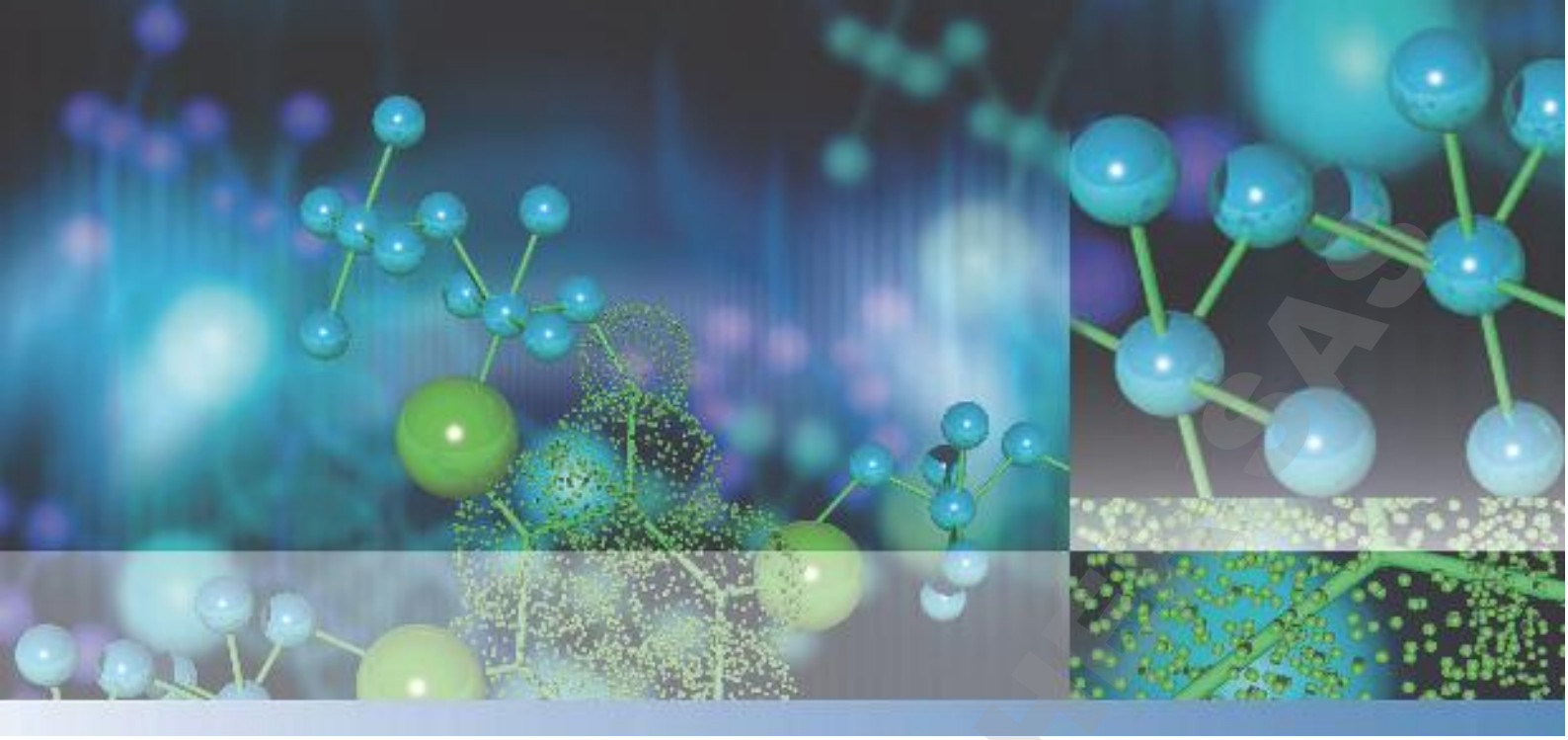


Thermo Scientific

Varioskan® LUX

User Manual

SkanIt® Software for Microplate Readers

Cat. No. N16044 2015

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Preface

About This Guide

Thermo Scientific™ Varioskan™ LUX is a modular multi-technology microplate reader and it is controlled by Thermo Scientific SkanIt® Software for Microplate readers. This guide gives an overview of the instrument and software installation procedures, and describes the main operations and routine maintenance.

Related Documentation

In addition to this guide, Thermo Fisher Scientific provides the following electronic documents for Varioskan LUX and SkanIt Software:

- *Thermo Scientific™ Varioskan™ LUX Technical Manual* (Cat. No. N16045)
- *Thermo Scientific™ SkanIt™ Software for Microplate Readers Technical Manual* (Cat. No. N16046)

The software also has a Help.

Safety and Special Notices

Make sure you follow the precautionary statements presented in this guide. The safety and other special notices appear in boxes.

Safety and special notices include the following:



CAUTION Highlights hazards to humans, property, or the environment. Each CAUTION notice is accompanied by an appropriate CAUTION symbol.

IMPORTANT Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or may contain information that is critical for optimal performance of the system.

Note Highlights information of general interest.

Tip Highlights helpful information that can make a task easier.

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Contacting Us

For the latest information on products and services, visit our website at:

www.thermoscientific.com/platereaders

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Introduction to Varioskan LUX

Thermo Scientific™ Varioskan™ LUX is a modular multi-technology microplate reader. Varioskan LUX is controlled by Thermo Scientific™ SkanIt™ Software for Microplate Readers.

End point, kinetic, spectral and multipoint measurements can be carried out in the UV/Vis/NIR range from appropriate microplate formats. In fluorescence intensity, time-resolved fluorescence, luminescence and AlphaScreen™ measurements 6- to 1536-well plates can be used, and correspondingly 6- to 384-well plates in absorbance measurements.

Figure 1. Thermo Scientific™ Varioskan™ LUX



The instrument is always equipped with the following detection technologies:

- Absorbance
- Fluorescence intensity (FI)

Depending on the instrument model, the following optional detection technologies (LAT module) may be included:

- Luminescence
- AlphaScreen
- Time-resolved fluorescence (TRF)

The instrument selects the measurement wavelength either by using filters or monochromators depending on the measurement technology.

