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



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@photocentric.co.uk www.photocentricgroup.com

USA 2205 West Parkside Lane, Phoenix, 85027, AZ USA







LC PRO USER MANUAL



Contents

General information
Safety information
Contents of crate
1. Installation & assembly instructions
1.1. Software installation CW
1.1.2 Software Installation Photocentric St
1.2. Connecting the printer CW
1.2.1 Connecting the printer Photocentric
2. Slicing your print CW
2.1. Slicing your print Photocentric Studio
3. Setting up a print CW
3.1 Setting up a print Photocentric Studio
4.Removing the finished part, cleaning & p
5. Emptying and cleaning the vat
6. Replacing the Vat Film
7. Software Instructions



	1-2
	3-4
	5
	6
	7-8
udio	9-10
	11
Studio	12
	13
	14
	15
	16
ost-exposing	17-18
	19-20
	21-23
	24



EU DECLARATION OF CONFORMITY

LIQUID CRYSTAL 3D-PRINTER Model: LC Pro

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 below.

Date of Issue: 08 June 2017 Place of Issue: Peterborough

Amanda Keating Director Manufacturer Photocentric Ltd Cambridge House, Oxney Road Peterborough, PE1 5YW, UK Year of CE Marking: 2017

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.

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SAFETY INFORMATION

Read the instructions carefully. Keep this document for future reference. Follow all warnings and instructions marked on the product.

- 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 the power 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.
- 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 cable. If you need to replace the power cable, make sure that the new power cable 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 the power.
- 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@photocentric.co.uk

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.



- Keep the printer and resins out of the reach of children.
- Printer requires two people to lift it from the packaging.
- 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.photocentricgroup.com/support





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.



CON The crate contains TENTS

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

USB Cable



Liquid Crystal Pro Printer

MINIMUM COMPUTER REQUIREMENTS

- 1.2 GHz processor or above
- Windows
- 2 GB RAM or above
- Computer must support a UHD monitor and have a spare display port

A one year Creation Workshop License is included with this printer. Please activate your license number on initial printer set up. The license number can be found on the back of the printer.

This printer also comes with a perpeutal license of Photocentric Studio.



Print Plate Vat Scraper Ratchet Socket Wrench Vat Nut Socket Allen Key Funnel Paper Strainer x 10 Spray Bottle Nitrile Gloves x 4 Print Sample Vat Film Vat gasket **Photocentric Studio License**

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)

1. INSTALLATION & ASSEMBLY **INSTRUCTIONS**

ASSEMBLY INSTRUCTIONS

- 1. Unscrew the screws on the top and front panels of the crate and place them to one side.
- 2. Remove the polystyrene from around the printer.
- 3. Remove the 5kg bottle of resin from the crate.
- 4. Unscrew the platform, remove and put it to one side. Lift the ancillary box out of the printer (To unscrew the bolts lift them up to disengage the lock and turn the bolt to loosen it. Repeat this step until the bolts are fully loose so the platform can be removed.)
- 5. Place the platform back into the printer and tighten the bolts.
- 6. With two people lift the printer out of the crate holding the printer at the bottom and top corner on both sides.
- 7. Place the printer on a flat and sturdy worktop ready for set-up.



Liquid Crystal PRO



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1.1. SOFTWARE INSTALLATION CW

- 1. Go to support on www.photocentricgroup. com and select LC Pro. Click on 'Downloads' and download the latest version of Creation Workshop.
- 2. Make sure the DisplayPort, 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.
- 3. Go to your computer desktop, right click and open "Display Settings". 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 3840 x 2160. There are videos online if you need further help. If Creation Workshop or Photocentric Studio software doesn't recognise 4k resolution and only 2k the carry out the following;

On Windows 8, right click on software shortcut, Properties then Click on 'Disable fullscreen optimization'. Refer bottom left screenshot on page 7.

On Windows 10 go to windows display settings, choose printer screen, change scale and layout from 200% to 100% Refer bottom right screenshot on page 7.

