renkforce

Operating Instructions

RF100 XL 3D printer, fully-assembled

Item No. 1592461 RF100 XL Plus
Item No. 1891634 RF100 XL r2

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1. Introduction

Dear customer,

Thank you for purchasing this product.

This product complies with statutory national and European regulations.

To ensure that the product remains in this state and to guarantee safe operation, always follow the instructions in this manual.

⚠ These operating instructions are part of this product. They contain important information on setting up and using the product. Please consider this if you give the product to a third party, and keep the instructions for future reference.

If there are any technical questions, please contact:

International: www.conrad.com/contact

United Kingdom: www.conrad-electronic.co.uk/contact

2. Explanation of symbols

⚡ The symbol with the lightning in a triangle indicates that there is a risk to your health, e.g. due to an electric shock.

⚠ The symbol with an exclamation mark in a triangle is used to highlight important information in these operating instructions. Always read this information carefully.

♨ This symbol warns you against hot surfaces that may cause injuries.

⚠ This symbol warns you against hand injuries that may occur if you insert your hands into the device.

⚠ This symbol warns you against hand injuries that may be caused by the belt.

⌂ For indoor use only.

📖 Read the operating instructions carefully.

→ The arrow symbol indicates special information and advice on how to use the product.

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3. Intended use

The 3D printer is shipped pre-assembled and ready to use. It can be controlled with the computer software provided or the built-in touchscreen colour display. It features a powder-coated metal housing to ensure a long lifespan. The printer can print objects up to a size of 200 x 200 x 200 mm and comes with bright built-in LEDs that enable you to monitor the printing progress. The SD card comes with 100 preset 3D models that can be printed in a few mouse clicks.

The 3D printer must be connected to a standard mains socket (100–240 V/AC, 50/60 Hz). It is intended for private use only.

The printer is intended for indoor use only. Contact with moisture (e.g. in bathrooms) must be avoided under all circumstances.

For safety and approval purposes, you must not rebuild and/or modify this product. Using the product for purposes other than those described above may damage the product. Improper use may lead to short circuits, fire, electric shocks or other hazards. Read the instructions carefully and store them in a safe place. Always provide these instructions when giving the product to a third party.

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Up-to-date operating instructions, 3D model files and configuration files

To download the latest operating instructions, 3D model files and configuration files, visit www.conrad.com/downloads or scan the QR code on this page. Follow the instructions on the website.

4. Package contents

- Fully-assembled 3D printer
- 250 g original Renkforce PLA filament (1.75 mm, white)
- 8 GB SD card with "Cura" software, 100+ ready-to-print 3D model files
- Power adapter
- Mains cable
- Quick start guide (in German and English)
- Filament spool holder
- Filament tube
- USB cable
- Scraper
- Tweezers
- Side cutters
- 2.0 mm hex key

- 2.5 mm hex key
- 2x screws to secure the filament spool holder
- Glass print bed with pre-installed print bed film (with item no. 1891634)
  - Includes hot plate and blue tape (with item no. 1592461)
- 5 x original Renkforce filament samples (copper, wood, glow-in-the-dark, colour-change and elastic, 1.75 mm / 50 g)
- 50 g ABS filament (1.75 mm, black) (with item no. 1592461)

5. SD card contents

- The SD card contains the following folders:
  - "3D models"
  - "Config"
  - "Manual" (user manual)
  - "Software"

→ To view the contents of the SD card, connect the 3D printer (with the SD card inserted) to your computer.

The control panel on the printer only gives you limited access to the SD card.

a) 3D models

- The "3D models" folder contains several subfolders, including "Basic shape", "Capital letters (A-Z)", "Constellation", "Mathematical symbols", "Numbers (0-9)" and "VariousObjects".
- These subfolders contain over 100 3D models.
- Each model is available in .gcode (.Digicode), .jpg and .stl format. Example: "RF100 ":

RF100.gcode   RF100.jpg   RF100.stl
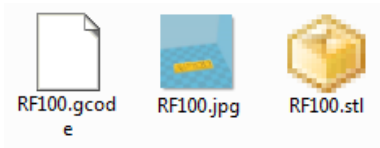
- The JPG file allows you to preview the model.

The STL file allows you to create your own GCODE file using the "Cura" software.

Use the GCODE file for printing.

- To start printing, insert the SD card into the slot on the 3D printer, or load the .stl file on your computer using the "Cura" software.

→ The printer's control panel only lists the files in .gcode format.

b) Config

- The "Config" folder contains configuration files for different filament materials:
  - "Copper" (copper)
  - "Elastic" (Elastic material)
  - "PLA"
  - "Wood" (wood)
  - "ABS"

• Load the configuration file in "Cura" to print an object using the corresponding material (see "e) Loading configuration files (Windows®)" on page 52 for details).

⟶ The contents of this folder are not displayed on the control panel. These config files are recommended for use with the supplied filaments. You can also use "Cura" to create your own configuration files.

c) Operating instructions

• The quick start guide is saved to the "Manual" folder.

⟶ The contents of this folder are not displayed on the control panel.

d) Software

• The "Software" folder contains the Windows® and Mac OS installation files for the "Cura" software and the necessary USB drivers.

⟶ The contents of this folder are not displayed on the control panel.

6. Features and functions

• Fully assembled and ready-to-use 3D printer
• Max. size of the printed object: 200 x 200 x 200 mm
• High-precision extruder with 0.4 mm nozzle
• Colour touchscreen control panel
• Works with a computer (via USB) or an SD card/USB stick
• Supports printing from an SD card, PC and USB stick
• Manually-configurable printer parameters
• Extremely stable metal design
• Suitable for 1.75 mm PLA, wood, copper, elastic, glow-in-the-dark and thermocolour filaments (for item no. 1891634, 1592461) and ABS filaments (for item no. 1592461)
• Over 100 ready-to-use 3D models
• Includes "Cura" software

7. Working principles of the 3D printer

- The 3D printer requires a file containing the three-dimensional data of the object that you wish to print (.stl is a standard format).

- You can create these files using suitable software or a 3D scanner. You can also download ready-to-use print files from the Internet to print objects quickly.

- The printer software converts the three-dimensional data into a .gcode file that contains information about the printed layers and temperatures for the nozzle and other components.

- The .gcode file can be sent to the printer from a computer via the USB port, or you can insert an SD card containing the file into the printer and use the built-in control panel.

- The 3D printer creates the object layer by layer (by fusing the filament material). The filament material is transported from the filament spool to the nozzle.

- The filament material is melted in the extruder and applied layer by layer to the print bed via a fine nozzle.

- The print bed moves along the Z axis (up/down), and the extruder moves along the X (left/right) and Y (forwards/backwards) axes. This allows the printer to create a three-dimensional object by applying the layers horizontally.

A 3D printer is a very complex machine that requires you to configure numerous parameters according to the 3D printer model, printed object and filament material.

The printing temperature, filament material, print bed calibration settings, size/shape of the printed object and the surface of the print bed also affect how the printed object adheres to the print bed.

Draughts, grease on the print bed and other factors can also affect the quality and durability of the printed object.

It is therefore not possible to ensure high-quality prints without testing the parameters in advance.

Change the parameters in small steps to ensure optimal results for your desired application. The pre-installed print templates on the SD card can be used for reference, but need to be fine-tuned based on the aforementioned parameters to ensure optimal results.

8. Safety instructions

Read the operating instructions and safety information carefully. If you do not follow the safety instructions and information on proper handling in this manual, we will assume no liability for any resulting personal injury or damage to property. Such cases will invalidate the warranty/guarantee.

a) General information

- For safety reasons, unauthorised conversions and/or modifications to the product are not permitted (other than those indicated in these instructions), as this may damage the components and affect the functionality/safety of the device.

- All people who use, install, mount or repair this product must be suitably qualified and follow the instructions.

- The 3D printer is not suitable for people with physical, sensory or mental disabilities or people who are not suitably qualified.

- This product is not a toy and must be kept out of the reach of children! Children do not understand the hazards associated with the incorrect use of electrical devices.

- The mechanical components are high-precision parts. Do not use any force, as this may damage the components and render the 3D printer unusable.

- Never cover the product during use. Only move, transport or store the product when it is switched off.

- Do not leave packaging material lying around carelessly, as it may become dangerous playing material for children.

- Protect the product against extreme temperatures, direct sunlight, strong jolts, vibrations, flammable gases, vapours, dust, solvents, high humidity, moisture (e.g. rainwater and steam) and strong mechanical loads.

- If it is no longer possible to operate the product safely, stop using it and prevent unauthorized use. Safe operation can no longer be guaranteed if the product:

  - is visibly damaged,

  - is no longer working properly,

  - has been stored for extended periods in adverse ambient conditions or

  - has been subjected to any serious transport-related stress.

- Always handle the product carefully. Jolts, impacts or a fall even from a low height may damage the product.

- Do not cover the ventilation slots on the bottom of the printer. Do not insert sharp objects into the printer, as this may cause an electric shock.

- Never attempt to disassemble the 3D printer or service any of the interior components.

- Warning, LED light: Do not look directly at the LED light! Do not look into the beam directly or with optical instruments!

- Observe all additional safety information in the individual sections of these instructions.

- Consult a technician if you are not sure how to use or connect the product.

- Maintenance, modifications and repairs must be done by a technician or a specialist repair centre.

- If you have questions which remain unanswered by these operating instructions, contact our technical support service or other technical personnel.

b) Setup

- Place the 3D printer on a level, horizontal surface of a sufficient size.

- Install the 3D printer in a location that is out of the reach of children.

- Ensure that the power switch on the printer is easily accessible so that you can switch it off quickly in the event of a fault.

- Do not expose the printer to extreme temperatures, strong vibrations, high humidity (e.g. rainwater or steam) or strong mechanical loads.

- Never place containers (e.g. glasses or vases) filled with liquid on or directly next to the printer or pour liquids over the appliance. Liquids may come into contact with the interior components and impair the electrical safety of the product or cause a fire or fatal electric shock.

  If the printer comes into contact with liquids, isolate the mains socket (e.g. switch off the circuit breaker and RCD), and then unplug the mains plug from the mains socket. Disconnect all cables from the printer. Discontinue use and take the printer to a specialist repair centre.

- Do not place open flames (e.g. burning candles) on or next to the printer.

c) Mains cable/connection

- The mains socket that the printer is plugged into must be easily accessible.

- Only power the product using the mains adapter provided.

- Only insert the mains adapter into a standard mains socket that is connected to the public grid. Before plugging in the power adapter, check whether the voltage stated on the power adapter complies with the voltage of your electricity supplier.

- Fully unwind the mains cable before use, otherwise the cable may overheat and cause a fire!

- Never connect or disconnect the power adapter if your hands are wet.

- Never unplug the power adapter from the mains socket by pulling on the cable. Always use the grips on the plug.

- Make sure that the mains cable is not squeezed, bent, damaged by sharp edges or subjected to mechanical stress. Avoid excessive thermal stress on the mains cable from extreme heat or cold. Do not attempt to modify the mains cable, as this may cause permanent damage. Damaged mains cables can cause a fatal electric shock.

- Do not allow the mains cable to hang over the edge of the table or other surface supporting the 3D printer.

- Always lay the cables so that nobody can trip over or become entangled in them, as this may cause an injury.

- For safety reasons, disconnect the power adapter from the mains socket during storms.

- Unplug the power adapter if you do not plan to use the 3D printer for an extended period.

- Always disconnect the power adapter before leaving the printer unattended.

