

# ⇒ PANOSPACE™

FUN EASY 3D PRINTING



USER MANUAL

PanoSpace I



# PANOSPACE

Thank you for purchasing our PanoSpace I 3D Printer. We pride ourselves in having the most innovative products on the market with cutting edge technology that is easy to use. We are dedicated to making the most enriching learning experiences for you and hope you have as much fun using it as we did creating it!

This user manual contains safety rules and instructions for printing, adjustments and maintenance. It shows you how to use the 3D printer properly to extend its lifetime. Please read this manual thoroughly and make sure you follow all the instructions.

## Declaration

- PanoSpace USA has thoroughly proofread the content of this user manual.
- PanoSpace USA will not be liable for typos and missing contents.
- This user manual is subject to change without notice due to improvements of our product and manual.
- This user manual is used for helping the user operate the 3D printer correctly. It doesn't illustrate hardware and software configurations.
- If there is inconsistency between the illustration in this user manual and the actual product, the actual product shall govern.

## Copyright

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# I. First use

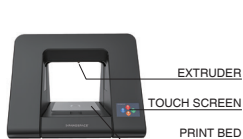
## 1.1 Note

- Please read this chapter carefully before first use.
- Please follow all the safety rules in this manual.
- Do not repair or modify PanoSpace I 3D Printer, doing so will void the warranty.
- Use of filament and / or components produced by other companies may void the warranty.

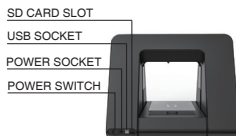
## 1.2 Safety

- Use the printer in a well ventilated place.
- Do NOT use or store the printer under moist conditions.
- Use the power adaptor supplied by PanoSpace. Power adaptors from other manufacturers might damage the printer or cause a fire.
- Children under 12 using this product should be supervised by a responsible adult. Printed objects or small parts may present a choking hazard and should be kept away from young children.
- Do NOT touch the extruder, print bed and all other moving parts while heating or printing.
- Do NOT use the printer for a long period of time when not present.
- Do NOT cleanup or move the printer when power is on.
- Do NOT use cleaning solvents or solutions to clean the printer. To clean the printer, use a clean, slightly damp cloth.
- When removing excess filament, wearing gloves and goggles is suggested.

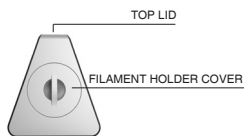
## 1.3 Product Appearance



Front



Back



Side

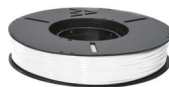
## 1.4 Accessories



Power Adaptor



USB Cable



Filament Roll



Teflon Tube



Glue Stick



Scraper



Adjustment Tool

*Note: The appearance of some components might be different from the pictures above.*



## 1.5 Technical Specifications

### Printing

Printing Technology:	PJP (Plastic Jet Printing)
Max Build Dimensions:	150 mm x 150 mm x 150 mm (about 6 inch x 6 inch x 6 inch)
Layer Resolution:	0.1 - 0.4 mm
Printing Filament:	PLA
Filament Diameter:	1.75 mm
Extruder Quantity:	1
Nozzle Diameter:	0.4 mm
Max Moving Speed:	X and Y axis 150 mm/s

### Software

Application:	PanoBuilder
Operating System:	Windows 7+; Mac OS X 10+
File Format:	3MF, STL, PLY
Connection:	USB cable, microSD card

### Mechanics

Chassis:	Steel
Body:	ABS
Print bed:	Glass
Motor:	Stepping motor

## Electronics

Screen:	3.2 inch resistor touch screen
Input:	AC 100 - 240 V, 2 A, 50 / 60 Hz
Output:	DC 24 V, 5 A

## Operation and Storage Requirement

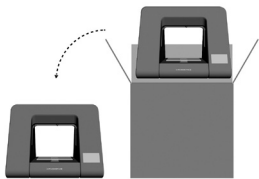
Printer:	15 - 26 °C (59 - 79 °F), < 70% RH (relative humidity)
Filament:	15 - 26 °C (59 - 79 °F), 25% - 45% RH (relative humidity)

*Note: Keep filament away from moist conditions. PLA absorbs water in the air. It might affect print quality. Once the filament package is opened, it must be used within a reasonable time.*

