

ddd drop

Installation and User manual



Models LEADER and LEADER TWIN

Firmware 160518 and later

ENGLISH

Translation of Dutch original

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The logo for 'dddrop' is rendered in a bold, black, sans-serif font. The letters 'd', 'd', 'd', and 'r' are connected to each other, while the 'o' and 'p' are separate. The 'p' has a distinctive shape with a vertical stem and a horizontal base.

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1 Introduction

This manual covers the necessary steps needed to get the best results from your dddrop printer. The manual covers Installation, Use, Maintenance and Issues. It is possible that you already have experience with other versions of dddrop 3D printers. It is however recommended to study this manual thoroughly in order to understand the latest procedures related with the use of the dddrop LEADER and LEADER TWIN 3D-printers.

In chapter 2 the product specifications are given of the dddrop LEADER/LEADER TWIN together with an overview of the machine. In chapter 3 the installation of the printer is described followed by its use in chapter 4. Chapter 5 is dedicated to the installation and use of Slic3r. Chapter 6 covers the procedure on how a print is started. Additionally, chapters Maintenance and Safety are found in chapters 7 and 8 respectively.

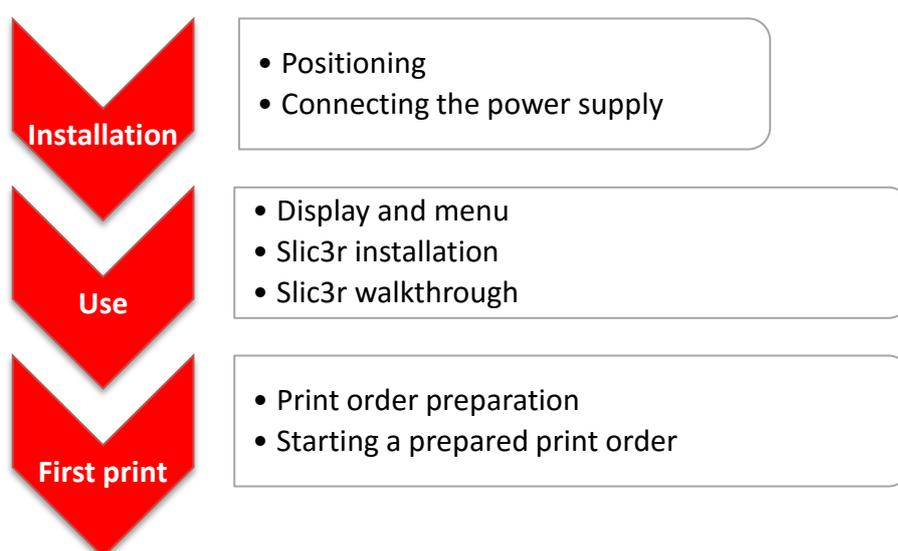


Figure 1. Quick start Steps

Following the quick start steps above, the manual guides you step by step through the procedures. Information that requires extra attention is presented in the following format:

WARNING

A warning is given when the concerning procedure may cause harm or injury to the user, or damage to the machine. A warning precedes the section it relates to.



2 Product details

2.1 Specifications dddrop leader/leader twin

Printing		Physical dimensions	
Print method	Fused Filament Fabrication (FFF)	Frame dimensions	X 530 mm Y 555 mm Z 570 mm
Print volume	320 x 310 x 305 mm	With material	X 530 mm Y 660 mm Z 570 mm
Layer thickness	0,01-0,4 mm (*)	Mass	± 30 kg
Filament diameter	1,75 mm	Total transport mass	35 Kg
Nozzle diameter	0,4 mm (**)		
Print speed	Max. 150 mm/s		
Software		Temperature	
Slicer software	Silc3r – dddrop config	Environment temperature	15 – 30 °C
File types	STL/OBJ/AMF	Nozzle temperature range	150 – 300 °C
OS supported	Windows Mac OS X GNU Linux	Heated bed temperature range	50 – 130 °C
Power/connectivity		Sound	
Power	100-240VAC / 47-63Hz 600 watt max.	Average sound level (in use)	<55 dB(A)
Connectivity	Stand-alone printing through SD-card USB (firmware)		

(*) Standard settings with standard nozzle included (0.25mm layer thickness, 0.4mm nozzle), possibly smaller nozzles are required for reduced layer thicknesses, please contact your supplier.

(**) Other nozzle diameters (e.g. 0.2mm, 0.4mm, 0.6mm or 0.8mm) are optional, please contact your supplier.

2.2 Printer overview

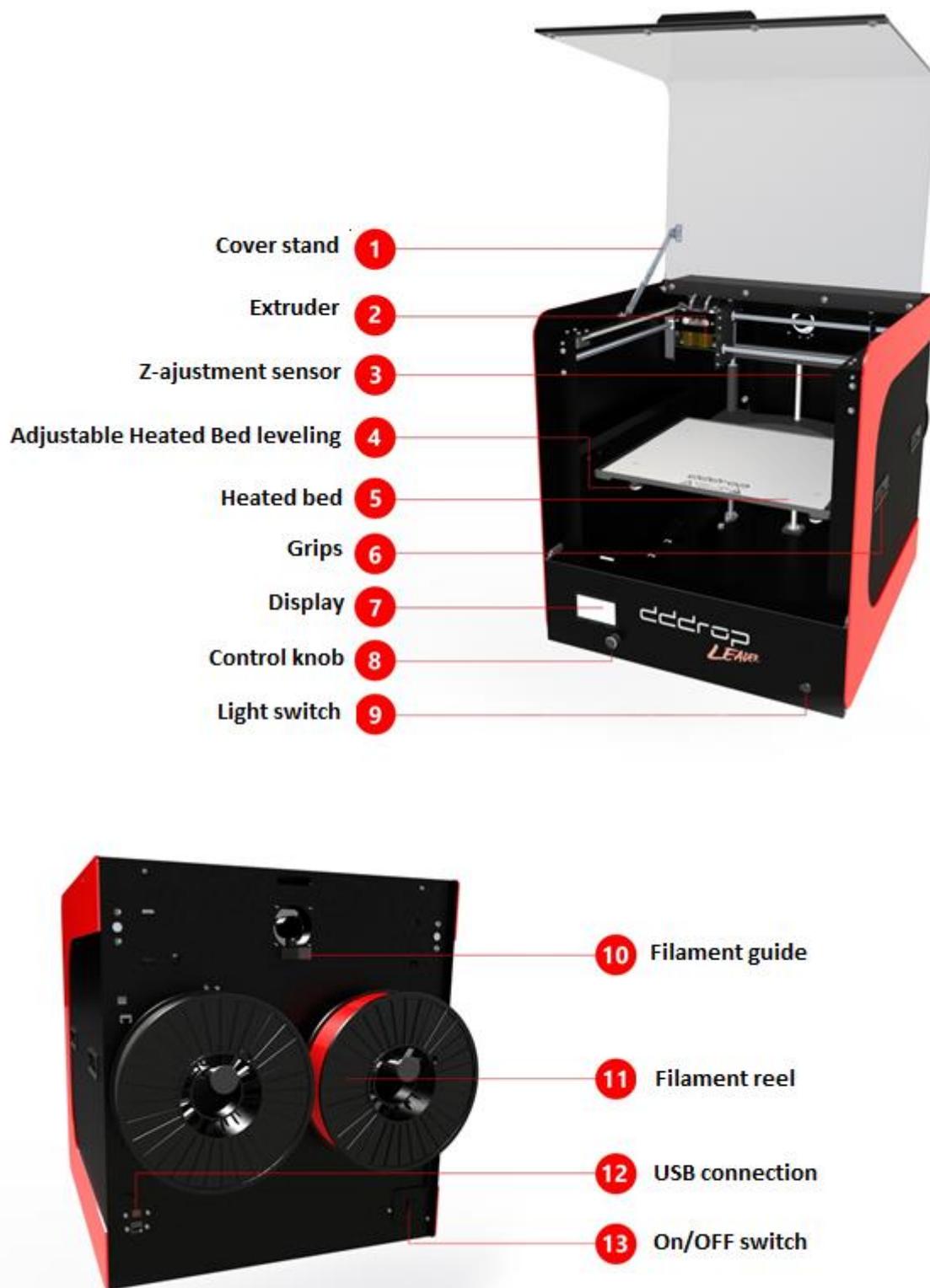


Figure 2. Printer overview (ddd drop leader twin)

3 Installation of the device

In this chapter the installation of the dddrop LEADER and dddrop LEADER TWIN 3D printers is described. These steps have to be made before use. The first step is placing the machine on a stable support, followed by the power connection to the mains.

**WARNING**

The machine is to be lifted and moved by two persons using the 4 grips on both sides of the machine in order to minimize the chance of pinching or dropping of the device. Place the machine on a stable support with a loading capacity of at least 50kg.

**WARNING**

The machine is to be used in well ventilated areas only. Fumes that can occur during the printing process are material dependent and, especially in case of insufficient ventilation, have to be extracted.

3.1 Placing the device

The dddrop printer is supplied with the SD-card in the printer, this manual and a power cable. Accessories like Quick Starting kits can be ordered additionally enabling the user to start right away. The machine needs to be placed on a stable support with a loading capacity of at least 50kg in a well ventilated area, free of weather influences, limited humidity and at room temperature.

**WARNING**

The machine is shipped with transport locks which have to be removed before the machine is connected to the mains and put to use. Failure to remove the transport locks may cause damage to machine components beyond repair.

3.2 Removing transport locks

The printer is shipped with 4 transport locks made from foam tubing. The transport locks eliminate movability of the extruder in X and Y directions during transportation. These transport locks have to be removed by a simple pull action in order to separate them from the guides they cover. Failure to do so may cause damage to machine components beyond repair. No tools are needed.

**WARNING**

Only use the power cable provided when connecting the machine to the mains. Use a grounded wall plug. Ensure that during maintenance the machine is turned OFF (O) and the mains cable is detached.