- Before conducting any repair or modification work, disconnect the printer from the mains and computer and allow it to cool down.
- Do not touch the mains cable if there are any signs of damage. If the mains cable is damaged, isolate the mains socket (e.g. switch off the circuit breaker and RCD), and then unplug the mains plug from the mains socket. Do not use the printer with a damaged mains cable.
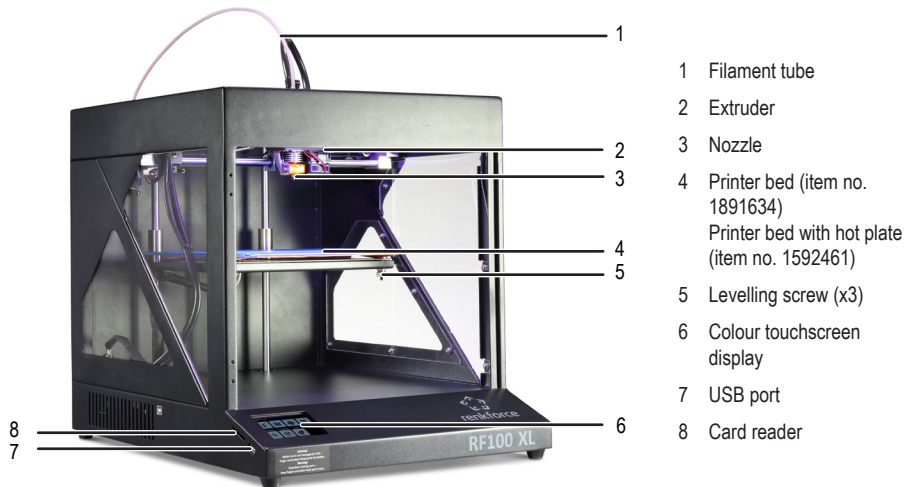
d) Operation

- Do not use the 3D printer outdoors.
- Do not use the printer near bath tubs, showers, swimming pools or washbasins. It must not be exposed to moisture.
- Some parts of the printer can become very hot and may cause burns. Exercise caution in the presence of children and vulnerable people.
- The nozzle (for item no. 1891634 and 1592461) and hot plate (for item no. 1592461) become very hot during use. Never touch these parts during or shortly after use. Allow them to cool down sufficiently (approx. 60 mins).
- Do not place any objects on the printer, as this may cause it to overheat. Never cover the printer during use.
- Never place your hands inside the 3D printer during use. The printer contains moving mechanical parts that may cause an injury.
- Before conducting any repair or maintenance work, disconnect the printer from the power supply (unplug the power adapter) and allow it to cool down.
- The printer makes a noise during use and may produce an odour depending on the type of filament material used. Bear these points in mind when selecting a setup location and choosing the filament material. Ensure that there is sufficient ventilation, or install an extraction system. Avoid inhaling the vapours produced by the printer. Other filament materials that are not recommended may produce poisonous vapours or gases.
- Do not operate the device when it is unattended.
- Only use the product in temperate climates. It is not suitable for use in tropical climates.
- Never use the product immediately after it has been brought from a cold room into a warm one. The condensation generated may destroy the product. Allow the product to reach room temperature before connecting it and putting it to use. This may take several hours.
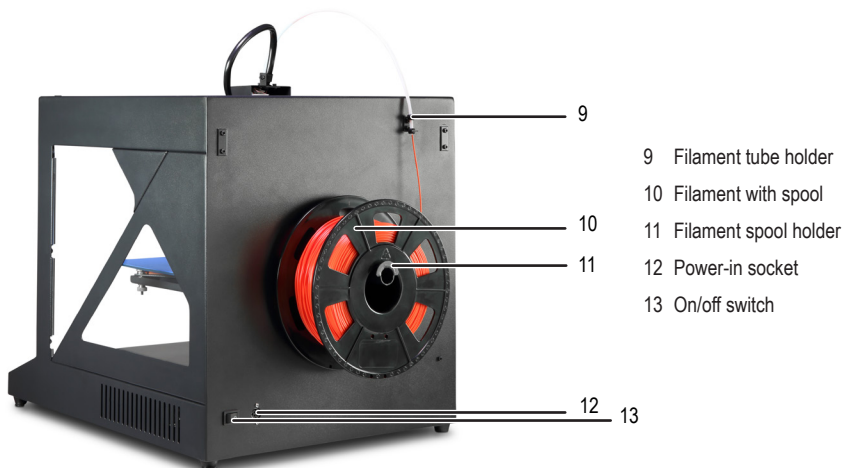
9. Control elements and components

a) 3D printer

Front

1 Filament tube

2 Extruder

3 Nozzle

4 Printer bed (item no. 1891634)
Printer bed with hot plate (item no. 1592461)

5 Levelling screw (x3)

6 Colour touchscreen display

7 USB port

8 Card reader

Back

9 Filament tube holder

10 Filament with spool

11 Filament spool holder

12 Power-in socket

13 On/off switch

b) Accessories

A   ABS filament (for item no. 1592461)

B   Small power adapter (for item no. 1891634)

C   Large power adapter (for item no. 1592461)

D   Mains cable

E   USB cable

F   Scraper

G   SD card

H   Tweezers

I   2 / 2.5 mm hex key

J   2x screws

K   Wire cutter

L   Filament tube

M   Filament spool holder

N   5x Original Renkforce filament samples

O   Original Renkforce PLA filament with spool

10. Before installation

- Carefully remove all parts from the packaging.

- Remove the protective film from the colour touch display.

- Cut the cable ties on both sides using a wire cutter.

- Ensure that no parts are missing or damaged. Do not use the printer if parts are missing or damaged.

11. Assembly

a) Setting up the 3D printer

⚠ When choosing a location for the 3D printer, ensure that the power switch is easily accessible so that you can switch it off quickly in the event of a fault.

Ensure that there is sufficient ventilation around the printer. Do not place the printer on soft surfaces (e.g. rug or bed). The air must be able to circulate freely and must not be obstructed by other objects. This would prevent heat from dissipating from the printer and lead to overheating (fire hazard).

Place the printer on a stable surface and ensure that it is securely in place. It may cause an injury if it falls off the surface.

Ensure that the USB and mains cable are not pinched or damaged by sharp edges.

Lay the cables in a place where people will not trip over them or become entangled. This may cause an injury.

- Place the 3D printer on a dry, level surface that is not sensitive to vibrations.

Anti-slip feet are attached to the bottom of the printer. If necessary, place a protective cover underneath the printer to prevent the surface from getting scratched.

b) Installation and connection

⚠ **The mains socket must be close to the printer and easily accessible so that you can quickly disconnect the printer from the mains in the event of a fault.**

Exercise caution when handling the mains cable and connecting it to the mains. Mains voltages can cause fatal electric shocks.

Before connecting the printer to the mains, check that the voltage stated on the printer matches the voltage of the mains socket. If not, do not connect the printer to the mains. An incorrect mains voltage can cause irreparable damage to the printer and endanger the user.

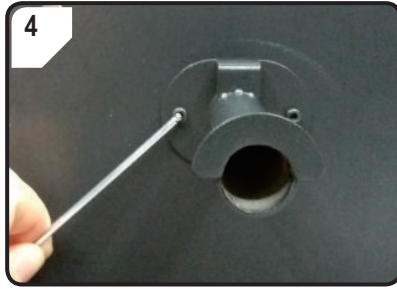**1**
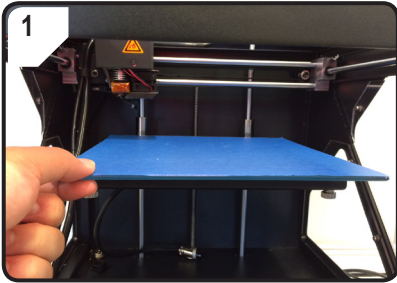
• Insert the print bed.

2
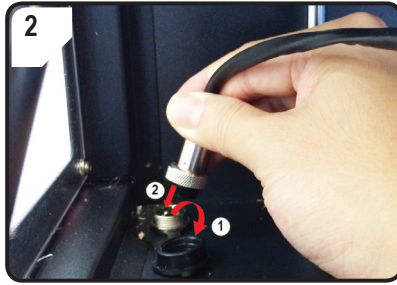
Only for item no. 1592461

• Remove the protective cover on the hot plate power socket (①).
• Plug the hot plate power cable into the socket (②).
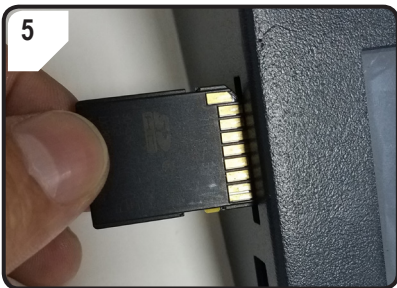• Secure the connection: Turn the lock nut onto the hot plate connection.
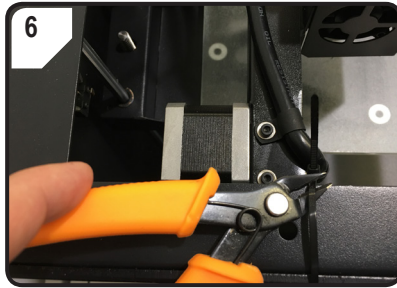
3
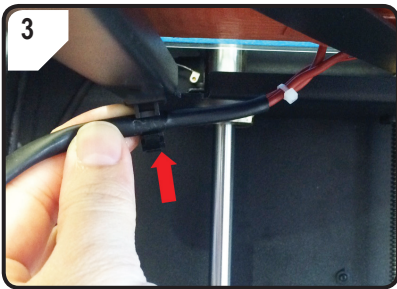
Only for item no. 1592461

• Insert the hot plate cable into the cable holder (on the bottom of the print bed).

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• Use two screws and the 2.5 mm hex key to attach the filament spool holder to the back of the 3D printer.

The "nose" on the end of the holder should face upwards.

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• Insert the SD card with the label facing downwards.

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• Cut through the cable tie on both sides using the wide cutter.

- Connect the mains cable to the power adapter, and then connect the power cable to the 3D printer.
- Plug the mains plug on the power cable into a mains socket.
- Move the on/off switch to the **I** position to switch the 3D printer on.

- The printer light will turn on.
- < ReadyPrint > will appear on the touchscreen display.
  The 3D printer is now ready for use.

12. Control panel

- The following explanations apply to printer firmware V2.1. Newer versions may have different functions.
- The 3D printer can be controlled using the control panel on the colour touchscreen display.
- Some options are highlighted in yellow after confirmation.

→ **The hot plate settings only apply to the RF100 XL Plus (item no. 1592461).**

a) General functions

Icon	Menu option	Function
⊕	< Add >	Increase the corresponding value.
⊖	< Dec >	Decrease the corresponding value.
⏏	< Back >	Return to the previous menu.

b) Menu options and functions

Icon	Menu option	Function
Main menu < ReadyPrint > (3D printer is ready for use)		
	< Preheat >	Go to the < Preheat > menu to adjust the temperature of the nozzle or hot plate.
	< Filament >	Go to the < Filament Change > menu to insert or remove a filament.
	< Fan >	Go to the < Fan > menu to set the fan speed.
	< Print >	Go to the < ChooseFile > menu to select a preset printing model.
	< Move >	Go to the < Move > menu to set the position of the X, Y and Z axes.
	< Home >	Go to the < Home > menu to set the X, Y and Z axes to the default position.
	< MotorOFF >	Switch off the motor. The extruder and print bed can be moved by hand on the X, Y and Z axes.
	< Setting >	Go to the < Set > menu to configure additional settings.
< Preheat > menu		
	< Add >	Increase the temperature of the extruder or hot plate. ⚠ Do not use the nozzle continuously at 260 °C. Continuously operating the printer at temperatures above 260 °C significantly reduces the life span of the extruder. Allow the printer to cool down before using it again.
	< Dec >	Decrease the temperature of the extruder or hot plate.
	< Extruder >	Heated object - < Extruder > (Extruder/nozzle) / < Heatbed > (hot plate) - select by touching the corresponding icon.
	< Heatbed >	

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Icon	Menu option	Function
	< 10°C >	
	< 5°C >	The temperature can be set in 10/5/1 % increments. Touch an icon to select one of these options.
	< 1°C >	
	< Turn Off >	Switches off the nozzle (for item no. 1592461, 1891634) or the hot plate (for item no. 1592461).
	< Back >	Return to the previous menu (< ReadyPrint >).