When this is complete reboot the software.

Creation/Workshop Properties	×
General Compatibility Security Details Previous Versions	
If this program ian't working correctly on this version of Windows, by running the compatibility troubleshooter. Run compatibility troubleshooter	Color
How do I choose compatibility settings manually?	Night light
Compatibility mode Run this program in compatibility mode for:	• Off
Windows 8	Night light settings
Settings Reduced color mode	Scale and layout
But in 640 x 410 access reach tion	Change the size of text, apps, and other items
Duble fullscreen optimizations	100% (Recommended) V
Change high DPI settings	Advanced scaling settings
Onange settings for all users	Resolution
	1920 × 1080 (Recommended) ~
OK Cancel Apply	Orientation

MINIMUM COMPUTER REQUIREMENTS

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





4. Configure your computer so that the screensaver 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.

Note: You will need to connect to the internet within 30 days of using your Creation Workshop license otherwise the license will deactivate. The license number can be found on the back of the printer. Then going forward the codes will need to be recognized online every 30 days after the first activation to validate and update the software.

- Execute the Creation Workshop software by double clicking on "CreationWorkshop.exe". If the software requires a license number insert the license number supplied on the back of the printer.
- 6. 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 there is a USB driver error you can download the driver from the below web addess;

https://photocentricgroup.com/lcpro-support/

7. If you are experiencing difficulties to start or connect your printer, go to our website www. photocentricgroup.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.



GO-2	 All Control Panel Items + Power 	Options 🕨 Edit Plan Settings	-	Search Control Pane	P
	Change settings for the	plan: Balanced			
	Uncose the sleep and display se	ettings that you want your comp	outer to use.		
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	Put the computer to sleep:	Never •	Never	•	
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1.1.2 SOFTWARE INSTALLATION PHOTOCENTRIC STUDIO

- 1. Go to support on www.photocentricgroup.com and select LC Pro. Click on 'Downloads' and download the latest version of Photocentric Studio.
- 2. Extract the Photocentric Studio zip folder and run the .msi application Note: If Windows Defender prevents the installation from starting simply click 'More Info' then 'Run Anyway' to begin the installation process.
- 3. The set up wizard will then load on your screen. To proceed with the installation simply click Next.
- 4. Now select the location for your installation to be saved to. If you wish to change the location simply click Browse and select a new location of your choice. Once the location has been selected click Next.
- 5.Once you have selected the location of the installation click Next to begin the installation of the software.
- 6. Installation has now completed, click Close and you can now open the software. When opening the software you will see a section to enter your license number which can be found on the USB in the envelope of the ancillary box, click on this section and enter your license number provided into the field as shown.

NOTE:

The software comes with a 30 day trial. If you wish to use the trial before activating your license simply click 'Continue Evaluation'.

MINIMUM COMPUTER REQUIREMENTS

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

7. Go to your computer desktop, right click and open "Display Settings". 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 3840 x 2160. There are videos online if you need further help. If Photocentric Studio software doesn't recognise 4k resolution and only 2k the carry out the following;

On Windows 8, right click on software shortcut, Properties then Click on 'Disable fullscreen optimization'.

On Windows 10 go to windows display settings, choose printer screen, change scale and layout from 200% to 100%.

When this is complete reboot the software.

1.2.1 CONNECTING TO THE PRINTER

- 1. Open the Print Controller by click on the print Resolution controller icon on the far right of the screen.
- 2. Refresh ports and choose com port display of the printer.
- 3. Press Connect



Liquid Crystal

Run compati	bility troubleshooter]	
Compatibility in Run this pr Windows 8	rođe rogram in compatibilitj	y mode for:	
Settings Reduced of 8-bit (256) or	tolor mode		
Run in 640) x 400 screen resolut Iscreen optimizations rogram as an administ	tion	
Change	high DPI settings		

Color

Night light

Off

Night light settings

Scale and layout

Change the size of text, apps, and other items



1920 × 1080 (Recommended)