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- Monochromators are used in absorbance and fluorescence intensity measurements.
- Filters are used in AlphaScreen and TRF measurements.
- Most luminescence measurements do not require any wavelength selection. But if required, filters can be used.

The LAT module has built-in excitation filters for TRF and AlphaScreen. The TRF and AlphaScreen (and luminescence) emission filters you need to install yourself.

Note All measurement technologies, except AlphaScreen, allow spectral scanning measurements with monochromators.

The instrument has an incubator for temperature control up to 45°C and a plate shaking capability with orbital shaking mode.

The instrument can also be equipped with:

- Dispensers (up to two) for automatic reagent addition.
- Integrated gas module for controlling the gas atmosphere (CO_2 & O_2) inside the instrument.

The optical system of the instrument allows you to perform:

- Fluorescence intensity measurements from the top or bottom of the well.
- Luminescence, TRF and Alpha technology measurements from the top of the well.
- Absorbance measurements through the well.

Note Fluorescence measurements from the bottom of the well require an instrument model supporting bottom reading.

Note Your instrument may not have all of the features presented in this guide. As the instrument is modular, you can upgrade it with missing features later.

Intended Use

The Varioskan LUX modular multimode reader is used to measure fluorescence intensity (FI), time-resolved fluorescence (TRF), absorbance, luminescence, and AlphaScreen from samples in appropriate microplates. The instrument also has incubating, atmospheric control, shaking and reagent dispensing capabilities.

It is used with an external computer control software. The reader is intended for use in research laboratories by professional personnel. The multimode reader is not intended for diagnostic use.

Use for self-testing is excluded.

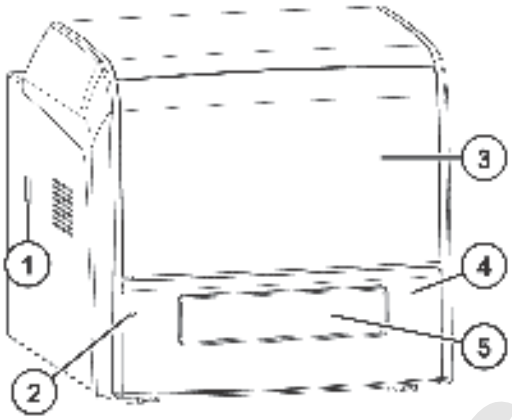
For validation of the entire system, it is recommended that Good Laboratory Practice (GLP) is followed to guarantee reliable analyses.

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Instrument Layout

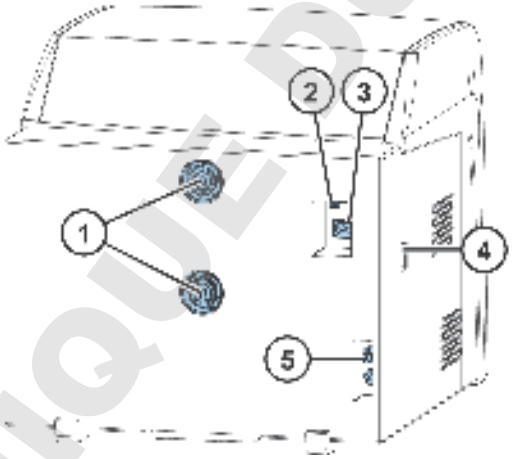
The front view of the instrument.

Figure 2. The power switch (1), LED indicator (2), dispenser sliding cover (3), front cover (4), and measurement chamber door (5).



The back view of the instrument.

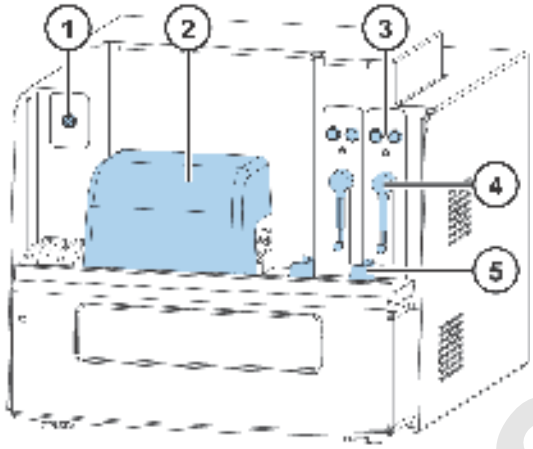
Figure 3. The cooling fan outlets (1), USB connector (2), mains power supply connector (3), power switch (4), and gas connectors (5).



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The instrument with the dispenser sliding cover open.

Figure 4. Plate In/Out button (1), LAT module (2), Prime and Empty buttons (3), dispensers 1 and 2 (4), reagent bottle holder (5).



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Install Varioskan LUX

This chapter describes how to install the instrument.



IMPORTANT The instrument weighs 53 - 60 kg (117 - 131 lbs.) and needs two persons to lift.

Take into account the weight, safety and instrument requirements when deciding where to place the instrument.

Installation

For detailed environmental requirements, see the *Thermo Scientific™ Varioskan™ LUX Technical Manual*.

IMPORTANT Do not touch or loosen any screws or parts other than those specified in the instructions.

Place the instrument on a sturdy laboratory bench that can take the weight of the instrument.

Installation order:

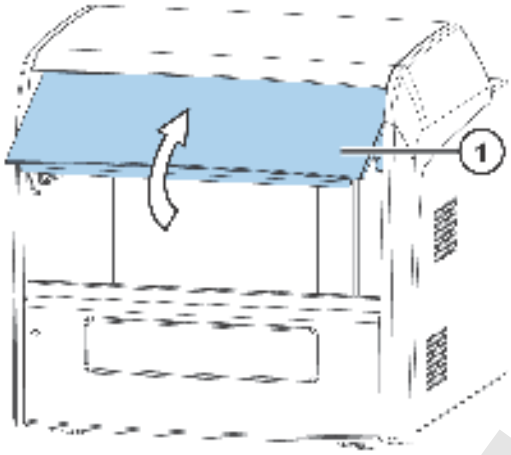
1. Release the tray holder transport lock.
2. Install the tray and adapter.
3. Set up the dispensers.
4. Connect the power supply cable and the USB cable.
5. Install SkanIt Software.

