Spark®

MULTIMODE MICROPLATE READER

The fully flexible detection platform with smart automation.

Made for discovery, today and tomorrow.

The Spark multimode microplate reader platform offers solutions to suit virtually any life science research or drug discovery application. It allows researchers to freely configure the reader to their current needs, and is fully upgradable to access other techniques and features in the future.

Spark provides unparalleled wavelength accuracy, with a dedicated High Speed Monochromator for absorbance measurements. Together with a cuvette port and the patented NanoQuant Plate™, it provides an all-in-one solution for ELISAs, low volume DNA/protein quantification and fast spectral scanning.

At the heart of the instrument are its unique Fusion Optics for fluorescence, allowing any combination of filters or monochromators on both the excitation AND emission sides for every measurement; you no longer have to choose between sensitivity OR flexibility for your assays. This option features the latest generation QuadX Monochromators™ and dichroic mirrors, offering variable bandwidth selection and full wavelength flexibility to provide exceptional measurement performance and speed.

Spark's multi-color luminescence module offers unparalleled flexibility for virtually any luminescence measurement, including flash, glow, BRET and laser-based Alpha Technology.

The instrument's bright field cell imaging capabilities, together with its incubator-like environmental control, enable long-term cell-based experiments and live monitoring of cell growth. The conditional workflow automation minimizes hands-on times and increases reproducibility, enabling long-term experiments with precious cell lines.

To ensure complete confidence in your data, Spark's Te-Cool™ module allows the user to set the reader temperature at or below ambient, offering complete environmental independence for more accurate and reliable results, regardless of the time of day or season.

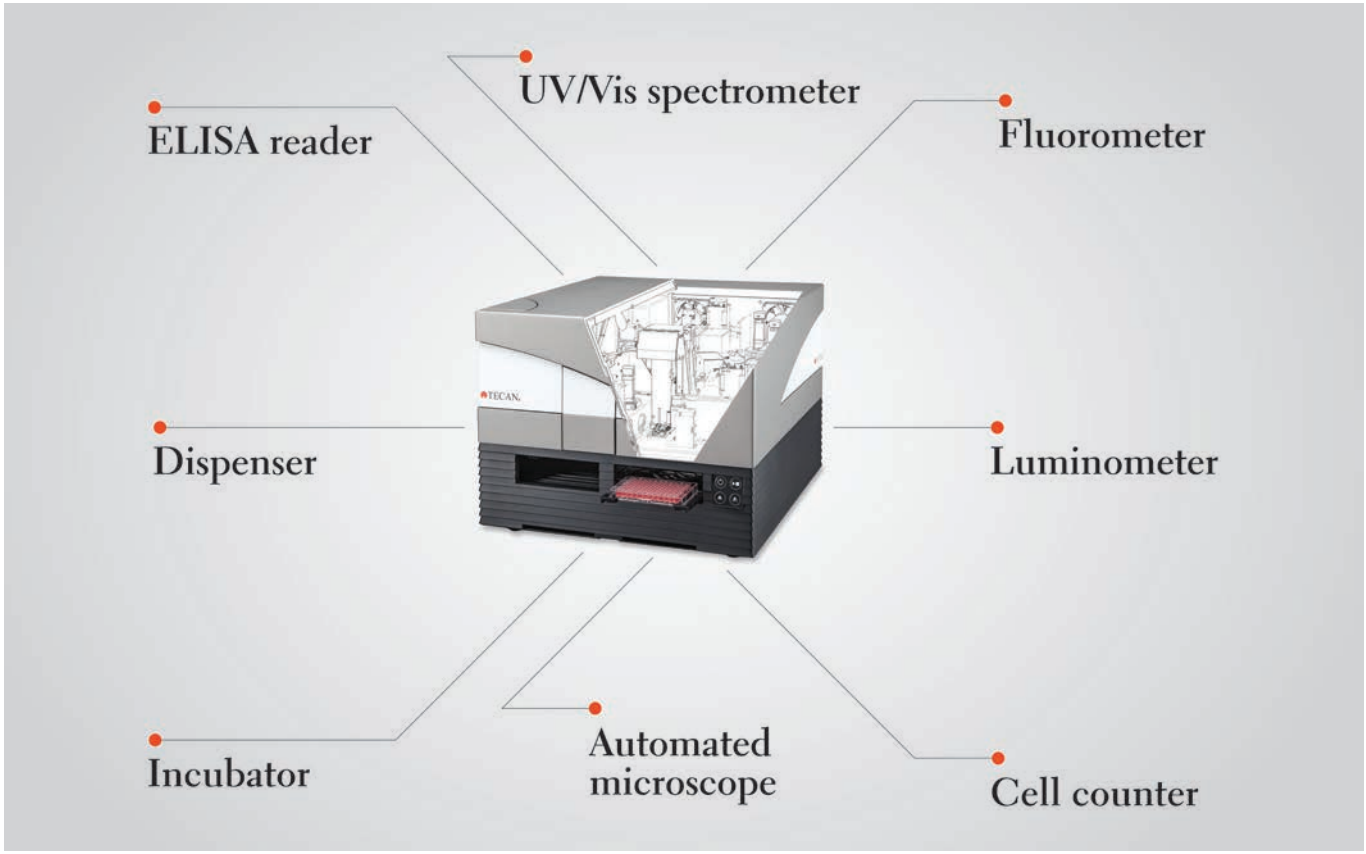
Spark capabilities

Applications
- ELISA
- Low-volume DNA/RNA quantification
- Nucleic acid labeling efficiency
- Protein quantification
- Reportergene assays
- HTRF®
- Transcreener®
- DLR®
- BRET – including NanoBRET™
- Cell counting and viability
- Confluence assessments
- Cell migration and wound healing

