

# Manual Builder extreme 1000/1500/2000

*For machines Build after S/N XXXX.XXX.19.0063*

*Software versie B10L*



# Manual Builder extreme 1000/1500/2000

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# Manual Builder extreme 1000/1500/2000

## Introduction

Thank you for buying the Builder extreme. This quality, industrial 3D FDM printer will allow you to build your prototypes and one of models in the quickest and cheapest way possible. Be sure to use only quality Builder print materials. If you experience any problems or need advice on material choice, please contact your local reseller or [helpdesk@builder3dprinters.com](mailto:helpdesk@builder3dprinters.com)

This manual will help you

- Correctly install your extreme;
- Perform preventive maintenance;
- Perform trouble shooting;
- Perform some minor repairs;
- Get the most out of your machine.

We advise to start with smaller, simple, objects, and gradually advance to the more complex shapes.

# Manual Builder extreme 1000/1500/2000

## Warranty

The Builder extreme 3D printer is warranted to the original purchaser for a period of 1 year. The Builder 3D Extruder head is warranted to the original purchaser for a period of three months from the original purchase date, only when the Builder 3D Printer is used with approved filament, delivered by Builder 3D Printers. The repair has to be carried out by builder3Dprinters.

The warranty of the Builder 3D printer will expire when the machine is;

- Damaged;
- Neglected;
- Immersed in water;
- Abused;
- Improperly installed;
- Disassembled;
- Improperly serviced.

If you experience any problems with your Builder 3D printer please visit our YouTube channel which provides you with service videos that might solve the issue

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

# Manual Builder extreme 1000/1500/2000

## Safety warnings

**Please** take a few minutes to read the **safety warnings**. Also read the manual, which helps you to 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. It can be used for the Extreme 1000, 1500 and 2000. When there are differences in how to use the different models the manual will show that.

If you have any questions, please contact your local reseller or [helpdesk@builder3dprinters.com](mailto:helpdesk@builder3dprinters.com)

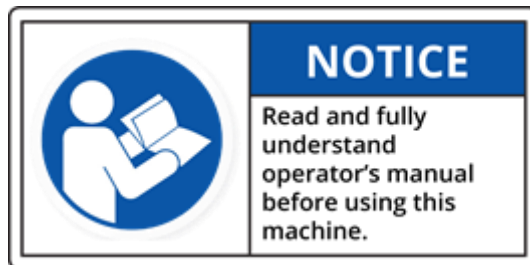
**If you have any prints that you would like to share, please use these hashtags #builder3dprinters #builderextreme**



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2211SH Noordwijkerhout  
[www.builder3dprinters.com](http://www.builder3dprinters.com)  
+31 (0)252 744 128

## **Safety Warnings** (please read warnings before use)

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

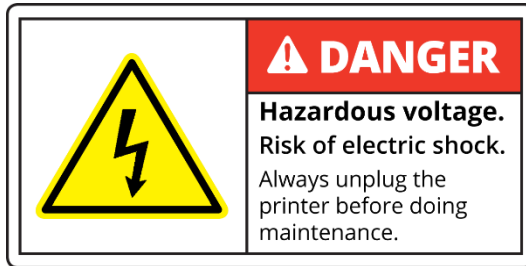


- Let only well trained personnel use this machine. Well trained personel has experience with 3D prining and 3D printing machines. Builder can provid a training so machine and personell have the skills to operatied the Builder Extreme. Please contact your local reseller or [helpdesk@builder3dprinters.com](mailto:helpdesk@builder3dprinters.com)
- Place the Extreme Builder on a concrete floor and set it level, so that the machine is stable.
- Install the Builder in a room with sufficient ventilation.

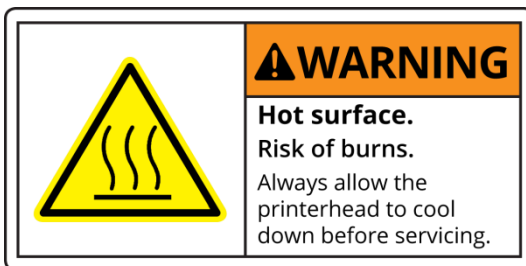


# Manual Builder extreme 1000/1500/2000

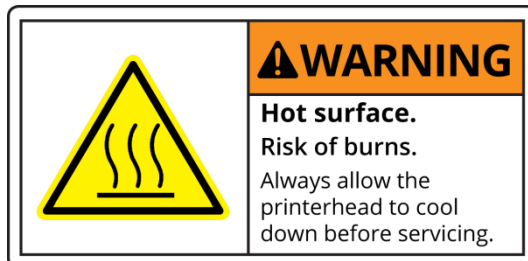
- **DANGER!** Do not open the electronics cabinet (access only, by authorised personnel). Risk of electric shock which may result in serious injury or death!



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



- **WARNING!** When the heater is on, the extruder (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. If you want to clean the glass plate first **turn off** the power then you can clean the glass plate with a wet towel. When the glass plate is dry you can turn on the power.
- **WARNING!** Maintenance of the electrical and mechanical components can only be done by authorized personnel.

# Manual Builder extreme 1000/1500/2000

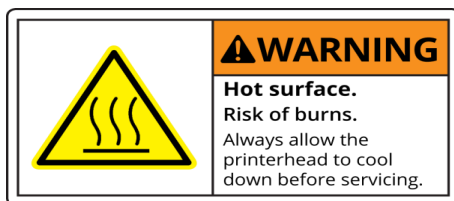
- **WARNING!** Do not step lean in or step in to the Builder. (The glass plate will break).



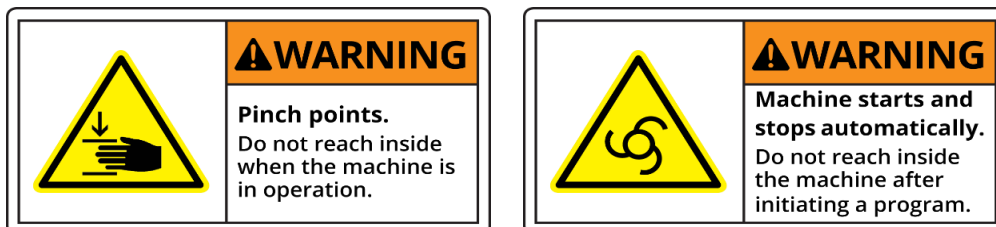
- Do not use the machine for other purposes than printing parts.
- When the Extreme Builder is in operation, keep the doors closed.



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



- Close the doors while printing objects.



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

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

[www.helpdesk@builder3dprinters.com](mailto:www.helpdesk@builder3dprinters.com)

# Manual Builder extreme 1000/1500/2000

## Quickstart

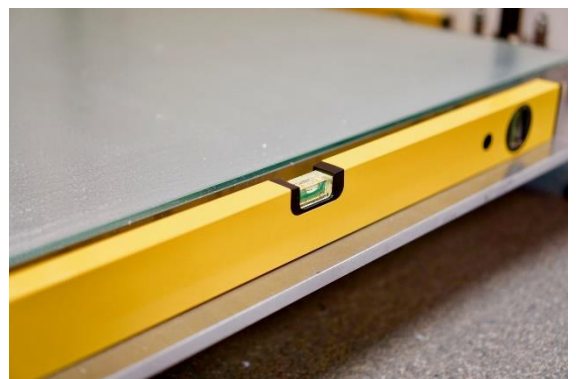
### Unbox the Builder Extreme

Please watch the unboxing video which shows how to remove the box and remove the Extreme from the pallet. Note that the Builder Extreme **MUST** be removed from the pallet and placed on a concrete stable floor at all times. See instruction video online.



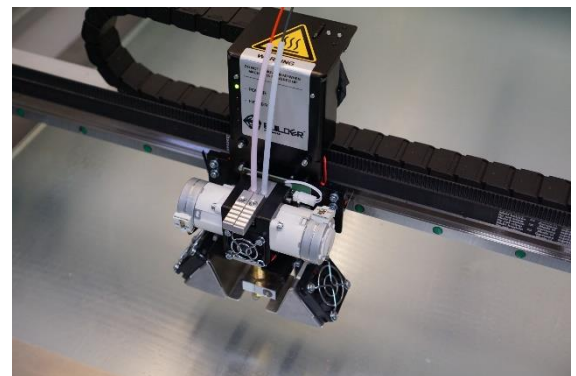
### Level the Extreme

Use the 2 levels supplied with the machine to make sure the machine is levelled before use. Use the level tools on the front, left and right. Note that you do not need to level the print bed or print frame, you need to level the machine itself. Put the levels on the bottom plate of the machine. The print bed was already levelled in our factory.



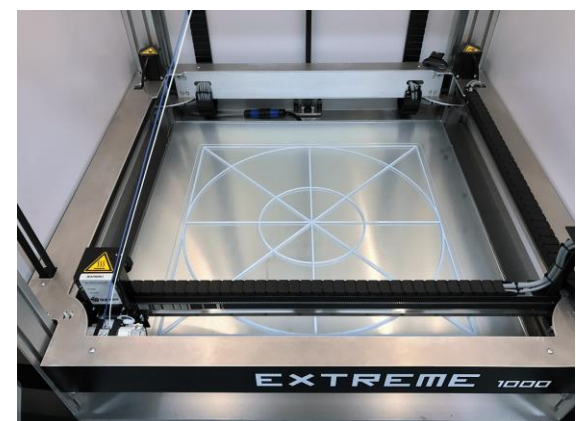
### Install filaments

Pre heat the extruder. Insert filament in BOTH extruders. Note that the Dual-Feed extruder needs to be filled with **BOTH** filaments all the time, even when you print in 1 color. This prevents the Dual-Feed extruder from clogging. See instruction video online.



### Surface test

The build plate was levelled in the factory. But it is important to check if this is still the case after transport and installation. Start printing the surface test from the SD card supplied with the machine. The surface test (0.4 mm nozzle) shows you if the build plate is still levelled. **Be aware that the surface test must be printed with 2 filaments!**





# Manual Builder extreme 1000/1500/2000

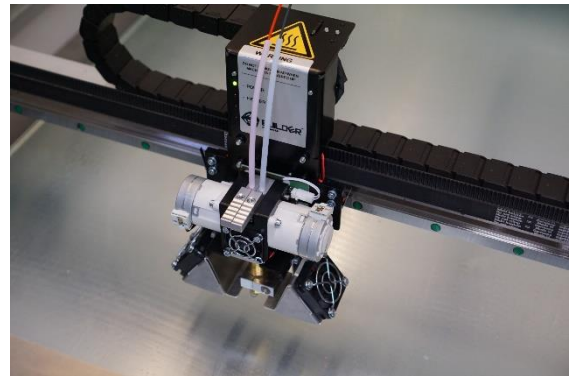
## Bedlevel point 1,2 and 3 (if needed)

If the surface test does not come out right, it can mean two things, the nozzle is too far or too close to the glass print bed. That means you need to level the frame on point 1, 2 and 3. Gently turn the screws clockwise when the nozzle is too close to the glass and turn the screws anti clockwise when the nozzle is too far from the glass. Do this on all 3 points, perform "auto home" and start the surface test again. See online instruction video.



## Print with BOTH extruders when not printing Dual coloured objects

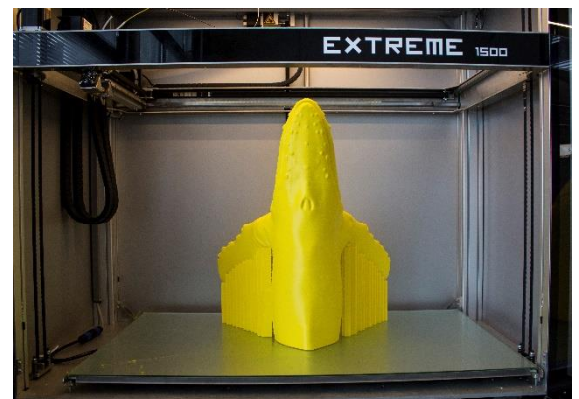
For the best quality prints and to ensure the lifetime of the Dual-Feed extruder, we advise you to print with both extruder motors all the time. How? Start your print and as soon as the print started go to control, change extruder ratio and change them to 50%/50%. Now both motors will be used. This also allows you to print 9 kg filament without having to stop your print and changing filaments.



