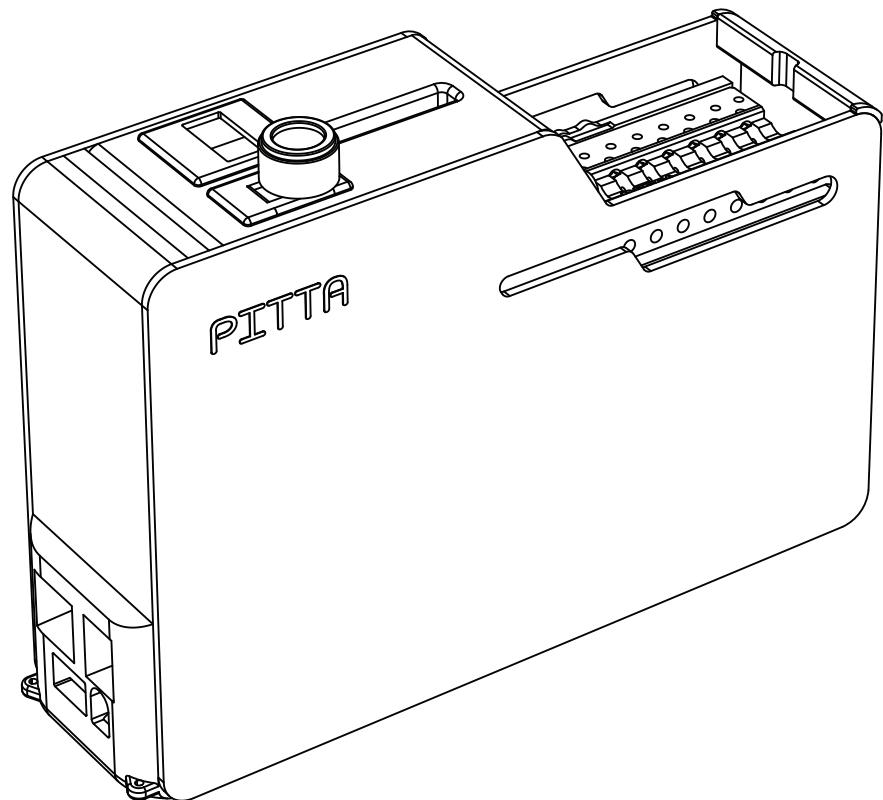


Multi-Color 3D Printing Module

PITTA User Manual



STELLAMOVE INC.



Contents

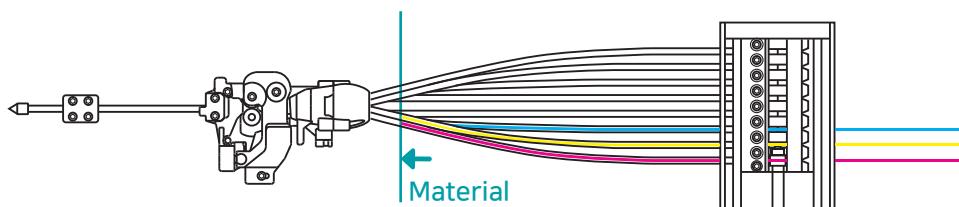
1. NOTES	02
2. UNPACKING	03
3. PARTS & FUNCTIONS	04
4. INSTALLATION & PREPARATION	06
Install EXTRUDER COMBINER	06
Install CYLINDER NOZZLE ASSEMBLY	07
Install PITTA BASE and BOWDEN TUBE	08
Install MOTOR EXTENSION CABLE	09
Install COMM EXTENSION CABLE	09
Friction Handling	10
5. HARD GRIP TUNING	11
6. Firmware Download for 3D Printer	13
7. PITTA MENU	17
MENU & FUNCTIONS	17
TB_LEN : Length of detector to nozzle tube	18
BR_POS : Offset value of the Bearing Position	19
8. TROUBLESHOOTING	20
9. SPLITTER BOBBIN USAGE	25

- In the user manual, some functions may be changed without prior notice to the user to improve product performance. Please read [NOTES] before use.

- The PITTA is a precision machine and must be handled with care.
- Please use it on a flat floor out of direct sunlight.
- If left unused for a long time, it may cause malfunction.
- When storing, avoid direct sunlight and heat, and be careful not to accumulate dust.
- Do not disassemble the machine arbitrarily.
- The ideal ambient operating temperature is from 15 - 30 °C (60 - 86 °F).
- Always tidy up and clean after finishing work. (Foreign substances such as strings may cause clogging of the nozzle or machine failure)

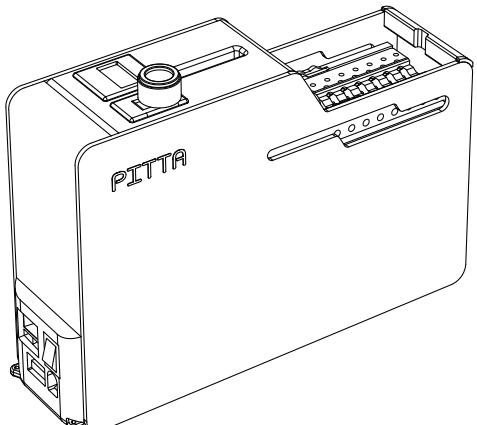
Quick Check Points Before start printing

- Check that the PITTA and 3D Printer are properly connected with various cables.
(6~10page)
- Turn on the power of the PITTA using the power switch. (Be sure to turn off the power when not in use)
- Make sure all materials to be used are loaded in the proper location.

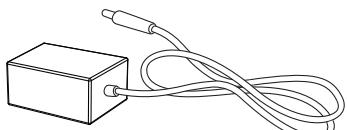


- Check that the drive gear of the PITTA and the Splitter Bobbin Usage is not loose.
- Check that PITTA's drive gear is positioned to be in slot 1.
- Before starting printing, use the PreHeat function to check whether the nozzle temperature is set to rise. 3D Printer will not start 3D Printing unless the nozzle temperature is at least 185 degrees.
- Make sure the drive gear positions of the hard grip and PITTA are tuned for maximum extrusion pressure. (11~12,19page)
- Recommendation : Material PLA, Nozzle Temp 205~215, Bed Temp 50 ~ 60°C
- During PITTA working, ender3 UI blocked, so stop, pause etc will not work. It is because the ender's UI and its interaction with PITTA during PITTA operation interfere with the system operation.

PITTA BASE



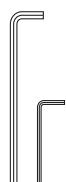
PITTA BASE



AC ADAPTER



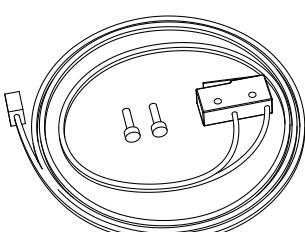
EJECTOR PIN



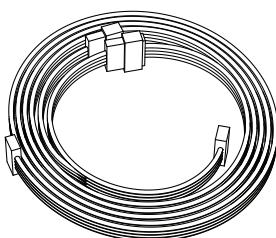
HEX WRENCH



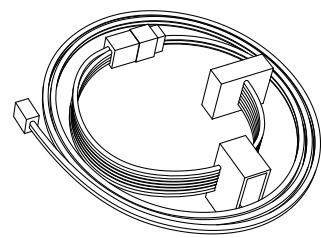
PITTA LOGO STIKER



DETECTOR CABLE

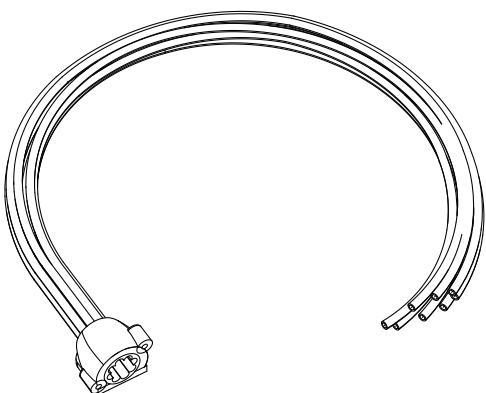


MOTOR EXTENSION CABLE

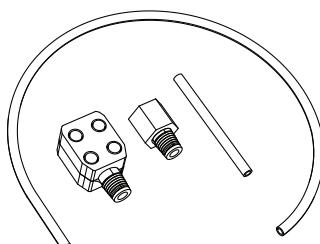


COMM EXTENSION CABLE

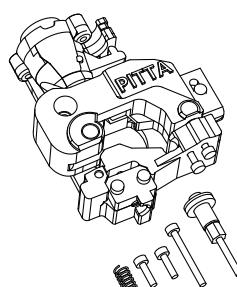
ADAPTATION KIT (For Ender3 V2 or Pro 32bit)



