

SpectraMax 190 Microplate Reader

A high-performance spectrophotometer

BENEFITS

- Tune in your performance for assays in UV/Vis spectrum
- Eliminate the need for concentration curves with PathCheck Sensor
- Interface with the latest state-of-the-art SoftMax Pro Software
- Ensure performance with validation tools

Introduction

The SpectraMax® 190 Microplate Reader from Molecular Devices is ideal for UV-Vis life science applications, especially DNA analysis. The multi-channel design truly mimics a dual-beam spectrophotometer. Each sample has a discrete sample beam and reference beam so that each well is measured directly, eliminating error due to variations in light output between the optic fibers. The system consists of eight sample beams and detectors and eight reference beams and detectors to deliver both superior precision and speed-of-reading across the microplate through 4.0 OD. Optional tools for verifying the SpectraMax 190 reader performance include the SpectraTest® ABS1 Absorbance Plate and IQ/OQ/PQ manual. Software tools for regulatory compliance, such as FDA 21 CFR Part 11, are available through SoftMax® Pro GxP Software.

Accurate and precise absorbance readings

The unique quartz fiber optic system minimizes stray light for precise readings across the microplate. Each channel has its own reference detector and the small beam size maintains high performance even with small sample volumes read in half-area wells. The 2 nm bandwidth provides the needed spectral resolution to ensure accuracy of DNA absorbance measurements. Up to 6 different wavelengths can be measured during one read.

PathCheck sensor eases the workload

For aqueous solutions, the patented* PathCheck® Sensor senses the depth of the liquid in each microplate well and normalizes the absorbance value to a 1 cm pathlength. The corrected absorbance is within 5% of the value obtained in a conventional spectrophotometer.

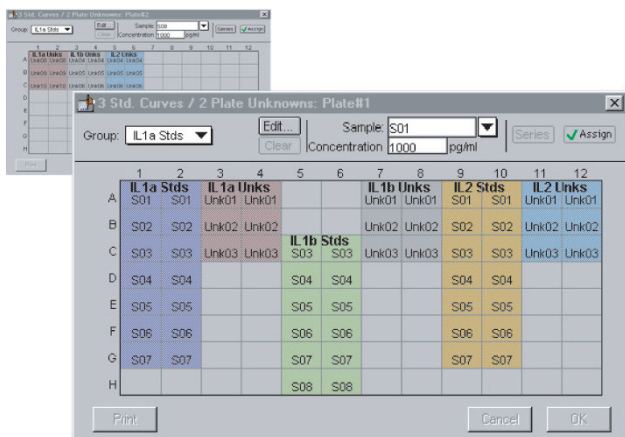


Figure 1. Flexible template assignment. Standards for multiple calibration curves and unknowns can be run on separate plates.

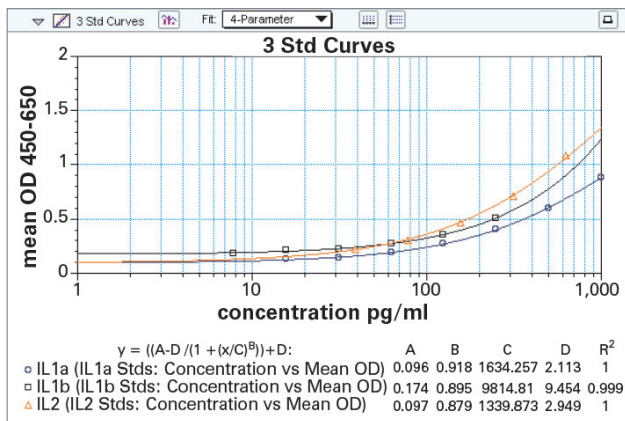


Figure 2. Multiple calibration curves. Multiple calibration curves can be plotted on one graph.

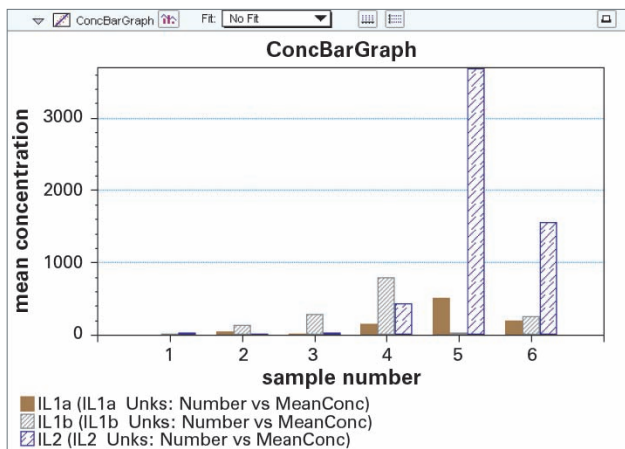


Figure 3. Combined data graphing. Results from unknowns run on different plates and different calibration curves can be plotted on one graph.

The PathCheck sensor makes it is easy to:

- Use the extinction coefficient of a sample to calculate concentration directly
- Correct for volume differences in the wells
- Expand the assay's dynamic range
- Check performance of pipetting devices

Spectral scanning for easy assay development

The complete spectrum of samples can be scanned to select the optimum wavelength for reading. Spectrum scanning also allows:

- Monitoring of sample or reagent stability
- Determination of interfering compounds or assay conditions

Performs virtually any UV/VIS assay

- Bacterial identification
- Biochemistry
- Cell biology
- Colorimetric
- DNA quantitation
- ELISAs
- Entomology
- Environmental testing
- Enzyme kinetics
- Food/agricultural
- Molecular biology
- Pharmacology

Accurate measurements

The SpectraMax 190 reader is the tool for DNA analysis. The ability to detect 16 ng/well of DNA and to quantitate 50 ng of DNA provides the same sensitivity as a spectrophotometer. The PathCheck sensor can extend the instrument linearity by a factor of three or more. For very concentrated samples, use a minimum volume in the microplate well (100 µL has a pathlength of about 0.30 cm), then use the PathCheck sensor to calculate an equivalent 1-cm pathlength absorbance value.

Ensure GxP compliance

The SpectraTest validation package provides a NIST-traceable solution for validating the performance of the SpectraMax 190 reader automatically.

Plate stacker and robot integration

The SpectraMax 190 reader can be integrated with Molecular Devices' StakMax® Microplate Stacker in a matter of minutes and begin reading microplates with seven mouse clicks. For a higher degree of automation, the Automation Vendor Partners Program has streamlined the integration of our microplate reader systems with all leading partner robots. The "out-of-the-box" automation solution saves up-front integration time and resources.

Technical specifications

Photometric performance specifications

Wavelength range	190–850 nm
Wavelength selection	Monochromator, tunable in 1 nm increments
Wavelength bandwidth	2 nm
Wavelength accuracy	< ± 1.0 nm
Wavelength repeatability	± 0.2 nm
Photometric range	0–4.0 OD
Photometric resolution	0.001 OD
Photometric accuracy	< ± 0.006 OD $\pm 1.0\%$, 0–2.0 OD
Photometric precision	< ± 0.003 OD $\pm 1.0\%$, 0–2.0 OD
PathCheck® sensor measurement error	< 5% compared to cuvette reading
Stray light	$\leq 0.05\%$ @ 230 nm
Light source	Xenon flash lamp
Microplate read times Endpoint Kinetics	12 seconds 9 second min. interval

Temperature specifications

Temperature range	Ambient +4– 45°C
Temperature uniformity (microplate)	$\pm 0.5^\circ\text{C}$ at 37°C, well-to-well
Temperature stabilization time	30 minutes maximum upon initiation
Reading chambers	Isothermal when temperature regulation not enabled, < 1°C

General specifications

Dimensions (in.)	8.6 (H) x 22.8 (W) x 15 (D)
Dimensions (cm)	22 (H) x 58 (W) x 38 (D)
Weight	30 lbs. (13.6 kg)
Power requirements	90–250 Vac 50/60 Hz
Power consumption	< 250 W
Operating temperature	10–40°C
Storage temperature	5–40°C

Ordering information

Contact your Molecular Devices sales representative for configuration options.

*The PathCheck sensor is covered under U.S. Patents 5,959,738 and 6,188,476.

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