**WARNING**

Before connecting your machine, ensure that the power switch is switched OFF (O) before connecting the power cable to the mains. The machine can be turned off AT ANY TIME by switching the power switch from ON (I) to OFF (O). It is however strongly recommended to only switch the machine OFF when it is not in use.

3.3 Connecting power

To connect the printer, use the supplied power cable. With the power switch in the OFF (O) position, connect the power cable on the machine side and then connect it to the mains by connecting the cable to the mains using a grounded wall plug. The printer is enabled when the power switch is switched from OFF (O) to ON (I). The led display and light switch will become illuminated and the firmware becomes initialized.

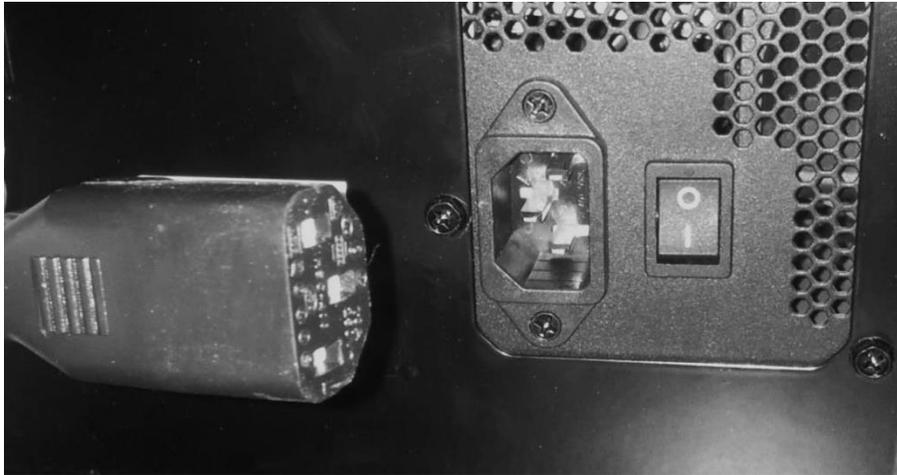


Figure 3. AC connection with supplied power cable and on/off switch

4 Use of the device

This chapter covers the menu structure step by step. The control knob by the display works as both a rotary and push button. Using the knob it is possible to scroll through the menu. This chapter starts with detailed information on the *info screen*, followed by the menu structure available **before printing** and the menu structure **during printing** thereafter.

4.1 Info screen

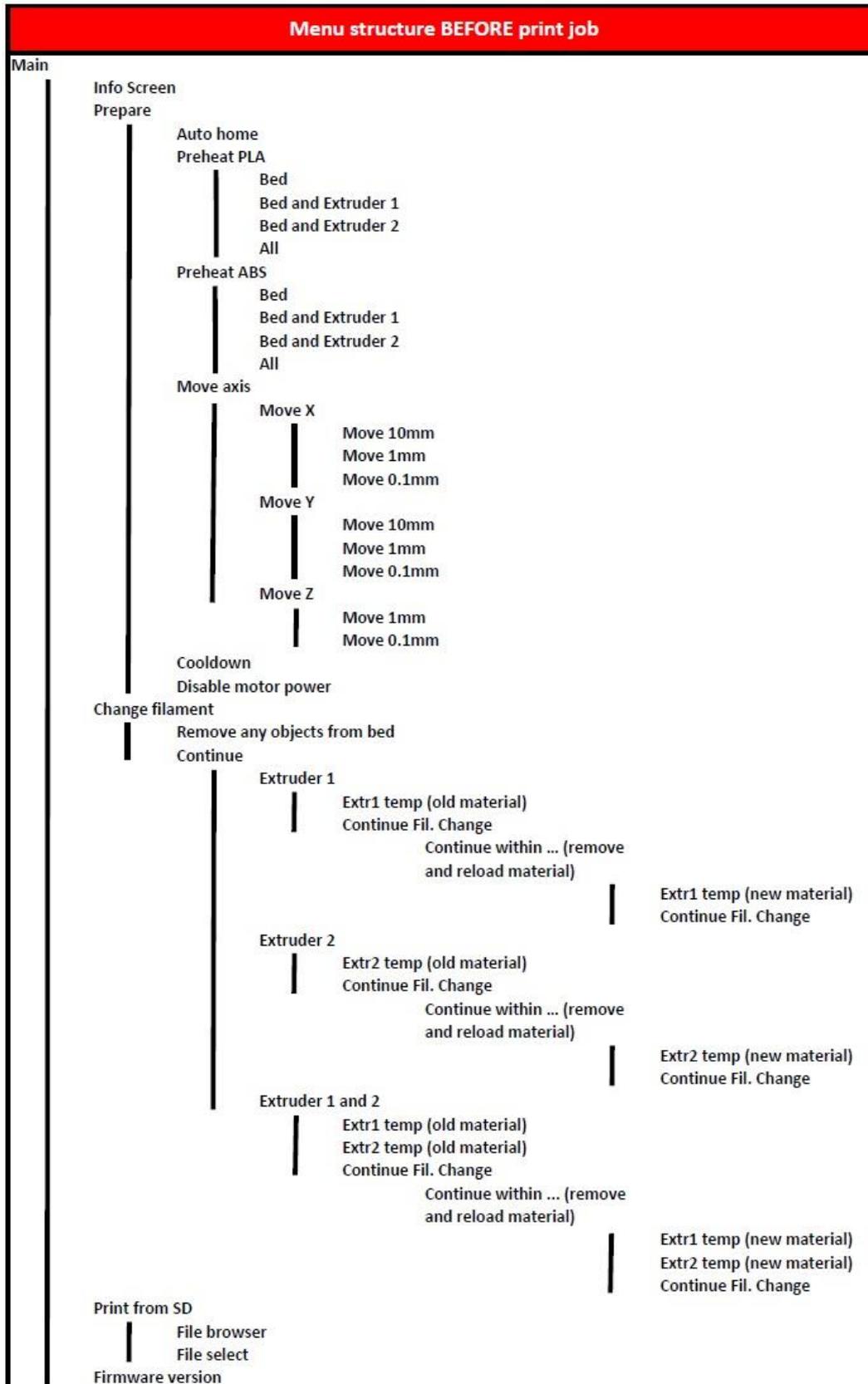
The printer is turned ON by switching the power switch on the back of the printer from OFF (O) to ON(I). The LED display and the light switch become illuminated and the firmware is initialized. After a short welcome screen with the DDDROP logo, the following screen is displayed.



The meaning of the values is as follows:

- 1a. Extruder set temperature (Extruder 1);
- 1b. Actual extruder temperature (Extruder 1);
- 2a. Extruder set temperature (Extruder 2, dddrop leader twin only);
- 2b. Actual extruder temperature (Extruder 2, dddrop leader twin only);
3. Heated bed set temperature;
4. Actual heated bed temperature;
5. Feedrate, 100 % is de standard print speed;
6. Progress bar with time indication of elapsed time including percentage;
7. Extruder position on print bed;
8. Status communication field;
9. Actual extruder fan speed;

4.2 Menu structure BEFORE printing



Menu structure BEFORE a print job is started on a dddrop leader twin (in case of dddrop leader ignore all "Extruder 2" statements)

4.3 Main menu BEFORE print job

When the info screen is displayed, a press of the button will show the main menu.

Info screen; the info screen has been explained in 4.1. Using the knob to select and click on this function, the display returns to the info screen.

Prepare; this function contains settings that can be made before a print job is started. The detailed functions in prepare are explained in 4.3.1. During a print job, this menu item is replaced by the *Advanced* menu (4.5.1).

Change filament; Using this function, filament can be changed both before and during a print job. It is however recommended to change the filament before a print job is started. More information on this is given in 4.3.2.

Print from SD; All g-codes (“machining codes”) generated by Slic3r are shown in this file browser function. More info is given in 4.3.3.

Firmware version; the firmware version on the machine can be shown using this function. More info is given in 4.3.4.

```
↑Info screen      ↑
Prepare          +
Change filament  +
Print from SD    +
Firmware version +
```

```
Info screen      ↑
Prepare          +
Change filament  +
Print from SD    +
Firmware version +
```

```
Info screen      ↑
Prepare          +
Change filament  +
Print from SD    +
Firmware version +
```

```
Info screen      ↑
Prepare          +
Change filament  +
Print from SD    +
Firmware version +
```

```
Info screen      ↑
Prepare          +
Change filament  +
Print from SD    +
Firmware version +
```

4.3.1 Prepare menu

When the *prepare* function is chosen using the selector knob, the following display is shown.

Main; the main menu is explained in 4.3, by choosing this function one returns to the main menu.

Auto home; using this function, the extruder(s) move to a predetermined position (X0Y0Z0). For safety reasons this is in the back left of the machine. The moving bed moves up using this command!

