



## FLUOstar OPTIMA

The multifunctional microplate reader with an exceptional combination of flexibility and performance



## FLUOstar OPTIMA - The optimal combination of performance and flexibility for all of your R&D applications

Whether you need sensitivity, flexibility or extensive kinetic capabilities, the FLUOstar OPTIMA from BMG LABTECH is the optimal solution for academic and pharmaceutical research.

### Flexibility

The FLUOstar OPTIMA is a versatile microplate reader offering four separate reading modes with integrated resonance energy transfer detection capabilities (FRET, BRET).

- Fluorescence Intensity
- Time-Resolved Fluorescence
- Luminescence (Flash and Glow)
- Absorbance (low UV to Vis)

The FLUOstar OPTIMA reads up to 384-well plates in all detection modes and provides 1536-well plate capability for fluorescence intensity measurements.

On-board reagent injectors can be used to initiate kinetic events. Due to the individually adjustable delivery volumes for each well, the injectors can be used to produce dilution schemes and concentration ranges throughout the plate. Top and bottom plate reading, precise temperature control up to 45°C (60°C is an option), well scanning, multi-mode shaking capabilities and gas vent connection enhance the assay flexibility of the FLUOstar OPTIMA.



...any plate format

### Optimized for Kinetic Reactions

Kinetic assays, such as Ca<sup>2+</sup> fluorescence measurements or flash luciferase luminescence, can be easily measured with a high degree of precision and reproducibility. Two precision syringe injectors have direct access to the plate measurement position allowing reagent injection and microplate well reading



simultaneously, thereby ensuring that you do not miss any experimental data.

The control software puts you in command over injection timing and pump settings such as injection speed, delivery volumes and the number of reagent injections per well. Kinetic data can be collected at a rapid 50 reading points per second, or as slow as one point every 2½ hours. Furthermore, data can be collected at different rates within the same experiment, allowing you to monitor the signal when and where needed.



...reagent injection and fast filter switching

### High-Performance Luminescence

The FLUOstar OPTIMA has been designed with a dedicated luminescence measurement system so you do not have to make a choice between a microplate fluorometer and luminometer. The FLUOstar OPTIMA offers exceptional luminescence performance in a single instrument package that easily fulfilled Promega's stringent DLReady™ (Dual Luciferase validation) criteria in 96- and 384-well plate formats.

### Multichromatic Detection Modes

With sixteen filter positions and features like sequential dual excitation and sequential dual emission, the FLUOstar OPTIMA is an ideal instrument for multichromatic or ratiometric applications such as FRET, BRET, 260/280 DNA quantification,



cellular indicators, calcium dyes, etc. In dual excitation applications such as FURA-2, fast filter switching enables rapid measurement at both excitation wavelengths.

### Stacker and Robot Compatibility

For medium level throughput, BMG LABTECH offers the Stacker II with an integrated barcode reader. For higher throughput, the FLUOstar OPTIMA can be integrated into many types of robotic systems from a variety of different manufacturers.



*...automated plate handling with Stacker II*

### Control and Evaluation Software

The Windows™ based PC software provides an extensive range of options for assay design and data evaluation while being fully compliant with FDA regulation 21 CFR Part 11. The control software offers many features including: real-time data display, unique labeling of well contents, optimization of kinetic assays, user-definable microplates, precise control of multiple injection, shaking and reading events and flexible data output options for bioinformatic programs.

The data evaluation part of the software is based on powerful Excel™ macros and allows you to utilize any of Excel's extensive data manipulation features. Worksheets are provided to display raw data, signal plots and standard curves. Powerful evaluation sheets are pre-programmed to perform calculations such as %CVs, ratios, curve fitting, EC<sub>50</sub>, dilution factors, etc. In addition, you can create your own workbooks for specific assays and evaluation methods.

