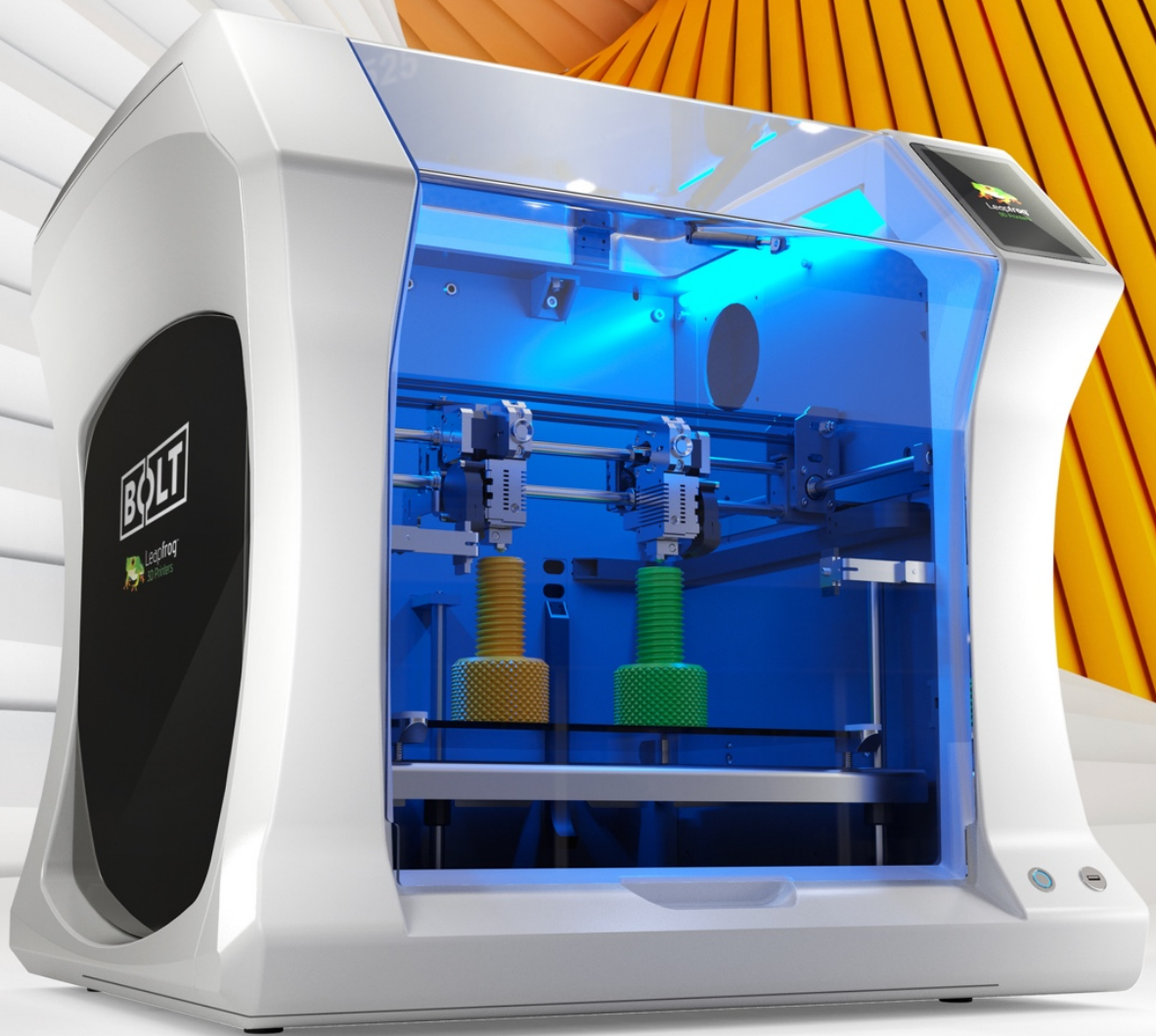


BOLT

LEAP FORWARD

Leapfrog 3D Printers

User Manual





DEAR VALUED CUSTOMER,

Thank you for purchasing the Leapfrog Bolt 3D Printer. We strive to make our machines as easy to use as possible, but printing 3D objects invites a lot of creativity. New solutions and unknown problems often require the user to stretch the limits and capabilities of their machines. This manual ensures that you will achieve the best results with your printer.

Please take the time to read through this manual as it was designed to help you get familiar with your new printer and get you on your way to creating great looking 3D models.

Keep in mind also that we have an eager and experienced Technical Support Team standing by to assist you with any questions you may have. If you are new to 3D printing, sometimes it is better to ask before trying something you are unsure of. Our Support Team works best through our ticketing system and regularly updated solution articles, both found on our website under [support](#).

We hope that you enjoy your new Bolt 3D printer, and look forward to providing assistance in any way we can.

Sincerely,

Your Leapfrog Customer Support Team

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1 USEFUL INFORMATION

We would like to provide you with some useful information to prevent any problems which may occur in the future.

1.1 PURCHASE INVOICE AND WARRANTY

We would like to kindly ask you at the beginning to make sure that you keep track of your *original purchasing invoice* that Leapfrog or one of our distributors sends after payment before the printer has been received. This invoice helps to verify the warranty of the printer, and it allows us to match it with our records to confirm authenticity of purchase. Please note that consumables are not within the standard warranty.

Without a copy of the printer's original purchase invoice, the amount of support that Leapfrog provides on technical issues may be considerably delayed and/or limited. Therefore, it is highly recommended that you maintain this document and provide it in any Technical Support Ticket that you may create in troubleshooting issues so that we can provide you with the best support possible.

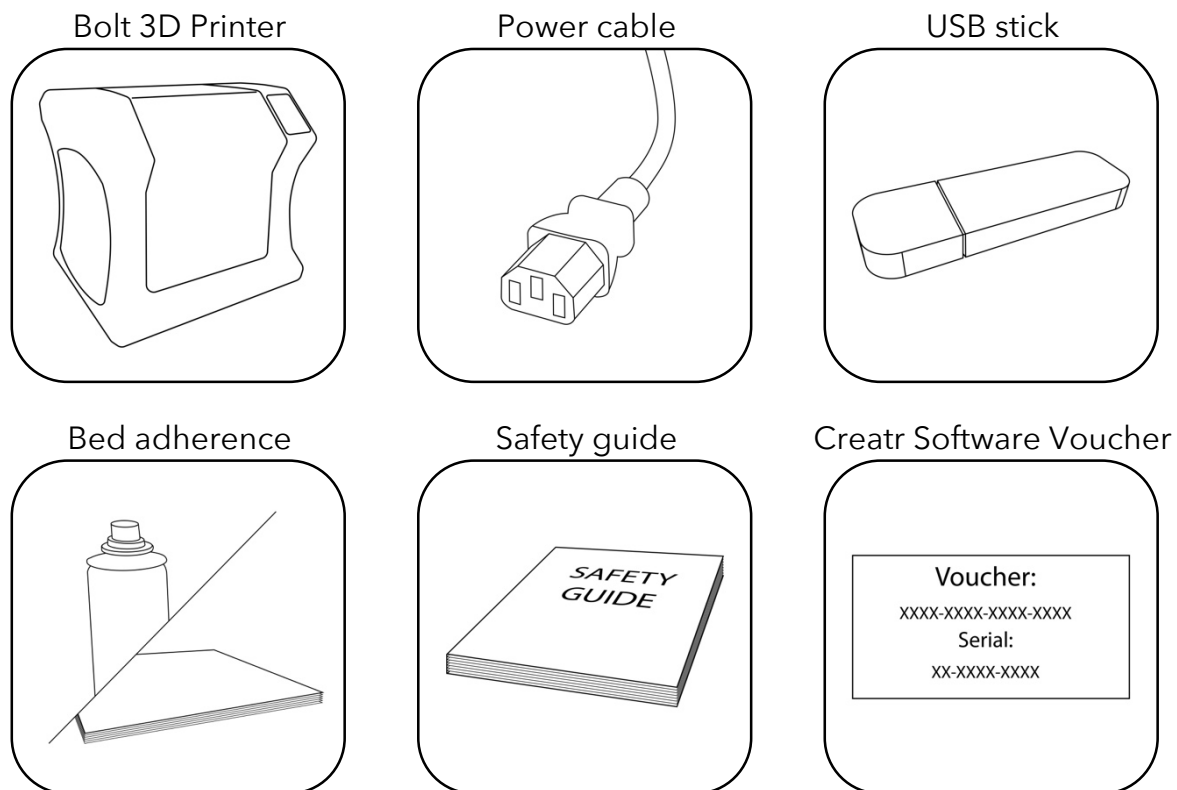
1.2 SUPPORT INFORMATION

Keep in mind also that we have a Technical Support Team standing by to assist you with any questions you may have. If you are new to 3D printing, do not hesitate to ask for any support.

Our Support Team works best through our ticketing system and regularly updated solution articles, both found on our website's *Support* tab. This will direct you to support.lpfrg.com. There are a lot of solutions already available so your solution might already be there.

If your solution is not there, then creating a support ticket is the quickest means to get help. By clicking new support ticket, you will create a personal communication channel between you and our support team. They will help resolve your problem as fast and efficient as possible.

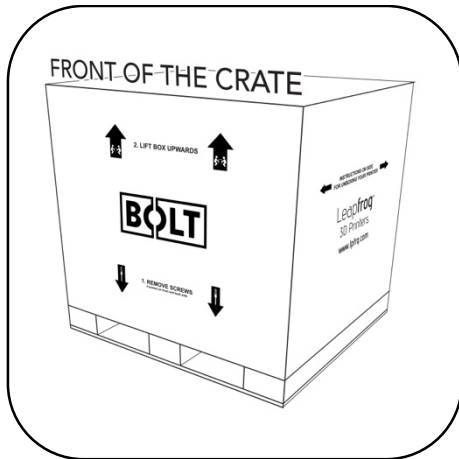
1.3 WHAT IS IN THE BOX



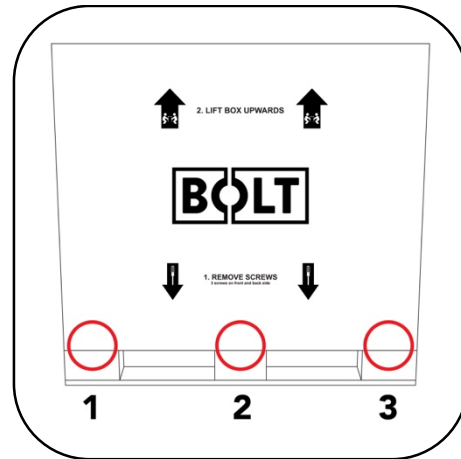
1.4 UNBOXING THE PRINTER

It is important to carefully unbox the printer according to the instructions in order not to damage the printer. Never try to lift the printer by pulling it up on the print heads, X or Y axis assemblies, or the print bed itself as this can throw off calibrations or possibly even break part of the printer.

