MONOPRICE

MP Cadet LCD Resin Printer

P/N 21824

User's Manual

MONOPRICE

3D Printer

Warranty Details

The product is guaranteed to be free from defects in workmanship and motherboard for a period of 12 months from the date of purchase. The LCD display is a consumable part with an MTBF of 1200 hours. You may need to purchase and replace it after 1200 hours of operation. Printing with materials other than resin types recommended on the www.monoprice.com website, may result in damage to the printer or bad quality prints. Defects that occur within this warranty period, under normal use and care, will be repaired, replaced, or refunded at our discretion. The benefits conferred by this warranty are in addition to all rights and remedies in respect of the product that the consumer has under the law.

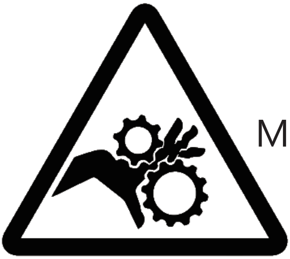
1
YEAR WARRANTY

A

Safety Instructions

Before you get started, please read these important safety instructions.

CAUTION: The 3D Printer includes moving parts that can cause injury. Never reach inside of the 3D Printer while it is in operation and allow time for the printer to cool down after operation.



MOVING PARTS

⚠ Do not leave the 3D Printer unattended during operation.

⚠ Always wear gloves and eye protection when handling resin or printing an object.

⚠ Always take care when using the scraper. Never direct the scraper towards your fingers.

- The printer must not be exposed to water or rain, or damage will occur.
- The printer is designed to be used with ambient temperature ranging from 15~30°C and humidity ranging from 20~50%. Operating outside these limits may result in low quality models.
- In case of emergency, turn off the 3D printer at the power outlet.
- It is recommended that you use eye protection when cleaning/sanding printed models to avoid small particles contacting your eyes.

Contents

Warranty Details 2

A. Safety Instructions 3

B. Congratulations 5

- The principle behind your printer 5
- Safety Information 5

C. Electrical power 6

- Disposal instructions 6

D. Useful advice 7

- The box contains 7
- Recommended items 7
- Minimum computer requirements 7

E. Installation & Assembly Instructions 8

F. Preparing the Duplicator 7 for Printing 15

G. Cleaning the Machine and Your Printed Objects 18

H. Detailed Creation Workshop Software Instructions 19

- System Compatibility 19
- **Main Screen** 19

1. Loading a Model 20
2. Scene View 21
3. Object Info 21
4. Move View 22
5. Mirroring Objects 22
6. Scaling Objects 22
7. Rotating Objects 23
8. View Options 23
9. Working with Model Support Tools 24
10. Saving a Scene 24
11. Slice View 25
12. Control 26
13. Configure 27
    - 13.1 Configure Machine 27
    - 13.2 Configure Slicing Profile 29
14. Slicing a Model 31
15. Connecting Software to Duplicator 7 31

Repair and Refurbished Goods or Parts Notice 33

B Congratulations

You have just purchased a new type of 3D printer, using Direct UV-light Printing (DUP) technology. This is a new method of LCD image creation allows controlled UV light to get through the LCD screen, which hardens liquid to form a model. This revolutionary system is a new way of printing that uses normal UV light as the energy providing source to initiate the free radical polymerization necessary to change the liquid resin into your hardened object.

The principle behind your printer

There are two surprising advantages of this new DUP technology:

i) We can use high-resolution, low-cost LCD screens that are widely available as monitors, tablets, mobile phones, and televisions, providing phenomenal value for the money.

ii) The energy used by Duplicator 7 printers is again an order of magnitude lower than used in comparable systems. This is good for your energy bills and the ecology, but there is a huge performance advantage in that there is no unnecessary energy created. All of the available photons strike photoinitiators and hand over their energy. In comparable Digital Light Projector and Laser systems there is a lot of excess energy which can lead to over-curing.

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 cord to the printer.

- Insert the power cord into the socket on the back of the printer.
- Turn off the printer before unplugging the power cord.
- The printer cooling fan is supposes to run when you turn on 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.
- Store the printer in its original packaging when not in use.
- Unplug the printer when it will not be used for a long period of time.

C Electrical Power

This 3D printer uses an AC adapter with an output of 12 VDC, and an input of 110 or 240 VAC, 50/60 Hz. Ensure that your electric outlets provide power in this range.

- 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, ensure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord's ampere rating. Also, ensure 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, immediately unplug the printer from the power source.
- Do not attempt to fix this product by yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. For service, contact Monoprice Technical Support at tech@monoprice.com

Unplug this product from the wall outlet and refer servicing to qualified service personnel when:

- The power cord or plug is damaged, cut, or frayed.
- Liquid was spilled into the product.
- The product was exposed to rain or water.
- The product has been dropped or the case has been damaged.
- The product exhibits a distinct change in performance, indicating a malfunction.
- The product does not operate normally after following the operating instructions.
- Keep the printer out of the reach of small children.

Disposal instructions

To minimize pollution and ensure utmost protection of the global environment, dispose of this product only in accordance with local, state, or Federal regulations for the disposal of electronic waste.

D Useful Advice

Have supervision when used by a minor.

The resin is an irritant to skin and eyes. Always wear gloves when coming into contact with the liquid resin.

The printer should be operated on a stable and level surface, preferably away from direct ambient light.

The box contains

- Duplicator 7 LCD printer with black hood and platform
- Power cord
- VAT with film
- HDMI® cable to connect the 3D printer to the secondary video output of your computer
- USB cable to connect your computer to the printer
- 1 replacement film for the VAT
- Plastic spatula
- 250ml UV resin

Recommended items

- Gloves
- Paper towels
- Industrial alcohol
- Soft brush or sponge to clean the object
- Plastic container to rinse the resin

Minimum computer requirements

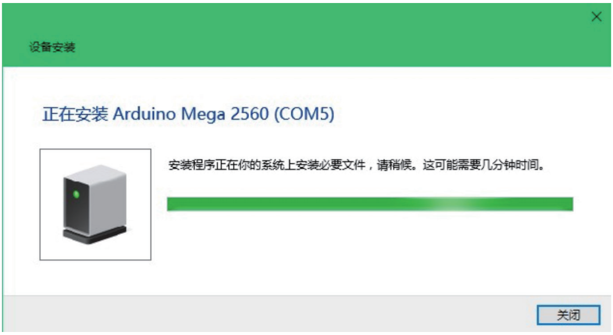
- Dual Core processor or above.
- Windows® or Linux® OS
- Software NOT compatible with Mac® OS X®
- 4 GB RAM memory or above
- Double video output graphics card (one for your monitor, one for the printer HDMI, with 500MB memory or above. A laptop with dual video output (HDMI) is also possible.

E Installation & Assembly Instructions

1.0 Set the printer display:

1.1 Right click the mouse and click the display setting.

1.2 Turn on the printer, connect the HDMI® and USB cables to the computer. The computer will install the Arduino Mega 2560 driver automatically.

