Mono2 Grid Calibration

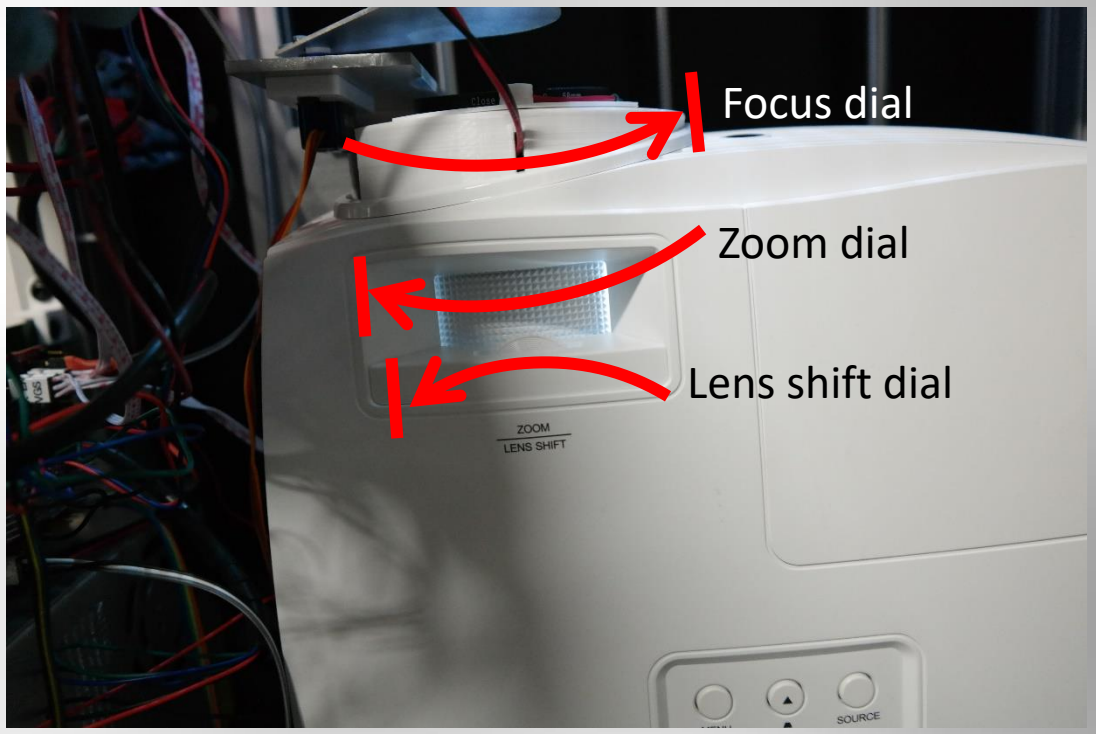
Ver. 1.0

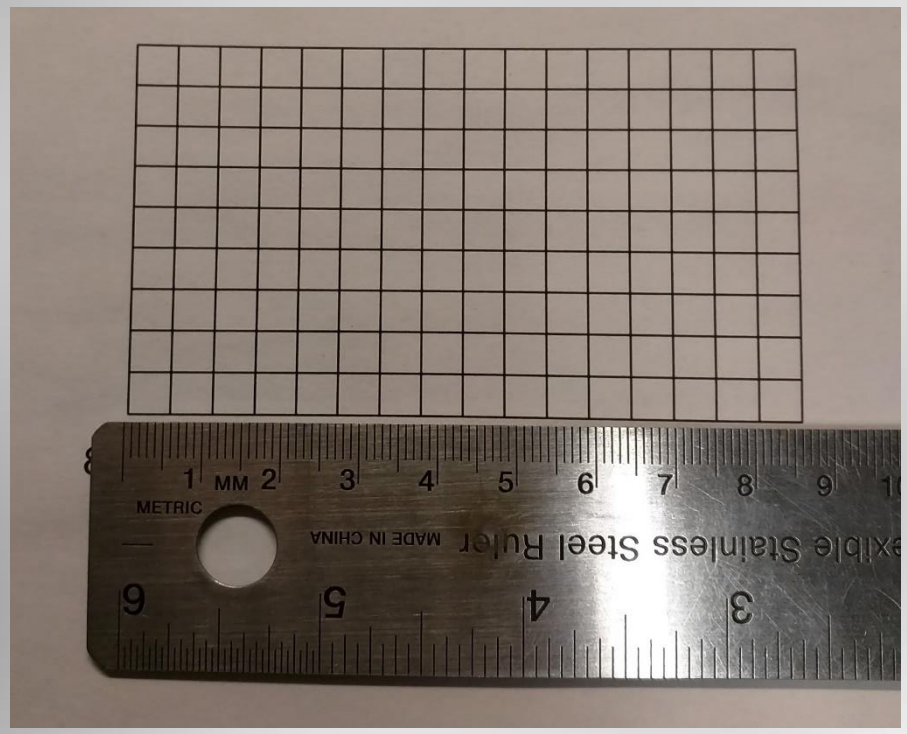
Dec. 8, 2017

Grid calibration pre-requisites

- Start with larger grid size (ex. 70 microns for mono2)
- Use the Keystone buttons of the projector to make the horizontal top and bottom lines are in equal length → this setting may be changed by macro lens.
  - 10x lens: Typical keystone value is -3
  - 4x or 2x lens: -1
- Projector’s output has heavy UV irradiation, so please use caution not to see the direct output from the lens

Mono2 Grid Calibration 1

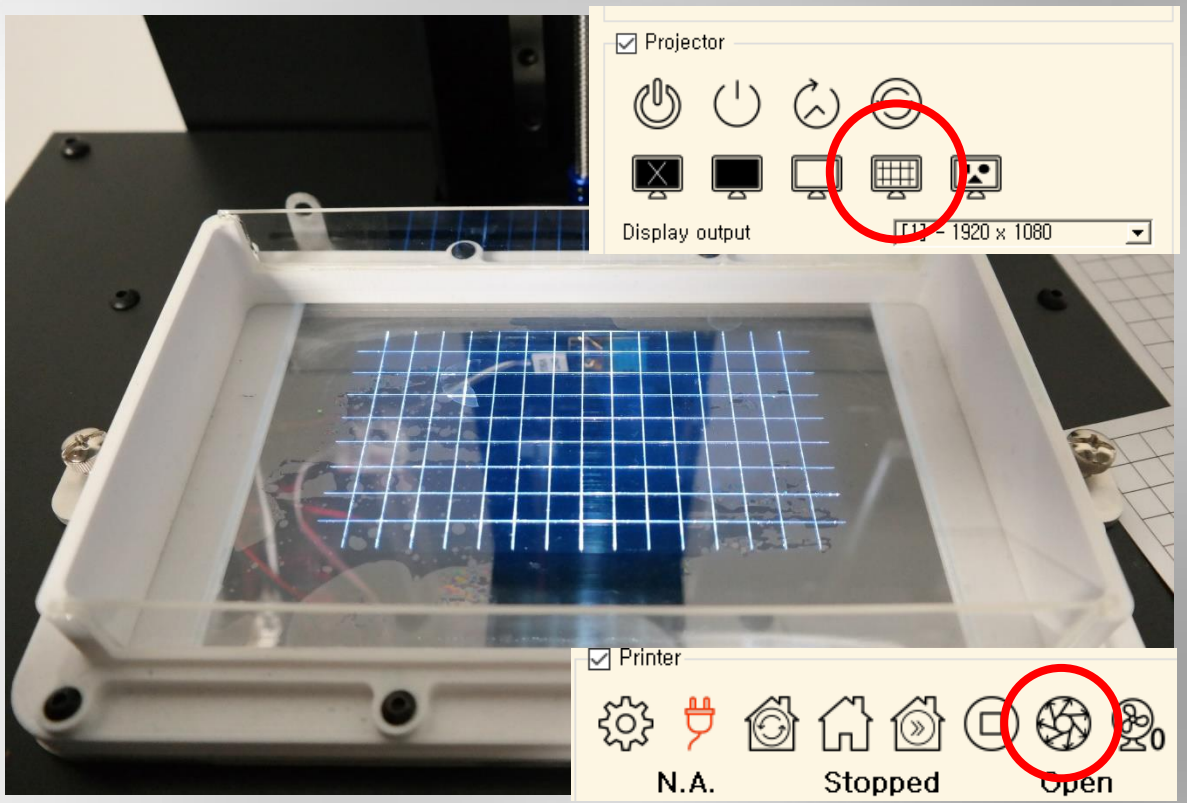


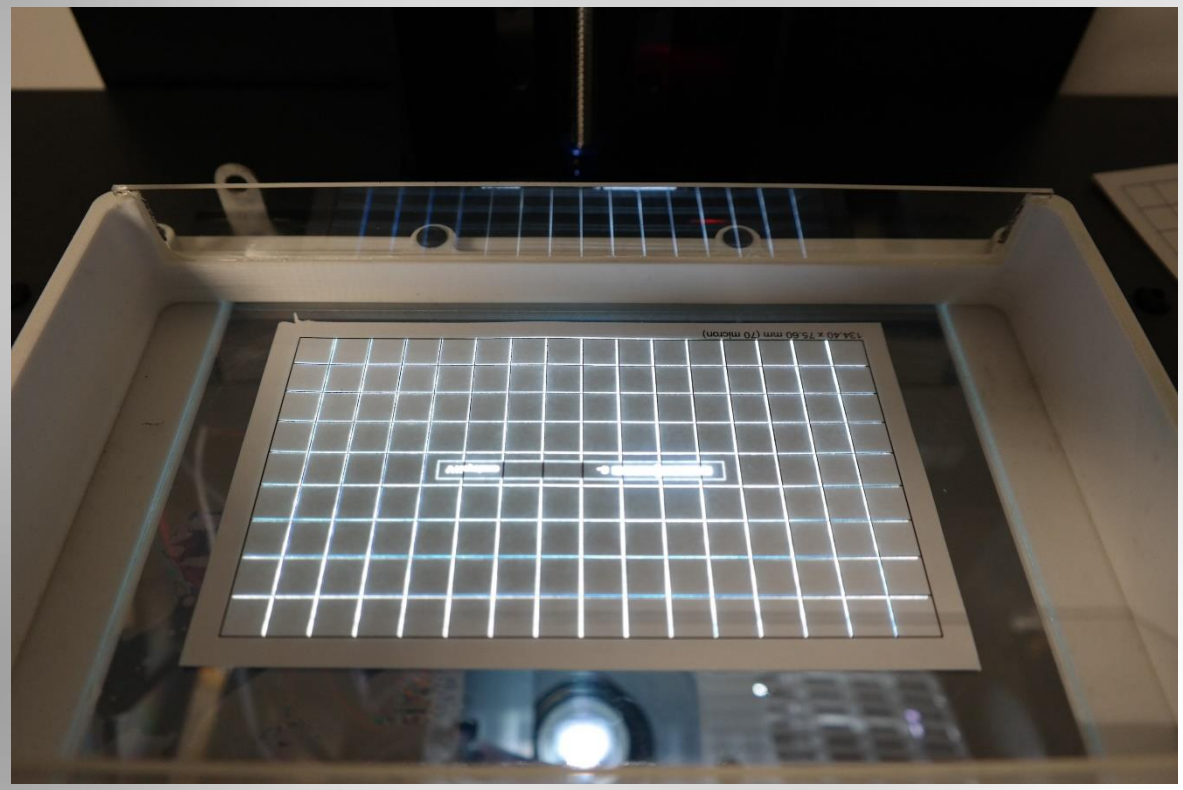


- Attach +2 macro lens. They are self positioned by magnets.
- Rotate three dials of a projector (focus, zoom, lens shift) to its end, if they are off position.

- Download and print calibration grid file
  - Sizing option when printing: Actual or 100%
- Cut them into individual pieces
- Make sure the grid width and height is correct

Mono2 Grid Calibration 2

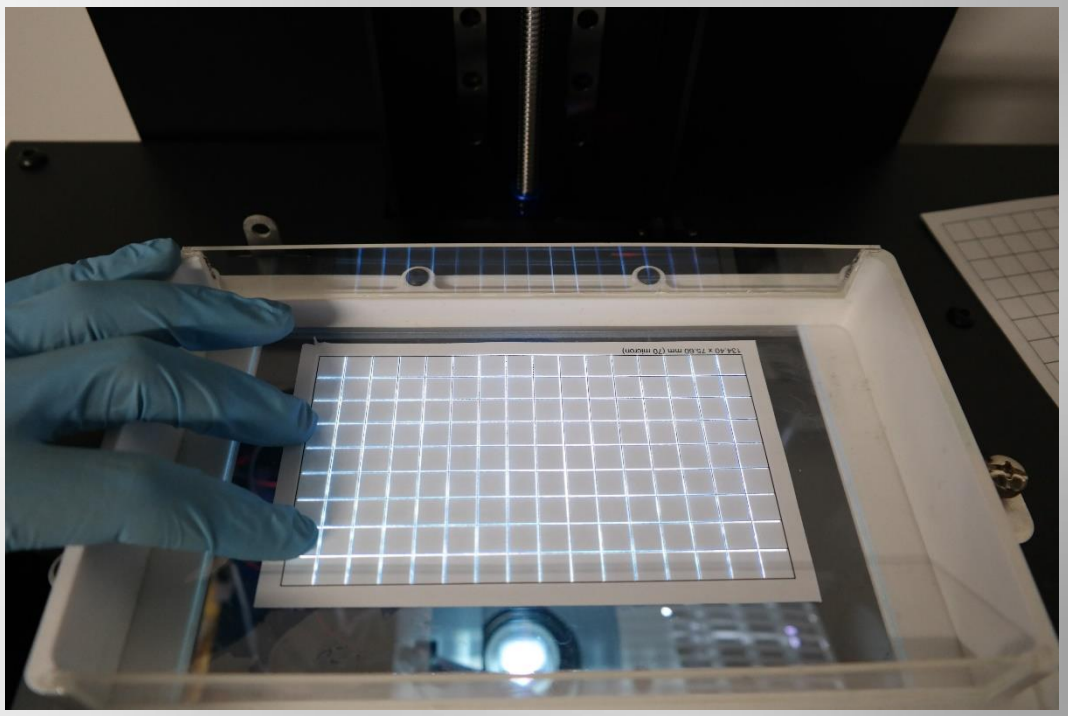




- Move the z-build arm to 100 mm or higher
- Place an empty resin tank with a film assembled
- Turn on the projector and press MonoWare grid button
- Check the display output is [1]
- Open the shutter

- Place the printed paper on the empty resin tank
- Use the keystone buttons if the upper and lower horizontal lines are different in their length

Mono2 Grid Calibration 3

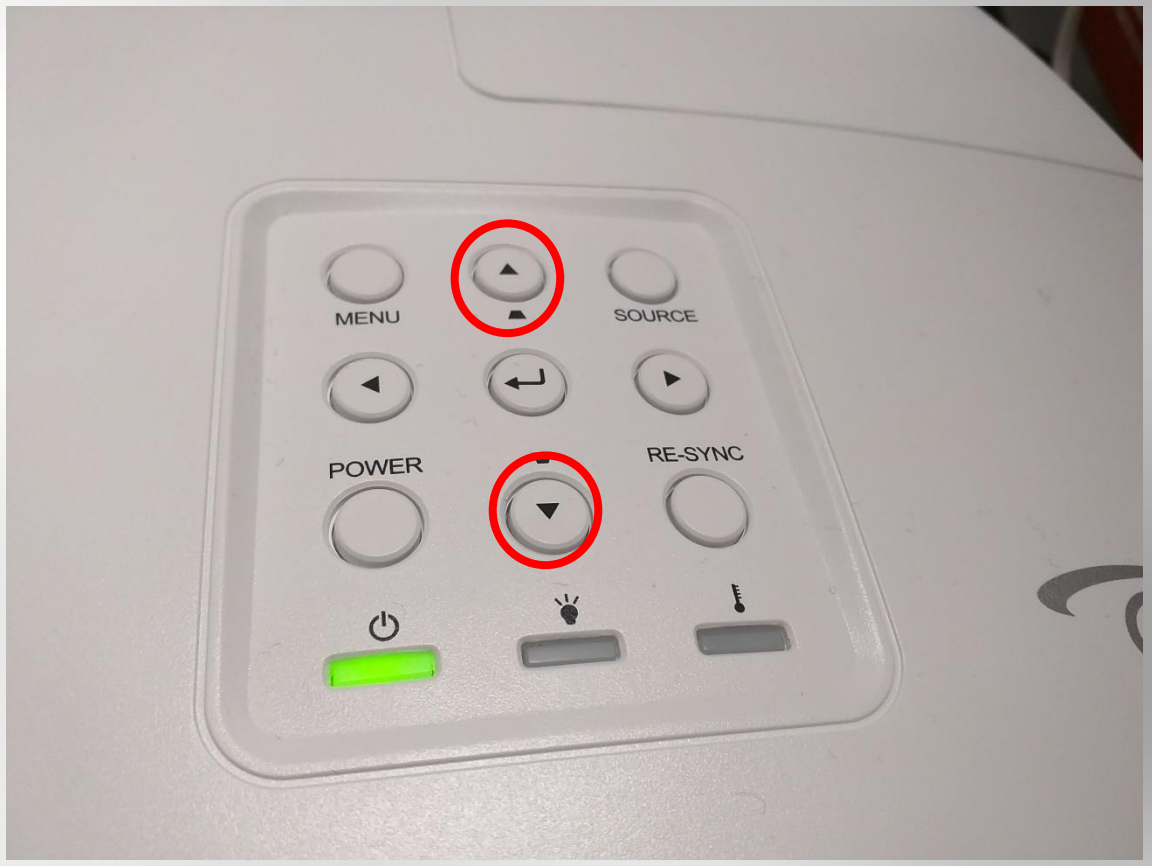


Default pixel size and projector position settings

Pixel size (microns)	Projector position (mm)	Keystone value	Macro lens
23	0	-3	+10
46	83	-1	+4
70	178	-1	+2

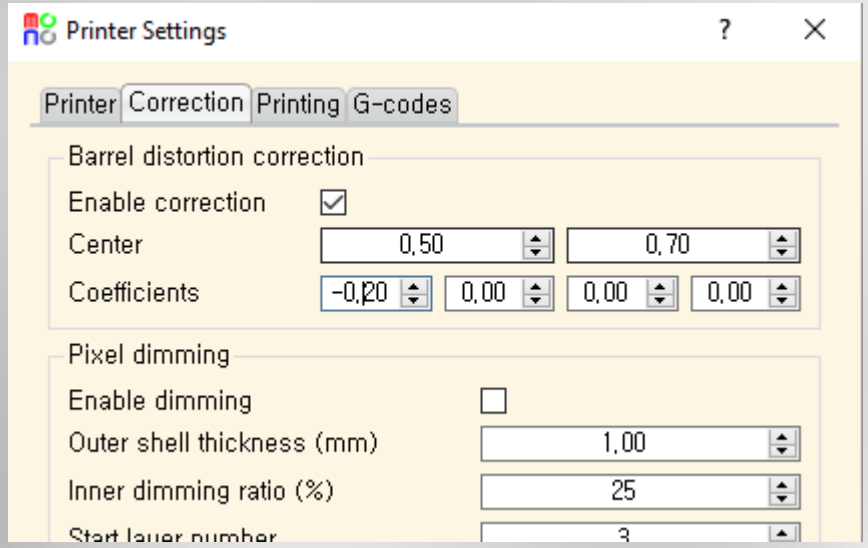
- Adjust its position as close as possible to the projected grid
- This demonstration used 70 microns grid paper and 2x macro lens. The projector position is 178 mm.

Mono2 Grid Calibration 4



- If the top and bottom horizontal lines are different in length, use the keystone buttons on the projector to make them equal length

Barrel correction settings for xy23 (10x macro lens)



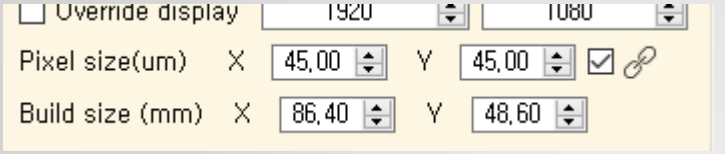
- If there is bent grid, use the barrel correction function in MonoWare.
- Above setting will usually work, but if you use lower mag. Lens (+4 or +2), reduce the first parameter from -0.20 to around -0.10

Closing the grid calibration

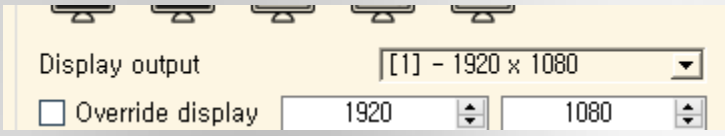
- Actual pixel size might be different from the one used during the grid calibration. After the test print, please measure the reference dimension and recalibrate the pixel size in MonoWare.
- Projector’s focus dial should be at its end position. If not, the calibrated grid is not reproducible later.
- Default pixel size is 23, 46, 70 microns. If you need other pixel size, use the zoom dial of the projector to tune the pixel size.
- You can create your own grid paper. The grid is 16 x 9 or 120 pixels for each grid.

FAQ and troubleshooting

Q: Printed dimension is not same as design. How can I correct this dimensional error?
A: If the printed dimension is 4.9 mm and the design is 5.0mm, you need to increase the current pixel size by a factor of 5.0/4.9 on MonoWare. So if the old pixel size was 45 microns, the new pixel size will be 45 x 5.0/4.9 = 45.92 microns.



Q: Grid is not shown on the vat bottom.
A: Check the HDMI cable. Then check the projector source (HDMI1) is properly selected. Next, check the output display is correctly set on MonoWare. It is usually [1].



Q: The output display is set to [1], but still no projection out of the projector.
A: Sometimes MonoWare is not updated with the projector's display id properly after turning on the projector. Click the display output combo box and select [1] again.

Q: Even if I change the pixel size, the printed dimension is not changed.
A: You need to re-slice the model with a new pixel size.

- Keystone value of Optoma HD37 can be adjusted around -1 or -3 for 4X and 10X macro lenses, respectively. Use this value as a starting point.

Thank you!