CALIBRATION

To be able to use both extruders on your B2X300, you will have to calibrate the distance between both nozzles, as well as make sure the height on both nozzles is the same.

5.1 XY offset Calibration



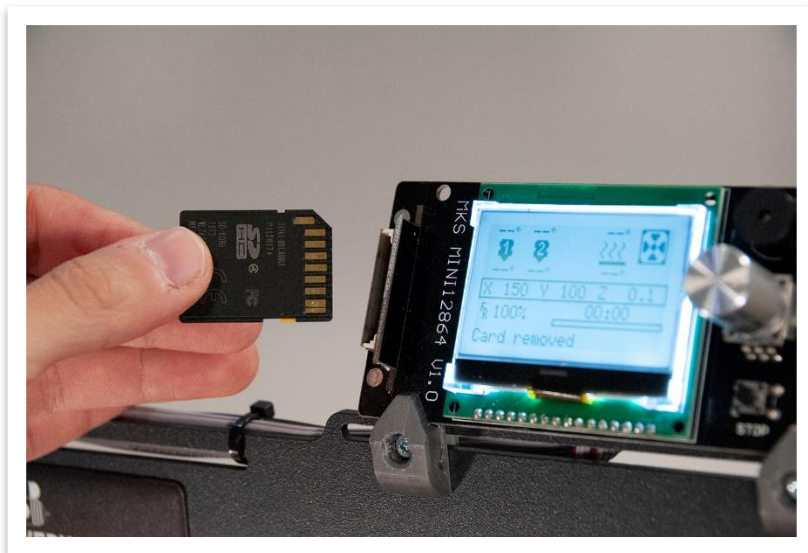
This procedure cannot be executed properly if the Z offset calibration isn't properly done. Please check [chapter 3.4](#) on this manual to learn how to calibrate nozzle height.

This will ensure that during the printing procedure the material extruded by both the nozzles is aligned with each other, in other words, to print on the same physical coordinates as requested by the Gcode. This is achieved by measuring the distance between the nozzles on both the X and Y axis.

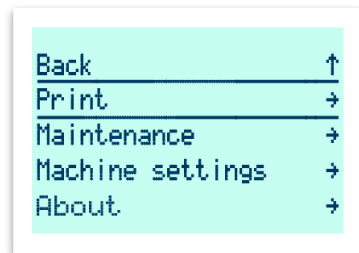
Procedure

Printing Measurement Gcode.

- 1) Load filament on both extruders, using the *Change filament* option, following the procedure in [chapter 4.4](#) on this manual.
- 2) Insert the SD card onto to the B2X300 LCD.

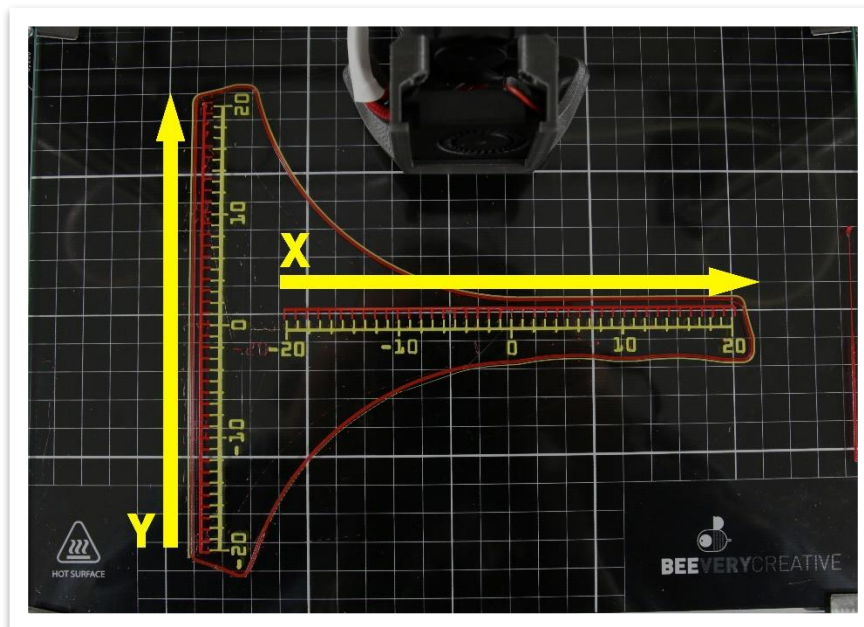


3) On the main screen, press the LCD button and select *Print*.