Orientation



1.2 CONNECTING THE PRINTER CW

- 1. Connect the printer to the PC using the connect button.
- 2. Check that the printer has successfully connected by moving the drive up a small distance. Remember that the printer will not move unless the door is closed
- 3. If the printer doesn't connect successfully, go to the 'Configure' tab and press the 'Configure' button in the 'Machine Connection' frame. Choose a different COM port from the dropdown menu (if available). Press 'OK' then press 'Apply Changes'. Connect the machine again and try moving the drive (remember the door must be closed). If all COM Port options have been tried unsuccessfully, contact Photocentric for further support.



1.2.1 CONNECTING THE PRINTER **PHOTOCENTRIC STUDIO**

- 1. Open the Print Controller by click on the print controller icon on the far right of the screen.
- 2. Refresh ports and choose com port display of the printer.
- 3. Press Connect



Photocentric Print Controller				>
ected print job	Sek	ect .zip Select slice folder	н.	
Print process	Projection display	VUNDISPLAY2 V	Connect Pau	se Start
urrent printjob Manual controls Print settings				
5:15:Schecking for screens and USB ports 5:15:Checking for screens and USB ports 5:15: 2 screen(s) found 5:15: 1 ports found.	Â	Full screen mode (F5)	Total time Remaining time Slices	00:00:00 00:00:00 0000 / 0000
				-
				-
				-
				-
	~			



2. SLICING YOUR PRINT CW

- 1. Set up the machine profile in Creation Workshop by clicking Configure Slicing Profile then Pick Profile. Remember to press 'Apply Changes'.
- 2. Set up the slicing profile in Creation Workshop as shown below. Remember to press 'Apply Changes'.
- 3. If you have a powerful computer, for highest quality prints, set anti-aliasing to 7. This will take more processing power and not all computers can process slicing when anti-aliasing is 4 or above. If yours will not slice, keep anti-aliasing at 3. Click Apply Changes.
- 4. Open the STL file that you wish to print. Adjust scale, position, rotation etc using the controls provided on the right hand tool bar in Creation Workshop. Your printed item(s) should be positioned centrally within the build area. Add supports if required using the left hand tool bar in Creation Workshop. You may need to expand this tool bar by pressing the '+' button.
- 5. Slice the STL file using the button. Use the 'Slice View' tab to review the slice images. If you have difficulty generating the slices correctly, contact Photocentric for further support



reation/Workshop - (Slice Profile : LC Pro Low Shrink Grey 100µm, Machine : LC Pro, Scene :)

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R	3D View	°)	SliceView	*	Control	°,	, c	onfigure		
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Price p	per liter:		50	Reflect	х	Reflect Y			Export SVG:	None
									Export Preview:	None



2.1 SLICING YOUR PRINT PHOTOCENTRIC STUDIO

- 1. Click on the 'Slice' button
- 2. Select the appropriate resin profile
- 3. You can rename the file or add a Print job description in the relevant fields.
- 4. Once ready click 'Ok, Start Slicing'

Slice overview								
Please double check your slic	e settings.							
Machine		Liquid C	rystal Pro		~			
Material and print profile		PRO Ha	PRO Hard Black 100 microns V Edt					
Build size and resolution		3840x21	60 (469.0mr	n x 239.5mm)				
Layer height		100 mu						
Total volume		15.47 ml						
Part	Item (ml)	Supports (ml)	Total (mi)	Support volume	Scalefactor			
dwaff2_print.stl	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy Copy	1.20	0.35	1.55	22.73%	1			
dwarf2_print.stl Copy	1.20	0.35	1.55	22.73%	1			
dwarf2 print.stl Copy Copy	1.20	0.35	1.55	22.73%	1			
Print job folder name			5	Print job description				
SliceJob_LiquidCrystalPro_22	11-2018							
Zip slice export			l					
Cancel								