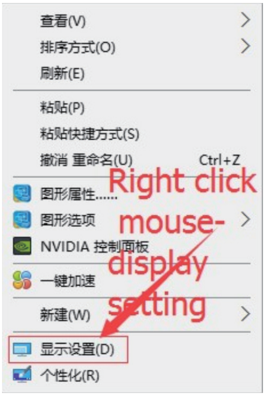


设备安装

正在安装 Arduino Mega 2560 (COM5)

安装程序正在你的系统上安装必要文件，请稍候。这可能需要几分钟时间。

1.3 Right click the mouse and click the display setting



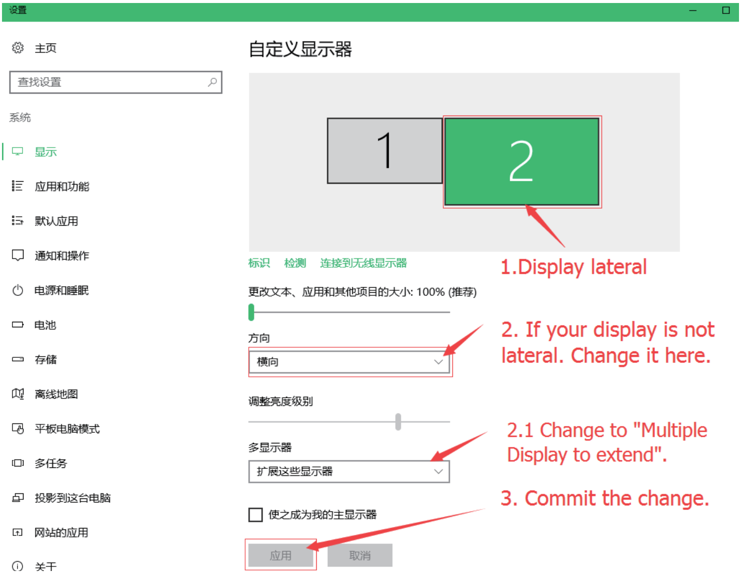
查看(V)
排序方式(O)
刷新(E)
粘贴(P)
粘贴快捷方式(S)
撤消 重命名(U) Ctrl+Z
图形属性......
图形选项
NVIDIA 控制面板
一键加速
新建(W)
显示设置(D)
个性化(R)

Right click mouse- display setting

1.4 Click the display No.2, then the No.2 display would be highlighted in green color.

1.5 If your display is not horizontal. Change it to horizontal by clicking **Direction** and choosing the **Horizontal** option.

1.6 Apply the change.


设置
主页
查找设置
系统
显示
应用和功能
默认应用
通知和操作
电源和睡眠
电池
存储
离线地图
平板电脑模式
多任务
投影到这台电脑
网站的应用
关于
自定义显示器
1
2
标识
检测
连接到无线显示器
调整亮度级别
应用
取消

更改文本、应用和其他项目的大小: 100% (推荐)

方向

横向

多显示器

扩展这些显示器

☐ 使之成为我的主显示器

1.Display lateral

2. If your display is not lateral. Change it here.

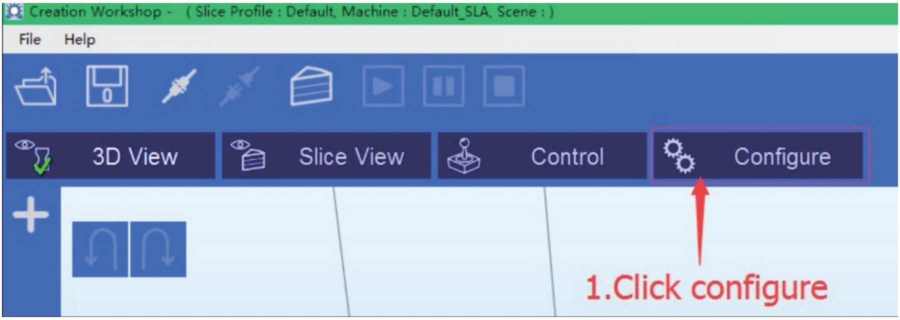
2.1 Change to "Multiple Display to extend".

3. Commit the change.

2.0 Set the Creation Workshop software:

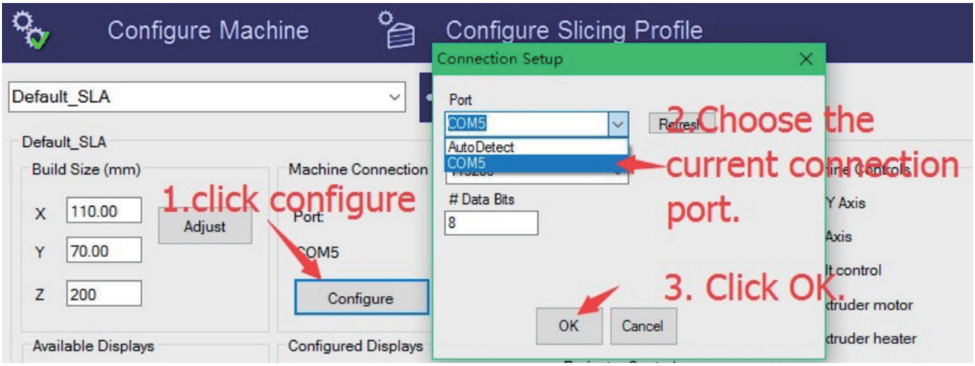
2.1 Decompress the Creation Workshop zip file. Click the **Creation Workshop** logo to run the software.

2.2 Click the **Configure** button.


Creation Workshop - (Slice Profile : Default, Machine : Default_SLA, Scene :)
File
Help
3D View
Slice View
Control
Configure

1.Click configure

2.3 Configure the machine:
Click **Configure**.
Choose the current connection port, which could be Com5, Com6, etc. depending on your computer.


1.click configure

2.Choose the current connection port.

3. Click OK.

Default_SLA

Build Size (mm)

X 110.00

Y 70.00

Z 200

Machine Connection

Port: COM5

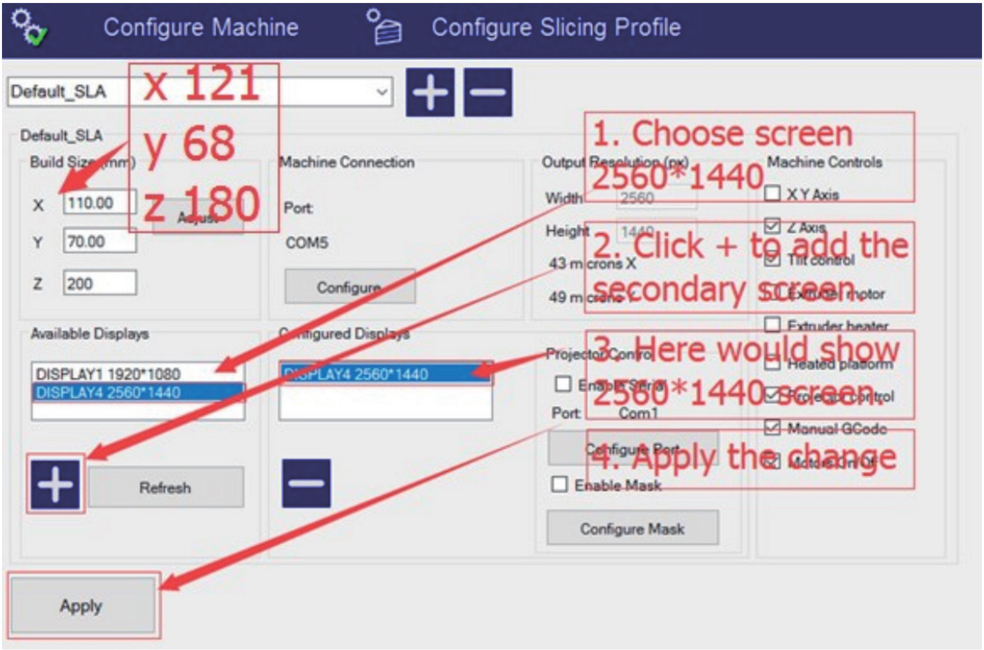
Connection Setup

Port: COM5

Data Bits: 8

Configure Machine
Configure Slicing Profile
Adjust
Configure
Available Displays
Configured Displays
Refresh
AutoDetect
COM5
OK
Cancel
Y Axis
Axis
t control
xtruder motor
xtruder heater

2.4 Select the screen size 2560x1440, then click **+** to add the secondary screen.
Apply the change.


x 121
y 68
z 180

1. Choose screen 2560*1440

2. Click + to add the secondary screen.

3. Here would show 2560*1440 screen.

4. Apply the change

Default_SLA

Build Size (mm)

X 110.00

Y 70.00

Z 200

Machine Connection

Port: COM5

Output Resolution (px)