< Filament Change > menu

Icon	Menu option	Function
	< Load >	Load filament into the extruder. The nozzle temperature must be higher than 170 °C.
	< Unload >	Remove filament from the extruder. The nozzle temperature must be higher than 170 °C.
	< Normal >	Touch the icon to set the loading/conveying speed for the filament. There are 3 speed settings:
	< Fast >	- < Normal > (default setting) - < Fast > - < Slow >
	< Slow >	The loading speed depends on the print speed. The nozzle may become blocked if the loading speed is too high.
	< Preheat >	Go to the < Preheat > menu to adjust the temperature.
	< Stop >	Stops the extruder (for item no. 1592461, 1891634) or the hot plate (for item no. 1592461).
	< Back >	Return to the previous menu (< ReadyPrint >).

< Fan > menu (fan for cooling the printed object)

Icon	Menu option	Function
	< Turn off >	Switches the fan off.

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Icon	Menu option	Function
50%	< 50% >	Reduces the fan speed by half.
75%	< 75% >	Reduces the fan speed by 25%.
100%	< 100% >	Sets the fan speed to maximum (default setting).
	< Back >	Return to the main menu (< ReadyPrint >).
< Print > menu		
		See "5. SD card contents" on page 6 for details.
	< gcode >	Before printing: Select a print template in .gcode format. During printing: Display the printing status and view/configure the parameters.
	< PageUP >	Return to the previous page.
	< Back >	Return to the main menu (< ReadyPrint >).
	< Page Down >	Go to the next page and view more print templates.
< Option > menu, displayed during the printing process		
	< Option >	List with parameters for setting the print speed, nozzle temperature, hot plate temperature, fan speed and filament loading speed.
		Display the nozzle temperature.
		Display the hot plate temperature.
		Display the printing speed.
		Display the fan speed.

Icon	Menu option	Function
< Printing > menu, displayed during the printing process		
(II)	< Pause >	Pause the printing process.
(▶)	< Resume >	Resume the printing process.
(■)	< Stop >	Stop the printing process. The nozzle and print bed will return to their initial position. The extruder will start the cooling process. It may take several seconds for the extruder to stop moving.
🌡°C	< Temp. >	Set the temperature of the nozzle or hot plate. You can choose a nozzle temperature between 0 and 260 °C. ⚠ Do not use the nozzle continuously at 260 °C. Continuously operating the printer at temperatures above 260 °C significantly reduces the life span of the extruder. Allow the printer to cool down before using it again.
🕐	< Speed >	Access the < Speed > menu to adjust the printing/filament loading speed.
🌀	< Fan >	Access the < Fan > menu to set the fan speed.
🚪	< Back >	Return to the previous menu (< Option >).
< Speed > menu, displayed during the printing process		
(+)	< Add >	Increase the printing/filament loading speed.
(−)	< Dec >	Decrease the printing/filament loading speed.
◀◆▶	< Move>	The printing speed can be set from 10 to 300 %. The standard setting is 100 %. ⟶ The printing speed is set by the "Cura" software when the GCODE file is generated. The speed option allows you to adjust the speed as a percentage of the preset speed (e.g. 150 %). For best results, use the "Cura" software to set the desired speed.

Icon	Menu option	Function
	< Flow>	The filament loading speed can be set from 10 to 300 %. The standard setting is 100%. The loading speed depends on the print speed. The nozzle may become blocked if the loading speed is too high.
	< 10% >	
	< 5% >	The speed can be set in 10/5/1% increments. Touch an icon to select one of these options.
	< 1% >	
	< Back >	Return to the previous menu (< Speed >).
< Move > menu (moves the axes)		
	< X+ >	Select the amount of movement for the X-axis: The extruder will move x steps to the right along the X-axis.
	< Y+ >	Select the amount of movement for the Y-axis: The extruder will move backwards along the Y-axis towards the control panel.
	< Z+ >	Select the amount of movement for the Z-axis: The extruder will move x steps downwards along the Z-axis.
	< 10 mm >	
	< 1 mm >	The X/Y/Z-axis movements can be adjusted in 10/1/0.1 mm increments. Touch an icon to select one of these options. The default increment is 10 mm.
	< 0.1 mm >	
	< X- >	Select the amount of movement for the X-axis: The extruder will move x steps to the left along the X-axis.
	< Y- >	Select the amount of movement for the Y-axis: The extruder will move forwards along the Y-axis.

Icon	Menu option	Function
⬆	< Z- >	Select the amount of movement for the Z-axis: The extruder will move upwards along the Z-axis.
🚪	< Back >	Return to the main menu (< ReadyPrint >).
< Home > menu		
🏠	< Home All >	The print bed and extruder will return to their initial position.
Ⓧ	< Home X >	The extruder will return to the zero position along the X-axis.
Ⓨ	< Home Y >	The extruder will return to the zero position along the Y-axis.
Ⓩ	< Home Z >	The extruder will return to the zero position along the Z-axis.
🚪	< Back >	Return to the main menu (< ReadyPrint >).
< Set > menu		
💾	< USB Settings >	Access the < FileSys > menu to select the printing source.
🖥	< Select Source >	Access the < Connect > menu to select the connection source.
Levelling	< Leveling >	Access the < Leveling > menu to calibrate the print bed.
📝	< About >	Display the firmware version and model number of the 3D printer.
🚪	< Back >	Return to the main menu (< ReadyPrint >).

Icon	Menu option	Function
< FileSys > menu		
SD	< SD Card >	Select "Print from the SD card" (default setting). Touch to confirm your selection. The icon will be highlighted in yellow. → The 3D printer must be disconnected from your computer. If necessary, unplug the USB cable from your computer.
	< USB drive >	Select "Print from a USB stick". Touch to confirm your selection. The icon will be highlighted in yellow.
	< Back >	Return to the previous menu (< Set >).
< Connect > menu		
9600	< 9600 >	No function.
57600	< 57600 >	No function.
115200	< 115200 >	Select "Control the 3D printer via the control panel". Touch to confirm your selection. The icon will be highlighted in yellow. → The 3D printer must be disconnected from your computer. If necessary, unplug the USB cable from your computer.
250000	< 25000 >	Select "Control the 3D printer with a computer". Touch to confirm your selection. The icon will be highlighted in yellow. → You will not be able to set the parameters via the control panel after connecting the 3D printer to a computer.
	< Back >	Return to the previous menu (< Set >).
< Leveling > menu		
	< First >	Set the first calibration point for the print bed. The extruder will move to the first calibration point.
	< Second >	Set the second calibration point for the print bed. The extruder will move to the second calibration point.

Icon	Menu option	Function
	< Third >	Set the third calibration point for the print bed. The extruder will move to the third calibration point.
	< Fourth >	Set the fourth calibration point for the print bed. The extruder will move to the fourth calibration point.
	< Back >	Return to the previous menu (< Set >).

c) Display layout during the printing process
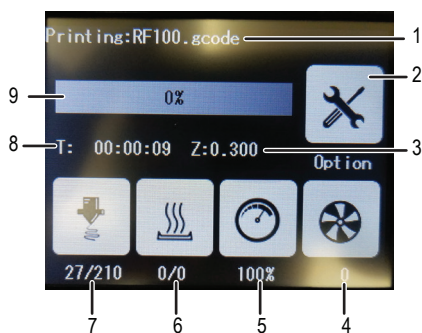
1 Name of the print model that is currently printing

2 < Option > menu for setting the print/fan/filament loading speed and nozzle/hot plate temperature.

3 Current position of the Z-axis

4 Fan speed

5 Print speed

6 Hot plate: Current temperature / target temperature

7 Nozzle temperature (current temperature / target temperature)

8 Elapsed time

9 Printing progress in %

d) Menu overview

Ready Print	**Preheat**	Add						
		Dec						
		Extruder	Heatbed					
		10°C	1°C	5°C				
		TurnOff						
		Back						
	Filament **Filament Change**	Load						
		Unload						
		Normal	Fast	Slow				
		Preheat						
		Stop						
		Back						
	Fan	Turnoff						
		50%	75%	100%				
		Back						
	Print	gcode	**Option**	**Printing**	Resume			
					Pause			
					Stop			
					Temp.	**--> Preheat**		
					Adjust **Speed**	Add		
						Dec		
						Move		
						Flow		
						10%	1%	5%
						Back		
					Fan	**--> Fan**		
					Back			
		PageUP						
		Page Down						
		Back						

Ready Print	Move	X+						
		Y+						
		Z+						
		10 mm	0,1 mm	1 mm				
		X-						
		Y-						
		Z-						
		Back						
	Home	Home All						
		Home X						
		Home Y						
		Home Z						
		Back						
	Motor OFF							
	Setting Set	USB Settings FileSys	SD Card					
			USB drive					
			Back					
		Select Source Connect	115200					
			25000					
			Back					
		Leveling	First					
			Second					
			Third					
			Fourth					
			Back					
		About						
		Back						

13. Tips for 3D printing

⚠️ Never disconnect the power supply, USB cable or SD card during the printing process.

- The print quality depends on numerous factors. These include:
  - Print speed
  - Layer thickness
  - Printer bed calibration
  - Nozzle temperature
  - Hot plate temperature (for item. 1592461)
  - Filament loading speed
  - 3D model structure
- These factors mean that it is not always possible to achieve a satisfactory result after the first print attempt. Fine-tune the parameters to improve the print quality.
- Each material requires different print settings.
- Avoid an overhang of more than 45°. If necessary, use the structural platform option in "Cura" and remove the platform after printing.

a) Nozzle temperature

- The optimum nozzle temperature depends on the filament material and the layer thickness. The printing temperature for the filament varies depending on the material and manufacturer. Always check the specifications of the filament before printing. For best results, use Renkforce Original filaments.
- Use the standard temperature for the first test print.
- To optimize the print quality, print the same object with the same layer thickness and a different nozzle temperature. Adjust the temperature in 5 °C increments, and then compare the test prints.

  This enables you to determine the optimal nozzle temperature for different filaments and layer thicknesses.
- If the nozzle temperature is too high, the material may fail to cool down quickly, causing it to melt into the layer underneath.
- If the nozzle temperature is too low, the filament will be too thick and it will not flow evenly. In addition, the filament layers may not adhere properly.

b) Preventing nozzle blockages

- Do not leave the nozzle at a high temperature for an extended period without printing.
- When loading the filament, hold the nozzle at a distance of least 20 mm from the print bed.
- Remove the filament after use.
- Ensure that there is sufficient ventilation. Do not cover the ventilation slots on the extruder.

c) Layer thickness

- The layer thickness determines the height of the individual layers and therefore the resolution and quality of the printed object.

