

Manual for:

Builder Extreme 1000 PRO

Builder Extreme 1500 PRO

Builder Extreme 2000 PRO

2020 models only

Version: 1



Get to know the Builder Extreme better by reading the manual carefully. The manual also informs you about the maintenance of the machine.



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Introduction

Thank you for buying the Builder Extreme. This high-quality, industrial 3D printer will allow you to build your prototypes and one-of-a-kind models in the quickest and cheapest possible way.

Be sure to only use print materials approved by Builder. If you experience any problems or need advice on material choice, please contact your local reseller or helpdesk@builder3dprinters.com.

This manual will help you:

- Install en start up your Builder Extreme correctly;
- Carry out preventive maintenance;
- Perform trouble shooting;
- Perform minor repairs;
- Get the most out of your machine.

We advise to start with smaller, simple objects and gradually proceed to printing more complex geometries.

Warranty

The Builder Extreme 3D printer is warranted to the original purchaser for a period of 1 year. The extruder head is warranted to the original purchaser for a period of 3 months from the original purchase date, only when the 3D printer is used with filament approved and delivered by Builder 3D Printers. The repair has to be carried out by Builder 3D Printers.

The warranty of the Builder 3D Printer will expire when the machine is:

- Damaged;
- Neglected;
- Immersed in water;
- Abused;
- Installed improperly;
- Disassembled;
- Serviced improperly.

If you experience any problems with your Extreme, please visit our YouTube channel which provides you with service videos that might help solve the issue.

<http://www.youtube.com/user/builder3dprinters>

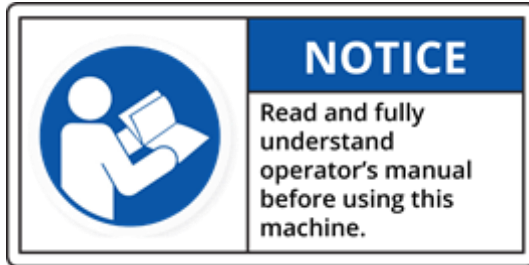
Safety warnings

Please take a few minutes to read the **safety warnings**. Also read the present manual, which helps you install your Builder Extreme and use it the way it is intended. This manual is setup in a way that it can be used for more than one model, so it applies to Extreme 1000 PRO, 1500 PRO and 2000 PRO. When there are differences between the models, this document will explain them for each type.

If you have any questions, please contact your local reseller or helpdesk@builder3dprinters.com

Safety Warnings (please read warnings before use)

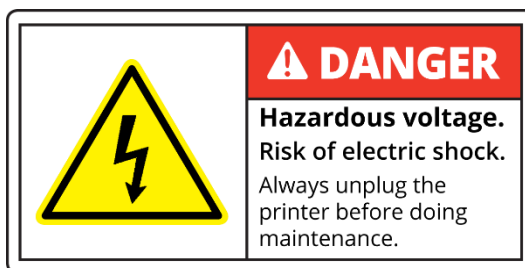
- Before using the Builder Extreme, read all the warnings and manuals.



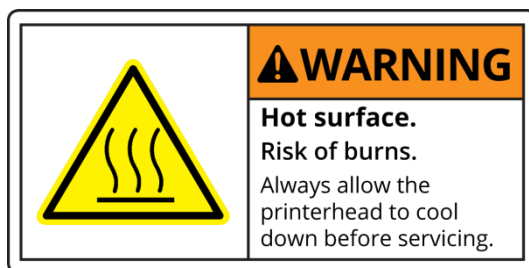
- Let only well trained personnel use this machine. Well trained personnel has experience with 3D printing and 3D printing machines. Builder 3D Printers can provide a training so machine and personnel have the skills to operate the Extreme. Please contact your local reseller or helpdesk@builder3dprinters.com
- Place the Builder Extreme on a concrete floor and set it level, so that the machine stands stable.
- Install the Builder Extreme in a room with sufficient ventilation.



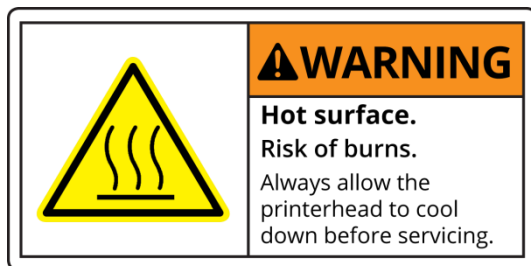
- **DANGER!** Do not open the electronics cabinet (access only by authorized personnel). Risk of electric shock which may result in serious injury or death!



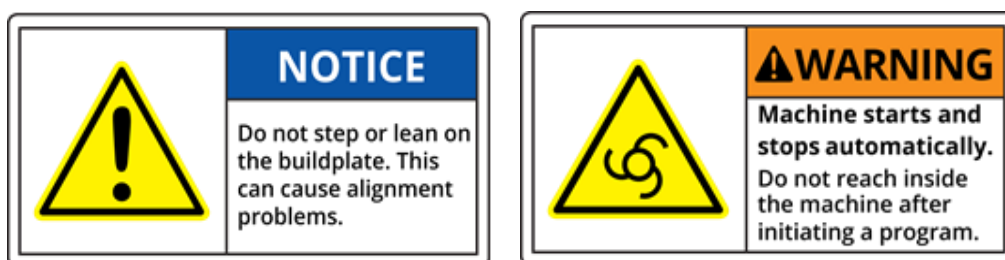
- **WARNING!** Before performing maintenance on the Builder Extreme or before making any adjustments to the machine, disable it by engaging the power off button. Beware! The print head and build plate can still be very hot!



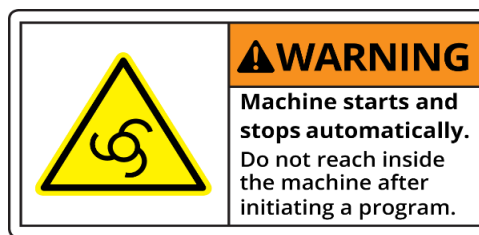
- **WARNING!** When the heater is on, the extruder (a nozzle, brass piece) is very hot!



- **WARNING!** When you want to replace the filament on top of the machine use safe work stairs.
- **WARNING!** Do not use flammable liquids inside or outside the Builder Extreme. If you want to clean the build plate **turn off** the power first, then you can clean the aluminium plate with a wet towel. When the build plate is dry, you can turn on the power.
- **WARNING!** Maintenance of the electrical and mechanical components can only be done by authorized personnel.
- **WARNING!** Do not lean in or step into the Builder Extreme.



- Do not use the machine for purposes other than printing parts.
- When the Builder Extreme is in operation, keep the doors of the machine closed.



- Use only Builder 3D Printers certified materials.
- **WARNING!** Turn off the power and wait for 15 minutes when you want to replace the extruder head. Be careful, this part is HOT!



- When the machine is operated 24/7, mount a working fire or smoke detector in the room where the Builder Extreme is installed.

If you are not sure what to do, contact the helpdesk.

helpdesk@builder3dprinters.com

Accessories

The Builder Extreme comes with the following accessories:

Extreme 1000 PRO	Extreme 1500 PRO	Extreme 2000 PRO
<ul style="list-style-type: none">• Paint roller set;• Level 60cm 2x;• Wood glue;• Heater block tool;• Nozzle tool;• Allenkey 2.5mm;• Nozzle 0.8mm;• Nozzle 1.2mm;• Set teflon tubes;• Power cord;• Quick-start manual;• Pressure plug 2x• Feeler gauge	<ul style="list-style-type: none">• Paint roller set;• Level 60cm;• Level 40cm;• Wood glue;• Heater block tool;• Nozzle tool;• Allen key 2.5mm;• Nozzle 0.8mm;• Nozzle 1.2mm;• Set teflon tubes;• Power cord;• Quick-start manual;• Pressure plug 2x• Feeler gauge;• Nylon wheels 4x	<ul style="list-style-type: none">• Paint roller set;• Level 60cm 2x;• Wood glue;• Heater block tool;• Nozzle tool;• Allen key 2.5mm;• Nozzle 0.8mm;• Nozzle 1.2mm;• Set teflon tubes;• Power cord;• Quick-start manual;• Pressure plug 2x• Feeler gauge;

Optional parts

- Spare print head;
- Fume extraction unit;
- Level gauge, for easy surface levelling the print bed;
- Grease gun for maintaining your Builder Extreme;
- Grease.

Please contact your local reseller or helpdesk@builder3dprinters.com for more information.

Installing the machine

Correct Surface

Be sure to place the Builder Extreme on a firm surface and be sure that there is more than 1 meter of space around the machine to perform future maintenance.

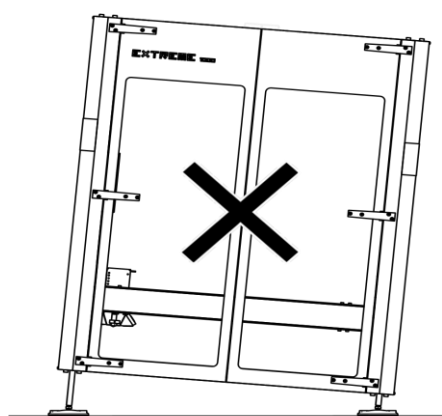
Installation

Levelling the printer is important for making good quality prints.

Make sure that the Builder Extreme is used in a surrounding temperatures between 15-32°C.

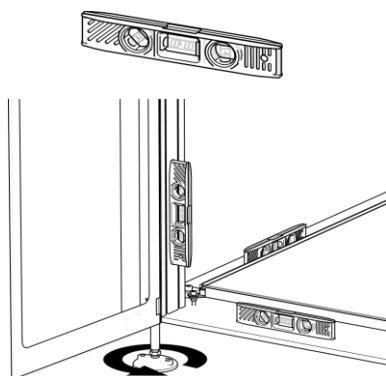
Level the printer

1. Place the printer on a stable floor and check if the printer is levelled



2. Spirit level

Level the printer with the included spirit levels. Check, and correct if necessary, all the three directions with the spirit level as shown. Correct the levelling of the machine using a wrench to move up or down the machine feet.



Extreme 1500 PRO wheels

Only the Extreme 1500 PRO is supplied with a set of wheels for easy transport through doors and in elevators. Move up the machine feet so the wheels can be mounted under the machine. Lower the machine feet so the wheels are on the ground and the machine can easily be transported to the final location. The machine can be levelled, be sure the wheels do not touch the ground after levelling.

