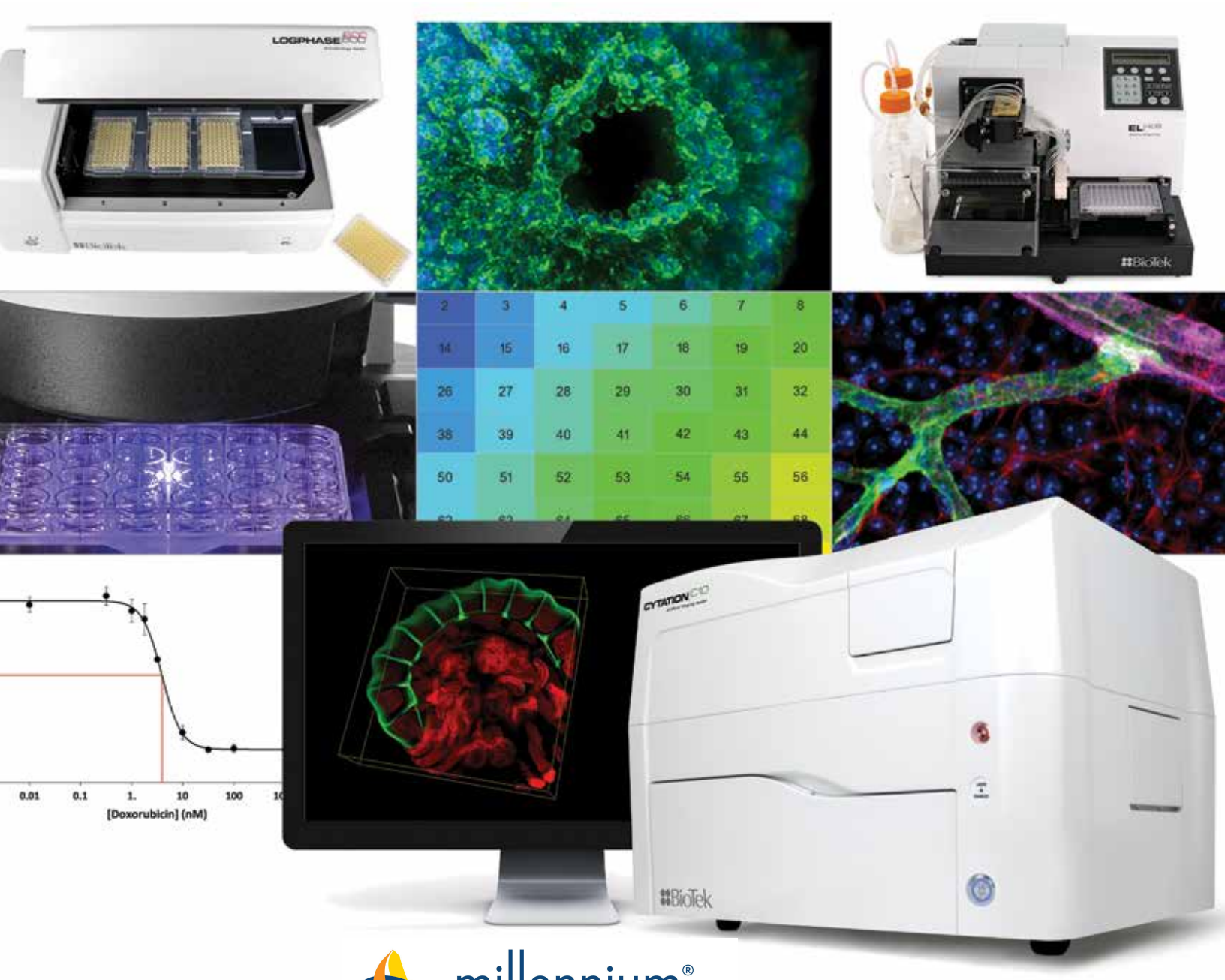
CATALOG 2021 | Life Science Instrumentation

Imaging & Microscopy • Detection • Liquid Handling • Robotics



BioTek®

A part of **Agilent**

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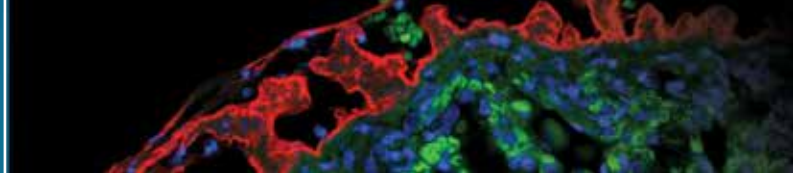

BioTek Instruments, Inc., a part of Agilent Technologies, is a global leader in the development, manufacture and sale of life science instrumentation, including imaging & microscopy, multi-mode detection, liquid handling and automation systems.

For over 50 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.

For more detailed information and up-to-date product specifications, visit our web site at www.biotek.com.

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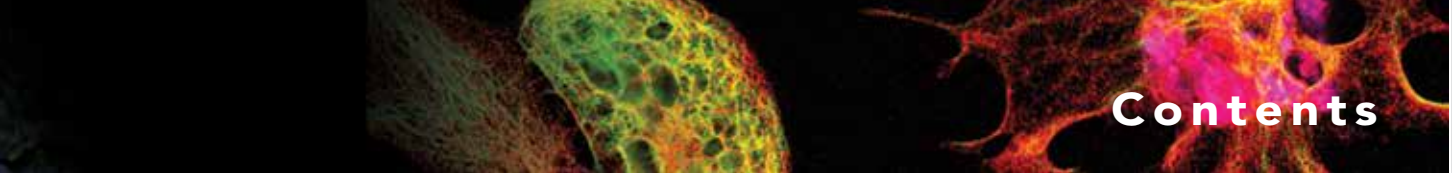
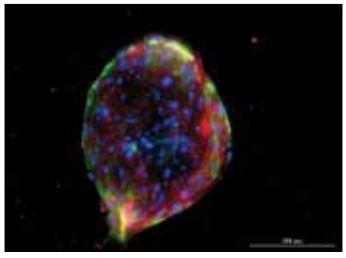


Contents

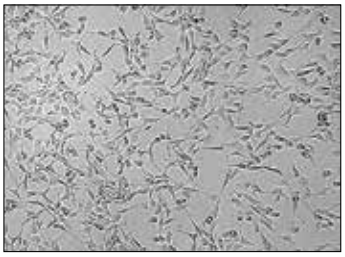
APPLICATIONS

BioTek's life science instrumentation addresses a very broad range of research applications in imaging & microscopy, multi-mode microplate detection, associated liquid handling and assay automation. Browse our growing list of timely research applications and see how BioTek instrumentation can facilitate even the most complex workflows.



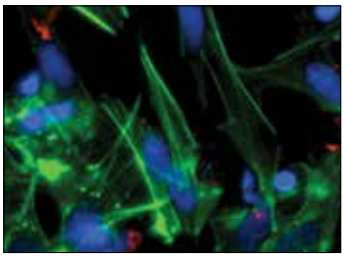
3D Cell Culture

Some of the most commonly incorporated technologies to create the desired 3D spheroids or tumoroids include polymeric and biological scaffolds, ultra-low attachment, hanging drop and magnetic bioprinting. 3D workflows are performed in a variety of microplate types, and are commonly analyzed using microplate reader optics or digital widefield microscopy.



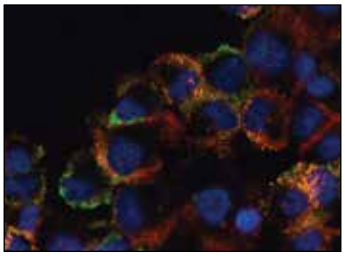
Live Cell Assays

BioTek's instruments support a wide variety of live cell applications addressing diverse biological processes in timescales from milliseconds to weeks. Features such as reagent injectors, temperature and CO_2/O_2 control and humidity monitoring enable applications in live cell kinetics and uninterrupted monitoring of rapid cellular reactions.



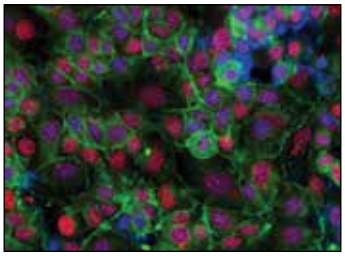
Immunofluorescence

Immunofluorescence reagent options range in scope from individual primary antibodies, to out-of-box multiplexed assay solutions for cell signaling pathway analysis. The basic IF workflow can be labor intensive, and benefits from automation to manage assays in microplates, microscope slides, Petri dishes and cell culture inserts.



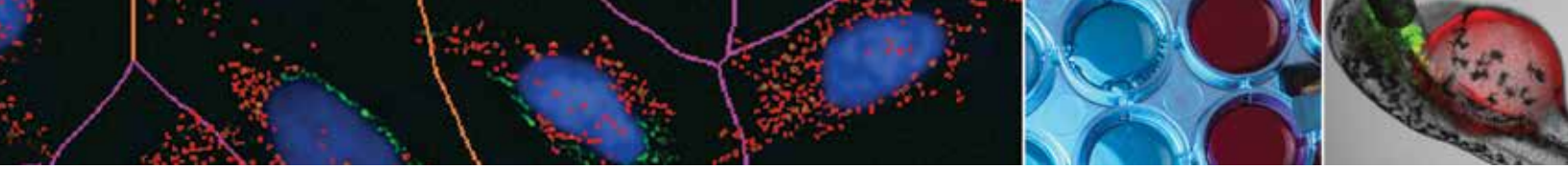
Biomarker Assays

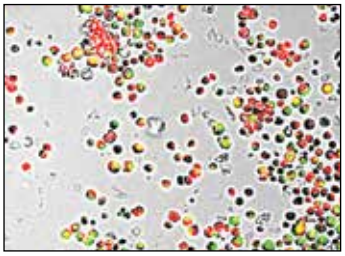
Quantitative determination of specific mRNA and protein biomarkers in cells can be performed using either conventional microplate reading to obtain an averaged cell population result or digital widefield microscopy to provide individual cell responses and the spatial location of the molecular biomarker. Biomarker assays are commonly run in higher density microplates using automated microscopy and multi-mode detection, as well as automated liquid handing for sample preparation to reagent addition.



Phenotypic Assays

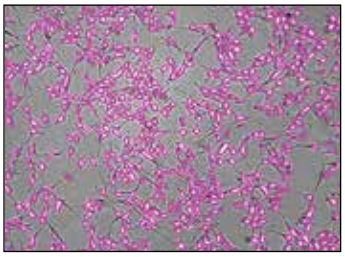
Phenotypic assays provide quantitative cellular structure and function data, measured using digital widefield microscopy. They are used to assess whether a compound or drug produces a desired effect on the cells. Gen5 Software can analyze multiple cellular phenotypic parameters simultaneously including size, shape, area and intensity; providing a comprehensive picture of individual cell phenotypes and entire population phenotypes that allows a researcher to make an educated decision.





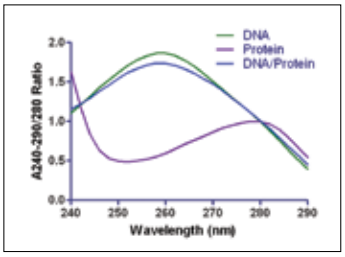
Cellular and Microbial Growth

Microplate-based cell proliferation assays can take on many different characteristics: Fluorescence stains that bind DNA are used to quantitate relative changes in DNA using whole-well PMT-based detection, stained nuclei can be counted using microscopy followed by image-based analysis, compounds that become colored, fluorescent or luminescent when acted upon in live cells can be used to quantitate cell growth or cell death though increases or decreases of their signal respectively.



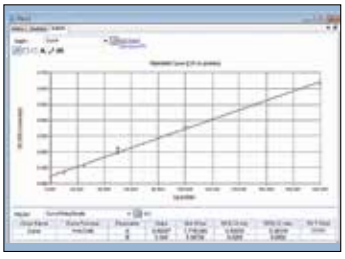
Cell-Based Assays

Microplate readers have adapted to accommodate advances in, and the complexities of, cell-based assays. Highly sensitive detection modes, such as time-resolved fluorescence, aid in the development of robust assays using cell lines or primary cells. Environment control within the detection chamber enables long kinetic readouts. Many of these assays are now incorporated into screening campaigns where sample throughput and automation are of prime importance.



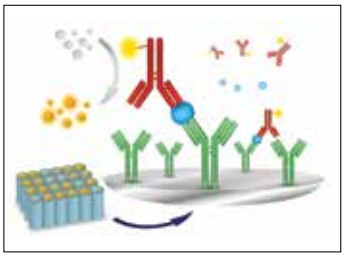
Nucleic Acid Quantification

Nucleic acid quantification assays use either absorbance or fluorescence to measure the concentration of DNA or RNA in the sample. With either method, many laboratories have adapted single cuvette protocols to 96- and 384-well microplate-based formats. These standardized formats, in conjunction with instrumentation capable of recording measurements from them, allow for the rapid quantification of large numbers of samples.



Total Protein Quantification

Total protein is quantified using the same methods as nucleic acids: Spectrophotometric determination of protein and peptides at A_{280}, colorimetric determination and fluorometric determination using intrinsic fluorescence or fluorescent probes. Several different fluorescence techniques eliminate many of the problems associated with the traditional absorbance-based colorimetric methods to measure total protein content.



ELISA and Related Immunoassays

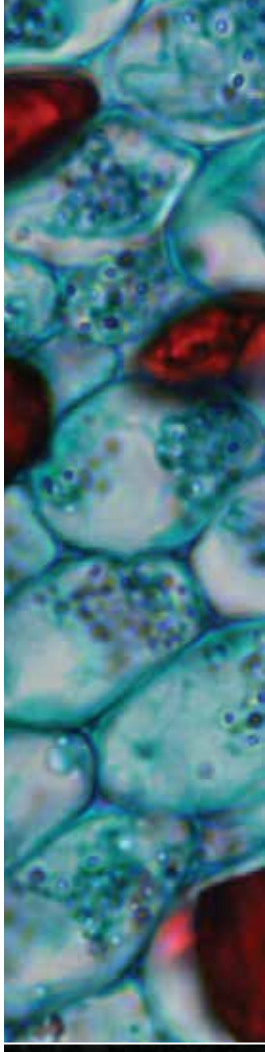
The ELISA technique causes formation of specific immune complexes that can be measured with colorimetric, fluorometric or luminometric detection, TR-FRET or HTRF, AlphaScreen and AlphaLISA methods. ELISAs are typically run in 96- to 1536-well microplates, but can also be performed in micro-volumes using specialized very low volume plates like the Take3 Micro-Volume Plate.

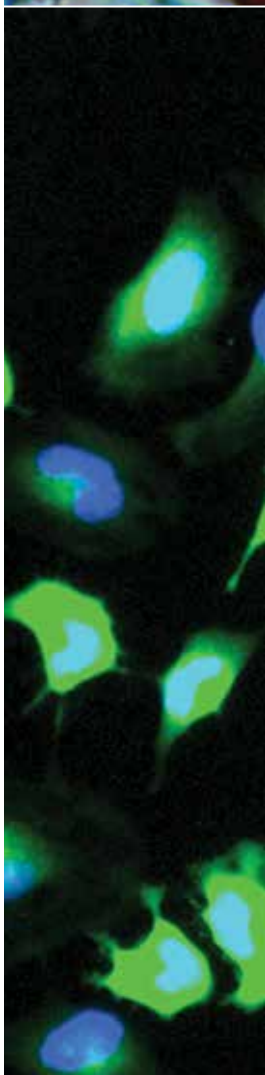
Imaging & Microscopy

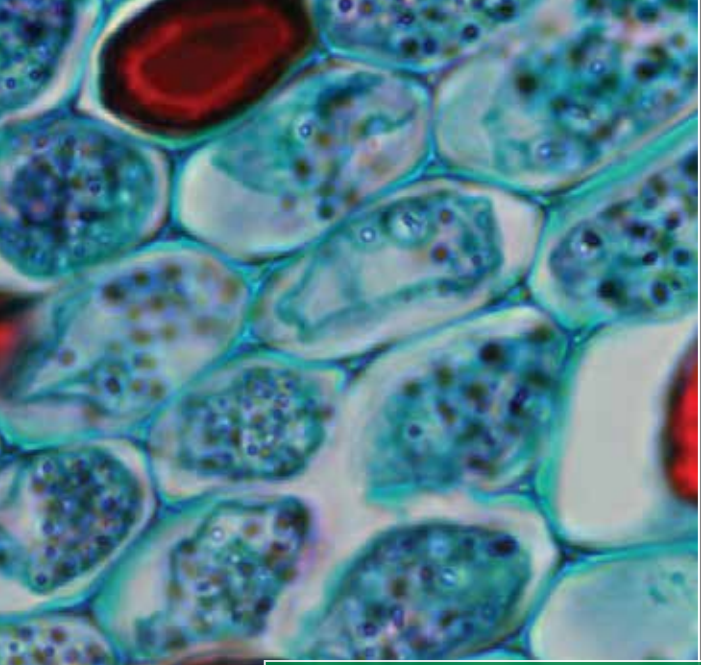
BioTek's Lionheart Automated Microscopes enable a wide range of imaging applications, with powerful configurations suitable for many laboratory budgets. Lionheart LX offers affordable microscopy with powerful capabilities. It joins Lionheart FX, a powerhouse of imaging features, including up to 100x oil immersion magnification, automated XY stage positioning and label-free cell counting. Lionheart FX is optimized with environmental controls that are crucial for successful short- and long-term live cell imaging applications.

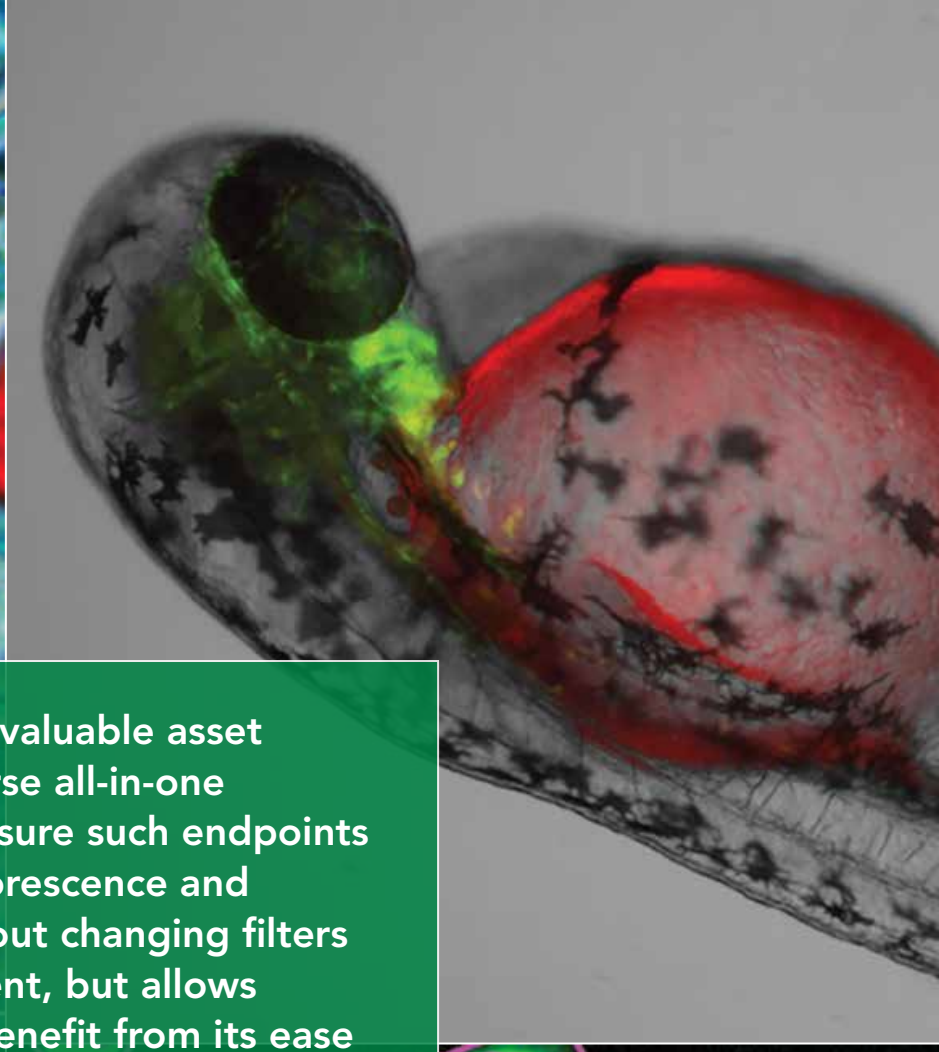
The new Cytation C10 Confocal Imaging Reader brings spinning disk confocal and widefield microscopy and multimode plate reading together in a cost-effective, compact system attainable for every laboratory. Cytation 7 combines automated digital upright and inverted widefield microscopy with monochromator-based multi-mode microplate reading. The inverted microscope provides fluorescence, brightfield and color brightfield, and the upright microscope enables other common applications including ELISpot, slide scanning and ROI detection. Cytation 5 is modular, combining imaging with conventional multi-mode detection functionality in user-selected configurations, while Cytation 1 offers both imaging and multi-mode detection with affordable, configurable options. Cytation can be integrated with BioSpa 8 Automated Incubator (page 18) for complete imaging workflow automation.