## Remove print from glass plate

After the print has finished, open the doors of the Extreme and let the build plate cool down to room temperature. This makes it easier for you to remove the object from the glass plate.

If you have any questions about the installation, please contact your local reseller or [helpdesk@builder3dprinters.com](mailto:helpdesk@builder3dprinters.com)



# Manual Builder extreme 1000/1500/2000

## Accessories

The extreme Builder comes with the following accessories:

Extreme 1000	Extreme 1500	Extreme 2000
<ul style="list-style-type: none"><li>• SD card;</li><li>• Paint roller set;</li><li>• Level 60cm 2x;</li><li>• Wood glue;</li><li>• Heater block tool;</li><li>• Nozzle tool;</li><li>• Allenkey 2.5mm;</li><li>• Nozzle 0.8mm;</li><li>• Nozzle 1.2mm;</li><li>• Set teflon tubes;</li><li>• Power cord;</li><li>• Manual extreme;</li><li>• Pressure plug 2x</li><li>• Feeler gauge.</li></ul>	<ul style="list-style-type: none"><li>• SD card;</li><li>• Paint roller set;</li><li>• Level 60cm;</li><li>• Level 40cm;</li><li>• Wood glue;</li><li>• Heater block tool;</li><li>• Nozzle tool;</li><li>• Allen key 2.5mm;</li><li>• Nozzle 0.8mm;</li><li>• Nozzle 1.2mm;</li><li>• Set teflon tubes;</li><li>• Power cord;</li><li>• Manual extreme;</li><li>• Pressure plug 2x</li><li>• Feeler gauge;</li><li>• Nylon wheels 4x.</li></ul>	<ul style="list-style-type: none"><li>• SD card;</li><li>• Paint roller set;</li><li>• Level 60cm 2x;</li><li>• Wood glue;</li><li>• Heater block tool;</li><li>• Nozzle tool;</li><li>• Allen key 2.5mm;</li><li>• Nozzle 0.8mm;</li><li>• Nozzle 1.2mm;</li><li>• Set teflon tubes;</li><li>• Power cord;</li><li>• Manual extreme;</li><li>• Pressure plug 2x</li><li>• Feeler gauge;</li><li>• Cabinet key;</li><li>• Machine feet 4x;</li><li>• Filament detection 2x;</li><li>• Ups battery box.</li></ul>

### Optional Parts

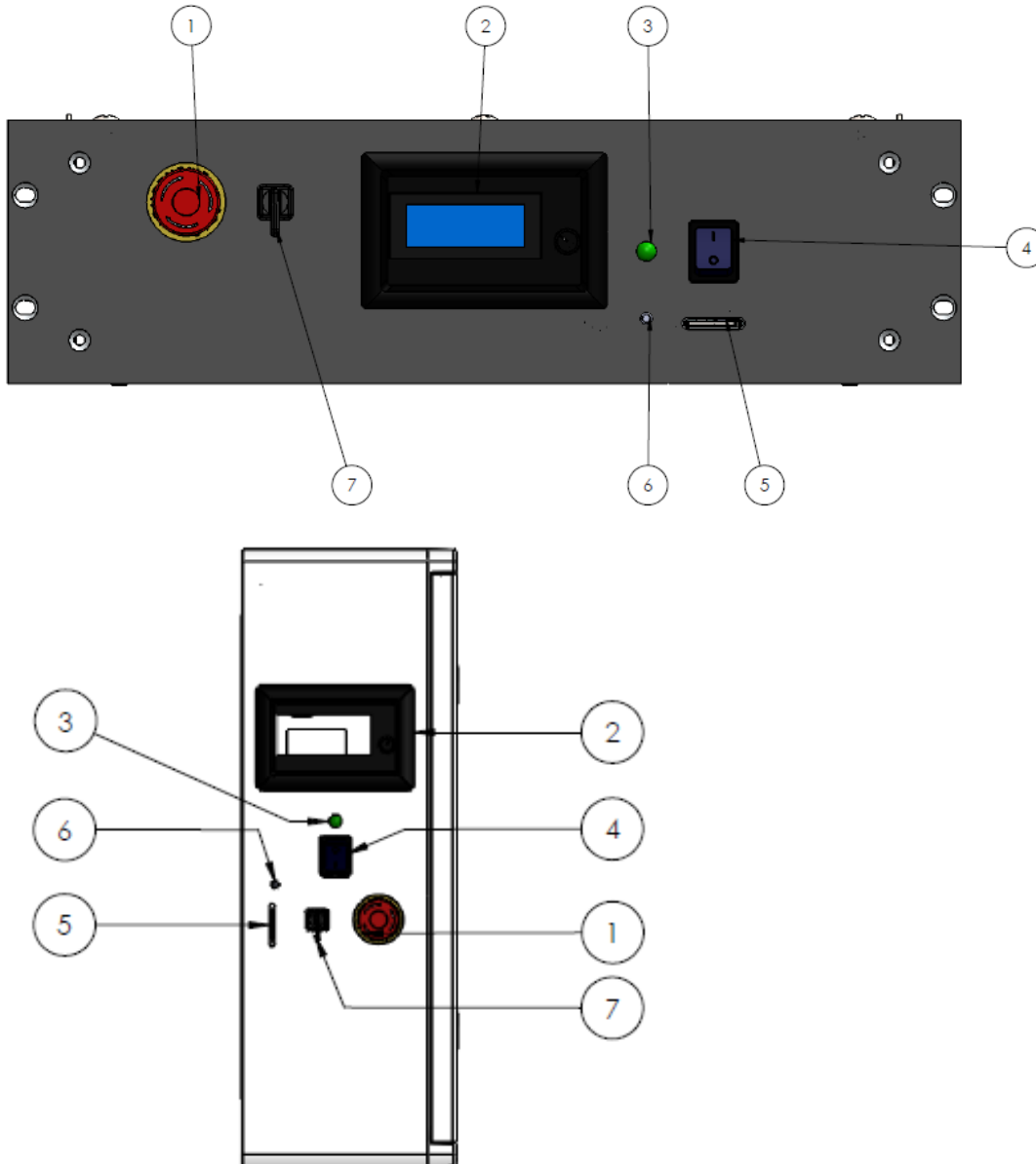
- Spare print head;
- Level gauge, for easy surface leveling the print bed;
- Grease gun for maintaining your builder extreme;
- Grease.

Please contact your local reseller or [helpdesk@builder3dprinters.com](mailto:helpdesk@builder3dprinters.com) for more information.

# Manual Builder extreme 1000/1500/2000

## Control panel

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

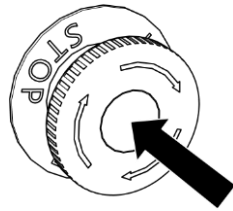


1. Emergency button;
2. LCD control button;
3. Main power;
4. On/off switch;
5. SD card slot;
6. Reset button;
7. Interior light switch.

# Manual Builder extreme 1000/1500/2000

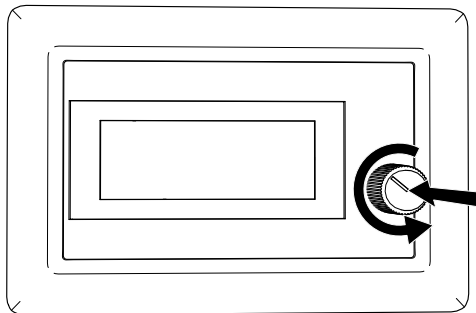
## Emergency button

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



## LCD control button

Rotate/Push the LCD control button to control the LCD screen. The display provides information about the printer and object.



## Main power

This led indicates if the main power on the back of the control box is switched on/off. When the main power is off, the batteries will not be charged and will de charge within a week.

## 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.

## SD card slot

Insert the SD card with the G-code. The SD card supplied by the machine has some ready g-codes, and also the G-code to check bed leveling.

## “Reset” Button

Only use this when updating firmware. Machine can be reset by switching it off/on.

## Interior light switch

Switches the lights in the machine on/off

# Manual Builder extreme 1000/1500/2000

## Installing the machine

### Correct Surface

Be sure to place the Builder extreme on a solid surface and be sure there is more than 1 Meter of space around the machine to perform maintenance.

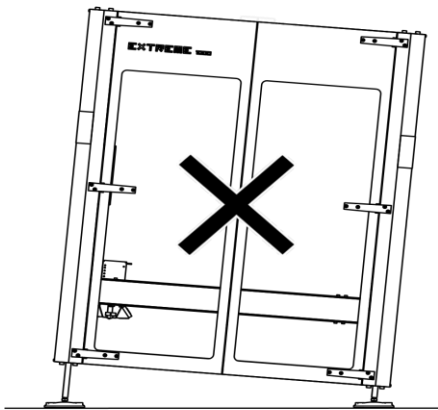
### Installation

Levelling the printer is important for making good quality prints.

**Be sure that the Builder extreme is used in a surrounding temperature between 15-32°C**

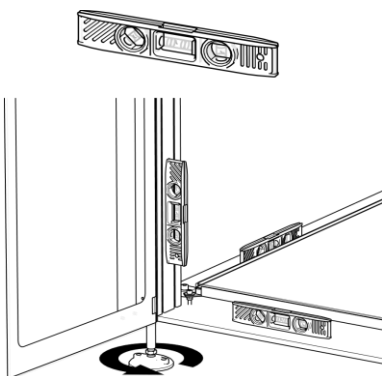
### Level the printer

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 leveling of the machine using a wrench to move up or down the machine feet.



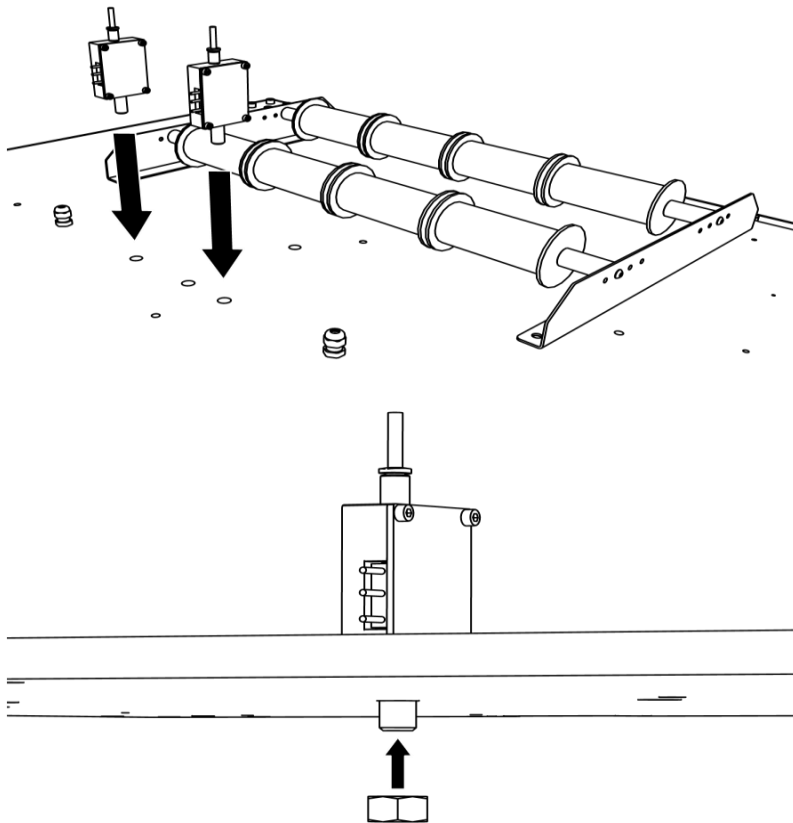
# Manual Builder extreme 1000/1500/2000

## Extreme 2000 installing filament detection

After receiving your extreme 2000 you have to install the filament detection on top of the machine.

**Filament detection for the extreme 1000/1500 is mounted in the factory, no action needed.**

Mount the two filament detection units as seen in the picture below. Don't forget to put the nut on the detection boxes and slightly tighten them.



After physically mounting the filament detection, connect them to the connectors on top of the machine. Which box you connect to which connector doesn't matter.