Width: 2560

Height: 1440

43 microns X

49 microns Y

Available Displays:
DISPLAY1 1920*1080
DISPLAY4 2560*1440

Configured Displays:
DISPLAY4 2560*1440

Projector Control

☐ Enable Serial

Port: Com1

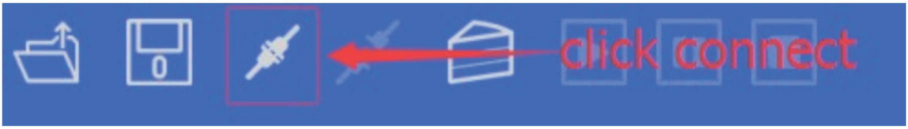
☐ Enable Mask

Machine Controls

☐ X Y Axis
☑ Z Axis
☑ Tilt control
☐ Extruder motor
☐ Extruder heater
☐ Heated platform
☑ Projector control
☑ Manual GCode
☑ Motors On/Off

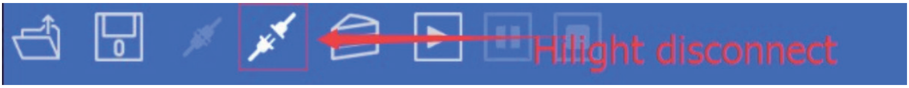
Configure Machine
Configure Slicing Profile
+
−
Adjust
Configure
Refresh
Apply
Configure Port
Configure Mask

2.5 Click the **Connect** button to link the printer and computer.



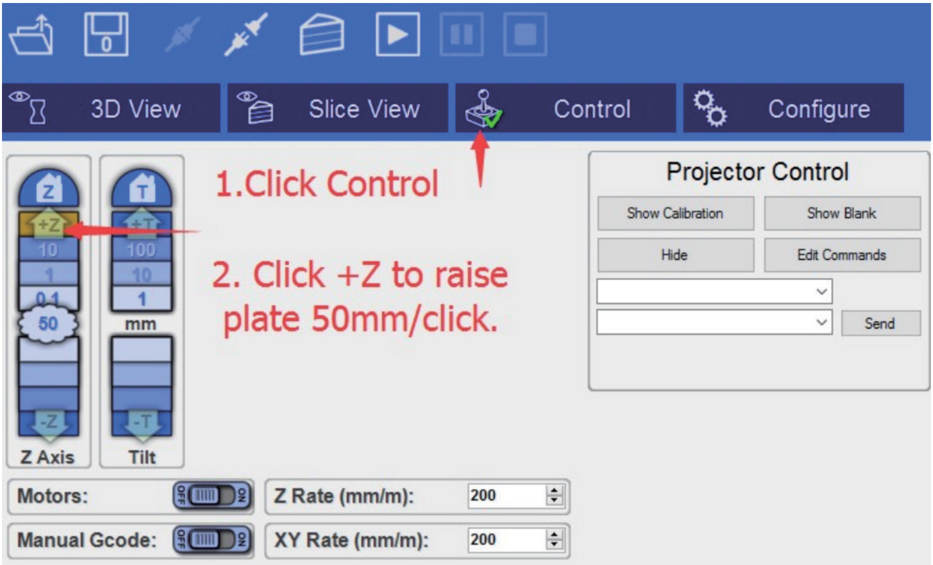
click connect

Once connected, the **Disconnect** button will be highlighted.



Hilight disconnect

3.0 Test the Z axis movement and raise the Z axis by at least 50mm, to check that the first layer was printed properly or not.
Click **Control**, then click the **+Z** option to raise the building plate by 50mm/click.
Note that the Z button is for Z axis home.
10= raise Z by 10mm/click
1= raise Z by 1mm/click
-z= lower Z by 50mm/click



1.Click Control

2. Click +Z to raise plate 50mm/click.

Z Rate (mm/m): 200

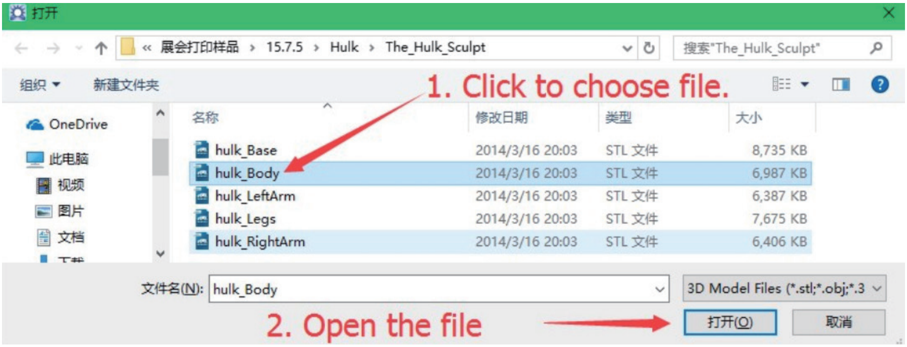
XY Rate (mm/m): 200

3D View
Slice View
Control
Configure
Z
+Z
10
1
0.1
50
-Z
Z Axis
T
+T
100
10
1
mm
-T
Tilt
Projector Control
Show Calibration
Show Blank
Hide
Edit Commands
Send
Motors:
Manual Gcode:
OFF
ON

4.0 Open the model file and verify that the first layer prints properly or not:

4.1 Click the **Open File** button.

4.2 Choose and open any 3D model with a STL or OBJ file extension.


打开
« 展会打印样品 › 15.7.5 › Hulk › The_Hulk_Sculpt
搜索"The_Hulk_Sculpt"
组织 ▾
新建文件夹
OneDrive
此电脑
视频
图片
文档
3D Model Files (*.stl;*.obj;*.3
打开(O)
取消

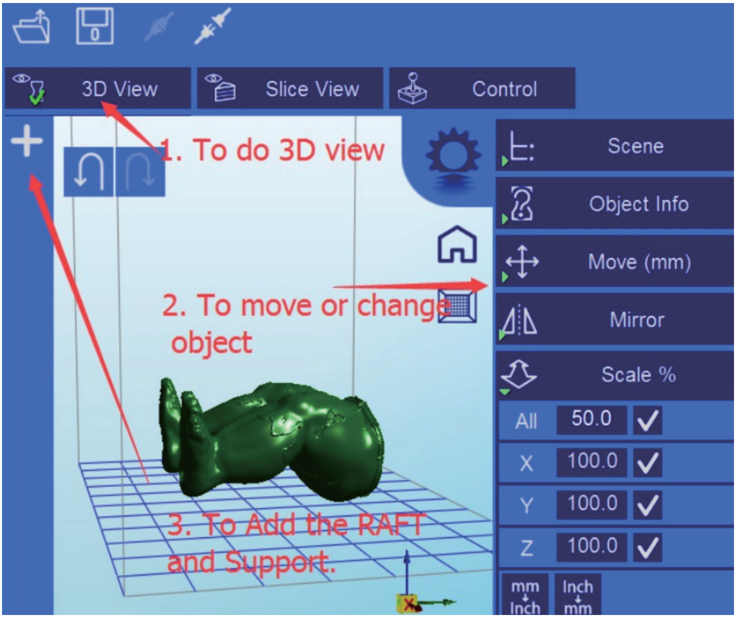
名称	修改日期	类型	大小
hulk_Base	2014/3/16 20:03	STL 文件	8,735 KB
hulk_Body	2014/3/16 20:03	STL 文件	6,987 KB
hulk_LeftArm	2014/3/16 20:03	STL 文件	6,387 KB
hulk_Legs	2014/3/16 20:03	STL 文件	7,675 KB
hulk_RightArm	2014/3/16 20:03	STL 文件	6,406 KB

文件名(N): hulk_Body

1. Click to choose file.

2. Open the file

4.3 Click the **3D View** button and adjust the object. Click **+** to add Raft and Support.


3D View
Slice View
Control
Scene
Object Info
Move (mm)
Mirror
Scale %
mm Inch
Inch mm