Gen5 Software controls BioTek's imaging and microscopy systems with Augmented Microscopy, automating the steps of a typical microscopy workflow: Image capture, processing, analysis and preparation of publication-ready data.



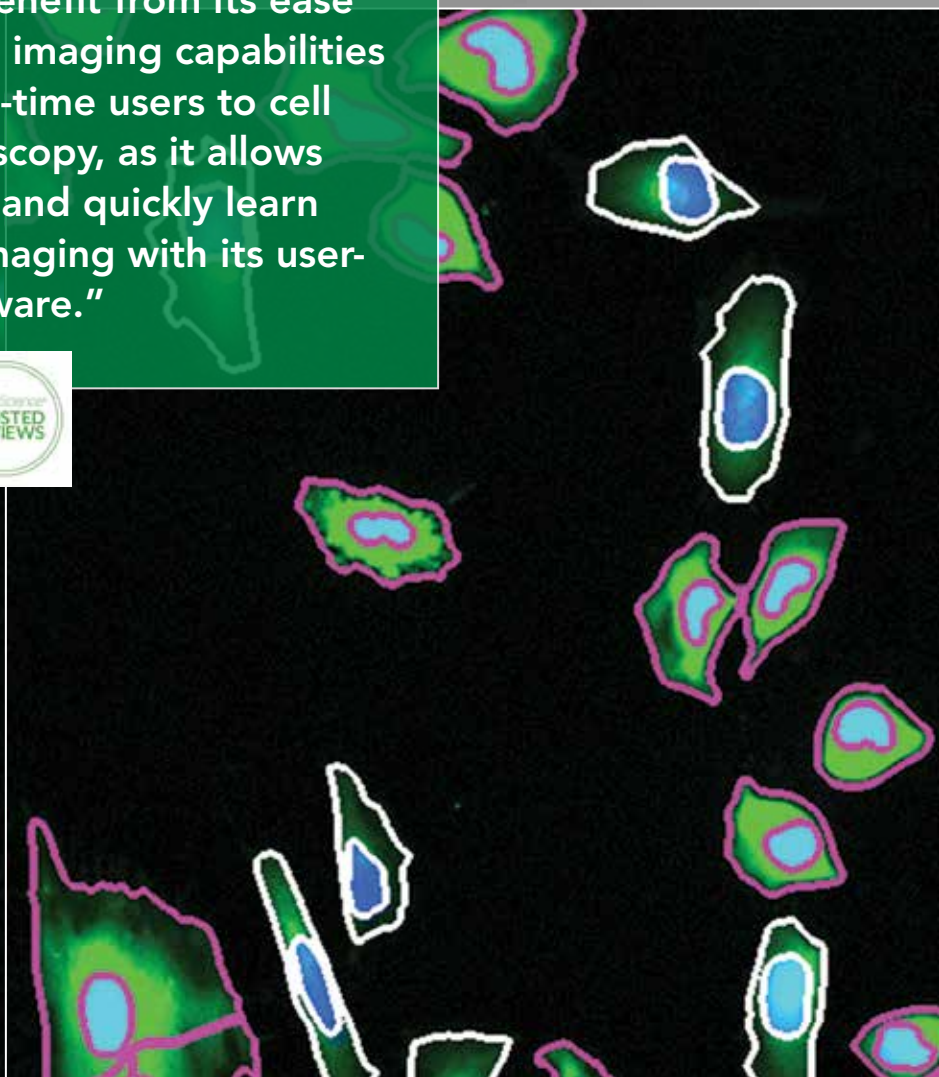






"Cytation 5 is an invaluable asset to our lab. Its diverse all-in-one capabilities to measure such endpoints as absorbance, fluorescence and luminescence without changing filters is not just convenient, but allows multiple users to benefit from its ease of use. Further, the imaging capabilities are perfect for first-time users to cell imaging and microscopy, as it allows one to understand and quickly learn the basics of cell imaging with its user-friendly Gen5 software."

TRUSTED REVIEWS



LIONHEART FX

automated microscope

Lionheart FX Automated Live Cell Imager is a digital microscope that automates image capture and analysis, with a combined power and ease of use that sets it apart from traditional microscopes. Lionheart FX and Gen5 Software capture and produce detailed information from live cell assays in real time; providing valuable qualitative and quantitative data quickly and easily. Augmented Microscopy is the collection of all of these features in one compact system. With Lionheart FX, you can capture, analyze, annotate images and produce videos with ease.

Whole Organism to Subcellular Imaging

Lionheart FX offers fluorescence, brightfield, color brightfield and phase contrast imaging modes to cover a broad range of applications. With four channels and more than 15 color cubes available, Lionheart FX is compatible with a wide range of fluorophores for multi-color imaging. With 1.25x to 60x air, plus 60x and 100x oil immersion magnification oil immersion magnification and new tools in Gen5 Image Prime Software, image capture and analysis streamlines the workflow. The automated 6-position objective turret provides quick selection of optimal imaging magnification.

Kinetic Live Cell Assay Support

With Lionheart FX, live cell assays can be measured over seconds, minutes, hours or days. The environmental control cover ensures the required temperature and gas circulation, and provides a darkroom-like environment for fluorescence imaging. A humidity chamber offers added protection for cells during long-term measurement and BioTek's new AutoScratch Wound Making tool automates sample prep for all migration assays. The dual reagent injectors provide rapid sequential dispensing and imaging to capture rapidly changing cellular activities.

Augmented Microscopy

Lionheart FX offers a combination of hardware and software features that provide automation for image capture, analysis, annotation and movie-making in a single integrated platform.

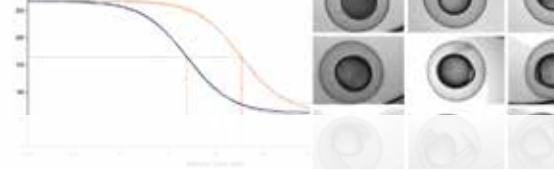
Image and laser-based autofocus, auto exposure and auto LED intensity aid in easy capture of images in real time.

From single sample imaging to long-term live cell kinetics on multiple samples, Gen5 analyzes each image quickly, easily and automatically. During capture, image cellular analysis is automatically updated. Gen5 offers an on-screen tool for real time annotation of single and sequential images. Easily make kinetic image sequences into .MP4 or .WMV files – no need to export to third-party software.

Lionheart FX comes with a compact, custom controller designed for simple, out-of-the-box integration and control via Gen5 Software for all of your imaging requirements.

TYPICAL RESEARCH APPLICATIONS

- 2D and 3D cell imaging and analysis
- Cell growth and death dynamics
- Label-free cell counting
- Cell viability/toxicity
- Immunofluorescence
- Phenotypic assays
- Subpopulation analysis
- Translocation assays
- Cell migration/invasion assays
- Wound healing



TECHNICAL DETAILS

General	
Microplate types	6- to 1536-well plates
Other labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25, T75), counting chambers (hemocytometers), chamber slides Support for labware up to 1.5" tall
Temperature control	Incubation to 40 °C with optional environmental control cover
Software	Gen5 Microplate Reader and Imager Software included Gen5 Image+ and Image Prime Software available for advanced image analysis (option) Scratch Assay App available
CO_2 and O_2 control	0 - 20% CO_2 control and 1 - 19% O_2 control, with optional Gas Controller
Environmental control cover	Top cover for light tight imaging and incubation control (option)
X/Y stage resolution	Lead screw driven stage with 0.1 µm resolution
Humidity control	Humidity chamber with rapid gas recharge (option)
Controller	Custom computer configured for BioTek's imaging systems. Includes Microsoft Windows 10, 24" LED monitor, keyboard and mouse
Imaging System	
Imaging modes	Fluorescence, brightfield, high contrast brightfield, color brightfield, phase contrast
Imaging methods	Single color, multi-color, montage, time lapse, z-stacking, burst mode
Image processing	Z-projection, digital phase contrast, stitching
Light source	High power LEDs; wavelengths from 365 nm to 740 nm available
Camera	Sony CMOS 16-bit grayscale
Camera binning	Optional 2x2 binning for focus and/or image capture
Camera exposure range	5 milliseconds to 4 seconds
Image outputs available	Raw Images: 16-bit TIFF Saved Images: TIFF, JPG, BMP, PNG, EMF, GIF Movies: MP4, WMV
Objective capacity	6 onboard, user-replaceable objectives
Objectives available	Fluorescence: Air: 1.25x, NA: .04; 2.5x (2.25x eff), NA: .07; 2.5x (2.75x eff), NA: .12; 4x, NA: .13; 10x, NA: .30; 20x, NA: .45; 40x, NA: .60; 60x, NA: .70 Oil: 60x, NA: 1.42; 100x, NA: 1.40 Phase objectives available: 4x, NA: .13; 10x, NA: .30; 20x, NA: .45; 40x, NA: .60
Image filter cube capacity	4 fluorescence cubes plus brightfield channel; more than 20 colors available
Automated functions	Autofocus, auto exposure, auto LED intensity
Autofocus method	Image-based autofocus User-trained autofocus Laser autofocus (option)
Image collection rate	Single well fastest frame rate capture: Full Resolution: up to 10 frames per second for single color images 2x2 Binning: up to 20 frames per second for single color images
Microscope stage control	Gen5 Software control Optional joystick controller
Reagent Injectors	
Number	2 syringe pumps
Supported labware	6- to 384-well microplates, Petri and cell culture dishes, chamber slides
Dead volume	<1.65 mL with back flush
Dispense tip options	Aligned tip - aligned with optical path for dispensing for fast kinetic assays Offset tip - dispensing is offset from the optical path
Dispense volume	5 - 1000 µL in 1 µL increments
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50 - 200 µL
Physical Characteristics	
Power consumption	250 W max
Dimensions	With cover closed or without cover: 17.9" W, 18.3" D, 14.1" H (45.5 x 46.5 x 35.8 cm) With cover fully open: 17.9" W, 18.3" W, 27.5" D (45.5 x 46.5 x 69.8 cm)
Weight	Without environmental control cover: 51 lb (23.1 kg) With environmental control cover: 58 lb (26.3 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

LIONHEART LX
automated microscope

Lionheart LX Automated Microscope is designed for affordability and simplicity. Along with Gen5 Software, Lionheart LX enables Augmented Microscopy to fully automate image capture, processing and analysis. Load samples, start a run and come back to publication-ready images and quantitative data. Lionheart LX can help increase your research output while reducing processing time and costs.

Affordable Automated Digital Microscopy

Lionheart LX has an automated 6-objective turret and can contain up to 4 LED/filter cubes for multi-channel image capture. The precise automated stage and autofocus, auto exposure and other Gen5 Software features enable simple, automated image capture and analysis.

Multiple Imaging Modes

With brightfield, color brightfield and fluorescence imaging in four channels – and more than twenty available LED/filter cubes, Lionheart LX offers versatility. Imaging processing from z-stacking to z-projection, montage collection to stitching; plus analysis from label-free cell counting to mitochrondrial membrane potential are all accomplished with Lionheart LX and Gen5 Software.

Augmented Microscopy

Augmented microscopy automates image capture, processing and analysis workflows for publication-ready images and data. Image capture starts with image-based and laser autofocus, plus auto LED intensity and auto exposure. Automated image pre-processing optimizes images for downstream analysis, from cell counting to characterization of subcellular details.

Quick Analyze: Instant Counts

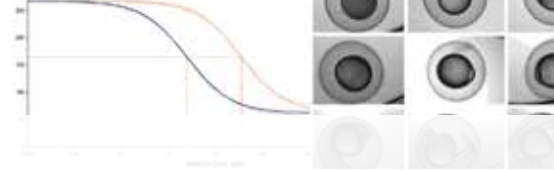
Gen5 Software makes it fast and easy to obtain cell counts and confluence calculations directly on the live camera feed from Lionheart LX. Gen5 quickly finds the region of interest and displays counts onscreen without needing to capture the image. The quick analyze function works for samples in a variety of labware.

Integrated, Compact Design

Lionheart LX integrates all microscopy hardware into a very compact footprint; saving valuable bench space. The easily accessible objectives and LED/filter cubes make setup and operation fast and simple, with a minimal learning curve.

TYPICAL RESEARCH APPLICATIONS

- Cell counting
- Endpoint live cell assays
  - Apoptosis, autophagy, cytotoxicity
- Histology (H&E)
- Label-free cell counting
- Confluence
- Immunofluorescence



TECHNICAL DETAILS

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Microplate types	6- to 1536-well plates
Other labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25, T75), counting chambers (hemocytometers), chamber slides Support for labware up to 1.5" tall
Software	Gen5 Microplate Reader and Imager Software included. Gen5 Image+ and Image Prime Software available for advanced image analysis.
Imaging System	
Imaging modes	Fluorescence, high contrast brightfield and color brightfield
Imaging methods	Single color, multi-color, montage, time lapse, z-stack, z-stack montage, burst mode
Image processing	Z-projection, digital phase contrast, stitching
Light source	High power LEDs (available wavelengths: 365 nm, 390 nm, 465 nm, 505 nm, 523 nm, 590 nm, 623 nm, 655 nm, 740 nm)
Camera	Sony CMOS, 16-bit grayscale
Camera binning	Optional 2x2 binning for focus and/or image capture
Camera exposure range	5 milliseconds to 4 seconds
Image outputs available	Raw Images: 16-bit TIFF Saved Images: TIFF, JPG, BMP, PNG, EMF, GIF, color TIFF Movies: MP4, WMV
Objective capacity	6 onboard, user-replaceable objectives
Objectives available	Air: 1.25x, NA: .04; 2.5x (2.25x eff), NA: .07; 2.5x (2.75x eff), NA: .12; 4x, NA: .13; 10x, NA: .30; 20x, NA: .45; 40x, NA: .60; 60x, NA: .70 Oil: 60x, NA: 1.42; 60x, NA: 1.25; 100x, NA: 1.4; 100x, NA: 1.3 High NA: 20x, NA: 0.75; 40x, NA: 0.95
Image filter cube capacity	4 user-replaceable fluorescence cubes plus brightfield channel; more than 20 colors available
Automated functions	Autofocus, user-trained autofocus, auto exposure, auto-LED intensity
Autofocus method	Image-based autofocus Laser autofocus option
Image collection rate	Single well fastest frame rate capture: Full Resolution: up to 10 frames per second for single color images 2x2 Binning: up to 20 frames per second for single color images
Microscope stage control	Gen5 Software control Optional joystick controller
Physical Characteristics	
Power consumption	60 W max
Dimensions	17.9" W, 18.3" D, 14.1" H (45.5 x 46.5 x 35.8 cm)
Weight	51 lb (23.1 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

CYTATION|C10

confocal imaging reader

Cytation C10 brings cost-effective automated spinning disk confocal and widefield microscopy, along with established multi-mode reading design in a single, easy-to-use instrument.

Compact, affordable confocal imager

Expertise gained over several years of Cytation development, along with customer feedback, resulted in the Cytation C10.... an automated confocal microscope with excellent performance, at an attainable price.

Improved image quality and analysis

Confocal microscopy enables detailed visualization of samples that are not effectively imaged with a widefield microscope. Not only can you obtain improved image quality, you can get improved quantification and analysis with confocal images and Gen5 software.

High quality optical components

High quality objectives, filters and other components including Olympus objectives, Hamamatsu sCMOS Orca camera and Semrock filters are used in Cytation C10, enabling the capture of stunning, publication-quality images.

Confocal imaging and multi-mode plate reader in one

With a combination of spinning disk confocal and widefield imaging, plus multi-mode reader, Cytation C10 is ready for any assay. And since Cytation C10 is upgradable; you can get the functionality you need today and add modules later as requirements change.

Confocal plus widefield = stunning images and analysis

Cytation C10 captures stunning detail in a wide variety of sample types. Use widefield imaging for faster acquisition of large samples at lower magnification, switch to confocal to image small intracellular details or 3D samples. Or combine both modes for highly multiplexed, multiparameter imaging experiments.

Environmental controls for live cell imaging

Successful live cell kinetic imaging relies on a consistent environment, including temperature control and CO_2/O_2 control and monitoring. Cytation C10 provides the perfect environment to grow and analyze live cells over time.

Variable bandwidth for sensitivity and specificity

The plate reader optics of Cytation C10 use a quad monochromator design with variable bandwidth, selectable between 9 and 50 nm in 1 nm increments. Large bandwidth settings provide increased sensitivity and lower limits of detection. Small bandwidth settings provide increased specificity when multiple signals are present, which reduces signal crosstalk and enhances assay performance.

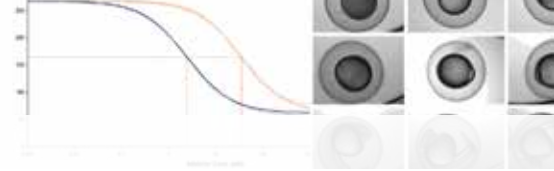
TYPICAL RESEARCH APPLICATIONS

Imaging

- 3D cell culture
- Cell viability/toxicitiy
- Cell migration
- Automated ROI identification
- Time-lapse live cell imaging
- Label-free cell counting
- Slide scanning
- Whole organism imaging
- Cell cycle analysis
- Calcium kinetics
- Transfection efficiency
- Stem cell differentiation
- Genotoxicity

Multi-Mode Detection

- ELISA
- Nucleic acid & protein quantification
- Luciferase reporter assays
- Cell growth studies



TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance, Fluorescence intensity, Luminescence
Read methods	End point, kinetic, spectral scanning, well area scanning
Microplate types	Monochromators: 6- to 384-well plates; Imaging: 6- to 1536-well plates
Other labware supported	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer), Take3 Micro-volume plates
Temperature control	To 45 °C with Condensation Control
Shaking	Linear, orbital, double-orbital
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Gen5 Image+ and Image Prime software available for full image analysis (option)
Automation	BioStack and 3rd party automation compatible
CO_2 and O_2 control (option)	Range: 0 - 20% (CO_2); 1 - 19% (O_2), with optional Gas Controller Models for both CO_2 and O_2 or CO_2 only are available
Imaging – Confocal Microscope	
Imaging modes	Fluorescence
Image processing	Z-projection, digital phase contrast, stitching
Camera	Hamamatsu Orca sCMOS, 16-bit grayscale camera or Sony CMOS 16-bit grayscale camera
Objective capacity	6-position automated turret for user-replaceable objectives
Objectives available	20x, 40x, 60x
Imaging filter cube capacity	4 user-replaceable fluorescence cubes
Imaging filter cubes available	CFP, CY5, DAPI, GFP, RFP, TRITC, brightfield
Laser	6-line
Automated functions	Autofocus, user-trained autofocus, autoexposure, auto-LED intensity
Autofocus method	Image-based autofocus, user-trained autofocus
Positional controls	Software control, joystick controller (option)
Image methods	Single color, multi-color, time lapse, montage, z-stacking, z-stack montage
Image collection rate	Laser autofocus, 0 ms delay, 96 wells: 8 mins, 9 secs
Imaging System – Widefield	
Imaging modes	Fluorescence, phase contrast, color brightfield, user-selectable brightfield/high contrast brightfield
Imaging methods	Single color, multi-color, time lapse, montage, z-stacking, z-stack montage
Image processing	Z-projection, digital phase contrast, stitching
Camera	Hamamatsu Orca sCMOS, 16-bit grayscale camera or Sony CMOS 16-bit grayscale camera
Objective capacity	6-position automated turret for user-replaceable objectives
Objectives available	1.25x, 2.5x (2.25x eff), 4x,10x, 20x, 40x, 60x
Phase objectives available	4x, 10x, 20x, 40x
Image filter cube capacity	4 user-replaceable fluorescence cubes, plus brightfield channel
Imaging filter cubes available	DAPI, CFP, GFP, YFP, RFP, Texas Red, CY5, CY7, Acridine Orange, CFP-FRET, CFP-YFP FRET, Chlorophyll, Phycoerythrin (PE), Propidium Iodide, CY5.5, TagBFP, Tag BFP-FRET, GFP (Ex)-CY5 (Em), RFP (Ex)-CY5 (Em), Alexa 568, Ex 377/Em 647, Oxidized roGFP2, TRITC
Imaging LED cubes available	365 nm, 390 nm, 465 nm, 505 nm, 523 nm, 554 nm, 590 nm, 623 nm, 655 nm, 740 nm, 405 nm
Automated functions	Autofocus, autoexposure, auto-LED intensity
Autofocus method	Image-based autofocus User-trained autofocus Laser autofocus (option)
Positional controls	Software control, joystick controller (option)
Image collection rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes
Image Analysis Software option	Gen5 Image+: Image analysis Gen5 Image Prime: Advanced image analysis Gen5 Secure: 21 CFR Part 11 compliant features
Fluorescence Intensity	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Quad monochromators (top/bottom)
Wavelength range	250 – 700 nm (900 nm option)
Monochromator	Variable, from 9 nm to 50 nm in 1 nm increments
Dynamic range	7 decades
Reading speed (kinetic)	96 wells, sweep mode: 10 seconds
Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	230 - 999 nm, 1 nm increments
Monochromator	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 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: 10 seconds
Reagent Injector Module (Optional)	
Supported detection modes	All modes
Number	2 syringe pumps
Supported labware	6- to 384-well plates, Petri and cell culture dishes
Dead volume	1.1 mL, with back flush
Dispense volume	5 – 1000 µL in 1 µL increments
Plate geometry	6- to 384-well microplates
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50 - 200 µL
Physical Characteristics	
Power	Instrument: External 250W (minimum), 24VDC power supply compatible with 100-240 VAC @50-60Hz. Optional 6-channel laser light source: External with 250W power supply, compatible with 100-240VAC @ 50-60Hz. Optional Hamamatsu scientific camera: External 5W power supply, compatible with 100-240VAC @ 50-60Hz.
Dimensions	18.5" H x 27" W x 20" D, (45.72 46.9 cm x 68.6 cm x 50.8 cm)
Weight	122 lbs (53.3 Kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

CYTATION 7

cell imaging multi-mode reader

Cytation 7 Cell Imaging Multi-Mode Reader combines automated digital upright and inverted widefield microscopy with monochromator-based multi-mode microplate reading. The inverted microscope provides 1.25x to 60x magnification in fluorescence, brightfield and color brightfield, while the upright microscope enables other common applications including ELISpot, slide scanning and ROI detection.