Installation Steps

1. **Release the tray holder transport lock.**
   a. Lift up the dispenser sliding cover.

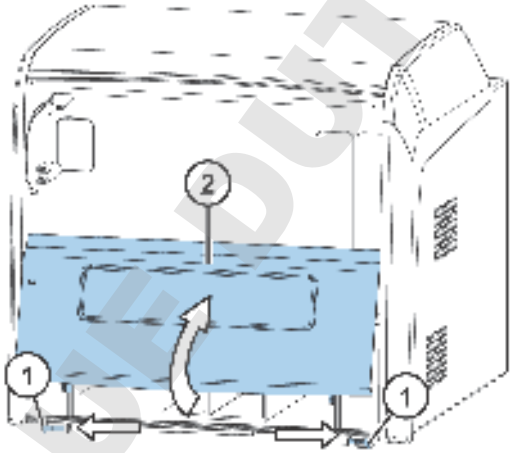
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Figure 5. Dispenser sliding cover (1).



b. Remove the front panel by pulling the two bolts, one on each side at the bottom, sideways, then by turning the bottom of the cover 30°, and lifting it off.

Figure 6. Side bolts (1), front panel (2).

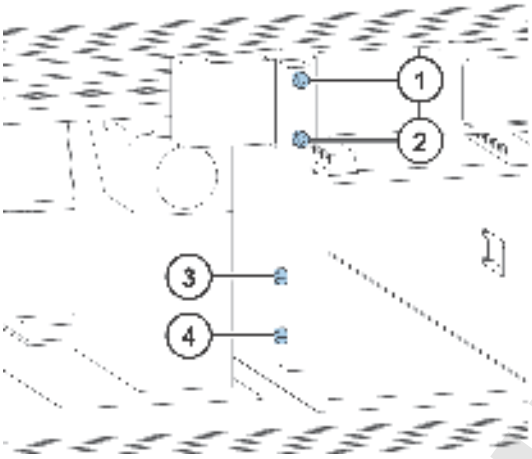


The metallic transport lock support is fastened with four screws. Two screws (1 and 2) are fastened to the tray holder, and two screws (3 and 4) are fastened to the track mechanism bar.

c. Remove the tray holder screws (1 and 2), and the transport lock tag. Store the lock tag for future use.

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Figure 7. Tray holder screws (1 and 2) and track mechanism bar screws (3 and 4) on the transport lock.



d. Gently push the track mechanism (where screws 1 and 2 were fastened) into the instrument.

e. Remove screw 3 and loosen screw 4.

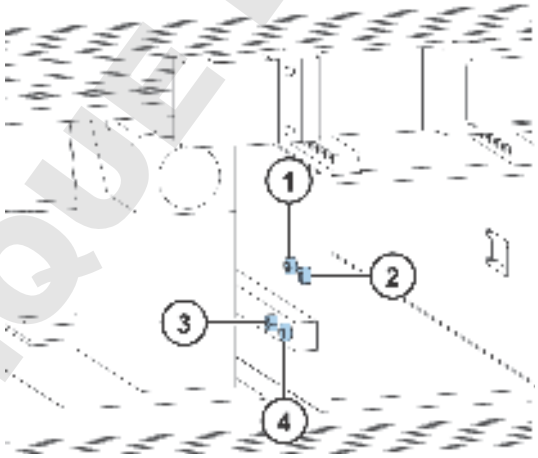
f. Turn the transport lock into its horizontal storage position.

g. Tighten screw 4. Fasten screw 3 back into the same hole from which it was unfastened.

h. Fasten screws 1 and 2 onto the track mechanism bar.

The transport lock is now in its storage position.

Figure 8. Screws 1, 2, 3, and 4, and the released transport lock.



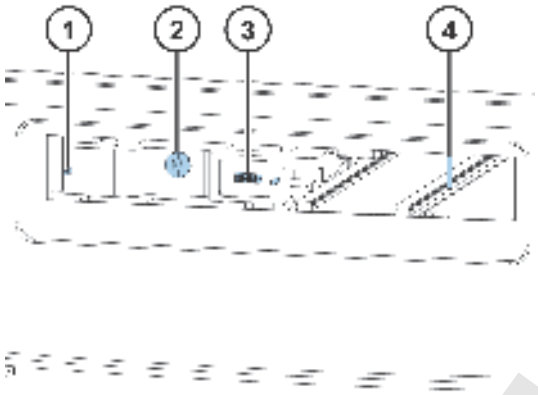
2. Install the plate tray and adapter.

First install the tray, then the adapter. The tray /adapter combinations are individually coded for automatic identification.

a. Gently pull the tray holder out and slide it to the left.

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Figure 9. Close-up of the tray holder. Guide pins (1), screw fix hole (2), contact pins (3), lever opening bar (4).

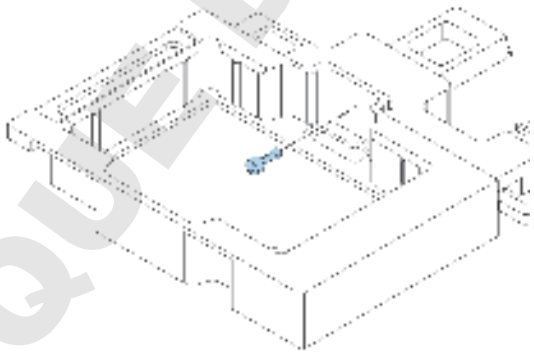


b. Install the tray into the tray holder. Make sure you first push the positioning lever to the left of the lever opening bar. Make sure the two guide pins located on both sides of the tray holder are inserted into the tray.

Note Install the universal tray without the adapter.