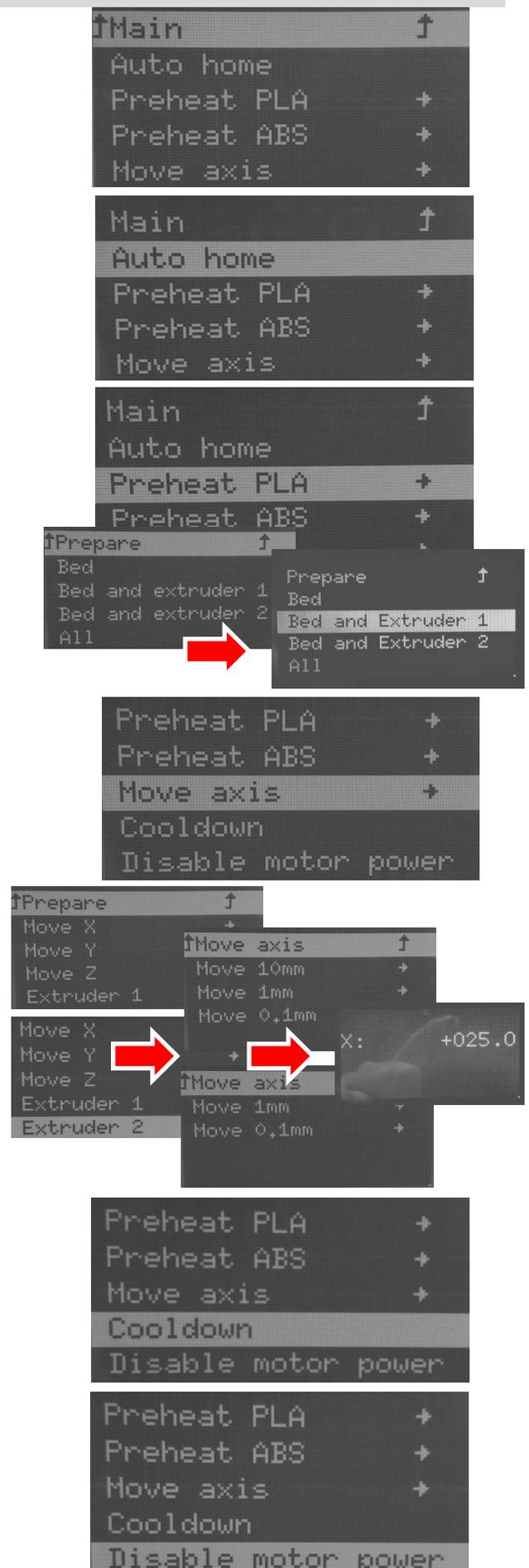
Preheat PLA/ABS; using this function, both the extruder and the heated bed can be pre-heated as a preparation before a print is started.

E.g.: Pre-heating for printing with PLA: *Preheat PLA* => *Bed and extruder 1*

Move axis; Auto home needs to be performed first. Using this function, the position of X, Y, Z can be altered manually. Besides this, material can be fed through the extruder. First the operator has to choose which shaft has to move or which extruder has to move filament. Next the step size is selected: 10mm, 1mm or 0.1mm (Note: Step size 10mm is only possible for movements of the X and Y directions). Using the control knob a preferred distance can be selected. A push of the button will return to the previous menu.

Cooldown; using this function both the extruders and the heated bed can be cooled down. When a print is stopped during a print job, the cooldown function is not enabled and the controls will maintain the last known set temperatures. When a print is completed, the cooldown function is automatically enabled.

Disable Motor Power; this function disables the hold function of the stepper motors.



4.3.2 Change filament (BEFORE a print job)

Main; the main menu is explained in 4.3, by choosing this function one returns to the main menu.

Continue; the user is warned to make sure all objects are removed from the heated bed before continuing with the procedure in order to prevent damage to the extruder heads. Only click *Continue* if sure it is safe to do so.

Extruder selection; next in the sequence is the selection of the extruder of which the filament needs to be changed by selecting *Extruder 1*, *Extruder 2* or *Extruder 1 and 2* and .

Current material temperature; before the current material can be removed, the selected extruder has to be heated to the material print temperature. Starting value is 150C and needs to be increased using the jog dial. When left at 150C the filament change process will be terminated. After setting the current material print temperature select *Continue Fil. Change*.

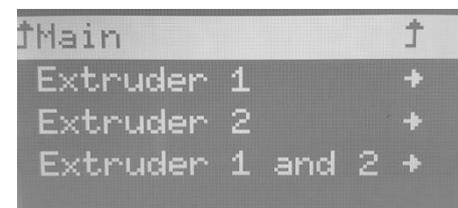
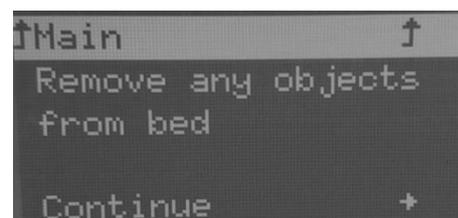
Sequentially the extruder will warm up to the selected temperature. (*Heating...*). When this temperature is reached (*Heating done*) the extruder will move towards the filament change position.

When the status changes to *Continue within...* (*countdown timer*), the old material can be removed and the new material can be loaded. The material needs to be loaded all the way into the nozzle. Confirm the change by a click of the control knob.

New material temperature; Next the operator is prompted to set the new material print temperature. Starting value is 150C and needs to be increased using the jog dial. When left at 150C the filament change process will be terminated. After setting the current material print temperature select *Continue Fil. Change*.

The extruder continues to move to the position above the container and extrudes an initial quantity of new material in the container wiping the nozzle clean, denoted by **Extruding...** in the status bar.

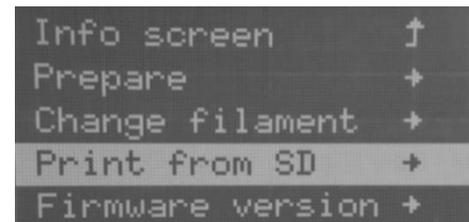
The filament change is complete and the status changes to **DDDROP Ready**.



4.3.3 Print from SD

Main; the main menu is explained in 4.3, by choosing this function one returns to the main menu.

All g-code files on the SD can be found using the browsing function 'Print from SD'. By using the control knob rotary function a file can be selected and the push function is given to start the print job (Note that you have the same materials supplied to the printer as the ones you have used generating the g-code!) The latest generated g-code automatically shows on top.



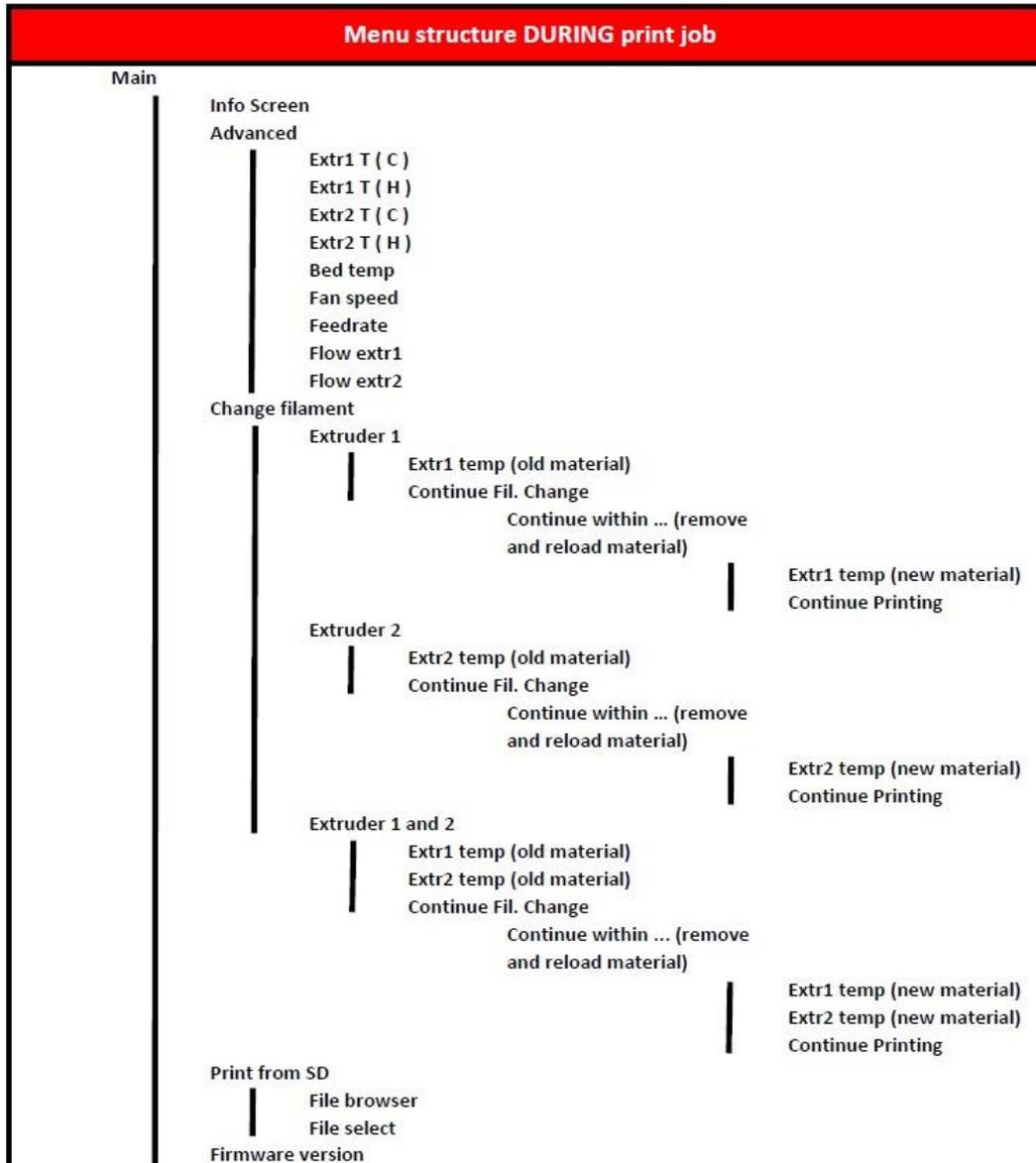
4.3.4 Firmware version

Main; the main menu is explained in 4.3, by choosing this function one returns to the main menu.

This function shows the installed firmware version.



4.4 Menu structure DURING a print job



Menu structuurboom tijdens het printen voor dddrop leader twin (bij ddrop leader vervalt Extruder 2 temp en Flow 2)

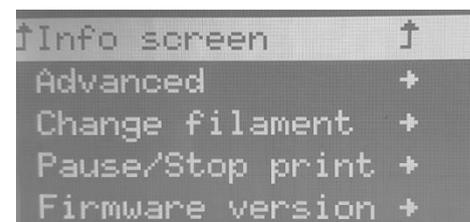
4.5 Main menu DURING a print job

Info screen; the main menu is explained in 4.3, by choosing this function one returns to the main menu.

Advanced; with this function the print settings can be altered on the go. More info is given in 4.5.1.

Change filament; Using this function, filament can be changed both during a print job. It is however recommended to change the filament before a print job is started. More information on this is given in 4.5.2.

Pause/Stop print; A print job can be paused (unpaused) or stopped with this function .



