

YOUR APPLICATIONS. YOUR WAY.

The Tristar 3 Multimode Microplate Reader



BERTHOLD

YOUR APPLICATIONS. YOUR WAY.

Application flexibility you can count on



Today's research is in constant change. Assay technologies, including ELISA, luminescence, fluorescence and interaction chemistries don't stop to progress. The same applies to the continuously developing applications.

Perhaps you are looking to perform ultra-fast injections for reliable flash-kinetics today. Maybe your project requires studying protein:protein interactions tomorrow. Your research is unique. That's why you deserve a multimode plate reader that provides you with the technologies you need to master your research today and upgrade when you need it.

The Tristar 3 provides you with application flexibility for today, tomorrow, and beyond to master your changing plate reading applications. With over 70 years experience in developing sensitive and reliable analytical systems we continue to support you on your mission to optimize your work processes and to improve life in meaningful ways.

THE TRISTAR 3

Simplicity and sensitivity for all levels of experience

The Tristar 3 is a user-friendly and affordable filter-based multimode plate reader that offers the high-performance analysis you expect from Berthold Technologies instruments. Equipped with ONE-4-ALL Optics for uncompromised performance of all detection modes, the system is ready to perform absorbance, luminescence and fluorescence measurements.



Tristar 3 benefits at a glance

- High performance filter system for optimal sensitivity
- ONE-4-ALL Optics for uncompromised performance of all detection modes
- JET injector technology (optional) for highest accuracy, speed and cell-friendliness
- Broad wavelength range selection from UV through the visible range
- BRET/BRET2 and NanoBRET™ upgradeable

INNOVATIVE MULTIMODE READING DESIGN & TECHNOLOGIES

Superior performance for both routine and challenging applications

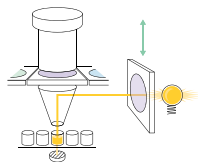
The Tristar 3 enables you to move from application to application with ease. Designed to perform, Tristar readers are equipped with various technologies to support your work and are ideal for labs with multiple applications.

Designed to support your work

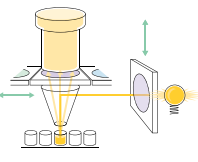
The ergonomic design of the system provides full front access for all key operations (e.g., plate loading, filter change and connecting reagents). Reagent vials can be placed in the integrated front compartment, providing easy access and visibility. It contains a removable trough that can be filled with water or ice to keep all reagents cooled. The system has a flat surface on its top, providing enough space to put down a laptop.



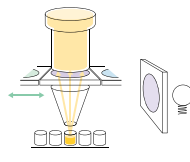
Absorbance



Fluorescence



Luminescence & BRET



ONE-4-ALL Optics – no compromises in performance in any mode

ONE-4-ALL Optics for uncompromised performance

Berthold's patented ONE-4-ALL Optics have been optimized to combine the stability and user-friendliness of a multimodal optical system with the sensitivity and versatility of dedicated optical devices.

ONE-4-ALL Optics - no compromise in performance in any mode.

Best-in-class luminescence

Berthold's highly-sensitive dual mode PMT detectors in combination with the optimized ONE-4-ALL optical path design provide best-in-class luminescence detection of less than 6 amol ATP per well.



High performance filter system – when sensitivity counts

The quick-change filter technology of the Tristar series provides you with the flexibility required to meet your application needs: up to 40 different excitation and emission filters can be easily mounted on exchangeable filter sliders.

The filters are characterized by high transmissions properties which can be up to 25-fold that of monochromators. Technologies like Time-Resolved Fluorescence (TRF) can be measured more efficiently with filters.

Furthermore, filters with a large bandwidth are available to analyse fluorophores with wide spectra and all luminescence-based assay that require filters, e.g., BRET, BRET2 or NanoBRET™ assays.