Detection modes
- Absorbance – incl. UV/Vis spectra
- Fluorescence top & bottom – incl. spectra
- Time resolved fluorescence (TRF) – incl. spectra
- FRET
- TR-FRET
- Fluorescence Polarization (FP)
- Luminescence – glow, flash, multi-color, spectra
- AlphaScreen®, AlphaLISA® & AlphaPlex®
- Automated live cell imaging – cell counting and confluence

Additional features
- Absorbance cuvette port
- NanoQuant Plate
- Temperature control (RT+3 °C – 42 °C)
- Liquid dispensers with reagent heater and stirrer
- CO_2 & O_2 control
- Evaporation protection (humidity cassette)
- Te-Cool (active temperature regulation from 18-42 °C)
- Integrated lid handling
- QC tools for IQOQ services

htrf This reader is HTRF® compatible. | Transcreener® Far Red FP validated | Transcreener® Red FI validated | Transcreener® Red TR-FRET validated | DLReady™ | quad4 monochromators™ | premium quadX monochromators™ | 2µl NanoQuant Plate™ compatible



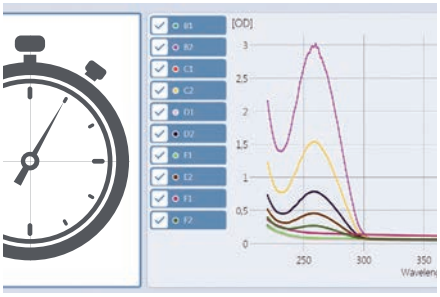
Full modularity and upgradeability

Spark allows free combination of a broad range of modules, giving researchers the ability to configure the system to exactly match their needs. It is fully upgradeable, ensuring a future-proof investment with the flexibility to grow to meet future requirements.

Absorbance UV/Vis Spectrometer

With its High Speed Monochromator, Spark provides unparalleled wavelength accuracy for DNA and protein analysis:

- Full absorbance spectrum data – from 200 to 1,000 nm – in less than five seconds
- Excellent accuracy in the deep UV range (230-260 nm) for improved DNA/RNA analysis
- An OD range from 0-4 ensures good linearity, requiring fewer dilutions and less manual pipetting

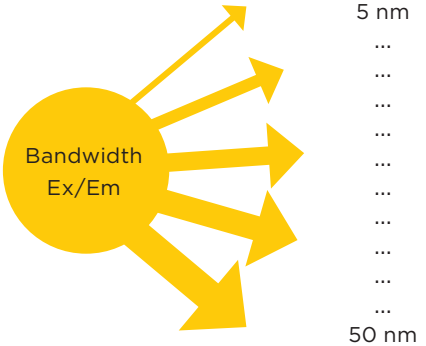


Fluorescence

Spark's unique Fusion Optics offer a free choice of filters or monochromators, not just in the same instrument, but in the same measurement. This eliminates any compromise between sensitivity and flexibility, and is especially beneficial for assay development. All optical modules are available as standard or enhanced versions, with full upgradeability.

High sensitivity across the spectral range – The high performance of the PMT used for fluorescence detection delivers exceptional sensitivity over the complete spectral range, from green dyes to red dyes.

Sensitivity – Combining QuadX Monochromators with dichroic mirrors gives the Spark reader industry-leading sensitivity. These mirrors reduce unwanted noise, particularly for fluorophores exhibiting narrow excitation and emission spectra. Choose from three built-in dichroic mirrors, or even choose a user-selectable mirror.



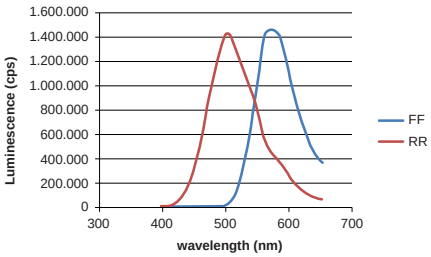
Variable bandwidth improves sensitivity for highly demanding FRET assays by allowing excitation and emission bandwidths separately.

User-selectable deep blocking dichroic mirror increases sensitivity for fluorophores with narrow excitation and emission spectra.

Full wavelength flexibility – The Premium QuadX Monochromators offer unparalleled wavelength accuracy and precision, as well as flexible bandwidth selection. In combination with the system's dichroic mirrors, this ensures enhanced flexibility and filter-like performance for assay development and screening.

Automated cell-based experiments
Spark overcomes the typical loss in sensitivity associated with bottom reading of cell-based assays using a lens-based system which guides the light to a focal point on the cells. In combination with cell confluence measurements, it enables fully automated, parallel monitoring of cell growth and fluorescence signal intensities while the cells are incubated inside the measurement chamber.