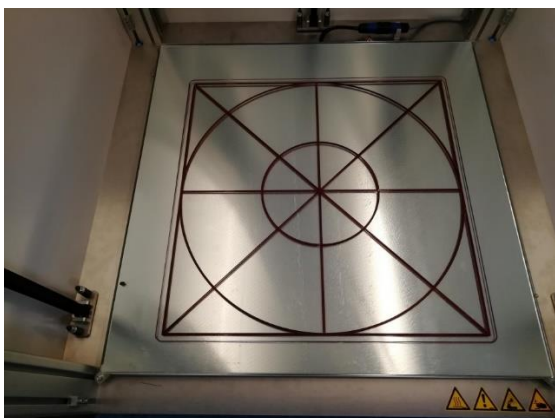
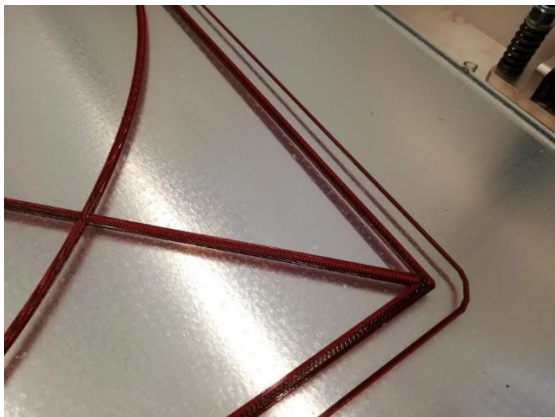
Switching on the battery pack

When the machine is levelled, the battery pack has to be switched on, using the switch on the battery pack. A green led in the battery pack indicates if the battery pack is activated. In Extreme 1000 PRO/1500 PRO the battery pack is behind the control box. The battery pack in the extreme 2000 is located in the top drawer.

Bed levelling

To get a good first layer the print frame and build plate have to be parallel in both the X-and Y direction. This was already adjusted during fabrication of the machine, but has to be checked after transport and installation.

Perform a surface test. The standard G-code is uploaded into the internal memory of your machine. If the surface test is ok, the machine is ready to use. The surface test is ok, when the test print looks like the pictures below and it sticks firmly to the build plate.



An indication that the nozzle is too far from the build plate is when the surface test does not stick to the build plate.

An indication that the nozzle is too close to the build plate is if no material is coming out of the nozzle.

Both indications suggest that the first start height has to be adjusted. That can be done using the “set z offset” menu.

Home screen → settings → Service → customer → Set Z-offset

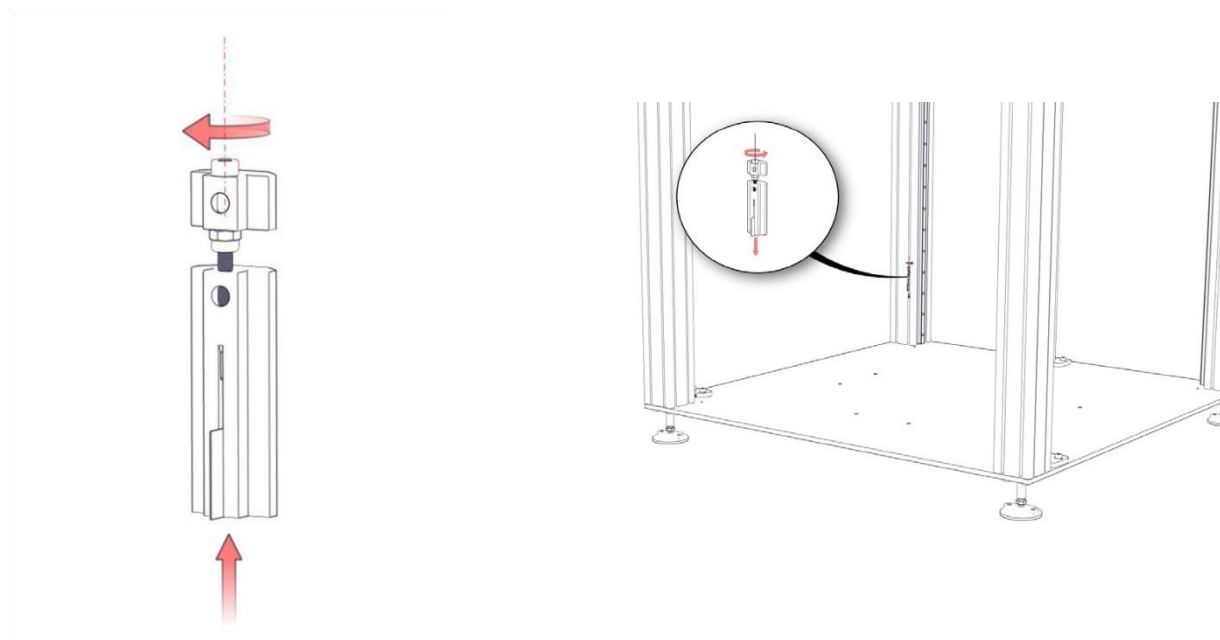
Missing lines in areas of the surface test indicate that the print frame is not parallel to the build plate.

How to adjust the print frames parallelity to the bedframe

The machine uses 3 pcs. Z-sensors mounted in the print frame. These sensors determine the Z-axis home position. These sensors are triggered by adjustable flags in the poles of the main frame. Two flags are located in the left- and right front poles, one flag in the left rear pole of the mainframe.

The virtual surface that is made by these three flags, has to be parallel to the build plate. If in doubt, please contact Builder3dprinters.

These flags can be adjusted in height so the parallelity can be corrected.



Looking from the top position:

- Turn clockwise and the nozzle moves away from the build plate
- Turn counter-clockwise and the nozzle moves closer to the build plate;

For every complete turn of the flag, is a 0.5 mm displacement of the print frame relative to the build plate

If there is an adjustment needed, do not adjust more than 1/2 of a turn at a time.

Adjust the flags on the side of the build plate where the bed level adjustment is needed.

Example: If the back of the print frame needs to go up relative to the bedframe, the rear flag has to go up. Turn the flag clockwise.

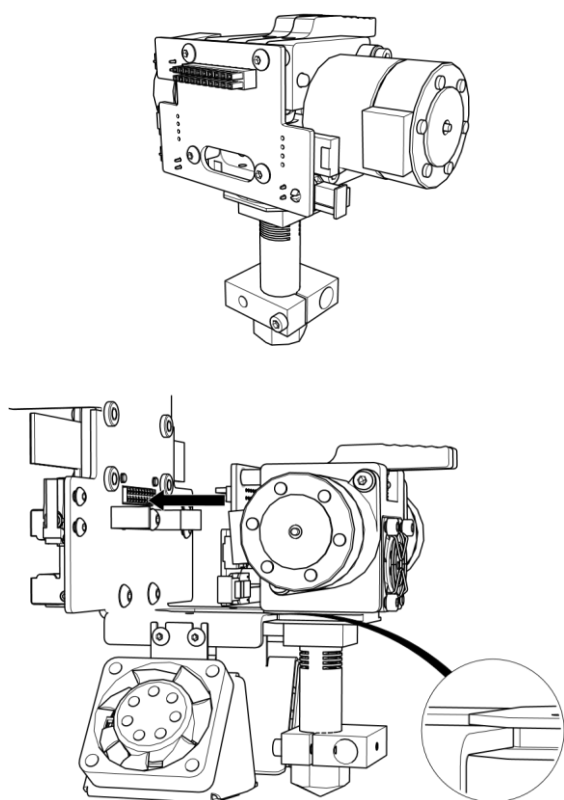
After adjusting the flags, always perform “Auto home”. Then the machine is in its new adjusted position!

Dual print head

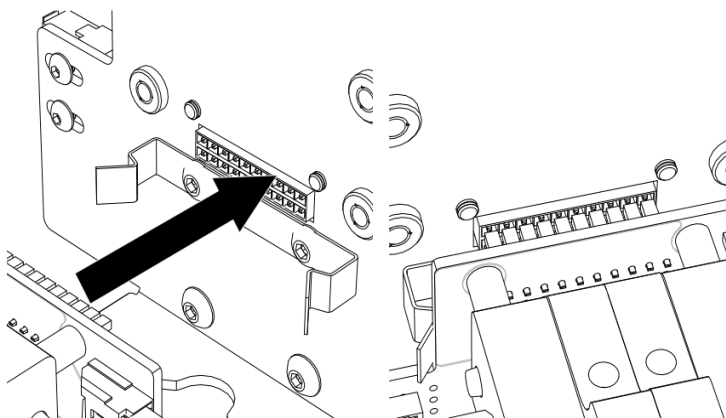
Warning! Make sure that the head is cooled down before maintenance is performed on the head!

For easy maintenance, it is possible to remove the print head from the print head frame.

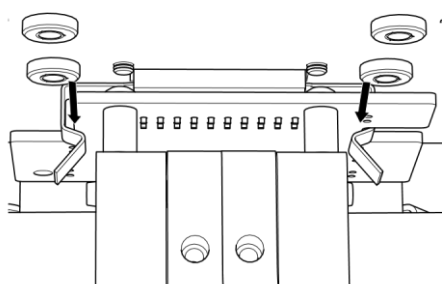
Use the “replace head” option in the “Customer”→ “Service” menu before changing the print head.



Be sure the connectors are aligned in front of each other. Push the print head until the connectors merge into each other.



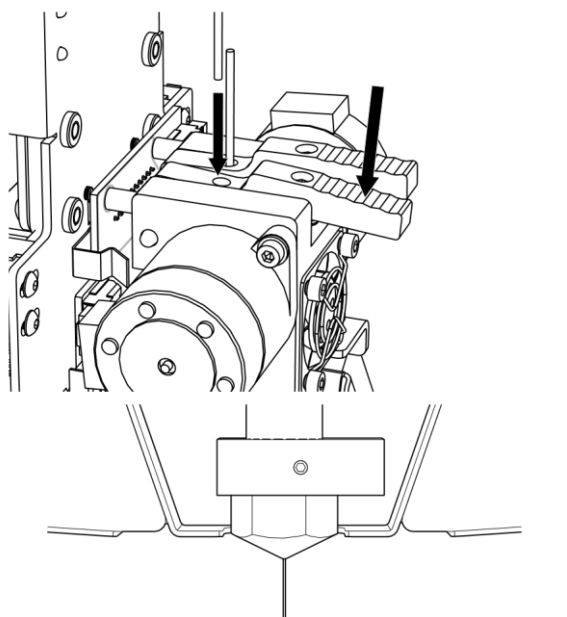
Check if the clips are snapped into place



Make sure when printing with the Dual-Feed both extruder holes are filled with a filament.

Inserting filament

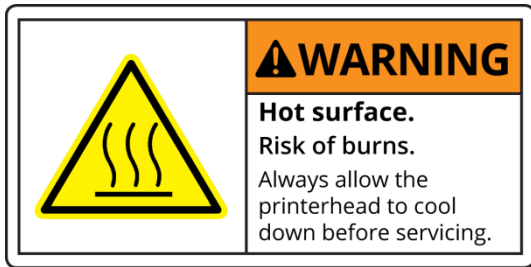
Be sure the print head is pre-heated. Push down the button and insert the filament until you feel some resistance. Now insert the second filament by doing the same. Keep pushing the buttons, and then push down the filament until it comes out of the nozzle. Do this with both filaments.



Adjusting the screws in the buttons, using a 2.5 mm Allen key, the pressure on the filament by which it is pressed against the extruder wheels can be adapted. These are adjusted during the fabrication process, so normally they do not need adjustment. Turning clockwise increases the pressure, turning anticlockwise will decrease the pressure on the filament.