- Thinner layers produce higher quality prints, but result in longer printing times.

- Thicker layers result in lower quality prints and shorter printing times.

→ Experiment with the aforementioned parameters until the printer produces a satisfactory result for your chosen material.

Use the PLA filament for the first few test prints, as this material is easy to handle and does not stick together when it cools down. It also adheres very well to the print bed.

d) Hot plate temperature (for item no. 1592461)

- The optimal hot plate temperature depends on the filament material. Using an optimal temperature ensures that the printed object adheres well to the hot plate.

- When the blue tape runs out, replace it with an identical tape to improve the surface adhesion.

- If the temperature of the hot plate is too high, the printed object may become distorted, or the lower layers may cool down too slowly.

- If the temperature of the hot plate is too low, the printed object may not adhere properly, or the edges may become loose during printing.

→ PLA can be printed without the hot plate. The optimal temperature in this scenario is 60 °C.

When printing with PLA (especially with small objects with a small surface area), the hot bed should be covered with plastering tape or a slightly textured masking tape to improve the surface adhesion.

14. Preparation

a) Calibrating the print bed
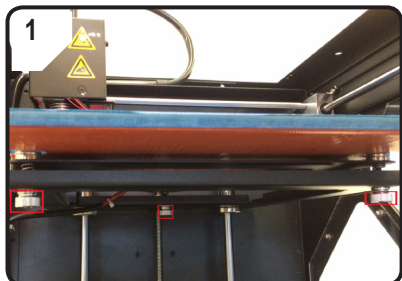
- Tighten the 3 levelling screws under the print bed as far as they will go.
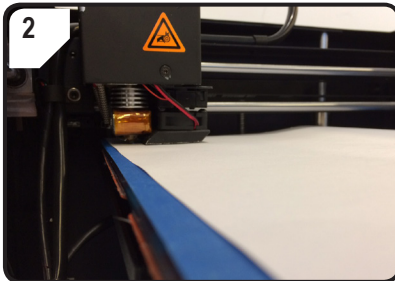
- Place an A4 sheet of paper between the nozzle and the print bed to use as a measurement guide.
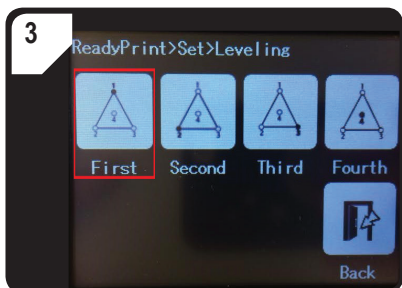
- Go to the < ReadyPrint > menu. Select < Set >, and then select < Levelling >.
- Touch < First >. The nozzle will move to the first point.
- Turn the first levelling screw to control the distance between the nozzle and print bed.
- The distance should be approximately 0.3 m (use an A4 sheet of paper as a measurement aid). The paper should be gently clamped so that you feel slight resistance when moving the paper. The nozzle must not touch the print bed!
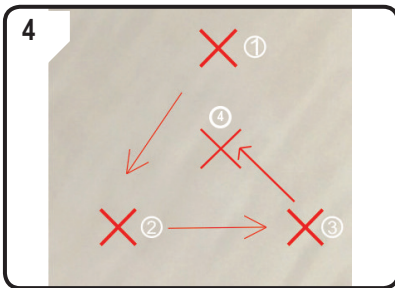
- Repeat step 3 for the second, third, and fourth point (calibration sequence and motion direction of the nozzle are shown above).

→ When adjusting the print bed, always ensure that the distance between the nozzle and the print bed is the same, otherwise the print bed will be uneven and the printed objects will not adhere properly.

If the distance between the nozzle and print bed is too small/large, repeat steps 3 and 4.

b) Attaching the filament

• Mount the filament on the spool holder.

• Insert the filament tube into the tube holder.
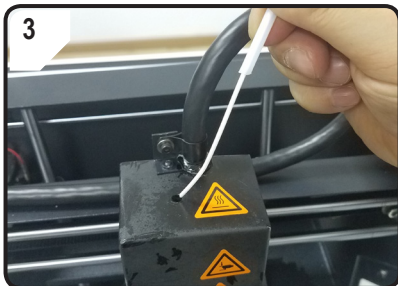
• Insert the filament into the tube until approximately 5 cm is visible at the end of the extruder.

c) Loading the filament
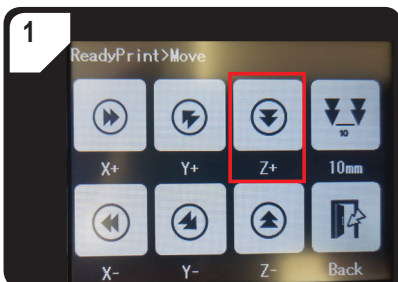
• In the < ReadyPrint > menu, select < Move > and then press < Z+ > twice to increase the distance between the nozzle and the print bed.
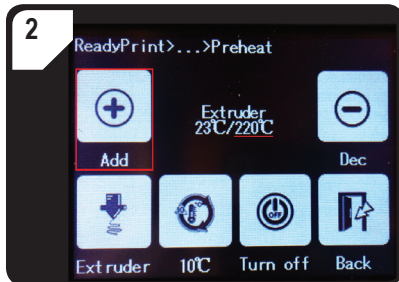
• Go to the < ReadyPrint > menu. Select < Filament >, and then select < Preheat >.

• Touch < Add > several times until the target temperature of 220 °C is displayed.
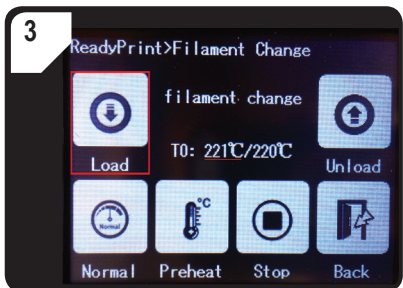
- Go to the < Filament Change > menu and wait until the current temperature (in this case 221 °C) has reached the target temperature (220 °C).
- Touch < Load >.

- <Filament changing > will appear on the touchscreen display. The 3D printer is now ready to load the filament.

- Gently slide the filament forwards until it is slowly pulled into the extruder.
- Release the filament.
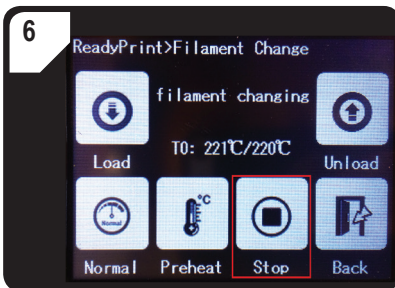
- If filament comes out of the nozzle, touch < Stop >.
- Use the tweezers to remove excess filament.

→ When adjusting the print bed, always ensure that the distance between the nozzle and the print bed is the same, otherwise the print bed will be uneven and the printed objects will not adhere properly.

d) Removing the filament

• Ensure that the nozzle temperature is not higher than 170 °C.

⚠️ Do not touch the nozzle – burn hazard!

• Go to the < Home > menu and select < Home All >. The print bed and extruder will return to the initial position.
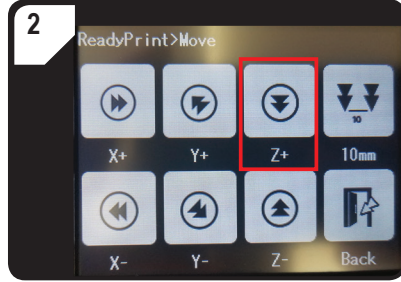
• In the < ReadyPrint > menu, select < Move > and then press < Z+ > twice to increase the distance between the nozzle and the print bed.
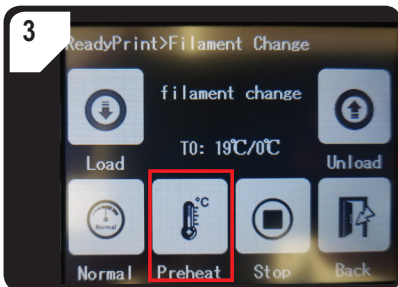
• Go back to the < ReadyPrint > menu. Select < Filament >, and then select < Preheat >.
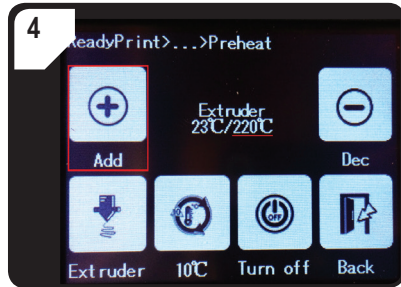
• Press < Add > several times until the target temperature of 220 °C is reached.
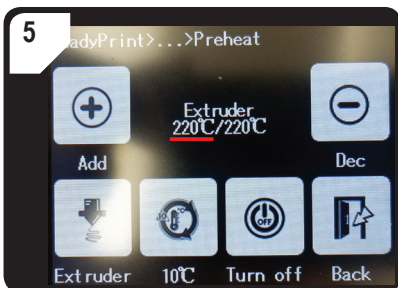
• Wait until the actual temperature (in this case 220 °C) has reached the target temperature.
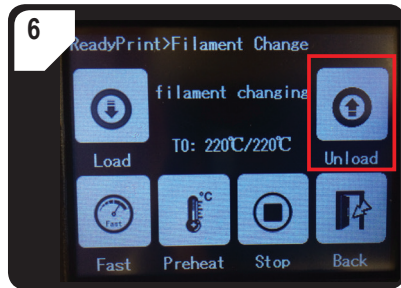
• Go back to the < Filament Change > menu, and then select < Unload >.

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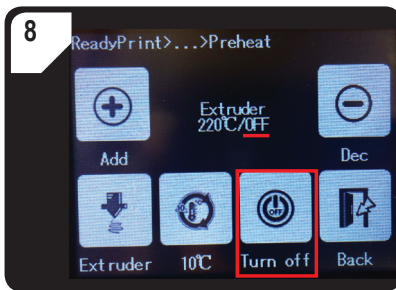
- If the filament can be pulled out of the top of the extruder, select < Stop >.
- Carefully remove the filament and filament tube from the top of the extruder.

- Go back to the < Preheat > menu and select < Turn off >.
- The extruder will stop heating. < OFF > will be displayed in place of the target temperature.
- Use the tweezers to remove filament residue from the nozzle.

e) Changing/replacing the filament

Change the filament when you want to use another colour or material.

Replace the filament when it is empty.

Before changing or replacing the filament, the extruder must be heated to ensure that the old filament can be removed from the extruder without any residue.

⚠️ Do not touch the nozzle – burn hazard!

- Remove the filament.
- Remove the filament spool from the spool holder and place the new filament on the spool holder.
- Align the filament.
- Load the filament.
- Extrude the new filament until the residue from the old filament has been completely removed from the extruder. This can be determined by the change in colour.
- Remove the residue with the tweezers

f) Installing the "Cura" software (optional)

Refer to "16. Printing with the "Cura" software" on page 39 for detailed instructions.

15. Printing from the SD card/USB stick

⚠ The printer may produce smoke or steam during the heating process. This is normal. Ensure that there is sufficient ventilation.

Never expose the print bed to mechanical stress, as this may cause it to break.

Printing directly from an SD card/USB stick (USB stick not included) is only possible via the control panel. The software does not need to be installed. If the 3D printer is connected to a computer, it must be disconnected before printing. Unplug the USB cable, otherwise the 3D printer will not recognize the SD card/USB stick.

a) Printing from the SD card

• Go to the < ReadyPrint > menu and select < Setting >.