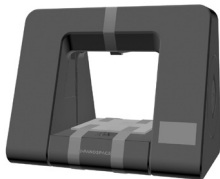
## Dimensions and Weight

Dimensions:	407 mm x 288 mm x 333 mm (16 inch x 11.3 inch x 13.1 inch)
Net Weight:	8.4 kg (18.5 lb)

## 1.6 Use



1. Take printer out of the box and place it on the table.



2. Remove fastening tapes.



3. Connect power adaptor.



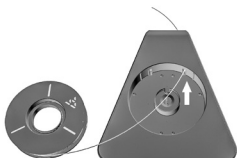
4. Turn on power switch. The printer should start the initialization process at this point.

By now the initialization should be ready.

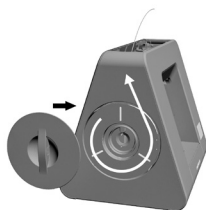
*Note: Please make sure all wires are connected tightly before use.*

*Tips: Please keep the package materials for later use.*

## 1.7 Load Filament



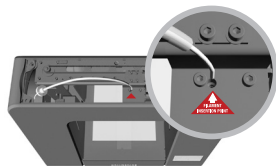
1. Open left filament holder cover and top lid, insert filament through the right hole on top of the filament holder.



2. Place filament roll into the holder and close the filament holder cover.

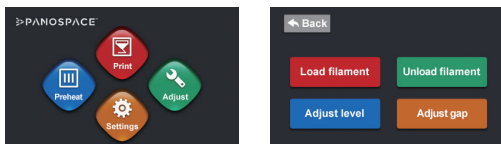


3. Insert filament through Teflon tube.

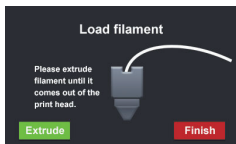


4. Insert filament into the hole on top of the extruder, and close top lid.

5. Click the “Adjust” button on the main menu on the touch screen, then click “Load filament” button.



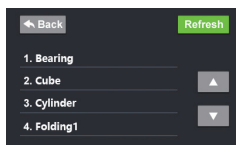
6. The extruder heats up the filament and extrudes the filament out of the print head.  
7. If the filament doesn't come out, click the “Extrude” button.



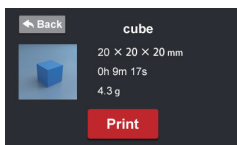
8. Click the “Finish” button after filament is extruded from the print head.

## 1.8 Print 3D Models

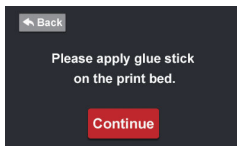
1. Click the “Print” button on the main menu on the touch screen. You should see a list of pre-installed files.



2. Choose any file you want to print.
3. Confirm the information on the screen, check the filament roll to make sure you have enough for the print.



4. Apply two thin layers of glue to the print bed with the supplied glue stick before continuing. Then, click the "Continue" button.

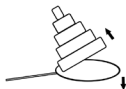


5. Your model will start to print at this stage.

## 1.9 Post-Process for Printed Objects

After printing has finished, use the supplied scraper to remove the printed object from the print bed.

Remove excess filament and 3D model support carefully.



*Tips: Use small tweezers or pliers (not included) and wear gloves and eye protection (not included) to remove excess filament.*

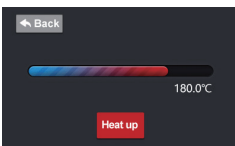
## II. Learning To Use The Touch Screen

On the touch screen, you can install / uninstall filament, and print a few pre-installed models.

### 2.1 Preheat

This is useful for preparation for demonstration or cleaning the print head.

Click the “Preheat” button on the main menu on the touch screen. Toggle the button to heat up / cool down the print head. The goal temperature can be set up on the settings page.



### 2.2 Print 3D Models

See section 1.8

### 2.3 Load Filament

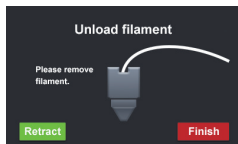
See section 1.7

### 2.4 Unload Filament

1. Click the “Adjust” button on the main menu on the touch screen, then click

the “Unload filament” button.

2. The extruder heats up the filament and soon pulls the filament out of the print head.
3. If the filament doesn't come back from the top of the extruder, click the “Retract” button.



4. Take out the filament and click the “Finish” button.

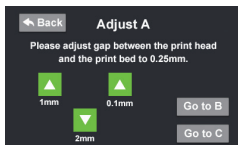
*Note: When not in use, please insert the filament end into the hole on the edge of the filament roll, to prevent tangling.*

## 2.5 Adjust Level of Print Bed

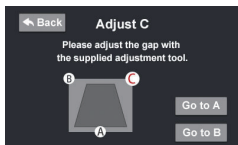
*Note: With our special printing algorithm, this operation is not necessary for most cases, unless the print bed or the extruder has changed.*

1. Click the “Adjust” button on the main menu on the touch screen, then click the “Adjust level” button.
2. The print bed will move up and position itself to point A.
3. Click arrow buttons to adjust the gap between the print bed and the print head. Fold a piece of print paper twice (about 0.4 mm thick), and insert into the gap. Find out a proper gap that the paper right not able to move any longer.





4. From the slot on the back of the print bed, loosen the fastening screw under point C with a M2.5 Allen wrench.
5. Click the “Go to C” button to point C.



6. Use the supplied adjustment tool to rotate the gear under the point C until the gap is 0.4 mm. Then go back to the point A and fasten the fastening screw.
7. Test the gap at the point A. If the gap changed, re-adjust step 3 to step 6.
8. Click the “Go to B” button and adjust the gap of point B, which is similar to the steps of adjusting the point C.
9. Check the gaps under all three points. If gaps differ too much, redo above steps.



10. Now you need to adjust the gap for the first layer. Click the “Back” button to continue. Please see details in the next section.

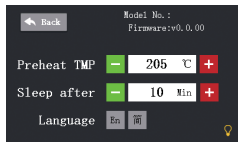
## 2.6 Adjust Gap

1. Click the “Adjust” button on the main menu on the touch screen, then click the “Adjust gap” button.
2. The print bed will move up and the extruder moves to the center.
3. Click arrow buttons to adjust the gap between the print bed and the print head. Fold a piece of print paper twice (about 0.4 mm thick), and insert it into the gap. Find the proper gap where the paper will not be able to move any longer.



4. Click the “Save” button to finish.

## 2.7 Settings



**Preheat TMP:** Setting up the preheat goal temperature. When you load

or unload the filament on the touch screen, the print head heats up to this temperature as well.

**Sleep after:** Within this amount of time, if there is no operations on the touch screen, it goes to power save mode. Touch anywhere on the screen can wake it up.

**Language:** Setting up display language.

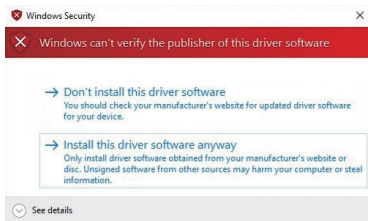
## III. PanoBuilder

In addition to the pre-installed 3D models, you may print others using the PanoBuilder application.

### 3.1 Download and Install PanoBuilder


1. Go to the <http://www.3dpanospace.com> page, download PanoBuilder installer for Windows or Mac OS X.
2. Run PanoBuilder installer, follow the setup wizard to finish installation.

*Notice: If following window pops up, please click the "Install this driver software anyway" button to continue.*



3. Click the icon  on the desktop to start PanoBuilder application.

### 3.2 Connecting Printer to PanoBuilder

Plug the printer cable from your printer to your computer, make sure the printer is on, and run the PanoBuilder application. The application will search for your printer automatically and connect to it. Once connected, the icon  shows up in the bottom right corner.

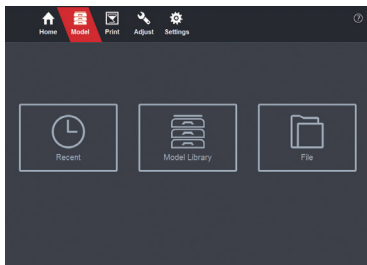
If connection fails, try to connect manually: Go to the “Connection” tab on the “Settings” page, choose proper serial port name and click “Connect” button.

*Note: If other applications occupy the serial port, please close that application and try again.*

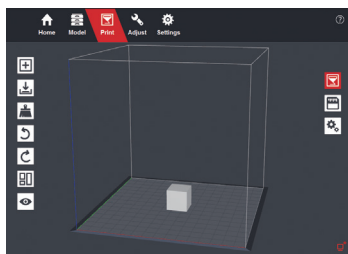
### 3.3 Load Digital 3D Model Files into PanoBuilder

PanoBuilder is able to load 3MF, STL, PLY format digital 3D model files.

Run PanoBuilder, go to the “Model” page. There are three options: open recent files, pick models from model library and open local files.




Once the 3D model is loaded, the model's figure shows up on the "Print" page.



*Tips: Here are some ways to acquire digital 3D model files:*

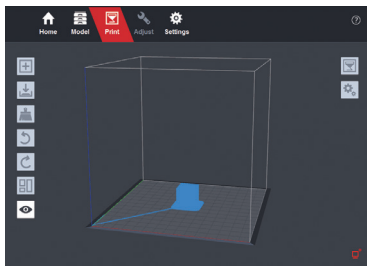
1. Pick from model library in PanoBuilder or website [www.3dpanospace.com](http://www.3dpanospace.com);
2. Download from 3D model sharing websites, such as [thingiverse.com](http://thingiverse.com);
3. Create 3D models on 3D modeling applications, such as 123D, SketchUp, Solidworks or 3DS Max;
4. Scan real objects and generate 3D models with a 3D scanner.

## 3.4 Print 3D Models

Click the "Print" button  on the right hand side of the window. This prints all 3D models you put on the screen. PanoBuilder will start analysis automatically. Once analysis is finished, a window with printing information pops up. There are four operations: view route, save, print and transfer.



Click "View route" button to preview the printing route.



Confirm information and click the "Confirm" button to print.

There are optional ways to print without computer. PanoSpace I 3D printer takes ZSP format files to control the printer. It has a few pre-installed ZSP files on the supplied micro SD card. These files can be printed directly on the printer. They contain fixed model sizes and printing temperature.

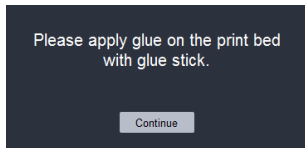
After analysis finished, you can choose from two ways to copy ZSP files to the micro SD card:

- Save ZSP file on your computer. Get micro SD card out of the slot and copy the file manually. Then plug the micro SD card back to the slot.

*Note: If SD card cannot work properly, please format it to FAT32 with 4096B sector size on Windows or FAT on Mac OS X.*

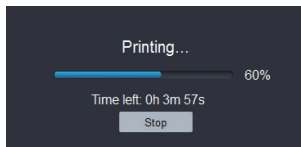
- Transfer ZSP file to the micro SD card via USB cable (this function is experimental)

Always apply two thin layers of glue with your glue stick before continue.

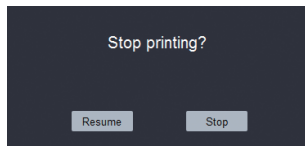


*Note: If the glue layer is not flat, it might affect the print quality. Please wipe the print bed clean with damp towel and apply two thin layers again.*


Printing starts. The estimated remaining time and progress displays on the screen.

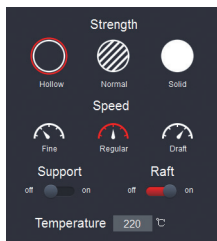


Click the “Stop” button to terminate current printing.





To improve the print quality, change the slicing configuration before printing. Click “Change slicing configuration” button  to open the following window.



**Strength:** Change infill density. The stronger, the longer the print time.

**Speed:** Change print speed. This will affect your print quality.

**Support:** Generate support structure for overhanging parts. It helps to increase the print success rate for objects that have overhanging parts.

**Raft:** Generate a base for the actual object. It helps to increase the print success rate.

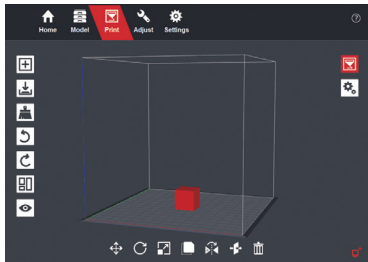
**Temperature:** Set up print temperature.

*Note: PanoSpace PLA filament has been developed through extensive, long-term testing. At room temperature and dry conditions, the ideal print temperature is approximately 220 degrees C (428 degrees F). The use of filament from other manufacturers may result in inferior print quality or difficulties removing the raft.*

*Tips: Initially, print with the recommended print temperature on the filament roll. If those settings do not produce the desired result, we recommend experimenting by changing the temperature setting up or down. The rule of thumb is: higher temperature makes the printed object stronger, but harder to remove raft and support; lower temperature makes the printed object weaker and the extruder harder to extrude filament.*

## 3.5 Edit Digital 3D Models

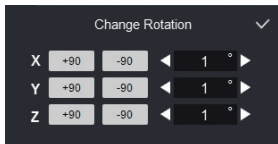
Go to the “Print” page and click 3D models to select the window. Once selected, it turns red, and the editing tool bar displays on the bottom of the window. Click the selected model again to cancel selection.



**Move selected models:** Move around the selected model in the print volume. Left column moves the model designated distance. Right column places the model to the designated point.



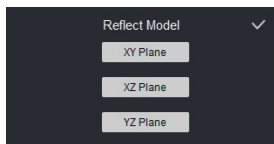
**Rotate selected models:** Rotate the selected model.



**Scale selected models:** Enlarge or shrink the selected model. Left column scales the model by percentage. Right column sets the model to the designated dimensions.



**Copy selected models:** Make a copy of the selected model.



**Reflect selected models:** Reflect the selected model to a plane.

**Revert surface direction:** Make surface towards outside or inside.

**Remove selected models:** Remove the selected model from the print volume.

On the left hand side of the window, there is an additional tool bar:

**Add models:** Add new models to the print volume.

**Save models:** Save all the models on the print volume to a single file. This is useful to keep all editing for later print.

**Clear all models:** Remove all the models from the print volume.

**Undo:** Undo recent operations. Up to 10 steps of operations can be undone.

**Redo:** Redo operations have been undone.

**Auto Placement:** Place all the models in the print volume automatically. This is useful to separate overlapping models.

**Change view:** Change views to look at models from different angles.



### 3.6 Load Filament

It is similar to the operations on the touch screen:

1. Insert the filament into the hole on top of the extruder.
2. Go to the “Adjust” page and click the “Load filament” button.
3. After the print head is at the right temperature, it extrudes the filament automatically.
4. Click the “Finish” button after filament comes out from the print head.

### 3.7 Unload Filament

It is similar to the operations on the touch screen:

1. Go to the “Adjust” page and click the “Unload filament” button.
2. After the extruder reaches proper temperature, it retracts the filament automatically.
3. Take out the filament roll and click the “Finish” button.

### 3.8 Adjust Level of Print Bed

Go to the “Adjust” page and click the “Adjust print bed leveling” button. It is

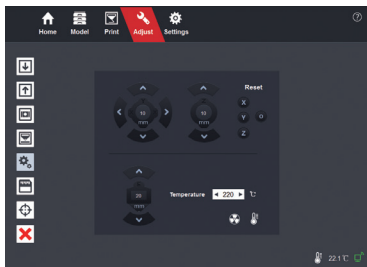
similar to the operations on the touch screen. Please see details in section 2.5

### 3.9 Adjust Gap

Go to the “Adjust” page and click the “Adjust gap” button. It is similar to the operations on the touch screen. Please see details in section 2.6

### 3.10 Adjust Printer


Go to the “Adjust” page and click the “Adjust printer” button.



**Move on X, Y or Z direction:** Move the extruder left and right (X direction), move the print bed forward and backward (Y direction) and move the print bed up and down (Z direction).

**Reset on X, Y or Z direction:** Move the extruder all the way to the right, move the print bed all the way to the front and move the print bed down to the bottom.

**Extrude / Retract filament:** Manually extrude / Retract filament.

**Heat up / Cool down the print head:** Toggle  button to heat up / cool down the print head.

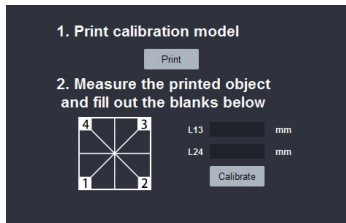
### 3.11 Print 3D Models on SD Card

Go to the “Adjust” page and click the “SD card” button. A list of ZSP files on the micro SD card are displayed on the window. Select one file and click the “Print” button to print.

### 3.12 Calibrate Printer

If the printed model looks skewed on the same layer, calibration is needed.

1. Go to the “Adjust” page and click the “Calibrate” button.



2. Click the “Print” button to print out the calibration model.

3. Measure the length of L13 and L24 and fill out the blanks on the window.

4. Click the “Calibrate” button.

### 3.13 Stop Printer

This is used to stop operations during adjustments.

Go to the “Adjust” page and click the “Emergency stop” button.

## 3.14 Settings

To configure PanoBuilder, go to the “Settings” page.

**Unit:** Set up length unit, weight unit and temperature unit.

**Connection:** Manually connect to the printer.

**Language:** Toggle between each available language.

## 3.15 Update PanoBuilder and Upgrade Firmware

Go to the “Version” tab on the “Settings” page. Here lists current application version and firmware version of the connected 3D printer.

Click the “Check updates” button to see if there is newer versions for update.

Click the “Upgrade” button to update firmware on the printer and the touch screen program. It takes about 12 minutes.

*Note: After installation of a newer version of PanoBuilder, it will check if the firmware on the printer is able to work with the application. If firmware does not match, upgrade is mandatory.*

# IV. Maintenance

## 4.1 Regular Cleaning

- Clean residuals

Some residual plastic may remain on the print bed. It can be removed with tweezers (not included) or by wiping with a soft, dry cloth.

- Clean the print head

After long use, some PLA plastic might stick to the surface of the print head. This might affect future prints.

Preheat the print head and remove excess with tweezers.

*Note: Be extremely cautious with the print head. It is extremely HOT!*

- Replace the extruder

If the extruder is jammed, please follow the steps below to replace:

1. Pull out the wire on the extruder.
2. Remove two screws on the top of the extruder.
3. Take the old extruder out.
4. Put a new extruder back inside the printer.
5. Screw in the two screws on top of the extruder.
6. Plug in the wire.

*Note: Please do this when the print head is at room temperature.*



## 4.2 Troubleshooting

Problem	Solutions
Printer has no response	<ul style="list-style-type: none"><li>- Make sure the power adapter is plugged in firmly and properly.</li><li>- Make sure the power switch is on.</li><li>- Wait until current operation is done.</li><li>- Wait until print head reaches room temperature.</li></ul>
Printer can not connect to the computer	<ul style="list-style-type: none"><li>- Make sure the Printer Cable inserted properly</li><li>- Close other application if you are using the serial port.</li><li>- Restart computer.</li></ul>
Filament does not extrude	<ul style="list-style-type: none"><li>- Increase print head temperature.</li><li>- Push down the filament towards the extruder to force it out from the print head.</li><li>- Remove filament and cut off the imperfect section.</li><li>- Remove filament, heat up and use thin iron wire to push residues out</li><li>- Contact customer service for technical support.</li></ul>
Printing does not start	<ul style="list-style-type: none"><li>- Update PanoBuilder and firmware.</li><li>- Use PanoBuilder for your printing.</li><li>- Make sure the ZSP file name is in ASCII letters.</li><li>- Format the micro SD card (<i>FAT32 with 4096B sector size on Windows or FAT on Mac OS X</i>)</li></ul>
Raft is hard to remove	<ul style="list-style-type: none"><li>- Decrease print temperature one degree at a time until it is easy to remove. See page 22 to adjust temperature.</li></ul>
Others	<ul style="list-style-type: none"><li>- Contact customer service for technical support.</li></ul>

## V. Support and Services

To download the latest applications, user manuals, or obtain other information, please visit PanoSpace USA official website <http://www.3dpanospace.com>.

PLEASE CALL **888-770-8078** (USA) *or* **+46 322 66 87 45** (Europe) FOR **TEC SUPPORT** with any questions regarding technical support, obtaining service, or any other assistance you may need.

[www.3dpanospace.com](http://www.3dpanospace.com)

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PanoSpace USA  
2078 E. Francis St.  
Ontario, CA 91761  
[www.3dpanospace.com](http://www.3dpanospace.com)

Customer Service/Tec Support:  
US 888-770-8078  
Europe +46 322 66 87 45