Multi-Mode Plate Reader with Sophisticated Imaging

Cytation 7 builds on the legacy of BioTek's multi-mode plate readers with modular and upgradable imaging and detection modes. Imaging opens up a range of applications for cell-based assays that cannot be performed on a standard plate reader. Information on cell morphology, localization of signal, cell count and more is obtained with Cytation 7's imaging mode.

Comprehensive Imaging Solution

The inverted microscope module enables fluorescence, brightfield and color brightfield from 1.25x to 60x, to analyze both large object and intracellular details. The upright microscope offers both reflected and transmitted light imaging for applications including ELISpot, colony counting, material inspection and much more.

Hit-Picking: Multi-Mode Detection + Imaging

Save time and computer memory by using multi-mode detection to identify wells of interest, then image only those wells.

ELISpot Imaging

Cytation 7's upright imaging module can be used to automate assays such as ELISpot, in which cell secretions are rendered visible through the use of a colorimetric reaction. Cytation 7 fully automates image acquisition, processing, image analysis and object count.

ROI Identification Feature

Cytation 7 and Gen5 software facilitate ROI identification. Cytation 7 scans samples at low magnification before prompting the user to identify regions of interest to be imaged at high magnification. This greatly accelerates the process of imaging ROIs in batches of complex microscopic samples.

Variable Bandwidth for Sensitivity and Specificity

The plate reader optics use a quad monochromator design with variable bandwidth. The bandwidth can be set between 9 and 50 nm in 1 nm increments. Large bandwidth settings provide increased sensitivity and lower limits of detection. Small bandwidth settings provide increased specificity when multiple signals are present, which reduces signal crosstalk and enhances assay performance.

Micro-Volume Analysis with Take3 Plate

Turn your Cytation 7 into a micro-volume analysis system with Take3. You can run 16 or 48 samples in one run to save a lot of time compared to single-sample devices. Gen5 is pre-programmed for ssDNA, dsDNA, RNA and protein quantification in 2 µL.

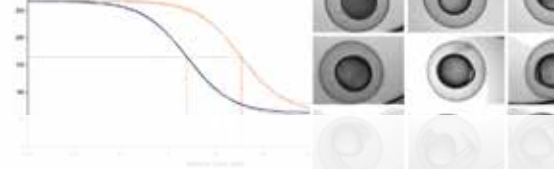
TYPICAL RESEARCH APPLICATIONS

Imaging

- 3D cell imaging
- Cell migration/invasion assays
- ELISpot assay imaging
- Slide scanning
- Live cell imaging
- Cell viability/toxicity
- Colony counting

Multi-Mode Detection

- ADME/Tox assays
- ELISA
- Nucleic acid and protein quantification
- Inject/read calcium assays
- ROS assays
- Flash luminescence assays
- Cell growth assays



TECHNICAL DETAILS

General	
Detection modes	Fluorescence, luminescence, UV-Vis absorbance
Read methods	End point, kinetic, spectral scanning, well area scanning
Microplate types	Monochromators: 6- to 384-well plates; Imaging: 6- to 1536-well plates
Other labware supported	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometers). Take3 Micro-Volume Plates
Temperature control	4-Zone incubation to 45 °C with Condensation Control
Cooling	Optional Peltier Cooling Module maintains internal temperature with < 1 °C rise over ambient. Provides internal cooling after incubated processes.
Shaking	Linear, orbital, double-orbital
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure available for 21 CFR Part 11 compliance
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
CO_2 and O_2 control (option)	Range: 0 - 20% (CO_2); 1 - 19% (O_2)
Imaging System – Inverted Microscope	
Imaging modes	Fluorescence, color brightfield, user-selectable brightfield/ high contrast brightfield
Imaging methods	Single color, multi-color, time lapse, montage, z-stacking, z-stack montage
Image processing	Z-projection, digital phase contrast, stitching
Camera	Sony CMOS, 16-bit grayscale
Objective capacity	6-position automated turret for user-replaceable objectives
Available objectives	1.25x, 2.5x (2.25x eff),2.5x (2.75x eff), 4x,10x, 20x, 40x, 60x
Imaging filter cube capacity	4 user-replaceable fluorescence cubes, plus brightfield channel
Imaging filter cubes available	>20 LED/filter cube colors available
Automated functions	Autofocus, user-trained autofocus, autoexposure, auto-LED intensity
Autofocus method	Image-based autofocus, user-trained autofocus, laser autofocus (option)
Positional controls	Software control, joystick controller (option)
Image collection rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes
Image analysis software option	Gen5 Image+: Advanced image analysis Gen5 Image Prime: Superior image analysis Gen5 Secure: 21 CFR Part 11 compliant features
Imaging System – Upright Microscope	
Imaging modes	Reflected color brightfield, transmitted color brightfield
Imaging methods	Single image, montage, time lapse, z-stacking
Image processing	Z-projection, digital phase contrast, stitching
Camera	Sony CMOS, 16-bit; WFOV
Lenses	Finder scope, 2x, 4x, 8x
Positional controls	Software control, joystick controller (option)
Image collection rate	Entire 100 mm dish @ 1x: ≤2:40 minutes Entire microscope slide @ 1x: ≤1:15 minutes 96-well ELISpot plate @ 1x: ≤5 minutes
Image Analysis Software option	Gen5 Image+: Image analysis; Gen5 Image Prime: Advanced image analysis Gen5 Secure: 21 CFR Part 11 compliant features

Fluorescence Intensity	
Light source	Xenon flash lamp
Detector	PMT (red-shifted PMT option)
Wavelength selection	Quad monochromators (top/bottom)
Wavelength range	250 – 700 (900 nm option)
Monochromator	Variable, from 9 nm to 50 nm in 1 nm increments
Dynamic range	7 decades
Sensitivity (sodium fluorescein)	Fluorescein 2.5 pM (0.25 fmol/well, 384-well plate) – top Fluorescein 4 pM (0.4 fmol/well, 384-well plate) – bottom
Reading speed (kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Luminescence	
Light source	300 - 700 nm
Detector	>6 decades
Wavelength selection	20 amol ATP (flash)
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	230 - 999 nm, 1 nm increments
Monochromator	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 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
Reagent Injector Module (Optional)	
Number	2 syringe pumps
Dispense volume	5 – 1000 µL in 1 µL increments
Dead volume	1.1 mL, with back flush
Injection speed	225, 250, 275, 300 µL/sec
Plate geometry supported	6- to 384-well microplates
Dispense precision	≤2% at 50 - 200 µL
Dispense accuracy	±1 µL or 2%
Physical Characteristics	
Power	External 24VDC power supply compatible with 100-240 VAC @ 50-60HZ. 150 W maximum consumption
Dimensions	20.2" D x 16.4" W x 17.5" H (51.4 cm D x 41.6 cm W x 44.5 cm H)
Weight	80 lb (36.3 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

CYTATION 5

cell imaging multi-mode reader

Cytation 5 combines automated digital microscopy and conventional multi-mode microplate detection in a configurable, upgradable platform. Gen5 software provides complete control over all imaging and data capture, plus powerful image and data analysis.

Multi-Mode Plate Reader with Imaging

The imaging capability of Cytation 5 opens up a range of applications for cell-based assays that cannot be performed on a standard plate reader. Information on cell morphology, localization of signal, cell count and more is easily obtained with Cytation 5.

Ready for Any Assay

With its combination of hybrid plate reader and advanced microscopy mode, Cytation 5 can transform your lab and increase your productivity.

Advanced Microscopy: Unlimited Possibilities

Cytation 5 automates many traditionally manual microscopy tasks, from slide scanning to time-lapse live cell assays; from low to high magnification. With more than 20 colors and wide field of view camera, Cytation 5 enables powerful image capture for a variety of biologies. CO_2/O_2 and temperature control enable time-lapse live cell imaging.

Hit-Picking: Multi-Mode Detection + Imaging

Save time and computer memory by using multi-mode detection to identify wells of interest, then image only those wells.

Powerful Image Processing and Analysis

No need to process and analyze images one by one on a dedicated computer. With Gen5, you can pre-program analysis tasks and walk away. Extensive image processing includes stitching, z-projection, deconvolution, digital phase contrast; image analysis includes cell count, confluence, cytoplasm analysis, intracellular analysis, subpopulation analysis, signal translocation and more.

Hybrid Plate Reader: Flexibility and Performance

With its patented combination of monochromator and filter optics, Cytation 5 is an advanced plate reader that delivers both the flexibility and performance you need for any microplate assay in your lab. Detection methods include UV-Vis absorbance, fluorescence, luminescence, fluorescence polarization, time-resolved fluorescence and laser-based Alpha detection.

Variable Bandwidth for Sensitivity and Specificity

Cytation 5 uses a quad monochromator design with variable bandwidth, that can be set between 9 and 50 nm in 1 nm increments. Large bandwidth settings provide increased sensitivity and lower limits of detection. Small bandwidth settings provide increased specificity when multiple signals are present, reducing signal crosstalk and enhancing assay performance.

Micro-Volume Analysis with Take3 Plate

Turn your Cytation 5 into a micro-volume analysis system with Take3. Run 16 or 48 samples in one run to save time compared to single-sample devices. Gen5 is pre-programmed for ssDNA, dsDNA, RNA and protein quantification in 2 µL.

TYPICAL RESEARCH APPLICATIONS

Imaging

- Label-free cell counting
- Calcium kinetics
- Time-lapse live cell imaging
- 3D cell culture
- Slide scanning
- Cell viability/toxicity assays
- Cell migration assays
- Stem cell differentiation
- Genotoxicity

Multi-Mode Detection

- ELISA
- TR-FRET
- Luciferase reporter assays
- Nucleic acid & protein quantification
- AlphaScreen®
- Fluorescence polarization

PATENTED HYBRID OPTICS

TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence Alpha detection
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	Monochromator: 6- to 384-well plates Filters: 6- to 1536-well plates Imaging: 6- to 1536-well plates
Other labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer) Take3 Micro-Volume Plates
Temperature control	4-Zone incubation to 65 °C with Condensation Control
Cooling	Optional Peltier Cooling Module maintains internal temperature with <1 °C rise over ambient. Provides cooling after incubated processes.
Shaking	Linear, orbital, double orbital
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Scratch Assay and Quantitative Assay Apps available
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
CO_2 and O_2 control	0 - 20% CO_2 control and 1 - 19% O_2 control, with optional Gas Controller
Light source	Fluorescence and absorbance: Xenon flash lamps Alpha detection: 100 mW 680 nm laser Imaging: High power LEDs
Detector	Fluorescence and luminescence: PMTs (one for monochromator, one for filter system) Absorbance: photodiode
Imaging System	
Imaging modes	Fluorescence, brightfield, high contrast brightfield, color brightfield, phase contrast
Imaging methods	Single color, multi-color, montage, time lapse, z-stacking
Image processing	Z-projection, digital phase contrast, stitching
Camera	Sony CMOS, 16-bit grayscale; standard or WFOV
Objective capacity	6-position automated turret for user-replaceable objectives
Objectives available	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
Phase objectives available	4x, 10x, 20x, 40x
Imaging filter cubes/capacity	4 user-replaceable fluorescence cubes plus brightfield channel
Imaging filter cubes	>20 LED/filter cube colors available
Automated functions	Autofocus, auto LED intensity, auto exposure
Autofocus method	Image-based autofocus User-trained autofocus Laser autofocus (option)
Positional controls	Gen5 Software control / optional joystick controller
Image collection rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes Burst Mode: 10 fps, single well, single color at ≤50ms integration time
Image analysis software option	Gen5 Image+: Advanced image analysis Gen5 Image Prime: Superior image analysis
Absorbance	
Wavelength selection	Monochromator
Wavelength range	230 - 999 nm, 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
Optical density	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
Sensitivity	Filters: Fluorescein 0.25 pM (0.025 fmol/well, 384-well plate) Quad Monochromator: Fluorescein 2.5 pM (0.25 fmol/well, 384-well plate) - top Fluorescein 4 pM (0.4 fmol/well, 384-well plate) - bottom
Reading speed (kinetic)	96 wells: 11 seconds, 384 wells: 22 seconds
Fluorescence Intensity	
Wavelength selection	Quad monochromators (top/bottom); filters (top)
Wavelength range	Monochromators: 250 - 700 nm (850 nm option) Filters: 200 - 700 nm (900 nm option)
Monochromator bandwidth	Variable; 9 - 50 nm, in 1 nm increments
Dynamic range	7 decades
Reading speed	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	
Wavelength selection	Filters
Wavelength range	280 - 700 nm (850 nm option)
Sensitivity	1.2 mP standard deviation at 1 nm fluorescein
Time Resolved Fluorescence	
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)
Alpha Detection	
Wavelength selection	Filters (top)
Sensitivity	100 amol LCK peptide (384-well low volume plate)
Reagent Injectors	
Supported detection modes	All modes
Number	2 syringe pumps
Supported labware	6- to 384-well plates, Petri and cell culture dishes
Dead volume	1.1 mL with back flush
Dispense volume	5 - 1000 µL in 1 µL increments
Dispense accuracy	±1 µl or 2%
Dispense precision	≤2% at 50 - 200 µL
Physical Characteristics	
Power consumption	250 W max consumption
Dimensions	20.2" D x 16.4" W x 17.5" H (51.4 cm D x 41.6 cm W x 44.5 cm H)
Weight	80 lb (36.3 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use may be available.

CYTATION 1

cell imaging multi-mode reader

Cytation 1 Cell Imaging Multi-Mode Reader combines fluorescence and high contrast brightfield imaging with conventional multi-mode detection in an upgradable, affordable platform. This patented design enables applications from cell proliferation studies to micro-volume nucleic acid quantification without requiring additional hardware. Gen5 Software provides powerful image and data analysis in an easy-to-use interface.

Quantitative Image Analysis

The microscopy module in Cytation 1 offers 1.25x to 60x magnification to capture large regions of interest or intracellular details in slides, microplates, cell culture dishes and other labware. Four color channels, plus the unique high contrast brightfield mode enable fixed and live cell imaging applications, including label-free cell counting, 3D cell culture and phenotypic assays. Temperature and CO_2/ O_2 control support kinetic live cell imaging.

Augmented Microscopy

With Cytation 1 and Gen5 Software, typical microscopy steps are integrated and automated: Image capture, processing and analysis steps help to create publication-ready images and data. Augmented Microscopy facilitates these workflows in Gen5; efficiently guiding scientists through the entire process without requiring extensive training.

Peltier Cooling Module

The Peltier Cooling Module ensures environmental stability inside Cytation 1. Maintaining internal temperature with less than a 1 °C rise over ambient during normal operation allows uncompromised assay integrity. The Cooling Module also accelerates cooling three times faster than typical; rapidly returning the system to ambient temperature once incubated workflows are complete.

Affordable Automation

The automated XY stage positioning, autofocus, auto exposure and auto LED intensity bring efficiency to common microscopy tasks for fixed and live cell assays. Cytation 1 integrates with BioSpa 8 Automated Incubator to automate long-term kinetic live cell imaging workflows for up to 8 microplates or other labware. For high throughput workflows, BioStack Microplate Stacker can process up to 50 lidded or unlidded plates at a time for imaging or multi-mode detection processes.

Multi-Mode Versatility

Cytation 1 uses filter/dichroic based optics for excellent sensitivity in luminescence, fluorescence intensity, polarization and time-resolved measurements. The monochromator-based absorbance optics offer a 200 – 999 nm wavelength range to enable applications from nucleic acid and protein quantification to turbidimetric measurements. Temperature control, shaking and dual reagent injectors expand applications to kinetics and fast inject/read protocols.

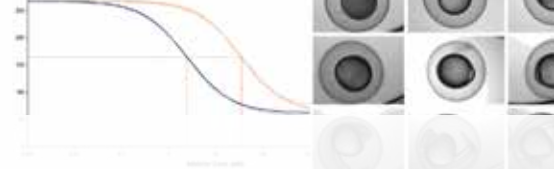
TYPICAL RESEARCH APPLICATIONS

Imaging

- 2D and 3D cell imaging and analysis
- Cell proliferation studies
- Label-free cell counting
- Cytotoxicity
- Biomarker quantification

Multi-Mode Detection

- Drug discovery
- Genetic analysis
- Drug absorption and metabolism
- Biologics drug discovery and development
- Environmental testing
- Food safety
- Nucleic acid quantification
- Protein quantification



TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	Monochromator: 6- to 384-well plates Filters: 6- to 1536-well plates Imaging: 6- to 1536-well plates
Other labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer) Take3 Micro-Volume Plates
Temperature control	4-Zone incubation to 45 °C with Condensation Control
Cooling	Optional Peltier Cooling Module maintains internal temperature with <1 °C rise over ambient. Provides cooling after incubated processes
Shaking	Linear, orbital, double orbital
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Scratch Assay and Quantitative Assay Apps available
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
CO_2 and O_2 control	0 - 20% CO_2 control and 1 - 19% O_2 control, with optional Gas Controller
Light source	Fluorescence and absorbance: Xenon flash lamps Imaging: High power LEDs
Detector	Fluorescence and luminescence: PMTs Absorbance: photodiode
Imaging System	
Imaging modes	Fluorescence High contrast brightfield
Imaging method	Single color, multi-color, montage, time lapse, z-stacking
Image processing	Z-projection, image stitching
Camera	Sony CCD, 16-bit grayscale
Objective capacity	2 user-replaceable objectives
Objectives available	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
Imaging filter cubes/capacity	4 user-replaceable fluorescence cubes plus brightfield channel; more than 20 colors available
Imaging LED cubes available	365 nm, 390 nm, 465 nm, 505 nm, 523 nm, 590 nm, 623 nm, 655 nm, 740 nm
Automated functions	Autofocus, auto LED intensity, auto exposure
Autofocus method	Image-based autofocus User-trained autofocus Laser autofocus (option)
Positional controls	Gen5 Software control
Image collection rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes Burst Mode: 10 fps, single well, single color at ≤ 50ms integration time
Image analysis software option	Gen5 Image+: Advanced image analysis Gen5 Image Prime: Advanced image analysis

Absorbance	
Wavelength selection	Monochromator
Wavelength range	200 - 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
Optical density	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
Reading speed (kinetic)	96 wells: 11 seconds, 384 wells: 22 seconds
Fluorescence Intensity	
Wavelength selection	Deep blocking band pass filters / dichroic mirrors
Wavelength range	Filters: 200 - 700 nm (850 nm option)
Dynamic range	7 decades
Sensitivity	Fluorescein: 0.25 pM (0.025 fmol/well, 384-well plate)
Reading speed	96 wells: 11 seconds, 384 wells: 22 seconds
Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Sensitivity	10 amol ATP (flash) 100 amol (glow)
Fluorescence Polarization	
Wavelength selection	Filters
Wavelength range	400 - 700 nm
Sensitivity	1.2 mP standard deviation at 1 nm fluorescein
Time Resolved Fluorescence	
Wavelength selection	Filters
Sensitivity	Europium 40 fM (4 amol/well, 384-well plate)
Reagent Injectors	
Supported detection modes	All modes
Number	2 syringe pumps
Supported labware	6- to 384-well plates, Petri and cell culture dishes
Dead volume	1.1 mL with back flush
Dispense volume	5 - 1000 µL in 1 µL increments
Dispense accuracy	±1 µl or 2%
Dispense precision	≤2% at 50 - 200 µL
Physical Characteristics	
Power consumption	150 W max
Dimensions	20.2" D x 16.4" W x 17.5" H (51.4 cm D x 41.6 cm W x 44.5 cm H)
Weight	65 lb (29 kg)
Regulatory	
Regulatory	CE and TUV marked. Models for In Vitro Diagnostic use may be available.