Firmware version; the firmware version on the machine can be shown using this function. More info is given in 4.3.4.

4.5.1 Advanced menu

Extr 1/2 T(C) or T(H); this function adjusts the extruder 1 or 2 nozzle temperature (degrees Celsius). T(H) is the print temperature and T(C) the cooldown temperature during nozzle inactivity.

Bed temp; this function adjusts the heated bed temperature (degrees Celsius).

Fan speed; this function adjusts the fan speed (product cooling). (%)

Feedrate; this function adjusts the total print speed (feedrate). (%)

Flow 1/2; this function adjusts the extruder 1, 2 or both material flow settings. (%)

```

↑Main                               ↑
Extr1 T(C):                          175
Extr1 T(H):                          220
Extr2 T(C):                          180
Extr2 T(H):                          225

```

```

Bed temp:                             90
Fan speed:                             60
Feedrate:                              100
Flow extr1:                            100
>Flow extr2:                            100

```

4.5.2 Change filament (DURING a print job)

Main; the main menu is explained in 4.3, by choosing this function one returns to the main menu.

Extruder selection; next in the sequence is the selection of the extruder of which the filament needs to be changed by selecting *Extruder 1*, *Extruder 2* or *Extruder 1 and 2* and .

Current material temperature; before the current material can be removed, the selected extruder has to be heated to the material print temperature. Starting value is 150C and needs to be increased using the jog dial. When left at 150C the filament change process will be terminated. After setting the current material print temperature select *Continue Fil. Change*.

Sequentially the extruder will warm up to the selected temperature. (*Heating...*). When this temperature is reached (*Heating done*) the extruder will move towards the filament change position.

When the status changes to *Continue within...* (*countdown timer*), the old material can be removed and the new material can be loaded. The material needs to be loaded all the way into the nozzle. Confirm the change by a click of the control knob.

New material temperature; Next the operator is prompted to set the new material print temperature. Starting value is 150C and needs to be increased using the jog dial. When left at 150C the filament change process will be terminated. After setting the current material print temperature select *Continue Fil. Change*.

The extruder continues to move to the position above the container and extrudes an initial quantity of new material in the container wiping the nozzle clean, denoted by **Extruding...** in the status bar.

The filament change is complete and the status changes to **Printing...**

```

↑Main          ↑
Extruder 1    →
Extruder 2    →
Extruder 1 and 2 →
  
```

```

Info screen    ↑
Extr1 temp:    220
Extr2 temp:    220
Continue Fil. Change
  
```

```

Info screen    ↑
Extr1 temp:    220
Extr2 temp:    220
Continue Fil. Change
  
```

5 Slic3r

In order to print a 3D model, the dddrop printer requires model information in order to create a printed model from 3D file. Slic3r is a program that converts a 3D model into this information, in a format that the dddrop printer can read. Slic3r cuts the model in horizontal layers and generates coordinates. These coordinates and settings together form the G-code. The installation and a quick walk-through of Slic3r are given in this chapter. For more information, please visit the slicer website: <http://slic3r.org/>.

5.1 Slic3r Install

Slic3r is ready to use in 5 minutes.

1. Move the folder "Slic3r" (on the SD-card in the printer) on the desktop;
2. Open the folder and click on Slic3r.exe (📁);
3. For first use, a screen pops up 'Configuration Wizard'. 'Cancel' this screen, the configuration is already ready for implementation in an *.ini* file that is made available by dddrop.

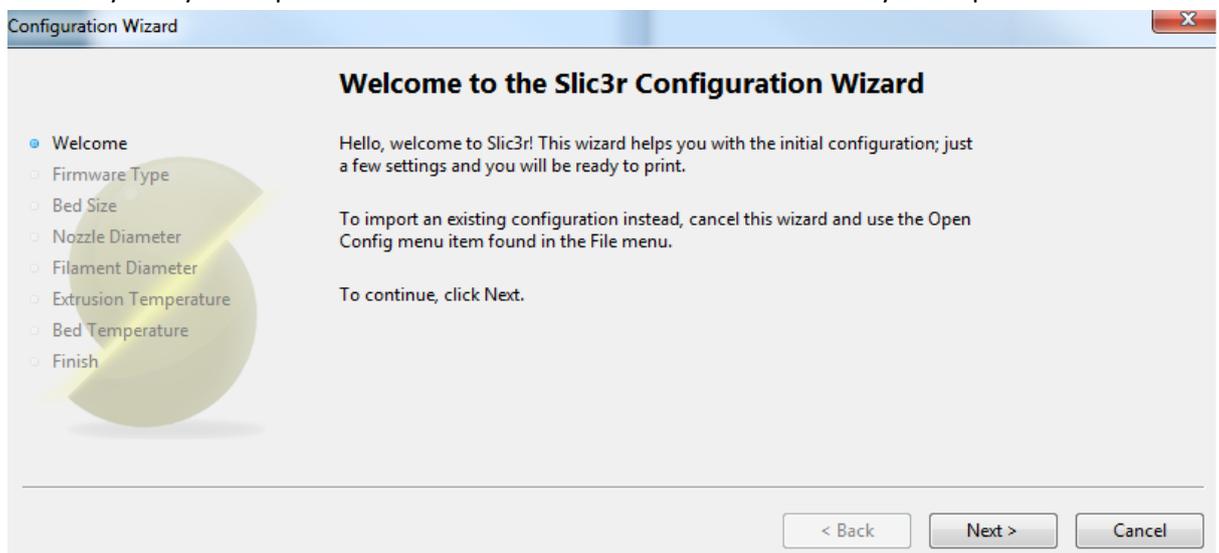


Figure 4. Slic3r configuration wizard

4. The screen ad shown in figure 5 appears. It is important to switch slic3r to Expert mode. Select 'File' -> 'Preferences'. The preferences screen appears (figure 6). Select 'Expert mode'

and click 'OK'; restart Slic3r when prompted.

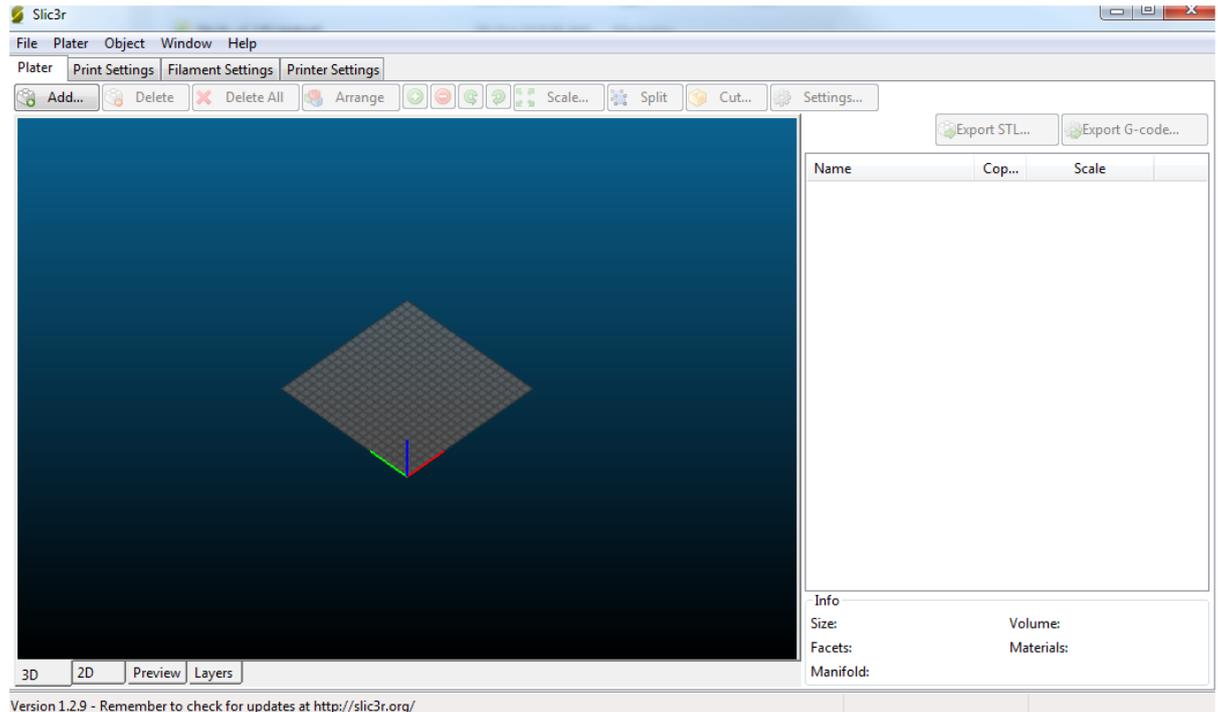


Figure 5. Slic3r tab 'Plater'

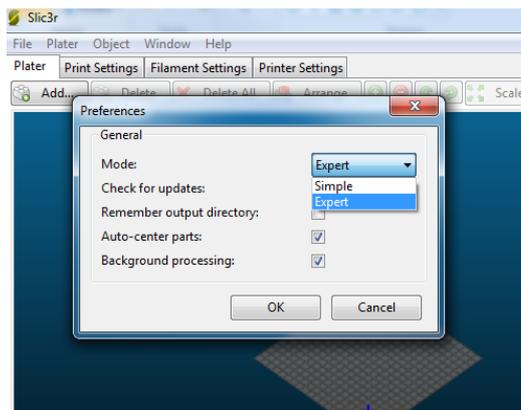


Figure 6 Preferences 'Expert mode'

5. Go to 'File' -> 'Load Config Bundle...' and open the *.ini* file that is available in the copied folder. The file is named 'dddorp_X_X.ini' (🔧) (X denoting version); the user is prompted that XX presets are successfully imported. Click 'OK'.
6. Slic3r is installed and has the presets for the dddrop printer on board.

5.2 Exploring Slic3r

Slic3r is supplied with an *.ini* file for the dddrop printer. The config file contains presets which makes creating your own settings practically unnecessary. For more information please check <http://slic3r.org/>.