BOWDEN TUBE



CYLINDER NOZZLE ASSEMBLE



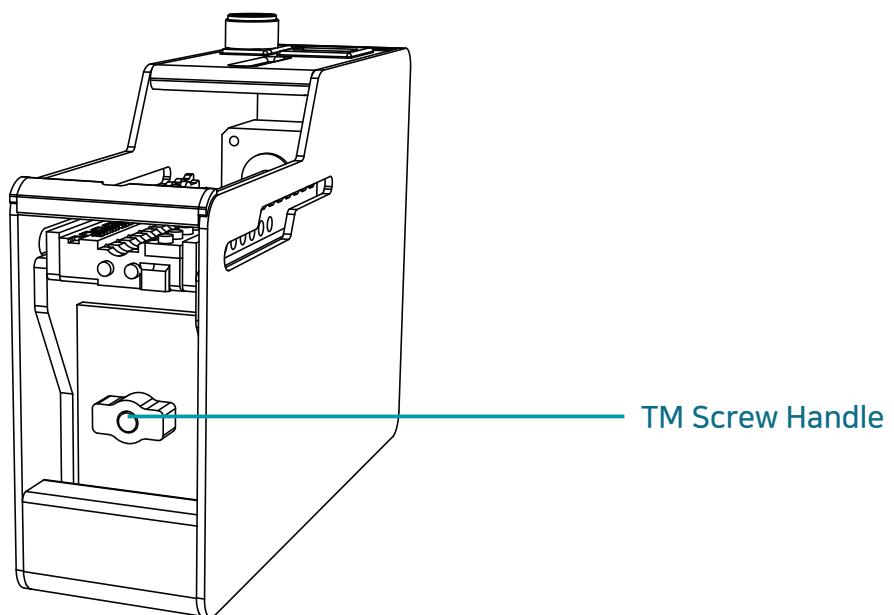
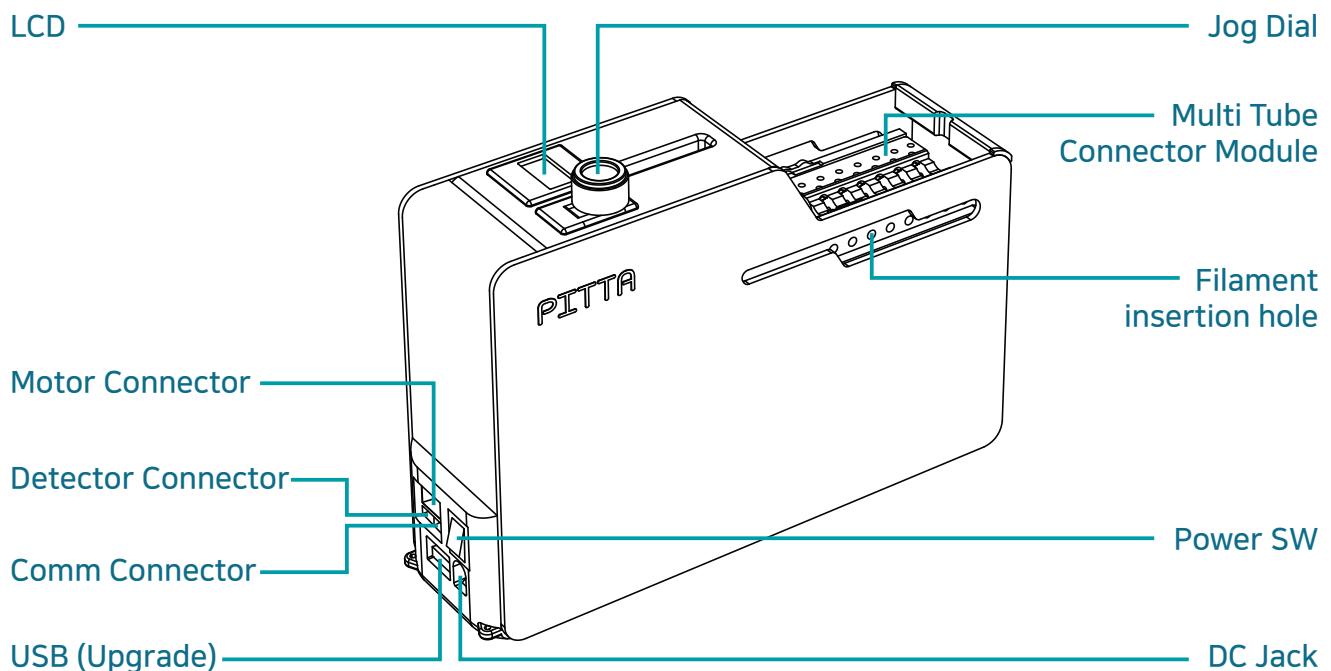
EXTRUDER COMBINER

- The illustrations may differ slightly from the items shipped with your product.
- PITTA is not responsible for any problems caused by using unauthorized accessories.
- Documentation and other materials necessary for installation and use can be obtained from the blog. (<https://pitta-color-3dprinting.blogspot.com>)

