

Synergy™ HT Multi-Mode Microplate Reader

The Synergy™ HT is an entry-level multi-mode microplate reader used in thousands of laboratories worldwide. All models come equipped with top and bottom fluorescence, UV-visible absorbance and luminescence detection. Temperature control to 50°C, shaking and advanced data analysis software are also included. An optional reagent injection system is available.

Ideal for Basic Research Applications

The Synergy HT is the ideal instrument for nucleic acid and protein quantification, enzyme assays, biomarker quantification and ELISA assays, as well as cell-based assays (gene expression, cellular growth, cytotoxicity).

Sensitive Filter-based Fluorescence

Four excitation and four emission filters are included with the reader, and can be used for top and bottom reading. Bottom reading is usually recommended when working with adherent cells, as it often provides better signal-to-background ratios. Top reading is usually best for assays where the fluorescence signal comes from the solution.

Flexible Monochromator-based Absorbance

All Synergy readers use monochromators for absorbance detection. This provides unlimited wavelength selection from the low UV to the near infrared, in 1 nm steps, and enables spectral scanning.

Low-noise Luminescence Detection

The Synergy HT can automate glow and flash luminescent assays, thanks to its optional injection system. Typical assays include ATP quantification as well as luciferase gene expression assays.

Typical Applications:

- ▶ Nucleic acid quantification
- ▶ Protein quantification
- ▶ Enzyme kinetics
- ▶ Biomarker quantification
- ▶ ELISAs
- ▶ Genetic analysis
- ▶ Cell proliferation
- ▶ Cytotoxicity
- ▶ Drug absorption and metabolism
- ▶ Food safety
- ▶ Environmental monitoring





Specifications

General	
Detection method	Fluorescence, Time-Resolved Fluorescence (secondary mode), Luminescence, UV-Visible Absorbance
Read method	End point, kinetic, spectral scanning, well-area scanning
Microplate types	6- to 384-wells PCR plates Compatible with Take3™ Micro-Volume Plate
Temperature control	4°C above ambient to 50°C; ±0.5°C at 37°C
Shaking	Yes
Software	Gen5™ Data Analysis Software
Automation	Compatible with BioStack™ and 3rd party automation
Absorbance	
Light source	SQ Xenon flash
Wavelength selection	Monochromator
Wavelength range	200 - 999 nm, 1 nm increments
Bandpass	2.4 nm
Dynamic range	0 - 4.0 OD
Resolution	0.001 OD
Pathlength correction	Yes
Monochromator wavelength accuracy	±2 nm
Monochromator wavelength repeatability	±0.2 nm
OD accuracy	<1% at 2.0 OD typical <3% at 3.0 OD typical
OD linearity	<1% from 0 to 3.0 OD typical
OD repeatability	0.03% at 230 nm typical
Reading speed	96 wells: 14 seconds 384 wells: 26 seconds

Specifications are subject to change.

Fluorescence Intensity	
Sensitivity	Top and Bottom: Fluorescein 5 pM typical (1 fmol/well 96-well plate)
Light source	Tungsten halogen SQ Xenon flash
Wavelength selection	Deep blocking filters
Wavelength range	300 - 700 nm (200 - 900 nm option)
Dynamic range	5 decades
Bandpass	Filter dependent
Detection system	PMT
Reading speed	96 wells: 31 seconds 384 wells: 80 seconds
Luminescence	
Sensitivity	30 amol ATP typical (flash)
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Detection system	Low noise PMT
Time-Resolved Fluorescence (Secondary Mode)	
Light source	SQ Xenon flash (optional)
Wavelength selection	Monochromator
Reagent Dispensers	
Number	2 syringe pumps
Dispense volume	5 - 1000 µL in 1 µL increments
Minimum prime volume	1.1 mL, 100 µL with backflush
Physical Characteristics	
Power	100 - 240 Volts AC 50/60 Hz
Dimensions	16"W x 15"D x 10"H (40.6 x 38 x 25.4 cm)
Weight	40 lbs (18 kg)
Regulatory	For In Vitro Diagnostic use. All BioTek microplate instrumentation is CE and TUV marked.

Synergy™ Reader Comparison Chart

Which Synergy Reader is right for you?

