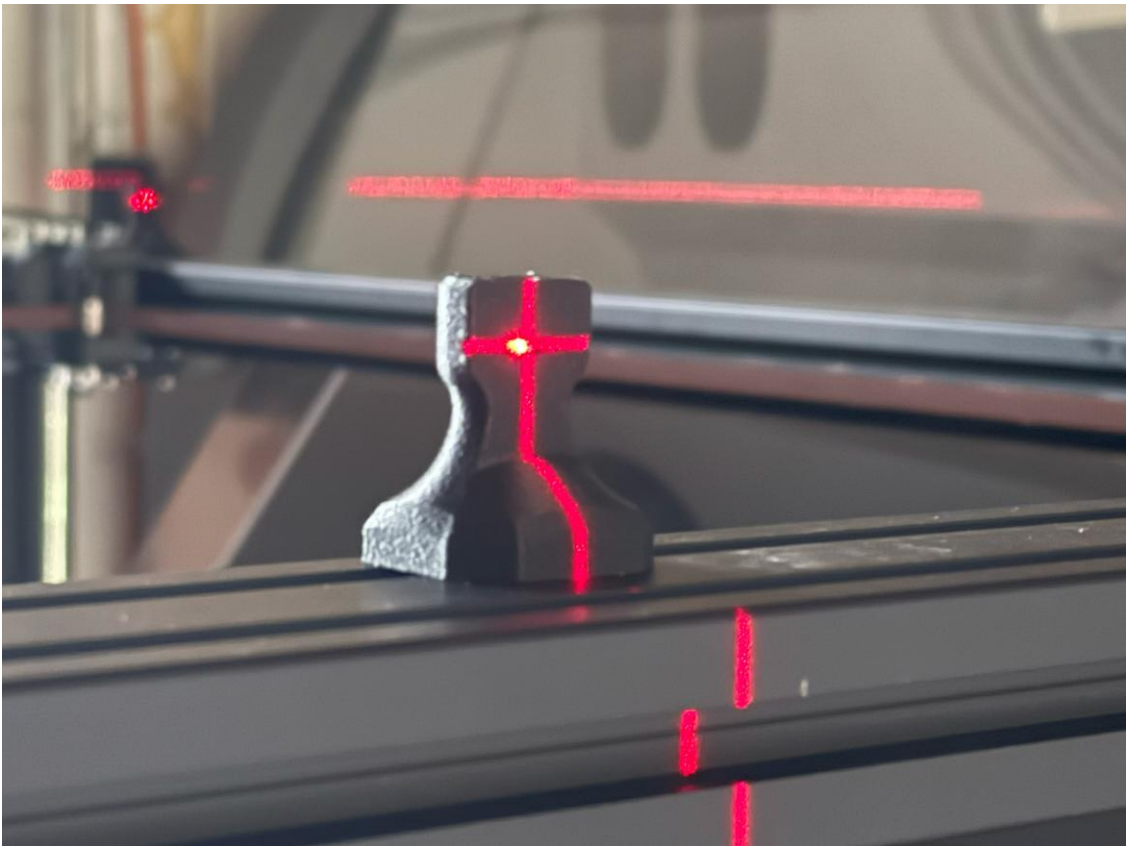


	<b>Gantry plane leveling procedure</b>	BRS-Engineering

# Gantry plane leveling

## Suivi des évolutions

Indice	Date	Description de l'évolution	Auteur
0.0	07/08/2025	Création	FBR



## 1 Settling

Let the machine settle on the ground where you will let it rest

**This is important, since no floor is flat, we will trim to machine to this specific place**

**If the machine is moved afterward, it can drastically change the Mesh**

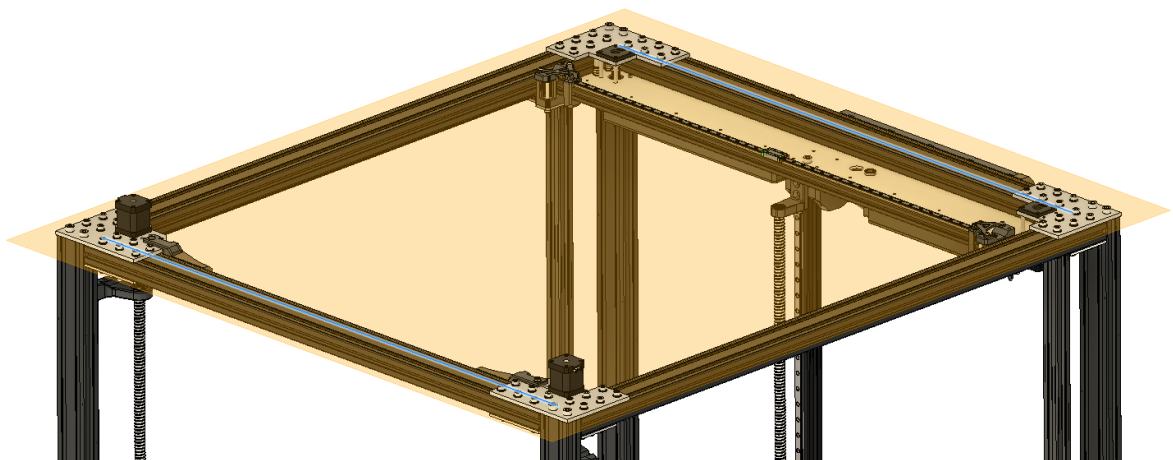
