

sigma

User Manual

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*You can see Switching On Your Printer For The First Time Section on our youtube channel:
<https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>

Introduction

EU Warranty

Technical Support

For any questions or problems with BCN3D Products, please contact us at:

c/ Esteve Terrades, 1
Edifici RDIT del PMT, 2a Planta 216
08860 Castelldefels, Barcelona (Espanya)
email: sat@bcn3dtechnologies.com
Tel: +34 934137088

Fundació Privada Centre CIM
c/ Llorens i Artigas, 12
08028 Barcelona (Espanya)
Tel. +34 934017171

List of Consumable components

This document lists the Consumable components that, for its natural deterioration, are excluded from the Warranty: **BCNozzle (Hotend), Teflon Tube, Hotbed Glass, Filament Spools, Glue Stick, Printed Parts.**

Fundació Privada Centre CIM ("Fundació CIM") grants this Warranty to the BCN3D brand Product users.

This Warranty is only valid in the country where the Product has been purchased originally, as long as it is member of the European Union, Iceland, Norway, Switzerland, Liechtenstein or Turkey. Otherwise, review the Warranty for non EU countries.

Fundació CIM guarantees that, within the Warranty Period, Fundació CIM or an authorized service company will correct, in a reasonable commercial time, the claims related with the non-conforming Product according to the following clauses.

Warranty Period

The Warranty Period starts when the Product is first delivered to the end-user.

The Warranty period lasts twenty-four (24) months. Both the parts that suffer wear and tear due to the normal operation of the Product and the "Consumable" elements are not covered by this Warranty.

The present Warranty is invalidated in case of incurring in any of the cases exposed in the Exclusions chapter.

In case of resale, repair or substitution of the Products the Warranty is not extended. The repaired or substituted parts are covered until the end of the Warranty Period or during six (6) months, depending on which date is later.

EU Warranty

How to get Warranty Service

In case of non-conformity with the Product:

- 1** Notify the seller before the end of the Warranty Period
- 2** Supply all the information to Fundació CIM or to the authorized service company about the nature of the claim in the period of two (2) months since its detection and never after the end of the Warranty Period.
- 3** Supply the original proof of purchase, which includes the Product serial number

In case of doubt, contact the Fundacio CIM Technical Assistant Service ("TAS") (sat@bcn3dtechnologies.com) or the authorized service company

Claim handling

- 1** The remedy of the non-conforming Product is solely determined by Fundació CIM or the authorized service company within a reasonable commercial time.
- 2** The amendment may consist in the repair, part replacements or total substitution of the Product, depending on each situation and disposed by Fundació CIM or the authorized service company (unless the current legislation states it otherwise).
- 3** The client takes responsibility for the transport of the machine to the facilities of BCN3D (going and return).
- 4** Fundacio CIM or the authorized service company, depending on which handles the claim, bears the repair, parts replacement or Product substitution costs.
- 5** All damaged, defective or replaced parts or Products become the property of Fundació CIM or the authorized service company.

Exclusions

This Warranty does not cover:

- 1** Physical damage caused by an inappropriate transport (not using the official packaging) or handling (including unlimitedly the damages caused by sharp or cutting elements, bending or compressing parts or fall of the Product).
- 2** The normal wear and tear occurred for the product normal use, including unlimitedly the wear of moving parts, control panels or elements interacting with the product operation.
- 3** The damages inflicted by the non-compliance of the Maintenance Plan specified in the Product User Manual.
- 4** Malfunctions or damage caused by modifications, alterations or repairs by any individual or company not authorized by Fundació CIM. The Consumable replacements are excluded of this point.
- 5** Damage caused by power grid failures
- 6** Damage caused by abuse, misuse, accidents or neglect using the Product.
- 7** Resulting damages of exposing the Product to floods, fire, humidity, spillage of food or chemicals, corrosion, oxidation, extreme weather conditions or any other external agent.
- 8** Damages caused by the use of software non recommended by Fundació CIM.
- 9** Damages caused by the use of printing materials non recommended by Fundació CIM .
- 10** The components considered as Consumables,

EU Warranty

numbered in the annexed document.

Limitations and Disclaimers

This Warranty is the end user's sole and exclusive remedy against Fundació CIM and the sole and exclusive responsibility of Fundació CIM to defects in their Products. Therefore, this Warranty supersedes any other warranties issued by Fundació CIM, either oral or written in any form.

However, this Warranty does not limit either the consumer user rights specified in the legislation nor the rights against the seller, also defined in the legislation.

Fundació CIM waives all liability for any loss of businesses, loss of contracts, loss of benefits, loss of savings, increase of costs or expenses due to the use of any of its Products. Likewise, Fundació CIM refuses any indirect, incidental, collateral damage by the use of its Products.

Non-EU Warranty

Fundació Privada Centre CIM ("Fundació CIM") grants this Warranty to the BCN3D Technologies brand Product users.

This Warranty is only valid in the country where the Product has been purchased originally, as long as it is not member of the European Union, Iceland, Norway, Switzerland, Liechtenstein or Turkey. Otherwise, check the Warranty for EU countries.

The present Warranty is invalidated in case of incurring in any of the cases exposed in the Exclusions chapter.

In case of resale, repair or substitution of the Products the Warranty is not extended. The repaired or substituted parts are covered until the end of the Warranty Period or during six (6) months, depending on which date is later.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Warranty Period

The Warranty Period starts when the Product is first delivered to the end-user.

The Warranty period lasts twelve (12) months. Both the parts that suffer wear and tear due to the normal operation of the Product and the "Consumable" elements are not covered by this Warranty.

How to get Warranty Service

In case of non-conformity with the Product:

1 Notify the seller before the end of the Warranty Period

Non-EU Warranty

2 Supply all the information to Fundació CIM or to the authorized service company about the nature of the claim in the period of two (2) months since its detection and never after the end of the Warranty Period.

3 Supply the original proof of purchase, which includes the Product serial number

In case of doubt, contact the Fundacio CIM Technical Assistant Service ("TAS") (sat@bcn3dtechnologies.com) or the authorized service company.

Claim handling

1 The remedy of the non-conforming Product is solely determined by Fundació CIM or the authorized service company within a reasonable commercial time.

2 The amendment may consist in the repair, part replacements or total substitution of the Product, depending on each situation and disposed by Fundació CIM or the authorized service company (unless the current legislation states it otherwise).

3 The client takes responsibility for the transport of the machine to the facilities of BCN3D (going and return).

4 Fundacio CIM or the authorized service company, depending on which handles the claim, bears the repair, parts replacement or Product substitution costs.

5 All damaged, defective or replaced parts or Products become the property of Fundació CIM or the authorized service company.

Exclusions

This Warranty does not cover:

1 Physical damage caused by an inappropriate transport (not using the official packaging) or handling (including unlimitedly the damages caused by sharp or cutting elements, bending or compressing parts or fall of the Product).

2 The normal wear and tear occurred for the product normal use, including unlimitedly the wear of moving parts, control panels or elements interacting with the product operation.

3 The damages inflicted by the non-compliance of the Maintenance Plan specified in the Product User Manual.

4 Malfunctions or damage caused by modifications, alterations or repairs by any individual or company not authorized by Fundació CIM. The Consumable replacements are excluded of this point.

5 Damage caused by power grid failures

6 Damage caused by abuse, misuse, accidents or neglect using the Product.

7 Resulting damages of exposing the Product to floods, fire, humidity, spillage of food or chemicals, corrosion, oxidation, extreme weather conditions or any other external agent.

8 Damages caused by the use of software non recommended by Fundació CIM.

9 Damages caused by the use of printing materials non recommended by Fundació CIM .

Non-EU Warranty

10 The components considered as Consumables, numbered in the annexed document. Some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Limitations and Disclaimers

This Warranty is the end user's sole and exclusive remedy against Fundació CIM and the sole and exclusive responsibility of Fundació CIM to defects in their Products. Therefore, this Warranty supersedes any other warranties issued by Fundació CIM, either oral or written in any form.

However, this Warranty does not limit either the consumer user rights specified in the legislation nor the the rights against the seller, also defined in the legislation.

Fundació CIM waives all liability for any loss of businesses, loss of contracts, loss of benefits, loss of savings, increase of costs or expenses due to the use of any of its Products. Likewise, Fundació CIM refuses any indirect, incidental, collateral damage by the use of its Products.

Conformity

The CIM Private Foundation Centre declares that the BCN3D Sigma printer complies with the essential requirements and any other applicable or mandatory provisions of the Directives.

It complies with the essential requirements of the European Directives:



2006/42/EEC Machinery Directive

2006/95/EEC Low Voltage Directive

2004/108/EEC Electromagnetic Compatibility Directive (EMC)

2011/65/EU Restrictions on the use of hazardous substances in electrical and electronic equipment (RoHS)

The BCN3D Sigma printer has been manufactured in compliance with the following harmonised standards, and consequently conforms to the essential requirements established by the Directives:

2006/42/EEC UNE-EN ISO 12100:2012; UNE-EN ISO13732-1 :2008; EN ISO 7010:2012

2006/95/EEC UNE-EN 60204-1; UNE-EN 60947-3:2009

2004/108/EEC UNE-EN 55022:2011; UNE-EN 55024:2011; UNE-EN 61000-4-3-2:2007

Changes / modifications not approved by the responsible party could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

REI-RAEE: 6107



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Llorens i Artigas, 12 08028 Barcelona.

