

PDExpert Setup Outline

A. Initial Platform Setup

1. Connect water source to the PDExpert heat sink and establish flow.
2. Open PDExpert lids all the way, or remove for best access to all areas on the platform.
3. **Align main laser**
 - a. Remove cell, beam dumps (alignment detectors) and Main Steering lens.
 - b. Place the main laser target (alignment jig) at 0° .
 - c. Override laser cut-outs by taping the 4 switches or putting a jumper plug on J4 of the circuit board inside the PDExpert.
 - d. Turn on Main laser. The beam should be collimated, level, and straight on the target. If not, adjust the laser until it is.
 - e. Replace the steering lens. Make sure that the beam is still straight. If not, adjust the steering lens.
4. **Align Alignment laser**
 - a. Place the Alignment target 180° from the alignment laser. This is usually 95° .
 - b. Remove the lens from the front of the alignment laser.
 - c. Turn on the Alignment laser and make sure that the beam is collimated, level, and straight. If not, adjust the laser until it is.
 - d. Replace the lens on the front of the laser and adjust so that the beam is straight on the target.
5. Make sure both lasers are off.
6. **Placement of Cell assembly**
 - a. Make sure that there is a thin film of Thermal grease on the bottom of the cell assembly and on the top of the heat sink assembly.
 - b. Place the cell assembly on the heat sink assembly such that the thermistor wires are towards the main laser.
 - c. Secure with the 4 screws, but leave very loose.
 - d. Make sure that there is solvent in the cell (Toluene works best)
 - e. Turn on both the main and alignment laser.
 - f. Slide the cell assembly on the heat sink until you get both the alignment and main lasers to be centered on their respective targets. Secure with the 4 screws.
7. Turn both lasers off.
8. **Alignment of cuvette position detectors**
 - a. Replace both beam dumps (alignment detectors).

such that the horizontal cross-hair line is centered between the cuvette walls.

13. Replace the front aperture, remove the eye-piece, and replace the rear aperture.
14. Check the photon count in the software. The photon count should be between 5.0×10^5 and 2.0×10^6 . If it is too high, decrease the laser power, or use a smaller front aperture. If it is too low, increase the laser power, or use a larger front aperture. Always try to adjust the photon count with the laser, then by changing apertures. The laser power range is 10-100%.
15. Once you have a good photon count, set the software up to collect 500 repetitions with accumulations of 1.
16. Use the vertical screw on the front lens of the detector to maximize the decay of the correlation function.