3

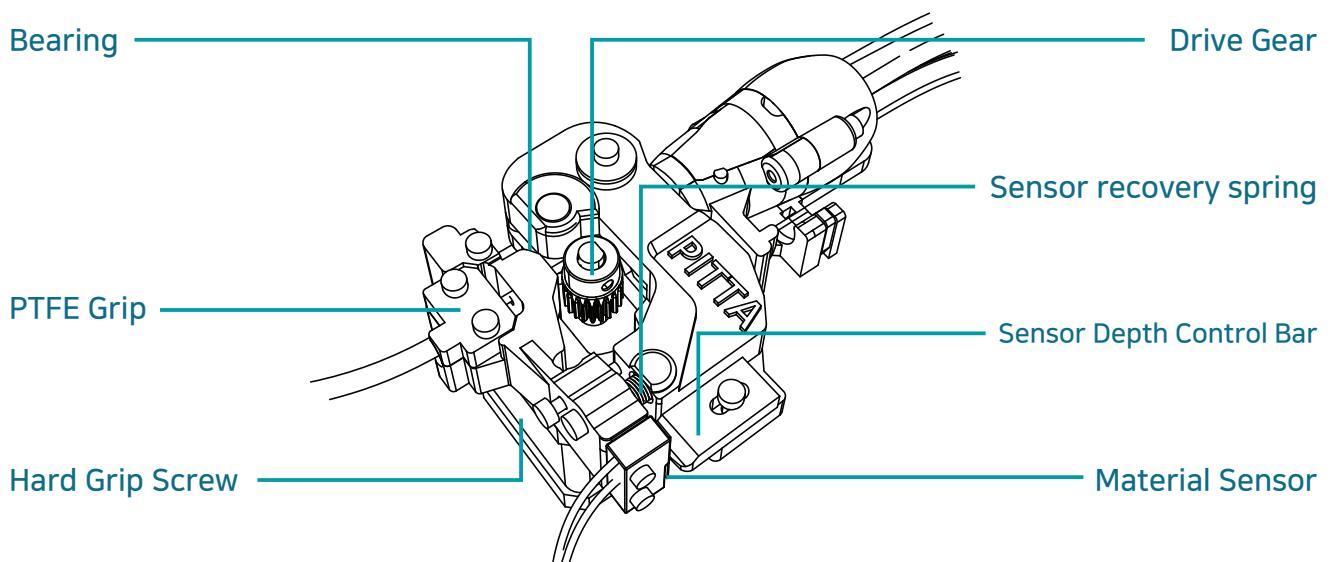
PARTS & FUNCTIONS

PITTA BASE

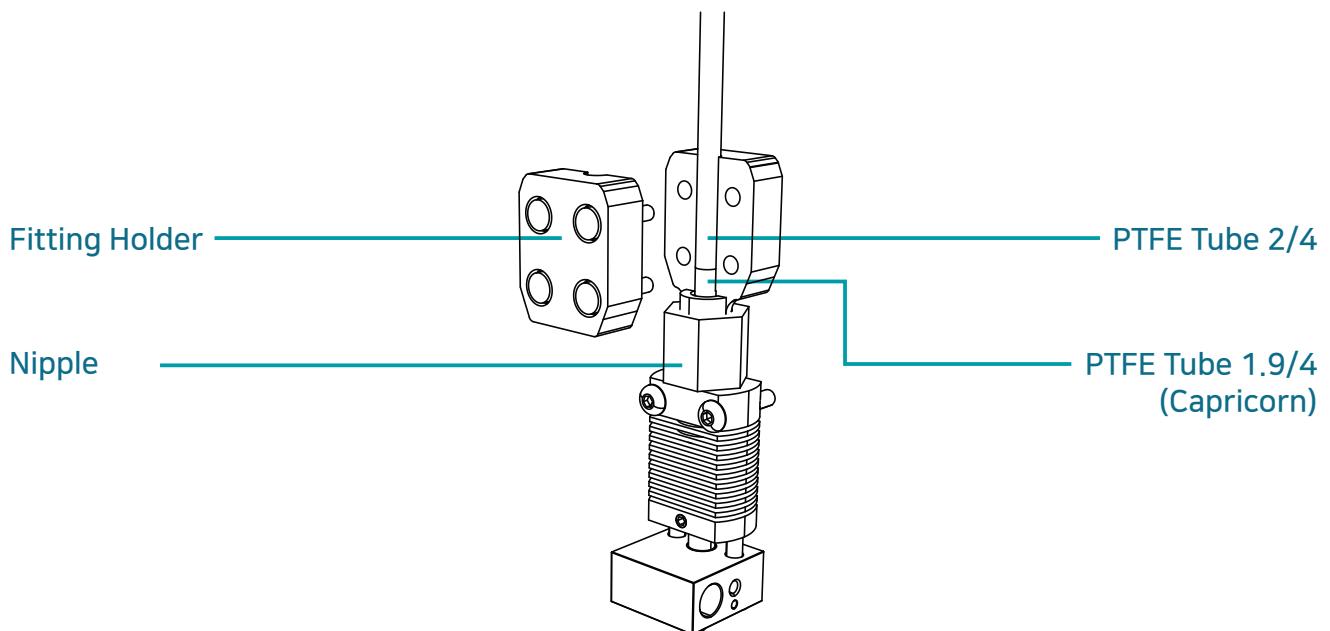


► PARTS & FUNCTIONS (continue)

EXTRUDER COMBINER



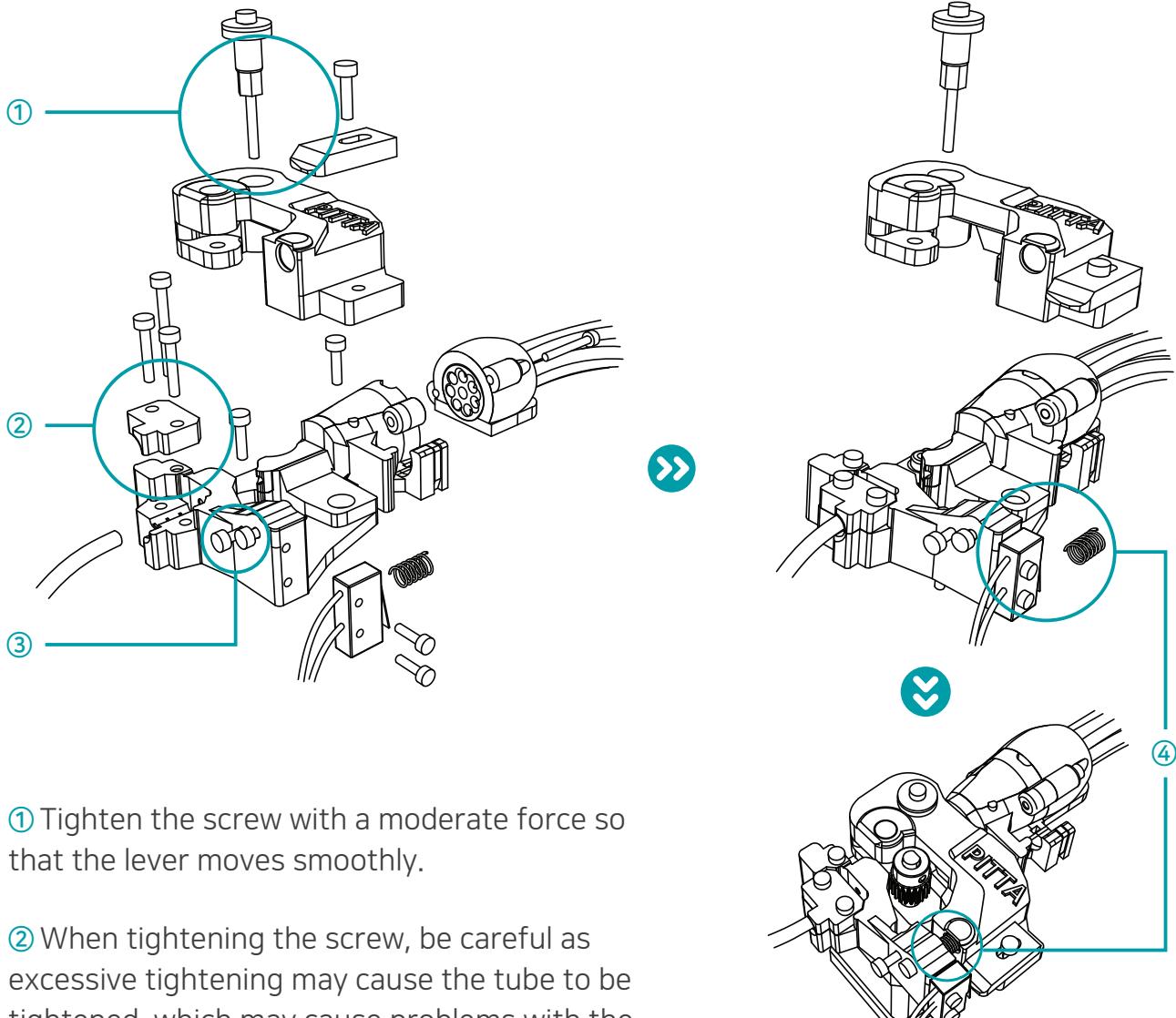
CYLINDER NOZZLE ASSEMBLY



4

INSTALLATION & PREPARATION

Install EXTRUDER COMBINER



① Tighten the screw with a moderate force so that the lever moves smoothly.

② When tightening the screw, be careful as excessive tightening may cause the tube to be tightened, which may cause problems with the movement of the material.

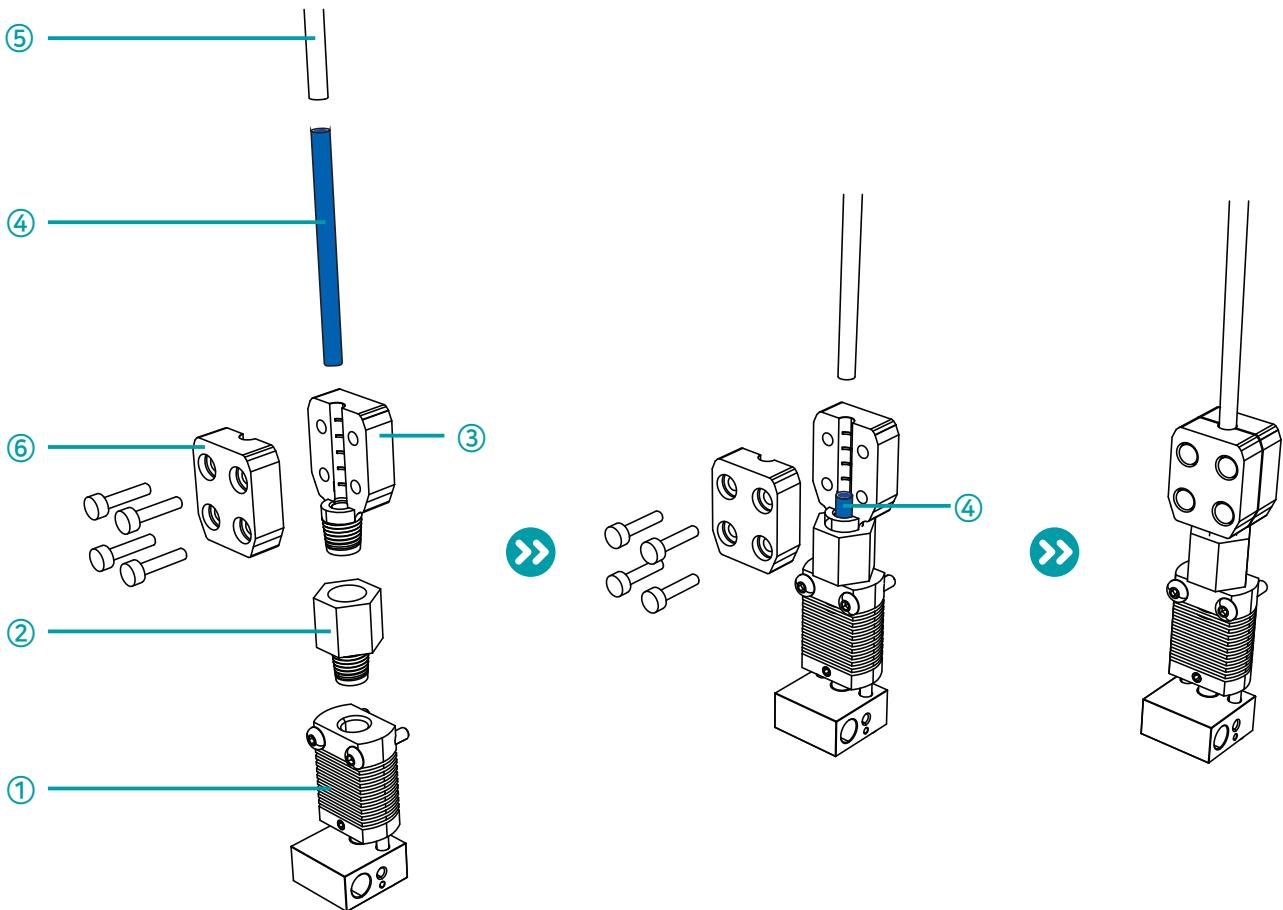
③ Leave them as they are when assembling with the screws used for tuning.