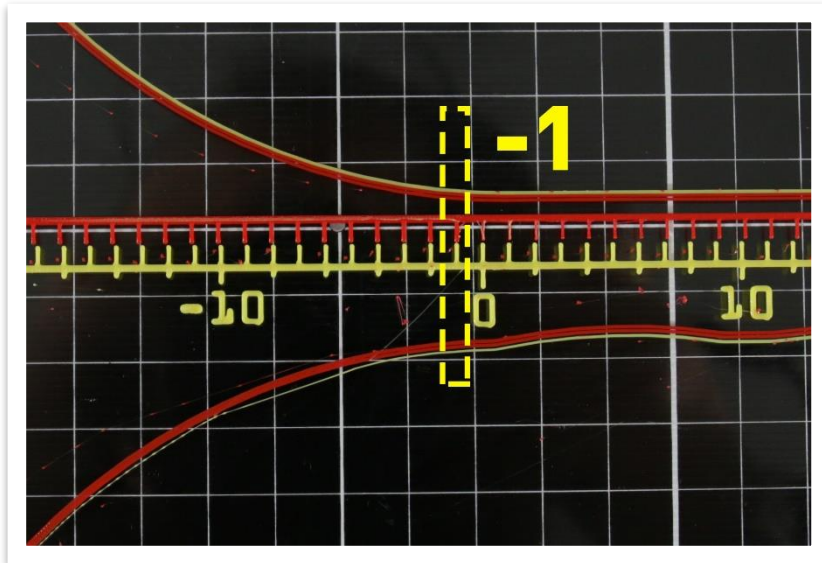
4) Select the Gcode offset_xy, also available [here](#).

5) Wait until the printing is done.

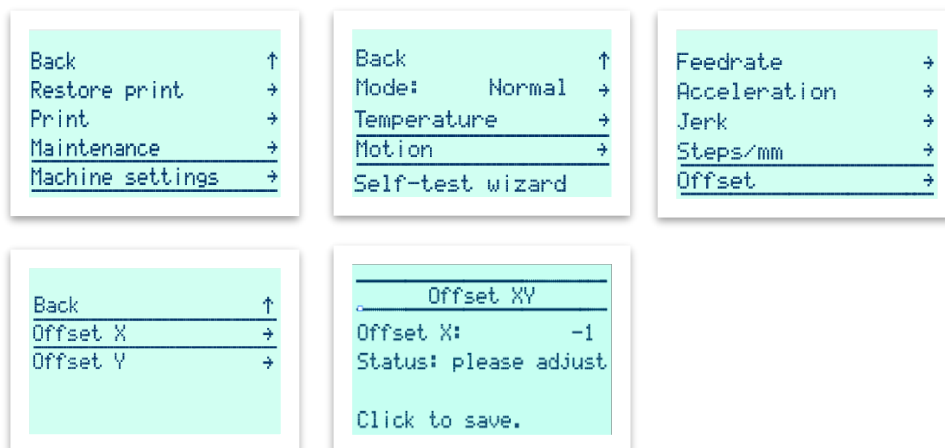


Measuring the X Offset

- 1) Look at the line and find the point where the lines of both extruders are aligned on the X axis.

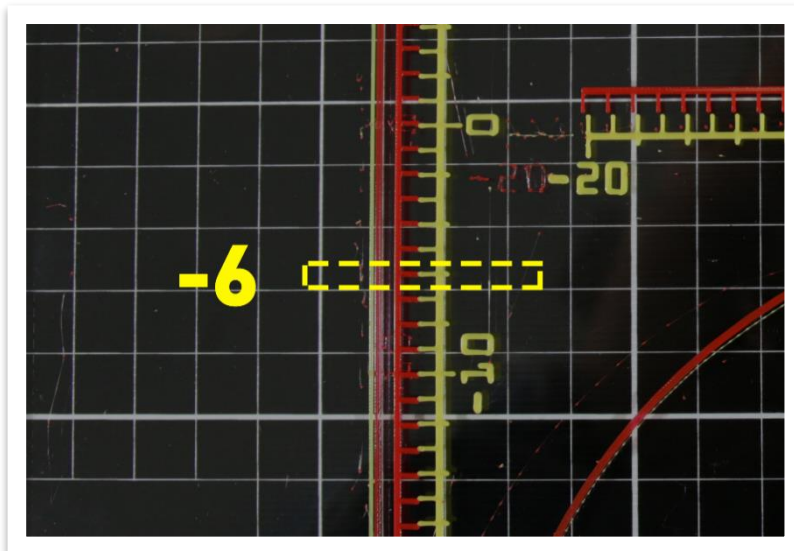


- 2) From the centre of the ruler where the 0 (zero) marker is, count how many lines until you find the best result. From the 0 (zero) to the right, the value is positive and from the centre to the left, the value is negative.
- 3) In the LCD menu select *Machine Settings / Motion / Offset / Offset X* and insert the value measured in the previous point.