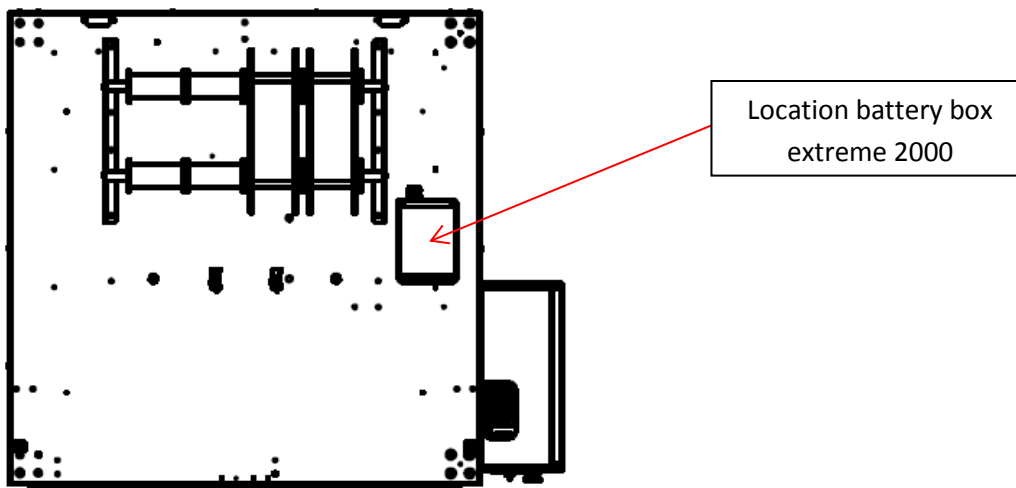
### **NOTICE**

**The filament detection unit can be plugged in both connectors.**

# Manual Builder extreme 1000/1500/2000

## Battery pack

*Only for extreme 2000: Battery pack is supplied separately from the machine so it has to be mounted on top of the machine. Screw the battery pack on top of the machine, using the supplied bolts. Open the battery box and screw the unit on top of the machine.*



When the machine is in place (and the battery pack is placed, in case of an extreme 2000) the battery pack has to be connected to the back of the electronic box.

## Extreme 1500 wheels

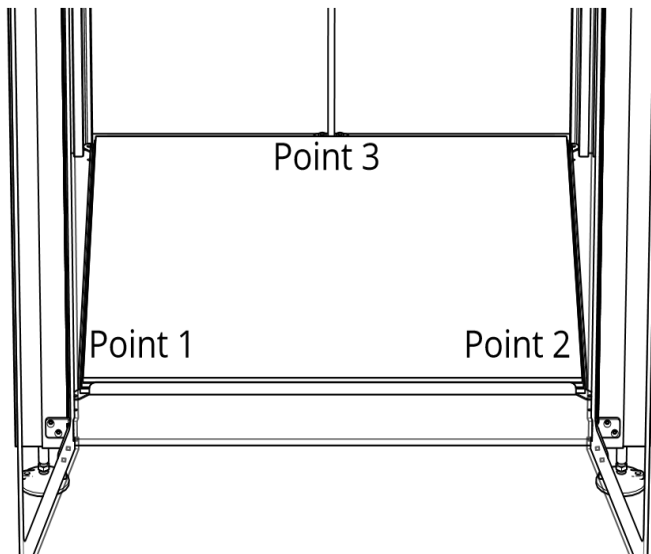
Only the extreme 1500 is supplied with a set of wheels for easy transport through doors and in elevators. Move up the machine feet so the wheels can be mounted under the machine. Lower the machine feet so the wheels are on the ground and the machine can easily be transported to the final location. There the machine can be leveled, so the wheels don't touch the ground.

# Manual Builder extreme 1000/1500/2000

## Bed leveling

During the fabrication process, the machine's build plate and bed leveling was adjusted, so the space between the build plate and nozzle is 0.25mm when the machine's Z axis is in the "auto home" position. This 0.25mm is called bed level position.

After transport and installing the machine, it's important to check this cap of 0.25mm. Go to the service → bed level menu and check the 3 points for a cap of 0.25mm using the supplied feeler gauge.

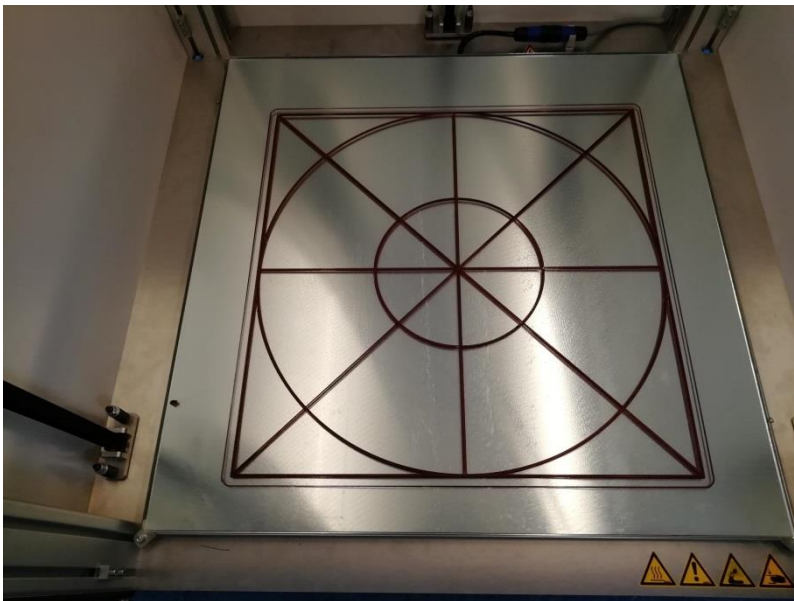
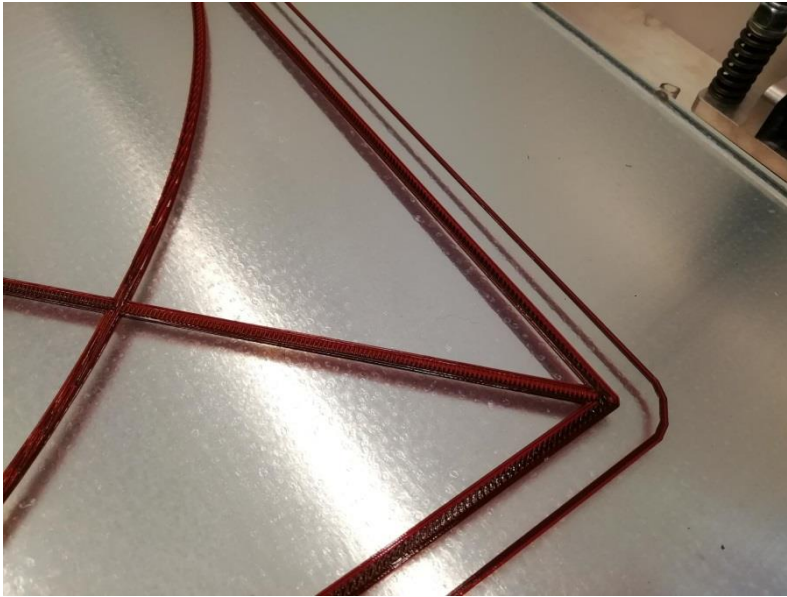


If these 3 points are 0.25mm then perform a surface test. If the surface test is ok, the machine is ready to use.



## Manual Builder extreme 1000/1500/2000

The surface test is ok, when the test looks like the pictures beneath and it sticks firmly to the build surface.



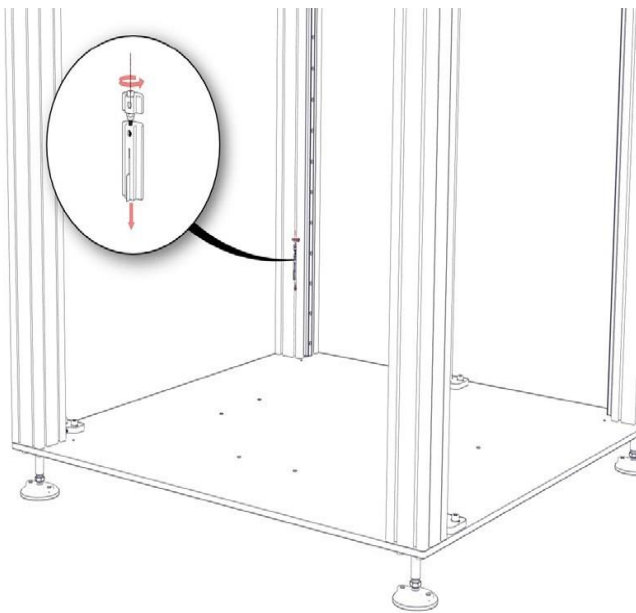
Missing lines in the surface test are an indication that the nozzle is too close to the build plate at the point. The bed level needs adjustment. The nozzle needs to be adjusted more away from the build plate.

When the surface test doesn't stick to the build plate, or comes loose during printing, the nozzle is too far from the build plate. The bed level needs adjustment. The nozzle needs to be adjusted closer to the build plate.

# Manual Builder extreme 1000/1500/2000

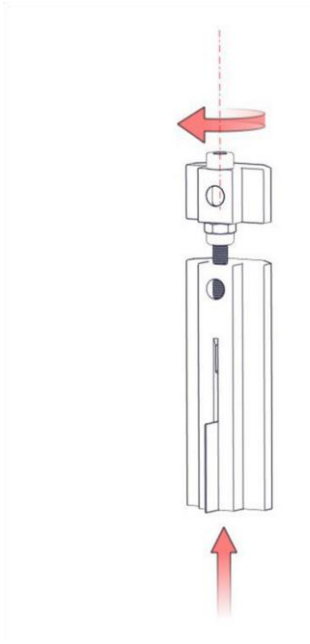
## How to adjust the bed level position

The machine uses 3 Z-sensors mounted in the print frame to determine the Z axes home position. These sensors are triggered by adjustable flags in the poles of the machine. 2 flags in the left and right front poles, one flag in the left rear pole.



## Manual Builder extreme 1000/1500/2000

These flags can be adjusted in height so the bed level position can be corrected if necessary.



Looking from the top position:

- Turn clockwise and the nozzle goes away from the build plate
- Turn counterclockwise and the nozzle comes closer to the build plate;

For every complete turn that is done there is a 0.5mm displacement of the nozzle according to the build plate.

***If there is a adjustment needed, don't adjust more than 1/2 a turn at a time.***

***Adjust the flags on the side of the build plate were the bed level adjustment is needed***

***After adjusting the flags, always perform "autohome" Then the machine is in his new adjusted position!***

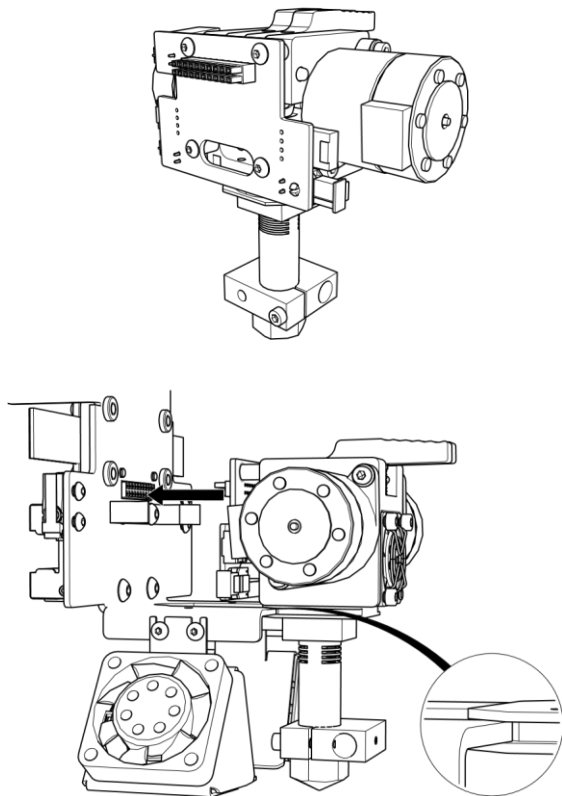
# Manual Builder extreme 1000/1500/2000

## Dual Printhead

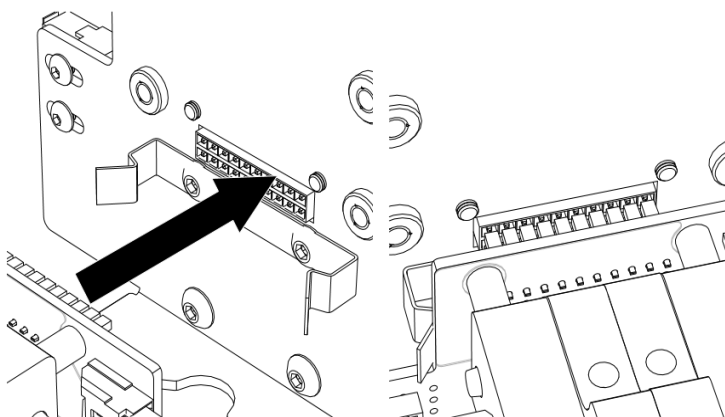
**Warning! Be sure that the head is cooled down before maintenance is performed to the head!**

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

**Use the “replace head” in the menu before changing the print head.**

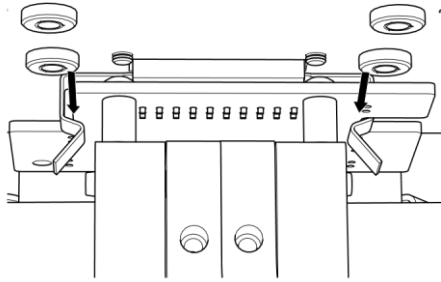


Be sure the connectors are aligned in front of each other. Push the print head until the connectors merge into each other.



