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Varioskan LUX multimode microplate reader

Versatility simplified for a range of applications

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Varioskan LUX multimode microplate reader

Optimized for fast and reliable results, even for the most challenging of applications



Designed specifically for bioscience researchers with a wide variety of needs and assay requirements, the Thermo Scientific™ Varioskan™ LUX multimode microplate reader comes equipped with a range of measurement technologies, including absorbance and fluorescence intensity with optional luminescence, AlphaScreen™ technology (PerkinElmer), and time-resolved fluorescence modules. Streamline your measurements with automatic dynamic range selection, which adjusts the optimal reading range based on the signal intensities. The Varioskan LUX reader also offers optional dispensers for reagent addition, a built-in shaker, gas and temperature control, bottom reading, and spectral scanning.

Catering to all applications, skill sets

The Varioskan LUX reader is a versatile tool for busy labs. Configure the instrument to your needs, then upgrade when your research focus changes. The Varioskan LUX reader supports the following measurement technologies:

- Absorbance (UV-Vis, including path length correction)
- Fluorescence intensity (including fluorescence resonance energy transfer (FRET))
- Luminescence (direct and filtered, including bioluminescence resonance energy transfer (BRET))
- AlphaScreen and AlphaLISA™ detection modes
- Time-resolved fluorescence (TRF, including TR-FRET, homogeneous TRF (HTRF))

Flexible wavelength selection

The instrument selects the measurement wavelength using optimal filters or monochromators for each measurement technology.

- Monochromators in absorbance and fluorescence intensity
- Filters in AlphaScreen mode and TRF
- Luminescence without wavelength selection (filters can be used if required)

The instrument also allows for flexible spectral scanning to identify the optimal wavelength for any assay, now and in the future.

The Varioskan LUX microplate reader offers you:

- Modular, upgradable system for customization to research needs
- Five measurement modes: endpoint, kinetic, spectra, multipoint, and kinetic spectra
- Spectral scanning for assay optimization
- Integrated gas module for atmospheric control of CO_2 and O_2 for cell-based assays
- Simultaneous dispensing and measurement for follow-up of fast reactions right from the start
- Thermo Scientific™ SkanIt™ Software paired with the system for intuitive instrument control and easy data handling
- Smart safety controls, which help protect the instrument and samples from user error
- Automatic dynamic range, which selects optimal reading range based on the signal intensity
- Autocalibration and self-diagnostics for confidence in results

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Reagent dispensers

The Varioskan LUX microplate reader can be equipped with up to two onboard dispensers, allowing for easy and accurate reagent addition. It supports simultaneous dispensing and measurement, enabling follow-up of kinetic reactions directly from the reaction onset—essential for flash-type luminescence reactions, Ca^{2+} studies, and other rapid kinetic applications. The ability to add reagents in any order or in any phase of the kinetic assay allows execution of sequential multistep assays such as ATP and reporter gene assays. Automated dispensing also helps ensure reproducible dispensing from user to user, from day to day (Figure 1).



Figure 1. Reagent dispensers allow for easy and accurate reagent addition.

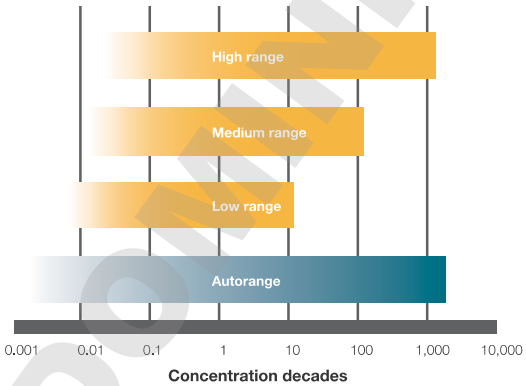


Figure 2. Automatic dynamic range feature selects the optimal reading range based on signal intensity in the well.

Accurate temperature control

With a built-in incubator for temperature control up to 45°C, the Varioskan LUX microplate reader is well-suited for temperature-critical applications, including certain enzyme assays and cell-based applications. The microplate is surrounded by temperature-controlled heaters, and the upper element is slightly warmer than the lower element to help avoid condensation on the plate lid.