BIOSPA

multi-plate live cell analysis system

Capture detailed cellular images and get in-depth cell-level analyses for migration and wound healing assays, 3D spheroid formation and many other kinetic applications in up to 8 microplates or other labware. Built-in scheduling, environmental monitoring and available liquid handling allow you to walk away with confidence – and allows multiple users to run processes simultaneously without disrupting others. The BioSpa Multi-Plate Live Cell Analysis System offers unique benefits for a wide variety of live cell imaging applications.

Five Imaging Modes

Fluorescence, brightfield, color brightfield, high contrast brightfield and phase contrast imaging enable an astonishing range of microscopy applications within a single, compact system. Automate workflows for up to 8 microplates or other labware, including cell culture dishes, flasks and microscope slides.

Broad Magnification Range

Capture the level of detail you need, from whole well montage to intracellular detail with 1.25x to 60x objectives available. The automated, 6-position turret makes it simple to capture multiple magnifications in a single workflow.

Environmental Controls

Successful long term live cell assays rely on a controlled environment to keep cells healthy and aid proliferation. BioSpa has integrated temperature and CO_2/O_2 control and monitoring, plus humidity monitoring to protect cells during kinetic runs that last days or weeks.

Powerful 3D Image Processing

Gen5 Software has powerful z-stacking capabilities to capture the important details of a 3D cell structure. Z-projection and image analysis provides in-depth information about the spheroid. Z-stacking montage capability brings powerful processing for 3D biologies.

Advanced Cell-Level Analysis

Powerful tools like nuclear and cytoplasmic masking define critical, information-rich regions of interest for automated, detailed cellular analysis.

TYPICAL RESEARCH APPLICATIONS

- Cell migration and invasion
- Cell cycle progression and analysis
- Cytotoxicity
- Apoptosis and necrosis assays
- Cell proliferation assays

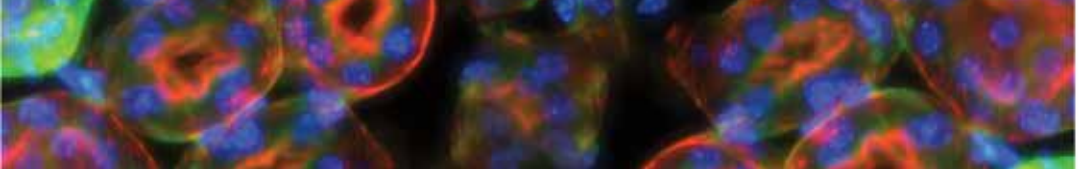
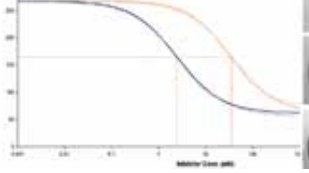
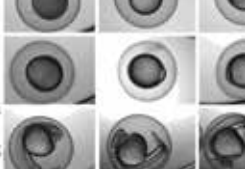
TECHNICAL DETAILS

General	
Microplate types	6- to 1536-well standard height microplates, with or without lids Plate height range: 7.6 to 25.4 mm
Other labware supported	Cell culture dishes (35 and 60 mm), T25 flasks
Lidded plate handling	BioSpa automated plate movement, including de-lidding and re-lidding between the incubator and imager
Microplate capacity	Up to 8 microplates (or other labware)
Air filter	User-replaceable HEPA filter
Compatible instruments	Cytation 7, Cytation 5, Cytation 1, EL406, 405 TS, MultiFlo FX
Temperature control	Range: to 45 °C Uniformity ±0.5 °C at 37 °C
Software	BioSpa OnDemand mode for simplified, intuitive workflows for single or multiple users BioSpa Session mode for all imaging, detection and liquid handling operations
CO_2 and O_2 control (option)	Range: 0 - 20% (CO_2); 1 - 19% (O_2)
Humidity control	rH: 80 to 95% (lidded plates and 5% CO_2); Removable water pan with low level alert
Imaging System	
Imaging mode	Fluorescence, brightfield, high contrast brightfield, color brightfield and phase contrast
Imaging method	Single color, multi-color, montage, time lapse, z-stacking
Image processing	Z-projection, digital phase contrast, stitching
Camera	16-bit gray scale Sony
Objective capacity	6 user-replaceable objectives
Objectives available	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
Phase objectives available	4x, 10x, 20x, 40x
Image filter cube capacity	4 user-replaceable fluorescence cubes plus brightfield channel
Imaging filter cubes available	More than 20 colors are available
Imaging LED cubes available	365 nm, 390 nm, 465 nm, 505 nm, 523 nm, 590 nm, 623 nm, 655 nm, 740 nm
Automated functions	Autofocus, autoexposure, auto-LED intensity
Autofocus method	Image-based autofocus, user-trained autofocus, laser autofocus (option)
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

Imaging & Microscopy Comparison Chart

	Lionheart FX	*Lionheart LX*	*Cytation C10*
General			
Microplate types			
Other labware			Slides, cell culture dishes & flasks
Labware capacity	1	1	1
Incubation	to 40 °C		to 45 °C
Peltier Cooling Module			
CO_2 and O_2 control available	•		•
Joystick controller available	•	•	•
Automation compatible			•
Multi-mode detection available			•
Upright microscope			
Objectives			
Capacity	6	6	6
Air objectives			
Phase objectives	4x, 10x, 20x, 40x		
Oil immersion objectives	60x, 100x		
Imaging Modes & Methods			
Widefield fluorescence	•	•	•
Confocal fluorescence			•
Brightfield	•	•	•
High contrast brightfield	•	•	•
Color brightfield	•	•	•
Phase contrast	•		•
Processing & Analysis			
Z-stacking	•	•	•
Montage	•	•	•
Cell counting	•	•	•
Z-projection*	•	•	•
Digital phase contrast*	•	•	•
Image stitching*	•	•	•
Advanced image analysis*	•	•	•

* With Gen5 Image+ or Gen5 Image Prime software

Cytation 7	*Cytation 5*	*Cytation 1*	*BioSpa System*
6- to 1536-well plates			
(T75 & T25), hemocytometers, chamber slides			Slides, cell culture dishes, hemocytometers, chamber slides
1	1	1	8
to 45 °C	to 65 °C	to 45 °C	to 45 °C
•	•	•	
•	•	•	•
•	•		•
•	•	•	•
•	•	•	•
•			
6	6	2	6
1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x			
	4x, 10x, 20x, 40x		4x, 10x, 20x, 40x
•	•	•	•
•	•		•
•	•	•	
•	•		•
	•		•
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•	•	•	•
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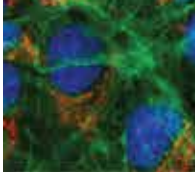
Gen5™

imaging & microscopy software



With Gen5 and BioTek's Lionheart or Cytation imaging systems, you can acquire high quality images across a broad range of fixed and live biologies for applications in life science, drug discovery and clinical laboratories. The new, highly visual interface makes image capture, processing and analysis easy and powerful, to produce publication-ready images and data.

Image Capture

Gen5 captures images from fixed and live cell assays, tissues, whole biology and more. From large regions of interest to subcellular and intracellular details, Gen5 captures images in a batch, endpoint, time lapse sequence and z-stacks. Fluorescence, brightfield, color brightfield or phase contrast modes enable diverse applications.

Process

Brightness and contrast adjustments, background flattening and deconvolution are a few of the many image pre-processing steps available in Gen5. Z-stacks can automatically be z-projected and digital phase contrast improves the appearance of challenging images. Gen5's processing steps allow you to work within one software package without requiring extensive training.

Analyze

Gen5 analyzes cellular features such as intensity, or morphology (size, perimeter, circularity), enabling applications such as transfection efficiency, nuclear translocation or cell cycle assays where multiple cell subpopulations are present in the samples. Label-free confluence and cell counts are accomplished with the unique high contrast brightfield mode. The add-on spot counting module enables detailed analysis of intracellular activity.

Publish

During or after image analysis, Gen5's integrated tools enable convenient annotation of important information in each image without having to export to a third-party software package. Gen5's built in movie-maker turns time lapse images into movies with a click of the mouse. Not only does Gen5 provide amazing visualization of your samples, it provides quantitative data and results from the entire experiment. Heat maps, dose response curves and multi-mode and image-based quantitative data can be combined to rapidly obtain, analyze and acquire both phenotypic and quantitative results.

KEY FEATURES

Powerful instrument control

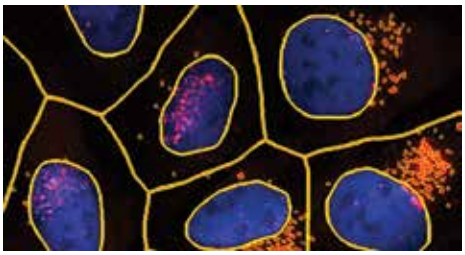
- User-trained autofocus, image-based and laser autofocus
- Automatic camera gain, exposure and LED intensity settings
- Endpoint, montage, z-stack and time-lapse imaging modes

Image pre-processing tools

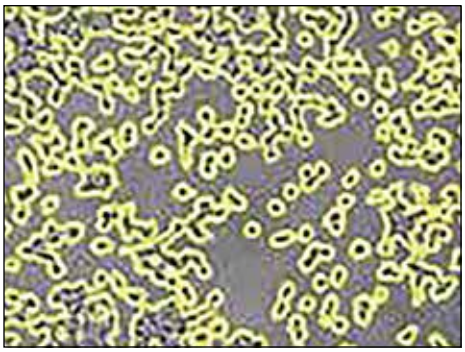
- Image deconvolution for improved visualization
- Automated flattening, smoothing, background correction
- Image stitching, z-projection
- Digital phase contrast algorithm

Image and data analysis tools

- Automated cell-counting and confluence; label-free cell counting
- Spot counting for intracellular detail analysis
- Primary & secondary masks; nucleus, cytoplasm or whole cell analysis
- Subpopulation analysis and image statistics
- EC_{50}, standard curves, kinetic analysis and more

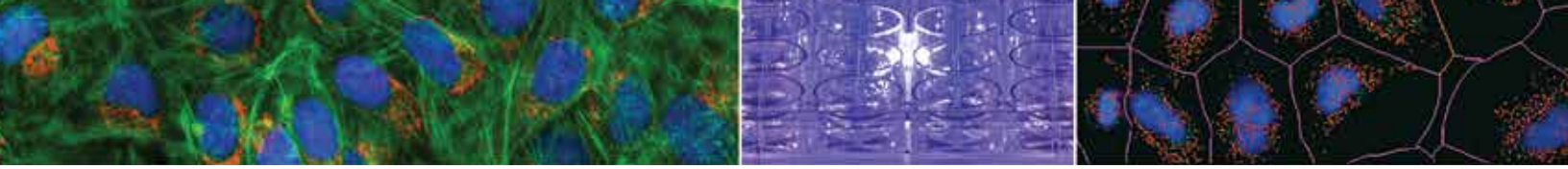


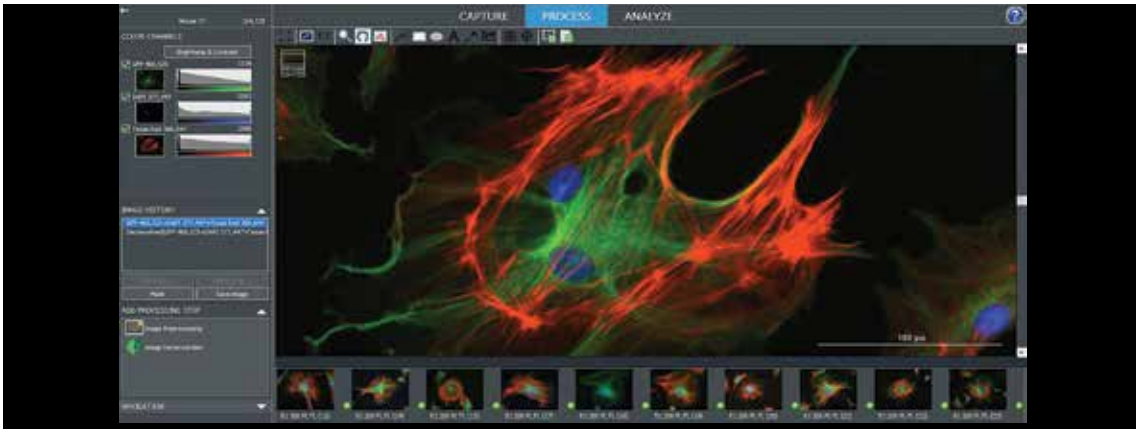
Spot counting: Intracellular details



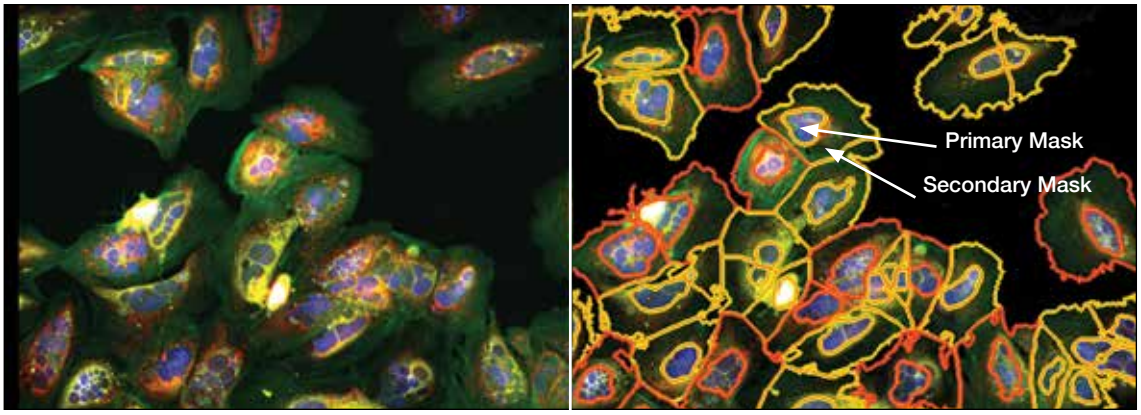
Confluence determination: High contrast brightfield

Gen5 is available in several editions for image processing and analysis. See page 49 for a comparison chart.



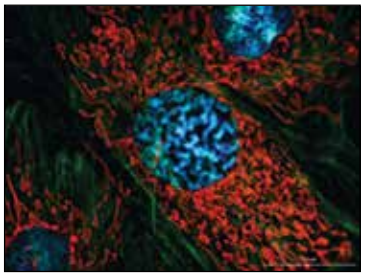


Gen5 has a highly visual interface to facilitate imaging workflows

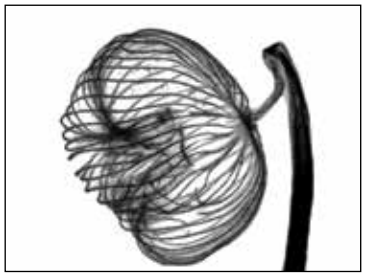


Cells treated with 0.3 µM Taxol; nuclear fragmentation visible (cells highlighted)

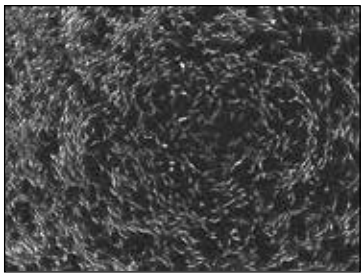
Zebrafish embryo at 2x, z-stacked and z-projected in brightfield



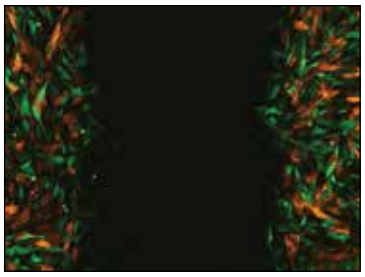
BPAE cells at 100x



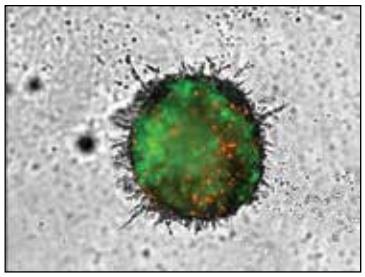
Dictydium sporotheca, 4x montage in color brightfield, z-stacked and z-projected



3T3 cells at 4x, digital phase contrast

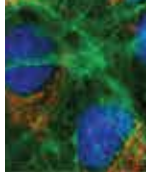


Fibroblasts expressing RFP and U-87 cell expressing GFP, just after scratch wound creation



U-87 Fibroblast tumoroid at 4x, 4 x 4 montage, z-stacked and stitched

Imaging & Microscopy Peripherals



BioTek offers a range of peripherals and accessories, including high quality objectives, LED/filter cubes, labware holders and adapters and many more. Each are designed to optimize imaging applications and enhance and automate throughput for many fixed and live cell imaging applications. Several key peripheral products are featured here – see the complete list of imaging and microscopy accessories on our web site.

Cell Count & Viability Starter Kit

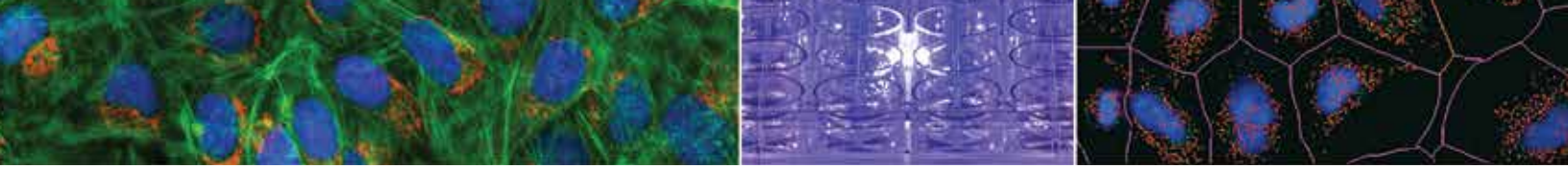
BioTek's Cell Count & Viability Starter Kit includes everything a researcher needs to count cells and measure viability in a mammalian cell suspension using a BioTek Cytation Cell Imaging Multi-Mode Reader or a Lionheart Automated Imager. The Kit saves time and increases data quality by automating the process of mammalian cell counting.

AutoScratch Wound Making Took

BioTek's AutoScratch Wound Making Tool automatically creates reproducible scratch wounds in cell monolayers grown in 24- or 96-well microplates for cell migration and invasion studies. AutoScratch automates the sample prep for imaging using BioTek's Cytation Cell Imaging Multi-Mode Readers and Lionheart Automated Microscopes. The Scratch Assay App automates image collection and analysis of wound width, wound confluence and maximum wound healing rate.

Agilent BenchCel Microplate Handler

The Agilent BenchCel Microplate Handler is a compact, automated system that can be integrated to Cytation cell imaging multimode readers, enabling automated workflows for a variety of applications. The BenchCel is a high-speed robot with plate storage stacks of varying capacities to meet a range of throughput requirements.



BioSpa 8 Automated Incubator

Cytation Cell Imaging Multi-Mode readers can be integrated with BioSpa 8 Automated Incubator and BioTek washers and dispensers to create a multi-plate Live Cell Analysis System. BioSpa automates the workflow for multiple plates and multiple users. Built-in scheduling, environmental monitoring and available liquid handling allow you to walk away with confidence – and allows multiple users to run processes simultaneously without disrupting others. See more about BioSpa 8 on page 76.

BioStack

Automate routine Cytation imaging or multi-mode detection processes with the compact BioStack Microplate Stacker. BioStack 4 offers patented plate de-lidding and re-lidding for sensitive cell-based workflows. For automated, higher volume slide scanning requirements, BioStack can process microscope slides for imaging on Cytation.

Peltier Cooling Module

The Peltier Cooling Module promotes a rapid interior cool down after incubated processes, to allow efficient switching between multiple applications without unwanted temperature influences. The Cooling Module maintains environmental stability within Cytation, allowing <1 °C rise in ambient temperature, regardless of external and internal temperature fluctuation.

Dual Reagent Injector Module

Dual reagent injectors allow rapid inject/image and inject/read functions during live cell imaging and multi-mode detection with Cytation.