Tel: +34 934017171

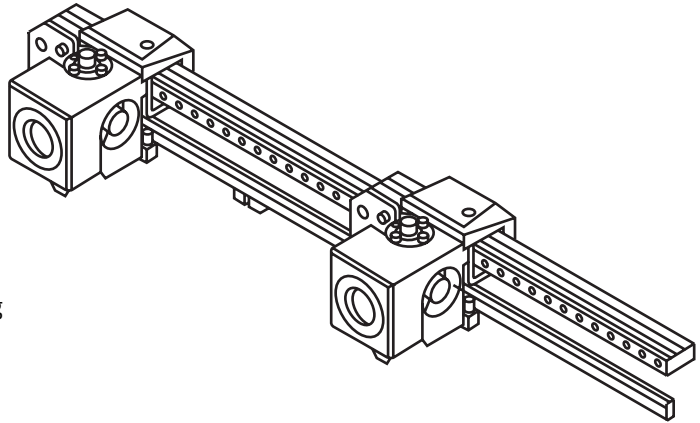
www.fundaciocim.org

Specifications

Technology	Independent dual extruder (IDEX)
Manufacturing technology	Fused filament fabrication (FFF)
General dimensions	465 mm x 440 mm x 680 mm (fully assembled)
Weight	15 kg (without filament spools)
Printing volume	210 x 297 x 210 mm
Number of extruders	2
Nozzle diameter (mm)	0.3 / 0.4 standard / 0.5 Special / 0.6 / 0.8 / 1mm
Layer height	0.05-0.5 mm (depending on the nozzle diameter)
Positioning resolution	Axis X: 0.0125 mm Axis Y: 0.0125 mm Axis Z: 0.001 mm
Operating temperature	15° C -35° C
Maximum extruder temperature	290° C
Max. temperature of heated bed	100° C
Filament diameter (mm)	2.85 ± 0.05
Compatible material	PLA / ABS / Nylon / PET-G / TPU / PVA / Composites / Others
Electronics	BCN3D Electronics v1.0
Connectivity	SD card (autonomous operation), USB
Firmware:	BCN3D Sigma - Marlin
Operating sound (dBA)	50
Compatible files	gcode
Software preparation files	BCN3D Cura, Slic3r, Simplify3D,...
Power supply	AC 84–240 V, AC 3.6-1.3A, 50–60 Hz
Electrical energy consumption	240W

IDEX / FFF technology

The BCN3D Sigma is a 3D printer which uses fused filament fabrication (FFF) technology, which manufactures objects by depositing molten material in a series of layers. Objects are created using a digital model of the object, which is sliced into thin layers. When printing the extruder print head moves along the axis to deposit the material for one layer at a time, before moving slightly upwards to begin printing a new layer. This process is repeated until the object has been completed.



Since FFF technology requires deposit material on top of plastic previously extruded, certain complex geometries with overhangs require additional support structures to be successfully printed. However, printing supports with the same material of the model can result in many post-processing problems.

The Independent Dual Extruder System (IDEX) is BCN3D's unique approach to avoid this issue and also offers a bunch of new key features. The two extruders are controlled independently, so that when one extruder is not being used it can be kept away from the printing area to prevent the plastic from oozing onto the object and spoiling the final result.

Having two independent extruders offer the user the ability to print, not only with soluble supports, but also multi-material objects, print in two different colors or even combine different nozzle sizes to get more resistant parts or cut down the printing process.

Safety

To avoid potential residual risks the user should read and understand the following safety measures (you are strongly advised to read this before using the machine).

To highlight the areas where extra care should be taken, safety alert stickers have been affixed to the relevant parts of the machine to warn the user of potential hazards.

Any modifications made to the machine without the manufacturer's approval will invalidate the product's Declaration of Conformity (CE) and warranty.

Consequently, the Fundació CIM and BCN3D Technologies ARE EXEMPT FROM ANY LIABILITY IF THE USER DOES NOT FOLLOW THE INSTRUCTIONS FOR USE:



Very important. As with any other appliance, do not touch the terminals of the mains, the switch, or the power supply. There is a risk of electrocution. The other cables of the machine operate at 24V and there is no risk whatsoever.

Connect the machine to an electrical outlet according to the current legislation.

Do not connect or disconnect any device and/or electrical connector when the machine is connected to the power supply.

Keep all of your body and all objects away from the moving parts of the machine when they are moving.

Do not touch the hot parts (heated bed and hot-ends) when the machine is switched on, and wait 15 minutes after it has been switched off before touching them.

Handle the glass printing surface with care. Make sure it is not dropped or hit with anything as this could seriously damage it.

The printing materials are not innocuous and emit toxic fumes. Always print in open or well-ventilated spaces and use a protective mask.

Do not breathe closer than 25 cm from the extruder head when printing.

Supervise the printer while it is printing to make sure it is working properly.

In the event of emergency, stop the machine immediately by pressing the ON button, and disconnect the power supply.

This device is not a toy. It should only be used by minors under 16 under the supervision of an adult.

The spatula is a dangerous tool that can cause injuries. Use it only to remove plastic rests when running the calibration assistant.

Safety signage

The following stickers have been affixed to the printer to warn users about the hazardous areas of the machine, and actions which are not recommended as they will stop the machine from working properly.

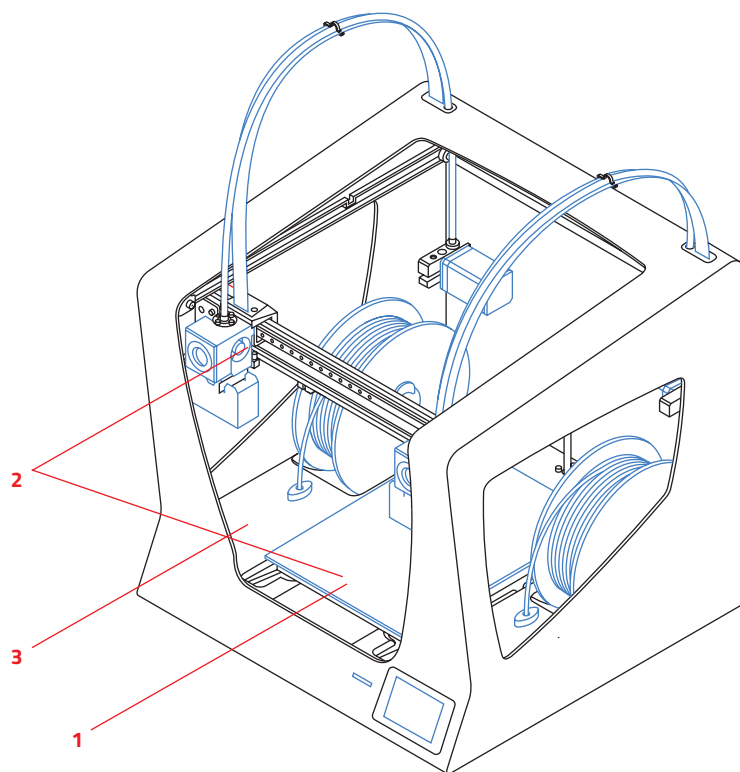
1 Pictogram: Danger. Hot surface.



2 Pictogram: Danger. Will cause burns.



3 Pictogram: Risk of trapped hand/ finger.

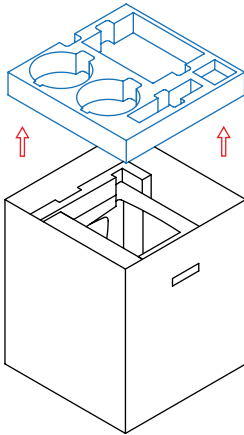


Setting up your printer

Unpacking

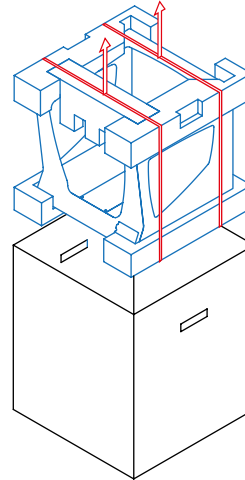
The BCN3D Sigma is delivered in a well-secured cardboard box which measures 550 x 660 x 570mm. We recommend you to follow the steps below in order to unpack your 3D printer correctly:

1.



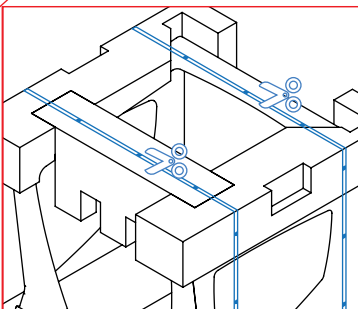
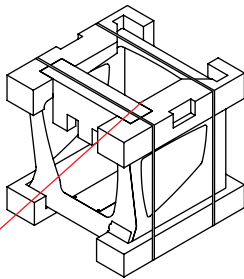
We recommend you to keep the cardboard box to transport or store the printer.

2.

