Nanolab 3D

Error-free particle sizing even at high concentration

Applications

Concentrated systems
Particle sizing
Viscosimetry

Systems

Nanoparticles
Polymers
Peptides
Proteins
Emulsions

Industries

Academic research
Pharmaceuticals
Paints, inks & coatings
Cosmetics
Food

LS Instruments

NanoLab 3D

Dynamic Light Scattering even at extremely high concentration

The NanoLab 3D is a compact and easy-to-use DLS instrument that measures particle size distribution **accurately**, where all other instruments fail. Standard DLS instruments require substantial dilutions to avoid the adverse influence of multiply scattered light which results in wrong particle size measurements, without warning you that your measurements are grossly incorrect! Our patented modulated 3D technology efficiently suppresses multiple light scattering and therefore **sample dilution is no longer required.** With its high-quality components, it offers the best measurement sensitivity on the market, faster than any other comparable DLS instrument. Not only will the NanoLab 3D improve your sample characterization in the widest possible range of concentrations, but it will also save you precious time.

What can it measure?

Particle size

Polydispersity

Viscosity

Your benefits

Error-free measurement

Best measurement sensitivity on the market

Characterize multimodal samples with our AI-powered CORENN algorithm

Small volumes

As little as 4µL of sample required

Fast

First results in less than 30 seconds

Easy-to-use

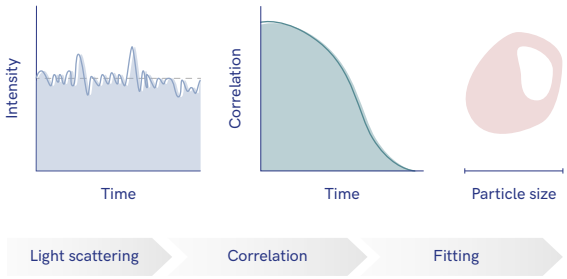
Try our intuitive software!

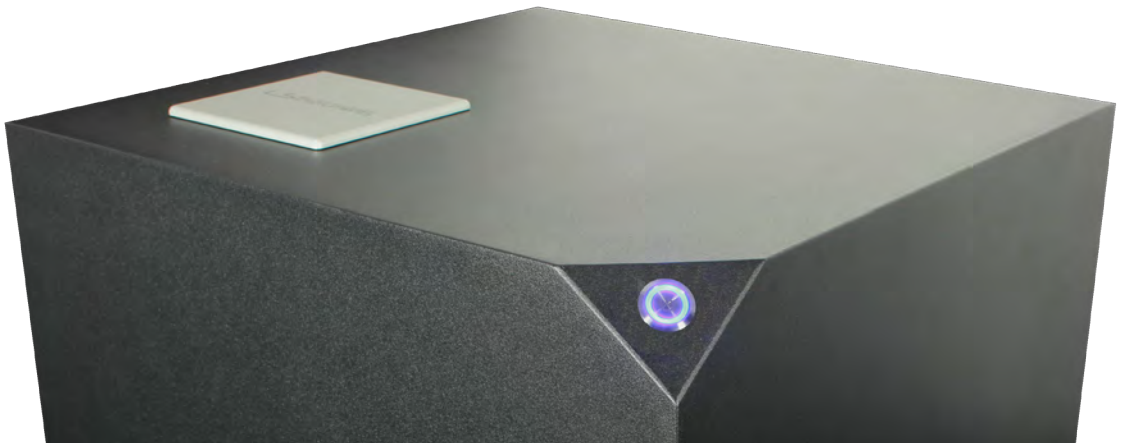
Customer support

Our team of experts is here to answer your questions

Dynamic light scattering

Dynamic light scattering is the technology of choice to measure the size of nanoparticles dispersion. Driven by Brownian motion, the particles move within the medium, causing the intensity of scattered light to fluctuate. The statistics of these fluctuations are reflected in the correlation function. Since the size of the particles influences the particle movement and thus the statistics, DLS can extract the particle size distribution from the obtained correlation function.

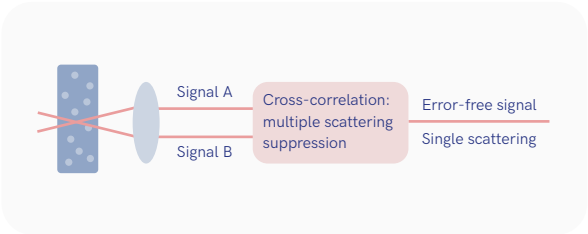




Modulated 3d Technology

Can you trust your measurements?

Unlike standard DLS instruments, the NanoLab 3D uses two laser beams which are modulated at very high frequency. The instrument thus performs two light scattering experiments simultaneously.
By cross-correlating the signals of the two experiments, we improve precision by eliminating multiple scattering that otherwise causes an undetectable error in all samples that are not substantially diluted! Only the Modulated 3D technology fully removes multiple scattering arising in concentrated samples, allowing measurements up to the highest concentrations guaranteeing the trustworthiness of the measurement.



Did you know?

DLS Microrheology is a technique for measuring the viscoelastic properties of your sample.
This is another application area in which the NanoLab 3D delivers impressive results. It not only measures simple viscosity but can also determine both elastic and viscous moduli (G′ and G′′).

Software

Powerful analytical tools

We designed the software of the NanoLab 3D for both DLS experts as well as beginners without specific training. Anything from one simple, yet reliable measurement, to a complex series of multiple measurements can be performed within just a few clicks. Powerful analytical tools allow highly customizable data display and export while saving all results in a well-organized and comprehensive database. Analytical tools included are Cumulant and the LSI proprietary algorithm CORENN.

AI-powered algorithm

CORENN is a novel advanced machine learning algorithm to extract the particle size distribution (PSD) from a DLS measurement. CORENN is the only DLS inversion algorithm that leverages on advanced signal approximation techniques and a unique theoretical estimate of the signal noise to yield extremely reliable results, robust against experimental distortions, thus enabling the end-user to **obtain the true PSD from real world DLS experiments**. The figure on the left shows a DLS measurement of a particle mixture of 4 nm and 45 nm. Only CORENN is able to correctly determine the two populations.

Specifications

DLS Technology	Modulated 3D
Hydrodynaic radius	0.15 nm-5 µm*
Cuvette sizes	3 x 3 mm, 5 x 5 mm, 10 x 10 mm (optional 1 x 1 mm)
Maximum concentration	40% w/v*
Sample volume	50 µL —2 mL (Fill it with as little as 4 µL)
Temperature range	4°C to 85°C (+/-0.02°C)** measured online
Laser class	1
Wavelength	638 nm
Laser power	120 mW
Scattering angle	90°
Detector	Two high performance APDs, QE 65%, dark counts < 400/s
Detection	Single mode fiber with integrated optics
Correlator	Two channel multiple tau, 12.5 ns -1 h, 320 channels
Laser attenuation	System with online incident power measurement
Software	Including Cumulant, CONTIN, CORENN analysis
Laboratory requirements	< 60% relative humidity and T = 17°C to 26°C
Size	45 x 45 x 30 cm
Weight	Approx. 30 kg

* As for all DLS instruments, the maximum range is sample dependent.
** A climate controlled room at or below 23°C required to meet these specifications, for temperatures below the dew point a dry air source is required.

Cuvettes

Seal your sample in the cuvette and characterize it over an extended period of time! You can choose between four different standard sizes of glass cuvettes (1 x 1 mm, 3 x 3 mm, 5 x 5 mm and 10 x 10 mm). Simply select the size that best suits your sample. If only small quantities of your sample are available, select the smallest cuvette and fill it with as little as 4 µL. Standard disposable plastic cuvettes can also be used if you want to avoid cuvette cleaning and/or need sterile conditions.

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