ADDITIONAL OPTIONS

Engineered to help you expand the boundaries of your research

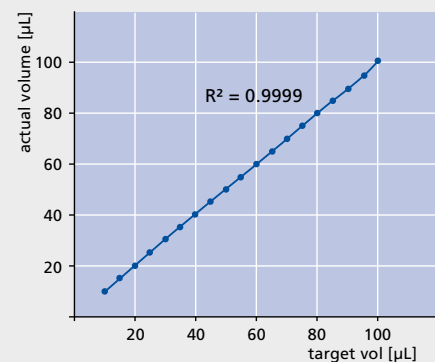
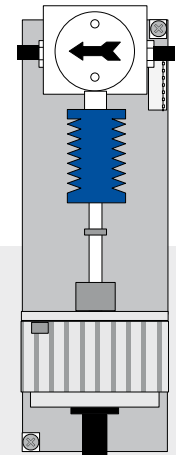
No matter what your application, the Tristar 3 offers you additional technical features to meet your advanced application needs, engineered to perform.

Ultra-fast injectors delivering highest precision

Tristar readers can be equipped with up to 3 injectors. Two injectors each can be installed in measurement position as well as in pre-position, to support different assay requirements and formats.

Berthold JET Injectors are made out of teflon and operate virtually friction-free, offering the following benefits

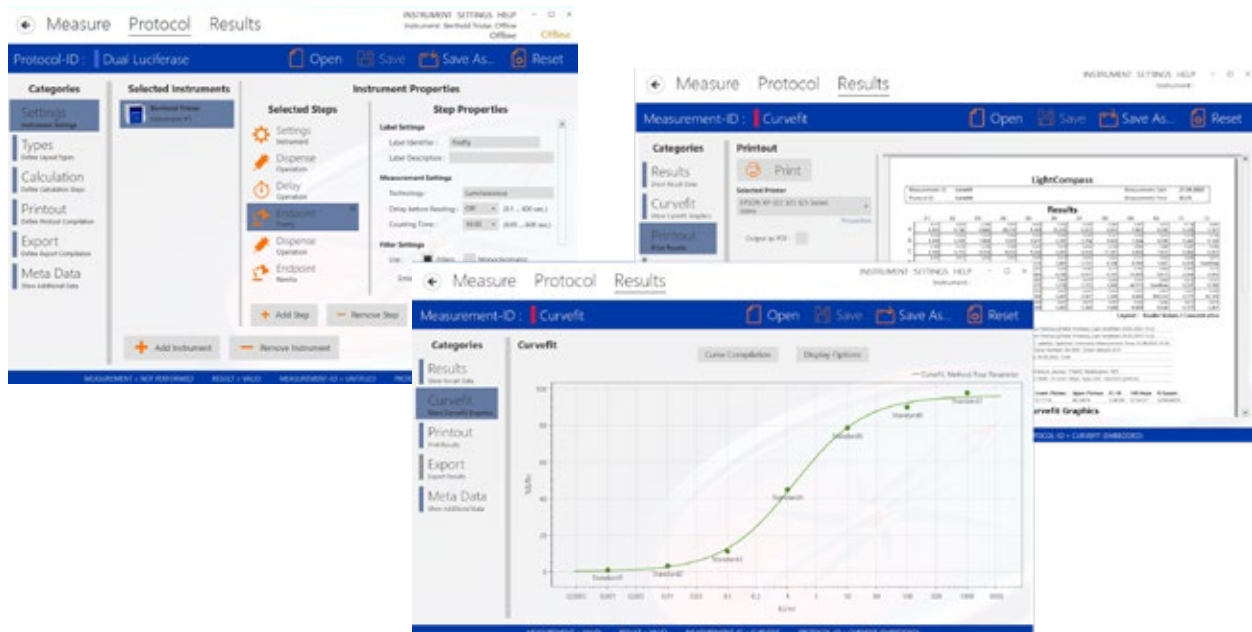
- Highest accuracy and reproducibility (< 2%)
- Low reagent consumption – Low dead volume.
Recovers up to 60 % of the reagent in the injector line. A single priming sequence is sufficient to achieve a 99 % homogeneous mix at the tip.
- Low maintenance costs – friction-free operation enables more than 3 million injections without mechanical failure.
- Optimal performance in flash-kinetics – ultra-fast injection enables the measurement of the first 150 ms of a kinetic assay (e.g., Fura-2 or Acridinium ester-assays).
- Worry-free injection of cell suspensions – negligible shear forces ideal when working with living cells, e.g., in Aequorin-based Calcium assays.



