TECAN.

Spark™ 10M multimode microplate reader

Ignite the productivity in your laboratory with a high performance detection platform

Productivity
starts with a **spark**

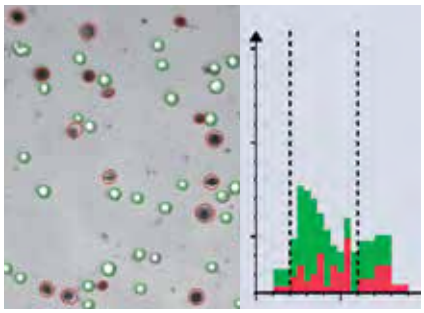
No matter what your application, the Spark 10M multimode microplate reader delivers the ideal combination of advanced capabilities and exceptional ease-of-use, enhancing productivity with a series of unique features and benefits.

Fast, simple and efficient operation through a touch-based interface that allows even inexperienced users to optimize instrument performance and generate robust, reliable results. Preset, one-click applications accelerate routine work, and remote access gives you complete control from your mobile device for added ease and convenience.

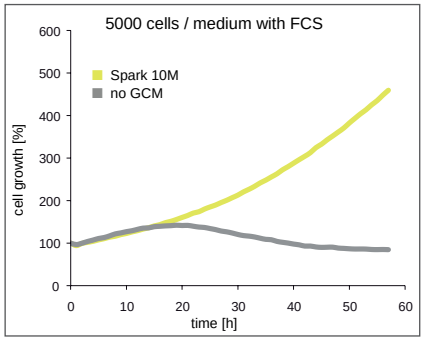
Optimize performance and shorten your time to results with Spark's revolutionary Fusion Optics. A unique combination of filters and monochromators on both the excitation and emission side of your sample, Fusion Optics combine exceptional sensitivity and speed, with complete assay flexibility.

Patent-pending High-Speed Monochromators (HSM) are also available for absorbance measurements, delivering a complete spectral scan in just five seconds for an ultra-fast, in-depth picture of your sample.

Faster, more reliable cell analysis can be performed with Spark's dedicated imaging module. A built-in cell counter provides precise data on cell number, size and viability in less than 30 seconds.



Precise CO_2/O_2, temperature and humidity control lets you create the ideal conditions for your cells in all standard microplates for complete confidence in your results. An integrated lid handler precisely balances gas exchange and evaporation protection for live cell kinetic assays and even allows automated reagent additions during an experiment.



Cell proliferation in a Spark 10M reader with integrated Gas Control Module (GCM™) and a standard microplate reader.

Capabilities

Cell counting and viability analysis

Cell incubation

Reagent dispensing

Fluorescence

Fluorescence Resonance Energy Transfer (FRET)

Time-Resolved Fluorescence Resonance Energy Transfer (TR-FRET)

Fluorescence polarization

Absorbance

DNA quantification

Luminescence flash & glow

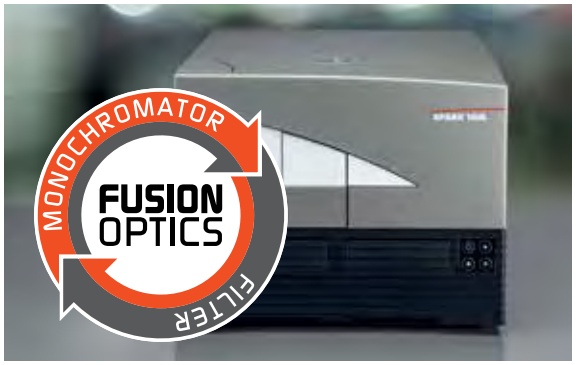
Luminescence scanning

Multi-color luminescence (BRET 1, 2, 3)

Conditions you can **control.** Results you can **trust.**

Fusion Optics deliver the best of both worlds – flexibility *and* sensitivity

Spark 10M delivers unmatched performance by being the first instrument to offer independent, user-selectable filters and monochromators on both the excitation AND emission side of your sample in any single measurement. So you don't have to choose between sensitivity OR flexibility – for the first time ever you can have both. Every well. Every assay. Every time. From both the top and bottom of your sample.