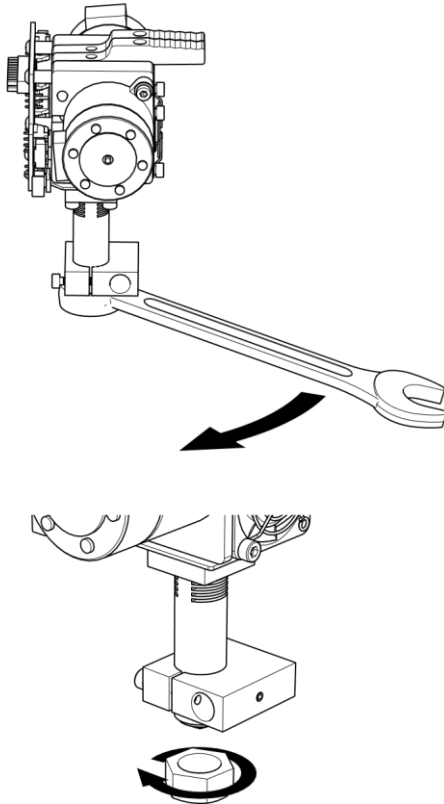
Changing nozzle

Be careful when performing any work on a heated print head!



Preheat the nozzle.

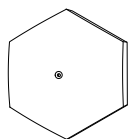
Remove the nozzle using a 17 mm wrench or the included tool.



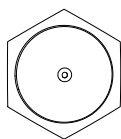
Mount the new nozzle the reverse way of taking it off. Be sure the connected surfaces are clean. Tighten the new nozzle, do not do it too strong (no more than 7Nm). Check the nozzle for the right torque when it is pre-heated.

Nozzle diameters

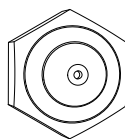
The nozzles are marked on the top of the nozzle.



0.4 mm



0.8 mm



1.2 mm

When using nozzles 0.8 and 1.2 mm be aware the extrusion speed needs to be very high. To avoid under extrusion tighten the pressure screws in the levers.

First layer height

The first layer height depends on the size of the nozzle. Here are a few examples for the different nozzle sizes:

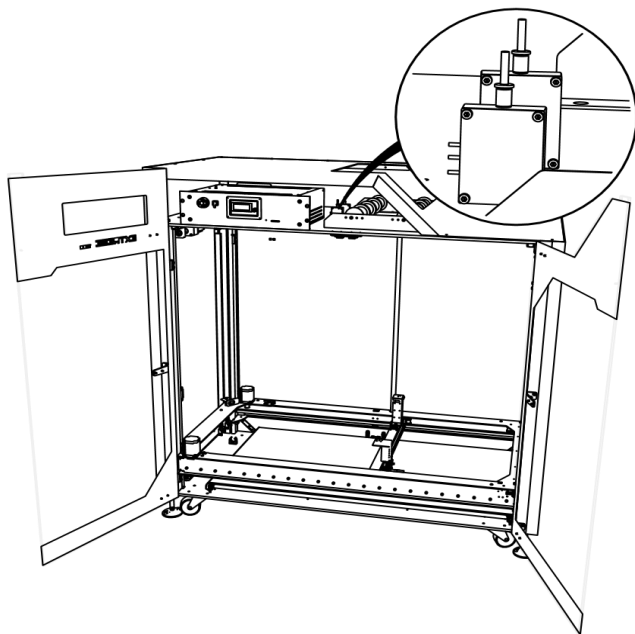
Nozzle 0.4 mm	First layer 0.3 mm
---------------	--------------------

Nozzle 0.8 mm	First layer 0.6 mm
---------------	--------------------

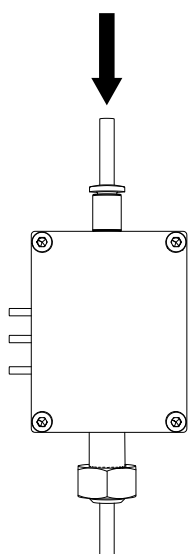
Nozzle 1.2 mm	First layer 0.8 mm
---------------	--------------------

Filament detection

The machine is equipped with filament detection. It detects the moment when there is no filament in one of the detection units and activates the sounds signal. The Extreme 1000 PRO and 1500 PRO have the detection on top of the machine. The Extreme 2000 PRO has the detection in the filament draw.



When inserting filament in the machine, push the filament through the filament detection unit and insert the filament in the print head. The printer will now detect the filament. If one of the extruders runs out of filament the printer will automatically pause and move to a pause position where it will wait for the user to enter new filament. Press the button to preheat and change filament. Then push the button to restart the machine.



Start Printing

Auto home

When you power up your Extreme, the machine has to be auto-homed. You can only move the machine when this action is done.

Adhesive layer

For perfect adhesion between your print and the aluminium build surface be sure that the layer of glue is in perfect state. Check this before the start of every print. The layer of glue has to cover the complete surface of the build plate. If the layer is not covering the complete build surface, apply a new layer using the supplied paint roller set and the wood glue. Put 1/3 glue and 2/3 water into the paint roller set and give it a good mix. Before applying the glue to the build plate, pre-heat it to 50°C, then apply the glue to the build surface using the paint roller. **Apply an even coat and be sure that no glue is coming under the aluminium build plate!**

Preheat

It can be convenient to pre-heat the Extreme Builder when in the mean time doing some preparations before starting the actual printing process. Pre-heating can be done using the user interface.

Timeout heater

When the machine is not used for 30 minutes, the machine stops heating. The print head stops heating after 30 minutes, the heated bed after 3 hours. After your print is finished, all heaters will stop heating automatically.

G-code/Slicing

To start printing, the printer needs a G-code file. The G-code can be generated by a so called slicer. We advise to use Simplify3D. The possible input file types for slicing software are: STL/OBJ/AMF/DAE files. To generate the correct G-codes for the Builder Extreme printers there are printer-profiles that can be downloaded from the Builder3dprinters.com website. Be sure to use the profile that fits your type of machine, nozzle diameter, materials, etc. When a G-code file has been generated it can be put on an USB-stick or send to the machine via Wi-Fi using the Builder web portal.

Exclusive G-code command for the Builder dual extruder:

- **G93 Rxx: You can adjust the ratio of the 2 extruders in the G-code. Put this code in after the last tool change, before the printing starts, see example below.**

```
G28 ; home all axes
M204 S1500 ; default acceleration
M205 X15.00 ; maximum X Y jerk
G92 E0
G1 E-3.0000 F900
G1 Z0.420 F1998
; process Materiaal collorfab
; layer 1, Z = 0.420
T0
; tool H0.420 W0.576
; skirt
G93 R50
G1 X72.545 Y76.018 F9000
G1 E0.0000 F270
G92 E0
G1 X72.555 Y76.008 E0.0015 F3360
G1 X74.748 Y73.914 E0.3217
G1 X74.758 Y73.804 E0.3222
```

When using 1 color/material, always use both extruders 50/50% to prevent clogging the nozzle!

Be sure the build plate is cooled to room temperature before removing a finished object!

We do not recommend to print multiple objects in one print. If failure occurs, all the object will fail and the time that is won by printing multiple object is minimal.

UPS function, power fail

The UPS function activates when the main power supply fails.

Detection takes place on/after: Power failure and resumption.

Battery pack needs to be charged. The battery will be charged when the main power switch is on, this is indicated by the led in the front panel.

When the main power is off the battery will not be charged!

Be aware that it takes a few ours to recharge the batteries when the machine is not used for a couple of days.

1. Time interval detection "POWERFAIL_DELAY" is set to 10sec.
2. After 10 seconds, a "POWERFAIL" popup appears on the screen
3. The internal buffer is completed.
4. The print is paused.
5. The printer goes to $Z = Z + 10\text{mm}$
6. The position is saved
7. A power fail restore file is created.
8. The Home screen status changes to "Powerfail!"
9. Once the power is restored, the print head a bed will start heating. Once the current temperature > target temperature-3 the print will continue. The print will automatically continue without any user interaction needed.
10. After the power returns, the printer deletes the powerfail restore file.
11. If the battery is empty and power has not yet been restored the printer will shut down. Once you reboot and press the print button in the home screen, you get a message: "powerfail has been detected". You have the option to continue the print in this menu. If you click "cancel", the restore file is deleted and continuing the failed print is no longer possible.

If the bed is cooled down to <40°C please check if the object is still stuck to the bed!

***Note : When printing from USB the print progress will be saved and after a power shutdown. The print can be resumed from the user interface. Resuming the print is not possible from the Builder web portal however!**

File data:

The power restore file contains following:

- The name of the file which was being printed.
- The restore file also contains the line (position) of where the print should continue.
- The current values of temperature, ratio, speed, federate, position, fan speed.

Maintenance

Maintenance schedule

	Every print	daily	weekly	monthly	Quarter	Annually	2 years	Hours
State of the adhesive layer of the build plate	X							
Bed levelling (surface test)				X				
Checking the function of the work piece cooling fans				X				
Check the filament detection function				X				
Cleaning the doors					X			
Greasing guides x/y axes								1000
Greasing the z axes								2000
Check the UPS function*					X			
Replace battery pack							X	
Cleaning filter electronic box					X			
Replacing filter of electronic box						X		
Check if the emergency stops functions					X			

* If the machine does not have a power supply for more than one week, switch off the battery pack behind the filament spool holder.

