

Introduction

The ONE-PIX kit hardware is consisted of an MDF nested box with inside all components fixed with 3D printed parts

In this tutorial all steps needed to produce the box and fixations parts are details.

The components and raw materials needed can be found [here](#).

Step 1 – 3D printing of components fixations and aerations

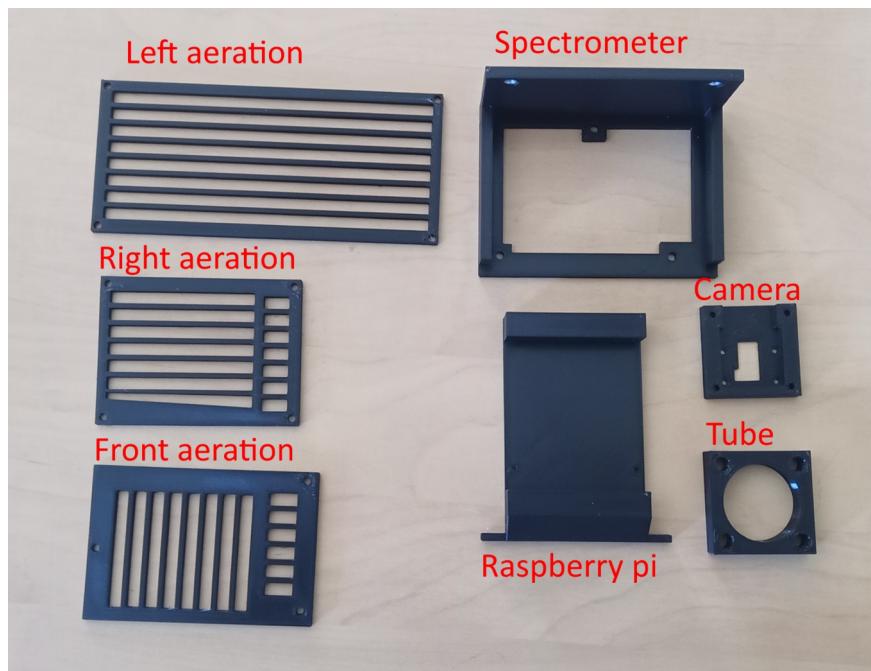
Comments :

There is seven pieces to 3d printed. 3 of them are aeration to fix on the ONE-PIX kit box and others are components fixation parts.

Links:

STL files for the 3d printing can be found [here](#)

duration: 8h on a MK3S 3D printer (parallelizable)



production step:

- Download stl files in this [folder](#)
- Slice each part with your favorite slicer
- 3D prints all the pieces

Step 2 –Laser cutting of the sides of the ONE-PIX kit box

Comments:

The ONE-PIX box is made of 6 sides and work under the principle of nested boxes.

The machining of the sides is made by laser cutting of 3mm ticks MDF board. The easiest way to have access to a laser cutter is to go to the nearest fablab.

Links:

Find the nearest fablab [here](#)

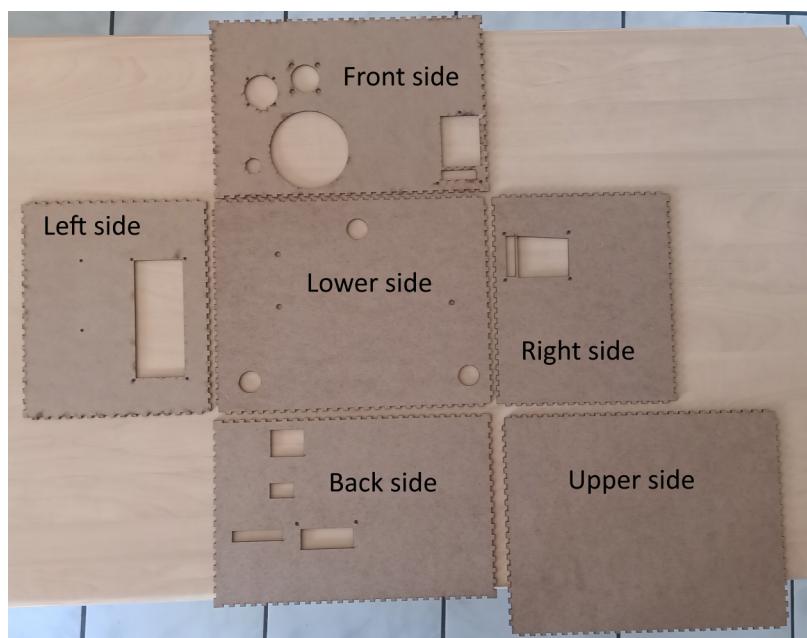
Cutting plan in dxf /svg and pdf: [here](#)

Duration: 1h

Product steps

- Call and book one-hour time on the nearest fablab
- Save all cutting plan on your usb key
- Go to the fablab with your key to cut the 6 sides of the ONE-PIX kit box

Before using laser cutter in your fablab just talk with fabmanagers for help and learn the using modality of the laser cutter.