JET injectors enable the injection of liquids with an accuracy and precision better 2 %.

SOFTWARE

Get productive right away



The LightCompass® Software

LightCompass® is a flexible software enabling easy data acquisition, analysis and reporting using Berthold Technologies' instruments. It has been optimized for different microplate and tube formats. LightCompass® features all the functions you can expect from an advanced scientific software, such as flexible creation of measurement protocols, curve fitting, qualitative analysis and compliance with FDA 21 CFR Part 11.

LightCompass® allows the flexible creation of measurement protocols, including dispensing of reagents, incubation and measurement with many different readout technologies. It supports all the measurement modes required by modern microplate readers, e. g., Endpoint, Kinetics and wavelength scans.



VALIDATION TOOLS, SERVICE & SUPPORT

For more productivity and better reproducibility

For many laboratories, validation, qualification and ensuring compliance with a number of GMP and GLP requirements is essential. We offer a range of tools and services to help you ensure that your system runs at peak performance.

Validation Tools



We provide a variety of tools to help you check and confirm the performance of your products over time.

- Absorbance test plates
- Luminescence test plates
- QC luminescence performance kit

Service



Berthold Expert Services provide a team of dedicated and factory-trained engineers and experts to optimize your productivity. We and our local partners are always at your disposal.

- Maintenance & repair services
- IQ / OQ / PQ services
- Calibration certification & more

Support



Our team of technical support scientists is your partner to overcome the unique challenges your application brings. Contact our team to discuss

- Your assay or experiment design
- Data analysis questions
- Troubleshooting

APPLICATIONS

Access your favourite applications with ease

The Tristar 3 provides the technology required to perform a broad range of applications. Simply choose the technologies that best support your research – or upgrade your system whenever it becomes necessary.

Applications

Biomarkers quantification
Cell viability/proliferation/
toxicity
Drug discovery
Environmental testing
Epigenetics
Food monitoring
Gene expression
Pathway analysis
Protein:protein interaction
Receptor panning
...and many more

Assay Formats

Binding
Biochemical
Colorimetric assays
Cell-based
ELISA/Immunoassay
Flash luminescence
Kinases
Kinetics
Quantification
(DNA/RNA, protein)
Reporter gene/GFP

PRECONFIGURED MODELS

Meet your application needs today and customize your device whenever required

The Tristar family offers you a growing number of models and possible configurations to meet your current and future application requirements.

Tristar 3 models

Functions	Tristar 3 Research 69173-10	Tristar 3 Research Plus 69173-20	Tristar 3 Research FL 69173-30	Tristar 3 Research Plus FL 69173-40
Absorbance	●	●	●	●
Luminescence	●	●	●	●
Fluorescence Intensity (incl. FRET)	●	●		
Fluorescence Intensity (incl. FRET) up to 850 nm			●	●
BRET/BRET2/NanoBRET™	○	○	○	○
Temperature Control		●		●
LightCompass® Software	●	●	●	●

Standard Features	Optional Features
Xenon flash lamp (200 – 1000 nm)	1 – 3 ultra-fast JET Injectors delivering highest precision
ONE-4-ALL optics for uncompromised performance	High-performance filters to meet your specific application needs
High-performance filter system	LightCompass® software providing 21 CFR Part 11 compliance and other features
Ergonomic design including integrated front compartment	
Top reading for plate formats up to 384-wells	
Shaker with three modes (linear, orbital and double orbital)	