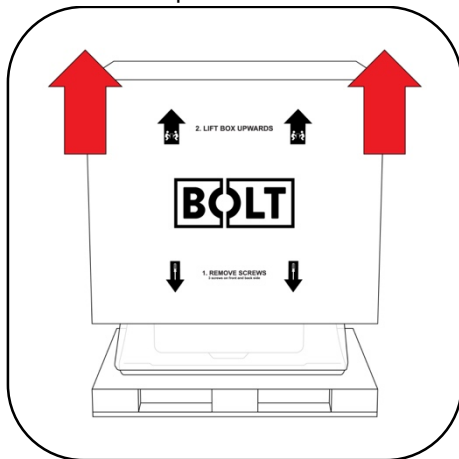
Place the box with the Box on the ground.



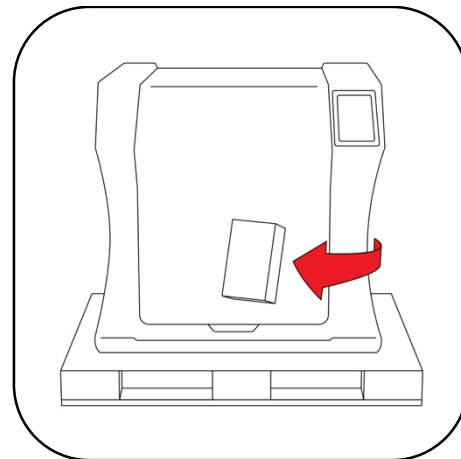
3 screws can be found at the base of the crate. Remove a total of 6 screws on the front and the back of the crate.



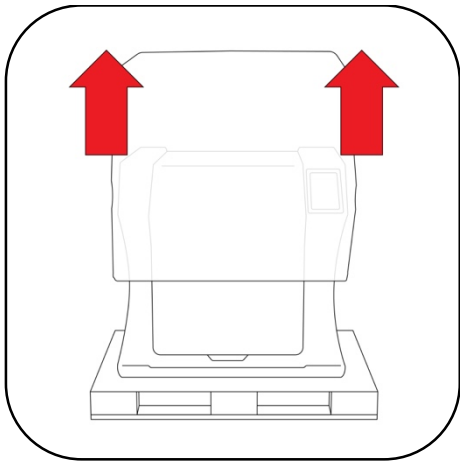
Lift the top of the box upwards with two persons.



Remove the box containing the power cable and other accessories.



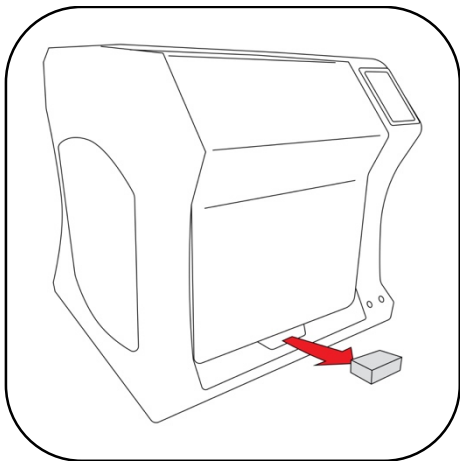
Remove the cover protection on the outside of the Bolt.



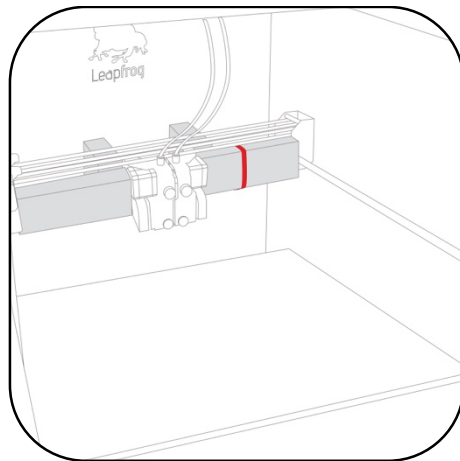
Place the Bolt securely on a table or workbench.



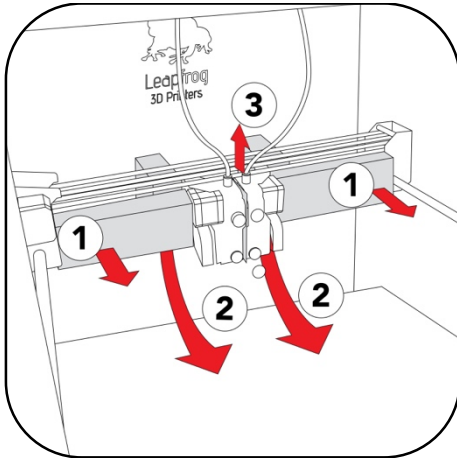
Open the door and remove the piece of foam between the Bolt and the door.



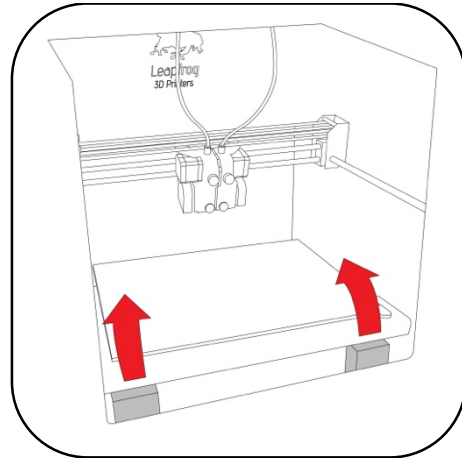
On the inside of the Bolt, cut the tie-wrap found on the right side of the Print heads.



Remove the 4 pieces of foam holding the print heads in its place. And remove the piece of protection between the two print heads.



Remove the two pieces of foam underneath the front of the bed.



Get the power cable and plug this in the back of the printer and plug the other end in a grounded (!) wall outlet.

Remove any remaining foil, protecting the exterior of the Bolt.

1.5 ELECTRIC POWER CORD COMPATIBILITY

Please check the power cord that came with the printer to see if the plug matches the electrical wall outlet that your country typically uses. The Bolt has a power supply unit that is switched-mode capable - meaning it will automatically switch between allowed voltage input between 100 volts and 230 volts. However, make sure that the correct power chord has been supplied along with your printer.

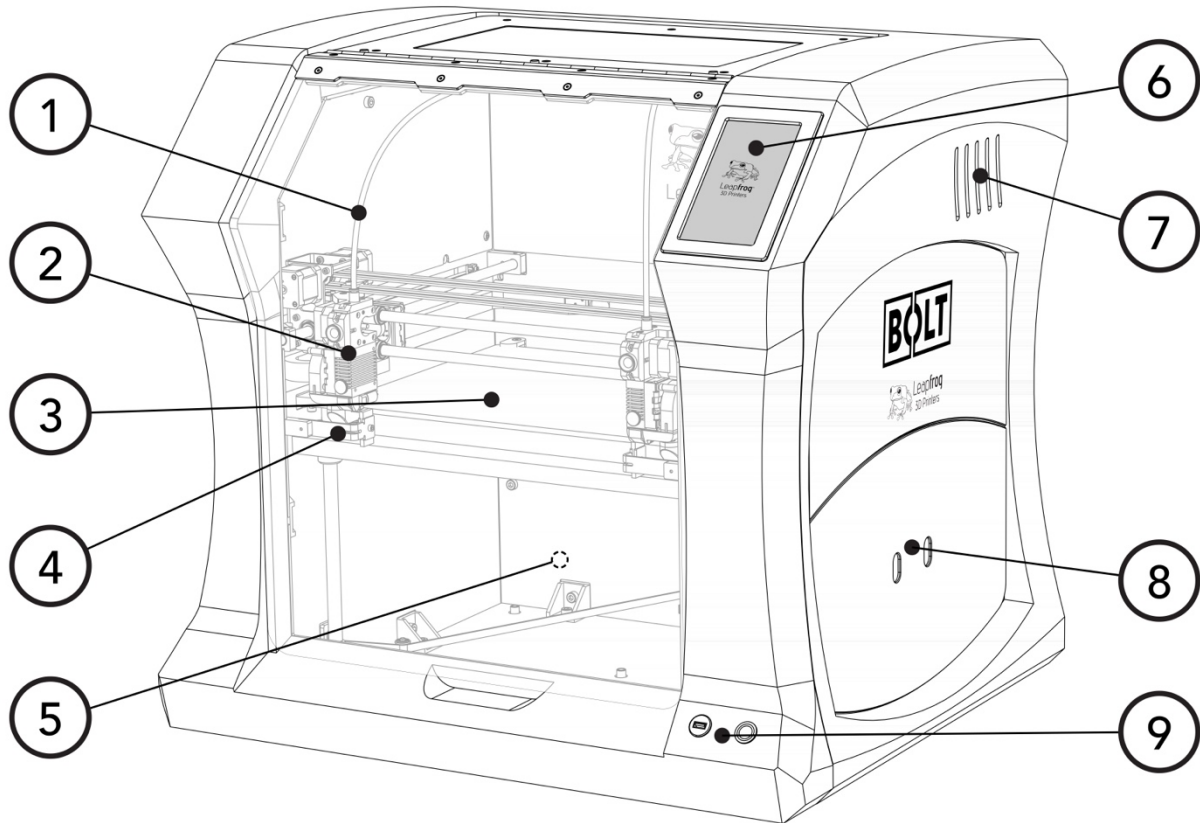
If this is not the case, please go to our website and open a support ticket, attaching a copy of the printer's original purchasing invoice and a photo of the power cable that came with the printer; our Technical Support Team will place an order for the correct power cable as soon as possible.

Once you have confirmed that you have the correct power cord, please connect the power cord to the back of the Bolt in the appropriate slot and plug the other end into a grounded (!) wall outlet. Failing to make sure that you have a grounded wall outlet can result in the printer possibly being damaged by an electric power surge. In addition to using a grounded power outlet, it is also recommended to use a surge protector.

At this point, you can safely turn on the power switch on the back of your printer.