3. SETTING UP A PRINT CW

- 1. Check the first slice of your print on the printer's screen using the button below, in the 'Slice View' tab. (Use the push button on the front of the printer to turn the screen on and off.)
- 2. Return the screen to black by pressing the 'Show Blank' button in the 'Control' tab.
- 3. The vat should be inside the printer, empty and clean. Use just the 2 front bolts to locate the vat on the screen but do not tighten. The vat needs to be free to move up and down. They should not apply downward pressure to the vat. They are only there to prevent the vat moving horizontally or tipping.
- 4. Check that the drive carriages are at least 100mm above the bottom of the rails. Slide the print plate assembly into place in the printer. Push it back against the stops. Tighten the two star knobs that secure the print plate to the drive carriages.
- 5. On the print plate assembly, loosen the hex-head bolts that secure the L brackets. They should be loose enough to slide easily in the slots but not more. A hex key is provided in the accessory box.
- 6. Press the 'Home' button on creation workshop (the door must be closed).
- 7. Wait for the printer to reach the home position. If the print plate started in a very high position, it may stop before reaching home. If so, press the 'Home' button again. Press down evenly on the print plate with one hand and tighten the hexhead bolts that secure the L brackets. Make sure that all 4 corners touch the screen. If you press the corners you should see white spots on the screen. This is good and means that the platform is flat against the screen. Once the platform is homed and your first print is good, there is no need to touch the L bracket hex head bolts again. These bolts should be tightened firmly.

Projector Control Show Calibration Show Blank Hide Edit Commands Send

- 8. Close the door and move the print platform up 10mm.
- 9. Check the volume of resin required in Creation Workshop. Make sure the circled icon has the green check mark to give the total volume. This will include all items and any supports. Add 700 cm3 to this figure to allow for a full covering of resin in the bottom of the vat during the final layers of the print. You will need at least 1kg of resin to cover the base and make your print.
- 10. Wear protective gloves and measure out the resin. Be careful not to expose it to bright light for more than a few seconds. Excessive resin will make emptying the vat more difficult, insufficient resin will prevent the print from completing successfully. The maximum recommended volume of resin in the standard LC Pro vat is 5000 cm3 (5 litres).
- 11. Carefully add the resin to the vat. Pour in the centre of the print plate and it will drain through the holes. Close the door and drive the print plate down 10mm. Wait a few seconds for the resin to settle. Press the 'Print' button in Creation Workshop to begin printing.

The print time given in CW is not currently accurate. On average Pro will print 1cm every 3 hours with firm resin or every 2hours 20 mins with flexible resin.

3.1 SETTING UP A PRINT PHOTOCENTRIC STUDIO

- 1. Open the print controller by clicking on the far right icon of the top menu.
- 2. Press 'Home Button'
- 3. Press Up arrow 10mm
- 4. Pour the resin into the vat. Refer to steps 10 and 11 above under section 3.
- 5. Press the downward arrow 10mm
- 6. Press Play button.







R	Object Info	
Scene	a 🔿	
Volume:	172.052 cm^3	
Cost:	0.000	
#	397254	
#	132418	
Min:	-32.06, -31.94, 0.00	
Max:	31.15, 31.28, 92.50	
Size:	63.21, 63.22, 92.50	



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USE	B/Serial Ports Refresh ports	Port settings	COM1	~ ¥	Ш	
rint process	Projection display \\\DISPLAY2			✓ Connect	t Pause	Start
arrent printjob Manual controls	Print settings					
Move axis	Testing grid			Manual Sender GC	ode (Advanced)	
10 🗘 mm	Display blank	De	splay Grid	Your command:		
move 1 mm	Grid co	blor	50 🚔 Grid size pixels	Commands sent:		Send
move 0.1 mm				Machine response:		
wove 1 mm						
↓ 10 💠 mm						