Enhance assay performance and flexibility with multi-color luminescence

Optimize your luminescence assays with Spark's variable bandwidth capability that delivers great sensitivity, excellent signal-to-background ratios, and high dynamic range. The instrument can also adapt to your future assay needs, offering a scanning option for luminescence measurements as well as ongoing compatibility with the BRET assays of today and tomorrow.

Evaporation protection

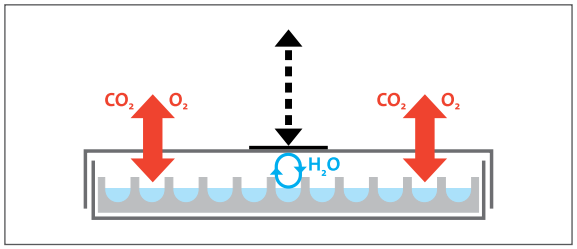
Spark's built-in, patent-pending Humidity Cassette is ideal for live cell kinetic assays, delivering excellent homogeneity for better reproducibility and more reliable data. All without requiring special and costly plates so you can continue to use your already-verified labware.

Get more information, quickly, with ultra-fast absorbance measurements

Spark 10M outperforms other systems with a patent-pending High-Speed Monochromator (HSM) that delivers spectra in just five seconds with a wavelength range of 200-1,000 nm. Ultra fast measurements can now be performed with wide-ranging and detailed spectra. The instrument also provides unparalleled wavelength accuracy for DNA and protein quantification while delivering a full spectrum scan to let you see the big picture. Now you can experience the speed of a diode array with the precision and flexibility of a monochromator.

Automated, integrated lid handling

With its patent-pending, automated lid handling capability, Spark 10M allows you to perform applications with lidded microplates and gives you the flexibility and efficiency of using an injector without the need for manual intervention during an experiment. It also optimizes gas exchange and evaporation protection, while enabling walkaway operation during experiments such as long-term kinetics and luminescence assays.



Designed for **flexibility.** Engineered for **performance.**

Choose the capabilities you want and add functionalities as your needs change, with Spark's fully modular design. A future-proof platform with no fixed configurations, the instrument is capable of evolving from a single-mode reader to a full workstation.

Enjoy unparalleled sample insight with Fusion Optics that offer independent, user-selectable filters (for sensitivity) or monochromators (for flexibility) working simultaneously on both the excitation and emission side of your sample in every measurement, both top and bottom.

Minimize evaporation and prevent contamination for more reliable results with Spark's integrated, automated, patent-pending lid handling capability. This also enables walkaway operation for applications such as luminescence measurements or injections in microplates with a lid.

Broaden your format flexibility with a full range of compatible accessories including Tecan's low-volume NanoQuant Plate™, disposable Cell Chips™, and all standard ANSI/SLAS microplate formats ranging from 1 to 384 wells.

Maximize the consistency and reproducibility of your results – well-to-well and plate-to-plate – with optional reagent dispensers that heat and stir sample vessels.

Mix reagents, biomolecules and cell suspensions more efficiently with linear, orbital and double-orbital shaking capabilities.

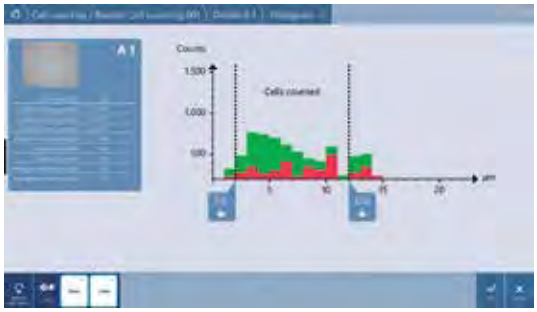
Optimize conditions for each assay by simultaneously controlling your CO_2 and O_2 levels with an integrated software-driven Gas Control Module.