5.2.1 Plater

The first tab in Slic3r is named 'Plater'. Here models are loaded, arranged and G-codes can be generated using presets.

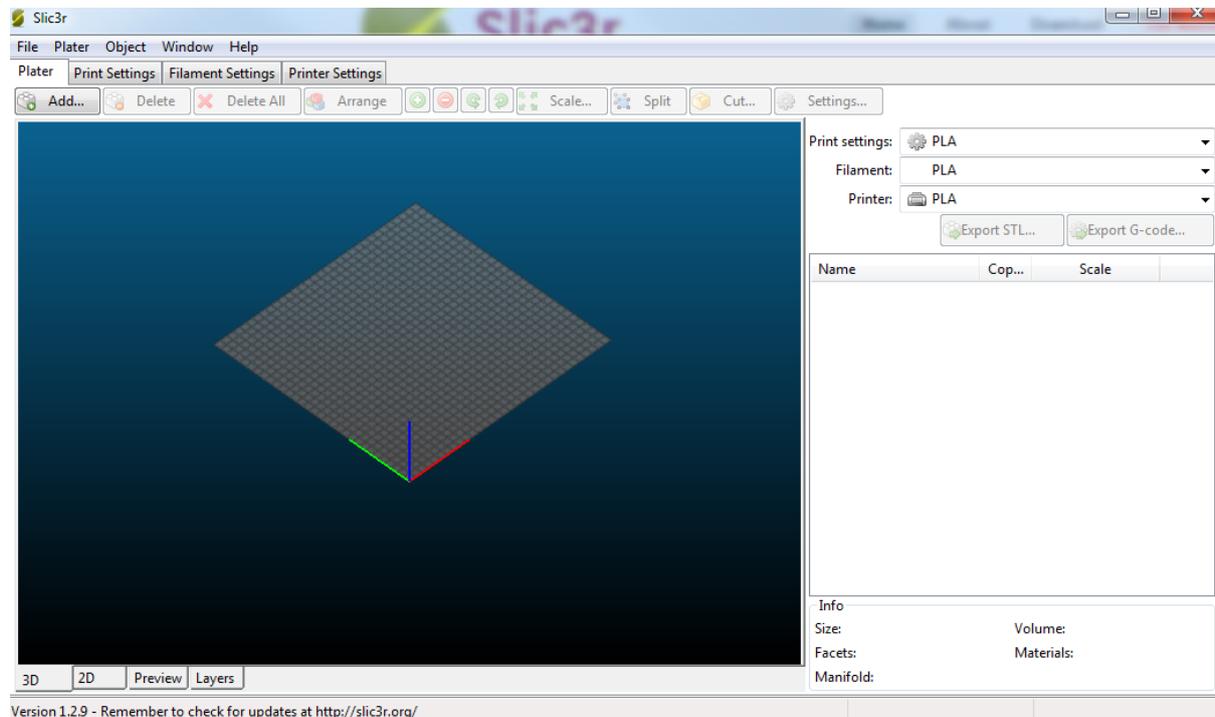


Figure 7. Tab 'Plater'

The model can be loaded using the 'Add' button or just be simply dragged onto the grid. Standard view is 3D, but one can also choose for 2D (Top view), Preview (showing printing pattern) and layers view (showing every layer in 2D detail).

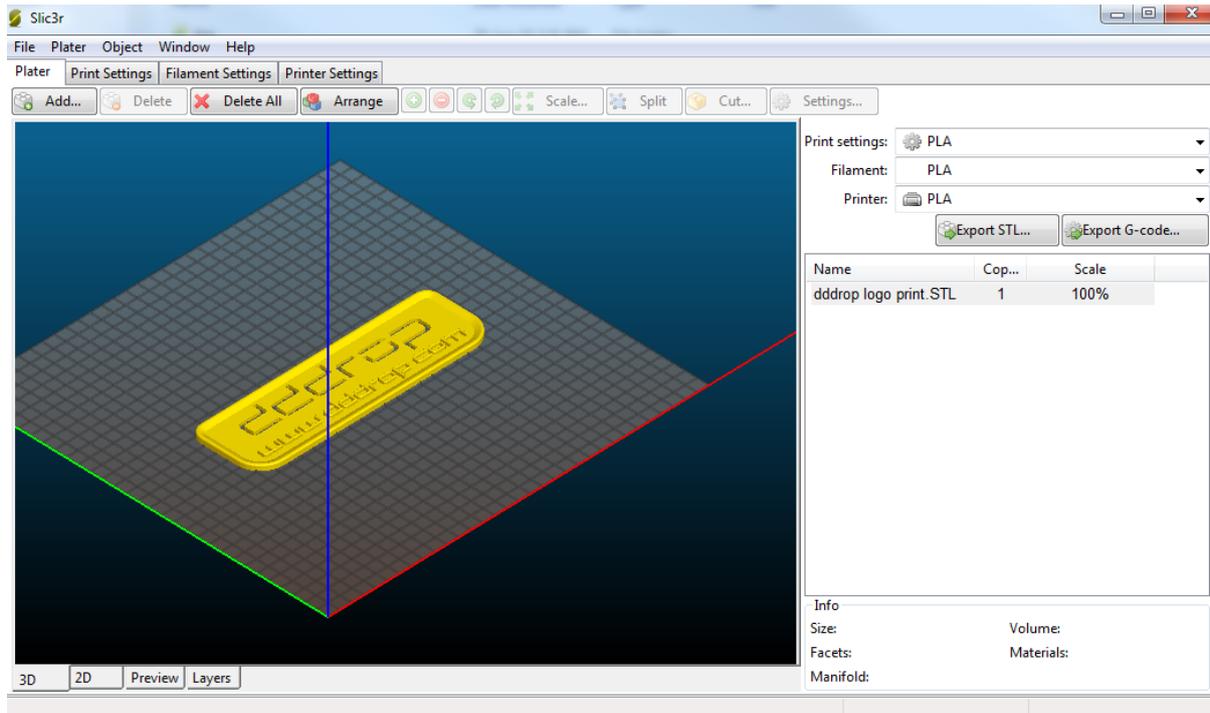


Figure 8. STL file loaded

The model will always be positioned in the middle of the grid. On the right-hand side a list of loaded models is given. The buttons on top give the possibility to change the layout as follows:

- **'Add'** – Add a model to the grid;
- **'Delete/Delete All'** – Remove a highlighted model or all models from the grid;
- **'Arrange'** - Slic3r determines an optimal model arrangement;
- **'More/Less'** – Change the number of copies of a selected model;
- **'45°/Rotate'** - Rotate about Z;
- **'Scale'** – Scale the model up or down;
- **'Split'** – Divide the model in multiple parts which can later be assembled;
- **'Cut'** – Cut the model in Z (useful with high products);
- **'Settings'** – Model specific settings;

Besides this there are 3 preset choices from the dropdown menus for *Print settings*, *Filament settings* and *Printer Settings*. These are available after loading the supplied Config Bundle (.ini file).

- **'Export G-code'** – Make a G-code from the current items on the grid;
- **'Export STL'** - Make a STL of the grid. (Useful for future reference).

5.2.2 Print Settings

The 'Print Settings' tab makes it possible to change values of the part to be printed. All sub menus are given on the left-hand side.

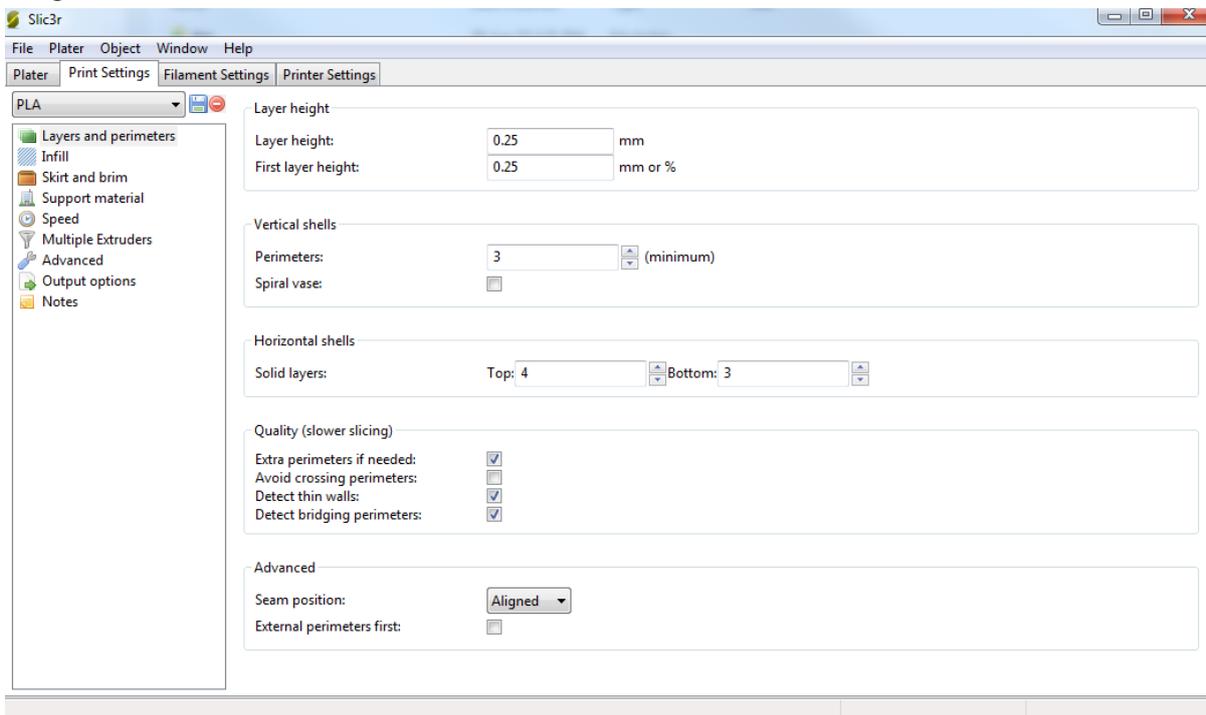


Figure 9. Tab 'Print Settings'

Most parameters are self-explanatory when the mouse pointer is placed over the parameter. A graphical representation of parameters is given in figure 10.

