

lumiForge

CRAFTER MANUAL



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1. GENERAL PROVISIONS

The present manual describes LumiForge DLP 3D printer and provides general information and security provisions. It includes the machine transportation and installation information and all necessary details for the machine use. This manual is an integral part of LumiForge.

Descriptions and illustrations provided in this publication, are not binding. Lumi Industries Srl reserves all rights to make necessary changes for improvement purposes, without being committed to update this publication.

Illustrations and images contained in this manual are intended only as examples and may differ from practical situations.

1.1 SAFETY INSTRUCTIONS:



This manual should be carefully read before the appliance is installed and operated. Read the warnings and guidelines contained in this booklet carefully as they provide essential information for the first time using of the appliance and for the continued safe use and maintenance of the appliance.

Retain this booklet for any further reference that may be necessary in the future.

THE MANUFACTURER CANNOT ACCEPT ANY LIABILITY FOR ANY NON-COMPLAINT APPLIANCE USE.

Removing or tampering of safety devices is a violation of European Union norms on safety.

1.2 CONVENTION

In this manual the following graphic and linguistic conventions have been adopted:

ATTENTION: this indication will appear before certain procedures. The inobservance of this indication may cause a damage on the appliance.

WARNING: this indication will appear before certain procedures. The inobservance may cause injuries to the user and the appliance.

1.3 ELECTRICAL SUPPLY

- Check that the voltage of your appliance matches that of your electrical installation.
- Any incorrect connection invalidates the warranty.
- Do not immerse the device, the power cord or plug in water or any other liquid.
- Do not leave the power cord within reach of children or close in contact with hot part of the appliance, close to a source of heat or on a sharp hedge.
- Do not use the appliance if the power supply cord or plug is damaged.

1.4 INSTRUCTION FOR USE

- This appliance should be destined only to the use for which it has been expressly conceived. Any other use should be considered improper and therefore dangerous. The manufacturer cannot be held responsible for injury or damage resulting from improper, incorrect, and unreasonable use. Failure to install, operate, and maintain the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage.
- Only people aged from 18 years old or above can use this appliance.
- This appliance is not intended for use by persons with reduced physical, mental and sensory capacity, unless a person responsible for their safety has given them supervision or instruction concerning use of the appliance.
- Do not execute any intervention on the appliance if not indicated in this manual.
- Do not put hands or other things in proximity or inside moving parts.
- Do not leave the appliance running unattended.
- In case of long stops in the appliance use, disconnect from the power plug.
- Never look direct UV sources, like the projector or other UV source.
- The resins could be dangerous, read always the provided Material Safety Data Sheet.
- Always wear nitrile protective gloves when using resins and glasses to protect eyes from resin contact.
- If there is contact with the eyes go to the hospital with the resin MSDS.
- Do not smell resin or any kind of alcohol.
- Use the printer in a ventilated space

1.5 DISPOSAL OF PACKAGING AND APPLIANCE

The packaging material may be disposed of in compliance with the recycling regulations in force in the user's country.

In case you decide not to use this machine anymore, we recommend to make it unusable taking off the power supply from the plug.



This appliance contains many materials that may be revalorised or recycled.

To scrap off the appliance, contact the department in question of your local council, for the disposal of recyclables and non-recyclables materials.

1.6 DISPOSAL OF RESIN



Keep product from waterways and watersheds. This substance is not readily biodegradable.

Dispose of in accordance with all applicable federal, state and local regulations;

Contact a licensed professional waste disposal service to dispose of this mixture. As with all foreign substances, do not allow to enter the storm or sewer drainage systems. Avoid release to the Environment.

Contaminated Packaging: Dispose of as unused product. Expose the open emptied container to light, and then dispose

2. LET'S GET STARTED

2.1 INTENDED USE

LumiForge is a device created to produce tridimensional prints of parts in the limit described in the following "Tech specs" paragraph. Any further use is forbidden.

LumiForge uses a DLP projector that cures the photosensitive resin contained in the vat. The original solid is the result of a predefined number of parallel slices, depending on the resolution chosen by the user. Each slice becomes an image which is projected into the vat by the DLP projector. The resin will start the curing process required to form a layer as soon as the light hits the resin. The process goes on layer by layer until an object is successfully created!

WARNING: This appliance can be used only by kids aged from 16 years old or above.

2.2 LUMIFORGE SPECIFICATIONS

Congratulations on your new purchase: LumiForge is a high quality, easy to use and reliable DLP 3D printer!

LUMIFORGE Tech Specs

Technology	Stereolithography (DLP)
Printer Dimensions	320 x 320 x 600 cm
Build Volume	10 cm in diameter and 10 cm in height, expandable to 10 x 15 cm with accessory XL-KIT
Layer Curing Time	700 - 8000 ms
Resolution X, Y axis	37µm for a printed area of 70x45mm, 100µm for a printed area of 150x100mm
Maximum Resolution Z	37 µm

ACER P1500 DLP Projector included

Data Sheet

Image	
Native Resolution	1920 x 1080
Maximum Resolution	1920 x 1200
Standard Mode Brightness	3000 lm
Native Aspect Ratio	16:9
Compatible Aspect Ratio	4:3
Contrast Ratio	10,000:1
Throw Ratio	1.15 to 1.5:1
Digital Zoom	2x
Vertical Keystone Correction	-40°/+40°
Maximum Vertical Sync	120 Hz

Maximum Horizontal Sync	100 kHz
Minimum Vertical Sync	50 Hz
Minimum Horizontal Sync	30 kHz
Color Supported	1.07 Billion Colors (30-bit)
Projection Lens	
Lens Type	Manual Focus/Manual Zoom
Minimum Lens Aperture	F/2.59
Maximum Lens Aperture	F/2.87
Minimum Focal Length	16.88 mm
Maximum Focal Length	21.88 mm
Minimum Diagonal Image Size	45"
Maximum Diagonal Image Size	25 ft
Minimum Projection Distance	59.06"
Maximum Projection Distance	24.93 ft
Optical Zoom	1.3x
Lamp	
Lamp Type	OSRAM
Number of Lamps	1
Lamp Power	210 W
Normal Mode Lamp Life	4000 Hour
Economy Mode Lamp Life	5000 Hour
ExtremeEco Mode Lamp Life	7000 Hour
Interfaces/Ports	
Number of HDMI Ports	1
HDMI	Yes
USB	Yes
Composite Video	Yes
S-Video	Yes
VGA In	Yes
VGA Out	Yes
Audio Line In	Yes
Audio Line Out	Yes
Technical Information	
Projection Method	Ceiling/Front/Rear
Video Compatibility	EDTV/HDTV/NTSC/PAL/SDTV/SECAM
Computer Compatibility	Mac PC/Windows PC
3D Capability	DLP 3D
Power Description	
Power Supply	100 V AC~240 V AC
Input Voltage	120 V AC 230 V AC
Operating Power Consumption	290 W
Physical Characteristics	
Fan Noise	26 dB Approximate Economy Mode 32 dB Approximate Standard Mode
Temperature	32°F (0°C) to 104°F (40°C)
Humidity	80% Maximum Relative Humidity
Weight (Approximate)	4.85 lb
Form Factor	Ceiling Mountable