Fluent™ Laboratory Automation Solution for cell-based assays

Tecan's commitment to cell biology research goes beyond the detection capabilities of Spark 10M and, including the revolutionary Fluent Laboratory Automation Solution. Designed to optimize plate handling for cell-based assays, Fluent automates everything from pipetting and reagent distribution to incubation and detection. For more information, please visit www.tecan.com/fluent.

Optimized **cell conditions** deliver **optimum** results.

As cell-based assays continue to become an increasingly attractive alternative to *in vitro* biochemical assays, laboratories are constantly looking for ways to accelerate their cell biology and culture workflows.



With a single click, SparkControl™ gives you fast, accurate cell counts for live/dead analysis

Spark 10M answers this need by enabling researchers to automate a variety of day-to-day analyses, including:

- High precision visual, label-free cell counting, even at low concentrations.
- One-click live/dead cell analysis.
- Automated replicate processing for multiple samples in a disposable Cell Chip, offering fast and simple mean value calculations, greater accuracy and more precise data.
- Accurate, reproducible cell counting with flexible area selection (1-, 4- or 8-well segments) for greater sensitivity, even with low cell concentrations.

Spark 10M lets you generate automatic mean value calculations by performing replicate processing of samples in a disposable Cell Chip

Spark 10M is compatible with Tecan's innovative disposable Cell Chips, which minimize sample preparation, offer greater application flexibility and open up new cell counting possibilities

Engineered with cell-based assays in mind

At Tecan, we understand the demands of cell-based applications and the challenges they pose every day. For optimum assay performance and reliable results, you need a plate reader that offers a range of specialized features and capabilities that ensure ideal cell conditions. And that's exactly what you get with Spark 10M.

Minimize evaporation and prevent contamination with an automated lid handling system that even works with injectors for added workflow automation.

Maintain stable culture conditions and improve cell growth by simultaneously controlling CO_2 and O_2 levels in the reader using the integrated Gas Control Module powered by SparkControl software. This module also allows assays to be performed under anaerobic or physiological conditions.

Ensure better cell viability and enhanced data quality – ideal for long-term kinetics – with integrated evaporation protection provided by Tecan's unique Humidity Cassette.

Enhance productivity and application flexibility with the automated injectors featuring reagent stirring and heating capabilities.

Experience excellent sensitivity and greater measurement reliability with optimal, automated z-focus in all read modes. Ideal for cell-based applications using autofluorescent growth media, this tool delivers the best resolution possible, automatically optimizing your signal-to-background ratio.

Optimize intra- and inter-well reproducibility in fluorescence bottom-reading measurements with Tecan's unique Optimal Read function that delivers very low CVs by performing multiple measurements on spatially separated spots arrayed across each well.

Software for greater **speed**, **simplicity** and **control.**

SparkControl also offers:

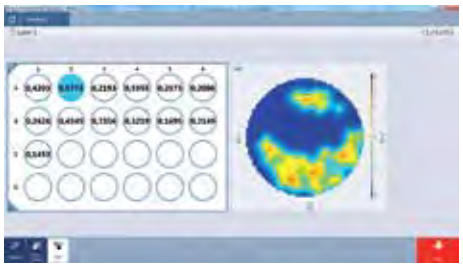
- Predefined reports, making it easy to keep your records complete and on track.
- Auto-adjusting z-focus for brilliant sensitivity and performance in plates of all volumes.
- Drag-and-drop functionality to streamline the creation of workflows – simply place the processing steps in sequence according to your assay protocol.
- Easy adjustment of parameters during a measurement, including environmental conditions such as CO_2 and O_2 levels.
- Conditional kinetic programming allows greater workflow automation, e.g. inject reagent A when bacterial growth reaches OD 1.

