



Probe Drum Lab-in-a-box

The Titrating Multi-mode Spectrometer for Research and Life Science.

Automate and refine measurements of ...

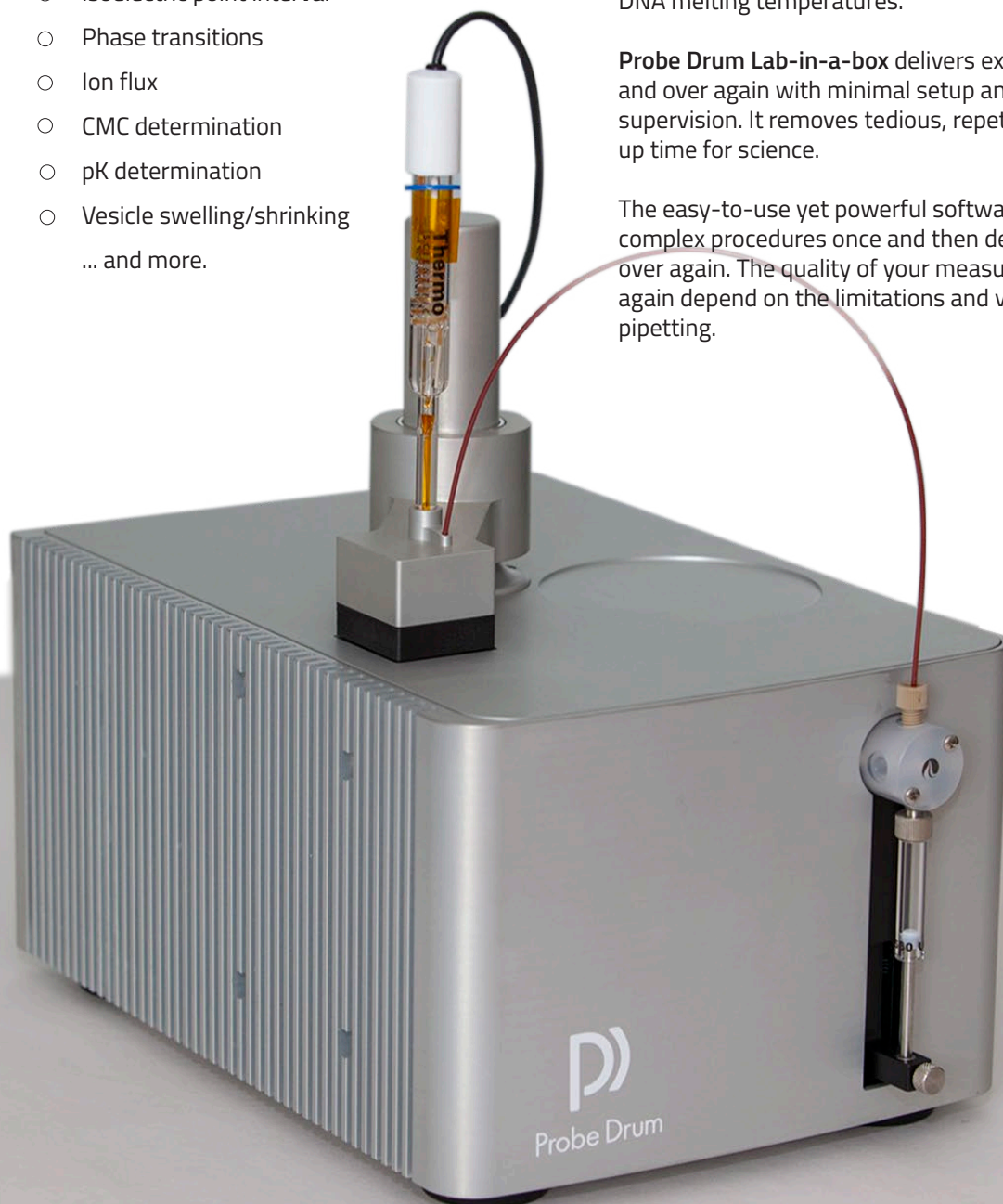
- Equilibrium ligand-binding
- Enzyme kinetics
- Temperature denaturation
- pH denaturation
- Chemical denaturation
- Aggregation
- Solvation
- Isoelectric point interval
- Phase transitions
- Ion flux
- CMC determination
- pK determination
- Vesicle swelling/shrinking
- ... and more.

Probe Drum Lab-in-a-box combines UV/vis absorbance, fluorescence and laser-based static light scattering measurements with a nanoliter titration system and a state-of-the-art temperature control system, tightly integrated in an instrument smaller than a regular shoe box. It is controlled by an inventive, experiment centered software.

The new state-of-the-art temperature control system controls the temperature of the sample, rather than the temperature of the sample holder, with 0.1 °C accuracy. This makes possible high resolution temperature titrations to determine for example protein temperature stability or DNA melting temperatures.

Probe Drum Lab-in-a-box delivers excellent data over and over again with minimal setup and a minimal need for supervision. It removes tedious, repetitive labor and frees up time for science.

The easy-to-use yet powerful software lets you specify complex procedures once and then deploy them over and over again. The quality of your measurements will never again depend on the limitations and variance of manual pipetting.



UV/vis, fluorescence and static light scattering

Probe Drum uses a sensitive and lightning-fast CCD spectrograph. Several full spectra time-points can be recorded per second.

For UV/vis absorbance a high repetition rate flash is used. For fluorescence excitation 12 different LEDs are used. The static light-scattering mode uses a narrow red laser.

Nanoliter titration system

The titration system has a resolution of 20 nl with a 250 µl easily replaceable syringe. An electrode for titration feedback (pH, conductivity, ion concentration) can be attached. Temperature control and magnetic stirring is standard.

Temperature control

The temperature control system controls the temperature of the sample, rather than the temperature of the sample holder. Calibrated against a NIST traceable reference to 0.1 °C accuracy. One-way and two-way temperature titrations.

Standard cuvettes for maximal flexibility

Minimum sample volume is 800 µl when using titration and electrode, 400 µl without electrode and 50 µl without electrode and stirring. No special cuvettes are needed to facilitate a stirring bar.

Fiber-less construction

Probe Drum Lab-in-a-box is designed without any attenuating fiber-optics. This gives the

CCD-spectrograph a sensitivity normally only achieved with a photo multiplying tube (PMT) setup.

Autolight for optimal S/N

In UV/vis absorbance mode the instrument uses a proprietary feature called Autolight to ensure that the optimal light level is used for the preferred detection range. This gives the best use of the detectors dynamic range and reduces noise to a minimum.

Virtual detectors

Four different optical features can be measured for every data point using virtual detectors. It may be absorbance, fluorescence, scattering or any combination of these.

Powerful experiment software

The experiment software is powerful yet easy and intuitive to use. Calculated data is presented in real time during the experiment. Failed experiment can be detected and aborted immediately and experiments can be terminated when no more change is observed.

Streamlined data handling

Probe Drum Lab-in-a-box can generate large quantities of data. To analyze, reduce data complexity and optimize the workflow, we supply a powerful data viewing software. Examine spectral data as well as metadata for every measurement point and then extract and calculate different kinds of sequential data plots.

Sample format

Standard optical cuvette: Base 12.5 * 12.5 mm
Z-height 8 mm

Minimum sample volume

50 µl to 800 µl depending on experiment

Maximum sample volume

3 ml

Titration volume resolution

20 nl minimum addition

Titration time resolution

≤ 1s (depending on integration time)

Temperature control

12–60 °C with 0.1 °C accuracy (to NIST traceable reference)

Electrode duct

3.4 mm diameter (pH, conductivity, ion selective)

The optical line comprises a CCD-based spectrograph and a total of 14 different light sources in two spatial orientations and has the following optical specifications:

- Fluorescence excitation from 280 to 630 nm. Limit of detection is lower than 5 pM fluorescein.
- Absorbance measurements over the whole detection range with a resolution better than 0.005 AU.
- Laser based static light scattering (638 nm laser)
- Spectral detection range: 200–735 nm (optional range 200–1200 nm)
- Spectral resolution: typically 1.2 nm
- Time resolution: 10 ms (assuming single-shot spectra)