## 2 Trimming the squariness

### 1/ The theory

Here we need the gantry plane to be flat, some variances can make it uneven :

- Bad assembly
- Floor plane uneven
- Flexibility of the frame
- A mix of all the previous points

What is the gantry plane ? : The plane created by the upper extrusions where the rails are moving

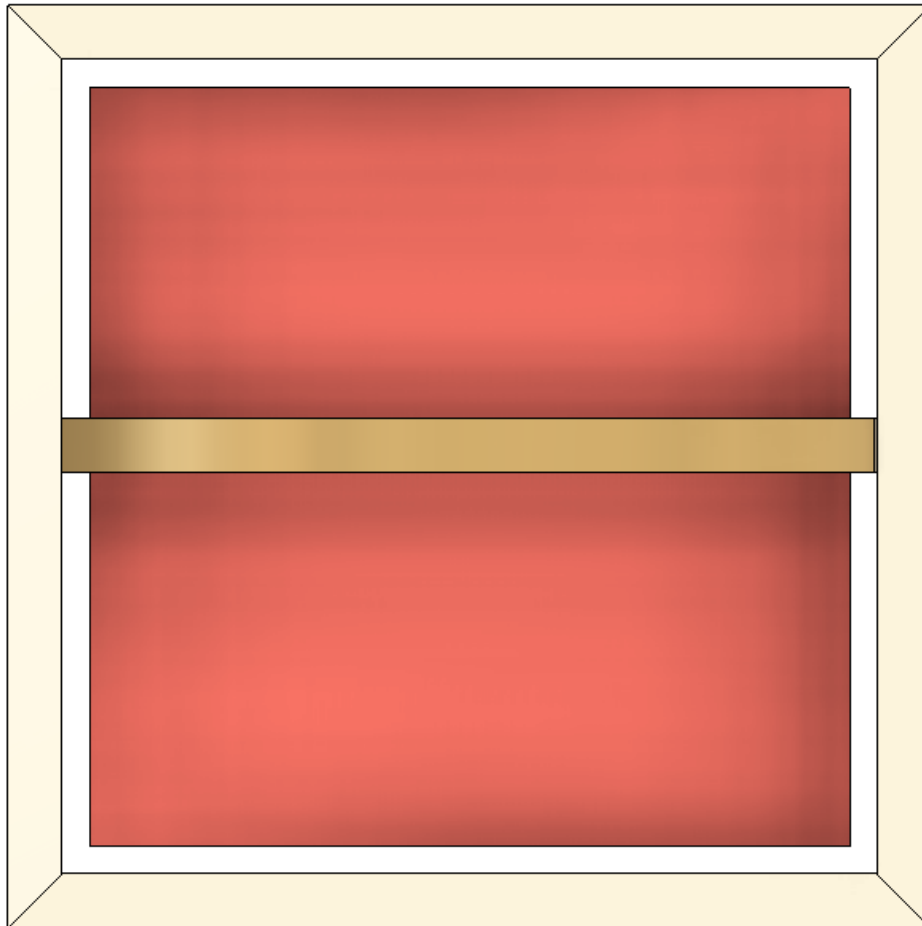


This plane is composed by 4 segments, which lead to a potential imprecision

Most of the time caused by a bad assembly, the floor can be uneven inducing a flex in the machine frame, leading this plane to be more like a curve