# Manual Builder extreme 1000/1500/2000

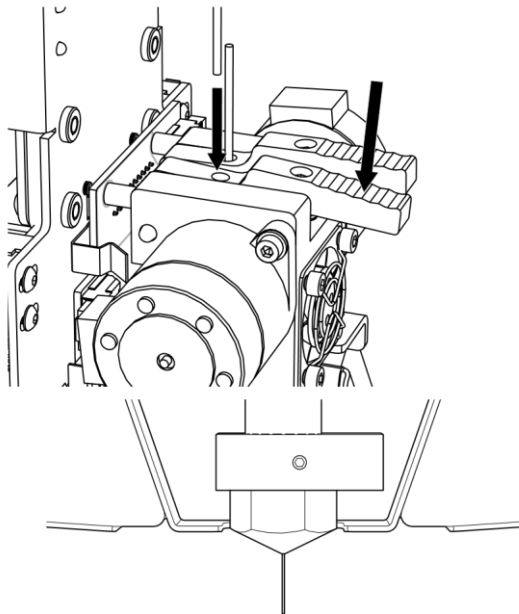
Check if the clips are snapped into place



**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.

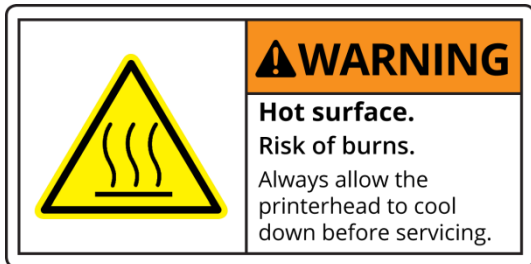


Adjusting the screws in the buttons, using a 2.5mm Allen key, the pressure on the filament by which it's pressed against the extruder wheels can be adapted. These are adjusted during the fabrication process, so normally they don't need adjustment. Turning clockwise increases the pressure, turning anticlockwise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

# Manual Builder extreme 1000/1500/2000

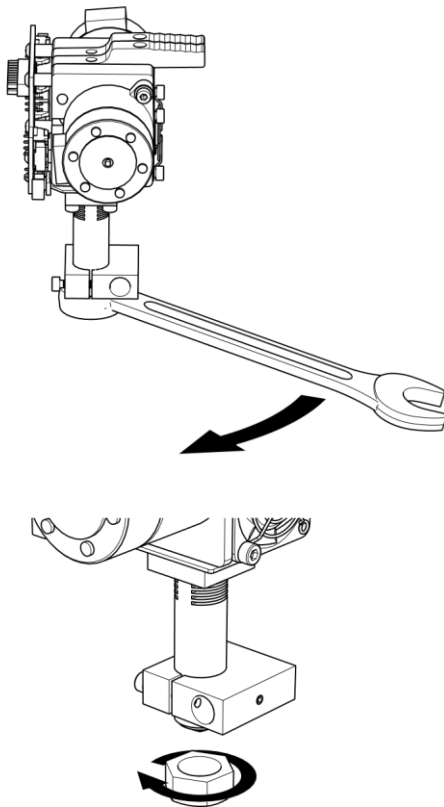
## Changing nozzle

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



Pre heat the nozzle.

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



Mount the new nozzle the reverse way of taking it off. Be sure the connected surfaces are clean. Tight the new nozzle, don't tighten the nozzle too much (7Nm). Check the nozzle for the right torque when it's pre heated.

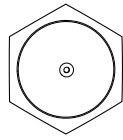
# Manual Builder extreme 1000/1500/2000

## 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

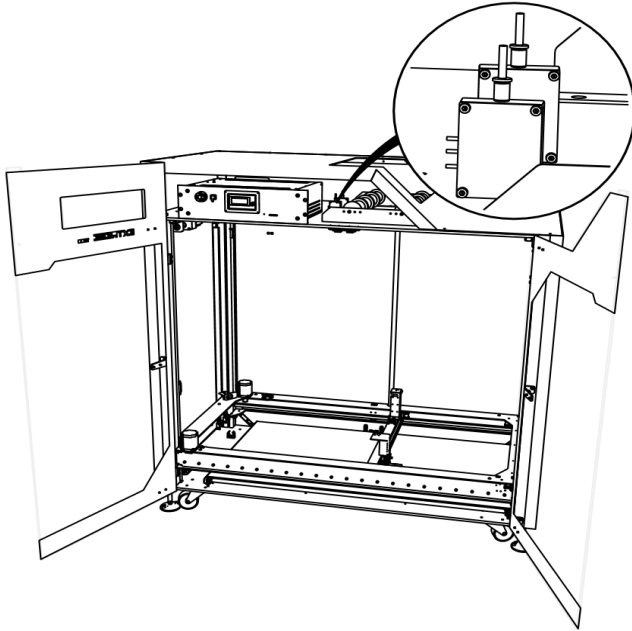
Nozzle 0.8 mm                      First layer 0.6 mm

Nozzle 1.2 mm                      First layer 0.8 mm

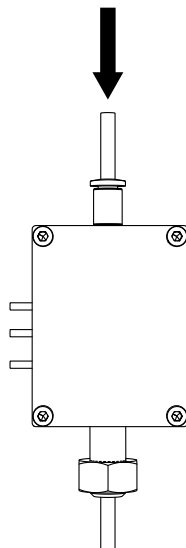
# Manual Builder extreme 1000/1500/2000

## Filament detection

The machine is equipped with filament detection. It detects the moment there is no filament in one of the detection units.



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 moves to a park position where it will wait for a user input. Press the button to pre heat 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 of your build tot the glass build surface be sure that the layer of glue is in perfect state. Check this before the start of e very print. The layer of glue has to cover the complete the glass build surface. 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 glass surface pre heat the build plate to 50°C, then apply the glue to the glass surface using the paint roller. **Apply an even coat and be sure that no glue is coming under the glass build plate!!**

### Pre-heat

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 control panel.

### Timeout Heater

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

# Manual Builder extreme 1000/1500/2000

## G-code/slicing

To start printing these machines need a G-code. The G-code can be generated by a so called slicer. We advise to us simplify3D. The input for these slicers are: STL/OBJ/AMF/DAE files. To generate the correct G-codes for the extreme Builders there are profiles that can be downloaded from the Buildere3dprinters.com website. Be sure to us the profile that fits you type of machine, nozzle diameter, materials, etc. When the G-code has been generated it can be put on a SD-card or send to the machine via Wi-Fi using Astrobox. When put on an SD-card the machine can be started, putting the SD card into the slot and using the control panel.