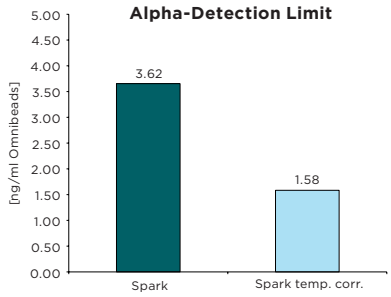
Fluorescence polarization
Spark's unique Fusion Optics allow flexible set-up of FP experiments using any combination of filter- or monochromator-based optics.



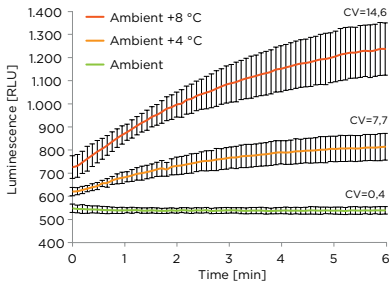
Emission spectral scan of Renilla (RR) and Firefly (FF) luciferases recorded with the Spark.

Luminescence

Spark offers a choice of luminescence modules, allowing standard or multi-color measurements using 40 user-selectable filters. This enables monochromator-like scanning from 390-660 nm with the sensitivity of filter-based measurements. The system uses a dedicated PMT to offer single photon counting without compromising other detection modes, giving excellent sensitivity over a dynamic range of 10^9 using three OD attenuation filters. The use of dedicated fibers for each plate format (96 to 1,536 wells) minimizes crosstalk and gives luminometer-like performance. In combination with the instrument's injector module, this offers unprecedented freedom for luminescence applications, including glow, flash, multi-color, scanning and BRET.



Alpha Technology
Alpha Technology – including AlphaScreen, AlphaLISA and AlphaPlex – is a luminescent bead-based assay technology designed for the measurement of biological interactions. Spark is equipped with a high performance laser excitation source and IR sensor for well-by-well temperature correction, ensuring better sensitivity, uniformity and linearity for Alpha Technology assays. SparkControl™ includes pre-determined filter settings for AlphaScreen, AlphaLISA and AlphaPlex, as well as user-selectable settings for future Alpha Technology applications.



Enzymatic assays are temperature sensitive. A luminescence assay was measured kinetically over a time course of 10 min. Best results with lowest CV were obtained when setting Spark at a constant ambient temperature with Te-Cool.

Improved temperature control with Te-Cool

A stable temperature is a prerequisite for reliable results. For most readers, the specified minimum temperature inside the measurement chamber is defined as a few degrees above ambient. This can vary significantly depending on the time of year and location, and so will your results. Temperature gradients can also occur across a microplate with many readers, leading to poor precision and variability.

Whether you are performing enzymatic reactions – such as luciferase assays – running temperature-dependent Alpha Technology assays, or studying assay kinetics in live organisms, you need precise, controllable cooling to ensure optimal performance. Spark's patent-pending Te-Cool module allows you to perform assays at, or even below, ambient temperatures, maintaining your specified temperature for long periods.

Format flexibility

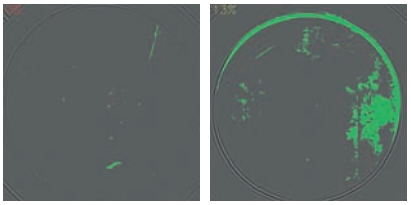
Increase your format flexibility and throughput with Cuvettes, Cell Chips™, Roboflask®, NanoQuant Plate and ANSI/SBS microplates up to 1,536 well format.

Tecan Microplates ensure reliability of your data for biochemical and cell based assays

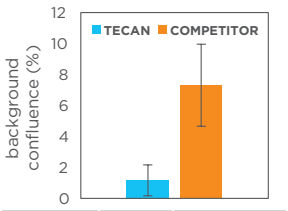
- Optimal plate height and manufacturing tolerances allow reader optics to be as close to the plate as possible, avoiding well-to-well signal crosstalk.
- Developed and tested to work in combination with Spark and the imaging algorithm, offering assured performance.
- Microplate well diameter is optimal to work with the Spark system's bright field imaging module – critical for confluence assessments.

Clear cell culture plates

It is critical to ensure the optical quality of microplate well bottoms for contrast-based confluence measurements, as optical artifacts or particles that have a higher contrast than the background could be incorrectly identified as cells. Our cell culture plates offer exeptional optical performance with minimum background signal.



Tecan Microplate | **Competitor C Microplate**



	Tecan	Competitor C
Average	1.2	7.3
SD	0.9	2.6

Difference in background confluence (artifacts) between a Tecan cell culture plate and a competitor plate using the Spark reader.