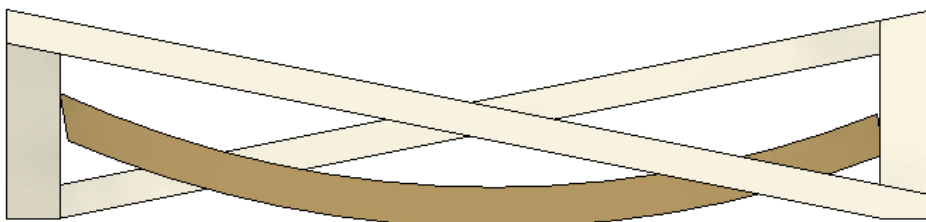
A X crossbar with flatness issues on a curve will create a more complex curve with sometimes strange topology, even with perfectly flattened bed. This issue is not a bed issue, it is a gantry flatness issue. Your probe is measuring the bed, but reversely probe the gantry flatness too.

Let's see what an exaggerated example can create :

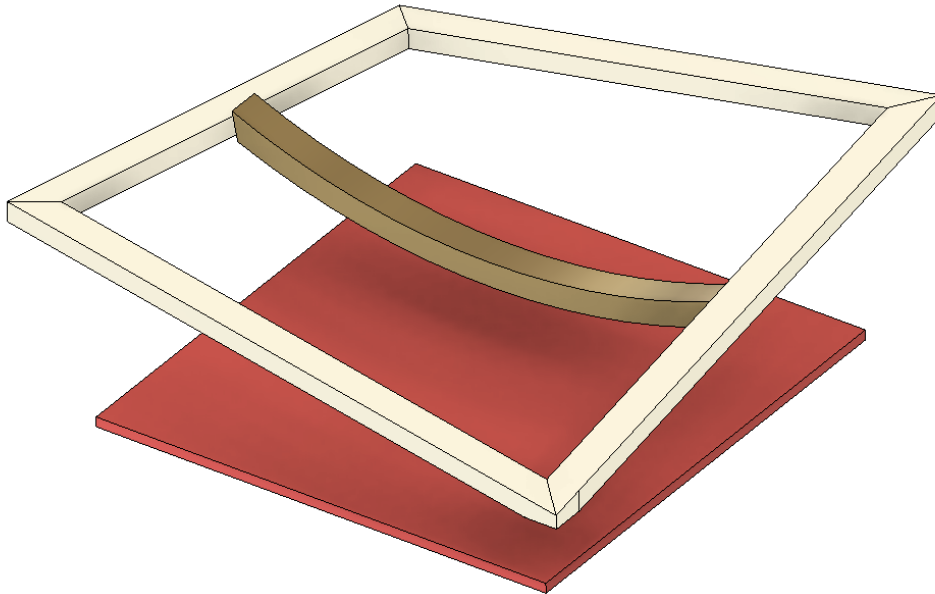


The top extrusion are white, the X bar is gold, the bed is red

Here you machine from the Top, it looks squared, but let takes anothe angle ; the front



The extrusion are poorly assemble, the X bar is not flat and weighting the toolhead with an inflexion. The bed is flat, let assume that



Now just imagine the probe on the toolhead moving all across the area, it will features a very bad mesh, not because of the bed, but because of the general situation.

In some case the bed is not flat either, which is a new level of issue

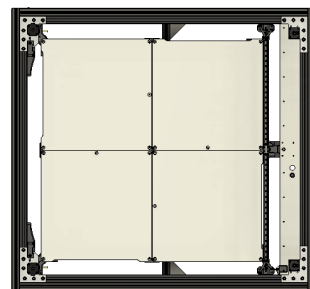
I even see sometime with some customer, a perfect bed mesh, but with an impossible first layer, or a bended printed part after each prints ; the reason why, 1 chance on a million, the bed imperfection matches the gantry imperfection, the mesh was fine, the reality was chaos.