Remote instrument control

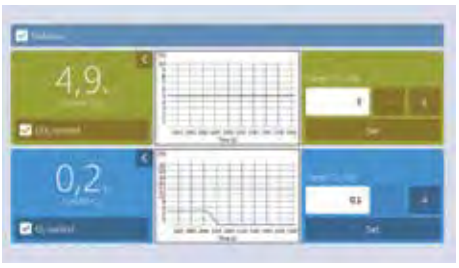
Run your experiments from anywhere, anytime, optimizing productivity with SparkControl's remote access capabilities. Simply use any network enabled computer or tablet to:

- Start any measurement or one-click application.
- Control and monitor your measurement in real time.
- Evaluate results instantly for greater efficiency and productivity.
- Adjust instrument settings, such as temperature and CO_2/O_2 levels.

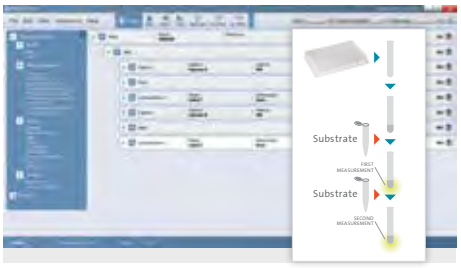
Designed to simplify the daily work in your laboratory, SparkControl software features a unique touch-optimized interface with fast, intuitive, one-click operation.



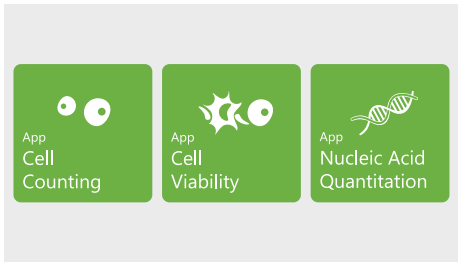
High definition well scans provide a complete picture of the cell population in each well for more accurate signals, even with inhomogeneous cell layers. The software generates an averaged result for your entire selected area and even shows a qualitative image of the cell distribution.



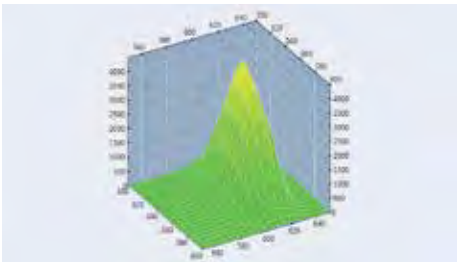
SparkControl makes it **easy to adjust** parameters during a run, including **environmental conditions** such as CO_2 and O_2 levels inside the reader.



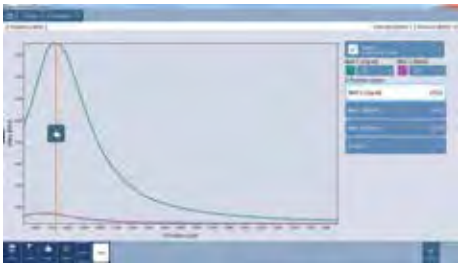
Get instant access to applications and enjoy easy operation with SparkControl's one-click, workflow-based interface. The software makes it easy and intuitive to translate your workflow into an protocol that can be saved, run and edited at any time.



One-click applications streamline your workflows, getting you from sample to results faster than ever before.



3D scanning accelerates assay development by providing simultaneous excitation and emission scans. These capabilities help to identify changes in the spectral properties of fluorescent probes and characterize unknown fluorescent samples.



Automated z-focus adjustment enhances sensitivity in top-reading fluorescence intensity and fluorescence polarization modes, significantly improving the quality of results. No matter what your plate volume, sample volume or well shape, this unique feature makes it easy to set up your reader for optimum performance with varying assay parameters.

