BSW for imaging demo

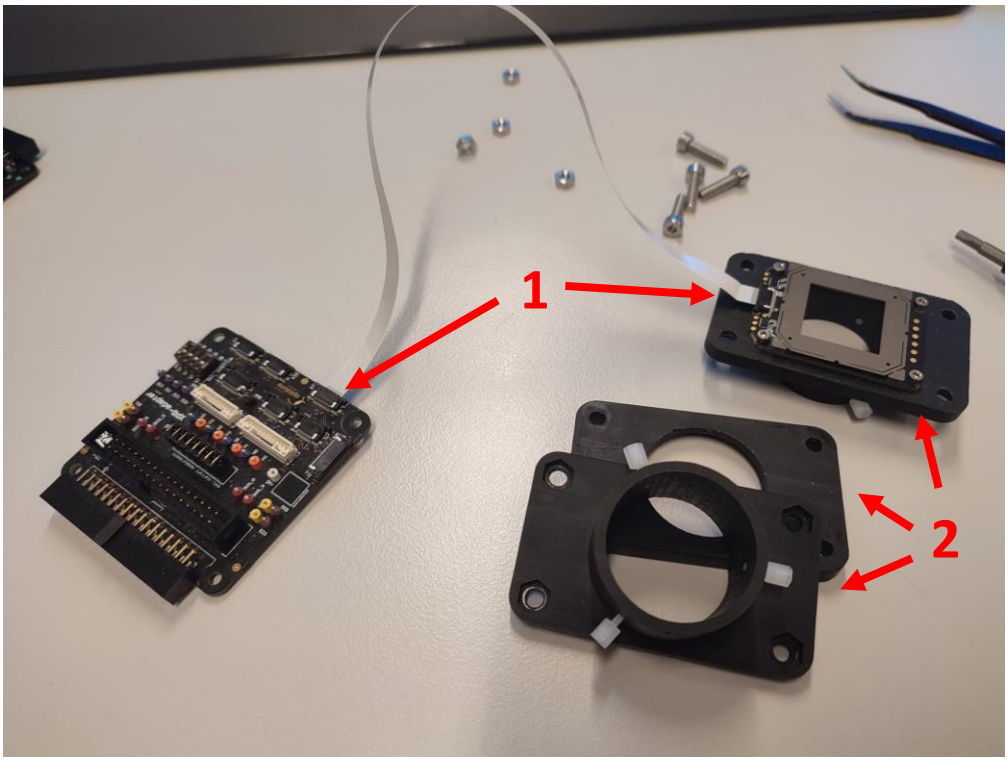
Updated 04.02.2026

Software requirements

- Register at https://en.daheng-imaging.com/ and install the latest Galaxy Windows SDK that includes the USB3 driver (for MERCURY2 cameras).
- Make sure Firmware supports smart step feature (Version >= 1.1.741034)
  260204: FW/SW incompatibility detected: newer versions > 1.1.741034 may **not** work (smart step functionality)

Setup

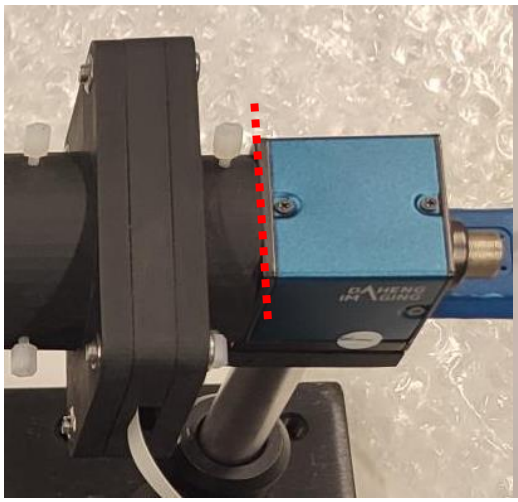
1. Connect the flex between the XPR adapter board and the XPR itself with shiny contacts facing up! Make sure the flex is connected straight and do not stress it.

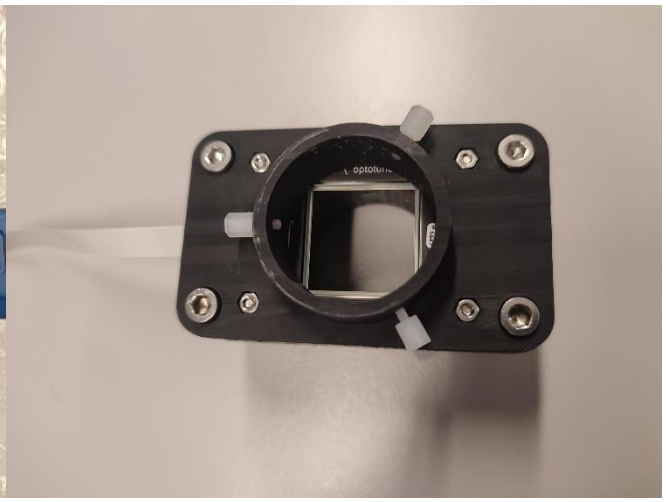


2. Screw the 3 parts of the XPR support (camera mount, XPR mount, objective mount). Use MINIMUM force to tighten screws. Once the parts are screwed, the wire connected to the XPR is no more accessible.

3. CAREFULLY screw, with minimum torque, the support to the camera with the face below against the camera, press it until the camera is in contact with the PCB of the XPR.

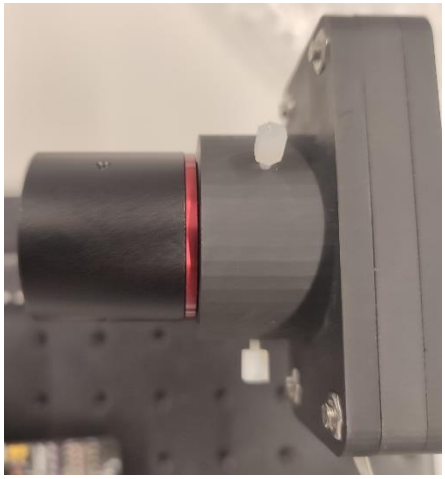
➔ Orientation: Flex needs to be on the left of the camera when looking from the top with the camera closer to you, otherwise software needs to be adjusted.

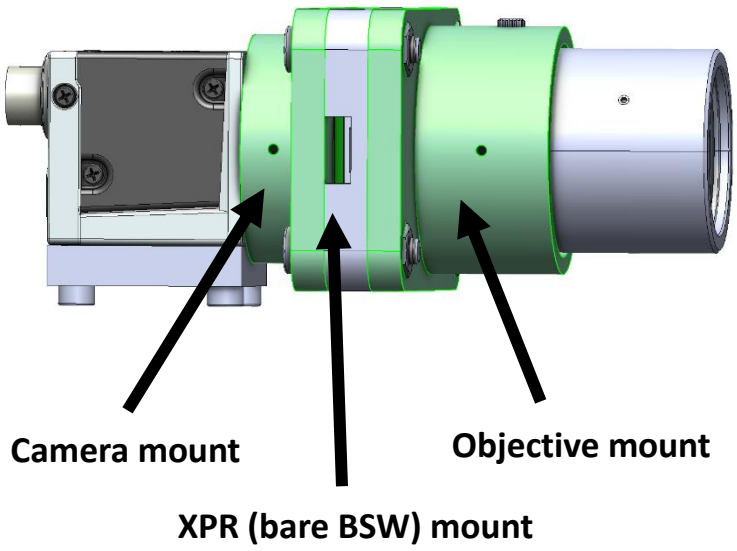


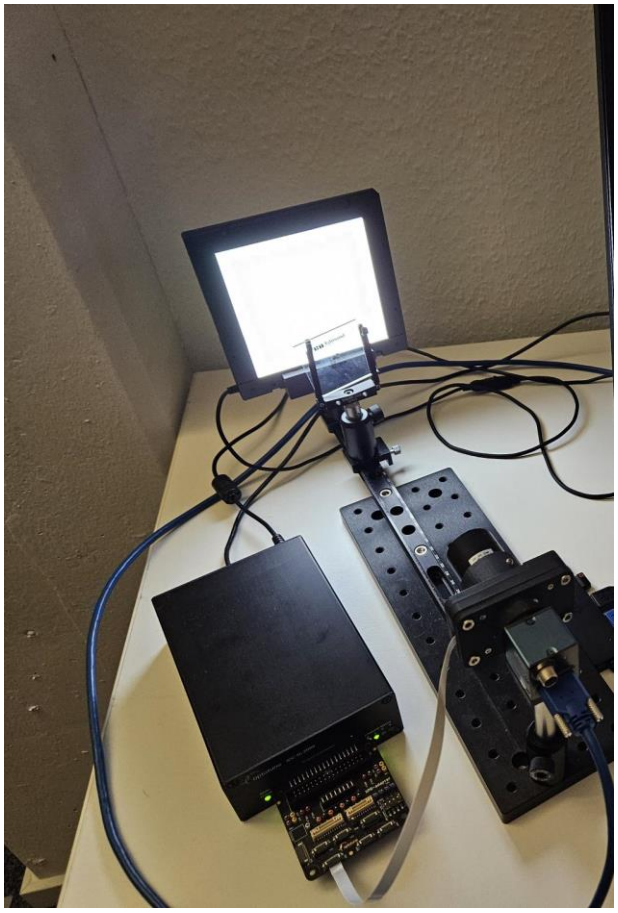


4. Important: Do not forget to set and lock the maximal aperture of the objective. Otherwise, pixel shifting may not have the desired effect with diffraction being the limiting factor. Use a small M2 locking screw that does not protrude to lock the aperture setting at F#5.6.

5. Align the red line with the edge of the support and screw it as to the left below. The resulting camera/XPR/objective assembly is shown to the right.



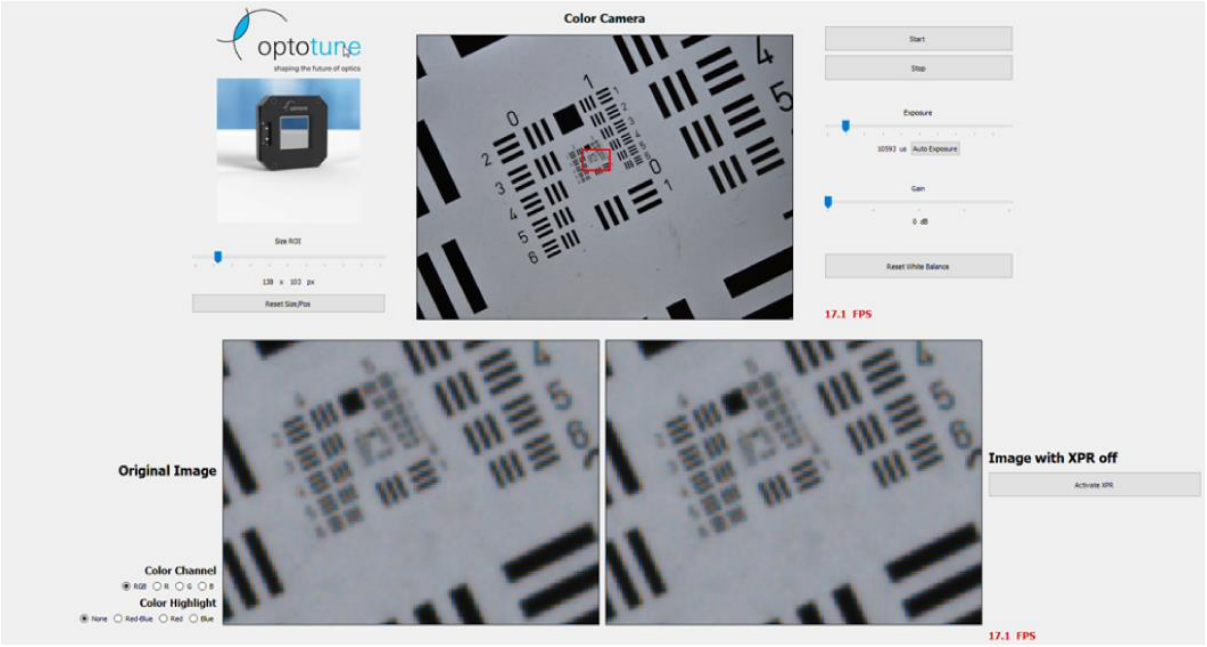




Connections and software

6. Position the backlight, USAF target, and objective/XPR/camera along one rail as shown in the image above.
   → backlight: connected to CCS PD2-3024 power supply, L1-1 connector in the back
   → XPR: connected via flex cable to port X21 on an XPR adapter (ICC-4C-2000 extension kit), which in turn is connected to the Output connector of an ICC-4C-2000.
   → ICC-4C-2000: connected via mini USB-B to a USB port
   → camera: connected via micro USB-B to a USB port
   Note: do not power ICC-4C-2000 until the XPR has been connected to it.

7. Execute XPR_Software.exe or install (check “how to install.txt”) and run XPR_Software.py



8. Move the USAF chart to be perfectly in focus.

9. Press Activate XPR to show a side-by-side comparison of the image with and without XPR. Play around with changing the Color Channel, to show the resolution increase in monochromatic vs non-monochromatic imaging. The Color Highlight helps seeing interpolation artefacts in the imaging specific to the different color channels.

- BSW-20 on Optotune's website
- BSW-20 Datasheet
- BSW-20 Manual