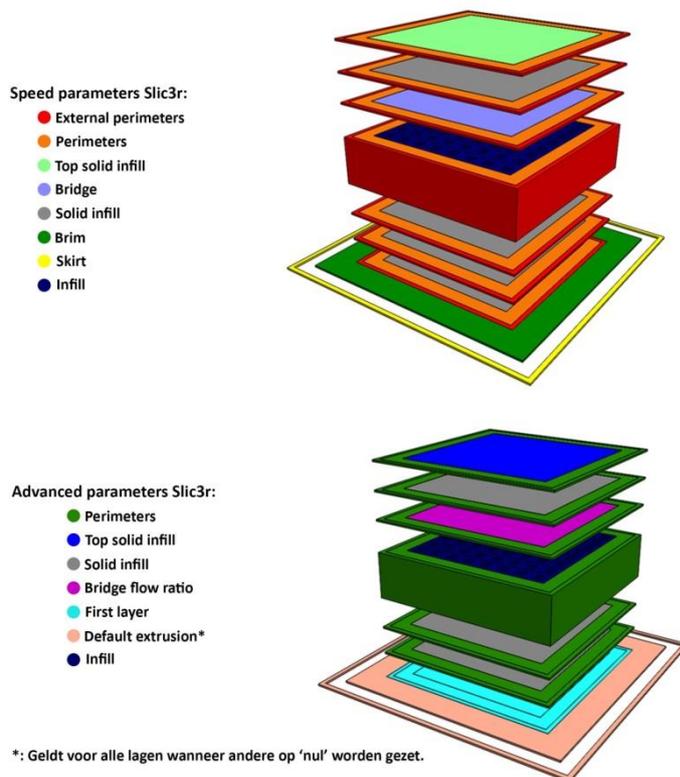


Figure 10. Indication Slic3r parameters.

5.2.3 Filament Settings

The filament settings tab contains the material parameters.

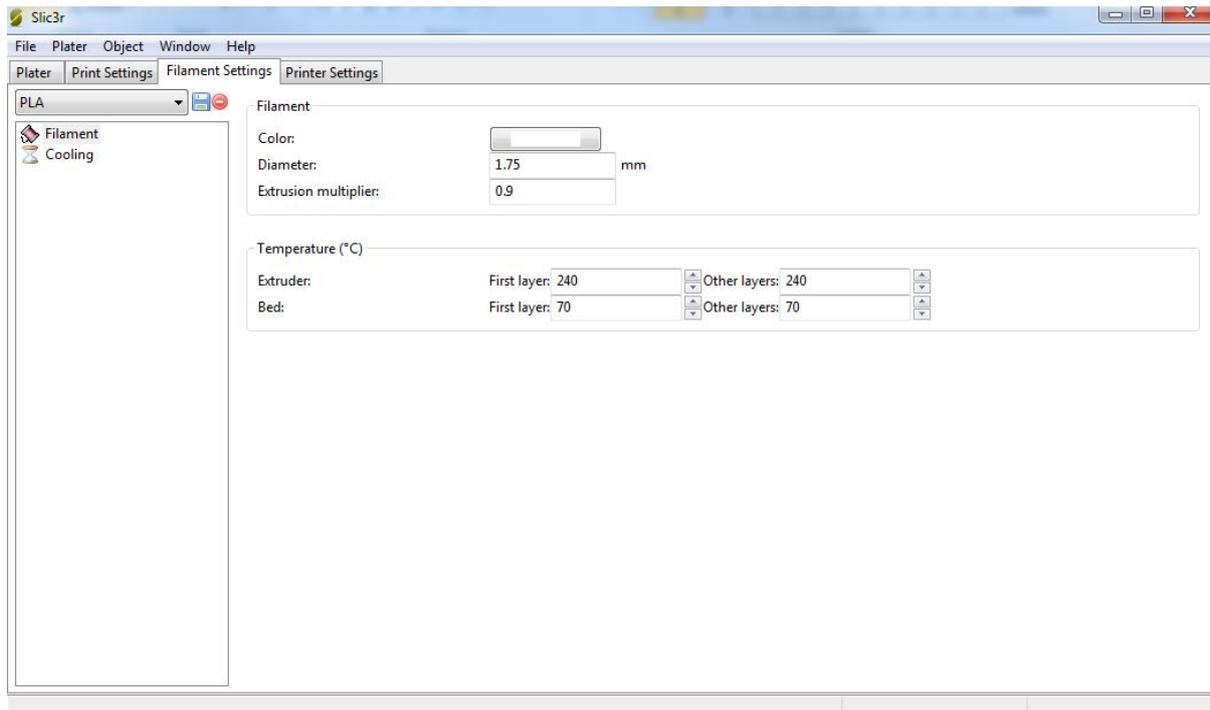


Figure 11. Tab 'Filament Settings', submenu 'Filament'

Slicer calculates the required extruder volume flow by the layer thickness, nozzle diameter and filament diameter. It is important to do this accurately. An option is added to optimize the calculated flow using 'Extrusion multiplier'. First layer temperatures can also be customized.

The other sub menu covers the material cooling parameters.

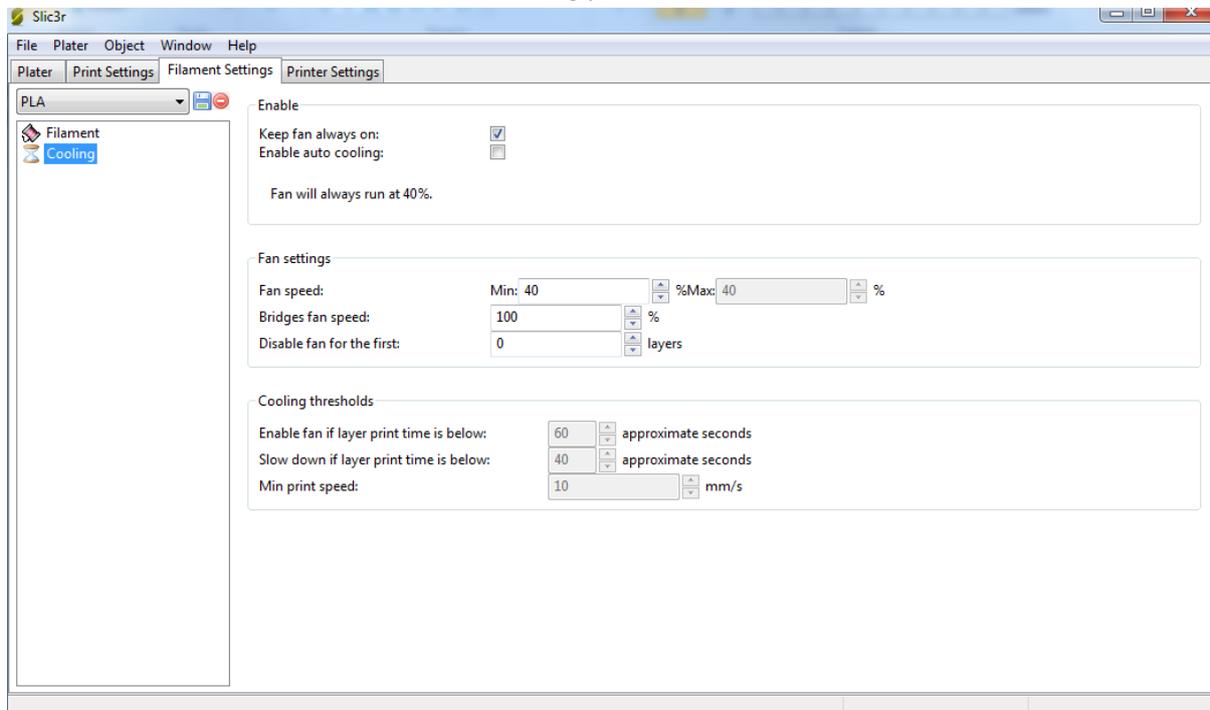
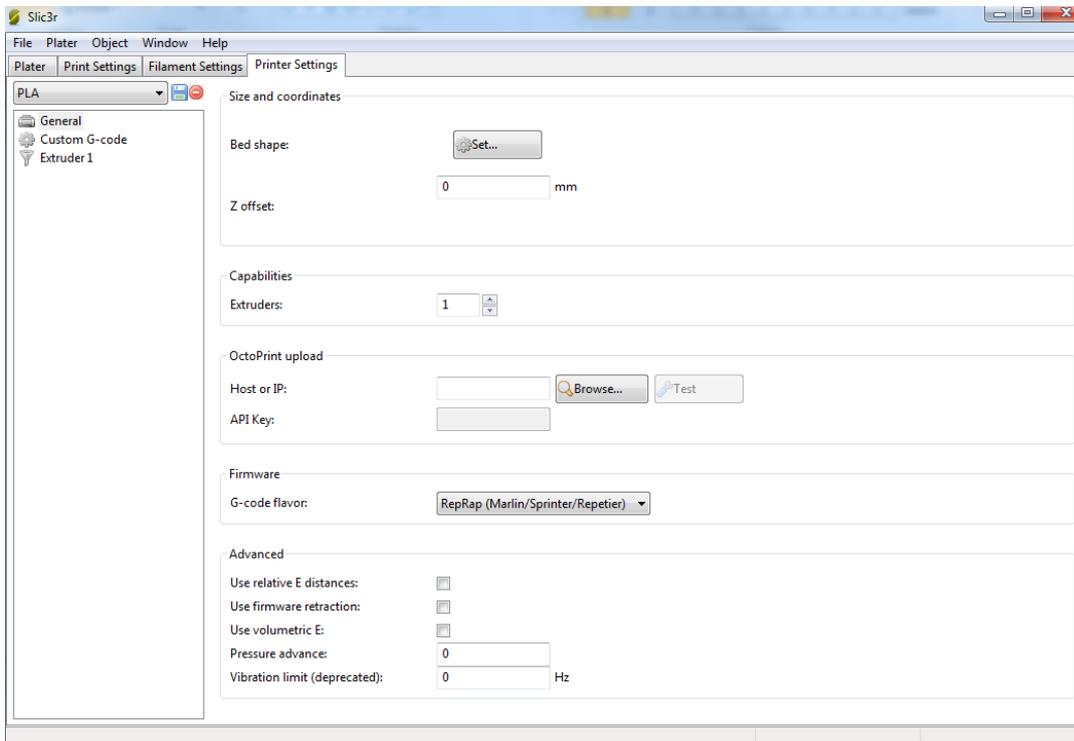


Figure 12. Tab 'Filament Settings', submenu 'Cooling'

5.2.4 Printer Settings

The tab 'Printer Settings' contains printer specific data as bed shape, G-code language and start- and encodes that have to be added to the G-code containing tasks to be performed before and after printing the model. In the 'extruder' submenu, extruder specific values can be set.