• Select < USB Settings >.
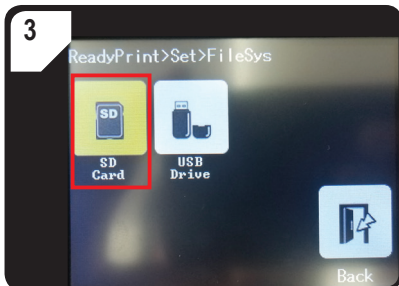
• Select < SD card > as the print source.
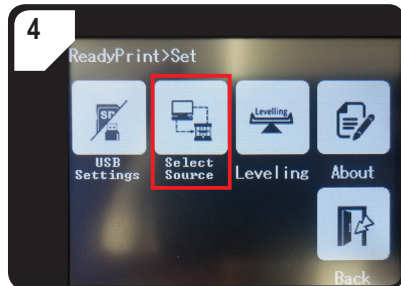
• Go back to the < Set > menu and select < Select Source >.
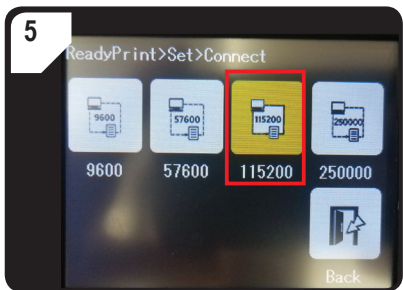
- Select < 115200 > to control the 3D printer via the control panel.

b) Printing from a USB stick

By default, the printing source is set to the SD card. If you want to print from a USB stick, follow the steps below.

- Go to the < ReadyPrint > menu and select < Setting >.
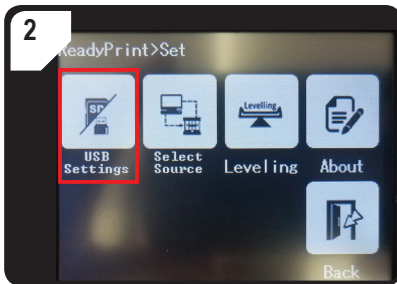
- Select < USB Settings >.
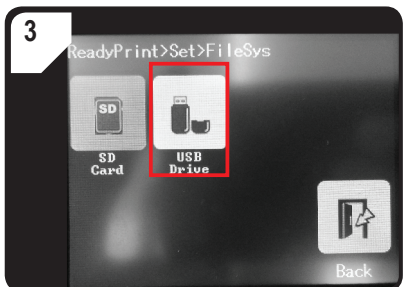
- Select < USB Drive > as the print source.
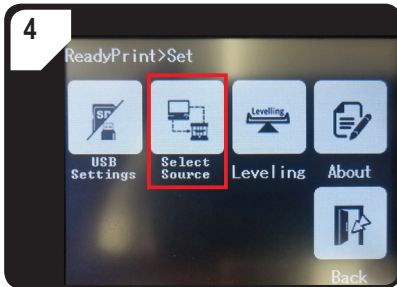
- Go back to the < Set > menu and select < Select Source >.
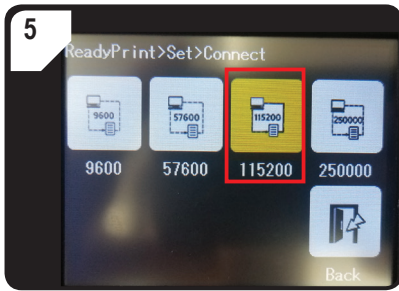
- Select < 115200 > to control the 3D printer via the control panel.
- The icon will be highlighted in yellow for confirmation.

c) Starting the printing process
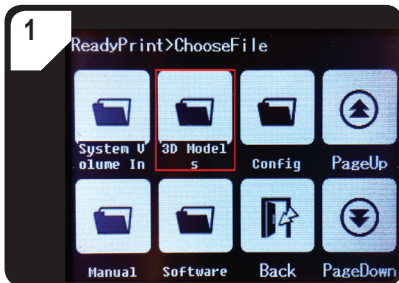
- Go to the < ReadyPrint > menu and select < Print >. Keep touching < PageDown > until the < 3D Models > folder is displayed.
- Open the < 3D Models > folder.
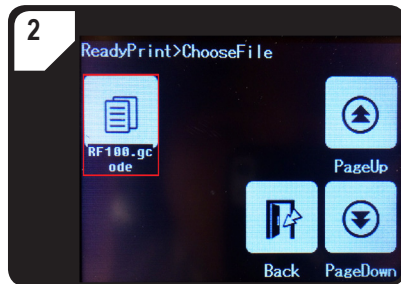
- Select a ready-to-print model (e.g. < RF100. gcode >) from the < 3D Models > folder.

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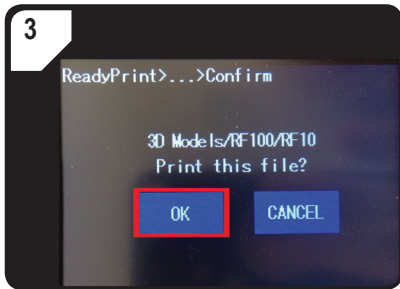
• Touch < OK > to confirm.

• < Printing > will appear on the touchscreen display.

• The print bed will move towards zero along the Z-axis. The nozzle will move to the starting position and start to heat up.

• Printing will start when the target temperature (e.g. 210 °C) has been reached.

• The printing progress is displayed in percent.

• Let the object cool down for a few minutes when it has finished printing.

• Remove the print bed (if necessary) and carefully remove the printed object with the scraper.

d) Pausing the printing process

⚠ The nozzle continues to heat when printing is paused. Only pause printing for short periods, otherwise the nozzle may overheat and become blocked.

• Go to the < Printing > menu and select <Pause >.

• To continue printing, select < Resume >.

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e) Configuring parameters during the printing process

⚠ **Only recommended for experienced users.**

• Go to the < Option > menu and select < Printing > to set the print speed, nozzle/hot plate temperature and fan/ filament loading speed.

⚠ **Print speed:** Observe the printing process and adjust the print speed accordingly. The print speed affects the print quality for certain objects and filaments. For example, if the print speed is too high, the printed object may not adhere properly to the print bed.

Nozzle temperature: Do not use the nozzle continuously at 260 °C. Continuously operating the printer at temperatures above 260 °C significantly reduces the life span of the extruder. Allow the printer to cool down before using it again.

Hot plate temperature (order no. 1592461): Adjust the hot plate temperature when printing objects with ABS.

Flow (load speed of the filament in the extruder): Observe the printing process and adjust the speed accordingly. If the speed is too high, the nozzle may become blocked.

Fan speed for cooling the printed object: Let the object cool down for a few minutes when it has finished printing. If the object is not easy to remove, carefully detach it using the scraper.

→ The **fan speed for cooling the motor** cannot be set manually. The fan turns off automatically when the nozzle temperature reaches 40 °C.

Stopping the printing process

• To stop printing, go to the < Printing > menu and select < Stop >. It may take several seconds for the 3D printer to come to a complete standstill.

• The nozzle will return to its initial position and the print bed will move downwards. The nozzle will start to cool down.

f) Restarting the 3D printer

• Restart the 3D printer in the following scenarios:

- If incorrect/no information is displayed on the colour touchscreen display.

- If the 3D printer does not work properly.

• If a USB cable is connected, unplug it from the printer.

• Switch the 3D printer off. Wait for a moment and turn it back on. You can now use the printer as normal.

16. Printing with the "Cura" software

General information

• The 3D printer is compatible with the "Cura" software, which is available for Windows® and Mac OS. Visit https://ultimaker.com/ for more information on operating system and hardware requirements. Ensure that your computer meets the minimum requirements.

• Due to space limitations, it is not possible to provide instructions for all functions of the software in this manual. Visit https://ultimaker.com/ for detailed instructions.

• The following section provides instructions on the basic functions and tells you how to produce your first prints. To simplify this process, the SD card comes with material-specific configuration files for the "Cura" software.

• "Cura" is a powerful software suite for 3D printers. It is easy to use and suitable for beginners.

⟶   The SD card comes with a preconfigured version of the software for Windows® and Mac OS. We recommend that you install this version of the software to avoid the need to manually configure the software settings. The required drivers (for Windows®) are included on the SD card.

• You can use the "Cura" software to perform the following tasks:

  - Place, rotate and scale the 3D object

  - Divide the printed object into thin layers (the 3D printer prints the object layer by layer). This creates a GCODE file.

  - Check GCODE files for errors and printability

  - Generate structural platforms and rafts for improving the print quality

  - Transfer GCODE files to the printer or save the files to an SD card to print without a computer

  - Configure and save printer/filament-specific files
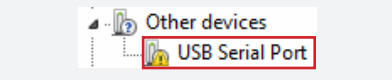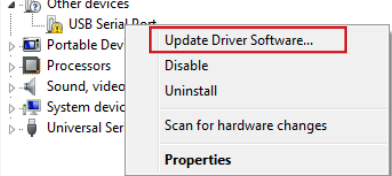
  - Manage printer and filament profiles
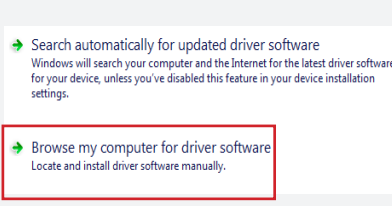
a) Installation

• Open the installation file "Cura_15.04.6.exe" (Windows®) or "Cura-15.04.6 -MacOS.dmg" (Mac OS) from the "Software" directory on the SD card.

• Follow the onscreen instructions during installation. Visit https://ultimaker.com/ for detailed instructions.

b) Setting up the software (Windows®)

Connecting the 3D printer

• Connect the 3D printer to a USB port on your computer using the USB cable provided. Switch the 3D printer on.

⟶   Keep the 3D printer switched on when it is connected to the computer.

• When you connect the 3D printer to your computer for the first time, the operating system will automatically detect the new hardware and search for a suitable driver.

⟶   If no suitable driver is found, follow the steps below to manually install the USB drivers:

1	Open the device manager on your computer. A new device will be displayed under "Other devices".	▲ Other devices USB Serial Port
2	Right click on "USB Serial Port" and select "Update Driver Software...".	▲ Other devices USB Serial Port ▷ Portable Dev Update Driver Software... ▷ Processors Disable ▷ Sound, video Uninstall ▷ System devic Scan for hardware changes ▷ Universal Ser Properties
3 4	Click on "Browse my computer for driver software". The required driver is saved to the SD card in the "software/ft232 usb UART driver" folder. Follow the onscreen instructions to complete the update.	→ Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings. → Browse my computer for driver software Locate and install driver software manually.

Starting the software

The configuration wizard will launch when the installation is complete. This provides step-by-step instructions for configuring the 3D printer.

⟶   Enter the information specific to your 3D printer model (RF100 XL or RF100 XL Plus).

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1 Select the desired language (e.g. English).
2 Click "Next".