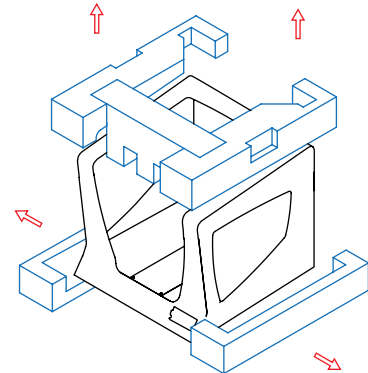


Take out the printer using the strap

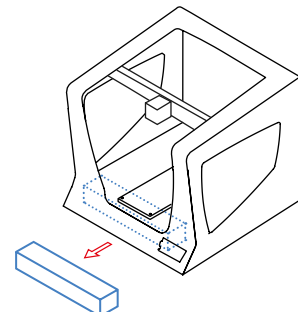
3.



4.

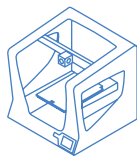


5.

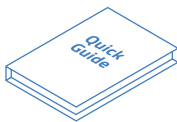


Contents

BCN3D Sigma



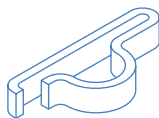
Quick start Guide



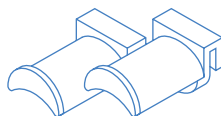
2 Teflon tubes



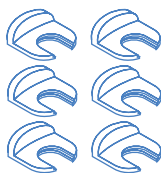
4 Flat cable clips



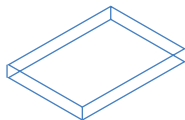
2 Spool holders



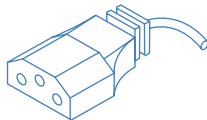
6 Clips



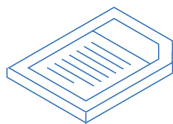
Glass



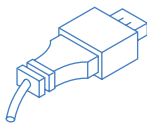
Power Cable



SD card



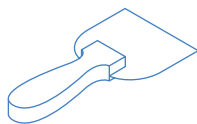
USB cable



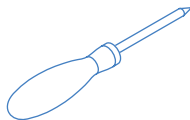
2 PLA spools



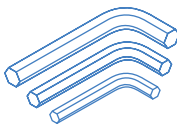
Spatula



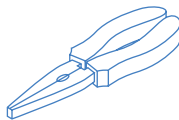
Cross-head screwdriver



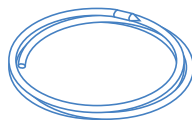
3 Hex keys



Pliers



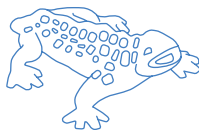
Nylon filament



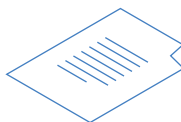
Glue Stick



Sample print



Warranty



Stickers



Set up

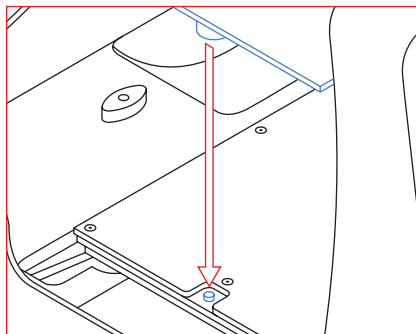
In order to ensure the safe packaging and transport of your printer some of the components have been sent unassembled. Before starting to print with the BCN3D Sigma printer you need to assemble them in order to complete the setting up process.

If you have any queries while assembling the machine, please contact BCN3D Technologies' technical services.

Follow the steps below to prepare the printer:

1.

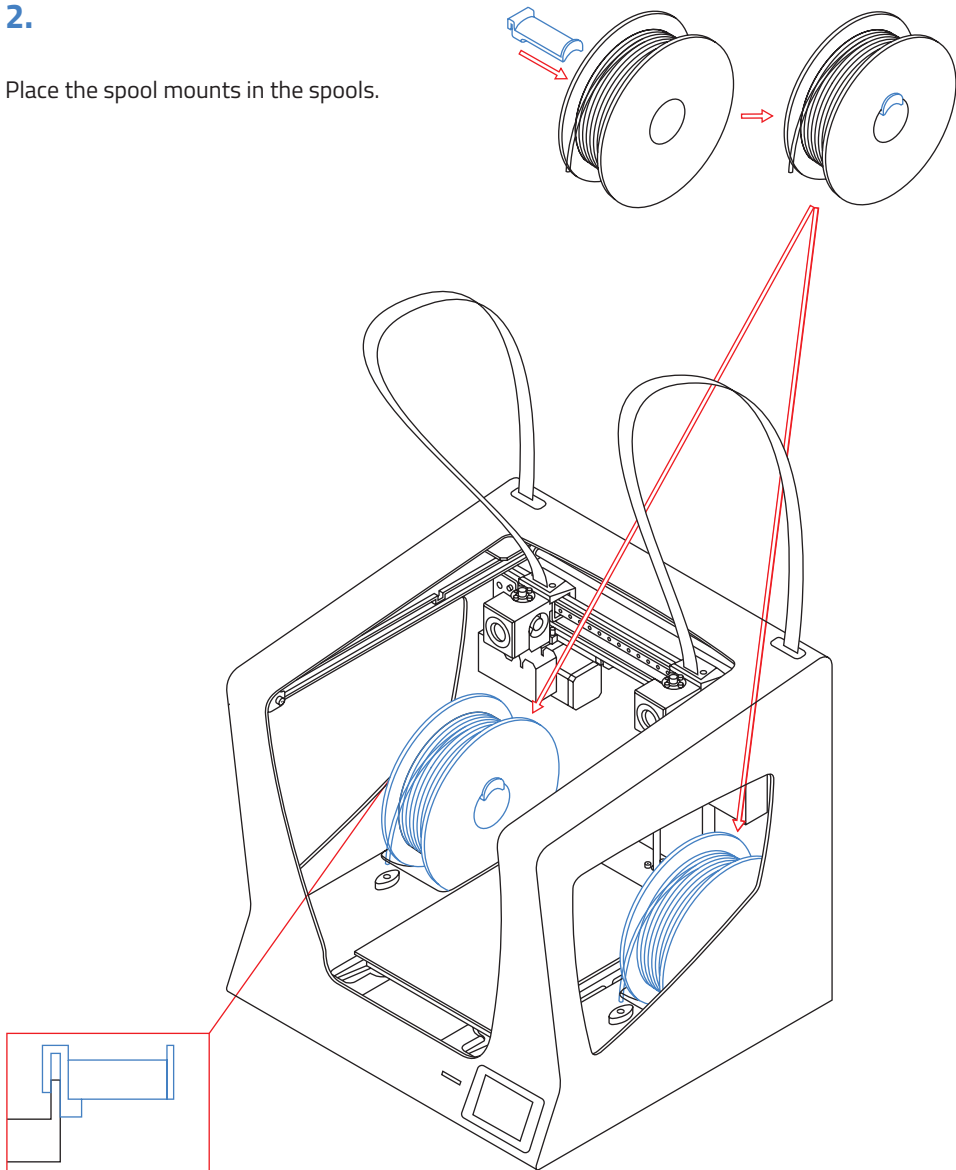
Place the glass on the platform, making sure the magnets fit in the slots.



Set up

2.

Place the spool mounts in the spools.



3.

Slot the spools with the mounts into the appropriate spaces.

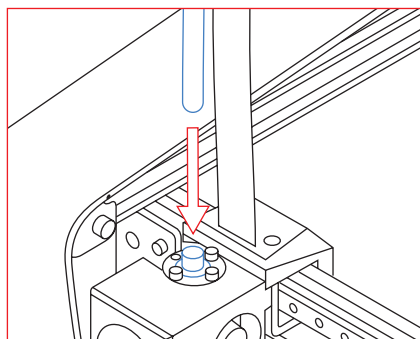
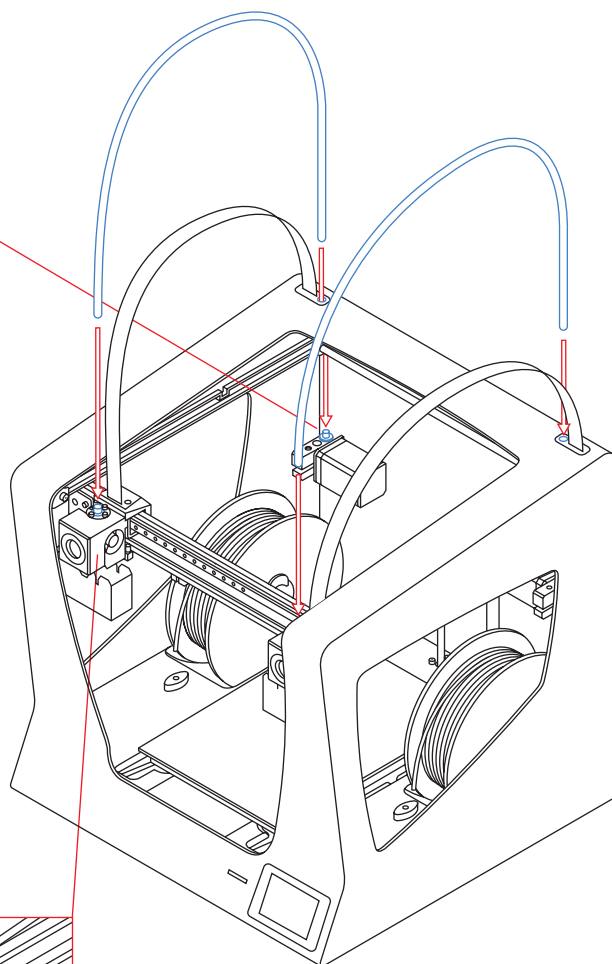
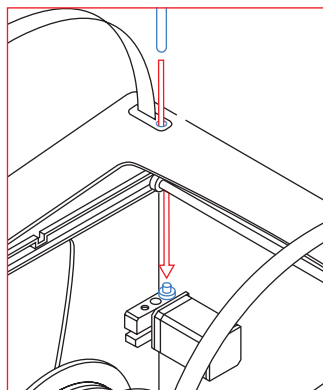
Set up

4.

