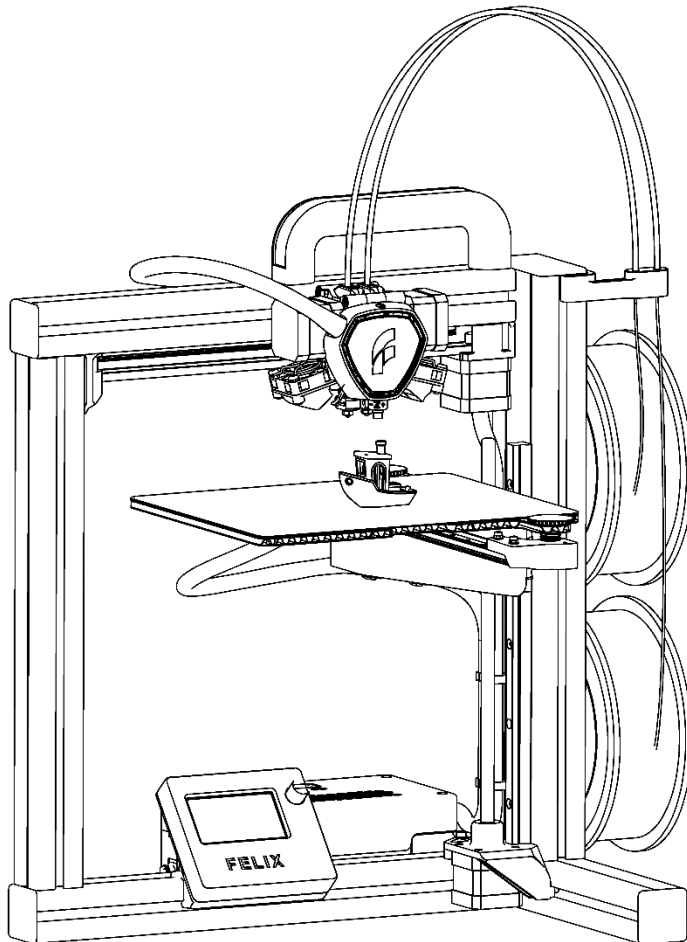


Upgrade manual
FELIX 3 to Tec 4

30 November
2017

Revision 4



1 Introduction

Thank you for choosing FELIXprinters!

This manual explains in short how to upgrade your FELIX 3 to a FELIX Tec 4. Please also download the assembly manual of the Tec 4 at www.felixprinters.com/downloads

We will reference to the assembly manual in this way: **[STEP x]**

Important: We strongly recommend to disassemble and assemble the printer in the steps below.:

1. Disassembly of the FELIX 3
2. Disassembly & assembly of print head
3. Disassembly & assembly of heated bed
4. Install Cable harness
5. Install display unit and new firmware
6. Do final checkup of assembly
7. Follow the quick start guide to get your printer up and running properly.
8. Install latest software and sliceprofiles

If you are unable to continue or have any questions, you can check at the support section of our website or you can contact us directly:

Website: www.felixprinters.com/support

Email: support@felixprinters.com

Telephone: +31 (0)30 30 31 387

Address: Zeemanlaan 15, 3401MV IJsselstein, The Netherlands

Kind regards,

FELIXprinters

2 Precaution

Start with the following steps:

1. Unload all filament
2. Remove all filament accessories
3. Turn the power switch off
4. Remove the power cable from the printer

Do not power on the printer during the process of upgrading.

3 Disassembly of the FELIX 3

3.1 Tips and Tricks

Disassembly is the perfect moment to clean the parts on the printer that would normally be out of reach. We recommend a cloth and alcohol to remove grease and dirt.

3.2 Cable Harness

1. Remove the cover of the electronic enclosure
2. Unscrew the following terminal blocks on the control board:

TIP: Make sure to put labels on the wires !!

- a. ENDSWITCH Z
 - b. THERMISTOR EXTR0
 - c. THERMISTOR EXTR1
 - d. THERMISTOR H B
 - e. FANS OPT
 - f. FANS MAIN
 - g. FANS HEAD
 - h. EXTR 0
 - i. EXTR 1
 - j. H BED
3. Remove all cable ties leading from the component itself to the control board
 4. Remove the plastic profile covers and **carefully** pull out the wiring out of the frame
 5. Remove all felt tape that bundles the wires so that the individual wires are exposed. It's best to start at the end and unwrap the tape. **Do not use a knife to cut the tape since this will likely damage the wires.**

3.3 Disassembly of the Display Unit

1. Remove the connectors on the control board for:
 - a. JOG
 - b. DISPLAY
2. **Only for 3.1:** Untighten the two screws on the underside of the display unit using a small Philips screwdriver.
3. Remove the display unit by pulling it forwards.