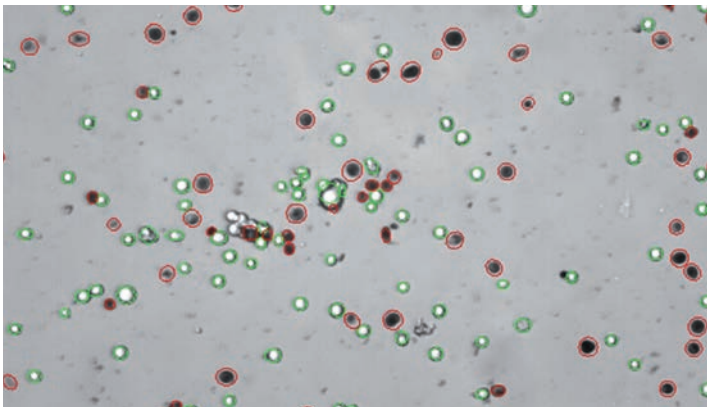
Automated microscope

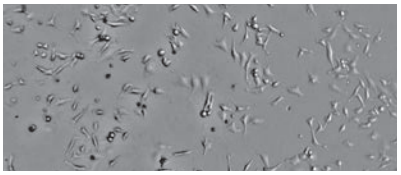
Spark's bright field imaging optics offers a 4x objective with laser-based autofocusing. This system can perform image acquisition and confluence determinations in microplates, or cell counting applications using Tecan's disposable Cell Chip. In addition, a Live Viewer option in SparkControl offers microscope-like functionality.

Label-free cell counting and fast viability analysis

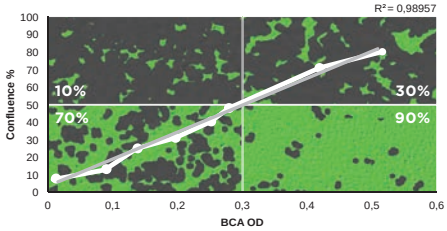
In combination with disposable Cell Chips, bright field imaging can be used for automated, label-free counting of a broad range of cell sizes and types. Trypan blue staining can be used to determine the number of live and dead cells.

- Accurate and reproducible cell counting, with flexible area selection for greater sensitivity
- Predefined, one-click applications for determination of cell number, size distribution or viability
- Easy export of cell images for visual confirmation
- Trypan blue-based staining for life/dead cell counts



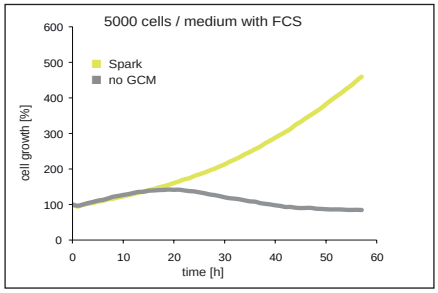


Take a last look before starting your assay
Defined positions within a Cell Chip or microplate well can be viewed and saved with 4x magnification using the Live Viewer. This allows microscope-like functionality, including user-definable focusing, for fast and easy quality control of your cells.



The growth of HeLa cells at various confluence levels and the corresponding increase of protein content measured using a BCA assay protocol.

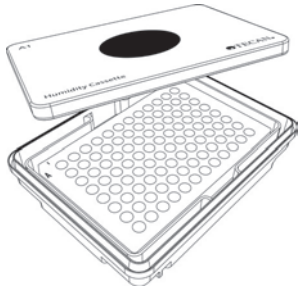
Automated cell imaging and confluence measurements
It is necessary to normalize results over several wells across a microplate to have confidence in your cell-based assay results. The problem is that you don't know how many cells have adhered to the bottom of the microplate, or even grown, over a certain period of time. With Spark, it is possible to automatically measure cell confluence and image cells in the well of a microplate. The system can then automatically inject a compound or measure a GFP signal once a user-defined cell confluence is reached, providing more reliable results.



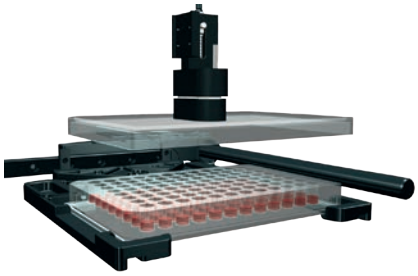
Comparison of cell proliferation in the Spark reader with integrated GCM and a standard microplate reader.

Maintain stable culture conditions and improve cell growth
A patented integrated Gas Control Module (GCM™) features two independent gas inlets that allow automated control of CO_2 and O_2 partial pressures inside the reader chamber, offering:

- Stable long-term cell culture environments
- Improved cell viability and extended experimental times without adversely affecting results
- Optimization of gas levels and mixtures with independent regulation of CO_2 and O_2 partial pressures
- Software-controlled, automated adjustments for real-time modulation of gas partial pressures during a run



Evaporation protection to enhance cell viability
Built-in evaporation protection enhances live cell kinetic assays for better reproducibility and more reliable data. A patented Humidity Cassette reduces evaporation in standard microplates, minimizing edge effects and enabling long-term live kinetic studies without the need to switch to dedicated and costly microplate types; simply use your current, validated plates.