Figuur 13. Tab 'Printer Settings'

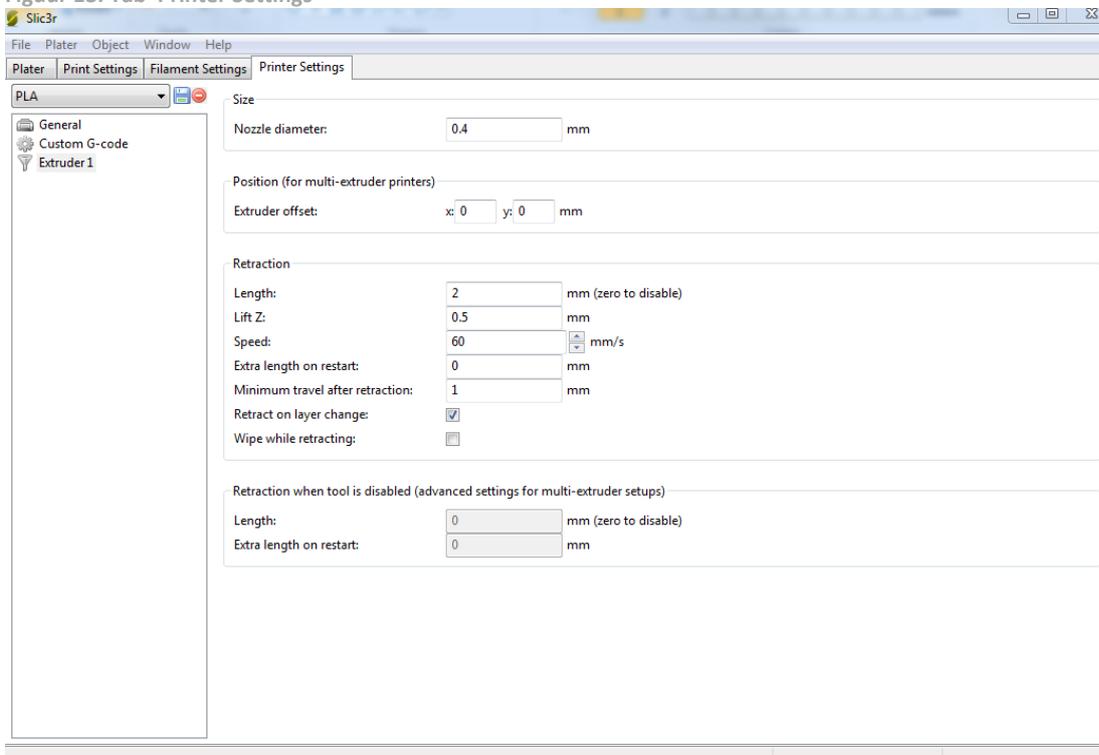


Figure 14. Tab 'Printer Settings', submenu 'Extruder'

5.3 Generating a G-code

It is strongly advised not to alter any of the standard values supplied with your printer in order to be able to revert to the standard settings at any time.

Next the steps are given which are required to generate a G-code and save this code to the SD card.

1. Start Slic3r with pre-loaded config bundle. (click Slic3r.exe (📁));
2. Click *Add*, browse for the model to print in STL (of any other supported format) and click *Open*. The file is automatically loaded in the center of the grid. When repositioning is needed, use the buttons *Arrange/rotate etc.* or position by dragging.
Using right-click on the model, rotation around X and Y is also possible. This may be helpful when the reference-axis of the design system is different than the system in the printer (Z vertical);
3. Choose the preferred preset settings for *Print settings*, *Filament settings* and *Printer Settings*. Use the dropdown menus in the top-right area of the 'Plater' tab. Use the table below in order to make sure the right choice is made, for example:
For a single extruder print in PLA you choose *PLA*, *PLA* and *PLA*.
For a dual extruder print in PLA with PVA support material you choose *PLA_Support_Twin*, *PLA_Support_Twin*, *PVA_Twin* *PLA_PVA_Twin*

Extruder	1	2	Print settings	Filament settings (Leader)	Filament settings (Leader Twin)	Printer settings
Leader	ABS	[-]	ABS	ABS	[-]	ABS
	PLA	[-]	PLA	PLA	[-]	PLA
Leader Twin	ABS	ABS	ABS_Twin	ABS_Twin	ABS_Twin	ABS_ABS_Twin
	ABS	HIPS	ABS_Support_Twin	ABS_Support_Twin	HIPS_Twin	ABS_HIPS_Twin
	PLA	PLA	PLA_Twin	PLA_Twin	PLA_Twin	PLA_PLA_Twin
	PLA	PVA	PLA_Support_Twin	PLA_Support_Twin	PVA_Twin	PLA_PVA_Twin

4. Click *Export G-code...* select the SD-card and click *Save*.
5. Wait for the G-code to be exported (status bar bottom left) and take the SD-card from the SD reader.

6 First print

This chapter covers the procedure required to start a print job.

WARNING

The machine is to be used in well ventilated areas only. Fumes that can occur during the printing process are material dependent and, especially in case of insufficient ventilation, have to be extracted.

WARNING

The printer is to be used with a closed cover only. The dddrop printer contains hot surfaces and the moving parts can lead to injuries. Never reach into the printer when in use.

Always use the control knob on the front of the printer or the on-off switch on the back of the printer to control the print job.

Allow to cool for at least 10 minutes before opening the cover and reaching into the printer.

When opening and closing the cover there is a chance of pinching. Operate the cover using both hands. Make sure the cover hinge is in lock position when opened and that the cover is in positioning hooks when closed.

6.1 Preparation of material

NOTE: For changing filament BEFORE a print, see 4.3.2. For changing filament DURING a print see 4.5.2. The general preparation is given below.

1. Place filament (1.75mm) on the back side of the printer on the filament reel brackets. Check that the filament is correctly wound on the reel and not in a loop which may block the material supply resulting in a failed print.
2. Feed the filament through the filament guide to the quick connector and metal curved tube.
3. Press the lever of the spring-loaded idler wheel free of the driven wheel (of the required extruder in case of LEADER TWIN) and feed the filament through the cooler all the way into the nozzle. The front fan assembly can be moved out of the way for better visibility. Feed until the extruder tip is reached and release the spring-loaded lever, allowing the idle wheel to drive the filament into the driven wheel. Place the curved tube through the lever into the bearing.
4. Check the material and material choice of the generated file.

WARNING

Failure to remove ALL material of a previous build from the heated bed or a badly adjusted heated bed can cause a collision and damage machine components.

6.2 Preparing heated bed

1. Clean the heated bed from residue of other prints.
2. Empty the container (See 7.2) and clean the brush (See 7.3).
3. Clean the heated bed with dddrop heat bed cleaner and paper.
4. Check correct heated bed adjustment.
5. Turn the printer ON by switching the switch on the back of the printer to the 'I' position and wait for the printer to be initialized.
6. Select the preheat function in the 'prepare' menu for the filament of choice in 6.1. Note the material of choice and extruder(s) choice. Only the extruder(s) that is (are) to be used should be preheated. It is preferred to at least preheat the heated bed since this takes most time.

6.3 Preparation of G-code

1. Follow the steps as described in 5.3 Slic3r/Generating a G-code. Take the material of choice into account as has been supplied to the machine in 6.1
2. Export the generated G-code to the SD card and place it in the SD slot in the printer. Close the cover.



WARNING

The machine contains hot and moving parts. It is strongly advised to only print with cover closed. The machine can be stopped AT ANY TIME in case of an emergency by switching the power OFF or disconnecting the power cord.

6.4 Start Print

1. Check if the container is empty and the brush and heated bed have been cleaned.
2. Check if the cover is correctly closed.
3. Select in the main menu **PRINT FROM SD**, select the generated print code and push the button to confirm. The print is automatically started.

6.5 Taking out the printed model

1. **Before opening the cover:** Check if the printer is ready. The status bar should display **print finished** and the total print time is given. The extruder is in its XY home position and the set temperatures are in cooldown mode.
2. **Before opening the cover:** Check if the printer is cooled down. The actual temperatures of nozzles and heated bed are given in the info screen.
3. Open the cover with both hands and check that the hinge is in lock position.
4. Take out the printed model. When it seems to be very stuck, the heated bed is probably still too hot to take out the product. Allow the bed to cool; the product will automatically become free. Be careful when using spatula or other tools to remove the product. Use protective clothing (e.g. Gloves, safety glasses etc.)!
5. Empty the container.
6. Turn OFF the printer by switching the power switch to the **O** position.

7 Maintenance

The dddrop printer is calibrated in order to make a quick start possible. If it however requires recalibration or maintenance, an overview is given of the steps involved.

Clean the printer externally with a damp cloth. The internals can be cleaned carefully with a vacuum cleaner.

WARNING



Failure to incorrectly, inaccurately or incompletely follow the calibration procedure will reduce print quality.

WARNING



Linear guides and the acme threaded rod are greased. Make sure not to contact the grease as it may work irritating and will stain cloths.

WARNING



Only use the supplied power cable when connecting your printer to the mains. Use a wall socket with earth pins. Make sure that during maintenance the power supply is switched OFF and the power cable is disconnected.