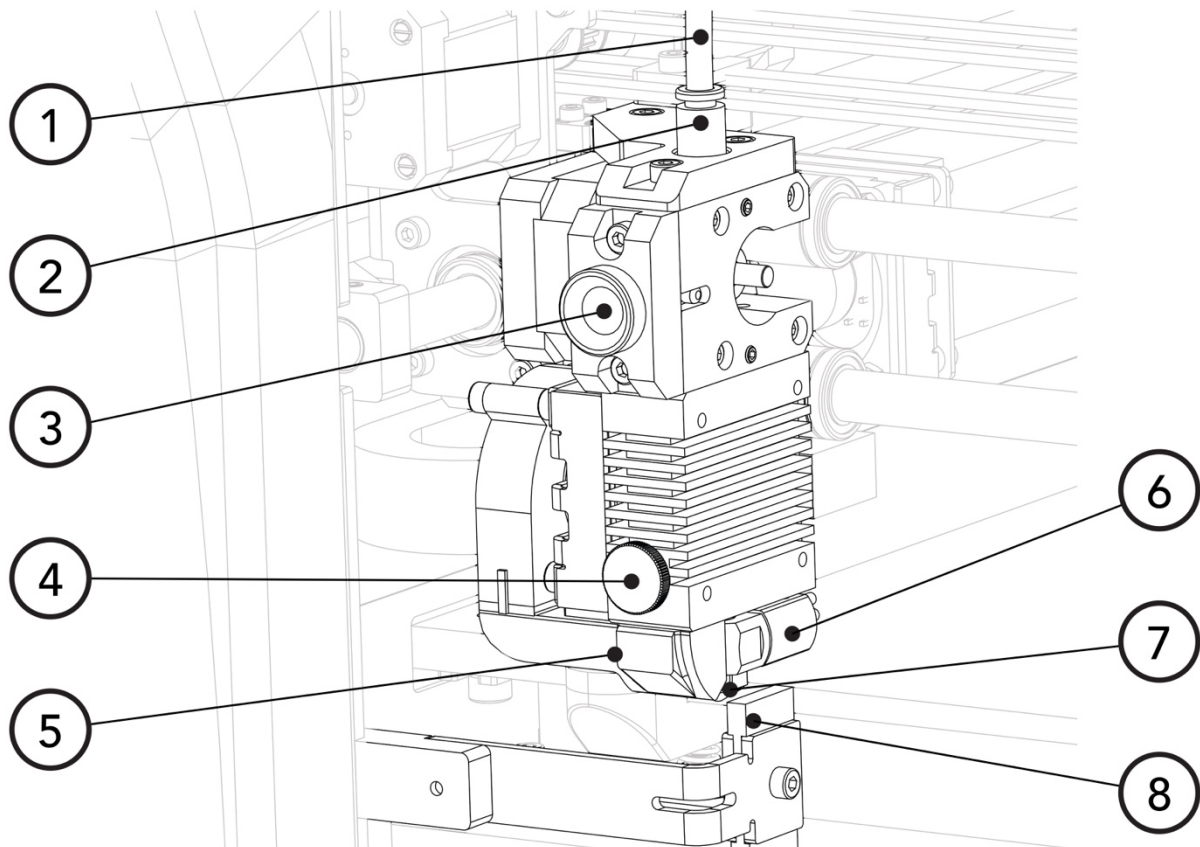
2 ABOUT THE BOLT

2.1 BOLT OVERVIEW



1. Filament guide tube
2. Print head (one of two)
3. Print bed
4. Nozzle wiper (one of two)
5. Power switch (on the back of the Bolt)
6. Touchscreen
7. Activated HEPA Carbon filter vent
8. Filament compartment
9. On/off button and USB port

2.2 BOLT PRINTER HEAD OVERVIEW



1. Filament guide tube
2. Push-in coupling
3. Filament pinch wheel (used to control the grip on loaded filament)
4. Hot-end thumb screw (used to swap hot-ends tool-less)
5. Fan-duct
6. Hot-end (includes also nozzle)
7. Nozzle
8. Nozzle wipe

2.3 BOLT SPECIFICATIONS

Specification	Metric						Imperial						
Physical dimensions (DWH)	723	x	831	x	801	mm		28.5	x	32.7	x	31.5	inch
Printer weight	61					kg		134					lbs
Input voltage range	88-264VAC												
Input frequency	47 - 63 Hz												
Power consumption	600W												
Build size single extruder (DWH)	320	x	330	x	205	mm		12.6	x	13.0	x	8.1	inch
Build size dual extruder (DWH)	320	x	300	x	205	mm		12.6	x	11.8	x	8.1	inch
Build size replicator/mirror mode (DWH)	320	x	164	x	205	mm		12.6	x	6.5	x	8.1	inch
Build volume	21.6					L		4.8					gall.
Heated bed max temp	90					°C		194					°F
Closed chamber	Yes												
Hot end Max temp*	360					°C		680					°F
Number of extruders	2												
Extruder size(s)	0.35					mm		1.38E-02					inch
Filament size	1.75					mm		6.89E-02					inch
Layer thickness	0.05		to		0.35	mm		1.97E-03		to		1.38E-02	inch
Advised printing speed (DW)	6000		$\frac{\text{mm}}{\text{min}}$		100	$\frac{\text{mm}}{\text{s}}$		236		$\frac{\text{inch}}{\text{min}}$		4	$\frac{\text{inch}}{\text{s}}$
Max. travel speed (DW)	15000		$\frac{\text{mm}}{\text{min}}$		250	$\frac{\text{mm}}{\text{s}}$		591		$\frac{\text{inch}}{\text{min}}$		10	$\frac{\text{inch}}{\text{s}}$
Stepper motors	1.8° Step angle with 1/32 micro stepping												
Positioning accuracy (DW)	0.008					mm		3.15E-04					inch
Positioning accuracy (H)	0.010					mm		3.94E-04					inch
Body/frame construction	Aluminium Framework												
Heated bed construction	High grade glass												
Semi-automatic print bed Z-levelling	Yes												
Ethernet connection	Yes												
Wifi connection	Yes												
Internal OS	Linux												
USB standalone format	.Gcode format												
Printing modes	Single, Dual Material, Replicator mode, Mirror mode												
Open system print materials (* experimental)	PLA, ABS, HIPS, Flex, Nylon, Hybrid, Woodfill, PVA*, Carbon*, other*												

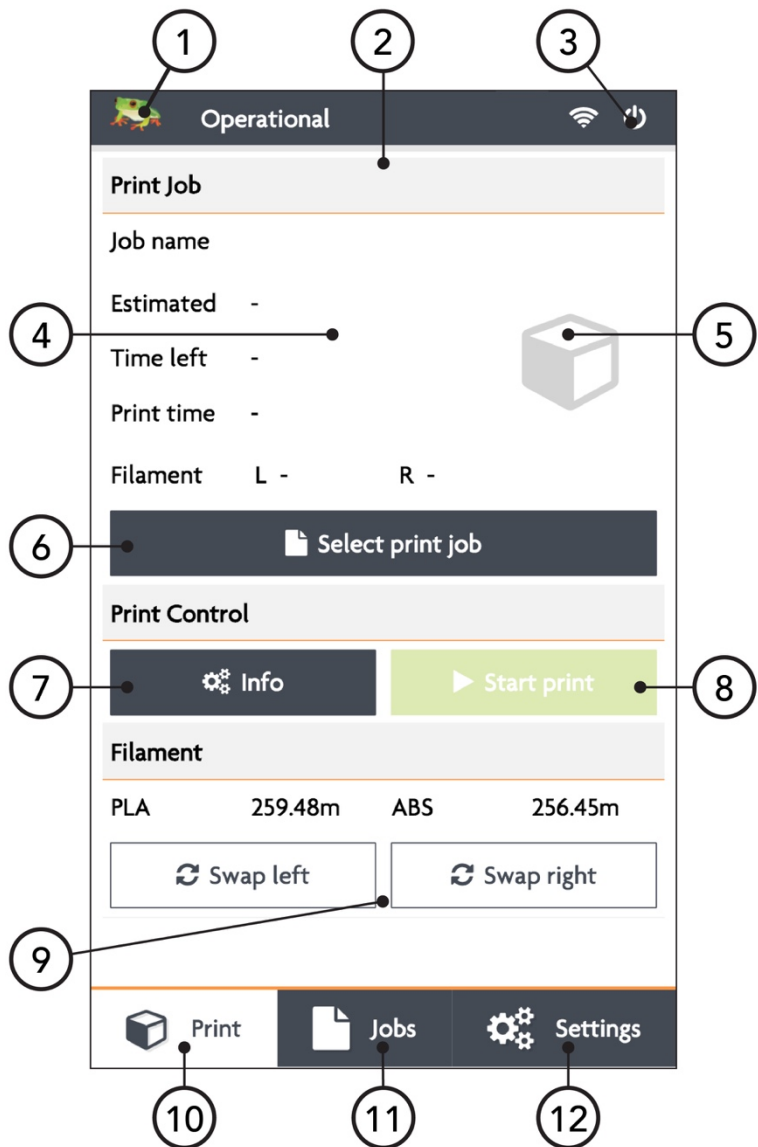
DWH: Depth, Width, Height. Coordinate system reference Y, X, Z

A Low-temp (max 250 degrees) and High-temp hotend (max 360 degrees) is supplied

2.4 LEAPFROG USER INTERFACE OVERVIEW

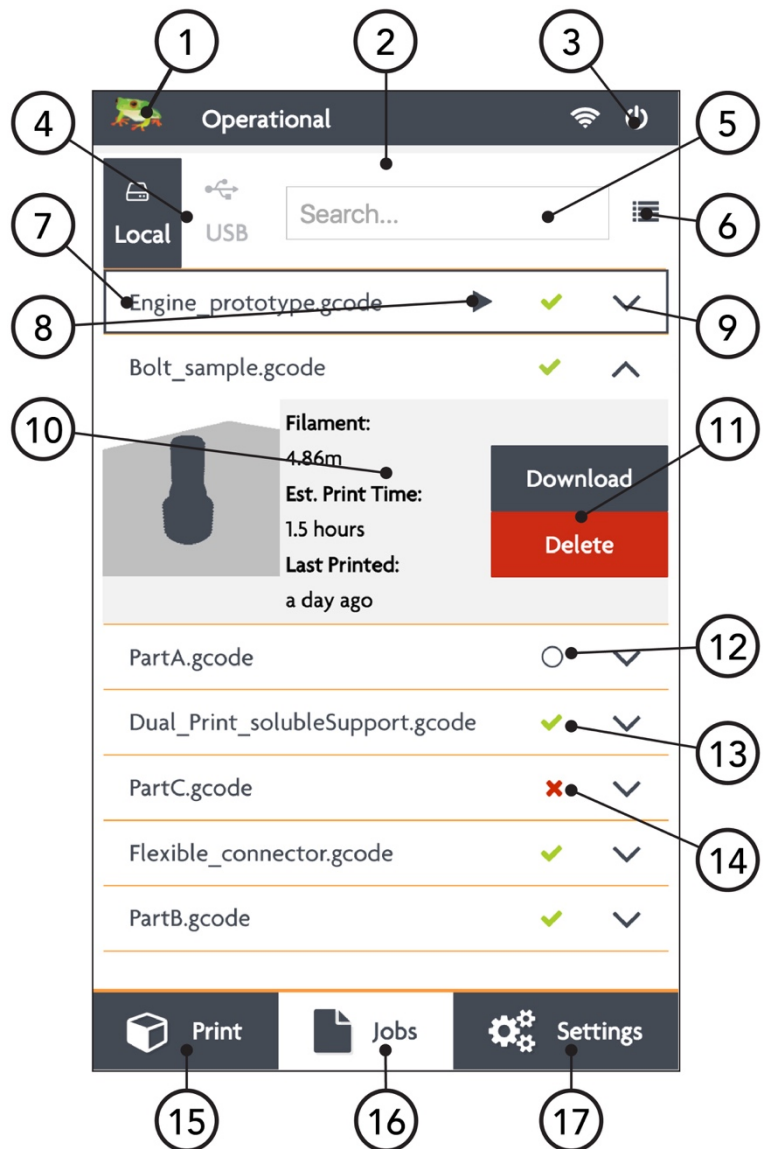
PRINT TAB

1. Software refresh
2. Notifications area
3. Power power options
4. Shows information about the selected print job.
5. Shows a preview of the selected print job
6. Navigate to the Jobs tab to select a print job
7. Shows the temperatures of the nozzles and bed and gives access to the built-in webcam live view
8. Start a print job and select the print mode
9. Loads the wizard to load or unload filament for the left and right extruder
10. Shows the current Print tab
11. Navigate to the Jobs tab
12. Navigate to the Settings tab