## 2/ The trimming

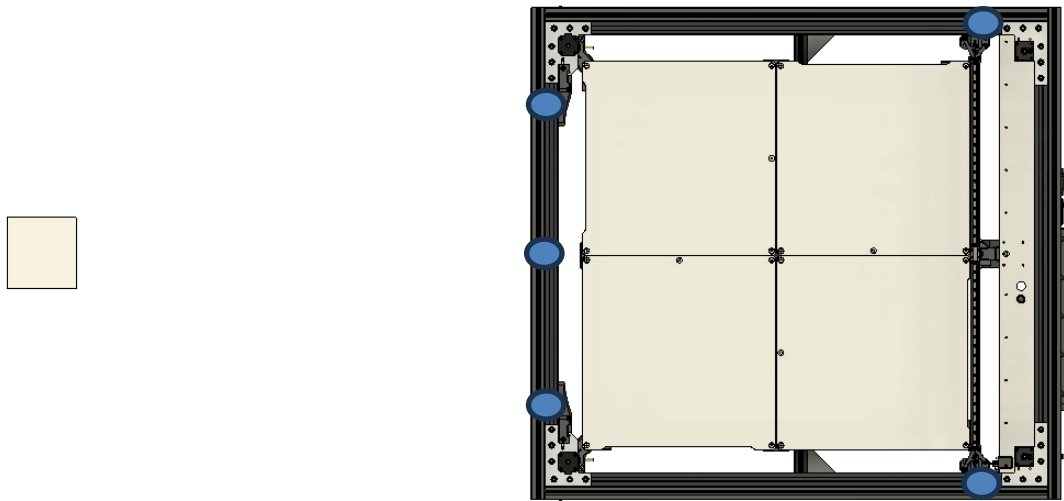
You will need :

- Laser niveler (few Euros at any local discount shop)
- 5x BRS target (Target piece + M3x30mm + m3 hammer nut) (4x target minimum)
- The machine on his FINAL PLACE
- Remove any reinforced corners or bars, we need it neat

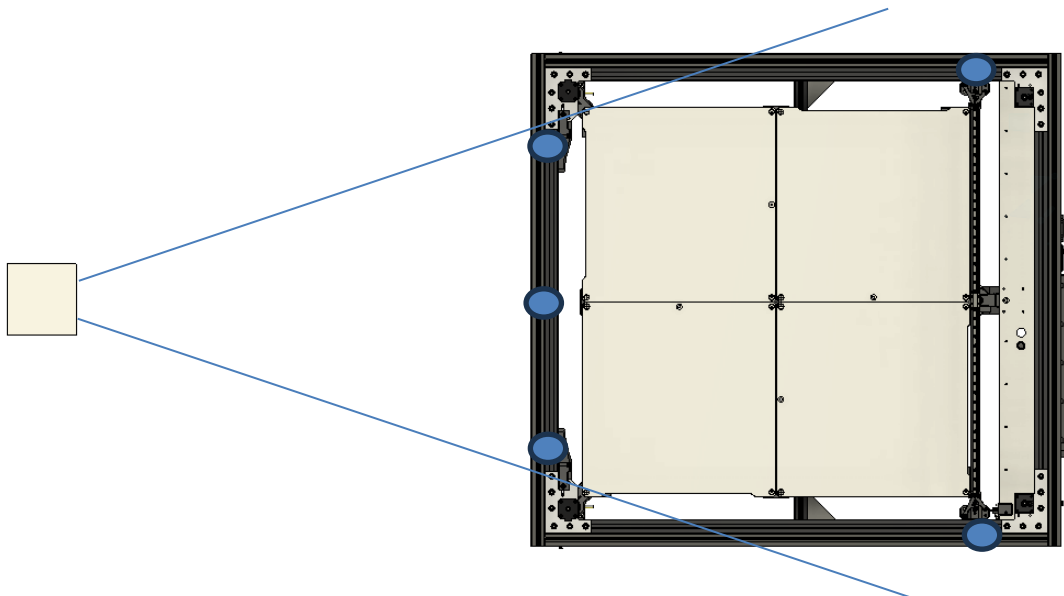
Place the laser leveler facing the machine



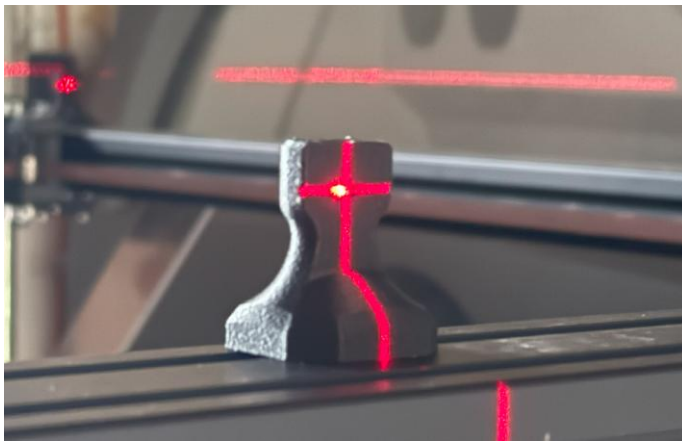
Install the 5 targets on the upper frame following those **positions** :