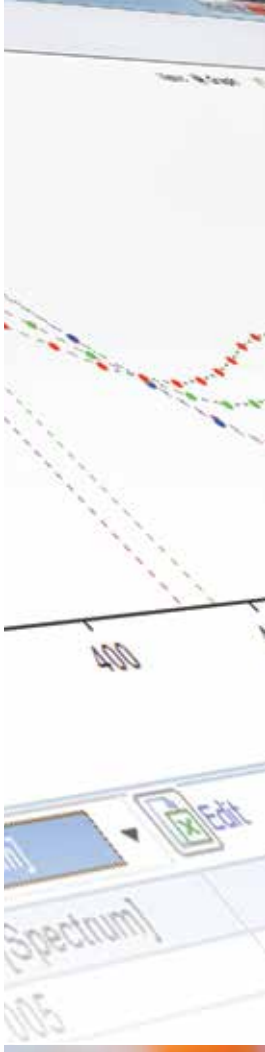
Gas Controller

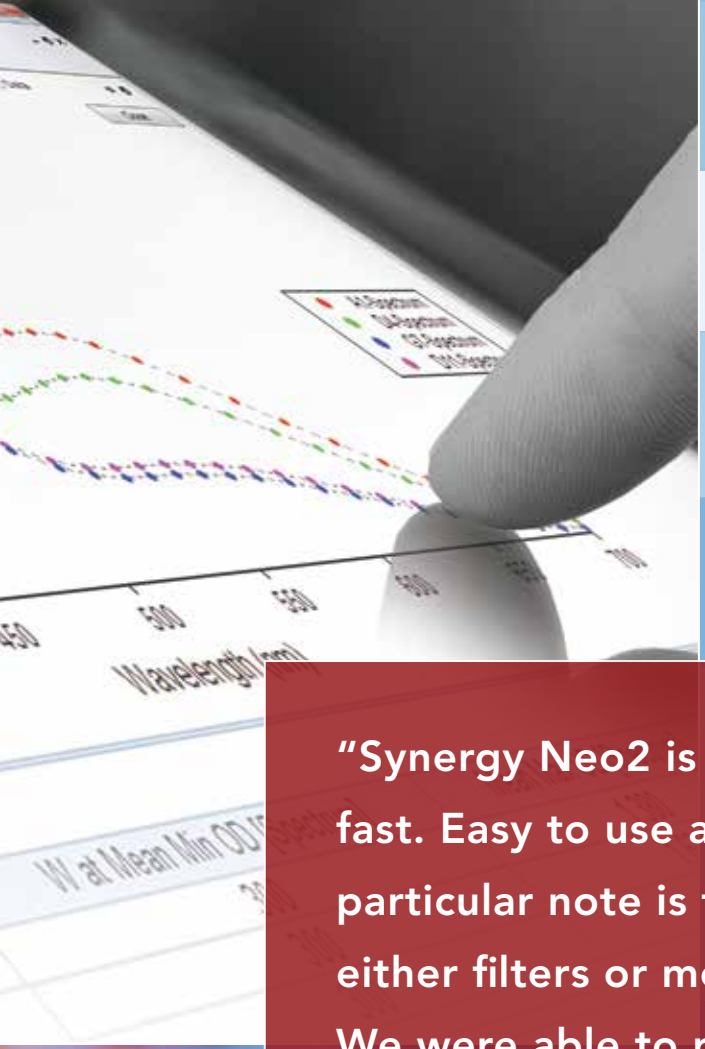
The compact Gas Controller integrates easily with Cytation, and Lionheart FX enabling full control over CO_2 and O_2 concentrations to help regulate the environment for live cell assays.

Detection

BioTek offers an extensive range of microplate readers, from the Synergy Neo2 Hybrid Multi-Mode Microplate Reader to the 800 TS Microplate Reader, packed with easy-to-use features for today's busy research and clinical laboratories. 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 µL in monochromator-based multi-mode and absorbance readers. BioTek's microplate readers come with Gen5 Software and many are compatible with BioStack and third-party automation products to provide increased throughput and unattended operation. To automate assay workflows, several readers are compatible with the BioSpa 8 Automated Incubator.





3.659	3.701	3.676	3.815
2.901	3.521	3.488	4.082
3.564	3.621	3.176	3.908
3.910	3.424	3.603	4.135
		3.617	3.966
		4.423	3.864

"Synergy Neo2 is sensitive and fast. Easy to use and flexible, of particular note is the ability to use either filters or monochromator. We were able to purchase the configuration we currently use, but can upgrade with additional functionality as needed."

TRUSTED REVIEWS

SYNERGY|neo2

hybrid multi-mode reader

Synergy Neo2 Multi-Mode Microplate Reader is designed for the screening laboratory, with speed and ultra-high performance. Synergy Neo2 features BioTek's patented Hybrid Technology, with its independent optical paths that ensure 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 - 50 nm in 1 nm increments, these continuously variable bandwidths help optimize detection of some fluorophores. Detection parameters for complex multiplexed assays like FRET and SNPs can be fine-tuned for the highest signal with the lowest crosstalk – and the results you expect.

Ultra-Fast: Two lasers and 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 a TRF laser to provide the fastest measurements with excellent sensitivity for critical screening applications like TRF and TR-FRET. Laser-based excitation ensures the best performance for Alpha assays.

Controlled Environment for Live Cell Assays

Along with incubation to 65 °C and shaking, Synergy Neo2 can be equipped with a CO_2/O_2 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 the Agilent BenchCel Microplate Handler and BioSpa 8 Automated Incubator.

TYPICAL RESEARCH 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

PATENTED HYBRID OPTICS

TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence Alpha detection
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	6- to 1536-well plates
Other labware	Petri and cell culture dishes Take3 Micro-Volume Plates
Temperature control	4-Zone incubation to 65 °C with Condensation Control
Shaking	Linear, orbital, double orbital
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Quantitative Assay Apps available
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
CO_2 and O_2 control	0 - 20% CO_2 control and 1 - 19% O_2 control, with optional Gas Controller
Barcode reader	1D and 2D camera-based scanner

Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	230 - 999 nm, in 1 nm increments
Monochromator bandwidth	2 nm (230 - 285 nm); 4 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 well: 6 seconds 384 well: 11 seconds 1536 well: 25 seconds

Fluorescence Intensity	
Light source	Xenon flash
Detector	Dual top PMTs Single top PMT (option) Low noise PMT (bottom filter system) Red shifted PMT (top/bottom monochromator system)
Wavelength selection	Quad monochromators (top/bottom) Filters (top/bottom)
Wavelength range	Monochromators: 250 - 850 nm Filters (dual PMT): 200 - 850 nm
Monochromator bandwidth	Variable; from 3 - 50 nm, in 1 nm increments
Dynamic range	7 decades
Sensitivity (Fluorescein)	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
Reading speed (kinetic)	96 well: 6 seconds 384 well: 11 seconds 1536 well: 25 seconds

Luminescence	
Wavelength range	300 - 700 nm
Dynamic range	>6 decades
Sensitivity	5 amol ATP (384-well low volume plate)

Fluorescence Polarization	
Light source	Xenon flash
Detector	Dual PMT or single PMT (option)
Wavelength selection	Filters
Wavelength range	280 - 850 nm
Sensitivity	1 mP standard deviation at 1 nM fluorescein (384-well low volume plate) 1.5 mP standard deviation at 1 nM fluorescein (1536-well plate)

Time-Resolved Fluorescence	
Light source	Xenon flash or TRF laser (option)
Detector	Dual PMT or single PMT (option)
Wavelength selection	Quad monochromators (top/bottom) Filters (top/bottom)
Wavelength range	Monos: 250 - 850 nm Filters (dual PMT): 200 - 850 nm
Sensitivity	With TRF laser: 5 fM (384-well low volume plate) With Xenon flash lamp: 40 fM (384-well low volume plate)

Alpha Detection	
Light source	100 mW 680 nm laser
Detector	PMT
Wavelength selection	Filters (top)
Sensitivity	100 amol bio-LCK-P (384-well low volume plate)
Read speed	96 well: 30 seconds 384 well: 1 minute 50 seconds 1536 well: 7 minutes 20 seconds

Reagent Injectors	
Number	2 syringe pumps
Supported labware	6- to 384-well plates, Petri dishes
Dead volume	1.1 mL with back flush
Dispense volume	5 - 1000 µL in 1 µL increments

Physical Characteristics	
Power consumption	250 W max
Dimensions	Without TRF laser: 15.4" W x 20.7" D x 16.1" H (39.2 x 52.5 x 40.8 cm) With TRF laser: 15.4" W x 24.2" D x 16.1" H (39.2 x 61.4 x 40.8 cm)
Weight	78 lb (35kg)

Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use may be available.

SYNERGY|H1

hybrid multi-mode reader

Synergy H1 is a configurable multi-mode microplate reader, with monochromator-based optics for flexibility, filter-based optics for sensitivity, or both… BioTek's patented Hybrid Technology offers applications versatility and excellent performance in a modular platform to expand as your laboratory's needs change.

Hybrid Plate Reader: Flexibility and Performance

With its patented combination of monochromator and filter optics, Synergy H1 is an advanced plate reader that delivers both the flexibility and performance you need for any microplate assay in your lab. Monochromators offer variable bandwidth, UV-Vis absorbance, fluorescence intensity, luminescence; filters enable fluorescence intensity, polarization, time-resolved fluorescence and filtered luminescence.

Upgradable to Meet Future Application Needs

Synergy H1's modular design allows you to start with what you need now, and add detection modes, gas control and dual reagent injectors as your laboratory's workflows evolve.

Variable Bandwidth for Sensitivity and Specificity

Synergy H1 offers quad monochromator optics with variable bandwidth. The excitation and emission bandwidths can be set between 9 nm and 50 nm, in 1 nm increments. Large bandwidths provide increased sensitivity and lower limits of detection. Small bandwidths provide increased specificity when multiple signals are present, reducing crosstalk and enhancing assay performance.

Automated Z-Focus: Best Performance With all Plate Types

Without automated z-focus available, performance at low volumes is affected. Automated z-focus enables reading height to be precisely adjusted for best performance in all plate types and all volumes.

Extended Dynamic Range

Synergy H1 offers an extended dynamic range, which allows detection of signals across a 7 log measurement range. Other systems can measure only small portions of the dynamic range of Synergy H1 using preset gains – this can cause reduced sensitivity on the low end or saturated signals on the high end of the assay signal range.

Environmental Controls for Cell-Based Assays

Temperature control to 45 °C, condensation control, CO_2/O_2 control and shaking create the ideal environment for live cell assay workflows. A consistent environment leads to consistent data for long-term kinetic assays.

Dual Syringe Injectors With Specialized Tips

The robust precise dual syringe design eliminates the need for regular tubing replacement required by some peristaltic pump injector designs. Synergy H1 offers two tip types: straight tips enable vigorous mixing for rapid inject/read assays, and angled tip option won't disturb cell layers for applications such as calcium kinetics.

TYPICAL RESEARCH APPLICATIONS

- ELISA
- Luciferase reporter assays
- Nucleic acid and protein quantification
- Microbial growth assays
- TR-FRET
- Fluorescence polarization
- BRET
- Enzyme kinetics
- Protein aggregation
- Cell-based assays
- Metabolic activity
- ROS

PATENTED HYBRID OPTICS

TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	6- to 384-well plates
Other labware	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 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Quantitative Assay Apps available
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
CO_2 and O_2 control	0 - 20% CO_2 control and 1 - 19% O_2 control, with optional Gas Controller
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	230 - 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 (monochromator system) PMT (filter system)
Wavelength selection	Quad monochromators (top/bottom) Filters (top)
Wavelength range	Monochromators: 250 - 700 nm (900 nm option)

Monochromator bandwidth	Variable: from 9 to 50 nm in 1 nm increments ("H1M2" configurations) Fixed: 16 nm
Dynamic range	7 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 well: 11 seconds 384 well: 22 seconds
Luminescence	
Sensitivity	Monos: 20 amol ATP Filters: 10 amol ATP
Fluorescence Polarization	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Filters
Wavelength range	Excitation range: 330 - 700 nm Emission range: 400 - 700 nm
Sensitivity	2 mP standard deviation at 1 nm fluorescein
Time-Resolved Fluorescence	
Light source	Xenon flash
Detector	PMT
Wavelength selection	Filters (top)
Sensitivity	<40 fM
Reagent Injectors	
Number	2 syringe pumps
Supported labware	6- to 384-well plates, Petri dishes
Dead volume	1.1 mL with back flush
Dispense volume	5 - 1000 µL in 1 µL increments
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50 - 200 µL
Physical Characteristics	
Power consumption	130 W max
Dimensions	15.4" W x 18.6" D x 12.9" H (39.1 x 47.2 x 32.8 cm)
Weight	50 lb (22.6 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use may be available.

SYNERGY|HTX

multi-mode reader

The Synergy HTX is an entry-level, affordable and upgradable 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 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

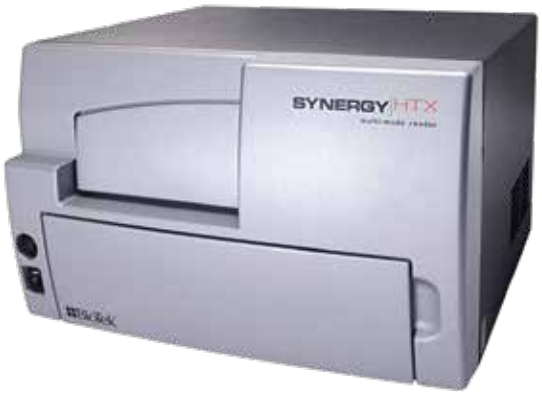
Two excitation and two emission filters are included with the reader, and can be used for top and bottom reading. Bottom reading is usually recommended when working with adherent cells, as it often provides better signal-to-background ratios. Top reading is typically best for assays where the fluorescence 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 increments and enables spectral scanning.

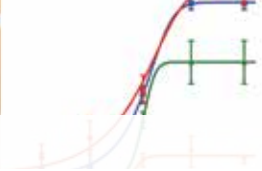
Low-Noise Luminescence Detection

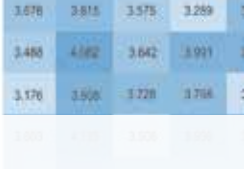
The Synergy HTX can automate glow and flash luminescence assays, thanks to its optional dual reagent injector module. Typical assays include ATP quantification as well as luciferase gene expression assays.



TYPICAL RESEARCH 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





TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence Time-resolved fluorescence (secondary mode) Alpha detection
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	6- to 384-well plates
Other labware	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 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Quantitative Assay Apps available
Automation	BioStack and 3rd party automation compatible
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 - 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)	5 pM (1 fmol/well, 96-well plate) - top and bottom
Reading speed (kinetic)	96 wells: 31 seconds 384 wells: 80 seconds

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 bio-LCK-P, 25 µL/well in 384-well plate
Read speed	96 well: 2 minutes
Reagent Injectors	
Supported detection modes	All modes
Number	2 syringe pumps
Supported labware	6- to 384-well plates
Dead volume	1.1 mL with back flush
Dispense volume	5 - 1000 µL in 1 µL increments
Dispense accuracy	±1 µL or 2%
Dispense precision	≤2% at 50 - 200 µL
Physical Characteristics	
Power consumption	130 W max
Dimensions	16" W x 15" D x 10" H (40.6 x 38.1 x 25.4 cm)
Weight	40 lb (18 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS Compliant. Models for In Vitro Diagnostic use may be available.

SYNERGY|LX

multi-mode reader

UV-Vis absorbance, fluorescence and luminescence detection are just a touch away, with Synergy LX Multi-Mode Microplate Reader. The color touchscreen simplifies programming and offers quick data display and output to a USB drive, printer or PC with powerful Gen5 Software. Synergy LX is the ideal microplate reader for many common endpoint assays including nucleic acid and protein quantification, ELISA and cell viability.

Affordable, Excellent Performance

At about half the price of similar instruments, Synergy LX is the solution for labs looking for an easy-to-use microplate reader for UV-Vis, fluorescence and luminescence assays. The independent optical paths use high quality components, ensuring uncompromised performance in all detection modes.

Common Assays

Synergy LX supports most common assays. The monochromator-based absorbance optics enable a wide range of UV-Vis measurements, including nucleic acid and protein quantification, while easily exchanged filter cubes make the Synergy LX a practical workstation for fluorescence intensity and luminescence assays. The onboard software includes several pre-programmed protocols, and allows easy programming for unique requirements.

Micro-Volume Quantification

Use BioTek's Take3 Micro-Volume Plate with Synergy LX for fast and easy nucleic acid and protein determinations. Pre-programmed protocols in Synergy LX display immediate results for up to sixteen 2 µL samples. Output results to a USB flash drive for use in downstream workflows.

Easy Operation

With its large color touchscreen, Synergy LX makes it simple to select and run a protocol. The data is displayed immediately after the measurement with a color gradient to help quickly visualize the data range.

TYPICAL RESEARCH APPLICATIONS

- Nucleic acid quantification (A_{260} and fluorescence-based)
- Nucleic acid purity assessment (A_{260}/A_{280})
- Micro-volume nucleic acid quantification (with Take3 Plate)
- ELISA
- Fluorescence ELISA
- Protein quantification
- Gene expression (luminescence and fluorescence)
- Cell viability assays
  - Absorbance MTT
  - Luminescence ATP
  - Various fluorescence-based

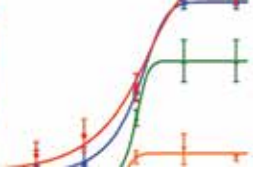
TECHNICAL DETAILS

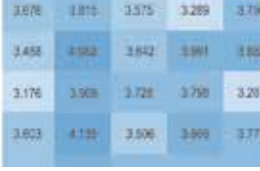
General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence
Read methods	Endpoint (onboard software) Endpoint, kinetic, area scanning, absorbance spectral scanning (under Gen5 control)
Microplate types	UV-Vis absorbance: 6- to 384-well plates (onboard software) Fluorescence intensity and luminescence: 96- and 384-well (onboard software) All modes: 6- to 384-well microplates (under Gen5 control)
Other labware	Take3 Micro-Volume Plates Take3 Trio Micro-Volume Plates (under Gen5 control)
Shaking	Linear, orbital, double-orbital
Software	Endpoint protocols (onboard software) Full data analysis and reporting (under Gen5 control) Quantitative Assay Apps available
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 - 999 nm, in 1 nm increments
Monochromator bandwidth	≤5 nm
Wavelength accuracy	±2 nm
Wavelength repeatability	±0.2 nm (standard deviation)
Dynamic range	0 to 4.0 OD
Resolution	0.001 OD (onboard software) 0.0001 OD (under Gen5 control)
Pathlength correction	Yes (under Gen5 Control)
OD accuracy	<1% at 2.0 OD <3% at 2.5 OD
OD linearity	<1% from 0 to 2.5 OD
OD repeatability	<0.5% at 2.0 OD
Stray light	0.03% at 230 nm
Reading speed (kinetic*)	96 wells: 12 seconds 384 wells: 23 seconds (*under Gen5 control)

Fluorescence Intensity	
Light source	Halogen
Detector	PMT
Wavelength selection	Bandpass filters
Wavelength range	320 - 700 nm (low noise PMT) 320 - 850 nm (red-shifted PMT)
Dynamic range	>6 decades
Sensitivity	2 pM fluorescein
Reading speed (kinetic*)	96 wells: 24 seconds 384 wells: 76 seconds (*under Gen5 control)
Luminescence	
Dynamic range	>6 decades
Sensitivity	10 amol ATP
Physical Characteristics	
Power consumption	60 W max
Connectivity	(1) USB 2.0 ports for computer control, (2) USB 2.0 ports for printer connection and USB thumb drive (touchscreen configurations only)
Dimensions	15″ W x 15″ D x 15″ H (with touchscreen) (38.1 x 38.1 x 38.1 cm) 15″ W x 15″ D x 12″ H (38.1 x 38.1 x 30.5 cm)
Weight	≤27 lb (12.3 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. IVD configurations may be available.