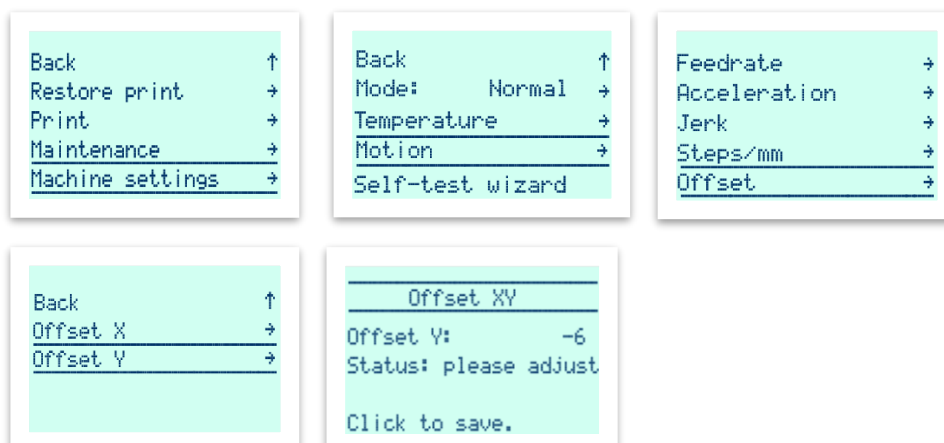


Measuring the Y Offset

- 1) Look at the line and find the point where the lines of both extruders are aligned on the Y axis.



- 2) From the centre of the ruler where the 0 (zero) marker is, count how many lines until you find the best result. From the 0 (zero) to the top, the value is positive and from the centre to the bottom, the value is negative.
- 3) In the LCD menu select *Machine Settings / Motion / Offset / Offset Y* and insert the value measured in the previous point.

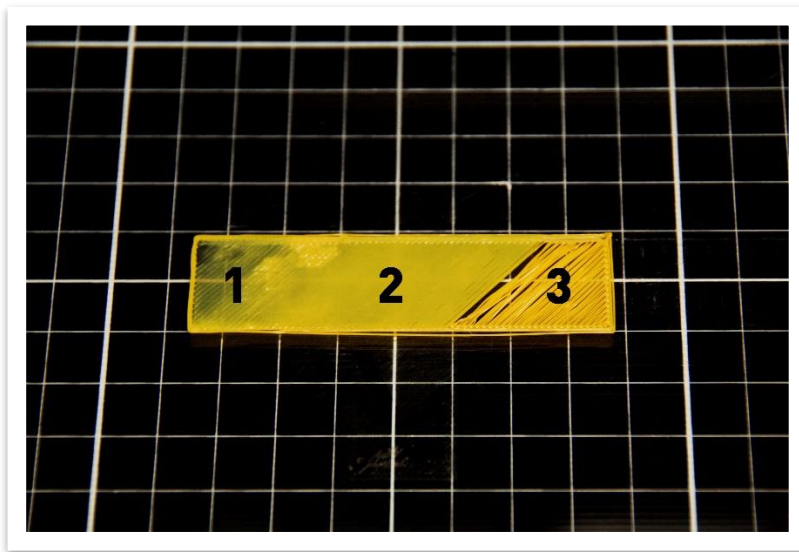


6. BASIC MAINTENANCE OPTIONS

6.1 First layer height adjustment during print

B2X300 allows you to change the first layer print height in real time, in order to improve layer adhesion. This process is useful when you change the filament you are printing with or to make small adjustments to the height of the first layer.

Ideally, the first layer should be printed with all its lines connected to each other, with no gaps between them, but still possible to recognize individual lines.



In this image, you can see what it looks like when the first layer is:

- 1 - Too crushed
- 2 - Perfect
- 3 - Too far apart

Procedure:

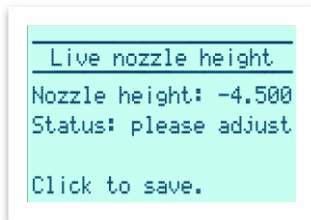
- 1) Start Printing a Gcode.
- 2) Wait until your 3D printer completes warming up and the calibration procedures.
- 3) Press the LCD button and select the *Print* → *Print settings* → *Nozzle height* option.

4) Rotate the LCD button to adjust the first layer height.

1. One rotation counter clockwise will move the nozzle away from heated bed.
2. One rotation clockwise will move the nozzle closer to the heated bed.

To sum up, the lower the number, the closer the nozzle will be to the heated bed.