Trouble shooting

Problem	Solution
No power	Is the power cable connected
Blocked nozzle/channel	Nozzle too close to the build plate (0.25mm), check bed levelling
	Always use 2 channels, 50/50
Bad print quality	Using the wrong nozzle diameter
	Using wrong print settings, temperature, speed, etc.
	Using wrong material
Blown fuse	Contact Builder 3D Printers (or the local reseller)
Machine cools down	If the machine is heating too long without being used, the heaters will stop heating.
Machine does not start printing	Surrounding temperature is too low, <5 °C

Dual print head maintenance

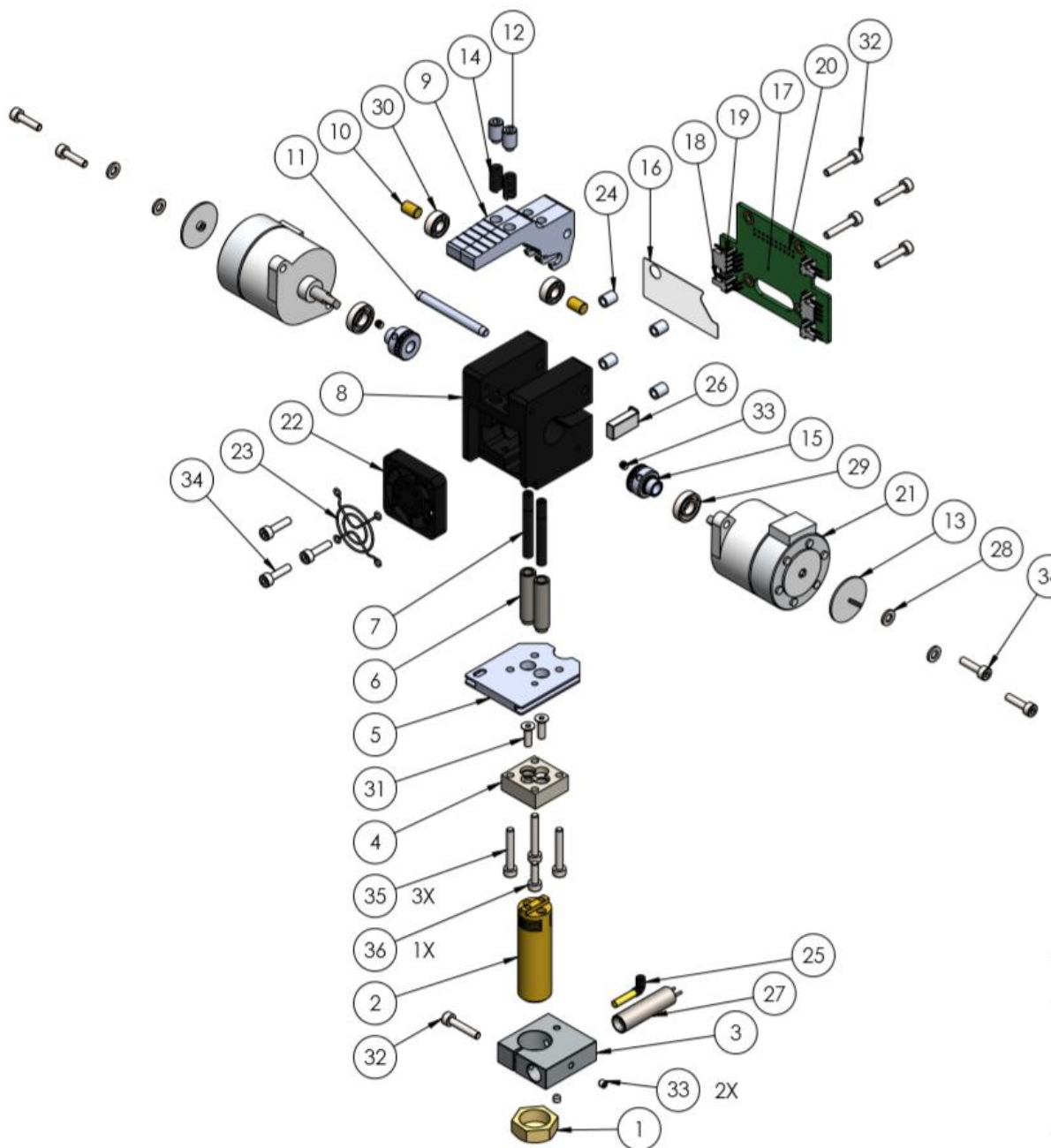
Between 1000/2000 hours the dual print head needs to be maintained. Depending on what materials are being printed.

If there are no obvious problems we advise to change the following parts, namely:

- Nr 7, tubes;
- Nr 4, thermal barrier.

If the print head is blocked we advise to also change the following parts, namely:

- Nr 1, nozzle;
- Nr 2, coupler.



Attachment

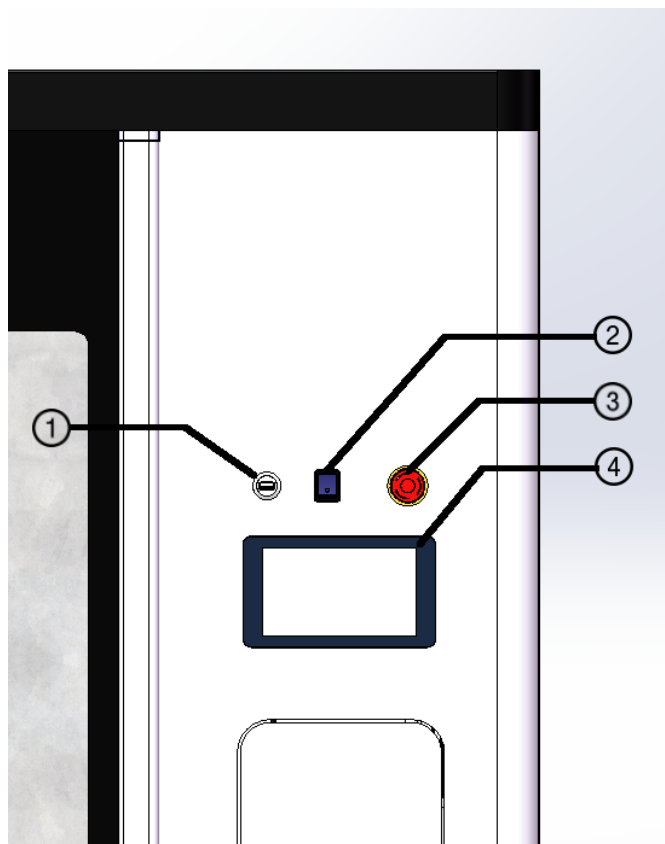
Technical specifications

Specifications	Extreme 1000 PRO	Extreme 1500 PRO	Extreme 2000 PRO
Technique	FDM/FFF		
Resolution	Low quality : 0.9 mm Normal quality: 0.4 mm High quality: 0.2 mm		
Position accuracy stepper	X: 10 micron Y: 12.5 micron Z: 2.5 micron		
Build Volume LxWxH	700x700x820	1100x500x820	700x700x1700
Printer external dimensions LxWxH	1006x1016x1500	1501x800x1500	1343x1072x2190
Weight	225 kg	225 kg	262 kg
Frame material	Aluminium		
Print bed (platform)	(Heated) Aluminium		
Certification	CE		
Surrounding operating temperature in °C	15-32°C		
Storage temperature in °C	0-35°C		
Operating nozzle temperature in °C	180-260°C		
Heated bed temperature in °C	Max 60°C		
Filament diameter	1.75mm		
Maximum print speed	300 mm/s		
Maximum travel speed	500 mm/s		
Nozzle diameter	0.4/0.8/1.2*		
Removable print head	Yes		
Power supply	AC 100-240V 50/60Hz		
Power consumption	800-1800W		
Connection	WIFI		
Data reader	USB stick		
CNC programming Language	G-code		

*for the nozzle 1.2 mm, maximum print speed depends on the shape of the product.

User Interface

Via the user interface the machine can be controlled. Attached to this document is the menu structure and the description of this menu.



1. USB

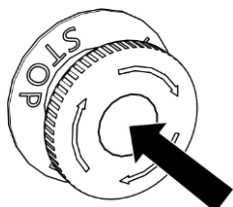
Insert a USB card with the G-code.

2. On/off switch

The on/off switch turns the machine on/off. The machine can only be switched on when the main power is on indicated by the LED light.

3. Emergency button

Pushing the emergency button in case of an emergency situation will shut off the power of the printer. Rotate the emergency stop to deactivate.



4. User interface

Used to control the printer with a touch screen.

Homescreen

Printer idle:

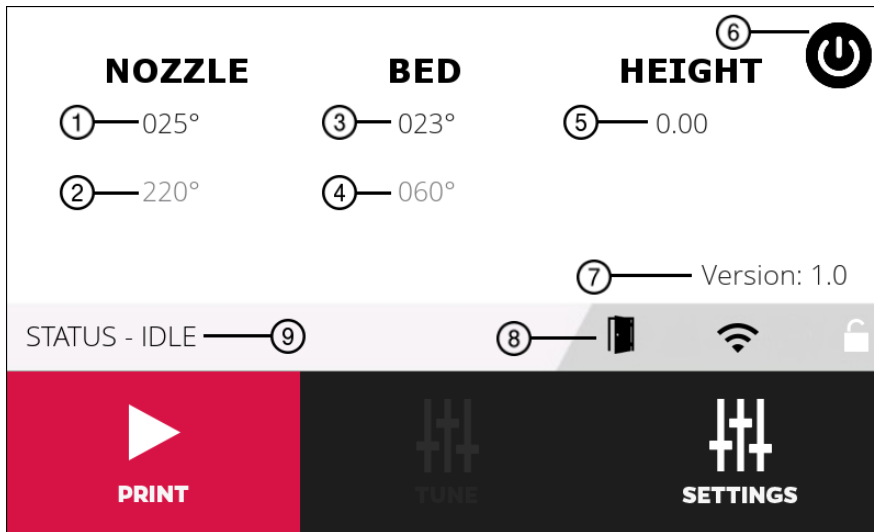
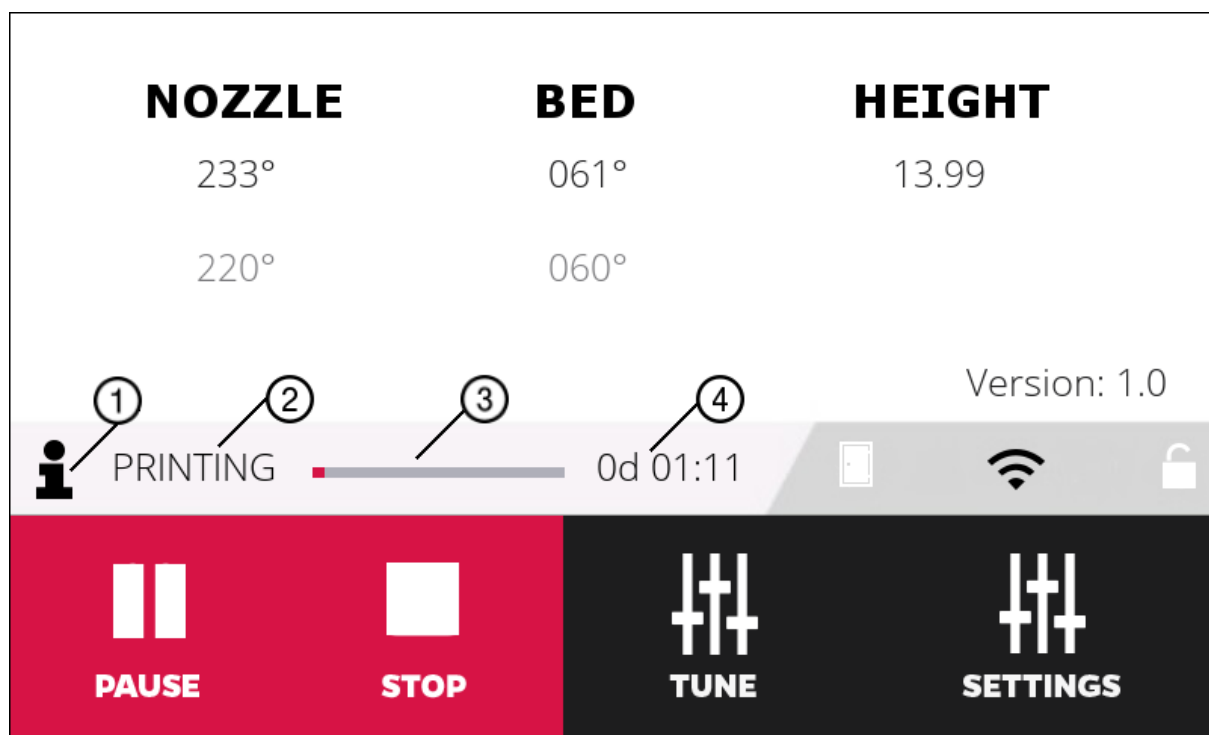


