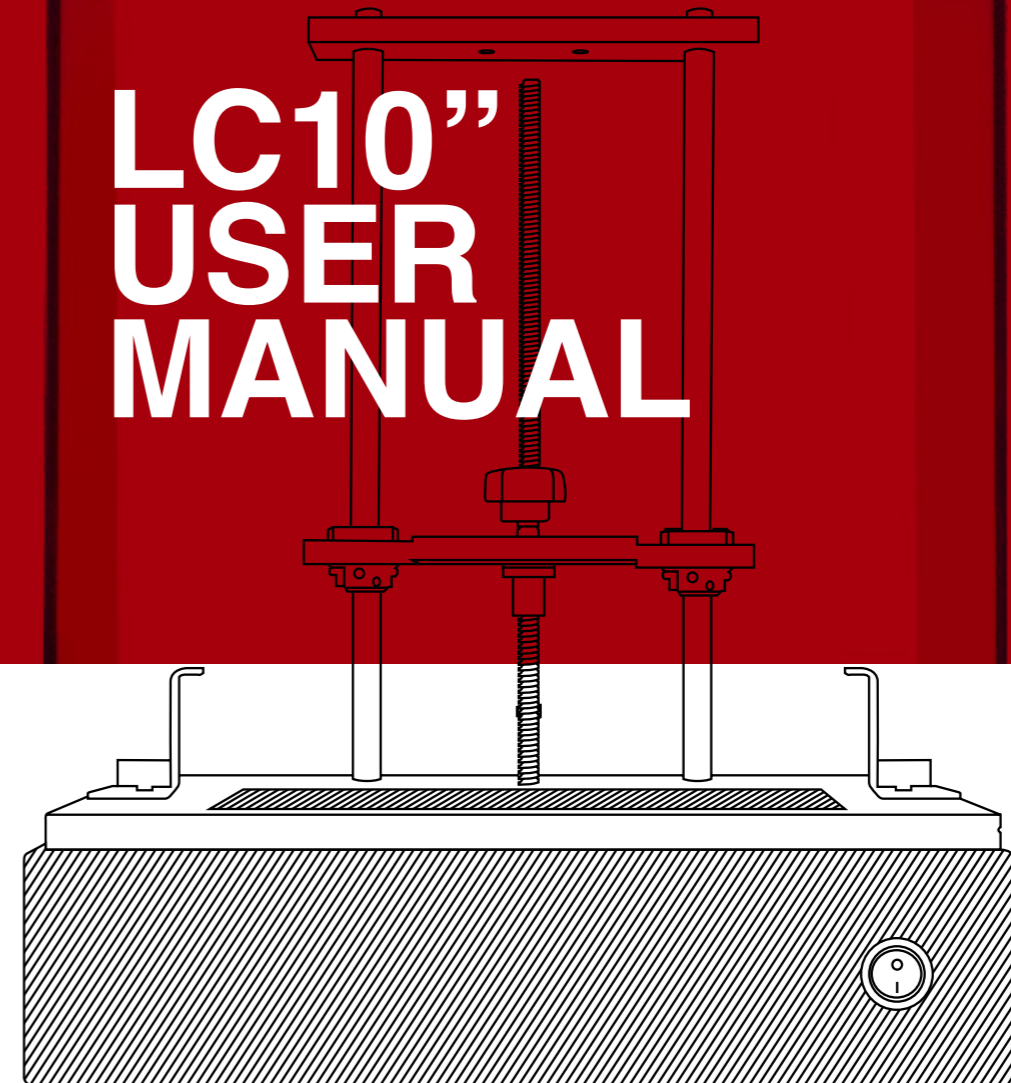
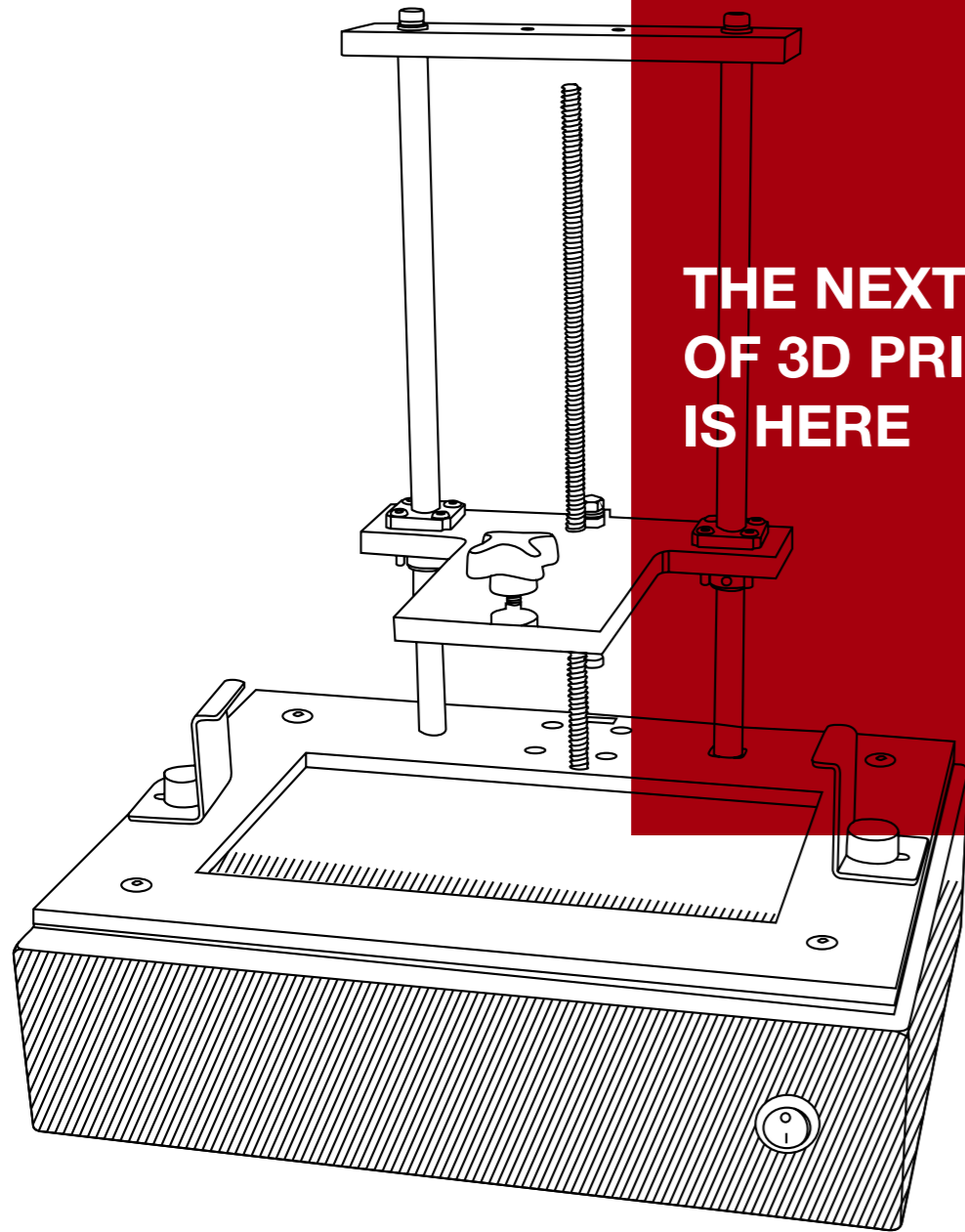


**THE NEXT GENERATION  
OF 3D PRINTING  
IS HERE**

**LC10”  
USER  
MANUAL**



Please keep all original packaging. In case of servicing or repairs needed, printers must be returned fully protected.

**DISPOSAL INSTRUCTIONS**

Do not throw this electronic device into the waste when discarding. To minimize pollution and ensure utmost protection of the global environment, please recycle or return to Photocentric for recycling.



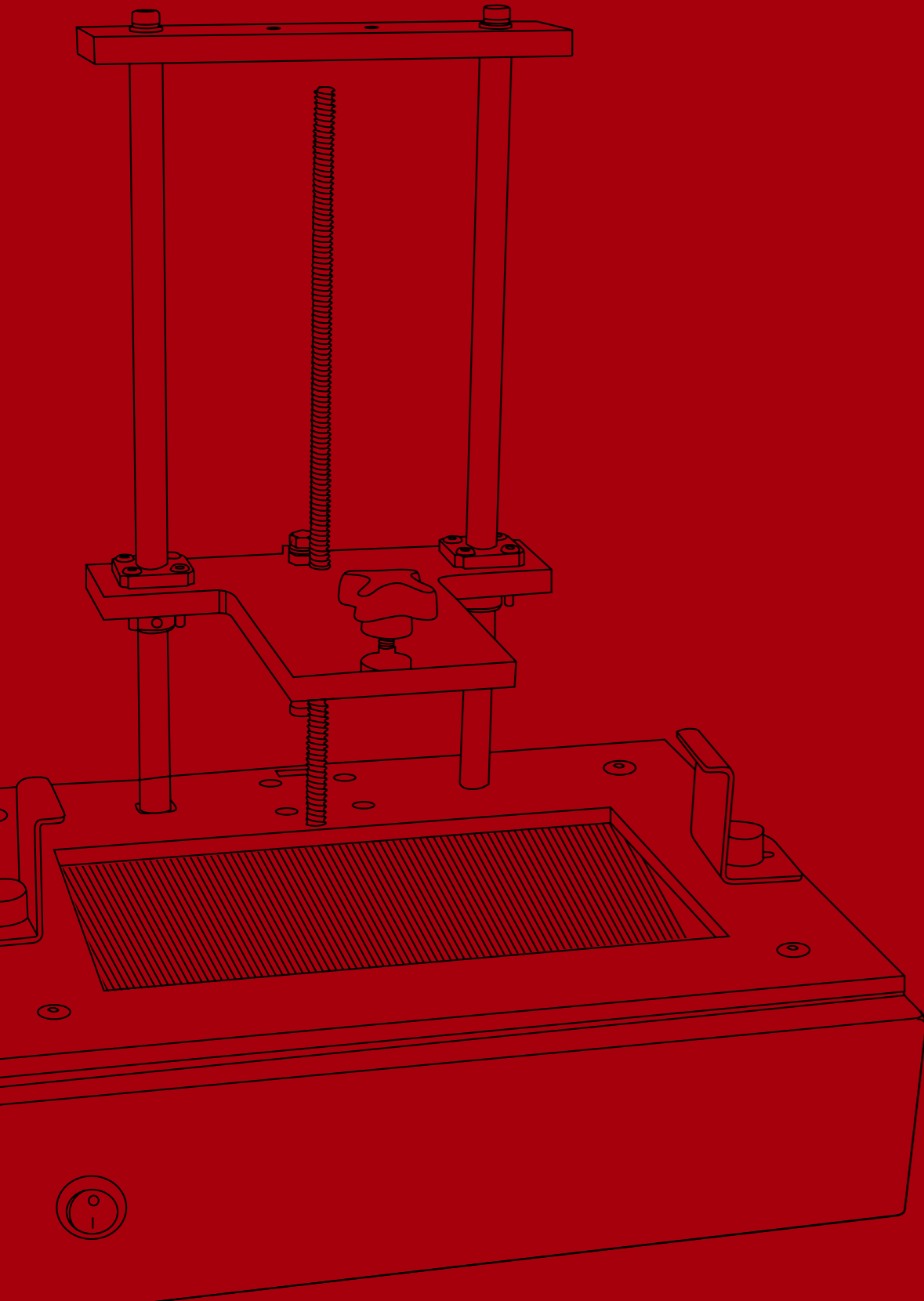
**UK**  
Cambridge House, Oxney Road  
Peterborough PE1 5YW UK.  
info@photocentric3d.com  
www.photocentric3d.com

