

# THINK POSSIBLE

BioTek Microplate Instrumentation



Think Possible

BioTek Instruments, Inc., headquartered in Winooski, VT, USA, is a worldwide leader in the design, manufacture, and sale of microplate instrumentation and software. For over 45 years, our products have been designed and manufactured in the U.S.A. BioTek's instrumentation is used to aid in the advancement of life science research, facilitate the drug discovery process, provide rapid and cost-effective analysis and to enable sensitive and accurate quantification of a wide range of molecules across diverse applications.

Our company-wide commitment to quality and value is backed by superior customer care, technical service centers, scientific application experts, and a knowledgeable sales force. Our commitment and focus helps to ensure your processes will be rapid, efficient and successful.

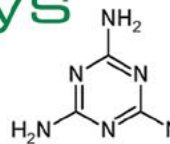
This catalog provides an overview of our complete line of microplate instrumentation, and features Cytation™, the first instrument to combine automated digital microscopy and conventional microplate detection. For more detailed information and product specifications, visit our web site at [www.biotek.com](http://www.biotek.com).

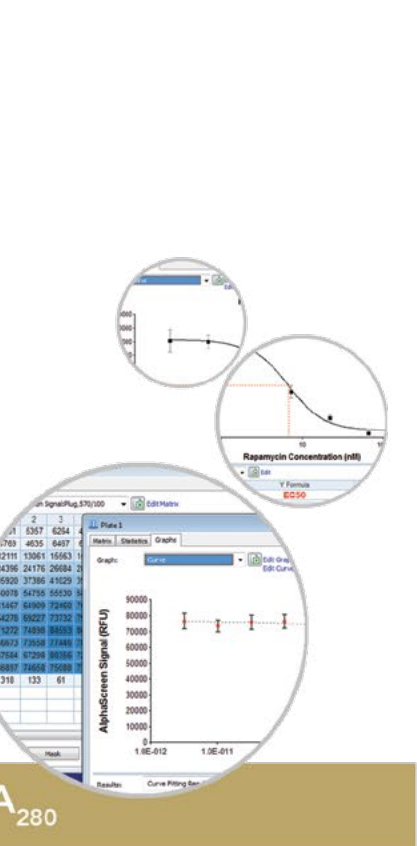
 Oxygen $O_2$	 Superoxide anion $\cdot O_2^-$	 Peroxide $\cdot O_2^{2-}$
 Hydrogen Peroxide $H_2O_2$	 Hydroxyl radical $\cdot OH$	 Hydroxyl ion $OH^-$

Cell fixing and staining

Cell-based assays

Magnetic bead assays

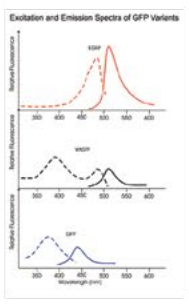




A 280

GFP

NH<sub>2</sub>



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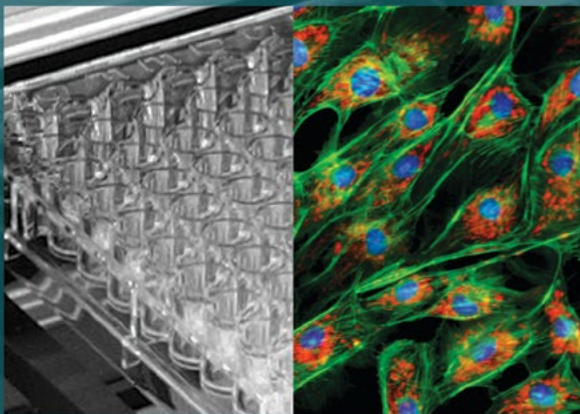
ATION|5  
imaging reader



*"It is very easy to use & produces high quality images. Useful for both IF of tissues and cells from 96 well plate to petri dishes."*

*(Cytation 3 Cell Imaging Multi-Mode Reader)*

# Imaging & Microscopy



The fusion of automated digital widefield fluorescent microscopy and multi-mode microplate detection in the Cytation Cell Imaging Multi-Mode Readers offers life science researchers a unique and powerful tool. Whether studying fixed or live cells, tissues or whole organisms, Cytation's automated fluorescence microscopy and conventional multi-mode detection of a wide array of fluorescent probes provides quantitative phenotypic data from images. These cellular images provide rich visualization and multi-parametric information concerning many biological processes.

This unique, patent pending design results in workflow efficiency and a reduction in data analysis and storage requirements, making Cytation the ideal instrument as a standalone automated imager or in combination with microplate reading as a total system.



# Cytation™ Cell Imaging Multi-Mode Reader

**Cytation™ is a uniquely integrated, configurable system that combines automated digital widefield microscopy with conventional multi-mode microplate detection to provide phenotypic cellular information and well-based quantitative data. With up to 60x magnification, the microscopy module provides high-quality cellular and sub-cellular visualization. The multi-mode detection module provides high quality quantitative and qualitative data in all detection modes. All controlled with Gen5™ software, specifically designed for uncomplicated processing of even the most complex assays**

## Powerful Automated Digital Microscopy

The Cytation family includes Cytation 5 and Cytation 3. Each is available in multiple upgradable configurations; from basic microscopy to complex

image collection and analysis in fluorescence, brightfield, color brightfield and phase contrast, Cytation offers critical methods like single- and multi-color, time lapse, montage and z-stacking. Available laser autofocus and image-based autofocus ensure fast and accurate image acquisition with minimal phototoxicity across a broad application range. Gen5 software offers unique features like user-trained autofocus and available joystick control for truly automated imaging with the highest quality results. Powerful image processing like image stitching, z-projection and digital phase contrast, are all available in this cost effective system.

## Live Cell Assays

To create the ideal environment for live cell assays, Cytation includes 4-Zone™ incubation up to 65 °C and a gas controller to monitor and control CO<sub>2</sub> and O<sub>2</sub> levels in the system. Linear, orbital

and double orbital shaking help keep cells gently agitated or well suspended to optimize many cell based assay protocols. To fully automate live cell assay workflows, Cytation integrates with BioSpa™ 8 Automated Incubator. From sample prep to image analysis, BioSpa 8 offers walkaway automation.

## Hybrid Technology

BioTek's patented Hybrid Technology, available with the multi-mode detection modules for Cytation, combines high performance filters with variable bandwidth monochromators, providing convenience, versatility and excellent performance. Luminescence, UV-Vis absorbance, time-resolved fluorescence, fluorescence polarization and Alpha detection modes greatly increase the application range of the system.

## Typical Applications:

- ▶ 2D and 3D cell imaging and analysis
- ▶ Cell proliferation studies
- ▶ Cytotoxicity
- ▶ Biomarker quantification
- ▶ Drug discovery
- ▶ Genetic analysis
- ▶ Drug absorption and metabolism
- ▶ Biologics drug discovery and development
- ▶ Environmental testing
- ▶ Food safety
- ▶ Nucleic acid quantification
- ▶ Protein quantification

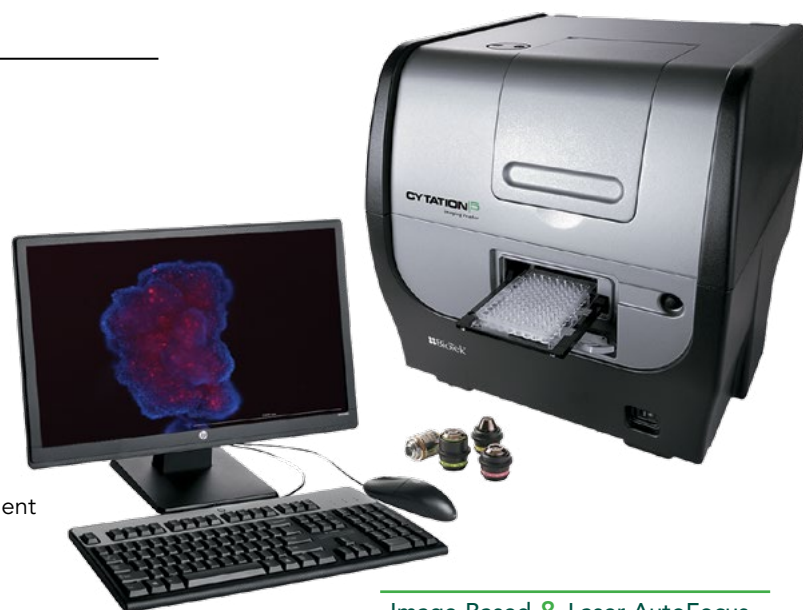


Image-Based & Laser AutoFocus



## Specifications

General	Cytation 5	Cytation 3
<b>Detection modes</b>	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence Alpha	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
<b>Read methods</b>	Endpoint, kinetic, spectral scanning, well area scanning	
<b>Microplate types</b>	Monochromator: 6- to 384-well plates Filters: 6- to 1536-well plates Imaging: 6- to 1536-well plates	
<b>Other labware supported</b>	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer) Take3 Micro-Volume Plates	
<b>Temperature control</b>	4-Zone™ incubation to 65 °C with Condensation Control™	4-Zone incubation to 45 °C with Condensation Control™
<b>Shaking</b>	Linear, orbital, double orbital	
<b>Software</b>	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)	
<b>Automation</b>	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible	
<b>Gas Control</b>	Range: 0 - 20% (CO <sub>2</sub> ); 1 - 19% (O <sub>2</sub> )	
<b>Light Source</b>	Xenon flash: FL and Abs 100 mW laser: Alpha	Xenon flash: FL and Abs
<b>Imaging System</b>		
<b>Imaging mode</b>	Fluorescence, Brightfield Color brightfield Phase contrast	Fluorescence Brightfield
<b>Imaging method</b>	Single color, multi-color, montage, time lapse, z-stacking	
<b>Image processing</b>	Z-projection, digital phase contrast, stitching	
<b>Camera</b>	16-bit gray scale, Sony CCD, 1.25 megapixel. 0.3 µm/pixel at 20 x	
<b>Objective capacity</b>	6 user-replaceable objectives	2 user-replaceable objectives
<b>Objectives available</b>	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x	
<b>Phase objectives available</b>	4x, 10x, 20x, 40x	
<b>Imaging cubes/capacity</b>	4 onboard, user-replaceable cubes; >15 colors available	
<b>Imaging LED cubes</b>	Available: 365 nm, 390 nm, 465 nm, 505 nm, 523 nm, 590 nm, 623 nm, 655 nm, 740 nm	
<b>Automated functions</b>	User-trained autofocus, autofocus, autoexposure, auto-LED intensity	
<b>Autofocus method</b>	Image-based autofocus; Laser autofocus (option)	
<b>Positional controls</b>	Software control Joystick control (option)	Software control
<b>Image collection rate</b>	96 wells, 1 color (DAPI), 4x: 6 minutes (3 minutes laser AF) 96 wells, 3 colors, 4x: 12 minutes (7:30 minutes laser AF)	
<b>Image analysis software option</b>	Gen5 Image+: Advanced image analysis Gen5 Secure Image+: Adds 21 CFR Part 11 features	
<b>Absorbance</b>		
<b>Wavelength selection</b>	Monochromator	
<b>Monochromator</b>	Bandwidth: 4 nm (230-285); 8 nm (>285 nm) Wavelength accuracy: ± 2 nm Repeatability: ± 0.2 nm Range: 230 to 999 nm, in 1 nm increments Resolution: 0.0001 OD	
<b>Dynamic range</b>	0 - 4.0 OD	

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

	Cytation 5	Cytation 3
<b>Optical density</b>	Accuracy: <1% at 2.0 OD; <3% at 3.0 OD Linearity: <1% from 0 to 3.0 OD Repeatability: <0.5% at 2.0 OD Stray light: 0.03% at 230 nm	
<b>Pathlength correction</b>	Yes	
<b>Reading speed</b>	96 wells: 11 s, 384 wells: 22 s (kinetic interval)	
<b>Fluorescence Intensity</b>		
<b>Wavelength selection</b>	Quad monochromators (top/bottom) Filters (top)	
<b>Wavelength range</b>	Monochromators: 250 - 700 nm (850 nm option) Filters: 200 - 700 nm (850 nm option)	
<b>Monochromator band-width</b>	Variable; from 9 to 50 nm, in 1 nm increments	Fixed, 16 nm
<b>Dynamic range</b>	7 decades	5 decades
<b>Sensitivity (Fluorescein)</b>	Filters: 0.25 pM (0.025 fmol/well, 384-well plate) Quad Monochromator: 2.5 pM (0.25 fmol/well, 384-well plate) - top 4 pM (0.4 fmol/well, 384-well plate) - bottom	
<b>Reading speed</b>	96 wells: 11 s, 384 wells: 22 s (kinetic interval)	
<b>Luminescence</b>		
<b>Wavelength range</b>	300 - 700 nm	
<b>Dynamic range</b>	> 6 decades	
<b>Sensitivity</b>	Monos: 20 amol ATP (flash) Filters: 10 amol ATP (flash), 100 amol (glow)	
<b>Fluorescence Polarization</b>		
<b>Wavelength selection</b>	Filters	
<b>Wavelength range</b>	280 - 700 nm (850 nm option)	
<b>Sensitivity</b>	1.2 mP standard deviation at 1 nm fluorescein	
<b>Time Resolved Fluorescence</b>		
<b>Detector</b>	PMT	
<b>Wavelength selection</b>	Quad monochromators (secondary mode) Filters (top)	
<b>Wavelength range</b>	Filters: 200 - 700 nm (850 nm option)	
<b>Sensitivity</b>	Filters: Europium 40 fM (4 amol/well, 384-well plate) Monos: Europium 1200 fM (120 amol/well, 384-well plate)	
<b>Alpha Detection</b>		
<b>Light source</b>	100 mW 680 nm laser	
<b>Wavelength selection</b>	Filters (top)	
<b>Sensitivity</b>	100 amol bio-LCK-P (384-well low volume plate)	
<b>Reagent Dispensers</b>		
<b>Number</b>	2 syringe pumps	
<b>Supported labware</b>	6- to 384-well plates, Petri dishes	
<b>Dead volume</b>	1.1 mL, 100 µL with back flush	
<b>Dispense volume</b>	5-1000 µL in 1 nm increments	
<b>Physical Characteristics</b>		
<b>Power</b>	250 Watts max.	
<b>Dimensions</b>	20" D x 16.5" W x 17.5" H (50.8 cm x 41.91 cm x 44.5 cm)	
<b>Weight</b>	80 lbs (36.3 Kg)	
<b>Regulatory</b>		
<b>Regulatory</b>	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use are available.	

**Gen5™ automates the entire imaging process: all the steps of image acquisition are fully automated including X, Y and Z movements, focus, LED intensity and camera exposure. Image analyses like cell counting and subpopulation analysis happen on the fly as images are acquired; Gen5's data analysis tools: kinetic analysis, curve fitting, EC50, potency calculation and others can then be applied to image analysis results. With Gen5 you can go from samples to final results in one click.**

### Imaging Made Easy

Gen5 was designed for users without prior automated microscopy experience. Image capture and acquisition is done through a simple interface that includes auto focus and auto exposure algorithms. Image

analysis can be as simple as a one click process with visual feedback to fine-tune analysis parameters.

### Automatic Cell Counting

Gen5 can automatically count cell nuclei in samples. In a 96- or 384-well microplate, this means performing a count on tens of thousands of cells in a matter of minutes. This makes Cytation a very powerful tool for cellular assays where multiple conditions need to be tested and changes in cell population need to be monitored.

### Sub-Population Analysis

Gen5 can sort cells by features such as intensity, or morphology (size, perimeter, circularity). This enables applications such as transfection efficiency, nuclear translocation or cell cycle assays where multiple cell sub-populations are present in the samples.

### Hit Picking

Gen5 can be programmed to quickly scan the plate with the standard plate reader optics and hit-pick the wells that meet a defined threshold for imaging. This saves valuable time, reduces data collection, analysis and storage requirements – ultimately reducing costs.

### Advanced Image Processing

Cytation Cell Imaging Readers can collect a montage of images from live cell kinetics, tissue sections and other large objects or samples. Gen5's powerful stitching capability seamlessly creates a complete picture of the sample with great accuracy, providing more meaningful data. After acquisition, Gen5 offers multiple processing tools prior to image analysis; automatic stitching of montages, z-projection of z-stacks, and digital enhancement of brightfield images.

