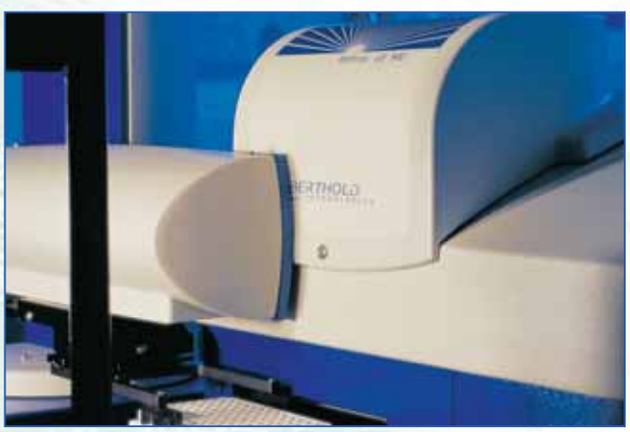
BERTHOLD TECHNOLOGIES

detect and identify



Mithras LB 940

Multimode Microplate Reader

Mithras LB 940

Multimode Microplate Reader

Discover what really counts

The modular Mithras multimode reader is unique in its versatility, reliability and sensitivity. It offers the biggest choice of reading technologies combined with up to 4 reagent injectors and temperature control.

Superior Detectors

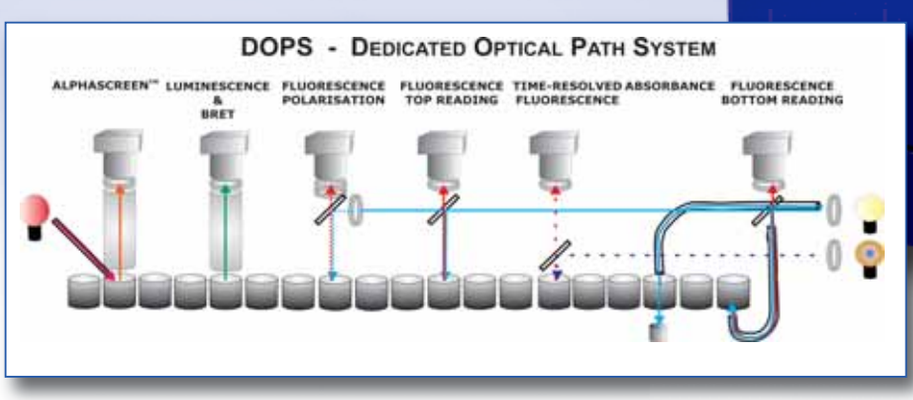
A stringent procedure for low and stable backgrounds and high efficiencies is applied when photomultipliers are selected for the Mithras. Together with Berthold´s true photon counting technology this is the only accepted way to achieve

- High sensitivity
- Large dynamic range
- Stable performance

A Peltier-cooling system may be applied to enhance stability and lower the background even more.

Dedicated Optical Path System (DOPS)

Each reading technology has its own specific demands on the optical system to be used. Only the Mithras with its unique DOPS can guarantee optimum performance for all reading technologies. The path selection is done automatically by the instrument based on the user-defined reading parameters.



High sensitivity
+ Wide dynamic range
+ Accurate reagent injectors
+ Extreme flexibility
+ Biggest choice of technologies
+ Small footprint

= Mithras Microplate Readers

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Built-in Crosstalk Reduction

Emission of neighbouring wells has to be eliminated to verify trustworthy and quantifiable data. In the Mithras proprietory crosstalk reduction devices are used to block away any unwanted signals.

Automatic Z-height Adjustment

As microplates of different formats and manufacturers vary in their respective heights the Automatic Plate Height Adjustment function of the Mithras ensures secure and optimised adjustment of the detection system.

Filters – the better choice

The benefits of the Dedicated Optical Path System are best facilitated by optical filters when it comes to sensitivity and versatility. Only the use of filters with transmission characteristics of as high as 80 % - versus approximately only 16 % of double monochromator assemblies – ensure the sensitivity needed for BRET and other colour luminescence as well as HTRF® or fluorescence polarisation applications.
Ratiometric assays – e.g ion channels - require fast wavelength changes only achievable with quickly switchable filters.

- Higher transmission
- Better sensitivity
- Fast wavelength change
- BRET/BRET²
- Fluorescence polarisation
- Maintenance-free
- Faster reading times
- Application-specific bandwidths

The Mithras can be equipped with up to 20 excitation and more than 30 emission filters fulfilling the needs for multiple dyes and users easily.

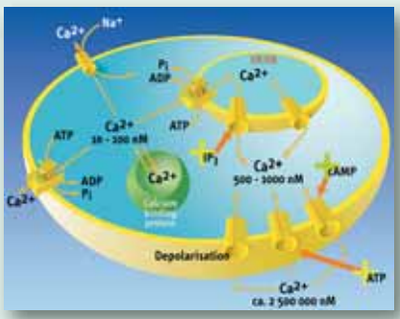
Microplate-based Assay / Detection Mode	Absorbance/ Colorimetric	AlphaScreen™	BRET/BRET²	Luminescence (Glow)	Luminescence/ Flash with Injec.	Fluorescence	Fluorescence/ Flash with Injec.	FRET	TR-FRET	Time-Resolved Fluorescence	Fluorescence Polarisation (FP)
Cell Proliferation	x			x	x						
Cell Viability	x			x	x	x					
Cytotoxicity	x			x	x					x	
ATP measurement				x	x						
Cyclic AMP	x	x		x		x			x	x	x
Ca⁺⁺ monitoring with Aequorin					x						
Ca⁺⁺ monitoring with Fura-2/Indo-1							x				
GPCRs/ß-arrestin			x								
Receptor dimerization		x						x			
GTPgS binding									x	x	
Receptor - Ligand Binding		x	x			x		x	x	x	x
Cytokine quantification	x	x		x		x			x	x	
Hormone quantification	x	x		x		x			x	x	
Reporter Gene	x			x	x	x	x				
Dual Reporter Gene				x	x						
Protein - Protein interactions		x	x			x			x	x	x
Enzyme activity	x	x	x	x	x	x	x		x	x	x
Kinase	x	x	x	x		x			x	x	x
Caspase	x		x			x				x	x
Protease	x	x	x	x		x			x	x	x
DNA/RNA quantification	x			x		x					
Protein quantification	x			x		x					
Immunoassay	x			x	x	x				x	x
Reactive Oxygen Species (ROS)	x			x	x	x	x				