**USA**  
2205 West Parkside Lane, Phoenix,  
85027, AZ USA  
info@photocentric3d.com  
www.photocentric3d.com



Liquid Crystal

# LC10" USER MANUAL



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Liquid Crystal

# EU DECLARATION OF CONFORMITY

LIQUID CRYSTAL 3D-PRINTER

Model: LC 10”

We hereby declare that the product above is in compliance with the essential requirements of the following:

Low Voltage (LV) Directive 2009/95/EC, 2014/35EU. Electromagnetic Compatibility Directive(EMC), 2004/108/EC,2014/30/EU.

Restriction of the use of certain hazardous substances (RoHS) Directive, 2011/65/EU Commission Regulation (EU) No. 453/2010 and IEC 60950-1 Safety of ITE

Technical Documentation is stored at the manufacturer’s address above.

Date of Issue: 02. December 2016

Place of Issue: Peterborough

**Amanda Keating**  
Director

**Manufacturer**  
Photocentric Ltd  
Cambridge House, Oxney Road  
Peterborough, PE1 5YW, VK  
Year of CE Marking: 2016



Liquid Crystal

# USER MANUAL

## NEW DAYLIGHT TECHNOLOGY HIGH RESOLUTION 3D PRINTER



*Congratulations!*

*You have just purchased a new type of 3D printer using Daylight Polymer Printing (DPP) technology. This is a patent applied-for method of image creation that hardens liquid with the normal visible light emitted from an LCD screen. This revolutionary system is a new method of Additive Manufacturing that uses the same intensity and part of the spectrum that we use to see. This is the energy providing source that initiates the free radical or cationic polymerisation necessary to change the liquid photopolymer resin into your hardened object. The light emitted from the screen is not modified and the images are safe for viewing.*

*These are some of the advantages of DPP technology:*

- i) Low cost- We use high resolution low cost LCD screens that are widely available in monitors, tablets, mobile phones and televisions. These provide phenomenal value for money, which we pass onto you.*
- ii) Reliable- Because we don't modify the back light the screens are used normally and have a long life expectancy.*
- iii) Very large scale- The screen lights every pixel,*

*which in turn exposes every voxel, so you can create large areas of custom product simultaneously. As the format grows this makes it much more efficient than all alternative means.*

- iv) Very low energy usage- It uses the amount of electricity to run a tablet, this is an order of magnitude lower than that required to operate a laser or a digital light projector.*
- v) Low adhesion at the build interface- the heat created by the screen is very low and the small amount of initiation energy in the polymerisation creates very little attraction to the vat film.*
- vi) Limited over-exposure- Using this low intensity visible light, the energy is dissipated very quickly, it either strikes a photoinitiator and creates a free radical or it loses all the energy hitting solid material, so there is very limited ability to over-expose and create solid parts where you don't want them.*



Liquid Crystal

## SAFETY INFORMATION



Read the instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product. Observe the following guidelines when connecting and disconnecting power to the external power supply unit:

- Install the power supply unit before connecting the power cord to the AC power outlet.
- Unplug the power cord before removing the power supply unit from the printer.
- Operate on a table or flat, stable surface, ensuring that the machine cannot fall and is level.
- Do not operate outdoors.
- Do not allow resin or any liquids to get inside the chassis, wipe up any liquid spills immediately.
- Do not use solvents to clean the printer as they may damage the screen. Use a little detergent and warm water to clean any resin spills.
- Disconnect the printer from AC before storage or when not used for a long period of time. This 3D printer is connected to the electrical network with an input of 110 or 240 V AC, 50/60 Hz, and has an operational voltage of 12 V.
- Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord.
- If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.

- Do not overload a power outlet, strip or receptacle by plugging in too many devices.
  - Use the product only with the supplied power supply cord set. If you need to replace the power cord set, make sure that the new power cord meets the following requirements: detachable type, UL listed/CSA certified, VDE approved or its equivalent, 4.5 meters (15 feet) maximum
  - In case of malfunction, disconnect the printer immediately from network.
  - Do not attempt to fix this product by yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all repairs to qualified service personnel. Please send an email to your national supplier or contact technical service at: [info@photocentric3d.com](mailto:info@photocentric3d.com)
- Unplug this product from the wall outlet and refer servicing to a qualified service personnel if:
- The power cord or plug is damaged, cut or frayed.
  - Liquid has been spilled in the machine.
  - The machine was exposed to rain or water.
  - The machine has been dropped or the case has been damaged.
  - The machine does not operate normally after following the operating instructions.



Liquid Crystal

## SAFETY GUIDELINES



IRRITANT

- Keep the printer and resins out of the reach of children.
- The resin is an irritant to skin and eyes. Always wear gloves when coming into contact with the liquid resin. Always use in a well ventilated room.
- Resins are classified as irritants, not harmful, but in exceptional circumstances people can be sensitive to the resin and develop a skin irritation or rash. Avoid this possibility by always wearing gloves and avoid breathing fumes.
- The printer should be operated on a stable and level surface, preferably away from direct ambient light.

Please note that the latest instructions will always be available from:

[www.photocentric3d.com/support](http://www.photocentric3d.com/support)

## DISPOSAL INSTRUCTIONS



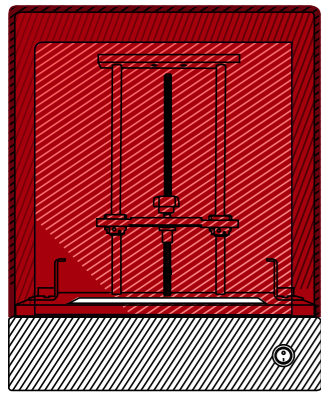
Do not throw this electronic device into the waste when discarding. To minimise pollution and ensure protection of the environment, please recycle or return to Photocentric for recycling.



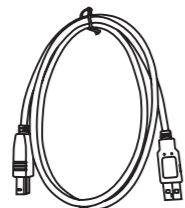
Liquid Crystal

# CONTENTS

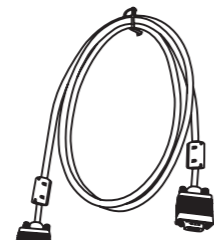
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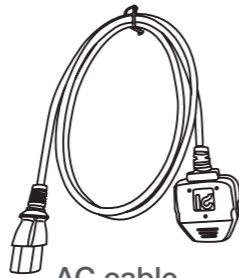
Liquid Crystal 3D Printer with red hood



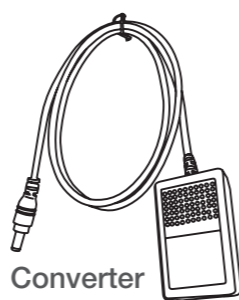
USB cable



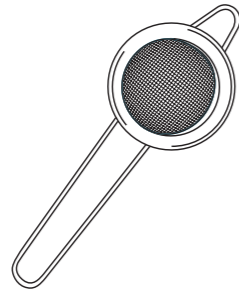
HDMI cable



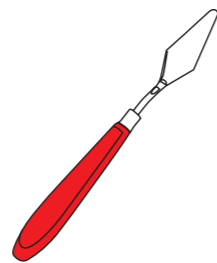
AC cable



Converter



Strainer



Spactula

## MINIMUM COMPUTER REQUIREMENTS

- 1.2 GHz processor or above.
- Windows
- 2 GB RAM memory or above.