Multi-Mode Reader Comparison Chart

	Synergy Neo2	*Cytation*
General		
Microplate types	6 to 1536	Monochromator: 6 to 384 Filter and imaging: 6 to 1536
Gas Controller compatible	•	•
Agilent BenchCel compatible	•	•
BioSpa 8 Automated Incubator compatible	•	•
BioStack compatible/automation-ready	•	•
Dual reagent injector compatible	•	•
Take3 Micro-Volume Plate compatible	•	•
Temperature control system	to 65 °C	to 45 °C (Cytation 7, Cytation 1) to 65 °C (Cytation 5)
Peltier Cooling Module option		•
Condensation Control	•	•
Key Features & Application Areas		
Monochromator-based UV-Visible absorbance	•	•
Monochromator-based fluorescence	•	•
Variable bandwidth fluorescence monochromator	•	Cytation 7, Cytation 5
Filter-based fluorescence	•	Cytation 5, Cytation 1
Luminescence	•	•
Filtered luminescence	•	Cytation 5, Cytation 1
TRF & TR-FRET	•	Cytation 5, Cytation 1
TRF Laser	•	
Fluorescence polarization	•	Cytation 5, Cytation 1
AlphaLISA/AlphaScreen	100 mw 680 nm laser	100 mw 680 nm laser (Cytation 5)
Patented Hybrid Technology	•	Cytation 5
Dual PMT read head	•	
Upgradable to imaging		•





Synergy H1	*Synergy HTX*	*Synergy LX*
6 to 384	6 to 384	Onboard software Absorbance: 6 to 384 FI & LUM: 96 and 384 Under Gen5 control All modes: 6 to 384 well
•		
•		
•	•	
•	•	
•	•	•
to 45 °C	to 50 °C	
•	•	
•	•	•
•		
•		
•	•	•
•	•	•
•	•	•
•	(secondary mode)	
•		
	•	
•		

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-inch color touchscreen interface with easy to navigate controls, and full onboard Gen 5 Software for data collection, analysis and flexible export and report options. Incubation, shaking and robot compatibility are standard features.

UV-Vis Measurements

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

An optional cuvette port provides 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 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 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 the Agilent BenchCel Microplate Handler or BioSpa 8 Automated Incubator for unattended automation.

TYPICAL RESEARCH 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

TECHNICAL DETAILS

General	
Detection mode	Absorbance
Read methods	Endpoint, kinetic, well area scanning
Microplate types	6- to 384-well plates
Other labware	Take3 Micro-Volume plates, standard cuvettes (option)
Temperature control	4-Zone incubation to 65 °C
Shaking	Linear, orbital, double-orbital
Onboard software	Gen5 Microplate Reader and Imager Software (touchscreen configurations)
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Quantitative Assay Apps available
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 - 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	0.0 to 2.0 OD ± 1% ± 0.010 OD 2.0 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 consumption	120 W max
Dimensions	With touchscreen: 12.5" W x 15.5" D x 13" H (31.8 x 39.3 x 33 cm) Without touchscreen: 12.5" W x 15.5" D x 8" H (31.8 x 39.3 x 20.3 cm)
Weight	With touchscreen: 25 lb (11.3 kg) Without touchscreen: 20 lb (9.1 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

EPOCH

microplate spectrophotometer

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

200 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 Software, is a high-value system with maximum assay flexibility.

TYPICAL RESEARCH 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

Technical Details

General	
Detection mode	Absorbance
Read methods	Endpoint, kinetic, well area scanning
Microplate types	6- to 384-well plates
Other labware	Take3 Micro-Volume plates
Software	Gen5 Microplate Reader and Imager Software included Gen5 Secure for 21 CFR Part 11 compliance (option) Quantitative Assay Apps available
Automation	BioStack and 3rd party automation compatible ("R" model)
Absorbance	
Light source	Xenon flash
Detector	Photodiode
Wavelength selection	Monochromator
Wavelength range	200 - 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	0.0 to 2.0 OD ± 1% ± 0.010 OD 2.0 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 consumption	48 W max
Dimensions	12" W x 12.5" D x 7.7" H (30.5 x 31.8 x 19.6 cm)
Weight	<15 lb (6.8 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be 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 µL without dilution.

Compatible with Most BioTek Multi-and Single-Mode Detection Systems

Use the Take3 Plate with your Cytation, Synergy or Epoch reader to rapidly and easily measure multiple 2 µL samples for direct DNA, RNA and protein quantification.

Unique Robust Construction and Easy Maintenance

For routine cleaning, use laboratory wipes on all anodized surfaces Damaged slides are easily user-replaced, saving time and expense.

Automated DNA, RNA and Protein Quantification

Gen5 Software includes predefined protocols for micro-volume quantification with Take3. Results include concentration, spectral scans and purity ratios.

TYPICAL RESEARCH APPLICATIONS

- Micro-volume DNA, RNA and protein quantification
- Micro-volume fluorescence measurements
- Fluorescent dye incorporation measurements

Technical Details

	Take3	Take3 Trio
2 µL sample capacity	16	48
Detection limit	2 ng/µL dsDNA	2 ng/µL dsDNA

LOGPHASE 600

microbiology reader

The LogPhase 600 Microbiology Reader is in a class of its own, designed for measuring microbial growth curves in up to four standard 96-well microplates at a time. It features purpose-built, robust shaking and consistent temperature control, which are critical to optimal bacteria and yeast cell growth, ensuring data quality. The LogPhase 600 is controlled with an App to acquire data and perform microbiology-focused analysis for all plates.

4-Plate Microplate Reader

LogPhase 600 is a 4-plate microplate reader that facilitates microbial growth assays.

Keep Your Cells in Suspension for Optimal Growth

The shaking mechanism in LogPhase 600 is specifically designed for microbial growth assays; its robust shaking ensures that your cells will not settle, even during long term kinetic assays.

Optimized Incubation

Consistent temperature control is essential to successful microbial growth assays. Incubation in the LogPhase 600 is controlled by several sensors to ensure even heating throughout, without edge effect or evaporation. Incubation can be inconsistent in some microplate readers, but LogPhase 600 ensures consistent inter- and intra-plate heating.

Condensation Control

Condensation Control sets a temperature gradient from top to bottom to prevent condensation on the sealed plates that can cause light scatter and reading artifacts.

Consistent Growth Conditions = Consistent Data

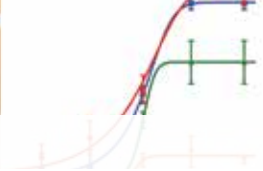
LogPhase 600 provides consistent growth conditions that are essential for microbial growth assays.

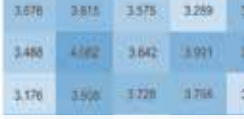
Targeted, Powerful and Easy-to-Use App

The LogPhase 600 App has an easy-to-use interface with analysis tools designed for microbial growth researchers. New users can be up and running in minutes with very little training. Multi-plate data can be viewed on the screen at the same time. The app automatically calculates lag time, maximum rate (OD/min) and time to stationary phase.

TYPICAL RESEARCH APPLICATIONS

- Yeast growth assays
- Bacterial growth assays
- Antimicrobial resistance
- Algal research
- Biofuels research
- Food and beverage testing





TECHNICAL DETAILS

General	
Detection modes	Absorbance
Microplate types	96-well microplates
Microplate capacity	4-microplate capacity
Temperature control	Incubation to 45 °C with Condensation Control Variation ±0.5 °C at 37 °C Plate to plate uniformity ±0.5 °C at 37 °C
Shaking	Orbital, user-selectable velocity
Software	LogPhase App included; provides reader control, data collection and complete analysis.
Absorbance	
Light source	LED
Detector	2 photodiodes (measurement & reference)
Wavelength range	560 nm – 640 nm, configuration dependent
Read methods	Discontinuous kinetic
Dynamic range	0 - 4.0 OD
Resolution	0.001 OD
OD accuracy	0.000 to 2.000 OD ± 1% ± 0.010 OD
OD linearity	0.000 to 2.000 OD ± 1% ± 0.010 OD
OD repeatability	0.000 to 2.000 OD ± 1% ± 0.005 OD
Reading speed	Reading speed: <60 sec per plate Minimum kinetic interval: 2 min 30 sec (<60 sec read time; 90 sec shake) per plate
Physical Characteristics	
Power consumption	24 VDC power supply compatible with 100-240 volts AC @50-60Hz, 250W (minimum)
Dimensions	10.5" H x 26.0" W x 16.0" D (26.7 x 66 x 40.6 cm)
Weight	50 lbs (22.7 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

800|TS

microplate absorbance reader

For high quality microplate reading at an affordable price, look no further than the 800 TS Absorbance Reader with its robust hardware and powerful software.

Wide Range of Applications

The 800 TS is ideal for a variety of applications including ELISA, protein and other endpoint protocols. Incubation and shaking expand the application range to include enzyme kinetics and cell-based assays. The 800 TS partners perfectly with the 50 TS Microplate Washer to automate all your workflows.

Quick and Easy Programming

The touchscreen interface makes protocol creation intuitive and simple. Defined protocols are saved onboard for convenient, quick selection. The 800 TS reads the plate efficiently, delivering results quickly and reliably.

USB Flash Drive Convenience

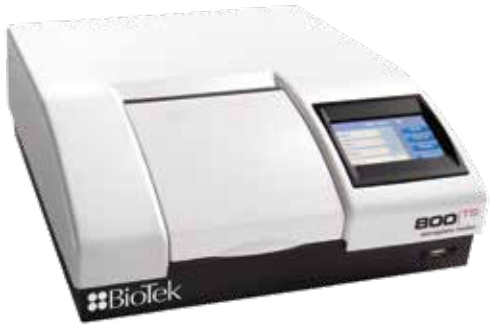
Results are displayed immediately after measurement, and can be sent to the optional printer or a USB flash drive. Import data to Gen5 Software for advanced data handling and custom reporting.

High Performance, Excellent Results

With the 800 TS, affordability doesn't mean compromised performance. The high quality hardware and optical design ensure results for all assays. As an FDA registered and ISO certified manufacturer, BioTek understands the importance of performance and data verification. Verify and qualify the 800 TS performance over time, using BioTek's Absorbance Test Plate and Product Qualification Package.

TYPICAL RESEARCH APPLICATIONS

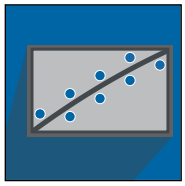
- ELISA
- Enzyme kinetics
- Protein assays
- Cell-based assays



Technical Details

General	
Detection mode	Absorbance
Read methods	Endpoint, kinetic and well area scanning (under computer control)
Microplate types	6-, 12-, 24-, 48-, 96-well microplates; 384-well and Terasaki trays (NB configurations)
Temperature control	To 50 °C
Shaking	Linear (except NB configurations)
User interface	4.3" color LCD touchscreen display
Onboard software	Up to 40 user-programmable protocols
Software	Gen5 Software included Gen5 Secure Software (option) Quantitative Assay Apps available
Absorbance	
Light source	Tungsten halogen lamp
Detector	Photodiode
Wavelength selection	Filters
Wavelength range	400 - 750 nm; 340 - 750 nm (UV configurations)
Filter capacity/supplied	5 positions/4 (5 with UV configurations)
Dynamic range	0 - 4.0 OD (normal & rapid read modes)
Resolution	0.001 OD (standalone mode) 0.0001 OD (under Gen5 control)
OD accuracy	Normal read mode ±1.0% ±0.010 OD from 0.0 to 2.0 OD @ 405 nm
OD linearity	Normal read mode ±1.0% ±0.010 OD from 0.0 to 2.0 OD @ 405 nm
OD repeatability	Normal read mode ±0.5% ±0.005 OD from 0.0 to 2.0 OD @ 405 nm
Read speed	96 wells, single wavelength Normal/Rapid/Sweep read mode: 30 seconds/ 18 seconds/11 seconds
Physical Characteristics	
Power consumption	40 W max 150 W max with incubation
Dimensions	15" W x 16.5" D x 7" H (38.1 x 41.9 x 17.8 cm)
Weight	18.5 lb (8 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

Quantitative Assay Apps



BioTek's Quantitative Assay Apps use the power of Gen5 behind a simple, step-by-step setup customization of pre-defined protocols for a streamlined process. Automated data export and report tools complete the workflow requirements.

Plate Reading to Results in Minutes

Many microplate reader software interfaces are multi-purpose and can be complex to program for reading parameters and data analysis. BioTek's Quantitative Assay Apps provide the tools you need for a simplified, streamlined experience.

10-Second Plate Map Definition

Say goodbye to cumbersome plate mapping! The Quantitative Assay Apps are specifically designed to make plate map definition easy. A few clicks and 10 seconds is all it takes.

Automatic Curve fitting

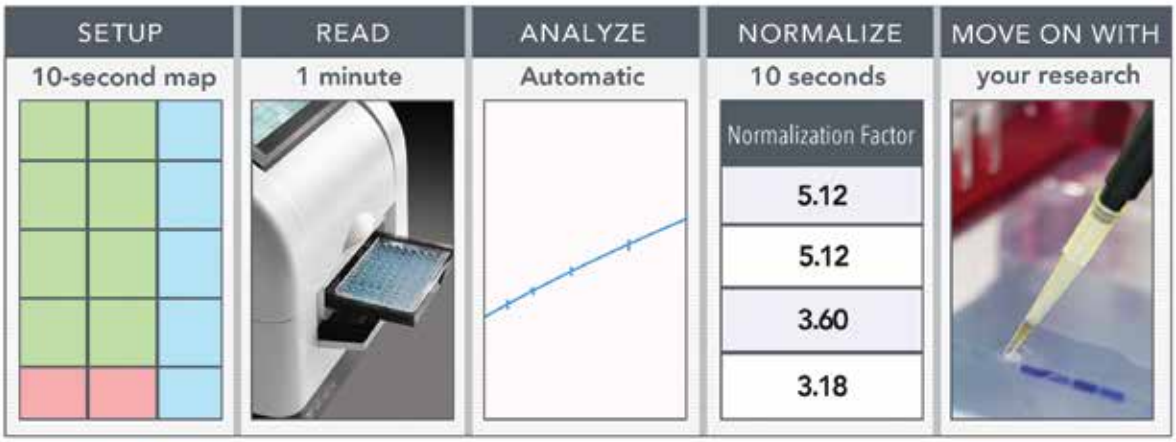
Curve fits are pre-programmed in the Quantitative Assay Apps. Define the plate map, read the plate and the standard curve is automatically plotted so you can see your final results in the shortest amount of time.

Normalization & Target Volume Calculation

Typical microplate reader software produces a final protein concentration. The Quantitative Assay Apps calculate additional metrics including normalization factors and volumes; ready for downstream assays such as western blots.

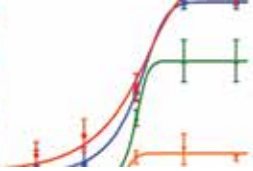
Easy Data Export

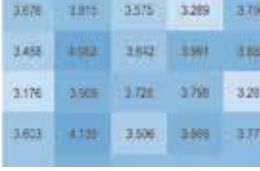
Export your data to a spreadsheet for further analysis or results documentation as needed for your laboratory's workflow.



Absorbance Reader Comparison Chart

	Epoch 2	*Epoch*
Key Features		
Wavelength selection	Monochromator	Monochromator
Wavelength range (nm)	200 - 999	200 - 999
Microplate types	6 to 384	6 to 384
Microplate capacity	1	1
Absorbance range	0 - 4.0	0 - 4.0
Temperature control	to 65 °C	
Shaking	Linear, orbital, double-orbital	
Cuvette measurement	Cuvette port (optional), Take3 or cuvette adapter	Take3 or cuvette adapter
Filter capacity	n/a	n/a
Automation ready/BioStack compatible	•	("R" configuration)
Agilent BenchCel Compatible	•	
BioSpa 8 Automated Incubator compatible	•	
Gen5 Software version included	Gen5	Gen5
Take3 Micro-Volume Plate compatible	•	•
Fastest read speed: 96 wells (seconds)	8	15





LogPhase 600	*800 TS*
Filter	Filter
560-640 nm (configuration dependent)	400 - 750 (340 - 750 option)
96	6 to 96 (6 to 384 option)
4	1
0 - 4.0	0 - 4.0
to 45 °C	to 50 °C
Orbital	Linear
1	5
LogPhase 600 App	Gen5
<60 sec per plate	11

Gen5™

data analysis software

Gen5 offers extensive data analysis tools for quantitative and qualitative analysis, including 4- and 5-parameter curve fits, EC/IC_{50} and Z' calculations. Data reduction transformations and customizable validation and cutoff calculations are all easily defined within the protocol. Gen5 provides quick low volume results with the Take3 plates, and data from any screen is exportable to Microsoft® Excel® at the touch of a single button.

Targeted Apps: Ultimate Ease

Individual, assay-specific Apps make it even easier to run your lab's most common assays, like BCA, Bradford and Lowry Protein assays, and fluorescence DNA quantification, among others. The simplified user interface has predefined, customizable protocols for easy setup, and data reduction is automated, using the power of Gen5 software.

Logical Workflow

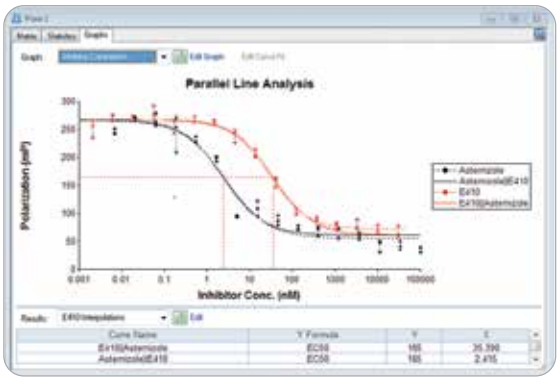
Gen5 is built around logical laboratory workflows to read microplates and produce/analyze data. Gen5's Task Manager makes it simple to get started designing a protocol or simply reading a plate quickly. With Gen5 you don't have to spend hours figuring out how to get things done.

Gen5 Secure: GxP Compliance

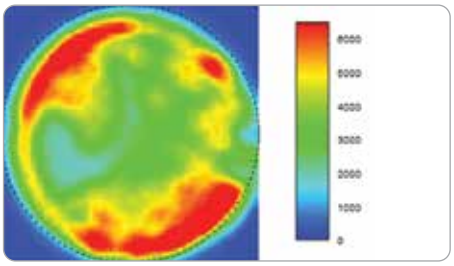
To meet GxP laboratory requirements, Gen5 Secure offers features designed to meet 21 CFR Part 11 regulations. Gen5 Secure is available for multi-mode and imaging applications – all include: Built-in administration with no additional software required, multi-level user permissions, electronic signature and protocol and data audit trails with configurable alerts.

QC and Validation Tools

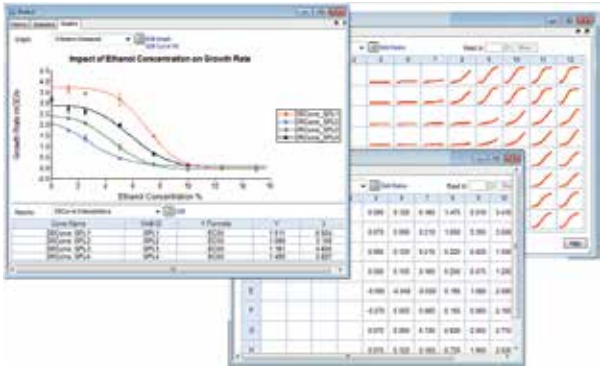
Gen5 is fully validated at BioTek, however, the available Gen5 Validation Package provides an efficient, step-by-step approach to facilitate your internal validation. The Gen5 Validation Package is compatible with BioTek's microplate reader Product Qualification Packages (IQ/OQ/PQ). Gen5 IVD and Gen5 IVD Image+ have QC trending capability, security features and validation protocols for convenience and efficiency.



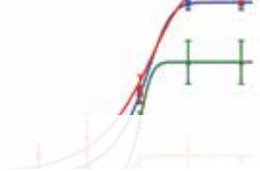
Parallel line analysis and EC_{50} determinations

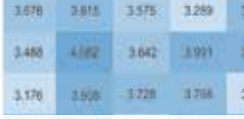


High-resolution 99 x 99 area scan



Multiple window views of plate data and results





Gen5™ Comparison Chart

General	GEN5*	GEN5SECURE*	GEN5IVD***	GEN5IPLUS*	GEN5SECUREIPLUS*	GEN5IVDIPLUS***	GEN5IPRIME*	GEN5SECUREIPRIME*
	Gen5	*Gen5 Secure*	*Gen5 IVD*	*Gen5 Image+*	*Gen5 Secure Image+*	*Gen5 IVD Image+*	*Gen5 Image Prime*	*Gen5 Secure Image Prime*
Instrument Control	•	•	•	•	•	•	•	•
Data reporting and exporting	•	•	•	•	•	•	•	•
Analysis								
Single and multi-mode data analysis	•	•	•	•	•	•	•	•
Image capture and basic analysis	•	•	•	•	•	•	•	•
Image capture and enhanced analysis				•	•	•	•	•
Image capture and advanced analysis							•	•
Additional Features								
21 CFR Part 11 compliant features		•	•		•	•		•
IVD compliant features			•			•		
QC Trending			•			•		
Gen5 Validation Package included**			•			•		

** For Research Use Only. Not for use in diagnostic procedures.*

*** Gen5 Validation Package is available for all other Gen5 editions, purchased separately.*

**** For In Vitro Diagnostic Use.*

Reader Peripherals

BioTek offers a wide range of peripherals and 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.