4 Disassembly and re-assembly of the Print Head

4.1 Disassembly of printhead

1. Remove any cable ties or cable clips still attached to the print head
2. Remove the fan cap, and remove the two screws holding the main fan in place.
3. Remove the bracket(s) including the duct fan(s).
4. Remove the hot-end(s).
5. Remove the two vertical screws located on the underside of the print head just behind were the hot-end(s) used to be. Use a hexagon key size 3mm.
6. Vertically lift the print head assembly upwards of the X-stage carriage.
7. **Only Dual Head:** Remove the two horizontal screws and nuts located at the top of the print-head. Use a hexagon key size 3mm.
8. Split the assembly and remove the three screws that hold the stepper motor to the plastic L-bracket. Use a hexagon key size 2,5mm.

4.2 Re-assembly of printhead

TIP:

- **Make sure to put LABELS on the wires !!**
- **Use the newly supplied cable for the motor cables, as the current length is most likely not enough to reach the mainboard.**

1. **[STEP 59 in assembly manual]** Rotate the stepper motor(s) 180 degrees. The wiring should be positioned downwards.
2. **[STEP 60 to 75]**

TIP: For step 63 it is recommended to use 2 pieces of filament to check alignment of extruder drive wheels and hot-ends.

5 Build Platform

5.1 Build platform Disassembly

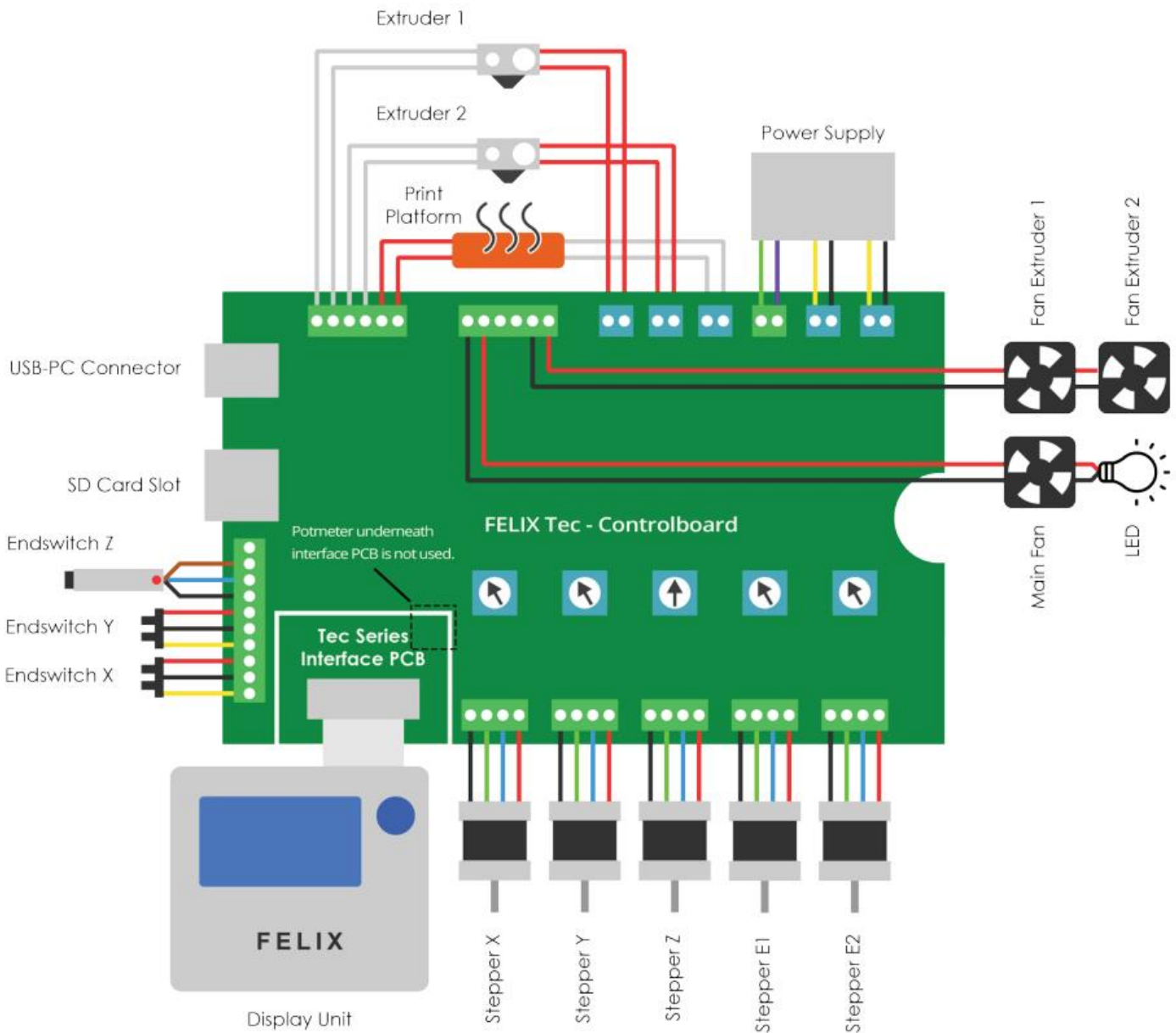
1. **Take two cable ties and loop them through holes in the linear rail next to both plastic brackets on both ends.** This will prevent the linear rail from running off the carriage later on in the process.
2. Make sure the wires leading to the build platform are completely disassembled from the printer frame and disconnected from the control board.
3. Completely loosen the Y-stage timing belt by using a size 3mm hexagon key and turning it counterclockwise. Remove the timing belt from the printer, keep it aside for later on.
4. Loosen and remove the C-profile in the middle of the Y-stage linear rail by removing the screw from the underside of the linear guide rail using a size 2,5mm hexagon key. You can leave the C-profile attached to the print platform.
5. Loosen and remove the four screws holding the two plastic brackets on both ends of the linear rail. Use a size 2,5mm hexagon key for the screws located on the underside of the linear rail. Use a size 5,5mm spanner for the nuts on the top of the plastic bracket. You can leave the plastic brackets attached to the print platform. Keep the screws and nuts aside for later on.
6. Remove the old print platform including wiring.
7. Remove the two M4 x 40mm set screws including nuts on the underside of the print platform. Start by loosening the nuts a couple of rotations but leave them on the set screw. Now unscrew the set screw itself while the nuts are still attached. Label these as "for thumbscrew" we will use these later on.
8. Remove the old Z-sensor including wiring located on the Z-stage behind the leadscrew. **Do not confuse the Z-sensor with the Y-sensor which is located next to the timing belt pulley on the left.**

