



Cell analysis

Guide to microplate readers

A one-stop solution for your microplate detection needs



Choose the microplate reader that best suits your research needs

Thermo Scientific™ microplate readers provide flexibility, performance, and ease of use for a variety of microplate assays. Whether you need to measure fluorescence, absorbance, luminescence, or time-resolved fluorescence (TRF), or you perform AlphaScreen™ assays, we offer a microplate reader solution to meet the requirements of your specific workflow. With a portfolio of dedicated modular and upgradable multimode readers, we also offer solutions that fit your current budget with options to meet the future needs of your laboratory.

Thermo Scientific plate readers have a number of features to help you save time and maximize productivity, including:

- Auto-calibration
- Easy export in Microsoft™ Excel™ format
- Automation readiness with robot compatibility
- No limit to the number of computers on which intuitive Thermo Scientific™ SkanIt™ Software can be installed
- Ready-to-use protocols available in our extensive online protocol library


For more information, go to thermofisher.com/platereaders

Consideration	Multiskan FC photometer	Multiskan SkyHigh spectrophotometer	
Applications	Absorbance		
Wavelength range	340–850 nm	200–1,000 nm	
Wavelength selection	Filters	Monochromator	
Plate format	96 wells (384 wells optional)	Thermo Scientific™ μDrop™ and μDrop™ Duo plates, 6- to 48-well plates,* 96- and 384-well plates	
Incubation	Optional	Yes	
Shaking	Yes	Yes	
Reagent dispensers	No	No	
Top/bottom reading	NA	NA	
Cuvettes	No	Optional	
Gas control module	No	No	
			

* Maximum plate height with lid is 19.5 mm.

** Third dispenser requires additional installation.

† Instruments with bottom reading capabilities feature multi-location reads per well.

Varioskan LUX scanning multimode reader	
	Absorbance, fluorescence Optional: time-resolved fluorescence (TRF), luminescence, AlphaScreen readout
	Absorbance and fluorescence excitation: 200–1,000 nm Fluorescence emission: 270–840 nm Luminescence: 360–670 nm (spectral scanning 270–840 nm) TRF excitation: fixed to 334 nm (spectral scanning 200–840 nm) TRF emission: 400–670 nm (spectral scanning 270–840 nm) AlphaScreen assay excitation: fixed to 680 nm AlphaScreen assay emission: 400–660 nm
	Monochromator for UV/Vis absorbance and fluorescence intensity Filters for luminescence when necessary, TRF, AlphaScreen assays
	6–1,536 wells (fluorometry, TRF, luminometry, AlphaScreen assays) μ Drop and μ Drop Duo plates, 6–384 wells (absorbance)
	Yes
	Yes
	Optional (up to two)**
	Top (standard) Bottom (optional)†
	With μ Drop plate
	Optional
	

A range of microplate readers for maximum flexibility and performance

To measure absorbance

Thermo Scientific™ Multiskan™ FC Microplate Photometer

A robust and reliable filter-based instrument that can be used for a wide variety of research and routine applications. It can be used as a stand-alone instrument or under PC control with intuitive SkanIt Software.



- Use for a wide variety of applications, including ELISAs, endotoxin assays, cytotoxicity assays, and growth curves.
- Shake and incubate at up to 50°C for temperature-sensitive assays.
- Proven performance and reliable day-to-day results through optical design and self-diagnostics.

thermofisher.com/multiskanfc

Thermo Scientific™ Multiskan™ SkyHigh Microplate Spectrophotometer

The Multiskan SkyHigh Microplate Spectrophotometer is easy to use for any photometric or turbidimetric research application, particularly nucleic acid and protein analysis. It offers an optional easy-to-use graphic touchscreen and multiple connectivity options (USB, computer, or cloud).