Software

Input File	STL (Standard Tessellation Language)
Features	STL Slicer (hollow or full objects) Printing session management

Supported OS (OpenGL 3.2 requested)

Windows	Vista, Windows 7, Windows 8, Windows 10
Mac	Lion, Mountain Lion, Mavericks (retina display supported), Yosemite
Linux	Disponibile come pacchetto binario

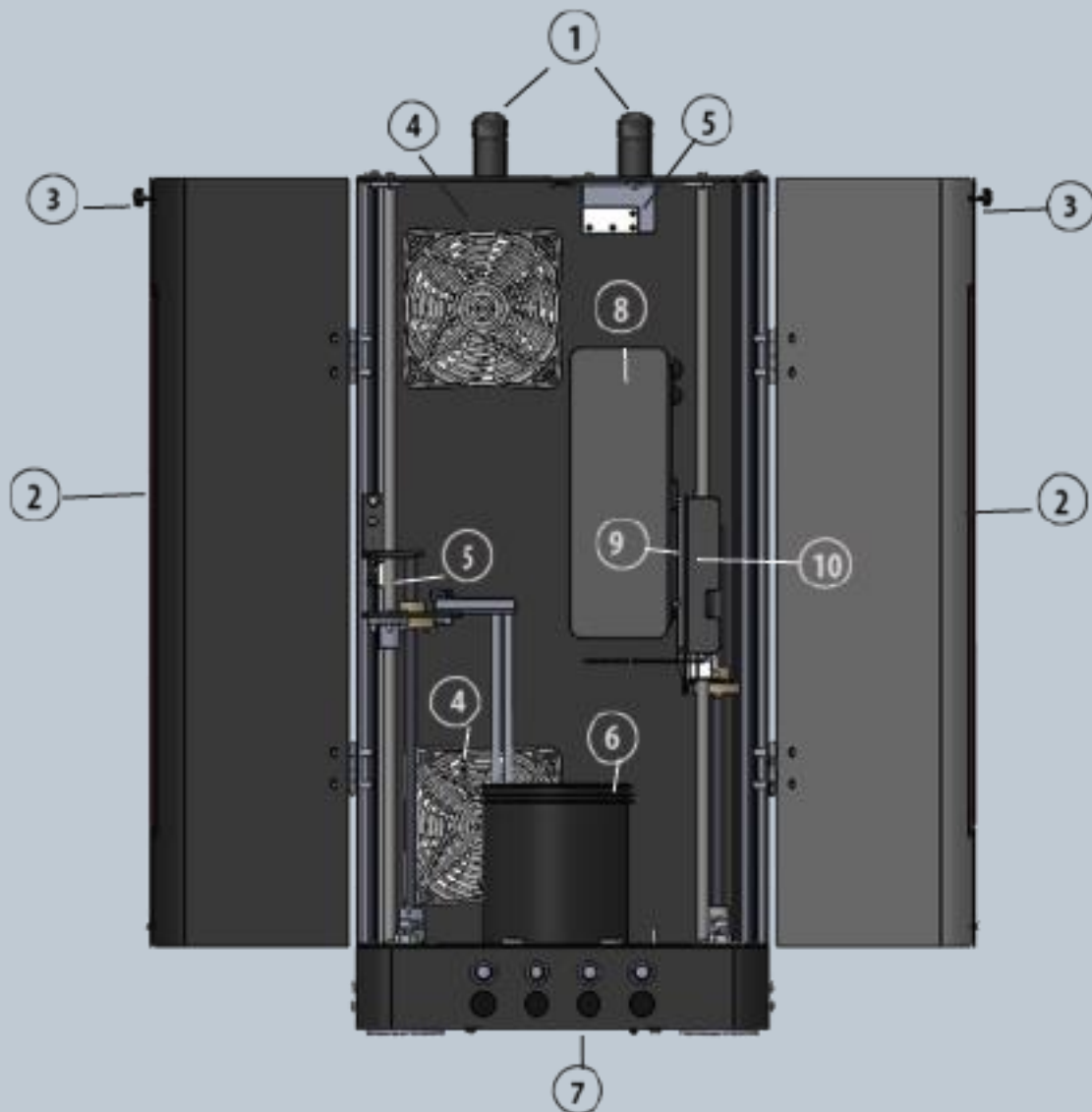
3. YOUR LumiForge 3D PRINTER

3.1 Inside the box

ATTENTION: Do not throw away the printer shipping box. Warranty will decay In case a printer is shipped to Support Service for technical problems without the original box.

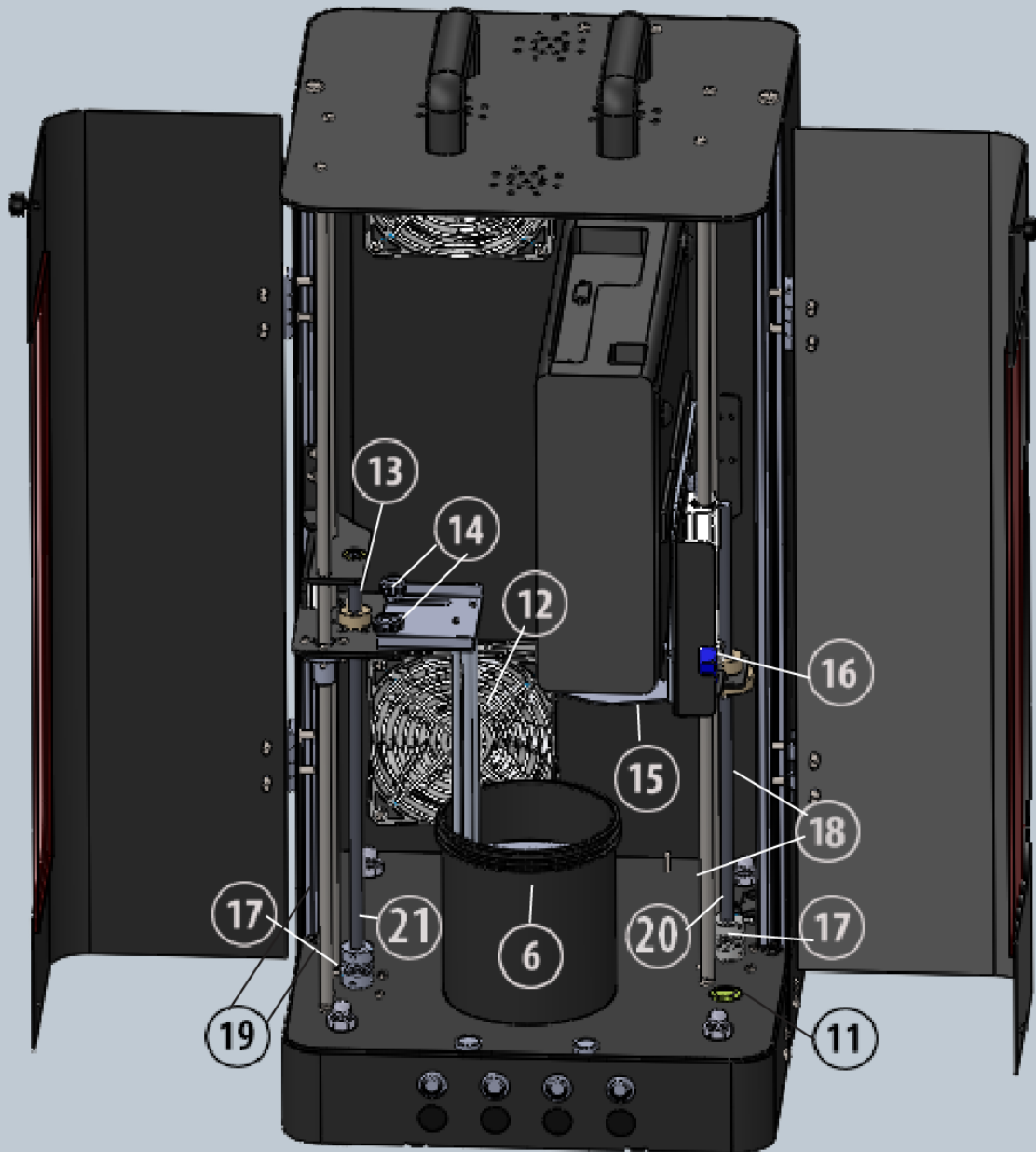
 <p>1 LumiForge 3D printer</p>	 <p>1 resin vat</p>	 <p>1 carriage</p>	 <p>1 USB Cable</p>
 <p>1 Proiettore Full HD Acer P1500</p>	 <p>1 Projector plate</p>	 <p>1 Projector screws and washers</p>	 <p>2 Projector knobs</p>
 <p>1 servo shutter</p>	 <p>1 allen key</p>	 <p>1 pair of nitril gloves</p>	 <p>1 spatula</p>