Agilent BenchCel Microplate Handler

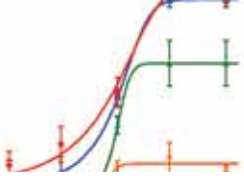
The Agilent BenchCel Microplate Handler is a compact, automated system that can be integrated to select Cytation, Synergy and Epoch 2 plate readers enabling automated workflows for a variety of applications. The BenchCel is a high-speed robot with plate storage stacks of varying capacities to meet a range of throughput requirements.

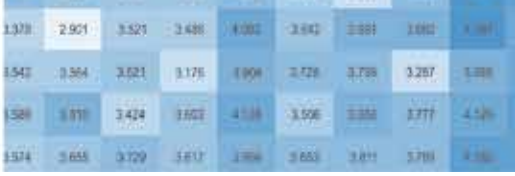
BioStack

Automate routine multi-mode detection processes with the compact BioStack Microplate Stacker. BioStack 4 offers patented plate de-lidding and re-lidding for sensitive cell-based workflows. BioStack Neo2 is a dedicated stacker offering super-fast plate processing exclusively for Synergy Neo2.

BioSpa 8 Automated Incubator

BioSpa Automated Incubator optimizes plate reading workflows for multiple plates and multiple users. Built-in scheduling, environmental monitoring and available liquid handling allow you to walk away with confidence – and allows multiple users to run processes simultaneously without disrupting others. See more about BioSpa 8 on page 76.



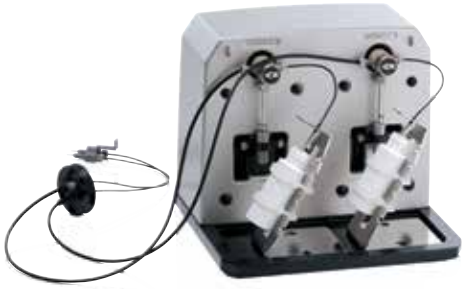


Take 3 Micro Volume Plate

Quickly quantify ultra-low volume samples of DNA, RNA and protein. Measure up to 48 samples with volumes as low as 2 µL without dilution. Compatible with most BioTek detection systems.

Peltier Cooling Module

The Peltier Cooling Module for Cytation promotes a rapid interior cool down after incubated processes, to allow efficient switching between multiple applications without unwanted temperature influences. Environmental stability is maintained, with <1 °C rise in ambient temperature, regardless of external and internal temperature fluctuation.



Dual Reagent Injector Module

Dual reagent injectors allow rapid inject/image and inject/read functions during live cell imaging and multi-mode detection with Cytation, Synergy Neo2, Synergy H1 and Synergy HTX.

Gas Controller

The compact Gas Controller integrates easily with Cytation, Synergy Neo2 or Synergy H1, enabling full control over CO_2 and O_2 concentrations to help regulate the environment for live cell assays.

Liquid Handling

BioTek offers a range of compact and affordable solutions for your laboratory's specific liquid handling needs. BioTek is known for manufacturing reliable and versatile microplate washers. From basic ELISA to sensitive cell washing to bead washing (including Luminex® xMAP® technology), the EL406, 405 TS, 50 TS and MultiFlo FX are configured with many options to meet myriad 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 500 nanoliters, 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.

"The MultiFlo FX is unbelievably compact, saving the much needed workbench space. The software and colour touch-screen user interface have been well designed - with fast and simple protocol programming and operation. It comes with some typical protocols for quick, routine use, and you can easily create protocols and save them for future use. The Dispenser has been very effective in my research, particularly on the quality of my experiments."

TRUSTED REVIEWS

EL|406

microplate washer dispenser

The EL406 Washer Dispenser offers fast microplate washing and BioTek's unique Parallel Dispense to optimize 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 entire workflow automation, the EL406 can be integrated to the Agilent BenchCel Microplate Handler, or BioSpa 8 Automated Incubator along with a BioTek imager or reader.

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 well suited for polystyrene beads and filtration-to-waste processes.

TYPICAL RESEARCH APPLICATIONS

- ELISA automation
- MSD assay automation
- HCS immunocytochemistry
- Cell-based assays
- FLIPR® Ca^{2+} 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)

General	
Microplate types	96-, 384-, 1536-well Low profile and standard height Solid and filter bottom (option)
Onboard software	Create, edit or run multiple protocols
Software	LHC Software (option) LHC Secure for 21 CFR Part 11 compliance (option) SiLA Compliant driver (option)
Separation	Biomagnetic separation, vacuum filtration (option)
Shaking	Programmable up to 60 minutes Slow, medium, fast or variable
Soaking	Programmable up to 60 minutes
Ultrasonic Advantage	Yes (standard on most configurations)
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
Washing	
Manifold types	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
Volume range	3 - 3000 µL/well, in 1 µL increments
Wash cycles	1 - 250
Buffer/reagent selection	Auto switching module for up to 4 buffers (option)
Supply bottle	4 L or 10 L (optional)
Dispense accuracy	±3%
Dispense precision	<3% CV (model dependent)
Residual volume	<2 µL/well
Wash speed	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
Flow rates	High flow to low flow Optimized rates for cell assays
Sterilization	Chemical
Vacuum range for filtration	0 to -380 mm Hg
Dispensing - Peristaltic Pump (Multi-Channel)	
Manifold types	8-tip (1 x 8) cassette with plastic, 316 stainless steel or sapphire jeweled 316 stainless steel tips
Dispense speed	96 wells, 10 µL/well: 8 seconds 384 wells, 5 µL/well: 12 seconds 1536 wells, 1 µL/well: 27 seconds
Volume range	500 nL - 3000 µL/well, selectable in 1 µL increments
Flow rates	User programmable rates from high to low Optimized rates for cell assays
Dispense performance	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 volume range: 5 - 2500 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 volume range: 10 - 3000 µL Dispense accuracy: ±2.0% at 10 µL Dispense precision: 2.0 CV at 10 µL Minimum prime volume: 7.36 mL
Recommended cassette replacement interval	1 µL Cassette: 1000 384-well microplates at 5 µL/well 5 µL Cassette: 1000 96-well microplates at 50 µL/well 10 µL Cassette: 1000 96-well microplates at 100 µL/well
Sterilization	Autoclave, chemical
Dispensing - Syringe Pump (Multi-Channel)	
Manifold types	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
Dispensing speed	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
Volume range	3 - 3000 µL/well, selectable in 1 µL increments Minimum prime volume: 12 mL
Flow rates	User programmable rates from high to low
Dispense accuracy	±1 µL at 5 µL ±1 µL at 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 or 2 L
Sterilization	Chemical, autoclavable option
Physical Characteristics	
Power consumption	900 W max 1250 W max with vacuum pump
Dimensions	16.5" W x 18" D x 12.5" H (41.9 x 45.7 x 31.8 cm)
Weight	32 lb (14.5 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

405|TS
microplate washer

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

The 405 TS 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 ports 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 TS 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 TS can be integrated with the BioSpa 8 Automated Incubator for unattended automation of many common processes.

Cell and Bead Assays

The 405 TS 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 TS.

Verify Technology and Automated Ultrasonic Cleaning

BioTek's 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 TS 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 RESEARCH APPLICATIONS

- ELISA automation
- MSD assay automation
- HCS immunocytochemistry
- FLIPR® Ca^{2+} 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)

TECHNICAL DETAILS

General	
Microplate types	96- and 384-well Low profile and standard height Solid and filter bottom (option) Filter pore sizes from 0.45 µm to 1.2 µm
Onboard software	Create, edit or run multiple protocols
Software	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
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 - 3000 µL/well, in 1 µL 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 µL/well (96-well washing) <4% CV: 80 µL/well (384-well washing)
Residual volume	< 2 µL/well (96- & 384-well plates) 96-tube manifold for 96 wells; 192-tube for 384 wells
Wash speed	96-wells, 300 µL/well, 3 cycles; ≤30 seconds 384-wells,100 µL/well, 3 cycles: ≤80 seconds 384-wells, 400 µL/well, 1 cycle: ≤20 seconds
Flow rates	High flow to low flow Optimized rates for cell assays
Sterilization	Chemical
Vacuum range for filtration	-38 to -506 mm Hg
Ultrasonic Advantage	Ultrasonic manifold cleaning (option)
Verify clog detection	Automated clog detection and reporting (option)
Physical Characteristics	
Power consumption	800 W max 1250 W max with vacuum pump
Dimensions	14" W x 17" D x 10" H (35.6 x 43.2 x 25.4 cm)
Weight	With internal buffer switching: 36 lb (16.5 kg)
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.

50 TS
microplate washer

The 50 TS Microplate Washer brings high quality and excellent automated washing to your laboratory at an affordable price. The robust design, easy to use software and excellent performance are typical of BioTek Microplate Washers.

Broad Applications Range

Applications for the 50 TS extend beyond simple dispense and aspirate routines typical of many ELISA processes. Fluid delivery can be optimized for gentle cell-based assay washing and available modules automate biomagnetic and vacuum filtration protocols. To automate many lower throughput workflows, the 50 TS partners well with the 800 TS Microplate Reader.

Simple, Powerful Programming and Operation

The 50 TS software includes pre-defined protocols for quick selection of commonly used wash parameters. Creating custom protocols onboard the 50 TS is easy – the touchscreen interface makes multi-step program creation intuitive and simple. Protocols are saved for quick recall. From just a single strip to a full microplate, the 50 TS washes quickly, efficiently and reliably.

Automated Buffer Switching

To facilitate maintenance or to accommodate complex wash routines, the 50 TS offers automated switching between supply bottles. Automated buffer switching is an affordable option for the 50 TS.

Reliable, Safe and Low Maintenance

Liquid level sensors will alert you to low supply or full waste levels, allowing wash programs to run safely and reliably. Pre-defined, automated maintenance routines keep the fluid path clean and prevent build-up of salt, protein or other material that can block manifold tubes, causing inadequate washing. As an FDA registered and ISO certified manufacturer, BioTek understands the importance of performance and data verification - BioTek's Product Qualification Package provides simple, straightforward instructions for verification of the 50 TS performance over time.

TYPICAL RESEARCH APPLICATIONS

- ELISA
- Cell-based assays
- Biomagnetic separation protocols
- ELISpot assays
- Vacuum filtration protocols
- Multiplex assays

General			
Microplate types	96 wells 96 and 384 wells (“16” configurations) Low profile and standard height 24 wells (with 4-well manifold) Solid and filter bottom (“V” models) Filter pore sizes 0.45 µm to 1.2 µm		
Onboard software	Up to 75 user-programmable protocols Quick menu Create or edit custom protocols Run protocols created onboard or downloaded from LHC Software		
Software	Liquid Handling Control (LHC), for external computer control and operation (optional)		
Separation	Biomagnetic separation (“M” configurations) Vacuum filtration (“F” configurations)		
Shaking	Programmable in mm:ss up to 30 minutes		
Soaking	Programmable in mm:ss up to 30 minutes		
User interface	4.3” color LCD touchscreen display		
Washing			
Manifolds	**Manifold type**	**Plate type**	
	4-well manifold	24-well	
	8-well manifold	96-well	
	8s-well manifold (short dispense tube)	96-well	
	2 x 8-well manifold	96-well	
	12-well manifold	96-well	
	16-well manifold	96- and 384-well	
Volume range	25 - 3000 µL/well		
Wash cycles	1 - 10		
Buffer/reagent selection	Auto switching module for up to 3 buffers (“V” configurations)		
Dispense precision	**Plate type**	**Manifold**	**Performance**
	96-well	8- and 8s-well	≤3.0% CV when measured over six 300 µL/well dispenses of deionized water with 0.1% Tween 20
	96-well	12-well	≤3.0% CV when measured over four 300 µL/well dispenses of deionized water with 0.1% Tween 20
	384-well	8-,16-well	≤4.0% CV when measured over six 100 µL/well dispenses of deionized water with 0.1% Tween 20
	96-well	2 x 8-well	≤4.0% CV when measured over six 300 µL/well dispenses (whole plate) of deionized water with 0.1% Tween 20
	24-well	4-well	≤4.0% CV when measured over six 1120 µL/well dispenses of deionized water with 0.1% Tween 20
Residual volume	**Plates**	**Manifold**	**Performance (avg residual/well)**
	96-well	8-well, 12-well	≤2.0 µL/well after 3-cycle wash, 300 µL/well dispensed
	96-well	2 x 8-well	≤4.0 µL/well after 3-cycle wash, 300 µL/well dispensed
	384-well	8-,16-well	≤4.0 µL/well after 1-cycle wash, 100 µL/well dispensed
	24-well	4-well	≤5.0 µL
	96-well filter bottom	8-, 2 x 8-, 12-well	<1.2 g increase after blotting
Wash speed	96 wells, 8-tube manifold, >300 µL/well: <130 seconds		
Fluid delivery	One positive displacement syringe drive		
Physical Characteristics			
Power consumption	40 W max		
Dimensions	15’ W x 15” D x 8” H (38.1 x 38.1 x 20.3 cm)		
Weight	22 lb (9.9 kg)		
Regulatory			
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.		

Washer Comparison Chart

	EL406	*MultiFlo FX*
Key Features		
6-, 12-, 24-, 48-well microplates		•
96-well microplates	•	•
384-well microplates	•	•
96-/384-deep well microplates		
1536-well microplate	•	
24-well microplates		
Full microplates	•	•
Strip microplates		•
Vacuum filtration	•	•
Biomagnetic separation	•	
Dual-Action manifold	•	
Ultrasonic Advantage	•	
Verify Technology		
Optimized cell washing	•	•
Agilent BenchCel Compatible	•	•
BioSpa 8 Automated Incubator compatible	•	•
BioStack compatible	•	•
LHC Software compatible	•	•
Touch Screen UI		•
USB flash drive port		•

405 TS	405 LS	ELx405 Select	50 TS
•	•	•	•
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MULTIFLO|FX

multi-mode dispenser

MultiFlo FX is an automated multi-mode reagent dispenser for 6- to 1536-well plates, dispensing volumes as low as 500 nL. Optional AMX Automated Media Exchange, RAD Random Access Dispense and plate washer modules expand its versatility and applications reach. A fully configured MultiFlo FX can replace 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 back flush capabilities, BioTek's syringe drives are program-and-forget solutions that never require recalibration.

RAD Random Access Dispensing

When the liquid handling workflow calls for individual well dispensing along with rapid bulk dispensing, MultiFlo FX manages the task with the unique RAD module. RAD provides single channel dispensing to discrete wells of 6- to 384-well plates. A custom plate map can be imported for use in concentration normalization protocols.

Wash Module

The MultiFlo FX wash module automates 6- to 384-well plate washing, using a precise syringe-driven dispense pump. Adding the wash module to MultiFlo FX configured with multiple dispensers provides astounding liquid handling versatility in one instrument.

AMX Automated Media Exchange

With its patent-pending AMX module, MultiFlo FX can meet the needs of increasingly important research that uses 3D cell structures such as spheroids and tumoroids, plus suspension cell-based applications. The AMX module provides automated, gentle media exchange for these critical workflows.

Modular and Upgradable

The MultiFlo FX is configurable and upgradable from dispense or wash only, to a combined dispense and wash combination, plus automated media exchange or single channel with the AMX and RAD modules. With its compact dimensions, the MultiFlo FX fits on any lab bench, and is easily integrated with the Agilent BenchCel Microplate Handler, BioTek BioSpa Automated Incubator or BioStack, along with third party automation systems.

TYPICAL RESEARCH APPLICATIONS

- Live cell workflows
- Automated media exchange
- 2D and 3D cell culture
- Cell fix and staining for imaging
- Concentration normalization
- Suspension cell culture
- Cell seeding
- ELISA

TECHNICAL DETAILS

General	
Onboard software	Create, edit or run multiple protocols
Software (computer control)	LHC2 Software LHC2 Secure for 21 CFR Part 11 compliance (option) SiLA Compliant driver (option)
Shaking	Programmable up to 60 minutes Slow, medium, fast or variable
Soaking	Programmable up to 60 minutes
User Interface	Color touchscreen
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
Dispensing - Peristaltic Pump (Multi-Channel)	
Microplate types	96-well standard, half-height and deep (ANSI/SLAS) 384-well standard, deep and PRC (ANSI/SLAS) 6- 12-, 24- and 48-well plates (with user-disconnected dispense tips)
Manifold types	1 x 8 tube, sapphire jeweled 316 SS, 316 SS, or polypropylene tips
Fluid delivery	1 or 2 peristaltic pumps
Dispense speed	96 wells, 5 µL cass, 10 µL/well: 3 seconds 384 wells, 5 µL cass, 5 µL/well: 6.5 seconds 384 wells, 1 µL cass, 1 µL/well: 6 seconds 1536 wells, 1 µL cass, 1 µL/well: 21 seconds
Dispense volume range	500 nL - 3000 µL/well, selectable in 1 µL increments
Flow rates	User programmable rates from high to low
Dispense performance	1 µL cassette: recommended range: 1 - 50 µL Accuracy: +5% at 1 µL Precision: <5% CV at 1 µL <10% CV at 500 nL Minimum prime volume: 1.20 mL 5 µL cassette: recommended range: 5 - 2500 µL Accuracy: +2.0% at 5 µL Precision: <2.5% CV at 5 µL Minimum prime volume: 4.23 mL 10 µL cassette: recommended range: 10 - 3000 µL Dispense accuracy: +2.0% at 10 µL Dispense precision: <2.0% CV at 10 µL Minimum prime volume: 7.36 mL
Recommended cassette replacement	1 µL Cassette: 1000 384-well microplates at 5 µL/well 5 µL Cassette: 1000 96-well microplates at 50 µL/well 10 µL Cassette: 1000 96-well microplates at 100 µL/well
Dispensing - Syringe Pump (Multi-Channel)	
Microplate types	96-well standard, half-height and deep (ANSI/SLAS) 384-well standard, deep and PCR (ANSI/SLAS) 6-, 12-, 24- and 48-well plates (Corning) with custom manifolds
Manifold types	96- and 384-well dispensing: One 16-tube (2 x 8) manifolds - 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
Fluid delivery	Two positive displacement syringe drives
Dispense speed	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
Volume range	3 - 3000 µL/well selectable in 1 µL increments Minimum prime volume: 12 mL
Flow rates	User programmable rates from high to low
Dispense accuracy	± 1 µL at 5 µL ± 1 µL at 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 or 2 L
Sterilization method	Chemical, autoclavable option

Washing	
Microplate types	96-. 384-well standard plates; 6-, 12-, 24-,and 48-well plates (with compatible manifold configuration)
Manifold types	96- and 384-well washing: 8-tube manifold 6-, 12-, 24-, 48-well washing: Custom manifolds available
Wash volume range	20-30,000 µL/well
Wash cycles	1-10
Wash speed	96 wells, 8-tube manifold, 3 cycles, 300 µL/well: <130 seconds
Dispense accuracy	±3%
Dispense precision	96-/384-well plates, 300 µL/well: <3% CV 6-well plates, 5560 µL/well: <5% CV
Residual volume	96-well plate, 300 µL/well: <2 µL/well
Flow rates	140 - 422 µL/well
Supply bottle capacity	2 L
Waste bottle capacity	2 L
Waste level detection	Yes
Sterilization method	Chemical
Media Exchange: AMX (Automated Media Exchange) Module	
Microplate types	96- and 384-well standard (ANSI/SLAS)
Manifold types	Two 8-channel autoclavable manifolds
Cassettes	Autoclavable cassettes with with 5 µL tubing
Dispense precision	≤5% CV
Dispense accuracy	≤ ±5%
Aspiration uniformity	≤ ±5%
Sterilization method	Cassettes and manifolds: chemical and autoclavable
Dispensing - RAD (Random Access Module)	
Microplate types	Single tip: 6-, 12-, 24-, 48-, 96-, 384-well plates; low profile standard height and deep well formats 8-to-1 tip: 6-, 12-, and 24-well plates
Other labware supported	96-well cluster tubes (minitubes) up to 50 mm height (requires custom carrier PN 7212042)
Manifold types	RAD single, with plastic or steel tip with 1, 5 or 10 µL tubing, 7° angle RAD 8-to-1 plastic tip, with 5 µL tubing, angled bulk dispense chute
Volume range	500 nL - 30,000 µL
Minimum prime volume	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
Dispense speed (high flow rate)	1 µL cass, 1 µL/well: 19s (96 wells), 55s (384 wells) 5 µL cass, 5 µL/well: 19s (96 wells), 58s (384 wells) 10 µL cass, 10 µL/well: 21s (96 wells), 66s (384 wells)
Dispense performance	1 µL cass (med), 0.5 µL/well: Precision 10% CV 1 µL cass (med), >2 µL/well: Accuracy +5%, Precision 5% CV 5 µL cass (high), >10 µL/well: Accuracy +2%, Precision 2.5% CV 10 µL cass (high), >20 µL/well: Accuracy +2%, Precision 2% CV 8-to 1 cass (high), >10 µL/well: Precision 2.5% CV 8- to 1 cass(high), >80 µL/well: Accuracy +2%
Physical Characteristics	
Power consumption	90 W max
Dimensions	Base instrument: 17.2" W x 11.8" D x 8" H (43.7 x 29.9 x 20.3 cm)
Weight	Base instrument: 19.5 lb (8.8 kg)
Connectivity	Two USB ports: Protocol storage/transfer and for optional external mouse or keyboard
Regulatory	
Regulatory	CE and TUV marked. RoHS compliant. IVD configurations may be available.