## Key Features:

### Powerful instrument control

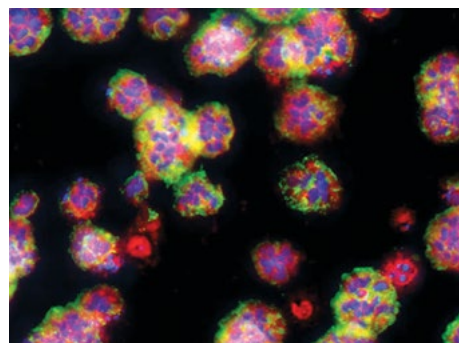
- ▶ Reliable autofocus methods including unique user-trained autofocus, and laser autofocus option
- ▶ Automatic camera gain, exposure and LED intensity settings
- ▶ End-point, montage, Z-stack and time-lapse read modes

### Image pre-processing tools

- ▶ Built-in hot-pixel correction
- ▶ Automated image pre-processing (flattening, smoothing, background correction)
- ▶ Image stitching, Z-projection
- ▶ Digital phase contrast algorithm

### Image and data analysis tools

- ▶ Automatic cell-counting and confluence
- ▶ Powerful sub-population analysis
- ▶ Image statistics
- ▶ Full data analysis software (EC50, standard curves, kinetic analysis and more)



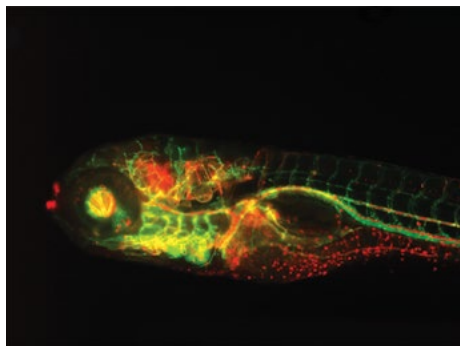
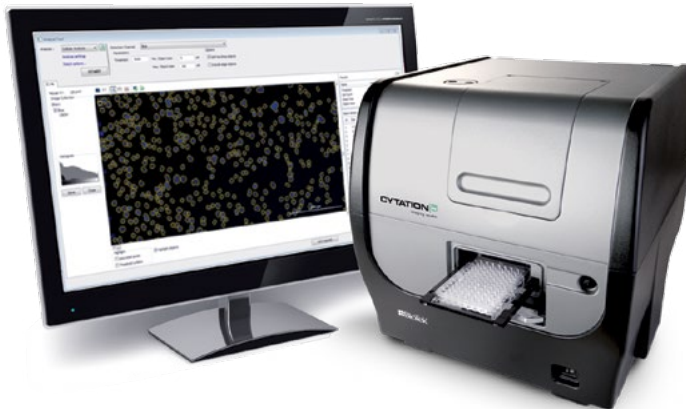
HCT 116 tumoroids at 20x. Z-stacked image



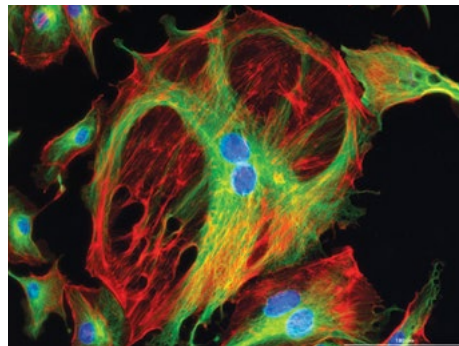
Whole mouse at 2.5x. Stitched montage, color brightfield



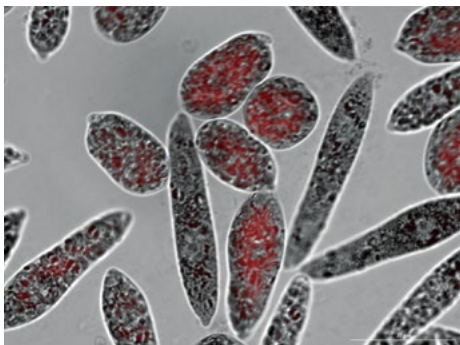
# Gen5™



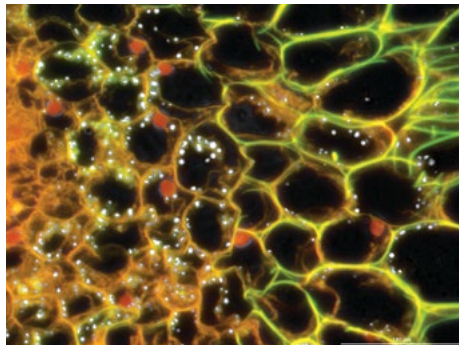
*Zebrafish at 4x. Texas Red (blood cells) & GFP (vasculature)*



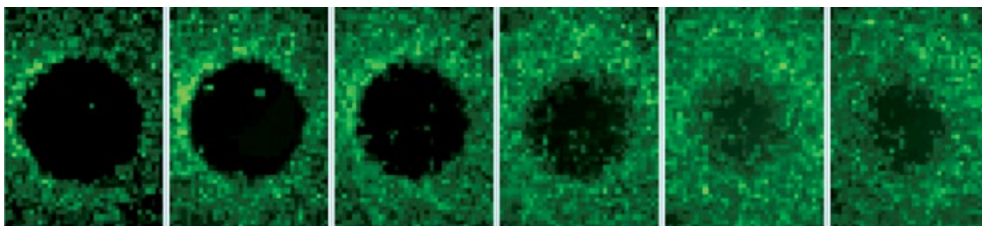
*BPAC cells at 20x. Texas Red, Phalloidin & GFP*



*Euglena gracilis at 60x. Brightfield & chlorophyll (Red)*



*Lily anther at 20x. Phase contrast, GFP & Texas Red*



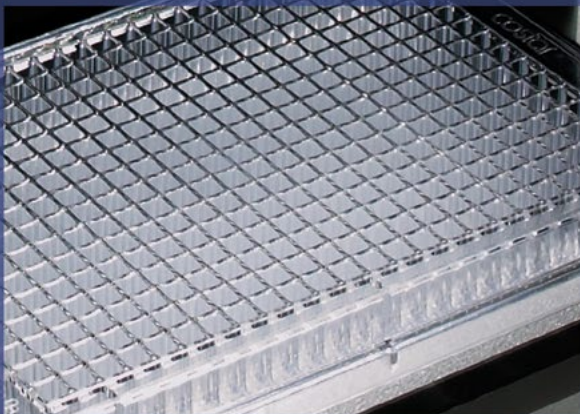
*HT-1080 cells, migration assay at 2.5x, 1 hr to 12 hr run*



*"Epoch is a nice plate reader that can read microplates of various formats, up to 384 wells. It is a pretty robust instrument, we've had it for three years now with frequent use, hasn't needed any service. The instrument can do wavelength scans as well. Software (Gen5) is easy to use, and also very versatile... I'd recommend this instrument for any lab that needs a UV-Vis microplate reader."*

*(Epoch Microplate Spectrophotometer)*

# Detection



BioTek offers an extensive range of microplate readers, from the Synergy™ Neo2 Multi-Mode Microplate Reader to the ELx800™, a basic ELISA reader used in tens of thousands of laboratories around the globe. Included in the BioTek reader product range are Hybrid readers, multi-mode readers, fluorometers, luminometers and a variety of both monochromator-based spectrophotometers and filter-based absorbance readers.

For assays like nucleic acid and protein quantification, where very small sample size is critical, BioTek's Take3™ Micro-Volume Plate offers the ability to measure multiple samples as small as 2  $\mu\text{L}$  in monochromator-based multi-mode and absorbance readers. BioTek's microplate readers come with the powerful Gen5™ Data Analysis Software and are compatible with BioStack™ and many third-party automation products, to provide increased throughput and unattended operation. To automate live cell assays, several readers are compatible with the new BioSpa™ 8 Automated Incubator.

# Synergy™ Neo2 Multi-Mode Reader

**Synergy™ Neo2 Multi-Mode Microplate Reader is the most advanced, high performance multi-mode microplate reader available today. The outstanding features of Synergy Neo2 allow complex applications including both biochemical and cell-based assays, to be performed rapidly, efficiently and with uncompromised performance, in all detection modes.**

## Patented Hybrid Technology™

Some workflows benefit from the flexibility of monochromator-based optical systems; there's no need to purchase multiple filters, and when a fluorophore's spectral peaks are unknown, monochromators can scan to find the ideal excitation and emission peaks. Other assays require the high sensitivity found in filter-based optical systems. BioTek's patented Hybrid Technology offers both major

benefits in a single platform, so there's no compromise of performance or flexibility.

## Variable bandwidth quad monochromators

Synergy Neo2's monochromators, have variable bandwidths for excitation and emission. Selectable from 3 nm to 50 nm in 1 nm increments, these continuously variable bandwidths help optimize detection of some fluorophores. Detection parameters for complex multi-plexed assays like FRET and SNPs can be fine-tuned for the highest signal with the lowest crosstalk – and the results you expect.

## Ultra-fast plate processing speeds with multiple PMT detectors

High throughput isn't just about fast plate reading – a high

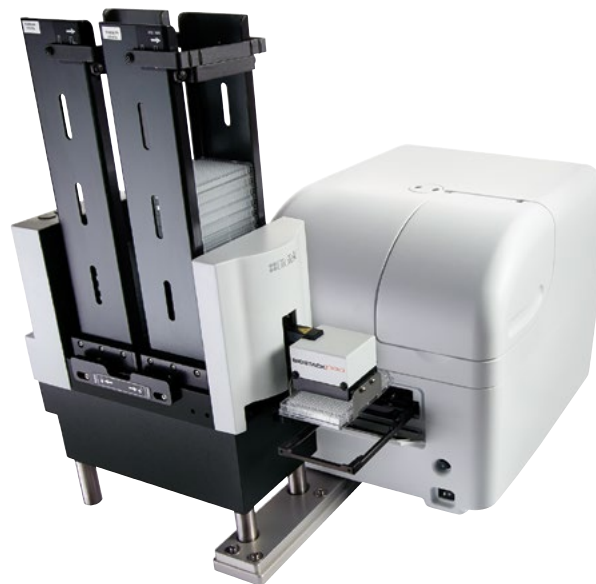
throughput multi-mode reader should handle common and complex assays with equally high performance even in 1536-well plates. Synergy Neo2 has dual PMTs for top measurement, so FP, FRET, TR-FRET and other ratiometric measurements are processed quickly and with excellent results. Up to four PMTs are available in Synergy Neo2, for the greatest speed and flexibility.

## Controlled environment for live cell assays

Along with incubation to 65 °C and shaking, Synergy Neo2 can be equipped with a CO<sub>2</sub>/O<sub>2</sub> controller to provide the ideal environment for robust live cell assays. Direct bottom detection provides ultra sensitivity for measuring cell-based fluorescence intensity. To automate live cell workflows, Synergy Neo2 integrates with BioSpa™ 8 Automated Incubator.

## Typical Applications:

- ▶ HTS screening
- ▶ Drug absorption and metabolism
- ▶ Biologics drug discovery and development
- ▶ Drug discovery
- ▶ Cell proliferation
- ▶ Cytotoxicity
- ▶ Biomarker quantification
- ▶ Genetic analysis
- ▶ Environmental testing
- ▶ Food safety
- ▶ Nucleic acid quantification
- ▶ Protein quantification



*Synergy Neo2 shown with optional high-speed microplate stacker*





## Specifications:

<b>General</b>		<b>Sensitivity (Fluorescein)</b>	Filters: 0.2 pM (4 amol/well, 384-well low vol plate) - top 1 pM (10 amol/well, 1536-well plate) - top 1 pM (0.1 fmol/well, 384-well plate) - bottom Quad Monochromator: 2 pM (40 amol/well, 384-well low vol plate) - top 2.5 pM (0.25 fmol/well, 384-well plate) - bottom
<b>Detection mode</b>	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization, Time-resolved fluorescence Alpha	<b>Reading speed (kinetic)</b>	96 well: 6 seconds 384 well: 11 seconds 1536 well: 25 seconds
<b>Read methods</b>	Endpoint, kinetic, spectral scanning, well area scanning	<b>Luminescence</b>	
<b>Microplate types</b>	6- to 1536-well plates	<b>Wavelength range</b>	300 - 700 nm
<b>Other labware</b>	Petri and cell culture dishes Take3™ Micro-Volume Plates	<b>Dynamic range</b>	>6 decades
<b>Temperature control</b>	4-Zone™ incubation to 65 °C with Condensation Control™	<b>Sensitivity</b>	5 amol ATP (384-well low volume plate)
<b>Shaking</b>	Linear, orbital, double orbital	<b>Fluorescence Polarization</b>	
<b>Software</b>	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)	<b>Light source</b>	Xenon flash
<b>Automation</b>	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible	<b>Detector</b>	Dual PMT or single PMT (option)
<b>CO<sub>2</sub> and O<sub>2</sub> control</b>	Range: 0 - 20% (CO <sub>2</sub> ); 1 - 19% (O <sub>2</sub> )	<b>Wavelength selection</b>	Filters
<b>Barcode reader</b>	1D and 2D camera-based scanner	<b>Wavelength range</b>	280 - 850 nm
<b>Absorbance</b>		<b>Sensitivity</b>	1 mP standard deviation at 1 nM fluorescein (394-well low volume plate) 1.5 mP standard deviation at 1 nM fluorescein (1536-well plate)
<b>Light source</b>	Xenon flash	<b>Time-Resolved Fluorescence</b>	
<b>Detector</b>	Photodiode	<b>Light source</b>	Xenon flash
<b>Wavelength selection</b>	Monochromator	<b>Detector</b>	Dual PMT or single PMT (option)
<b>Wavelength range</b>	230 to 999 nm, in 1 nm increments	<b>Wavelength selection</b>	Quad monochromators (top/bottom) Filters (top/bottom)
<b>Monochromator bandwidth</b>	2 nm (230-285 nm); 4 nm (>285 nm)	<b>Wavelength range</b>	Monos: 250 – 850 nm Filters (dual PMT): 200 – 850 nm
<b>Dynamic range</b>	0 - 4.0 OD	<b>Sensitivity</b>	Europium 40 fM (384-well low volume plate) Europium 70 fM (1536-well plate)
<b>Resolution</b>	0.0001 OD	<b>Alpha Detection</b>	
<b>Pathlength correction</b>	Yes	<b>Light source</b>	100 mW 680 nm laser
<b>Monochromator wavelength accuracy</b>	±2 nm	<b>Detector</b>	PMT
<b>Monochromator wavelength repeatability</b>	±0.2 nm	<b>Wavelength selection</b>	Filters (top)
<b>OD accuracy</b>	<1% at 2.0 OD <3% at 3.0 OD	<b>Sensitivity</b>	100 amol bio-LCK-P (384-well low volume plate)
<b>OD linearity</b>	<1% from 0 to 3.0 OD	<b>Read speed</b>	96 well: 30 seconds 384 well: 1 minute 50 seconds 1536 well: 7 minutes 20 seconds
<b>OD repeatability</b>	<0.5% at 2.0 OD	<b>Reagent Dispensers</b>	
<b>Stray light</b>	0.03% at 230 nm	<b>Number</b>	2 syringe pumps
<b>Reading speed (kinetic)</b>	96 well: 6 seconds 384 well: 11 seconds 1536 well: 25 seconds	<b>Supported labware</b>	6- to 384-well plates, Petri dishes
<b>Fluorescence Intensity</b>		<b>Dead volume</b>	1.1 mL, 100 µL with back flush
<b>Light source</b>	Xenon flash	<b>Dispense volume</b>	5-1000 µL in 1 nm increments
<b>Detector</b>	Dual top PMTs; Single top PMT (option) Low noise PMT (bottom filter system) Red shifted PMT (top/bottom monochromator system)	<b>Physical Characteristics</b>	
<b>Wavelength selection</b>	Quad monochromators (top/bottom) Filters (top/bottom)	<b>Power</b>	250 Watts max.
<b>Wavelength range</b>	Monochromators: 250 – 850 nm Filters (dual PMT): 200 – 850 nm	<b>Dimensions</b>	15.4" W x 20.7" D x 16.1" H (39 x 52.5 x 41 cm)
<b>Monochromator bandwidth</b>	Variable; from 3 to 50 nm, in 1 nm increments	<b>Weight</b>	78 lbs (35Kg)
<b>Dynamic range</b>	7 decades	<b>Regulatory</b>	
		<b>Regulatory</b>	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.



# Synergy™ H1 Multi-Mode Reader

**Synergy™ H1 Multi-Mode Reader is equipped with both monochromator and filter optical systems. Synergy H1 provides flexibility and performance, at a very attractive price.**

## Flexibility at a Great Price

Synergy H1 is available in a monochromator-only configuration. Supporting top and bottom fluorescence, UV-visible absorbance and luminescence, it is the most cost-effective solution of its type on the market. Combined with the Take3™ Micro-Volume Plate for low volume 2 µL assays, it is the perfect instrument for life-science research laboratories.

## Patented Hybrid Optical System

Adding the optional filter module turns the Synergy H1 into an advanced Hybrid reader. This patented optical design is only available from BioTek. Monochromators provide ease-of-use and flexibility, while filters provide increased optical efficiency and sensitivity.

## Gas Controller for Live Cell Assays

An available Gas Controller for Synergy H1 allows control and monitoring of CO<sub>2</sub> and O<sub>2</sub> levels in the system. The Gas Controller, along with advanced temperature control to 45 °C and orbital shaking, create the ideal physiological environment needed

for assays using live cells. Live cell workflows can be automated by integrating Synergy H1 with BioSpa™ 8 Automated Incubator.

## Upgradable to Advanced Read Modes

When equipped with the optional filter module, Synergy H1 may be used for fluorescence polarization assays as well as Time-Resolved Fluorescence (TRF) and TR-FRET assays.

## Dual Reagent Injector Module

For rapid, precise reagent injection in all plate types, Synergy H1 has an available dual reagent injector module, ideal for inject/read applications.

## Typical Applications:

- ▶ Nucleic acid quantification
- ▶ Protein quantification
- ▶ Enzyme kinetics
- ▶ Biomarker quantification
- ▶ ELISAs
- ▶ Yeast kinetic analysis
- ▶ Genetic analysis
- ▶ Drug discovery
- ▶ Cell proliferation
- ▶ Cytotoxicity
- ▶ Drug absorption and metabolism
- ▶ Biologics drug discovery and development
- ▶ Food safety
- ▶ Environmental monitoring



*Synergy H1 shown with optional Gas Controller module*



## Specifications

General	
Detection mode	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	1- to 384-well plates
Other labware supported	Petri and cell culture dishes Take3™ Micro-Volume Plates
Temperature control	4-Zone™ incubation to 45 °C with Condensation Control™
Shaking	Linear, orbital, double orbital
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible
CO <sub>2</sub> and O <sub>2</sub> control	Range: 0 - 20% (CO <sub>2</sub> ); 1 - 19% (O <sub>2</sub> )
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	230 to 999 nm, in 1 nm increments
Monochromator bandwidth	4 nm (230-285 nm); 8 nm (>285 nm)
Dynamic range	0 - 4.0 OD
Resolution	0.0001 OD
Pathlength correction	Yes
Monochromator wavelength accuracy	±2 nm
Monochromator wavelength repeatability	±0.2 nm
OD accuracy	<1% at 2.0 OD <3% at 3.0 OD
OD linearity	<1% from 0 to 3.0 OD
OD repeatability	<0.5% at 2.0 OD
Stray light	0.03% at 230 nm
Reading speed (kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Fluorescence Intensity	
Light source	Xenon flash
Detector	PMT for monochromator system PMT for filter system
Wavelength selection	Quad monochromators (top/bottom) Filters (top)
Wavelength range	Monochromators: 250 - 700 nm (850 nm option) Filters: 200 - 700 nm (850 nm option)

Monochromator bandwidth	Fixed, 16 nm
Dynamic range	5 decades
Sensitivity (Fluorescein)	Filters: 0.25 pM (0.025 fmol/well, 384-well plate)  Quad Monochromator: 2.5 pM (0.25 fmol/well, 384-well plate) - top 4 pM (0.4 fmol/well, 384-well plate) - bottom
Reading speed (kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Sensitivity	Monos: 20 amol ATP (flash) Filters: 10 amol ATP (flash), 100 amol (glow)
Fluorescence Polarization	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Filters
Wavelength range	280 - 700 nm (850 nm option)
Sensitivity	1.2 mP standard deviation at 1 nm fluorescein
Time-Resolved Fluorescence	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Quad monochromators (secondary mode) Filters (top)
Wavelength range	Filters: 200 - 700 nm (850 nm option)
Sensitivity	Filters: Europium 40 fM (4 amol/well, 384-well plate) Monos: Europium 1200 fM (120 amol/well, 384-well plate)
Reagent Dispensers	
Number	2 syringe pumps
Supported labware	6- to 384-well plates, Petri dishes
Dead volume	1.1 mL, 100 µL with back flush
Dispense volume	5-1000 µL in 1 nm increments
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50-200 µL
Physical Characteristics	
Power	130 Watts max.
Dimensions	15.4"W 18.6"D 12.9"H (39.1 x 47.2 x 32.8 cm)
Weight	50 lbs (22.5 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# Synergy™ 2 Multi-Mode Reader

The Synergy™ 2 has been designed for life science research and drug discovery applications. It incorporates enhanced fluorescence, luminescence and absorbance optics for superior performance. Advanced read modes such as fluorescence polarization and time-resolved fluorescence are available as individual, upgradable modules and an available reagent injection system expands the applications range.