- Allows kinetic, spectral, and endpoint measurements for a variety of applications.
- Separates optimized measurement modes for absorbance and turbidimetric measurements.
- Fast reading speed that is essential for kinetic applications.
- Available in three different configurations: 1) touchscreen, 2) cuvette and touchscreen, and 3) operated only with SkanIt Software (PC).
- Reads μ Drop and μ Drop Duo plates for microvolume analysis of DNA, RNA, and protein.
- Models with touchscreens have an easy-to-use interface for standalone use and include ready-made protocols for UV-based nucleic acid and protein quantification as well as colorimetric protein quantification.
- Fast operation: full spectrum (200–1,000 nm) of a sample well is obtained in less than 10 seconds, and a full 96-well microplate is read in 6 seconds.
- Access to the Thermo Fisher™ Cloud Platform or Microsoft™ OneDrive™ cloud-based tools allows you to securely store, access, share, and manage data remotely (touchscreen models).

thermofisher.com/multiskanskyhigh

For multimode readouts

Thermo Scientific™ Varioskan™ LUX Multimode Microplate Reader

Designed to suit a wide variety of needs, the Varioskan LUX Multimode Microplate Reader has a flexible range of measurement modes. The instrument simplifies measurement setup with automatic dynamic range selection, and its smart safety controls help you avoid experimental errors. The Varioskan LUX multimode reader raises the bar for reliability and ease, and features:



- Five detection modes: absorbance, fluorescence, luminescence, TRF, and AlphaScreen modules
- Five measurement modes: endpoint, kinetic, spectral, multipoint, and kinetic-spectral
- Spectral scanning for assay optimization
- Simultaneous dispensing and measurement of fast reactions right from the start
- Integrated gas module for control of CO₂ and O₂
- thermofisher.com/varioskanlux

Software for readout

Skant Software

The intuitive interface of the updated Skant Software will guide you through the measurement process to help you get the results you need. With Skant Software, you have full control over the instrument settings for all of your Thermo Scientific microplate readers. Skant Software is available in two editions. The Research Edition is for scientists working in life science research, and the Drug Discovery Edition has features to help you comply with FDA 21 CFR Part 11 requirements.

Skant Software makes microplate reading easy

Skant Software provides excellent usability and flexibility, even for the most challenging microplate assays. This software offers visual workflow setup and effortless data reduction and export.

- Capable of endpoint, kinetic, spectral scanning, and bottom reading with a multipoint option, as well as kinetic-spectral measurements.
- An extensive cloud-based library of ready-made protocols is available.
- The intuitive user interface simplifies measurement setup.
- The Fluorescence SpectraViewer tool enables easy assay setup.
- The Virtual Pipette Tool makes it easy to define sample-to-plate layout.
- Produces user-customizable graphs.
- Built-in calculations for fast, accurate data analysis, including:
 - Parallel line analysis
 - Enzyme kinetics (K_m and V_{max})
 - Z-factor
 - Linear and logistic curve fitting with extrapolation
 - And many more
- Single-click data export to Excel program.
- Manually or automatically export data in .xlsx, .pdf, .xml, and .txt file formats.
- Robotic automation interface is available for high-throughput needs.
- Open license software allows unlimited installation on multiple computers.
- No annual fee is required to use the software.

[thermofisher.com/skanit](https://www.thermofisher.com/skanit)

Applications

Cell health and imaging assays

Fluorescence microplate assays

Combining the sensitivity of a fluorescence-based assay with a microplate format enables rapid, quantitative readouts and is suitable for high-throughput analysis. We offer a diverse selection of probes and assays for the analysis of cell viability, proliferation, cytotoxicity, apoptosis, ion flux, generation of reactive oxygen species, and various enzymatic activities. In a microplate well, the fluorescence signal can be generated in whole cells, cell lysates, or purified enzyme preparations. Fluorescence intensity in the well can be measured without the need for cellular imaging. These products have been verified on multiple instrument platforms, including microplate readers.

[thermofisher.com/microplate-fluor-assays](https://www.thermofisher.com/microplate-fluor-assays)

Absorbance microplate assays

For more than 30 years, absorbance-based detection has been the preferred mode for many microplate-based assays, such as ELISAs and protein quantitation, nucleic acid quantitation, and enzymatic assays. Many absorbance assays have a chromogenic substrate which, upon enzymatic conversion to the final product, results in a compound that will absorb light at a specific wavelength.

Absorbance assays are popular because of their ease of use, cost-effectiveness, and superior well-to-well reproducibility. A color change in an absorbance assay can help confirm the progression of an enzymatic reaction.