Handy codes 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 Y73.904 E0.3222
```

**If using 1 color/material, always use both extruder 50/50% to prevent blocking the nozzle**

**Be sure the build plate is cooled to room temperature before taking the object of!**

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

# Manual Builder extreme 1000/1500/2000

## UPS function, power fail

The UPS function activates when the main power supply fails.

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

Battery needs to be charged. The battery will be charged when the main power switch on the back of the electronic box 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 battery's when the machine is not used for a couple of days.**

1. Time interval detection "POWERFAIL\_DELAY" is set to 10sec.
2. After about 10 seconds, "POWERFAIL" appears in the picture
3. The internal buffer is completed.
4. The shortened filename\* is saved (13 characters, filename is modified)
5. The position is saved
6. The printer goes to  $Z = Z + 10\text{mm}$
7. The printer saves this Z position
8. The screen changes with "Power fail" / "Check Main Power!"
9. If the temperature of the bed is  $> 40$  degrees after the voltage has returned, the printer is immediately resumed (without the intervention of the user).
10. If the temperature of the bed is  $< 40$  degrees, the printing will not be resumed immediately, but "Press Heating" will appear on the screen.
11. The menu then appears:  
"Load Extr. Front"  
"Load Extr. Rear "  
"Return"
12. After return, the printer returns to the stop position deletes the stored data and resumes printing.  
Power failure and failure of the backup voltage.  
If after step 8 the voltage is completely lost and the printer is restarted:
13. The bed is warmed up again with the stored set value.
14. The message will appear on the screen:  
"A Power Shutdown" // "Has Happened" // "Press to continue ..."
15. After the button is pressed the following screen appears:  
"Print from SD ^"  
"Resume Print"  
"File Data"  
"Remove Data"  
**If the bed is cooled down to  $< 40^{\circ}\text{C}$  please check if the object is stil stuck to the bed!**

**\*Note : When printing from sd-card the filename will be saved and after "A Power Shutdown" the print can be resumed this cannot be done when printing from the AstroBox !**

# Manual Builder extreme 1000/1500/2000

## Resume Print

If "Resume Print" is selected from the "Root" directory of the SD card, the data of the "File" is loaded and the print is resumed:

- Autohome is being performed in the x/y axes;
- Printhead is heated;
- After the printhead is heated on the display appears:  
    "Load Extr. Front"  
    "Load Extr. Rear"  
    "Return"

You can change both extruders before restarting the print.

- After selecting return, the print is being started.

## File Data:

This menu contains the data of the file printed during the power fail

File: The shortened filename: name (8-characters.gco)

Line number: the line (position) number in the print file

## Remove Data:

If "remove Data" is selected, the stored data is deleted.

Parameter that will be saved during power fail:

- Shortened filename (13 characters: name.gco);
- Line number of the line where stopped;
- SD card index number, position in the file on the SD card;
- X-axis position;
- Position Y axis;
- Z-axis position;
- Position E-axis;
- Ratio;
- Ratio block value (on / off);
- Feedrate;
- Feed multiply;
- Extruder multiply;
- Fanspeed;
- Target temperature extruder;
- Target temperature bed;
- Print time;
- Operating hours;
- Printing hours;

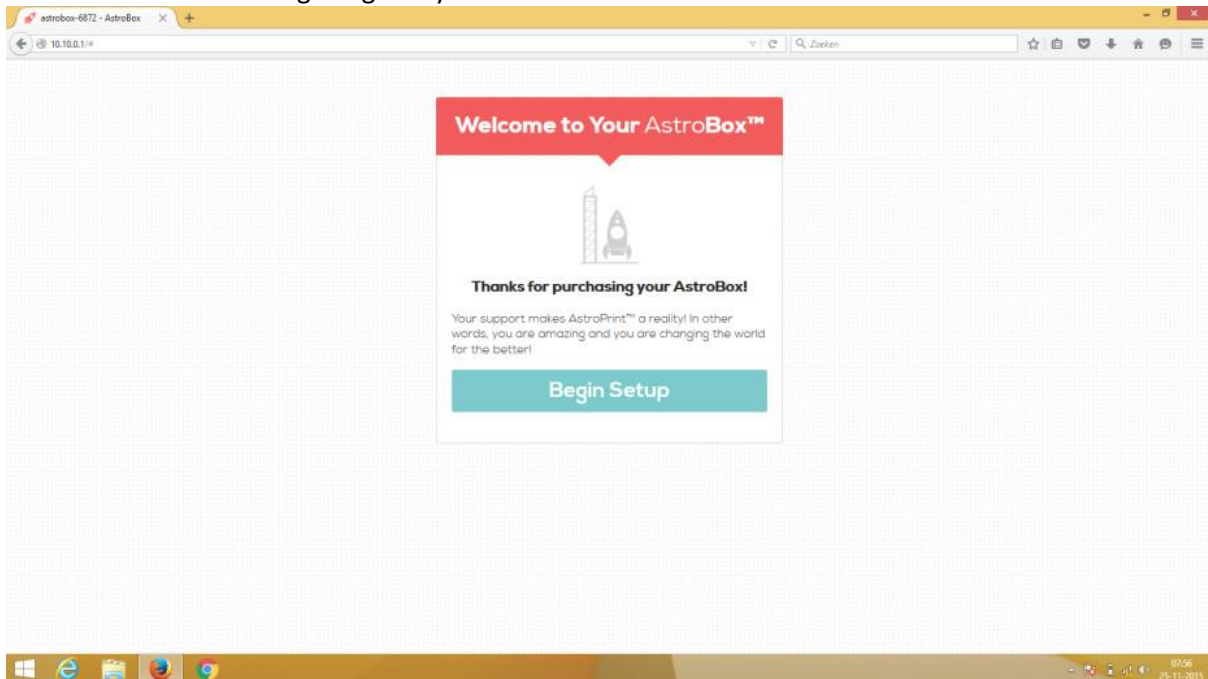
# Manual Builder extreme 1000/1500/2000

## Astro box setup

### Setup

- Turn on the Builder Extreme;
- select “Control”, “Remote Control:on” on the control box
- Wait for a couple of minutes until the internal AstroBox™ starts;
- Using your laptop or tablet search for the WiFi network “**Extreme X000**” (X=1 or X=2) and connect to this network;
- Open an internet browser and type in the following address: <https://10.10.0.1>.

You will see the following image on your screen:

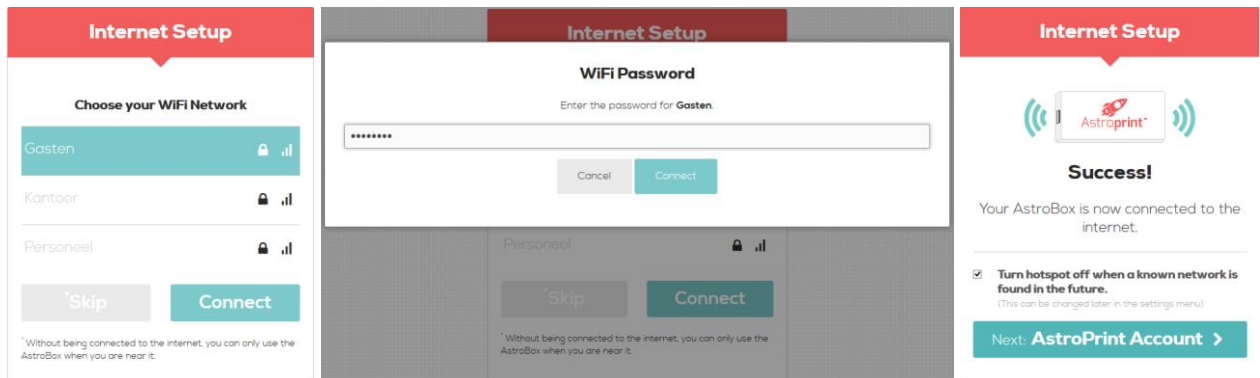


- Now, click on “Begin Setup”

# Manual Builder extreme 1000/1500/2000

## Setup Wifi

If you want your printer to be accessed through a local WiFi network, select your network from the list and click on “**Connect**”.



AstroBox™ should now be connected to your network.

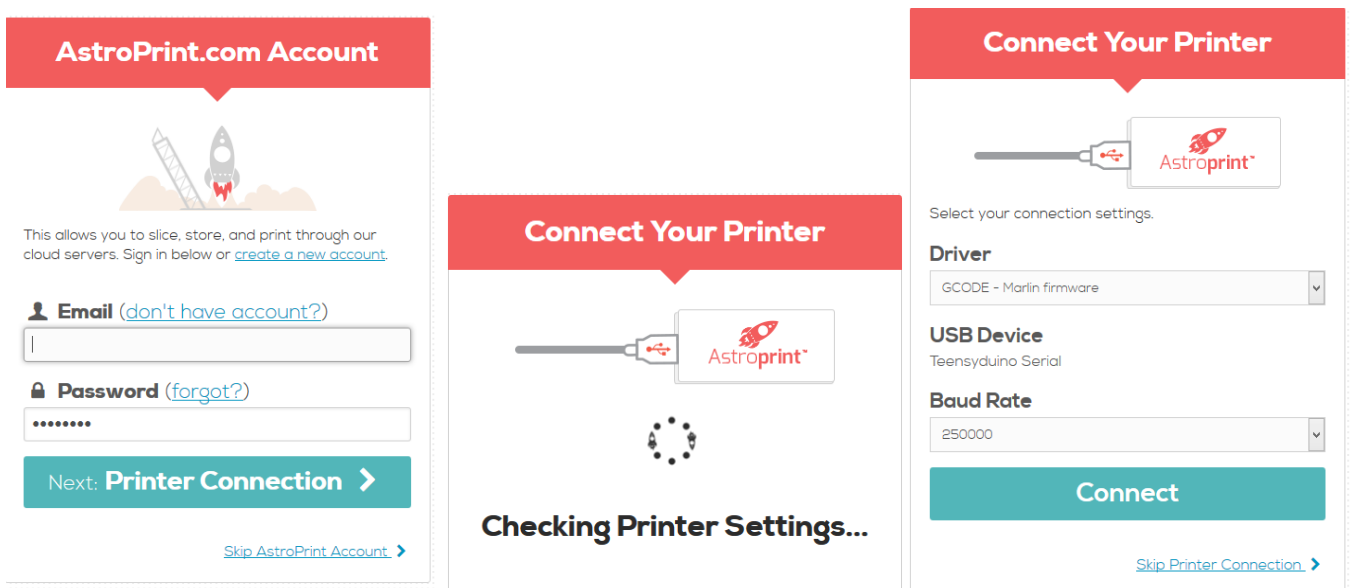
To ensure that your printer will not be accessible through Hotspot, when AstroBox™ is connected to a familiar network (e.g. to make sure your printer cannot be accessible to other users of the network), uncheck the box “Turn hotspot off when a known network is found in the future.”

## AstroPrint™ Account

Now you can create an AstroPrint™ account, so you can upload .STL-files and slice files with AstroPrint™.

## Printer connection

If you do not wish to set an account or if you wish to set an account later, click on “**Printer Connection**”.

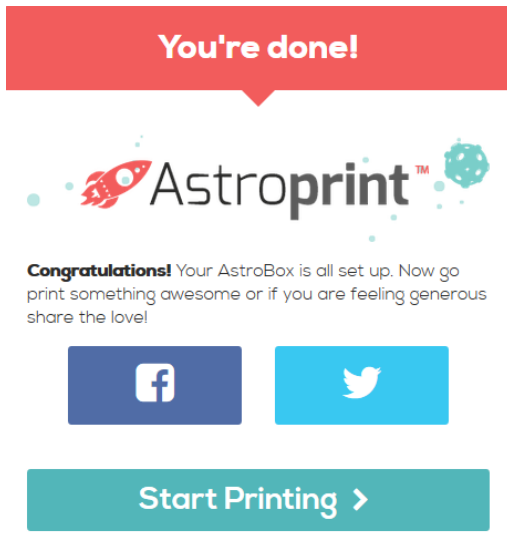


After that, click “**connect**”

## Manual Builder extreme 1000/1500/2000

The AstroBox™ is now connecting to the printer.

**Note:** The operation of the display and the internal AstroBox™ are semi-separate systems. It is possible to control your printer also through one of the two systems while the printer is at use. When the printing is paused or stopped and printing had been started with AstroPrint™, use AstroPrint™. The AstroPrint™ is now connected with the printer.



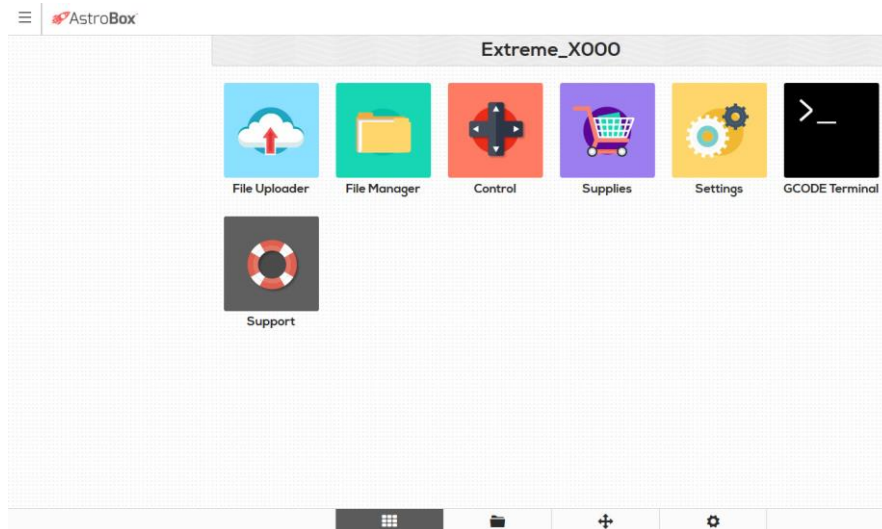
# Manual Builder extreme 1000/1500/2000

## Overview of the Icons

- Click on “Start Printing”

An overview page will now appear:

1. File Uploader: With this icon, you can directly upload a file to print it;
2. File Manager: Here you can select and load the file to print it;
3. Control: Here you can find the manual operation of the printer Supplies: Internet stores (if connected to internet);
4. Settings: Here you can find settings of AstroBox™;
5. GCODE Terminal: Here you can enter G-CODE commands ;
6. Support: Here you can find email link of the helpdesk of AstroPrint™

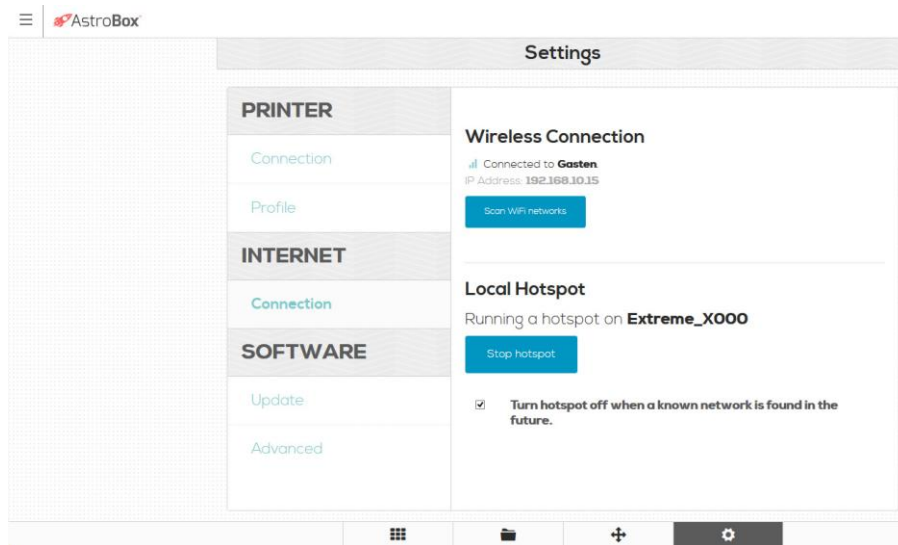
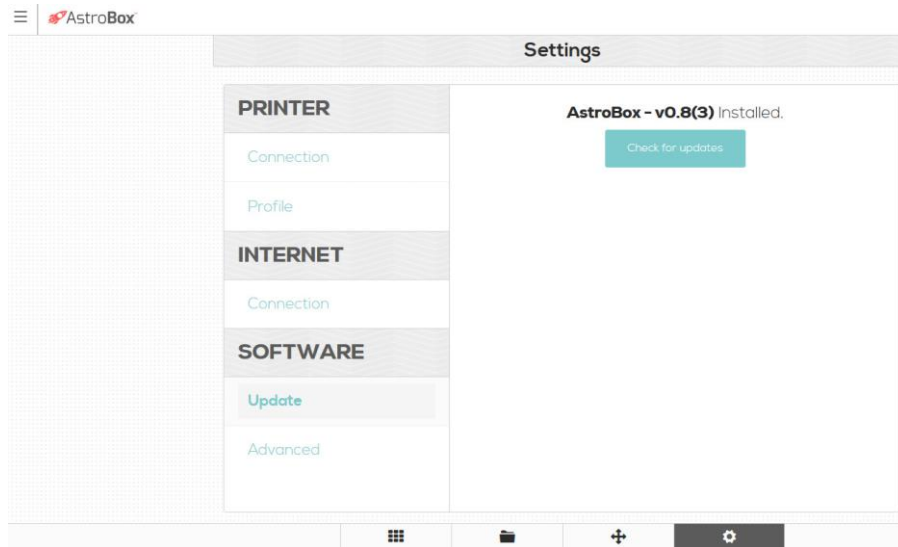




# Manual Builder extreme 1000/1500/2000

## IP-address of the local network

- Click on “Settings”
- Click on “Connection”



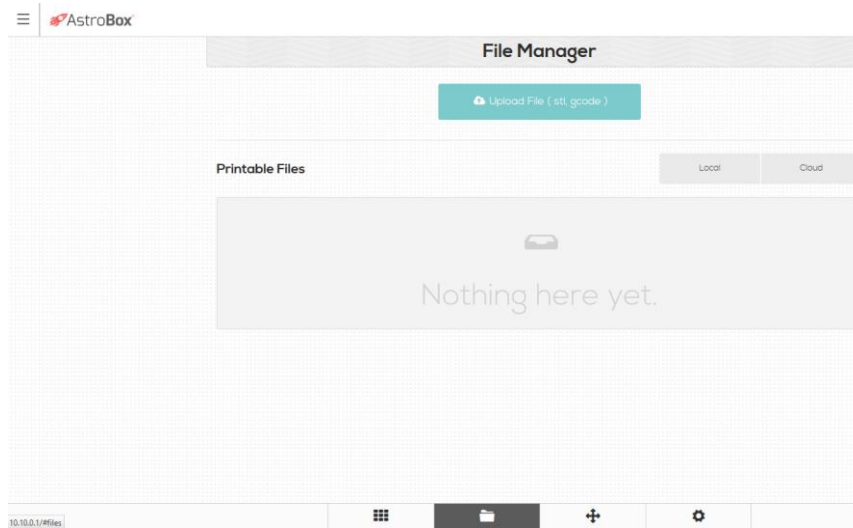
Write down the IP address under which you can find your printer in the network.

\* In this case is "Gasten" the name of the network and the IP address is 192.168.10.15. Use this IP address to connect to your printer in your network.

# Manual Builder extreme 1000/1500/2000

## File manager

- Click on “File manager”

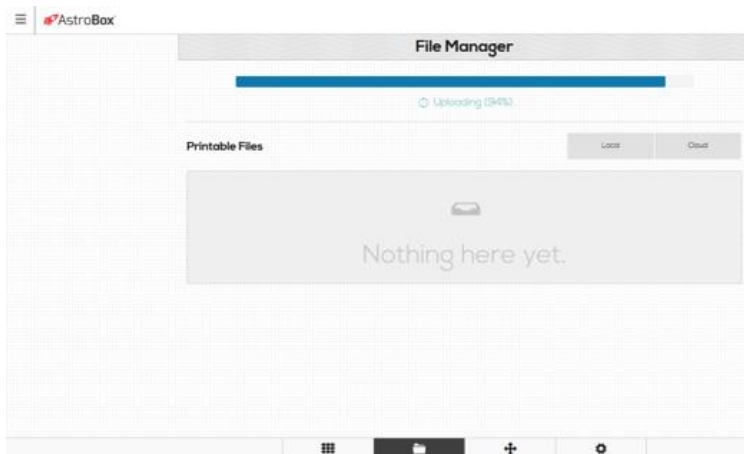
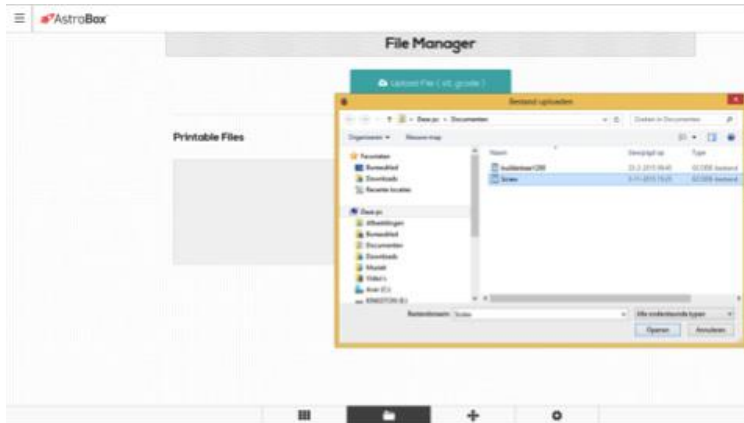


If you would like to “slice in the cloud”, you will have to create an AstroPrint™ account and log in first.

# Manual Builder extreme 1000/1500/2000

## Astro box Print examples

- Insert the SD card in your laptop;
- Click on **“Upload file”** (stl.gcode);
- Select the file called **“Screw”** and click on **“Openen”**



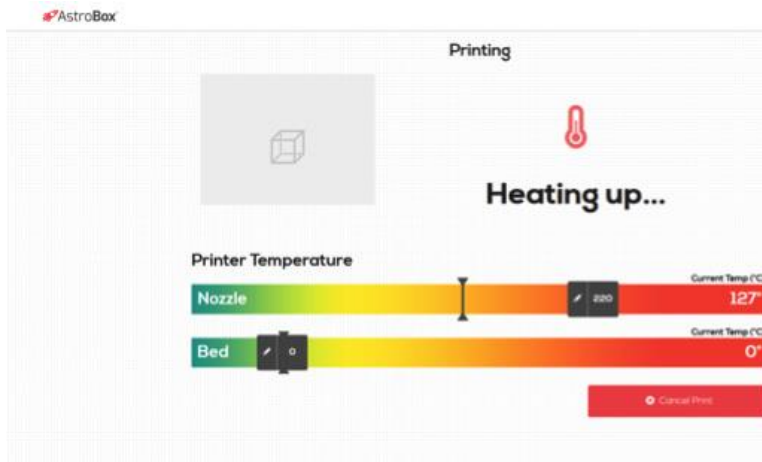
After the file has loaded, it gets controlled through **“Analyzing G-Code”**

After the file has been analysed, you can start printing.

- Click on the light blue icon next to the filename to start printing.

# Manual Builder extreme 1000/1500/2000

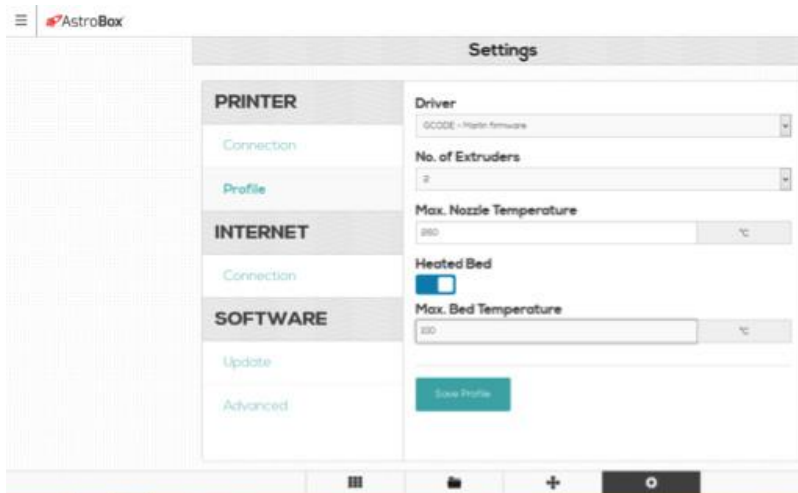
The printer will now start warming up the extruder.  
On the left side, you can see a “Snapshot” of the bed.



If you want to change the temperature, flow or printing rate while using the AstroBox™ for printing you can only use the control panel on the printer (tune).

After warming up of the extruder, the printer will initiate printing of the chosen object.

In the menu “**Settings**”, you can make adjustments to the printer profile. Here you can see the settings of the Builder Extreme:



No. Of Extruders:2  
Max. Nozzle Temp:260  
Max. Bed Temp:100

### 3.1 Factory Settings

You can always reset the factory settings in the menu “**Advanced**” through clicking on “**Restore Factory Settings**”.

# Manual Builder extreme 1000/1500/2000

## Maintenance

### Maintenance schedule

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

\*When the machine doesn't have a power supply for more than one week, disconnect the battery pack on the back of the electronic box.

# Manual Builder extreme 1000/1500/2000

## Trouble shooting

<b>Problem</b>	<b>Solution</b>
No power	Is the power cable connected
Blocked nozzle/channel	Nozzle too close to the build plate (0.25mm), check bed leveling
	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 (reseller)
Broken build plate	Take off the object when the build plate is cooled down to room temperature. Otherwise the glass can break.
Object doesn't stick to the build plate	Nozzle is too far from the build plate (0.25mm) check bed leveling
Machine cools down	If the machine is heating too long without being used, the heaters will stop heating.
Machine doesn't start printing	Surrounding temperature is too low, <5



# Manual Builder extreme 1000/1500/2000

## Attachment

### Technical specifications

Specifications	Extreme 1000	Extreme 1500	Extreme 2000
Technique	FDM/FFF		
Resolution	Low quality : 0.6 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	1100x515x820	700x700x1820
Printer external dimensions LxWxH	1006x1016x1500	1501x800x1500	1175x1016x2300
Weight	220kg	200kg	250kg
Frame material	Aluminium		
Print bed (platform)	(Heated) glass		
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	80mm/s		
Maximum travel speed	200mm/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	SD card		
CNC programming Language	G-code		

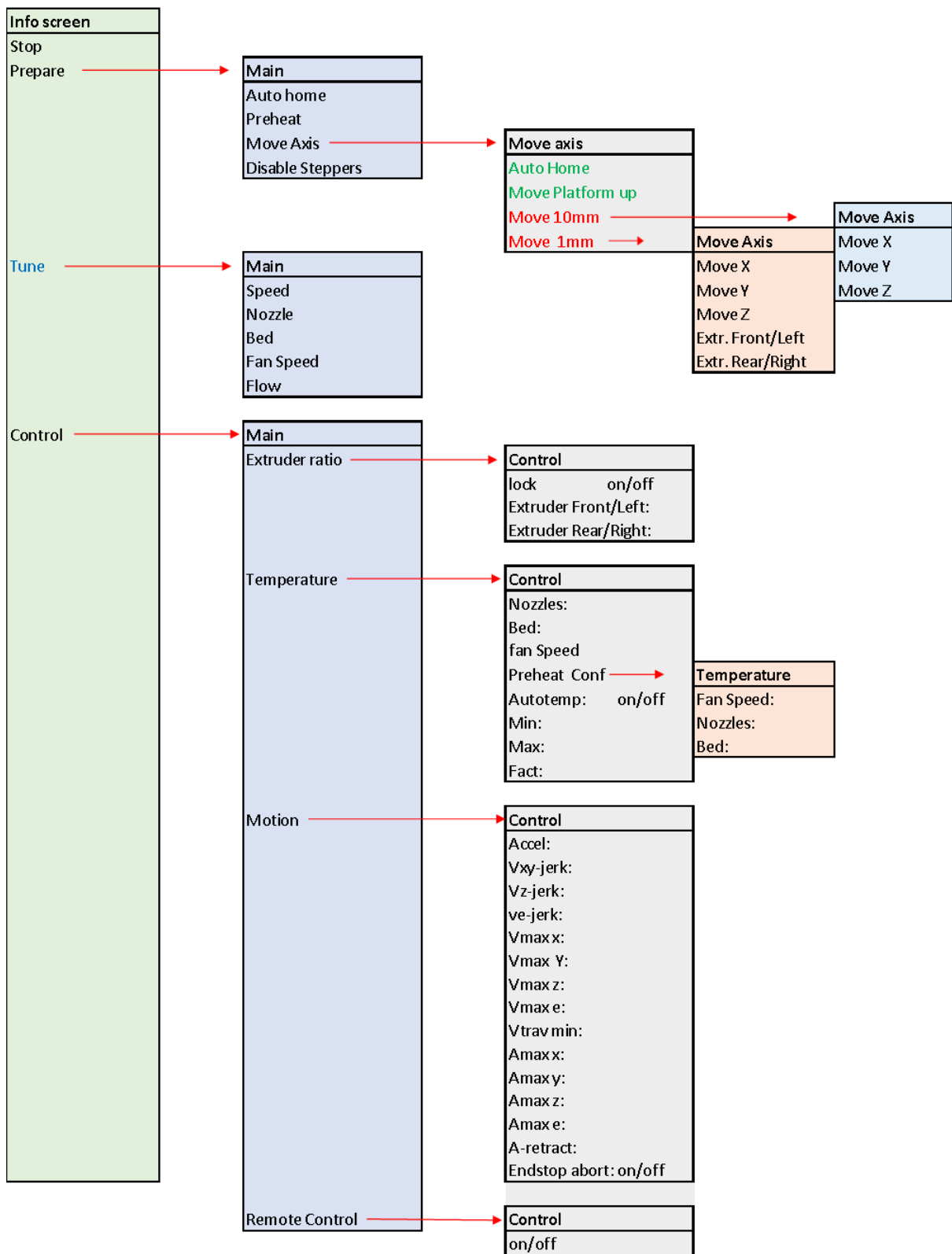
\*Nozzle 1.2mm, maximum print speed depends on the situation.



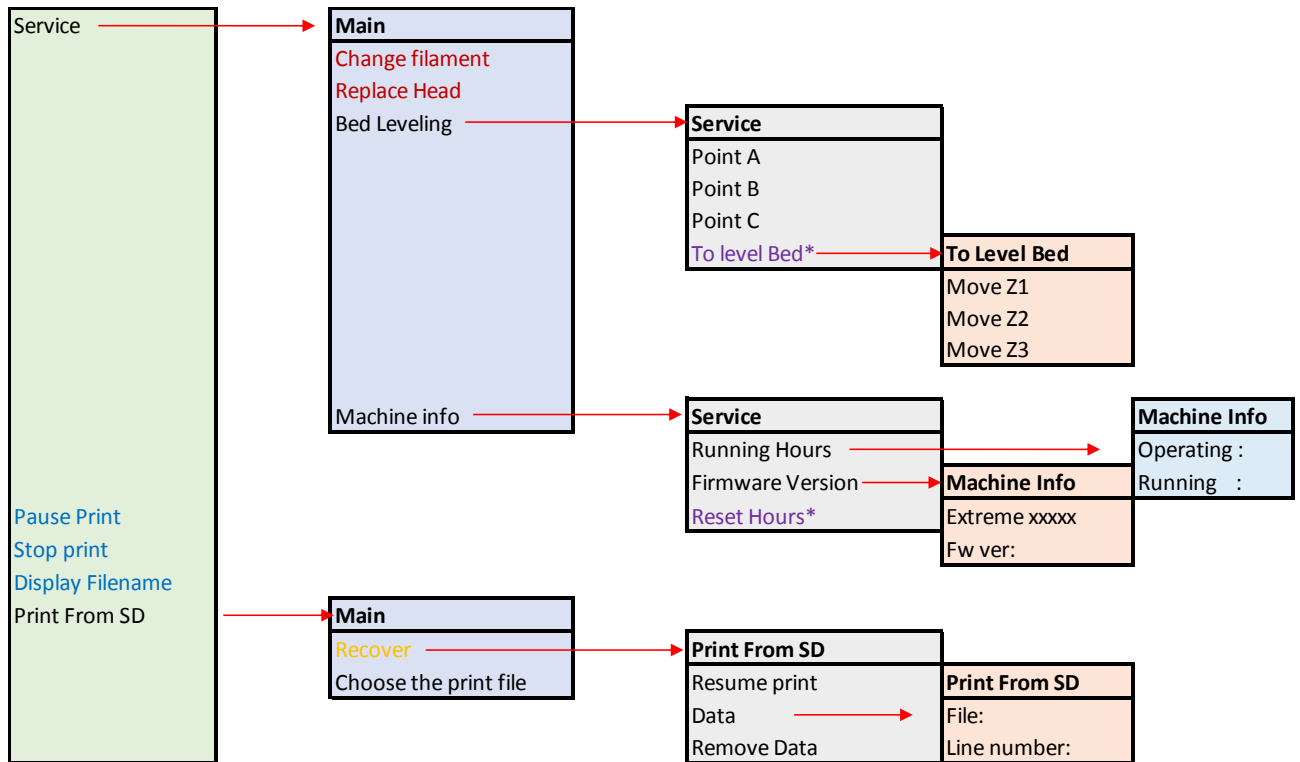
# Manual Builder extreme 1000/1500/2000

## Menu structure

Extreme 1000,1500 & 2000  
 Menu structure  
 For machines Build after S/N XXXX.XXX.18.0172



# Manual Builder extreme 1000/1500/2000



Text color	Discription
Red	Menu is active when there is a known autohome position
Orange	Menu is active after the external power has been cut of while printing from the sd-card
Purple	Menu only visible for a Builder mechanic
Green	Menu is active when the autohome position is unknown
Blue	Menu is active when printing from the sd-card and Remote control is turned off

# Manual Builder extreme 1000/1500/2000

## Description menu structure and functions:

### Description of the Software

**Machine: Extreme**

**Version:V2\_2011I\_Zxx00\_B10G\_Corexy\_Z\_band**

**Datum:13-11-18**

**By: MKO**

**Description: Software with UPS function and improvements**

**Info screen**

**Meaning symbols:**

---/---°= Measured temperature / set temperature extruder.

**F:---%** = Extrusion ratio of the front/left extruder. The ratio of both extruders combined is always 100%.

**H ---/---** = Measured temperature of the heatedbed / set temperature.

**Z:---.---** = The current value of the z-axis. At the moment the display shows "--- -", indicates. that the actual z-height is unknown. The machine first needs to do autohome function to be able to display the correct value.

**F/R---%** = Feedrate gain factor. This is relative to the the feederate in the G-code.

**SD---%** = Percentage of the read G-code lines compared to the total number of lines of the print file. **This has no direct relation to the print time.**

**Remote** = the remote control function is active and the machine can be controlled by the AstroBox

**o---:--** = The actual printing time.

**Bottom line:** information line

**Stop:**

When the printer is moving and the "stop" function (not "Stop print") is selected, the motors are immediately stopped. Autohome has to be re-established.