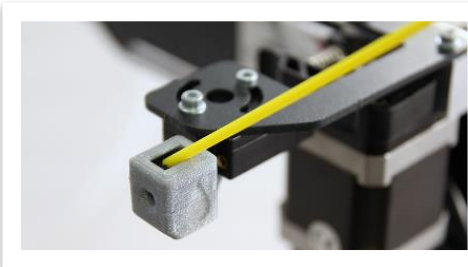

Note that this number is a negative number!



5) Press the LCD button to confirm and save the adjustment.

7. POSSIBLE ISSUES AND RESPECTIVE SOLUTIONS

Execute the solutions sequentially until the problem is solved, if you can't solve the problem you can contact us through: customer_service@beeverycreative.com or through our [forum](#).

Symptom	Solution
<i>First layer won't adhere to the print bed.</i>	<ul style="list-style-type: none"> a. Make sure the glass is clean and prepared for printing (adhesive anti warping spray for 3D Printers(or similar), blue tape, etc). b. Adjust the height while the first layer is being printed. c. Make sure the filament used is in good condition.
<i>Filament isn't being extruded and the extruder won't rotate properly and makes a weird noise.</i>	<ul style="list-style-type: none"> a. Make sure that the Cura project is the recommended project. b. Soak the sponge with oil (WD40) and insert the filament. <i>For filament filter and lubricator assembly instructions, consult the latest Assembly Manual version available here: https://beeverycreative.com/manuals-tutorials/</i> <div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> c. Unload the filament and clean the nozzle, using the maintenance kit. d. Switch the nozzle.
<i>Filament isn't being extruded but the extruder keeps rotating and doesn't make any weird noise (grinds filament).</i>	<ul style="list-style-type: none"> a. Unload the filament, pulling it slightly and load again. b. Try raising the temperature to facilitate extrusion. e. Try another filament because the one you are using might be brittle, being nibbled by the driver gear.
<i>During filament loading, the extruder won't rotate evenly and makes noise.</i>	<ul style="list-style-type: none"> a. Manually activate the extruder lever, loosening the filament and removing it. Cut the end in a v shape and manually insert the filament until it is visible on the PTFE tube. b. Make sure the tube is completely inserted on both ends.
<i>Ran out of filament and the 3D printer is paused.</i>	<ul style="list-style-type: none"> a. Run the instructions on the LCD screen to load new filament and continue printing.

Symptom	Solution
<i>The 3D printer is paused due to a power loss.</i>	<ul style="list-style-type: none"> a. If the power loss had a short duration the printer should resume printing without any interaction b. In case the print doesn't restore on its own, you can do it manually by accessing the printer menu and selecting <i>Restore print</i>
<i>The 3D printer stopped mid print.</i>	<ul style="list-style-type: none"> a. Check the Gcode used. b. Check if the SD card is in place on the LCD. c. Check the cables between the LCD and the motherboard.
<i>The 3D printer doesn't read the SD card.</i>	<ul style="list-style-type: none"> a. Check if the SD card is in place on the LCD. b. Format the SD card with the SD card formatter software, on the <i>Overwrite format</i> option. c. Place again the original files on the SD card available here.
<i>The extruder continuously hits the right side of the structure / the heated bed continuously hits the front of the structure.</i>	<ul style="list-style-type: none"> a. Select the <i>Machine settings</i> → <i>Motion</i> → <i>Trinamic settings</i> → <i>Sensorless homing</i> options and select the <i>Auto adjust</i> option. b. Run the Self-test wizard by accessing the menu and selecting <i>Machine settings</i> and check to see if any error occurred.
<i>The Auto Calibration on the Servomotor makes noise or won't function.</i>	<ul style="list-style-type: none"> a. Make sure the Auto Calibration cables are not blocking the servomotor movement. b. Check the cable connection to the motherboard.
<i>Both Z threaded rods won't rotate evenly.</i>	<ul style="list-style-type: none"> a. Make sure both threaded rods and linear guides are properly lubricated. b. Check if both the couplers that unite the Z motors and the threaded rods are properly tightened and correctly positioned, loosening and tightening them again.
<i>One or multiple axis won't move.</i>	<ul style="list-style-type: none"> a. Run the Self-test wizard again, by accessing the menu and selecting <i>Machine settings</i> and checking for mistakes. b. Check all the connections to the motherboard. c. Ensure air duct fan is turned on.
<i>The extrusion of the filament is inconsistent and/or makes snap noises.</i>	<ul style="list-style-type: none"> a. Lower the printing temperature. b. Use another material since this one might be damaged.
<i>The 3D printed object was ripped off by the inactive nozzle.</i>	<ul style="list-style-type: none"> a. Select the <i>Change filament</i> process to heat the extruder and clean any leftover plastic stuck on the inactive nozzle tip. b. Repeat the Z offset adjustment procedure.
<i>The LCD screen stopped responding mid print.</i>	<ul style="list-style-type: none"> a. Make sure the LCD cables are as far away as possible from all the stepper motors and heating element cables. b. Wait until the LCD restarts.

