

## NANOSTAR Dynamic Light Scatterer

1. Turn things on in this order: computer, instrument, software. The computer should be on when you arrive. Check that it is by hitting the space bar, then flip the black toggle switch on the front of the NanoStar.
2. Wait for the DLS to reach 25.00<sup>o</sup> and the temp. box to turn green before opening the software. Open the Dynamics 7.1.2 software. Pull down from File to New File to open the experiment window. Click on the Connect icon (two arrows) to connect the DLS to the computer and turn on the laser.
3. To check cuvette cleanliness before you begin, click on the Instrument Control Panel icon to see readings. Air alone will give about 1,000 counts.
4. If you're using UVettes, the black adaptor should be in place. If you're using the quartz cuvette, remove the adaptor with the special forceps in the DLS drawer. (Note the proper orientation of all these parts on the chart above the DLS.) The quartz cuvette should have fewer than 2,000 counts to be considered clean and both types of plastic ones should have about 20,000 counts.
5. Sample concentration should be about 1 mg/ml for proteins as a starting point or you can use the Optimization utility under Tools/Calculations for other particles. Samples should be filtered or spun to remove spurious particles which will scatter light. Add your sample to the cuvette without adding bubbles. Tap the cuvette on the bench a few times to dislodge any microbubbles which might be lurking.
6. Place the cuvette carefully into the DLS and close the door gently. The thump at the end switches the laser back on. Watch on the Instrument Control Panel to monitor the counts coming from your sample. The sample should equilibrate temperature-wise for 1-2 minutes. While that's happening, set up the software by telling it which model and solvent you are using, on the Sample window. There are hidden drop-down menus at the right-hand end of the Model and Solvent boxes.
7. The laser will attenuate itself to get the counts to about 1-2 million. After the counts have stabilized, click on the green Go button to start acquiring data. To see your numbers coming out, click on Meas 1 in the left panel. You'll see the raw data coming out on the Data Log Grid view. If the numbers are red, it means the values are "outside the expected range" of the instrument and it won't analyze them. We can turn them black using the trick posted over the computer.

8. After your data is collected, check the shape of your auto-correlation curve by clicking on that icon. If it looks like the left-hand curves on the sheet, things are fine. If you need to make adjustments, do so and take data again. Then check it and the Regularization View to see your histogram. You can easily label the peaks on the histogram using the right panel checkboxes.
9. Save data in a personal folder you'll make in the DLS Data folder on the desktop. You can copy the data into Excel to email it to yourself or take the Dynamics software with you so that you can email the raw data files.
10. To end your session, close the software first, then turn off the DLS itself with the black toggle switch. (That turns off the laser at the same time.) You can leave the computer on.
11. Clean the cuvette by washing with 5% Liquinox detergent then rinsing extensively with deionized water. Small rubber brushes are available if needed. If you do an alcohol rinse, follow it with water rinses since the alcohols leave a film residue. Dry the cuvette with the compressed air line and lens paper.

Updated: 09/21/2021

Note: This protocol is a practical hands-on guide to using the instrument.

Reading this is not a substitute for reading the manufacturer's manual,  
something we strongly recommend that you do.