## RECOMMENDED ITEMS

- Extra gloves.
- Paper towels.
- Access to a sink with hot water to clean the object.
- Liquid Soap (detergent) to clean the object.
- Soft brush or sponge to clean the object.
- Glass or clear plastic container to post expose the object in.
- Ultrasonic Cleaner (Optional)

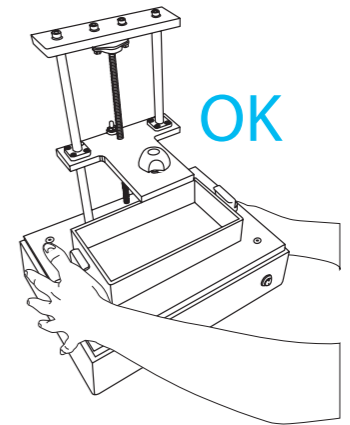
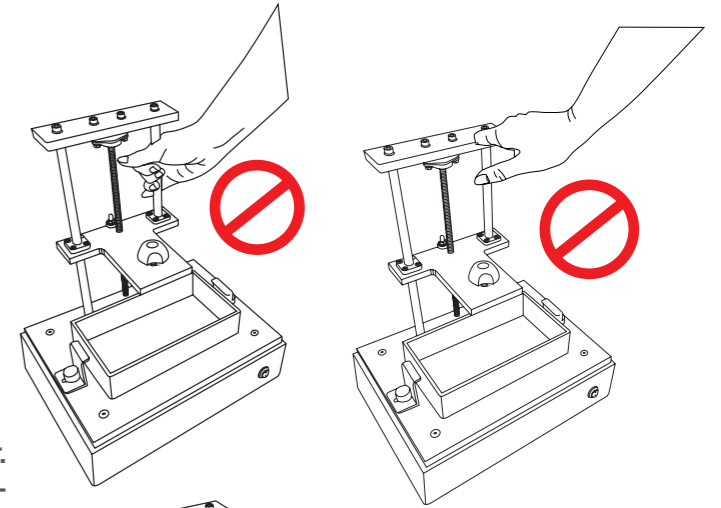


Liquid Crystal

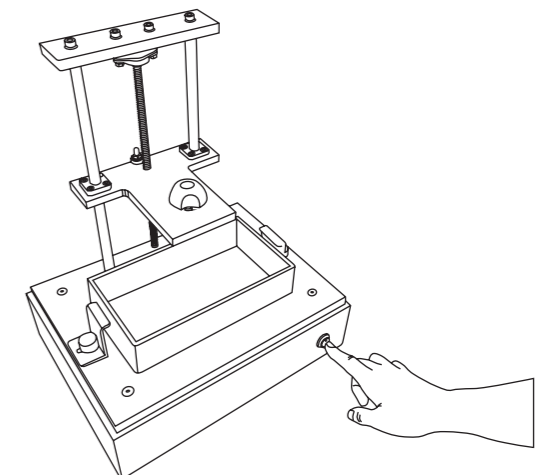
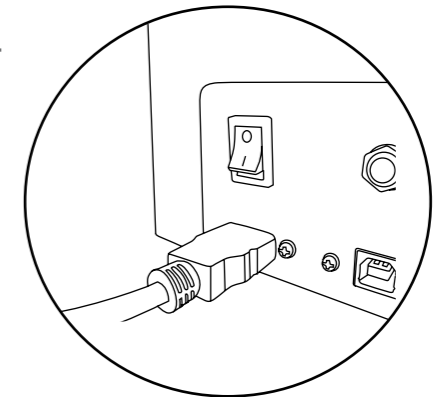
# 1. INSTALLATION & ASSEMBLY INSTRUCTIONS

## ASSEMBLY INSTRUCTIONS

1. Open the box and carefully remove the printer. Do not pull the printer out by the linear drive/z-axis.
2. Place the printer in the work area and screw in the 4 feet supplied in the ancillary box.



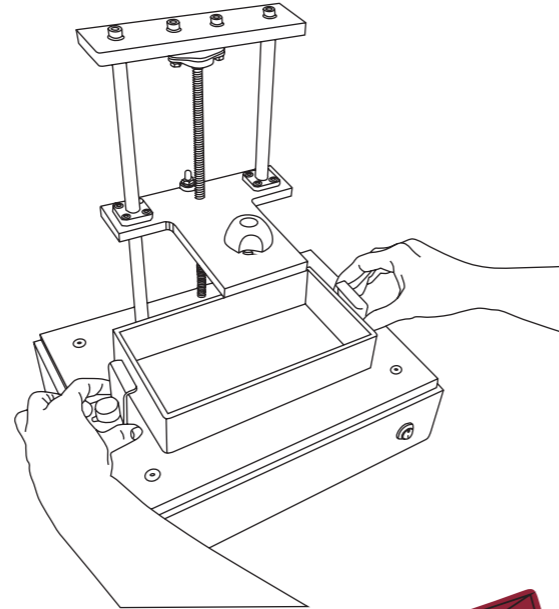
3. Connect the USB cable, HDMI cable and Power cable supplied to the back of the printer.



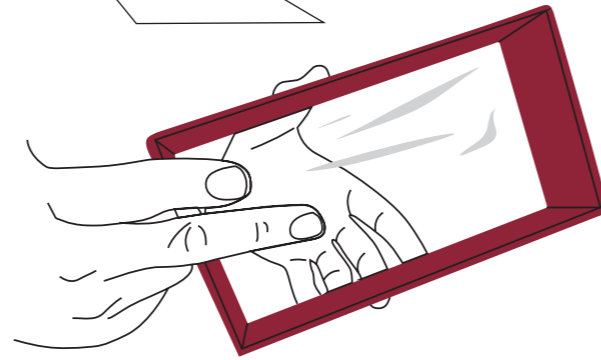


Liquid Crystal

- Remove the vat from the printer by loosening the thumbscrews and pulling away the vat retaining brackets. Check the film for any imperfections or holes; any problem with the film may cause a leak. To change the film, see section Re-Skinning Vat on pages 17-18. To check the integrity of the vat, fill with water and stand for 5 minutes on absorbent paper, look for leaks and dry thoroughly before use. Once inspected, install the vat back into the machine. Tighten the two thumbscrews on the vat retaining brackets. Before each print, wearing gloves, sweep the film completely down onto the screen to ensure that there are no objects on or under the film.

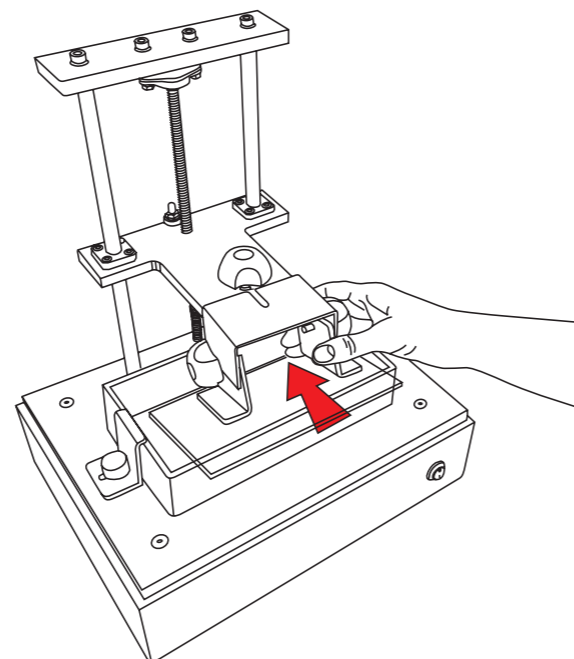


- Assemble the platform from the ancillary box by placing the black U bracket over the outside of the L brackets. Slide it onto the printer arm and tighten the top knob only, leave the two side knobs loose.



- If you are experiencing difficulties setting up your printer please visit our website: [www.photocentric3d.com/support](http://www.photocentric3d.com/support).

The vat should be tensioned, this can be checked by gently tapping on the film with your finger, not your fingernail!



Liquid Crystal

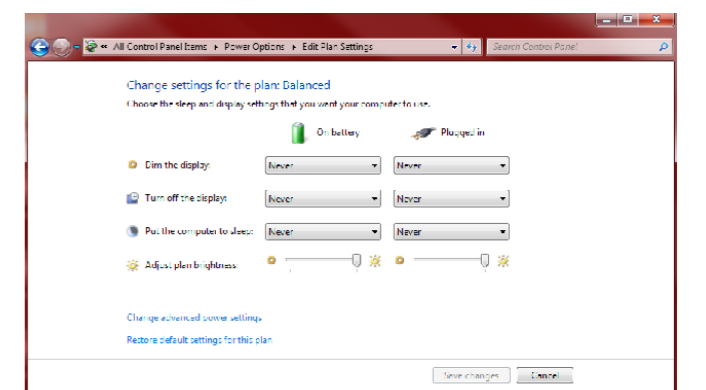
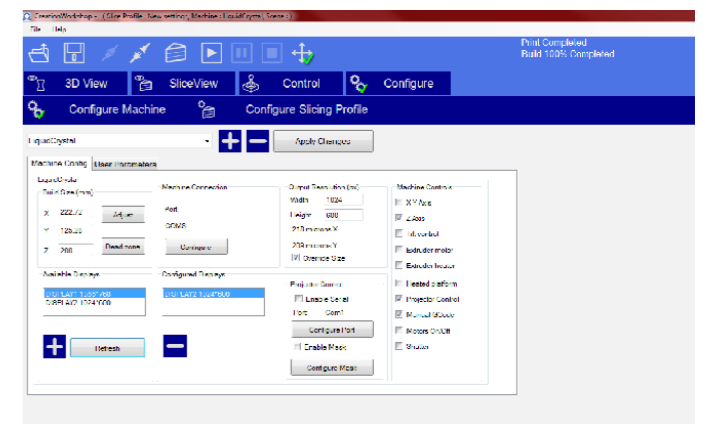
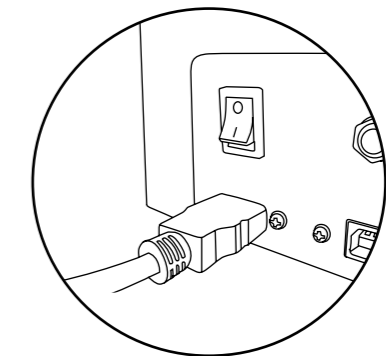
# 1.1. SOFTWARE INSTALATION

## 1.1.1 CREATION WORKSHOP

- Go to [www.photocentric3d.com](http://www.photocentric3d.com) and download the “Liquid Crystal 10” Driver” and “Creation Workshop for Liquid Crystal 10” which can be found on the “Software” page. The latest version is always online.
- Install the driver “CypressDriverinstaller\_1” on your computer so that the USB port will recognize the Liquid Crystal Printer. Restart your computer.
- Make sure the HDMI, USB and Power cables are plugged into the printer and then turn on the power using the rocker switch at the back. Turn on the screen using the switch at the front of the printer.
- Go to your computer desktop, right click and open “Screen resolution”. Set your screens to “Multiple Displays” and “Extend this display mode”, keeping your computer monitor as the main screen. Make sure that the printer’s screen is set to a resolution of 1024 x 600. There are videos online if you need further help.
- Configure your computer so that the screen-saver does not come on and ensure that it does not have the power-saving mode enabled. If you forget to do this your computer may shut down mid process and the printer will switch off.