[thermofisher.com/elisa](https://www.thermofisher.com/elisa)

[thermofisher.com/cytotoxicity](https://www.thermofisher.com/cytotoxicity)

[thermofisher.com/microplate-cell-viability](https://www.thermofisher.com/microplate-cell-viability)

Luminescence microplate assays

Luminescence microplate assays utilize biochemical or chemical reactions to generate photons that are detected by a photomultiplier tube (PMT) or charge-coupled device (CCD) in the plate reader. Typically in luminescence assays, the full spectrum is collected and measurement is not restricted to particular wavelengths. Luminescence assays are popular because they are sensitive and have wide dynamic ranges.

[thermofisher.com/luciferase](https://www.thermofisher.com/luciferase)

Colorimetric and fluorometric protein and peptide assays

We offer numerous colorimetric assays for detection and quantitation of total protein that can be utilized in both tube and microplate formats. Thermo Scientific™ Pierce™ protein assays provide exceptional accuracy, compatibility, and broad applicability that enable most laboratory protein samples to be quantitated with ease. We also offer easy-to-use colorimetric and fluorescent peptide assays that are designed specifically to improve the sensitivity and reproducibility of peptide mixture quantitation.

[thermofisher.com/proteinassays](https://www.thermofisher.com/proteinassays)

Pairing the Varioskan LUX instrument with Thermo Scientific™ assay kits and reagents allows researchers to elucidate intricate biological questions, and minimal effort is needed to optimize instrument settings and assay conditions. The Varioskan LUX instrument has excellent capabilities for interrogating cell viability and other cellular functions in 2D as well as 3D models.

Cell viability readouts can be obtained from complex 3D cell

structures using the Varioskan LUX multimode reader. For example, exposure of A549 lung 3D spheroids to gambogic acid results in concentration- and time-dependent cytotoxicity that can easily be quantified on the instrument using the Invitrogen™ CyQUANT™ Direct Cell Proliferation Assay. This assay enables effective quantitation with a microplate reader and simultaneous imaging of cell death on an imaging platform like the Invitrogen™ EVOS™ M7000 Imaging System or the Thermo Scientific™ CellInsight™ CX7 High-Content Analysis (HCA) Platform.

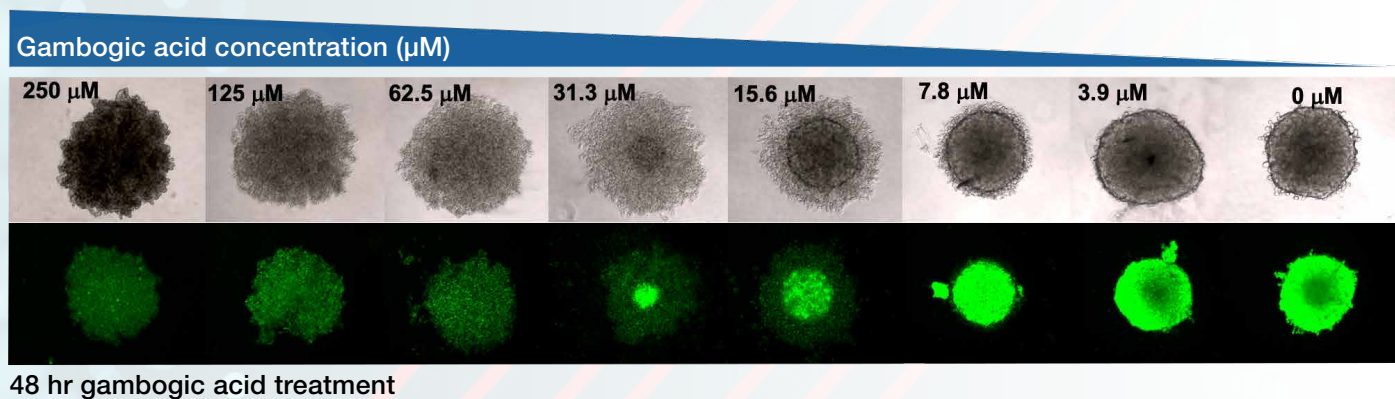


Figure 1. Measurement of A549 lung spheroid viability using the Varioskan LUX instrument (top) and visualization of viable cells using the CellInsight CX7 HCA Platform (bottom). Spheroids were grown for 19 hours in Thermo Scientific™ Nunclon™ Sphera™ 96-well plates, then stained with the CyQUANT Direct Cell Proliferation Assay. Green fluorescence, in this assay associated with living cells with high DNA content, was measured using bottom optics in the Varioskan LUX instrument (12 nm excitation bandwidth) with excitation and emission at 508 nm and 527 nm, respectively.

