

High performance detection with the Safire² microplate reader

Bridging the gap between assay development and
high throughput screening

Safire² – outstanding performance in a fully modular design

Safire² is a fully modular monochromator-based microplate detection system for modern drug discovery and advanced research applications. By offering wavelength flexibility, modularity, and the ability to expand capabilities at any time by integrating additional state-of-the-art detection techniques, Safire² brings unprecedented flexibility to assay development, compound characterization, high throughput screening and a host of other applications.

Delivering speed and versatility to drug discovery

Researchers in drug discovery need to screen continually the widest possible range of compounds and constantly develop new assays. Central to this effort is the need for high performance detection to empower assay development (AD) and high throughput screening (HTS). By using Safire² in both AD & HTS, the customer saves costly re-evaluations when an assay is transferred from AD to HTS.

Additionally, the researcher now has the freedom of wavelength selection combined with the performance of filter-based instrumentation.

Different detection options, many applications

Safire² offers a full range of top-of-the-line high-speed detection modules of applications including the latest biomolecular assays for primary and secondary screening, receptor-ligand binding studies and other molecular interaction assays, kinase assays, protease assays, highly sensitive G-protein-coupled receptor assays, cell based assays as well as DNA/RNA quantification and applications based on UV fluorometry. Safire² serves researchers worldwide in numerous settings including:

- Therapeutic areas/groups – initial screening assays for new drug target programs



Integrated stackers with compact design for minimum increase in footprint.

- Assay development groups – definition, fine-tuning and miniaturization of assays from the therapeutic areas
- High throughput screening facilities
- Secondary and confirmatory screening groups
- Contract research/ screening companies
- Academic laboratories

Unsurpassed detection flexibility

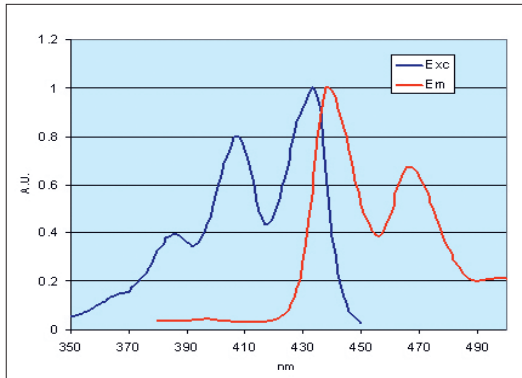
As a recognized leader in providing state-of-the-art monochromator-based detection systems, Tecan is again setting new performance standards through the introduction of Safire². In one easy-to-use modular instrument, Safire² offers the following:

High-speed detection modes

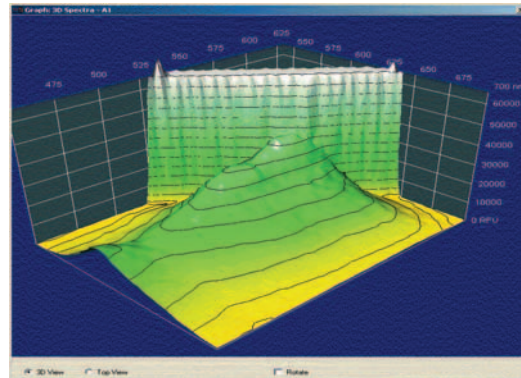
- Fluorescence intensity top and bottom reading
- TimeResolved Fluorescence (TRF)
- Fluorescence Resonance Energy Transfer (FRET)
- Fluorescence polarization
- Multi-channel absorbance
- Multi-channel luminescence (1 – 4 channels)

High performance features

- Fully modular and upgradeable system
- High speed recording of excitation and emission spectra in the fast scanning mode



Fast excitation and emission scanning over a wide wavelength range from low UV up to NIR.



3D scanning enables characterization of unknown samples.