Move Y axis manually towards the front in order to work more comfortably.

5.

Insert the teflon tube until it stops.



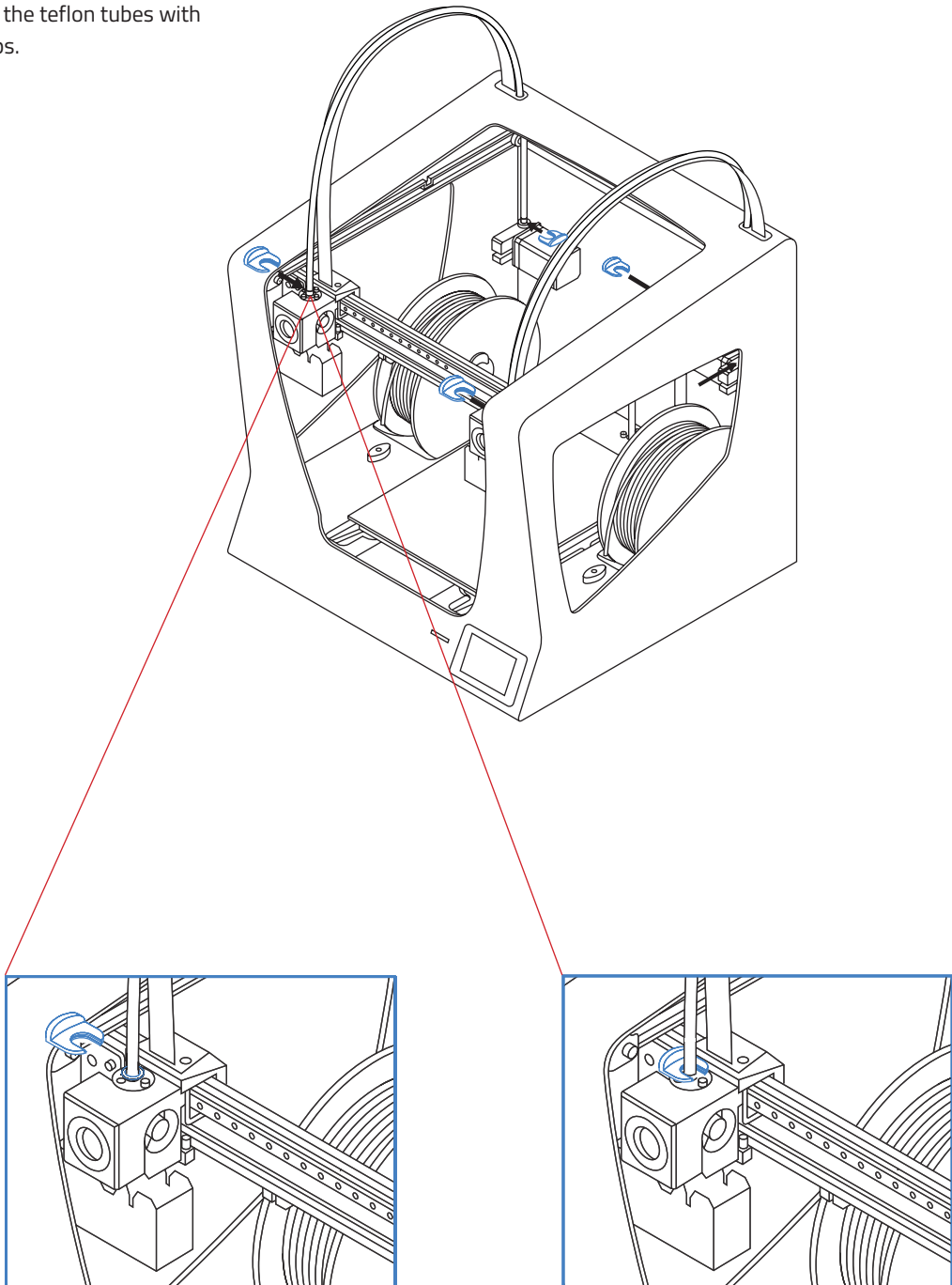
6.

Insert the opposite end of the teflon tube into the hotend's hole.

Set up

7.

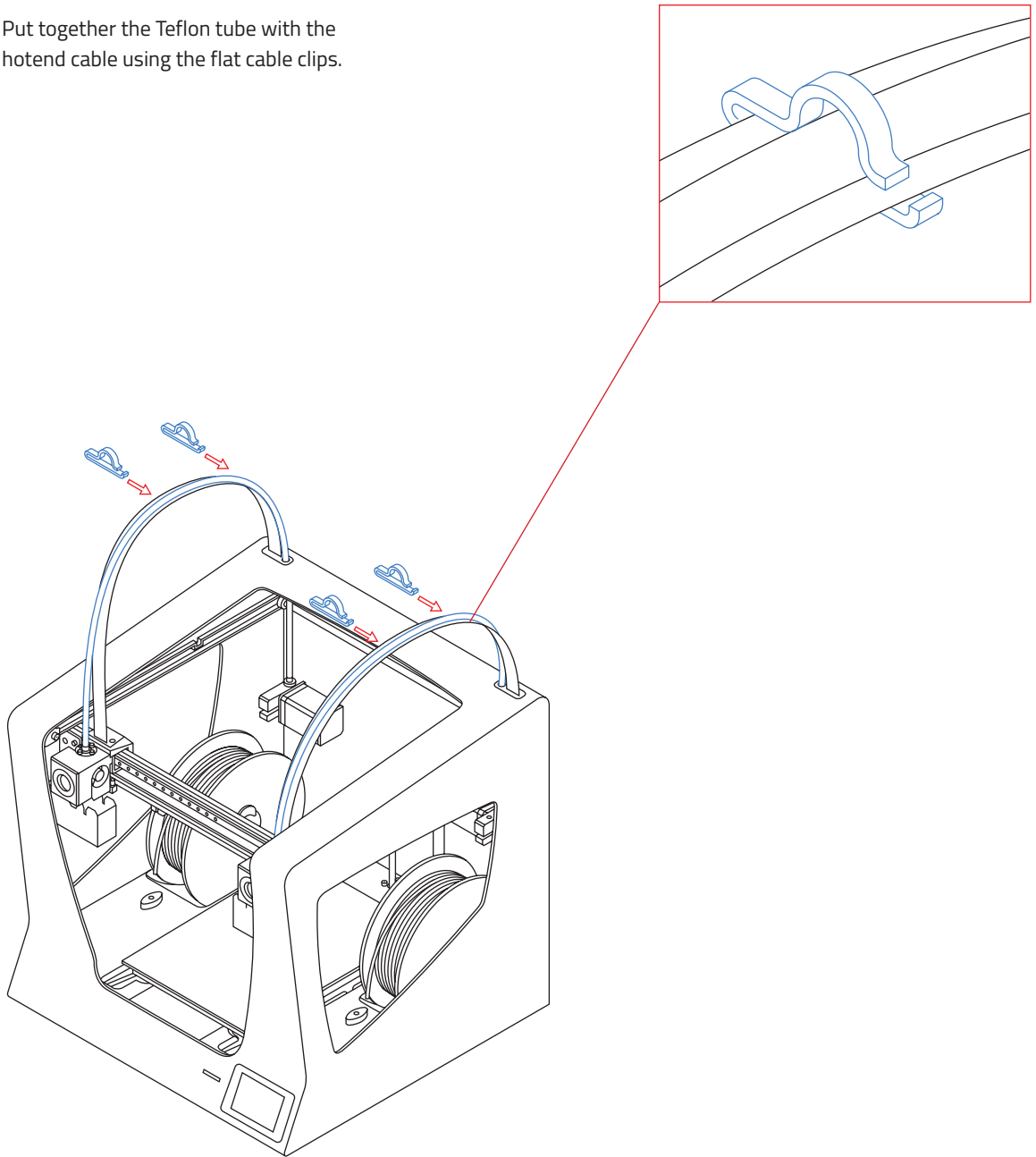
Attach the teflon tubes with the clips.



Set up

8.