Microplates

Thermo Scientific™ Nunc™ cell culture plates

Choose from a wide selection of surface modifications and formats for a variety of 2D and 3D cell-based assays.

Thermo Scientific™ Nunc™ black and white polystyrene plates

Get optimal performance with minimal background and crosstalk between wells for maximum signal detection.

Thermo Scientific™ Nunc™ Edge™ plates

Minimize evaporation concerns for live cell assays with long incubations.

To find the Nunc plate that best suits your needs, go to [thermofisher.com/cellcultureplates](https://www.thermofisher.com/cellcultureplates)

Ordering information

Description	Cat. No.
Multiskan FC Microplate Photometer	
Multiskan FC Microplate Photometer	51119000
Multiskan FC Microplate Photometer with incubator	51119100
Multiskan SkyHigh Microplate Spectrophotometer	
Multiskan SkyHigh Microplate Spectrophotometer	A51119500C
Multiskan SkyHigh Microplate Spectrophotometer with touchscreen	A51119600C
Multiskan SkyHigh Microplate Spectrophotometer with touchscreen and cuvette	A51119700C
Multiskan SkyHigh Microplate Spectrophotometer with touchscreen and μ Drop Plate	A51119600DPC
Multiskan SkyHigh Microplate Spectrophotometer with touchscreen, cuvette, and μ Drop Plate	A51119700DPC
Varioskan LUX Multimode Microplate Reader	
Varioskan LUX Multimode Microplate Reader with fluorescence (top) and absorbance	VL0000D0
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, and luminescence	VL0L00D0
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, and TRF	VL0L0TD0
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, and AlphaScreen	VL0LA0D0
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, AlphaScreen, and TRF	VL0LATD0
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom) and absorbance	VLB000D0
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, and luminescence	VLBL00D0
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, and TRF	VLBL0TD0
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, and AlphaScreen	VLBLA0D0
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, AlphaScreen, and TRF	VLBLATD0
Varioskan LUX Multimode Microplate Reader with fluorescence (top) and absorbance, 1 dispenser	VL0000D1
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, and luminescence, 1 dispenser	VL0L00D1
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, and TRF, 1 dispenser	VL0L0TD1
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, and AlphaScreen, 1 dispenser	VL0LA0D1
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, AlphaScreen, and TRF, 1 dispenser	VL0LATD1
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom) and absorbance, 1 dispenser	VLB000D1
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, and luminescence, 1 dispenser	VLBL00D1

Description	Cat. No.
Varioskan LUX Multimode Microplate Reader, continued	
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, and TRF, 1 dispenser	VLBL0TD1
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, and AlphaScreen, 1 dispenser	VLBLA0D1
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, AlphaScreen, and TRF, 1 dispenser	VLBLATD1
Varioskan LUX Multimode Microplate Reader with fluorescence (top) and absorbance, 2 dispensers	VL0000D2
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, and luminescence, 2 dispensers	VL0L00D2
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, and TRF, 2 dispensers	VL0L0TD2
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, and AlphaScreen, 2 dispensers	VL0LA0D2
Varioskan LUX Multimode Microplate Reader with fluorescence (top), absorbance, luminescence, AlphaScreen, and TRF, 2 dispensers	VL0LATD2
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom) and absorbance, 2 dispensers	VLB000D2
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, and luminescence, 2 dispensers	VLBL00D2
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, and TRF, 2 dispensers	VLBL0TD2
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, and AlphaScreen, 2 dispensers	VLBLA0D2
Varioskan LUX Multimode Microplate Reader with fluorescence (top and bottom), absorbance, luminescence, AlphaScreen, and TRF, 2 dispensers	VLBLATD2

* Includes PC software and filter pairs: excitation 355 nm/emission 460 nm and excitation 485 nm/emission 538 nm. Other filters are available upon request.

** Includes PC software. Luminometric filters are available upon request.

Find out more at thermofisher.com/skanit and thermofisher.com/platereaders

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