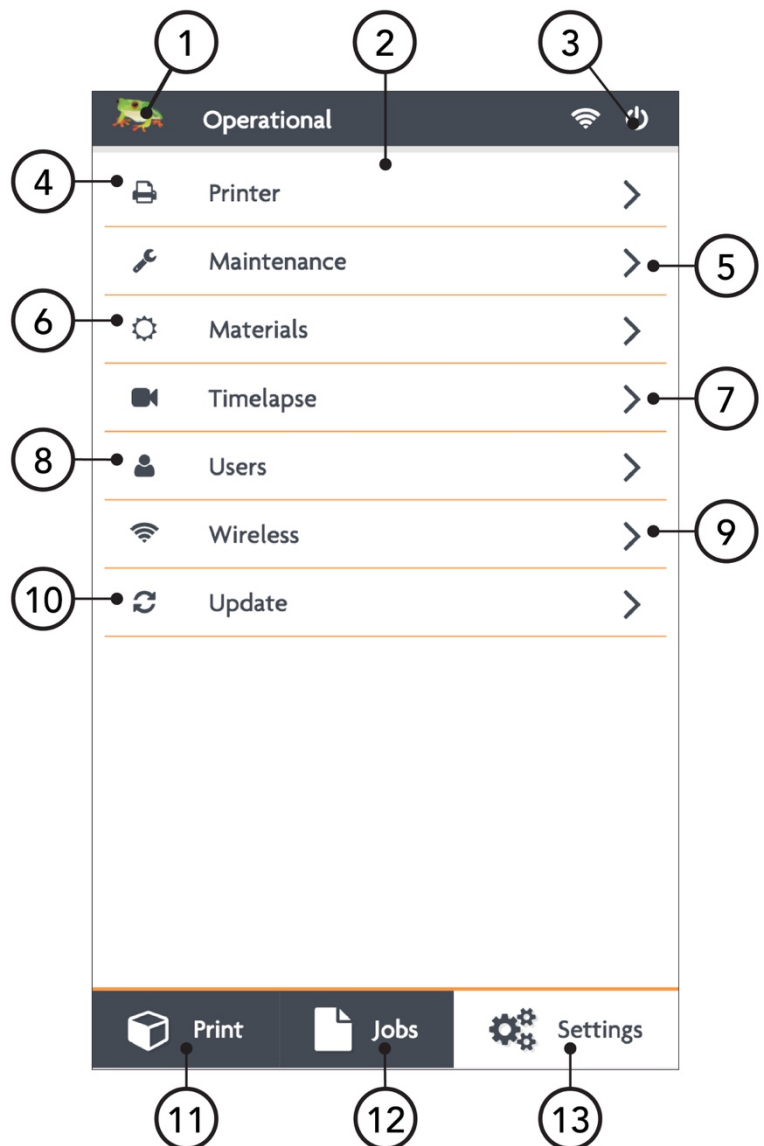
JOB TAB

- 13. Software refresh
- 14. Notifications area
- 15. Power power options
- 16. Local and USB storage
- 17. Search storage
- 18. Sort storage
- 19. Filename
- 20. Print selected file
- 21. Show information on file
- 22. Additional information on file.
- 23. Delete or copy file to USB or local storage
- 24. Shows that the file is not yet printed
- 25. Shows that the file is successfully printed
- 26. Shows that the file wasn't successfully printed
- 27. Navigate to the Print tab
- 28. Shows the current Jobs tab
- 29. Navigate to the Settings tab



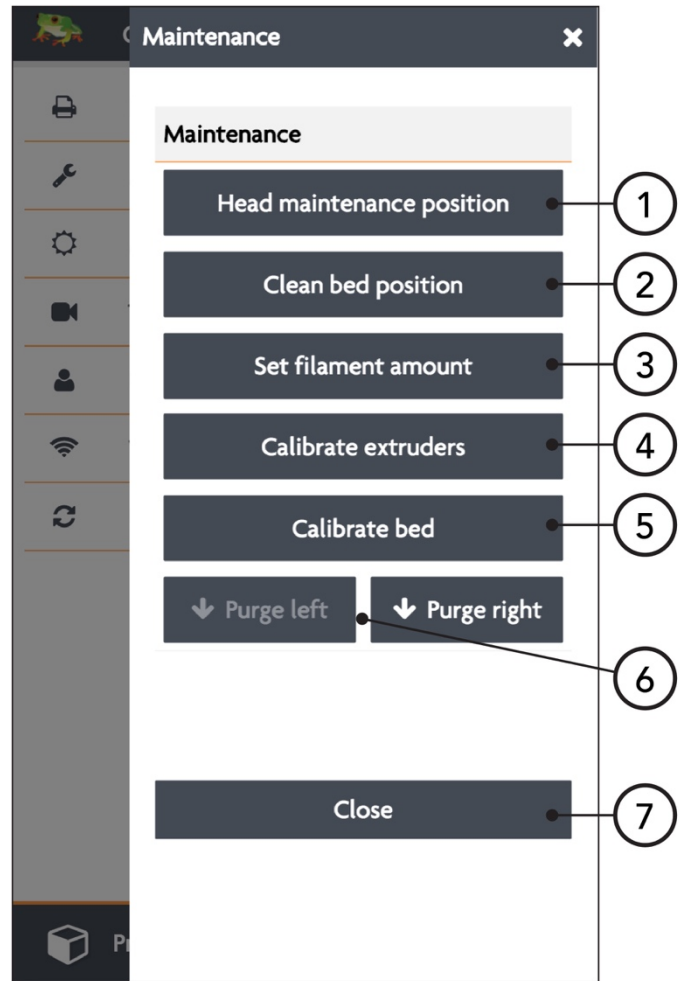
SETTINGS TAB

1. Software refresh
2. Notifications area
3. Power power options
4. General printer information
5. Navigate to maintenance menu
6. Add, edit or remove materials
7. Access built-in camera and set/download created timelapses
8. Add, edit or remove user
9. Connect to wireless network and check IP address.
10. Update the Bolt software and firmware
11. Navigate to the Print tab
12. Navigate to the Jobs tab
13. Shows the current tab



SETTINGS TAB

1. Moves both print heads to the front of the Bolt for head maintenance
2. Moves both prints heads to the back of the printer for bed maintenance
3. Change the amount of filament on the loaded spools
4. Calibrate both extruders in reference to each other
5. Calibrate the print bed in reference to the nozzles
6. Purge left/right extruder
7. Close maintenance menu



3 PRINTER SETUP

Before you can start using the Bolt, some preparation is required. Also, be sure to read Chapter 1.5: Electric Power Cord Compatibility.

The following chapters should be followed to make the Bolt operational and print ready.

- 3.1 Setting up user accounts
- 3.2 Connecting the Bolt to the internet
- 3.3 Update the Bolt
- 3.4 Calibrate print bed
- 3.5 Load filament
- 3.6 Add materials (if necessary for 3.6)
- 3.7 Apply bed adhesive

You will be setting up admin and user accounts in order to control the amount of privileges every user has on the Bolt

Connecting the to the internet and Wi-Fi is also highly recommended and fully use its auto-updates and connectivity with your mobile phone and/or computer.

Calibrating the bed should be done at least once after transporting the Bolt. The wipers will need to be check as well.

And finally filament should be loaded and the print bed should be prepared before each print.

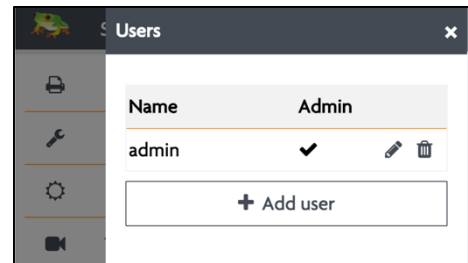
3.1 SETTING UP ADMIN AND USER ACCOUNTS

As our 3D printers are being used in shared office environments, Leapfrog 3D Printers has designed the Bolt Software to have User accounts. Remote control will only be accessible to users with an account and those that do have access may be limited to what they can do based on their account settings.

Setting up an Admin account is highly recommended *before* providing the Bolt's IP address to the users in your office environment.

NOTE Replacing a forgotten password for an Admin account will be very difficult to do, so please write it down in a location that you will be able to recover it if need be later on.

To add a user, select the *Settings* tab and tap on the *Users* menu option. Add a admin user and be sure to set the check-box on green, next to *Admin*.



In the picture you see that user *admin* has administrative privileges and 'john' is an active user. To the right you see a pencil icon for editing this user account, a key for locking the account, and a trash can for deleting the user account.

NORMAL USERS These users can only upload files but cannot start prints from a remote device.

ACTIVE USERS These users can upload and print, but cannot change settings from a remote device.

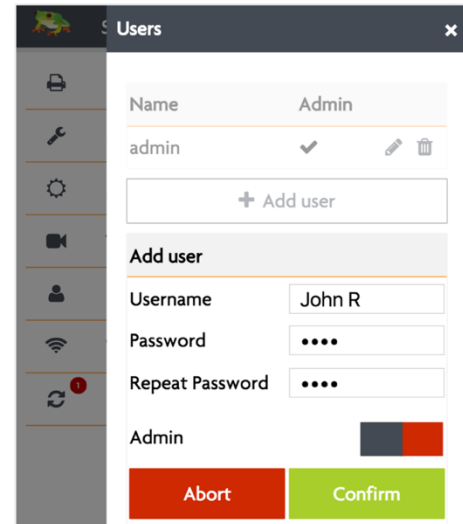
ADMIN USERS Admin users can also upload and print as well as change settings on the printer from a remote device.

To add a user, click the *Add user* button.

Use the touchscreen keyboard (by typing inside each text field) to fill out the Username, Password, and Repeat Password fields.

Make sure to indicate whether they will have administrative privileges or not but switching the slider on green or red.