CO_2 and O_2 control for cell-based assays

Reduce time and labor of cell-based assays with an optional integrated gas module, designed to precisely and simultaneously control CO_2 and O_2 concentrations. Even during the longest runs, you have the freedom to walk away while the experiment is in progress, knowing that cells are thriving under the right conditions. The gas module is integrated into the instrument, not taking any extra space in the lab. Gas concentrations are reported in SkanIt Software throughout the run for traceability, providing added reassurance and data integrity.

Automatic dynamic range selection

Don't let frequent test runs and restricted concentration ranges hold you back. The automatic dynamic range feature eliminates the need to manually adjust measurement parameters—a tedious process and the only option among many microplate readers on the market. Varioskan LUX reader's automatic gain adjustment feature selects the ideal reading range for your instrument based on signal intensity in the well (Figure 2), to help you get it right the first time. The result is a consistent, reliable assay with optimal measurement settings, no matter what signals are measured.

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Built-in smart safety controls

The Varioskan LUX microplate reader uses advanced technology to help avoid costly mistakes that can harm the instrument, hinder your results, or waste precious time and reagents. With smart safety features, you get clear and timely alerts, anticipating mistakes before they occur. The Varioskan LUX reader was designed with a variety of automatic checks (Figure 3), including:

- **Plate check**—preventing measurement or dispensing from being accidentally started without a microplate in the tray
- **Prime check**—making sure the dispenser is primed prior to starting the run
- **Position sensors**—verifying that the dispensing heads are correctly placed for each assay
- **Volume check**—preventing very high dispensing volumes
- **Shaker check**—controlling the shaking speed and force based on the plate format, preventing accidental spillage

Instrument self-diagnostics and autocalibration

At every start-up, a sophisticated self-diagnostics system performs a complete set of initialization tests and adjustments to mechanical, electrical, and optical functions to ensure that the instrument is ready for operation. The instrument also calibrates itself automatically at the beginning of each run and during runtime (if timing allows) to help provide consistent and comparable results from assay to assay.

Intuitive setup with SkanIt Software

A microplate reader with so many automated features requires a truly user-friendly interface. Enter the newly designed 5th generation SkanIt Software. Its easy-to-navigate interface will guide you through the measurement process and help you get the results you need. The SkanIt Software is available in two editions: “Research Edition” for scientists working in life science research, and “Drug Discovery Edition” that provides features to help you comply with the requirements of FDA 21 CFR Part 11 (Figures 4 and 5).

SkanIt Software is available in nine languages: English, French, German, Spanish, Portuguese, Italian, Chinese (simplified), Japanese, and Russian.



Figure 3. Built-in safety controls are designed to anticipate mistakes before they occur.

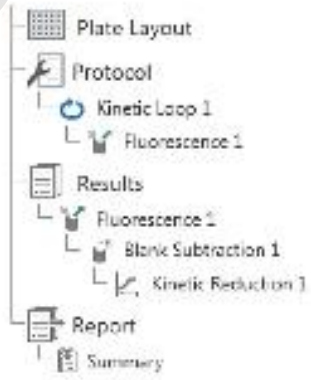


Figure 4. The session tree of the SkanIt Software provides a user-friendly list of steps.

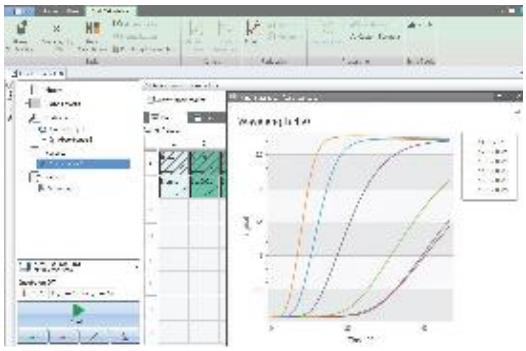


Figure 5. The intuitive user interface of SkanIt Software allows for straightforward setup.

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Enabling reliable results across multiple applications

Leverage consistent and trustworthy data without wasting your time—the Varioskan LUX reader raises the bar for reliability and ease of use

We are on the same wavelength.



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How does SkanIt Software ease microplate reading?