3 Select "Other".

4 Click "Next".
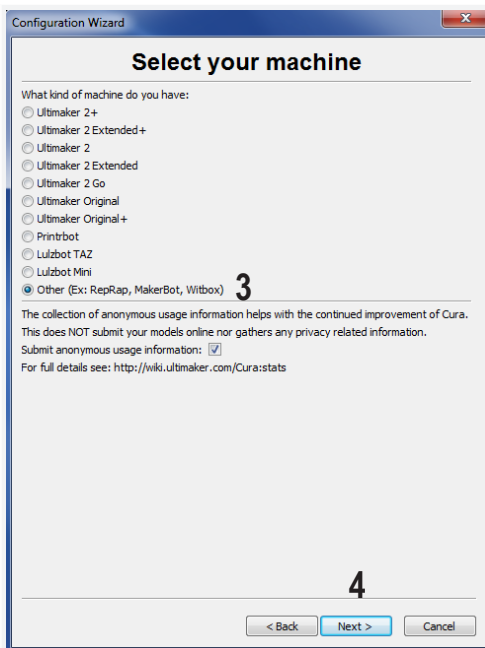
5 Select "Custom...".

6 Click "Next".

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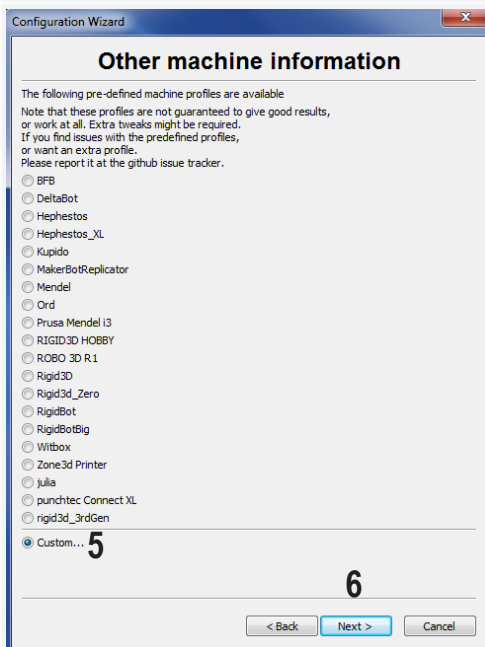
7 Enter the parameters as shown. For the RF100 XL Plus, select "Heat bed" (hot plate).

8 Click "Finish" to close the configuration wizard.

c) Setting up the software (Mac OS)

• Ensure that you set up the printer profile in the software before connecting the printer to your computer.

1	When the installation is complete, right click on the "Cura" symbol in the "Applications" folder. Select "Show Package Contents".
2	Search for "Resources/ machine_profiles".
3	Select the profile file ("RF100 XL.ini" or "RF100 XL plus.ini") on the SD card and copy it to the "machine_profiles" folder.
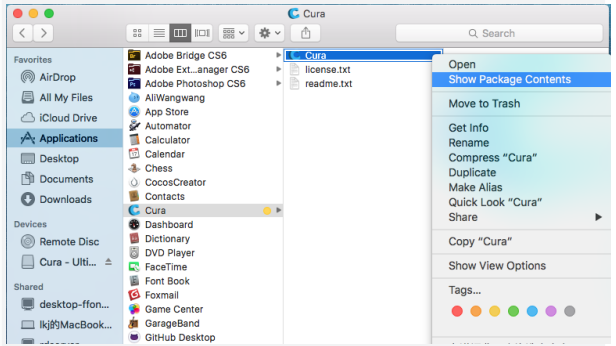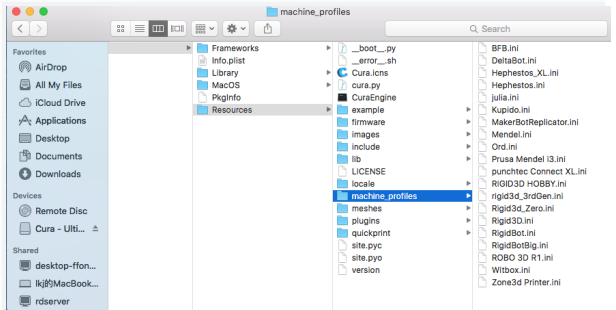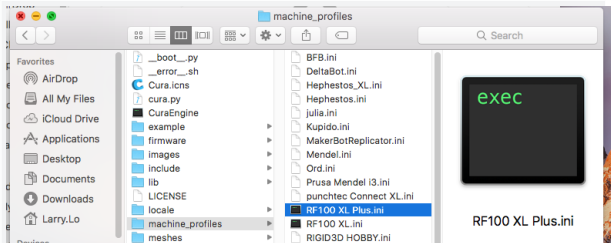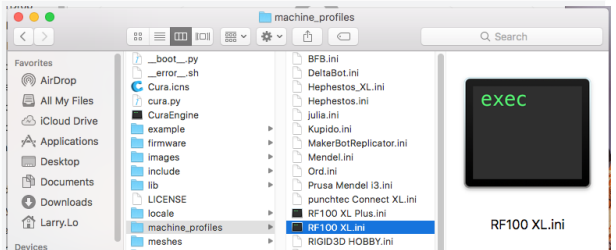
4	Launch the "Cura" software.
5	Go to the "Machine" menu and select "Add new machine",
6	Click "Next >".
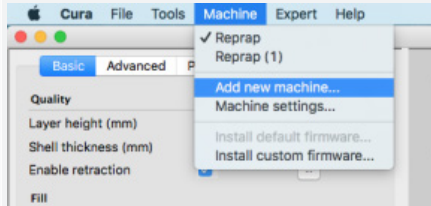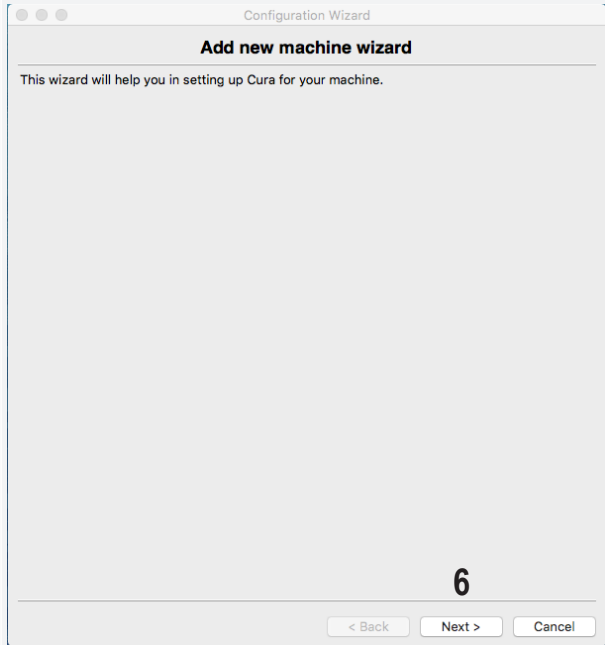
7   Select "Other".

8   Click "Next >".

Configuration Wizard

Select your machine

What kind of machine do you have:

○ Ultimaker 2+
○ Ultimaker 2 Extended+
○ Ultimaker 2
○ Ultimaker 2 Extended
○ Ultimaker 2 Go
○ Ultimaker Original
○ Ultimaker Original+
○ Printrbot
○ Lulzbot TAZ
○ Lulzbot Mini
◉ Other (Ex: RepRap, MakerBot, Witbox)   **7**

The collection of anonymous usage information helps with the continued improvement of Cura. This does NOT submit your models online nor gathers any privacy related information.

Submit anonymous usage information: ☑

For full details see: http://wiki.ultimaker.com/Cura:stats

8

< Back   Next >   Cancel

9   Select the 3D printer model.

10 Click "Next >".

Cura Ready!

Cura is now ready to be used!

11

< Back | Finish | Cancel
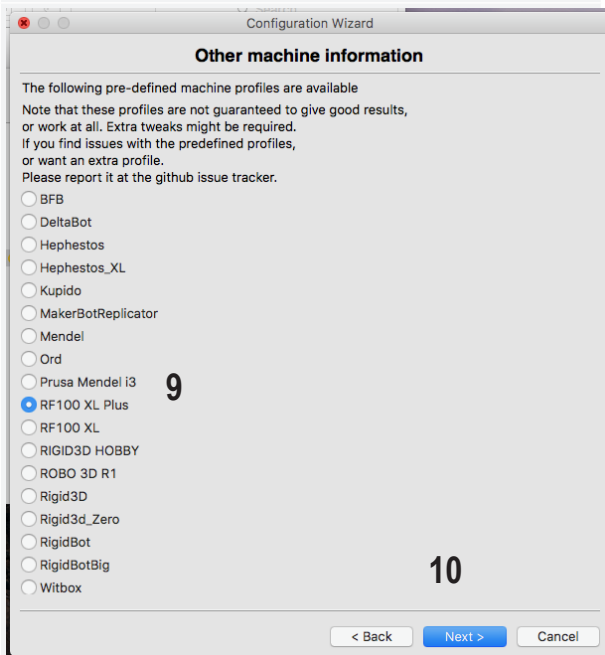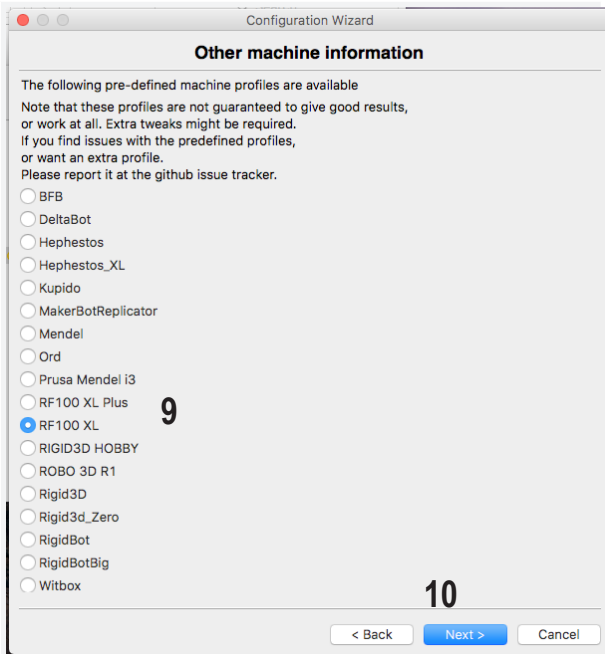
11 Click "Finish". This completes the installation process.
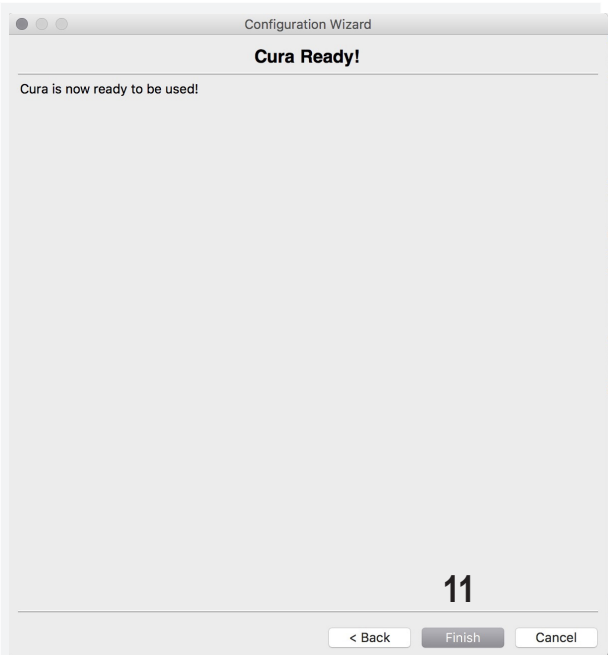
d) Software settings (Windows®)

⚠ You can also configure additional settings. These settings are intended for experienced users. Refer to the online software help for more information on these functions.

Configuring the incorrect settings can damage the 3D printer or result in defective prints. Beginners should use the basic settings.

1 Start the software.

2 Select "Machine".

3 Select "Machine settings".

4. Select the serial port to which the 3D printer is connected. The port number is independent of the system (see "Connecting the 3D printer" on page 40 for details). Set the "Baud rate" to "115200" (for both 3D printer models). Set the "Serial port" to "COM3" (for the RF100 XL) or "AUTO" (for the RF100 XL Plus).