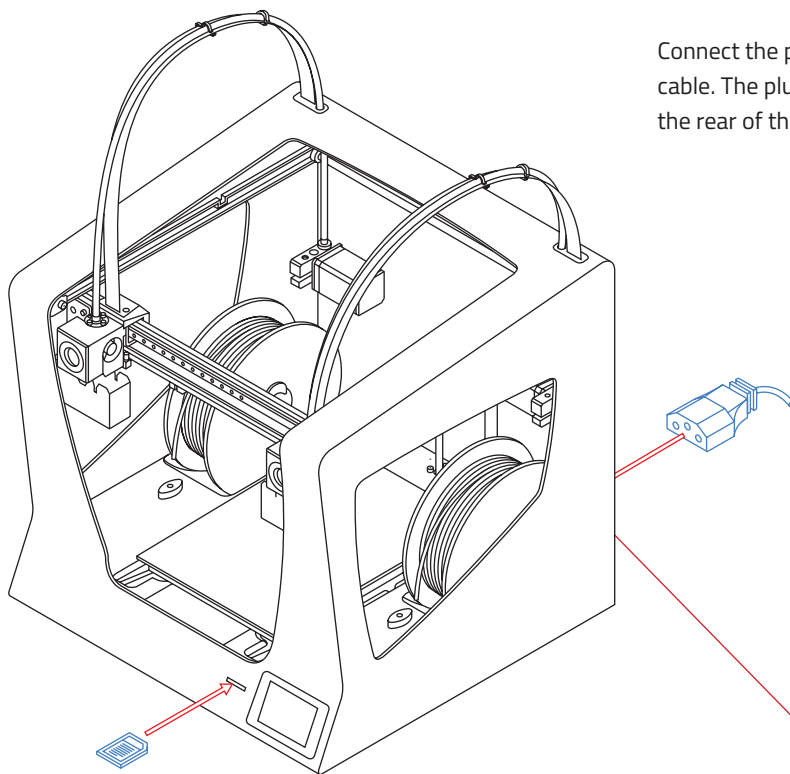
Put together the Teflon tube with the hotend cable using the flat cable clips.



Set up

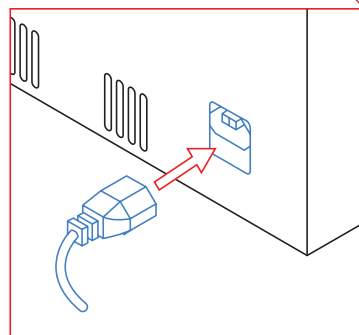
9.

Connect the power supply cable. The plug is located at the rear of the machine.



10.

Insert the SD card into the reader.



Getting started

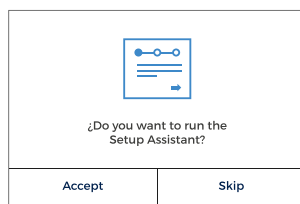
Setup Assistant

1. Welcome



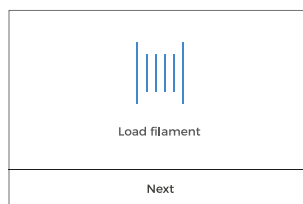
2. Setup Assistant

Press *Accept*.



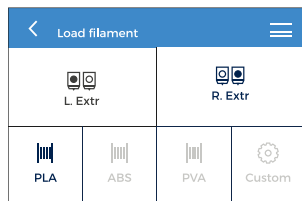
3. Load filament

Press *Next*.



4. Select material

Choose PLA.



5. Follow screen's instructions.

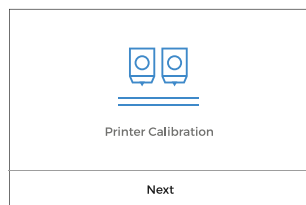
Warning: Extruders will be heated up. This process could take 1 or 2 minutes.



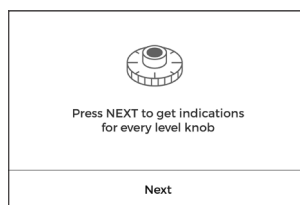
6. Repeat all the process with the other extruder.

7. Printer calibration

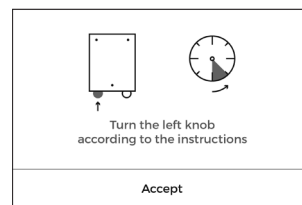
Press *Next*.



8. Printing surface calibration.



9. Turn calibration screw as indicated by the display.



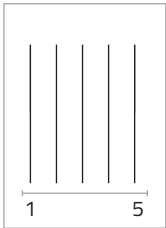
You can see Switching On Your Printer For The First Time Section on our youtube channel:
<https://www.youtube.com/playlist?list=PL8iOVmTsyvGRYhiB4ykxxzcl1gnakOReg>

Setup Assistant

10. Z Axis calibration

Follow the instructions of the calibration sheet. You can find this sheet separately within the Quick Start Guide Manual or in the SD card.

11. The printer will print a test to validate the previous process.

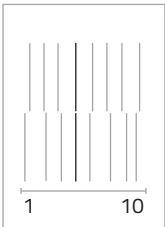


12. Look for the transparent line. Then count 2 to the right. Redo if necessary.

Z Axis Calibrate R. Extr				
1	2	3	4	5
Select which line looks more like the good one. If none is good, press REDO				
Redo				

13. X Axis calibration

The printer will print vertical lines.

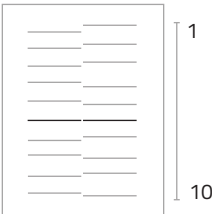


14. Choose best aligned couple of lines.

X Axis				
1	2	3	4	5
6	7	8	9	10
Choose the best aligned pair of lines. Press REDO if none fits				
Redo				

15. Y Axis calibration

The printer will print horizontal lines.



16. Choose best aligned couple of lines.

Y Axis				
1	2	3	4	5
6	7	8	9	10
Choose the best aligned pair of lines. Press REDO if none fits				
REDO				

Congratulations! Your printer has been calibrated and it is ready to print.

First print

After the calibration process has been completed, you can access the printing menu. The first object you will print with the BCN3D Sigma is the Draudi figure, as it will allow you to check that everything is working properly and you are now ready to start printing your own objects. Make sure that the glass is clean, and apply a small amount of the included adhesive substance to get the best results.

Starting out with BCN3D Cura

Even though the BCN3D printers are compatible with all the different Gcode generator softwares, we recommend the usage of the Cura version that has been developed by BCN3D.

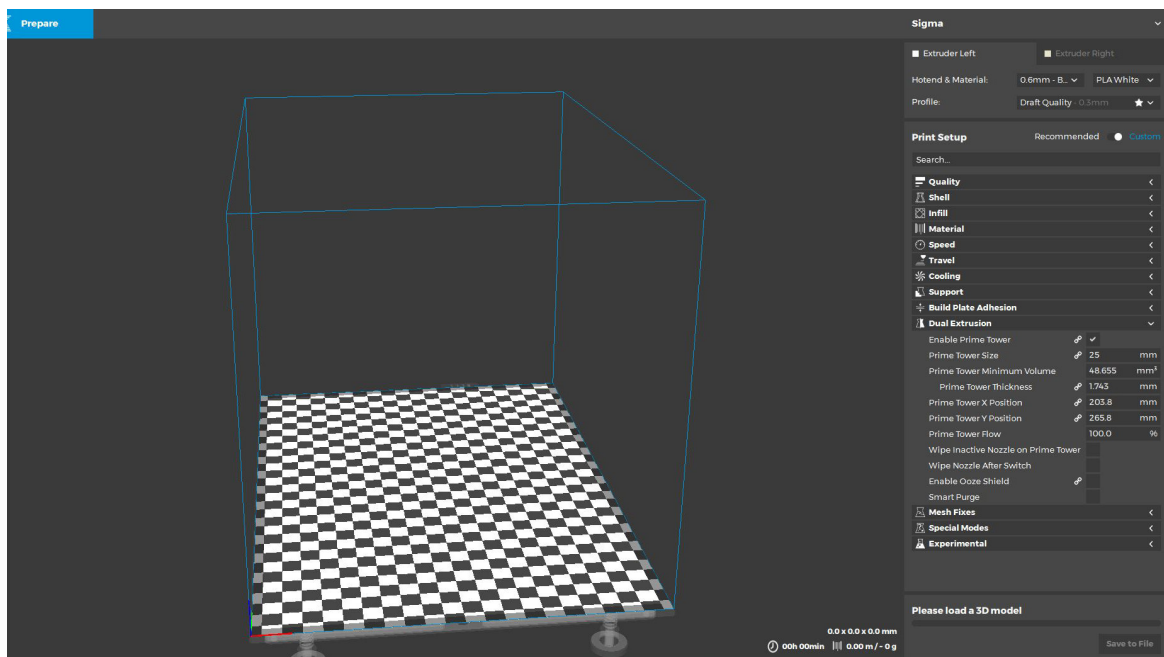
Cura is an open source software that adapts exceptionally well to the new IDEX (independent dual extruder) functionality. Just as other Gcode generator softwares, Cura sections the 3D model in layers and establish a difference between the perimeter and the infill of the object.

In order to provide a better printing experience, the version developed by BCN3D contains a number of changes both in the interface and in Cura functionalities. Thus the software has been adapted to our product configurations.

Visit <https://www.bcn3dtechnologies.com/en/3d-printer/bcn3d-cura/> and download the suitable version of BCN3D Cura for your Operative System. Once downloaded, follow the installation wizard.

Your first dual print

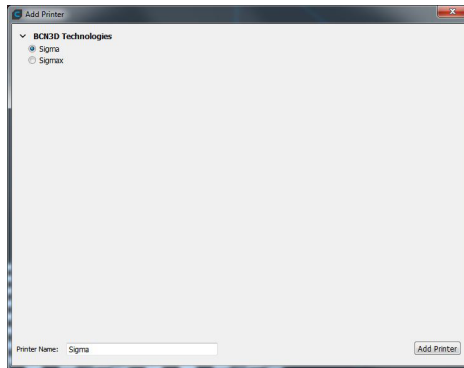
1. Open BCN3D Cura that previously downloaded and installed.