④ After the basic assembly is completed, the spring is well compressed and put in between.

- Parts may be damaged if overtightened, so be aware of this and assemble as shown in the picture.
- It is helpful to refer to the assembly video on the PITTA blog.

►INSTALLATION & PREPARATION (continue)

Install CYLINDER NOZZLE ASSEMBLY



STEP1 After raising the temperature of the heater to 200 degrees or more, clean the inside of the ① cylinder so that there are no obstructions that may interfere with assembly work.

STEP2 Screw the ② nipple into the cylinder to fix it firmly.

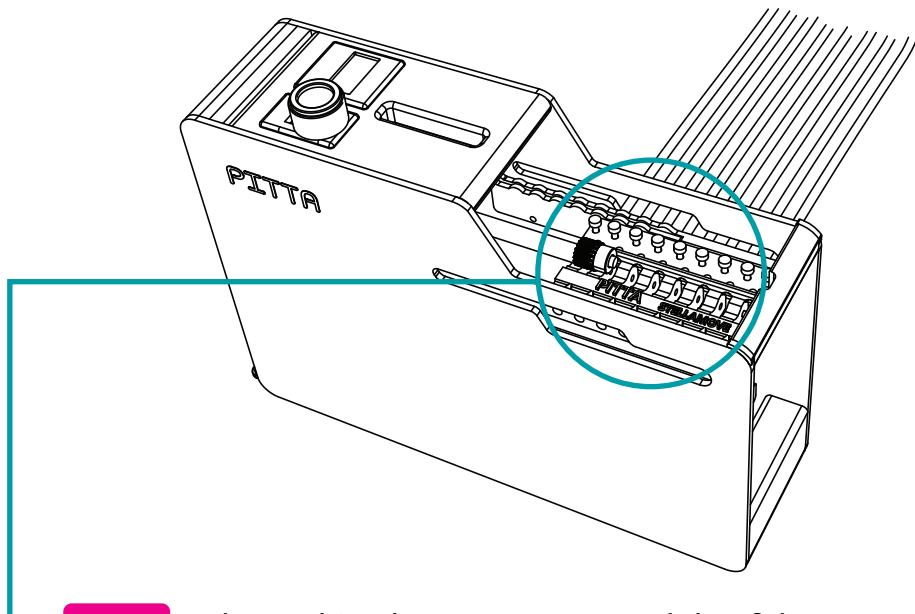
STEP3 Turn the ③ grip to the nipple to fix it firmly.

STEP4 Push the ④ blue tube firmly into the cylinder until the bottom of the tube is in contact with the top of the nozzle. (Heater temperature is maintained over 200 degrees)

STEP5 After properly locking the screw and putting the ⑥ grip cover on, insert the ⑤ Bowden tube in contact with the ④ blue tube, then tighten the screw firmly so that there is no gap between the tubes.

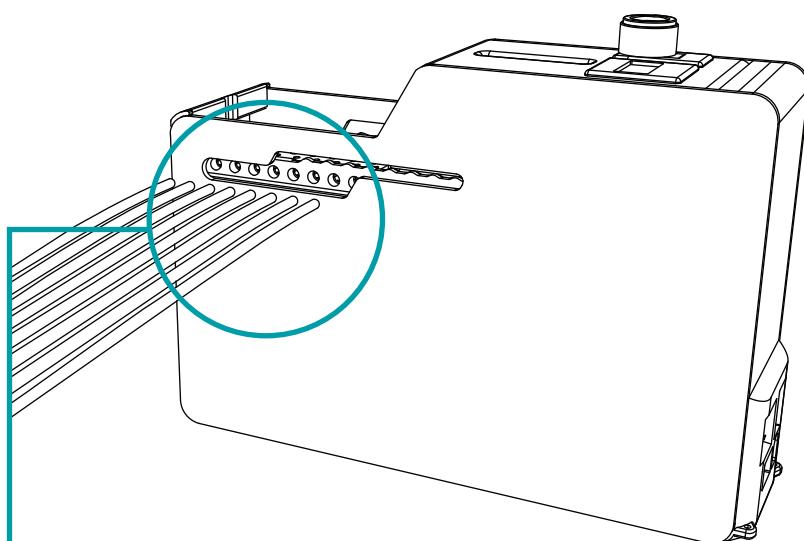
►INSTALLATION & PREPARATION (continue)

Install PITTA BASE and BOWDEN TUBE



STEP1

The Multi Tube Connector Module of the PITTA base is shipped with the screws loosely locked as shown in the picture. Each screw has a different length, and if it is completely loosened, you may not be able to lock it again, so please never loosen it all the way.

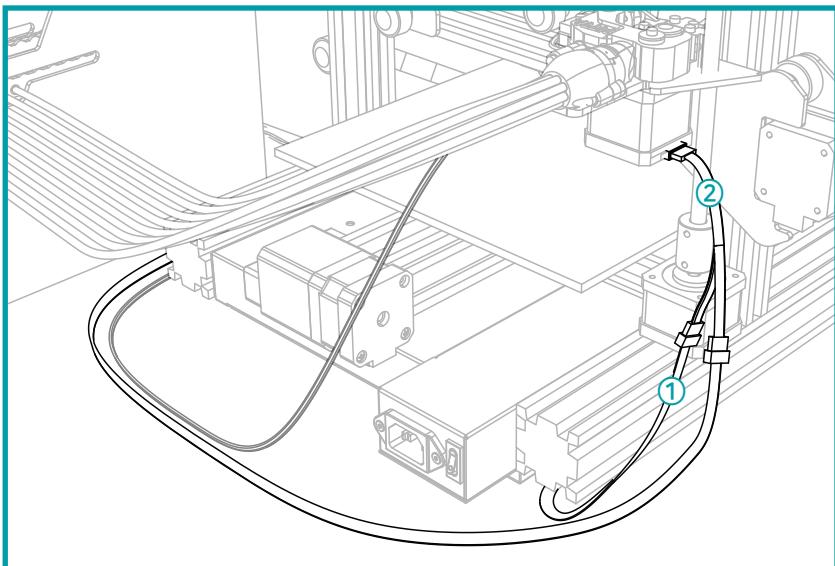


STEP2

Push the Bowden tube all the way through between the loose cover, and then lock the screw tightly.

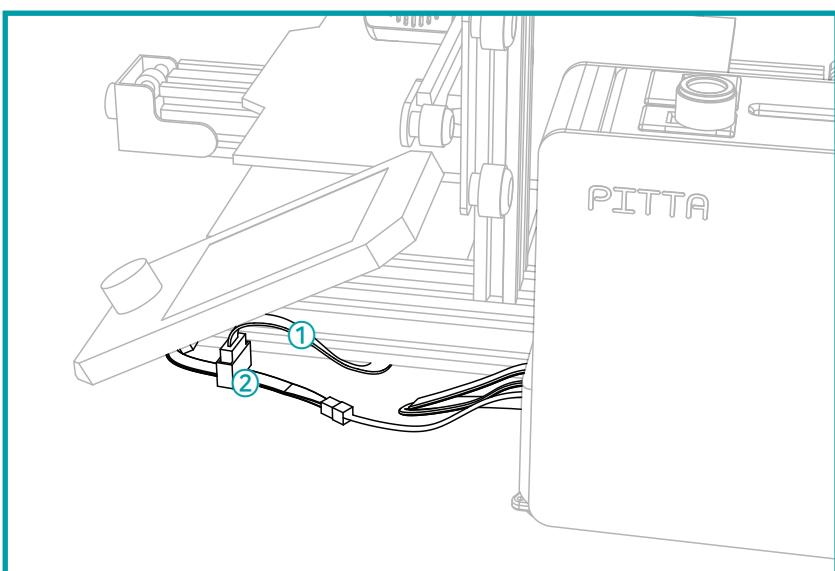
►INSTALLATION & PREPARATION (continue)

Install MOTOR EXTENSION CABLE



After Unplugging the ① Motor cable of the 3D Printer, plug the ② PITTA MOTOR EXTENSION CABLE as in the figure.