8. MENU MAP

Menu	Action
Info Screen	Initial screen where you can check the current status of your printer (temperatures, axes positions, fan speed, feed rate and print progress).
Back	Go back to previous screen.
Restore print <i>(Only visible if there is a print to be restored)</i>	Restore print after a power failure.
Print <i>(Only available while printing)</i>	Choose a file to print from the SD card. The accepted file format is GCODE and the SD card must be FAT formatted).
Back	Go back to previous screen.
Pause print	Cancel current print. Upon cancellation, the printer homes X and Y axes.
Cancel print	Cancelar a impressão e fazer Home ao XY.
Change Filament	Change the filament mid print. The nozzle temperature cannot be adjusted (the procedure happens at the current extruder temperature).
Print settings	Modify printing parameters mid print. This parameters will over-ride the ones on the current GCODE file.
Back	Go back to previous screen.
Temperature E1	Adjust Extruder 1 temperature.
Temperature E2	Adjust Extruder 2 temperature.
Temperature bed	Adjust Heated Bed temperature.
Fan speed	Adjust Blower fan speed.
Feed rate	Adjust printing speed.
Flow E1	Adjust the multiplier factor for extrusion on Extruder 1.
Flow E2	Adjust the multiplier factor for extrusion on Extruder 2.
Nozzle height	Manually adjust the offset between the nozzle tip and the printing surface in real-time.
Maintenance <i>(not available while printing)</i>	Machine maintenance operations.
Back	Go back to previous screen.
Change Filament	Load or change the filament on your 3D printer.
Back	Go back to previous screen.
Extruder 1	Select to change filament on Extruder 1.
Extruder 2	Select to change filament on Extruder 2.
Back	Go back to previous screen.

	PLA 210 °C	Pre-heat the selected extruder to 210°C (works with most PLA filaments).
	PETG 230 °C	Pre-heat the selected extruder to 230°C (works with most PETG filaments).
	ABS 240 °C	Pre-heat the selected extruder to 240°C (works with most ABS filaments).
	PC 260 °C	Pre-heat the selected extruder to 260°C (works with most PC filaments).
	Back	Go back to previous screen.
	Auto Load	Automatically load the filament all the way to the extruder. Make sure the filament goes through the oil filter (if any), the filament sensor and finally, through the extruder.
	Back	Go back to previous screen.
	Extrude more	Extrude more filament. This is useful when changing between different materials or colors – repeat this procedure until the filament coming out of the nozzle isn't tinted with the previous color loaded.
	Auto Unload	Automatically unload the filament. Please pull firmly the filament tip to ensure the filament is correctly unloaded.
	Manual Extrusion	Manually move the selected extruder motor.
Auto-home		Find each axis "zero" position.
Move axis		Manually set each axis position.
	Back	Go back to previous screen.
	Move X	Set X-axis position.
	Move Y	Set Y-axis position.
	Move Z	Set Z-axis position.
Set nozzle height		Calibrate the offset between the nozzle tip and the printing surface using the on-screen assistant.
Nozzle Z-offset test		Tests if both nozzles are calibrated to be at the same height.
Level bed		Run the auto-calibration procedure. This process measures the height of 15 points across the whole printing surface and compensates for warping and non-parallelism between axes.
Machine settings		Modify machine settings.
	Back	Go back to previous screen.
	Mode	Select Trinamic TMC2130 motor drivers operation mode.
	Back	Go back to previous screen.
	Normal mode	Select normal operation mode (increased torque, higher printing speeds at a cost of slightly louder operation). This mode is set by default.
	Silent mode	Select silent operation mode (less torque, higher printing speeds, very quiet operation).