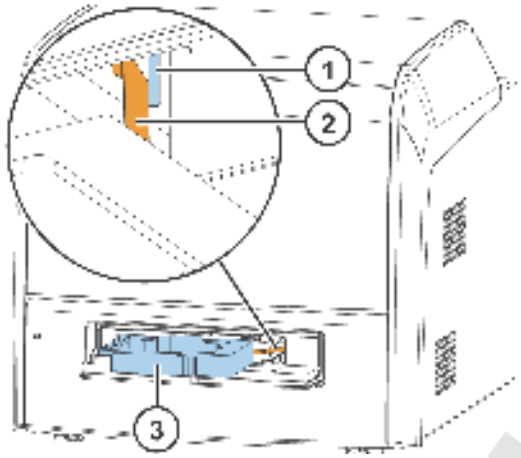
c. Fasten the tray to the tray holder by the screw fix by turning the key clockwise.

Figure 10. Tray and tray holder.



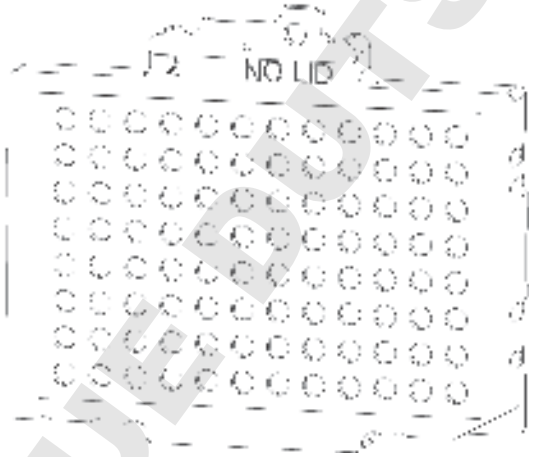
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Figure 11. Close-up of the lever opening bar (1) and positioning lever (2) behind the plate tray (3).



d. Choose the detachable adapter according to the plate type you are using.

Figure 12. Detachable adapter for a 96-well plate.



e. Place the adapter at the very bottom of the tray and make sure it is level. It may be a tight fit. A click sound indicates a successful installation

Note The adapter will not go to the bottom of the tray if the positioning lever is in the way.

f. Push the plate tray into the instrument.

g. Replace the front cover by inserting the two top door latches into place while turning the cover 30° and then snapping it shut.

3. Set up the dispensers

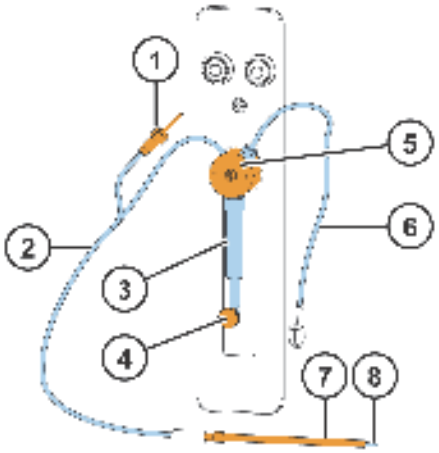
a. Fit the complete dispensing tube assembly into the left hole of the valve and tighten it finger tight. The dispensing tube is used to dispense reagent from the syringe into a microplate.

Connect the male connector of the dispensing head position sensor to the corresponding female connector above the valve.

The aspirate tube assembly is factory installed into the right hole of the valve.

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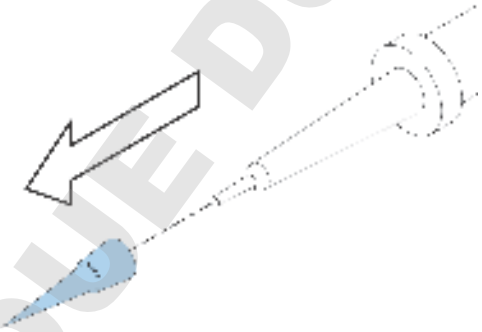
Figure 13. Dispenser. Male connector of the dispensing head position sensor (1), dispensing tube assembly (2), dispenser syringe and plunger (3), plunger lock screw (4), valve (5), aspirate tube assembly (6), dispensing head (7), dispensing tip (8).



b. Insert the dispensing heads into their respective head holder slots on the left-hand side of the dispenser.

c. Remove the protective cap from the dispensing tip.

Figure 14. Cap and dispensing tip.



4. **Connect the power supply cable and the USB cable.**

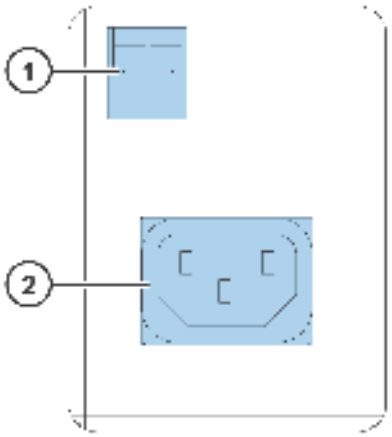
CAUTION Make sure the power switch is in the 'off' position. Do not operate your instrument from a power outlet that has no ground connection.

a. Connect the mains supply cable to the mains power supply connector on the back panel. If you need to use a different type of mains supply cable other than the one supplied, use only cables certified by the local authorities.

b. Connect the instrument mains supply cable to a correctly installed line power outlet that has a protective conductor that is grounded.

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Figure 15. USB connector (1) and mains power supply connector (2).



c. Connect the instrument to the PC using a USB cable.

5. **Install SkanIt Software.**

   For installation instructions, go to Install SkanIt Software.

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Operations

This chapter describes the instrument preparation steps you can take before you start a measurement.

After you have installed the instrument, switch it on and start SkanIt Software. The software finds the instrument automatically. If you have not installed the software, go to Installation Overview.

Do do not operate the instrument when it is disassembled.

Switch the Instrument On

The power switch is on the left side panel of the instrument. Switch it to the 'on' position.

The LED indicator on the front cover of the instrument indicates three states:

- green = on and ready for operation
- orange = in operation
- red = error

If there is no light, the power switch is off, or the power cable is not plugged in.

Instrument Startup

The instrument performs a set of initialization tests and adjustments. It also performs mechanical, electrical and optical checks. The LED light is orange during this check.

When the instrument is ready for measurements, the LED light turns green, and the plate tray is run out.

If anything fails in the initialization tests or adjustments, the LED light turns red. Turn the power switch off, then on. If this does not help, contact the authorized technical service.

Switch the Instrument Off

Switch the instrument off after daily use.