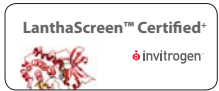
	Hybrid Technology™		Monochromator-based	
	Synergy H4 Performance	Synergy H1 Value	Synergy Mx Performance	Synergy H1m Value
Key Features				
Monochromator-based UV-visible absorbance	•	•	•	•
Fluorescence top/bottom	•	•	•	•
Luminescence	•	•	•	•
Filtered luminescence	•	•	•	
Injectors	•	•	•	•
TRF & TR-FRET	•	•	(secondary mode)	(secondary mode)
Fluorescence polarization	•	•		
AlphaLISA® / AlphaScreen®	•			
Hybrid Technology™	•	•		
Automation Ready/BioStack™ Compatible	•	•	•	•
Performance Specifications				
Fluorescein typical – top	1 pM / 2 pM	1 pM / 2.5 pM	2 pM	2.5 pM
Fluorescein typical – bottom	2.5 pM	5 pM	2.5 pM	5 pM
ATP typical – flash luminescence	10 amol	10 amol	10 amol	20 amol
Polarization typical – 1 nM Fluorescein	3 mP	5 mP	n/a	n/a
Europium typical	60 fM	100 fM	n/a	n/a
AlphaScreen typical	100 amol	n/a	n/a	n/a
Fastest read speed 96-/384-well plates	11/22	11/22	11/22	11/22
General Specifications				
Microplate types	1 to 1536	1 to 384	1 to 384	1 to 384
Fluorescence dynamic range	>6 decades	5 decades	5 decades	5 decades
Take3™ Micro-Volume Plate Compatible	•	•	•	•
Cuvette port option			•	
Temperature control system	to 65°C	to 45°C	to 65°C	to 45°C
Filter capacity	4 filter sets	2 filter sets	n/a	n/a
Fluorescence bandpass	Filter dependent mono variable: 9, 13.5, 17, 20 nm	Filter dependent mono 16 nm	Variable: 9, 13.5, 17, 20 nm	16 nm



Filter-based	
Synergy 2 Performance	Synergy HT Value
•	•
•	•
•	•
•	•
•	•
•	(secondary mode)
•	
•	
•	
•	•
1 pM	5 pM
5 pM	5 pM
10 amol	30 amol
3 mP	n/a
60 fM	n/a
100 amol	n/a
11/22	14/26
1 to 1536	1 to 384
>6 decades	5 decades
•	•
to 65°C	to 50°C
4 filter sets	4 filter sets
Filter dependent	Filter dependent

Partners

Through reagent vendor partnerships, you are assured that our readers perform optimally with a wide range of assays. Application notes available on www.biotek.com present data obtained in partnership with these companies and the conditions required to perform these assays on BioTek's equipment.



Compatible with Take3 Micro-Volume Plates with 2 μ L Microspots



Measure up to forty-eight 2 μ L samples in one run with the Take3 Trio Micro-Volume Plate. This accessory enables high-throughput nucleic acid quantification at 260 nm, and 260/280 nm ratio determination, using a minimal amount of precious samples. The standard Take3 plate has sixteen 2 μ L sample capacity, plus optional cuvette and BioCell™ measurements.

FLx800™ Fluorescence Microplate Reader

The compact FLx800™ fluorescence reader provides high performance in 6- to 384-well microplates at an attractive price. Options include top and bottom detection, temperature control and reagent injector.

Great Price/Performance Ratio

The FLx800 uses the same fluorescence optical system as the Synergy HT: top and bottom bifurcated quartz fibers ensure strong sample excitation and efficient collection of the emitted signal. This reader combines sensitivity, convenience and ease of use all at a great price.

Bottom Reading and FRET Detection

The bottom detection system uses a large 5 mm diameter quartz fiber optimized for cell-based assays in 96-well plates and smaller densities. The reader may be equipped with up to 4 filter sets and may be used to run cell-based FRET assays.

Sensitive Luminescence Detection

The FLx800's detector provides very high sensitivity when running luminescent assays. ATP or luciferase can be quantified down to very low concentrations using the reader's photon integration mode.

Fluorescent Ion Channel Assays

A syringe pump injector is available as an option to automate fluorescent ion-channel assays. This system is used to inject a trigger reagent that induces a fast change in fluorescent signal. The FLx800 kinetically monitors the signal just after injection.