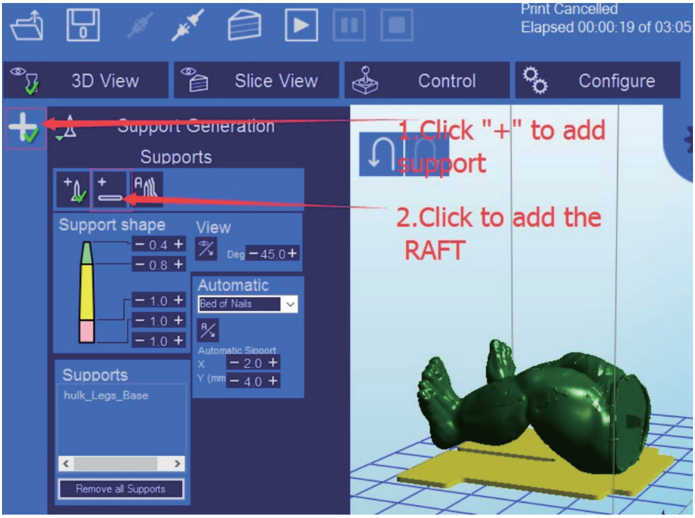
All 50.0 ✓
X 100.0 ✓
Y 100.0 ✓
Z 100.0 ✓

1. To do 3D view

2. To move or change object

3. To Add the RAFT and Support.

4.4 Click the **+** button then the ___ button to add the Raft.

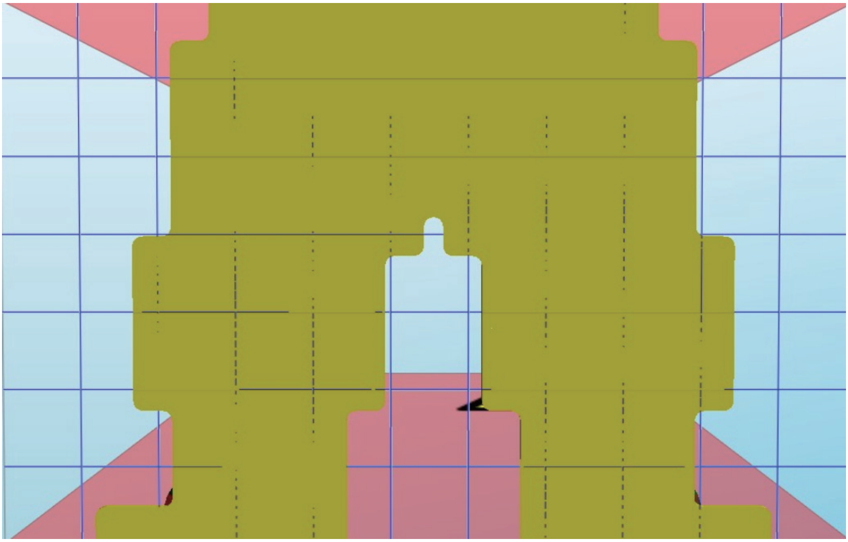


1.Click "+" to add support

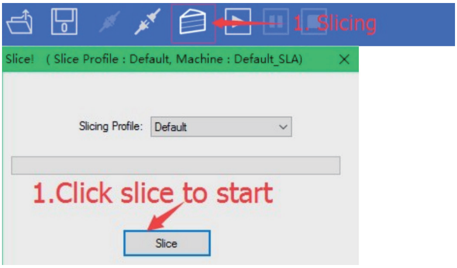
2.Click to add the RAFT

Print Cancelled
Elapsed 00:00:19 of 03:05
3D View
Slice View
Control
Configure
Support Generation
Supports
Support shape
View
0.4
0.8
Deg
45.0
1.0
1.0
1.0
Automatic
Bed of Nails
Automatic Sipport
X
Y (mm
2.0
4.0
Supports
hulk_Legs_Base
Remove all Supports

4.5 Right click the screen and move the print object, so you can the raft, as shown below.



4.6 Click the **Slicing** button, then click the **Slice** button to begin slicing.

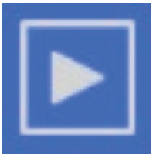


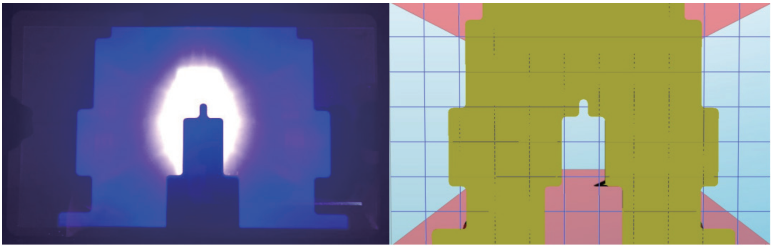
Slice! (Slice Profile : Default, Machine : Default_SLA)

Slicing Profile: Default

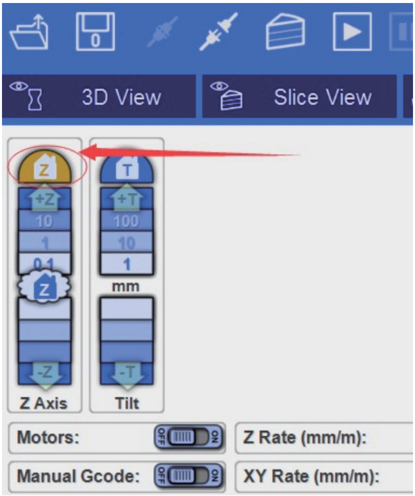
1. Slicing
1.Click slice to start
Slice

4.7 Click the **Print** button. You should see the image projected on the LCD screen, which is exactly the same as the first layer on your computer screen.





Congratulations! You have successfully installed the machine. Now you can start your first print.

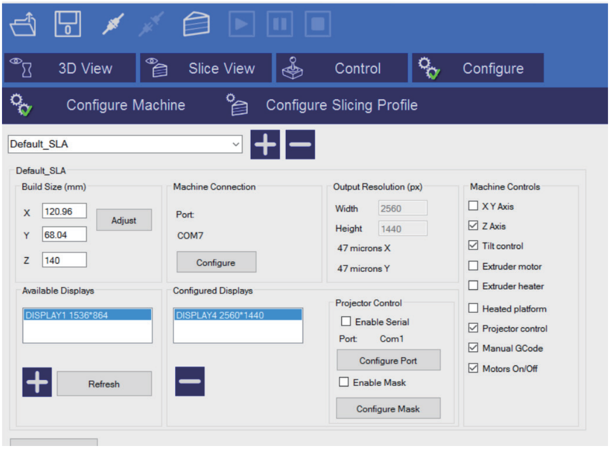


3D View
Slice View
Z
+Z
10
1
0.1
Z
-Z
Z Axis
T
+T
100
10
1
mm
-T
Tilt
Motors:
Manual Gcode:
Z Rate (mm/m):
XY Rate (mm/m):

5.0 First print:

5.1 Click the **Z axis home** button to put the build plate in the home position.

5.2 Repeat the 7.0 to print the first object.



Default_SLA

Build Size (mm)
X 120.96
Y 68.04
Z 140

Machine Connection
Port
COM7

Output Resolution (px)
Width 2560
Height 1440
47 microns X
47 microns Y

Machine Controls
☐ X Y Axis
☑ Z Axis
☑ Tilt control
☐ Extruder motor
☐ Extruder heater
☐ Heated platform
☑ Projector control
☑ Manual GCode
☑ Motors On/Off

Available Displays
DISPLAY1 1536*864

Configured Displays
DISPLAY4 2560*1440

Projector Control
☐ Enable Serial
Port: Com1
☐ Enable Mask

F

Prepare the Duplicator 7 for Printing

Now you have your printer installed and configured. Please read these software instructions to understand the different settings before starting.

Let’s start by printing the first object using the stock resin and do the printout at the lowest resolution so that the test doesn’t take too long. You will find some test objects (STL file) in the folders supplied with the software.

1. Switch on your computer and the switch on the Duplicator 7. Open the software and load an object (STL, OBJ, or AMF).

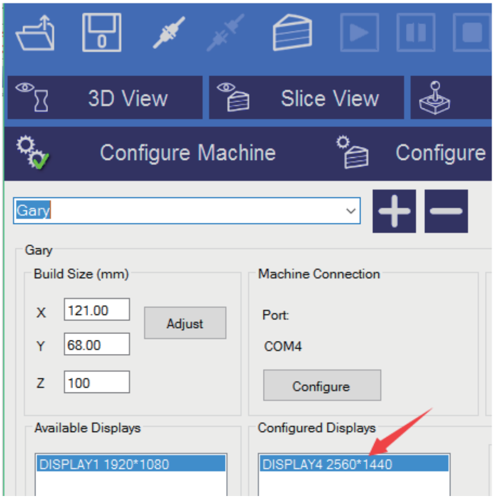
2. With the object loaded and located in the build area, check the settings of the printing profile.