Typical performance values*

Absorbance	Light source	Xenon flash lamp
	Spectral Range	200–1000 nm
	OD range	0–4 OD
	Scan Speed 200–1000 nm	≤ 5 sec
	Wavelength accuracy	≤ 0.8 nm
	Wavelength reproducibility	≤ 0.5 nm
	Wavelenght ratio accuracy 260/230	< 0.08
	Wavelenght ratio accuracy 260/280	< 0.07
	OD precision @ 260 nm	≤ 0.2%
	OD accuracy @ 260 nm	≤ 0.5%
	Limit of detection (DNA)	< 1 ng/µl
Fluorescence intensity+	Spectral range	Ex: 230–900 nm; Em: 280–900 nm
	Wavelength accuracy	Ex: < 1 nm ; Em: < 2 nm
	Wavelength reproducibility	< 1 nm
	Limit of detection F/F - top	≤ 0.25 pM (≤ 25 amol/well; 100 µl) [1]
	Limit of detection M/F - top	≤ 0.35 pM (≤ 35 amol/well; 100 µl)
	Limit of detection F/M - top	≤ 0.35 pM (≤ 35 amol/well; 100 µ)
	Limit of detection M/M - top	≤ 0.5 pM (≤ 50 amol/well; 100 µl)
	Limit of detection F/F - bottom	≤ 2.5 pM (≤ 0.5 fmol/well; 200 µl)
	Limit of detection M/F - bottom	≤ 3.5 pM (≤ 0.7 fmol/well; 200 µl)
	Limit of detection F/M - bottom	≤ 3.5 pM (≤ 0.7 fmol/well; 200 µl)
	Limit of detection M/M - bottom	≤ 4 pM (≤ 0.8 fmol/well; 200 µl)
	Well scanning	up to 100 x 100 data points
FP (Fluorescence polarization)	Spectral range	300–850 nm
	Limit of detection F/F	≤ 1.5 mP [2]
	Limit of detection F/M	≤ 2.5 mP
	Limit of detection M/F	≤ 2.5 mP
	Limit of detection M/M	≤ 3.0 mP
TRF (Time-resolved fluorescence)	Limit of detection F/F	≤ 40 fM (≤ 4 amol/well; 100 µl) [3]
	Limit of detection F/M	≤ 65 fM (≤ 6.5 amol/well; 100 µl)
	Limit of detection M/F	≤ 65 fM (≤ 6.5 amol/well; 100 µl)
	Limit of detection M/M	≤ 100 fM (≤ 10 amol/well; 100 µl)
Luminescence	Spectral range	300–700 nm
	Limit of detection (glow)	≤ 9 pM (≤ 225 amol/well; 25 µl) [4]
	Limit of detection (flash)	≤ 218 fM (≤ 12 amol/well; 55 µl) [5]
	Dynamic range	> 9 orders of magnitude
	Multi-color luminescence	38 spectral filters; OD1, OD2, OD3 attenuation filters
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 incl. data reduction	< 30 sec/sample
	Number of samples / run	up to 8 samples
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%
	Concentration accuracy O_2	< 0.5%
Reagent injectors	Syringe sizes	0.5 ml; 1 ml
	Pump speed	100–300 µl/sec
	Injection volume	5–1000 µl; stepsize 1 µl
	Dead volume	≤ 100 µl
	Injection accuracy and precision	≤ 0.5% at 450 µl
Temperature control		ambient +4 °C up to 42 °C
	Uniformity	< 0.5 °C
Shaking	linear, orbital, double-orbital; variable amplitudes and frequencies	
Plate format	1–384 wells; NanoQuant plate; CellChip; cuvettes	
Fastest read time	96 well plate (FI)	≤ 13 sec
	384 well plate (FI)	≤ 30 sec

Spark multimode reader is for Research Use Only. Not for clinical diagnostics.

* Specifications are subject to change. Performance values represent the average observed factory tested values.
+ Fluorescence Fusion Optics: F-Filter; M-Monochromator
[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 for ATP (ENLITE® Kit).
For product specifications refer to operators manual.

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398454 V1.0 01-2015, 30096323

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