1. Rinse the dispenser tubing thoroughly with deionized, distilled water after each use. Leave the fluid pathway filled for storage.
2. Run the plate tray in from the software or from the instrument.

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3. Switch the instrument off from the on/off switch on the left side panel of the instrument.

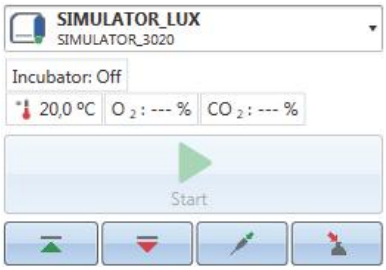
Run the Plate In / Out

You can run the plate tray in or out from the software or instrument.

From the Software

Click on the **Run plate in** or **Run plate out** icon below the **Start** button.

Figure 16. From left to right under Start: Run plate in, Run plate out, Prime dispenser(s), Empty dispenser(s).



From the Instrument

Press the Plate In/Out button in the instrument (left side) to run the plate in or out.

Figure 17. The Plate In / Out button icon.



Set the Instrument Temperature

You can set the instrument temperature up to 45°C from the software.

1. When a measurement session is open, click the temperature icon above the **Start** button.
2. Check the **Temperature** box and set the temperature.
3. Click **OK**.

   The software shows both the current and target temperatures until the target temperature is reached.

Tip You can also set the temperature from application menu -> **Settings** -> **Instruments**-> **General** -> **Use instrument temperature**.

Note The instrument has no cooling system.

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Dispense

You can use two dispensers in the instrument for automatic reagent addition to a microplate.

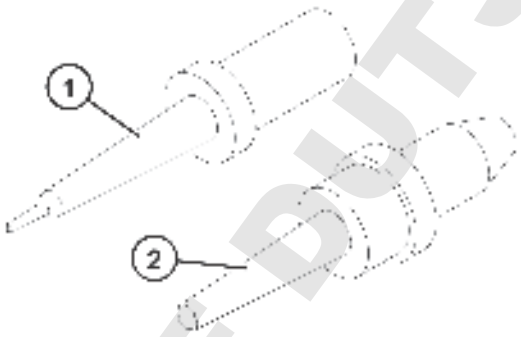
Dispensing Tips

There are two dispensing tips:

1. Tip 0.40 (Ø 0.40 mm) is the default tip and used for volumes > 5µl.
2. Tip 0.25 (Ø 0.25 mm) is for small volumes ranging from 1 to 20µl.

Note If you change the tip size, set the right size also in SkanIt Software. Go to application menu -> **Settings** -> **Instruments**-> **Dispensers** -> **Tip size**.

Figure 18. Tip 0.25 (1) and tip 0.40 (2).



Dispensing Positions F and L

The instrument has two dispensing positions, F (fluorescence) and L (luminescence). Both positions can be used either with dispenser 1 or 2. The instrument recognizes which dispensing position a dispenser head is inserted into.

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Figure 19. Dispensers 1 and 2, dispensing positions F and L.

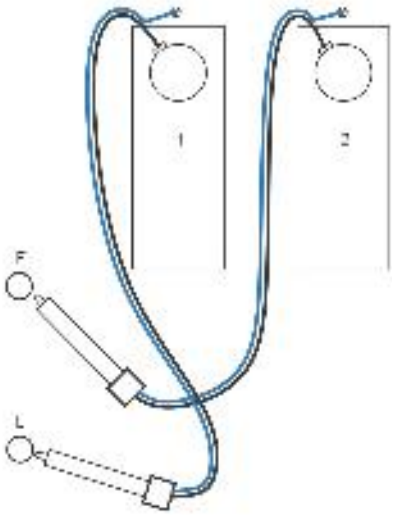


Table 1. Dispensing positions and the measurement positions they point at.

Position F	Position L
Fluorescence (top of the well)	Luminescence
Absorbance	Fluorescence (bottom of the well)
Spectral TRF	TRF
Spectral luminescence	AlphaScreen

To start a measurement at the same time as dispensing, place the dispensing head into the dispensing position (F or L) that points at the correct measurement position (see Table 1 above). This way there is no delay time between dispensing and measurement, which is important in fast kinetic reactions.

If you use a dispensing position that does not point at the correct measurement position, the instrument makes an extra plate movement before the measurement step. This may cause minor time delays between dispensing and measurement.

Prime the Dispensers

Before you use dispensers in a measurement session, you must prime them. Priming dispensers means filling the tubing with the dispensing liquid. The aspirate tube is the input tube, which is between the reagent container and syringe. The dispense tube is the output tube.

Figure 20. Prime button icon.



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You can start the priming from the software or instrument.

1. Insert an empty plate of the same height as the assay plate into the plate tray.
2. Place the head of the aspirate tube into the reagent container.
3. Hold the dispense head in a waste container.

   IMPORTANT Do not insert the dispensing head into the dispensing position F or L during priming.

4. Start the priming.
   a. from the instrument:

      Press the **Prime** button until the liquid flows out.

   b. from the software:

      i. Click the **Prime dispenser(s)** icon to open the **Prime** window.

      ii. Select the dispenser.

      iii. Select the volume and speed.

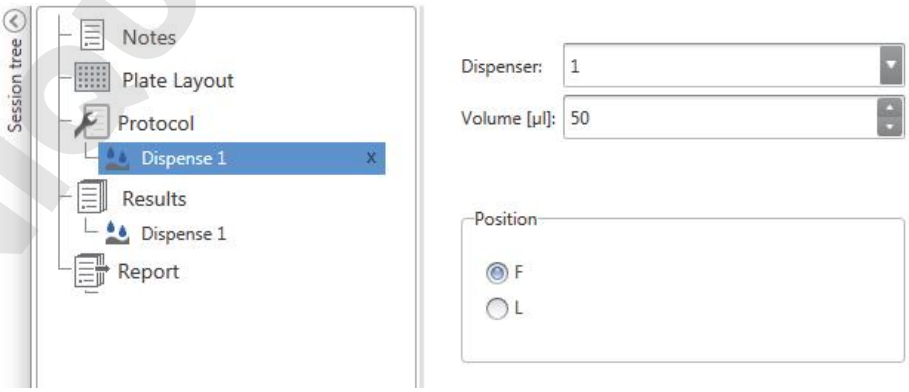
      iv. Click **Prime**.
5. Insert the dispensing head in position F or L.