3. Set the values in the **Setting** fields to:

   - layer thickness = 0.100 mm
   - exposure time = between 6.000-12.000
   - for other resins and resolutions check the exposure times stated
   - exposure time for bottom layers = between 100.000 and 120.000 ms
   - number of such bottom layers = between 3 and 5

These settings can be adjusted depending upon the complexity of the desired object. Finally click **Apply Changes** to save any changes. If you do not, your changes will be lost.

The screen should look as follow:



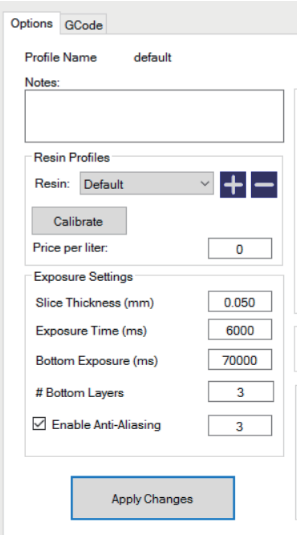
Gary

Build Size (mm)
X 121.00
Y 68.00
Z 100

Machine Connection
Port:
COM4

Available Displays
DISPLAY1 1920*1080

Configured Displays
DISPLAY4 2560*1440



Profile Name default
Notes:

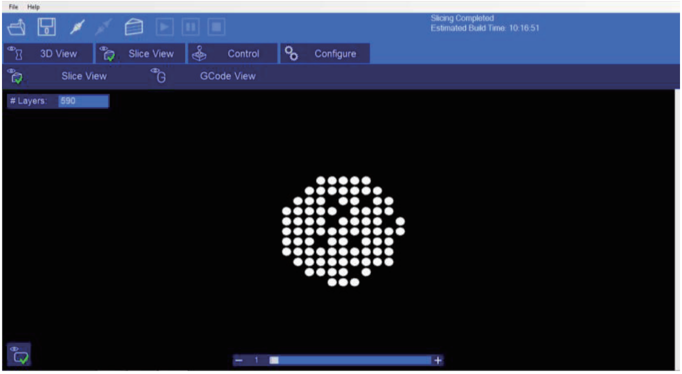
Resin Profiles
Resin: Default
Price per liter: 0

Exposure Settings
Slice Thickness (mm) 0.050
Exposure Time (ms) 6000
Bottom Exposure (ms) 70000
Bottom Layers 3
☑ Enable Anti-Aliasing 3

4. Now click **3D View** and check that the object is correctly placed inside the printing area. Press the **Slice** button to start the slicing operation. A confirmation window will be displayed.

You can check again that the correct profile is being used and if not, you can select the correct one. Always click on the **Slice** button if you adjust the layout in any way.

5. 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. Ensure that objects are 2 squares inside the edge of the build area shown.



Slicing Completed
Estimated Build Time: 10:16:51

Layers: 590

6. Place the vat on top of the LCD screen and tighten the retaining Z brackets down to secure it in place. If you tighten it too much, the LCD screen will go white at the edges. The tray should not be able to be lifted up.

7. Slide the platform onto the platform arm and firmly tighten the central knob. Loosen the 4 screws at the sides, so there is free movement of the platform up and down. IMPORTANT! If these knobs are not completely loose, you could crush the bottom screen when lowering it with the home function).

8. Press the **Home** button to lower the platform onto the screen. The platform will move down to rest on the screen (level 0 in Z axis.) and stop. Remove the hood. With one hand press down on the middle of the glass platform and with the other tighten a side bolt, then repeat with the other bolt. Now the 3 knobs should be tight. You can check that the platform is making contact with the screen by pressing lightly when it is on and it will appear white in the corners. You can check that the screen is working by pressing the **Show Calibration** button located on the **Control** tab and a grid will appear. It is now locked in the home position.

9. Press the +10 steps button in **Control** and the platform will rise enough to pour resin in under it. Remove the hood and fill the vat with resin. Prints don't consume a lot of resin, so a quarter full vat will be enough for a medium sized print. Note that once started, the print can't be paused and refilled, so it's safer to overfill and reuse the resin. Place the hood back on the printer and move the platform back to the **Home** by hitting the -1 step button 10 times. Leave a few seconds between clicks to enable the resin to move out. It is essential it is grounded before starting printing. If you miscount, it is safer to press an additional step. The platform will not move further when correctly located.

10. Now you are ready to print. Press **Play**. Once the print has finished, the computer will show **Print 100% complete** and will stop. Do not remove the hood during the print, or the print will stop.

G

Cleaning the Machine and Your Printed Objects

These steps will reduce any resin spillage and keep your machine clean.

1. Go to Control and move the platform up enough so the base of your object is clear of the vat. Remove the hood on the print platform. Tilt the platform backwards to allow the excess resin to drip back into the vat.

2. With absorbent paper under it, remove the platform completely and set it down on a surface that will not be affected by resin. Place the hood back on immediately to protect the resin in the vat from light.

3. Remove any excess polymer with paper first. Place the platform in a washing-up bowl and remove the objects by sliding the scraper in at their base. Wash off any liquid polymer with alcohol. You can gently clean it with a soft brush or sponge, taking care not to damage it. It will not achieve full hardness until after post exposing in light. If you have an ultrasonic cleaner, this will clean it without the possibility of damaging it.

4. Check it is thoroughly clean then place it in a container for 10-20 minutes in an area with bright sunlight. You can use light from a UV lamp. When it has been completely post exposed, it will be stronger and have a dry surface. You will notice that it darkens in color as it is exposed to light. Dry it and check that it is dry, if not repeat.

5. Clean the build platform with industrial alcohol. Chip off any cured resin and dry it before inserting it back into the printer.

6. You should empty the vat and clean it every time in case you have any solid pieces on the bottom, as these would prevent the platform from homing correctly. Loosen the Z brackets and remove the vat from the printer. Pour the resin back into the bottle through a strainer. Place the vat on a flat surface and wipe the base of the vat with absorbent paper. Make sure it is clean and not damaged. If it is not flat, clean, and tight like a drum, remove the film and replace it with a new piece.
7. If you have a leak on the screen it is easy to remove the hardened resin without damaging the screen by chipping it off with a blunt, non-serrated knife.

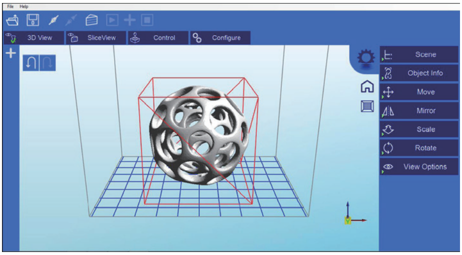
H

Detailed Creation Workshop Software Instructions

System Compatibility

Creation Workshop is a .NET 3.5 application written in C#. This is native to the Windows Operating System, but it also runs on many versions of Linux®/Posix using the Mono Framework (http://www.mono-project.com/Main_Page). You will need to download and install Mono when using Creation Workshop on a Linux-based system. Windows® users may need to run the application as Administrator.

Main screen

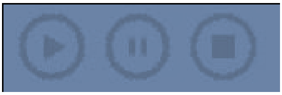


Click to open files in one of the following formats: .STL, .OBJ, .3DS, or .AMF. You can also open scene files with the .CWS extension.

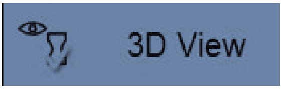
Click to save the current object as a .STL or .CWS file. The .CWS format allows you to prepare a scene to be printed repeatedly in the future, together with supports and positioning.

Click to start the connection between your computer and your Duplicator 7 3D printer. Once the button is grayed out, this means that the printer is connected.