**The print file is closed and the print cannot be continued but will have to be restarted.**

**Prepare:**

**AutoHome:**

The print head is moved to its "0" position (axes X, Y & Z ).

This is done with heated extruder.

If the extruder temperature is lower than the Preheat temp, the extruder is first heated before the axes are moved to the "home" position.

# Manual Builder extreme 1000/1500/2000

## Preheat:

The heating of the extruder and of the bed are switched on at a value of Preheat default: BED = 50 degrees Celsius and the printhead = 210 degrees Celsius.

The default values can be adjusted in the "Control", "Temperature" & "Preheat conf."

## Move axis:

Within the "Prepare" menu, the functions "Autohome" and "Move platform up" are active if the "auto-home" position of the machine is unknown. If the "car home" position is known then the other functions of this menu are visible, namely: "Move 10mm" and "Move 1mm"

Autohome is not known after the following situations, namely:

- Disable steppers;
- After the start of the machine;
- End of a print;
- The "stop" function is used.

## Move Platform Up:

Moves the Z-axis up 5mm. This works without an "autohome" position being known. This function can be used once to get rid of an unwanted situation.

## Move:

Only if the machine has a known "Autohome" position the individual axes be moved.

By turning the knob the position value is changed, by subsequently pressing the button this value is actively taken over and executed.

If the button is pressed once again, the menu is exited.

Both extruders can only be operated in the 1mm menu and the extruder must be at least 170°C to be able to extrude.

## Disable Steppers:

All motors are being disabled

The x/y axis can be moved manually by hand.

Note: In order to be able to relocate the axes / print again, an "Autohome" must first be carried out again.

## Tune

In this menu different print parameters can be adjusted. Select one of the parameters and just press and turn the knob to adjust the parameter you want.

# Manual Builder extreme 1000/1500/2000

## Control

### Extruder ratio

#### Lock:

The set ratio is fixed.

Tool change "T0" and "T1" and G93 Rxx.x in the used G code are ignored during printing of the file, so the ratio remains during the print on the value set in the menu and the value is only entered via the "Ratio" menu.

The Lock function is set to "Off" by default (machine off / on).

#### Extruder Ratio:

Here the extrusion ratio between both extruders can be changed

See the info screen (Extreme 1500 F: (Front) and for the 1000 & 2000 L: (Left) extruder) for the current value.

The sum of ratio of both extruders is always 100%.

The set value can be overwritten if the command "G93 R" value, "T0" (ratio = 100%) or "T1" (Ratio = 0%) is used in the print and lock is set to "Off".

#### Temperature:

In this menu, different parameters can be changed.

#### Nozzles:

Temperature set value for printhead adjustable between 0 (off) and 260 (max) degrees Celsius.

#### Bed:

Temperature set value for the print-bed temperature. Adjustable between 0 (off) and 60 degrees Celsius.

#### Fan Speed:

Set value for speed of the print cooling fan. Adjustable between (0) and 255 (max).

#### Autotemp : off/on

Settings PID controller

#### Preheat Conf:

The set value for the "Prepare", "Preheat" function used in the menu.

Fan Speed: 0-255

Nozzles: 170-260

Bed: 0-60

The adjusted values can be saved with "Store Settings" function.

The values can be reset to the factory value using "Service", "Machine Info" & "Factory Reset"

# Manual Builder extreme 1000/1500/2000

## Motion

This part of the menu is for professional use only. The Builder advise is not to use this part of the menu.

### Remote Control: off/on

When selected Remote Control you can print from the AstroBox and the display will show "Remote" instead of "SD---%".

When Remote Control is turned "off" no movement instructions will be executed from the AstroBox.

## Service Menu

### Change Filament:

The printhead moves to the parking position and if the temperature is  $<170^{\circ}\text{C}$  the extruder is first heated to the "preheat" temperature. Then a signal sounds that the filament can be exchanged if no filament is placed (Filament detection is empty) the message "Place Filament!" appears after pressing the button. If filament is now placed (Filament in detection) the message "Press to continue" appears on the screen. After pressing the button, the head returns after the start position.

### Replace Head:

The printhead moves to the parking position.

The extruder motors, heater and cooling fans are turned off.

The print head can be changed.

After changing the printhead, Press the button. This turns the expanded parts back on and the head returns to its previous position.

### Bed leveling:

Point 1: position A left front \*

Point 2: position B right front \*

Point 3: position C in the middle behind \*

\* See attachment for position per machine

Procedure:

- The head moves  $Z = +10\text{mm}$  and moves to the selected position.
- The head moves to  $Z = 0\text{mm}$ .

### Machine Info:

"Operating Hours", the hours that the machine was on standby

"Running hours", the hours that the machine has performed movements.