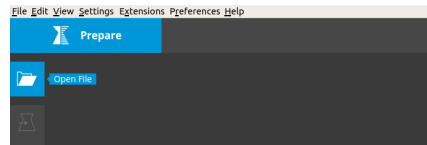
Your first dual print

2. Select BCN3D Sigma in the main menu

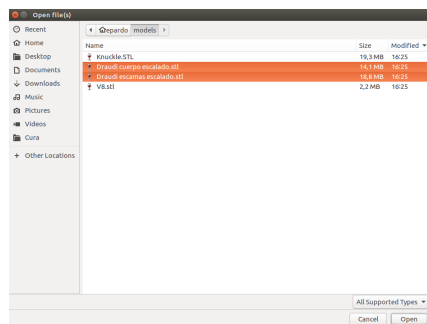
Select your machine.



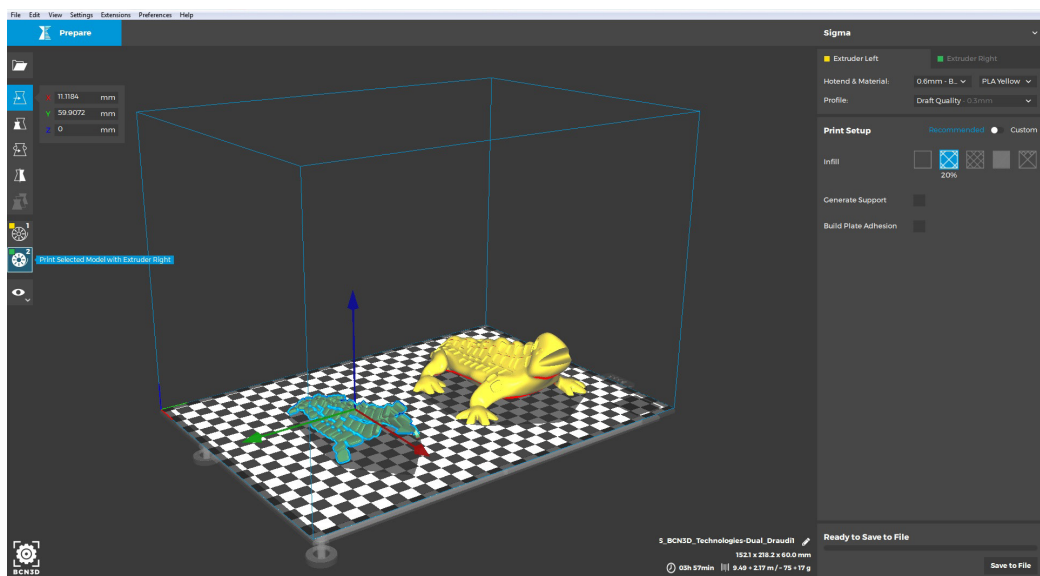
3. Click *Open File*.



4. Select files to print.

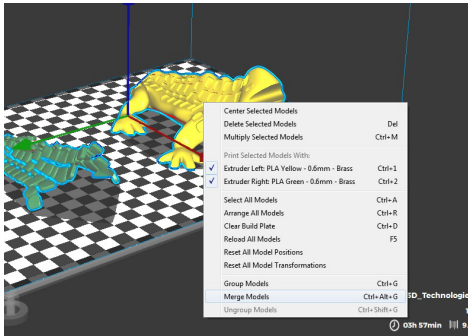


5. Assign the extruder to print with for each model.

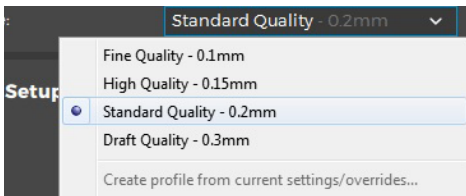


Your first dual print

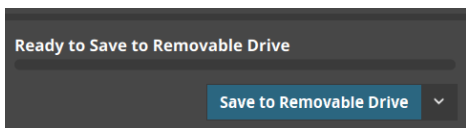
6. Select the models by Shift+Left Click. Selected models will be highlighted with a blue outline. Right click on any of the selected models, and select "Merge Models" .



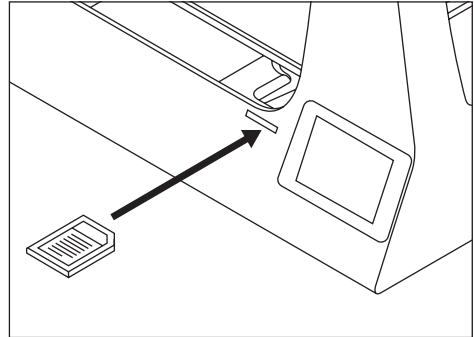
7. Select profile. The printing file generation will start automatically.



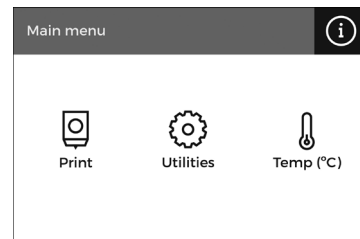
8. Insert the SD card in your computer and save the file.



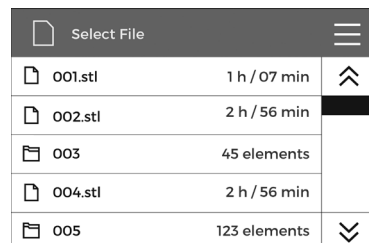
9. Safely remove the SD card from the computer and insert it in the printer. After that, turn it on.



10. Select Print in the main menu of Sigma display.



11. Select the file to print.

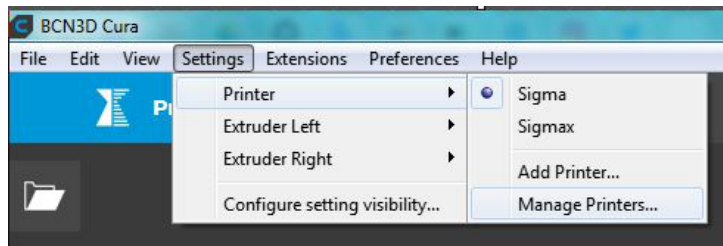


¡Congratulations! You have started printing your first 3D part with the BCN3D Sigma.

Firmware upgrade

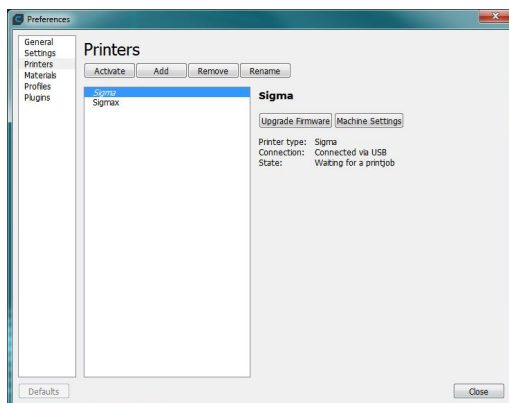
At BCN3D Technologies we want you to have a great printing experience, and to achieve this we are continually working to create new firmware upgrades for our printers. Follow this process through BCN3D Cura for checking if the latest firmware version is installed on your printer. If not, it will get the latest firmware and it will be installed.

1. Use the USB cable to connect the Sigma to the computer.
2. Open BCN3D Cura. Go to Settings > Printer > Manage Printers



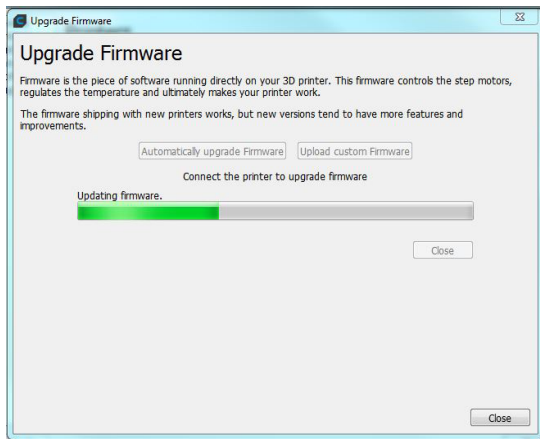
3. Select Upgrade Firmware.

4. Click "Automatically upgrade Firmware" to download and install the latest version available.

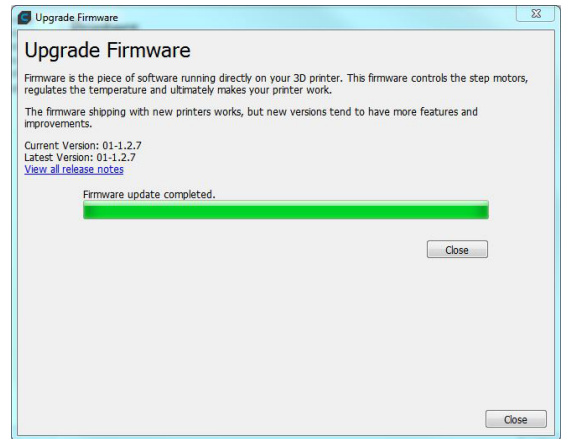


Firmware upgrade

5. Wait until the firmware is installed. The process may take a few minutes to complete.



6. Once the process is completed, close the window.



¡Congratulations! You have upgraded the firmware of your BCN3D Sigma.

Functionalities

This section contains a description of BCN3D Sigma functionalities. The main menu is divided into two large groups: printing and utilities. The first covers all the standard printing functions, while the second includes functions such as calibration, maintenance, settings, etc.