3.2 Lumi Forge Diagram



- 1- Carrying handles
- 2- Door
- 3- Door handle
- 4- Fan
- 5- End stop sensor

- 6- Resin Vat
- 7- Frontal panel
- 8- Projector
- 9- Projector plate
- 10- Projector black holder plate



- 11- Spirit level
- 12- 3D printer carriage
- 13- Carriage movable base
- 14- Carriage knobs
- 15- Shutter
- 16- Blue servo

- 17- Couplers
- 18- Projector sustain bars
- 19- Carriage sustain bars
- 20- Projector precision treated bar
- 21- Carriage precision treaded bar

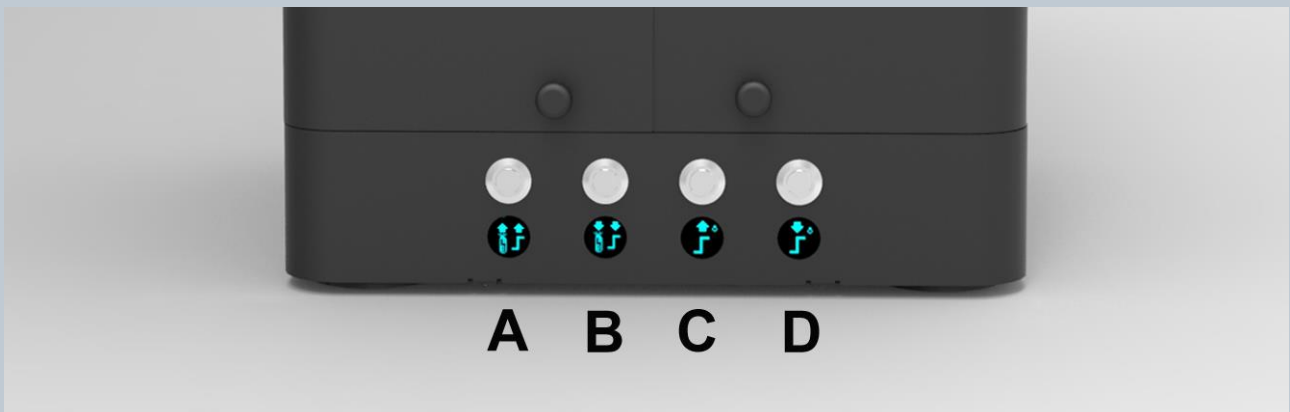


22- Power socket
 23- Power switcher
 24- VGA port
 25- USB port

26- USB plug
 27- VGA plug
 28- Power plug

3.3 Frontal Panel keys

The keys on the frontal panel will light up when Lumiforge is connected with USB cable to the computer. They work even when Lumiforge Creator software is not launched.



KEYS MEANINGS AND COMBINATIONS :

- A- Move the carriage and projector UP together to keep calibration
- B- Move the carriage and projector DOWN together to keep calibration
- C- Move ONLY carriage DOWN
- D- Move ONLY carriage UP.
- C+D simultaneously – OPEN and CLOSE the shutter.

4. LUMIFORGE SET UP

IMPORTANT: LumiForge has to be set up:

- On a flat solid surface parallel to the floor, the spirit level (n.11) will help you find the correct position.
- In a well ventilated area since resin odour may cause headaches and nausea.
- Away from direct sunlight contact or any kind of light exposure which may cause the resin to cure improperly!

4.1 Software download and installation

- Visit the following webpage: <http://www.lumindustries.com/lumiforge-downloads>
- Download LumiForge software (LumiCreator) and resin.ini file on your computer.
- Unpack the software into a folder of your choosing.
- Now copy the resin.ini file inside the LumiForgeCreator folder

4.2 Installing door handles

- Take one black handle, one washer and one magnet screw
- Insert the magnet screw at the door back
- On the front part place the washer and screw the handle



Img.1 Install Lumiforge door handles

- Repeat this process for the following three handles

4.3 Installing DLP projector

- Extract the projector from its own shipping box.
- Remove the lamp cover.
- Install the projector-holder plate (n.9), start placing the provided washers (img 2.a) on top of the three threaded holes, place the plate in the right position (img 2.b), tighten the screws into the three threaded holes on the projector bottom as per image (img 2.c).



Img.2 Install the projector-holder plate

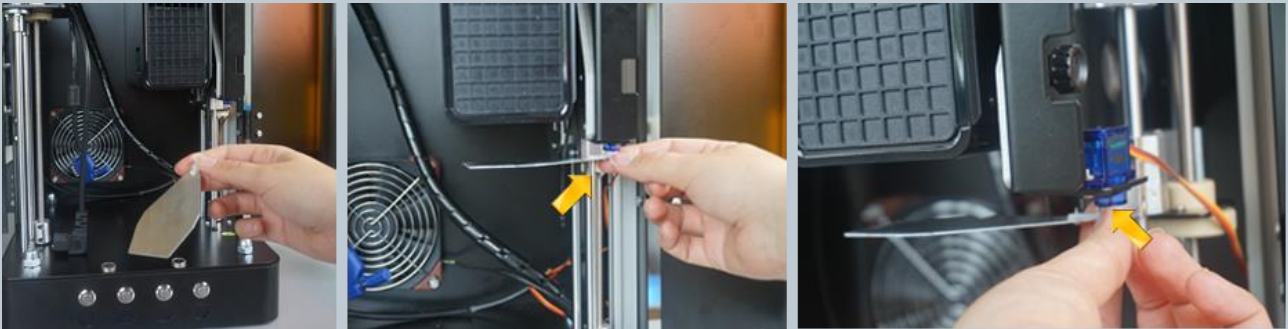
- To install the projector inside the 3D printer, hold it vertically with the lamp facing down (img. 3.a).
- Match the plate mounted on the projector to the black plate **(n. 10)** inside the printer (img. 3.b)
- Screw the two knobs provided into the two holes indicated on the plate external side (img. 3.c and img. 3.d)
- Now connect VGA and Power Supply cable inside the printer to the corresponding socket on the projector (img. 3.f).