Stealth mode	Select stealth operation mode (less torque, lower printing speeds, even quieter operation).
Temperature	Set and configure temperature parameters.
Back	Go back to previous screen.
Temperature E1	Adjust Extruder 1 temperature.
Temperature E2	Adjust Extruder 2 temperature.
Temperature bed	Adjust Heated Bed temperature.
Fan speed	Adjust Blower fan speed.
Advanced settings	Configure advanced temperature settings.
Back	Go back to previous screen.
Pre-heat PLA	Pre-heat the extruder and heated bed to the pre-set temperatures for PLA.
Pre-heat ABS	Pre-heat the extruder and heated bed to the pre-set temperatures for ABS.
Cool down	Turn-off heating elements and begin the cool down of the machine. The current system temperatures can be checked in the "Info screen".
PID auto-tune E1	Automatically calibrate the PID temperature control loop parameters for Extruder 1 for optimal performance at the selected temperature.
PID auto-tune E2	Automatically calibrate the PID temperature control loop parameters for Extruder 2 for optimal performance at the selected temperature.
PID-P E1	Adjust the Proportional parameter of the PID temperature control loop for Extruder 1.
PID-I E1	Adjust the Integral parameter of the PID temperature control loop for Extruder 1.
PID-D E1	Adjust the Derivative parameter of the PID temperature control loop for Extruder 1.
PID-P E2	Adjust the Proportional parameter of the PID temperature control loop for Extruder 2.
PID-I E2	Adjust the Integral parameter of the PID temperature control loop for Extruder 2.
PID-D E2	Adjust the Derivative parameter of the PID temperature control loop for Extruder 2.
Motion	Set and configure movement-related parameters.
Back	Go back to previous screen.
Trinamic settings	Adjust Trinamic TMC2130 drivers settings.
Back	Go back to previous screen.
Stepper current	Set each axis driver current. This setting can be over-ridden by your GCODE file, check your "start-gcode".
Back	Go back to previous screen.
X (mA)	Electronically adjust X-axis current.

	Y (mA)	Electronically adjust Y-axis current.
	Z (mA)	Electronically adjust Z-axis current.
	E (mA)	Electronically adjust extruder motors current.
	Sensorless homing	Adjust and calibrate the parameters for axes "zero"-position detection.
	Back	Go back to previous screen.
	Auto adjust	Automatically calibrate the axes "zero"-position detection parameters. This process might take up to 5 minutes and some noise and impacts are expected.
	X calibration	Manually adjust X-axis detection parameter.
	Y calibration	Manually adjust Y-axis detection parameter.
	Test X homing	Test X-axis sensorless homing. The X-axis will "home" 5 times in a row.
	Test Y homing	Test Y-axis sensorless homing. The Y-axis will "home" 5 times in a row.
	StallGuard2 settings	Adjust "zero"-position detection amplification settings.
	Back	Go back to previous screen.
	X threshold	Manually adjust X-axis amplification.
	Y threshold	Manually adjust Y-axis amplification.
	E threshold	Manually adjust Z-axis amplification.
	Reset default	Load default Trinamic TMC2130 configuration values.
Feed rate		Adjust printing speed settings.
	Back	Go back to previous screen.
	V-max X	Set maximum velocity for X-axis.
	V-max Y	Set maximum velocity for Y-axis.
	V-max Z	Set maximum velocity for Z-axis.
	V-max E	Set maximum velocity for currently active extruder.
	V-max E1	Set maximum velocity for Extruder 1.
	V-max E2	Set maximum velocity for Extruder 2.
	V-min	Set minimum velocity for all axes.
	V-travel-min	Set minimum travel velocity for all axes. This parameter only applies to movement for X, Y and Z axes (when no filament is being extruded).
Acceleration		Adjust movement acceleration settings.
	Back	Go back to previous screen.
	A-retract	Adjust the acceleration factor when doing firmware retractions (using "G10" commands).
	A-travel	Adjust the acceleration factor for movements without extrusion.

	A-max X	Adjust the maximum acceleration factor for X-axis movements.
	A-max Y	Adjust the maximum acceleration factor for Y-axis movements.
	A-max Z	Adjust the maximum acceleration factor for Z-axis movements.
	A-max E	Adjust the maximum acceleration factor for the current extruder movements.
	A-max E1	Adjust the maximum acceleration factor for Extruder 1 movements.
	A-max E2	Adjust the maximum acceleration factor for Extruder 2 movements.
Jerk		Configure movement jerk parameters. Jerk is the maximum velocity difference between two segments at which the printer can perform the velocity change instantaneously (without applying acceleration/deacceleration between the two segments velocities).
	Back	Go back to previous screen.
	V-jerk X	Adjust X-axis movement jerk.
	V-jerk Y	Adjust Y-axis movement jerk.
	V-jerk Z	Adjust Z-axis movement jerk.
	V-jerk E	Adjust E-axis movement jerk.
Steps/mm		Adjust how many steps each motor should take in order to advance 1mm. This setting is highly dependent on the printer mechanics and usually doesn't need to be changed. If you want to revert this value to the factory settings, click <i>Reset settings</i> under <i>Machine settings</i> .
	Back	Go back to previous screen.
	X steps/mm	Adjust steps/mm setting for X-axis.
	Y steps/mm	Adjust steps/mm setting for Y-axis.
	Z steps/mm	Adjust steps/mm setting for Z-axis.
	E steps/mm	Adjust steps/mm setting for both Extruders.
	E1 steps/mm	Adjust steps/mm setting for Extruder 1.
	E2 steps/mm	Adjust steps/mm setting for Extruder 2.
Self-test wizard		Run the self-test wizard. This will check your printer connections and help get your printer ready for printing after assembly. You should run this wizard at least once.
Save/Reset settings		Save or reset the current settings to printer permanent memory (EEPROM). Unless you do a "Save settings", most settings will default to the previous set values once you turn-off your 3D printer.
	Save settings	Save and store the current settings into the permanent printer memory.
	Back	Go back to previous screen.
	Confirm!	Confirm to save and store the current settings into the EEPROM.