Dispensing Step in a Measurement Session

After priming the dispensers, you can run a session which includes dispensing. Make sure the dispensing parameters are correct.

Select the same dispenser (1 or 2) and position (F or L) for both the software and instrument. The instrument automatically checks that the same positions are selected.

Figure 21. Select the same dispenser (1 or 2) and position (F or L) in the software as you selected in the instrument.



Empty the Dispensers

You can use the instrument or software to empty the liquid from the tubes back into the reagent container.

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Figure 22. Dispense button icon.



a. From the instrument:

   Press the **Empty** button until the liquid flows back.

b. From the software:

   i. Click the **Empty dispenser(s)** icon to open the **Empty** window.

   ii. Select the dispenser.

   iii. Select the volume and speed.

   iv. Click **Empty**.

Plate Trays and Plate Adapters

Plate Trays

There are two types of plate trays: universal and robotic.

The universal plate tray is for basic use. It is compatible with all plate formats (6 to 1536 well plates). Always use a plate adapter with a universal tray.

A robotic plate tray is for automation use with robots. It is compatible with 96 to 1536 well plate formats. Use the special robotic plate adapter when using a plate without a lid. Remove the plate adapter when using a plate with a lid on a robotic tray.

When you have installed the plate tray, insert a tip priming vessel to the hole on the left edge of the tray. Strips of a 96-well strip plate can be used as a priming vessel. One strip plate is delivered with the instrument accessories.

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Figure 23. Assembly illustration of a universal plate tray: tray / adapter combination identification (1), tip priming vessel (2), screw fix (3), position calibration hole (4), tip priming vessel holder (5), plate adapter (6), positioning lever (7), plate tray (8).

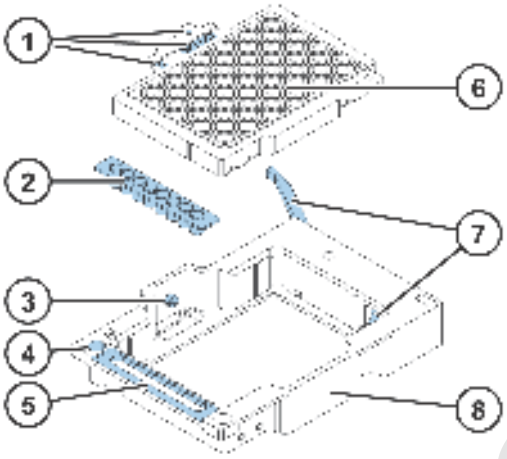


Plate Adapters

Plate adapters are used for adapting plates that are of different heights. Adapters lift the plates to the optimum height for measuring and dispensing.

Before you run a measurement, check that the correct plate adapter is in the plate tray. Choose the adapter based on the plate format you have (96, 384,...) and if you are using a lid or not.

Table 2. Available plate adapters.

Adapter no	Plate adapter	Supports dispensing
2	96-well adapter without lid*	•
3	96-well adapter with lid	
4	384-well adapter without lid*	•
5	384-well adapter with lid	
6	96-well adapter for PCR plate without lid	•
48	6-48-well adapter with lid	
65	1536-well adapter (10mm) without lid	
80	6-48-well adapter without lid*	•
126	Robotic tray with adapter without lid	•
127	Robotic tray without adapter without lid	

*) Supplied with the instrument.

Plate Template and Adapter Association in the Software

You need to select the plate template you will use in the measurement:

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1. Click on the **Plate template** drop-down list in the **Plate Layout** view.
2. Select a template that you will use in a measurement.

   The plate templates are automatically associated with the compatible plate adapters. When you start a measurement, the software checks that the selected plate template and the installed plate adapter are compatible.

Install LAT Module Filters

The LAT module has built-in AlphaScreen and TRF excitation filters. You need to install the AlphaScreen, TRF, and luminescence emission filters.

IMPORTANT Do not touch the surfaces of the filters with bare hands.

1. Turn on the instrument and open SkanIt Software.
2. Open the dispenser sliding cover and the LAT module cover.
3. Select the filter position in SkanIt Software:
   a. Click **Settings** on the application menu.
   b. Click **Instruments**.
   c. Click the icon (on the right side of the instrument name) to open the **Edit instrument parameters** window.
   d. Click the **Filter definition** tab.
   e. Click **Add**.
   f. Select a free filter position from the filter wheel and add the new filter information.
   g. Click **Next**.

      The filter wheel is now turned to the selected position.

Figure 24. The Add new filter pop-up window.

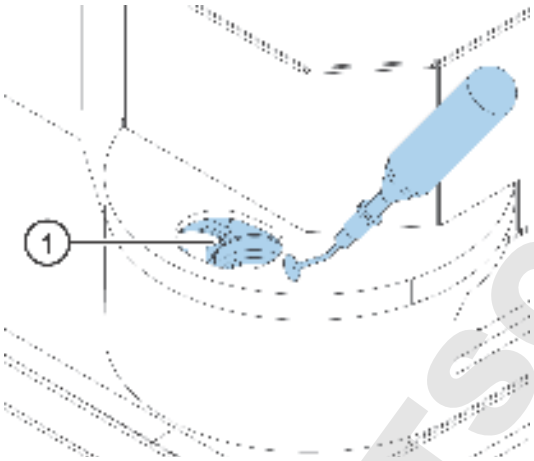


4. Open the blue filter nest lid on the LAT module.

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5. Loosen the filter wheel screw on the selected position.
6. Place the filter on a clean, dust free surface with the arrow on the side of the filter pointing upwards.
7. Use the filter pick-up tool to place the filter into the bottom of the filter nest.
8. Tighten the filter wheel screw.

Figure 25. Filter nest (1) and pick-up tool.



9. Close and fasten the filter nest lid.
10. Click **Finish**.

Gas Control

The optional Integrated gas module allows you to control the CO_2 and / or O_2 concentration inside the instrument measurement chamber in cell-based assays.