Once the laser is lit, be assured all 5 targets are within the laser line beam



The objective now is to trim the feet to line the laser line on all 5 targets



Target pin are made of a plastic part, and a screw to fix it. An 0.2mm opening has been made to reflect the laser on the screw head, this will be the spot to lit.

Take the centre front as a référence, place the initial light on it

Then you need to assess which target are'nt on the line, trim the 4 feet accordingly to level the machine until the 5 target are aligned with the laser beam

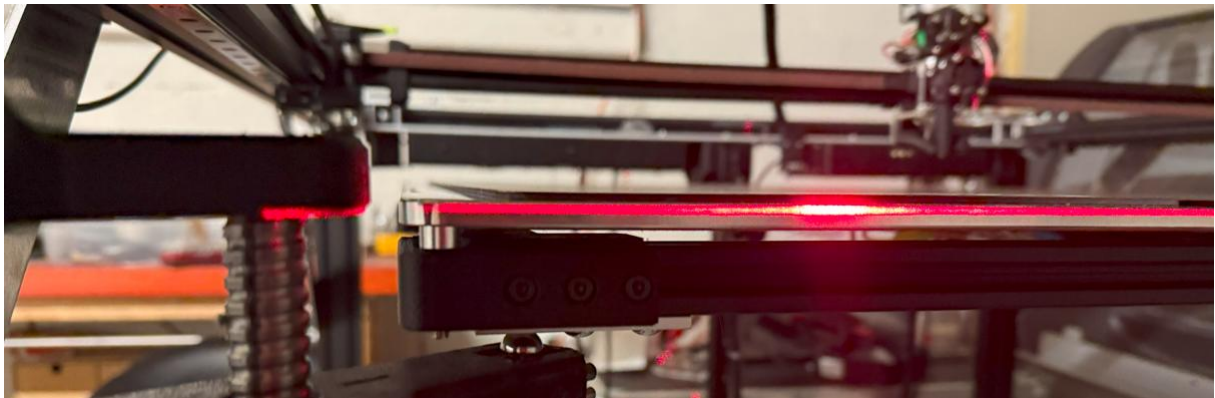
### **3/ The control**

- Once done, let the machine rest a bit
- Power it, Home it, make a tilt
- Recontrol the target still ligned up with the laser

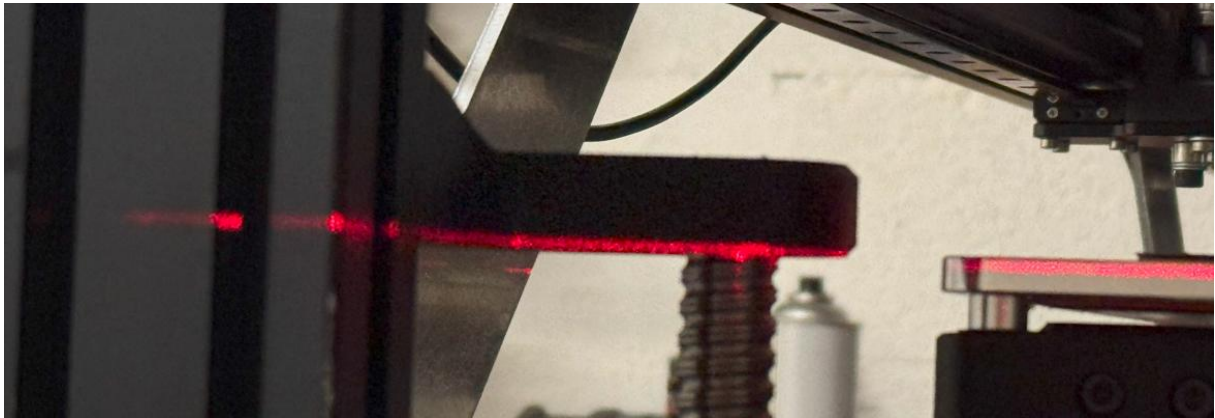
Now if the gantry is flat and ligned, a Tilt will tell us the bed place it perfection parallel to this gantry plane