Mithras LB 940

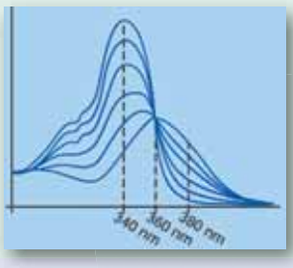
Multimode Microplate Reader

Calcium Monitoring

Intracellular Ca^{++} levels have become important indicators for the activation state of ion channels and G-protein coupled receptors as well as for the phases of apoptosis and cell injury. Though the respective kinetics and the absolute amounts of the Calcium levels are different for each of these physiological processes there are common ways for monitoring them.

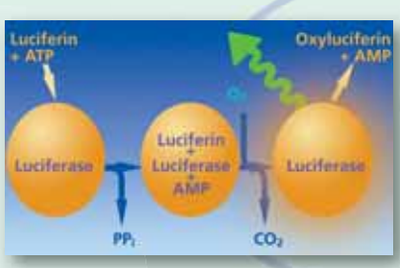


Luminescent labels like Aequorin as well as fluorescent ones are versatile and widely used solutions for microplate assays. Fura 2 and Indo-1 provide a ratiometric readout thereby reducing effects caused by leaking or bleached dyes or varying assay conditions.



OregonGreen offers a fast single wavelength readout especially suited for high throughput environments. These assays can easily and reliably be performed with the use of the Mithras´s variable reagent injectors.

ATP Determination

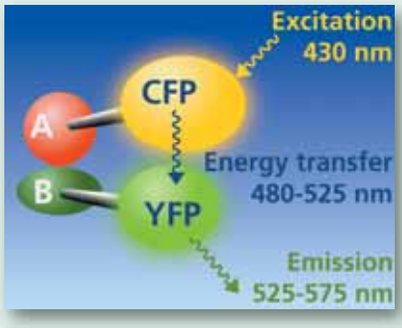


A detection limit of less than 6 attomol of ATP per well makes the Mithras one of the best suited microplate instruments for the determination of cell viability, e.g. in tumor chemosensivity assays, cell proliferation, antibiotic susceptibility testing or hygiene monitoring.

DNA Probe Assays

Several diagnostic DNA probe assays based on Acridinium ester labelled oligonucleotides are commonly used providing the most sensitive detection and diagnosis of infectious diseases.

Fluorescence Resonance Energy Transfer (FRET)

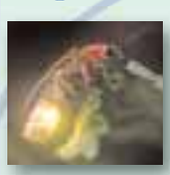


Fluorescence Resonance Energy Transfer (FRET) has for long been known to be a smart method for visualisation of molecular interactions of proteins and nucleic acids.

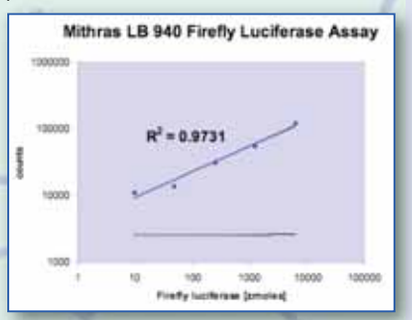
The discovery and further development of the Fluorescent Protein family as well as the Cy dyes have led to an increased use in microplate assays. Another popular donor/acceptor combination is FITC and Rhodamine.

FRET is based on the fact that a donor dye like CFP in an excited state can transfer a part of this energy and excite an acceptor dye like YFP. Its emission can be detected as soon as both dyes are in close proximity.

Reporter Gene Assays



In basic research of gene regulation as well as in drug discovery the use of luciferases, ß-galactosidases, ß-glucuronidases and secreted alkaline phosphatases have become a standard tool offering the highest sensitivity. Especially the dual luminescence type assays, e.g. Dual-Luciferase® Reporter Gene Assay, have become a favourite means as they provide an internal control for transfection efficiency or general expression level. Superior sensitivity in luminescence – better than most dedicated luminescence plate readers – make the Mithras the instrument of choice for reporter gene assays with a detection limit of less than 3 zeptomol Firefly luciferase.



DLReady™

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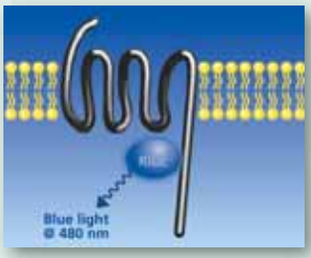
Homogeneous Functional GPCR Assay Using BRET Detection

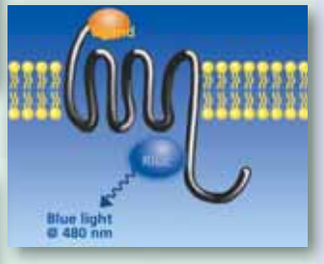
G-protein coupled receptors, also referred to as 7-transmembrane (7TM) receptors, comprise the largest and most diverse superfamily of proteins known. To a minor part only the ligands are known.