- CO_2 concentration range 0.1 - 20%
- O_2 concentration range 1 - 21%

You need to connect gas bottles to the instrument. The O_2 concentration is adjusted by feeding nitrogen (N_2) into the instrument. See the *Thermo Scientific™ Varioskan™ LUX Technical Manual* (Cat. No. N16045) for details on how to connect the gas bottles and use gas control.

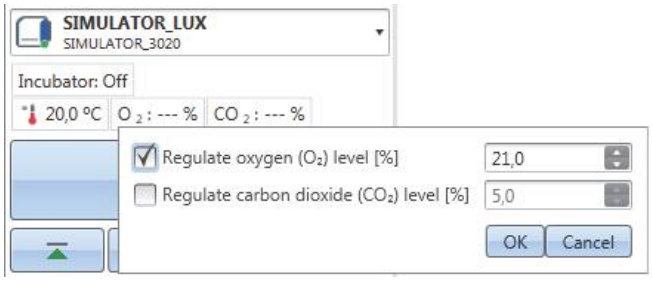
CAUTION Use a carbon dioxide and oxygen sensor in the room where the Integrated gas module is used.
CAUTION Follow safety procedures when working with gas bottles.

Set the Gas Atmosphere

1. Click the gas atmosphere icon above the **Start** button to open the pop-up window.

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Figure 26. The gas atmosphere pop-up window.



2. Set the oxygen and carbon dioxide levels as needed and click **OK**.

   You can now see the current and target gas concentrations above the **Start** button.

Rules for Safe Use



CAUTION

1. Do not open optical covers to avoid ultraviolet radiation injury.
2. Do not operate the instrument when it is disassembled or exposed.
3. Do not use cell or tissue cultures in the device that are not in accordance with the regulations of safety levels L1, L2 and L3.
4. Use a carbon dioxide and oxygen sensor in the room where the Integrated gas module is used.
5. Follow safety procedures when working with gas bottles.

IMPORTANT

1. Do not open the chamber door during operation
2. Only authorized personnel can open optical covers.
3. Use blind plugs to close empty dispensing positions to avoid stray light.
4. Do not wash the electronic parts of the LAT base when you clean the instrument from below.
5. Make sure the dispense tubing is properly installed to avoid leakage.
6. Do not autoclave any part of the instrument.
7. Do not loosen or remove screws or parts other than those allowed in the instructions.
8. Do not touch filter or optical lens surfaces with bare hands.
9. Do not damage the optical system components.

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Note

1. Decontaminate the instrument before removing from the laboratory and before servicing.
2. Check the installation and maintenance checklists.
3. Keep all of the holes in the plate adapter clean.
4. Do not use the instrument if it does not function properly.
5. Do not spill fluids in or on the equipment.
6. Take the chemical resistance of the dispensers and microplates into account.
7. Make sure the microplate or tip priming vessel is not too full.
8. Do not use any liquids that may cause precipitation or congealing or that contain mechanical particles with the automatic dispensers.
9. Do not let the dispensers run dry.

Tip

1. Empty the priming vessel after use.
2. Keep the bottom of the microplates dry to avoid contamination.
3. Change the 8 well plate strip (1x8 Thermo Scientific™Microtiter™ Solid Strip Assembly) priming vessel when needed.

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Install SkanIt Software

This chapter gives an overview of the software installation process and introduces the main elements in the user interface. For more information about the software, see the *Thermo Scientific™ SkanIt™ Software for Microplate Readers Technical Manual* (Cat. No. N16046).

The software automatically detects how Varioskan LUX is configured and shows only those features that are available.

Note Your instrument may not have all of the features presented in this guide.

SkanIt Software

With SkanIt Software you can:

- Control instrument actions.
- Create measurement sessions and start measurements.
- View measurement results and perform calculations with the data.
- Create comprehensive result reports.
- Print or export result reports in different file formats (e.g., Microsoft™ Excel).
- Export and import sessions between SkanIt Software databases in different PCs.

All measurement and calculation data is stored in the SkanIt Software database.

Installation Overview

To install SkanIt Software you need:

- Administrator rights for the PC.
- To register at http://www.thermoscientific.com/skanit to receive the installation code by email.
- The installation CD.
- To make sure your PC meets the minimum requirements.

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Table 3. PC requirements

System	Minimum requirements	Recommended requirements
Supported operating systems	Microsoft™ Windows™ 7 with Service Pack 1, or Microsoft™ Windows™ 8.1	64-bit edition of Microsoft™ Windows™ 7 with Service Pack 1, or 64-bit edition of Microsoft™ Windows™ 8.1
Disk space	14 GB free disk space	Solid-state drive with 14 GB free disk space
Processor	Dual-core processor, 2 GHz or faster	Quad-core (or dual-core with four logical processors), 2 GHz or faster
Memory	4 GB RAM	8 GB RAM
USB port available	1 (one)	1 (one)
CD-ROM drive	1 (one)	1 (one)
Graphics Processing Unit	Dedicated	Dedicated
Monitor	SXGA monitor with 1280 x 1024 resolution	SXGA monitor with 1280 x 1024 resolution

Note We strongly recommend using a computer that fulfills the recommended requirements, especially if you process sessions with more than total of 150 000 individual measurements or with complex calculations.

Installation Process

1. Insert the installation CD into the CD-ROM drive.
2. Follow the installation instructions.
3. The installation ends with a 'Completed' message.

   To open the software, click the SkanIt Software shortcut on the desktop.
4. Enter the serial number that is on the installation CD.
5. Enter the installation code you received after you registered.

Note You can use SkanIt Software for 30 days without the installation code.

For detailed installation steps, see the *Thermo Scientific SkanIt Software Technical Manual*.

Connect the Software to the Instrument

Connect the software to the instrument by plugging the USB cable from the PC to the instrument. Switch the instrument on and start SkanIt Software. The software finds the instrument automatically.

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Main Elements

The main elements in the software are the application menu, the **Session tree** and the task ribbon. When you open the software, the application menu opens.