4. REMOVING THE FINISHED PART, CLEANING AND POST-EXPOSING

- 1. Use your print controller to drive the print plate up until the print is clear of the vat. Allow the print to drain for a few minutes to reduce the chance of drips.
- 2. Make preparations for cleaning the print. You will ideally need a large sink with a good supply of hot water. The ambient light level should be low. Have a spray bottle with a hot, very dilute solution of washing up liquid is also useful. Wear protective gloves at all times you come into contact with liquids. You can also clean with IPA if available (Iso Propyl Alcohol).
- 3. Loosen the bolts that secure the print plate to the drive carriages. Grip the print plate L brackets firmly and take the weight of the print. Carefully slide the print plate towards you and out of the machine. Close the printer door take care not to drip resin.
- 4. When your print is finished remove the platform from the printer and lay it with the object facing upwards in a large plastic tray. Spay the part throughouly to remove all the unreacted surface polymer. When you have covered the entire surface, finish by spraying with warm water. You can use a sponge or soft brush to clean detailed parts. Alternatively use a large utrasonic cleaner.



- 5. Using a scraper detach the supports at the base to remove the part from the platform. Handle it gently as it won't achieve full strength until after full post exposure. Note that for large models, we recommend post curing the model on the build plate in order to minimize any possible warping. If your part is strongly adhered to the build platform you can aide removal by heating the metal to expand it by applying hot water or a hot air gun to it.
 - 6. Fill the tray with clean water and place the part in it so that it is fully covered. Expose to strong visible or UV light for 120 mins to dry the surface and achieve full hardness. In the case of larger prints you will have to turn it over so the underside receives light as well. For larger models, we recommend placing the whole platform in water under UV light.
 - 7. Clean the print plate thoroughly. Make sure all cured resin is removed from the underside of the plate as this may cause damage to the vat or screen. Hot soapy water and/or methylated spirits can be used to clean off uncured resin. Make sure the print plate is completely dry before returning it to the printer.
 - 8. Once the printed part(s) have been fully postexposed they should be removed from the water and dried thoroughly. Any support material can be removed using clippers.The part can be sanded if neccessary.







5 EMPTYING AND CLEANING THE VAT

- Before starting a print on the Liquid Crystal Pro, the vat should be emptied and cleaned. Wear protective gloves. Ensure that the ambient light level is not too high, don't work in direct sunlight and use low lighting where practical.
- 2. Prepare an area for cleaning the vat. You should have a smooth, flat, clean surface with plenty of space. Lay down two layers of paper towel to protect the vat film from scratches and soak up any spilled resin. Have a supply of paper towels, a bottle of methylated spirits, and a bin nearby. Do not work on a surface that could be stained or damaged by contact with resin.
- 3. Position a 5 litre resin bottle near the printer on a flat, stable surface and at a convenient height. Be sure that there is enough space in the bottle for all of the resin from the vat. Remove the lid of the bottle and insert the funnel (supplied in the accessory box) into the top. Place a clean filter (supplied in the accessory box) inside the funnel.
- 4. Remove the two vat bolts and set them aside. Grip the vat firmly by the handles and lift it carefully out of the printer. The vat will be heavy, especially if there is a large volume of resin remaining. Pour the resin gently into the funnel from one corner of the vat. Pour at a steady rate and be careful not to over-fill the funnel. Resin will flow over the flange of the vat; this is not a problem. Use a plastic card to push resin down the vat film towards the funnel.
- 5. When most of the resin has drained from the vat, place it on the paper towels ready for cleaning. When the funnel has drained, remove it from the resin bottle and replace the lid.



- 6. Use paper towels to clean up the resin on the flange of the vat. Be particularly careful to clean the resin out of the holes. If resin is allowed to cure in the holes it can obstruct the nuts and make it difficult to re-skin the vat. Methylated spirits can be used to help clean the vat body.
- 7. Use paper towels to clean up any further resin inside the vat. At this point it is important to remove any pieces of cured resin that remain in the vat. Anything left inside the vat could cause damage to the vat or screen when the printer is homed. It could also could prevent successful printing. It is best not to apply methylated spirits directly to the vat film.
- 8. Once the vat is clean, inspect the film for any signs of damage or excessive wear. If there is a puncture, or obvious damage, replace the vat film. You can cover tiny holes in the vat film with clear tape (eg. sellotape). If the vat is in good condition, return it to the printer. Replace the 2 vat bolts (do not tighten).