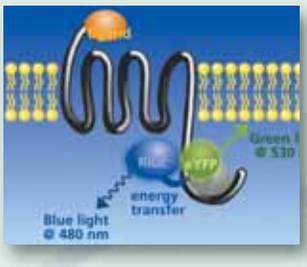
Especially in the field of G-protein coupled receptor research, the BRET technology offers the opportunity for the establishment of a homogeneous and universal functional assay, taking advantage of the fact that ß-arrestin (which is naturally playing a role in the desensitisation of the receptors) binds to the intracellular part of the activated receptor.



Renilla luciferase emits blue light at 480 nm upon addition of its substrate coelenterazine.

Activation of receptor (conformation change, attachment of G-protein) due to binding of ligand.

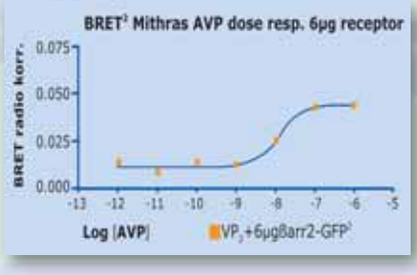




ß-arrestin / eYFP fusion protein attaches to receptor enabling energy transfer between Renilla luciferase and the eYFP moiety resulting in a rising peak of green light at about 530 nm.

BRET is based on the fact that the energy derived from a Renilla luciferase reaction can be used to excite a fluorescent protein molecule if the latter is in close proximity to the luciferase enzyme. There are several advantages of BRET over other methods.

It is a non-radioactive and homogeneous technology. The ratiometric signal minimises interferences from assay conditions and keep the time management non critical. There is no auto-fluorescence coming from compounds or cell and buffer components as no light source is required.

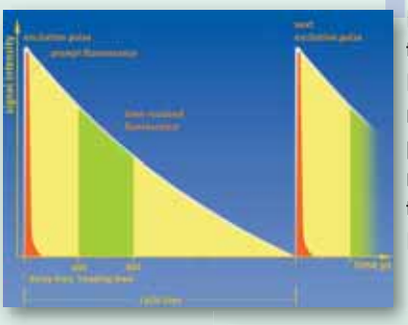


Effect of agonist AVP on COS7#41 cells expressing VP2-Rluc and ß-arrestin-GFP2

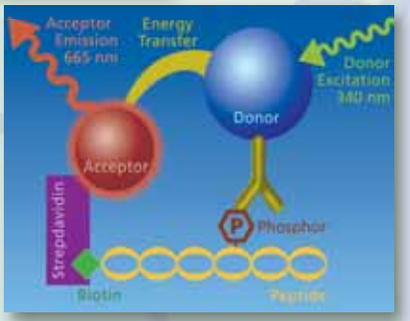
Luminescent Immunoassays (LIA, ILMA)

By exchanging colorimetric substrates of horseradish peroxidase or phosphatases with luminescent ones a 100-fold increase in sensitivity can usually be achieved. MikroWin software with the curve fitting option adds convenient and extensive data evaluation capabilities to the superb instrument performance.

HTRF® Kinase Assays



Kinase assays in the Time-Resolved Fluorescence format have been proven to be a very robust and reliable technology used for Kinase work.



A biotinylated substrate for Serin, Threonin or Tyrosin Kinases is phosphorylated by the respective Kinase enabling aspecific antibody to bind. The Europium label of the antibody can be excited upon which an energytransfer to a Streptavidin-Acceptor conjugate occurs enabling the measurement of the Acceptor specific emission.

htrf
This reader is HTRF® compatible

Mithras LB 940

Multimode Microplate Reader

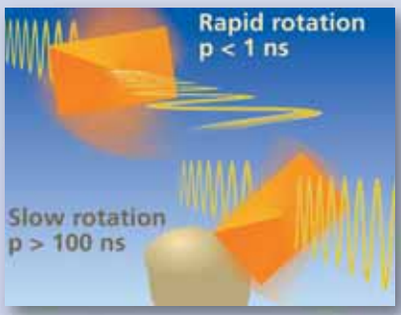
AlphaScreen® Technology for Secondary Messenger Screening

AlphaScreen® relies on the use of *Donor* and *Acceptor* beads providing functional groups for conjugation for biomolecules. The beads come in close proximity when the biomolecules interact by molecular binding, e.g. antibody-antigen or receptor-ligand. Laser excitation at 680 nm of a photosensitiser present on the *Donor* bead results in the production of singlet oxygen.

The singlet oxygen migrates to react with chemiluminescers on the Acceptor bead. The chemiluminescers then activate fluorophores emitting light at 520 - 620 nm.

AlphaScreen® has proven to be a reliable and sensitive method in detection assays for secondary messengers like cyclic AMP or IP3 activity.