Printing

Located on the left-hand side of the main menu, this starts the printing process. You can control some of the parameters of the settings while the object is being printed from here.

Select object: When you access the printing function a screen appears with a list of files and folders. Use the onscreen arrows to navigate and then click on the selected file to confirm your selection.

Print: This screen displays the progress of the printing process. Press the Pause button to move the extruders away from the object and stop the printing process. When the printjob is paused it is possible to load/unload or purge filament, as well as cancel or resume the print.

The Stop button let's you whether cancel the printing process and take you back to the main menu or save the printjob.

Settings: This option allows you to modify the printing speed and temperatures. When you select the element that you want to adjust, the objective temperature/speed value appears, and you can adjust them by using the arrows. The Back button in the top left-hand corner will take you back to the printing screen.

Utilities

Situated at the center of the main menu, allows you to operate and maintain your printer.

Filament: this menu allows you to manage the filaments of the printer. The menu functions are:

–Load: This is for loading filament into one of the extruders. You should first select the side where you want to load the filament. Next, you should insert the filament into the extruder following the onscreen instructions (the extruder should first reach the right temperature, which may take a few minutes). Once you have inserted the filament the extruder can be adjusted slightly to allow you to load the rest of the filament. When purging we recommend you pull out a generous amount of filament to ensure the extruder is purged correctly.

PLA, ABS and PVA presets are offered, but it's possible to load different materials. Just select "Custom" and set the 4 temperatures demanded. The "Load Temperature" is recommended to be 10°C higher than the Printing Temperature. The "Unload Temperature" is recommended to be 30°C below the Printing Temperature. Follow the manufacturer indications to set the "Printing Temperature" and the "Bed Temperature".

–Unload: This operation is the opposite of the operation described above, although it is performed in a similar way. After you have selected which side you want to remove the filament from, wait until the hot-end has reached the right temperature and then remove the filament.

–Purge: This menu allows you to control the temperature of the two hot-ends, and extract or dislodge clogged filament. In order to be able to move the filament, the temperature difference between the objective temperature (under the thermometer) and the actual temperature (under the extruder icon) should be less than 10° C.

Functionalities

Calibrate: This menu allows you to calibrate the BCN3D Sigma printer's surface and extruders. This process should be performed when components are replaced, and during standard printer maintenance (described in this manual).

–**Bed calibration:** This option allows you to level the printing surface. The process is performed by an on-screen self-test run by the printer, followed by instructions to correct the position. The screen displays how many turns (in eighths of a turn) each of the levelling screws should be turned, and in which direction.

–**Full Calibration:** This option allows you to perform a full calibration, where the heated bed and the relative positions of the extruders are calibrated. You will be guided by onscreen instructions, and the aim is to select the best of the different test prints performed by the printer.

–**Manual Fine Calibration:** This option lets you to manually modify the calibration values found in the Full Calibration process. On the left menu, select the axis to adjust and press the arrows to correct the calibration value.

Maintenance

–**Move Z Axis:** This option lets you to move the platform up and down.

–**Nylon Cleaning:** Perform this operation to clean the hotend. Just follow the instructions of the screen. This operation is recommended when you notice any sign of underextrusion, when switching materials and after printing with soluble or special materials.

–**Autotune hotends:** Select this operation every time you change the hotend. The internal routine will check the thermal behaviour of the hotends installed and will allow the printer to have a better temperature control.

Temperature

Placed on the right-hand side of the main menu, lets you to preheat or cooldown the hotends and the heated bed. The preheat temperatures will be set depending on the filaments loaded.

Filament

The BCN3D Sigma printer gives the best printing results when printing with BCN3D Filaments, although it accepts many other materials from other manufacturers.

BCN3D Filaments are industrial-grade materials designed to deliver outstanding results for BCN3D printers. BCN3D Filaments, formulated to ensure the highest print quality, are common polymers in several industries and cover the majority of the technical applications. Those filaments are: PLA, ABS, Nylon, PET-G, PVA, TPU and Composites. Visit our dedicated website for detailed information about each one. Furthermore, you will find the Technical and Safety Datasheets of all of them.

<https://www.bcn3dtechnologies.com/en/3d-printer/filaments/>

A brief description of those materials is given below:

PLA

PLA (Polylactic Acid) is a biodegradable, sustainable and food safe polymer made from organic sources.

It is the most common used filament in FFF 3D printers for its ease of use and wide range of applications, specially those not mechanically or thermally demanding. Definitely a good starting point to learn about the 3D Printing manufacturing process.

It comes in a wide range of colours, and will allow you to print complex shapes easily. The finish is slightly glossy or semi-matte. When printing the operating temperature oscillates from between 205° C and 220° C.

Printing overhangs is easier if the layer fan is used.

It has average mechanical properties, although it becomes slightly brittle when printing irregularly-shaped objects. At operating temperatures of 50° C or more, the mechanical properties and rigidity of the objects may decrease.

ABS

ABS (Acrylonitrile Butadiene Styrene) is one of the most common technical materials in several industries around the globe. Its great mechanical and thermal behavior make ABS the ideal polymer for countless applications.

Traditionally a challenging material to print with FFF printers, it has been re-formulated to ensure good interlayer adhesion and to reduce warping. Printing with ABS is more complex, and requires a certain amount of care: it is not recommended for non-experienced users.

ABS is printed at temperatures of between 240°C and 260°C. Its base does not adhere to the surface as well as those of PLA objects, as it contracts when cooling down, which means it usually requires an adhesive lacquer even when the temperature of the printing surface is 90°C.

It has higher mechanical properties than PLA and is more stable at high temperatures. If the object has a very large base, the adhesion problems become worse, in particular with the edges of the object.

Filament

PVA

PVA (Polyvinyl alcohol) is a water-soluble polymer, ideal to work as support material for multi-material 3D Printing.

Optimized for the FFF manufacturing process, our PVA works seamlessly with PLA, TPU, PET-G and Nylon, becoming a reliable universal support material to print complex geometries, large overhangs or intricate cavities.

PVA supports allow to achieve better surface quality, to orientate the part to get better mechanical properties and even to print multi-component models and mechanisms.

PET-G

PET-G (Polyethylene terephthalate glycol-modified) is a globally used co-polyester, from plastic water bottles to cloth fibers and it is 100% recyclable.

As a technical material, PET-G provides good mechanical properties and improved chemical and thermal behaviors than PLA but with similar ease of use.

It has an outstanding chemical resistance, a great dimensional stability and toughness and a good glossy surface quality. PET-G also offers a good abrasion resistance, a high humidity resistance and it withstand operating temperatures up to 70°C. It is compatible with PVA supports.

Nylon

Nylon (polyamide) is an extensively used material for its unique mechanical and chemical properties.

Thanks to characteristics like durability, flexibility and resistance to corrosion, Nylon is ideal for multiple applications in the 3D printing field, like end-use parts or custom jigs and fixtures. It is compatible with PVA supports.

TPU

Nylon (polyamide) is an extensively used material for its unique mechanical and chemical properties.

Thanks to characteristics like durability, flexibility and resistance to corrosion, Nylon is ideal for multiple applications in the 3D printing field, like end-use parts or custom jigs and fixtures. It is compatible with PVA supports.

Composites

Composites are materials with a polymeric base infused with other particles or fibers in different proportion.

From wood to metal particles to achieve an aesthetic and attractive finish to carbon fibers to combine lightness and mechanical performance, composite materials for FFF printers unleash creativity.

Filament

General considerations

To ensure good adhesion between the printing surface and the 3D printed part, you will need to use an adhesive product that will be applied to the printing surface before start printing. For general materials, we recommend using the glue stick included with the printer or a generic lacquer. However, for technical materials such as ABS or PET-G, we recommend Dimafix lacquer.

We recommend using an enclosure when printing with technical materials such as ABS, Nylon or PET-G. It provides a constant interior temperature to prevent warping and protects your working environment from potentially harmful particles thanks to the HEPA filter. More information: <https://www.bcn3dtechnologies.com/en/3d-printer/bcn3d-sigma-max-enclosure-hepa-filter/>

Nylon and PVA plastic are hygroscopic, that means it readily absorbs water from the air. Make sure they are dry before printing. There are two ways to dry them. Place them in an oven or in a dehydrator at 50 °C for 6 to 8 hours. After drying, store it in an airtight container with desiccant.

Maintenance Plan

We recommend you carry out the maintenance procedures described in the table below in order to keep your printer running optimally. The procedures are grouped depending on frequency they should be performed is shown on the right.

FREQUENCY	ACTION TO PERFORM
Daily	Keep the printer free of dust and in a dry, cool place
	Storage the spools in a dry, cool place
	Remove the filament inside the Purge Tank
	Remove the filament leftovers spread inside the printer
Weekly	Clean the Printing Surface
	Clean the nozzles
	Level the Printing Surface (also after a transportation)
Monthly	Clean fans dust
	Full calibration (also after a transportation or replacing a hotend)
	Clean X/Y linear guides using a cloth
	Clean Z bars using a cloth
	Lubricate X/Y linear guides using sewing machine oil
	Grease Z leadscrew using industrial multipurpose grease.
Quarterly	Check firmware updates
	Check bolted and threaded joints
	Check tension of extruder springs
	Check X/Y belt tension
	Check connections of moving cables

BCN3D Technologies

Technical Assistance Services

If you do not find a solution to your problem in this manual, please contact the BCN3D Technologies team through any of the following channels:

Forum

We recommend that you visit our forum before taking any other action. It is very likely that another user has had the same problem as you, and the forum is where most of them are solved.

www.bcn3dtechnologies.com/es/forum

You can find all of this information in the Contact Section of our website:

www.bcn3dtechnologies.com/es/contact

Be sure to include the serial number of your computer whenever you send us a query to help us provide the best possible services.