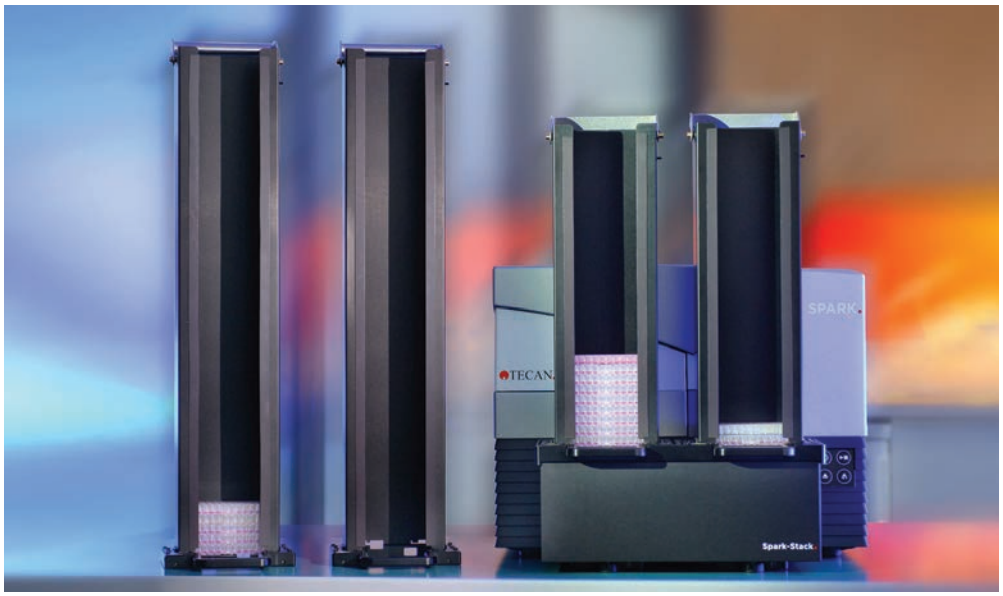
Minimize evaporation and contamination with automated microplate lid handling
The integrated patented microplate Lid Lifter™ allows automated lid handling within the reader, enabling incubation, measurements and injections without manual intervention. The Lid Lifter is compatible with the Humidity Cassette and any ANSI/SLAS-format plate lid which can be fitted with a magnetic pad. In combination with the GCM, advanced temperature control and the Humidity Cassette, Spark turns into a reader/incubator hybrid with flexible workflow automation capabilities, increasing reproducibility and reducing hands-on time. Additional benefits include:

- Reduced contamination risk for cell-based experiments
- Lower risk of user exposure when working with pathogens
- Luminescence measurements in lidded plates
- Reduced background noise for absorbance measurements in lidded plates

Reagent dispenser with heating and stirring enhances application flexibility
Integrated injectors enable experiments with fast reaction times like flash luminescence or Ca^{2+} release assays. Spark injectors offer a heating and stirring option for the reagent storage. This is especially beneficial for cell based applications, minimizing cold shock caused by reagent addition and enabling automated dispensing of viable cells within the reader.

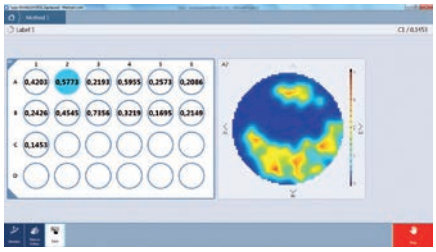
Spark-Stack™
This versatile and field-upgradeable integrated stacker module is designed to reliably automate plate loading, unloading and re-stacking for non-lidded ANSI/SLAS-format microplates from six to 1,536 wells. Ideal for assays requiring room temperature pre-incubation steps, the Spark-Stack is equipped with removable dark covers to protect light sensitive assay, such as AlphaLISA, AlphaScreen, AlphaPlex and GFP-transfected cells. Software updates to both SparkControl and SparkControl Magellan™ provide seamless operation of the Spark-Stack module, helping to streamline laboratory workflows and allowing overnight running for greater productivity.

Highlights of Spark-Stack plate stacker include:
- Set of short/long plate magazines with a capacity of up to 30/50 plates per run
- Delayed Start-function in SparkControl enables pre-incubation of plates at room temperature inside the plate magazines
- Optional integrated barcode scanner for process control
- Light protection elements are provided for the plate magazines to enable benchtop automation of light-sensitive assays



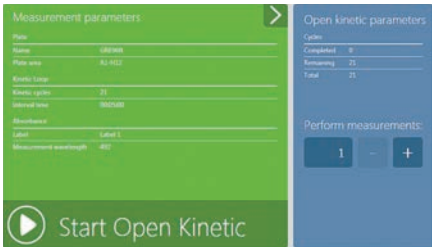
SPARKCONTROL

Fast, simple instrument operation is at your fingertips with SparkControl's touch-optimized, intuitive interface. Engineered to simplify your daily laboratory tasks, SparkControl offers:

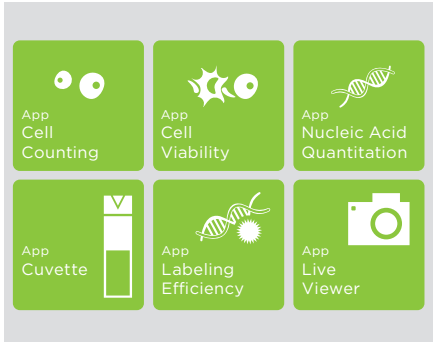


High definition well scans provide a complete picture of the cell population in each well for more accurate signals, even with inhomogeneous cell layers. The software also provides a qualitative image of the cell distribution.

