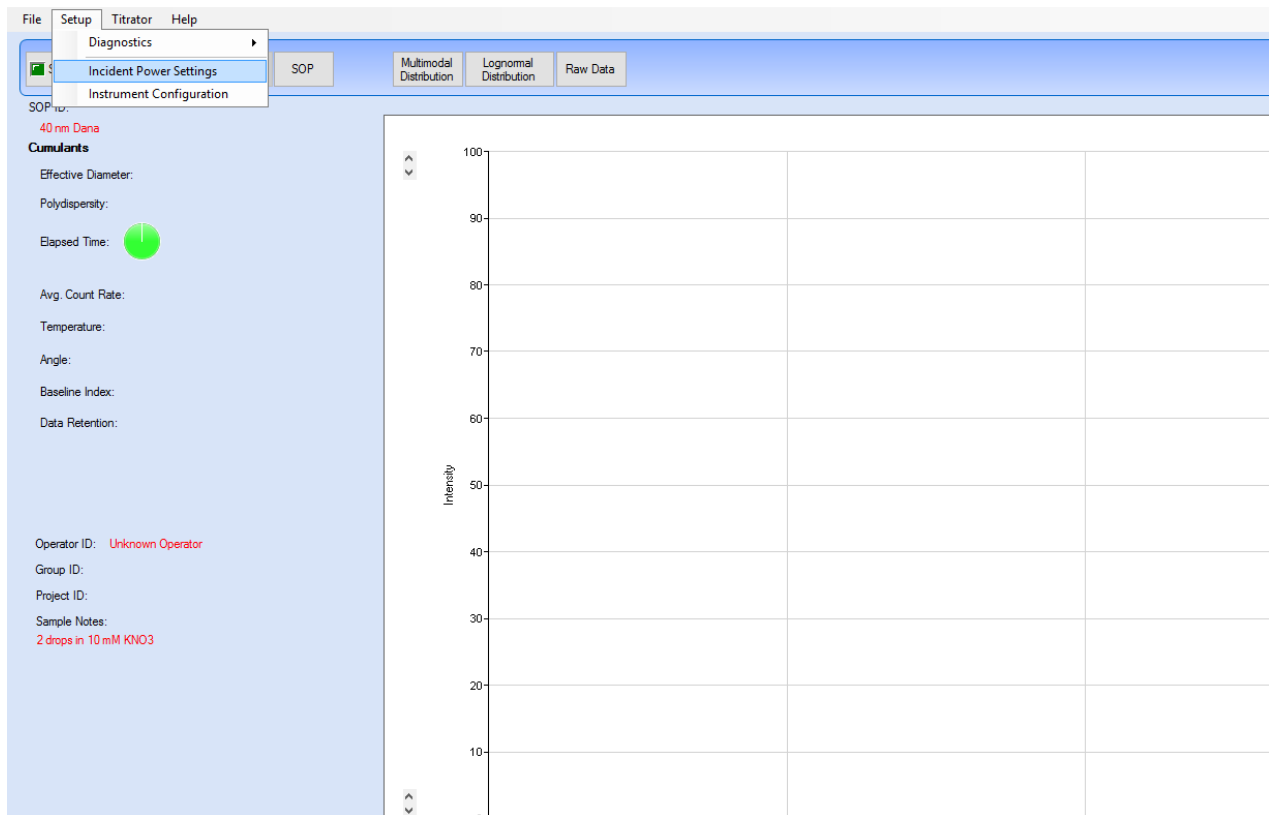


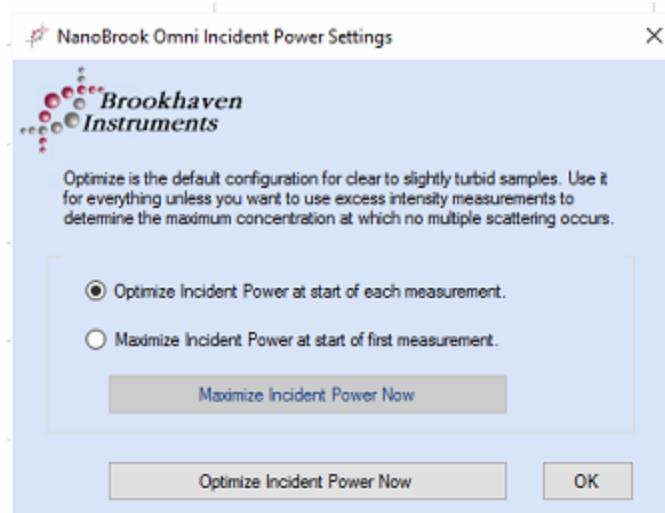
Scattering Intensity Comparison Test

The NanoBrook line of instruments is used for particle sizing and zeta potential measurements. In addition to formal measurement-making and data analysis, there are other features that can be used independently to make relative observations. One example of this is scattering intensity detection.

The NanoBrook line of instruments has a laser inside of the instrument to pass through the sample. There is also a neutral density filter (polarization wheel) used for adjusting the amount of laser light that can pass through the sample. This allows the instrument to accommodate a large range of sample concentrations: for samples that are dilute, the instrument will allow all of the laser light to pass through to achieve enough signal; for samples that are concentrated, the instrument will allow less laser light pass through so that the detector isn't overflowed with signal. This setting is called "Optimize Count Rate" and can be set in the Setup of any SOP, as seen below.

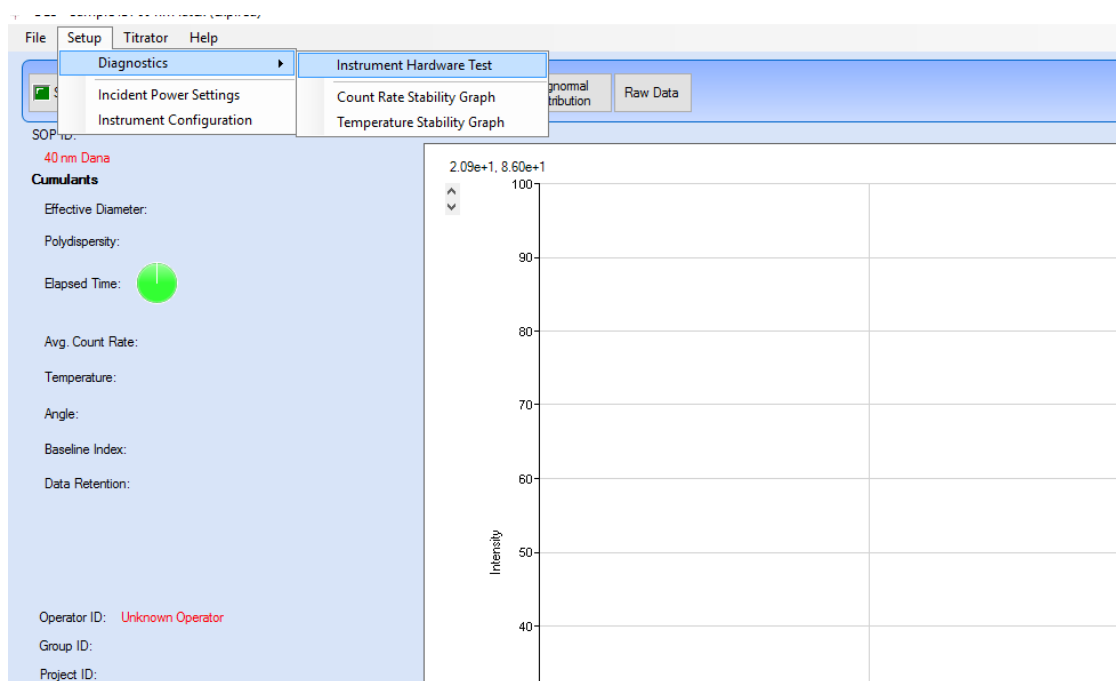


Click on Setup→Incident Power Settings

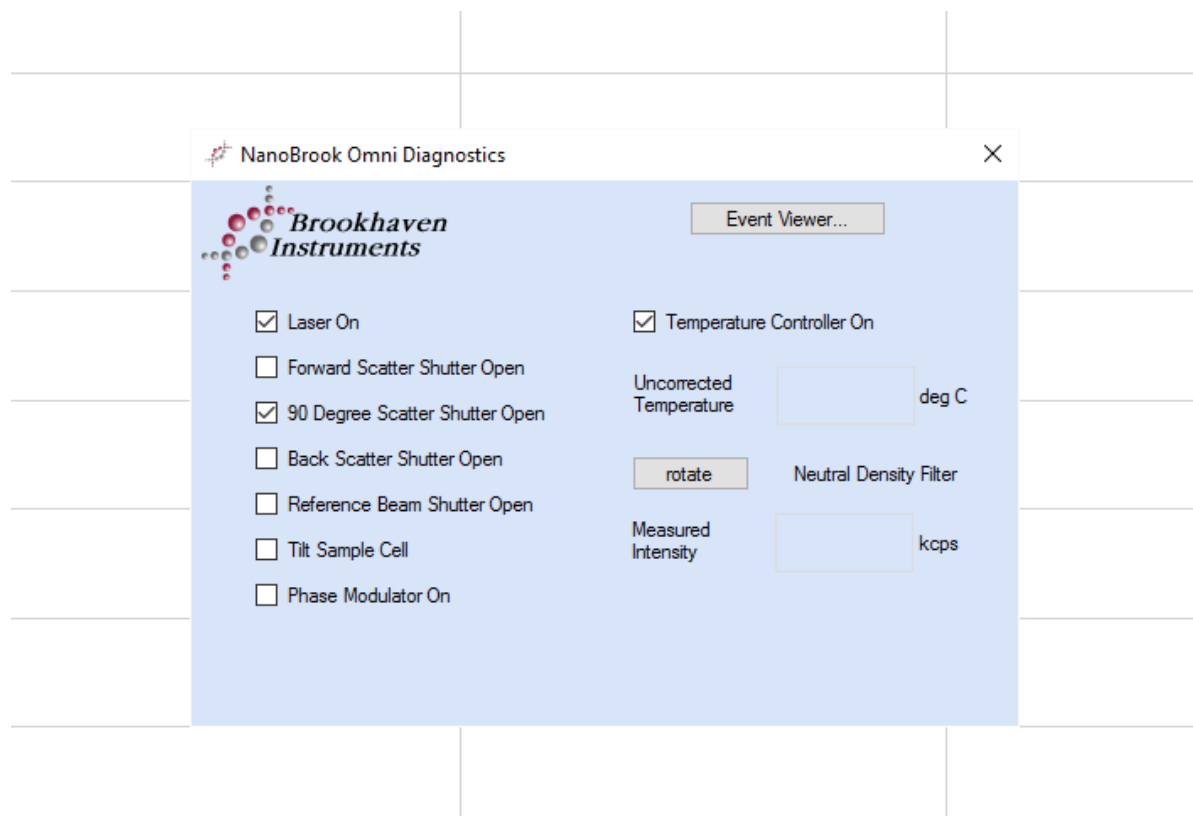


Here, you can choose to have the instrument optimize the count rate at the start of each measurement, which means it will rotate that filter wheel until it can achieve a count rate of 500 kcps for the sample. You can also choose to maximize the power, which will automatically turn the wheel so that all of the laser light will pass through the sample, no matter what. This is rarely used. It is specific for cases of very dilute samples. These are settings for the start of a formal DLS measurement.

Another set of options is found in the Diagnostics:



Here, you can check that shutters are working, turn the laser on and off, and more.



This is where scattering intensity relationships can be made.

Instructions:

- 1) Prepare your sample in a cuvette and place into the instrument.
- 2) Open a DLS measurement and go to Diagnostics.
- 3) If not already on, turn on the laser, and open the angle you are interested in detecting the scattering intensity at. Make sure all other boxes are unchecked.
- 4) Note the Measured Intensity.
- 5) Manually rotate the neutral density filter by pressing and holding the “rotate” button in 2 second intervals. You should see a change in the measured intensity. Rotate until you find a maximum count rate. Note this count rate and return to it by using the rotate function.
- 6) Now you have maximized the intensity manually for your sample. You can write down this intensity for this angle.
- 7) Now you can also make relative measurements. Remove the first sample and insert another one. Do NOT change anything about the settings thus far. The scattering intensity will be

measured at the same conditions as the first sample so you can make relative conclusions about the concentrations (which is more concentrated).

These instructions allow you to make quick intensity measurements, but do not give size information. Sizing will come from running a full DLS measurement, in which case count rate optimization is recommended.