### MINIMUM COMPUTER REQUIREMENTS

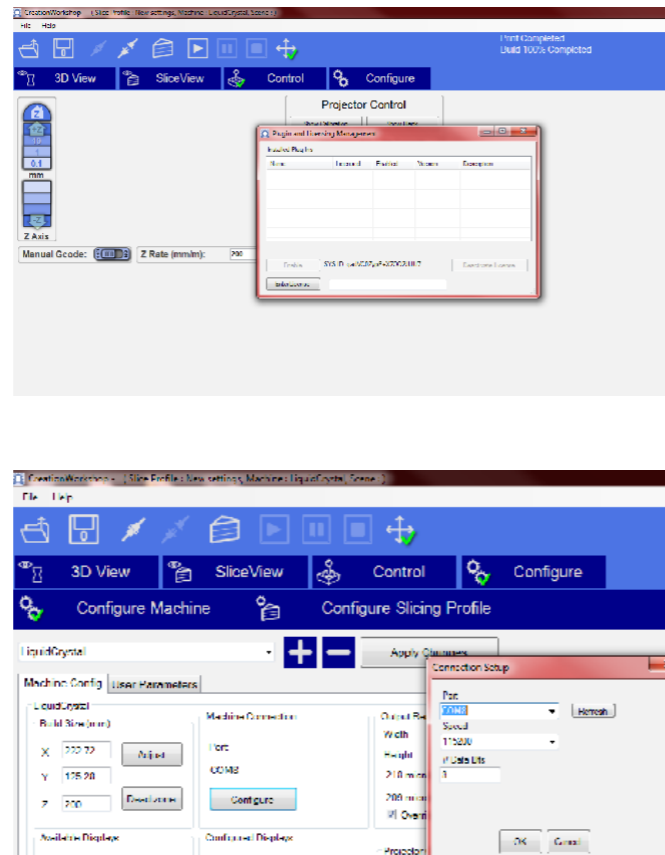
- Dual Core processor or above
- Windows
- Software NOT compatible with MAC and Linux
- 2 GB RAM memory or above





Liquid Crystal

- Execute the Creation Workshop software by double clicking on "CreationWorkshop.exe". If the software requires a license number insert the license number supplied.
- In Creation Workshop, click on "Configure", and then open the subfolder "Configure Machine". In the configuration folder connect the printer to the computer by clicking on the button "Configure" in the Machine Connection section. Select the port you have connected the USB to and set the speed to 115200 and data bits to 8. Press "OK" and finally press "Apply Changes". Now click [CONNECT ICON] to connect your computer and the Liquid Crystal.
- If you are experiencing difficulties to start or connect your printer, go to our website [www.photocentric3d.com](http://www.photocentric3d.com), and visit "Support". You will find videos that will run you through the issues you may find due to specific computer settings. Should you still find difficulties, please contact your national supplier or contact us at [info@photocentric.co.uk](mailto:info@photocentric.co.uk).



Liquid Crystal

### 1.1.2 WI-FI ENABLER

To set up the Wi-Fi enabler, insert the USB, HDMI and Wi-Fi enabler power cable into the correct connectors. Make sure to power up the enabler and the printer at the same time. Not doing so may cause the printer not to function correctly.

The LC10 supports two different types of network connection: Ethernet and Wi-Fi. To set up ethernet, simply plug the ethernet cable into the back of the printer and connect it to your router.

- Power on the printer with the rocker switch at the back of the printer.
- Click "Settings" on the touchscreen on the front of the printer.
- Wait a minute for it to boot up and click "Wi-Fi Settings".
- Wait until your desired Wi-Fi network shows.
- Select the desired network and press the button "Setup Network".
- Enter your Wi-Fi Password and press "Accept".
- Finish by pressing "Save".
- Press "Home" to get back to the main screen.





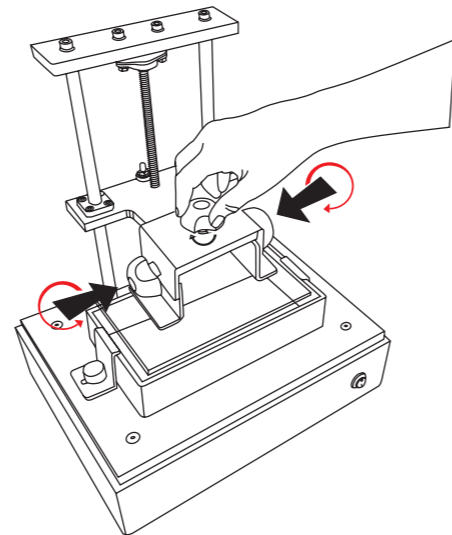
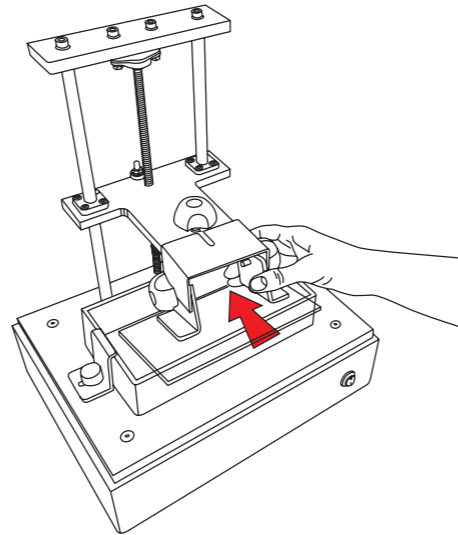
Liquid Crystal

## 2. THE HOMING PROCEDURE

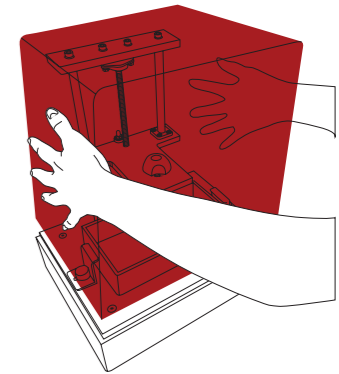
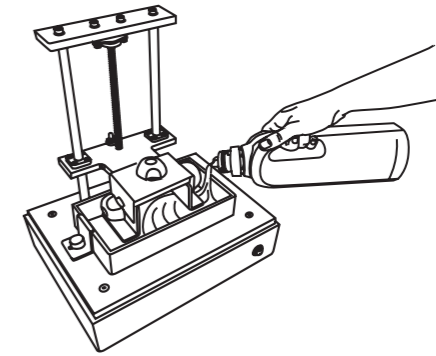
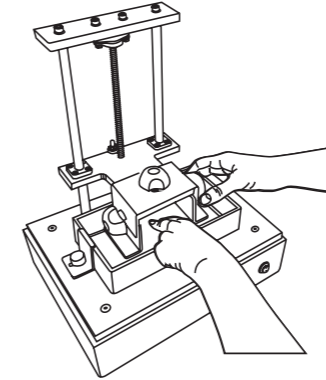
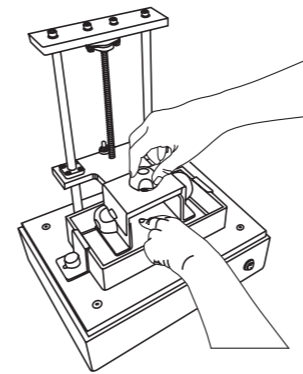
Ensure that the screen is clean (wipe with a little liquid soap and warm water if it's dirty) and dry. Place the vat on top. Tighten the two side bolts retaining the vat down onto the chassis are tight.

Wearing gloves, wipe with a piece of absorbent paper (kitchen paper similar) over the bottom of the vat film, to check that there is no dirt on the film or trapped between the vat film and the screen.

Make sure the glass platform is clean by scrubbing with liquid soap and water and wipe dry. Loosen the two side bolts and the central one on the print platform. In Creation Workshop, go to the control tab and press the home button (located at the top of the z-Axis controls). If you are using the Wi-Fi enabler, press Maintain and then 'Home z-axis'. This will lower the platform until the home switch is activated. Note that the platform will not move until the hood is placed back on. Align the glass platform so that it is directly over the screen and tighten the central bolt. Wearing gloves press down hard in the middle of the glass and then tighten both side bolts on the platform one after the other. Press '+10', and the platform will lift 10mm, pour the amount of resin you need, then press '-10' to return it to the screen and you are homed!



Liquid Crystal



**NOTE:** You can check the screen is working by pressing the "Show calibration" button located in the "Control" tab and a red grid will appear.

**NOTE:** If you have an object that is 100 cm<sup>3</sup> then it will use 115g of resin. Always overfill by at least 20% to ensure consistent resin flow. For most prints, filling the vat to 1/3 full is more than enough. Place the hood back on the printer.

**NOTE:** Don't remove the hood during the operation or the print will stop.







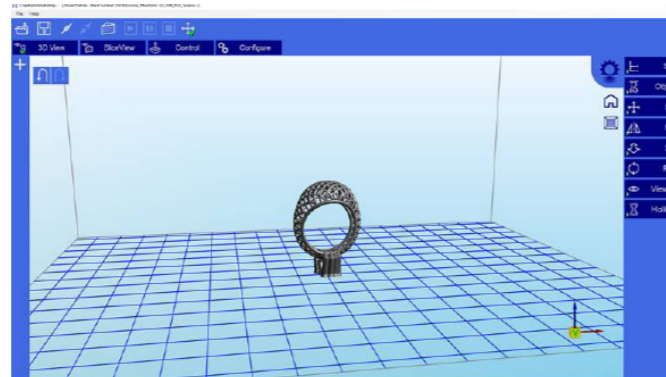
Liquid Crystal

### 3. STARTING A TEST PRINT

Now you have set up your printer, lets make your first print! Your Liquid Crystal 10" has been shipped with a default test print pre-loaded. Use this print file and the sample resin supplied with your printer.