ATTENTION: We suggest inserting the VGA cable between the two sustain bar (n.17) to avoid it to interfere with projector movement (img.3.f).



Img.3 install the projector inside the 3D printer

- Follow projector manual to turn the grey zoom ring above the projector outwards so to set the closest zoom. Always make sure that zoom ring is in this position.
- Install the servo-shutter provided **(n.15)** on the blue servo **(n.16)** located below the projector **(n. 8)** (img.4)
- After installation It is possible to open or close the servo-shutter manually, pressing together the last two keys on the right on Lumiforge front panel **(n.7)** (img.5).
- If, when on the closing position, the shutter does not cover all the light flux, remove it and install it again with a rotation.



Img.4 Install the servo-shutter

IMPORTANT: the servo-shutter is meant to protect the resin from unwilling light from the projector and we advise to keep it closed. During the printing process, it will open and close before and after every layer projection, unless “stop servo” is flagged on LumiCreator.

In case you are keeping the projector so close to the projector that the servo-shutter is banging on the resin vat, you can remove it and flag “stop servo” to stop the action. However, be aware that removing the servo-shutter, the resin will not be protected in case the projector will start emitting strong light.



Img.5 Open or close the servo-shutter manually

4.4 Installing printing carriage and vat on LumiForge

- Insert the carriage (**n. 12**) in the housing of the movable base (**n. 13**) (img.6)
- Tighten the two knobs (**n.14**) until they are perfectly tightened (img.7).



Img.6 Insert the carriage.



Img.7 Tighten the two knobs.

4.5 Connecting LumiForge

- Connect the appropriate USB (**n.26**) cable end and one of the VGA (**n.27**) cable (supplied with the projector box) end to the corresponding jacks (**n.24 and 25**) on Lumiforge back side (img.8).



Img.8 connecting USB and VGA cable.

- Connect the other end of both USB and VGA cable to the corresponding ports of your computer (img.9).
- In case your computer does not have a VGA port, you can use an adapter.



Img.9 Connecting USB and VGA cable to the computer.

IMPORTANT: LumiForge will only work if, upon connecting the projector, your computer screen setting is set on extended screen.

- Enter screen settings on your computer to project on a second screen. **Choose screen extension.**

4.6 Switching LumiForge on

- Connect the corresponding end of the power supply cable (**n.28**) provided in the projector box to the black socket (**n.22**) at LumiForge back and the plug into the electric socket (img.10).



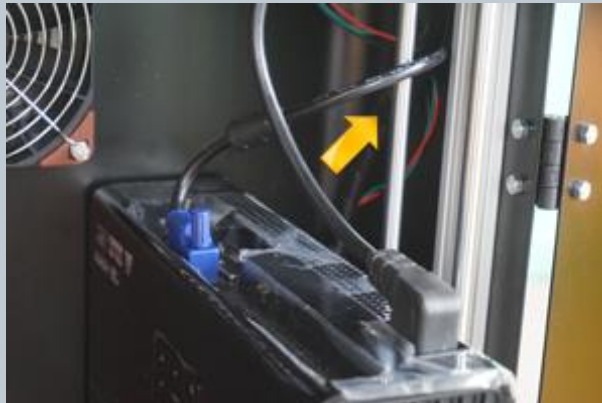
Img.10 Connect power supply cable

- Switch the red switcher (n.23) on
- The printer is NOW on.
- Once the printer is on and connected with the computer with the USB cable, the frontal panel (n.7) screens will light up and fans (n.4) will start to move.

IMPORTANT: Fans are very important to keep the temperature inside the printing area cool and save projector life. LumiForge fans are provided with a set of filters to protect the printer inside from dust. Check filters regularly to make sure they are always clean. To clean the filters, blow them with compressed air o similar.

- Launch LumiCreator software.
- Once the software is launched, the carriage (n.12) and the projector movable (n.9 and 10) bases move up at the starting point.

ATTENTION: when carriage and projector start to move up, be careful that internal black cable spiral holder and the VGA cable do not interfere with their movements. If it does, push them away. We suggest to insert the VGA cable between the two sustain bar (n.18) to avoid the cable to interfere with the movement (img.11).



Img.11 Correctly position of VGA cable.

ATTENTION: After moving up, both carriage and projector should stop and sensors (n.5) should light up in red (img.12).



Img.12 sensors lighting up.

If sensors do not light up and you keep listening a sound of striving motor, this mean that:

- The black spiral cable holder is interfering with the projector movement, in this case just move the cable holder away.
- Something else is in the way and is not letting the sensors to stop the movement, in this case remove the obstacle
- Sensors are faulty, in this case switch the printer immediately off and ask for assistance.

ATTENTION: CHECK THE SENSORS (N.5) FLAP REGULARLY. SENSORS SHOULD LIGHT UP WHEN FLAP IS MOVED UP! (img. 13)



Img.13 sensors flap.

IMPORTANT: If the starting movement does not happen, please proceed to calibration on the Software second screen. On the right menu, click on “scan for printer”. If the printer is not detected, please check if the USB cable is correctly plugged to both the printer and the computer. Try to plug and unplug and press “scan for printer” after each time until printer is detected.

- Now turn the Projector on (either with the power button on the device or through the remote controller if supplied).

ATTENTION: Many projectors will flash light on start-up, or, if you switch your projector on without having launched LumiCreator software, it will project a powerful light, which may cure your resin unwillingly. Therefore, if you have already placed the resin vat below the projector, be sure that the servo-shutter (n.15) is covering the projector lamp.

It is possible to open and close the servo-shutter, pressing together the last two keys on the right (C+D) on Lumiforge front panel (n.7) (img.5).

4.7 Preparing the resin vat

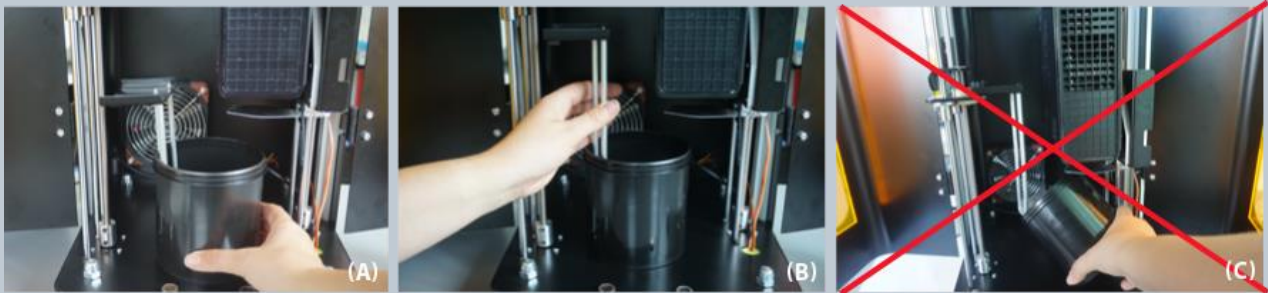
- Pour the resin from the bottle to the provided resin vat (n.6)

WARNING: always wear protective gloves and goggles when using the resin. They may cause skin, eye and respiratory system irritation, and skin sensitization/allergic reaction by skin contact.