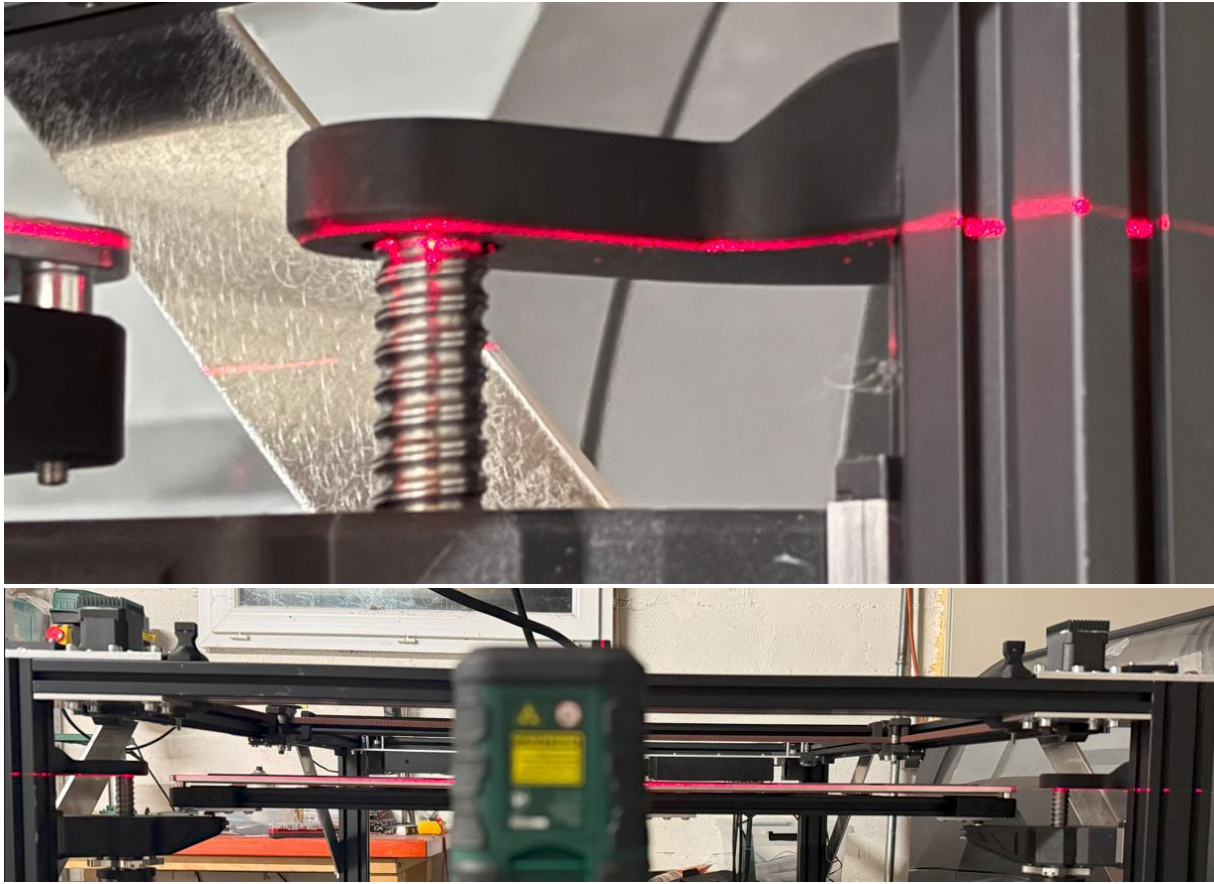
Lets control it :





Here we can compare the retainer level with the bed, the level is perfect





You are now sure the gantry plane is flat ( $\pm 0.1\text{mm}$ )

#### **4/ Rest the machine**

Let the machine rest some hours, sometime the floor will work the machine a bit on the frame flexibility side

Take a new measurement of the Target 24h later

### **3 Assistance**

If you need assistance ; I can help on:

**Mail :** [contact@brs-engineering.com](mailto:contact@brs-engineering.com),

**Discord:** BRS-ENGINEERING-Florent Broise  
brsengineeringflorentbroise\_3873

**Meta Messenger:** BRS-Engineering



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