#### 3.1 STARTING FROM CREATION WORKSHOP

In creation workshop, click the "open" button in the top left and open the file from the Creation Workshop folder named "Ring.cws". Press the print button and all of the files that have been uploaded to the printables will be available to print.



#### 3.2 STARTING FROM THE WI-FI ENABLER

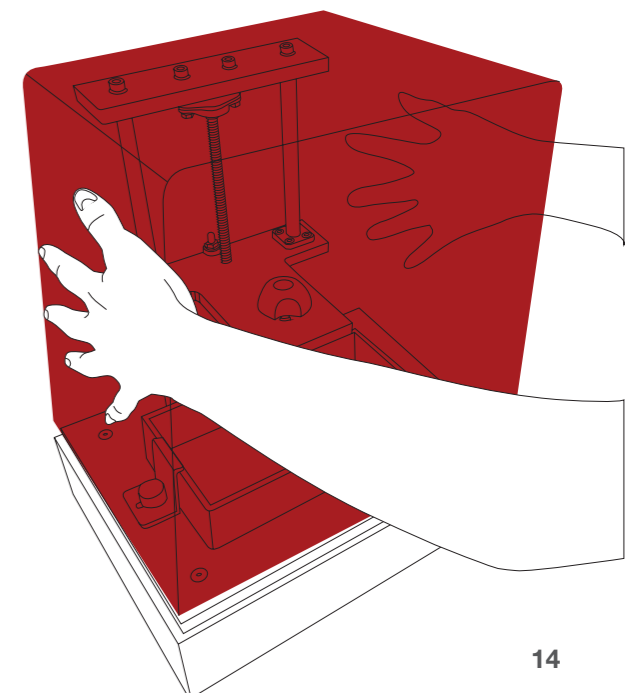
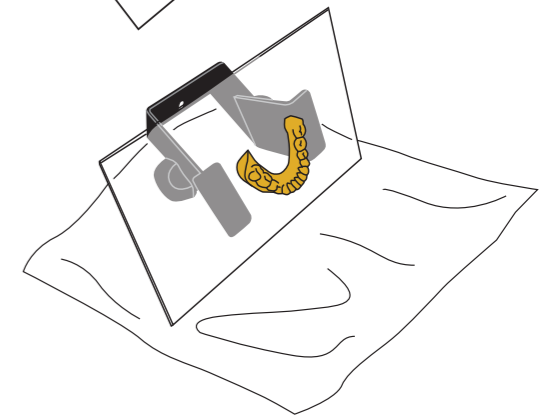
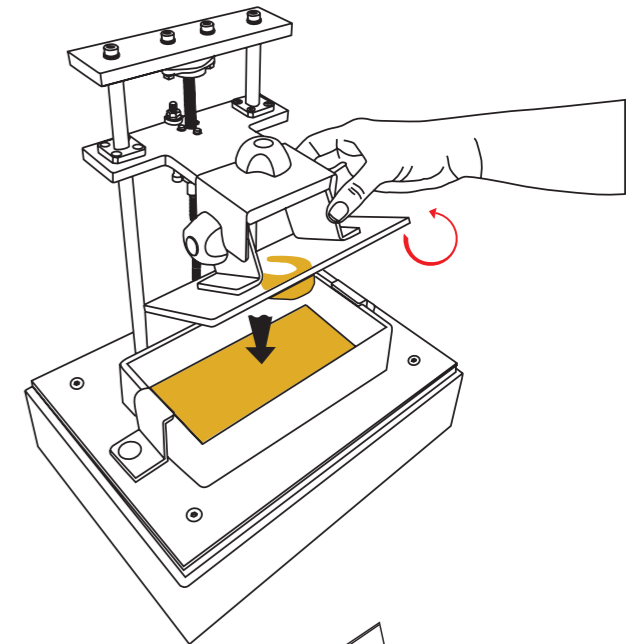
On the homepage, press the 'Print' button. This screen will be displayed. Press the test file Ring.cws and press 'Print!'. The print will then start.



Liquid Crystal

### 4. WASHING

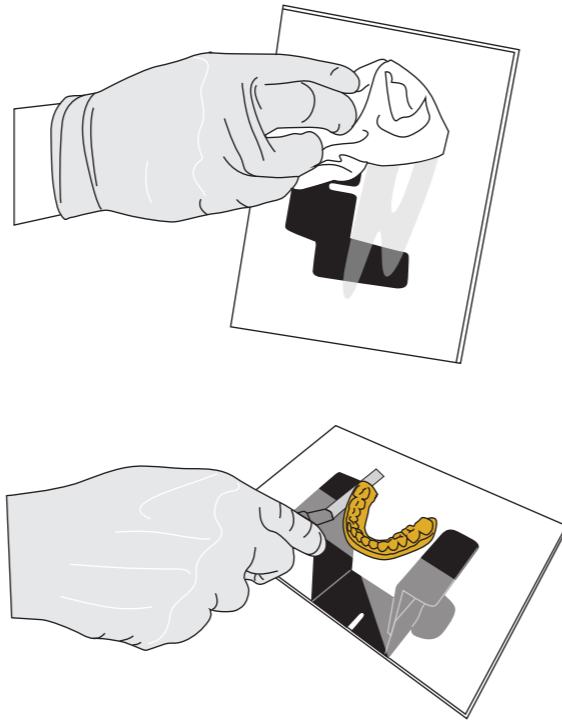
1. When your print has finished, press the '+50' button and the platform will rise to above the level of the vat. Remove the hood and loosen the two side bolts, tilt the platform slightly to allow the resin to drip off. Put the hood back on and leave to drain for a few minutes.
2. Remove the hood again and with absorbent paper under it, remove the platform completely and set it down on the paper. Place the hood back on to protect the resin in the vat from light.





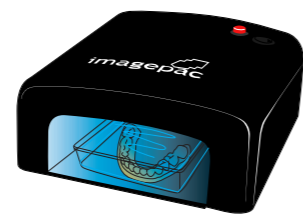
Liquid Crystal

- After all the liquid resin has drained off, gently remove any excess polymer with absorbent paper. The fastest way to clean it and achieve a dry surface is by spraying or immersing it in IPA. Alternatively you can wash it in hot water and detergent. Hold the part under running hot water and gently clean it with a soft brush or sponge and liquid detergent. Then remove the object by sliding a scraper in at the base and cut off the supports. Take care not to damage it, it will not achieve full hardness until after post exposing in light. An ultrasonic cleaner is useful to clean delicate objects.



## 5. HARDENING

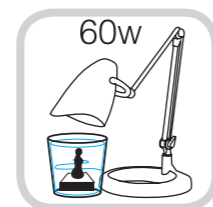
- When completely clean, place it underwater in light (UV, sunlight or a table light) for a least 30 minutes to remove the surface tack. The part will only have around 1/4 of its final strength before post-exposure and strength increases slowly with more light. Full strength is achieved with 30 mins in a UV unit, or 60 mins under a normal 60W table lamp. Then remove from water and dry.



30 mins  
post exposure

60 mins  
post exposure

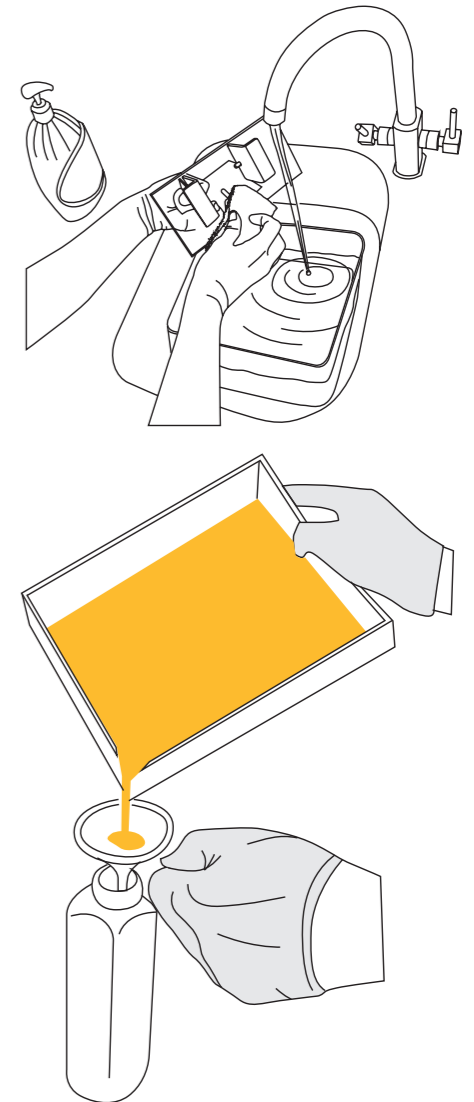
60 mins  
post exposure



Liquid Crystal

## 6. PREPARING FOR THE NEXT PRINT

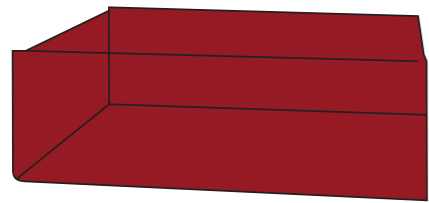
- Chip off any cured resin and clean the build platform with hot water and liquid detergent. Dry it thoroughly before inserting it back into the printer.
- Empty the vat and clean it after every print in case you have any solid pieces on the bottom as these would prevent the platform from homing correctly. Loosen the thumb screws and remove the vat from the printer; pour the resin back into the bottle through the funnel using the strainer provided.
- If you have a leak on the screen mop up the liquid resin immediately using absorbent paper. Clean off with a damp cloth with detergent. Hardened resin can be removed by chipping off with a credit card or plastic scraper. Metal scrapers should only be used with extreme care to avoid scratching the screen.