## Best Price/Performance Ratio

The Synergy 2 incorporates dedicated, optimized optical paths for each detection mode using filters for fluorescence and a monochromator for absorbance. The result is excellent performance in all modes, at an attractive price.

## Sensitive Dichroic-based Fluorescence Optics

The Synergy 2 fluorescence optics are a step up from the Synergy HTX, incorporating dichroic mirrors, which decrease background noise, as well as a liquid-filled emission fiber that increases the system's light collection efficiency. The result is higher sensitivity for demanding assays.

## Dedicated Luminescence Light Path

A dedicated liquid-filled light guide coupled with a low noise detector provides high-performance luminescence detection, on par with dedicated microplate luminometers. Synergy 2 is DLReady™ certified by Promega to run their Dual-Luciferase® assay system.

## Advanced, Modular Read Modes

In addition to the basic read modes available on the Synergy HTX, Synergy 2 offers fluorescence polarization, time-resolved fluorescence and Alpha detection modes, available as individual, upgradable modules.

## Typical Applications:

- ▶ Nucleic acid quantification
- ▶ Protein quantification
- ▶ Enzyme kinetics
- ▶ Biomarker quantification
- ▶ ELISAs
- ▶ Genetic analysis
- ▶ Drug discovery
- ▶ Cell proliferation
- ▶ Cytotoxicity
- ▶ Drug absorption and metabolism
- ▶ Biologics drug discovery and development
- ▶ Food safety
- ▶ Biofuels research
- ▶ Environmental monitoring



## Specifications

General	
Detection mode	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence Alpha
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	6- to 1536-well plates 1- to 384-well (luminescence)
Other labware supported	Petri and cell culture dishes Take3™ Micro-Volume Plates
Temperature control	4-Zone™ incubation to 65 °C
Shaking	Linear
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	BioStack™ and 3rd party automation compatible
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 to 999 nm, in 1 nm increments
Monochromator bandwidth	2.4 nm
Dynamic range	0 - 4.0 OD
Resolution	0.0001 OD
Pathlength correction	Yes
Monochromator wavelength accuracy	±2 nm
Monochromator wavelength repeatability	±0.2 nm
OD accuracy	<1% at 2.0 OD <3% at 3.0 OD
OD linearity	<1% from 0 to 3.0 OD
OD repeatability	<0.5% at 2.0 OD
Stray light	0.03% at 230 nm
Reading speed (kinetic)	96 wells: 11 seconds 384 wells: 22 seconds 1536 wells: 42 seconds
Fluorescence Intensity	
Light source	Tungsten halogen Xenon flash (option)
Detector	PMT
Wavelength selection	Filters/ dichroic mirrors
Wavelength range	Tungsten lamp: 300 - 700 nm (850 nm option) Xenon lamp: 200 - 700 nm (850 nm option)
Dynamic range	>6 decades
Sensitivity (Fluorescein)	Top: 1 pM (0.2 fmol/well 96-well plate; 0.1 fmol/well 384-well plate) Bottom: 5 pM (1 fmol/well 96-well plate; 0.5fmol/well 384-well plate)
Reading speed (kinetic)	96 wells: 11 seconds 384 wells: 22 seconds 1536 wells: 42 seconds

Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Sensitivity	10 amol ATP (flash) 100 amol ATP (glow)
Fluorescence Polarization	
Light source	Tungsten halogen High energy DPR xenon flash (option)
Detector	PMT
Wavelength selection	Filters/dichroics
Wavelength range	400 - 700 nm (320 - 850 nm option)
Sensitivity	3 mP at 1 nM fluorescein
Time-Resolved Fluorescence	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Filters/dichroics
Wavelength range	Filters: 200 - 700 nm (850 nm option)
Sensitivity	Europium 60 fM (12 amol/well 96-well plate; 6 amol/well 384-well plate)
Alpha Detection	
Light source	Tungsten halogen
Detector	PMT
Wavelength selection	Filters
Sensitivity	100 amol of bio-LCK-P, 25 µL/ well in 384-well plate
Read speed	2 minute (96-well plate)
Reagent Dispensers	
Supported detection modes	All modes
Number	2 syringe pumps
Supported labware	6- to 384-well plates
Dead volume	1.1 mL, 100 µL with back flush
Dispense volume	5-1000 µL in 1 nm increments
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50-200 µL
Physical Characteristics	
Power	250 Watts max.
Dimensions	17"W x 17.5"D x 14.5"H (43.5 x 44.5 x 37.3 cm)
Weight	60 lbs (27 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# Synergy™ HTX Multi-Mode Reader

The Synergy™ HTX is an entry-level, affordable and upgradeable multi-mode microplate reader. Available read modes include top and bottom fluorescence, UV-visible absorbance and luminescence detection. Temperature control to 50 °C, shaking and advanced Gen5™ data analysis software are also included. A dual reagent injector module is available for all read modes and plate types.

## Ideal for Basic Research Applications

The Synergy HTX 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).

## AlphaScreen®/ AlphaLISA®

AlphaScreen and AlphaLISA assays can be performed on Synergy HTX with excellent results. Alpha-capable configurations add assay versatility to basic research requirements.

## Sensitive Filter-based Fluorescence

Two excitation and two 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 typically 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 HTX can automate glow and flash luminescence assays, thanks to its optional dual reagent injector module. Typical assays include ATP quantification as well as luciferase gene expression assays.

## Typical Applications:

- ▶ AlphaScreen®/AlphaLISA®
- ▶ 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 mode	UV-Vis absorbance Fluorescence intensity Luminescence Time-resolved fluorescence (secondary mode) Alpha
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	6- to 384-well plates
Other labware supported	PCR plates, Petri and cell culture dishes Take3™ Micro-Volume Plates
Temperature control	4-Zone™ incubation to 50 °C with Condensation Control™
Shaking	Linear, orbital
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	BioStack™ and 3rd party automation compatible
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 to 999 nm, in 1 nm increments
Monochromator bandwidth	2.4 nm
Dynamic range	0 - 4.0 OD
Resolution	0.0001 OD
Pathlength correction	Yes
Monochromator wavelength accuracy	±2 nm
Monochromator wavelength repeatability	±0.2 nm
OD accuracy	<1% at 2.0 OD <3% at 3.0 OD
OD linearity	<1% from 0 to 3.0 OD
OD repeatability	<0.5% at 2.0 OD
Stray light	0.03% at 230 nm
Reading speed (kinetic)	96 wells: 14 seconds 384 wells: 26 seconds
Fluorescence Intensity	
Light source	Tungsten halogen Xenon flash (option)
Detector	PMT
Wavelength selection	Filters
Wavelength range	300 - 700 nm (200 - 850 nm option)
Dynamic range	>6 decades
Sensitivity (Fluorescein)	Top and Bottom: 5 pM (1 fmol/well 96-well plate)
Reading speed (kinetic)	96 wells: 31 seconds 384 wells: 80 seconds

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Sensitivity	10 amol ATP (flash) - Lum and Abs / Lum configurations 30 amol ATP (flash) - Multi-mode configurations
Time-Resolved Fluorescence	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Monochromator
Alpha Detection	
Light source	Tungsten halogen
Detector	PMT
Wavelength selection	Filters
Sensitivity	300 amol of bio-LCK-P, 25 µL/ well in 384-well plate
Read speed	2 minute (96-well plate)
Reagent Dispensers	
Supported detection modes	All modes
Number	2 syringe pumps
Supported labware	6- to 384-well plates
Dead volume	1.1 mL, 100 µL with back flush
Dispense volume	5-1000 µL in 1 nm increments
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50-200 µL
Physical Characteristics	
Power	100-240 VAC, 50/60 Hz
Dimensions	6"W x 15"D x 10"H (40.6 x 38 x 25.4 cm)
Weight	40 lbs (18 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use are available.

# Multi-Mode Reader Comparison Chart

## Which Multi-Mode Reader is right for you?

	Synergy™ Neo2	Cytation™	
<b>Key Features</b>			
Monochromator-based UV-visible absorbance	•	•	
Fluorescence top/bottom	•	•	
Luminescence	•	•	
Filtered luminescence	•	•	
Injectors	•	•	
TRF & TR-FRET	•	•	
Fluorescence polarization	•	•	
Standard AlphaLISA®/AlphaScreen®			
Laser AlphaLISA/AlphaScreen	•	Cytation 5 only	
Hybrid Technology™	•	•	
Dual PMT read head	•		
<b>Performance Specifications</b>			
Fluorescein typical – top	2 pM (monos) / 0.2 pM (filters)	2.5 pM (monos) / 0.25 pM (filters)	
Fluorescein typical – bottom	1 pM (filters)	4 pM (monos)	
ATP typical – flash luminescence	5 amol	10 amol	
Polarization typical – 1 nM Fluorescein	1 mP ST	1.2 mP SD	
Europium typical	40 fM	40 fM (filters)	
AlphaScreen typical - LCK peptide	100 amol	100 amol (Cytation 5)	
Fastest read speed 96-/384-well plates (seconds)	6/11	11/22	
<b>General Specifications</b>			
Microplate types	6 to 1536	Mono: 6 to 384 Filter and imaging: 6-1536	
Gas Controller compatible	•	•	
BioSpa™ 8 Automated Incubator compatible	•	•	
Automation ready/BioStack™ compatible	•	•	
Dual reagent injector compatible	•	•	
Barcode reader option	•		
Take3™ Micro-Volume Plate compatible	•	•	
Temperature control system	to 65 °C	To 45° C (Cytation 3) To 65° C (Cytation 5)	
Condensation Control™	•	•	
Filter capacity	Up to 6 filter sets	2 filter sets	
Fluorescence bandwidth	Filter dependent Mono: variable from 3 nm to 50 nm	Filter dependent Mono: variable from 9 nm to 50 nm (Cytation 5) Fixed 16 nm (Cytation 3)	



# FLx800™ Fluorescence 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 top and bottom bifurcated quartz fibers to 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 mode	Fluorescence intensity Luminescence
Read method	Endpoint, kinetic, well area scanning (under computer control)
Microplate types	6- to 384-well plates
Temperature control	4 °C above ambient to 50 °C (I models)
Shaking	Linear (I models)
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Fluorescence Intensity	
Light source	Tungsten halogen
Detector	PMT
Wavelength selection	Filters
Wavelength range	300 - 700 nm (850 nm option)
Dynamic range	5 decades
Sensitivity	Fluorescein 5 pM (1 fmol/well 96-well plate)
Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	5 decades
Sensitivity	100 amol ATP (flash)
Reagent Dispensers	
Supported detection modes	Fluorescence
Number	1 syringe pump
Dead volume	1.1 mL, 100 µL
Dispense volume	5-1000 µL in 1 nm increments
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	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# PowerWave™ HT 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 mode	Absorbance
Read method	Endpoint, kinetic
Microplate types	96- and 384-well plates
Temperature control	4-Zone™ incubation to 50 °C
Shaking	Linear
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	BioStack™ and 3rd party automation compatible
Absorbance	
Light source	Xenon flash
Detector	Photodiodes
Wavelength selection	Monochromator
Wavelength range	200 to 999 nm, in 1 nm increments
Monochromator bandwidth	5 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% + 0.01 OD
OD linearity	±1%
OD repeatability	0.5% + 0.005 OD
Stray light	0.03% at 230 nm
Reading speed (kinetic)	96 wells: 5 seconds 384 wells: 11 seconds
Physical Characteristics	
Power	100-240 Volts AC. 50/60 Hz
Dimensions	8.5"W x 16"D x 8.5"H (21.6 x 40.6 x 21.6 cm)
Weight	
Regulatory	
Regulatory	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.



# Epoch™ 2 Microplate Spectrophotometer

**Epoch™ 2 is a compact monochromator-based microplate spectrophotometer for 6- to 384-well microplates, cuvettes and 2 µL measurements. Epoch 2 features a 10" color touchscreen interface with easy to navigate controls, and full onboard Gen 5™ software for data collection, powerful analysis and flexible export and report options. Incubation, shaking and robot compatibility are standard features.**

## UV-Vis Measurements

Epoch 2's monochromator-based optics offers wavelength selection from 200 nm to 999 nm – for applications from nucleic acid quantification to ELISA, without using filters. Epoch 2 can measure up to 48 2 µL samples in the unique Take3 Micro-Volume plates for rapid direct quantification. An optional cuvette port provides

quick 1 cm measurements, making Epoch 2 a versatile spectrophotometer for multiple applications.

## Touch. Run. Done.

Designed for easy-to-use, yet powerful functionality, Epoch 2 features a 10" color touchscreen interface, WiFi, Bluetooth and USB connectivity and flash drive storage. It's a self-contained computer, in a space and cost saving design, configurable for the laboratory's needs today and in the future.

## Full Gen5 Data Analysis Software

With Epoch 2, "onboard software" doesn't mean "limited software". Complete reader control, protocol design, data analysis and export/report functions are at your fingertips. For applications in microplates, cuvettes or

Take3 plates, Gen5 offers the same intuitive navigation and full capability as an external computer. With Gen5 on the Epoch 2 – there's no need for a dedicated computer – it's all built-in!

## Advanced 4-Zone™ Incubation

Epoch 2 features BioTek's 4-Zone natural convection incubator up to 65 °C with minimal variation across the plate – ideal for a wide range of temperature-sensitive assays. Epoch 2's unique Condensation Control™, solves the common problem of condensation build up on plate lids during incubated kinetic runs. Epoch 2 can be integrated with BioSpa™ 8 Automated Incubator for unattended automation.

## Typical Applications:

- ▶ ELISA
- ▶ Enzyme kinetics
- ▶ Nucleic acid and protein quantification
- ▶ Cell proliferation
- ▶ Cytotoxicity
- ▶ Spectral scanning
- ▶ Reactive oxygen species
- ▶ Food safety and quality
- ▶ Bacterial identification
- ▶ Total protein determination
- ▶ Nucleic acid purity assessment



## Specifications

General	
Detection mode	Absorbance
Read method	Endpoint, kinetic, well area scanning
Microplate types	6- to 384-well plates
Other labware supported	Take3™ Micro-Volume plates
Temperature control	4-Zone™ incubation to 65 °C
Shaking	Linear, orbital, double-orbital
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 to 999 nm, in 1 nm increments
Monochromator bandwidth	2.9 nm
Dynamic range	0 - 4.0 OD
Resolution	0.0001 OD
Pathlength correction	Yes
Monochromator wavelength accuracy	±2 nm
Monochromator wavelength repeatability	±0.2 nm
OD accuracy	0 to 2 OD: +1% +0.010 OD 2 to 2.5 OD: +3% +0.010 OD
OD linearity	0 to 2.0 OD ± 1% ± 0.010 2.0 to 2.5 OD ± 3% ± 0.010
OD repeatability	0 to 2.0 OD ± 1% ± 0.005 2.0 to 2.5 OD ± 3% ± 0.005
Stray light	0.03% at 230 nm
Reading speed (kinetic)	96 wells: 8 seconds 384 wells: 14 seconds
Physical Characteristics	
Power	100-240 Volts AC. 50/60 Hz
Dimensions	With touchscreen: 15.5" D x 12.5" W x 13" H (39.3 x 32 x 33 cm) Without touchscreen: 15.5" D x 12.5" W x 8" H (39.3 x 32 x 20.3 cm)
Weight	With touchscreen: 25 lbs (11.3 kg) Without touchscreen: 20 lbs (9.1 kg)
Regulatory	
Regulatory	CE and TUV marked, RoHS compliant. Models for In Vitro Diagnostic use are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# Epoch™ Microplate Spectrophotometer

**Epoch™ is a monochromator-based microplate spectrophotometer that offers superior functionality for the life science laboratory at an accessible price. Controlled by the powerful, yet easy-to-use Gen5™ Data Analysis Software, Epoch is designed to be the new lab workhorse for a wide variety of applications. For walk-away automation, an optional BioStack™ compatible Epoch is available.**

## **200 nm to 999 nm Wavelength Range**

The monochromator-based optical system in Epoch allows any wavelength selection between 200

and 999 nm in 1 nm increments. No filters required! From low UV nucleic acid measurements to standard ELISA assays, Epoch is ideally suited to the life science laboratory where application flexibility is required.

## **6- to 384-well Microplate Reading**

Epoch's optical and mechanical systems are designed to provide optimal measurements in a variety of microplates. The area scanning capability provides multiple measurements across larger diameter wells, resulting in more meaningful data analysis.

## **Take3™ Micro-Volume Plate Compatible**

When sample size matters, as in critical nucleic acid and protein quantification, the Take3 plate provides up to sixteen 2 µL measurements – without needing to dilute important samples.

## **Endpoint, Kinetic, Spectral Scanning**

There's no need to buy expensive instrumentation to perform a variety of absorbance measurements. Epoch, driven by Gen5 Data Analysis Software, is the ultimate high-value system with maximum assay flexibility.

## **Typical Applications:**

- ▶ Nucleic acid quantification
- ▶ Protein quantification
- ▶ 260/280 and 260/230 purity measurements
- ▶ ELISA
- ▶ Enzyme kinetics
- ▶ Cytotoxicity
- ▶ Cell proliferation
- ▶ Micro-volume assays with Take3 plate



## Specifications

General	
Detection mode	Absorbance
Read method	Endpoint, kinetic, well area scanning
Microplate types	6- to 384-well plates
Other labware supported	Take3™ Micro-Volume plates
Software	Gen5™ Data Analysis Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	BioStack™ and 3rd party automation compatible ("R" model)
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 to 999 nm, in 1 nm increments
Monochromator bandwidth	5 nm
Dynamic range	0 - 4.0 OD
Resolution	0.0001 OD
Pathlength correction	yes
Monochromator wavelength accuracy	±2 nm
Monochromator wavelength repeatability	±0.2 nm
OD accuracy	0 to 2 OD: +1% +0.010 OD 2 to 2.5 OD: +3% +0.010 OD
OD linearity	0 to 2.0 OD ± 1% ± 0.010 2.0 to 2.5 OD ± 3% ± 0.010
OD repeatability	0 to 2.0 OD ± 1% ± 0.005 2.0 to 2.5 OD ± 3% ± 0.005
Reading speed (kinetic)	96 wells: 15 seconds 384 wells: 31 seconds
Physical Characteristics	
Power	100-240 Volts AC. 50/60 Hz
Dimensions	12" W x 12.5" D x 7.7" H (30.5 cm x 31.8 cm x 19.6 cm)
Weight	<15 lbs (6.8 kg)
Regulatory	
Regulatory	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# ELx808™ Absorbance Reader

Excellent optical performance and superior incubation are among the top features of this multi-channel reader. The ELx808™ is suitable for a wide array of applications, from endpoint ELISAs to kinetic cell growth studies.