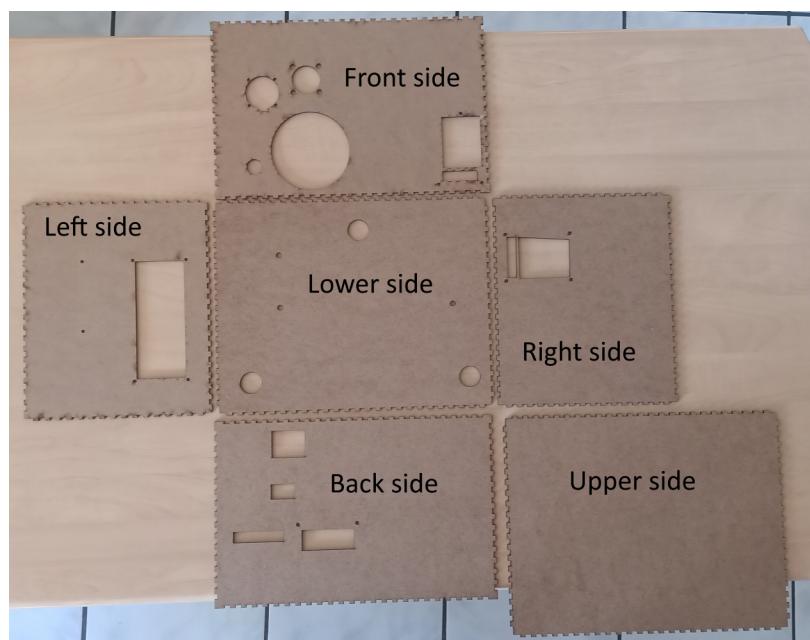


Step 3 - box assembly:

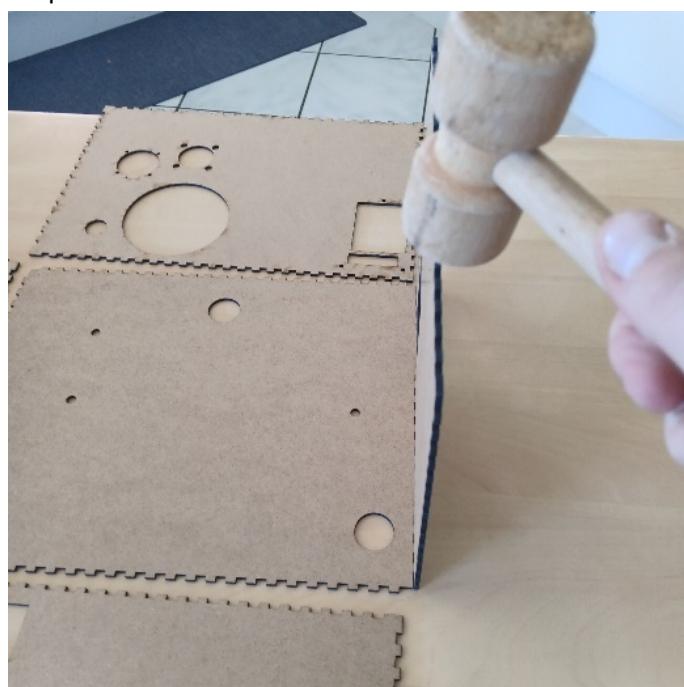
Duration: 1h

Productions step:

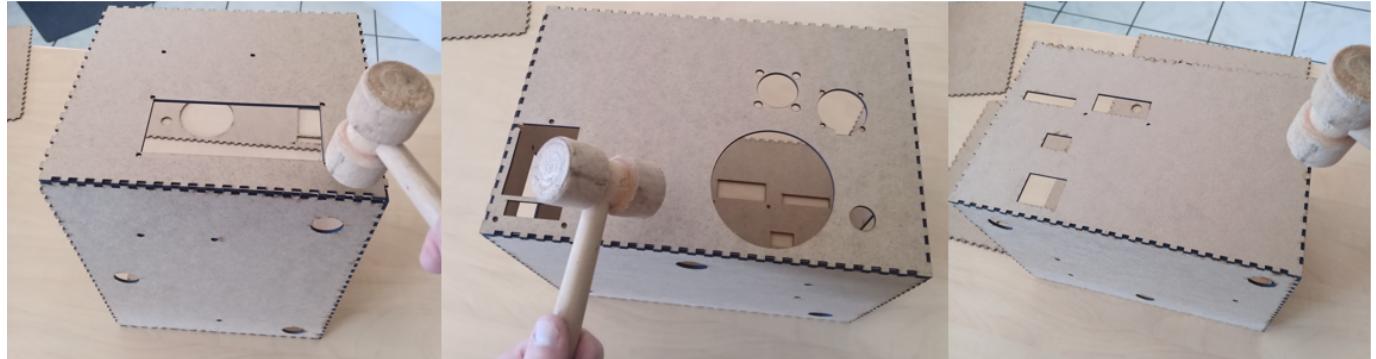
- Position sides on a flat surface dispossessed as in the photo below. It is in this arrangement that sides must be assembled



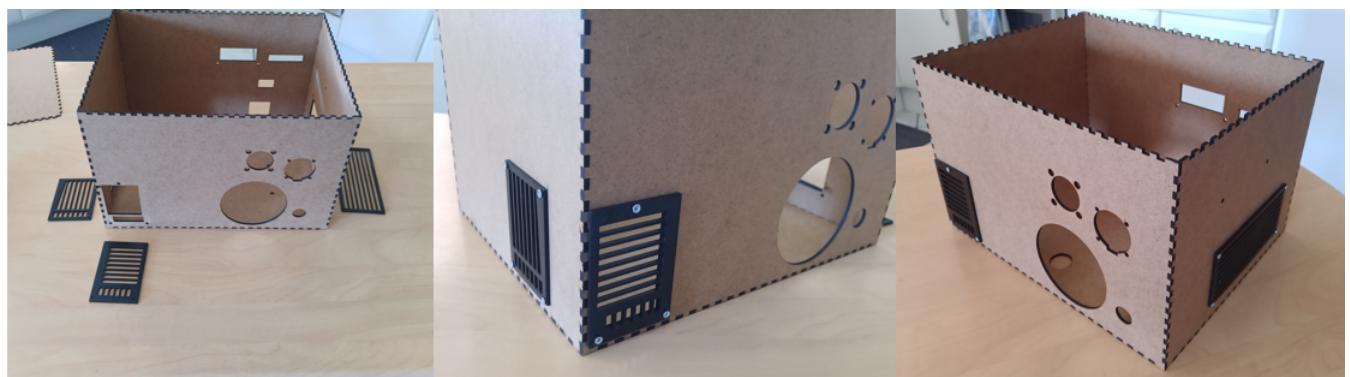
- Position right side perpendicular to the edge of the lower face with slots coincide with as in the photo below



- Tape with a mallet (without too much force) to fit all the slots
- Carry out this step for the back the left and finally the front side (check carefully the orientation of sides) do not nest the top side