Install COMM EXTENSION CABLE

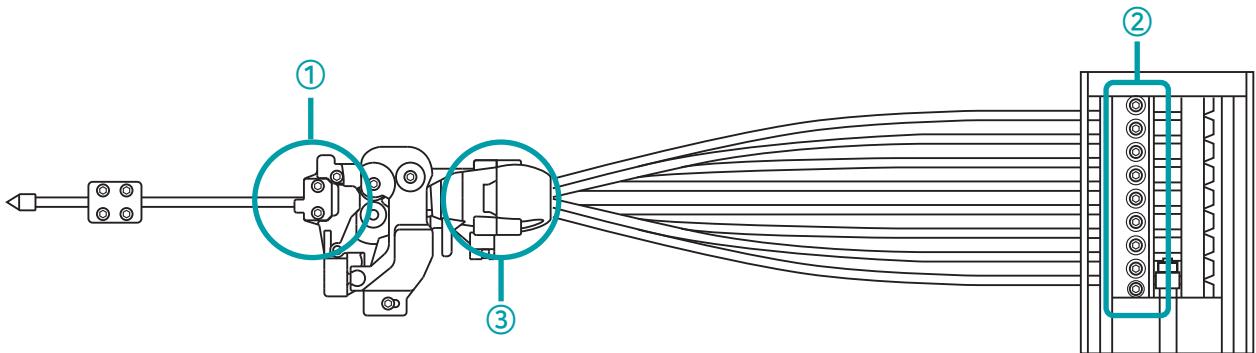


After Unplugging the ① LCD cable, plug the ② PITTA COMM EXTENSION CABLE as in the figure.

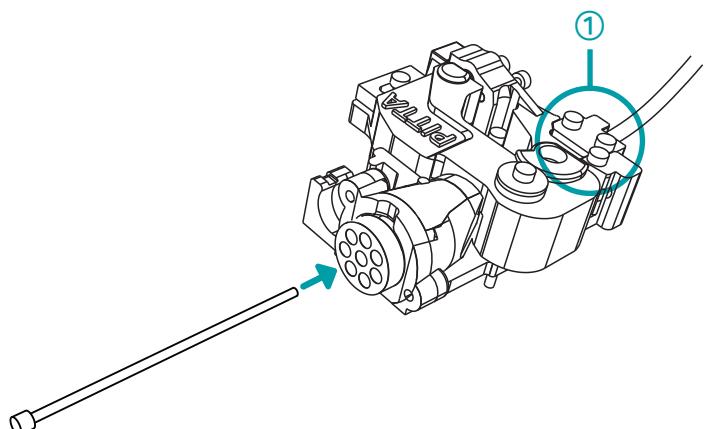
►INSTALLATION & PREPARATION (continue)

Friction Handling

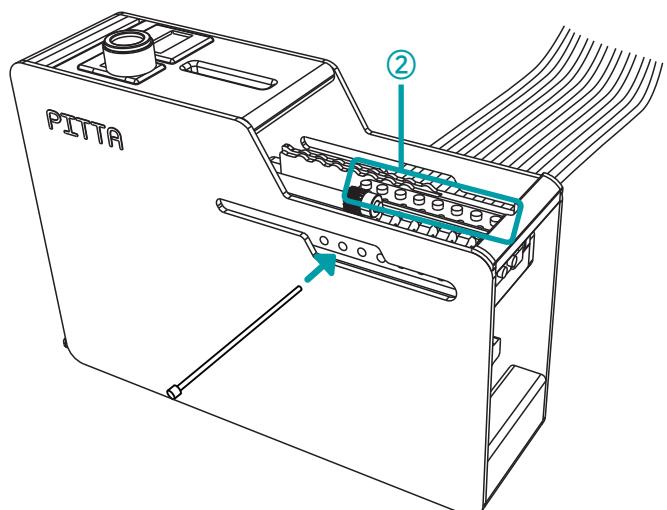
When assembling the ① and ② tubes, if they are tightened too tightly, the tubes may become narrow and excessive friction may occur. Improvements are needed for reducing friction.



③ Loosen 2 screws and disassemble the Bowden tube. Insert the EJECTOR PIN(2mm diameter) as shown in the right figure to widen the ① tube.



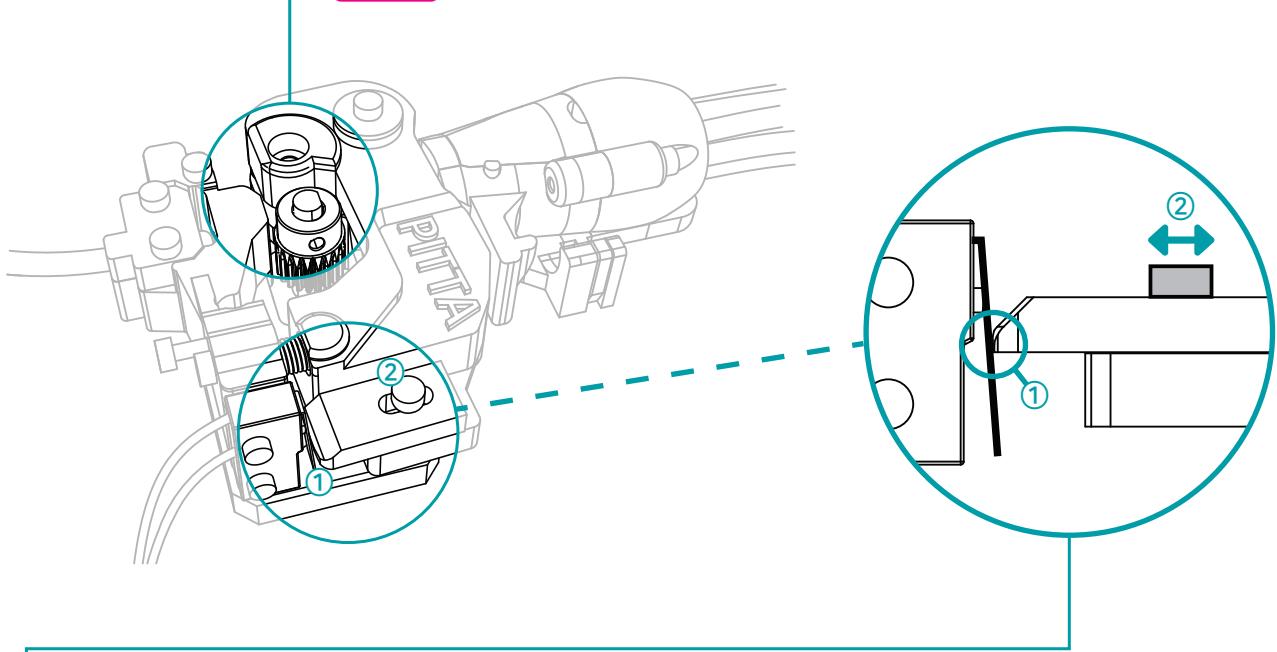
Insert the EJECTOR PIN as shown in the picture on the right to widen the ② tube(1~8).



