

(DLS) Dynamic Light Scattering Instructions

- Sign on.
- Turn on the computer and login in.
- Wait until Windows XP launches, and then turn on the sample holder chamber (upper box).
- After a few moments, you need to move the toggle switch of the laser/correlator system (lower box) up and down (from 256X to 64X position) a couple of times. Return the toggle to the 256X position. Then turn on the laser/correlator system (lower box). This procedure helps you prevent the “Test mode” problem.
- Let the laser launch and stabilize for 30 minutes. Also, monitor the sample temperature until it be 20°C.
- Launch the “Precision Deconvolve32” Software on Desktop.
- Without a sample in the sample holder, try to take a measurement by clicking the Go button. If everything is correct, measurements will be obtained. Otherwise, you will receive a warning signal about miscommunication between the software and the correlator. In that case the instrument, might switch automatically to “Test mode”.
- If you encounter the “Test mode” problem, close the “Precision Deconvolve32” program, turn off the laser/correlator system, switch off the sample holder apparatus, and turn off the PC.
- Restart the computer and follow the above procedure again. This time you do not have to wait 30 minutes for the laser to stabilize.
- Before taking measurements without a sample, make sure the “Test mode” option is not selected. To do that, go to the Set up menu and then hardware option and, removing the mark from the “Test mode”. Try to take a measurement.
- Put your sample into sample cell. Keep the sample in the sample holder and avoid any vibrations for at least 5 minutes before running.
- Open the “Measure/Measurement Setup” window.
- Click on “Sample record” and set up your operation information. Choose your right folder to save your test results by clicking on “Browse” button. Set up “file name”, “operator” and “info” accordingly.
- Click on “Sample data” option and verify those parameters. For the “required”, the default setup is for water (Viscosity 0.01002, Temperature 20 °C, Refraction 1.33). If you need to change these setup parameters for those of a different solvent, please remember to return the original ones for water after you finish taking your measurements. For the “optional”, keep them except you have accurate data.
- Click on “Intensity” option and verify the “Cutoff intensity level” to be “Relative”. This will set up the maximum level of intensity presented in the “intensity” dialog box.
- Click on “Measurement”, which is the most important setup in the test.
 - “Sample time” (in units *us*). Adjust it until you have good “Correlation Function” on the left window, which means the correlation curve falls to the bottom at ca. 1/3 scale of the whole sample time.

- “Channels”. It’s been auto-adjusted according to “Sample time”.
 - “Last”. This indicates the time delays in correlator channels. Put it to be 3 or 4 times “Channels” number. The possible range is 1-1024.
 - “Run time” (in unit s). Small run time give more readouts in the same time, while larger run time has higher S/N ratio. Default is 1 second.
 - “Accumulate”. This is the number of repeating times for runs for one measurement. Larger number makes longer test time and more averaged result. Typically 30-50.
 - “Repeat”. This sets the number of individual measurements for each sample.
 - “Smoothness”. This acts on the size distribution of the results. Use small number first (e.g. 10) and increase it (e.g. 30) until you have reproducible results. For larger particles, use larger numbers.
 - Do not check the “Don’t save” option.
 - (Optional) Remove the mark from the “Keep in memory” option. By doing so, you ensure that the computer’s RAM will always be free, allowing the software to perform faster.
- Then, start test by clicking on green “GO” button on top left menu bar and monitor the intensity on the right side of “Intensity” window on the screen. Make sure the intensity is **BELOW 1,000,000 counts/sec**. Click on the red “Stop” button and dilute your sample if above this value. Start over test again until meets the intensity requirement.
 - Start test and monitor the correlation function curve. Adjust “Measurement” parameters, run again and repeat this procedure until good correlation function is obtained. Stop run if necessary.
 - After intensity is adjusted and good correlation function is achieved, start your test and record the data.
 - Avoid leaning against the instrument’s table or causing vibrations.
 - Make sure the mouse cable does not touch the fiber optic that connects the laser/correlator box with the sample holder cavity.
 - Do not attempt to remove the fiber optic as it will cause damage to the instrument.
 - Data saving. After measurement, data will be saved as “*.pdi” file **automatically** within the specified folder. Also, data can be saved as “*.txt” file by clicking on “File/Save As a text file” to a specified folder.
 - Do not click on File/Save or on the Save button. If you do that, you will alter the critical configuration file that controls the instrument.
 - Always remember that your data will be saved automatically in the folder you specified.
 - Take out sample, setup parameters back to default conditions in the software. Close the software and, turn off the DLS machine, and turn off the computer.
 - Log out.