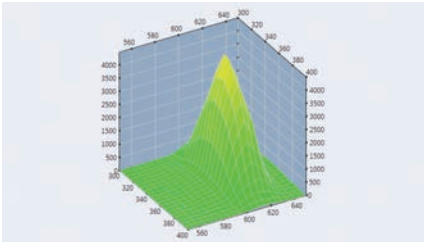
SparkControl makes it **easy to adjust** parameters during a run, including **environmental conditions** such as temperature (even below ambient) and the CO_2 and O_2 levels inside the reader.



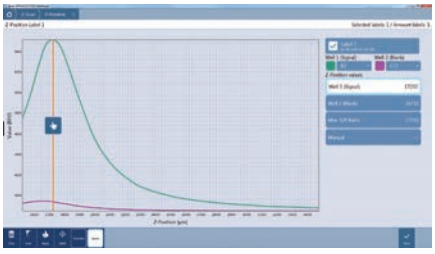
Open kinetics – Free-up your reader during long-term kinetic measurements. Pause/resume a kinetic run and allow your peers to access the reader in between. Increase productivity while running long-term cell-based assays.



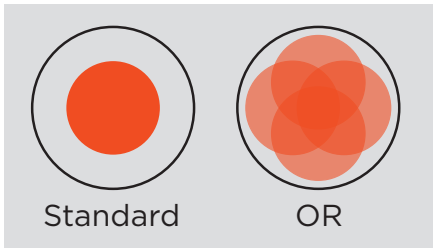
One-click applications streamline your workflows, getting you from sample to results faster than ever before.



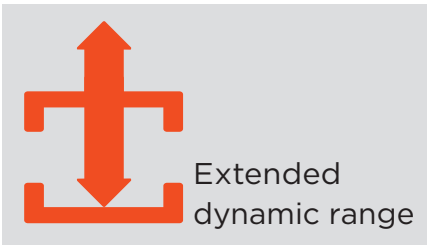
3D scanning accelerates assay development by providing simultaneous excitation and emission scans. This can help to identify changes in the spectral properties of fluorescent probes or characterize unknown fluorescent samples more quickly and easily.



Automated z-focus adjustment enhances the sensitivity of 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.



Optimized fluorescence bottom-reading with Tecan's unique Optimal Read (OR) function. OR ensures very low CVs by performing multiple measurements on spatially separated spots arrayed across each well.

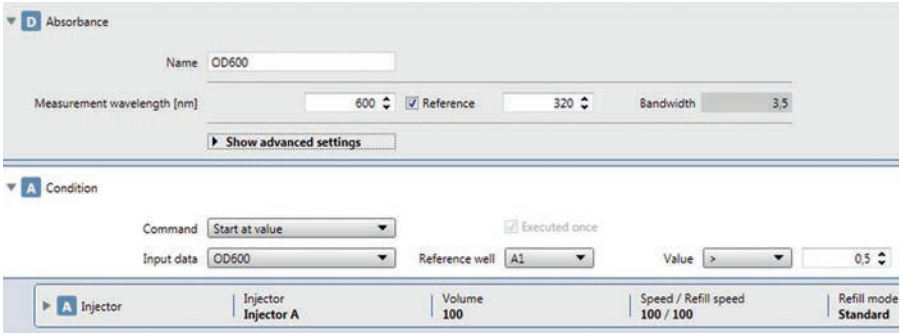


Detect even very low signals with the Spark **extended dynamic range.** This function automatically adjusts the gain settings during a measurement run, allowing the detection of very low signals without compromising on sensitivity. All results are automatically correlated and displayed within one single data set.

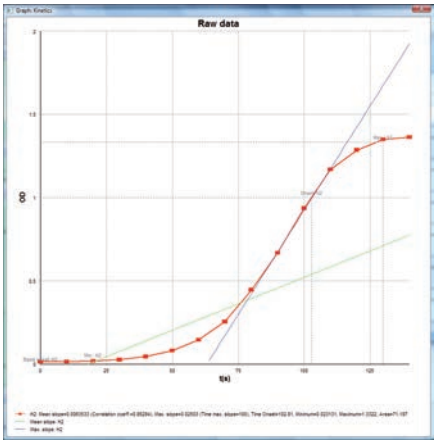
Safeguard your kinetic assays using automated gain regulation to avoid fluorescence measurements running into saturation. Measurements with different gain settings are then automatically correlated, allowing evaluation of the entire dataset.

Smart automation

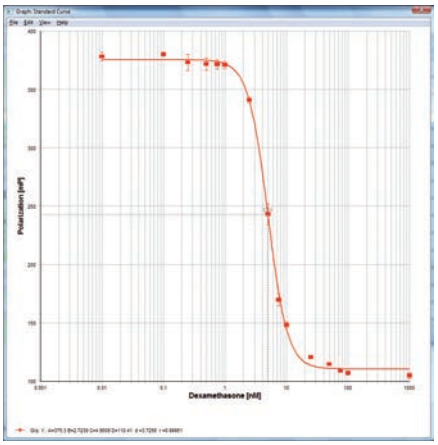
SparkControl excels in workflow automation. Combining an OD600 measurement with an injection at a specific absorbance value increases walkaway automation. Let SparkControl work for you, freeing up more time for important research.