Figure 1: Home screen when idle

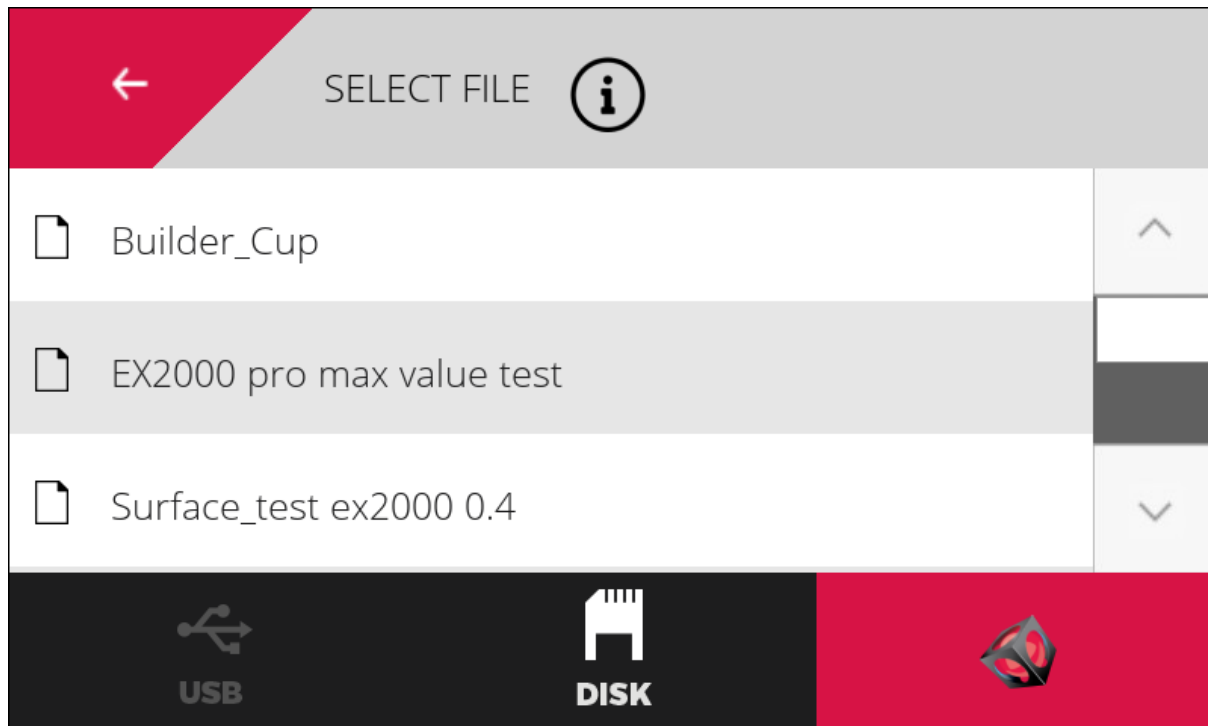
1. Nozzle current temperature
2. Nozzle target temperature
3. Bed current temperature
4. Bed target temperature
5. Current height of the printer head
6. Shutdown-button
7. Current software version
8. Icon bar, from left to right:
 - a. Door icon, use it to open the door. The icon will turn grey when the printer is printing.
 - b. Network icon, active if the printer has a network connection, either WIFI or Ethernet. If you press the icon you will get a qr_code to scan with your phone. This will load the browser application to control the printer.
 - c. Lock icon, active when printer is locked. If you press the icon you will move into the lock screen.
9. Current printer status. This status message will show what the printer is doing. It will also show error messages when something is wrong.

Printer printing:

1. Info button, press it to see current print file
2. Printer status
3. Progress bar. Fills up when printing, print done when full.
4. Time since print started

Select file:

If you click the print button in the home screen you go to a file selection screen. You can select which print file you want to use in this screen.



On the bottom there are 3 icons:

- USB
- DISK
- Builder Logo

USB:

These are the different file locations. If you wish to print a file from USB you click the USB icon. You can now select a file from the USB drive. Once you selected a file, this file will now copy to the SD-card of the printer. The print will start when the copy is done.

As soon as the printer starts printing, you can remove the USB-drive.

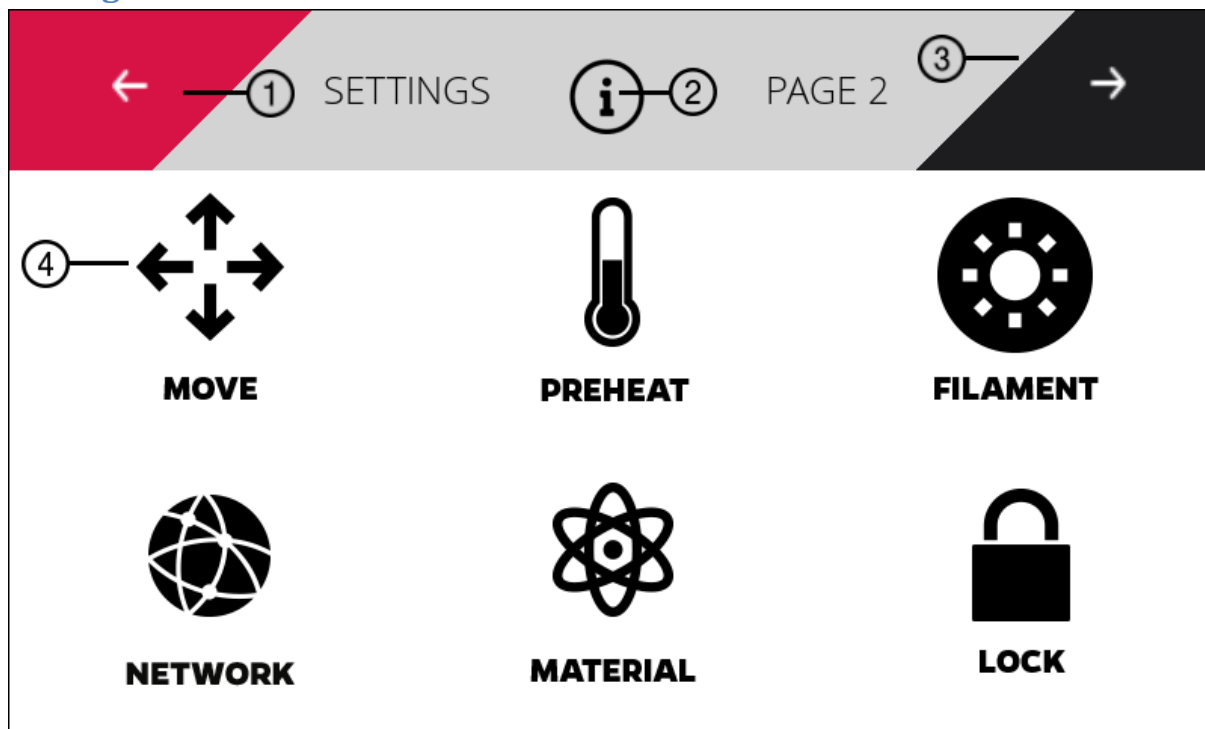
DISK:

This is the local storage of the printer. There is about 25GB of free space for the user's gcode-files.

Builder Logo:

These are the Builder default print-files. These are often used to test the printer, and if the user ever needs support, we might use one of these default print files to test whether the problem is located in a gcode file or the printer. These files cannot be deleted.

Settings:



1. Back button, return to previous screen
2. Information button, gives you useful information about the current screen. Can be removed in configure menu (screen settings page 2).
3. Next button, go to page indicated to the left of the button (page 2 in this case).
4. Click the different icons to move to the menu mentioned (move menu in this case).

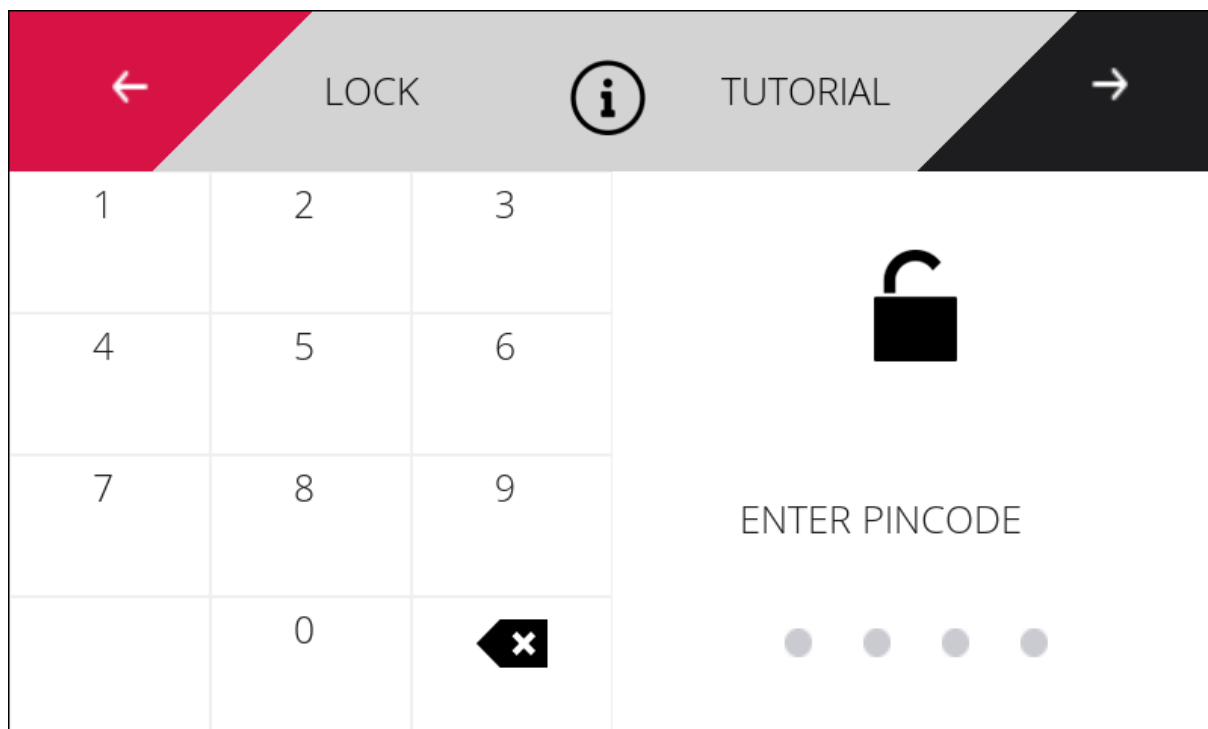
The different setting menus:

- **Move** – move the nozzle.
- **Preheat** –set the desired temperature for the bed and nozzle here
- **Filament** –extrude and change filament
- **Network** – select a WIFI connection. You can also see your Wifi and Ethernet IP-address here.
- **Material** – select the material you wish to use here.
- **Lock** – locks the printer to make sure it can't be touched while printing.
- **Tutorial** – help videos
- **Camera** – shows you a view of the webcam image
- **Light** – set brightness and turn lights on/off
- **Configure** – various configurations for your printer
- **Info** – general information about your printer

Note: While printing several menu options are disabled.