5. Click "OK". "Machine settings" will close.
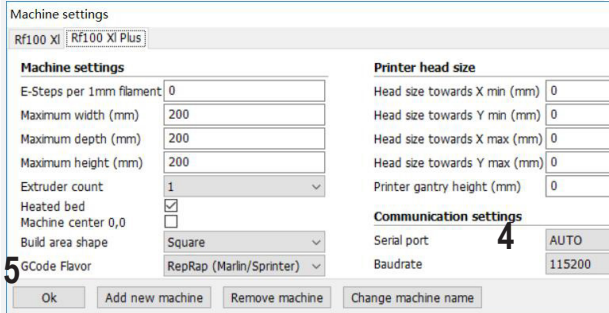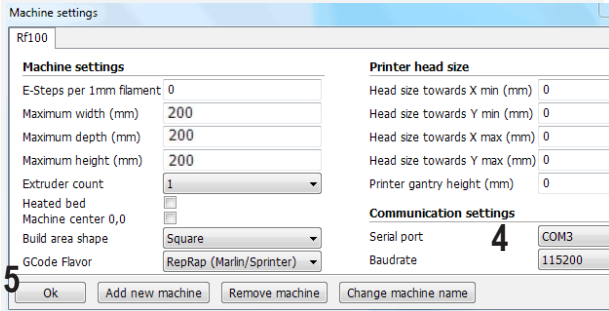
6. Configure the parameters under "Basic Settings" as shown. These are the parameter options for a PLA filament.

→ A small info window will be displayed when you move the mouse over the parameter.
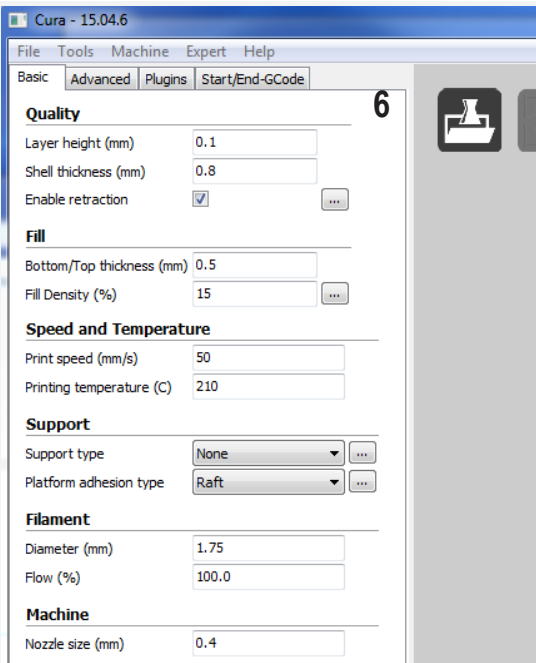
7 Configure the parameters under "Advanced" as shown. These are the possible parameters for a PLA filament.
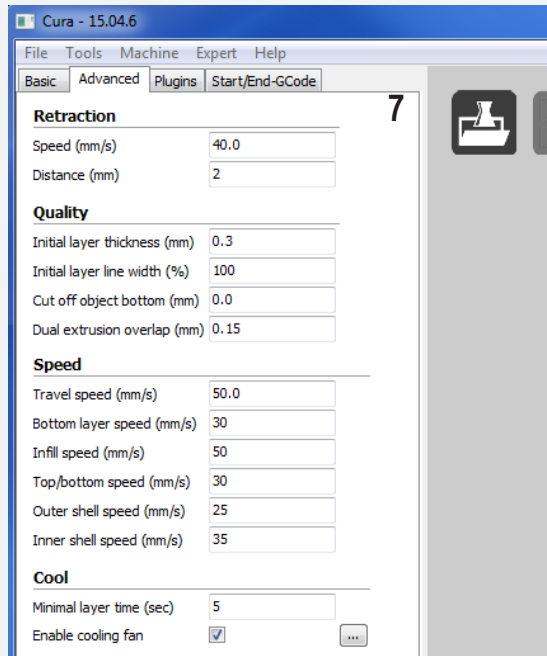
8 Select "Open expert settings" under "Expert".
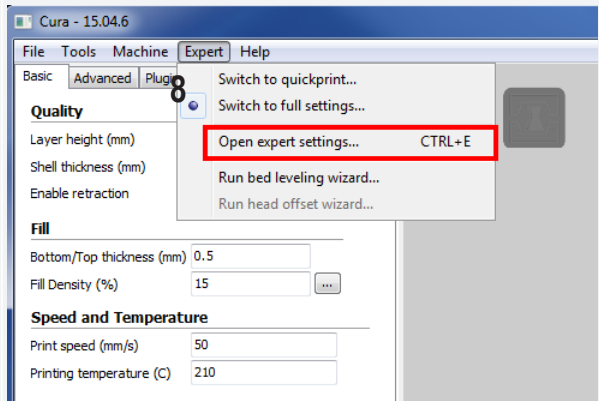
9   Configure the parameters under "Support" as shown.

10 Click "OK".
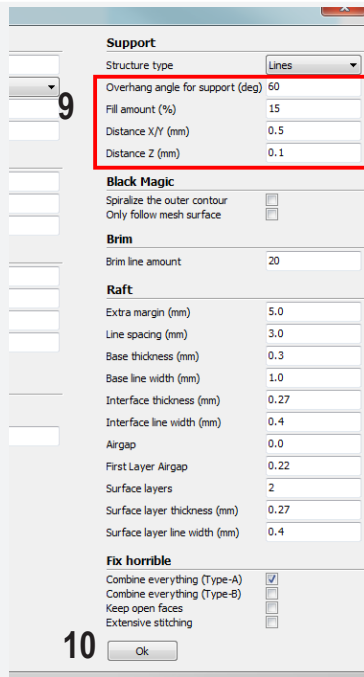
Filament diameter

The filament diameter is specified by the filament manufacturer. If the filament diameter is not specified (e.g. there is no label on the filament spool) you can calculate the diameter as follows:

• Measure 1 m of filament material.

• Take diameter measurements at 10 different points at equal intervals (measure at least 1 m of material). Use a caliper to take the measurements.

• Calculate the average of all the measurements to obtain the filament diameter.

The optimal temperatures vary considerably depending on the filament manufacturer, therefore you should do several test prints to determine the best temperature for your chosen filament material. Adjust the temperature in 5 °C increments and compare the results during or after printing. The first layer should always be printed more slowly at a slightly higher temperature to ensure that it adheres to the print bed.

e) Loading configuration files (Windows®)

- You can load a preset configuration file for your filament from the SD card to simplify the printing process. These configuration files are also available to download from www.conrad.com.

1   Click "File".

2   Select "Open Profile ...".
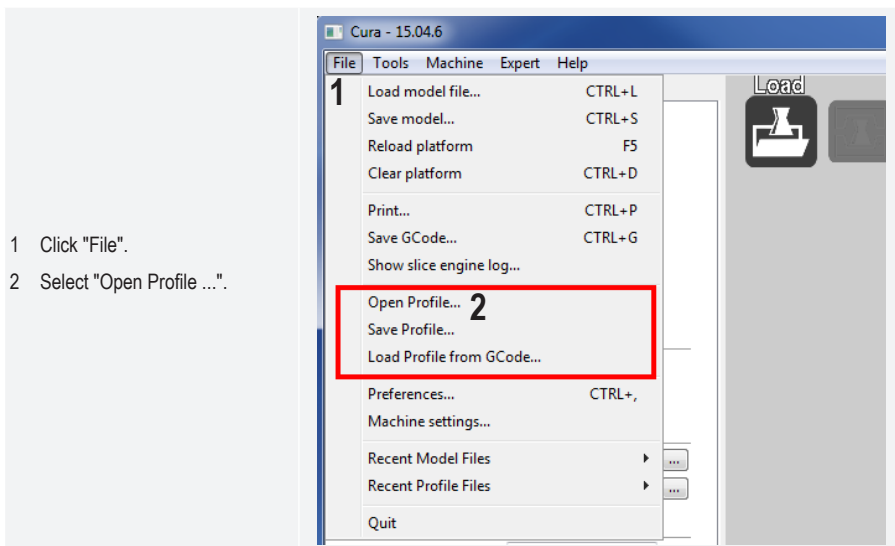
3   Select the desired filament configuration file from the pop-up window and confirm your selection.

→ The configuration files are saved to the SD card in the "Config" folder. Alternatively, you can skip this step and configure the settings from the previous section (see "d) Software settings (Windows®)" on page 48 for details).

f) Loading configuration files (Mac OS)

- Configuration files for Mac OS are not included on the SD card.

- These configuration files are available for download from www.conrad.com/downloads.

- Copy the files to your computer.

- Load the configuration files by repeating the steps in "c) Setting up the software (Mac OS)" on page 44.

→ Ensure that the downloaded configuration files start with "RF100 XL-xxx" or "RF100 XL Plus-xxx". Only these files are compatible with Mac OS. Files that start with "Config-xxx" are only compatible with Windows®.

g) Loading model files (Windows® and Mac OS)

- The "3D models" folder on the SD card contains a few examples for your first prints. You can also download a wide range of 3D models from the Internet. Alternatively, you can use a 3D program to design your own model. Ensure that the 3D model is in .stl format.

- Load the model file by running the mouse over the virtual print bed in the main window, or by clicking on . The file will be automatically converted into .gcode format.
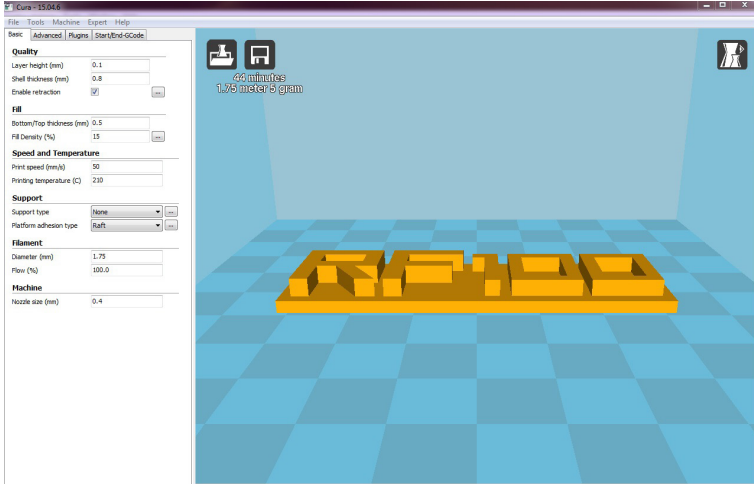
If the SD card is not inserted into your computer, click on the symbol to save the GCODE file to your computer.

- To print without using your computer, save the GCODE file to the SD card. Insert the SD card into the 3D printer and initiate printing via the control panel.

- If the SD card is inserted into your computer, the symbol will be displayed, which enables you to save the file to the SD card.

h) Disabling the control icons on the 3D printer

• By default, the printer is controlled via the control panel.

• If you wish to control the printer using the software, the connection source must be changed.

• Go to the <ReadyPrint> menu and select < Setting >.
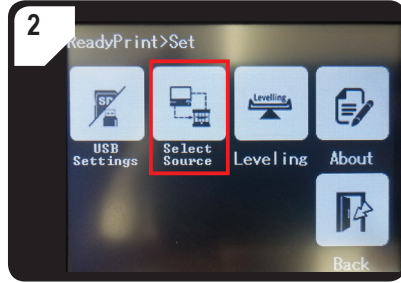
• Select <Select Source >, and then select < 250000 > to control the printer using the software.

i) Starting the printing process

• The symbol will appear when the printer is connected to a computer via the USB cable.