Confirm to create the account, and *Abort* will cancel the account creation.



3.2 CONNECTING THE BOLT

The Bolt can access the internet and your network by Ethernet or Wi-Fi.

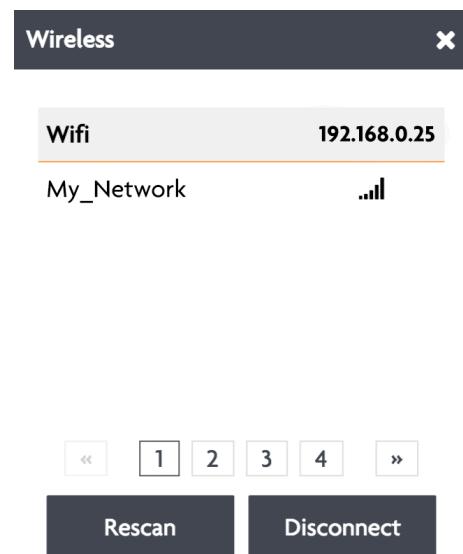
To do so, you will need an internet service in your home/office that is set up on a router.

For a wired connection, simply connect the Bolt with your router using an Ethernet cable.

For wireless you will also need to know the name and password of the wireless network being transmitted by that router so that your Bolt will be able to connect to the correct network.

Once you have this information, go to *Settings* tab and select the *Wireless* menu option. Your printer should automatically scan for any wireless networks, but if the network is not listed, select the *Rescan* button to have it refresh the network list.

To connect, simply select the listed network that you wish to connect to, type in the password and tab the *Connect* button.



Once connected, you'll see the network name, that it is communicating, the signal strength and that it is locked by the Admin.

If you are currently connected to a network and wish to change networks, you will need to first disconnect from the current one by selecting the *Disconnect* button.

3.3 AUTOMATIC UPDATE FUNCTION

Because our Research & Design department is constantly trying to improve the quality experience that our customers have with our 3D printers, they periodically provide new updates that further improve the printer-user experience. For your convenience, these updates are made available online and can be directly installed on the Bolt, with minimal printer down-time.

To update your Bolt, go to *Settings* and press *Update* to Update to the latest version available. Please ensure that you are connected to the internet to use this function.

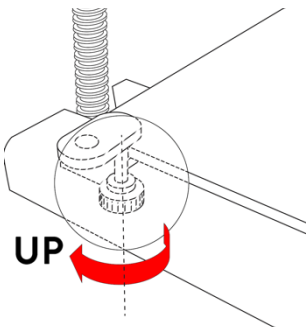
3.4 CALIBRATE PRINT BED

The Bolt is a sensitive machine that moves and extrudes on the micro-meter level, and exposure to shipping and transportation can possibly cause the bed level to lose calibration.

If the first layers don't adhere to the printer bed, the whole part can move while printing, resulting in a bad print. The right distance between the bed and nozzle prevents this from happening.

To level and calibrate the bed, go to *Settings* → *Maintenance* → *Calibrate bed*.

Continue Calibration and the screen will show a top view of the print bed with 4 squares in each corner and a fifth one in the middle of the print bed. Each of these squares represent a position on the print bed used for calibration.

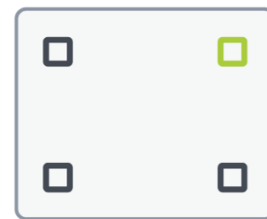


The recommended distance between bed and nozzle is around 0.15 mm or roughly the height of a sheet of paper.

Choose a corner position on the screen and find the knob underneath the bed at the corresponding position. Turn this knob clock-wise to raise the bed, and counter clock-wise to lower the bed.

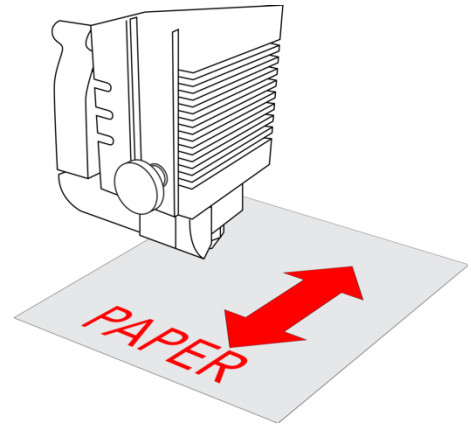
Bed leveling

Select the corner you would like to calibrate. The extruder will move into this position. You may adjust the bed by turning the knob below the bed.



Close

Hold a piece of paper between the nozzle and print bed and raise the bed until the paper is slightly pinched between the bed and nozzle. Repeat this until all four corner nozzles have the same distance from the bed, checking the middle calibration position last.



3.5 LOADING/UNLOADING FILAMENT

Filament is the material what the Bolt uses to print. The extruder on the right side is treated as the default/main extruder. Our Creatr Software (powered by Materialise) is also is set up that way.

We recommend Leapfrog MAXX filaments and preferably PLA for the initial loading process and prints.

Filament will be loaded in the right side of the Bolt and guided via tubes to the designated print head. The filament will be melted in the print head and printed to the print bed.

In the following steps we will swap the Right filament. Swapping the Left filament will follow the same process.

NOTE The print head assembly will perform some forceful movements during this process. Please keep all body parts or objects clear when this movement occurs to prevent injury or damage of the machine.

NEEDED STEPS TO LOAD FILAMENT

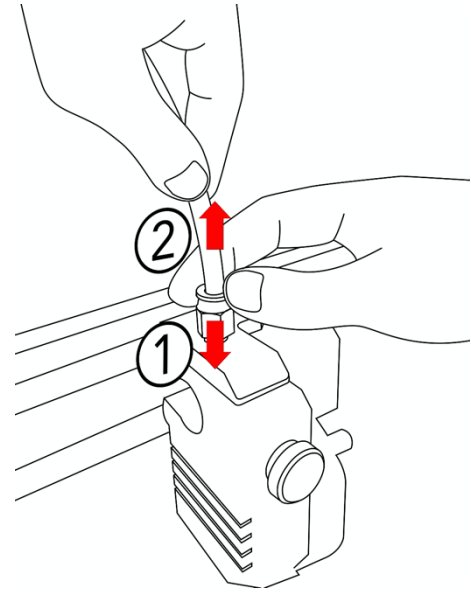
1. Remove the filament guide tube from the coupling
2. Select Swap Left/Right in the print tab
3. Unload the current filament if necessary
4. Select the correct filament and set the estimated amount left on the spool
5. Feed the filament up to the drive gear
6. Feed the filament into the drive gear
7. 'Load filament' or 'Load extra filament' until the filament is gripped in the drive gear
8. Re-connect the filament guide tube to the coupling if necessary



STEP 1

Locate the orange push-in coupling on the right print head, connecting the print head to the filament guide tube. Remove the tube from the print head by pushing the orange coupling down and pulling tube upwards in the opposite direction. Let the tube disconnected until the filament is loaded correctly.

NOTE Loading filament can also be done without disconnecting the push-in coupling, but it is strongly advised to use this method in order to ensure success loading filament and know what is happening.



STEP 2

On the Bolt Software, select the *Print* tab and choose the *Swap Right* option for the right extruder.

It will ask you to confirm the unload process; please do so.

Filament			
PLA	330.00m	None	-
⌂ Swap left		⌂ Swap right	

NOTE The printer will first pre-heat the selected nozzle to help load and unload filament. This will extend the life of your nozzle blocks and will help prevent clogs.

STEP 3

You'll then be prompted to physically unload and roll of the filament spool that was previously loaded in the printer, if applicable. To do this, open the filament compartment on the right side of the Bolt and remove the filament spool from the filament compartment. The right extruder will then be empty and available to load the replacement roll of filament.

STEP 4

After unloading the previous roll of filament (if applicable), the software will ask which type of filament is loaded into the extruder that you just unloaded.

Select the right material from the drop menu. If the correct material isn't listed, select abort and add an additional material. This can be done in the in the Settings tab under Materials, as is explained in the next chapter.

Select how much filament is on the spool. This way, the Bolt knows whether or not there will be sufficient filament to print the selected print job and will notify you when there will not be enough. Keep in mind that this is as accurate as the user can determine the amount of filament left on the spool, so it will be an estimate.

Filament [X]

Swapping filament: Left

Please select the new filament material

PLA

Select how much filament is on the spool:

330 100%

Insert the filament in the filament drawer past both wheels.

Load

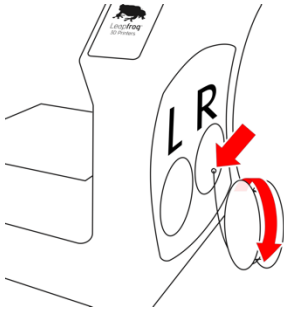
Abort

STEP 5

Get the filament that needs to be loaded and un-package a roll of filament from the box if needed.

NOTE Some filaments (like PVA and Nylon) have special properties that make them susceptible to things like air moisture or sunlight. Please take extra care of these types of filaments, making sure not to leave them in the printer or outside of their protective packaging. PVA in particular should always be unloaded from the printer immediately after use to help prevent clogging of the nozzle.

In order to help the filament feed through the machine, clip the end of the filament to where it forms a point and then use your fingers to straighten the filament out. Being wound around spool, the filament has a natural bend; straightening just the first few centimetres out helps to prevent the filament from catching when it reaches a filament tube coupling.



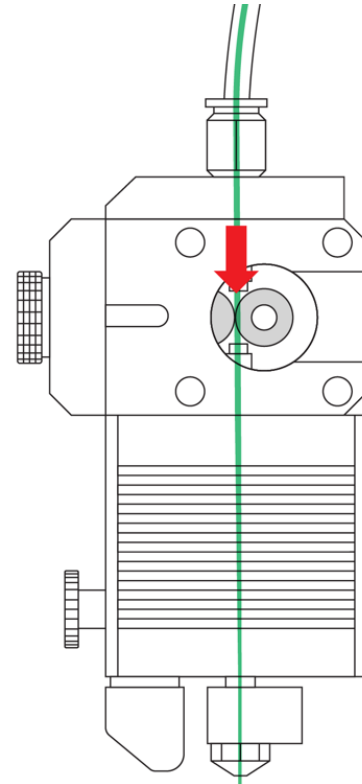
Begin feeding the filament through the correct filament tube port on the right side of the printer. For loading filament into the right extruder, the right filament compartment must be used, for the Left extruder, the left.

When feeding the filament to the filament entry port, ensure that the filament is rolled of correctly of the filament spool. The filament should be rolled from the bottom of the spool into the entry port. If the filament is loaded incorrectly, then the loaded filament can get damaged while printing and clog the nozzles.

STEP 6

Feed the filament through the filament entry port; keep feeding until you see the filament in the translucent filament guiding tube reach all the way print head filament drive gear. Make sure to that the filament is fed past the end of the tube.