## 4-Zone™ Temperature Control

For temperature sensitive assays, there is no better incubation system in this microplate reader class than the ELx808. The natural convection heating is software controlled for consistency and performance over time.

## Fast Measurement

The ELx808 can collect kinetic data in intervals as short as 6 seconds, for the most demanding assays. Gen5™ Data Analysis Software provides multiple kinetic and end point data analysis options for a variety of applications.

## Superior Optical Performance

The ELx808 can accommodate up to six absorbance filters, and its optical channels are staggered to prevent crosstalk between wells. The reference channel eliminates channel-to-channel variation. This unique design gives the ELx808 its proven optical performance.

## Typical Applications:

- ▶ ELISA
- ▶ Enzyme kinetics
- ▶ Endotoxin assays
- ▶ Cell growth studies
- ▶ Cytotoxicity
- ▶ Protein assays



## Specifications

General	
Detection mode	Absorbance
Read method	Endpoint, kinetic, linear scanning
Microplate types	96-well plates
Temperature control	4-Zone™ incubation to 50 °C ±0.2 °C at 37 °C
Software	Gen5™ Reader Control Software Gen5™ Data Analysis Software (optional)
Absorbance	
Light source	Tungsten halogen
Detector	Photodiode
Wavelength selection	Filters
Wavelength range	380 to 900 nm 340 to 900 nm (ELx808IU)
Dynamic range	0 - 4.0 OD
Resolution	0.001 OD
Pathlength correction	No
OD accuracy	<1% at 2.5 OD <2% at 3.5 OD
OD linearity	<1% at 2.5 OD
OD repeatability	<0.5% at 2.5 OD <1.5% at 3.5 OD
Reading speed (kinetic)	96 wells: 8 seconds
Physical Characteristics	
Power	100-240 Volts AC. 50/60 Hz
Dimensions	15.5"W x 16"D x 8.75"H (39.4 x 40.6 x 22.2 cm)
Weight	30 lbs (13.6 kg)
Regulatory	
Regulatory	For In Vitro Diagnostic use. CE and TUV marked, RoHS Compliant.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.





The ELx800™ is a compact, robust microplate reader ideally suited for applications within the clinical and life science research laboratories.

## Reliable And Robust Design

These characteristics are the reason there have been more than 25,000 ELx800s placed in laboratories around the globe. There simply isn't a more reliable reader with proven performance than the ELx800.

## Gen5™ Software Expands Versatility

Under computer control by Gen5 Data Analysis Software, ELx800 applications are expanded to include kinetic and well area scanning measurements. Data analysis and reporting/exporting features in Gen5 are completely customizable to suit your laboratory's requirements.

## High Performance, High Value

The ELx800 comes with four filters (user-selectable wavelengths), with a five filter capacity. In addition to standard 96-well microplate reading, the ELx800 offers 6-, 12-, 24-, 48- and optional 384-well microplate reading, to fit a variety of assay needs.

## Typical Applications:

- ▶ ELISA
- ▶ Protein assays
- ▶ Cytotoxicity



## Specifications

General	
Detection mode	Absorbance
Read method	Endpoint. Kinetic, well area scanning (under computer control)
Microplate types	6- to 384-well plates
Software	Gen5™ Reader Control Software Gen5™ Data Analysis Software (optional)
Absorbance	
Light source	Tungsten halogen
Detector	Photodiode
Wavelength selection	Filters
Wavelength range	400 to 750 nm 340 to 750 nm (UV option)
Dynamic range	0 - 3.0 OD
Resolution	0.001 OD
Pathlength correction	No
OD accuracy	<1% at 2.0 OD
OD linearity	<1% at 2.0 OD <3% at 3.0 OD
OD repeatability	<0.5% at 2.0 OD
Reading speed (kinetic)	96 wells: 30 seconds
Physical Characteristics	
Power	100-240 Volts AC. 50/60 Hz
Dimensions	15"W x 16.5"D x 7"H (38.1 x 41.9 x 17.8 cm)
Weight	18.5 lbs (8 kg)
Regulatory	
Regulatory	For In Vitro Diagnostic use. CE and TUV marked, RoHS Compliant.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# Absorbance Reader Comparison Chart

*Which Absorbance Reader is right for you?*

	PowerWave™ HT	Epoch™ 2	Epoch™	
<b>Key Features</b>				
Wavelength selection	Monochromator based	Monochromator based	Monochromator based	
Wavelength range (nm)	200 - 999	200 - 999	200 - 999	
Microplate types	96 and 384	6 to 384	6 to 384	
Absorbance range	0 - 4.0	0 - 4.0	0 - 4.0	
Temperature control	to 50 °C	to 65 °C		
Shaking	Linear	Linear, orbital, double-orbital		
Cuvette measurement	Cuvette adapter	Cuvette port (optional), Take3 or cuvette adapter	Take3 or cuvette adapter	
Filter capacity	n/a	n/a	n/a	
Automation ready/BioStack™ compatible	•	•	("R" configuration)	
BioSpa™ 8 Automated Incubator compatible		•		
Gen5™ Software version included	Gen5	Gen5	Gen5	
Take3™ Micro-Volume Plate compatible		•	•	
Fastest read speed: 96 wells (seconds)	5	8	15	
<b>Typical Performance</b>				
OD accuracy	1% +0.01 OD	0 to 2.0 OD: ±1% ±0.010 OD 2.0 to 2.5 OD: ±3% ±0.010 OD	0 to 2.0 OD: +1% +0.010 OD 2.0 to 2.5 OD: +3% +0.010 OD	
OD linearity	±1%	0 to 2.0 OD: ±1% ±0.010 OD 2.0 to 2.5 OD: ±3% ±0.010 OD	0 to 2.0 OD: +1% +0.010 OD 2.0 to 2.5 OD: +3% +0.010 OD	
OD repeatability	0.5% ±0.005 OD	0 to 2.0 OD: ±1% ±0.005 OD 2.0 to 2.5 OD: ±3% ±0.005 OD	0 to 2.0 OD: +1% +0.005 OD 2.0 to 2.5 OD: +3% +0.005 OD	
Resolution	0.001 OD	0.0001 OD	0.0001 OD	

<i>ELx808 IU</i>	<i>ELx808™</i>	<i>ELx800™</i>	<i>ELx800 UV</i>	<i>ELx800 NB</i>
Filter-based	Filter-based	Filter-based	Filter-based	Filter-based
340 - 900	380 - 900	400 - 750	340 - 750	400 - 750
96	96	6 to 96	6 to 96	6 to 384
0 - 4.0 to 50 °C	0 - 4.0	0 - 3.0	0 - 3.0	0 - 3.0
Linear	Linear			
6	6	5	5	5
Gen5RC	Gen5RC	Gen5RC	Gen5RC	Gen5RC
8	8	30	30	30
<1% at 2.5 OD <2% at 3.5 OD	<1% at 2.5 OD <2% at 3.5 OD	<1% at 2.0 OD	<1% at 2.0 OD	<1% at 2.0 OD
<1% at 2.5 OD	<1% at 2.5 OD	<1% at 2.0 OD <3% at 3.0 OD	<1% at 2.0 OD <3% at 3.0 OD	<1% at 2.0 OD <3% at 3.0 OD
<0.5% at 2.5 OD <1.5% at 3.5 OD	<0.5% at 2.5 OD <1.5% at 3.5 OD	<0.5% at 2.0 OD	<0.5% at 2.0 OD	<0.5% at 2.0 OD
0.001 OD	0.001 OD	0.001 OD	0.001 OD	0.001 OD

**Gen5™ Data Analysis Software incorporates over 30 years of experience and user feedback into outstanding microplate reader software. Gen5 is a unique combination of power and ease-of-use that drives productivity and saves time. Use Gen5 to control BioTek's readers and export data, or as a fully integrated processing tool.**

### Beginner-friendly Software

Gen5 is built around logical laboratory workflows to read microplates and produce/analyze data. In Gen5, you simply click "Read Now" and follow the prompts. At the end of the read, answer the question: "Do you want to export to Excel?" With Gen5 you don't have to spend hours figuring out how to get things done.

### Powerful Functionality

Gen5 comes with powerful built-in tools such as 4-P and 5-P curve fits with or without weighting, parallel-line analysis, advanced kinetic analysis, and much more. The software has been specifically designed to analyze matrices of data that are difficult to process in Microsoft® Excel® spreadsheets. Special attention has been placed on result presentation so complex data can be displayed in a clean, colorful way to facilitate data interpretation.

### Up-to-date Web-based Sample Files

A searchable library of sample files with data is available on the BioTek web site. Existing files are kept up to date and new files are added on a regular basis. Gen5

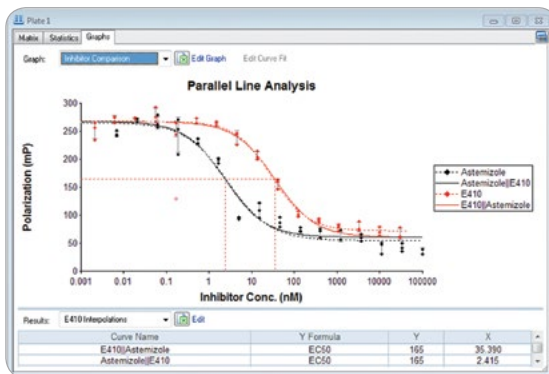
users can upload files to share their experiments and sample data with other Gen5 users.

### Gen5 Secure: You Are In Control

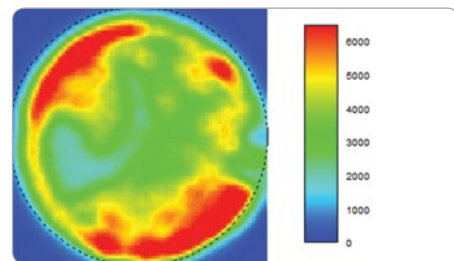
Gen5 Secure is for you if secured data storage, user group management or 21 CFR Part 11 compliance are a core part of your requirements. It includes extra features such as 25 licenses per copy, quality control trending module with Levey-Jennings charts and automatic email notification on trigger events.

### All-in-One Solution

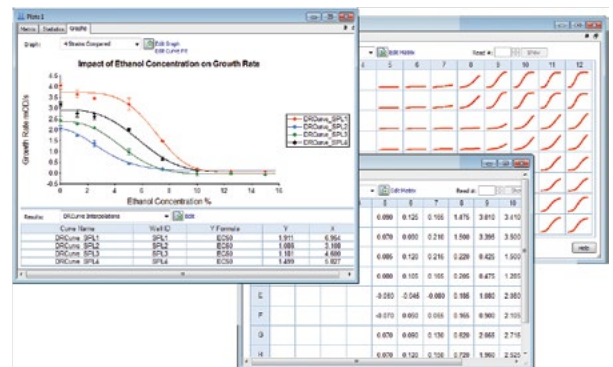
Control any BioTek reader, automate the entire process and produce publication-ready reports with one integrated, powerful software. It doesn't get more efficient than this.



Parallel line analysis and EC<sub>50</sub> determinations



High-resolution 99 x 99 area scan



Multiple window views of plate data and results

## Gen5™ Comparison Chart

	Gen5 RC	Gen5	Gen5 Image+	Gen5 Secure	Gen5 Secure Image+
<b>Readers Supported</b>					
All Cytation and Synergy readers; Epoch 2 (external), Epoch, PowerWave HT, FLx800, ELx808, ELx800	•	•	•	•	•
<b>Read Modes and Methods</b>					
Absorbance, fluorescence, luminescence, time-resolved fluorescence, fluorescence polarization, Alpha	•	•	•	•	•
End point, kinetic, spectral scanning, linear scanning, Take3 interface	•	•	•	•	•
<b>Single and Multi-Mode Data Analysis</b>					
Qualitative, quantitative, kinetic, spectral analysis, custom transformations, EC50, parallel line analysis, Z' calculation, validation and cutoff formulae		•	•	•	•
<b>Imaging Modes and Methods</b>					
Fluorescence, brightfield, phase contrast, color brightfield	•	•	•	•	•
Single color, multi-color, montage, Z-stacking	•	•	•	•	•
<b>Image Processing and Analysis</b>					
Cell counting		•	•	•	•
Subpopulation analysis			•		•
Hit-picking			•		•
Z-projection			•		•
Digital phase contrast			•		•
Image stitching			•		•
<b>Security / 21 CFR Part 11</b>					
User groups, single sign-on (SSO) option				•	•
Secure database data storage, audit trails				•	•
Electronic signature, email notification				•	•
<b>Validation Tools</b>					
Gen5 Validation Package	available	available	available	available	available



# Take3™ Micro-Volume Plate

Quickly quantify ultra-low volume samples of DNA, RNA and protein. Measure up to 48 samples with volumes as low as 2  $\mu\text{L}$  without dilution. Take3™ can be used to measure a standard cuvette or patented BioCells™ for quick 1 cm measurements. Low volume, higher throughput is available with the Take3 Trio.

## Compatible with Most BioTek Detection Systems

Epoch™, Synergy™ and Cytation™ reader functionality can easily reach into the micro-volume range using the Take3 plate. Measure multiple 2  $\mu\text{L}$  samples, cuvettes or BioCells. Adding the Take3 plate to a BioTek detection system creates an incredibly versatile workstation for a variety of applications.

## Unique Robust Construction and Easy Maintenance

The anodized aluminum base construction, precision crafted slides and hydrophobic sample surfaces make



pipetting simple and cleanup effortless. For routine cleaning of the sample surfaces, a laboratory wipe is all that's needed. If a slide becomes damaged, replacement is easy – no need to return the Take3 to the factory for repair or calibration.

## Gen5 Take3 Module: Automated DNA, RNA and Protein Quantification

It couldn't be easier to get multiple (up to 48) nucleic acid or protein sample results. Gen5's Take3 module includes pre-programmed protocols with immediate results output including spectral scans and purity ratios. There's no need for complicated configuration or calculation.

## Typical Applications:

- ▶ Micro-volume DNA, RNA and protein quantification
- ▶ Micro-volume fluorescence measurements in Synergy and Cytation readers
- ▶ Fluorescent dye incorporation measurements
- ▶ Spectral scanning in micro-volume, cuvette or BioCell

## Specifications

	Take3	Take3 Trio
2 $\mu\text{L}$ sample capacity	16	48
Detection limit	2 ng/ $\mu\text{L}$ dsDNA	2 ng/ $\mu\text{L}$ dsDNA
BioCell capacity	2	2
Cuvette capacity	1	n/a

Specifications are subject to change.

# Reader Accessories

BioTek offers a wide range of accessories to help increase productivity, expand your plate reader's capabilities, and maintain the performance of your BioTek microplate reader system. See our web site for a complete listing of available accessories.



## Dual Reagent Injector Module

Automate inject/read assays such as flash luminescence assays (ATP, luciferase) and fluorescent ion channel assays on all Synergy and Cytation readers.



## Instrument Qualification

See the Compliance Section on pages 62-63 for details about BioTek's product qualification tools and services.



## Gas Controller

The Gas Controller module for the Synergy H1, Synergy Neo2 and Cytation allows full control over CO<sub>2</sub> and O<sub>2</sub> concentrations to modulate the environment for microplate-based live cell assays.



## Gen5 Secure Software

Upgrade to Gen5 Secure for 21 CFR Part 11 compliance, user management features, data encryption and much more.



## Filters and Mirrors

A full range of standard and custom filters and dichroic mirrors are available for applications from the low UV to the near infrared.



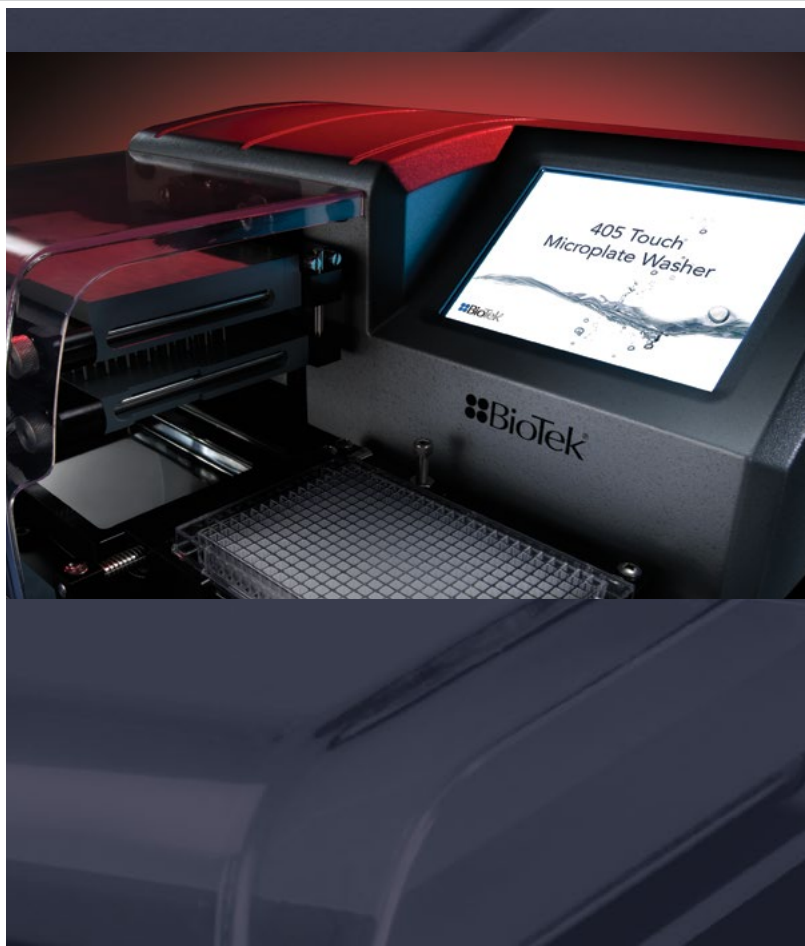
## BioStack™ Microplate Stacker

Automate routine processes with this compact stacker. BioStack is also compatible with BioTek's liquid handling instruments.