5

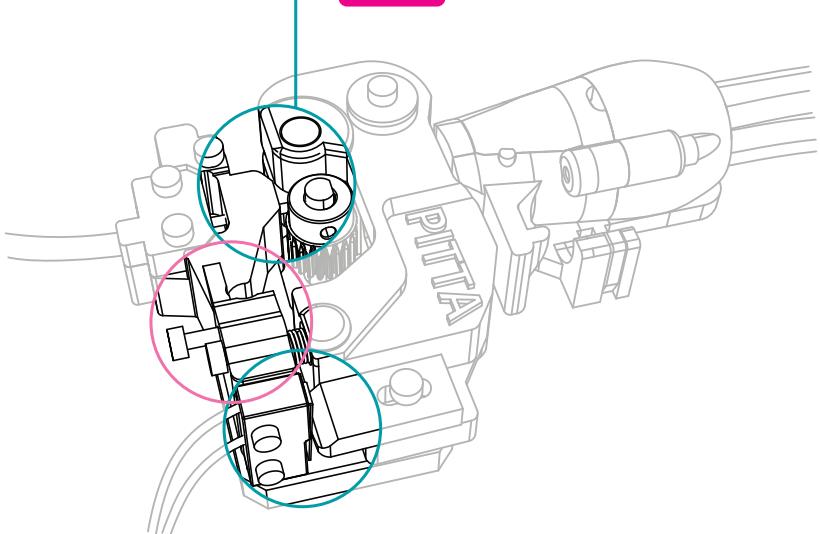
HARD GRIP TUNING

STEP1 condition: without filament

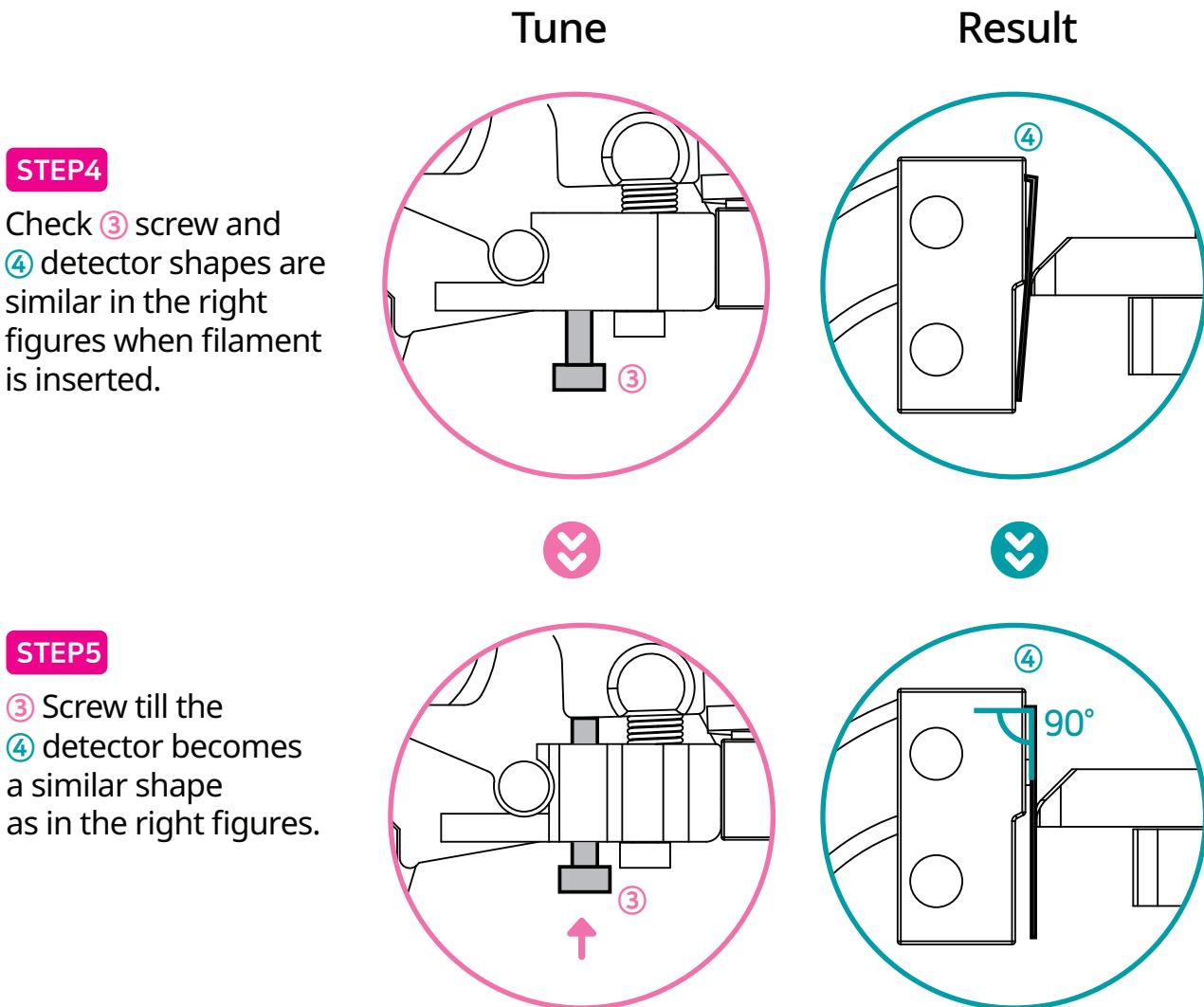


STEP2 Place ① the end tip of the bar close to the detector as shown in the picture ② with loosing screw, and then screw tightly.

STEP3 condition: filament inserted



► HARD GRIP TUNINGN (continue)



caution

- When tuning the detector angle, be careful not to exceed 90 degrees.
If it exceeds 90 degrees, the detector may malfunction and the material can not be exchanged.



Firmware Download for 3D Printer

Firmware Update

Ender3 V2 requires the mainboard update and LCD update.

Ender3 Pro requires the mainboard update only.

Download Link

The firmware file differs depending on the 3D printer model and motherboard. Download the appropriate file that matches your 3D printer.

<https://github.com/Stellamove/Marlin4Pitta/releases>

→Check the 3D Printer model and motherboard version before.

Firmware

- DWIN_SET.zip (LCD for Ender3 V2)
- Private.zip (LCD for Ender3 V2 - SZCX4827, and Rev 1.x)
- firmware-XXXXXXX-ender3pro-4.2.2.bin
- firmware-XXXXXXX-ender3pro-4.2.7.bin
- firmware-XXXXXXX-ender3v2-4.2.2.bin
- firmware-XXXXXXX-ender3v2-4.2.7.bin

Ender3 V2

Main Board Firmware Update

1. Download the mainboard firmware file from download link and copy it to the empty SD card.
 2. Insert the SD card into the 3D Printer and reboot(power off and on)
 3. Firmware update starts automatically when the power is turned on, and the update ends when booting is complete.
- If the boot screen does not appear after updating, format the SD card and update again. (FAT32, 4096 format)

►Firmware Download for 3D Printer (continue)

LCD module Firmware Update

There are 2 types of LCD firmware, you can check your LCD with the number as in the picture below. Most LCD uses DWIN_SET firmware but sometimes it uses Private firmware.



3SZCX4827, and Rev 1.x
→ Private Steps (15~16page)

Or Other
→ DWIN_SET Steps

| DWIN_SET Steps |

1. Download the LCD firmware file(DWIN_SET.zip) from download link, unzip it, and copy the whole including the folder to the empty SD card.
Folder name should be "DWIN_SET".
2. Turn off the 3D Printer, disconnect the LCD cable, and disassemble the LCD with a hexagon wrench.
3. After inserting the SD card into the slot on the back of the LCD, reconnect the LCD cable and turn on the 3D Printer.



4. When the LCD screen turns from blue to orange, turn off the 3D Printer again.
5. Remove the inserted 3D card and reassemble the LCD.

►Firmware Download for 3D Printer (continue)

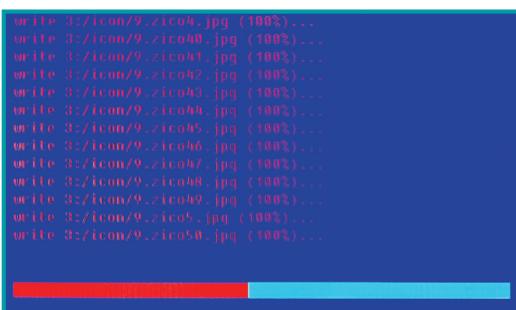
6. When the 3D Printer is turned on and the screen is displayed as the following picture, the update is complete.



- If the boot screen does not appear after updating, format the SD card and update again. (FAT32, 4096 format)

| Private Steps |

1. Download the LCD firmware file(private.zip) from download link, unzip it, and copy the whole including the folder to the empty SD card.
Folder name should be "private".
2. Turn off the 3D Printer, disconnect the LCD cable, and disassemble the LCD with a hexagon wrench.
3. After inserting the SD card into the slot on the back of the LCD, reconnect the LCD cable and turn on the 3D Printer.
4. When after the LCD displays booting sequence as in the picture, turn off the 3D Printer again.



►Firmware Download for 3D Printer (continue)

5. Remove the inserted 3D card and reassemble the LCD.
6. When the 3D Printer is turned on and the screen is displayed as the following picture, the update is complete.