If you need help feeding the filament to the drive gear, feel free to disconnect the translucent filament guiding tube from the top of the print head and feed the filament through the top down into the print head.



STEP 7

When the extruder is preheated, you will be prompted to confirm that you are ready to load the filament. Press the Load button and the print head will begin feeding filament. While the drive gear in the print head will start turning in order to feed filament, keep feeding filament by hand and apply a little pressure in order for the drive gear to grip the filament. Repeat this until the filament is gripped by the drive gear.

STEP 8

The filament will be correctly loaded if the nozzle extrudes filament by simply pressing 'load more filament' on the software. Re-connect the tube if necessary by pushing the tube back in the pushing coupling.

3.6 ADD MATERIAL

Materials in the Bolt software are used to pre-heat and prepare the Bolt for loading and unloading filament. The actual materials settings are set in the G-code of the print file. Settings of changing temperatures for print settings is done in the Creatr Software.

When a material isn't available when loading filament, it can be manually added. To see what materials are available or to add an additional filament, go to the Materials under the Settings tab.

A list of materials is visible under Materials and adding a material can be done with +Add profile.

When adding a material, fill in a profile name and add the correct temperatures to complete the material profile. Press save to keep, and start using the profiles.

Material	Extruder	Bed	(°C)
ABS	210	100	Loaded
PLA	180	60	Delete

+ Add profile

Cancel

Save

3.7 ADHESIVE MATERIAL

Many filament types require an adhesive material to be applied to print bed in order to help the printed part to stick and hold to the bed. Without it, most 3D printed parts would stick to the print head and move around after the first few layers. Therefore, we recommend almost always applying some sort of adhesive material such as our print stickers or 3D Spray from Leapfrog MAXX Essentials (for European countries only).

NOTE Failing to ensure that a print is sticking to the bed for at least the first few layers could result in a large mass of filament collecting on the tip of the nozzle and can severely damage the printer. Though we don't expect the print to be monitored from beginning to end, we strongly advise to monitor the first critical layers of the print. Using the built-in webcam enables the user to monitor the printing process remotely.



4 PRINTING

The Bolt is capable of storing and 3D printing G-codes generated with Creatr powered by Materialise.

The following will be covered in the next chapter

- 4.1 Starting Print jobs
- 4.2 Finishing Print jobs
- 4.3 Using different printing modes. Sync mode and Mirror mode
- 4.4 Information available on print jobs
- 4.5 Accessing and storing print jobs

4.1 STARTING PRINT JOBS

To make a 3D print, 3 things are required. Filament, a 3D file in G-code format and a 3D Printer. Creating a G-code from a STL is explained in the next chapter. To start your first print, you can use the pre-installed file on the storage of the Bolt. Choose PLA as filament for the Bolt example print.

NOTE When starting a print, it is strongly advised for the user to know that the filament is loaded correctly, the bed is correctly calibrated and the print bed is supplied with adhering material like 3D Spray or a print sticker. This is explained in the previous chapter.

The following steps will be explained below.

1. Start-up the Bolt
2. Prepare the print bed
3. Select the print job
4. Select 'Start print'.
5. Wait until the Bolt is heated up and starts printing its first layers.

STEP 1

Start up the Bolt and load filament in the Bolt as explained in the previous chapter. Navigate on the Bolt software to the Print tab.

STEP 2

Prepare the print bed with necessary adhesive. This is explained in chapter 3.7.

STEP 3

Press 'Select print job' to navigate to the internal storage of the Bolt. Here all prints on the Bolt are located, as well as the linked USB storage device. Select the file you want to print and navigate to the Print tab by pressing the 'play' button or 'Print' in the bottom of the screen.

NOTE Trying to run a G-code file that was not designed for the Bolt and filament type that you have loaded will result in a failed print, most likely a clogged extruder and can damage the hardware of the Bolt. Ensure that you have used the latest and correct settings in the Creatr Software from Leapfrog 3D Printers.

STEP 4

Press 'Start print', select the desired 'printing mode' (for the first sample print, we advise 'normal') and press Start Print.

STEP 5

The Bolt will start heating its extruders to the correct temperature. Afterwards it will begin moving its head and start extruding filament on to the bed. The first couple of layers is critical for a successful print.

For more advanced users; during the first layers, the bed height can still be adjusted using the knobs underneath the bed.

NOTE If for any reason the result has holes, split layers, or failed, please contact Leapfrog Technical Support via our ticketing system on support.lpfrg.com; please upload a photo of the result along with a digital copy of your original purchasing invoice so that we can provide you with a solution as fast as possible.

4.2 FINISHING PRINT JOBS

After the needed amount of time, the Bolt will finish its Print job and will let the user know that the Print job is finished.

The following steps can be followed to successfully remove the print and prepare the Bolt for future print jobs.

1. Check if the print is done printing
2. Remove the print from the print bed
3. Clean the print bed.

STEP 1

A notification on the top of the Bolt software telling the user that the Print is finished. Pressing the notification will remove it from the screen and the print can be removed from the Print bed. The notification will also be visible on another device if the user was still logged into the printer.

STEP 2

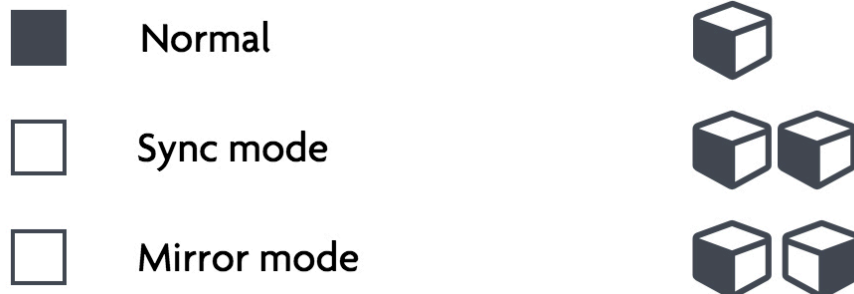
Carefully remove the print from the print bed. The print might still be strongly adhered to the print bed so apply gradually apply force if necessary. Applying, or spraying regular water to the bed can help loosen the print from its bed. Waiting a couple of minutes will let the water dissolve the 3D Spray, releasing the print from the print bed.

STEP 3

Clean the print bed of any debris and left over filament sticking to the print bed. A putty knife or similar tool can be used. Take care when using a tool when cleaning a debris from a print sticker, as it can damage the sticker. Window cleaner can be used to clean the residue of 3D Spray.

4.3 USING DIFFERENT PRINTING MODES

The Bolt is fitted with two separate heads which provides for new ways of printing. The two heads can work at the same print job, extruding a single or dual material print, or work simultaneously, both printing at the same time.



NOTE When the selected print is not yet fully analysed, a *Force print* button will appear. This will allow the user to print the print. Be sure that the selected print is within the bounds of the printing area.

Job preparation

The print job is still being analysed. This can take several minutes.

 Force print

NORMAL PRINTING MODE

Pro: Dual material/Dual colour
Full bed range, larger objects

Con: Normal production speed

In Normal printing mode, the Bolt can print single extrusion or dual extrusion prints and the full print bed can be used in Normal printing mode.

Creating a single or dual extrusion print is set in the G-code and is done when creating a G-code file.

Printing a single extruder print will need only the Right, or Left filament loaded. When printing a dual extrusion print, both Right and Left filaments will have to be loaded.

SYNC MODE PRINTING

Pro: Double production speed
Make a copy of the print
Used for multiples of 1 print

Con: Single material/Dual colour

Sync mode printing will use both print heads simultaneously for one single extruder print, printed twice. The result is a copy of the selected G-code over the duration of one print job. This means that printing with both heads simultaneously the Bolt prints twice as fast!

In Sync mode, the print bed will be halved since the Bolt will have to print the same object twice. Both extruders will be used so both the Left and Right filament should be loaded.

Printing in sync mode will require a G-code file set on the correct (right) half of the print bed. The Bolt will copy the G-code automatically to the other half of the print bed.

MIRROR MODE PRINTING

Pro:	Double production speed	Con:	Single material/Dual colour
	Make a mirror copy of the print		
	Used for symmetrical prints		

Printing a file in mirror mode will also use both print head simultaneously for on single extruder print, printed twice. The difference with Sync mode printing is that the print will be not be copied, but mirrored over the Z-axis. This can be useful when making moulds or orb shaped objects.

In Mirror mode, the print bed will be halved since the Bolt will have to print an additional mirrored copy of the selected print. Both extruders will be used so both the Left and Right filament should be loaded.

Printing in sync mode will require a G-code file set on the correct (right) half of the print bed. The Bolt will copy and mirror the G-code automatically to the other half of the print bed.

4.4 INFORMATION AVAILABLE ON PRINT JOBS

The Bolt analyses any print job uploaded on the local storage of the Bolt. This information will help you prepare you amount of filament en time, creating more insight on the selected print job.

The Bolt will let the user know which nozzle is set in the G-code, as well as how much filament will be needed. If the amount of filament left on the loaded filament spool is less than needed, then the Bolt will disable the start print function, preventing the user to start printing an incomplete print.

It will also give you a rough preview of the selected print job as well as an estimation on how much time it will take printing it.

4.5 ACCESSING AND UPLOADING PRINT JOBS

The Bolt is fitted with 32 GB which can be used for storage of G-codes for the Bolt. This storage can be accessed on the Bolt or on your computer, phone or tablet using Wi-Fi. The Bolt has a USB port as well.

Accessing the Storage can be done via the Jobs tab in the bottom of the screen. Here you can access the local storage, USB storage and search for a print.

When plugging in a USB storage device, you will be prompted to browse the USB files. You can also access the USB on the top of the Jobs tab. On the USB storage you can navigate to the desired file and upload it to the Bolt.

Any file on the Bolt storage will be analysed. The Bolt will read the G-code for information like which nozzle is used, how much filament will be needed and will provide the user with a rough preview.

To upload prints to the Bolt using Wi-Fi, the Bolt has to be connected to the same network as your computer. In the wireless menu, an IP address can be found. Place this IP address into your browser as you would a website URL to access the Leapfrog User Interface of the Bolt. Login to get the right privileges and upload files in the Jobs tab.

For more information on accessing the Bolt via your network, see to chapter 6.3.

5 CREATING A PRINTFILE

The Bolt reads G-code. A G-code is a common used file type for production machines and setting the right parameters for the Bolt is essential. The use of a different type of settings of another machine can damage or crash the Bolt.

To create a G-code for the Bolt, a 3D model will be needed and imported in the Creatr Software. A common used file type for digital 3D models is STL and this will be used to import the 3D model into the Creatr Software.

NOTE Creating a 3D model is not explained in this tutorial. Free 3D model STL's can be found online, as well as free 3D modelling tools.