SPARKCONTROL magellan



SparkControl Magellan makes it easy to perform complete kinetic data analysis including the calculation of slopes, onsets and enzyme kinetics.



Designed to simplify the user experience, SparkControl Magellan conveniently handles all dilution series and ICx calculations.

SparkControl Magellan is a data analysis package providing powerful data reduction tools for numerous detection modes.

SparkControl Magellan offers users an array of tools designed to enhance functionality, simplicity and security.

- Ideal for microplate-based applications such as ELISAs, end-point assays, kinetic assays, ratiometric measurements, multi-label measurements and 3D scanning
- Rapidly perform everything from data reduction and curve fitting to the calculation of kinetic parameters, such as Michaelis-Menten constants
- Video tutorials and example files simplify operation
- Plate definition editor allows creation of customized plate geometry files

The software provides a suite of sophisticated functions including:

- Full qualitative and quantitative EIA analysis
- All major curve fittings, including point-to-point, linear regression, non-linear regression, polynomial, cubic spline, Akima, logit-log, four- and five-parameter fits
- Convenient handling of dilution series and ICx calculations
- General data import and export options, as well as automated import of sample ID lists
- Kinetic data analysis with calculation of slopes, onsets and enzyme kinetics
- Spectral calculations to provide rapid background correction, curve smoothing, wavelength selection, peak identification and 3D scanning

SparkControl Magellan Tracker offers all the functionalities necessary for compliance with FDA regulation 21 CFR part 11 for electronic records and signatures, while still providing all the advantages of SparkControl Magellan Standard.

Fluent® Laboratory Automation Solution for cell-based assays
Tecan's commitment to cell biology research goes beyond the capabilities of Spark. The revolutionary Fluent Laboratory Automation Solution for cell-based assays is designed to optimize cell-based workflows, automating everything from pipetting and reagent distribution to incubation and detection.

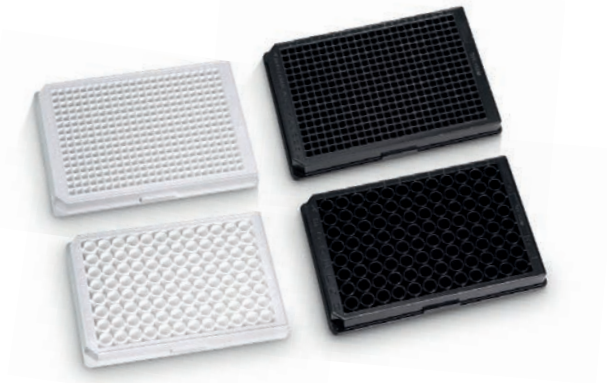
For more information, please visit www.tecan.com/fluent.

Consumables.

At Tecan, we work continually to ensure that our instruments meet your application requirements. We offer a broad range of consumables tailored to your application and laboratory needs.

Tecan Microplates
Performance assured with Tecan Microplates, for absorbance, fluorescence, and luminescence measurements as well as cell imaging. We offer a selection of polystyrene, medium-binding microtiter plates in the ANSI/SLAS-format.

- Optimal plate height and the height tolerance limits allow moving the optics of the Spark reader as close as possible to the plate avoiding the well-to-well signal crosstalk
- The imaging algorithm of the Spark reader is developed and tested in combination with Tecan Microplates – we assure good performance with this combination
- Microplate well diameter is optimal to work with Spark – critical in confluence assessments



Tecan Microplates come in transparent, white, and black colors. Available plate formats are 24, 48, 96, and 384 wells.

Cell Chips for cell counting
Tecan's innovative Cell Chips minimize sample preparation, offering greater application flexibility and opening up new cell counting possibilities for cells in suspension.

- Accurate, reproducible cell counting, with flexible area selection for greater sensitivity
- One-click analysis of cell number, size distribution and viability
- High precision cell counting, even at low concentrations
- Automated replicate processing for multiple samples in disposable Cell Chips
- Export images for visual confirmation

Cell Chips are packaged individually and come in 50 pcs/box.

Lid Lifter discs
For long-term incubation and in-between measurement, the Lid Lifter helps researcher to increase workflow automation to reduce hands-on time. To further reduce sample evaporation, Tecan offers a convenient solution. Apply the sample into a Tecan Microplate, cover with a Lid Lifter disc attached, place it in Spark and incubate as long as required. Spark Lid Lifting System will lift the lid from the plate for readings at specified time intervals.

Lid Lifter Discs come in 50 pcs/box.

Additional Options.