## BioSpa™ 8 Automated Incubator

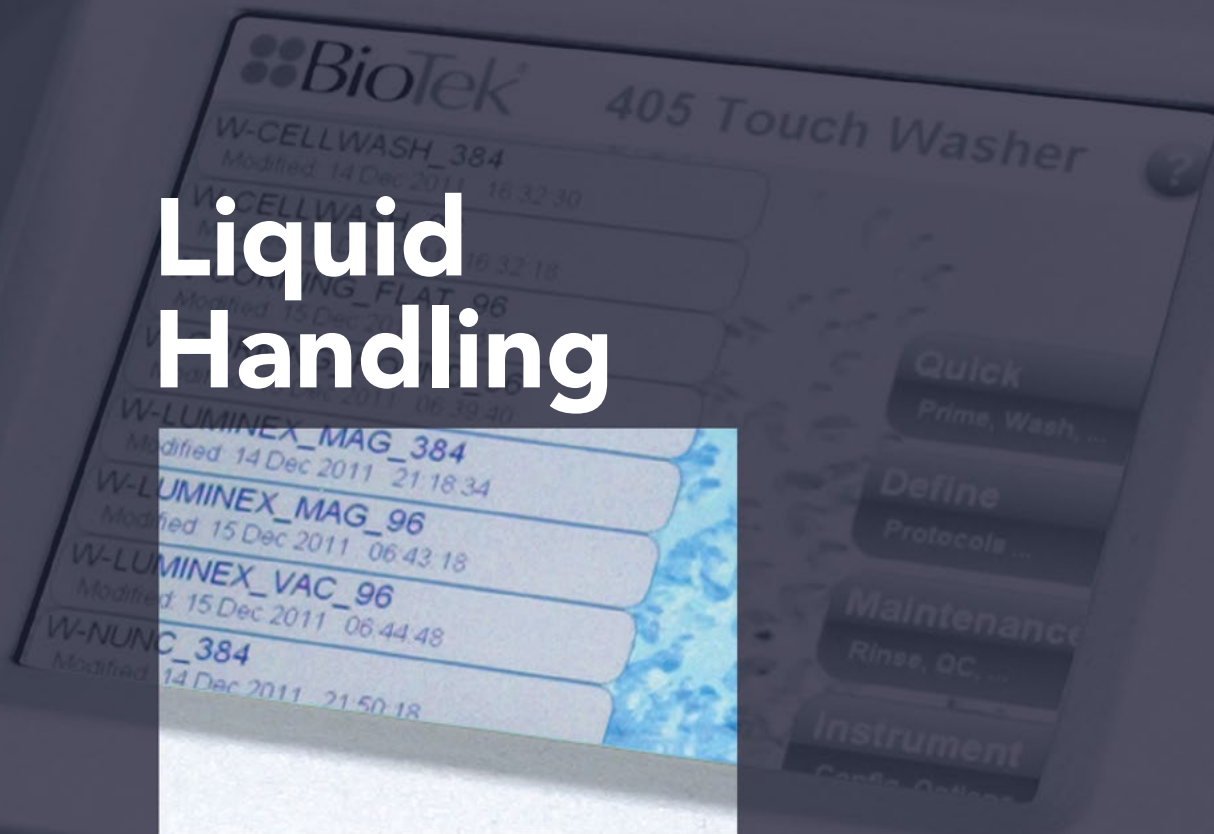
BioSpa 8 is an automated incubator linking BioTek readers or imagers together with washers and dispensers for full workflow automation of up to 8 microplates.



*"I have used the MultiFlo FX Microplate Dispenser since August 2014 for my routine research experiments and assays such as ELISAs and other biochemical kinetic/endpoint reactions. The dispenser is indispensable in modern laboratories... It is unbelievably compact, saving the much needed workbench space. The software and colour touch-screen user interface have been well designed for the average user - with fast and simple protocol programming and operation making it the simplest machine to operate...The Dispenser has been very effective in my research, particularly on the quality of my experiments. "*

*(MultiFlo FX Multi-Mode Dispenser)*

# Liquid Handling



BioTek offers a range of compact and affordable solutions for your laboratory's specific liquid handling needs. BioTek is world renowned for manufacturing the most reliable and versatile microplate washers on the market. From basic ELISA to sensitive cell washing to bead washing (including Luminex® xMAP® technology), the EL406™, 405™ Touch, ELx50™ and MultiFlo™ FX are configured with many options to meet a myriad of assay requirements. For unattended automation of live cell and other assays, the 405, EL406 and MultiFlo FX integrate with the BioSpa™ 8 Automated Incubator. From milliliters down to one microliter, our reagent dispensers offer simple, repeatable and precise liquid delivery throughout their defined volume range. Single, 8- and 12-channel transfer tools are available, along with bulk reagent dispensers, to meet varied liquid handling requirements.

# EL406™ Washer Dispenser

**The EL406™ Combination Washer Dispenser is the only instrument on the market offering fast microplate washing together with BioTek's unique Parallel Dispense™ technologies for optimized liquid handling processes.**

## **Unattended Automation of ELISAs and Cell-based Assays**

The EL406 integrates 96-, 384- and 1536-well microplate washing with three dispensers in one compact instrument. Now you can simply press a button and walk away, or automate an entire batch by adding a BioStack™ Microplate Stacker. For unattended automation the EL406 can be integrated to BioSpa™ 8 Automated Incubator. Add a BioTek imager or reader and entire workflows can be automated.

## **Patented Dual-Action™ Manifold and Ultrasonic Advantage™**

The EL406 incorporates BioTek's Dual-Action manifold for thorough yet gentle washing of loosely adherent cell layers, and Ultrasonic Advantage for automated wash manifold maintenance.

## **Parallel Dispense Technologies**

The EL406 eliminates the need to choose a dispensing technology by offering both peristaltic and syringe pumps on a single platform.

## **Fast and Efficient Biomagnetic Separation and Vacuum Filtration**

The EL406 automates full microplate washing of magnetic microspheres used in an increasing number of multiplex assays. Developed in conjunction with Luminex® xMAP® technology leaders, BioTek's separation modules incorporate high energy neodymium iron boron magnets for speed and efficiency. An available vacuum filtration module makes the EL406 also well suited for polystyrene beads and filtration-to-waste processes.

## **Typical Applications:**

- ▶ ELISA automation
- ▶ MSD assay automation
- ▶ High content screening immunocytochemistry
- ▶ Cell-based assays
- ▶ FLIPR® Ca<sup>2+</sup> flux
- ▶ Magnetic bead assay automation
- ▶ Polystyrene bead assay automation
- ▶ Drug transport assays
- ▶ Automated cell washing, fixing and staining for cellular imaging
- ▶ SiLA compliant integration (with LHC software)





## Specifications

General	
<b>Microplate types</b>	96-, 384-, 1536-well Low profile and standard height Solid and filter bottom (option)
<b>Onboard software</b>	Create, edit or run multiple protocols
<b>Software (pc control)</b>	LHC Software (option) LHC Secure for 21 CFR Part 11 compliance (option) SiLA Compliant driver (option)
<b>Separation</b>	Biomagnetic separation, vacuum filtration (option)
<b>Shaking</b>	Programmable up to 60 minutes Slow, medium, fast or variable
<b>Soaking</b>	Programmable up to 60 minutes
<b>Ultrasonic Advantage™</b>	Yes (standard on most configurations)
<b>Automation</b>	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible
Washing	
<b>Manifold types</b>	96-well washing: 96-tube manifold 96- and 384-well washing: 96-tube Dual-Action manifold 384-well washing (fast): 192-tube Dual-Action manifold 1536-well washing: Two 32-tube dispense manifolds, 316 SS tubes or sapphire jeweled 316 SS tubes
<b>Volume range</b>	3- 3,000 µL/well, in 1 µL increments
<b>Wash cycles</b>	1-250
<b>Buffer/reagent selection</b>	Auto switching module for up to 4 buffers (option)
<b>Supply bottle</b>	4 L or 10 L (optional)
<b>Dispense accuracy</b>	±3%
<b>Dispense precision</b>	<3% CV (model dependent)
<b>Residual volume</b>	<2 µL/well
<b>Wash speed</b>	96 wells, 300 µL/well, 96-tube manifold: 13 seconds 384 wells, 100 µL/well, 192-tube manifold: 17 seconds 1536 wells, 10 µL/wells, two 32-tube manifolds: 36 seconds
<b>Flow rates</b>	High flow to low flow Optimized rates for cell assays
<b>Sterilization</b>	Chemical
<b>Vacuum range for filtration</b>	0 to -380 mmHg
Dispensing - peristaltic pump (multi-channel)	
<b>Manifold types</b>	8-tip (1 x 8) cassette with plastic, 316 stainless steel or sapphire jeweled 316 stainless steel tips
<b>Dispense speed</b>	96 wells, 10 µL /well: 8 seconds 384 wells, 5 µL /well: 12 seconds 1536 wells, 1 µL /well: 27 seconds
<b>Volume range</b>	500 nL - 3,000 µL/well, selectable in 1 µL increments
<b>Flow rates</b>	User programmable rates from high to low Optimized rates for cell assays

<b>Dispense performance</b>	1 µL: Recommended Volume Range: 1 - 50 µL Dispense Accuracy: ±5% at 1 µL Dispense Precision: ≤5% CV at 1 µL ≤10% CV at 500 nL Minimum Prime Volume: 1.20 mL 5 µL cassette: recommended range: 5 - 2,500 µL Dispense Accuracy: ±2.0% at 5 µL Dispense Precision: ≤2.5% CV at 5 µL Minimum Prime Volume: 4.23 mL 10 µL cassette: recommended range: 10 - 3,000 µL Dispense Accuracy: ± 2.0% at 10 µL Dispense Precision: 2.0 CV at 10 µL Minimum Prime Volume: 7.36 mL
<b>Recommended cassette replacement interval</b>	1 µL Cassette: 1,000 384-well microplates at 5 µL well 5 µL Cassette: 1,000 96-well microplates at 50 µL well 10 µL Cassette: 1,000 96-well microplates at 100 µL well
<b>Sterilization</b>	Autoclave, chemical
Dispensing - syringe pump (multi-channel)	
<b>Manifold types</b>	96-well dispensing: One 16-tube (2 x 8) manifold - 316 stainless steel tubes 96-/384-well dispensing: Two 16-tube (1 x 16) manifolds - 316 stainless steel tubes 1536-well dispensing: Two 32-tube (1 x 32) manifolds - sapphire jeweled 316 stainless steel or 316 stainless steel tubes
<b>Dispensing speed</b>	20 µL /well, 96 wells, 1 x 16 tubes: 5 seconds 20 µL /well, 384 wells, 1 x 16 tubes: 14 seconds 3 µL /well 1536 wells, 2 x 32 tubes: 7 seconds
<b>Volume range</b>	3 - 3,000 µL/well, selectable in 1 µL increments Minimum Prime Volume: 12 mL
<b>Flow rates</b>	User programmable rates from high to low
<b>Dispense accuracy</b>	±1 µL at 5 µL ±1 µL at 20 µL ±1% at 100 µL
<b>Dispense precision</b>	≤5% CV at 5 µL ≤2.5% CV at 20 µL ≤1% CV at 100 µL
<b>Supply bottle</b>	1 L or 2 L
<b>Sterilization</b>	Chemical, autoclavable option
Physical Characteristics	
<b>Power</b>	100 - 240 Volts AC. 50/60 Hz
<b>Dimensions</b>	16.5" W x 18" D x 12.5" H (42 x 46 x 32 cm)
<b>Weight</b>	32 lbs (14.5 kg)
Regulatory	
<b>Regulatory</b>	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# 405™ Touch Washer

**BioTek's 405™ Touch Microplate Washer takes plate washing to the next level with an enhanced user interface, increased convenience, assay applications and automated maintenance features.**

## **Industry Leading, User Pleasing**

The 405 Touch Microplate Washer incorporates all the features and functionality of the prior ELx405 models, and improves accessibility through its touchscreen and extensive onboard software. 96- and 384-well microplate based wash procedures are only 'two touches' away with the easy-to-use interface. Additionally, two USB flash drives provide convenient file transfer, storage and operation. A context sensitive Help System and several instructional videos are also included.

## **The Standard for Automation**

The 405 Microplate Washer makes quick work of any washing assay, and is especially well suited for integration into automated systems, where the wash process is controlled remotely. The 405 can be integrated with the BioSpa™ 8 Automated Incubator for unattended automation of many common processes.

## **Cell and Bead Assays**

The 405 is available in various models for optimized performance with the most sensitive and rigorous assay requirements. When the protocol calls for washing loosely adherent cells, the Select model is fine-tuned with angled dispense tubes, extra low flow rates and unique X, Y and Z positioning. Magnetic and polystyrene bead washing are effectively accomplished with the 405.

## **Verify™ Technology and Automated Ultrasonic Cleaning**

BioTek's new patented Verify technology runs an automated QC check for manifold tube blockage, and visually reports any failures. Patented Ultrasonic Advantage™ can then be used to automatically clean the manifolds. Together, these features make the 405 a self-checking, self-maintaining microplate washer!

## **Applications in Deep Well Washing**

The ELx405 Select Deep Well washes 96- and 384-well plates up to 50 mm tall, and is also compatible with standard height plates without any hardware or software changes. This versatile system is optimal for labs working in deep well blocks and standard plates.

## **Typical Applications:**

- ▶ ELISAs
- ▶ MSD assays
- ▶ HCS immune cytochemistry
- ▶ FLIPR® Ca<sup>2+</sup> flux
- ▶ Cell-based assays
- ▶ Magnetic and polystyrene bead assays
- ▶ Gene expression assays
- ▶ Cytokine assays
- ▶ ELISPOT assays
- ▶ Plasmid DNA purification
- ▶ Serum/plasma sample preparation
- ▶ Cell signaling – phospho flow setup for flow cytometry
- ▶ SiLA compliant integration (with LHC software)



## Specifications

General	
Microplate types	96- and 384-well Low profile and standard height Solid and filter bottom (option) - Filter pore sizes from 0.45 $\mu$ m to 1.2 $\mu$ m
Onboard software	Create, edit or run multiple protocols
Software (pc control)	LHC Software LHC Secure for 21 CFR Part 11 compliance (option) SiLA Compliant driver (option)
Separation	Biomagnetic separation, vacuum filtration (optional)
Shaking	Programmable up to 60 minutes Slow, medium, fast or variable
Soaking	Programmable up to 60 minutes
Ultrasonic Advantage™ available	Yes
Verify™ clog detection available	Yes
Automation	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible
Washing	
Manifold types	96-tube manifold for 96-well washing 96-tube Dual-Action manifold for 96- & 384-well washing 192-tube Dual-Action manifold for fast 384-well washing
Volume range	25-3,000 $\mu$ L/well, in 1 $\mu$ L increments
Wash cycles	1-250
Buffer/reagent selection	Auto switching (internal) for up to 4 buffers (option)
Supply bottle	4 L or 10 L (optional)
Dispense precision	<3% CV: 300 $\mu$ L/well (96-well washing) <4% CV: 80 $\mu$ L/well (384-well washing)
Residual volume	< 2 $\mu$ L/well (96- & 384-well plates) 96-tube manifold for 96 wells; 192-tube for 384 wells
Wash speed	96-wells, 300 $\mu$ L/well, 3 cycles: $\leq$ 30 seconds 384-wells, 100 $\mu$ L/well, 3 cycles: $\leq$ 80 seconds 384-wells, 400 $\mu$ L/well, 1 cycle: $\leq$ 20 seconds
Flow rates	High flow to low flow Optimized rates for cell assays
Sterilization	Chemical
Vacuum range for filtration	-38 mmHg to -506 mmHg
Ultrasonic Advantage™ available	Option
Verify™ clog detection available	Option
Physical Characteristics	
Power	100 - 240 Volts AC. 50/60 Hz
Dimensions	14" W x 17" D x 10" H (35.6 x 43.2 x 25.4 cm)
Weight	With internal buffer switching - 36 lbs (16.5 kg)
Regulatory	
Regulatory	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# ELx50™ Strip Washer

**The ELx50™ Microplate Strip Washer's compact footprint conceals a powerhouse of washing capabilities unsurpassed in its class. Exceptional dispense precision and evacuation efficiency can be utilized for both 96- and 384-well strip and plate washing.**

## Multiple Washers in One

The ELx50 is a 3-in-1 solution for 96-well plate formats automating the wash steps of ELISAs, magnetic bead assays and polystyrene bead assays. The ELx50 can also be equipped with BioTek's Dual-Action™ manifold allowing independent control of dispense and aspiration manifolds

in both 96- and 384-well formats. As a welcome upgrade from manual processing, the ELx50 provides an all-inclusive wash solution offering consistent performance and unattended operation.

## Syringe Drive Fluid Delivery

As a self-contained and programmable washer, the ELx50 allows for complete control of precise fluidic delivery from the gentle dripping of a simple squeeze bottle to the full force of pressure delivery systems. Comprehensive onboard software makes creating protocols quick and intuitive.

## Automated Liquid Level Sensing

Liquid Level Alert™ allows the convenience of continuous monitoring for both supply and waste bottles. At the beginning and end of a wash protocol, the liquid level is verified to ensure an adequate buffer remains to complete a wash. Sufficient storage capacity in the waste bottle is also verified.

## Typical Applications:

- ▶ ELISAs
- ▶ Cell-based assays
- ▶ Magnetic bead assays
- ▶ Polystyrene bead assays
- ▶ ELISPOT assays
- ▶ Multiplex assays





## Specifications

General	
Microplate types	96- and 384-well
Onboard software	Create, edit or run multiple protocols
Separation	Biomagnetic separation, vacuum filtration (model dependent)
Shaking	Programmable up to 60 minutes Selectable intensity (15 - 19 cycles/second)
Soaking	Programmable up to 60 minutes
Washing	
Manifold types	8-tube manifold for 96-well washing 12-tube manifold for 96-well washing 16-tube Dual-Action manifold for 96- & 384-well washing
Volume range	25-3,000 $\mu$ L/well, in 1 $\mu$ L increments
Wash cycles	1-10
Buffer/reagent selection	Auto switching module for up to 3 buffers (option)
Supply bottle	2 L
Dispense precision	$\leq$ 3% CV
Residual volume	Solid bottom plates: $\leq$ 2 $\mu$ L/well Filter bottom plates: Average increase weight of plate $\leq$ 1.2 g after dispensing 300 $\mu$ L to 0.45 $\mu$ m plate, filtration 30 seconds, low vacuum, blotted
Wash speed	96-wells, 8-tube manifold, $>$ 300 $\mu$ L/well: $<$ 130 seconds
Flow rates	High flow to low flow
Sterilization	Chemical
Vacuum range for filtration	-91 mmHg to -313 mmHg
Physical Characteristics	
Power	100 - 240 Volts AC. 50/60 Hz
Dimensions	14"W x 16"D x 6.5"H (35.6 x 40.6 x 16.5 cm)
Weight	22 lbs (9.8 kg)
Regulatory	
Regulatory	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.