### Applications

The FLUOstar OPTIMA offers a unique combination of features to support all major assay types in many application areas including:

#### □ Biomolecular Interaction Assays

A major field in basic research and drug discovery is the monitoring of biomolecular interactions using highly sophisticated assays based on FRET or BRET technologies and time-resolved fluorescence. The FLUOstar OPTIMA offers all of these detection modes combined with on-board reagent injection and sequential dual emission detection for studying receptor-ligand, protein-protein, DNA-protein and DNA-DNA interactions.

#### □ Cell-Based Assays

Cell-based measurements include a large variety of assays that measure cell proliferation, viability, cytotoxicity, apoptosis, the analysis of second messengers like detection of cAMP and Ca<sup>2+</sup> and the use of reporter gene expression systems. For quantifying cell-based assays, the FLUOstar OPTIMA provides all the important features like top and bottom reading (for optimal detection of cell suspensions and adherent cells), gas venting and on-board injectors.

#### □ Enzyme Activity Assays

Kinase, caspase and protease gene families are targets that play an important role in the regulation of numerous biological processes, and have been implicated as contributors to several diseases. The FLUOstar OPTIMA offers the highest level of flexibility in developing enzyme activity assays and analyzing kinetic data. Four separate measurement modes, precise temperature control, on-board injection, shaking, high sensitivity combined with wide dynamic range and versatile kinetic software features allow you to accommodate a variety of enzyme assays.

#### □ Quantification Assays

The concentration of DNA, RNA and protein samples can be quantified quickly and conveniently with the FLUOstar OPTIMA. Both fluorescence-based assays and direct UV-absorbance-based detection are possible with the unique optical system that covers a spectral range from 240 nm to 740 nm (to 900 nm with extended wavelength PMT).

#### □ Reporter Gene Assays

Reporter genes like luciferase and GFP are extensively used to study gene expression and associated cellular events. With the FLUOstar OPTIMA, it is also possible to use advanced co-reporter assays such as dual luciferase and FRET-based GFP. Featuring bottom reading, well scanning, kinetics, precise temperature control, gas venting and on-board-injection, the instrument is the perfect tool to perform reporter gene assays.

## FLUOstar OPTIMA

### Technical Specifications

<b>Measurement Principles</b>	Fluorescence Intensity	
	Time-Resolved Fluorescence	
	Luminescence (Flash and Glow)	
	Absorbance (low UV to Vis)	
<b>Measurement Modes</b>	Endpoint and kinetic measurements	
	Sequential dual emission measurements	
	Sequential dual excitation measurements	
	Ratiometric measurements	
	Well scanning	
<b>Light Source</b>	High energy xenon flashlamp	
<b>Detector</b>	Side window photomultiplier tube	
<b>Filters</b>	Excitation and emission filter wheel for 8 filters each	
<b>Spectral Range</b>	240 ... 740 nm (240 ... 900 nm optional)	
<b>Reagent Injection</b>	Up to two built-in reagent injectors	
	Injection into 384-well plates at measurement position	
	Individual injection volumes for each well (3 ... 350 µL)	
	Variable injection speed (100 ... 420 µL/s)	
	Up to four injection events per well	
	Reagent back flushing	
<b>Incubation</b>	+ 5°C above ambient to 45°C (60°C optional)	
	Temperature stability: 0.2°C	
	Temperature gradient: < 0.5°C	
<b>Shaking</b>	Linear, orbital and double orbital	
<b>Microplate Formats</b>	6 ... 384-well plates	
	1536-well plates in fluorescence intensity mode	
<b>Sensitivity</b>	Fl:	< 1 fmol/well Fluorescein
	TRF:	< 70 amol/well Europium
	LUM:	< 50 amol/well ATP
	ABS:	± 0.01 OD for OD range 0 ... 2 ± 0.03 OD for OD range 2 ... 3
<b>Read Times</b>	1 flash:	15 s (96)
	flying mode	29 s (384) 57 s (1536)
<b>Dimensions</b>	Width: 44 cm, depth: 48 cm, height: 27 cm Weight: 27 kg	
<b>Stacker II</b>	Magazines for up to 50 plates	
	Continuous loading feature	
	Barcode reader	

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