Empower your research with related products

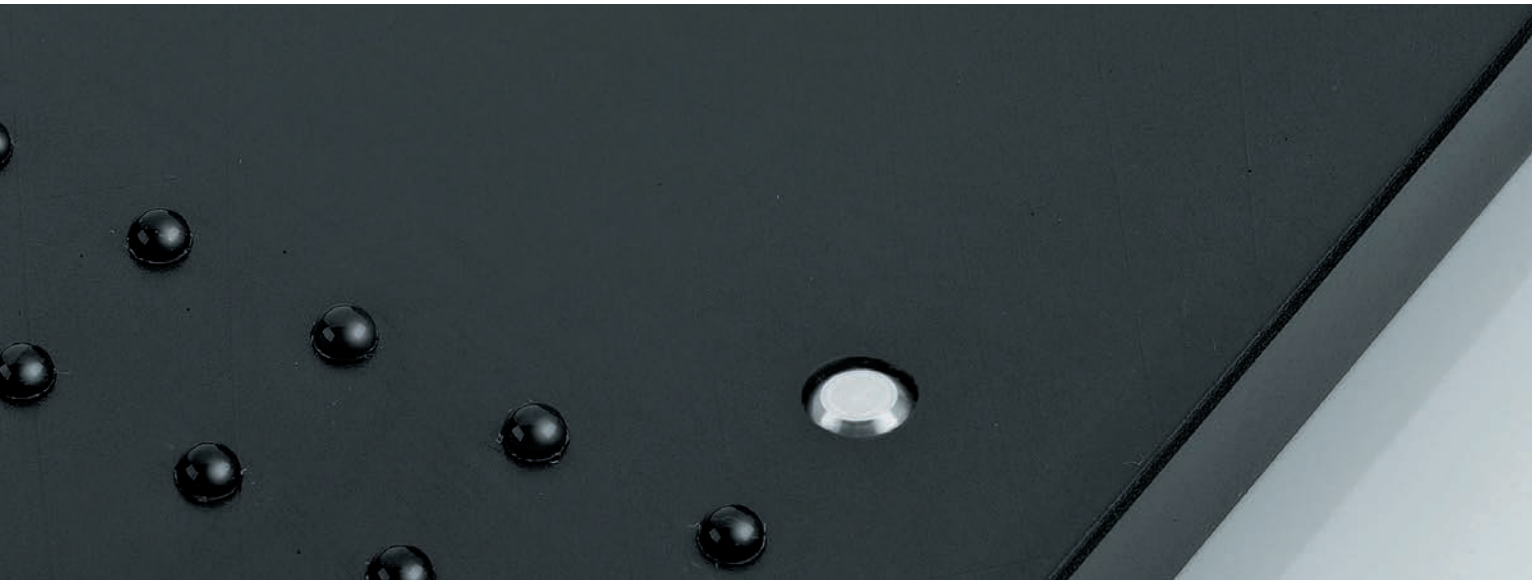
NanoQuant Plate™
Allows parallel quantification and analysis of up to 16 nucleic acid or protein samples, in volumes as little as 2 µl.

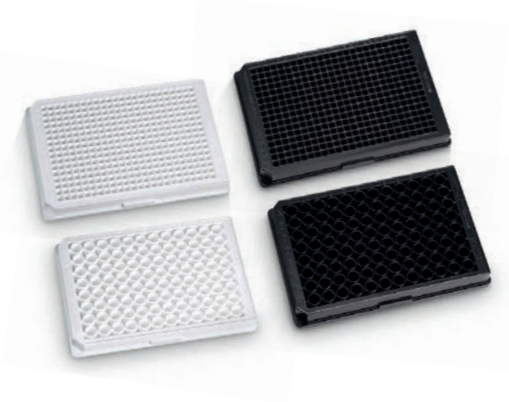
For convenience and optimal data quality, the NanoQuant Plate is the only low volume plate on the market that is 100 % calibration free. Saving you time and giving you consistent reliable performance, unlike alternative solutions.

In addition to standard absorbance measurements the NanoQuant plate is compatible with fluorescence top measurements (e.g. for Picogreen®, Ribogreen® assay), improving your DNA/RNA detection limits.

MultiCheck™ – QC package
Gain a new level of confidence in your laboratory equipment in an accurate, cost-effective, and near effortless solution. The MultiCheck QC-package is designed to enable the rapid function check for Tecan multimode readers, and consists of the MultiCheck software package and an advanced QC-plate, supporting all major reading modes, including FI, TRF, FP, absorbance & luminescence.

Filters & Filter Slides
Investing in a filter-based system gives you a cost-effective solution for sensitive absorbance and fluorescence assays. Tecan's wide range of filters ensures that you will be able to support your wide range of assays, while attaining peak performance.





Tecan Microplates
Ensure performance with Tecan Microplates for absorbance, fluorescence and luminescence measurements as well as cell imaging. Transparent, black and white biochemical assay plates are designed for absorbance, fluorescence and luminescence measurements with low auto phosphorescence of white plates, assuring performance with minimum background signal.
The Spark reader is designed to be compatible with ANSI/SLAS microplate format.

QC tools and IQOQ services
Confidence throughout the whole lifecycle. Tecan's quality control packages help you to fulfill regulatory requirements for your Tecan microplate readers in an efficient, cost-effective way.

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 – 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 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 – 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 6–1,536 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

Temperature control

ambient +3 °C up to 42 °C

Uniformity	< 0.5 °C

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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