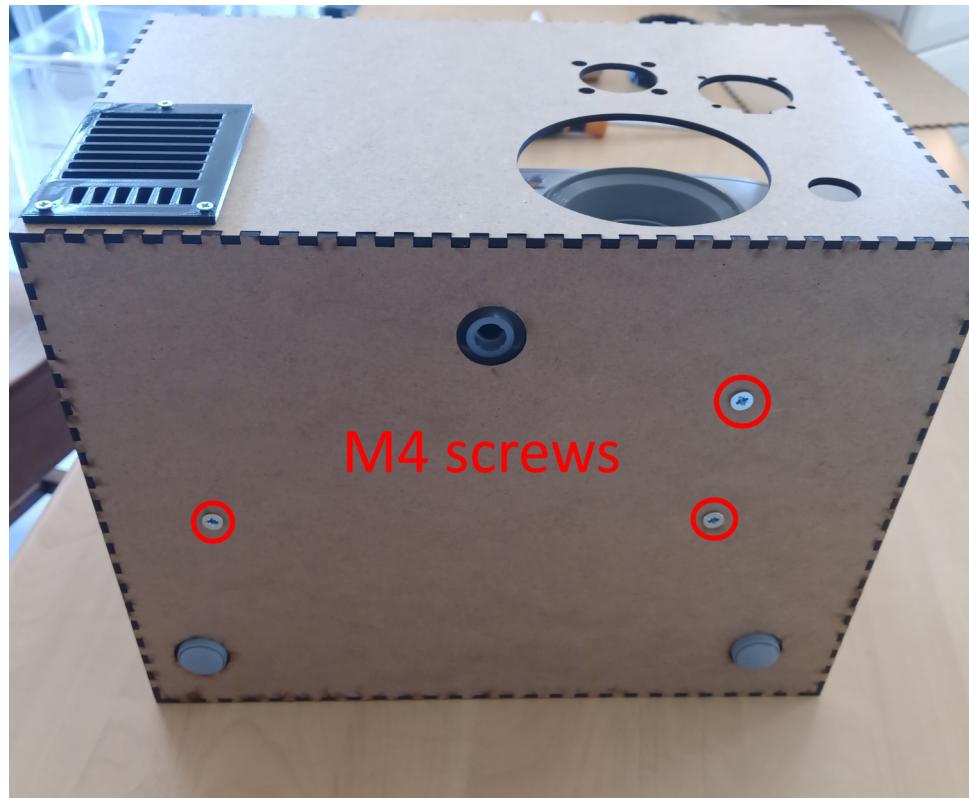


- Once all sides fitted together repeat all the edges with the mallet to have all the slots perfectly fitted together
- Screw the 3d printed ventilation plates on the left the right and the front side using 11 screws and 11 M3 nuts.



Step 4-components fixation in the box

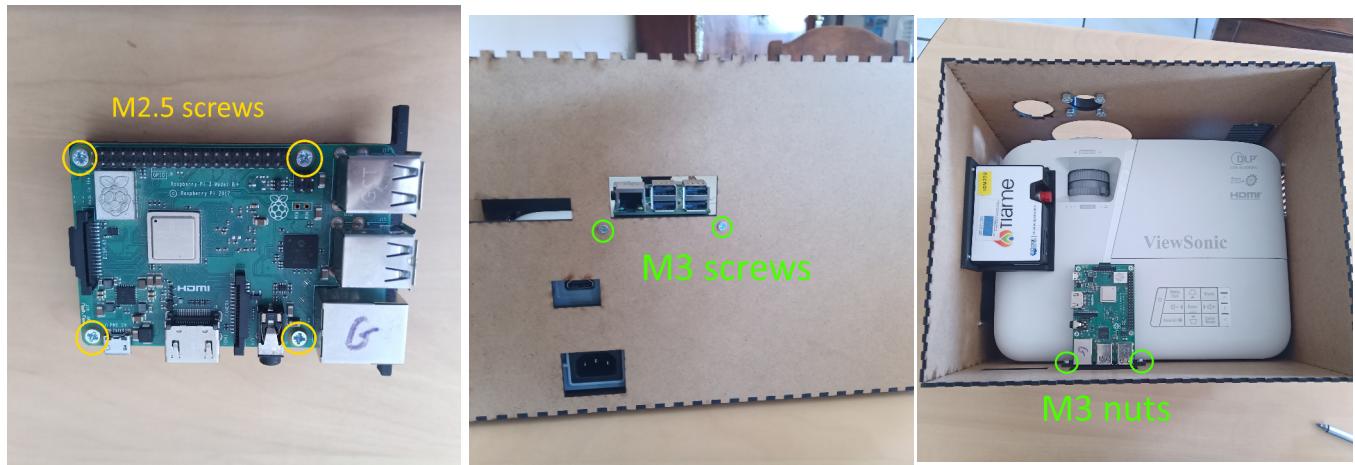
- Position the video projector in the box with its three pods out by the three windows on the lower side
- Position the box on the side and screw three M4 screws through the box in the video projector



- Insert two M3 nuts in the spectrometer fixation part
- Screw the spectrometer on its fixation part with 3 M2.5 screw.
- Fix the spectrometer fixation part with it on the left side of the box by screwing it with two M3 screws



- Fix the raspberry pi board on its fixation part with four M2.5 screws
- Fix the Raspberry pi fixation part on the back side of the box with two M3 screws and two nuts.