Technical Assistance

You can contact the technical assistance services by email, and we will answer you as quickly as possible. Please remember to include your phone number so we can contact you.

sat@bcn3dtechnologies.com

Email

If you have a question that is not related to technical assistance, please send us an email to the address below. A BCN3D Technologies expert will contact you as quickly as possible.

info@bcn3dtechnologies.com

Telephone

We have a helpline for situations that cannot be dealt with through the other channels:

(00) +34 934 137 088

Diagram of BCN3D Sigma

- 1 Teflon tube
- 2 Extruder
- 3 Hot-end cable
- 4 Spool mount
- 5 0.4mm Hot-end
- 6 Purge chamber
- 7 Printing surface
- 8 SD reader
- 9 Touchscreen
- 10 Filament input hole
- 11 Plastic Spool
- 12 Switch
- 13 Platform
- 14 Power supply socket
- 15 USB port

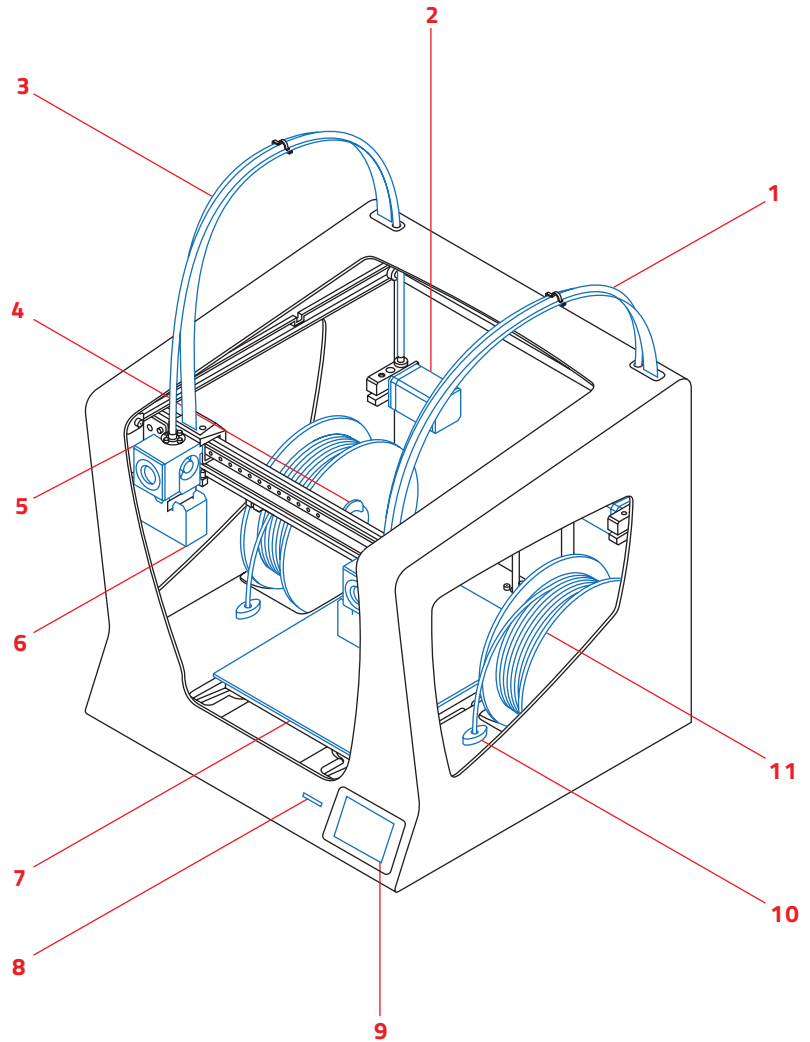
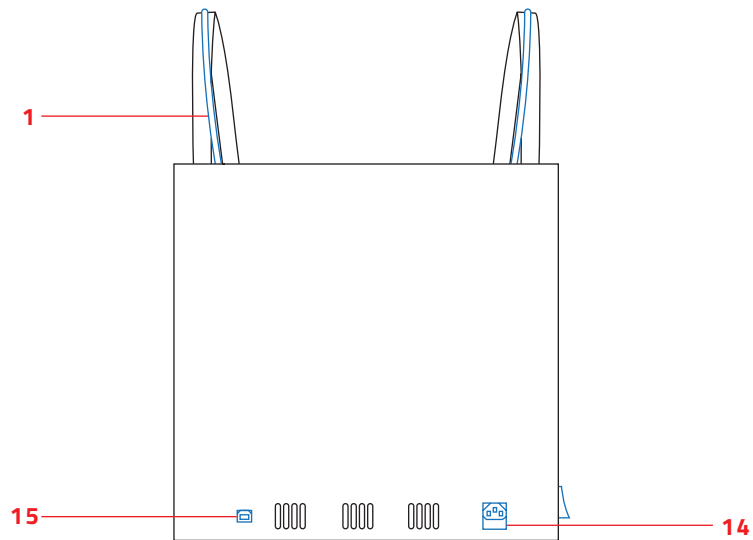
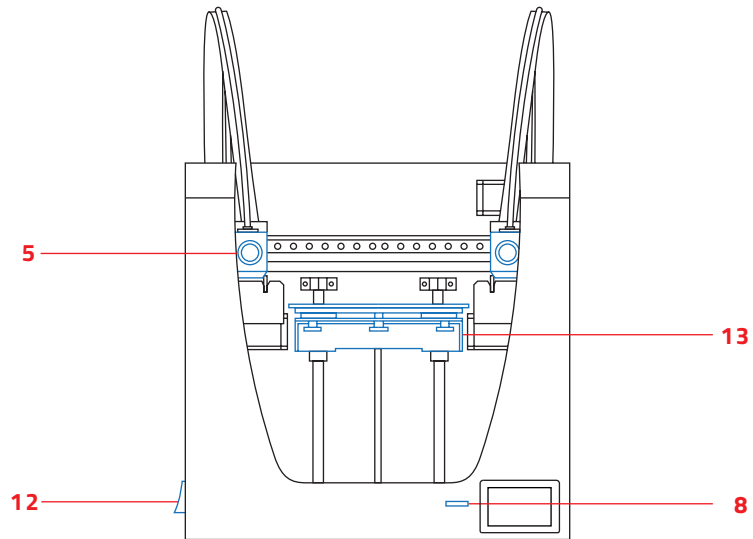


Diagram of BCN3D Sigma



Return Policy

Returns will only accepted for products that have not been used within a period of 14 business days, starting from when the printer was delivered. Once this period has expired, all sales will be considered to be final. "Not used" is understood to mean products that have never been assembled, switched on, programmed or altered in any other way.

Terms and conditions of service

The information in this manual is subject to change at any time without notice, and is provided solely for informational purposes. BCN3D Technologies reserves the right to change or modify the manual at any time at its sole discretion, and you agree to be bound by any such changes and/or modifications. If you would like to get the most up-to-date information, please contact BCN3D Technologies' technical team or visit the www.bcn3dtechnologies.com/es/forum on our website.

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Open source

Open source is a development model that promotes universal access by granting software licenses free of charge, and also universal distribution, including subsequent improvements.

We believe that adopting an open source philosophy offers many advantages:

- **More control:** We can see everything that is happening with the source code, designs etc., and modify them to suit our needs.
- **It helps us learn:** We can see and read the software designs that other people have made, which helps us to become better programmers and engineers.
- **Safety:** Since the designs are open designs, a lot more people can modify and/or correct any errors that the original programmer may have made.
- **Making improvements quickly:** The open source community provides a lot of information about how to improve the product. This helps us to fix errors and update programmes much more quickly.

Using open source licenses for the products we develop is a way of expressing our willingness to share, to collaborate with other people in a transparent way (so that others can see what we are doing and join in), to embrace failure as a means of improving, and to expect, even encourage, everyone else to do the same.

BCN3D Technologies and its products would not be where they are today without the RepRap project and its open source community. The RepRap project started out as an initiative whose objective was to develop a 3D printer which could print most of its own components and be a low-cost printer. As an open source project, all of the designs produced by the project have been released under a free software General Public License (GPL).

This project does not only include hardware, but has been conceived as a complete ecosystem of tools for printing, from the CAD/CAM software to the code read by the machine to print physical objects.

BCN3D Sigma printers use many open source tools and technologies, such as Marlin software and the Cura pre-processed software. The first controls all the printer's components, while the second converts the 3D file into G-code, a language the machine is able to understand.

Marlin firmware is published under a GPL license. This means that we must keep Marlin open, and must provide our source code to end users. For this reason we have our repository on the Github platform, where we post all the changes we make.

Cura software is published under an AGPLv3 license. This is the same as the GPLv3 general license but a paragraph has been added to Section 13 which makes it obligatory to provide source code to those who use software through a network. We therefore have repositories for each operating system so that users can access the source code.

Open Source is not only used for code, but also covers hardware. In our case all the mechanical and electronic parts are published under a GPLv3 license.

BCN3D Technologies is firmly committed to open source initiatives, and we believe that with the help of the community we will be able to make better products.