Receptor-Ligand Binding Assays Based on Fluorescence Polarisation

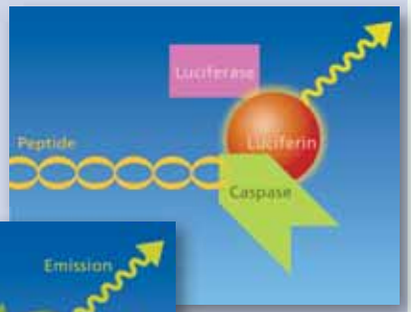


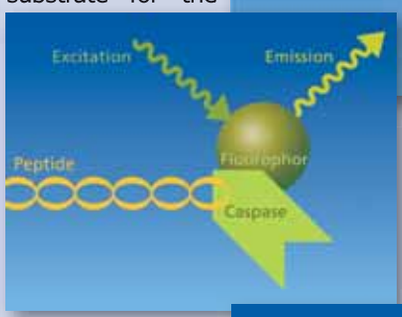
Fluorescence polarisation (FP) is ideal to measure the binding of a small molecule to a much larger one. Unbound fluorescent tracers will depolarise light during emission resulting in low polarisation, because the unbound molecules tumble more rapidly than bound tracers. In contrast, bound fluorescent labelled molecules keep the polarisation orientation as their rotation is inhibited.

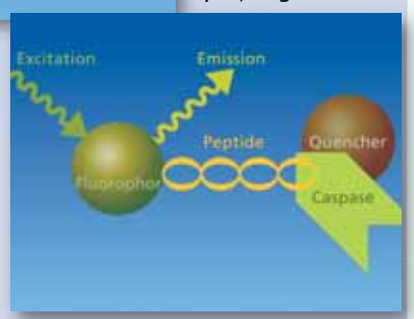
Caspase Assays

Monitoring the activity of Caspases – a group of cystein-aspartic acid peptidases – is a key method in apoptosis research. The assays are designed around specific peptide substrates for Caspase 3, 7, 8 and 9 respectively which will be cleaved when Caspases are present indicating cells are in an apoptotic state.

Assay technologies are available with luminescent readout through the release of Luciferin which acts as the substrate for the subsequent light generating Luciferase reaction. Other setups release fluorescent dyes, e.g. Fluorescein or Coumarin derivatives, upon cleavage or coloured substances detectable with absorbance measurements. Finally there are substrates labelled with Lanthanide chelates and quenchers which are cleaved off by the Caspases making the time-resolved fluorescence emission detectable.







SNPs

SNPs are the most common type of human genetic variability playing a key role in the diversity of the development of diseases and response to therapeutic treatments.

Fluorescence and especially Fluorescence Polarisation are convenient technologies for SNP determination with excellent possibility for miniaturisation.

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Plate Stacker

Unattended operation and increased throughput are facilitated with the Stacker unit LB 931. The stacker unit can simply be attached to the Mithras without any modifications of the main instrument.

Two different types of stacks are available to hold either 25 or 50 microplates. They are easily exchangeable to match everday´s varying throughput needs. The stacker accepts 24, 96, 384 and 1536 well microplates from all major plate manufacturers. Manual and robotic loading is still possible even with the stacker attached by simply removing the plate stacks.

A unique feature of the LB 931 Stacker is the re-stacking operation mode which can be used in long-term kinetic monitoring of samples in multiple microplates, e.g. circadian rhythms of gene expression.

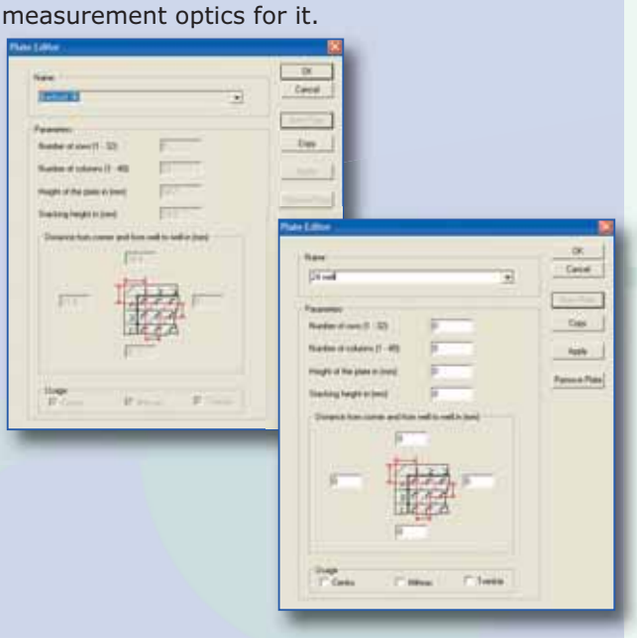
Barcode readers may be added and used for positive plate identification or for automatically selecting parameter files containing the respective measurement settings. The software supports multiple options for data storage using the barcode information.

Robot Integration

Specially designed for but not restricted to the use in HTS departments of drug discovery companies the robot access module allows for uncomplicated integration of the Mithras into any type of lab automation system. Software and hardware easily integrate into existing robotic or liquid handling systems.

Microplate Formats

Any kind of microplate regardless of its colour and design can be measured in Mithras. All microplate formats from 6 wells up to 1536 well can be measured when the automatic plate height adjustment option is present. In addition Petri dishes, Terasaki plates and filter membranes can be loaded with respective adapters.
There is no need for any mechanical adjustment by the user – simply select the appropriate plate format in the operating software. The plate height adjustment module detects the height of the plate loaded and automatically adjusts the measurement optics for it.