- If the boot screen does not appear after updating, format the SD card and update again. (FAT32, 4096 format)

Ender3 Pro

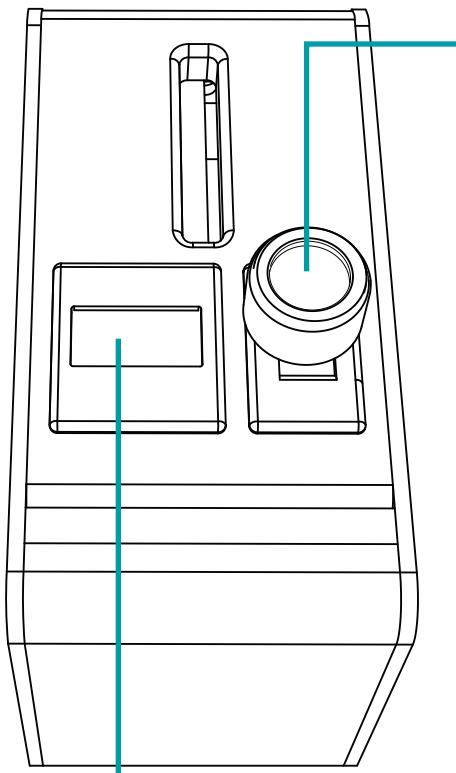
Main Board Firmware Update

1. Download the mainboard firmware file from download link and copy it to the empty SD card.
 2. Insert the SD card into the 3D Printer and reboot(power off and on)
 3. Firmware update starts automatically when the power is turned on, and the update ends when booting is complete.
- If the boot screen does not appear after updating, format the SD card and update again. (FAT32, 4096 format)

7

PITTA MENU

MENU & FUNCTIONS



Jog Dial

- Turn Left and Right

1. Menu move
2. Number Increase or Decrease

- Push

1. Menu Selection
2. Number Selection

Status Window

Slot	1
Turn	1
Pitta Ready	

- Slot : Current Slot Position

- Turn : Number of Exchanges

Status	^
TB_LEN:	440
RESRV1:	0
RESRV2:	0
RESRV3:	0
RESRV4:	0
PTRN_N:	0
BR_POS:	0

- TB_LEN : Tube Length

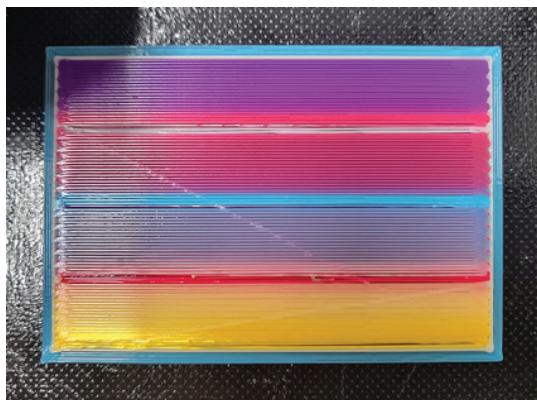
- RESRV1~4 : Not Use

- PTRN_N : 0 (should be 0)

- BR_POS : PITTA Wave Bearing Position

►PITTA MENU (continue)

TB_LEN : Length of detector to nozzle tube

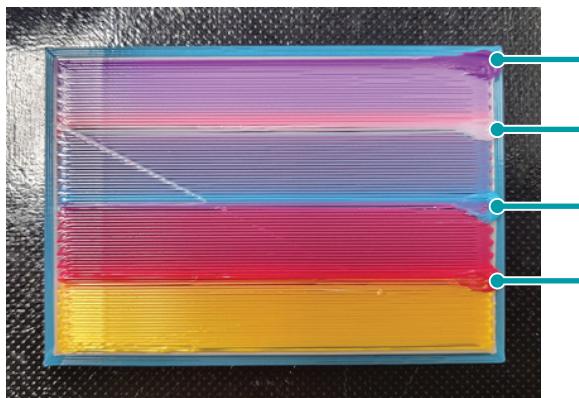


Status ^
TB_LEN: 440
RESRV1: 0
RESRV2: 0

440 TB_LEN is the Factory default value.
Adjust the tube length to set it appropriately as shown in the image. The unit of tube length 1 is approximately 1 mm of 1.75 filaments.



If you see empty space as in the picture, it means that the TB_LEN value is small. Increase this value. ex) 440 → 445

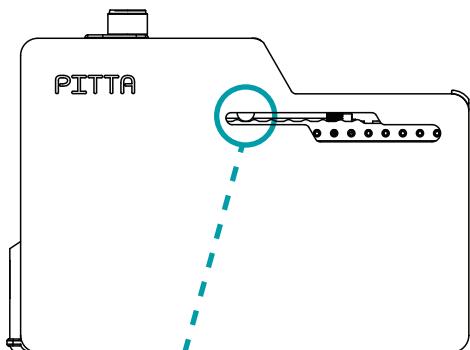


If the tube length is set to be over, the filaments will be stacked in dots. Please lower the number for tube length. ex) 440 → 435

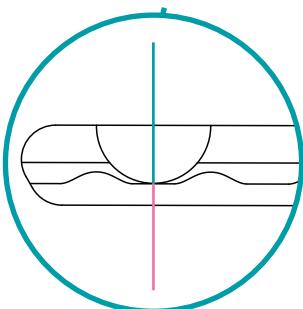
- When you tune the TB_LEN at first, it is better to set its value 20 lower (420), then increase its value by +5 every time because stacked dots might induce nozzle hitting and layer shifting.
Also, there are many factors that might affect TB_LEN, it is better to maintain its value lower than its fittest value for having margin.

►PITTA MENU (continue)

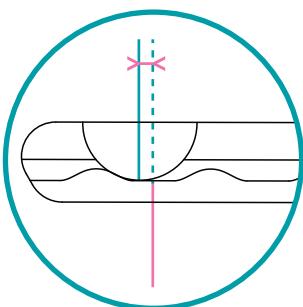
BR_POS : Offset value of the Bearing Position



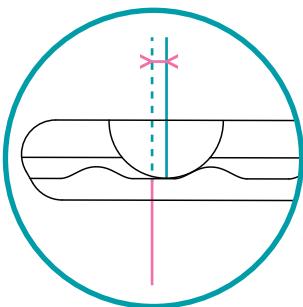
```
Status ^  
TB_LEN: 440  
RESRV1: 0  
RESRV2: 0  
RESRV3: 0  
RESRV4: 0  
PTRN_N: 0  
BR_POS: 0
```



The offset value of the BR_POS should be corrected so that the center of the bearing in the figure aligns with the center of the wave-shaped guide. When the center of the bearing and the center of the wave-shaped guide are aligned, the material can be fed with the maximum pressure of the drive gear.



When the drive gear moves for material selection if it does not match the center as shown in the left figure, increase the value of BR_POS appropriately. (ex: 10 means shift right the bearing approximately 1mm **BR_POS: 10**)



When the drive gear moves for material selection if it does not match the center as shown in the left figure, lower the value of BR_POS appropriately. (ex: 10 means shift left the bearing approximately 1mm **BR_POS: -10**)

- After changing the value, when the drive gear returns to slot 1, the changed value is applied and must be saved. (The unsaved value will return to the previous setting value when the power is turned off)

8

TROUBLESHOOTING

When printing is abnormal paused

Check1

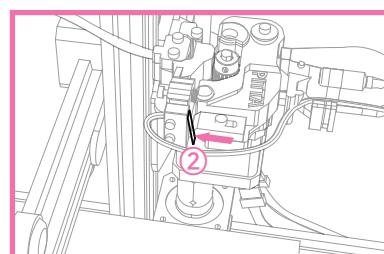
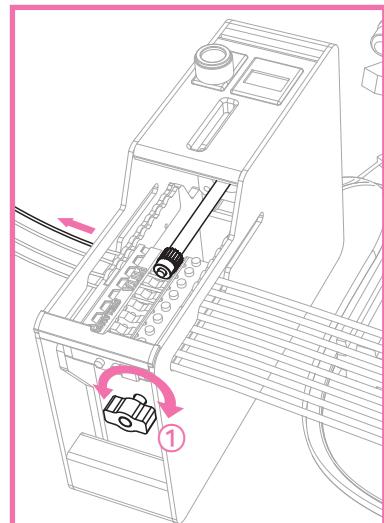
In case the extruder temperature is 140°C and Bed temperature 40°C.

Reason

The filament may have thickened or a string may be caught in the extruder.

► Solution

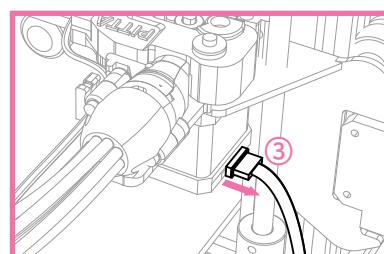
1. Turn the ① TM Screw Handle slightly and take out the filament.
2. Cut the abnormal parts of the filament.
3. Insert the filament and turn the ① TM Screw Handle back into place.
4. Push the ② Material Sensor for a while(~1sec), printing starts when after the Nozzle temperature reaches around 185°C.



