



Thermo Scientific

Varioskan LUX Multimode
Microplate Reader

Simplified versatility
for a range of applications

The Thermo Scientific™ Varioskan™ LUX multimode microplate reader is designed 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, Varioskan LUX comes equipped with a range of measurement technologies including absorbance and fluorescence intensity with optional luminescence, AlphaScreen and time-resolved fluorescence modules. Streamline your measurements with automatic dynamic range selection, which adjusts the optimal reading range based on signal intensities. Varioskan LUX 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

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

- Absorbance (UV-Vis, including pathlength correction)
- Fluorescence intensity (including FRET)
- Luminescence (direct and filtered, including BRET)
- AlphaScreen / AlphaLISA
- Time-resolved fluorescence (including TR-FRET, hTRF)

Flexible wavelength selection

The instrument selects the measurement wavelength using filters or monochromators, depending on which is optimal for each measurement technology.






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

The instrument also allows spectral scanning for ultimate flexibility for identifying the optimal measurement wavelength for any assay, now and in the future.



Varioskan LUX offers you:

- Modular, upgradable system for customization to research needs
- Five measurement modes: end-point, kinetic, spectra, multipoint and kinetic spectra
- Spectral scanning for assay optimization
- Integrated gas module for atmospheric control of CO₂ and O₂ for cell-based assays
- Simultaneous dispensing and measurement for follow-up of fast reactions right from the reaction start
- Paired with Thermo Scientific™ SkanIt™ software for intuitive instrument control and easy data handling
- Smart safety controls help protect instrument and samples from user error
- Automatic dynamic range selects optimal reading range based on signal intensity
- Autocalibration and self-diagnostics for confidence in results

| | | | | |
|---|---|---|--|--|
|  Absorbance |  Fluorescence |  Luminescence |  TRF |  AlphaScreen |
| Absorbance | Fluorescence intensity | Luminescence | Time-resolved fluorescence (TRF) | AlphaScreen |

Reagent dispensers

Varioskan LUX 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. (See Figure 1)



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

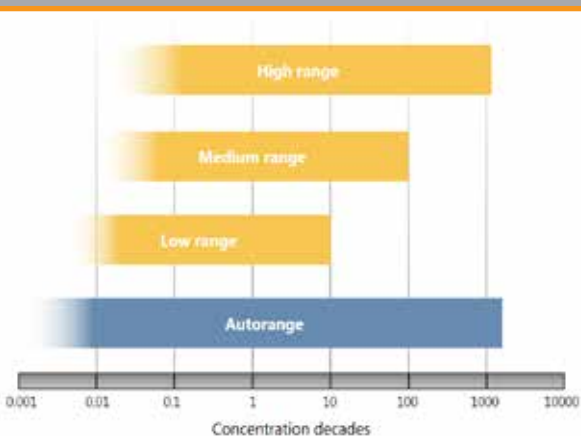


Figure 2 Automatic dynamic range selection selects the optimal reading range based on signal intensity in the well.

Accurate temperature control

With a built-in incubator for temperature control up to 45°C , Varioskan LUX 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 optional integrated gas module, designed to precisely and simultaneously control CO_2 and O_2 concentrations. Even during the longest runs, you have 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 that's the only option among many microplate readers on the market. Varioskan LUX's automatic gain adjustment feature selects the ideal reading range for your instrument based on signal intensity in the well, getting it right the first time. The result is a consistent, reliable assay with optimal measurement settings no matter what signals are measured. (See Figure 2)



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

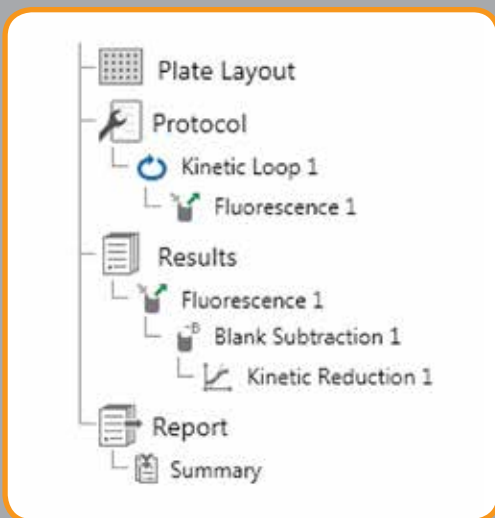


Figure 4 The session tree of the SkanIt software provides a user-friendly steplist.

