H400 User Manual V0.1



Download the full user manual at www.afinia.com/support

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Safety Precautions

1\The Afinia H400 3D printer requires the power adapter provided by the original manufacturer, otherwise the machine could become damaged or cause a hazard. Please keep the power adapter away from water and out of high temperature environments.

2\ During printing, the nozzle of the printer will reach 260°C and the print platform could reach over 70°C. Please do not touch these parts with your bare hands while they are hot—not even with the heat resistant gloves included with the machine—as the temperature could damage the gloves and injure your hands.

3\ During printing, the printhead and other mechanical parts move at high speeds.
 Touching these parts while they are moving could cause injuries.





Warning Label: Moving parts, do not touch!

4\ Please wear goggles when removing the supporting material from models and detaching models from the perf board.

5\When printing with ABS and PLA, the plastics will create a light odor. Please run the printer in a well-ventilated environment. We also suggest you put the printer in an environment with a stable temperature as unwanted cooling could cause adverse effects to the print quality. When the printer is extruding filament, make sure there is enough space between the print head nozzle and the platform. Otherwise the nozzle could become blocked.

Printing Environment

As light odor will be produced during printing, please run the printer in a well-ventilated environment and keep the doors closed on the printer.

The Afinia H400's ideal working temperature is between 15°C and 30°C with a relative humidity between 20–50%. Printing at temperatures out of this range could cause adverse effects to the printing process. When using the "Extrude" function, keep at least 50mm between the nozzle and the platform. If too close, the nozzle may become blocked.

Afinia 1-Year Limited Warranty

Below is the one-year limited warranty included with this Afinia product. Afinia prides itself on its outstanding product line and its technical support. If for some reason, your product fails, Afinia, a division of Microboards Technology, LLC, stands behind its warranty and assures you the best service possible in a quick and timely manner.

Afinia warrants to the original purchaser that this product is free from defects in material and workmanship. Afinia will for one year, at its option, repair or replace at no charge for parts and labor from the date you purchased the product from an authorized Afinia reseller. Nozzles and Cell/Perf Boards are warranted for ninety (90) days.

- Warranty registration must be completed within 30 days of receipt of the product in order to validate the warranty.
- Afinia, a division of Microboards Technology, LLC, reserves the right to determine the validity of all warranty claims.
- Warranty is void if the product serial number has been altered or removed.
- Warranty is void if the product has been misused or damaged or if evidence is present that the product was altered, modified, or serviced by unauthorized service people.

The above stated warranty is exclusive and replaces all other warranties, express or implied, including those of merchantibility and fitness for a particular purpose. Afinia, a division of Microboards Technology, LLC, will not be liable for any other damages or loss, including breach of warranty or negligence.

This product has been thoroughly tested and inspected at the factory prior to shipment. Nevertheless, inspect your product completely for any damage or loss of parts that may have occurred during shipment. Notify the delivering carrier promptly if damage claims are to be filed.

Afinia reserves the right to modify or update its product without obligation to replace any equipment delivered prior to any such change.

Compliance FCC CE ROHS

FCC ID:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try

- to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unpacking

Remove the cushioning foams from the inside the printer before use.





If anything is missing, please contact your local distributor or at support@afinia.com



Filament Spool Holder







Print Head Installation



Open front door, back door and top covers





Print Head Mounting Plate (on rear of extruder)

Print Head Installation





Plug in the print head cable.



Install Studio Software

Download the Studio software by going to www.afinia.com/support/downloads, then install it on your computer.









Initialization is required for every time the machine is switched on. During initialization, the print head and print platform move slowly and hit the endstops of the XYZ axes. This is essential as the printer needs to find the endpoint of each axis. Many software options will light up and become available for use only after initialization.

There are three ways to initialize your printer:

1. Hold the initialization button on the printer.

2. Clicking the "Initialize" option in the software menu (shown above).

3. When the printer is idle, press the initialize button on touch screen.

Other functions of Initialization Button:

Stop the current print job:

- 1. During a print, press and hold the button.
- 2. Reprint the last job: Double-click the button.

3. Turn on/off internal lighting: Single-click the button.



Touch Screen

Config

Initialize

Information

Touch Screen Control



Prepare for Printing - Update Nozzle Height 2-8

The printer was calibrated before leaving the factory, but users are recommended to update the nozzle height value using the automatic nozzle height detection function on the touch screen before the first print.



During nozzle height detection, the print head nozzle will touch the nozzle detector to make the measurement.



Install the filament and guiding tube shown in blue.



Push the guiding tube into the rubber ring as shown above.





Prepare for Printing - Load Filament 2-10



Back Side



Prepare for Printing - Load Filament 2-11

1 Insert the filament from the spool into guiding tube; arrange the guiding tube as shown in previous page. Press the Material button on the touch screen.



2 Choose the printing material as ABS by press the Wheel button to switch between different materials input the filament weight by using the +/- buttons.

3 Click "Extrude." The print head will start to heat up, within 3 minutes. Its temperature will reach 260°C, then the printer will beep and the print head will start to extrude.

4 Gently insert the filament into the small hole on the print head. The filament will be fed into the print head automatically when it reaches the extruder gear inside the print head.



6 Finally insert the guiding the tube in to the filament entrance and press the tube into the holding clip on the print head mount.



5 Check the nozzle for plastic extrusion. If plastic is coming out from the nozzle, the filament is loading correctly and the printer is ready for printing (the extrusion will stop automatically).



Loading a 3D Model



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组织 ▼ 新建3	文件夹				•
∨ 📌 快速访问	^	名称 个	修改日期	类型	^
➡ 下载	*	ue cube.stl	2015-4-17 9:54	STL 文件	
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金融 新田		💷 dongcheng50fen.stl	2015-3-27 10:11	STL 文件	
天 750 話 盆	*	dongcheng50fen.UP3	2015-4-1 13:58	UP3 文件	
2 文档	*	FDM test.STL	2015-5-4 12:37	STL 文件	
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English		jointed_dog_onepiece.stl	2015-4-12 7:40	STL 文件	
stl		I SHELL_J.STL	2015-4-28 15:48	STL 文件	
US VISA		Untitled.stl	2015-4-28 15:52	STL 文件	
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Make sure printer is connected to computer through USB or WIFI (go to section 3-1 for details about WIFI setting) and load a model.



When the software is slicing or sending data to the printer, the progress is displayed on the status bar on top of the software interface. Do not unplug the USB cable as this will disrupt the data transfer and result in a print failure. The USB cable can be unplugged after the data transfer is finished.

§⁼ 100% 100%	6	🤶 🖯 999 🐼	
Time to Finish Material Progress	: 05:40:30s : ABS,443g : 70%	Hot	Print job progress
Ĩ	100%		
	Printing		Pause print job

After pressing the pause button, the nozzle will be paused but the temperature is maintained at the printing temperature. While paused, the following control buttons will appear to allow users to resume, stop, or change filament.



Please note that stopping is irreversible, the current print job cannot be restarted.



Reprint or Printing Stored Print Jobs 2-16

Info c	of the stored file	e print job		Start Printing
0-				
J= 100%	6 100%			? 8 ∟
Infill	: 🕀	Time	:25%,	Print
Z-resolut	ion: 0.2mm	Weight	:10	
Date	Fast			
Test0	01			
Test0	02			
				\sim 5
av.				
Stored file	e name			Change Page

Black Out Recovery

If electricity is lost during printing, the print job can be continued after resuming power. **NOTE:** Do not remove the print job from the platform after the power failure. When the machine turns on again, initialize the printer. The printer will ask whether the user would like to recover the interrupted print job.





Connecting to the Afinia H400 through WIFI requires a Wireless Local Area Network (WLAN). Computers, devices, and printers must connect to the same WIFI network (same SSID) in order to communicate.

In order to achieve stable WIFI connection, users are recommended to connect under a capacious WIFI environment. A crowded network or an area with a large number of different networks can cause interruption during data transfer.

WIFI Setup through Touch Screen.







If you turn on the private function in WIFI setting, a password field will appear to allow password setup. This password will be required for WIFI connection to the printer to prevent unauthorized usage through the WIFI Network. Please note that anyone who can access the printer through USB or the touch screen could change the private password.



1 Connect the H400 to a computer through USB.



3 Click network to choose an available network (user can also use the touch screen panel to setup a WIFI connection).



Choose your network from the drop down list.

4\ Input the password for the WIFI network.

🛜 Wifi		
NetWork	your_network	ļ
Password		
	Cancel	Confirm

5\ If "Private" is set to ON, a private password could be optionally added to limit printer WIFI access to trusted users. Please note that the password is a weak protection that can be accessed and changed by anyone who can connect the machine through USB.

Private	ON CON
Password	

6\ Printer Tab



Disconnect USB and choose available printers on the network to operate through WIFI.

Set Materials (Touch Screen)



Set Materials (Software)



For setting nozzle height with the touch screen please refer to page 2-8.



Open the Calibration panel

At the Nozzle Height section, click "Auto" to initiate the automatic nozzle height detection process.

Clicking +/- button will move the platform up and down, or input a specific value at the text field and click the "To" button the move the platform to a specific height.

Click Save to replace the nozzle height value with the current platform height.



During nozzle height detection, the print head nozzle will touch the thin metal sheet on the detector to make the measurement.

Machine Configuration



Preheat switch, when turned on, the printer will first preheat 15 minutes before proceeding to printing.



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Model S.N. Firmware Ver.	:H400-01 :12345-9876 :V1.0.0	0	
Screen Ver. Printed Time	: V 1.0 : 1hr : 100m	Reset	Language
Actived Date MAC	: 2015-5-1 : 2015-5-1		

Model: current machine model

S.N.: machine serial number

Firmware Ver: shows current firmware version

Printed Time: total print time count

Print Weight: total print weight count

Activated Date: the date of printer activation MAC: mac address of printer

Reset: revert to factory setting. This will change some machine setting to default; remove total printed time and weight data.

Language: choose language. Current available language: Chinese simplified,

Chinese Traditional, Korean, Japanese, French, German, English



Other possible error prompt:



Choose the model and click the rotate button.

Choose rotation axis

User may input a specific value or choose a preset value for rotation.

Alternatively, user can use the rotation guide to rotate model in real time by hold and drag with mouse.







 \square

Scaling Models



Choose the model and click the scale button.

By default the scaling is in all axes. User may also choose a specific axis for scaling.

User can input a specific scaling factor or choose a preset value.



Click MM or INCH to convert models to sizes of corresponding units.

Alternatively, user can use the scaling guide on the model to scale in a specific axis or scale in all directions by holding and draging the mouse.





Choose the model and click the move button.

Choose the direction of movement

User may input a specific value or choose a preset value for the distance of movement in millimeters.

Alternatively, user can use the translational guide on the model to move on the XY plane or a single direction by holding and dragging the mouse.





Make Copies



Choose the model by clicking it (highlighted), the right - click to bring up the menu and select the number of copies to add.

Repair A Model

1\ If the model contains defective surfaces, the software will highlight the surfaces in red. Click the reach the second level menu.



2\ Click the wrench button the repair the the red defective surfaces will resume a normal color when repaired.





1\ Ctrl/CMD-click all the models on the build plate



2 The Merge button on the second level of the adjustment wheel will become available, click to merge the models.



3\ Click the save button to save the merged models to your computer.

	Setting	×
Part		
Surface	4 layer	v
Angle	50 Deg	V

Surface: The number of solid/sealed layers at the top and bottom of the printed object.

Support		
Dense	6 layer ▼	
Angle	30 Deg 🔻	
Area	3 mm2 🔻	
Space	8 lines ▼	

Angle: This determines at which angle the Surface layers will start to be printed.

Dense: Choose the number of dense layers between support and supported surfaces.

Angle: Determines the angle which support and dense layer to generated.

Area: Determines the minimal surface area that will be supported. Surface area

less than this value will not be supported.

Space: Determines how dense the support will be. The larger the value, the less

dense/compact the support will be.

Print Preference (Continued)



No Raft: Print without a raft.

No Support: Print without support.

Stable Support: Support structure will be stronger, but less easy to remove.



Unsolid Model: The software will attempt to print a non-solid model.

Thin Wall: The Software will detect wall thickness that is too thin to print and expand

the feature to a printable size.

Keep Heating: The platform will stay heated after the print job is completed.

Printing Parameters



Dense: Solid support structure ensures that the surface being supported retains its shape and surface finish.

Infill: The inner structure of the printed object. The density of the crosshatch-patterned infill can be adjusted.

Raft: The thick structure that assists with the adhesion of the object to the platform.

Surface: The top and bottom solid layers of the printed object.

Procedure for Setting Nozzle Height 5-1



- 1 Initialize the printer
- 2 Put the Calibration Card or folded piece of paper on the platform under the nozzle.



3 Move the print head to the middle of the platform by clicking the 5 button.



4 Raise the platform until it is just touching the nozzle. Move the paper between the nozzle and the platform to see if there is any resistance.

Procedure for Setting Nozzle Height (Continued) 5-2



Platform too high, nozzle is pinning paper onto the platform Lower the platfrom slightly.



Just right, can feel slight resistance when moving the paper.



Platform too low, no resistance at all when moving paper, raise the platform slightly.

5 When the ideal platform height is obtained, record the platform height value. Repeat steps 1 –5 for all of the other eight positions and note their platform height values.

6 When you have obtained the platform height values for all nine positions, find the lowest value among all the values.

In this example, the first calibration point has the lowest value and is thus the highest point on the platform. (The highest point of the platform requires the minimal amount of travel to reach the nozzle).

7 Move the platform to the position with lowest platform height value as determined in Step 6 and click the "Set" button. This will set this point as the "Nozzle Height".



	on points		
	`1: 118	2: 118.5	3: 118.7
	4:118.6	5: 118.9	6: 119
	7: 118.8	8: 118.9	9: 118.8



Calibration

The 9-button calibration screen shows the calibration points of the platform. Clicking on the value next to a number moves the nozzle to the corresponding position on the platform. The arrow buttons move the platform up or down for manual platform calibration. Before adjusting the platform calibration, click the "Reset" button to clear the previous values. Perform the Nozzle Height Procedure in Sections 5-1 and 5-2 before setting the Platform Calibration. Leave the platform at the Nozzle Height and click on the value in a numbered box. Use the up or down keys to move the platform until the nozzle is just touching the platform. Do this for each of the 9 positions then click Save.

The auto buttons triggers automatic leveling and nozzle height detection. Auto Level is not available on the H400.

Moves the platform up/down: click the +/- buttons to move the platform up and down.

For sending the platform to a specific height, input the value in the text eld between + and - and then click "Move" button.

Click "Set" button user want to save currently platform height as nozzle height.

After running the Platform Calibration, the 9 buttons will have values similar to those in the figure to the right. If your values are outside a total range of 2.00 mm, please attempt the Platform Calibration again.

NOTE: Having a level platform and correctly set nozzle height are essential for consistent, error-free printing. If the platform is unlevel or the nozzle height is not set correctly, the following issues may happen:

- Nozzle jams
- Warping or lifting of prints from the platform
- Prints breaking free from the platform during printing







Printer info will be displayed by clicking the small button on the top left hand corner of the connected printer icon. Information including printer type, serial number and firmware version will be displayed. User could also set a custom name for the printer at the Name field.

Software Version and Update



Check Auto Update to allow the software to inform user of the latest version.

Convert Picture Into 3D Model



Click add picture button and select a picture.



The Base height determines the thickness of the flat layer that will hold the picture.

Model Height determines the contrast of the final print.



- 17

The convert negative button will reverse the pixel intensity so that the user can choose for the picture to be protruding from or sunken into the base.

Convert Picture Into 3D Model





Update 3D model button. This button will convert the modified picture on the left to a 3D rendering on the right.



The OK button will send the 3D rendering to the 3D printing interface for printing.

1. Ensure the nozzle height is set correctly. If the nozzle height is set too low, it will cause warping; if it is too high, it will crash the nozzle into the platform causing damage and nozzle clogging. You can manually fine tune the nozzle height in the "Calibration" screen (see section 5-1 through 5-3). You can also try to adjust the nozzle height value plus or minus 0.1 - 0.2 mm from the previous nozzle height value.

2. Calibrate the printing platform well (see section 5-1 through 5-3). An unleveled platform usually causes warping. Also, allow enough time for pre-heating the platform. Please use the 3D Print Preheat function. A well preheated platform is essential for printing large objects without warping.

3. The airflow on the print head is adjustable, slide the air flow adjustment knob to change the amount of air going over the top of the model to cool it. Generally, the more cooling performed on the object, the better the print quality. Cooling also helps in raft and support removal. However, cooling also encourages warping, especially for ABS.

PLA can accept strong cooling without deformation. ABS can accept light to medium cooling. ABS Plus can accept medium cooling.

4. Printing with no raft. It is highly recommended to use a raft for normal printing as it improves adhesion and is required for platform leveling compensation (Calibration). It is turned on by default, but may be turned off in the "Print Preference" panel.

5. Printing with no support. It is possible to print without support structures. This can be turned off by choosing "No Support" in the "Print Preference" panel.



Air Flow Adjustment knob

Printer Maintenance - Air Filter Replacement 6-4

Change air filter for air filtration unit. It is recommended to change the filter every 300 hours of usage or 6 months.



Front View







The printhead cover can be removed after removing two screws (see circled).

Top View



Nozzle Removal/Replacement

To replace the nozzle, heat up the nozzle to at least 200C by using the Retract function in the maintenace interface.

The nozzle can be removed with the Nozzle Removal Tool found with the printer accessories. Please make sure to support the nozzle heater with a light grip from a pliers.

Note: The extruder cover does not need to be removed to replace the nozzle.

Nozzle Height will need to be updated after nozzle replacement is complete.



Printer Maintenance - Motherboard/CPU 6-7

WARNING: Turn off power and remove power cord to avoid risk of injury. Before performing this work, please contact Afinia Tech Support or risk voiding your warranty.





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