MICROFILL

microplate 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 with 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 µL 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 RESEARCH APPLICATIONS

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

General	
Microplate types	24-, 96- and 384-well Low profile, standard and deep well formats
Other labware	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	24-well dispensing: One 8-tube (1 x 8) manifold - 316 stainless steel tubes 96-well dispensing: One 8-tube (1 x 8) manifold - 316 stainless steel tubes 96-/384-well dispensing: One 16-tube (1 x 16) manifold - 316 stainless steel tubes
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 consumption	40 W max
Dimensions	15" W x 18" D x 7" H (38.1 x 45.7 x 17.8 cm)
Weight	20 lb (9.1 kg)
Regulatory	
Regulatory	CE and TUV marked. ROHS compliant. Models for In Vitro Diagnostic use may be available.

Dispenser Comparison Chart

	EL406
General	
Microplate types	96, 384 and 1536, standard and low profile
Modules available	Peristaltic dispense pump module Dual syringe pump module
Number of reagents	1 to 3
Dispense technology	Peristaltic pump Dual syringe pump
Fully modular and upgradable	•
Automation ready/BioStack compatible	•
Agilent BenchCel Compatible	•
BioSpa 8 Automated Incubator compatible	•
Variable flow rates	•
Volume range	1 - 3000 µL/well
Microplate shaking	•
Autoclavable fluid path	•
Onboard software included	•
Liquid Handling Control Software compatible	•
Key Features & Application Areas	
ELISA	•
Cell-based assays	•
Bulk reagent dispensing	•
Single well dispense	
Automated media exchange	•
Performance	
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 - at 5 µL, peristaltic pump; syringe pump	±2%; ±1 µL
Dispense precision - at 5 µL, peristaltic pump; syringe pump	≤2.5% CV; ≤2.5% CV

	MultiFlo FX	*MicroFill*
	6 to 1536 standard, low profile and deep well	24, 96 and 384 standard, low profile and deep well
	Wash module AMX Automated Media Exchange module RAD Random Access Dispense module Peristaltic dispense pump module Dual syringe pump module	
	1 to 5	1
	Peristaltic pump Dual syringe pump	Single syringe pump
	•	
	•	•
	•	
	•	
	500 nL - 30,000 µL/well	5 - 6000 µL/well
	•	
	•	•
	•	•
	•	
	•	•
	•	•
	•	•
	RAD module	
	AMX module	
	3 sec; 6 sec	n/a
	5.25 sec; 14 sec	4 sec; 7 sec
	±2%; ±1 µL	n/a; ±1 µL
	≤2.5% CV; ≤5% CV	n/a; ≤5% CV

LHC

liquid handling control software

Liquid Handling Control (LHC) Software allows MultiFlo FX Dispenser, EL406 Washer Dispenser and 405 TS Washer users the convenience of programming important assay-specific protocol requirements in a Microsoft® 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 Peripherals

BioTek offers a wide range of peripherals and 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 or Liquid Handling Accessories Brochure for a complete listing of available accessories.

Agilent BenchCel Microplate Handler

The Agilent BenchCel Microplate Handler is a compact, automated system that can be integrated to the MultiFlo FX multimode dispenser and EL406 washer dispenser, enabling automated workflows for a variety of applications. The BenchCel is a high-speed robot with plate storage stacks of varying capacities to meet a range of throughput requirements.

BioStack

Automate routine microplate washing or dispensing processes with the compact BioStack Microplate Stacker. BioStack 4 offers patented plate de-lidding and re-lidding for sensitive cell-based workflows, and all BioStacks are available with 10-, 30- or 50-plate capacity stackers.

BioSpa 8 Automated Incubator

BioSpa Automated Incubator optimizes liquid handling, plate reading and imaging workflows for multiple plates. Built-in scheduling and environmental monitoring allow you to walk away with confidence – and allows multiple users to run processes simultaneously without disrupting others. See more about BioSpa 8 on page 76.

Automated Media Exchange (AMX) Module

The patent-pending Automated Media Exchange (AMX) module uses peristaltic pumps to gently add and remove media from the wells, without disturbing 2D, 3D cell structures (spheroids, tumoroids). It's also useful for washing spheroids and suspension cells.

Dispense & Waste Systems

Robust reagent supply and waste removal systems are critical elements to many liquid handling operations. BioTek offers a complete line of supply and waste systems to accommodate low to high throughput workflows. High quality bottles with available 4L, 10L and 20L capacity, plus standard and high flow pumps or direct drain systems offer options that provide the best performance for your washing and dispensing systems.

Robotics

Many life science workflows benefit from expanded automation for increased throughput or process efficiency. BioTek offers unique automation solutions that integrate with our microplate washers, dispensers, readers and imagers.

BioSpa 8 Automated Incubator links BioTek readers or imagers together with washers or dispensers for full workflow automation of up to 8 microplates. Temperature, CO_2/O_2 and humidity levels are controlled and monitored through the BioSpa software to maintain an ideal environment for cell cultures during all experimental stages.

BioStack is a compact stacker that offers fast plate exchange options for 50 plates or more, and patented plate de-lidding and re-lidding with BioStack 4.

"BioStack 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."

TRUSTED REVIEWS

BenchCel Microplate Handler

The Agilent BenchCel Microplate Handler is a compact, automated system that can be integrated with BioTek plate washers, dispensers, plate readers and imagers, enabling automated workflows for a variety of applications. The high-speed robot has capacities to meet a broad range of throughput requirements, and its modular design provides the flexibility and scalability required to accommodate many diverse laboratory applications.

Open, Flexible Platform Automates a Variety of Workflows

BenchCel fully automates workflows between several BioTek liquid handling, detection and imaging instruments, including:

- MultiFlo FX Dispenser
- EL406 Washer Dispenser
- Synergy Neo2 Multi-Mode Reader
- Cytation 5 Imaging Reader
- Epoch 2 Absorbance Reader

ELISA Workflow Automation

The BenchCel Microplate Handler with an EL406 and Synergy Neo2 can batch process several ELISA plates. Automated plate washing, reagent addition and absorbance measurements facilitate the process to get results quickly.

Flexible Scheduling Software

Agilent's VWorks software offers an intuitive graphical interface and dynamic scheduling capabilities. Users can create and run protocols, forms and monitor progress of their workflows from VWorks.

Several Stack Sizes: Variety of Vessels

BenchCel's convenient front-loading stacks can be used in a wide variety of environments: benchtop, hood, biosafety cabinet. They accommodate a variety of microplate types including deep well plates

TYPICAL RESEARCH APPLICATIONS

- Automated ELISA workflows
- Automated add & read assays
- Automated cell fixation, staining & imaging

TECHNICAL DETAILS

Dimensions: BenchCel 2R & 4R					
Overall height	250 mm stacks	27.8 in	70.1 cm		
	660 mm stacks	43.8 in	111.1 cm		
	860 mm stacks	51.8 in	131.6 cm		

Dimensions: BenchCel 2R					
Liquid handler	**Reader/ Imager**	**Width (in)**	**Width (cm)**	**Depth (in)**	**Depth (cm)**
EL406	Epoch2	56.52	143.56	18.8	47.75
EL406	Neo2	64.09	162.79	20.32	51.61
EL406	Cytation 5	62.82	159.56	20.77	52.76
EL406		35.48	90.12	17.27	43.87
MultiFlo FX w/ wash	Epoch 2	58.13	147.65	20.83	52.91
MultiFlo FX w/ wash	Neo2	65.61	166.65	22.35	56.77
MultiFlo FX w/ wash	Cytation 5	64.34	163.42	22.8	57.91
MultiFlo FX w/ wash		37.02	94.03	18.94	48.11
MultiFlo FX w/o wash	Epoch2	58.08	147.52	14.8	37.59
MultiFlo FX w/o wash	Neo2	65.61	166.65	16.16	41.05
MultiFlo FX w/o wash	Cytation5	64.34	163.42	16.57	42.09
MultiFlo FX w/o wash	NA	37.02	94.03	12.85	32.64
	Epoch2	38.08	96.72	12.68	32.21
	Neo2	45.63	115.90	15.35	38.99
	Cytation5	44.35	112.65	16.34	41.50

Dimensions: BenchCel 4R					
Liquid handler	**Reader/ Imager**	**Width (in)**	**Width (cm)**	**Depth (in)**	**Depth (cm)**
EL406	Epoch2	73.52	186.74	18.8	47.75
EL406	Neo2	81.09	205.97	20.32	51.61
EL406	Cytation5	79.82	202.74	20.77	52.76
EL406		52.48	133.30	17.27	43.87
MultiFlo FX w/ wash	Epoch2	75.13	190.83	20.83	52.91
MultiFlo FX w/ wash	Neo2	82.61	209.83	22.35	56.77
MultiFlo FX w/ wash	Cytation5	81.34	206.60	22.8	57.91
MultiFlo FX w/ wash		54.02	137.21	18.94	48.11
MultiFlo FX w/o wash	Epoch2	75.08	190.70	14.8	37.59
MultiFlo FX w/o wash	Neo2	82.61	209.83	16.16	41.05
MultiFlo FX w/o wash	Cytation5	81.34	206.60	16.57	42.09
MultiFlo FX w/o wash	NA	54.02	137.21	12.85	32.64
	Epoch2	55.08	139.90	12.68	32.21
	Neo2	62.63	159.08	15.35	38.99
	Cytation5	61.35	155.83	16.34	41.50

Weight		
BenchCel 2R	w/o stacks: 60 lbs (28 kg)	w/ 660 mm stacks: 72 lbs (32.5 kg)
BenchCel 4R	w/o stacks: 87 lbs (32.5 kg)	w/ 660 mm stacks: 107 lbs (48.6 kg)

General	
Microplate types	ANSI/SLAS standard microplates, deep well plates
Capacity - # stacks	BenchCel is available in 2-stack or 4-stack versions for a range of throughput requirements
Stack height / capacity (14 mm plates)	860 mm (34") / 61 660 mm (26") / 47 250 mm (10") / 17
Stack type	Front-loading; when opened, rack accepts stack of plates for efficiency and convenience
Instrument compatibility	Synergy Neo2 Multi-Mode Reader Cytation 5 Imaging Reader Epoch 2 Absorbance Reader EL406 Washer Dispenser MultiFlo FX Multi-Mode Dispenser
Software	Agilent VWorks, integrated with BioTek Gen5 and LHC2
Safety features	Safety shield, emergency-stop pendant
Sensors	Plate-presence sensor, rack-presence sensor, plate orientation sensor

BIOSPA 8
automated incubator

BioTek's 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_2/O_2, 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_2/O_2 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 the 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 RESEARCH APPLICATIONS

Automated sample preparation for cell-based assays

- Drug absorption
- 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

General	
Microplate types	6- to 1536-well standard height microplates, with or without lids Plate height range: 7.6 to 25.4 mm
Other labware	Petri and cell culture dishes (35 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
Compatible BioTek instruments	Cytation 7, Cytation 5, Cytation 1, 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_2 Control	
Range	1 - 20%
Control resolution	±0.1%
Stability	±0.2 at 5% O_2
O_2 Control	
Range	1 - 19%
Control resolution	±0.1%
Stability	±0.2 at 5% O_2
Humidity	
rH	80 to 95% (lidded plates and 5% CO_2)
Source	Removable water pan
Water level sensor	Low water level alert
Software	
BioSpa Software	Provides programming interface for BioTek detection and liquid handling devices Allows user notification (text or email) of events and/or errors in the system Provides control, monitoring and logging of: - CO_2/O_2 - temperature Provides humidity level monitoring and logging Allows long-term uninterrupted runs up to 2 weeks
Physical Characteristics	
Power consumption	250 W max
Dimensions	27.2" W x 20.1" D x 18.9" H (69.1 x 51.1 x 48.0 cm)
Weight	<85 lb (39 kg)
Regulatory	
Regulatory	CE and TUV marked, RoHS compliant. Models for In Vitro Diagnostic use may be available.

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 walkaway automation for routine processes, including processes requiring plate de-lidding and re-lidding.

Fast Transfer Speeds

BioStack takes 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 walkaway 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 a 75-plate 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 and maintenance-free use. The rotational gripper and small footprint allows for integration position versatility and for optimal fit within a biosafety enclosure or for space-savings on the benchtop.

TYPICAL RESEARCH APPLICATIONS

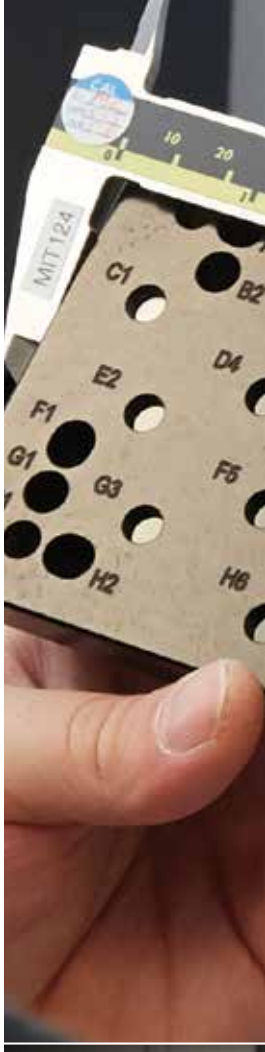
- Cell-based assays
- ELISAs
- Primary screening assays
- Colorimetric, fluorometric and luminescent assays

TECHNICAL DETAILS

	BioStack 4	BioStack 3 • BioStack Neo • BioStack
General		
Microplate types	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
Lidded plate handling	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
Microplate capacity	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
Barcode scanner (option)	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)
Processing speed (plate exchange time)	<20 seconds (with de-lidding) <12 seconds (without lids)	<10 seconds: BioStack 3, BioStack Neo <33 seconds: BioStack
Direct control	Washers and dispensers with keypad interface can directly control BioStack	Washers and dispensers with keypad interface can directly control BioStack
Software (PC control)	LHC for liquid handling instruments (optional) Gen5 for readers	LHC for liquid handling instruments (optional) Gen5 for readers
Physical Characteristics		
Power consumption	40 W max	40 W max
Dimensions	8.3" W x 22" D (21.1 x 55.9 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 (17.8 x 47.0 cm) Overall height will vary depending on connected instruments and stacks used
Weight	<25 lb (11.3 kg)	<25 lb (11.3 kg)
Regulatory		
Regulatory	CE and TUV marked. RoHS compliant. Models for In Vitro Diagnostic use may be available.	

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's Field Applications Scientists, Engineers, Technicians and Sales Representatives provide valuable assistance to laboratories worldwide.



"Consistent high-quality BioTek service, both online and by service representatives, is a major factor in our decision to use BioTek exclusively for our microplate readers."

– Synergy H1 customer

LabScience TRUSTED REVIEWS

Compliance

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

21 CFR Part 11 Compliance Products

Gen5 Secure and **LHC Secure** software editions 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. Other products may have IVD Compliant models available. Email CustomerCare@biotek.com for more information.

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

Product Qualification

All product Qualification Packages are fully validated to ensure 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 (with exemptions) and EU 2015/863

BioTek is committed to helping protect the environment. All of BioTek's products meet the RoHS directive as indicated in the Regulatory section of the product specifications in this catalog.

Instrument IQ/OQ Packages

BioTek offers a menu of Qualification Packages for all of our microplate instruments.

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 Plate
For use with BioTek absorbance readers and multi-mode readers with absorbance capability. Ensure GxP compliance by checking instrument performance against specifications for:

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

A 340 nm-only test plate is available to replace liquid NADH tests.

Fluorescence Test Plate
The Fluorescence Test Plate replaces fluorescence liquid tests. Instrument performance can be evaluated against specifications to ensure GxP compliance by automatically checking a series of critical performance parameters, including:

- Fl limit of detection
- FP limit of detection
- TRF limit of detection
- Carrier flatness
- Linearity

The fluorescein equivalent standards used in the plate are NIST-traceable.

Luminescence Test Plate
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 Certification
Since BioTek test plates are precision validation tools, it is highly recommended that they be calibrated and recertified regularly. BioTek offers a test plate recertification program to assist laboratories with ensuring quality results as well as their regulatory standards. Request a test plate certification via our online service request form on biotek.com or the CRC (https://customer.biotek.com).

TEST PLATE RECERTIFICATION PROGRAMS ARE AVAILABLE.
Contact BioTek Service for details.
www.biotek.com/contact

Global Service & Support

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. For any service or support need, contact us at 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

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

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 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 the CRC at **https://customer.biotek.com**

THIRD-PARTY CUSTOMER SATISFACTION SURVEY EXCERPTS

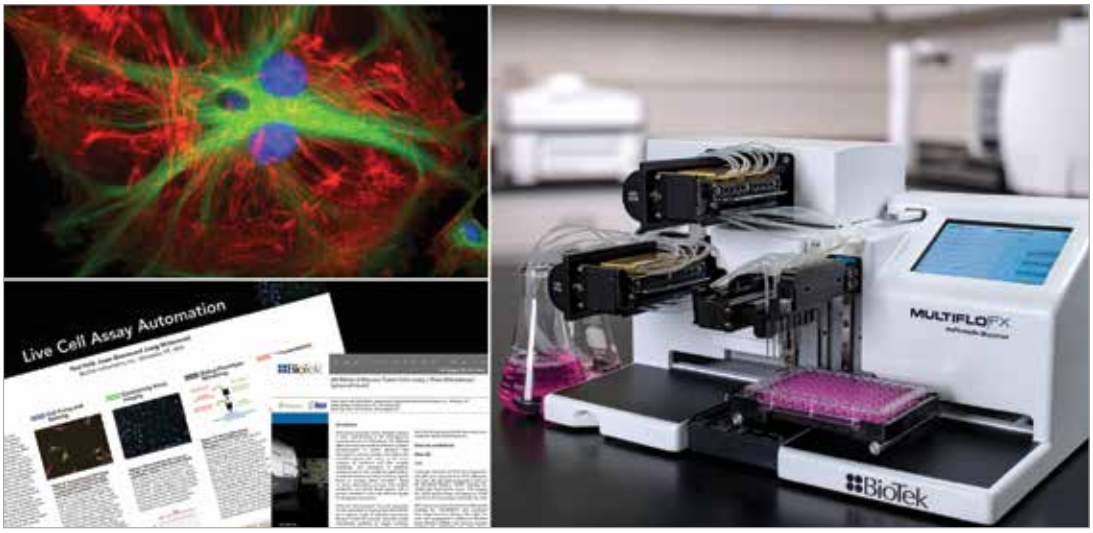
"BioTek technical service is one of the best I have encountered in more than 20 years working in labs – every person I speak to on the phone is knowledgeable, professional, and works very hard to help me out. Keep up the great work!"

"Field Service Rep did an amazing job training us on our new instrument. I've been trained on many different instruments by field engineers and our Field Service Rep was easily one of the best teachers I've ever had. He did an excellent job going through the instrumentation and all aspects of the software. I feel completely prepared to start using our new instrument!"

"BioTek is an excellent vendor to work with. I wish all my critical vendors had such great service."

Applications Support

BioTek recognizes the critical need to fully support our customers and their unique applications. Showing the efficacy of customer assays running our wide range of instruments is key to our customers' success and advancing scientific research in general. Under the direction of Dr. Peter Banks, Scientific Director, BioTek continues its commitment in 2017 by more than doubling the size of its fully equipped laboratory and cell culture facility and increasing scientific staff by 50%.



Our in-house, full time scientists have over 100 years accumulated experience all with the goal of assisting our existing and prospective customers with their most difficult challenges. With over 500 scientific articles ranging from peer-reviewed publications, application notes and conference presentations on topics such as 3D cell culture methods, quantitative phenotypic assays and live cell imaging, the Applications Team is experienced in the latest assay technologies.

FASTeam
field applications scientists

Our support for our customers' research does not stop there. BioTek has a global team of more than thirty (30) Field Application Scientists (FAS) dedicated to understanding and trouble shooting customers' applications. Their role is to demonstrate customer assays on BioTek instrumentation and provide post sales applications training in our customers' laboratories. Both our in-house scientists and our FAS team cooperate closely to ensure BioTek's full scientific knowledge and experience are available to support our customers' needs.

CATALOG 2021

At BioTek, our philosophy transcends conventional thinking and challenges the status quo. We develop fresh, original solutions by unifying concepts that often appear to be opposed. It means to shape and reshape. To engineer, build, deliver and support products that best serve the marketplace by providing what you need, when you need it.

Think Possible.
It's the difference between leading and following.

BioTek®

A part of **Agilent**

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