# Washer Comparison Chart

## Which Washer is right for you?

	EL406™	MultiFlo™ FX
<b>Key Features</b>		
ELISA	•	•
Cell-based assays	•	•
Magnetic bead assays	•	•
Polystyrene bead assays	•	
Filtration-to-waste processes	•	
Touchscreen user interface		•
USB ports for protocol transfer		•
<b>Performance Specifications</b>		
Washing speed: 3 aspirate/dispense cycles, 96-well solid bottom plate, 300 µL/well	≤30 sec	≤130 sec
Dispense precision	≤3% CV	≤3% CV
Residual volume: solid bottom plate	≤2 µL/well	≤2 µL/well
Vacuum filtration: 1.2 µm 96-well plate	0 mmHg to -380 mmHg	
<b>General Specifications</b>		
Microplate types	96, 384 and 1536	6, 12, 24, 48, 96 and 384
Low profile and standard height	•	•
Solid and filter bottom	•	
Deep well		
Manifold		
6-, 12-, 24-, 48-well washing		Custom manifolds available
96-well washing	96-tube (8x12)	
96-/384-well washing	Dual-Action 96-tube (8x12)	Dual-Action 8-tube (1x8)
384-well washing	Dual-Action 192-tube (16x12)	
1536-well washing	Dispense: Two 32-tube (1x32) Aspiration: 128-tube (4x32)	
Ultrasonic Advantage™	•	
Verify™ technology		
BioSpa™ 8 Automated Incubator compatible	•	•
Automation ready/BioStack™ compatible	•	•
Automatic buffer switching	Up to 4	
Flow rates	High flow rates to low cell wash rates	High flow rates to low rates
Volume range	3 - 3000 µL/well	25 - 30,000 µL/well
Microplate shaking	•	•
Fluid and waste detection	•	(optional)
Flow and vacuum detection	•	
Overflow protection	•	•
Pre-programmed maintenance routines	•	•
Onboard software included	•	•
Liquid Handling Control™ Software compatible	•	•

405™ Touch	405 LS	ELx405™ Select	ELx50™
•	•	•	•
•	•	•	•
•	•	•	•
•	•		•
•	•		•
•			
•			
≤30 sec	≤30 sec	≤30 sec	≤130 sec
≤3% CV	≤3% CV	≤3% CV	≤3% CV
≤2 µL/well	≤2 µL/well	≤2 µL/well	≤2 µL/well
-38 mmHg to -506 mmHg	-38 mmHg to -506 mmHg		-95 mmHg to -299 mmHg
96 and 384	96 and 384	96 and 384	96 and 384
•	•	•	•
•	•		•
		•	
96-tube (8x12)	96-tube (8x12)		8-tube (1x8) or 12-tube (1x12)
Dual-Action 96-tube (8x12)	Dual-Action 96-tube (8x12)	Dual-Action 96-tube (8x12)	Dual-Action 16-tube (1x16)
Dual-Action 192-tube (16x12)	Dual-Action 192-tube (16x12)		
•	•	•	
•	•	•	•
•	•	•	
•	•	•	
Up to 4	Up to 4	Up to 4	Up to 3
High flow rates to low cell wash rates	High flow rates to low cell wash rates	High flow rates to low cell wash rates	High flow rates to low cell wash rates
25 - 3000 µL/well	25 - 3000 µL/well	50 - 3000 µL/well	25 - 3000 µL/well
•	•	•	•
•	•	•	•
•	•	•	
•	•	•	•
•	•	•	•
•	•	•	•
•	•	•	
•	•	•	

# MultiFlo™ FX Multi-Mode Dispenser

**The new MultiFlo™ FX Multi-Mode Dispenser offers modular configurations of up to four independent dispensers and a microplate washer in one compact platform. A color touchscreen interface makes programming quick and easy.**

## Multi-Mode Dispensing

MultiFlo FX becomes a versatile multi-mode dispenser with the addition of either the RAD™ technology for random access dispensing to 6- to 384-well plates or a wash module for 6- to 384-well plate washing. Fast, intuitive programming and operation are via the color touchscreen user interface. A MultiFlo FX configured with either RAD™ technology or the wash module replaces up to five liquid handlers.

## Parallel Dispense™ Technologies

Offering BioTek's unique combination of peristaltic and

microprocessor controlled syringe pump dispensing, the MultiFlo FX enables users to choose which is best for a specific reagent. While peristaltic pumps offer low prime volumes and backflush capabilities, BioTek's syringe drives are program-and-forget solutions that never require recalibration. Automated dispensing with walk-away confidence.

## Modular and Upgradable

The MultiFlo FX is configurable and upgradable from dispense or wash only, to a combined dispense and wash combination, with 1-to-4 reagent dispensing with peristaltic and/or syringe driven precision dispensers, or the addition of a RAD module for single channel and high volume dispensing. Purchase the modules required now, and upgrade in the future as assay needs change. With its compact footprint and base height of less than 8 inches, the MultiFlo FX

comfortably fits on any lab bench or robotic system. The MultiFlo FX is easily integrated with a BioStack™ Microplate Stacker for walk-away automation. For complete live cell workflow automation, MultiFlo FX can be integrated with the BioSpa™ 8 Automated Incubator.

## Versatile Applications - Liquid Handling

A wide array of plate type settings accommodates 6- to 1536-well plate formats up to 50 mm high for dispensing. Volumes from 500 nL  $\mu$ L to 3 mL are dispensed with accuracy and precision. The wash module works with 6- to 384-well plates in standard, half and deep well, and with cluster or mini-tubes. Automate cell-based assays by integrating MultiFlo FX with the new BioStack™ 4 to handle lidded plates with speed and ease.

## Typical Applications:

- ▶ Cell-based assays
- ▶ Primary and secondary screening assays
- ▶ Dispense/wash protocol automation
- ▶ Compound storage
- ▶ Genomics and proteomics research
- ▶ Magnetic bead assays
- ▶ ELISAs
- ▶ Multiplex assays
- ▶ Automated cell washing, fixing and staining for cellular imaging



## Specifications

General	
<b>Microplate types</b>	Dispensing (peri pump and syringe): 96-, 384- and 1536-well standard, deep and PCR plates 6-, 12-, 24- and 48-well plates (dispense tip configurable) Washing: 96-, 384-well standard plates; 6-, 12-, 24-, and 48-well plates (with compatible manifold)
<b>Onboard software</b>	Create, edit or run multiple protocols
<b>Software (pc control)</b>	LHC Software LHC Secure for 21 CFR Part 11 compliance (option) SILA Compliant driver (option)
<b>Shaking</b>	Programmable up to 60 minutes Slow, medium, fast or variable
<b>Soaking</b>	Programmable up to 60 minutes
<b>Automation</b>	BioStack™ and 3rd party automation compatible BioSpa™ 8 Automated Incubator compatible
Washing	
<b>Manifold types</b>	96- and 384-well washing: 8-tube manifold Custom manifolds available for 6-, 12-, 24-, 48-well washing
<b>Volume range</b>	20-30,000 µL/well
<b>Wash cycles</b>	1-10
<b>Supply bottle</b>	2 L
<b>Dispense accuracy</b>	±3%
<b>Dispense precision</b>	≤3% CV (96-/384-well plates; 300 µL/well) ≤5% CV (6-well plates; 5560 µL/well)
<b>Residual volume</b>	< 2 µL/well, 300 µL dispense, 0.1% Tween
<b>Wash speed</b>	96-wells, 8-tube manifold, >300 µL/well: <130 seconds
<b>Flow rates</b>	140 to 422 µL/well/second
<b>Sterilization</b>	Chemical
Dispensing - peristaltic pump (multi-channel)	
<b>Manifold types</b>	1 x 8 - sapphire jeweled 316 SS, 316 SS or polypropylene tips, with 1, 5 or 10 µL tubing
<b>Fluid delivery</b>	1 or 2 peristaltic pumps
<b>Dispense speed</b>	96 wells, 5 µL cass, 10 µL/ well: 3 seconds 96 wells, 5 µL cass, 20 µL/ well: 3.5 seconds 384 wells, 5 µL cass, 5 µL/ well: 6.5 seconds 384 wells, 10 µL cass, 10 µL/ well: 8 seconds 384 wells, 1 µL cass, 1 µL/ well: 6 seconds 1536 wells, 1 µL cass, 1 µL/ well: 21 seconds
<b>Volume range</b>	500 nL - 3,000 µL/well, selectable in 1 µL increments
<b>Flow rates</b>	User programmable rates from high to low
<b>Dispense performance</b>	1 µL: Recommended Volume Range: 1 - 50 µL Dispense Accuracy: ±5% at 1 µL Dispense Precision: ≤5% CV at 1 µL ≤10% CV at 500 nL Minimum Prime Volume: 0.78 - 1.20 mL 5 µL: Recommended Volume Range: 5 - 2,500 µL Dispense Accuracy: ±2.0% at 5 µL Dispense Precision: ≤2.5% CV at 5 µL Minimum Prime Volume: 2.75 - 4.23 mL 10 µL: Recommended Volume Range: 10 - 3,000 µL Dispense Accuracy: ± 2.0% at 10 µL Dispense Precision: ≤2.0% CV at 10 µL Minimum Prime Volume: 4.79 - 7.36 mL
<b>Recommended cassette replacement interval</b>	1 µL Cassette: 1,000 384-well microplates at 5 µL well 5 µL Cassette: 1,000 96-well microplates at 50 µL well 10 µL Cassette: 1,000 96-well microplates at 100 µL well
<b>Sterilization</b>	Autoclave, chemical

### Dispensing - syringe pump (multi-channel)

<b>Manifold types</b>	96- and 384-well dispensing: One 16-tube (2 x 8) manifold - 316 SS tubes Two 16-tube (1 x 16) manifolds - 316 SS tubes 1536-well dispensing: Two 32-tube (1 x 32) manifolds - sapphire jeweled 316 SS or 316 SS tubes 6- to 48-well dispensing: custom autoclavable manifolds available
<b>Fluid delivery</b>	Two positive displacement syringe drives
<b>Dispensing speed</b>	20 µL /well, 96 wells, 1 x 16 tubes: 5 seconds 20 µL /well, 384 wells, 1 x 16 tubes: 14 seconds 3 µL /well 1536 wells, 2 x 32 tubes: 7 seconds
<b>Volume range</b>	3 - 3,000 µL /well, selectable in 1 µL increments Minimum Prime Volume: 12 nL
<b>Flow rates</b>	User programmable rates from high to low
<b>Dispense accuracy</b>	±1 µL at 5 µL and 20 µL; ±1% at 100 µL
<b>Dispense precision</b>	≤5% CV at 5 µL; ≤2.5% CV at 20 µL; ≤1% CV at 100 µL
<b>Supply bottle</b>	1 L or 2 L
<b>Sterilization</b>	Chemical, autoclavable option

### Dispensing - RAD

<b>Labware types</b>	Single tip: 6-, 12-, 24-, 48-, 96-, 384-well plates; low profile standard height and deep well formats; PCR trays and microtubes 8-to-1 tip: 6-, 12-, and 24-well plates
<b>Manifold types</b>	RAD single, with plastic or steel tip with 1, 5 or 10 tubing, 7° angle RAD 8-to-1 plastic tip, with 5 µL tubing, angled bulk dispense chute
<b>Volume range</b>	500 nL - 30,000 µL
<b>Minimum prime volume</b>	1 µL cass, 18": 90 µL ; 1 µL cass, 30": 150 µL 5 µL cass, 18": 320 µL; 1 µL cass, 30": 530 µL 10 µL cass, 18": 555 µL; 10 µL cass, 30": 920 µL
<b>Dispense speed (high flow)</b>	1 µL cass, 1 µL/well: 19s (96 wells) 55s (384 wells) 1 µL cass, 10 µL/well: 33s (96 wells), 112s (384 wells) 5 µL cass, 5 µL/well: 19s (96 wells), 58s (384 wells) 5 µL cass, 100 µL/well: 76s (96 wells), 286s (384 wells) 10 µL cass, 10 µL/well: 21s (96 wells), 66s (384 wells) 10 µL cass, 100 µL/well: 70s (96 wells), 259s (384 wells)
<b>Dispense performance</b>	1 µL cass (med), 0.5 µL/well: Precision 10% CV 1 µL cass (med), 1 µL/well: Accuracy ± 10%, Precision 10% CV 1 µL cass (med), ≥2 µL/well: Accuracy ± 5%, Precision 5% CV 5 µL cass (high), 5 µL/well: Accuracy ± 4%, Precision 5% CV 5 µL cass (high), ≥10 µL/well: Accuracy ± 2%, Precision 2.5% CV 10 µL cass (high), 10 µL/well: Accuracy ± 4%, Precision 4% CV 10 µL cass (high), ≥20 µL/well: Accuracy ± 2%, Precision 2 %CV 8-to 1 cass(high), 40 µL/well: Accuracy ± 4% 8-to 1 cass (high), ≥10 µL/well: Precision 2.5%CV 8- to 1cass(high), ≥80 µL/well: Accuracy ± 2%

### Physical Characteristics

<b>Power</b>	100 - 240 Volts AC. 50/60 Hz
<b>Dimensions</b>	Base instrument: 17.19"W x 11.75" D x 8" H (43.51 x 29.21 x 20.32 cm)
<b>Weight</b>	Base instrument: 19.5 lbs (8.8 Kg)
Regulatory	
<b>Regulatory</b>	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# MicroFill™ Dispenser

**With its microprocessor-controlled syringe drive technology, the MicroFill™ Microplate Dispenser provides outstanding accuracy and precision while dispensing into 24-, 96- and 384-well plates.**

## Low Maintenance Design

The MicroFill is an economical, compact and reliable alternative to conventional microplate dispensers. Its microprocessor-controlled syringe pump provides optimal dispense performance without time-consuming recalibration, cassette replacement and maintenance. Syringes are ideal for higher volume filling, with noteworthy speed improvements compared to other dispense technologies.

## Guaranteed Sterility

The entire fluid path is autoclavable for applications requiring sterility. The MicroFill's pump, tubing, dispense manifold and supply bottle are quickly changed for no reagent carryover. User-controlled dispense flow rates allow low- to high-velocity dispensing for both biochemical and cell-based assays. Low-profile, standard and deep well microplates are all accommodated with a broad volume range from 5  $\mu$ L to 6 mL.

## Unattended Operation

For increased throughput, the MicroFill can be integrated with BioTek's BioStack™ Microplate Stacker or interfaced to third party automated systems with its available interface software. MicroFill drivers are available from most of today's leading system providers.

## Typical Applications:

- ▶ Primary and secondary screening assays
- ▶ Compound storage
- ▶ Genomics and proteomics research
- ▶ Cell-based assays
- ▶ ELISAs





## Specifications

General	
Microplate types	24-, 96- and 384-well Low profile, standard and deep well formats
Other labware supported	PCR tubes, microtubes
Onboard software	Create, edit or run multiple protocols
Software (pc control)	Interface software (optional) for robotic system integration
Shaking	Programmable up to 60 minutes Slow, medium, fast or variable
Soaking	Programmable up to 60 minutes
Automation	BioStack™ and 3rd party automation compatible
Dispensing - syringe pump (multi-channel)	
Manifold types	924-well dispensing: One 8-tube (1x8) manifold - 316 stainless steel tubes 96-well dispensing: One 8-tube (1x8) manifold - 316 stainless steel tubes 96-/384-well dispensing:
Dispense speed	96 wells, 10 µL/well, 1 x 16: 4 sec 384 wells, 5 µL/well, 1 x 16: 7 sec
Volume range	5 - 6000 µL/well (manifold dependent) Minimum Prime Volume: 10 mL
Flow rates	User programmable rates from high to low
Dispense accuracy	±1 µL at 5 µL and 20 µL ±1% at 100 µL
Dispense precision	≤5% CV at 5 µL ≤2.5% CV at 20 µL ≤1% CV at 100 µL
Supply bottle	1 L
Sterilization	Autoclave, chemical
Physical Characteristics	
Power	100 - 240 Volts AC. 50/60 Hz
Dimensions	18" D x 15" W x 7"H (46 cm x 38 cm x 18 cm)
Weight	20 lbs (8.9 kg)
Regulatory	
Regulatory	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.



# Dispenser Comparison Chart

## Which Dispenser is right for you?

EL406™

Key Features	
ELISA	•
Cell-based assays	•
Number of reagents	1 to 3
Dispense technology	Peristaltic and/or Syringe
Fully modular and upgradable	•
Performance Specifications	
Dispensing speed	
Peristaltic pump (8-tip, 1x8)	
96-well, 10 µL/well; 384-well, 5 µL/well	3 sec; 6 sec
Syringe pump (16-tube, 1x16)	
96-well, 20 µL/well; 384-well, 20 µL/well	5.25 sec; 14 sec
Dispense accuracy - typical at 5 µL	
Peristaltic pump	±2%
Syringe pump	±1 µL
Dispense precision - typical at 5 µL	
Peristaltic pump	≤2.5% CV
Syringe pump	≤5% CV
General Specifications	
Microplate types	96, 384 and 1536
Low profile and standard height	•
Deep well	
Strips and full plates	•
Cassette/manifold	
RAD cassettes	
Peristaltic pump	8-tip (1x8)
Syringe pump, 6-well to 384-well dispensing	
Syringe pump, 96-well to 1536-well dispensing	8-tube (1x8)
Automation ready/BioStack™ compatible	•
Variable flow rates	•
Volume range	1 - 3,000 µL/well
Microplate shaking	•
Autoclavable fluid path	•
Onboard software included	•
Liquid Handling Control™ Software compatible	•



<i>MultiFlo™ FX</i>	<i>MicroFill™</i>
•	•
•	•
1 to 4	1
Peristaltic and/or Syringe	Syringe
•	
3 sec; 6 sec	
5.25 sec; 14 sec	4 sec; 7 sec
±2%	
±1 µL	±1 µL
≤2.5% CV	
≤5% CV	≤5% CV
6 to 1536	24, 96 and 384
•	•
•	•
•	•
•	
8-tip (1x8)	
•	8-tube (1x8)
	8-tube (1x8)
•	•
•	
1 - 30,000 µL/well	5 - 6,000 µL/well
•	
•	•
•	•
•	

# Liquid Handling Control™ Software

Liquid Handling Control™ (LHC™) Software allows MultiFlo™ FX Dispenser, EL406™ Washer Dispenser and 405™ Touch and 405 LS Washer users the convenience of programming important assay-specific protocol requirements in a Windows® environment.

## Expanded Versatility

LHC Software is a powerful yet flexible interface for use with BioTek's microplate dispensers and washers. Any programming sequence possible onboard the liquid handler may be duplicated from the computer with LHC Software. LHC also allows a virtually unlimited number of methods to be linked together for the most complex liquid handling routines. From a washer's first prime routine, multiple microplate processes over time, ultrasonic cleaning to dissolve protein or salt crystal build-up to a final system rinse, LHC Software enables unattended operation.

## 21 CFR Part 11 Compliance

To meet the demands of the GxP laboratory, LHC Secure offers features to ensure compliance to 21 CFR Part 11. Flexible multi-user permission levels and electronic protocol and system audit trail signing are all available whenever additional security is required.