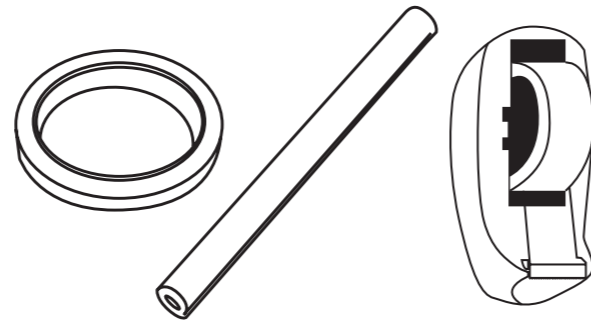
# 7. RE-SKINNING THE VAT

*Please read carefully.  
A loose vat can have creases which create ridges in the base of the object.*



### TOOLS REQUIRED

- Scissors
- Craft knife
- Pallet knife

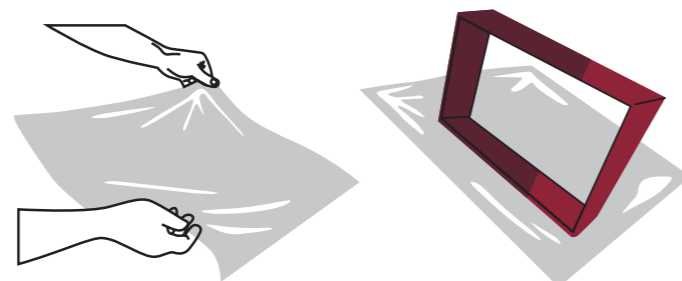
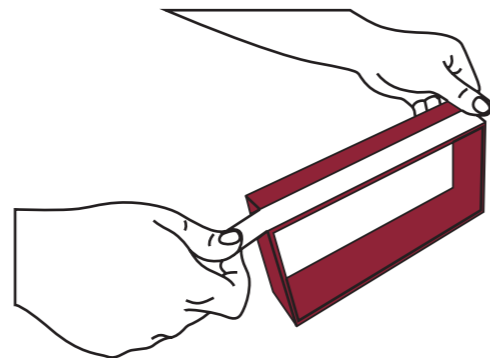


### MATERIALS REQUIRED

- Photocentric vat film replacement pack, single sided sticky tape, double sided tape and paper

Re-skinning the vat is a simple process but care and attention must be paid to cleanliness and removing cured bits of resin. Make sure at each stage of the process that the work surface, vat, and your hands are very clean and free from debris that may cause holes in the film.

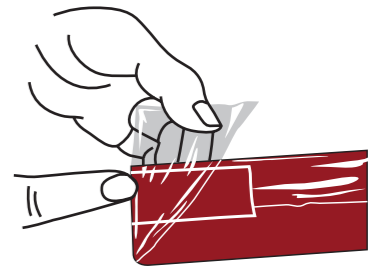
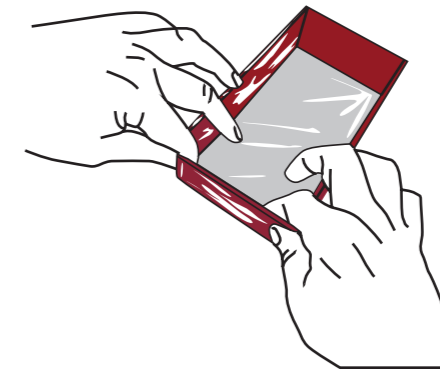
1. Remove the film currently taped to the vat and dispose of it. It may be possible to use the double-sided tape again if it has no resin on it. If the tape cannot be reused, remove it completely and replace on the lower edge of the vat.
2. Wipe the vat clean and wash all parts with soap and water. Pay attention to the underside of the vat, resin may have cured here. Remove any hard bits of resin as they may make a hole when tightening the new film over it.
3. Check the new vat film isn't pierced or dented and place it over the protective brown paper, on a flat work surface. Place one edge of the vat along the edge of vat film.



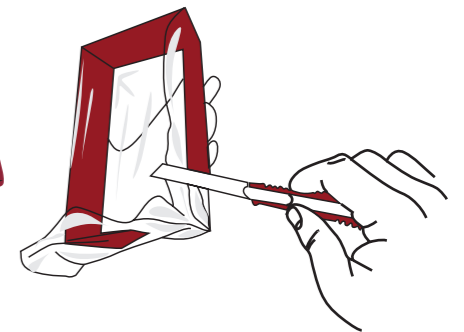
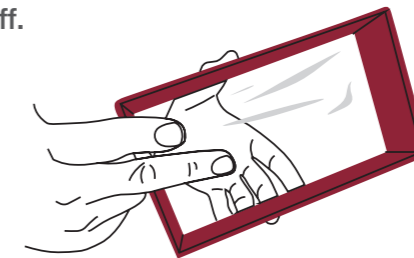
4. Fold over the other side of the film and pulling it firmly tight in the middle stretch the edges out so there are no creases.



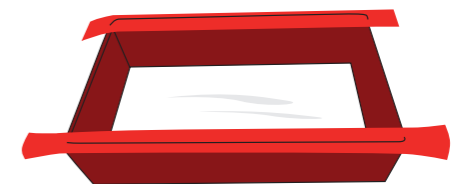
5. Pull each side of the film up and onto the sides of the vat.



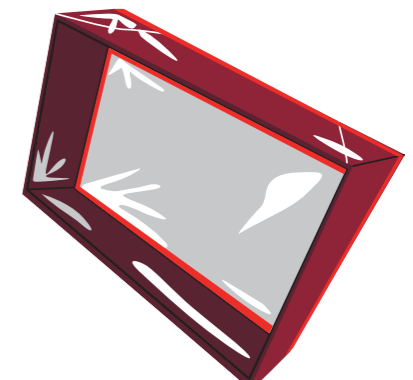
6. Apply single sided tape at the corners over the folds to keep the film tight. The vat should now be tensioned. Trim excess edges off.



7. You can apply insulation tape to the underside of the film over the vat to stop the resin curing between the vat and film and potentially piercing it.



8. Finally, fill with water and leave on absorbent paper to check for leaks. Drain and dry with paper towel before use.



If you are unsure of the process and need a video guide, then please visit the Support section of our website.



# 8. PRINTING YOUR OWN PARTS

You should now have successfully printed the ring and it's time to print your own parts.

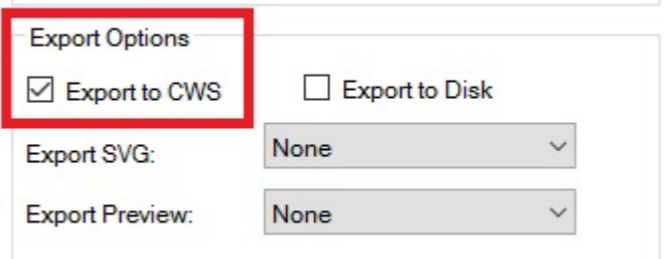
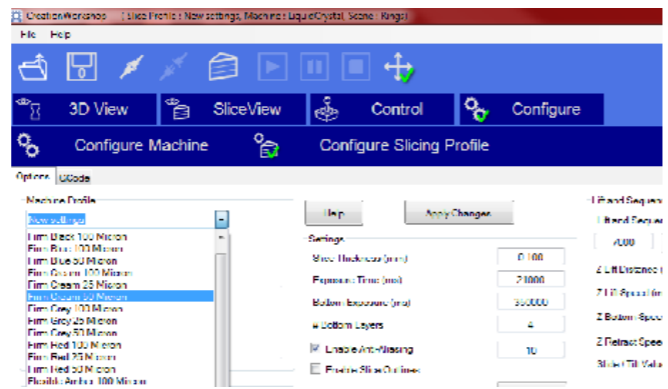
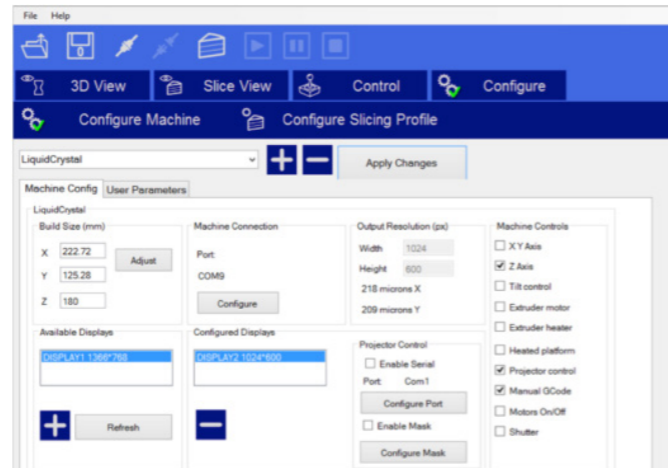
## 8.1 STARTING A PRINT WITH CREATION WORKSHOP

In this section, we will learn how to use Creation Workshop to prepare your 3D parts for printing.

1. Home the printer by consulting section 2 the homing procedur.
2. Open Creation Workshop.exe and load your objects (STL, OBJ or AMF).
3. With the object loaded and located in the build area check the settings of the printing profile. Go to the "Configure" screen and open the "Configure Slicing Profile" tab. Select the printing profile from the "Machine Profiles" list that matches your resin and desired resolution for example "LC10 Hard Amber 100 Microns large objects".