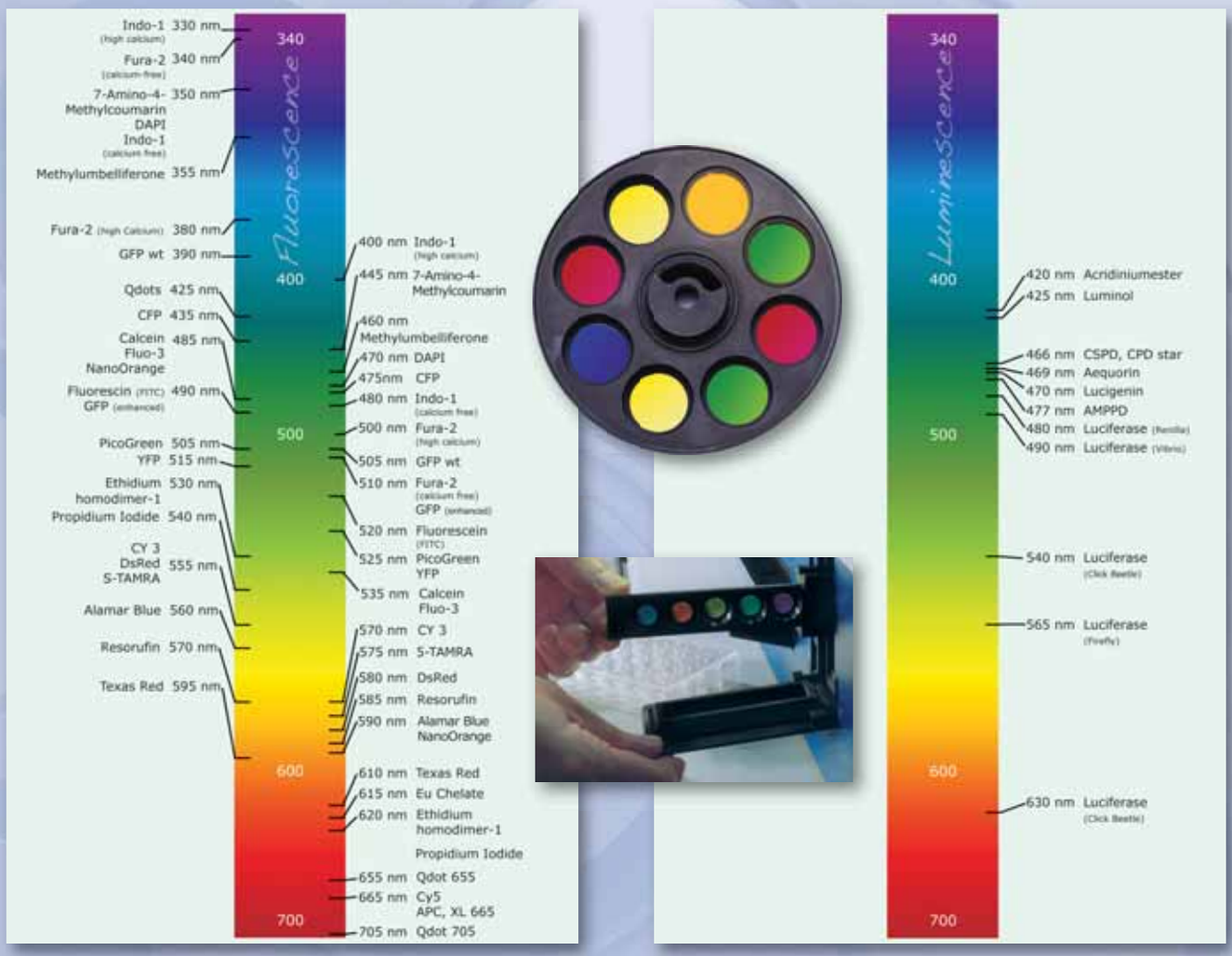


Mithras LB 940

Multimode Microplate Reader

Excitation & Emission Filters

Mithras microplate readers can work with up to 20 excitation and more than 30 emission filters conveniently mounted in exchangeable slides and wheels. These filter carriers are software-driven and provide quick change of emission and excitation filters within one run especially important for all applications with ratiometric readout, e.g. Indo-1, Fura 2 or BRET. The changing time for adjacent filter positions is as low as 130 ms made for highest resolution in kinetics. The filters offered by Berthold Technologies are high quality filters with selected transmission and bandwidth specifications for the respective applications. Additional filters can by added by the users at any time. Only filters with high transmission characteristics ensure best sensitivity needed for BRET and other colour luminescence assays. When little emission light is present as in fluorescence polarization and time-resolved fluorescence measurements the readings can be performed with higher sensitivity and better reproducibility using appropriate filters.



Microplate Shaking

The integral shaking function with 3 shaking modes – linear, orbital and double orbital – each of them adjustable in amplitude and speed can be activated to enhance mixing and optimise sample distribution before measurement. This can be very useful in long-term kinetic assays with cells.

Small footprint

Mithras LB 940 has been designed with a very small footprint. Housing dimensions are only 472 mm x 494 mm including reagent injectors saving valuable laboratory space.

BERTHOLD TECHNOLOGIES

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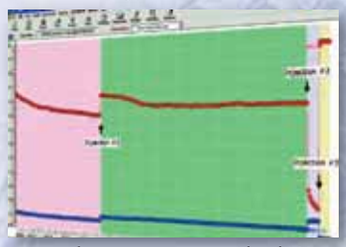
Temperature Control

The Mithras can be equipped with a heating system for the microplates for assays which need to be measured at elevated and constant temperatures, e.g. common in cells based assays. Each parameter file can have its individual temperature setting which is simply activated by loading the respective parameter file. The detector is cooled by a Peltier unit to keep its temperature and noise low and maintain its high sensitivity.

