

SpectraMax M5/M5^e multi-detection reader

A FIVE-MODE MICROPLATE READER WITH THREE-MODE CUVETTE PORT



- FIVE-MODE READER WITH WIDE RANGE OF APPLICATIONS
- THREE-MODE CUVETTE PORT
- DUAL MONOCHROMATORS
- PATHCHECK SENSOR
- INSTRUMENT AND SOFTWARE VALIDATION
- ROBOTICS COMPATIBILITY



The SpectraMax[®] M5/M5^e from Molecular Devices is a dual-monochromator, multi-detection microplate reader with assay performance similar to dedicated single-mode readers. Detection modes include UV-Vis absorbance (Abs), fluorescence intensity (FI), fluorescence polarization (FP), time-resolved fluorescence (TRF), and luminescence (Lum). The reader also has a separate three-mode cuvette port that enables Abs, FI, and Lum readings. Monochromator tunability and high-performance detection capability make the SpectraMax M5 multi-detection reader a valuable tool in assay development and research as well as in low- to medium-throughput screening. The SpectraMax M5^e has the added functionality of being certified for the CIS bio HTRF[®] assays.

DUAL MONOCHROMATORS

With SpectraMax M5/M5^e, there is no need for expensive filters. The system uses two scanning monochromators to determine optimal excitation and emission settings. Changing methods or fluorophores requires only a few mouse clicks to optimize the system.

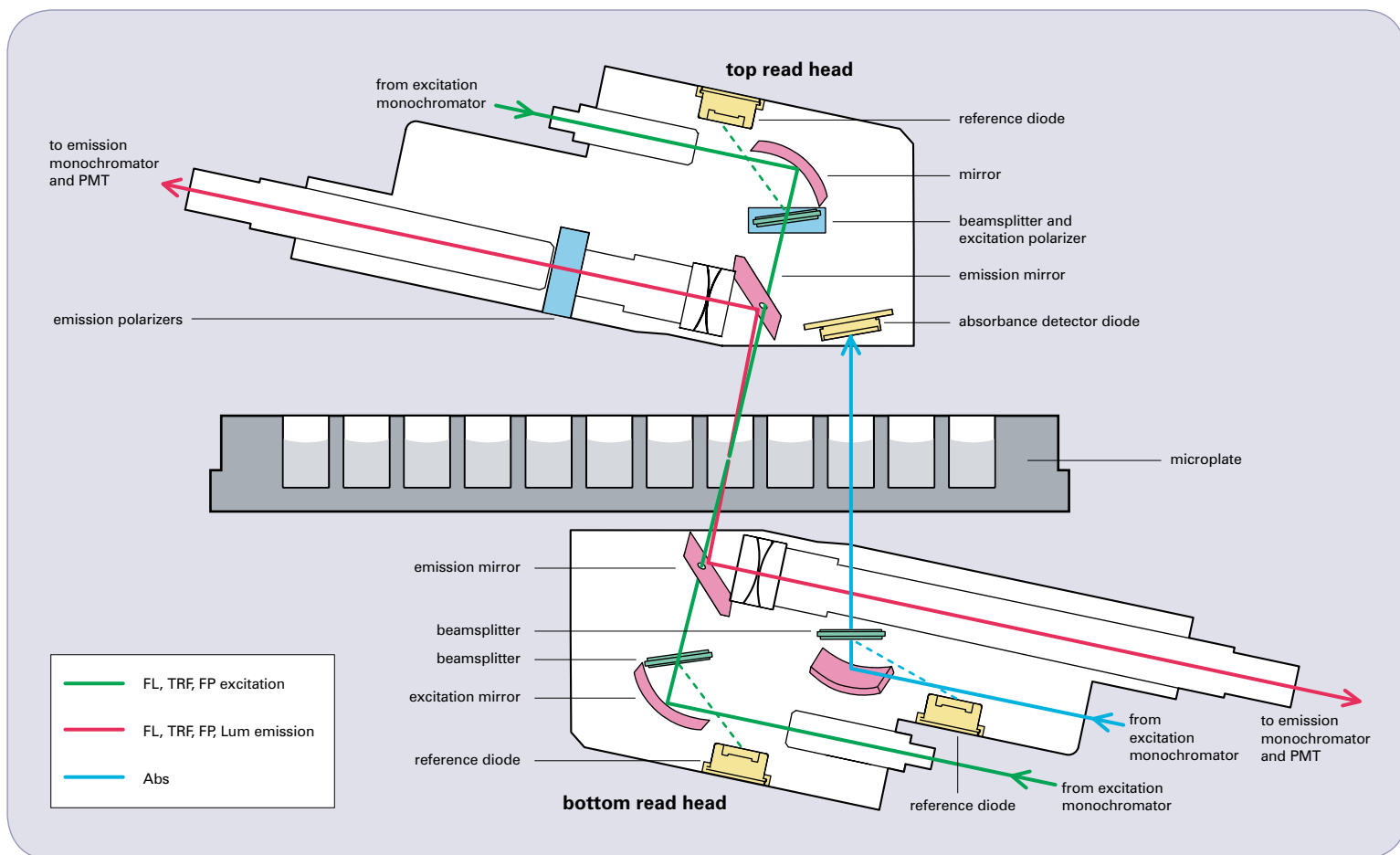
PATENTED PATHCHECK SENSOR

PathCheck[®] is the only patented[†] technology available that measures the depth (optical pathlength) of samples in a microplate. With SoftMax[®] Pro software, PathCheck automatically normalizes the well absorbance to a cuvette equivalent pathlength of 1 cm—similar to using 96 or 384 cuvettes simultaneously. PathCheck allows for the elimination of standard curves and, for compounds with a known absorptivity, concentration can be calculated directly from absorbance.

SUPERIOR OPTICS

The optics in SpectraMax M5/M5^e are designed to provide optimal assay performance. The reference diodes enable elimination of measurement noise due to slight fluctuations in excitation light intensity. The angled emission beam improves signal-to-noise, especially in narrow Stokes shift fluorophores, by reducing stray light. Elliptical mirrors are used instead of lenses for maximum transmission with minimal wavelength distortion. Top-quality UV-grade fibers give the highest light transmission down to even the lowest wavelengths.

five-mode microplate reading with superior optics



APPLICATIONS

Endpoint, kinetic, spectrum, and area-well scanning read types and Molecular Devices' PathCheck Sensor allow homogeneous and heterogeneous biochemical- or cell-based microplate assays and assays that have multiple readouts to be combined into one single experiment. Applications include:

- DNA/RNA/protein quantitation and purity
- PicoGreen®/NanoOrange®/Bradford assay
- ELISAs/enzyme kinetics (*e.g.*, K_m , K_i , etc.)
- Drug dissolution profiles
- Live/Dead® viability/cytotoxicity assays
- Caspase-3 and protease assays
- CatchPoint® cAMP assays
- IMAP® kinase assays

- Intrinsic tryptophan fluorescence
- Green fluorescent protein
- FRET and TR-FRET assays
- HTRF assays (SpectraMax M5®)
- Reporter gene assays
- ADME-Tox assays
- Membrane Permeability assays (PAMPA)
- FluoroBlok™ cell migration assays
- Delfia® assays

COMPREHENSIVE DATA ANALYSIS

SoftMax Pro software provides data acquisition, analysis and management capabilities, allowing cross-plate analysis and custom calculations. There is no need to export data to a spreadsheet program.

INSTRUMENT AND SOFTWARE VALIDATION

The SpectraTest™ ABS1 absorbance and SpectraTest FL1 fluorescence validation packages allow validation of optical characteristics. The SoftMax Pro Software Validation Package and IQ/OQ/PQ validation protocols provide tools for GLP, GMP, and FDA 21 CFR Part 11 compliance.

technical specifications

General Photometric Performance

Plate formats:	6, 12, 24, 48, 96, 384 wells
Light source:	Xenon Flash Lamp (1 joule/flash)
Detectors:	2 photomultiplier tubes
Shaker time:	0 to 999 seconds
Temp. control:	2°C above ambient to 60°C
Temp. uniformity:	< 1°C at 37°C set point
Temp. accuracy:	±1°C at 37°C set point
Endpoint reading :	All modes
Kinetic reading :	All modes
Spectral scanning:	All modes
Well scanning:	Abs, FI, TRF, Lum

Absorbance Photometric Performance

Reading capabilities:	Cuvette or microplate
Wavelength range:	200–1000 nm
Wavelength selection:	Monochromator, tunable in 1.0 nm increments
Wavelength bandwidth:	≤ 4.0 nm
Wavelength accuracy:	±2.0 nm
Wavelength repeatability:	±0.2 nm
Photometric range:	0–4.0 OD
Photometric resolution:	0.001 OD
Photometric accuracy (microplate):	< ±0.006 OD ±1.0%, 0–2 OD
Photometric accuracy (cuvette):	< ±0.005 OD ±1.0%, 0–2 OD
Photometric precision:	< ±0.003 OD ±1.0%, 0–2 OD
Stray light:	< 0.05% @ 230 nm

Fluorescence Intensity Performance

Reading capabilities:	Cuvette or top or bottom of a microplate
Wavelength range:	250–850 nm
Wavelength selection:	Monochromators, tunable in 1.0 nm increments
Bandwidth (EX, EM):	9 nm, 15 nm
Sensitivity:	< 5 pM fluorescein in 96 wells or cuvette, < 20 pM in 384 wells

Fluorescence Polarization Performance

Wavelength range:	400–750 nm
Wavelength selection:	Monochromators, tunable in 1.0 nm increments
Bandwidth (EX, EM):	9 nm, 15 nm
Precision:	< 5 mP standard deviation at 1 nM fluorescein in 96 and 384 wells

Time-Resolved Fluorescence Performance

Reading capabilities:	Top or bottom of a microplate
Wavelength range:	250–850 nm
Wavelength selection:	Monochromators, tunable in 1.0 nm increments
Bandwidth (EX, EM):	9 nm, 15 nm
Precision data collection:	1–100 flashes, delay of 0–600 µsec. before read, integration time selectable between 50–1500 µsec.
Sensitivity:	100 fM europium in 96 or 384 wells with top-read
SpectraMax M5 ^c only:	Compliant with CIS bio HTRF performance specifications

Luminescence Performance

Reading capabilities:	Cuvette or top or bottom of a microplate
Wavelength selection:	All wavelengths or with selected wavelengths
Wavelength range:	250–850 nm
Sensitivity:	< 2 fg/well lower detection limit for firefly luciferase in 96- and 384-well top read
Cross-talk:	< 0.3% in white 96- and 384-well microplates

Typical Read Times (minutes:seconds)*

	96 wells	384 wells
Absorbance	0:18	0:49
Fluorescence Intensity	0:17	0:48
Fluorescence Polarization	0:42	2:03
Time-Resolved Fluorescence	0:17	0:48
Luminescence	2:00	7:00

*With 3 flashes/well in absorbance and fluorescence modes, and 1 sec./well integration in luminescence.

General Specifications

Dimensions (in.):	8.6 (H) x 22.8 (W) x 15.3 (D)
Dimensions (cm):	22 (H) x 58 (W) x 39 (D)
Weight:	36 lbs. (16.4 kg)
Power consumption:	< 420 watts
Power source:	100–240 VAC, 3 A, 50/60 Hz
Robotic-compatible:	Yes

ROBOTICS COMPATIBILITY

SpectraMax readers can be integrated with an optional plate stacker or robot from Molecular Devices. The StakMax™ microplate handling system is a simple, easy-to-use stacker operated from within SoftMax Pro. It can hold up to 50 plates with barcode reading. Another option for more advanced needs is the SynchroMax™ ET plate handling robot. With SynchroMax ET, a washer, dispenser, and reader can be integrated into an assay workstation with a plate capacity of 320 plates, barcode reading, and simple scheduling capabilities. SpectraMax microplate readers are the number one choice of our robotic partners. The plate carriage

design has no springs or clamps, and its robotic communication interface makes integration of the SpectraMax M5/M5^c straightforward.

ORDERING INFORMATION

- SpectraMax M5/M5^c Multi-Mode Reader
- SpectraMax M5/M5^c microplate reader
 - SoftMax Pro software for Windows® and Macintosh®
 - SpectraTest ABS1 and/or FL1 validation plates
 - StakMax microplate handling system

Contact your Molecular Devices sales representative for configuration options.



flexible



labor saving



time saving



better results



cost saving

multi-mode microplate readers from Molecular Devices

	SpectraMax M5/M5^e	SpectraMax M2	SpectraMax M2^e	Analyst[®] GT
primary detection modes	FI, FP, UV/VIS Abs, TRF, Lum	FI, UV/VIS Abs	FI, UV/VIS Abs	FI, FP, UV/VIS Abs, TRF, Lum
secondary detection modes		TRF, Luminescence	TRF, Luminescence	
wavelength selection	tunable monochromator	tunable monochromator	tunable monochromator	8 Ex, 8 Em filters
wavelength range (Absorbance)	200–1000 nm	200–1000 nm	200–1000 nm	250–740 nm
wavelength range (Fluorescence)	250–850 nm	360–850 nm	250–850 nm	250–740 nm
bandwidth	4 nm for Abs 9 nm Ex, 15 nm Em for FI	4 nm for Abs 9 nm for FI	4 nm for Abs 9 nm for FI	variable (5–80 nm)
cuvettes	Abs, FI, Lum	Abs, FI	Abs, FI	No
microplate formats	6–384	6–384	6–384	96–1536
cuvettes & test tubes	Yes	Yes	Yes	No
endpoint read	Yes	Yes	Yes	Yes
kinetic read	Yes	Yes	Yes	Yes
multiple wavelength per well	Yes	Yes	Yes	Yes
wavelength-selectable luminescence	Yes	No	No	Yes
spectral scanning	Yes	Yes	Yes	No
PathCheck Sensor	Yes	Yes	Yes	No
temperature control	Yes (ambient +2°C to 60°C)	Yes (ambient +4°C to 45°C)	Yes (ambient +4°C to 45°C)	No
plate handling options	integrated stacker or SynchroMax ET	integrated stacker or SynchroMax ET	integrated stacker or SynchroMax ET	integrated stacker or SynchroMax ET
bottom-reading	FI, TRF, Lum	No	Yes	FI, TRF
FDA 21 CFR Part 11 compliance	Yes	Yes	Yes	No
robot-compatible	Yes	Yes	Yes	Yes
HTRF certified	Yes (M5 ^e only)	No	No	Yes

SALES AND SUPPORT

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† The PathCheck Sensor is covered under U.S. Patents 5,959,738, 6,320,662, 6,339,472, 6,404,501, 6,496,280 and 6,188,476. SpectraMax M5/M5^e is covered under U.S. Patents 5,112,134, 5,766,875, 6,232,608, 6,236,456, 6,313,471 and 6,316,774.