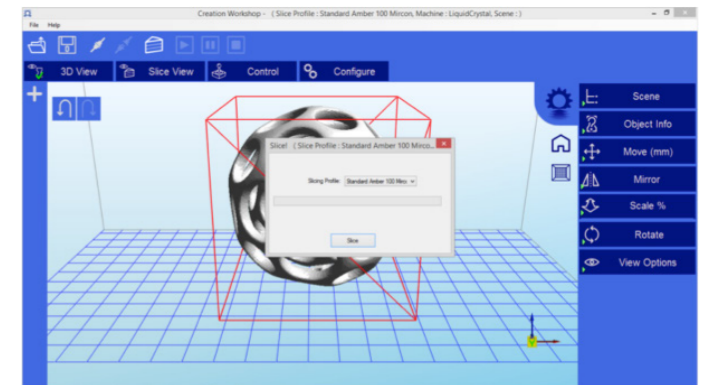
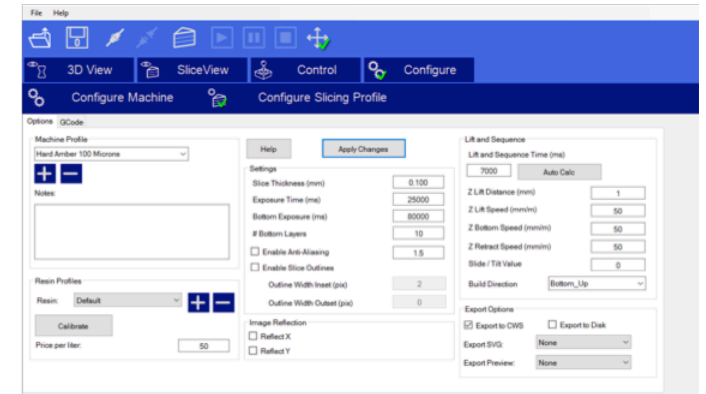
Note: Always click "Apply Changes" to save if you had to change any values. If you don't click this your data will not be re-set.

4. Now click "3D View" and check that the object is correctly placed inside the printing area. Make sure the file is saved with the button before you start slicing. Name your file and choose an appropriate location for it. Saving directly to a usb can sometimes slow down the slicing process, it is better to save it to a location on your pc. When saving, make sure you save the file type as a scene file (\*.cws). When using the Wi-Fi enabler, make sure the "Export to CWS" checkbox is ticked.
5. Press the slice button to start the slicing operation. A confirmation window will show. Always re-click the "Slice" button if you adjust



the file in any way.

6. Now check the "Slice View" screen to check that the first layer of every object is in contact with the build base. If it is above the build platform it will not adhere. If you click on the view box located in the bottom left corner you can scroll forward through the slicing views using the slider bar and check that the object is always inside the build area.
7. If you are happy with the slices, then press print



## 8.2 STARTING A PRINT WITH THE WI-FI ENABLER

If you are using a Wi-Fi Enabler, there are a few more steps to follow to start printing. You will need to use the steps from the previous section to create a .cws file. Once you have done this there are 2 ways to start a print:

1. Save to USB. Save the file saved from the section above (as either a .cws or .zip format) onto a USB stick and insert it in the front socket. Then wait for 10 seconds and press Print to refresh and the printable files will show your file on the screen. Highlight your file and press 'Print'.
2. Print from your web browser on your PC. These instructions are described below



Liquid Crystal

### 8.2.1 STARTING A PRINT FROM A BROWSER

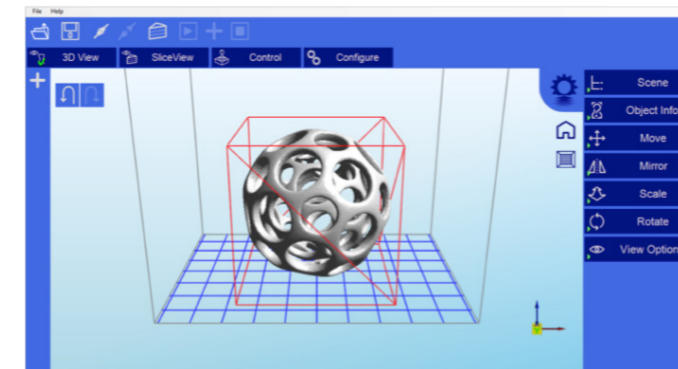
1. Download the desktop software called "Printflow3D\_opener" for your operating system from [www.photocentric3d.com/printflow](http://www.photocentric3d.com/printflow).
2. Move the Printflow3D\_opener.exe onto your desktop, double click and start the software.
3. When your printer has been found successfully, it should open up the following window.
4. Click "Upload" and select your .CWS file created; your window should look like this.
5. Go back to the tab "Home" and then press "Print". This will cause the software to start the

### 8.2.2 REMOVING A FILE FROM THE WIFI ENABLER

1. From the home page press "Print".
2. Select the printable you want to remove and click the red button with the X on the right.
3. Click "Yes" to delete the file.

## 9. DETAILED CREATION WORKSHOP SOFTWARE INSTRUCTIONS

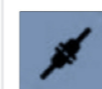
### Main screen



Click to open files in one of the following formats: .STL, .OBJ, .3DS or .AMF. You can also open scene files with the .CWS extension.



Click to save the current object as a .STL or .CWS file. The .CWS format allows you to prepare a scene to be printed repeatedly in the future, together with supports and positioning.



Click to start the connection between your computer and your Liquid Crystal 3d printer. Once the button is grayed out, this means that the printer is connected.



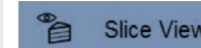
Click this button to disconnect your printer from the computer. If the button is grayed out, it means that the machine is currently



These three buttons start, pause and stop a print. These buttons only become active once you have sliced your object.



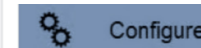
Clicking this button allows you to view the 3D objects within their boundary box. You can add supports in this function.



Clicking this button accesses the "Slicing" screen. You can see the individual slices that have been generated as well as the G-code.



This allows you to control the z axis motor, home it and lift it after a print has finished.



This is the setup screen that allows you to configure the slicing and printing profiles.



Liquid Crystal



### 1. Loading a Model

Click here to 'Load' your file. Multiple objects can be loaded and manipulated independently. You can also open scene files with the .CWS extension.

### 2. Scene View

The Scene View allows you to manipulate various aspects of the scene.

#### Selecting

You can select a model by double clicking on the model, or selecting it with the scene view

#### Removing a Model

You can remove a model by right-clicking on the name in the scene graph and selecting "Remove". The Minus sign "-" will also remove the current model. You can also delete a model by selecting it and then pressing the "delete" key on your keyboard.

#### Cloning a model

You can select a model in the scene and click the "+" sign to clone it. The cloned object will appear

### 3. Object Info

This tabs provides you with information about your model

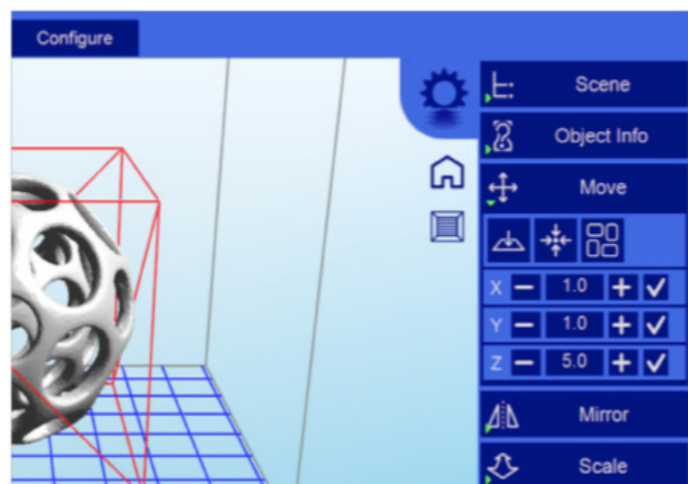
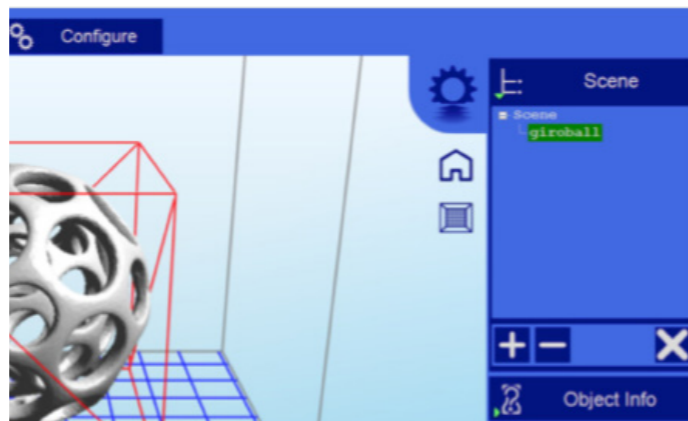
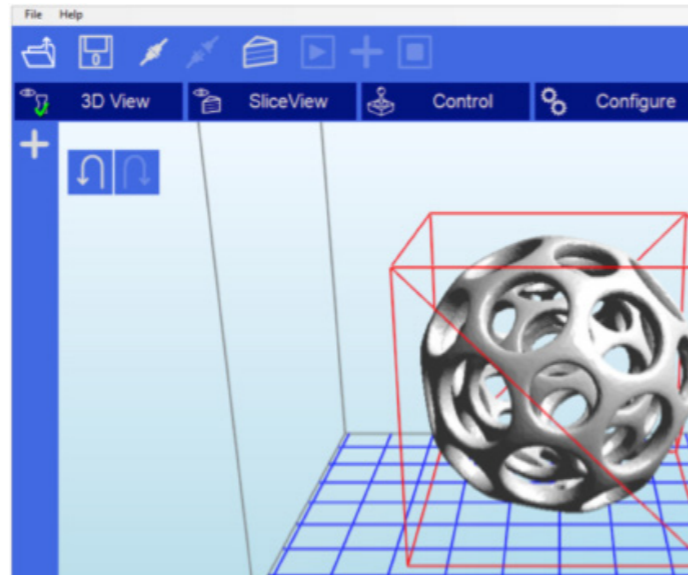
### 4. Move View

The Move function allows you to move objects on the build platform along the x:y:z axis by the distance entered.

From left to right, the other tools are:

The 'Place on Platform' button will position the bottom of the model to rest on the bottom of the build platform. The 'Center' button will center the model at (0,0,0).