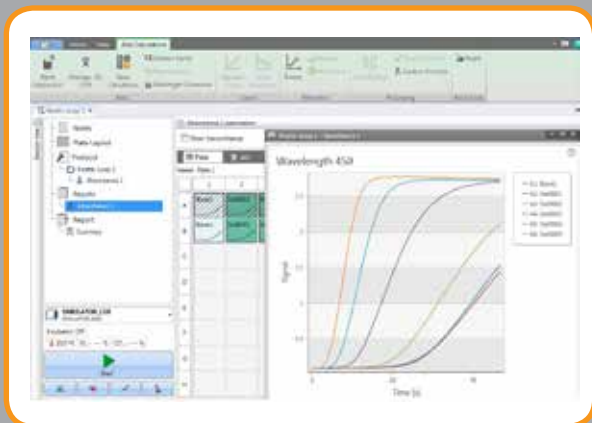


Figure 5 The intuitive user interface of SkanIt software allows for straightforward setup.

Built-in smart safety controls

Varioskan LUX 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. Varioskan LUX was designed with a variety of automatic checks, including (See Figure 3):

- Plate check ensures measurement or dispensing is not accidentally started without a microplate in the tray
- Prime check makes sure the dispenser is primed prior to starting the run
- Position sensors verify that the dispensing heads are correctly placed for each assay
- Volume check prevents too high dispensing volumes
- Shaker check controls the shaking speed and force based on 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 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 4th generation SkanIt software. Its easy-to-navigate interface will guide you through the measurement process and getting the results you need. SkanIt 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. (See Figures 4 and 5)

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

How does SkanIt software ease microplate reading?

- 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
- Several file formats for data export: *.xlsx, *.pdf, *.xml and *.txt
- Manual or automatic data export to any location
- Automatic result report emailing after run is complete
- No limit on the number of licenses; install the software on as many computers as needed
- Measurement data continuously saved to the database; helps prevent data loss due to interruptions such as power outage or accidental aborting



Delivering reliable results across applications shouldn't be complicated

You need a microplate reader that produces consistent and trustworthy data, without wasting your time. Varioskan LUX raises the bar for reliability and ease.

We are on the same wavelength.

| Absorbance | |
|---|--|
| Plate types | 6 - 384 well plates |
| Wavelength selection | Double monochromators |
| Wavelength range | 200 - 1000 nm |
| Light source | Xenon flash lamp |
| Read out range | 0 - 6 Abs |
| Linear measurement range | 0 - 4 Abs (96-well plate) at 450 nm, $\pm 2\%$ 0 - 3 Abs (384-well plate) at 450 nm, $\pm 2\%$ |
| Accuracy | 0.003 Abs or $\pm 2\%$, at 200 - 399 nm (0 - 2 Abs) 0.003 Abs or $\pm 1\%$, at 400 - 1000 nm (0 - 3 Abs) |
| Precision | SD < 0.001 Abs or CV < 0.5%, at 450 nm (0 - 3 Abs) |
| Fluorescence Intensity | |
| Plate types | 6 - 1536 well plates |
| Wavelength selection | Double excitation and emission monochromators |
| Excitation wavelength range | 200 - 1000 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) Top reading > 6 decades Bottom reading > 5.5 decades |
| Dynamic range | Bottom reading > 5.5 decades |
| Time-resolved fluorescence | |
| Plate types | 6 - 1536 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 - 1536 well plates (spectral scanning 6 - 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 - 1536 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 - 384 well plates |
| No. of dispensers | None, one or two |
| Syringe size | 1 ml (standard), 5 ml (optional) 2 - 5000 μ l, in 1 μ l increments (1 ml syringe) |
| Dispensing volume | 5 - 25 000 μ l, in 5 μ l increments (5 ml syringe) |
| Accuracy | < 1 μ l with 50 μ l (0.4 mm tip), < 0.2 μ l with 5 μ l (0.25 mm tip) |
| Precision | < 1 μ l with 50 μ l (0.4 mm tip), < 0.25 μ l with 5 μ l (0.25 mm tip) |
| Dead volume | Reagent loss < 100 μ l, Total tubing volume < 800 μ l |
| 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 | $\pm 0.3\%$ at 5% CO ₂ |
| O ₂ concentration range | 1% - 21% |
| O ₂ concentration stability | $\pm 0.3\%$ at 1% O ₂ |
| General Features | |
| Measurement modes | End-point, kinetic, spectra, multipoint and kinetic spectra Reads a 96-well plate in 15 s, a 384-well plate in 45 s, and a 1536-well plate in 135 s (minimum times) |
| Measurement speed | |
| 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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