Kinetics

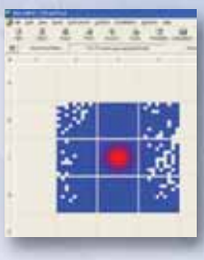
With the Kinetic and Repeated measurement modes time courses of physiological processes can be monitored over short (few seconds) and long periods of time, e.g. up to 7 days. Enzyme activities, phagocytosis and Calcium monitoring are typical applications for the use of the kinetic functionality. The Kinetic and Repeated modes include possibilities to define interval and cycle times as well as intermittent injections or dual label settings (as in BRET and Fura 2 assays).



Flexible graphical displays and numerous calculation options enable sophisticated data evaluation, e.g. AUC, V_{max}, slope, minimum, maximum. In addition the kinetic mode can support the user to establish optimum assay conditions or to monitor the reaction time of luminescence or fluorescence assays and define appropriate measurement times.

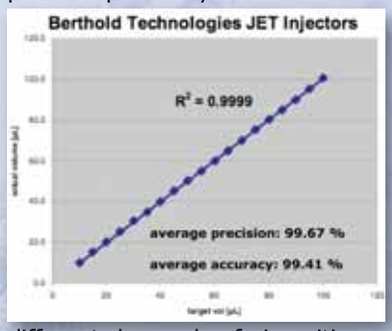
Well Scanning

The Scanning mode enables the researcher to scan a well of a microplate in up to 10,000 steps each of them creating an individual data point. This procedure is recommended when the assay is based on adherent cells which are heterogeneously distributed and signals are not located at the centers of the wells. A graphical representation of the signal distribution as well as mathematical formula for minimum, maximum, average and total signal facilitate data interpretion e.g. in chemotaxis applications.



Reagent Injectors

Up to 4 independently controlled injectors with variable volume give entire freedom in the selection of assay type and assay sequence. The injectors are located in measurement and pre-measurement positions of the luminescence and the fluorescence path respectively.



JET injection technology stands for precision and accuracy - better than 98 %-and the most reliable way of proper mixing of the added reagents. Tuneable injection speed covers the different demands of viscosities, cells or filling heights.

The volumes are adjustable from 10 to 100 µL – in increments of 1 µL. This is perfectly matching the requirements for reagent addition into 96 and 384 well plates. Dispensing can even be performed within a running kinetic measurement, e.g. to watch the effects of added agonists / antagonists. Cell-friendly materials and diameters as well as the ability for low speed injection make the Berthold Technologies JET injectors the ideal tools for the addition of cell suspensions to compound plates, e.g. in Aequorin-type Calcium assays.

"Economy Prime" a special priming mode which is unique to Berthold Technologies JET injectors has been developed and implemented to facilitate homogeneous filling of the injection lines whilst using as little prime volume as possible helping the users to save valuable reagents.

Red enhanced photomultiplier

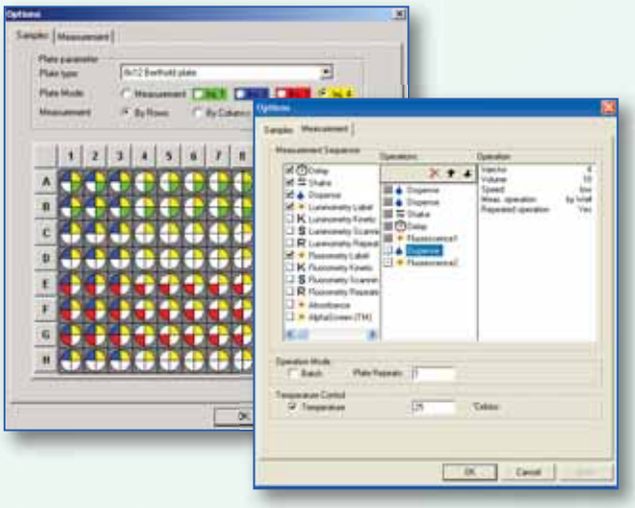
The red enhanced photomultiplier with an extended spectral range (340 – 800 nm) is especially designed for measurement of fluorescence dyes with emission wavelengths higher than 650 nm. The photomultiplier is Peltier cooled to reduce background noise.

Mithras LB 940

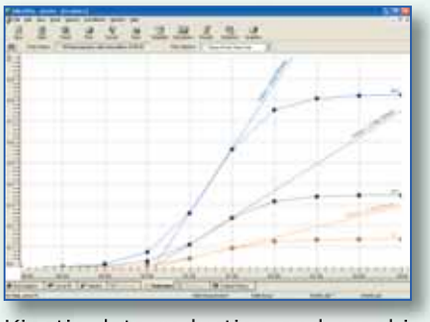
Multimode Microplate Reader

MikroWin 2000 Software

The Windows® based software combines operation and definition of instrument settings as well as data reduction and evaluation.

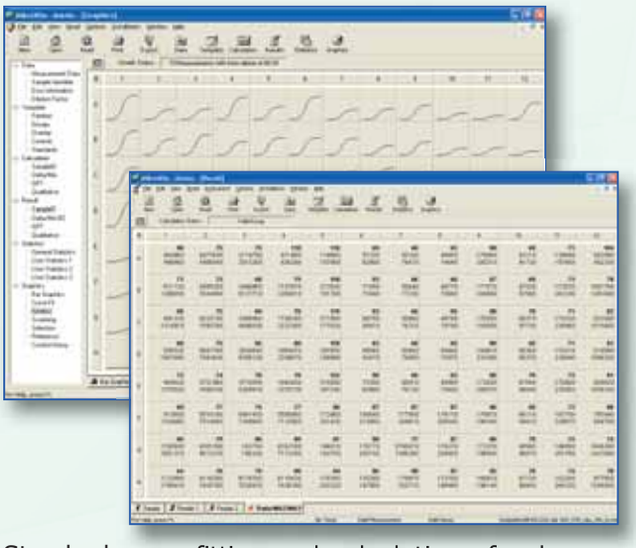


The wells for measurement and injection can be selected independently. Various operations can be picked and placed in any order to accommodate for all different requirements of the assays to be performed.