Reset settings	Reload and store the factory default settings into the permanent printer memory.
Back	Go back to previous screen.
Confirm!	Confirm to save and store the factory default settings into the EEPROM.
About	Check the current installed firmware version and some diagnostic flags. When contacting the customer service (customer_service@beeverycreative.com) you should always communicate the information on this screen to help the diagnostic process.

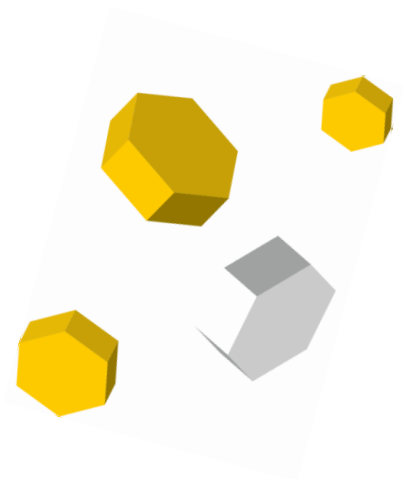
9. ERROR CODES

CODE	SITUATION	ERROR	PROPOSED SOLUTION
EC11	Self-test Wizard	Extruder 1 temperature is less than -14°C	<ol style="list-style-type: none"> 1. Turn the printer off. 2. Check if the temperature sensor on Extruder 1 is correctly connected to the control board. 3. Make sure it is properly inserted and in the right socket. 4. Turn the printer back on and run the test again.
EC12	Self-test Wizard	Extruder 2 heats up instead Extruder 1	<ol style="list-style-type: none"> 1. Turn the printer off. 2. Before checking the extruders, make sure they have properly cooled down. Always value your safety first. 3. Check if the heating elements on both extruders are properly connected and make sure the screws on the connector hold the cables firmly: Cable E1 go to Extruder 1 and Cable E2 go to Extruder 2. 4. Check if the temperature sensor for both extruders is connected in the right socket. 5. Turn the printer back on and run the test again.
EC13	Self-test Wizard	Extruder 1 doesn't reach the temperature test	<ol style="list-style-type: none"> 1. Turn the printer off. 2. Check if the cables for the heating element for Extruder 1 is properly connected and make sure the screws on the control board hold the cables firmly. 3. Check if the heating element is correctly seated on the heating block for Extruder 1 (on the left). Check if the temperature sensor for Extruder 1 is correctly connected to the control board and inserted into the heating block for the Extruder 1. 4. Turn the printer back on and run the test again.
EC21	Self-test Wizard	Extruder 2 temperature is less than -14°C	<ol style="list-style-type: none"> 1. Turn off your printer. 2. Check if the temperature sensor on Extruder 2 is correctly connected to the control board. 3. Make sure it is properly inserted and in the right socket. 4. Turn the printer back on and run the test again.
EC22	Self-test Wizard	Extruder 1 heats up instead Extruder 2	<ol style="list-style-type: none"> 1. Turn the printer off. 2. Before checking the extruders, make sure they have properly cooled down. Always value your safety first. 3. Check if the heating elements on both extruders are properly connected and make sure the screws on the connector hold the cables firmly: Cable E1 go to Extruder 1 and Cable E2 go to Extruder 2. 4. Check if the temperature sensor for both extruders is connected in the right socket. 5. Turn the printer back on and run the test again.
EC23	Self-test Wizard	Extruder 2 doesn't reach the temperature test	<ol style="list-style-type: none"> 1. Turn the printer off. 2. Check if the cables for the heating element for Extruder 2 is properly connected and make sure the screws on the control board hold the cables firmly.