Settings windows:

Lock



The image shows a lock screen interface. At the top, there is a header bar with a red left section containing a white left arrow, a grey middle section with the word "LOCK", an information icon (i in a circle), the word "TUTORIAL", and a dark grey right section with a white right arrow. Below the header is a numeric keypad with four rows: the first row has 1, 2, 3; the second row has 4, 5, 6; the third row has 7, 8, 9; and the fourth row has an empty space, 0, and a black button with a white 'x'. To the right of the keypad, there is a large black padlock icon, the text "ENTER PINCODE", and four grey dots representing a progress indicator.

Enter a code twice to lock the printer. You can unlock the printer in this menu afterwards by entering the same code again. If the printer is locked, the browser is also locked.

When the printer is locked you are not able to perform any action until the printer is unlocked again.

Material:

←

MATERIAL

ⓘ

LOCK

→

Printmaterial: PVA

Material:	NozzleTemp:	BedTemp:	^
ANY	0-300	0-80	
PLA	200-230	40-70	▼

The material window is used to protect users from mistakes in their gcode-files.

If a gcode file is used with a nozzle temperature setting of 100°C and PLA is used as material, the print would normally fail. If you have **print assistance** enabled in the configure menu and selected PLA as the material to use, the software will recognize that 100°C is too low to print PLA and correct the print temperature to the average of the boundaries (in this case 215°C).

To disable this function, either disable **print assistance** in the configure menu or select “ANY” as printed material.

Network:

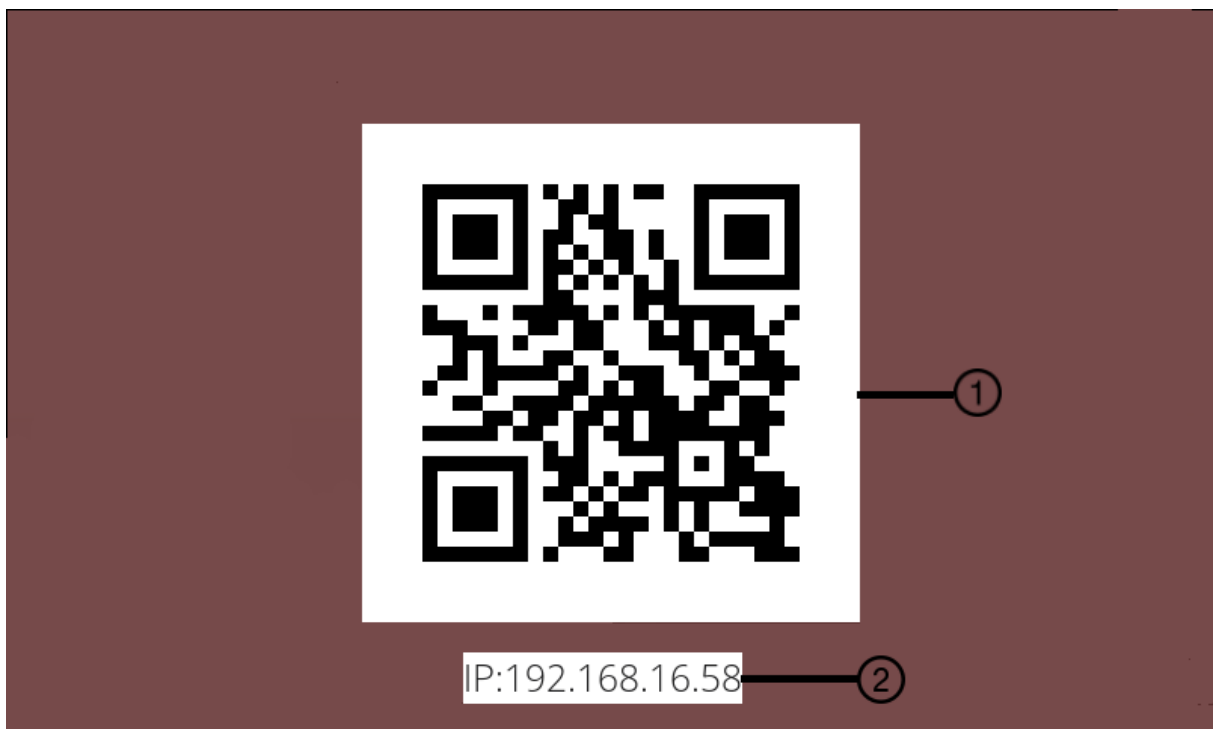
To log into the printer remotely from a browser the printer needs to be logged into the same network as the device you wish to use.

To connect the printer to a network via Ethernet plug in the Ethernet cable.

To connect the printer to a network via WIFI go to the network screen in options and select WIFI. In this screen you can select the network you want to use and enter the password.

Once the printer is connected to a network the printer has an IP-address. The printer can have two IP addresses simultaneously if it is connected to both WIFI and Ethernet. You can view the IP address of your 3D printer in the main screen's status bar. If you click the WIFI icon in the main screen you see an image of a QR-code. On the bottom of this page you can also see the IP-address.

If an Ethernet cable is used, the ip shows will always be the Ethernet-IP address.

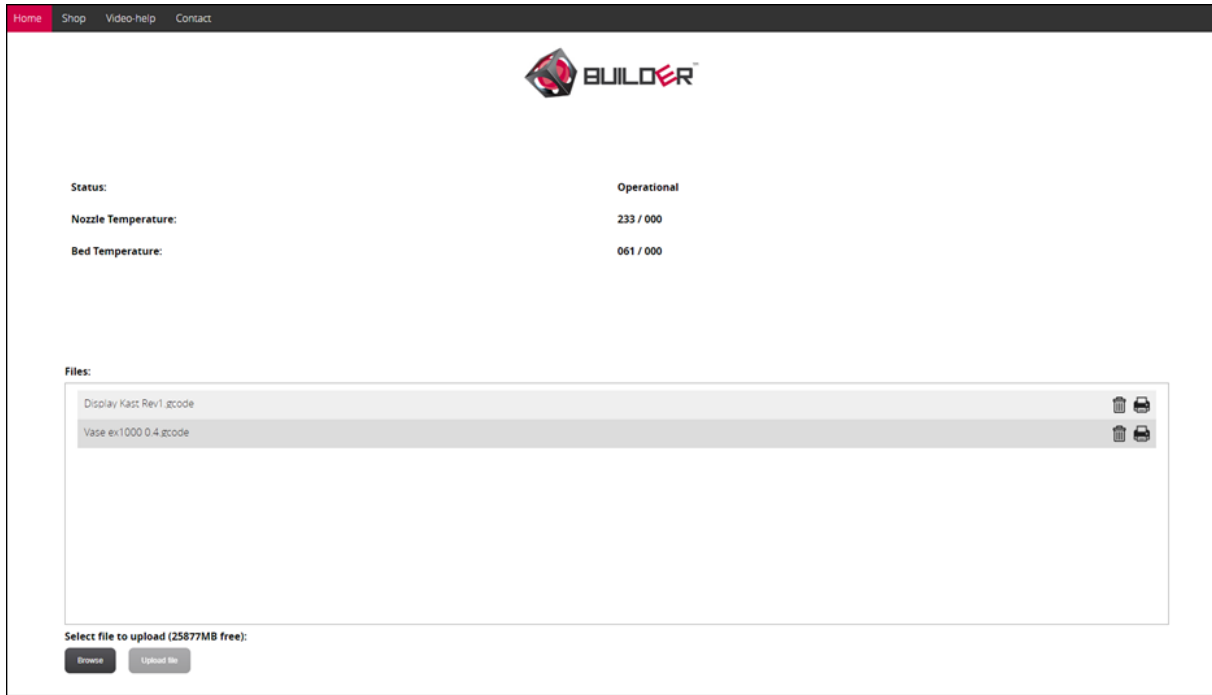


1. QR-code to scan with a phone.
2. IP address

Scan the QR-code on a phone and open the corresponding page in a browser to enter the printer's browser page. You can also enter the IP address manually into any internet browser.

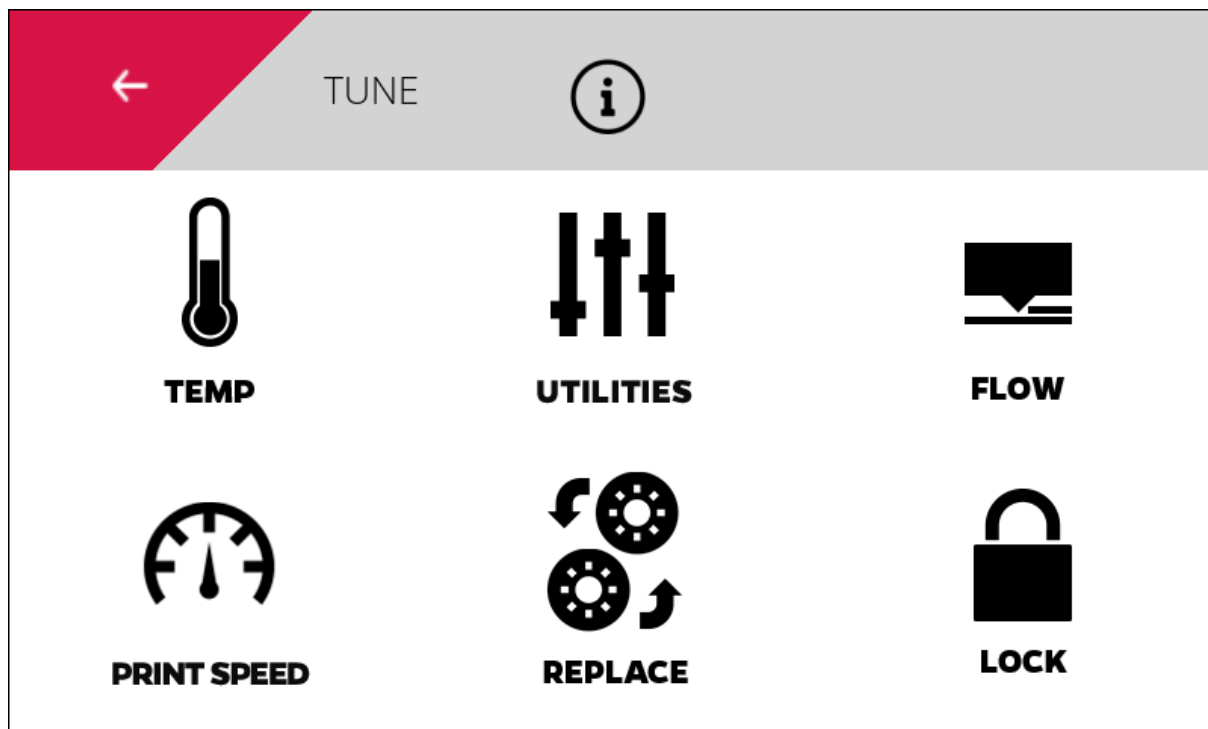
Note: make sure the device is connected to the same network as the 3D printer.