Typical Applications:

- ▶ Nucleic acid quantification
- ▶ Protein quantification
- ▶ Enzyme kinetics
- ▶ Genetic analysis by fluorescence
- ▶ Cellular analysis by fluorescence



Specifications

General

Detection method	Fluorescence, Luminescence
Read method	End point, kinetic and area scanning under computer control
Microplate types	6- to 384-wells PCR plates (FLx800TBP)
Temperature control	4°C above ambient to 50°C (I models)
Shaking	Yes (I models)
Software	Gen5™ Data Analysis Software
Onboard software	55 user-programmable protocols

Fluorescence Intensity

Sensitivity	Fluorescein 5 pM typical (1 fmol/well 96-well plate)
Light source	Tungsten halogen
Wavelength selection	Deep blocking filters
Wavelength range	300 - 700 nm (900 nm option)
Dynamic range	5 decades

Luminescence

Sensitivity	100 amol ATP typical (flash)
Wavelength range	300 - 700 nm
Dynamic range	5 decades

Reagent Dispensers

Number	1 syringe pump
Dispense volume	5 - 1000 µL in 1 µL increments
Minimum prime volume	1.1 mL, 100 µL with backflush

Physical Characteristics

Power	100 - 240 Volts AC 50/60 Hz
Dimensions	15"W x 16"D x 9"H (38.1 x 40.64 x 22.89 cm)
Weight	30 lbs (13.6 kg)

Regulatory	For In Vitro Diagnostic use. All BioTek microplate instrumentation is CE and TUV marked.
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Specifications are subject to change.

PowerWave™ Microplate Spectrophotometer

The PowerWave™ HT is a high-throughput, robot friendly microplate spectrophotometer with a very small footprint, ideal for integration into automated systems. Wavelength selection in 1 nm increments, temperature control and superior performance up to 4.0 OD add to its appeal for a variety of assay needs.

High Speed, Higher Throughput

In automation and high-throughput, timing is everything... With 8 reading channels, the PowerWave HT can read a 96-well plate in 5 seconds.

Low Stray Light Monochromator Optics

PowerWave HT's monochromator optics pre-select the measurement wavelength before light goes through the sample. This results in very low stray light reaching the detector...with the added benefit of excellent performance even at high optical densities.

BioStack Compatible for Benchtop Automation

When walkaway benchtop automation is required, the PowerWave HT, coupled with BioStack, provides a compact system for rapid processing of up to 50 plates at a time.

Gen5™ Control = Assay Flexibility

Gen5 Data Analysis Software not only allows easy control of all the functionality of the PowerWave HT, it also supports a vast number of applications in absorbance. Quick export to Microsoft® Excel® or use Gen5's powerful data analysis tools to make quick work of the most complex assays.

Typical Applications:

- ▶ Enzyme kinetics
- ▶ ELISAs
- ▶ Genetic analysis by colorimetry
- ▶ Cellular analysis by colorimetry
- ▶ Cell proliferation



Specifications

General	
Detection method	Absorbance
Read method	End point, kinetic, spectral, linear scanning
Microplate types	96- and 384-wells
Temperature control	4°C above ambient to 50°C; $\pm 0.5^\circ\text{C}$ at 37°C
Shaking	Yes
Software	Gen5 Data Analysis Software
Automation	Compatible with BioStack and 3rd party automation
Absorbance	
Light source	Xenon flash lamp
Wavelength selection	Monochromator, selectable 1 nm or greater increments
Wavelength range	200 - 999 nm
Bandpass	5 nm
Dynamic range	0 - 4.0 OD
Resolution	0.001 OD
Monochromator wavelength accuracy	± 2 nm
Monochromator wavelength repeatability	± 0.2 nm
OD accuracy	1% ± 0.01 OD typical
OD linearity	$\pm 1\%$ typical
OD repeatability	0.5% ± 0.005 OD typical
Stray light	0.03% at 230 nm typical
Reading speed	96 wells: 5 seconds 384 wells: 11 seconds
Physical Characteristics	
Power	100 - 240 Volts AC 50/60 Hz
Dimensions	16"D x 8.5"W x 8.5"H (40.6 x 21.6 x 21.6 cm)
Weight	24 lbs (11 kg)
Regulatory	
For In Vitro Diagnostic use. All BioTek microplate instrumentation is CE and TUV marked.	

Specifications are subject to change.



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Pricing on any accessories shown can be found by keying the part number into the search box on our website.

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct. If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

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Please contact us if this literature doesn't answer all your questions.