## Custom Maintenance Reminders

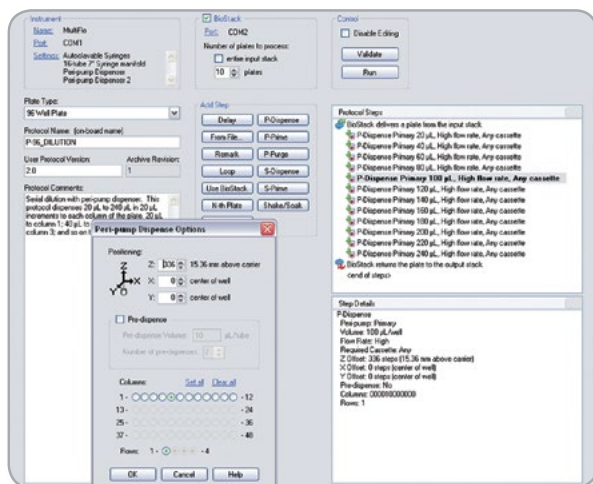
To facilitate maintenance and keep a washer or dispenser in peak condition, factory recommended maintenance procedure reminders can be preset and customized appropriately for a busy laboratory's usage and throughput requirements. LHC also supports BioStack™ Microplate Stacker and BioSpa™ Automated Incubator integrations.

## Safe Record Keeping

Protocol parameters may be quickly printed for safe record keeping. Alternatively, onboard instrument protocols may be uploaded and backed up on a laboratory's network. Satellite research labs working on joint projects can be certain their wash parameters are identical for experimental integrity.

## SiLA Compliant Drivers

For automated systems that require SiLA compliant integration, LHC SiLA is available.



Intuitive StepWise™ protocol creation for ultimate flexibility



# Washer & Dispenser Accessories

BioTek offers a wide range of accessories to help increase productivity, expand your plate washer's and dispenser's capabilities, and maintain the performance of your BioTek microplate liquid handling system. See our web site for a complete listing of available accessories.



## Peristaltic Pump Dispenser Cassettes

A wide selection of peristaltic pump cassettes are available with choices in volume ranges, tip materials and bore sizes for use with EL406™ and MultiFlo™ FX.



## BioStack™ Microplate Stacker

Automate routine processes with this compact stacker.



## BioSpa™ 8 Automated Incubator

BioSpa 8 is an automated incubator linking BioTek readers or imagers together with washers and dispensers for full workflow automation of up to 8 microplates.



## Dispense/Waste Systems

A dispense/waste system is required on all 405™ Touch, 405 LS and EL406 models. Many selections are available based on throughput, bottle size and vacuum pump requirements.



## Syringe Pump Dispenser Manifolds

A range of MultiFlo FX and MicroFill™ dispense manifolds are available for various microplate types and reagent characteristics.



## 3-Instrument Rack

For third party robotic system integration, a rack is available for supporting up to three dispensers or other BioTek instrumentation.



## Instrument Qualification

See the Compliance Section on pages 62-63 for details about BioTek's product qualification tools and services.

# Precision™ Microplate Pipetting Systems

**The Precision™ is an innovative solution for automated liquid handling. With its ability to perform virtually any routine liquid transfer, Precision replaces tedious manual pipetting.**

## **Automate Manual Pipetting**

The Precision can be customized with a range of options perfect for medium throughput labs looking to automate their everyday pipetting with walk-away confidence. BioTek's proprietary pipette technology and unique tip sealing allow most standard tips to be used for transfers in common sample tubes and 6- to 384-well microplate formats.

## **Open Deck Layout and Flexible Software**

A user-configurable, multi-station deck allows for flexible experimental design; microplates, tips and other labware may be placed in nearly any location for optimal efficiency. Available Precision Power™ Software offers complete Precision control with intuitive protocol creation, expanding the instrument's dynamic capabilities with a graphical program simulator and sample ID tracking.

## **Space Saving, Compact Footprint**

Its small footprint and well-organized design make the Precision ideally suited for installation inside standard size biological safety cabinets and chemical fume hoods. The Precision XS model delivers outstanding liquid handling performance with four liquid transfer tools on a single platform. All four may be intermixed throughout a fully automated protocol – single and multi-channel pipetting along with single- and multi-channel bulk reagent dispensing.

## **Typical Applications:**

- ▶ Sample transfers from tube to microplate
- ▶ Serial dilutions
- ▶ Mixing
- ▶ Plate replication - mother/daughter transfers
- ▶ Reagent addition
- ▶ Hit picking
- ▶ ELISA automation
- ▶ Secondary screening assays
- ▶ Compound profiling
- ▶ Cell-based assays





## Specifications

General	
<b>Microplate types</b>	Precision XS: 6-to 384-well microplates,  Precision: 96- and 384-well microplates
<b>Other labware supported</b>	Test tubes <100 mm
<b>Onboard software</b>	Precision: Create, edit or run multiple protocols Precision XS: Computer control only
<b>Software (pc control)</b>	PrecisionPower Software
<b>Automation</b>	BioStack™ and 3rd party automation compatible (except 1 x 12 pipetting)
<b>Platform</b>	Precision XS: 6 stations Precision: 1x8, 6 stations; 1x12, 4 stations
Dispensing - Syringe Pump	
<b>Manifold types</b>	Precision XS: 96-/384-well dispensing: One 8-tube (1x8) manifold - 316 SS tubes 6- to 384-well dispensing: One single-channel probe  Precision: One 8- (1x8) and/or 12-tube (1x12) manifold - 316 SS tubes
<b>Dispense speed</b>	Precision XS: 100 µL/well, 96 wells, 1x8: 14 seconds 100 µL/well, 96 wells, single-channel: 4 minutes  Precision: 100 µL/well, 96 wells, 1x8: 14 seconds
<b>Volume range</b>	Precision XS: 1x8: 10 µL - 10 mL Single-channel: 5 µL - 10 mL  Precision: 10 µL - 10 mL
<b>Dispense accuracy</b>	±1% at 100 µL
<b>Dispense precision</b>	≤1.5% CV at 100 µL
<b>Supply bottle</b>	2 L; 2 L and 125 mL (Precision XS)
<b>Sterilization</b>	Autoclave, chemical

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

Pipetting	
<b>Manifold types</b>	Precision XS: 1x8, single channel Precision: 1x8, 1x12 (configuration dependent)
<b>Pipetting speed</b>	Precision XS: 1x8: 100 µL/well, 96 wells, tip change: 3 min Single-channel: 100 µL/well, 96 wells, tip change: 22 min  Precision: 1x8: 100 µL/well, 96 wells, tip change: 3 min
<b>Volume range</b>	Precision XS: 1x8: 5 - 120 µL Single channel: 5 - 200 µL  Precision: 5 - 120 µL
<b>Fluid delivery</b>	Air displacement syringe drives
<b>Dispense accuracy</b>	±1% at 100 µL
<b>Dispense precision</b>	≤1.5% CV at 100 µL
<b>Pipette tips</b>	BioTek and other commercially available tips
Physical Characteristics	
<b>Power</b>	100 - 240 Volts AC. 50/60 Hz
<b>Dimensions</b>	Precision XS Instrument only: 25" W x 16" D x 20" H (640 x 410 x 510 mm ) Instrument with optional cabinet: 30" W x 20" D x 22" H (760 x 510 x 560 mm)  Precision Instrument only: 21" W x 15" D x 16" H (525 x 374 x 400 mm) Instrument with optional cabinet: 23" W x 17.5" D x 17.5" H (575 x 435 x 435 mm)
<b>Weight</b>	Precision XS: Instrument only: 40 lbs (18 kg) Instrument with optional cabinet: 64 lbs (29 kg)  Precision: Instrument only: 28 lbs (12.7 kg) Instrument with optional cabinet: 38 lbs (17.2 kg)
Regulatory	
<b>Regulatory</b>	CE and TUV marked. ROHS compliant. In Vitro Diagnostic use models are available.

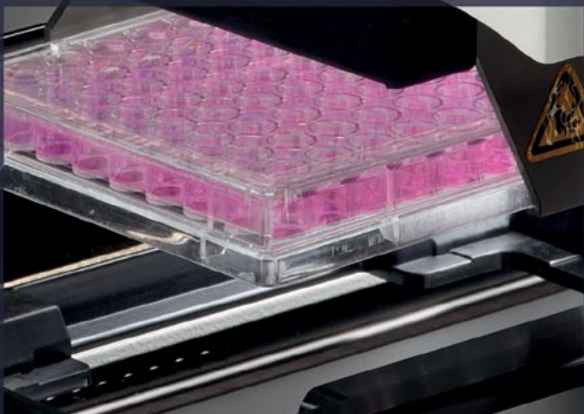




*"This stacker is very simple to program and operate through a PC based software. It is a very reliable machine. Its open format allows for easy cleaning and maintenance and the release mechanism is up front and easily accessible for rapid removal and installation of the stacks."*

*(BioStack Microplate Stacker)*

# Robotics



**BIOSPA|8**  
automated incubator

Automation products provide speed, flexibility, consistent results and unattended operation when configured with BioTek's line of microplate imagers, readers, washers and dispensers. The result is a scalable, cost-effective system that can adapt to your changing requirements. The latest innovation in BioTek's line of automation products, the BioSpa™ 8 Automated Incubator, is designed to automate cell-based assay workflows in a controlled and monitored environment.

# BioSpa™ 8 Automated Incubator

**BioTek's new BioSpa™ 8 automates incubated assay workflows by moving and storing microplates containing live cells or temperature sensitive reagents. More versatile than a benchtop incubator, BioSpa 8 manages up to 8 microplates, flasks, or cell culture dishes in a CO<sub>2</sub>/O<sub>2</sub>, temperature and humidity monitored environment. Integrated with BioTek's washers, dispensers, imaging and detection systems, BioSpa 8 manages the entire process from sample preparation to detection or imaging in one compact system.**

## **Environment control and monitoring leads to cell assay success**

BioSpa 8 offers incubation to 45 °C, CO<sub>2</sub>/O<sub>2</sub> control and monitoring, plus humidity monitoring – everything a successful live cell assay needs.

## **Biosafety cabinet compatible**

BioSpa 8 is designed to help protect against contamination, with a HEPA filter for incoming air and an interior that is easily cleaned and decontaminated. For the ultimate protection against potential contamination, BioSpa 8 is compact – it fits within a biosafety cabinet along with integrated washer, dispenser, imager or plate reader.

## **Full workflow automation integrates sample prep**

BioSpa 8 automates processes that commonly burden many labs working with live cells; inconvenient culture maintenance requirements, contamination hazards and handling multiple instruments required for both sample plate preparation and downstream processing. BioSpa 8 handles from 1 to 8 plates, moving them between the integrated washer or

dispenser and imaging system or multi-mode reader for complete, unattended process automation.

## **Continuous recording and monitoring with notifications**

BioSpa 8 continuously monitors and records important workflow parameters, and can automatically send text or email notifications. BioSpa 8 provides confidence and control for unattended automation.

## **Simple integration for rapid implementation**

BioSpa 8 is compatible with several BioTek imaging and multi-mode readers, plate washers, dispensers and combination systems. The simple integration doesn't require specialized tables or other hardware or software, and BioSpa 8 is compact enough to be used in a biosafety cabinet for critical live cell assays.

## **Typical Applications:**

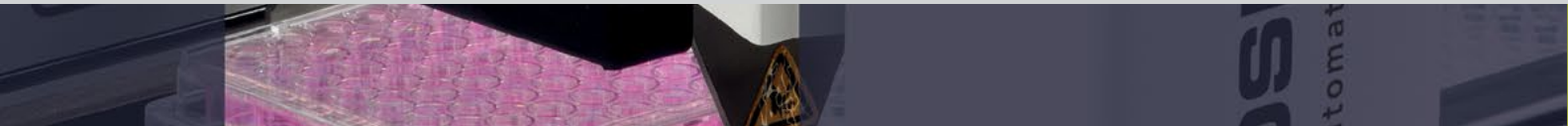
Automated sample preparation for cell based assays

- ▶ Drug Absorption

Automated sample preparation for cell based assays

- ▶ Cell Culture QC
- ▶ Cell Proliferation
- ▶ Apoptosis
- ▶ Cytotoxicity
- ▶ 3D Cell Culture
  - ▷ Tumor Invasion
  - ▷ Signal Transduction
  - ▷ Stem Cell Differentiation
  - ▷ Phenotypic Assays
- ▶ Cell Migration and Invasion
- ▶ Fluorescent Protein Detection
- ▶ RNA Expression





## Specifications

General	
Microplate types	6- to 1536-well standard height microplates, with or without lids. Plate height range: 7.6 mm to 25.4 mm
Other labware supported	Petri and cell culture dishes (35 mm and 60 mm), T25 flasks
Plate capacity	Up to 8 microplates
Air filter	User-replaceable HEPA filter
Decontamination:	Easy interior access for cleaning and decontamination.
Plate handler	Robotic arm moves plate to and from BioSpa 8 and connected instrument; handles de-lidding and re-lidding plates.
Dimensions	27.2" W x 20.1" D x 18.9" H 69 cm W X 51 cm D x 48 cm H
Compatible BioTek instruments	Cytation 5, Cytation 3, Synergy Neo2, Synergy H1, Epoch 2 EL406, 405 TS, 405 LS, MultiFlo FX, MultiFlo
Interfacing capacity	1 or 2 devices: Reader/imager only, washer/dispenser only, or both
Temperature Control	
Range	To 45 °C
Control resolution	0.1 °C
Uniformity	± 0.5 °C at 37 °C
CO <sub>2</sub> Control	
Range	1 – 19%
Control resolution	±0.1%
Stability	±0.2 at 1% O <sub>2</sub>
O <sub>2</sub> Control	
Range	1 – 19%
Control resolution	±0.1%
Stability	±0.2 at 1% O <sub>2</sub>
Humidity	
rH	80 to 95% (lidded plates and 5% CO <sub>2</sub> )
Source	Removable water pan
Water level sensor	Low water level alert
Software	
BioSpa Automated Incubator Software	<ul style="list-style-type: none"> <li>• Provides programming interface for BioTek detection and liquid handling devices</li> <li>• Allows user notification (text or email) of events and/or errors in the system</li> <li>• Provides control, monitoring and logging of:               <ul style="list-style-type: none"> <li>- CO<sub>2</sub>/O<sub>2</sub></li> <li>- temperature control</li> </ul> </li> <li>• Provides humidity level monitoring and logging</li> <li>• Allows long-term uninterrupted runs up to 2 weeks</li> </ul>
Regulatory	
Regulatory	CE and TUV marked, RoHS compliant.

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.

# BioStack™ Microplate Stacker

**BioStack™ is a compact and versatile microplate stacker compatible with BioTek's microplate washers, dispensers, pipetting, detection and imaging systems. BioStack is easy to use and provides walk-away automation for routine processes, including processes requiring plate de-lidding and re-lidding.**

## Ultra Fast Transfer Speeds

BioStack offers the fastest plate transfer time, taking less than 10 seconds to remove and replace plates on the instrument carrier. BioStack is well-suited for high throughput plate stacking requirements with BioTek readers, washers and dispensers.

## Plate De-lidding

Many cell-based microplate processes require lidded plates during incubation and to protect

sterility. Typically, automation of these processes meant purchasing an expensive microplate handler to de-lid the plates for measurement or liquid handling operations. BioStack now offers an affordable option for plate de-lidding in the BioStack 4 model to interface with BioTek's detection and liquid handling instruments.

## Multiple Microplate Geometry Compatible

BioStack is compatible with standard 96- and 384-well plates, low volume 384-well plates and 1536-well plates. The BioStack 4 adds 24- and 48-well plates to its menu of compatible microplate labware, providing higher throughput in a walk-away system for a variety of microplate geometries. An available barcode scanner provides additional automation for high-throughput plate processing.

Plate IDs are read and sent to the plate data file in Gen5™ or LHC™ Secure software for storage or export.

## 10-, 30- or 50-Microplate Stacks

Choose between 10-, 30- or 50-plate stacks to best suit your throughput requirements. Low volume, half-height plates are also compatible, with up to 75-plates capacity in the 50-plate stack.

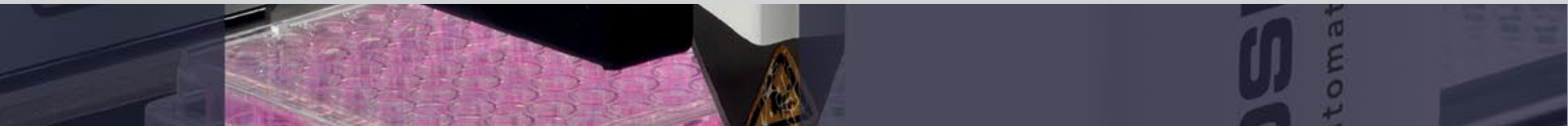
## Compact, Rugged Design

BioStack allows worry-free operation, even under the heaviest usage. The motors, mechanical assemblies and software are all designed for long term, continuous use and maintenance-free use. The rotational gripper and very small footprint allows for integration position versatility and for optimal fit within a biosafety enclosure or for space-savings on the benchtop.