Creating a G-code from a STL means that the Creatr Software will slice the STL in separate layer, in order for the Bolt to build the 3D model layer per layer. Another commonly used word for a program like this is therefor a 'slicer'. For more information on 3D printing and slicing, go to courses.lpfrg.com and follow the free introduction course.

5.1 CREATR POWERED BY MATERIALISE

Install the Creatr Software on a computer which meets the minimum requirements and create or download the desired STL file that you want to print. For more information on the Creatr Software refer to the Creatr Software User Manual:

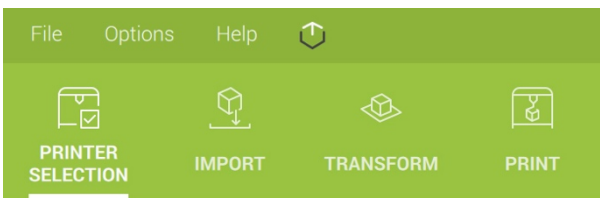
<http://cloud.lpfrg.com/materialise/manuals/CREATR.pdf>

And download the Creatr Software here:

<http://www.lpfrg.com/materialise/download>

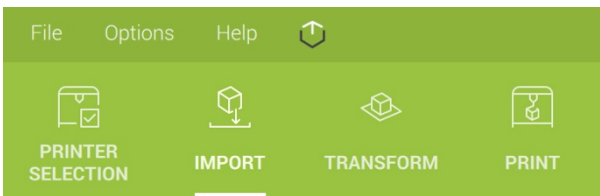
NOTE Make sure you are using the latest version and profiles of the Creatr Software for best results.

5.2 PRINTER SELECTION



Once Creatr Software opens, select the *Bolt* from the *Printer Selection* tab at the top of the program.

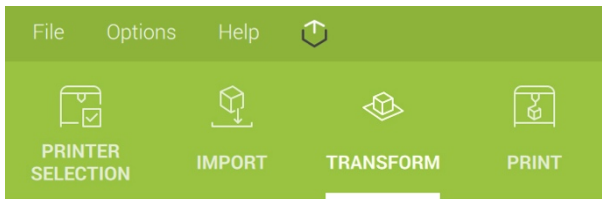
5.3 IMPORT



Click the *Import* tab button at the top. You'll be prompted to browse for the STL file that you would like to print. Find the file's location, select the file, and click *Open*.

Your STL model will be imported to the build platform according to how you have your settings in the *Options* menu.

5.4 TRANSFORM



Upon importing, the *Transform* tab will automatically be selected. In the transform tab you can adjust the imported model using various options;

Move - This will let you move the selected object on the print bed.

Rotate - This will let you rotate the selected object.

Lay-flat - This will lay the selected plane of the object flat on the print bed.

Rescale - This can make the selected object bigger or smaller.

Duplicate - This allows you to duplicate the selected object multiple times.

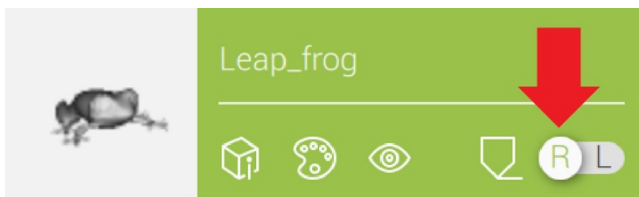
Arrange the model keeping in mind in what printing mode the model will be printed.

In Normal printing mode, the print can be placed anywhere on the print bed.

SYNC AND MIRROR PRINTING MODE The print has to be placed on the Left half of the print bed. The other half will be generated by the Bolt.

5.5 SELECT NOZZLE

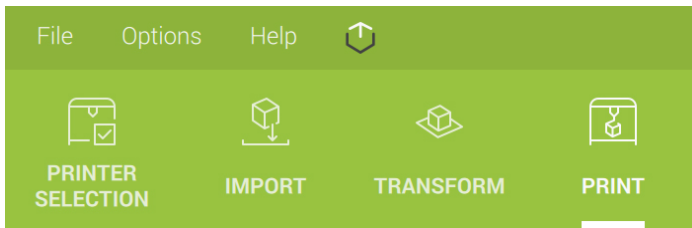
Select the desired nozzle for the G-code. By default, the Right nozzle will be selected. To switch nozzle, or allocate the desired nozzle to the desired part, toggle the Right and Left indicator on the part information on the right top of the screen.



When using Sync or Mirror mode, the single nozzle selection will be by-passed and the nozzle selection won't be used.

When printing dual material, the correct filament needs to be loaded to the correct nozzle.

5.6 PRINT



Select the *Print* tab. Creatr Software has Categories of Profiles that need to be set; one of them (Machine Settings) is set automatically in the Edit Profiles window. However, there are variations of the other 4 types of

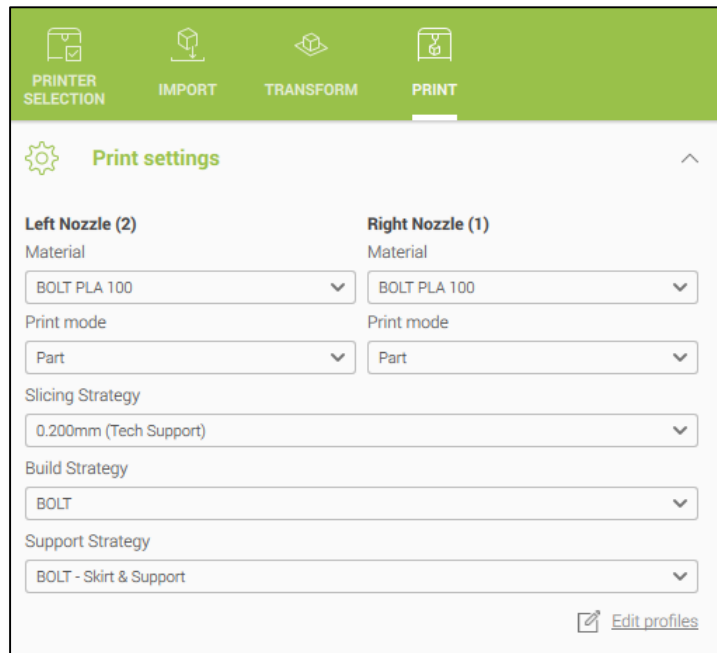
profiles, so you'll need to select which of the variations you want to use under the *Print* tab:

Material Profile - this profile contains settings for the filament material type that you plan to print with.

Print mode - this determines what

Slicing Strategy - this profile contains settings for layer thickness.

Build Strategy - this profile contains settings for the outside contours of the print, the upskins/downskins (top and bottom printed layers), the infill, and more.



Support Strategy - this profile contains settings for any additional printed material such as a skirt, brim, raft, or generated support structure material.

The *Edit profiles* button allows you to change the settings of these profiles

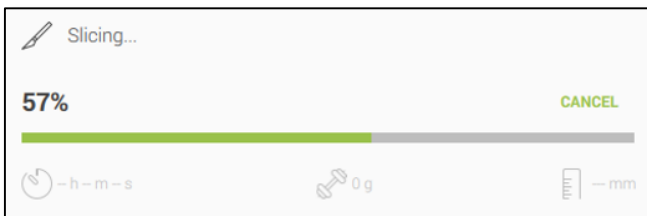
NOTE For more detailed and in depth information, refer to the Creatr Software User manual

<http://www.lpfrg.com/materialise/download>

Or contact our support: <http://support.lpfrg.com/>.

5.7 PREVIEW AND GENERATE G-CODE

When you're ready to 'slice' the model into a G-code, select the *Generate G-CODE* button (found under the same *Print* tab near the bottom) and click *Save*. The software will show a slicing completion percentage.



Note that there is a *Cancel* button if you would like to change settings and re-slice.

For now, we no longer need the Creatr Software. However, printing more complex parts often ask the user

to tweak and tune the settings to the shape of the part. This involves testing and adjusting print settings in order to get the best result possible.

6 LEAPFROG USER INTERFACE

The Bolt is equipped with software that will give the user control and information on printing, storage and maintenance of the Bolt. For a quick overview of the Leapfrog User Interface, see to chapter 2 of this manual. For more information on how to use the software for printing, see to the chapter 'Printing'.

6.1 LEAPFROG USER INTERFACE FEATURES

The software provides the user control over the Bolt when printing and keeping the printer in good condition. In the settings tab the Bolt can be calibrated and set in certain positions to help the user maintain and clean their Bolt.

The User Interface is accessible via other platforms like a phone, tablet and computer and can update automatically. When connected to the Bolt with a remote device, the user can download and upload files, stored on the Bolt. The built-in webcam can be accessed as well and timelapses can be made and downloaded from the Bolt.

When uploading files, the Bolt will analyse the file to provide useful information as printing time and needed filament. When the Bolt sees that the amount of filament exceeds the amount filament left on the spool, it will tell the user.

6.2 REMOTE ACCESS

The Leapfrog User Interface can be controlled using the touchscreen on the machine, or with another device equipped with network capability and a browser. This also enables the user to use the webcam's live view function.

Using the Bolt from the touchscreen will give the user full access to it's functions and capabilities. Accessing it remotely will restrict the user with certain functions depending on the assigned privileges from the account. The different types of users are;

NORMAL USERS These users can only upload files but cannot start prints from a remote device.

ACTIVE USERS These users can upload and print, but cannot change settings from a remote device.

ADMIN USERS Admin users can also upload and print as well as change settings on the printer from a remote device.

6.3 CONNECTION THE BOLT USING YOUR NETWORK

Connecting to the Bolt via a remote device can be done using the following steps.

1. Connect the Bolt to your network
2. Find the IP address of your Bolt on your Bolt
3. Connect your device to the same network
4. Open the IP address in your preferred browser
5. Login with your user account

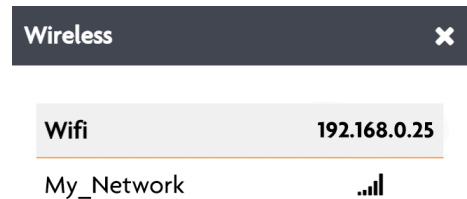
STEP 1

Connect the Bolt to the network using Ethernet or Wi-Fi. When using Ethernet, use a Ethernet-cable to connect the Bolt directly to the router.

When using Wi-Fi, connect the Bolt to the Wi-Fi network using the Settings → Wireless tab, as explained in the chapter 'Printer Setup'.

STEP 2

Go to Settings on the Bolt and go to Wireless. If the Bolt is connected correctly to the network, there will be a number shown in the top right corner consisting of 6 to 8 numbers. In this example we will use the IP address 192.168.0.25.



This is the IP address your network as allocated to the Bolt when it connected to the network and which will be used to connect the remote device to the Bolt.

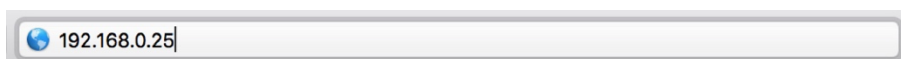
STEP 3

Go on your preferred device with network capabilities and a browser and connect it to the same network as the Bolt.



