Instructions for the LensControl

The LensControl is used to set the focus and aperture of a pco.panda camera and a ZEISS Dimension lens. It also includes some bright LEDs to illuminate calibration targets and an inertial measurement unit to measure the roll and pitch angle of the camera.

Initial hardware setup

- Firmly attach the lens to the camera (if you are using a bandpass filter, first unscrew the C-Mount adapter of the camera and insert the bandpass on top of the CMOS chip).
- Attach the camera body to the LensControl and the tripod adapter using the four supplied screws.
- Attach the ExposureActive cable to camera output nr. 4 on the pco.panda.
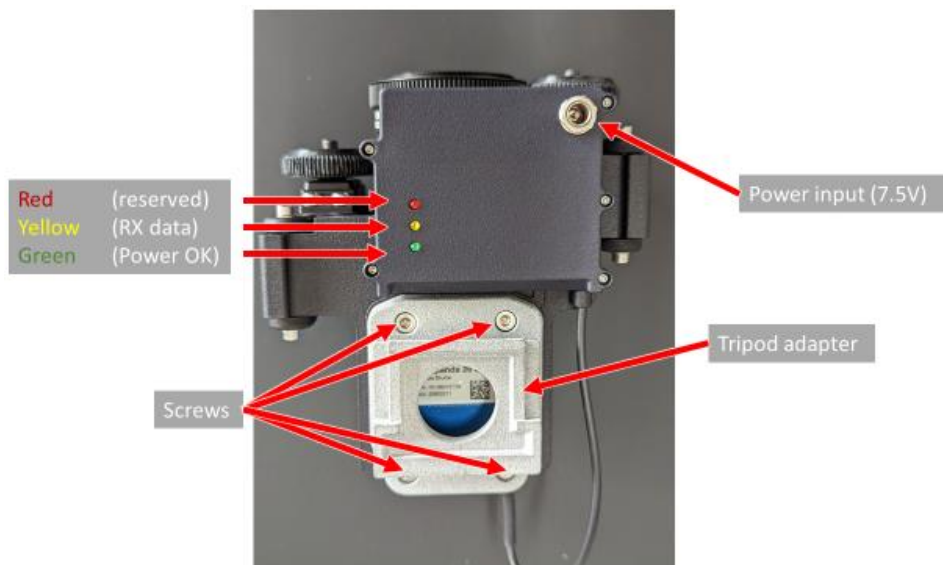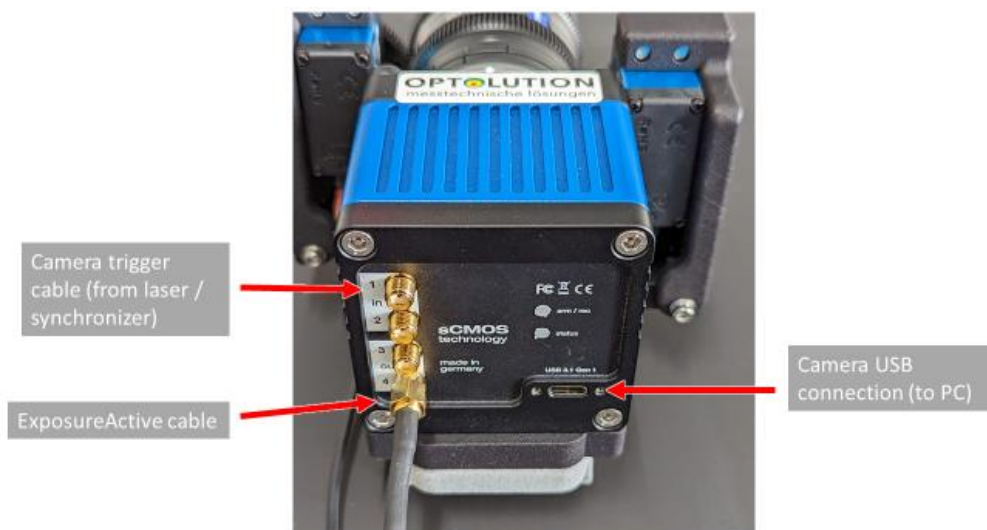

Figure 1: Bottom view of the LensControl

Figure 2: Rear view of the camera

Calibration

This setup only needs to be performed after you inserted the camera to the LensControl.

- Plug in the power supply
- Follow the instructions of your laser / synchronizer to install their USB drivers
- Connect to your synchronizer / laser dongle in PIVlab by selecting the appropriate COM port and clicking "Connect" (a message box about a missing laser can be ignored).
- Open the lens GUI, the connection status should become green.
- Select your lens from the drop-down menu.
- Hold the motors / gears away from the lens and move the focus ring all the way to infinity (clockwise when standing in front of the lens). Move the aperture ring to the fully open position (clockwise when standing in front of the lens).
- Still hold the motors / gears away from the lens and click the "Iris open" button and the focus "Far" button until the servos do not move anymore.
- Release the motors / gears and test if the lens moves correctly with the motors.

Figure 3: Holding the motors / gears away from the lens during calibration.
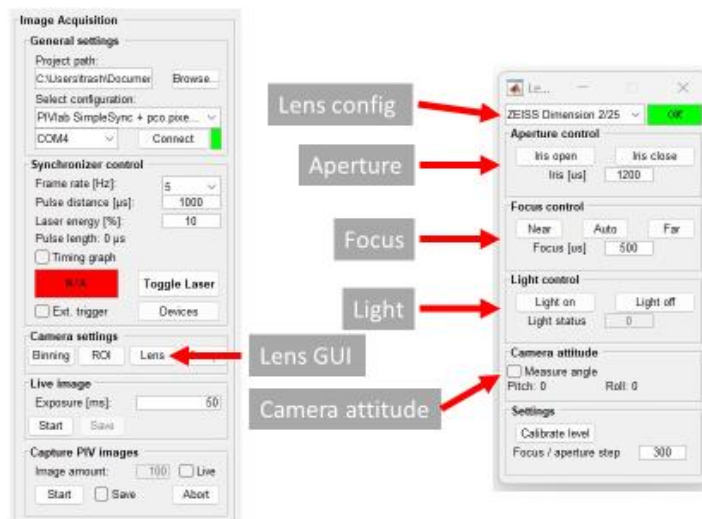

Figure 4: PIVlab GUI (ledt) and Lens GUI (right).

Hints

- The LED lights will only turn on when the camera is actively exposing, so only during live preview or image capture.
- The autofocus will work when a live preview or PIV capture is running.
- If the motors do not travel enough to move the lens from one limit to the other, you can adjust the allowed travel range of the motors. Open the file "PIVlab_capture_lensconfig.mat" in the folder "PIVlab_capture_resources". Edit the variable "lens_configurations" by double-clicking it. Here, you can enter new limits for the focus and aperture motor limits. Save the file (by entering "save PIVlab_capture_lensconfig.mat"and restart the lens GUI for the settings to take effect and testing the new limits.
- If the lens does not follow the motion of the motors, try to increase the contact pressure of the slipping clutch.

Figure 5: Adjustment of the slipping clutch.