ATTENTION: As photosensitive pigments tend to deposit after a while, stir the resin well before each print, in order to avoid colour spoiling.

IMPORTANT: the level of the resin **MUST** be at least 1 cm higher than the height of object you are about to print

- Uninstall the printing carriage (n.12) from the movable base (n.13), unscrewing the two knobs (n. 14)
- Immerse the carriage inside the vat (n.6) full of resin (img 14.a)
- Place the vat with the resin and the carriage on the printer internal surface (img 14.b)
- Now install the carriage as mentioned in point 4.4.



Img.14 How to install the resin vat correctly.

IMPORTANT: Never place the resin vat when the carriage is installed by tilting the vat (img. 14.c). Resin might pour out.

ATTENTION: In case resin is unwillingly poured on the printer internal surface, switch the printer immediately off, absorb the resin with a paper towel and clean the surface with alcohol to remove resin traces.

Before switching the printing on again, make sure that the liquid has been totally removed and it has not infiltrated inside the printer bottom part where the electronic board is placed.

Always contact our service support and never open the printer bottom area, it will invalidate the warranty.

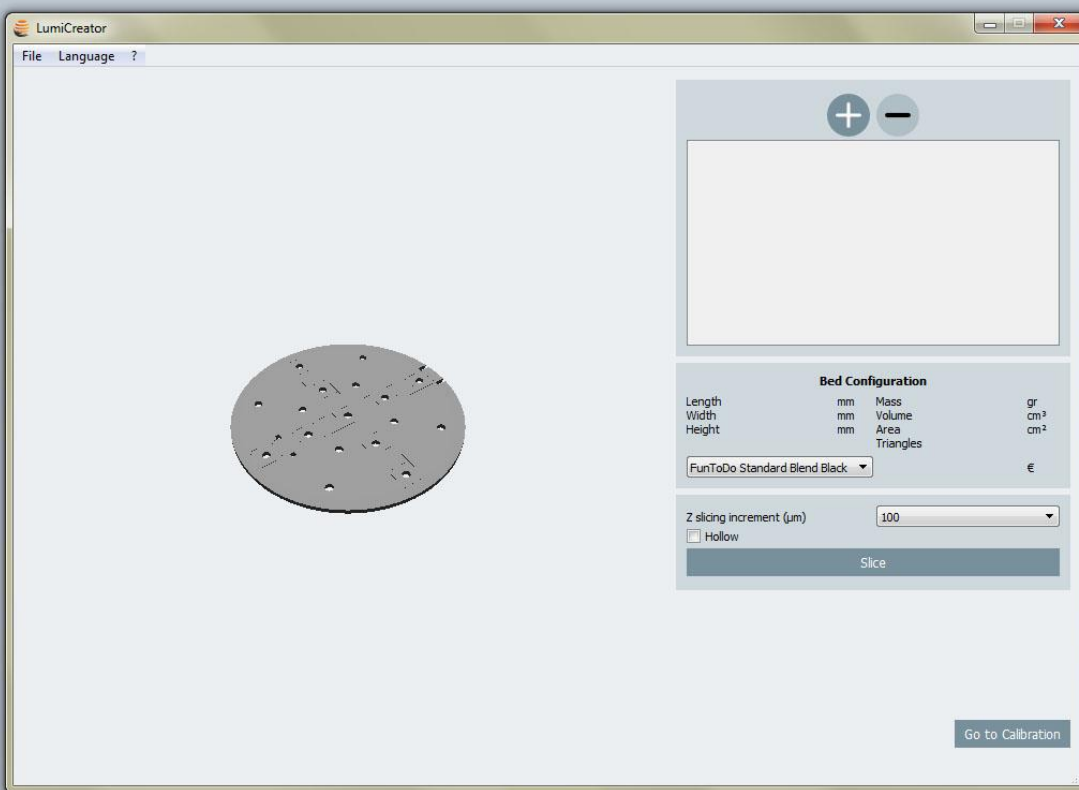
5. LET'S START PRINTING:

ATTENTION: Since printing time could take long, make sure your computer is not running only on battery (if you are using a laptop) to avoid that it turns off during the printing process. For the same reason, make also sure that your Operating System's settings regarding Energy saving settings, monitor sleep and screensavers are turned off.

5.1 Phase 1: FILE LOADING AND SLICING

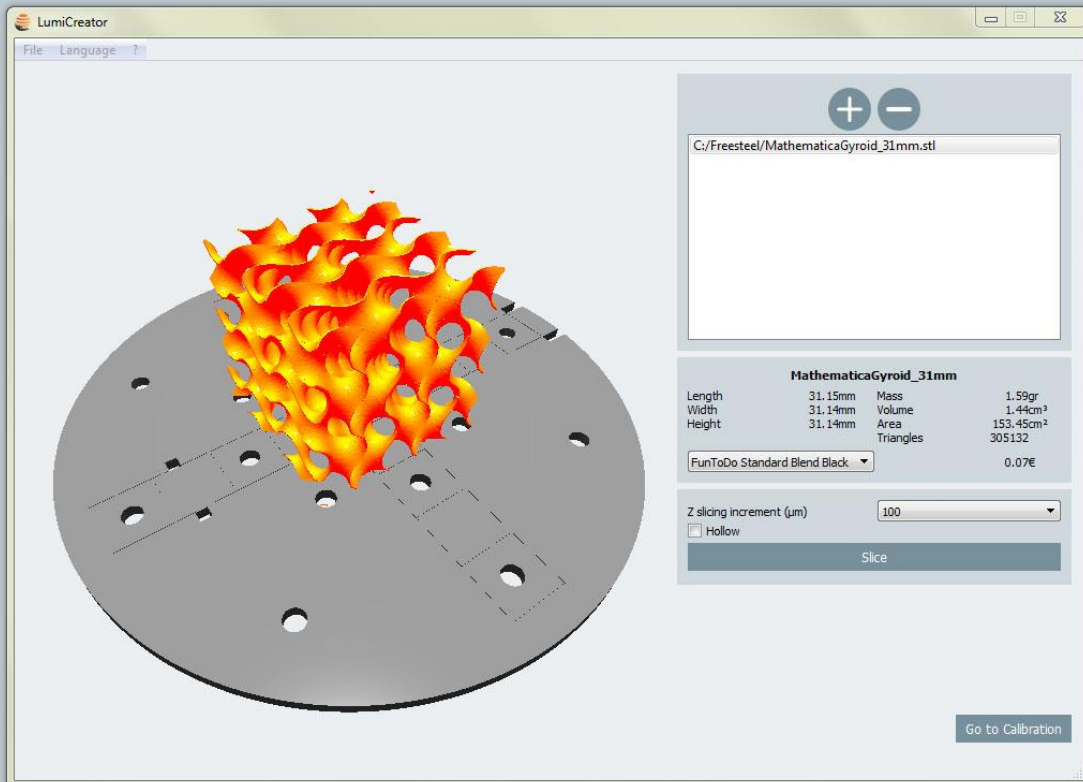
- First of all, launch LumiCreator software on your computer.
- By clicking on the (+) button on the top right you can load the .Stl file (stereolithography file) of the object that you want to print with LumiForge (img.15).