STEP 4

Open your preferred internet browser on the remote device and type in the IP address you have found in the Wireless menu of the Bolt.



The browser should start up the Leapfrog User Interface of the Bolt on your device.

STEP 5

In order to be able to print or change settings, the remote device should be logged in to the admin or similar privileged user account.

To log in, click login in the top right corner of the screen and fill in the correct user name and password.

6.4 USING THE WEBCAM

The Leapfrog User Interface can be used to access the built-in webcam to view the current print job or create a time lapse of your print.

There are two places where you can access the webcam. On the print screen go to info, and click *Live stream* to see a live stream of the built-in webcam.

To access the webcam, go to Settings → Webcam, to open the webcam screen.

Here a current view of the webcam will be shown as a picture, which can be refreshed. Livestream can also be selected to view a live stream of the current print job.

To create a time lapse, the Timelapse settings must be enabled before starting a print job. Afterwards, the timelapse can be found under 'Finished timelapses' where they can be saved or deleted from the Bolt.

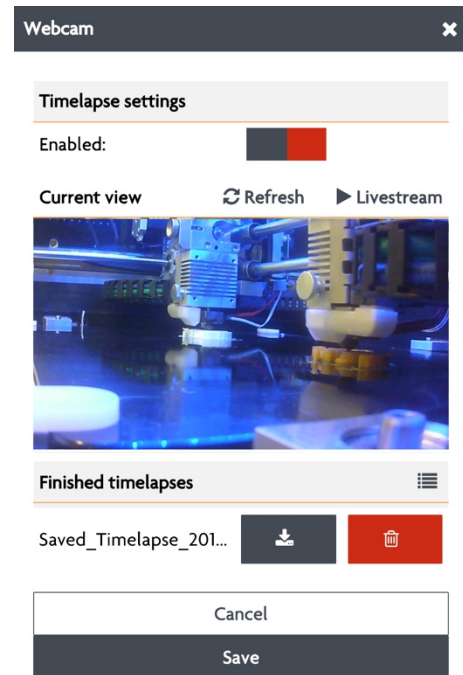
6.5 PURGE NOZZLES

This function can be used to purge the nozzles of excess or old filament. This can be useful when cleaning the nozzles and keeping them in good condition.

6.6 MATERIALS

Under Settings → Materials different types of materials and filament can be added, edited and removed.

The Bolt pre-heats the nozzles before purging, cleaning and swapping filament. Different filaments have different nozzle temperatures. Setting the temperature per



type of material correctly helps prolong the life of your nozzles and will reduce the possibility of clogged nozzles greatly.

7 PRINT SETTINGS

Print settings are very important for successful prints. The print settings are tailored to the type of material, part, use and quality the user wants.

A part consists of the outside and the inside, or skin and infill. How to print each part of a total print can be changed, with the speed, amount of skins, amount of retraction and many more. More information about print settings can be found in the Creatr Software manual or on courses.lpfrg.com.

7.1 PRINT SPEED VS PRINT QUALITY

As is with regular paper printers, 3D printers also give the user the option to choose between speed and quality. In general, this means that printing on slower speeds yields better results in terms of quality and details.

7.2 MATERIAL PROFILES

Material profiles are settings for printing with a specific material. Choosing a profile will tell the printer how to print the chosen material. This will heavily influence your print quality and advanced users will adjust the settings per specific print.

7.3 PRINT MODE

Print mode specifies the kind of print you will print. There are 4 different print modes each with their own use.

Part - Printing a part will print a regular print. This will be the setting most used

Support - This is generally used with dual extrusion. It can be useful to print the part with one nozzle, and the support with the other like soluble support.

Contour - This will print a single wall shell, or contour, of the selected part in the Creatr Software.

Infill - This is again generally used with dual extrusion. A part is made of its outside, or the skin, and the inside, or the infill. The infill can influence the strength or weight of the part by using more, or less infill.

7.4 SLICING STRATEGY

Slicing strategy determines how thick each layer is of the print. Thicker layer will result in faster print, but courses finishes and lower detail.

7.5 BUILD STRATEGY

The Build strategy determines the amount of up-skin and down-skin (top and bottom layers) as well as the amount of contours and infill.

7.6 SUPPORT STRATEGY

Support is needed in 3D printing to prevent part of a print from falling down, also known as overhang. Or is used for complex parts in combination with soluble support, a material which can be dissolved after printing.

Brim - A brim is a layer, of multiple layer around the print, touching the outside of the print. This can help stabilise delicate parts printed upwards of the print.

Raft - A raft is a layer underneath the print, which can be broken away, after printing. This can help stabilise small footprints of the part to create a stronger foundation to print on.

Standard - With standard, no support will be printed.

Support (same material) - Also known as break-away support. This support will be printed in the same material and can be easily broken of the part after finished the print job.

Support (solvable material) - This support can be dissolved after printing, using a soluble material like Hips or PVA. This can be useful for complex part, where breaking or removing the support can be hard to reach.

8 MAINTENANCE & TROUBLE SHOOTING

When using a machine, maintenance has to be done to keep the Bolt in good condition, or to ensure the Bolt is calibrated correctly. Whenever you encounter a problem, or the printer isn't functioning properly, don't hesitate to contact our support on support.lpfrg.com.

8.1 INSTALLING UPDATES

The Bolt can update automatically when connected to the internet. Be sure to check regularly in the Settings tab if an update is available. The number of updates available is indicated by the number shown in the red circle.

To update, go to Update in the Settings tab, and press refresh in the top right corner.

Then, press update to update the Bolt.

8.2 CLEANING THE PRINT BED

The print bed is normally provided of an adhesive layer, a sticker or 3D Spray, and debris from the last print.

This Spray and debris can be removed using a detergent like window cleaner and a putty knife. Scrape the filament debris away with a putty knife and clean the free platform with a mild detergent. Be careful using a putty knife when removing any debris from a print sticker as it can easily damage the print sticker.

8.3 CLEANING THE EXTRUDERS

In case of a clogged nozzle, heat up the clogged nozzle as if you were swapping filament. Try to unload all filament from the extruder. Afterwards, wait until the extruder is properly heated and re-load filament into the extruder.

8.4 REPLACING THE EXTRUDERS

When a nozzle is not working properly, replacing the hot-end can be a solution. To replace the hot-end, unscrew the lower thumb screw on the front of the print head. Disconnect the hot-end at the back of the nozzle block and replace the faulty hot-end

8.5 LEVELLING EXTRUDERS

Perform bed calibration and calibrate the bed on the four corners. Position the print heads at the center position and get a sheet of paper, or a spacer of 0.150mm. Place the spacer, or piece of paper, between the bed and nozzles. Unscrew the lower

thumbscrews of both heads, loosening both hot-end and dropping them on the spacer. Tighten both thumbscrews when both extruders are down on the spacer to level the both extruders.

8.6 CALIBRATE PURGE WIPERS

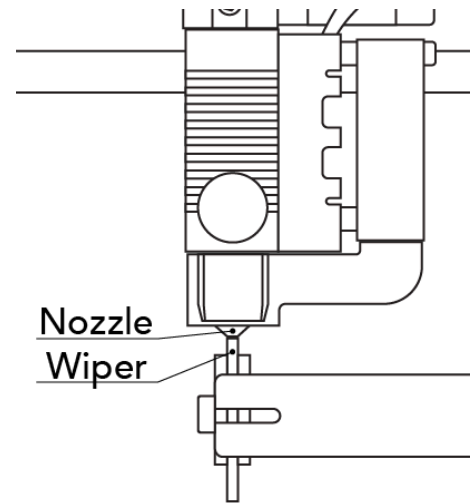
NOTE The wiper height should be calibrated when the customer receives their Bolt. If you think that the wipers aren't calibrated correctly, continue reading.

Before and after each layer, the Bolt will purge its nozzle to remove any excess filament to prevent oozing and leakage of filament on the printed part. The wiper height should be gently touching the nozzles.

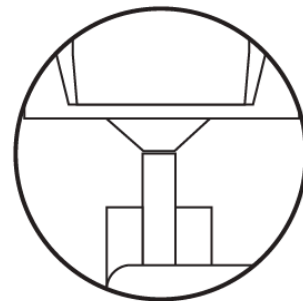
When the wipers are too low or too high, purging won't be effective, resulting in strings and oozing your printed parts which need to be removed afterwards.

To adjust the height of the wipers, you can unscrew the wiper from its holder. Then the wiper can be adjusted by either widening the hole in which it is fastened or cutting the top of the wiper to the correct height.

When the wiper is at the right height, fasten the screw holding the wiper in place.



Correct height:



9 CONTACT & ADDITIONAL SUPPORT

9.1 TECHNICAL SUPPORT INFORMATION

Obviously, there is a lot to 3D printing with the Bolt that we couldn't include in our User Manual. That doesn't mean that the information isn't available. We have already mentioned that we provide an ever-growing knowledge database that we like to refer to as 'Solution Articles.' If you've got a question or technical issue that we didn't answer in this manual, please feel free to go to:

<http://support.lpfgr.com/support/home> and start typing key words related to your question/issue in the search field on that page. This search field will start generating a list of articles usually before you're even finished typing.

If you find that there isn't an article related to your question/issue, we also have a ticketing system that, once you set up an account (which is a free, and fast process), you'll be able to open new tickets direct to our support agents, who are eagerly awaiting to assist you. In the ticketing system, up to 15MB of files can be sent per message allowing Technical Support to send you links, photos, videos, test G-code files, and more. You too could upload photos and videos of your technical issue to better describe what is happening. Customers have praised our ticketing system in the past as being fast, chat-like, and a quick method of resolving any questions or issues that they had.

We also offer live messaging chat - when agents are available - that can be accessed by logging into the ticket system.

Questions can also be answered over the phone. We advise you to create ticket beforehand and have you ticket number nearby. Simply give us a call: +31852080825 between the hours of 7:00AM - 3:30PM CET, Monday through Friday. At the time of writing this manual, we do not have a toll free phone number.

When leaving a message for a phone appointment, it is advised to have a ticket created as well.

9.2 CREATR SOFTWARE ASSISTANCE

You may also find that you need Technical Support for the Creatr Software (powered by Materialise) program. Materialise (the company) has asked us to remind you that you purchased the software through Leapfrog and are therefore our customers, not Materialise's customers. Therefore, please contact Leapfrog 3D Printers Technical Support or Order Support (depending on your question) if you need help regarding the software.

9.3 COMPANY INFORMATION

ADDRESS

Leapfrog 3D Printers
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2408 AW Alphen aan den Rijn
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ONLINE

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Twitter: https://twitter.com/Leapfrog_3D
Instagram: https://www.instagram.com/leapfrog_3d/
Youtube: youtube.com/c/Leapfrog3DPrintersBV
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