Kinetic data reduction and graphical display of the respective curves help the user to judge the results.

Any type of ratio calculation, e.g. DLR®, or other mathematical formulas can be linked to every well individually.



Standard curve fitting and calculation of unknown samples is available for those users looking for quantification of their results (Advanced I and II).

All data can be exported in EXCEL® or ASCII formats.

Instrument settings, user signatures and file information are stored with the results.

The password system and the audit trail function of the Advanced I and II versions are important tools for data security.

21 CFR part 11 Statement

System access is controlled by log-on routines where unique combinations of user name and password are required to enter operation levels.

Unauthorised access is denied and documented.

Electronic signatures are provided by user ID and date/time stamps in data files.

Files can be viewed in electronic and printable form.

Audit trails are generated.

System has been developed, tested and documented according to ISO 9001 regulations.

ISO 9001 BERTHOLD Quality you can trust

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detect and identify

Order information

Basic models		Order number
Mithras Basic:	Luminescence, Fluorescence (top), waste pump, MikroWin Lite*	38099-10
Mithras Basic T:	Luminescence, Fluorescence (top), temperature control, cooled PMT, waste pump, MikroWin Lite*	38099-15
Mithras Basic TRF:	Luminescence, Fluorescence (top), TRF, waste pump, MikroWin Lite*	38099-50
Mithras Basic T/TRF:	Luminescence, Fluorescence (top), TRF, temperature control, cooled PMT, waste pump, MikroWin Lite*	38099-55
Mithras Basic T/HTRF®:	Luminescence, Fluorescence (top), HTRF®, temperature control, cooled PMT, waste pump, MikroWin Lite*	38099-57

Application Packages		Order number
Mithras Absorbance:	Luminescence, Fluorescence (top), Absorbance VIS, injector 3, waste pump, MikroWin Lite*	38099-40
Mithras Fluorescence:	Luminescence, Fluorescence (top & bottom), plate height adjustment, temperature control, cooled PMT, injector 4, waste pump, MikroWin Lite*	38099-43
Mithras BRET:	Luminescence, Fluorescence (top), plate height adjustment, temperature control, cooled PMT, BRET package, injector 1+2+3+4, waste pump, MikroWin Lite*	38099-44
Mithras Research I:	Luminescence, Fluorescence (top), Absorbance VIS, plate height adjustment, injector 2+3, waste pump, MikroWin Lite*	38099-41
Mithras Research II:	Luminescence, Fluorescence (top & bottom), Absorbance VIS, plate height adjustment, temperature control, cooled PMT, injector 4, waste pump, MikroWin Lite*	38099-42
Mithras Research III:	Luminescence, Fluorescence (top), Absorbance VIS, TRF, plate height adjustment, temperature control, cooled PMT, injector 4, waste pump, MikroWin Lite*	38099-62
Mithras Research IV:	Luminescence, Fluorescence (top), Absorbance UV & VIS, TRF, waste pump, MikroWin Lite*	38099-80
Mithras Research V:	Luminescence, Fluorescence (top), Absorbance UV & VIS, TRF, Fluorescence Polarisation, plate height adjustment, temperature control, cooled PMT, waste pump, MikroWin Lite*	38099-82
Mithras Research VI:	Luminescence, Fluorescence (top), Absorbance UV & VIS, TRF, temperature control, cooled PMT, waste pump, MikroWin Lite*	38099-81
Mithras HTS I:	Luminescence, Fluorescence (top), Absorbance VIS, Fluorescence Polarisation, AlphaScreen®, plate height adjustment, temperature control, cooled PMT, BRET package, injector 1+3+4, robot integration module, waste pump, MikroWin Advanced II	38099-45
Mithras HTS II:	Luminescence, Fluorescence (top), Absorbance VIS, Fluorescence Polarisation, AlphaScreen®, HTRF®, plate height adjustment, temperature control, cooled PMT, BRET package, injector 1+3+4, robot integration module, waste pump, MikroWin Advanced II	38099-75
Mithras HTS III:	Luminescence, Fluorescence (top), Absorbance UV & VIS, HTRF®, Fluorescence Polarisation, plate height adjustment, temperature control, cooled PMT, BRET package, robot integration module, waste pump, MikroWin Advanced II*	38099-85

Accessories	Order number
Petri dish adapter Falcon 35 & 60 mm	42047
Petri dish adapter Nunc 35 & 60 mm	39362
Filter membrane adapter	22674
Adapter for Terasaki plates	39363
Adapter for Terasaki plates absorbance	56514
Additional excitation filters slide "B"	41537
Additional excitation filters slide "C"	52539
Additional emission filter wheel "B"	55384
Additional emission filter wheel "C"	55385
Luminescence test plate for QC	40105-10
Absorbance test plate	50895-10
Cleanit Daily, injector cleaning solution	45218
Microplates 96 well, white, 40 pieces	23300
Microplates 96 well, black, 40 pieces	23302
Microplates 96 well, white, sterile, 50 pieces	51838
Microplates 96 well, black, sterile, 50 pieces	51839
Micropl. 96 well, white, clear bottom, cell culture, 50 pcs	24910
Micropl. 96 well, black, clear bottom, cell culture, 50 pcs	38840
Micropl. 24 well, white, clear bottom, cell culture, 56 pcs	41081
Micropl. 24 well, black, clear bottom, cell culture, 56 pcs	41082
Microplates 384 well, white, 40 pcs	32505