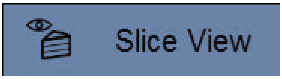
Click this button to disconnect your printer from the computer. If the button is grayed out, it means that the machine is currently disconnected.



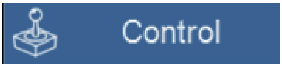
These three buttons start, pause, and stop a print. These buttons only become active once you have sliced your object.



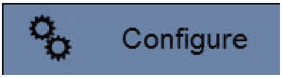
Clicking this button allows you to view the 3D objects within their boundary box. You can add supports in this function.



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

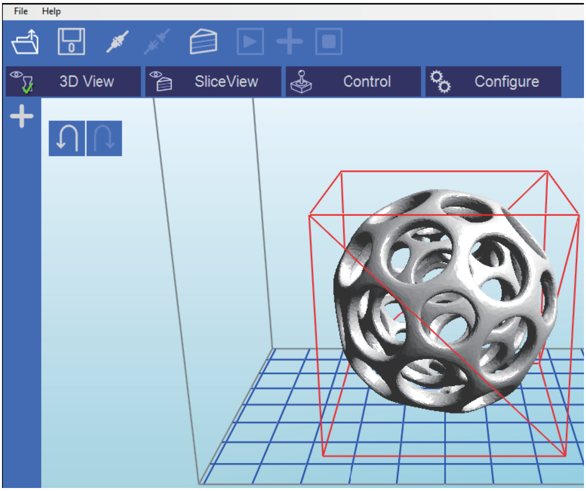


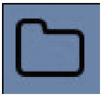
This allows you to control the Z axis motor, home it, and lift it after a print has finished.



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

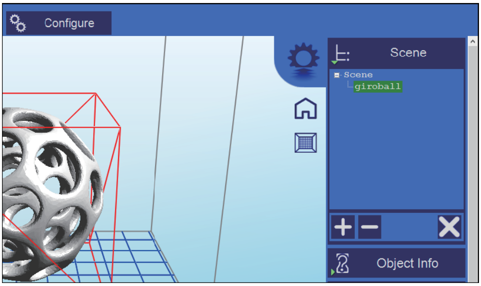
1. Loading a Model


File
Help
0
3D View
SliceView
Control
Configure



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


Configure
Scene
Scene
giroball
Object Info

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.

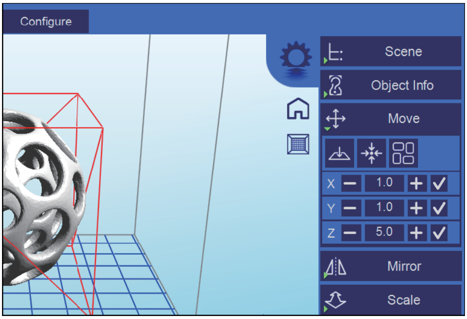
Removing a Model

You can remove a model by right-clicking on the name in the scene graph and selecting **Remove**.
The Minus button **-** 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 + button to clone it. The cloned object will appear in the scene view.

3. Object Info

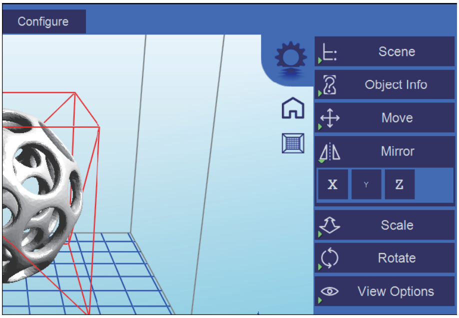

Configure
Scene
Object Info
Move
X
1.0
Y
1.0
Z
5.0
Mirror
Scale

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.

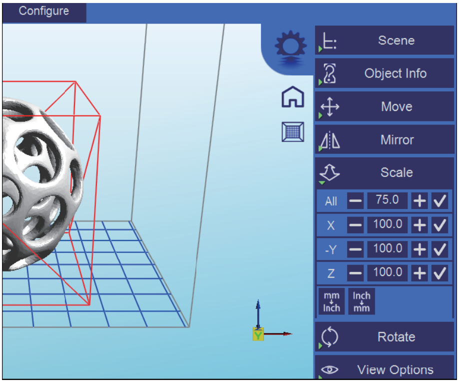
From left to right, the other tools are:
The **Place on Platform** button will position the bottom of the model to rest on the bottom of the build platform.
The **Center** button will center the model at (0,0,0).
The **Auto-Arrange** button will automatically lay out all models to fit on the build platform. Any model that does not fit within the build platform will be moved outside the build area.

5. Mirroring Objects


Configure
Scene
Object Info
Move
Mirror
X
Y
Z
Scale
Rotate
View Options

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

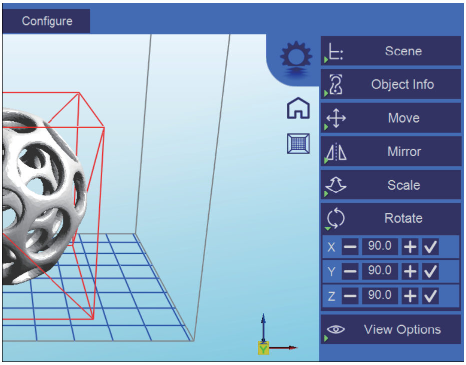
6. Scaling Objects


Configure
Scene
Object Info
Move
Mirror
Scale
mm Inch
Inch mm
Rotate
View Options
Y

All 75.0
X 100.0
-Y 100.0
Z 100.0

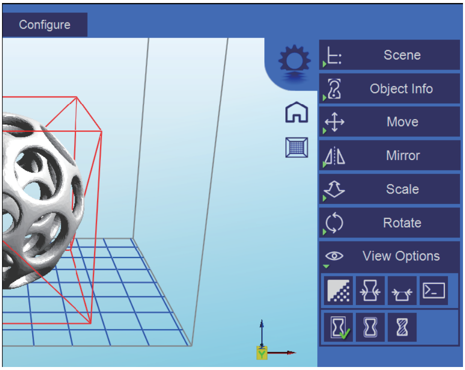
A model can be scaled (reduced or increased) by selecting it and using the **Scale** button to enter in a new scaler value. Press the **Tick** button to rescale your object.

7. Rotating Objects


Configure
Scene
Object Info
Move
Mirror
Scale
Rotate
X 90.0
Y 90.0
Z 90.0
View Options

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

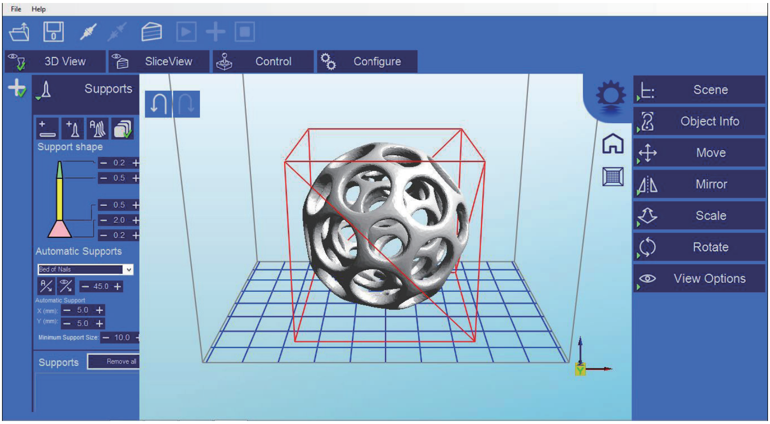

Configure
Scene
Object Info
Move
Mirror
Scale
Rotate
View Options

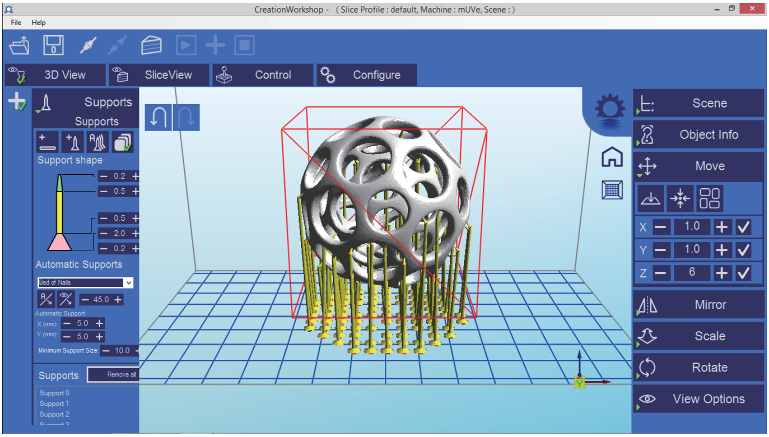
The **View** option allows you to manipulate various views and models. **On the top row from left to right:**

