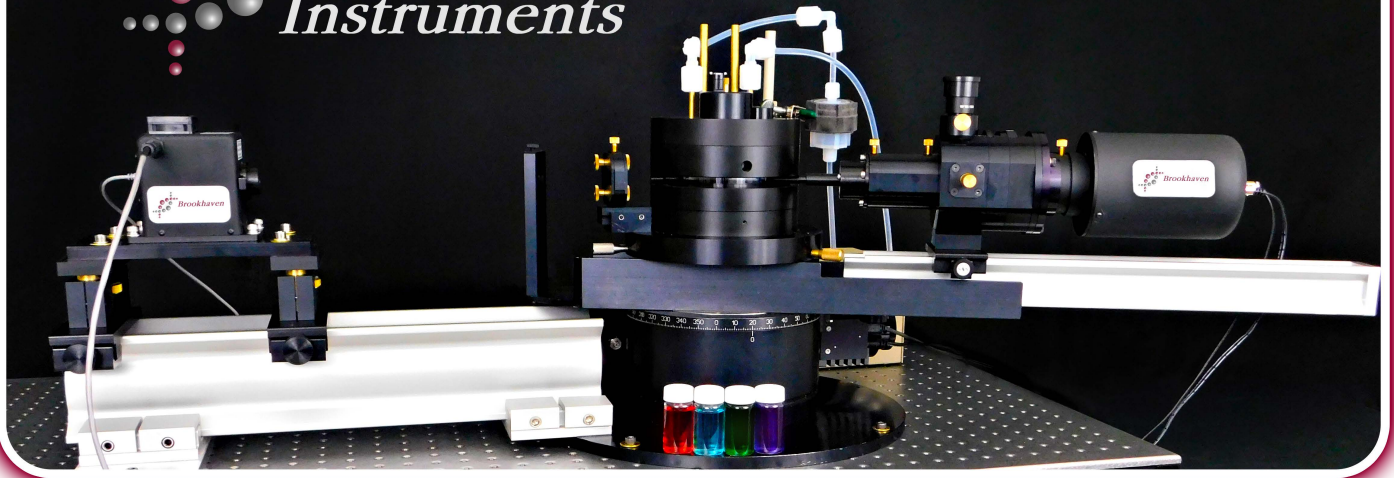




Brookhaven
Instruments



BI-200SM

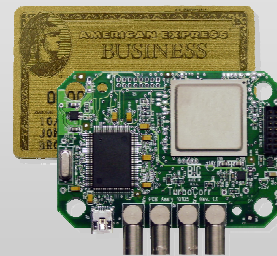
Dynamic and Static Light Scattering System

- Nanoparticle Characterization
- Particle Size Distributions
- Protein & Polymer Characterization
- Molecular Weight
- Complex Fluid Characterization

The Brookhaven Instruments' **BI-200SM** system opens the door to the rich fields of exploration of both Static Light Scattering (**SLS**) and Dynamic Light Scattering (**DLS**).

The **BI-200SM** Research Goniometer System provides access to these studies with an automatic, modular and versatile system. It is a precision instrument designed for exacting scattering measurements. Based on a special turntable with precision ball bearings and stepping motor, the **BI-200SM's** modern design and quality construction guarantee precise measurements due to the wobble-free movement of the detector. It is field proven in thousands of laboratories. It is ideal for molecular studies and submicron particle sizing.

Brookhaven Instruments' scientists have extensive experience in the development of instruments and methods for light scattering and this experience has been incorporated into the **BI-200SM** to make it the finest instrument available for research applications of light scattering.



TurboCorr Digital Correlator Features at a Glance

- USB Communications
- Compact Size, low power requirements (less than 300 mW)
- Auto & cross-correlation modes
- Up to 522 hardware channels
- Sampling time 25 ns to 40 ms
- Delay range 25 ns to 1,310 s
- 100% efficient, real-time operation over the full delay time range

Special Features of the *BI-200SM* Research Goniometer System

Both DLS and SLS Modes

Correlation & Intensity Measurements

Large Angular Range

8° to 155° with 25 mm cells; 15° to 155° with 12 mm cells

Fine Adjustment Control

Read angle to 0.01° directly on large, fine-control knob

Open Design/Standard Optical Rails

Facilitates user customizations for special purposes

Temperature Control

Automatic heating and cooling with internal probe and any standard external circulator

Isolated Circulation System

Separate temperature and filtration plumbing

Special Design Glass Vats

Specially polished entrance window ensures minimum flare

Alignment Cell

Fine-screw vertical adjustment makes center of rotation easier

Multiple Laser Line Filters

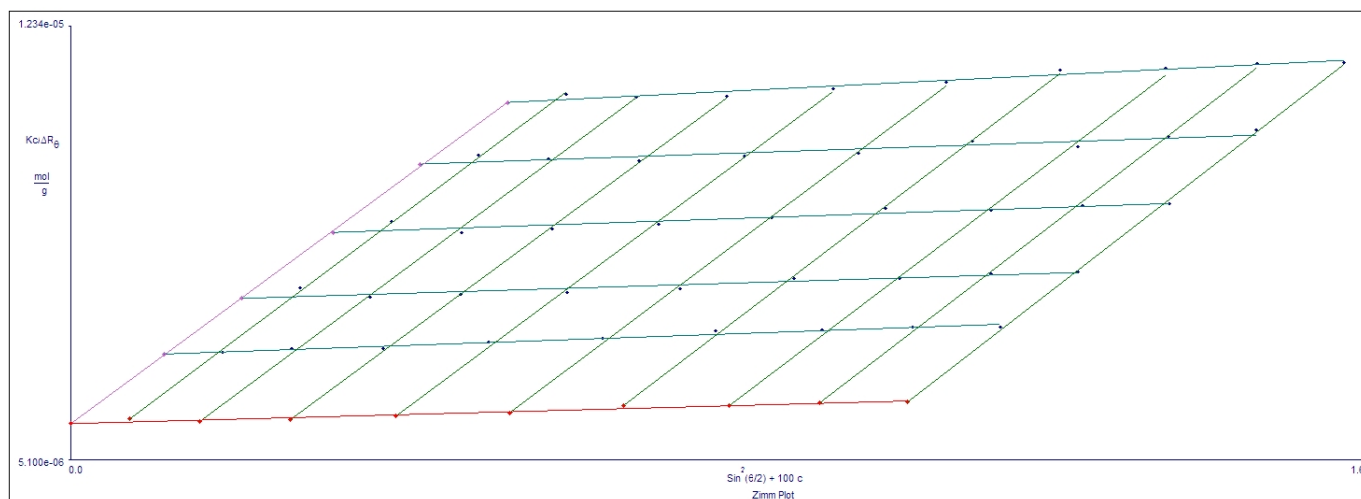
Filter wheel with 632.8 (HeNe), 514.5/488.0 nm (Ar+), one open position for weak scatterers, and 2 blank (shutter) positions. Also available with band-pass filters for other wavelengths.

Enhanced Viewing Optics

Coated, precision achromats coupled with behind-the-silt viewing and high quality eyepiece make alignment easier

Variety of Cell Holders

High precision cell holders, standard, low-ribose round cells available: 27.5 mm dilution vials fit cell holder sleeve—
Special small-volume cell available



An example of a Zimm plot produced by the *BI-200SM*

In the field of **DLS** the dynamics of the scattered light are quantified and analyzed. The short-term intensity fluctuations (dynamics) of the scattered light arise from the fact that the scattering particles are undergoing rapid thermal motions. These movements are called Brownian motion and they cause short term fluctuations in the intensity of the scattered light.

Typical DLS Applications

- Particle size distribution
- Particle aggregation phenomena
- Micellar systems
- Micro-emulsion technology
- Colloid behavior
- Vesicles & liposomes
- Plasmid DNA's
- Particle size growth
- Nucleation processes & protein crystallization

Mini-L40

The **Mini-L40** is a small, stand-alone, red laser diode assembly with superb temperature and power stabilization. It can be used with Brookhaven's **BI-200SM** goniometer for dynamic and static light scattering. With nominal 40 mW power at a wavelength of 640 nm, it is an ideal replacement for the traditional 35 mW, HeNe laser (632.8 nm) when space is at a premium.



Features at a Glance

- 40 mW, 640 nm, Class 3B
- Compact Diode Laser, 11 cm in length
- TEM₀₀, stabilized, calibrated
- For use in SLS/DLS

The BI-200SMPt allows direct measurement of the temperature in the index matching liquid near the sample cell. It is no longer necessary to assume the temperature of the external circulator is the same as the cell temperature. Values updated every second in 32-bit, BI-DLSW software and used in calculations. A USB cable is provided that connects the data interface shown (left) to the PC. Power for the Pt is supplied through this same cable. BI-200SM goniometers supplied after August 2006 are ready to accept the screw-in thermometer. Goniometers delivered earlier will require a manifold swap. Careful removal and replacement of a manifold will not disturb alignment. Contact the factory for more information.



Features at a Glance

- USB powered
- Direct measurement in vat
- Fully integrated with 32-bit, constant current

In **SLS** mode, time-averaged intensity measurements are made at either fixed or variable angles in the range of 8° to 155° and analyzed with software provided for the methods of Zimm, Berry, Debye, Guinier, Kratky, etc.

Typical SLS Applications

- M_w Molecular weight determinations
- R_G Radius of gyration
- A₂ determination of second virial coefficient
- Micro-emulsion technology
- Colloid behavior complex fluid characterization
- Emulsion polymerization
- Particle size growth nucleation processes

BI-200SM

Research Goniometer for Static and Dynamic Light Scattering Analysis

Specifications

Beam Focus and Steering Lenses	Includes mounts, adjustments, and apertures.
Turntable	200 mm O.D. turntable, worm gear and ball bearings; manual or automatic selection of angles in 0.01° steps; precision machined base with mounting holes; positioning table with micrometer adjustments.
Specimen Cell Assembly	Including thermal enclosure, centering adjustments, separate plumbing for temperature control and index matching liquids, round cell holders, square cell holder and alignment cell.
Index Matching Vat	With optically flat and specially polished entrance window; precision machined and annealed to minimize stray light.
Periscopic Beam Stop	Located inside vat to prevent flare from exit windows; provided with coupling for use with optional, zero-angle reference detector.
Detector Optics	Entrance aperture of 3mm. Coated, adjustable achromat for focusing scattered light onto 200 µm slit. Slit position adjustable. Reflex mirror and high quality eye piece for viewing scattering region through slit. Filter turret with 632.8, 514.5, 488.0 nm, 2 closed positions, and 1 open position. Other filters available. Secondary pinhole turret: 100, 200, and 400 µm pinholes for DLS measurements; 1, 2, and 3 mm pinholes for SLS measurements
BI-200SMPt	Allows direct measurement of temperature in the index matching liquid, -25 °C to + 155 °C.

Standard Accessories

BI-FC	Filtration/circulation system for index matching liquid. New gear pump and rigid Teflon tubing
BI-RC12	Nominal 12 mm O.D. round glass cell, polyethylene cap
BI-LRM	Laser rail and mounts for most lasers. Lasers are frequently supplied by the user
BI-RC27	Nominal 27.5 mm O.D. dilution vials, package of 100 with HDPE screw caps
BI-APDx	High quantum efficiency avalanche photo diode detector, up to 30 times the sensitivity of a standard photomultiplier tube

Options

BI-SCG	10 mm path length glass square cell & PTFE cap
BI-RC25	Nominal 25 mm O.D. round quartz cell, dual Teflon tops, mounting ring
BI-PA	Polarization analyzer, Glan-Thompson prism, 5×10^{-6} extinction, 2 position mount
BI-CrossCorr	Eliminates detector artifacts by cross correlation
BI-SVC	Small volume cell for precious samples
BI-Spec/Adap	Inquire about adapting parts of your existing light scattering systems
BI-TCD	Digital temperature controller, external circulator type -20 to 100 °C, alphanumeric setting and readout, $\pm 0.1^\circ$ stability
BI-SFS	Sample filtration system provides a fast and convenient way to clean your light scattering samples

A policy of continual improvement may lead to specification changes.



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With distributors around the world, contact us for details for the office nearest you.