ATTENTION: The file format of the 3d object you want to print must be in Stl file format.



Img.15 Lumicreator software- first screen "file loading".

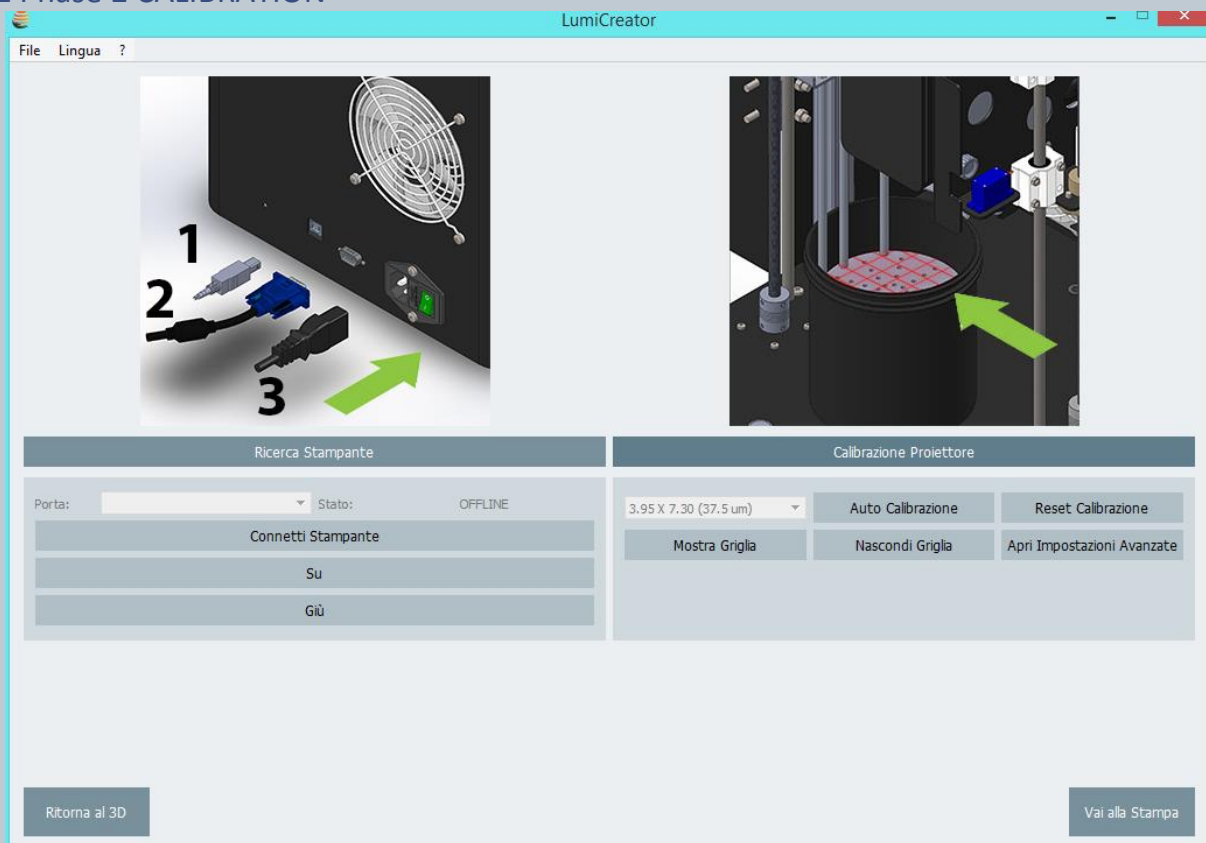
- After loading the 3d model, you will see a preview of the printing tray and the object you are about to print (img.16). You can delete it (-) and load a new one in this phase.
- Under "**Bed configuration**" the info about the 3d model are listed.
- Choosing one of the available resin type from the dropdown menu will allow:
 - to see the volume of material used and the corresponding price,
 - to set the suggested layer curing time.



Img.16 Lumicreator software slicing.

- Choose the favourite slicing resolution (150/75/37,5 µm).
- Click on “**Slice**”, the software will slice the .Stl file, and you can proceed to the next phase.

5.2 Phase 2 CALIBRATION



Img.17 Lumicreator Software – second screen: Calibration.

- Press the **“Go to Calibration”** Button on the bottom left.
- The software has already calculated the needed printing area according to the volume of the part we are going to print.
- Just press **“Calibration”** followed by **“Auto Calibration”** key and the projector will adjust automatically the calibration.
- It is also possible to choose manually one of the five available printing areas on the drop down menu and then press **“Auto Calibration”**, **but only after you have first reset the Calibration pressing on the corresponding button “Reset Calibration”**.

ATTENTION: When **“Calibration”** key is presses, if the following error message appears **“Seems projector resolution isn’t 1920x1080. Please fix it”**, go to the advanced setting on your computer control panel and choose the right resolution for your projector.

- The projected red grid will help the projection focus.
- Focus the projector so that the red grid is perfectly on focus, turning the focus ring above the projector lamp as per producer’s Focus instruction.

ATTENTION: make sure you have enough space on the disk C before printing. If the disk is full the slicing might not start.

ADVANCED SETTING:



Img.18 Calibration advanced settings.

- The red cross is made of 1 cm* 1 cm squares. In case you notice that your cross is bigger or smaller than what it should be, you can apply “**Zoom +/-**” to correct it.
- When making a printing preview, if you notice that your part is not perfectly inside the printing area you can adjust it using “**Offset X/Y**” and “**Rotation**”, pressing for each one the key -/+.
- If you want to save these settings for next uses click on **File** dropdown menu at the upper left side of the program screen, choose “**setting**”.
- Click on “**Get Values from Actual**” on the bottom left side of the window which has just opened, then “**Save**” and “**Close**”.

5.3 Levelling the printing carriage

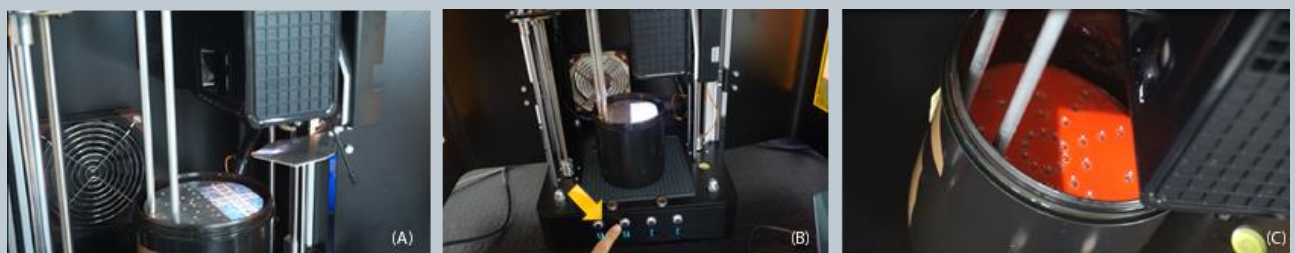
- Fill the printing vat with resin so that the level is higher than the part you want to print and position the carriage as mentioned in point 4.5

WARNING: always wear protective gloves and goggles when using the resin. They may cause skin, eye and respiratory system irritation, and skin sensitization/allergic reaction by skin contact.

