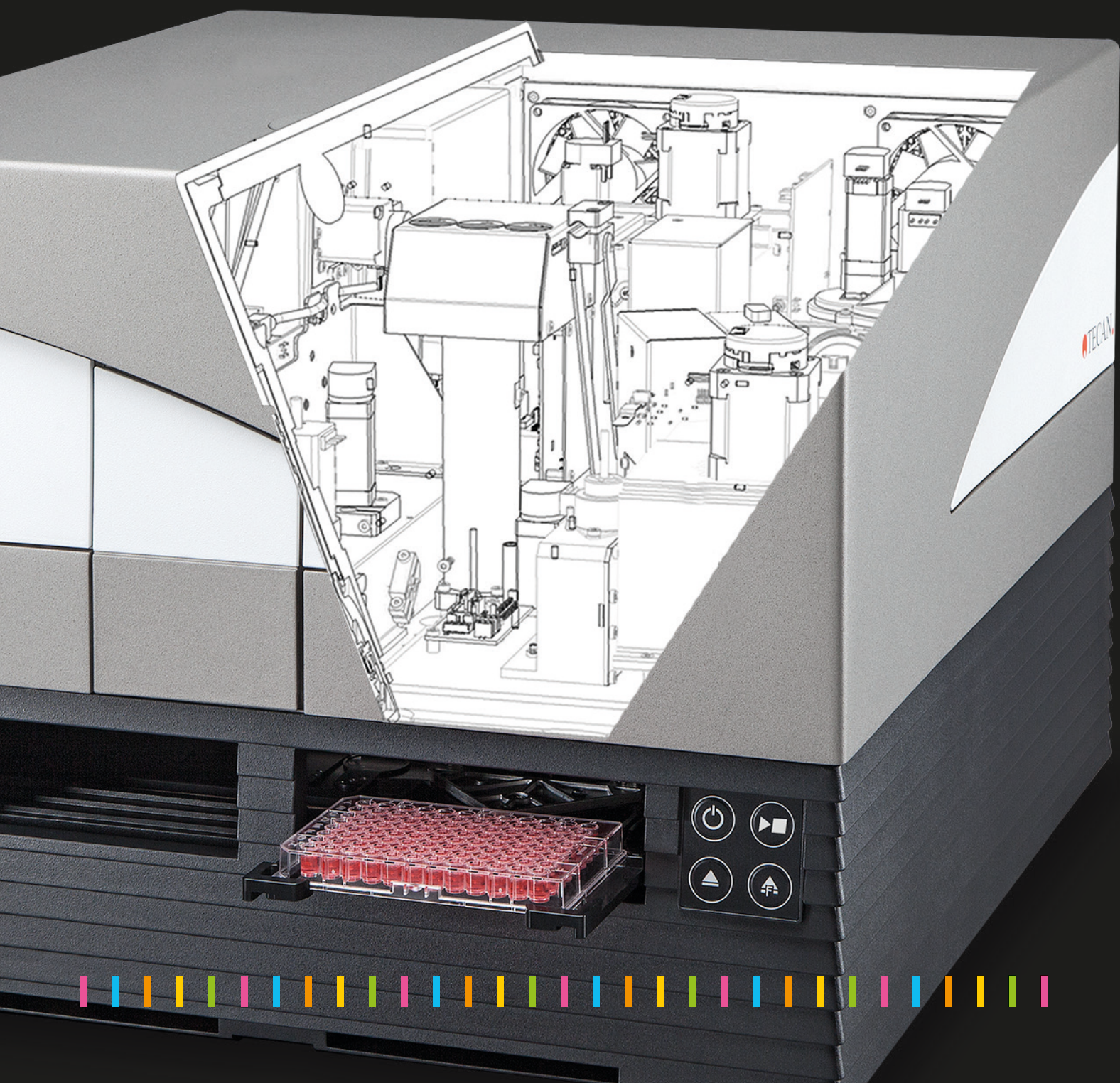


Spark[®]

MULTIMODE MICROPLATE READER
TYPICAL PERFORMANCE VALUES



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 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) ¹
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 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 well) ³
Limit of detection Fusion	≤ 0.6 amol/well (20 µl; 384 sv well)
Limit of detection Mono	≤ 0.7 amol/well (20 µl; 384 sv well)

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

FI (Fluorescence intensity)

Limit of detection ¹	
Filter - top	≤ 25 amol/well (100 µl; 384 well) ¹
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 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 well) ³
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; Cell Chip;
Cuvettes; Roboflask

Plate formats for all read modes – standard

1 - 384 wells; NanoQuant Plate; Cell Chip;
Cuvettes; Roboflask

Luminescence (enhanced or standard)

Spectral range	370–700 nm
Luminescence (glow) –	
Limit of detection ⁴	≤ 225 amol/well (25 µl; 384 sv well) ⁴
Luminescence (flash) –	
Limit of detection ⁵	≤ 12 amol/well (55 µl; 384 well) ⁵
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)



Cell counting

Size range	4-90 μm
Counting accuracy	+/-10% (10-30 μm)
Counting reproducibility	< 10% (10-30 μm)
Cell concentration	1×10^4 - 1×10^7 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	1.3 $\mu\text{m}/\text{pixel}$
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 $\mu\text{l}/\text{sec}$
Injection volume	5-2,500 μl ; step size: 1 μl
Dead volume	$\leq 100 \mu\text{l}$
Injection accuracy and precision	$\leq 0.5\%$ at 450 μl

Temperature control

	ambient +3 $^\circ\text{C}$ up to 42 $^\circ\text{C}$
Uniformity	< 0.5 $^\circ\text{C}$

Te-Cool cooling module

Temperature range	+18-42 $^\circ\text{C}$
Cooling power	max 12 $^\circ\text{C}$ 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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