Check2

In case the extruder temperature is printing temperature.

And the filament is in the main bowden tube?



Reason

It is the case that the material could not be removed due to friction or strings or other matter during the material exchange.

► Solution

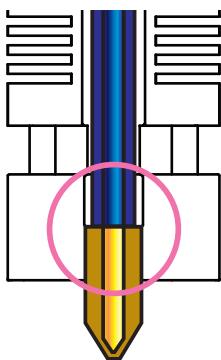
1. Turn the ① TM Screw Handle slightly and disconnect the ③ Motor Connector then the extruder gear becomes loose. Then remove the filament.
2. Plug the ③ Motor Connector back and rotate the ① TM Screw Handle back into place.
3. Push the ② Material Sensor for a while(~1sec), printing starts when after the Nozzle temperature reaches around 185°C.

► TROUBLESHOOTING (continue)

Tube connection troubleshooting when string happens or material exchange jam happens.

Normal connection

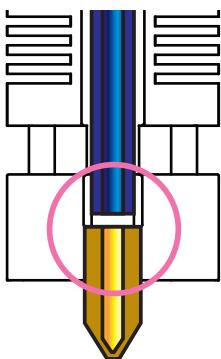
smooth flow of material



Gap between nozzle and tube

Material flow is impeded by the gap.

Causes of nozzle clogging

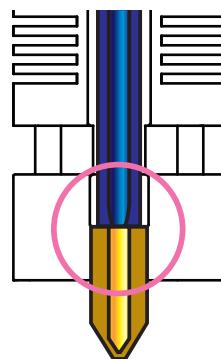


► *Solution*

Reassemble so that nozzle and tube are in contact

No gap occurs due to excessive pressing, but the tube is deformed.

The end of the tube is narrowed, which impedes the flow of the material, and the shape of the material end becomes unstable during material exchange, increasing the possibility of material exchange failure.



► *Solution*

Reassemble the narrowed tube by widening it using EJECTPR PIN or replacing it with a new tube

► TROUBLESHOOTING (continue)

The most possible reason for Jam

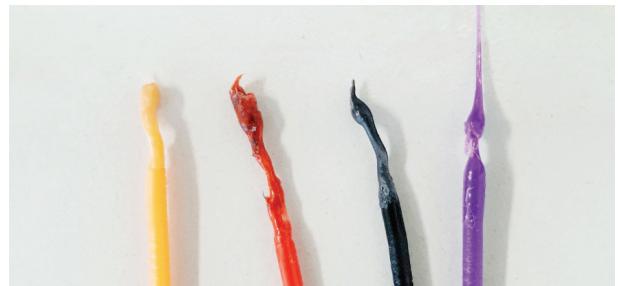
Good Shape of Material End

If PITTA and the 3D printer all work properly, you will see the material end shape like the picture below.



Bad Shape of Material End

However, if you see the end shape of the material as in the photo when exchanging the material, there is a problem with the tuning of the PITTA.



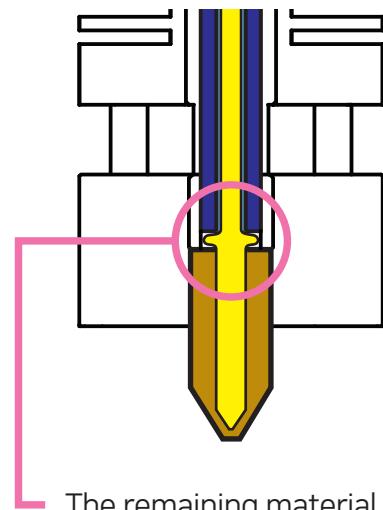
► *In this case, please tune properly by checking the following items.*

1. blue tube close connection

Most likely, even if all other parts are working well, if the blue tube is not in contact with the nozzle firmly, the material will get caught in this gap and cause a string, the end of the material thickens, or a lump of material at the end of the material.

As a result, the possibility of jamming when exchanging materials is increased, and color bleeding due to residual material stagnating in the gaps occurs for a long time.

Be sure to tune the tube so that it contacts the nozzle firmly, and if it is damaged or the position of the tube moves due to deformation after using it for a long time, please replace it with a new one. The length of the tube is 6cm and you can use a capricone tube with an inner diameter of 1.9mm. After replacing the tube, you may need to change the value of TB_LEN a little.



The remaining material in the gap impedes the flow and the reason for bad end shape etc, and also the reason for color bleeding.

►TROUBLESHOOTING (continue)

2. Loosend drive gear

When this occurs, it is easy to find because it is visible immediately, but sometimes it is not recognized.

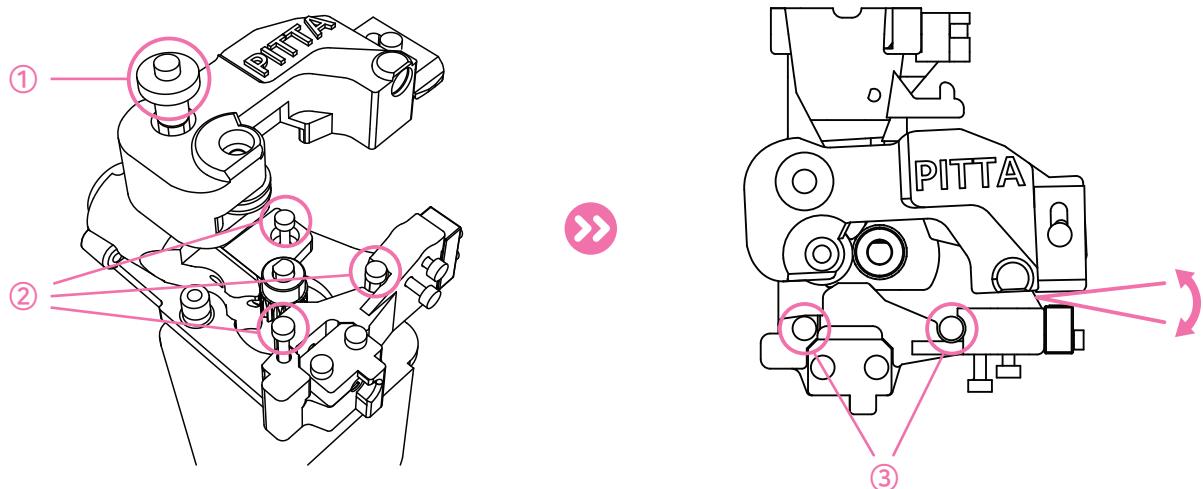
Be sure to fix it well before use.

In the case of drive gears, the material may slip due to the wear of the gear teeth. In this case, the output quality deteriorates, and in particular, the movement distance of certain movements performed when exchanging the material may change, resulting in string generation and thickening of the material end. In this case, the possibility of jam is increased, so it must be checked.

3-1. Hard Grip tuning

In order for the drive gear to push the material with an appropriate force, the position of the hard grip and BR_POS should be well positioned, and at this time, it is necessary to check whether the operation of the switch is okay.

3-2. How to assemble the extruder lever and extrude_combiner (with proper tuning)



After removing the ① screw, remove the lever.

Loosen the remaining ② 3 screws and assemble the lever into the groove.

After widening the gap between the lever and the combiner, align them as shown in the picture, and then tighten the ③ 2 screws.

After tightening the screw under the lever, connect the lever with the screw.

►TROUBLESHOOTING (continue)

4. Friction handling

Even if all parts are well tuned, if the bowden tube itself is bent or narrowed and the material passing through it receives a large frictional force, this may lead to poor extrusion or slipping during specific operation when exchanging materials. Please check carefully whether there is a problematic section and take action.

5. Use the latest software

Optimal software is updated to the latest version to minimize the occurrence of strings that may occur during material exchange.

Tuning of TB_LEN may be required after software update.

Always use the latest firmware.

6. Other conditions

If the nozzle itself is worn out or clogged, it is of course a part to check.

Strings build up around the drive gear with use. Please clean this. This may cause jams.

In addition, filament quality, temperature, and humidity also affect material exchange.

However, if the machine is kept in optimal condition, these effects are minimal. You will find better conditions as you use it.

9

SPLITTER BOBBIN USAGE

The use of a splitter bobbin is strongly recommended to prevent twists of the material and ensure stable printing.

As shown in the picture, place the bobbin at least 50cm below the PITTA, wind the material 2 turn around the bobbin and insert it into the PITTA as below.

