

Spark[®] Cyto.

PLATE READER WITH LIVE CELL IMAGING AND REAL-TIME CYTOMETRY
TYPICAL PERFORMANCE VALUES



Typical performance values[†]

Fluorescence imaging and cytometry

Imaging technologies	Fluorescence, bright field, digital phase contrast			
Imaging methods	Single color, multicolor, end-point, kinetics, whole-well			
Sample formats	6- to 384-well ANSI/SLAS-format microplates			
Camera sensor	Grayscale, 5 Mpixel, CMOS Sony			
Objectives	2x (NA 0.08), 4x (NA 0.13), 10x (NA 0.30)			
Optical properties	Objective	Pixel resolution	Optical resolution	Field of view
	2x	3.45 μm	4.50 μm	8.47 x 7.09 mm
	4x	1.72 μm	2.77 μm	4.24 x 3.54 mm
	10x	0.69 μm	1.20 μm	1.69 x 1.42 mm
Channels	Bright field, four fluorescence channels (blue, green, red, far-red)			
Autofocus	Proprietary astigmatism-based technology			
Field of view	Whole-well, 96- and 384-well imaging with a single image (2x and 4x objectives)			
Applications	4 pre-defined applications: Confluence, transfection efficiency, cell viability and cell death (apoptosis via annexin V-FITC), plus user-defined applications			
Image collection rate	≤ 12 min for 96-well plate, whole-well image with 2x, bright field and digital phase contrast			
	≤ 15 min for 96-well plate, center image with 10x, bright field, digital phase contrast + 1 fluorescence channel			
Analysis speed	≤ 20 min for 96-well plate, whole-well image with 2x, bright field and digital phase contrast including real time confluence assessment			

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
FI (fluorescence intensity)	Limit of detection ¹
Filter - top	≤ 8 amol/well (10 μl ; 1,536-well)
Fusion* - top	≤ 15 amol/well (10 μl ; 1,536-well)
Mono - top	≤ 20 amol/well (10 μl ; 1,536-well)
Filter - bottom	≤ 180 amol/well (10 μl ; 1,536-well)
Fusion - bottom	≤ 200 amol/well (10 μl ; 1,536-well)
Mono - bottom	≤ 220 amol/well (10 μl ; 1,536-well)

FP (fluorescence polarization)²

Spectral range	300–850 nm
Precision - Filter	≤ 1.25 mP
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-well SV)
Limit of detection - Fusion	≤ 0.6 amol/well (20 μl ; 384-well SV)
Limit of detection - Mono	≤ 0.7 amol/well (20 μl ; 384-well SV)

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	Fixed @ 20 nm
Optical mirrors	50 %; 510 nm dichroic
Well scanning	Up to 100 x 100 data points ⁰
FI (fluorescence intensity)	Limit of detection ¹
Filter - top	≤ 25 amol/well (100 μl ; 384 well)
Fusion - top	≤ 35 amol/well (100 μl ; 384 well)
Mono - top	≤ 50 amol/well (100 μl ; 384 well)
Filter - bottom	≤ 500 amol/well (200 μl ; 96 well)
Fusion - bottom	≤ 700 amol/well (200 μl ; 96 well)
Mono - bottom	≤ 800 amol/well (200 μl ; 96 well)

FP (fluorescence polarization)²

Spectral range	300–850 nm
Precision - Filter	≤ 1.5 mP
Precision - Fusion	≤ 2.5 mP
Precision - Mono	≤ 3.0 mP

TRF (time-resolved fluorescence)³

Limit of detection - Filter	≤ 4.0 amol/well (100 μl ; 384-well)
Limit of detection - Fusion	≤ 6.5 amol/well (100 μl ; 384-well)
Limit of detection - Mono	≤ 10 amol/well (100 μl ; 384-well)

Fastest read time

96-well plate (FI)	≤ 13 sec
384-well plate (FI)	≤ 30 sec

Absorbance (enhanced or standard)

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

Plate formats for all read modes – enhanced

1-1,536 wells; NanoQuant Plate™; Cuvettes; Roboflask®

Plate formats for all read modes – standard

1-384 wells; NanoQuant Plate; Cuvettes; Roboflask

Luminescence (enhanced or standard)

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

AlphaScreen® (enhanced or standard)

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)

Gas Control Module (GCM™)

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
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

Temperature control

	Ambient +3 °C up to 42 °C
Uniformity	<0.5 °C

Shaking

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

*Specifications are subject to change. Performance values represent the average observed factory tested values.

*Fusion Optics: a combination of filter and monochromator on the excitation and emission sides

- 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 Cyto multimode reader is For Research Use Only.

For product specifications refer to operators manual.

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Australia +61 3 9647 4100 **Austria** +43 62 46 89 330 **Belgium** +32 15 42 13 19 **China** +86 21 220 63 206 **France** +33 4 72 76 04 80 **Germany** +49 79 51 94 170
Italy +39 02 92 44 790 **Japan** +81 44 556 73 11 **Netherlands** +31 18 34 48 17 4 **Nordic** +46 8 750 39 40 **Singapore** +65 644 41 886 **Spain** +34 93 595 25 31
Switzerland +41 44 922 89 22 **UK** +44 118 9300 300 **USA** +1 919 361 5200 **Other countries** +41 44 922 81 11
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