Make sure that before connecting the power cable to the mains the power switch is switched to the OFF position (O).

The machine contains hot and moving parts. It is strongly advised to only print with cover closed. The machine can be stopped AT ANY TIME in case of an emergency by switching the power OFF or disconnecting the power cord.

7.1 Adjusting heated bed

Goal: the heated bed is to be parallel with the path of the extruder and the distance between the heated bed and the extruder is equal to 0.1mm;

1. Turn the 4 adjustment knobs below the heated bed all the way in (clockwise). This will lower the heated bed, avoiding collisions between nozzle and heated bed in the steps that follow. (Figure 18, right side).
2. Make sure the printer is in 'home' position by selecting 'prepare' -> 'auto home'.
3. Switch off the printer by switching the power switch to the **O** position and disconnect the power cable from the mains.

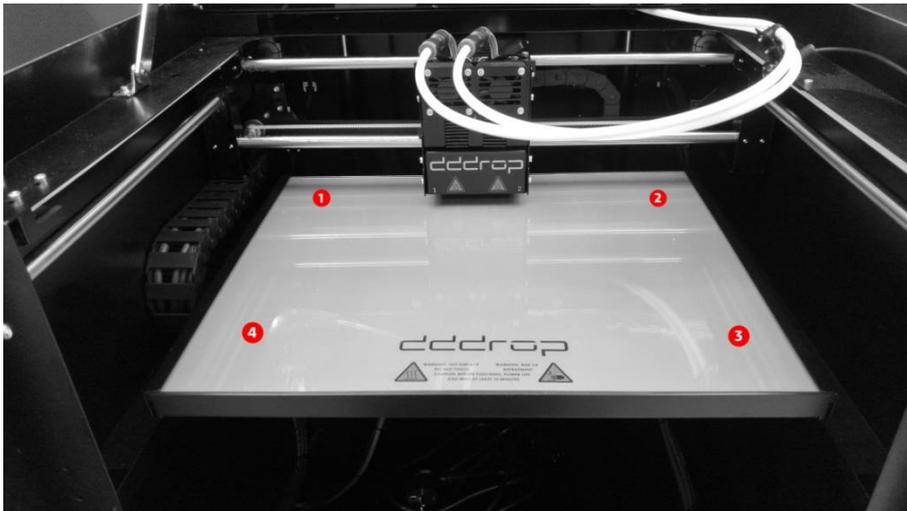


Figure 16. Overview of adjustment knob positions



Figure 17. Overview of adjustment knob positions

4. Position the printer head manually above adjustment knob 1 (POSITION1, BACK LEFT). Slide a gage or piece of paper ($\pm 0.1\text{mm}$) between the glass and nozzle. Turn the adjustment knob 1 (POSITION1, BACK LEFT) out (counterclockwise; figure 18 left, the heated bed moves up on position 1). Continue until the gage or piece of paper is on the edge of pinching. Stop and remove the gage or piece of paper.



Figure 18. Adjustment knobs moving the bed up (left) and moving the bed down (right)

5. Position the printer head manually above adjustment knob 2 (POSITION2, BACK RIGHT). Slide a gage or piece of paper ($\pm 0.1\text{mm}$) between the glass and nozzle. Turn the adjustment knob 2 (POSITION2, BACK RIGHT) out (counterclockwise; figure 18 left, the heated bed moves up on position 2). Continue until the gage or piece of paper is on the edge of pinching. Stop and remove the gage of piece of paper.
6. Position the printer head manually above adjustment knob 3 (POSITION3, FRONT RIGHT). Slide a gage or piece of paper ($\pm 0.1\text{mm}$) between the glass and nozzle. Turn the adjustment knob 3 (POSITION3, FRONT RIGHT) out (counterclockwise; figure 18 left, the heated bed moves up on position 3). Continue until the gage or piece of paper is on the edge of pinching. Stop and remove the gage of piece of paper.
7. Position the printer head manually above adjustment knob 1 (POSITION4, FRONT LEFT). Slide a gage or piece of paper ($\pm 0.1\text{mm}$) between the glass and nozzle. Turn the adjustment knob 1 (POSITION4, FRONT LEFT) out (counterclockwise; figure 18 left, the heated bed moves up on position 4). Continue until the gage or piece of paper is on the edge of pinching. Stop and remove the gage of piece of paper.
8. Continue with steps 4-7 of this procedure until the heated bed is parallel with the path of the extruder.

7.2 Empty the container

The dddrop LEADER and LEADER TWIN are equipped with a container on the front of the build volume. This container catches material that needs to be extruded in order to initiate extruder flow. With the LEADER TWIN this has to be done also at 'tool change' operations (switch between extruders). The container is magnetically mounted to the brush bracket. The container also has two cut-outs to create room for the fastener items of the brush, also functioning as a vertical block for the container.

1. Check that the printer is not busy but stationary (no print job running). Check that the printer is cooled down.
2. Open the cover and check that the hinge is in locking position.
3. Take the container in one hand and the bracket in the other. A light pull towards the operator separates the container from the bracket.
4. Empty the container.
5. Place the empty container back on the bracket. Ensure contact of the magnets with the metal and position the cut-outs over the fasteners.
6. Close the cover.

7.3 Cleaning the brush

The dddrop LEADER and LEADER TWIN are equipped with a brush on the front of the build volume. This brush cleans the nozzle from material that needs to be extruded in order to initiate extruder flow. With the LEADER TWIN this has to be done also at 'tool change' operations (switch between extruders). A clean brush is of interest in order to get the best print results.

1. Check that the printer is not busy but stationary (no print job running). Check that the printer is cooled down.
2. Open the cover and check that the hinge is in locking position.
3. Remove any material residue from the brush.
4. Close the cover.

7.4 Adjusting bed to nozzle distance (major adjustments only!)

This setting is normally achieved by adjusting the heated bed adjustment knobs. If this however does not create sufficient room (too much or too little tension in the heated bed springs) the possibility exists to adjust the optical sensor several millimeters in Z direction. This is not necessary in normal use!

1. Put the extruder in 'home' position by selecting '*prepare*' -> '*auto home*';
2. Switch the printer off by switching the power switch to the **O** position and disconnect the power cable from the mains.
3. Turn the 4 adjustment knobs below the heated bed all the way in (clockwise). This will lower the heated bed, avoiding collisions between nozzle and heated bed in the steps that follow. (Figure 18, right side).
4. Determine whether more tension (heated bed lower, closer to the frame) or less tension is needed (heated bed higher, further from the frame). Loosen the two bolts on the back of the frame holding the Z sensor in place. Move the sensor up or down (as required) in the slot. Tighten the bolts
5. Continue with 7.1, adjusting the heated bed until the surface is parallel with the path of the extruder.

8 Safety and Conformity

8.1 Electromagnetic compatibility (EMC)

This product may cause radio interference which may require the user to take necessary precautions. The dddrop leader may in some cases lose functionality due to ESD. This functionality can be restored by switching the machine off and back on.

WARNING

Always switch off and unplug the machine during maintenance or adjustments.



8.2 Electrical safety

The dddrop leader operates on voltages less than 24 volt (Extra-low-voltage) internally. The power supply used however falls in the Low Voltage directive and is CE marked. For further information on electrical safety please refer to the data sheets of the used power supply.

WARNING

Always switch off and unplug the machine during maintenance or adjustments



8.3 Mechanical safety

The dddrop leader contains moving parts. Engine torque is however limited in order to minimize the chance of serious injury. It is highly recommended to only reach into the printer when it is switched off and when it is cooled down.

WARNING

Always allow the printer to cool for at least 30 minutes before any maintenance or adjustments.



8.4 Risk of burn

With nozzle temperatures up to 300 °C and heated bed temperatures up to 150 °C, the risk of burn exists. The hot parts are covered as much as possible and have been marked with WARNING symbols. It is highly recommended to only reach into the printer when it is switched off and when it is cooled down.

WARNING

Only use the printer in a well ventilated area.



8.5 Health

The dddrop leader is designed to print with PLA and ABS filaments. The use of other materials is not recommended though technically possible. During print jobs fumes may find their way into the area where the printer is set up. When printing ABS for example, small concentrations of styrene vapor may cause headaches, fatigue, dizziness, depression, concentration problems and a feeling of intoxication.

Proper ventilation is necessary and a long term exposure should be omitted. It is recommended to use a fume extractor. It is obligated to make use of fume extraction in offices, classrooms etcetera. Printing of pure PLA is considered to be safe, however ventilation is advised as fumes may also arise from (color-) additives.

8.6 General note on safety

The dddrop leader is not a toy. It is not intended to be used by persons (including children) with reduced physical or mental capabilities, users who lack the knowledge and experience, unless under

the supervision by or have had instructions to use the machine, from a person who is responsible for their safety. Children should be only let in the room with the printer when under constant supervision.

The aforementioned information is believed to be correct, but is not exhaustive and should therefore only be used as a tool for safe use. The conditions used for assembling, transportation, storage, use and disposal of the products are beyond our control and possibly beyond our knowledge. For these and other reasons, we assume no responsibility and expressly disclaim liability for loss, injury damage or expense that may result in any way from maintenance, handling, storage, use or disposal of the product.

The information in this document was obtained from sources that are reliable in our opinion. The information is however provided without any warranty to be complete or correct.



ddd drop

EU DECLARATION OF CONFORMITY

Type of Equipment: 3D Printer
Model: dddrop leader series
Serial number: 337362004-337362103



Manufacturer: IF-Adamas B.V.
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 +31(0)314377050
info@if-adamas.com

We declare under our sole responsibility that the devices mentioned above comply with the following EU Directives:

Machinery Directive	2006/42/EG
Electromagnetic compatibility (EMC)	2014/30/EU
Low Voltage Directive	2014/35/EU

Technical documentation is kept at Manufacturer's address

Date of validity:	October 29, 2015
Name of authorize signatory:	F.H.G. Uytdewilligen
Position held in company:	CEO

Signature: