BLACKBELT

BlackBelt Server manual

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BLACKBELT 3D Printer

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Preface

This user manual has been composed for those persons assigned to work with the Blackbelt 3D Printer. Prior to operating the Blackbelt 3D Printer and the Blackbelt Server, it is highly recommended to thoroughly read and understand this user manual.

The user manual consists of important instructions and information how to proceed with the printer on a safe and skilled manner.

! Please make sure a copy of this manual is available at any time near the printer !

We advise that the user manual can / shall be completed with directions and legislations with respect to national compliances concerning: Safety / Health / Environment (SHE)

! Please read and understand the contents of this user manual carefully !

Failure to read the manual may lead to personal injury, inferior results or damage to the BlackBelt 3D Printer. Always make sure that anyone who uses the Blackbelt knows and understand the contents of the manual and makes the most out of Blackbelt 3D Printer.

The conditions or methods used for assembling, handling, storage, use or disposal of the device are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, injuries, damage, or expense arising out of or in any way connected with the assembly, handling, storage, use or disposal of the product. The information in this document was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness.

Blackbelt 3D BV will assume no responsibility for direct / indirect damage resulting from improper operation / lack of maintenance and any other use of the machine as intended is this manual. Any modification on the Blackbelt 3D Printer without proper written consult and permission by BlackBelt 3D BV will automatically void any right to warranty.

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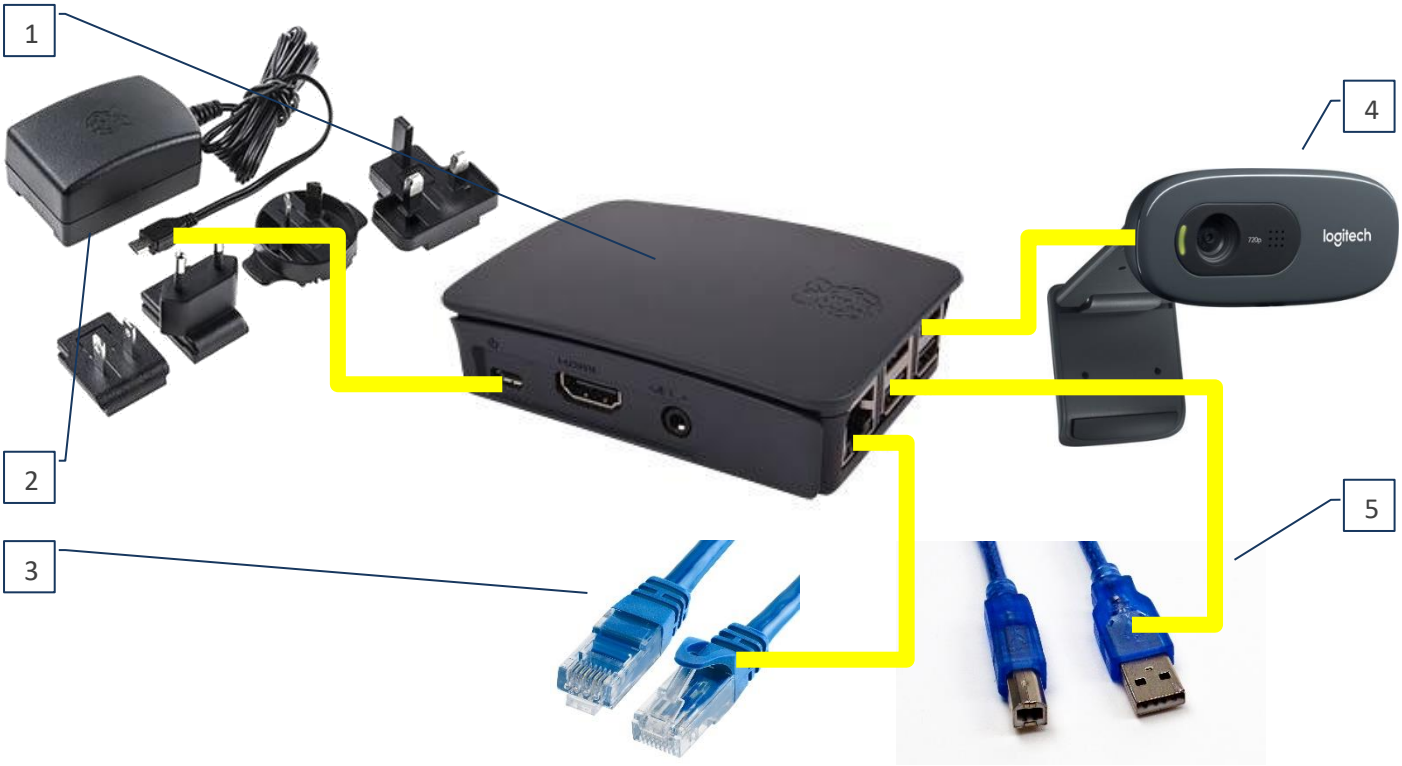
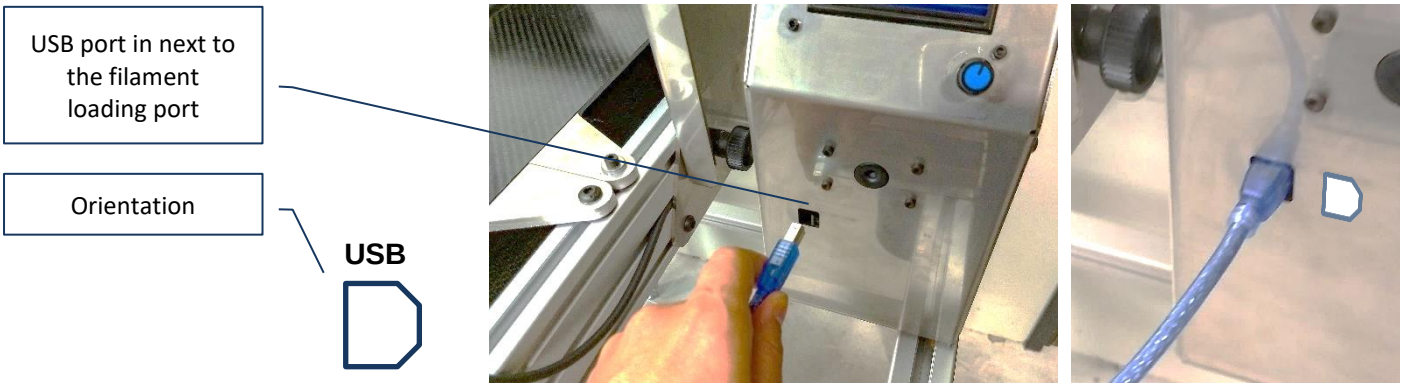
1 Server setup

In order to correctly update the firmware, the following requirements are necessary:

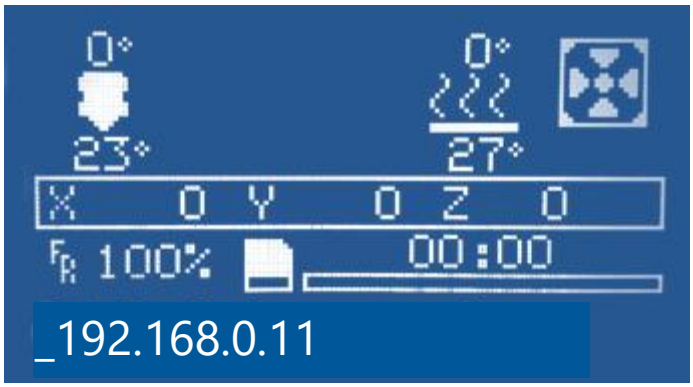
- A Mac or PC equipped with an SD card reader. The newest version of BLACKBELT Cura software needs to be installed onto the hard drive as described in Installation manual chapter 6.2
  http://www.blackbelt-3d.com/download-area
- BlackBelt Server box. [1]
- Server power plug with your local adapter plug. [2]
- Ethernet cable to connect the server to your local network (not included, if present always contact your ICT department for connection to the network). [3]
- Compatible webcam (supplied with the server). [4]
- The USB cable supplied with the BlackBelt 3D printer. [5]



1. First turn on the BlackBelt 3d controller by flipping the main switch and make sure it powers up.
2. Hook-up the machine to the server box with the USB cable. The USB port of the printer can be found in the front side of the controller console marked USB (figures 1+2). Make sure that the orientation of the USB plug is as indicated below – the flat side pointing left:



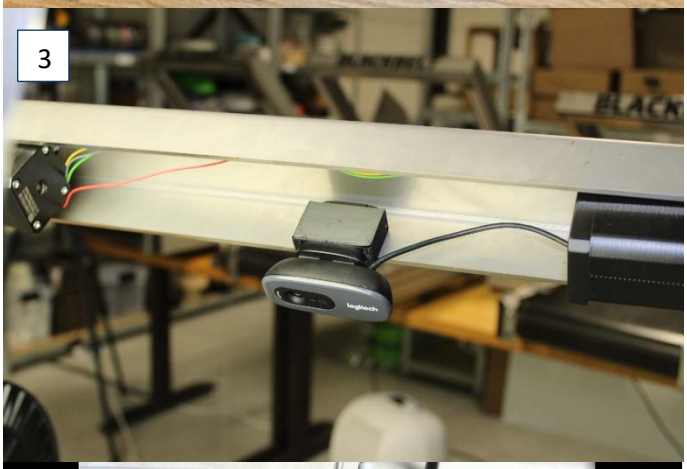
3. Connect the webcam and the Ethernet cable to the correct ports.
4. Plug in the power adapter and plug the micro Sd plug in the correct port in the server box
5. When the server boots up the printer will reset and boot up again automatically.
6. When the correct connection is established the LCD screen will show you the IP-address of the server.

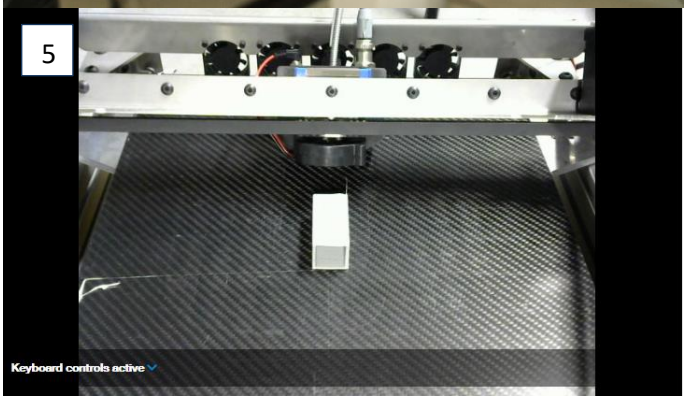


1.1 Webcam mount

The package is supplied with a 3d printed webcam mount. Follow the instructions below to correctly install the webcam for optimal use.

1. Move the clip over the webcam with the rubber dots towards the lip. [1-2]
2. Place the webcam on the inside of the frame with BlackBelt logo on it. Make sur the lip is on the outside. [3-4]
3. Afterwards you can tune the angle and position if it's not fully aimed at the center. [5-6]





2 Software setup

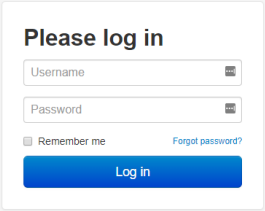
To make sure the BlackBelt server runs optimal in your local network run the following steps to setup all the software.

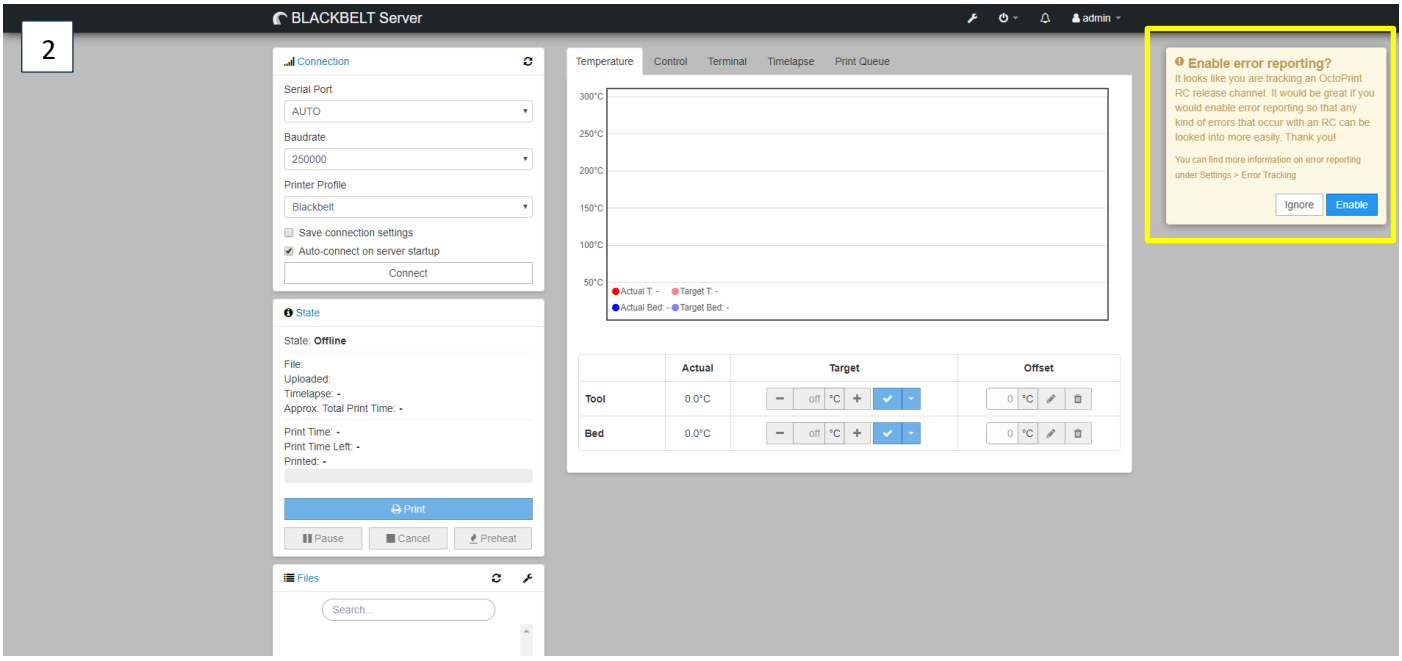
1. Open your browser and surf to the IP-address that is shown on the LCD screen and a login screen will pop-up. To enter the server for the first time please use the following info: [1]

Username	**BLACKBELT**
Password	**Server**
Admin	**admin**
Password	**BB#server**

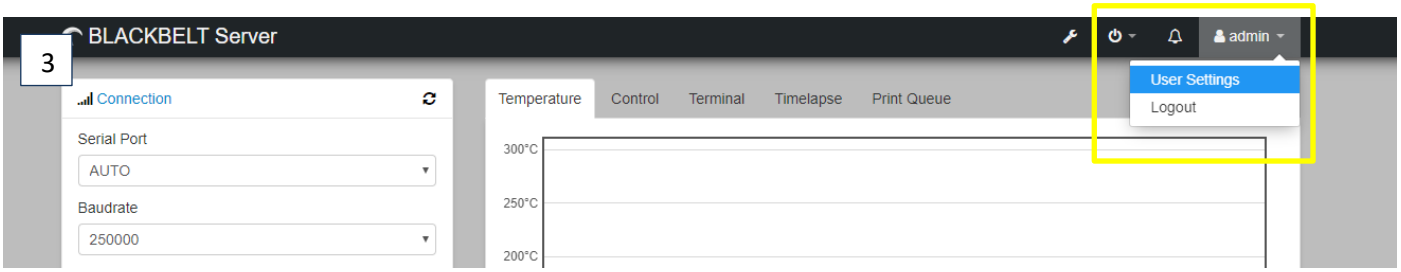
2. After login in you will see some pop-up to the right you can choose to enable error reporting and it will ask for updating the plugins that aren't up to date. We recommend applying all the updates and enable error reporting.

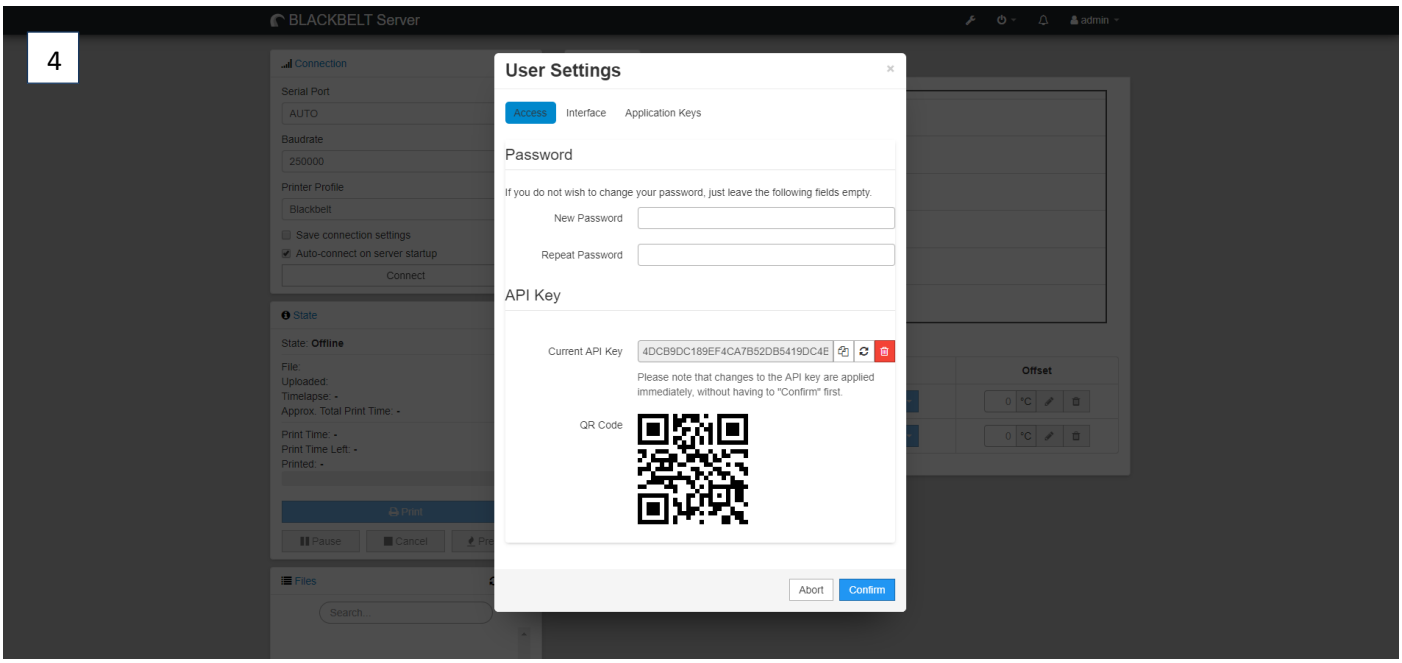
1





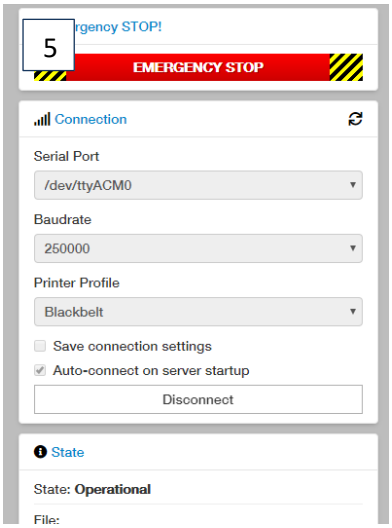
3. Feel free to change to standard password to one of your choosing to increase security. Go to admin user menu and click on user settings. A screen will pop-up that allows you to change the password. [3-4]

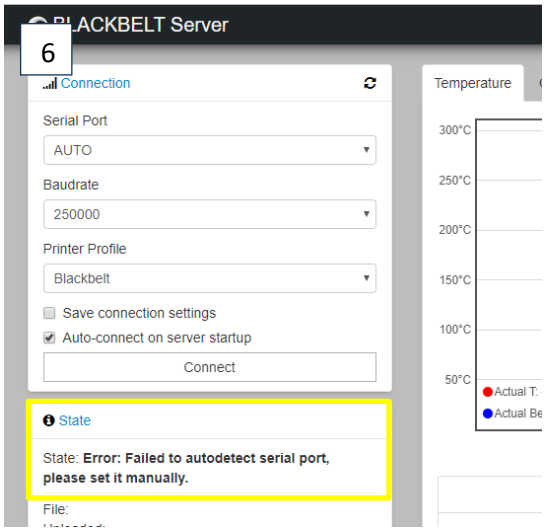




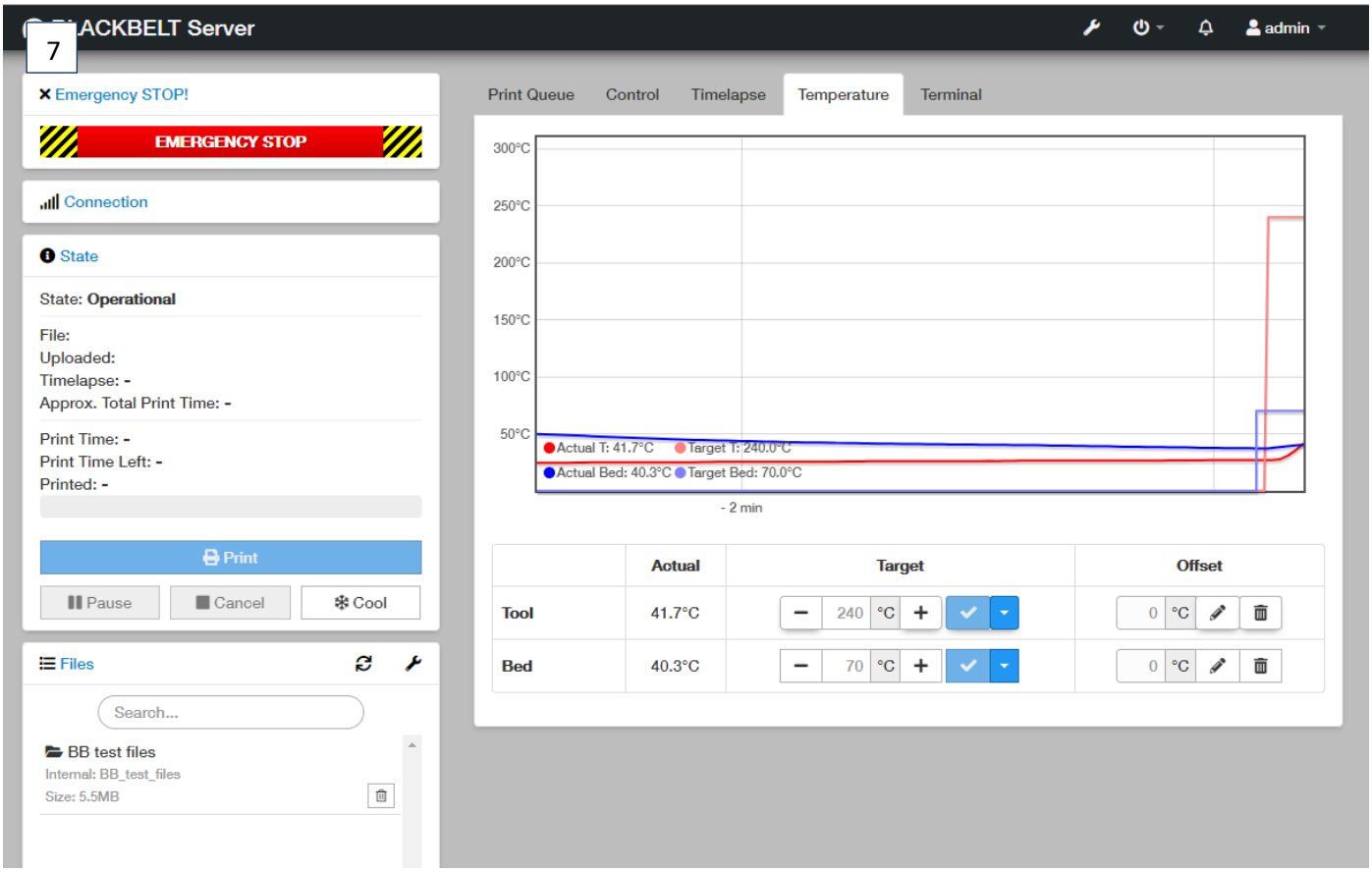
4. If your all setup updated and rebooted, you can check the connection to the machine by checking the connection screen and state. If it is not auto connected press the connect button. If an error state is shown the following things are most likely:

a. The power to the printer is down and the printer is offline (power on the machine)
b. The USB-cable to the printer is not connected (connect it)
c. The printer itself is busy or in error state (finish the print or restart the printer).
d. If it none of the above, contact support@blackbelt-3d.com for further assistance.





5. If everything is ok and the printer is connected. You should see an *Operational* state and a temperature read out [7].

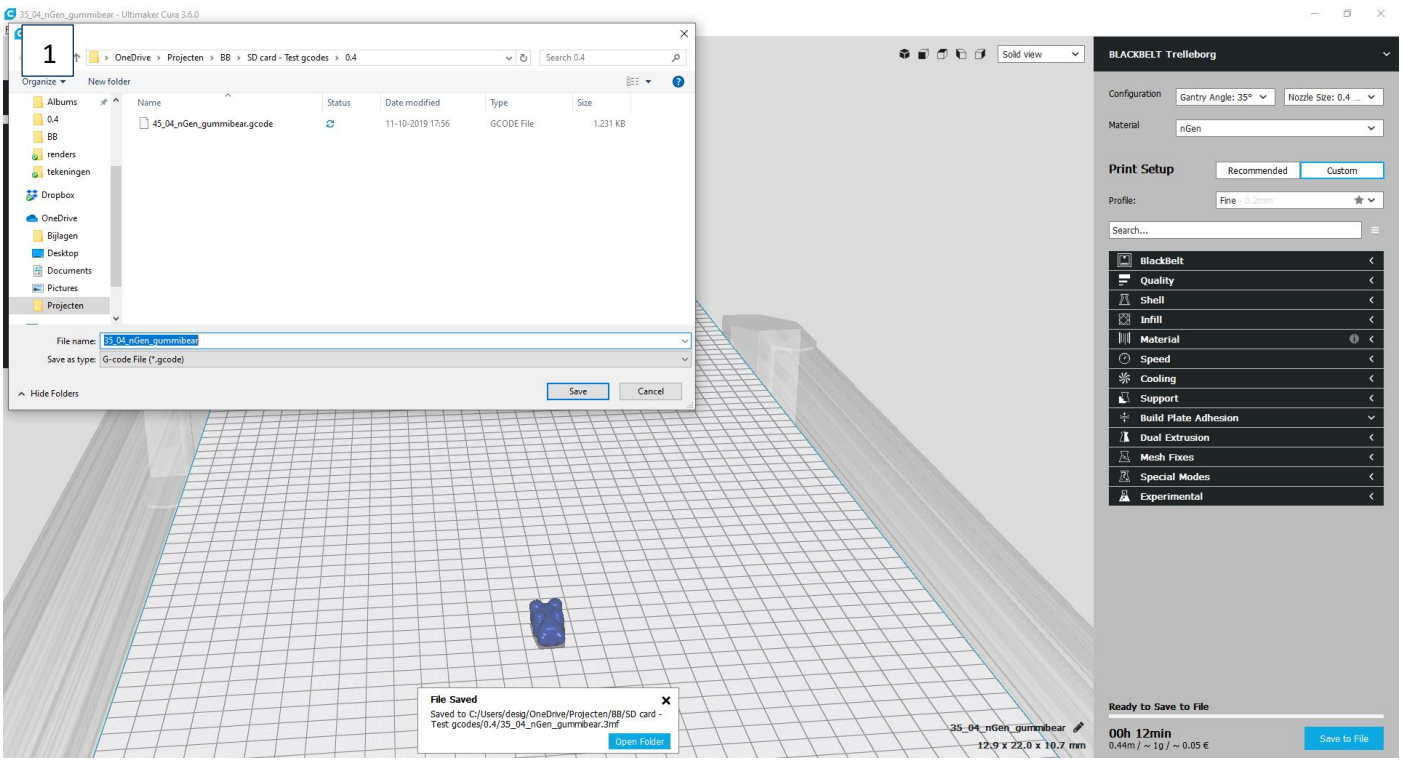


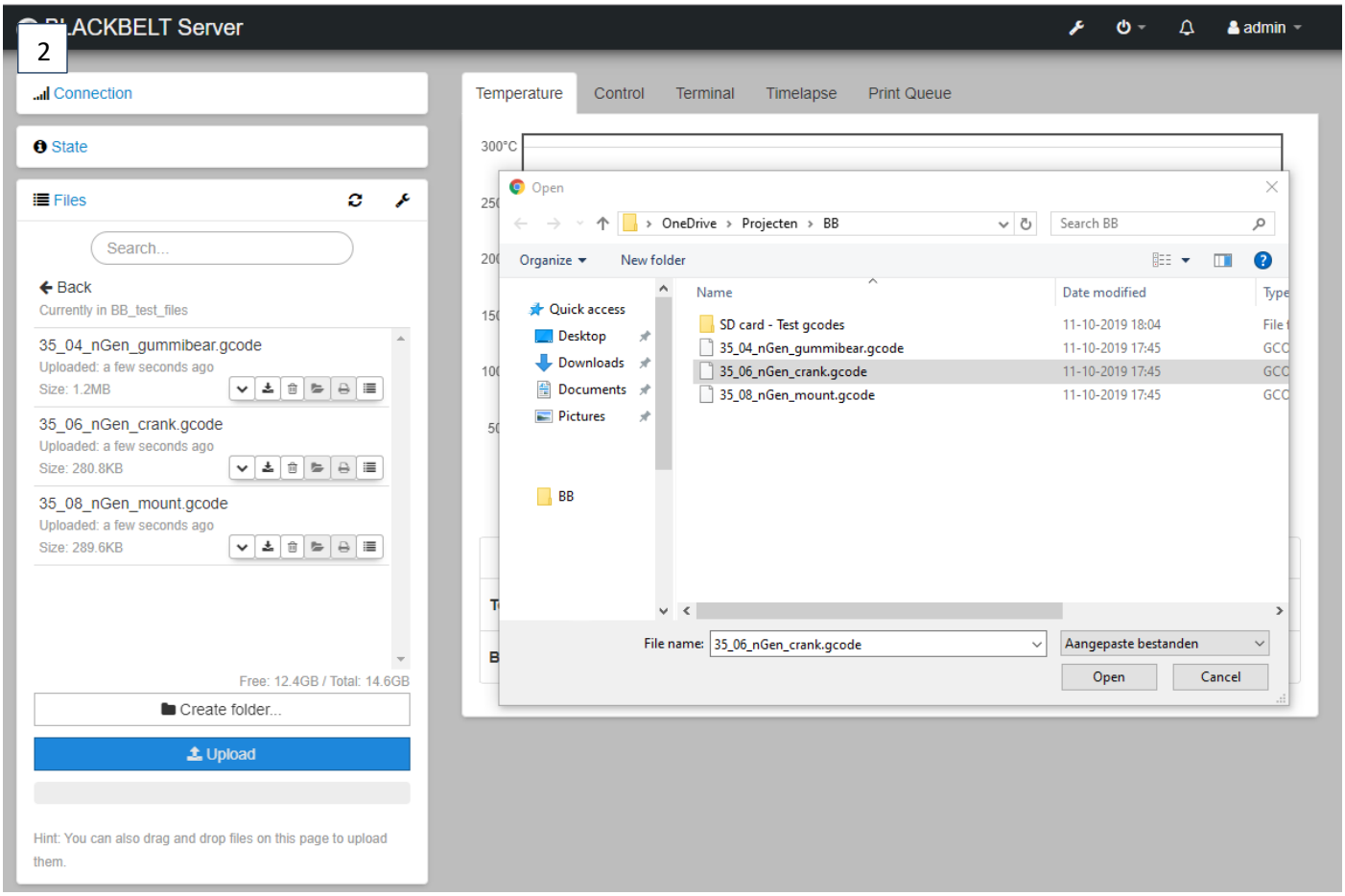
2.1 File upload

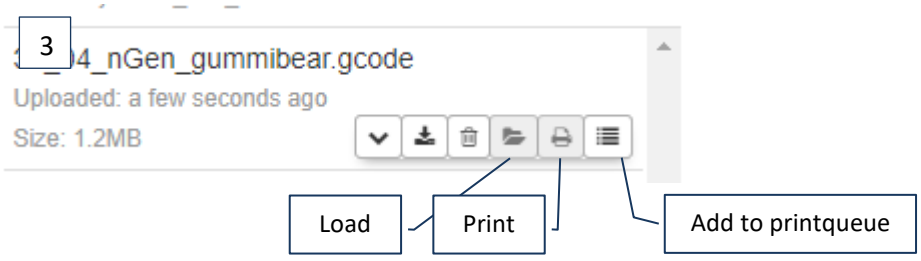
When the server is operational you can start uploading files to the server and start your first print. We already uploaded a few files when you want to test drive the connection.

Always double check the angle and nozzle setup on your printer before starting the print remotely. There is no feedback loop and you will not get a warning. Printing with the wrong physical setup can cause damage to the printer.

1. Prepare a file in BlackBelt Cura like your used to for SD-card printing.
2. Save the file to a known location on your device as GCODE. [1]
3. Upload the file using file upload button or drag the GCODE into the browser. [2]
4. The filename will contain the ANGLE and NOZZLE info to keep track of the setup for the printer. Make sure the printer is angled correctly!
5. Start your print by using the following functions [3]
    a. ***Load***: this preloads the file but doesn't start printing
    b. ***Print***: this will load the file and starts to run the GCODE.
    c. ***Print queue***: this will add the file to the queue and prints it when the rest of the queue is printed (chapter 2.2 for more info).
6. If you only preloaded the file you can start the print by pressing print in the *State* section

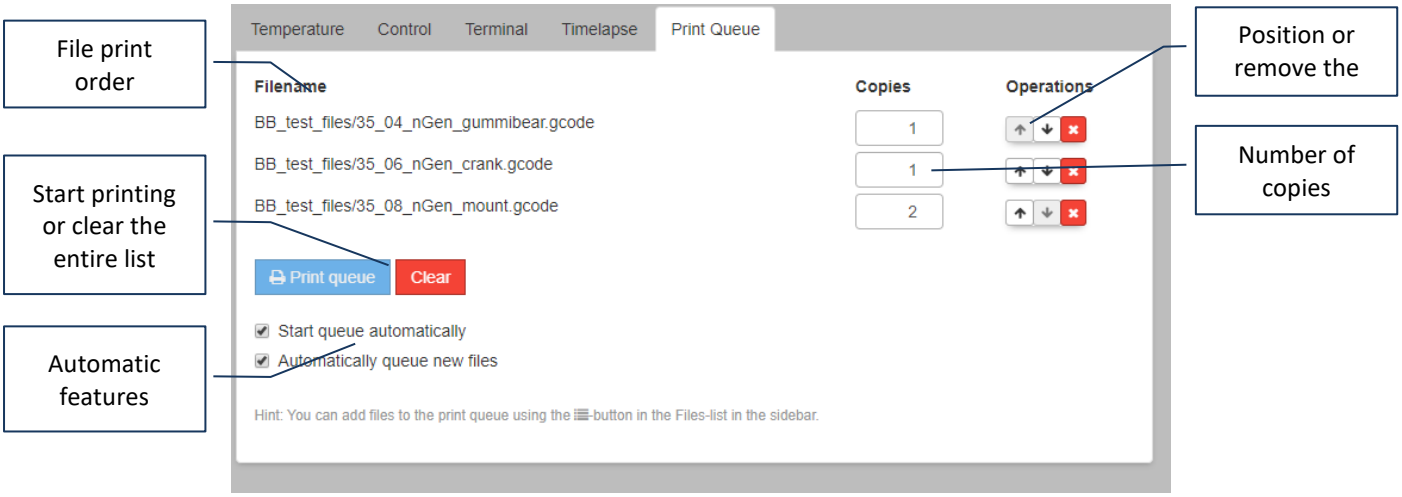



2
BLACKBELT Server
admin
Connection
State
Files
Search...
Back
Currently in BB_test_files
35_04_nGen_gummibear.gcode
Uploaded: a few seconds ago
Size: 1.2MB
35_06_nGen_crank.gcode
Uploaded: a few seconds ago
Size: 280.8KB
35_08_nGen_mount.gcode
Uploaded: a few seconds ago
Size: 289.6KB
Free: 12.4GB / Total: 14.6GB
Create folder...
Upload
Hint: You can also drag and drop files on this page to upload them.
Temperature
Control
Terminal
Timelapse
Print Queue
300°C
Open
OneDrive › Projecten › BB
Search BB
Organize
New folder
Quick access
Desktop
Downloads
Documents
Pictures
BB
Name
Date modified
SD card - Test gcodes
11-10-2019 18:04
35_04_nGen_gummibear.gcode
11-10-2019 17:45
35_06_nGen_crank.gcode
11-10-2019 17:45
35_08_nGen_mount.gcode
11-10-2019 17:45
File name: 35_06_nGen_crank.gcode
Aangepaste bestanden
Open
Cancel


3
4_nGen_gummibear.gcode
Uploaded: a few seconds ago
Size: 1.2MB
Load
Print
Add to printqueue

2.2 Print queue

The BlackBelt Server is equipped with a special *Print Queue* plugin developed to print 24/7. Especially for series production of custom objects this is a must use feature.

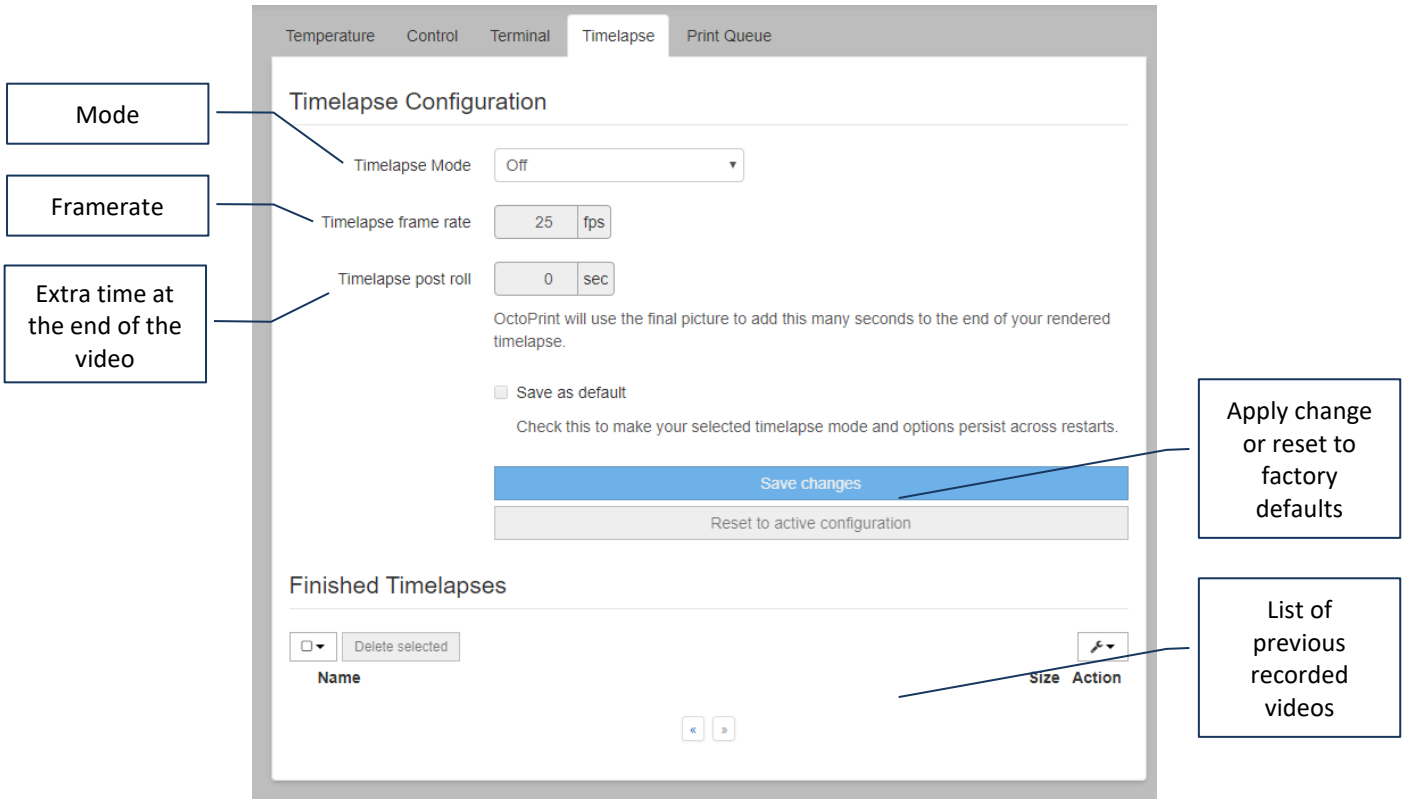


2.3 Timelapse

Need to promote your work or check up on production flaws or failures the *Timelapse* is a great feature.

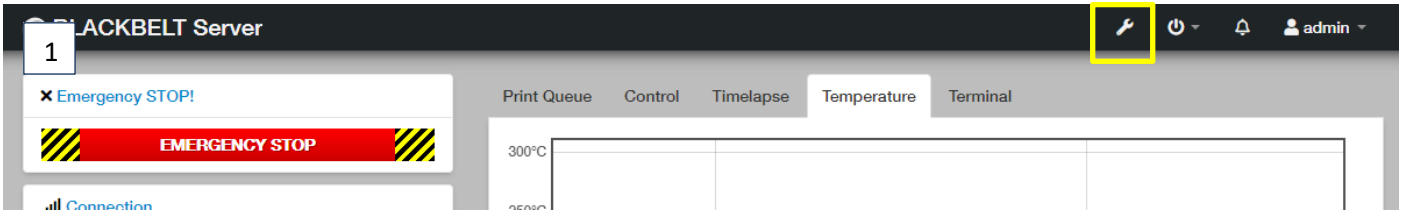
The following modes are available:

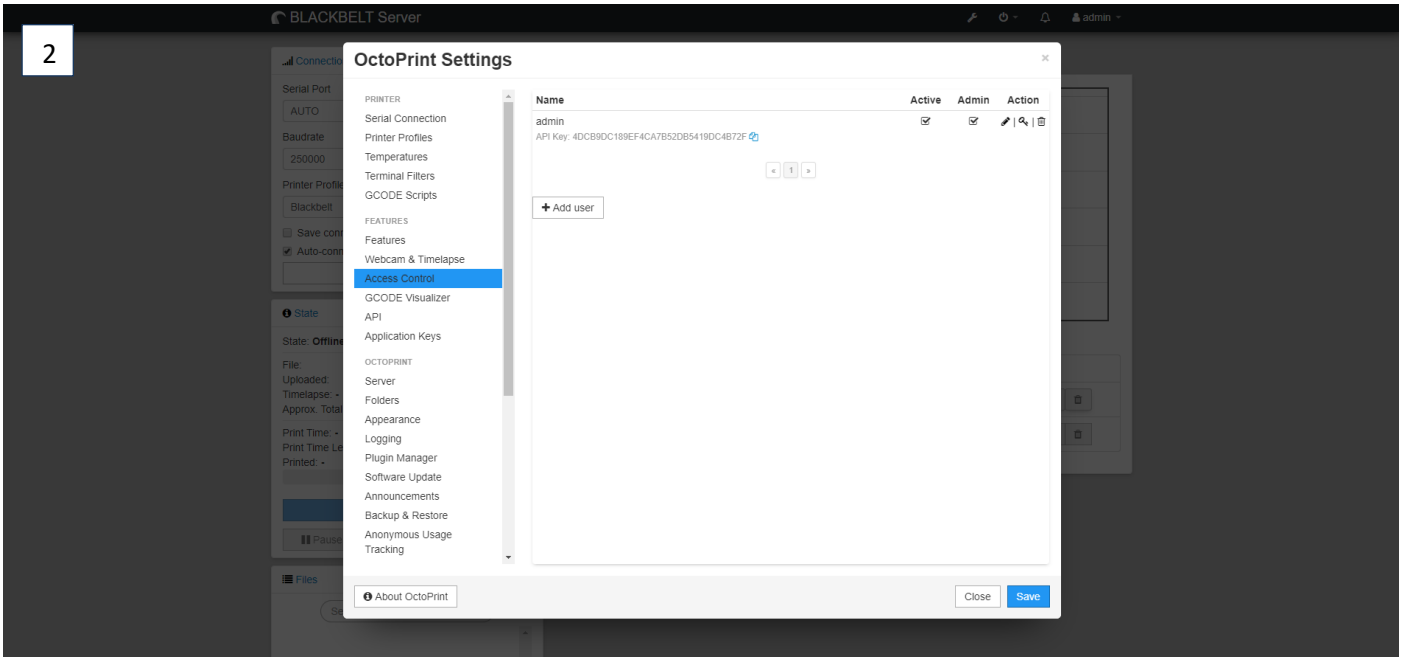
1. **Off**: nothing happens
2. **Timed**: take a picture every set interval (standard every 10 seconds). For prints that take up a day or more we recommend 30 seconds interval.
3. **On Z change**: take a picture every z-layer change. We recommend using the standard settings [beta feature]

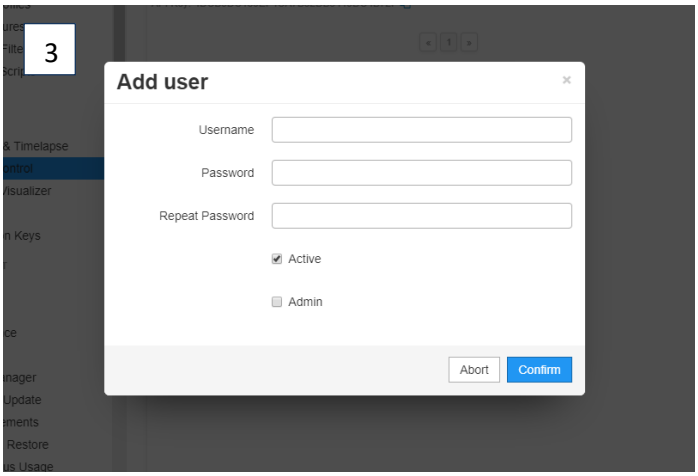


2.4 Adding multiple users

If your using the printer with multiple users and want to make use of different privileges, there is an option to add multiple users with different user levels. For this go to the settings menu [1 - wrench symbol] and go to the access control section. Press the *add user* button to add additional users, not checking admin will add a user that is not allowed to change settings and privileges [3].

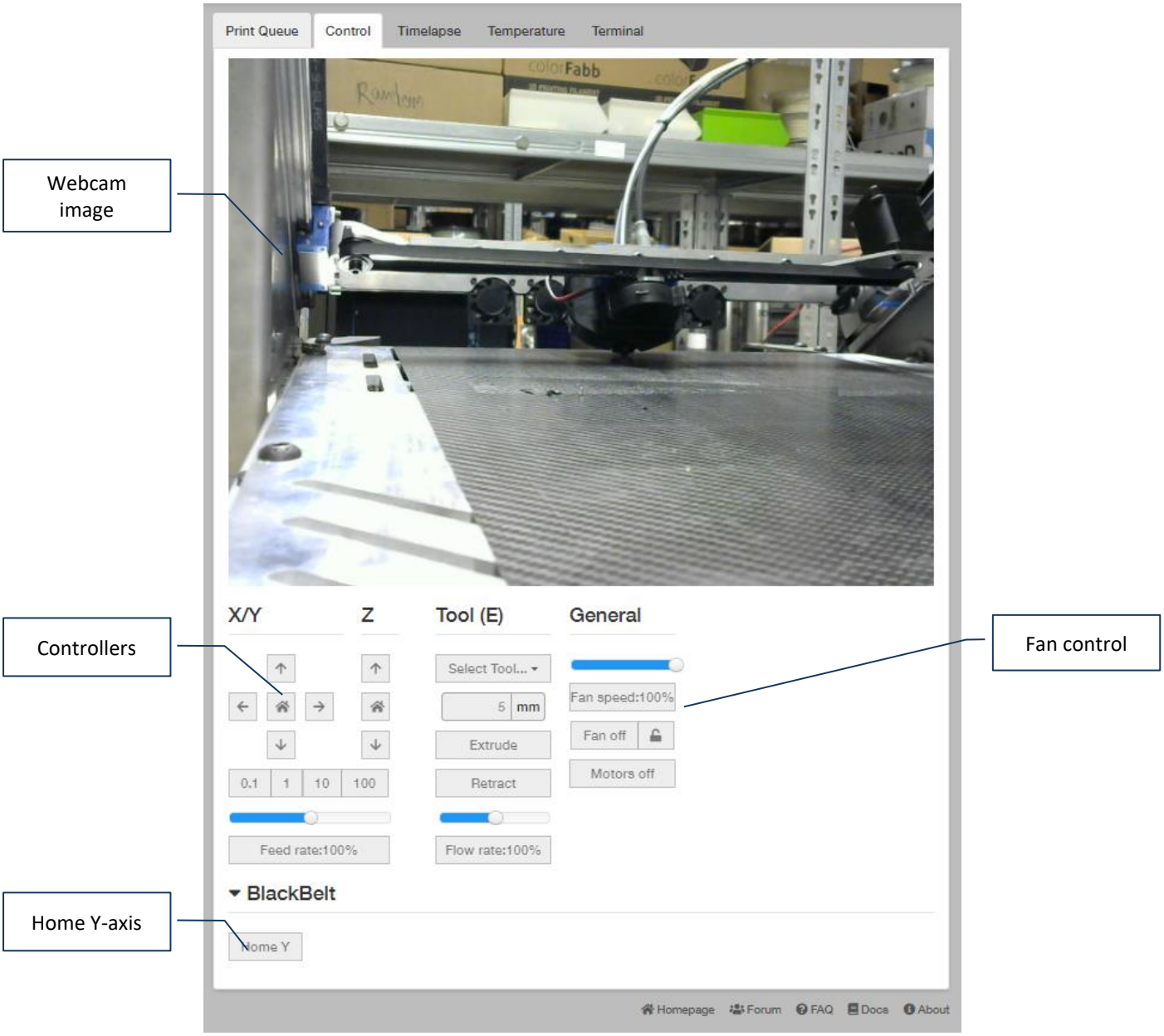


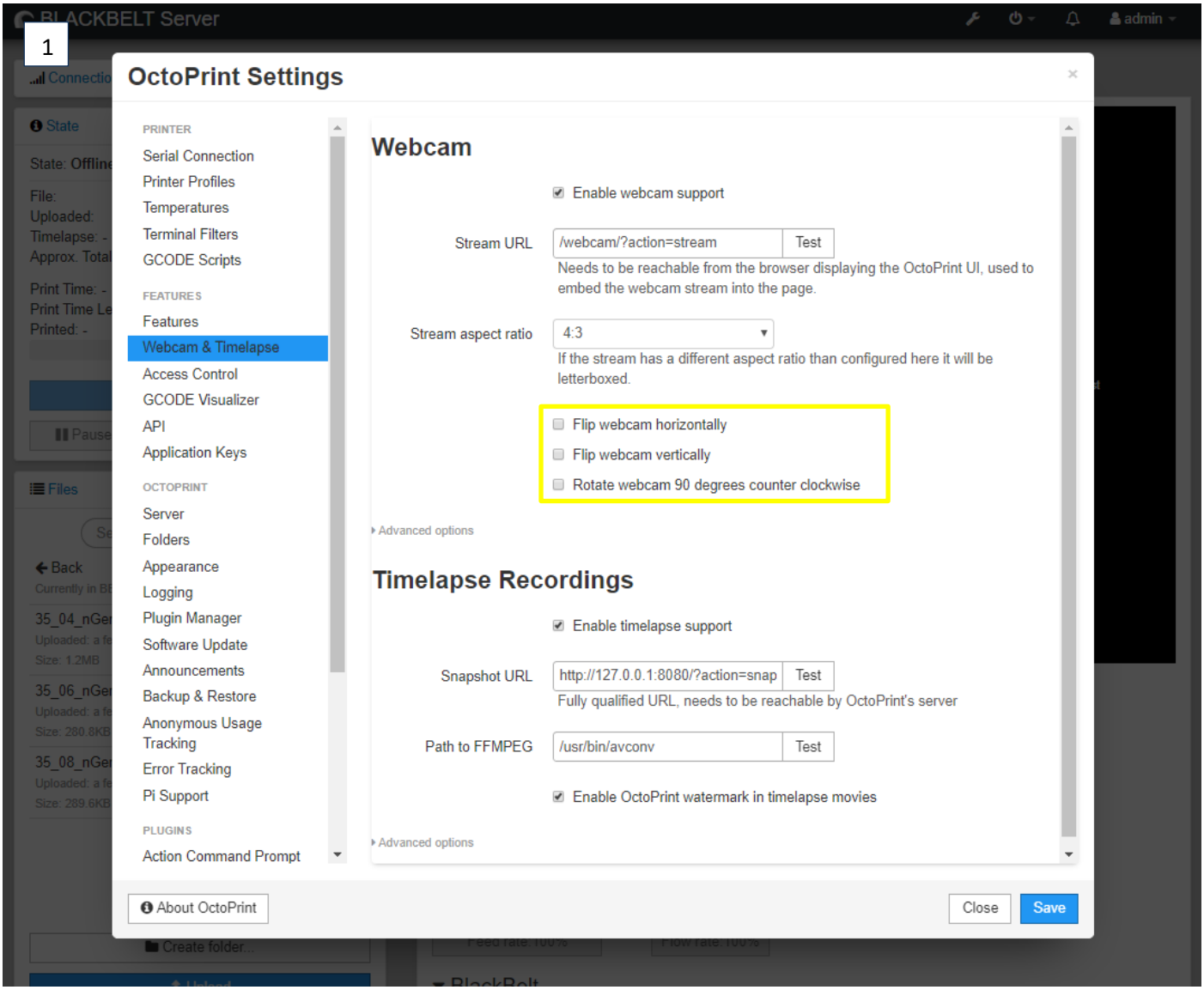




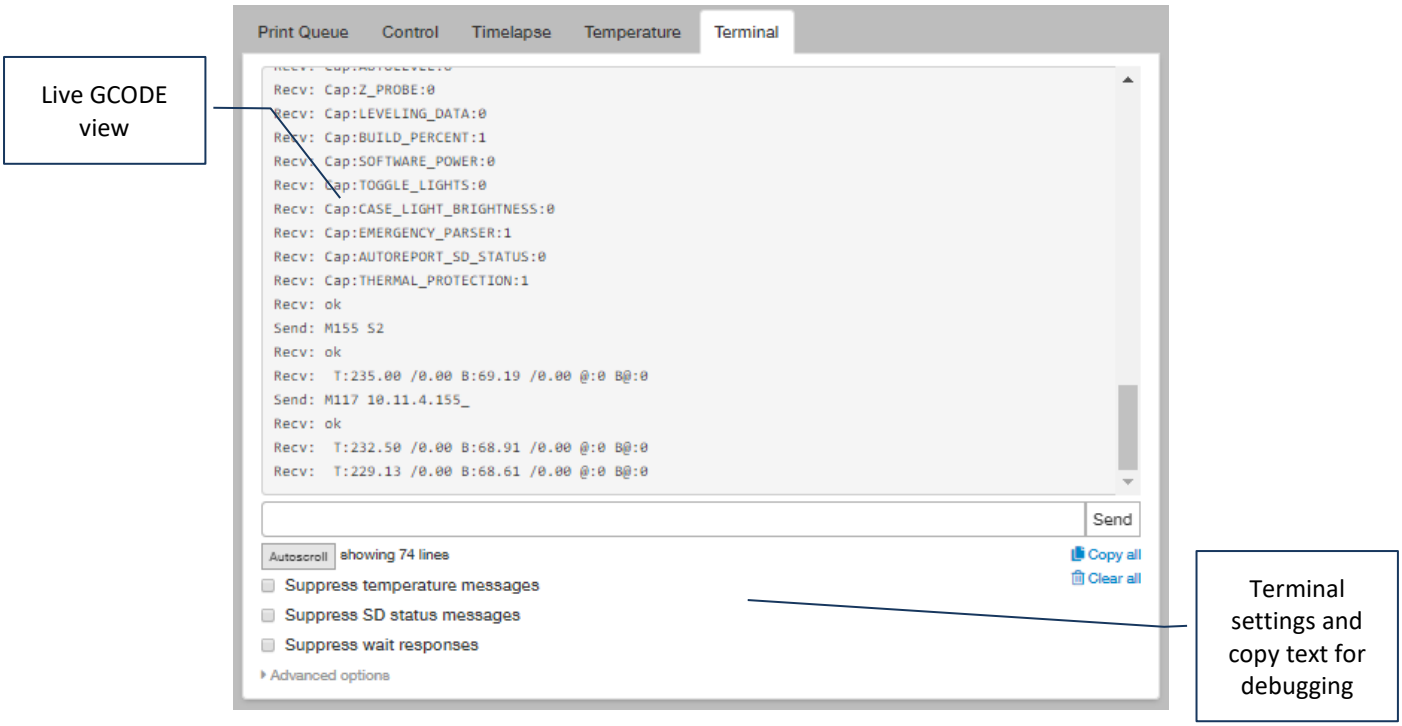
2.5 Control

Control window for manually controlling the printer. The webcam will install automatically and show up as image here. If the webcam is showing an image that is upside down or mirrored, you can change this in the settings menu [1].




1
BLACKBELT Server
admin
OctoPrint Settings
PRINTER
Serial Connection
Printer Profiles
Temperatures
Terminal Filters
GCODE Scripts
FEATURES
Features
Webcam & Timelapse
Access Control
GCODE Visualizer
API
Application Keys
OCTOPRINT
Server
Folders
Appearance
Logging
Plugin Manager
Software Update
Announcements
Backup & Restore
Anonymous Usage Tracking
Error Tracking
Pi Support
PLUGINS
Action Command Prompt
Webcam
Enable webcam support
Stream URL
/webcam/?action=stream
Test
Needs to be reachable from the browser displaying the OctoPrint UI, used to embed the webcam stream into the page.
Stream aspect ratio
4:3
If the stream has a different aspect ratio than configured here it will be letterboxed.
Flip webcam horizontally
Flip webcam vertically
Rotate webcam 90 degrees counter clockwise
Advanced options
Timelapse Recordings
Enable timelapse support
Snapshot URL
http://127.0.0.1:8080/?action=snap
Test
Fully qualified URL, needs to be reachable by OctoPrint's server
Path to FFMPEG
/usr/bin/avconv
Test
Enable OctoPrint watermark in timelapse movies
Advanced options
About OctoPrint
Close
Save

2.6 Terminal