ATTENTION: As photosensitive pigments tend to deposit after a while, stir the resin well before each print, in order to avoid colour spoiling.

IMPORTANT: the level of the resin MUST be at least 1 cm higher than the height of object you are about to print

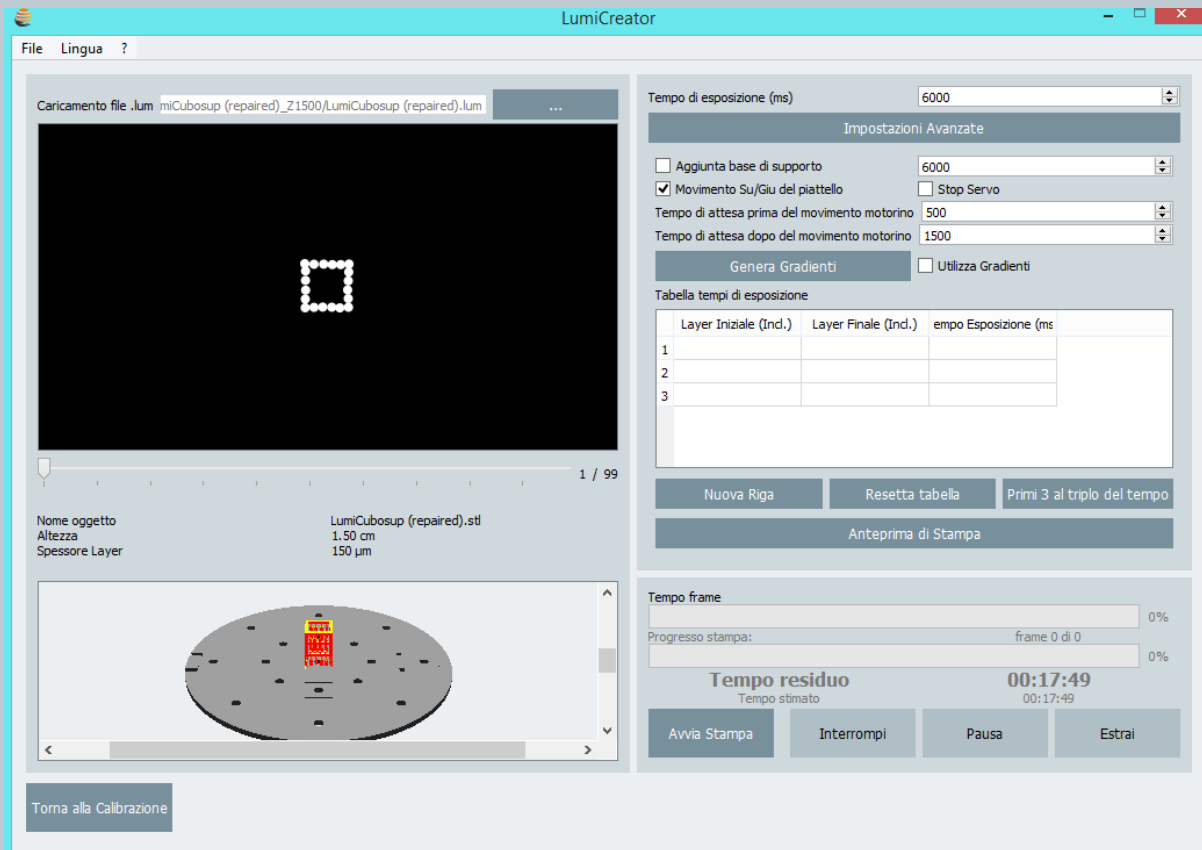
- Now **using the first two keys (A and B) on Lumiforge front panel (n.7)** you can make the carriage go up and down together with the projector (img.19.b). Use these commands to move the carriage without losing the calibration setting that have just been set.
- Position the carriage right at resin level (img.19.c).
- Once you press “**start printing**” the carriage will move up automatically so that during the first layers the carriage will be a little bit higher than resin level, allowing a perfect adherence of the model.



Img.19 Levelling the printing carriage.

- Pressing **the second two keys (C and D) on the right of the frontal panel (n.7)** it is possible to move up and down only the carriage.

5.4 Phase 3: PRINTING



Img.20 LumiCreator Software – third screen - printing

- Click the **“Go to Printing”** button on the bottom right.
- The top screen on the left part will show all the slices that have been created from the loaded part.
- Move the arrow left and right to visualize the different layers and check that no abnormal layers have been created
- On the lower screen the model ready for 3D printing is visualized
- On the top right menu, a suggested curing time has already been set according to the resin chosen in the first LumiCreator screen, when model has been loaded, and to the pre-set printing area in the LumiCreator second screen (**calibration**)
- In case you need to adjust the curing time, the layer curing time can be set manually just typing the new time (in milliseconds).

ADVANCED SETTINGS (change them only if you really know how they will affect the print process)

- Check **“Add Base”** if an additional base is needed to your model (in case of big models, we suggest not to use it since it is going to cover all the carriage holes needed for the resin flow during printing)
- Never deflag **UP/Down movement** option. The carriage will immerse a bit further into the resin before re-joining to the correct position. This movement is fundamental, as it allows the resin to flow better.
It is possible to adjust the timing before and after submersion.
- **Stop servo**: allows stopping the servo-shutter movement.

- **Gradients:** when the model has big full areas, during printing a convexity in the central area might happen. Using **Gradients**, it is possible to make the central part of the sliced model darker so that the convexity effect is reduced.
Click on **“make gradients”**. After the process is completed, flag **“Apply gradients”**.

ATTENTION: always keep the servo-shutter (n.15) closed during gradients creation to avoid resin unwilling curing.

- **Curing Time specialization table:** this table will allow setting specific times for single or groups of layers.
- Clicking on **“Add row”** It is possible to add new row to set more layers specific timing.
- If any timing has been introduced, with **“reset table”** it will be erased and setting will go back to default.
- Clicking on **“First 3 at 3x curing time”** the software will automatically triple the set curing time only for the first 3 layers.

IMPORTANT: We suggest always to set the “First 3 at 3x curing time” or to manually lengthen the exposure time of the first 3-4 layers to make sure that they adhere very well to the base. During the first 3-4 layers we suggest to check if they have adhered, trying to scratch them away. If they do not come off easily, printing process can proceed.

- **Print preview:** will project the different layers of you model very fast with a red light which will not affect the resin. It is possible to check if the model is in the right position on the printing carriage.

IMPORTANT: In case the layers are projected beyond the carriage it is possible to adjust the projection back on calibration advanced settings.

Clicking on + or – in “Offset X/Y” or “Rotation” it is possible to move the projected model up, down inside the selected printing area.