- Auto-Arrange will automatically lay out all models to fit on the build platform. Any model that does not fit within the build platform will be moved outside the build area.



### 5. Mirroring Objects

The Mirror view allows you to mirror the selected object on the specified axis.

### 6. Scaling objects

A model can be scaled (reduced or increased) by selecting it, and using the 'Scale' view to enter in a new scaler value. Press the tick button to re-scale your object.

### 7. Rotating Objects

Rotating a model works in a similar way to moving a model. Simply select the model you want to work with, and use the X/Y/Z +/- buttons to rotate the model by your specified degrees.

### 8. View Options

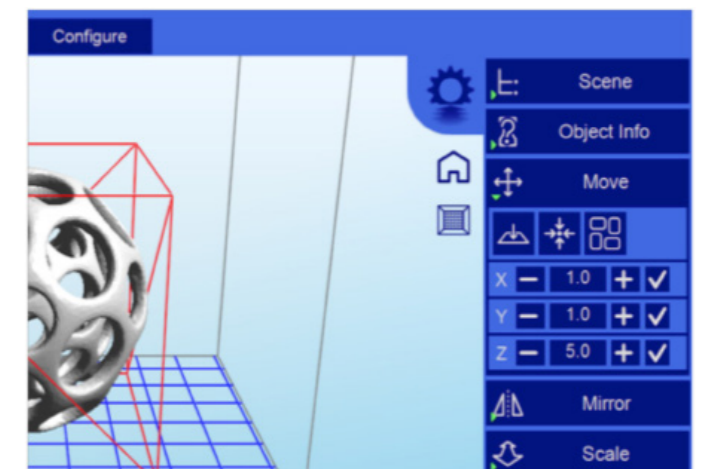
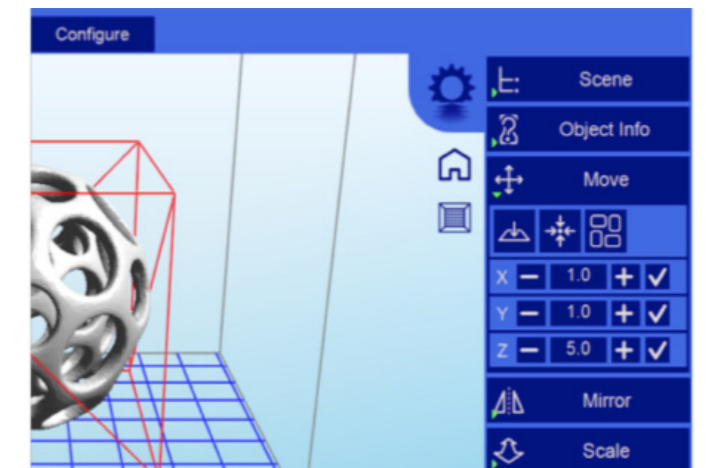
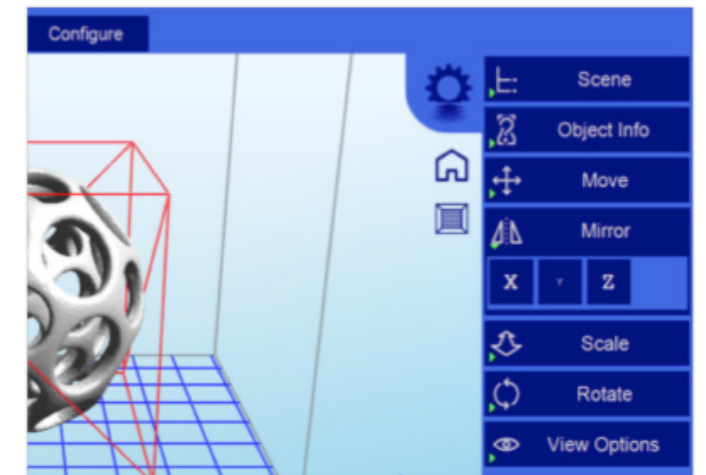
The view option allows you to manipulate various views and models.

On the top row from left to right:

- 50% Alpha-Blending toggle. This will allow you to see through the objects in the scene to see the geometry
- Show Slice Preview on Scene. After slicing this toggles on/off the view of the 3D view of the current slice layer as selected by the horizontal scrollbar.
- Show Console. This toggle button shows or hides the debug window. This window is used for debugging purposes.

On the bottom row from left to right are tools to change the way the objects appear on the screen:

- Show objects with a bounding box.





## 9. Working with Model Support tools

### Using Supports

Supports are sometime required to properly attach a model to the build space. Because of the nature of DPP the lower layers must be supported by the supports unless it has a wide surface in the first layers. We recommend checking no supports pass through your object. If they do, you can delete them and manually add others if needed.

### Adding a single Support

A single support can be generated by clicking the manual support button.

### Moving Supports

After a manual or automatic support has been generated, individual supports can be moved around the x:y plane the same way models can be moved. Select the support by double clicking on it to select it, and hold down the 'Shift' key on your keyboard and move the mouse. Supports will automatically scale vertically under the model they support.

### Angled Supports

Supports can be angled inwards towards the objects they support. This can often resolve clearance issues with vertical supports. You can turn a vertical support into an angled support by selecting it, and holding the 'Ctrl' key and clicking on the model you want to support.

### Manual Configuration

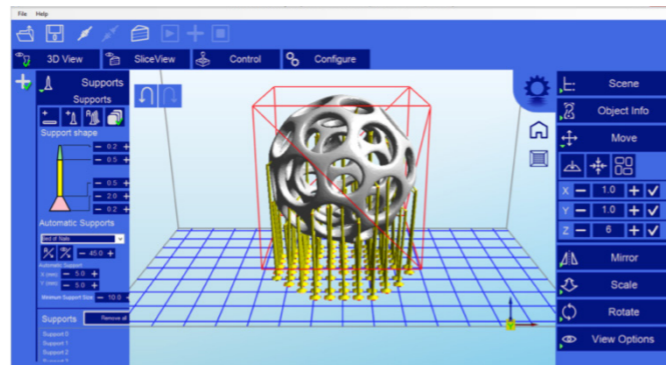
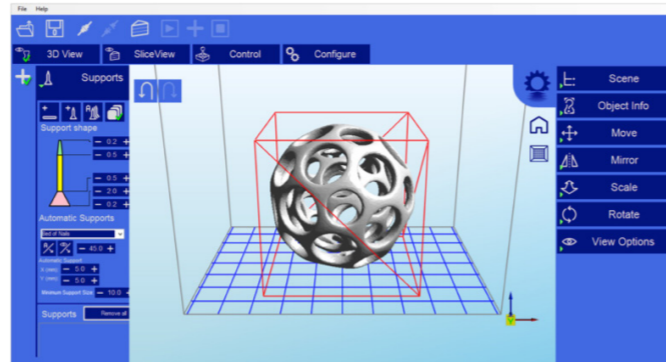
Under the Support Generation view, you can click 'show downward facing polys'. This will highlight all polygons in the model that are pointed downward by the specified degree. This helps you manually place supports under un-supported downward facing areas of a model.

### Auto Support on Grid

After a model is loaded into the scene and selected, you can automatically generate a 'bed of nails' support for the model by selecting . You can specify the grid spacing and the size of the generated supports. If you wish to only generate supports on downward facing polygons, check the boxes under 'support general' and 'generate only on downward'

### Adaptive supports

You can add supports to areas in the model that are unsupported. There are 2 algorithms to help



## 10. Saving a Scene



Click to save the current object as a .STL or .CWS file. The .CWS format allows you to prepare a scene to be printed repeatedly in the future, together with supports and positioning.

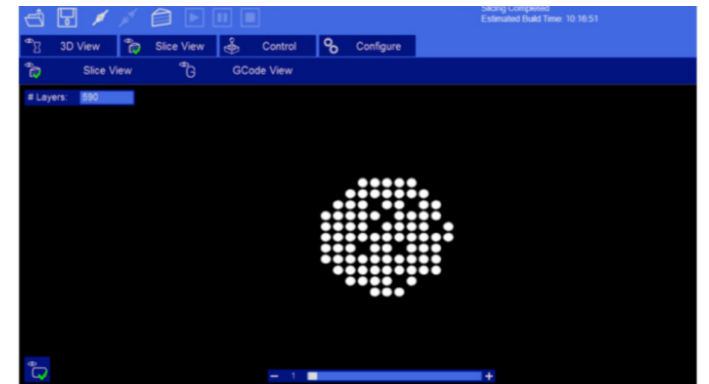
After one or more models have been loaded and manipulated on the build platform, the entire scene can be saved as an STL model for later use. Simply click on the 'File->Save Scene STL' menu item to save the scene model. This will flatten all models in a scene into a single STL file. Scenes can also be saved to CWS files.. These scene files can be used to create a scene with supports, slice the scene, and later load to print your scene without the need for re-slicing.

## 11. Slice View

In the Slice View screen we get the following information:

There are two buttons for each of the available options.

- The first option has the same name as the screen itself (Slice View). In this setting we can see (as shown in the image) each successive layer of the generated "Slicing". With the lower bar we can scroll through the entire slicing result to check each of the layers. In the upper left corner we can see the total number of layers that have been generated. In the lower left corner we have a ( ) button to turn the projector on and expose the selected layer. This can be useful to check the positioning of the vat.
- G-Code View: On this screen you can see the G-code generated during the "Slicing" operation. This option is intended for advanced users. We recommend to leave this screen



## 12. Slicing a Model



Once you have loaded one of the models, configured your machine profile, and configured your build & slicing profile, you can slice a model. Choose the slice icon from the toolbar to bring up the slicing screen.





## Liquid Crystal

*You can change the currently selected slicing profile to use. Click the 'Slice' button to begin slicing. You can stop slicing by pressing the 'Cancel' button. If your slicing profile is configured to export images, a progress bar will appear here. Otherwise, just the gcode for the scene will be generated and the images will be rendered during build-time.*