CODE	SITUATION	ERROR	PROPOSED SOLUTION
			<ol style="list-style-type: none"> 3. Check if the heating element is correctly seated on the heating block for Extruder 2 (on the right). Check if the temperature sensor for Extruder 2 is correctly connected to the control board and inserted into the heating block for the Extruder 2. 4. Turn the printer back on and run the test again.
EC31	Self-test Wizard	Heated bed temperature is less than -14°C	<ol style="list-style-type: none"> 1. Turn off your printer. 2. Check if the cable for the heated bed temperature sensor is correctly connected to the right socket. 3. Check if the connector that connects the control board to the heated bed is properly connected. 4. Turn the printer back on and run the test again.
EC32	Self-test Wizard	Heated bed doesn't reach the temperature test	<ol style="list-style-type: none"> 1. Turn off your printer. 2. Check if red and black cables that come from the heated bed are properly placed in the control board connector and are firmly secured by the screws on the connector. 3. Check if the connector that connects the heated bed to the control board is properly connected and held in place. 4. Make sure there are no residues or left-over filament stuck in the contacts by cleaning the contacts with a cloth embedded with a bit of pharmacy alcohol. Make sure it has dried completely before reconnecting the cable again. 5. Turn the printer back on and run the test again.
EC41	Self-test Wizard	Blower doesn't turn on	<ol style="list-style-type: none"> 1. Turn off your printer. 2. Check if the blower cabling is properly connected to the control board (red wire on the (+) connector, black wire on the (-) connector) and if both cables are firmly held by the screws on the connector. 3. Check if there is filament residues or other objects blocking the movement of the blower blades. 4. Check if the blower blades can move freely. 5. Turn the printer back on and run the test again.
EC51	Self-test Wizard	Stepper driver disconnected	<ol style="list-style-type: none"> 1. Take note of which stepper drivers are indicated as NOK on the errors screen. 2. Turn off your printer. 3. Check if the previously indicated stepper drivers are correctly oriented and connected to the motherboard and to the white expansion board which connects all the stepper drivers, making sure that none of the pins is outside of the connectors. 4. Check if the flat cables that connect the white expansion board to the motherboard are correctly oriented and connected. 5. Turn the printer back on and run the test again.
EC61	Self-test Wizard	Error on powerloss detection pin	<ol style="list-style-type: none"> 1. Turn off your printer. 2. Check if the powerloss detection board is correctly aligned and connected as indicated on the Assembly Manual available here. 3. Turn the printer back on and run the test again.

9.1 Other codes

CODE	SITUATION	PROCEDURE	PROPOSED SOLUTION
OC01	Self-test Wizard	Set nozzle height	<ol style="list-style-type: none"> 1. Grab a paper sheet (standard 70-100g/m²) and wait for the printer to stop moving. Place the paper sheet between the 2 nozzles and the printing surface. 2. Turn the knob on the LCD screen to adjust the offset between the nozzle and the printing surface. Remember, the offset is a negative number which means that a lower value (more negative) means a bigger distance. 3. Adjust the nozzle height until you feel the paper sheet is neither completely stuck by the nozzles (at this, you should be able to drag the paper sheet without much effort and the nozzle should leave a light mark on the paper – if the nozzles tear the paper, you’ve gone too far). 4. When you’re ready, click the LCD knob to confirm and save the new offset. 5. If you wish to repeat the process again, you can find it under <i>Maintenance</i> → <i>Set nozzle height</i>. 6. The nozzle should be as-clean-as-possible before running this process, otherwise the plastic on the tip of the nozzle might give you incorrect offset values. To avoid this, you should unload the filament by doing <i>Maintenance</i> → <i>Change filament</i> before running the calibration procedure.
OC02	Dual extrusion Z offset	Test nozzle height calibration - Dual Z offset	<ol style="list-style-type: none"> 1. Before executing this test procedure, please calibrate the two Z-axis screws according to the procedure on the chapter 3.3. 2. Make sure the printer has filament loaded on both extruders, it’s very important that you use the same material from the same brand on both extruders, otherwise the test results might be misleading. 3. During this procedure the printer will ask what kind of filament is loaded and proceed to heat both nozzles and the bed to the default temperature for the loaded filament. Finally, the machine will home, auto level the bed and print the test pattern (this pattern consists of two parallel lines, each of the lines printed with a different extruder). 4. For the test to be considered successful both lines should be very similar (in width and height) and must share similarly adhesion conditions to the build surface. 5. Due to a possible loss of pressure when the nozzles begin to print, please consider only the second-half of the lines, from the center up to the front of the heated bed. If one of the lines is obviously more squeezed or loose than the other you will need to repeat the calibration process and repeat the test procedure. 6. If you skip this adjustment, when using dual extrusion the lowest nozzle can knock the printed part, making it pop from the build surface, resulting in a failed print.



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