- Absorbance scans performed with four channels in parallel
- Rapid 3D and synchronous scanning

Fast ratiometric measurements- like dual PMT

- In FP mode, the direction of polarization may be changed within one millisecond
- The new ratio mode enables immediate changes in wavelength in a FRET assay

Highest sensitivity

- Two double monochromators deliver the highest possible sensitivity due to optimized stray light rejection. (1000-times higher straylight rejection than with single monochromators)
- Easy access to high speed/high sensitivity modes

1536-well capability

- Free definition of plate formats up to 1536

Easy optimization of readouts

- Autofocus optimizes Safire² for the assay volume or plate height
- Bandwidth adjustment from 5nm up to 20 nm optimizes the system for the fluorophore
- The auto – gain feature ensures that Safire² is always using the entire dynamic range

Easy processing of up to 50 microplates

- Optional integrated stacker allows fast batch processing of up to 50 microplates with a minimal increase in footprint

Intuitive software

The XFLUOR software supplied with the Safire² gives complete instrument control and allows direct use of a familiar Microsoft Excel™ spreadsheet. For advanced data reduction or calculations, Tecan offers Magellan software that supports background correction of spectra, curve smoothing, wavelength selection, peak identification and a 3D scanning feature. Both software packages enable the user to perform excitation-, emission- and synchronous scans. For FDA regulated environments Magellan Tracker version fulfills all requirements of rule 21 CFR part 11 for electronic records and signatures.

Meeting future needs

If higher throughput is required, Safire² is easily combined with a stacker module that allows rapid processing of up to 50 microplates. What's more, Safire² is easily integrated into Tecan's Freedom EVO series of platforms should users need access to fully automated drug discovery platforms.

Affordability through modularity enables a wide range of customers to have access to state of the art technology. To find out more about Safire², call one of our consultants today or visit our web site at www.tecan.com

Specifications

Light Sources	High energy UV Xenon flashlamp, Light emitting diodes
Detectors	Fluorescence- Extended wavelength, low dark current PMT Luminescence- Photon counting PMT, up to 4 PMTs optional Absorbance- UV Silicon photodiode, 4 channel parallel reading
Plate formats	6 to 1536 well plates
Temperature control	Ambient + 4 °C to 42 °C
Shaking	linear, orbital, 3 velocities
Fluorescence Intensity	
Wavelength selection	Two double monochromators
Wavelength range	Excitation: 230 – 850 nm, emission: 280 – 850 nm
Bandwidth	Adjustable from 2.5 nm – 10 nm below 280 nm, 5 nm – 20 nm else
Wavelength accuracy	+ / – 1 nm
Wavelength precision	+ / – 1 nm
Sensitivity* – top reading – 384 well plate	2 pM Fluorescein @ 100 µl/well, 128 sec (10 flashes)
Sensitivity* – bottom reading – 384 well plate	30 pM Fluorescein @ 100 µl/well, 128 sec (10 flashes)
Time Resolved Fluorescence	
Sensitivity* – 384 well plate	750 fM Europium @ 100 µl/well, 128 sec (10 flashes)
Fluorescence Polarization	
Precision – 384 well plate	3 mP @ 1nM Fluorescein, 100 µl/well, 125 sec
Absorbance	
Wavelength selection	Double monochromator
Wavelength range	230 – 1000 nm
Bandwidth	2.5 nm below 280 nm, 5 nm else
Wavelength Accuracy	+ / – 1 nm
Wavelength Precision	+ / – 1 nm
Measurement range	0 – 4OD
Accuracy @ 492 nm	0 – 2OD: + / – 1% and 0.006OD
Precision @ 492 nm	0 – 2OD: + / – 0.5% and 0.005OD
Luminescence	
Sensitivity* – 384 well plate	2 fmol ATP/well, 100 µl, 207 s with 4 channels (250 ms integration time/channel)

Shortest read times – fixed wavelength

	Fluorescence	Absorbance	FP
384 well plate	25 sec	25 sec	45 sec
1536 well plate	37 sec	27 sec	108 sec

Read times – fast scanning

Fluorescence scanning of 384 well plate, 450 nm – 550 nm, 5 nm step:	321 sec for 384 spectra
Absorbance scanning of 384 well plate, 450 nm – 550 nm, 5 nm step:	103 sec for 384 spectra

* Sensitivity values are calculated according to the IUPAC standard: 3 (SD blank) / slope

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