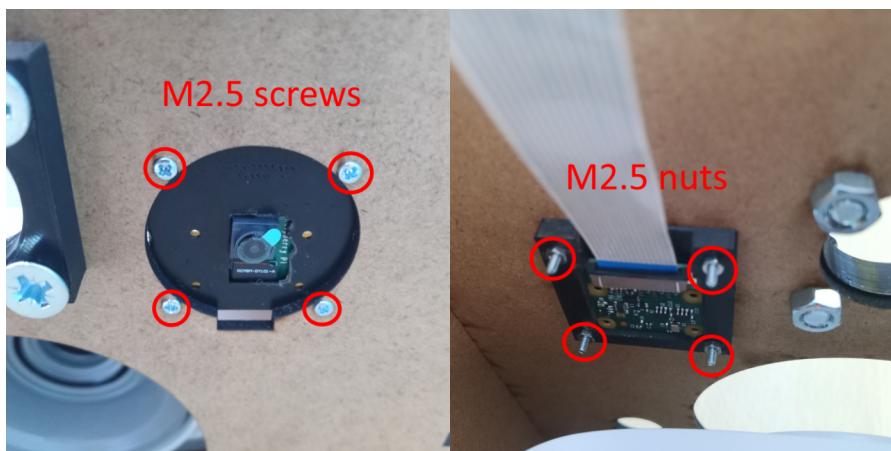
- Insert a M3 nut in the optical tube support
- Fix the optical tube support on the box front face with 4 M6 screws and 4 nuts



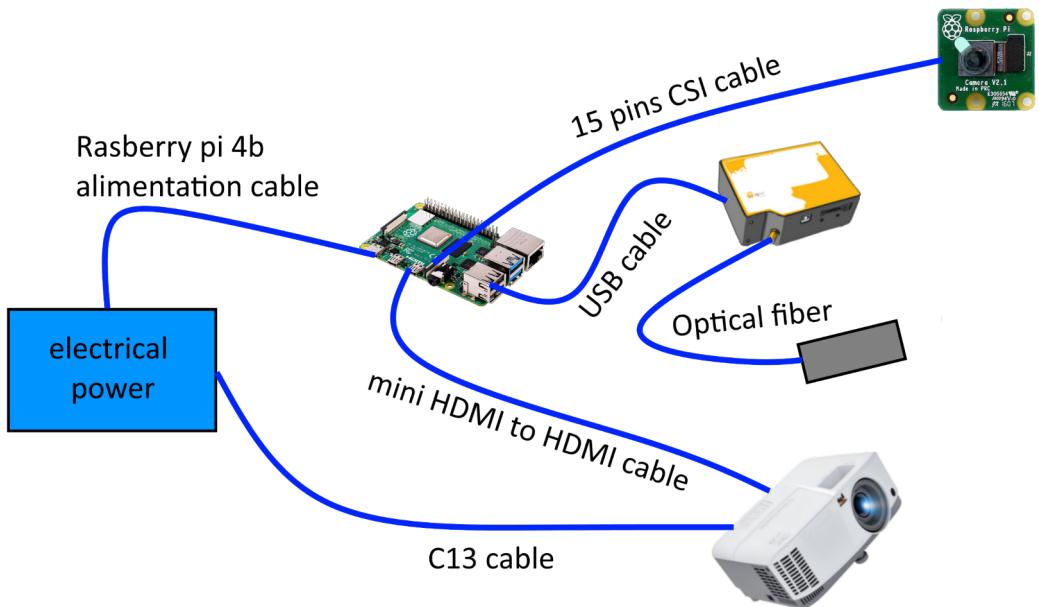
- Screw at one end of the optical Thorlabs tube the SM1/SMA fiber connector
- Screw at the other end the divergent concave lens



- Insert the mounted tube in the tube support and solidarize it by screwing a M3 screw in the support insert
- Fix the raspberry pi camera on its fixation part with 4 M2 screws and nuts
- Fix the raspberry pi camera fixation part with 4 M2.5 screws and nuts



Step 5 -Wiring



- Connect the wire raspberry pi camera on the raspberry pi board
- Connect once end of the optical fiber on the spectrometer and the other to the optical tube
- Connect the HDMI end to the connector of the video projector at the back side. Pass the mini HDMI end thought the cable windows at the bask side and plug it in the HDMI11 port of the raspberry pi.
- Pass the spectrometer usb cable end through the cable window as the back side of the box and plug in the usb2.0 port of the raspberry pi
- Pass the usbc raspberry pi alimentation end by the cable windows at the back side of the box and plug in to the raspberry pi
- Plug the C13 cable on the video projector