- **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
- Show objects with an outline
- Show selected objects in a different color

9. Working with Model Support Tools


File
Help
3D View
SliceView
Control
Configure
Supports
Support shape
0.2
0.5
0.5
2.0
0.2
Automatic Supports
Bed of Nails
45.0
Automatic Support
X (mm):
5.0
Y (mm):
5.0
Minimum Support Size
10.0
Supports
Remove all
Scene
Object Info
Move
Mirror
Scale
Rotate
View Options


CreationWorkshop - (Slice Profile : default, Machine : mUVe, Scene :)
File
Help
3D View
SliceView
Control
Configure
Supports
Supports
Support shape
0.2
0.5
0.5
2.0
0.2
Automatic Supports
Bed of Nails
45.0
Automatic Support
X (mm):
5.0
Y (mm):
5.0
Minimum Support Size
10.0
Supports
Remove all
Support 0
Support 1
Support 2
Scene
Object Info
Move
X 1.0
Y 1.0
Z 6
Mirror
Scale
Rotate
View Options

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.

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, then 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, then hold 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 it. 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 you accomplish this.

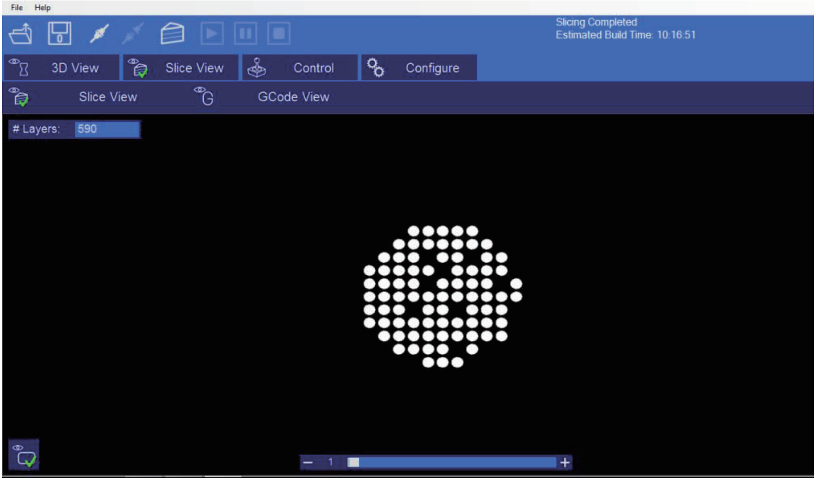
10. Saving a Scene

💾 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 reslicing.

11. Slice View

In the Slice View screen we get the following information:


File
Help
3D View
Slice View
Control
Configure
Slice View
GCode View
1

Slicing Completed
Estimated Build Time: 10:16:51

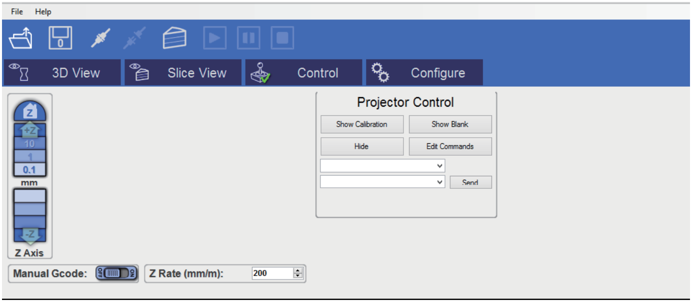
Layers: 590

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 untouched.

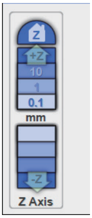
12. Control

Opening the **Control** screen shows you the following dialogues:


File
Help
3D View
Slice View
Control
Configure
Projector Control
Show Calibration
Show Blank
Hide
Edit Commands
Send
Z
+Z
10
1
0.1
mm
-Z
Z Axis
Manual Gcode:

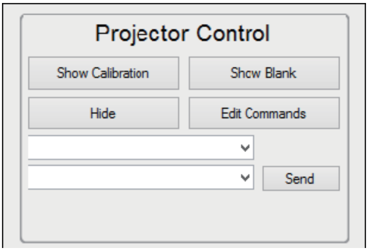
Z Rate (mm/m): 200

From this screen we will be able to control the motors of the printer, which means displacing the build base over the Z axis, as well as controlling the LCD.



In this section of the **Control** screen we have the buttons that will allow us to move the Z position of the build base. As you can see, we have 4 buttons for each direction, 50, 10, 1 and 0.1 mm. Using the value indicated as Z Rate (at the bottom) you can change the speed of progress measured in millimeters / minute. We also find the **Home** button. This is similar in function to the button that we have described above in the 3D View screen, that is, if you click it, the whole build base will rise to the detector limit, where it will seek the zeros of each axis, then descend to a lower position. The descent is done first fast then slow. This **Home** also includes a stage where the build base raises to a higher position so as to be able to prepare the machine to pour the resin in and leave it ready to lower the base and start printing.

With this box you can control the image exposed by the LCD with the following options:



- **Show Calibration**: A red grid is projected. This will allow you to check if your projector is well focused on the vat bottom.
- **Show Blank**: A black screen is shown, meaning a screen that won't cure the resin instantly.
- **Hide**: This option hides the slice projection screen, allowing the projector to display the main desktop background (the extended part).
- **Edit Commands**: This option allows you to edit commands to control the projector. Fields beneath this are not recommended for use.

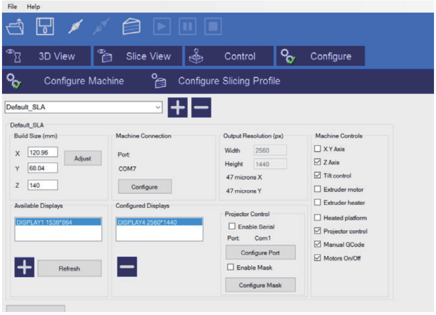
13. Configure

13.1 Configure Machine

Machine Connection COM Port

Once a machine profile has been selected, the **Configure** button on the **Machine Connection** box can be selected to show the **Connection Setup** screen.
This screen allows you to choose the correct COM port and speed to communicate with the printers’ controller card via serial connection.

***NOTE** – The current version of the application will allow connections up to **115200 bps.** Please ensure your controller firmware is configured for the speed chosen.