Ordering Information

Optional Features

JET Injector #1, pre-position	70379-31
JET Injector #2, reading- or pre-position	70379-32
JET Injector #3, reading-position	70379-33
BRET/BRET2 Package	39350
BRET High Efficiency Package	53431
BRET2 High Efficiency Package	53432
nanoBRET™ Package	63140
Chroma-Glo Package	43544

Accessories

µDrop Microvolume Plate	64154
Gas connection, cpl.	55408

Consumables

Reagent filter set (10 pieces)	43193
Cleanit Daily – Injector cleaning solution (2 x 250 ml)	45218

Software

LightCompass® Basic	37854-402
LightCompass® Professional	37854-403
LightCompass® Plus	37854-404

Validation Tools

LB 9515 luminescence test plate for QC	40105-10
LB 9516 test plate for absorbance check (VIS validation)	50895-10
Luminescence Performance Kit	55101

TECHNICAL SPECIFICATIONS

Tristar 3

Detection Unit	Low-noise photomultiplier tube in dual mode, spectral range 280 – 650 nm (up to 850 nm with extended range PMT) Photo diode, spectral range 200 – 1000 nm	Shaking	3 modes, variable amplitude and speed
Excitation Source	Xenon flash lamp: spectral range 200 – 1000 nm	Temperature Control	+5 °C above room temperature up to 45 °C
Wavelength Selection	High quality interference filters	Microplate Formats	6 to 384 well, solid and strip, Dimensions 128 x 86 mm (L x W) height 14.0 – 21.0 mm (adapters necessary) Petri dishes 35 and 60 mm µDrop™ Plate for low sample volumes down to 2 µL Standard cuvettes (with cap)
Measurement Technologies	Luminescence BRET/BRET2, NanoBRET™ Fluorescence (top) Absorbance UV & VIS	Interface	USB
Performance:		PC Operating System	Windows 10 (32/64 bit)
Luminescence	< 6 amol/well ATP (96 well)	PC Requirements	Pentium like CPU (2 GHz or better / Intel Core iX recommended), 1 free USB port
Fluorescence	< 7 amol/well FITC (384 sv)	Regulations	CE, NRTL
Absorbance	Accuracy better 2 %, Precision better 0.6 %	Power Supply	100 – 240 VAC ±10 % 50 / 60 Hz Class I
TRF	Not available	Operating Voltage	24 VDC ±5 %
Dynamic Range	6 orders of magnitude (photon counter) 0 – 3.5 OD (photodiode)	Power Consumption	140 VA
Crosstalk	Low crosstalk due to crosstalk reduction design: 10 ⁻⁶ (black plates)	Temperature Range	Storage: 0 – 40 °C Operation: 15 – 35 °C
Injection Unit	Up to 3 injectors, JET injection technology Variable volumes: 10 – 100 µL Speed 200 – 440 µL/sec Accuracy better 2 % Precision better 2 % Injections into microplates with up to 384 wells	Humidity	10 – 80 % non-condensing Maximum relative humidity of 80 % for temperatures up to 31 °C Decreasing linearly to 50 % relative humidity up to 40 °C
		Altitude	Max. 2000 m (above sea level)
		Dimensions (W x D x H)	391 x 470 x 344 mm
		Weight	Approx. 20 kg
		LightCompass® Software	Data acquisition: Endpoint, Kinetics, repeated and scanning Data analysis: quantitative (curve fitting), qualitative (cut-off) Result reporting: fully customizable Multi-user: different access levels

TRANSFORMING SCIENCE INTO SOLUTIONS



Berthold Technologies is a global technology leader in life sciences. Our extensive range of analytical system solutions made in Germany has been trusted by scientists since 1949. These range from small standalone readers, such as microvolume spectrophotometer and luminometers to various dedicated and multimode readers, microplate washers, microplate workstations, RIA and ELISA automation products to high-end imaging systems, HPLC radio detectors and gamma-counters. It is our mission to create a healthier world, a safer environment and more efficient manufacturing processes.

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