## Typical Applications:

- ▶ Cell-based assays
- ▶ ELISAs
- ▶ Primary screening assays
- ▶ Colorimetric, fluorometric and luminescent assays





## Specifications

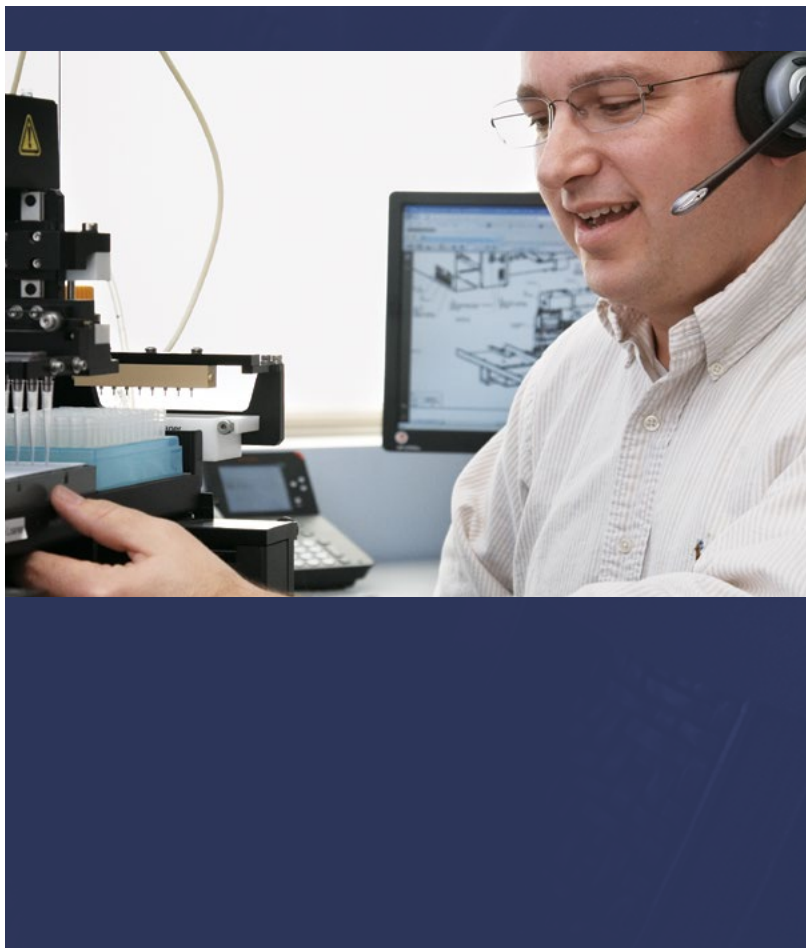
### BioStack 4

### BioStack 3 • BioStack Neo • BioStack

General		
<b>Microplate types</b>	ANSI/SLAS Standard and low profile 96-, 384- and 1536-well plates 24- and 48-well plates (model dependent) Maximum plate height 23.2 mm	ANSI/SLAS Standard and low profile 96-, 384- and 1536-well plates Maximum plate height 14.6 mm
<b>Lidded plate handling</b>	De-lidding capability: (lids always removed during processing) 96-,384-, and 1536-well plates. Maximum height, including lids:16.9 mm  Nunc plates: (lids can remain on plate during process, or can be removed) 6-, 12-, 24-, 48- well plates. Maximum height, including lids: 23.2 mm	n/a
<b>Microplate capacity</b>	10 and 30 plate stacks are removable and interchangeable (50-plate stacks may be used with non-lidded plates only)  96-/384-well plates: Up to 30 plates (with lids) 1536-well plates: Up to 75 plates	10-, 30- and 50-plate stacks are removable and interchangeable  96-/384-well plates: Up to 50 plates 1536-well plates: Up to 75 plates
<b>Barcode scanner (option)</b>	Landscape or portrait orientation, Code 39, Codabar, UPC/EAN, Code 128 compatible	Landscape or portrait orientation, Code 39, Codabar, UPC/EAN, Code 128 compatible 1D and 2D barcodes (BioStackNeo)
<b>Processing speed (plate exchange time)</b>	<20 seconds (with de-lidding) <12 seconds (without lids)	<10 seconds: BioStack 3, BioStack Neo <33 seconds: BioStack
<b>Direct control</b>	Washers and dispensers with keypad interface can directly control BioStack	Washers and dispensers with keypad interface can directly control BioStack
<b>PC software</b>	LHC2 for liquid handling instruments (optional) Gen5 2.0 for readers	LHC2 for liquid handling instruments (optional) Gen5 2.0 for readers
Physical Characteristics		
<b>Power</b>	100 - 240 Volts AC. 50/60 Hz.	100 - 240 Volts AC. 50/60 Hz.
<b>Weight</b>	<25 lbs (11.3 kg)	<25 lbs (11.3 kg)
<b>Dimensions</b>	8.3" W x 22" D (21 x 56 cm)  Overall height will vary depending on connected instruments and stacks used	BioStack and BioStack Neo 7.4" W x 20.7" D (18.8 x 52.6 cm)  BioStack 7" W x 18.5" D (18 x 47 cm) Overall height will vary depending on connected instruments and stacks used
Regulatory		
<b>Regulatory</b>	CE and TUV marked. ROHS Compliant.	

Specifications are subject to change. Performance values represent the average observed factory test values. See [www.biotek.com](http://www.biotek.com) for a complete list.





*"BioTek is great. The BioTek engineer is very professional, helpful, knowledgeable, and flexible."*

# Service & Support



Our teams are committed to providing the service and support you need to sustain the optimal performance of your BioTek products. BioTek Service Engineers provide personal support for instrumentation, software, parts and applications at our Global Technical Support Center. BioTek Scientists, Engineers, Technicians and Sales Representatives provide valuable assistance to laboratories worldwide.

As an ISO certified manufacturer, BioTek understands the importance of standardized product qualification procedures and traceability and provides a number of tools and services designed to streamline the process and minimize the resources required to perform such testing.



## **21 CFR Part 11 Compliance Products**

**Gen5™ Secure** Data Analysis Software for microplate readers and **LHC™ Secure** protocol definition and control software for BioTek's microplate washers and dispensers are uniquely designed to help ensure compliance to 21 CFR Part 11. Both software programs offer important security features, including:

- ▶ Electronic signature of data and protocol files
- ▶ Secure data storage
- ▶ Multiple and definable user permission levels
- ▶ Data and protocol audit trails
- ▶ Protected functions

### **IVD Compliance**

Many BioTek microplate instruments are labeled for In Vitro Diagnostic use, identified by the IVD logo. Other products may have IVD

**IVD** Compliant models available. Contact CustomerCare at [CustomerCare@biotek.com](mailto:CustomerCare@biotek.com) for more information.

## **Product Qualification**

### **Software Validation**

A Validation Package is available for Gen5 Software to allow testing and validation of key functions within Gen5 and Gen5 Secure. Included in the easy-to-use package are:

- ▶ Test Plans
- ▶ Results Checklists
- ▶ Data sets



### **Instrument IQ/OQ/PQ Packages**

BioTek offers a complete menu of Product Qualification Packages for all of our microplate instruments. All product Qualification Packages are fully validated to assure that the procedures and associated data/spreadsheets supplied in the package meet regulatory requirements. Within each package, you'll find detailed:

- ▶ Product Specifications
- ▶ Qualification interval guidelines
- ▶ IQ/OQ/PQ test plans and procedures
- ▶ Data sets (where applicable)
- ▶ Qualification checklists and log sheets for complete documentation

### **RoHS2 Directive 2011/65/EU**

BioTek is committed to helping protect the environment in all of our customers' countries. BioTek products that meet the RoHS directive are indicated in the Regulatory section of the product specifications in this catalog.



## **Test Plates**

The use of standardized plates to supplement the verification of an instrument's performance is a time- and resource-saver in most laboratory environments. BioTek offers several test plates to facilitate the test procedures found in our microplate reader IQ/OQ/PQ packages, and can be automated through the Gen5 software.

### **Absorbance Test Plates**

For use with the ELx800, ELx808, Epoch 2, Epoch, PowerWave HT, Synergy and Cytation multi-mode reader absorbance modes. Ensure GxP compliance by checking instrument performance against specifications for:

- ▶ Accuracy
- ▶ Repeatability
- ▶ Linearity
- ▶ Wavelength accuracy (for monochromator-based systems)

### **Fluorescence Test Plates**

Ideal for quick checks of the fluorescence intensity detection system between more thorough instrument qualification. The Fluorescence Test Plate aids in maintaining GxP compliance by automatically checking a series of critical performance parameters, including:

- ▶ Alignment
- ▶ Cross talk
- ▶ Signal-to-noise ratio
- ▶ Linearity
- ▶ Precision

### **Luminescence Test Plates**

This NIST-traceable Luminescence Test Plate is used with the applicable Product Qualification Package or updated User's Manual. Features include:

- ▶ NIST-traceability certificate guarantees a controlled light output from the test plate
- ▶ Simple design, easy to use: just turn the plate on, and read the ultra-stable, low light level LEDs

**Test Plate Recertification Programs are available. Contact BioTek Service for details. [www.biotek.com/contact](http://www.biotek.com/contact)**

At BioTek, our customers' applications come first. Whether it's our existing or new products in development, we design in capabilities to enable your most important applications. To facilitate this process, BioTek has an on-site Applications Lab with a team of seasoned scientists continuously working on cutting-edge scientific applications and partnering with the best-known reagent and consumable vendors. Below are some examples of hot application areas where we have demonstrated the utility of our products.



### 3D Cell Culture

- ▶ Signal transduction in a collagen-based scaffold
- ▶ Long term toxicity in liver microtissues
- ▶ Methods development for spheroid formation in hanging drop plates
- ▶ Automation of 3D cell culture work flows
- ▶ Cell invasion assays using spheroids formed in ULA microplates

### Phenotypic Assays and Screening

- ▶ Hypoxia assays in keratinocytes and spheroids
- ▶ Oxidative stress assays for ROS production
- ▶ Cell cycle using nuclear stains and sensors

- ▶ Mitochondrial oxidative stress and apoptosis
- ▶ Autophagy and lysosomal disorder assays

### Live Cell Assays

- ▶ RNA quantification using fluorescent nanoprobes
- ▶ Multiplexed second messenger assays ( $\text{Ca}^{2+}$ , cAMP, diacylglycerol,  $\text{PIP}_2$ ) using genetically engineered probes
- ▶ Cell invasion and migration in FluoroBlok microplates
- ▶ Automation and analysis of drug absorption in Caco-2 and MDCK cells
- ▶ Characterization of multi-drug resistance transporters

### Biologics/Biosimilars

- ▶ ADCC assays using non-radiometric detection and freshly isolated NK cells, cryopreserved NK cells, an NK cell line and a bioluminescent cell reporter
- ▶ Immunogenicity assays with AlphaLISA beads
- ▶ Bridging assay comparisons between solution ELISA and AlphaLISA

- ▶ Cell-based assays for blocking antibodies
- ▶ Aggregation assay using a molecular rotator-type fluorescent probe

### Food Safety and Quality

- ▶ Food freshness assay based on ATP depletion
- ▶ Determination of E coli and other pathogens in lettuce wash
- ▶ Antioxidant potential using an ORAC Assay
- ▶ Semi-automated ELISA assay for melamine in milk
- ▶ Analysis of histamine in wine

### Biofuel Research

- ▶ Determination of algal cell lipids using Nile Red
- ▶ Monitoring algal growth using their intrinsic properties
- ▶ Enzymatic digestion of polysaccharides
- ▶ Identification of biofuel producing bacteria through temperature resistance
- ▶ Monitoring enzymatic glucose production from cellulosic feedstock

**More than 2,600 BioTek application notes, white papers, poster presentations, citations and sample files are available at:**  
[www.biotek.com/resources](http://www.biotek.com/resources)



Extend the life of your BioTek instrument, and protect your research results, with BioTek's service professionals. Our service experts in the field and at our regional service centers receive extensive, ongoing training at our headquarters to stay abreast of the latest products, and service techniques. Our products and services are compliant with FDA, GLP and ISO requirements. With all of this information at hand, our service experts help you to maintain precise results over the life of your BioTek instrument while providing an experience that is superior to our competition.

For any service or support need, contact us at [TAC@biotek.com](mailto:TAC@biotek.com) or (888) 451-5171.



### Field Service

Our team is ready to visit your laboratory and provide:

- ▶ Installation, Training and Installation Qualification
- ▶ Operational Qualification
- ▶ Preventive Maintenance
- ▶ Instrument Upgrades and Software Upgrades
- ▶ Repairs

### Regional Service Centers

BioTek Service Centers are located across the globe ready to service your BioTek products:

- ▶ Test Plate Certification
- ▶ Preventive Maintenance
- ▶ Instrument Upgrades
- ▶ Dispense Cassette Refurbishment

### Technical Assistance Center (TAC)

BioTek's TAC is staffed with skilled scientists and engineers available to provide technical assistance for instrumentation, software and applications.

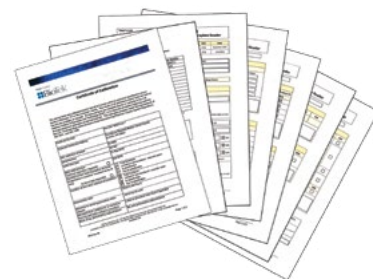
### Customer Resource Center (CRC)

BioTek's Customer Resource Center gives customers access to information about their specific BioTek microplate instrumentation and software. This web site makes it easy for customers to acquire relevant and necessary information about their products.

Customers can:

- ▶ Track orders
- ▶ Maintain equipment inventory
- ▶ Access warranty information
- ▶ Download technical information, user manuals and software updates
- ▶ Request service and technical support

Access to BioTek's Customer Resource Center and more details on BioTek's service and support are available at [www.biotek.com](http://www.biotek.com)



BioTek Preventive Maintenance Service includes a certificate of calibration for every instrument.

### Third party customer satisfaction survey excerpts:

*"I was discussing with a colleague after the help BioTek provided how competent and willing to help BioTek has always been. Because you guys are willing to just sort out problems, even with old equipment, you have a loyal customer base. I have and will continue to buy BioTek products wherever I work. So, thanks, we look forward to continued positive interactions with BioTek."*

*"BioTek provided the best customer service. Service was able to listen to my problem and resolve it very quickly. I am very pleased by the level of service I received. I actually enjoy calling BioTek"*

*"Working with BioTek is really Awesome. I get my answer quickly, A high level of follow up. Always good results. Just keep it like this."*





BioTek is a family-run organization founded in 1968. In 1981 BioTek entered the microplate instrument arena and introduced its first microplate reader. Since then, BioTek has emerged as a global leader in microplate-based solutions that increase the productivity for customers engaged in healthcare, pharmaceutical, agricultural and research applications. Today, BioTek is completely focused on microplate instrumentation, automation and software. Our products continue to be designed and manufactured in Vermont, U.S.A.

**1968 - 79** ◀  
BioTek develops, manufactures and sells biomedical testing equipment

▶ **1969**  
BioTek moves to its first facility located on East Spring Street, Winooski, VT

**1980** ◀  
BioTek's first laboratory instrument, the EL307 EIA, is launched

BioTek moves to Burlington, VT

**1983** ◀  
BioTek awarded U.S. patent for EL307's microwell position indicator



▶ **1982**  
EL307B microplate reader introduced by BioTek



**1987** ◀  
BioTek introduces the EL320 Stacking Automated Reader for automatic reading of up to 25 plates

▶ **1988**  
BioTek introduces the EL311 and EL312 Microplate Readers, EL403 Automated Microplate Washer, the EL301 Manual Strip Reader for field use, and Kineticalc PC Software



**1968 - 1979**

**1980 - 1985**

**1986 - 1990**

**1984** ◀  
BioTek's first Automated Microplate Reader, the EL310, the EL308 Microplate Reader and the first Microplate Washer, the EL402, are introduced

▶ **1985**  
BioTek introduces the EL309 Microplate Reader, and the EL401 Microplate Strip Washer

BioTek moves to current location in Winooski, VT

**1989** ◀  
EL340 Biokinetics reader, EL944 Turbo Software for EL311 and EL312 clinical data reduction and the ELP-35 Automated Strip Washer are introduced by BioTek



**1991** ◀

Kineticalc II software is introduced by BioTek

BioTek begins development of Omni System for automated high throughput infectious disease diagnostics and screening



▶ **1992**

Ceres 900 launched by BioTek

BioTek enters into an agreement with Immucor, Inc, to develop the first automated blood typing and crossmatching analyzer, the ABS2000



**1996** ◀

BioTek receives ISO9001 certification



BioTek introduces ELx808

**1998** ◀

μQuant and PowerWaveX Microplate Spectrophotometers and KCJunior software are introduced by BioTek



▶ **1997**

BioTek introduces the PowerWave, our first Microplate Spectrophotometer, the FL600 Multi-Detection Reader, the ELx50 Microplate Strip Washer and KC4 Data Reduction Software



**2001** ◀

Powerwave HT, MicroFill are launched by BioTek



▶ **2002**

BioTek sells Biomedical division to focus solely on Laboratory Microplate business

BioTek opens European Coordination Center in Germany

BioTek launches Synergy HT, PowerWave XS, BioStack



1991 - 1995

1996 - 2000

2001 - 2005

**1993** ◀

BioTek launches ELs1000 automated ELISA system

▶ **1994**

BioTek introduces the FL500 Fluorescence Microplate Reader and ELP-40 Microplate Strip Washer



**1995** ◀

ELx800 Microplate Reader, EL404 Microplate Washer, and KC3 for Windows data analysis software are introduced by BioTek



**1999** ◀

BioTek launches FLx800, ELx405, ELx405M



BioTek awarded U.S. patent for the ELx405 "Dual-Action" manifold

BioTek awarded U.S. patent for the quartz BioCell cuvette for fixed 1 cm vertical photometry

▶ **2000**

Precision 2000 Microplate Sample Processor and Precision Power Software introduced by BioTek



**2003** ◀

BioTek enters into an agreement with UVM and Immucor, Inc to develop a practical fluorescence based platelet assay for determining platelet activation

▶ **2004**

Precision XS, Clarity introduced by BioTek



**2005** ◀

BioTek launches its customer newsletter, TekTalk

BioTek finalizes an agreement with Immucor to develop the next generation blood typing and cross matching instrument, the Galileo Echo



**2006** ◀  
Synergy 2,  
NanoQuot, Gen5  
software are  
launched by BioTek



**2008** ◀  
BioTek launches  
MicroFlo Select,  
EL406



▶ **2007**  
BioTek opens China,  
India, Singapore  
offices

Synergy 4, Liquid  
Handling Control  
software are  
introduced by BioTek

BioTek launches  
online Customer  
Resource Center

**2011** ◀  
BioTek opens  
South Korea office

BioTek introduces ELx405  
Select Deep Well, Eon,  
Gen5 version 2.0



▶ **2012**  
405 Touch, Synergy Neo,  
BioStack3, Gas Controller  
for Synergy H1, 405 LS are  
launched by BioTek



BioTek opens Shanghai office

Web site offers content  
in 10 languages

**2015** ◀  
BioTek launches  
Synergy Neo2



BioTek introduces  
BioSpa 8



BioTek expands  
in the UK

**2006 - 2010**

**2011 - 2014**

**2015**

**2009** ◀  
Epoch, Take3, Synergy Mx  
are introduced by BioTek



BioTek is awarded  
Best Place to Work in  
Vermont from VT Business  
Magazine and Business  
of the Year from the Lake  
Champlain Regional  
Chamber of Commerce

BioTek launches multi-  
lingual web site

BioTek receives EP Patent  
for Verify technology and  
Ultrasonic Advantage  
washer technologies

▶ **2010**  
BioTek launches Synergy  
H1, Synergy H4, Synergy  
2 Alpha, MultiFlo



BioTek wins Vermont  
Deane C. Davis  
Outstanding Business  
of the Year award

BioTek opens  
Switzerland office

**2013** ◀  
BioTek introduces MultiFlo FX,  
BioStack 4 and 405 Verify



BioTek opens  
Taiwan and Japan offices

BioTek enters the  
imaging market with the  
Cytation5 Cell Imaging  
Multi-Mode Reader



▶ **2014**  
BioTek launches MultiFlo FX RAD,  
Epoch 2, Synergy HTX  
and Cytation 5



BioTek receives US Patent for  
Verify technology and Ultrasonic  
Advantage washer technologies

Think Possible



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www.biotek.ch

### **Taiwan**

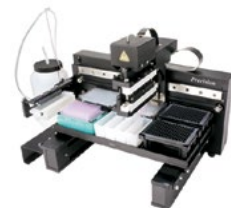
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