Options	Order number
Injector 1 pre-position Luminescence, 10-100µL	37772-11
Injector 2 meas. position Luminescence, 10-100µL	37772-12
Injector 3 meas. position Luminescence, 10-100µL	37772-13
Injector 4 meas. position Fluorescence, 10-100µL	37772-14
Automatic plate height adjustment	39364
Cooling unit for photomultiplier	39337
Fluorescence bottom reading	39348
BRET package incl. 4 filters	39350
BRET package "high efficiency" incl. 2 filters	53431
BRET² package "high efficiency" incl. 2 filters	53432
Chroma-Glo package (em 510 and 610 nm)	43544
AlphaScreen® module incl. filter	39359
Fluorescence Polarisation module	39351
Fluorescence Polarisation module for TRF/HTRF® models	49867
Absorbance module	39360
Absorbance module for TRF/HTRF® models	49794
Red-enhanced PMT	52919
High sensitivity fluorescence module	50245

For further information of available filters see Filter Data Sheet.
PMT: Photomultiplier TRF: Time-resolved fluorescence

Mithras LB 940

Multimode Microplate Reader

Technical Specification	
Detection Units	Low-noise photomultiplier tube in single photon counting mode, spectral range: 340 - 650 nm; PMT in single photon counting mode with extended range: 340 – 850 nm; photo diode: 200 - 1000 nm
Excitation Sources	halogen lamp, 75 W (340-700 nm); Xenon flash lamp (TRF/HTRF® models); laser, 680 nm (AlphaScreen® option)
Excitation Filters	355 nm, 485 nm; 405 nm, 450 nm, 490 nm, 620 nm (with Absorbance option)
Emission Filters	460 nm, 535 nm; 400 nm, 515 nm, 480 nm, 530 nm (with BRET option); 615 nm (TRF models) 615, 620, 665 nm (HTRF® models) 565 nm (AlphaScreen® option)
Measurement Technologies	Luminescence Top-reading Fluorescence Bottom-reading Fluorescence (option) Fluorescence Polarisation (option) Time-Resolved Fluorescence (option) HTRF® (option) Absorbance (option) AlphaScreen® (option) BRET (option)
Sensitivity	
Luminescence	<6 amol ATP; <3 zmol firefly luciferase, equals less then 800 molecules
Fluorescence	<0.3 fmol FITC
Absorbance	linear range 0-3.5 OD accuracy <2 % cv (@ 2.0 OD)
Time-Resolved Fluorescence	6 amol Eu (96 well), 2 amol Eu (384 well)
HTRF®	DF high > 900 %
Fluorescence Polarisation	cv 4.4 % with 1 nM Fluorescein
AlphaScreen®	<12.5 ng standard beads
Dynamic Range	>6 orders of magnitude
Crosstalk	low crosstalk through crosstalk reduction design: 5 x 10^{-6}
Injection Unit	up to 4 injectors (variable volume: 10 – 100 µL), JET Injection technlogy injection into 384 well plates
Plate formats with Plate height adjustment (option)	all 6 well to 1536 well microplates with outer dimensions: 86x128 mm (W x L); plate height: 8.0– 22.2 mm Petri dishes, Terasaki Plates, filters with resp. adapters (option)
Plate formats without Plate height adjustment	all 96 and 384 well microplates with outer dimensions: 86x128 (WxL); plate height: 13.9 – 15.1 mm
Temperature Control	+5°C above RT to 42 °C (option), includes cooling unit for PMT

Stacker	Stacker LB 931 (option)
Interface	serial RS232, 9 pin
PC Operating System	Win XP, Win Vista
PC Requirements	Pentium processor, 500 MHz (or better), CD ROM drive, display 1024x768 (or better), serial port, parallel port, USB
Software	MikroWin 2000
Power Supply	110 - 240 V; 50 /60 Hz; 240 VA
Regulations	CE, UL, CSA
Certifications	DLReady™, HTRF®compatible
Temperature Range	storage: 0° - 40° C operation: 15° - 35° C
Humidity	10 – 85%, non condensing
Dimensions	472 x 494 x 374 mm (WxDxH), incl. injectors
Weight	30 – 45 kg (depending on configuration)

Operation Modes	
Integral measurement	0.1 – 600 sec
Kinetics measurement	total time up to 24 h
Repeated measurement	total time up to 7 days
Plate repeats	up to 50,000
Delay	up to 600 sec
Scanning	up to 10,000 individual meas. points
Dispensing	with 4 independently controlled variable volume injectors
Shaking	3 modes, variable amplitude and speed

Default parameter files, e.g. BRET, BRET², Dual-Luciferase® and Dual-Glo™ reporter gene, Chroma-Glo™, TRF, HTRF®, Fluorescein, Umbelliferone, AlphaScreen®, FRET, Fluorescence Polarisation, kinetics and repeated type, ratiometric assays.

Patents: EP 0 523 522 ; EP 1 279 946 (pending); DE 4 123 818 ; DE 10 136 863 (pending); 6,949,754 US

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