

TYPICAL PERFORMANCE VALUES.

Spark® Multimode Microplate Reader.



Typical performance values*

Fluorescence – enhanced.	
Light source	High energy xenon flash lamp
Spectral range	Ex: 230-900 nm Em: 280-900 nm
Wavelength accuracy	Ex: <0.5 nm; Em: <0.5 nm
Wavelength reproducibility	<0.5 nm
Bandwidth	Adjustable from 5-50 nm
Optical mirrors	50%, 510, 560, 625 nm built-in; 410, 430, 458, 593, 660 nm user-selectable dichroics
Well scanning	Up to 100 x 100 data points
Inject and Read	for FI bottom; kinetic interval time: ≥ 10 ms, up to 1000 data points and up to 3 different measurement sequences per kinetic run
FI (fluorescence intensity)	
Filter – top	Limit of detection ¹ ≤8 amol/well (10 µl; 1,536 wells) ¹
Fusion – top	≤15 amol/well (10 µl; 1,536 wells)
Mono – top	≤20 amol/well (10 µl; 1,536 wells)
Filter – bottom	≤180 amol/well (10 µl; 1,536 wells)
Fusion – bottom	≤200 amol/well (10 µl; 1,536 wells)
Mono – bottom	≤220 amol/well (10 µl; 1,536 wells)
FP (fluorescence polarization) ²	
Spectral range	300-850 nm
Precision Filter	≤1.25 mP ²
Precision Fusion	≤2.0 mP
Precision Mono	≤2.5 mP
TRF (time-resolved fluorescence) ³	
Limit of detection Filter	≤0.5 amol/well (20 µl; 384 sv wells) ³
Limit of detection Fusion	≤0.6 amol/well (20 µl; 384 sv wells)
Limit of detection Mono	≤0.7 amol/well (20 µl; 384 sv wells)
Fastest read time	
384-well plate (FI)	≤22 sec
1,536-well plate (FI)	≤34 sec

Fluorescence – standard.	
Light source	Dedicated xenon flash lamp
Spectral range	Ex: 230-900 nm Em: 280-900 nm
Wavelength accuracy	Ex: <1 nm; Em: <2 nm
Wavelength reproducibility	<1 nm
Bandwidth	fix @ 20 nm
Optical mirrors	50 %; 510 nm dichroic
Well scanning	Up to 100 x 100 data points
Inject and Read	for FI bottom; kinetic interval time: ≥ 20 ms, up to 1000 data points and up to 3 different measurement sequences per kinetic run
FI (Fluorescence intensity)	
Filter – top	Limit of detection ¹ ≤25 amol/well (100 µl; 384 wells) ¹
Fusion* – top	≤35 amol/well (100 µl; 384 wells)
Mono – top	≤50 amol/well (100 µl; 384 wells)
Filter – bottom	≤500 amol/well (200 µl; 96 wells)
Fusion – bottom	≤700 amol/well (200 µl; 96 wells)
Mono – bottom	≤800 amol/well (200 µl; 96 wells)
FP (Fluorescence polarization) ²	
Spectral range	300-850 nm
Precision Filter	≤1.5 mP ²
Precision Fusion	≤2.5 mP
Precision Mono	≤3.0 mP
TRF (time-resolved fluorescence)	
Limit of detection Filter	≤4.0 amol/well (100 µl; 384 wells) ³
Limit of detection Fusion	≤6.5 amol/well (100 µl; 384 wells)
Limit of detection Mono	≤10 amol/well (100 µl; 384 wells)
Fastest read time	
96-well plate (FI)	≤13 sec
384-well plate (FI)	≤30 sec

Absorbance – standard and enhanced.

Light source	Dedicated xenon flash lamp
Spectral range	200-1,000 nm
OD range	0-4 OD
Scan speed (200-1,000 nm)	≤5 sec
Wavelength accuracy	<0.3 nm
Wavelength reproducibility	≤0.3 nm
Wavelength ratio accuracy (260/230)	<0.08
Wavelength ratio accuracy (260/280)	<0.07
Precision @ 260 nm	<0.2 %
Accuracy @ 260 nm	<0.5 %
Limit of detection (nucleic acids)	<1 ng/μl

Luminescence – standard and enhanced.

Spectral range	370-700 nm
Luminescence (glow) –	
Limit of detection ⁴	≤225 amol/well (25 μl; 384 sv wells) ⁴
Luminescence (flash) –	
Limit of detection ⁵	≤12 amol/well (55 μl; 384 wells) ⁵
Dynamic range	>9 orders of magnitude
Multi-color luminescence	38 spectral filters; OD1, OD2, OD3 attenuation filters

AlphaScreen – standard and enhanced.

Limit of detection	<100 amol/well bio-LCK-P ⁶ ; 20 μl <2.5 ng/ml Omnibeads ⁷ ; 20 μl
Uniformity	≤3.0 %
Z' value	>0.9
Fastest read times ⁸	≤2 min (384-well plate) ≤1 min (96-well plate)

ANSI/SLAS plate formats for all read modes – standard and enhanced.

1-384 wells (standard); 1-1,536 wells (enhanced);
NanoQuant Plate; Cell Chip; cuvettes; Roboflask; Tecan microplates.
Spark-Stack is compatible with 6- to 1,536-well plates.

Cell counting.

Size range	4-90 μm
Counting accuracy	+/-10 % (10-30 μm)
Counting reproducibility	<10 % (10-30 μm)
Cell concentration	1x10 ⁴ -1x10 ⁷ cells/ml
Imaging speed inc. data reduction	<30 sec/sample
Number of samples/run	up to 8 samples

Automated cell imaging.

Illumination	High power LED
Image	Bright-field
Objective	4x
Autofocus	Laser based
Optical resolution	>3 μm
Read Speed	1 image/well (96-well plate); <5min

Gas Control Module.

Adjustable concentration range – CO ₂	0.04-10 % (vol.)
Adjustable concentration range – O ₂	0.1-21 % (vol.)
Concentration accuracy – CO ₂	<1 % (vol.)
Concentration accuracy – O ₂	<0.5 % (vol.)

Reagent injectors.

Syringe sizes	0.5 ml; 1 ml; 2.5 ml
Pump speed	100-300 μl/sec
Injection volume	5-2,500 μl; step size: 1 μl
Dead volume	≤100 μl
Injection accuracy and precision	≤0.5 % at 450 μl
Injector at measurement position	Fluorescence bottom for both injectors

Temperature control.

Uniformity	ambient +3-42 °C <0.5 °C
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Te-Cool cooling module.

Temperature range	+18-42 °C
Cooling power	max 12 °C below ambient

Shaking.

Linear, orbital, double-orbital;
variable amplitudes and frequencies

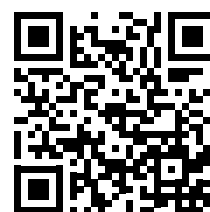
*Fusion Optics: a combination of filter and monochromator on the excitation and/or emission side

- 1) Detection limit for fluorescein
- 2) FP detection limit @ 1 nM fluorescein
- 3) Detection limit for europium
- 4) Detection limit for ATP (144-041 ATP detection kit SL (BioThema))
- 5) Detection limit for ATP (ENLITEN® Kit)
- 6) (PE# 6760620; P-Tyr-100 assay kit)
- 7) (PE# 6760626D; Omnibeads)
- 8) Including temp. correction

Spark multimode reader is for Research Use Only.

+ Specifications are subject to change. Performance values represent the average observed factory tested values.
For product specifications refer to operators manual.

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