- Extensive library of ready-made protocols with a truly user-friendly interface
- Intuitive user-interface simplifies measurement setup
- Virtual pipette tool makes it easy to define samples-to-plate layout
- Visual tools and instructional pictures guide users through every step
- Built-in calculation options ease data processing
- Single-click data export to Microsoft™ Excel™ software
- Several file formats for data export: *.xlsx, *.pdf, *.xml, and *.txt
- Manual or automatic data export to any location
- Automatic emailing of result report after run is complete
- No limit on the number of licenses; install the software on as many computers as needed
- No annual fee to own the software
- Measurement data continuously saved to the database, helping prevent data loss due to interruptions such as power outage or accidental aborting

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Technical specifications

Absorbance	
Plate types	6- to 384-well plates
Wavelength selection	Double monochromators
Wavelength range	200–1,000 nm
Light source	Xenon flash lamp
Read-out range	0–6 Abs
Linear measurement range	0–4 Abs (96-well plate) at 450 nm, ±2% 0–3 Abs (384-well plate) at 450 nm, ±2%
Accuracy	0.003 Abs or ±2%, at 200–399 nm (0–2 Abs) 0.003 Abs or ±1%, at 400–1,000 nm (0–3 Abs)
Precision	Standard deviation (SD) <0.001 Abs or coefficient of variation (CV) <0.5%, at 450 nm (0–3 Abs)

Fluorescence intensity	
Plate types	6- to 1,536-well plates
Wavelength selection	Double excitation and emission monochromators
Excitation wavelength range	200–1,000 nm
Emission wavelength range	270–840 nm
Light source	Xenon flash lamp
Sensitivity	**Top reading:** <0.4 fmol fluorescein/well (black 384-well plate) **Bottom reading:** <4 fmol fluorescein/well (clear-bottom, black 384-square well plate)
Dynamic range	**Top reading:** >6 decades **Bottom reading:** >5.5 decades

Time-resolved fluorescence	
Plate types	6- to 1,536-well plates
Wavelength selection	Filters (spectral scanning with double excitation and emission monochromators)
Excitation wavelength range	Fixed to 334 nm (spectral scanning 200–840 nm)
Emission wavelength range	400–700 nm (spectral scanning 270–840 nm)
Light source	Xenon flash lamp
Sensitivity	<1 amol Eu/well (white, low-volume 384-well plate)
Dynamic range	>6 decades

Luminescence	
Plate types	6- to 1,536-well plates (spectral scanning from 6- to 384-well plates)
Wavelength selection	Direct or filters (spectral scanning with double monochromators)
Wavelength range	360–670 nm
Sensitivity	<7 amol ATP/well (white 384-well plate)
Dynamic range	>7 decades

AlphaScreen	
Plate types	6- to 1,536-well plates
Wavelength selection	Filters
Excitation wavelength range	Fixed to 680 nm
Emission wavelength range	400–660 nm
Light source	LED
Sensitivity	<100 amol phosphotyrosine/well (white 384-well plate)

Dispensing	
Plate types	6- to 384-well plates
No. of dispensers	None, one, or two
Syringe size	1 mL (standard), 5 mL (optional)
Dispensing volume	2–5,000 µL, in 1 µL increments (1 mL syringe) 5–25,000 µL, in 5 µL increments (5 mL syringe)
Accuracy	<1 µL with 50 µL (0.4 mm tip), <0.2 µL with 5 µL (0.25 mm tip)
Precision	<1 µL with 50 µL (0.4 mm tip), <0.25 µL with 5 µL (0.25 mm tip)
Dead volume	Reagent loss <100 µL, total tubing volume <800 µL

Incubator and shaker	
Temperature range	From ambient +4°C to 45°C
Shaking type	Orbital

Integrated gas module	
CO_2 concentration range	0.1–15%
CO_2 concentration stability	±0.3% at 5% CO_2
O_2 concentration range	1–21%
O_2 concentration stability	±0.3% at 1% O_2

General features	
Measurement modes	Endpoint, kinetic, spectra, multipoint and kinetic spectra
Measurement speed	Reads a 96-well plate in 15 sec, a 384-well plate in 45 sec, and a 1,536-well plate in 135 sec (minimum times)
Interface	PC software (SkanIt Software)
Dimensions (D x W x H)	58 x 53 x 51 cm (23 x 21 x 20 in.)
Weight	54–59 kg (119–130 lb), depending on configuration

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Find out more at **thermofisher.com/varioskanlux**

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