# Manual Builder extreme 1000/1500/2000

## Print from SD

### Recover after power fail

**File data**"File" \* the abbreviated file name of the print file \* (total 13 characters "name.gco")

"Linenumber" is the line number where the printer was in queue when it was interrupted.

**Remove data** deletes the "recover" print file data

**Resume print** searches for the filename on the sd card and starts the print:

Resume print Procedure:

- X & Y axes go to home position.
- The z-axis height is loaded and set as current.
- The print file settings are retrieved and loaded
- The bed & head are heated
- Extruder menu comes up
- Printing is resumed after return

\* **Short name consists of 13 characters including ".gcode", so max 8 for the name and also note that the first 8 characters of a name do not occur in another file.**

# Manual Builder extreme 1000/1500/2000

## Machine Notifications:

Notifications	Meaning
"Extreme XX00 Ready"	Machine is ready
"SD-card inserted "	SD card is placed
"SD-card removed "	SD card is removed
"Insert SD-card "	Place SD card
"Printing... "	Machine is printing from sd Card
"Print,Heating..."	Print head is heating
"Print,Bed Heating.."	Print bed is heating
"Pause Print "	Het print is paused
"Resume Print "	Resumes print
"Returning... "	The print head is returning after a service routine
"Replace Head "	Replace a printhead
"STOPPED "	Print is being stopped by the "stop" function
"EMERGENCY STOP "	The emergency button is pressed
"Filament runout... "	One of the filament channels is being detected as "Empty"
"Moving to pos... "	Printhead is being moved to parking position for service
"Change Filament "	Filament can be changed
"Place Filament! "	Place filament in both channels
"Change Head "	Printhead can be changed
"Power Failure "	Power supply has failed.
"Check MainPower ! "	Check if the main voltage is present and / or direct wiring for defects
"A Power Shutdown " "Has Happened "	During printing the machine has been stopped and turned off due a power shutdown
"System Reset"	The printer has been reset caused by a software/hardware failure
"Err: MINTEMP"	The ambient temperature is lower than 5 <sup>0</sup> C The temperature sensor is defective The extruder is not inserted or has come loose from the holder.
"Err: MAXTEMP"	The printhead has exceeded the maximum temperature, > 275 <sup>0</sup> C
"Err: MAXTEMP BED"	The bed has exceeded the maximum temperature, > 100 <sup>0</sup> C
"Extruder to Cold!"	The printhead is too cold (Temp <170 <sup>0</sup> C) to be able to extrude
"Bed Heating... "	The print bed is being heated
"Bed done. "	The bed has reached the set temperature
"Timeout On Heater"	The extruder is disabled because the printer has not been used / operated for 30 minutes.
"Timeout On bed "	The bed is switched off because the printer has not been used / operated for 180 minutes.
"Push to Start Heater"	Push the button to start heater
"Heating... "	Print head is heating
"Press To Continue "	Push the button to continue
"Sleep..."	The printer temporarily goes into standby
"Service"	Machine is in "service mode"
"Auto Homing... "	Machine is autohoming
"Do First AutoHome !"	First do "autohome"



# Manual Builder extreme 1000/1500/2000

## Additional Information

### G-code list

Gcode	Meaning
G0,G1	Coordinated Movement X Y Z E
G4	Dwell S<seconds> or P<milliseconds>
G10	Retract filament according to settings of M207
G11	Retract recover filament according to settings of M208
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
M0,M1	Unconditional stop - Wait for user to press a button on the LCD (only in Remote Control)
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
M85	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
M115	Capabilities string
M117	Display message
M119	Output Endstop status 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 <sup>2</sup> for print moves (M201 X1000 Y1000)
M203	Set maximum feedrate that your machine can sustain (M203 X200 Y200 Z300 E10000) in mm/sec

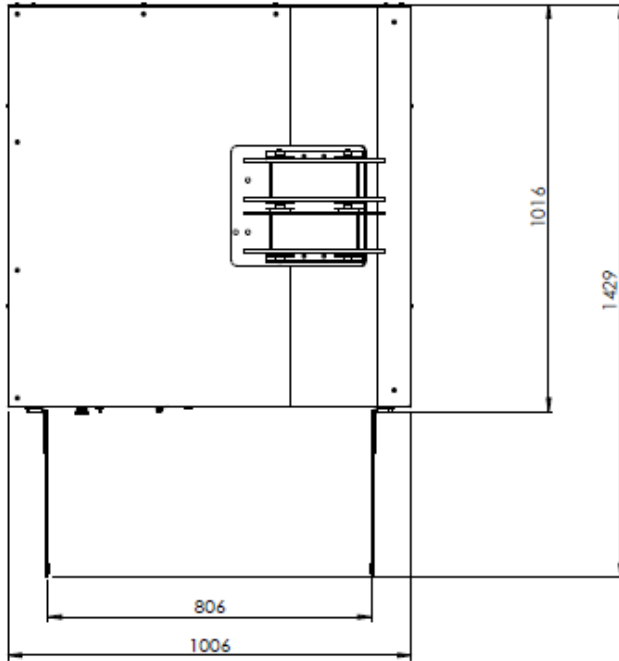
## Manual Builder extreme 1000/1500/2000

M204	Set default acceleration: S normal moves T filament only moves (M204 S3000 T7000) in mm/sec <sup>2</sup> also sets minimum segment time in ms (B20000) to prevent buffer underruns and M20 minimum feedrate
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
M206	Set additional homeing offset
M207	Set retract length S[positive mm] F[feedrate mm/sec] Z[additional zlift/hop]
M208	Set recover=unretract length S[positive mm surplus to the M207 S*] F[feedrate mm/sec]
M209	S<1=true/0=false> enable automatic retract detect if the slicer did not support G10/11
M220	S<factor in percent>- set speed factor override percentage
M221	S<factor in percent>- set extrude factor override percentage
M300	Play "beep" sound S<frequency Hz> P<duration ms>
M301	Set PID parameters P I and D
M302	Allow cold extrudes, or set the minimum extrude S<temperature>.
M304	Set bed PID parameters P I and D
M400	Finish all moves
M502	Reverts to the default "factory settings"
M503	Print the current settings
M540	Use S[0 1] to enable or disable the stop SD card print on endstop hit (requires ABORT_ON_ENDSTOP_HIT_FEATURE_ENABLED)
M600	Pause for filament change
M610	Pause for printhead change
M999	Restart after being stopped

# Manual Builder extreme 1000/1500/2000

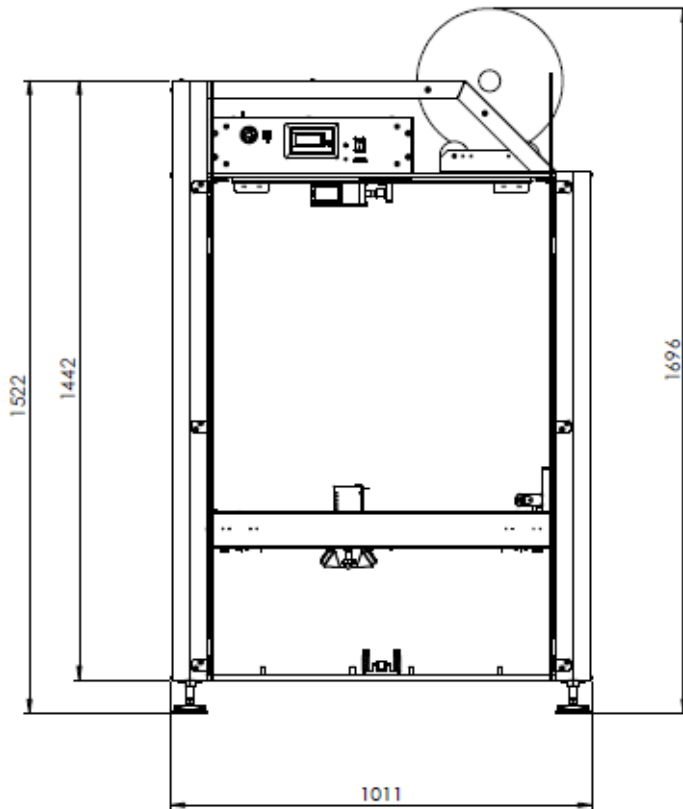
## Machine drawings

### Extreme 1000 top view

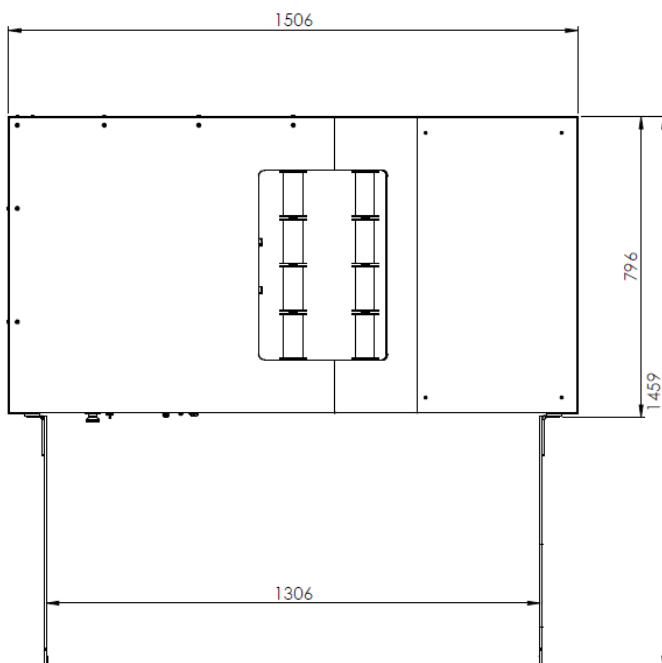


### Extreme 1000 front view

# Manual Builder extreme 1000/1500/2000

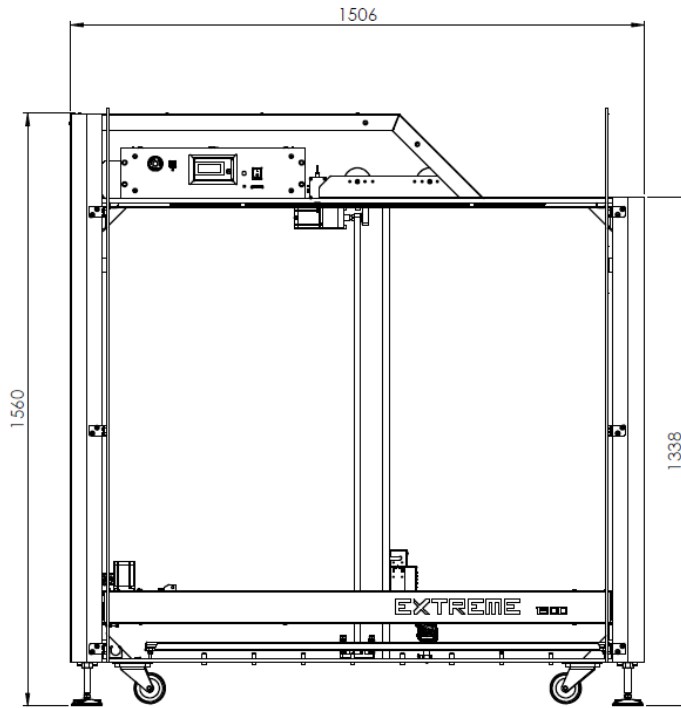


**Extreme 1500 top view**



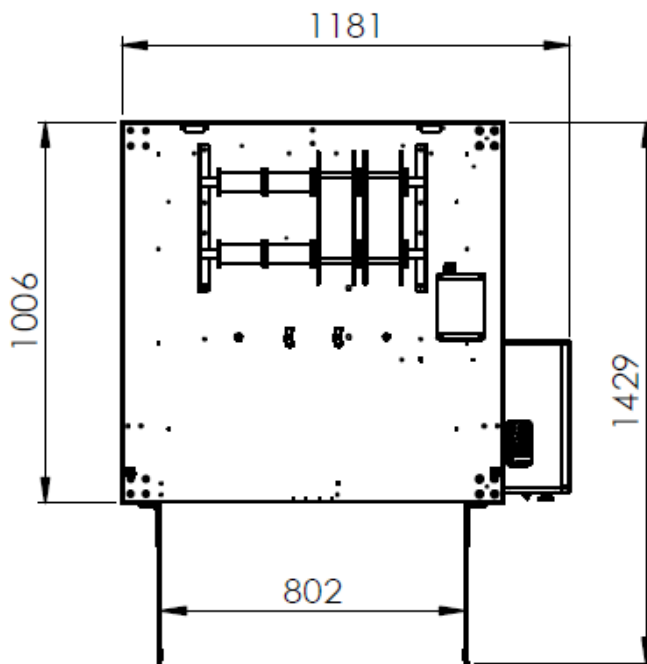
**Extreme 1500 front view**

# Manual Builder extreme 1000/1500/2000



# Manual Builder extreme 1000/1500/2000

Extreme 2000 top view



Extreme 2000 front view

