

# EMBL Rapid Droplet Calibrator

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Version 1.0.0 Beta

This device allows the visual estimation of the droplet break-off point in a sorter. Designed with a Jet-in-air sorter in mind, the device speeds up the setup process of the instrument.

UHU Plus 300 or any strong glue.  
Selection of tools (or access to a Mechanical Workshop)  
Soldering Iron and solder.  
Insulation tape.

Parts:

Purchased from Apinex ([www.apinex.com](http://www.apinex.com)):  
20mW 532nm Laser Module GM CW02.  
Mounting bracket for laser modules Ø12mm BRH-12 (for GM-CW02 & GM-CW02L)

Purchased from Laser2000 (OptoSigma)  
Cylindrical lens Plano Convex BK7 ref:022-0280.

General electrical stuff:  
One 3.5mm jack plug and Socket.  
One 3V 800mA power supply.  
2 adjustable power supplies 3-12 volts, 0.25 Amps set to the appropriate voltages for the camera and laser. Get the type with the interchangeable jack plugs

Other useful stuff:  
Hemostats  
BNC cable 1-3m long.  
Lens paper.  
Tissues for cleaning up.  
Beckman Coulter Flow Check Beads or any equivalent bright bead (10µm).

Delux model:  
Video QUAD BOX (plus BNC cables) -allows the display of all the cameras on the MoFlo simultaneously.

### **Laser Preparation:**

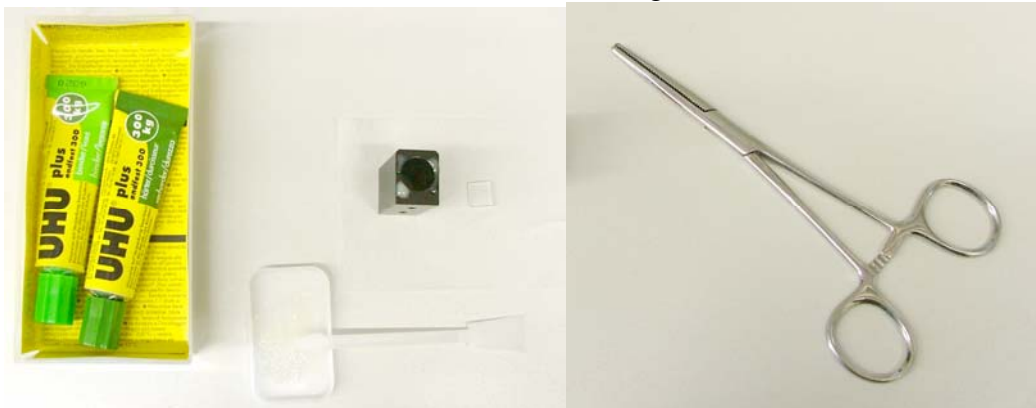
Solder the Female jack-socket onto the +ve and -ve wires of the laser. Solder or attach (depending on power supply chosen) the male jack-plug onto the transformer, using the correct polarity.



*Female 3.5" Jack socket soldered.*

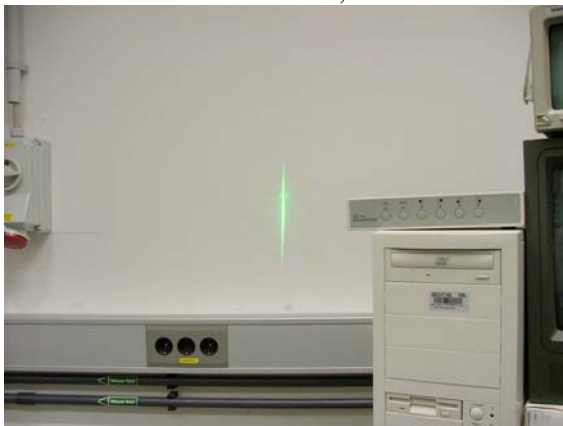
### **Assembly:**

Use the laser mount block of BRH-12 for mounting the laser.



*Glue/Mixer and pallet knife, Laser mounting Block BRH-12, Cylindrical Lens Plano Convex and hemostats.*

When gluing the lens, check the lens orientation. This lens has a focal spot length of 40mm, so at a distance, at least 1 meter or more, if you fire the laser beam through it you should see the beam as a vertical line, not a horizontal line.



*Correct Orientation of the lens. Beam expanded at about 3 meters.*

This is the orientation you should glue the lens onto the block, which should have the screw holes top and bottom.



*Lens glued in the correct orientation onto the block.*

Align the lens so that the centre of the lens is at the centre of the block. Then carefully clean off excess glue and leave to harden for 24 hours.

Attach the Laser to the block and fasten with one of the supplied laser mounting screws.



*Top of the mounting block with laser securing screw.*



*Bottom of the mounting block with adjust screw.*

## MoFlo

### **Centre Catch Tube Preparations.**

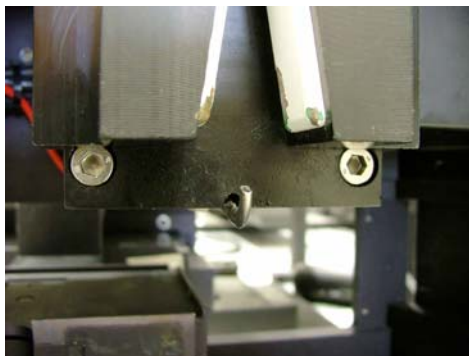
Using the Allen Key, remove the Centre Catch Tube (CCT) holder.

Using a pair of pliers, gently bend the CCT downwards, until it is about 15 to 30mm lower, but still able to 'catch the stream'.



*Bending the Centre Catch Tube with pliers.*

The CCT should be below the deflection plates.



*CCT is now below Deflection Plates.*

**WARNING!!!!!!**

**DANGER LASER RADIATION. DO THIS AT YOUR OWN RISK!**

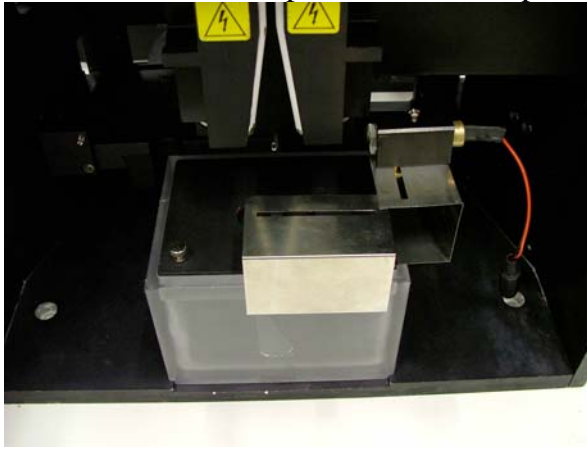
Take all the precautions necessary for safety. Read and enact the safety information here:

[http://fccfweb.embl-heidelberg.de/fccfweb/index.php?option=com\\_content&task=view&id=68&Itemid=101](http://fccfweb.embl-heidelberg.de/fccfweb/index.php?option=com_content&task=view&id=68&Itemid=101)

- and their links.

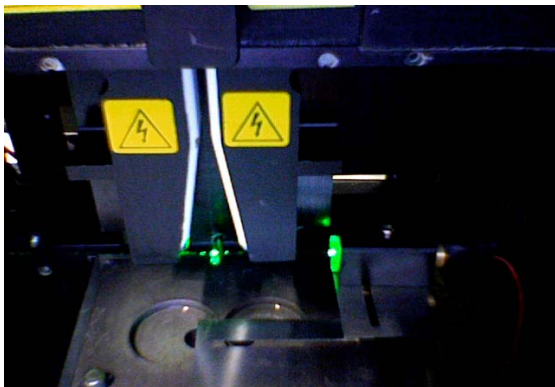
### **Aligning the Laser to the stream.**

Using M3 screw attach the Laser holder block to the frame. And fit the frame onto the MoFlo's Sort Tube capture block. Then position the block into the MoFlo sort Chamber.



*The laser mounted and ready to align to the streams.*

Apply a test pulse and align the laser block so that it illuminates the centre stream and one of the test streams optimally.



*Laser illuminates the Centre Stream and Left and Right test streams.*

Fit the camera to the frame and attach it to the MoFlo sort capture block. Power up the camera and fit a BNC cable to the back of your MoFlo Black and White monitor. Select the picture.

### **Defanning:**

Set up defanning as you would normally but, looking at the Monitor, optimise the defanning of the streams.



Adjust to this->



*Test Pattern before defanning*

*Test Pattern after Defanning*

Setting Break-Off point:  
Put the filter holder into the Camera box.



Camera fitted with filter.

Reattach it to the Frame.

### SUMIT SETUP:

Align the system as you would normally.

Create a FSC SSC plot and make a region in the corner of the plot. Set the region to sort everything OUTSIDE to the Laser illuminated sort stream. Set the CSU to Purity 1.0. Run the beads at about 1000ev/sec and sort.

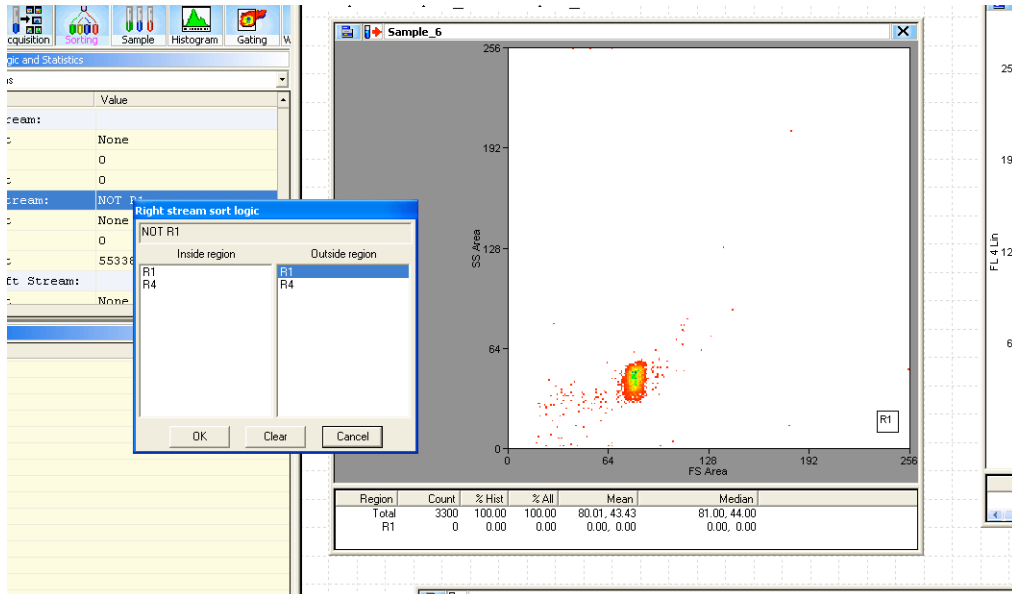


Figure Shows Sumit™ Configuration

Looking at the monitor, roll the Drop Delay knob until all the beads are in the sort stream.



Roll the Drop Delay Knob to see all the beads deflected to the right

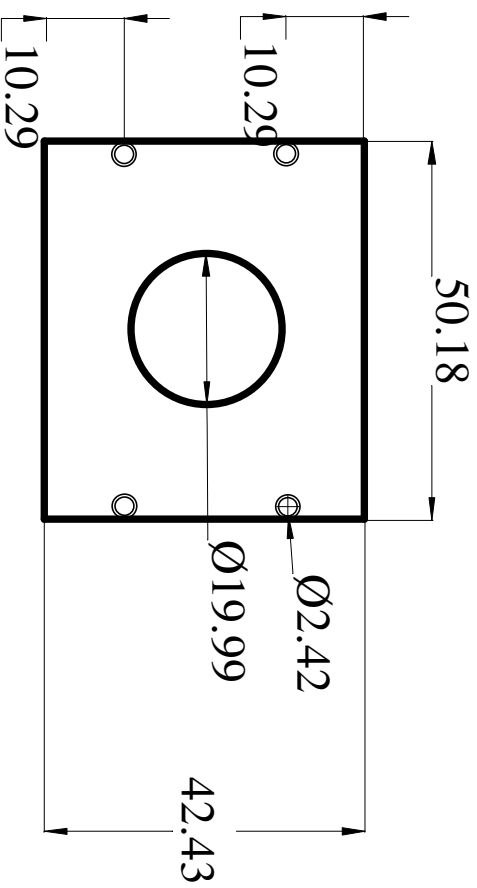
You have set the drop delay. You can remove the filter from the front of the camera to monitor the sort deflections.

**TIPS and HINTS:**

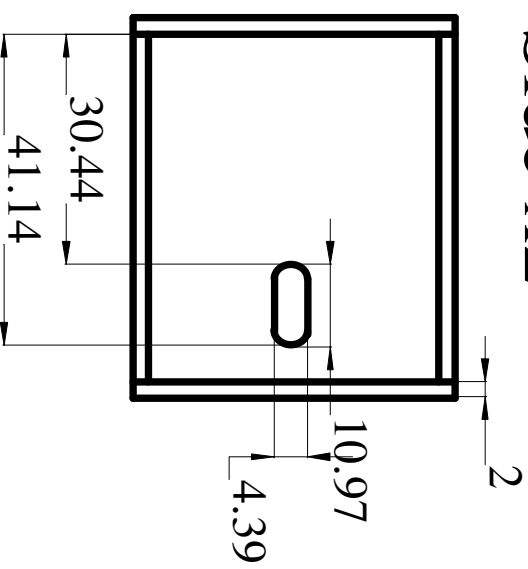
You can use a quad video box to display the video images of all the cameras.

# Camera box holder 2

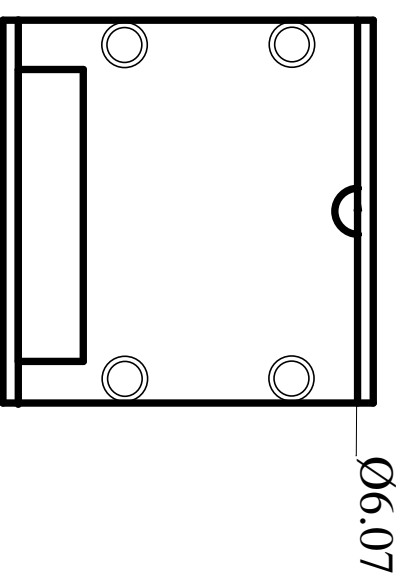
## Front



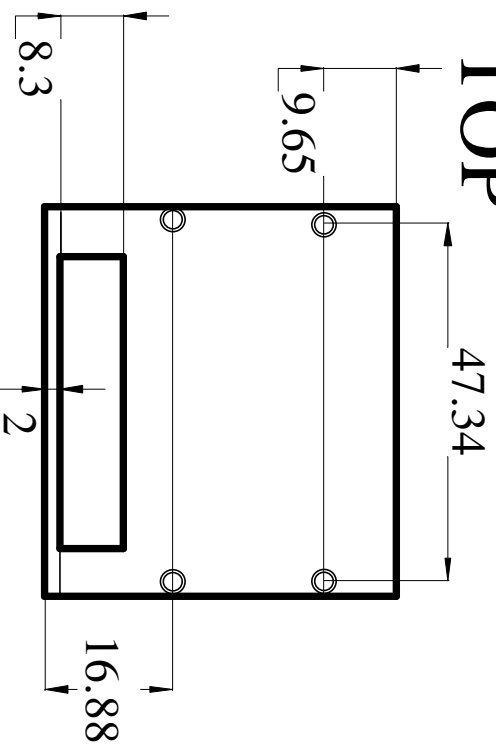
## Side x2



## Bottom



## TOP



### Notes:

All measurements in mm

Material: PVC

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FCCF

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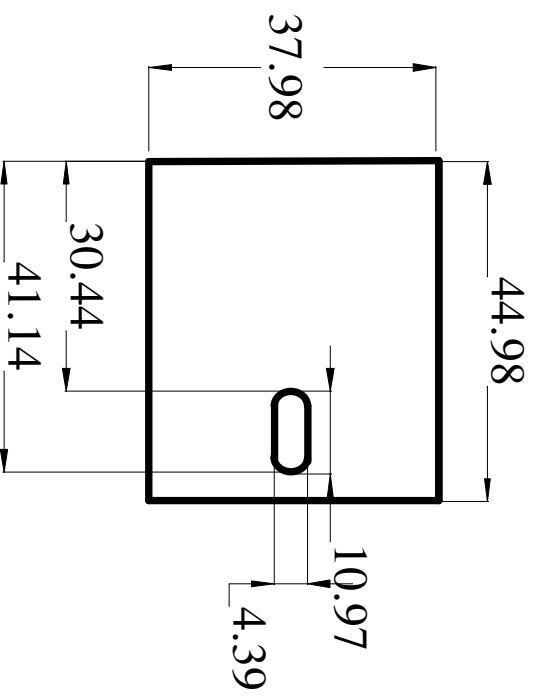
Meyerhofstrasse

Heidelberg

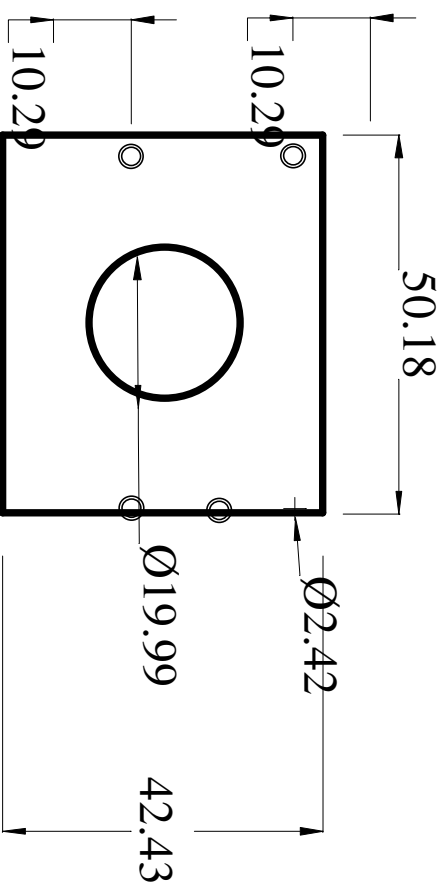
Germany

# Camera box holder Front-Side-Top-Bottom

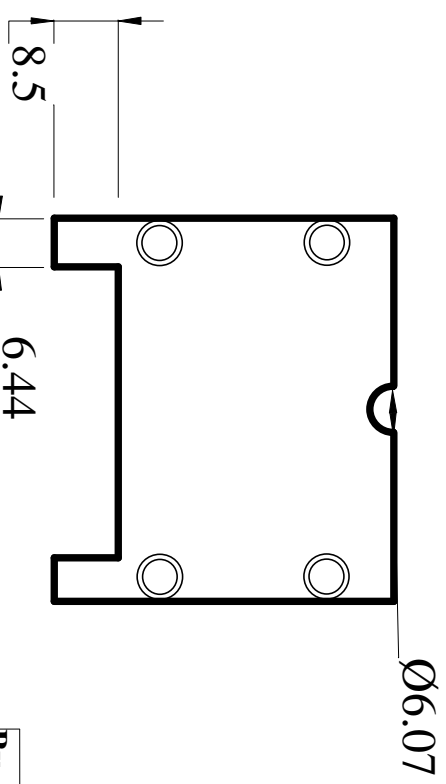
## Side x2 6mm thick PVC



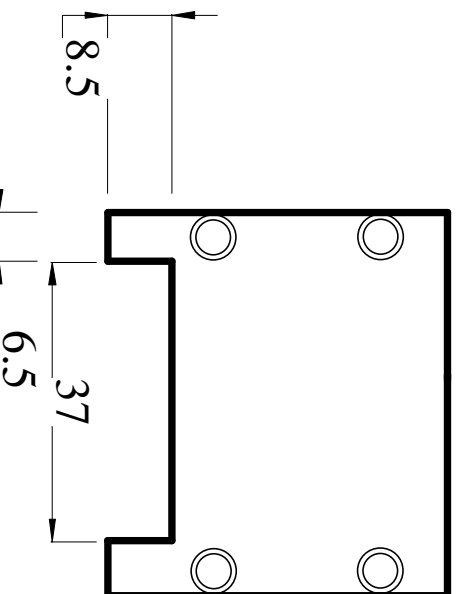
## Front 2mm PVC



## Bottom 2mm PVC



## Top 2mm PVC

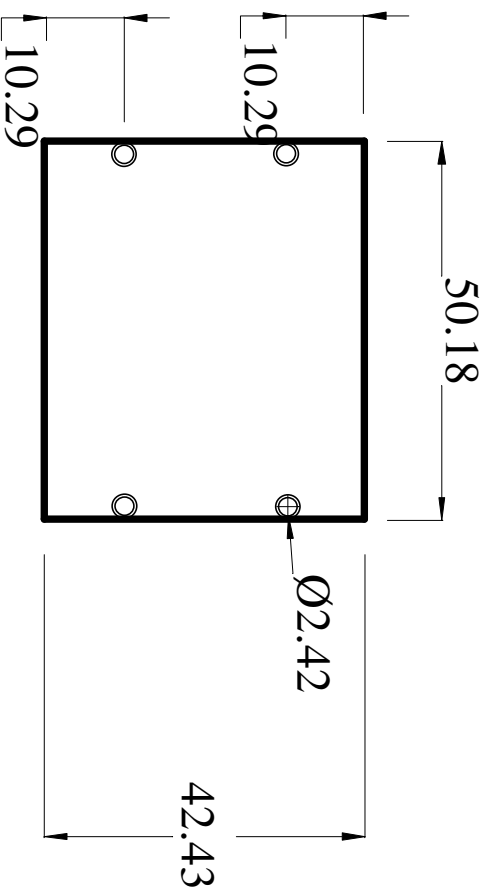


**Notes:**  
All measurements in mm  
Material: PVC

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# Camera box holder rear view

## Back 2mm PVC



## Component List

Box Material:  
Black PVC 2mm and 6mm

Camera:  
From ELV  
Cat No. ELV-54235  
Description: B/w .5 Lux camera

Screws+threads:  
Camera Screw adjusters M3  
PVC Body Component/Screw M3.

Camera Power Supply:  
From profitec  
Model No: SMP-1000AV/-1000  
Set to 12V

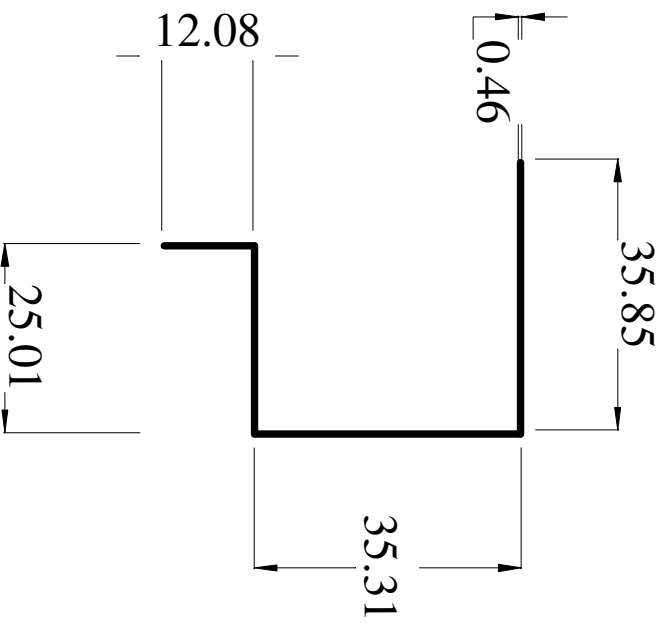
3m BNC cable for Video.

**Notes:**  
All measurements in mm  
Material: PVC

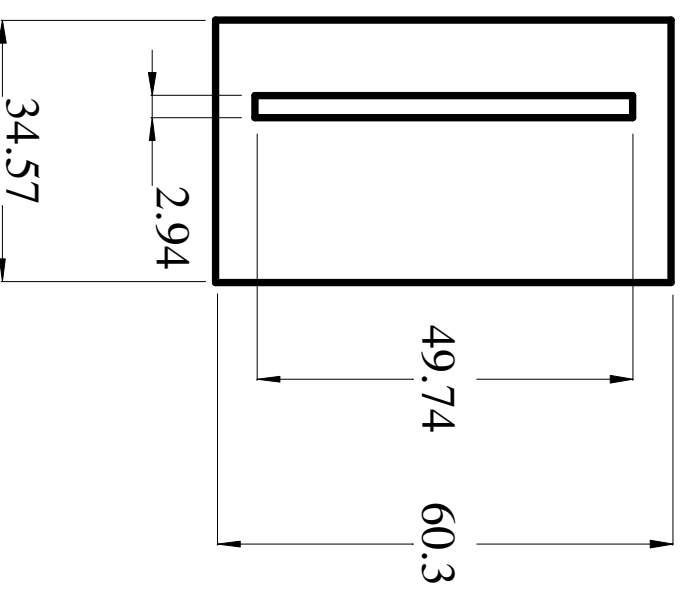
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# MoFlo Laser and Camera Stand

**Side**



**TOP**



**Notes:**  
All measurements in mm  
Material: Aluminium

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