6. REPLACING THE VAT FILM

You Will need:

- Complete vat New piece of vat film New vat bottom gasket New vat top gasket Ratchet socket wrench (or socket driver) Paper towels Methylated spirits, IPA or Acetone Scraper or palette knife
- 1. Disassemble the vat, dispose of the film and gaskets, and clean all other parts thoroughly. Check that any cured resin is removed. The vat parts will not be damaged by cleaning solvents.
- 2. Place the vat bottom film frame.
- 3. Lay the new piece of film over the vat bottom film frame. Position it centrally. Grip the film tightly on either side of one of the long bolts. Press the film down firmly to puncture it.
- 4. Move to an adjacent long bolt and press the film down to puncture it again. Make sure that the film is under tension as you create the new hole so that there are no creases.
- 5. You can use the socket supplied in the accessory box as a tool for puncturing the film. The square hole in the top of the socket works best as it is a close fit over the bolts.
- 6. The backing paper supplied with the replacement film can be placed under the vat bottom film frame. This will help protect the film from damage during the rest of the assembly procedure.
- 7. Carry out the same procedure for the short bolts, using the socket to puncture the film.

Note:

Work on a clean flat surface with plenty of space







8. Use scissors to cut away a triangular piece of film outside each of the bolts. Carefully make two cuts from the edge of the film to the punched hole.

9. Widen each of the remaining holes by gripping the edge of the film near each long bolt and stretching outwards slightly.

- **10.** Lay the vat bottom gasket (with small holes) down over all the bolts.
- 11. Lay the vat top gasket (with small and large holes) down over all the bolts.



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Liquid Crystal

- 12. Do not tighten the short bolts. Place the vat body onto the bolts. The handles should be on the top.
- 13. Take 18 vat nuts and thread them about one turn onto the long bolts. You may find that you need to lift the vat bottom film frame slightly to allow the thread to engage.
- 14. Once all 18 vat nuts are in place, you can start to tighten them using a ratchet socket wrench or a socket driver. Work around the vat giving each nut two or three turns. It should take three or four passes to fully tighten all the nuts.
- 15. The film should be pulled taught as the nuts are tightened. If any creases remain once the film is taught, the vat body will have to be removed and the holes in the film stretched to correct the creases.
- 16. Lift the completed vat and carefully turn it on to one edge. Rest it on the table and check that the vat body and the vat bottom film frame are parallel. The gaskets should be under uniform compression. If there are any gaps, the nuts have not been fully tightened evenly or something is obstructing the thread. If the vat body has been significantly distorted by the compression around each nut, they are too tight.
- 17. Also inspect the vat film where it is stretched over the wall of the vat. There should be no holes, creases or other visible damage. If any pieces of cured resin or other contamination is trapped between the vat wall and the film, this could cause a leak during use. In the corners, there may be some creasing in the film. This is acceptable as long as the creases do not extend onto the base of the vat.
- 18. Turn the vat around and inspect each side as described above. You can check for leakage by filling with water and leaving for 1 hour.
- 19. The vat is complete and ready to use in your Liquid Crystal Pro. Following this procedure applies less tension to the vat film than in the standard configuration. This can assist with release of the print from the vat and improve reliability.







7. SOFTWARE INSTRUCTIONS

For more detailed instructions and video tutorials on how to use Creation Workshop or Photocentric studio please visit www. phohotcentricgroup.com, click on Support and select LC Pro. Under the 'Adding supports' tab you will find guides and videos for both software packages for adding supports. Under the 'downloads' tab you will find the User Guide for both Creation Workshop and Photocentric Studio.