Live GCODE view
Print Queue
Control
Timelapse
Temperature
Terminal
Recv: Cap:Z_PROBE:0
Recv: Cap:LEVELING_DATA:0
Recv: Cap:BUILD_PERCENT:1
Recv: Cap:SOFTWARE_POWER:0
Recv: Cap:TOGGLE_LIGHTS:0
Recv: Cap:CASE_LIGHT_BRIGHTNESS:0
Recv: Cap:EMERGENCY_PARSER:1
Recv: Cap:AUTOREPORT_SD_STATUS:0
Recv: Cap:THERMAL_PROTECTION:1
Recv: ok
Send: M155 S2
Recv: ok
Recv: T:235.00 /0.00 B:69.19 /0.00 @:0 B@:0
Send: M117 10.11.4.155_
Recv: ok
Recv: T:232.50 /0.00 B:68.91 /0.00 @:0 B@:0
Recv: T:229.13 /0.00 B:68.61 /0.00 @:0 B@:0
Send
Autoscroll
showing 74 lines
Copy all
Clear all
Suppress temperature messages
Suppress SD status messages
Suppress wait responses
Advanced options
Terminal settings and copy text for debugging

2.7 Possible failure mode

Problem	Possible cause	Action / solution
Blackbelt server seems to be offline	boot issues	restart / reboot the server 2 times. This so far only occurs the first time on a new network
IP address does not occur on the LCD	false communication	The Ip address is send once to the LCD display. This means you need to make sure the machine is on and standby (not heating or printing etc.) Then restart the server and make sure the internet port is blinking indicating connection. If no network is detected the IP address will also not show up.
The password is not working	Wrong symbol	Make sure the symbol you type in blind is the correct one and all letters are capitalized as n the manual. When in doubt copy the password from the manual to fill in the correct one.