The browser should show the following site:



In this screen the user is able to start or stop a print. You can also add or delete files. At the bottom of the page there is a live webcam image of the print.

Tune Menu:

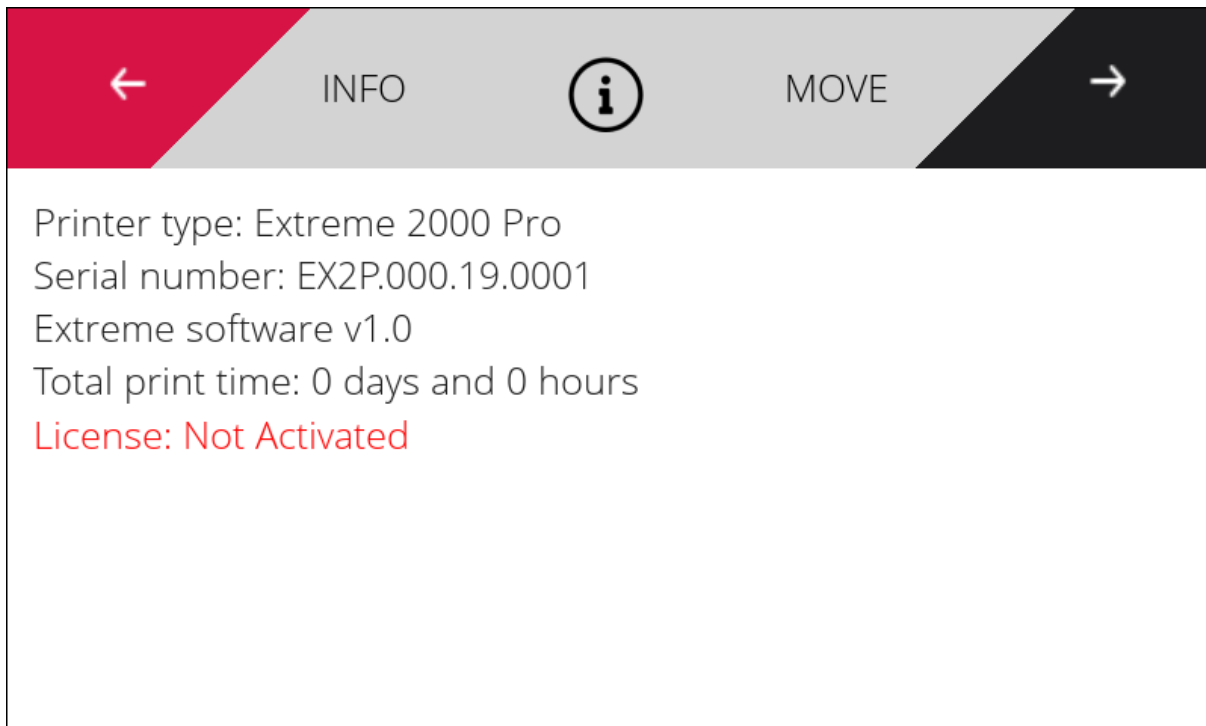


- **Temp** – set temperature for bed and nozzle
- **Utilities** – change fan speed, extraction or turn lights on/off
- **Flow** – change the amount of filament used and which nozzle is used
- **Print speed** – change print speed
- **Replace** – replace filament used
- **Lock** – lock the printer

License:

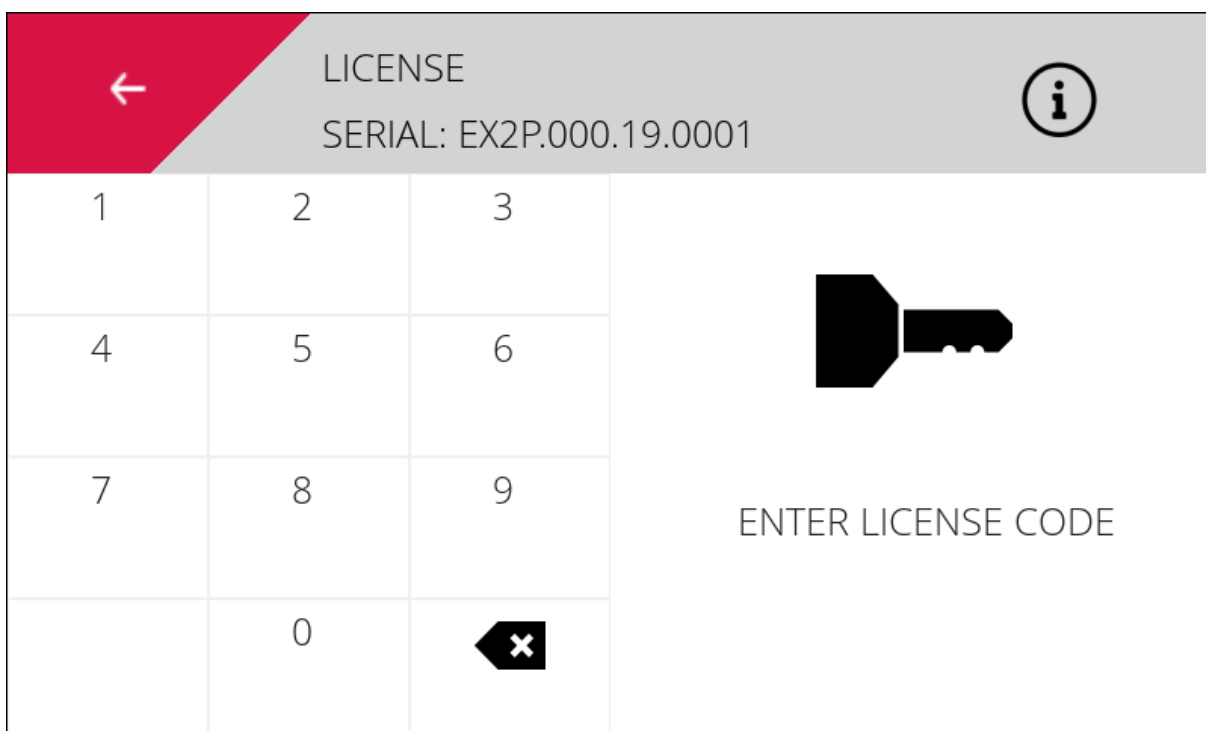
After you have paid for the Builder 3D printer you will get a license code. This code can be used to activate your printer. If you do not activate your printer it will stop working after printing seven days.

To check if your printer has been activated you can go to the info screen in the settings menu.

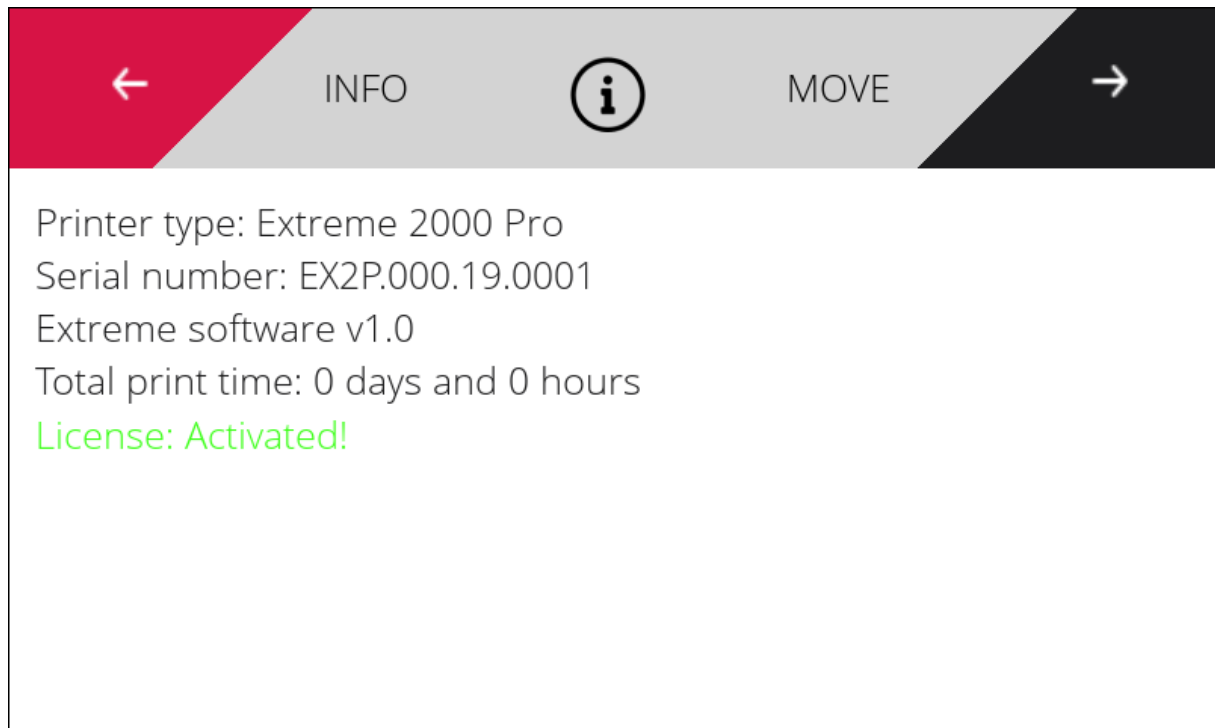


On the bottom of this window you see the red text: License: Not Activated.

To activate your printer go to the service menu. Click customer and 'Enter License'.



You can enter your license code in this screen. If the code is valid, the printer is now activated! You can check this in the info menu. The red text will now be green and read: License activated!