NOW Click on START PRINTING and your LumiForge will start the printing process!

The area below will inform you on the progress of the print in terms of how many layers have been completed and how much time has elapsed. There is also an estimation of how much time LumiForge will take to complete the printing process, calculated since the moment that the starting button has been pushed.

ATTENTION: AVOID ANY MOVEMENT OF THE SURFACE WHERE LUMIFORGE IS RUNNING. VIBRATIONS MAY SPOIL THE 3D PRINTING PROCESS.

ALWAYS CLOSE THE PRINTER DOORS WHEN STARTING THE PRINTING PROCESS TO AVOID THE RESIN ODOR AND THE RESIN UNWILLING CURING WITH EXTERNAL LIGHT.

ATTENTION: Do not keep LumiForge Unattended. It does not switch off automatically.

- After the printing, if you do not need to use the printer again, switch the projector off (either with the power button on the device or through the remote controller if supplied).
- Leave it for sometimes off without switching the printer off to allow the projector fan to cool it down.

- Close Lumicreator software.
- Switch Lumiforge off from the back switcher **(n.23)**.
- Disconnect VGA and USB cables from your computer.

6. CALIBRATION TEST FOR CORRECT CALIBRATION

Before shipping, Each and every LumiForge printer undergo a calibration process for each of the selectable printing areas.

However, with the use, a slight modification on calibration may happen.

To test calibration rightness it is possible to execute the following test:

- download LumiCubo.stl file from the website download page

<http://www.lumindustries.com/lumiforge-downloads>.

It is perfect cube size 1cm*1cm, supports have been already placed.

- load the file on LumiCreator and print it out following the printing instruction at the previous points.

. After having cleaned it, removed supports, check the sizes with a gauge.

- if sizes correspond perfectly, Lumiforge is perfectly calibrated.

- if sizes do not completely correspond:

1. calibrate again the previously selected printing area,
2. click on **“calibration”** or **“show grid”** to bring up the red grid.
3. enter Calibration advanced settings and click on **zoom +/-** to make the grid larger or smaller. (you can help yourself with a ruler or meter, making sure that every single square of the grid has a length and a width of exactly 1 cm).
4. print again the LumiCubo file and measure it again
5. repeat the test until it size is correct.
6. to save these settings, click on **File** dropdown menu at the upper left side of the program screen, choose **“setting”**.
5. Click on **“Get Values from Actual”** on the bottom left side of the window which has just opened, then **“Save”** and **“Close”**.

Settings which have just been modified will be saved and applied automatically each time that, the corresponding printing area will be selected, ensuring its precision.

It is possible to repeat the same test for each of the 5 selectable printing areas.

ATTENTION: this test do not take into account the possible resin shrinkage which may happen changing from liquid to solid state, therefore the result can vary when using a different resin.

7. FINISHING OF THE 3D PRINTED PARTS

- Once printing is finished, the carriage goes automatically up and a sound (if sounds are enabled in the settings) will warn you of the completion of the printing process.
- Remove the carriage (n.12) by unscrewing the knobs (n.14).

WARNING: always wear protective gloves and goggles when using the resin. They may cause skin, eyes and respiratory system irritation, and skin sensitization/allergic reaction by skin contact.



Img.21 Finishing of the 3D printed parts.

- Use the scraper provided along with your LumiForge to remove the printed part from the carriage (img.21.A) without using too much strength in order to avoid any break of the printed part.

WARNING: be careful when using the scraper, it has sharp corners which may cause injuries.

- Using tweezers immerse (Img.21.B) and wash the printed model for 3/5 seconds keeping moving it and not letting it immerse in ethylic alcohol*.

WARNING: carefully follow the alcohol package safety instructions to avoid any injury.

- Put it on a paper towel and check if it is completely clean from excess resin. If you notice further resin residues use a towel or a brush previously immersed in alcohol to brush gently the model

IMPORTANT: Be sure that all uncured resin is removed before the finishing curing process.

- Dry the model with compressed air or blowing on it until completely dry.
- Carefully remove the supports using the tweezers (Img.21.C)
- Put the model on a paper towel and leave it in front of a UV lamp from 30 min. to 1 hour maximum according to model volume. If only one lamp is available, remember to turn the model to get a complete hardening on every side (Img.21.E).

*most of DLP resins are very sensitive to isoprophil alcohol, with Fun To Do and Lumi React resins we suggest to use ethylic alcohol only.

Your model is finally 3D printed!

8. TROUBLESHOOTING, DIAGNOSTICS, AND MAINTENANCE

8.1 Troubleshooting

A - In case the 3D printer is not detected by the software in phase 2 (**calibration**):

1. make sure power and USB cables are wired correctly to the printer
2. unplug the cables
3. plug them again
4. Click the “**scan printer**” button again. Should it not work, restart the software and try again.

B- In case the projector is not automatically extended:

1. make sure that power and VGA cable is correctly plugged
2. go to your computer control panel and enter screen setting
3. choose to extend to a second screen

C- In case the carriage or the projector do not move up and down, with the provided alley key, check if couplers screws (**n.17**) are perfectly tighten.

D- If the software does not allow you to add or slice a model, check if there is enough memory space in your computer. If this problem persists, switch the LumiForge Creator software off, enter its folder and erase the file called “setting.ini”. Then launch LumiCreator again.

E- If upon pressing “**calibration**” in the software second screen, the red grid is not in a central position, switch the LumiForge Creator software off, enter its folder and erase the file called “setting.ini”. Then launch LumiCreator again.

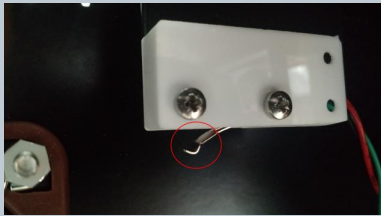
F- If the printer is overheated after prolonged use unplug it from power supply

G- While moving the carriage up and down **DO NOT GO OVER THE LIMIT**. It may cause a failure of the stepper motor. In case of failure, the motor will need to be replaced. Contact our support service to get the proper assistance and get information on how to buy the spare part.

H- Avoid resin or other liquid to fall on the LumiForge base. It contains electronic components! In case of failure, the electronic components need to be replaced. Contact our support service to get assistance and get information on how to buy the spare part.

8.2 Maintenance

- Remove the electrical plug after using the printer.
- Check the sensors **(n.5)** flap regularly. Sensors should light up when flap is moved up. If they do not, try to bend them gently so to create an angle. If they do not work anymore, switch off the printer and call for assistance.



- Check fan **(n.4)** filters regularly to make sure they are always clean. To clean the filters, blow them with compressed air or similar.
- To clean the printer body, use a paper towel or a cloth soaked with alcohol, do not sprinkle the alcohol to avoid to strain inside the machine.
- Do not use alcohol or other detergents to the acrylic windows, it can ruin the surface. Use only a soft damp cloth.
- After about 100 printing hours, you should lubricate the Z trapezoidal bar using PTFE grease.
- After you are done printing, do cover the resin vat and store it in a cool and dry place. Avoid direct contact with light sources of any kind, as a precaution.

9. COMPANY INFORMATION

LumiForge is a product developed by Lumi Industries Srl.

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