1 Right-click on the symbol. Select "Print from COM3" to start printing. (Alternatively, you can save the .gcode file to the SD card).	
2 Click "Print". The nozzle will start to heat up. You can start printing when the "Printing temperature" has been reached.	
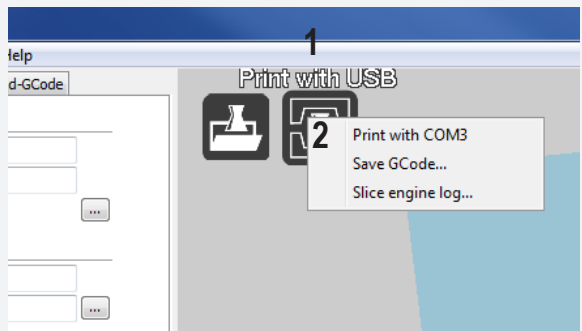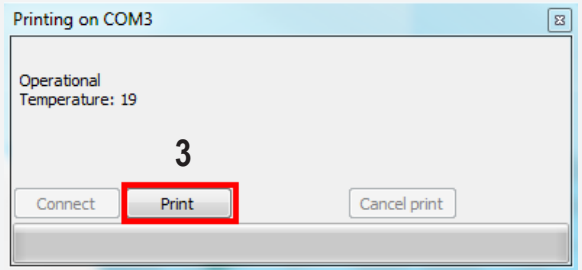
j) Stopping the printing process

Select "Cancel print" in the "Cura software" to stop printing.

→ Data is buffered by the software, therefore it may take up to 1 minute for the 3D printer to stop printing.

Do not select "Cancel print" when the nozzle is heating, otherwise you may have to remove the USB cable and restart the 3D printer.

The nozzle temperature will be kept constant after the print task is cancelled. To cool the nozzle, set the temperature to 0 °C and select < Move axis > from the 3D printer menu to move the print bed downwards. Remove the USB cable and restart the 3D printer.

17. Updating the 3D printer firmware

This version of the instructions is valid for firmware version 2.1 or higher. Check for firmware updates on a regular basis.

a) Displaying the firmware version

• Go to the < ReadyPrint > main menu and select < Setting > to open the < Set > menu.

• Select < About > from the < Set > menu.

• The firmware version number will be displayed.

b) Performing a firmware update

• To download the latest firmware version, visit www.conrad.com/downloads or scan the QR code on this page.

• Unzip the firmware folder, which contains the following three files:

- mks_pic

- mks_config.txt

- mkstft28.bin

• Copy these three files to the SD card.

• Switch the 3D printer off. Insert the SD card into the card reader on the 3D printer.

• Switch the printer back on. The 3D printer will automatically start the update when the SD card is detected. The update progress is shown on the display.

⚠ Do not remove the SD card from the card reader during the update, as this may cause irreparable damage.

• The < ReadyPrint> menu will be displayed when the firmware update is complete.

• Check the current firmware version (see "a) Displaying the firmware version" on page 55 for details).

- By default, the printer is controlled via your computer when the firmware update is complete. If you wish to control the printer via the control panel and print from the SD card, enable "Control the 3D printer via the control panel" and set the print source:
  - Go to the < ReadyPrint > main menu and select < Setting > to open the < Set > menu.
  - Select < SelectSource > from the < Set > menu, and then select < 115200 >.
- Go back to the < ReadyPrint > menu.
- Restart the 3D printer.
- Two files and a folder are saved to the SD card during the update process. Delete these files (e.g. on your computer).

  ⚠️ These files cannot be deleted via the control panel (only via your computer).

  Delete these files immediately after the update, otherwise the next update may not install properly.

18. Cleaning and maintenance

⚠️ Do not use aggressive detergents, rubbing alcohol or other chemical solutions, as these could damage the casing or even impair the functioning of the product.

Never immerse the printer in water.

⚠️ Burn hazard! Never touch the hot nozzle with bare fingers.

a) Cleaning the printer
- Use a dry, soft cloth or a brush to clean the exterior of the 3D printer.

b) Cleaning the nozzle

Cleaning the outside of the nozzle
- Use a dry, soft cloth or other similar material to wipe the nozzle after each print.

  → The nozzle must still be hot. If this is not the case, heat the nozzle before cleaning it.

Cleaning the inside of the nozzle

• Heat the nozzle. Load/remove the filament until the filament flows normally.

⟶ If the nozzle does not eject enough filament, let the nozzle cool down to the melting temperature stated by the filament manufacturer (the filament must be viscous) and carefully extract the filament until it has been removed from the extruder (including impurities). Cut off the contaminated part from the filament and reload it after the nozzle has heated up again.

c) Cleaning the inside of the extruder

• For details, download the "Cleaning and maintenance" booklet from www.conrad.com/downloads, or scan the QR code on page 5. Follow the instructions on the website.

d) Cleaning the print bed

• Carefully remove residues from the print bed using the scraper.

e) Removing the filament

• Ensure that the nozzle temperature is not higher than 170 °C.

⟶ If the filament is metal or wood, cut through it, replace it with a PLA filament, and then remove the PLA filament. The PLA filament will eliminate any residues from the wood or metal filament.

f) Storing the 3D printer

• Remove the filament.

• Move the on/off switch to the **O** position and disconnect the 3D printer from the power supply. Allow it to cool down to room temperature.

• Clean the 3D printer if you do not plan to use it for an extended period.

• Store the 3D printer in a dry, dust-free location out of the reach of the children.

19. Troubleshooting

Problem	Possible solution
The 3D printer does not switch on. The touchscreen display and printer light do not turn on.	Check that the mains cable is connected properly.
	Check the mains socket. Is it supplied with electricity?
You cannot establish a USB connection with the 3D printer.	Check that the USB cable is connected.
	Have you selected the correct USB port in the software?
	Are the required drivers installed?
	Disconnect and then reinsert the USB cable.
	Switch the 3D printer off, and then switch it back on.
	Restart your computer.
	Use a different USB port on your computer.
	Connect the 3D printer directly to a USB port on your computer. Do not use a USB hub.
The printed object is defective.	Check the nozzle temperature settings. These must be suitable for the filament material and printed object. Experiment with several temperature settings.
	Do not start printing until the nozzle has reached the required temperature.
	Decrease the distance between the print bed and nozzle (see "a) Calibrating the print bed" on page 29).
	When printing via your computer, avoid using other programs that require a lot of computing power. Virus scanners and downloads can affect the transfer of data to the 3D printer. Try printing the same model via the SD card to check that the USB connection is not the cause of the problem.
	Remove excess filament from the nozzle before each print.
The flow of filament stops, or there is not enough filament material.	Check the filament spool. It must be able to rotate easily.
	Check whether the filament material has become trapped or wrapped around the spool/spool holder.
	Check that the filament was inserted correctly over the filament spool.
	Check whether the nozzle temperature is too low for the filament material.
	Check whether the nozzle is blocked. If necessary, clean the nozzle (see "b) Cleaning the nozzle" on page 56 for details).

Problem	Possible solution
Printing stops unexpectedly.	When printing from the SD card, the 3D printer must be disconnected from your computer.
	Check the settings on your computer. It must not enter standby mode (check the power settings) or shut down (after installing software or software updates) during printing.
The printed object does not adhere to the print bed.	The nozzle temperature is too low. Increase the nozzle temperature.
	There is residue on the print bed that is preventing the object from sticking. Clean the print bed (see "d) Cleaning the print bed" on page 57 for details).
	The print speed is too high. Select a lower print speed.
	Recalibrate the print bed.
	Use a raft as an aid for the printed object.
The printed object cannot be removed from the print bed.	Wait until the printed object has cooled down.
	Remove the printed object with the scraper.
Incorrect information is displayed on the touchscreen display, or the touchscreen display is empty.	Restart the 3D printer (see "f) Restarting the 3D printer" on page 38).
The nozzle cools down unexpectedly.	Go to the < Preheat > menu and select < Extruder >. Perform an action within 5 minutes (e.g. add/remove filament or start printing).
The transport route to the nozzle is blocked.	Always remove excess filament from the nozzle before each print.
The nozzle is blocked.	Clean the inside of the nozzle (see "b) Cleaning the nozzle" on page 56).
	Remove the extruder and clean the interior (see "c) Cleaning the inside of the extruder" on page 57).
	Check whether the extruder fan is defective. If so, replace the extruder.
The extruder moves in the wrong direction.	Check that the filament spool rotates freely on the holder.
The filament is jammed and cannot be removed.	Load and then extract some filament.
The extruder does not heat up or carries on heating up.	Restart the 3D printer.
	Go to the < Preheat > menu. Select < Extruder > and wait for approximately 2 minutes.
	Check the nozzle temperature on the control panel.
	The thermistor and heating bead are defective. Replace the thermistor and heating bead.
The heating temperature displayed on the control panel is 0 °C or similar to the room temperature.	The thermistor and heating bead are defective. Replace the thermistor and heating bead.

Problem	Possible solution
You cannot configure any settings on the control panel.	Check the connection source. Go to the < ReadyPrint > menu. Select < SelectSource >, and then select < 115200 > (to control the 3D printer via the control panel).
The firmware does not update.	Check whether the SD card contains the update files for the last firmware update. If so, delete these files from the SD card.

20. Disposal

Electronic devices are recyclable waste and must not be placed in household waste. At the end of its service life, dispose of the product according to the relevant statutory regulations.

You thus fulfil your statutory obligations and contribute to the protection of the environment.

21. Technical data

a) General information

System requirements............................Windows® XP or higher, Mac OS 10.6.8 or higher

Dimensions (W x H x D) ....Max. 200 x 200 x 200 mm

Layer resolution ....0.1 - 0.2 mm

Print speed ....30–300 mm/s

Interfaces...USB 2.0 and SD card reader

Printing method ....Melting of filament materials

Print format..GCODE

Nozzle (ø)..0.4 mm

Filament (ø) ....1.75 mm

Extrusion temperature ....+180 to +260 °C

Compatible with "Cura" software ....Version 15.04.6 or lower

Operating conditions............................+15 to +55 °C, 30–90 % relative humidity (non-condensing)

Storage conditions...............................+5 to +35 °C, 30–90 % relative humidity (non-condensing)

Dimensions (W x H x D) ....370 x 397 x 417 mm

Weight ....15.15 kg

b) RF100 XL Plus (item no. 1592461)

Operating voltage/current ....12 V/DC, 21 A

Output power ....Max. 252 W

Hot plate temperature ....+50 to +110 °C

Compatible filament materials ....PLA, elastic material, wood, copper, aluminium, ABS

Power adapter

Input voltage/current ....100–240 V/AC, 50/60 Hz, 4.5 A

Output voltage/current ....12 V/DC, 21 A

c) RF100 XL r2 (item no. 1891634)

Operating voltage/current ....12 V/DC, 5 A

Output power ....Max. 60 W

Compatible filament materials ....PLA, elastic material, wood, copper, aluminium

Power adapter

Input voltage/current ....100–240 V/AC, 50/60 Hz, max. 1.5 A

Output voltage/current ....12 V/DC, max. 5 A

Compatible filament materials ....PLA, elastic material, wood, pearls, copper, aluminium

1592461_1891634_v3_0619_02_dh_m_gb