Machine notifications:

Notifications	Meaning
"STATUS - IDLE"	Machine is ready
"PAUSED"	Printer paused
"PRINTING"	Printer printing
"HEATING"	Printer is heating
"EMERGENCY"	Emergency button pressed
" FILAMENT"	No printer filament detected
"POWERFAIL"	No power supply

Additional information

G-code list

Gcode	Meaning
G0,G1	Coordinated Movement X Y Z E
G28	Home all Axis
G90	Use Absolute Coordinates
G91	Use Relative Coordinates
G92	Set current position to coordinates given
G93	Set color ratio Rxxx .x (percentage front/left extruder)

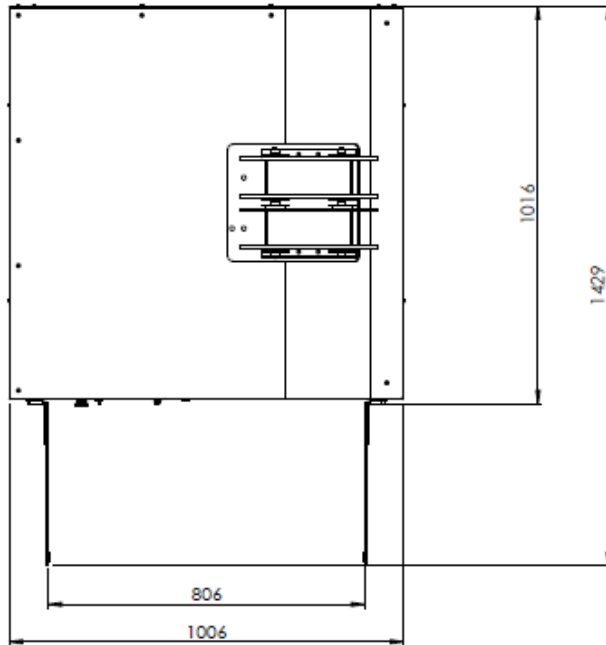
M-code list

Mcode	Meaning
M17	Enable/Power all stepper motors
M18	Disable all stepper motors; same as M84
M35	Select Remote printing with AstroBox and block sd-card menu
M36	Deselect Remote Printing
M82	Set E codes absolute (default)
M83	Set E codes relative while in Absolute Coordinates (G90) mode
M84	Disable steppers until next move
M104	Set extruder target temp
M105	Read current temp
M106	Fan on
M107	Fan off
M109	Sxxx Wait for extruder current temp to reach target temp. Waits only when heating Rxxx Wait for extruder current temp to reach target temp. Waits when heating and cooling
M114	Output current position to serial port
M140	Set bed target temp

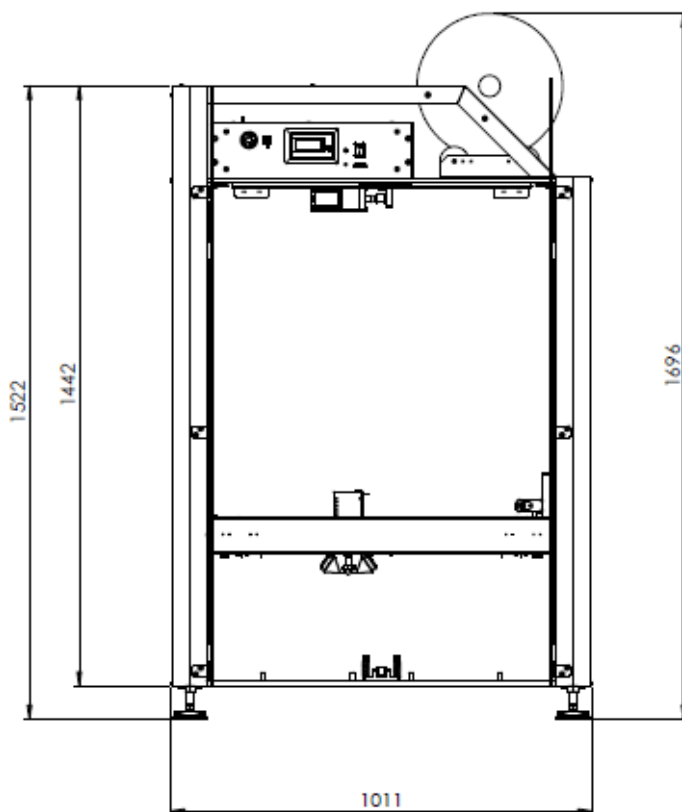
M190	Sxxx Wait for bed current temp to reach target temp. Waits only when heating Rxxx Wait for bed current temp to reach target temp. Waits when heating and cooling
M201	Set max acceleration in units/s ² for print moves (M201 X1000 Y1000)
M203	Set maximum feed rate that your machine can sustain (M203 X200 Y200 Z300 E10000) in mm/sec
M204	Set default acceleration: S normal moves T filament only moves (M204 S3000 T7000) in mm/sec ² also sets minimum segment time in ms (B20000) to prevent buffer underruns and M20 minimum feed rate
M205	Advanced settings: minimum travel speed S=while printing T=travel only, B=minimum segment time X= maximum xy jerk, Z=maximum Z jerk, E=maximum E jerk
M207	Set retract length S[positive mm] F[feed rate mm/sec] Z[additional zlift/hop]
M220	S<factor in percent>- set speed factor override percentage
M221	S<factor in percent>- set extrude factor override percentage
M302	Allow cold extrudes, or set the minimum extrude S<temperature>.
M999	Restart after being stopped

Machine drawings

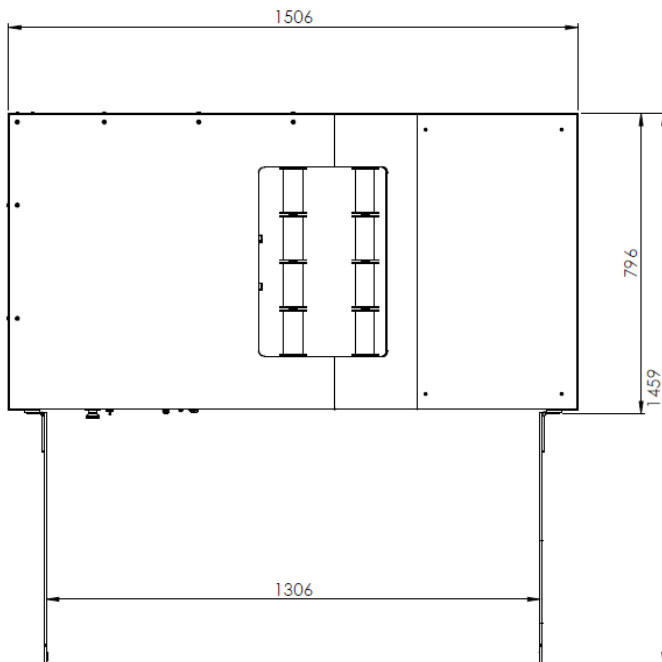
Extreme 1000 PRO - top view, door open



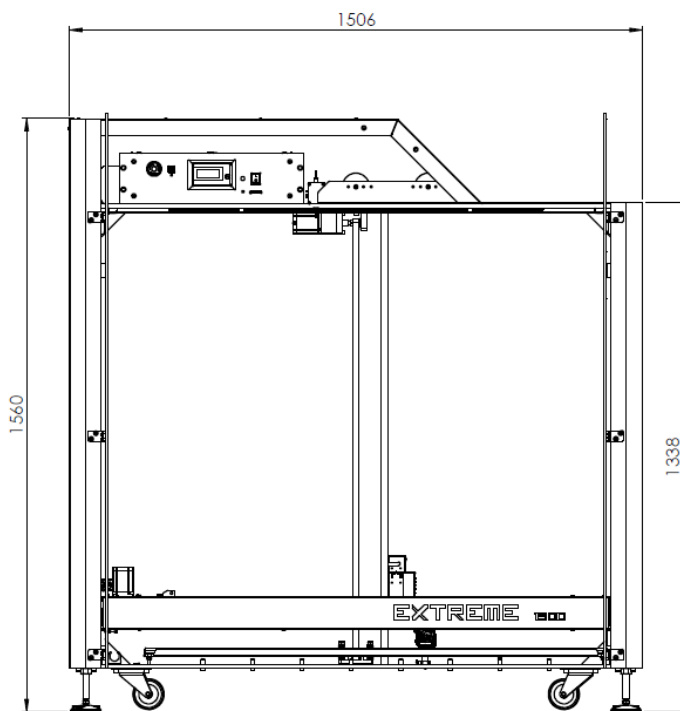
Extreme 1000 PRO - front view



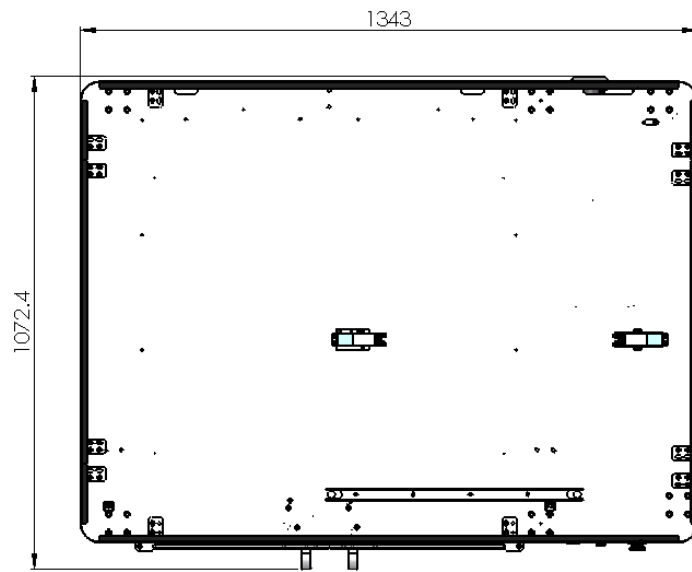
Extreme 1500 PRO - top view, door open



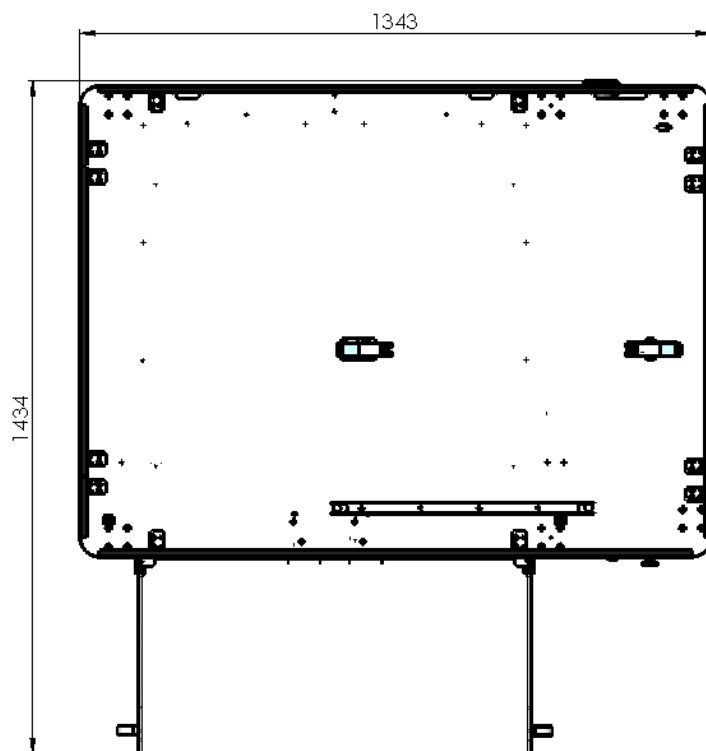
Extreme 1500 PRO - front view



Extreme 2000 PRO - top view



Extreme 2000 PRO - top view, door open



Extreme 2000 PRO - front view