File
Help
3D View
Slice View
Control
Configure
Configure Machine
Configure Slicing Profile
Adjust
Configure
Refresh
Configure Port
Configure Mask

Default_SLA

Build Size (mm)
X 120.96
Y 68.04
Z 140

Machine Connection
Port: COM7

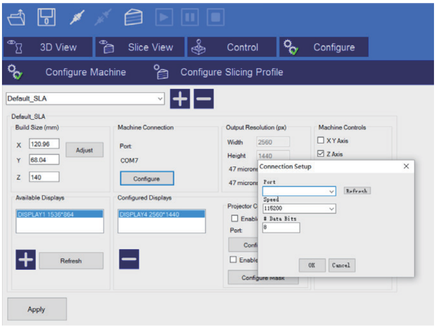
Output Resolution (px)
Width 2560
Height 1440
47 microns X
47 microns Y

Available Displays
DISPLAY1 1536*864

Configured Displays
DISPLAY4 2560*1440

Projector Control
☐ Enable Serial
Port: Com1
☐ Enable Mask

Machine Controls
☐ X Y Axis
☑ Z Axis
☑ Tilt control
☐ Extruder motor
☐ Extruder heater
☐ Heated platform
☑ Projector control
☑ Manual GCode
☑ Motors On/Off


3D View
Slice View
Control
Configure
Configure Machine
Configure Slicing Profile
Adjust
Configure
Refresh
Refresh
OK
Cancel
Apply

Default_SLA

Build Size (mm)
X 120.96
Y 68.04
Z 140

Machine Connection
Port: COM7

Output Resolution (px)
Width 2560
Height 1440

Available Displays
DISPLAY1 1536*864

Configured Displays
DISPLAY4 2560*1440

Machine Controls
☐ X Y Axis
☑ Z Axis

Connection Setup
Port
Speed 115200
Data Bits 8

Setting up Display Devices

Available Displays

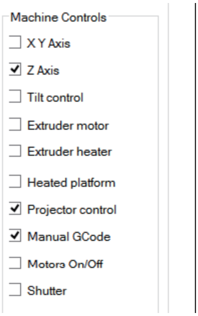
This shows you the available configured and connected displays on the system. You can click the **Refresh** button to refresh the list of displays. The **+** button will add a display to the **Configured display** box.

Configured Displays

This area shows the displays that will be used for projection on the system. Once a display is added to this area, it can be selected to configure the LCD controls. Typically, only one display is used. Creation Workshop can support 2 projectors – each with the same resolution and projection size, either in a horizontal or vertical format.

Machine Controls

There is a column of check boxes on the right hand side of the machine configuration screen. Enabling these allows you to customize the controls that appear on the **Manual Control** screen. Select the controls that are appropriate for your machine.



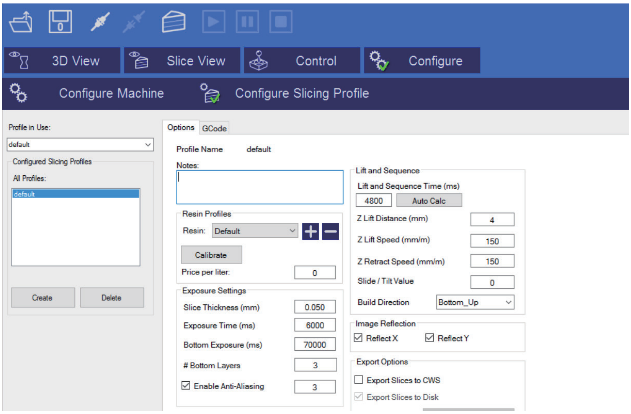
Machine Controls
☐ X Y Axis
☑ Z Axis
☐ Tilt control
☐ Extruder motor
☐ Extruder heater
☐ Heated platform
☑ Projector control
☑ Manual GCode
☐ Motors On/Off
☐ Shutter

The ones shown in the screen are the ones suggested to start working with this LCD printer.

Saving Your Changes

After you have configured your machine profile, be sure to click the **Save Changes** button to save and apply the changes.

13.2 Configure Slicing Profile



Profile in Use: default

Configured Slicing Profiles

All Profiles: default

Profile Name default

Notes:

Resin Profiles

Resin: Default

Price per liter: 0

Exposure Settings

Slice Thickness (mm) 0.050

Exposure Time (ms) 6000

Bottom Exposure (ms) 70000

Bottom Layers 3

☑ Enable Anti-Aliasing 3

Lift and Sequence

Lift and Sequence Time (ms) 4800

Z Lift Distance (mm) 4

Z Lift Speed (mm/m) 150

Z Retract Speed (mm/m) 150

Slide / Tilt Value 0

Build Direction Bottom_Up

Image Reflection

☑ Reflect X ☑ Reflect Y

Export Options

☐ Export Slices to CWS

☑ Export Slices to Disk

In order to slice a model into images, you must first set up a slicing profile. A default profile has been created the first time the application was started. You can create new slicing profiles and manage them in much the same way you can manage machine profiles. The **Slice Profiles Config** tab item will allow you to create, delete, or edit a slicing and building profile.

On the left side of the screen we can see the following:

- **Profile in Use**: In this drop down box we can select the profile we are currently using, within a list of previously available profiles. The software comes preloaded with a number of preset profiles based on our resins. We recommend using the **XY resolution of 100 µm** profile. With this profile you can perform your first printouts with the test figures provided.

- **Configured Slicing Profiles**: In this dialogue we can see the list of all profiles that are available. The program comes preloaded with several profiles created at different types of resolution (100 and 50 µm) and for different resins. We will keep updating the profiles and sharing the files on the website. We expect these profiles to be enough, as there may be prints that vary in complexity and layer thickness. You can also create a new profile using the button or delete one by pushing the button.

If you want to create a new profile, carefully read the section **Creation of New Printing Profiles** section.

Slice Thickness: This field is to set the thickness of each slice in mm. The default is .05mm (20 slices per mm)

Exposure Time per Layer: This time value specifies how long the projector will display an image slice on a per-layer basis.

Bottom Layer Exposure Time: In order to ensure the model is properly adhered to the bottom of a vat, a longer exposure time can be used for a specified number of bottom layers.

# Bottom Layers: This specifies the number of **Bottom Layers** that receive the longer exposure time.

Blanking Time Between Layers: This is a time delay that allows the machine to perform a Lift/tilt/slide. You may have to experiment with this value to determine a proper timing for your machine.

Resin Price per Liter: You can specify the cost of the resin used here. This is used to calculate printing costs under the **File->Calculate Volume & Costs** menu item.

Lift and Sequence Time: This time specifies in milliseconds how long the lift and retract sequence takes. You can use the **Auto Calc** button to generate a time estimate for the lift and retract. This value may need to be modified based on the speed of your machine.

Lift Distance: This is the distance that the printer will raise and lower the Z axis after the exposure has taken place.

Z Lift Speed: When a layer is printed on a bottom up machine, a large amount of force may be required to separate the slide from the vat. This speed indicates how fast to perform the lift, a slower speed may be required to help vat separation.

Z Lift Retract Speed: After the lift occurs, this speed indicates how fast the Z axis should travel back to the initial start position.

Slide/Tilt Value: For machines with a slide or tilt mechanism connected to the X axis, this value specifies how much to move in conjunction with the Lift.

X/Y Pixel Offset: This X/Y value allows you to offset the rendered image by a pixel amount.

Build Direction: Top down or Bottom up. This value determines which direction the Lift occurs. For a bottom up machine, this is used to peel the model from the bottom of the build vat, sometimes in conjunction with a tilt/slide. For a Top-down machine, this makes the lift operation dip into the resin.

Image Slice Export Options

Image Slice Export Options: This allows you to control how the generated image slices and gcode files are saved. You have the option of exporting to Zip file or to a subdirectory when the **Export Images and GCode** button is checked. If this is left unchecked, slices and gcode will still be generated, but not saved to disk.

14. Slicing a Model

Once you have loaded one or more models, configured your machine profile, and configured your build and slicing profiles, you can slice a model. Choose the **Slice** icon from the toolbar to bring up the Slicing Screen.

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.

15. Connecting Software to Duplicator 7

You can connect to your 3D printer with the **Connect** toolbar item. Please ensure that you've properly configured your machine profile, as well as setting up the correct COM port before connecting.

MONOPRICE

3D Printer

Repair and Refurbished Goods or Parts Notice

Unfortunately, from time to time, faulty products are manufactured which need to change components or return to the Supplier for repair.

Please be aware that if your product is capable of retaining user-generated data (such as files stored on a computer hard drive, telephone numbers stored on a mobile telephone, songs stored on a portable media player, games saved on a games console, or files stored on a USB memory stick). During the process of repair, some or all of your stored data may be lost. **We recommend you save this data elsewhere prior to sending the product for repair.** You should also be aware that rather than repairing goods, we may replace them with refurbished goods of the same type or use refurbished parts in the repair process.

Please be assured though, refurbished parts or replacements are only used where they meet stringent quality specifications.

1

YEAR WARRANTY

MONOPRICE