5.2 Build Platform Assembly

1. **[STEP 77]** Start by mounting the two Tec 4 plastic brackets to the linear rail in the same orientation as before. Use a size 2,5 hexagon key for the screws located on the underside of the linear rail. Use a size 5,5 spanner for the nuts on the top of the plastic bracket.
2. Follow **[STEP 78 to 89]**

6 Cable Harness

1. Follow [STEP 90 upto 95] , to install the cable harness.
2. Connect the wires to the control board as shown in the diagram below.
 - a. Most likely the wire cables of the extruder motors are too short, that's why extra motor cables are supplied to the kit. You can either replace them or lengthen them.



3. Clean up the wiring in the electronic enclosure using cable ties

7 Display Unit

Follow [\[STEP 104 upto 114\]](#)

8 Installation of the Tec 4 Firmware

8.1 Download the Firmware

Download the latest FELIX Tec 4 Firmware version from http://www.felixprinters.com/downloads_felixprinters

8.2 Upload the Firmware to the Control Board

1. Unzip the downloaded file to a convenient location.
(Note: if you click on the zip file from within the Windows explorer, it will NOT be unzipped. You just view the contents of the zip. You need to select the files and drag them to the desired location.)
2. Connect your printer to your computer and turn it on. Do not make a connection at this time with the printer with programs like Repetier-Host or Simplify3D.
3. Start the batch file "upload_automatic.bat". A script will start in a command window.
4. The script will try to detect what COM port your printer is using. Check if this is correct, and then proceed by entering 'Y' in the command window.
5. The firmware is uploaded when "Programming finished!" is displayed, this may take a few minutes.
6. Press any key to continue. The FELIX TEC 4 firmware is now successfully uploaded!

IMPORTANT:

MAKE SURE TO reset the EEPROM to default, by running the gcode: *reset EEPROM printer.gcode* file.

IMPORTANT Note: the baudrate is lowered to 115200 for this release. Due to compatibility issues with linux based systems. Make sure to adjust the settings in the used software accordingly.

9 Preflight checks

We are close to firing up the printer further. But first we need to do some preflight checks.

Make sure to [follow the checklist in Chapter 10](#) of the assembly manual.

IMPORTANT: Make sure the z-sensor is properly functioning.

Some older control boards, only have 5V output on the opto sensor port. The induction bed sensor needs 12V. So in some cases it is required to connect the vcc wire of the sensor directly to the 12V line (yellow) of the power supply.

The internal led-light of the sensor should burn when the printer is turned on. It should turn off when a metal object is close to it. Take for instance your key.

If the led is off, you know that it does not get enough power and you need to take action to connect it to the 12V.

IMPORTANT: HOMING ALL or Homing Z axis will heat up both hot-ends to 120 degC, to prevent scraping the top layer of the print-bed if there is a blob of plastic on the hot-end.

IMPORTANT: Profiles of the FELIX 3 will most likely not work, due to changed hot-end different retraction settings are required.

10 First print with the Tec 4

Congratulations you've finished all the step to the upgrade. Your printer is now ready to start printing. Please follow the Quickstart manual of the Tec 4 from our download section. This will guide you through the calibrations steps.

11 Software

Make sure to get the latest software and or sliceprofiles to get the most out of your printer. Also download the quickstart manuals in our download section.

TIP: Do not use FELIX 3 profiles for the Tec 4. When there are a lot of retractions during the print, this will cause hot-end blockage.

11.1 Repetier-Host.

During the release of the tec 4 we also launched a new repetier-host version. This contains new slice profiles for the Tec 4. Be noted that slic3R slicer is no longer standard supported by FELIXprinters. To use it you have to manually import the profiles.

11.2 Simplify3D

We've released also new sliceprofiles for the FELIX Tec 4 and a quickstart guide.