Application Menu

The application menu is for general tasks. This is where you create new sessions, open saved sessions and access instrument settings.

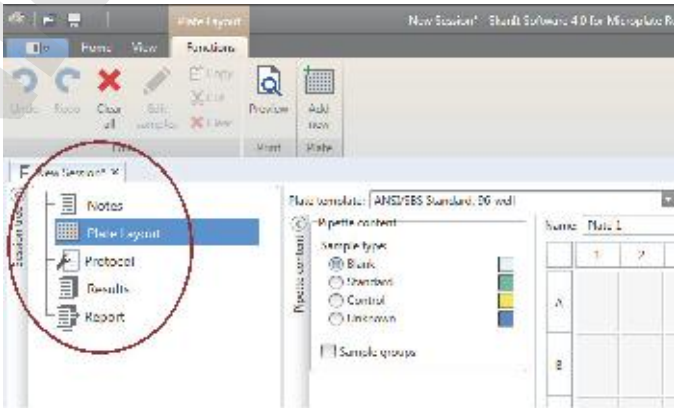
Figure 27. The application menu.



Session Tree

The **Session tree** is visible when you have created or opened a session. This is the main area where you navigate to define what wells to measure, to select the protocol, view the measurement results, perform calculations and to create a result report.

Figure 28. The Session tree with Plate Layout selected.

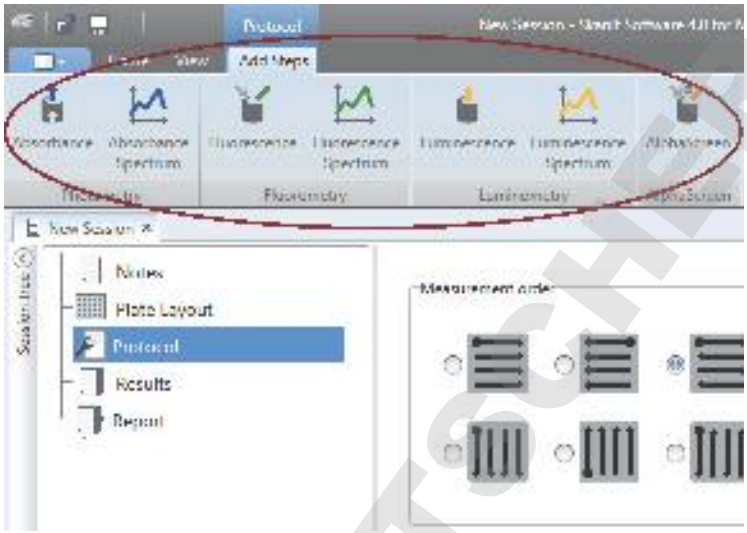


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Task Ribbon

The actions in the task ribbon are linked to the section you have selected in the **Session tree**. When you select **Plate Layout**, **Protocol**, **Results** or **Report** in the **Session tree**, the relevant task ribbon opens. The task ribbon shows the actions you can select.

Figure 29. The Protocol task ribbon.



Select the Software Language

The default language is English. You can change the language to French, German, Italian, Japanese, Portuguese, Russian, Simplified Chinese or Spanish.

To change the language:

1. Click **Settings** in the **Application menu**.

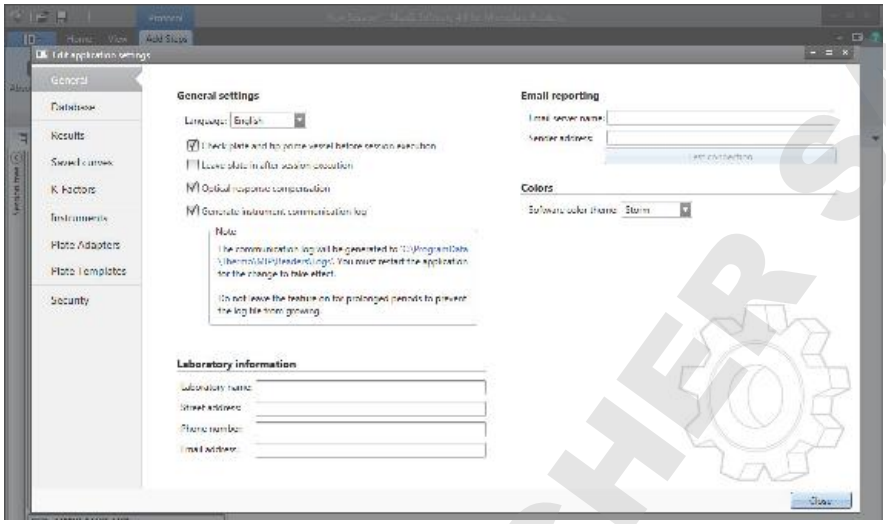
   The **Settings** window opens.

2. Select the language from the drop-down list under **General settings**.

3. Restart the software to set the new language.

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Figure 30. The Settings window.



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Using SkanIt Software

This chapter describes the Session tree which is the main part of the software user interface. You will find information on how to create sessions, view and export measurement results, perform calculations, and create data reports.

The general outline for using the software is:

1. Create a new session or open an existing one.
2. Define the plate layout and protocol.
3. Start the session.
4. View the results and perform calculations.
5. Create result report and export data.

Sessions

The information that is needed to define and run an assay is saved in a *session*. With SkanIt Software you can build sessions for your own assays and run or modify ready-made sessions

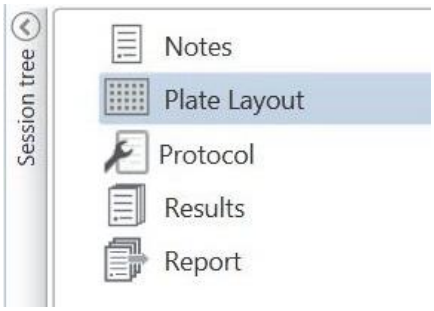
Session Structure

The **Session tree** is the main use area in the software. The **Session tree** has five main sections:

1. **Notes -** write notes about a session.
2. **Plate Layout** - define which wells of the microplate you want to measure.
3. **Protocol** - define what you want the instrument to do (e.g., measure, shake).
4. **Results** - view the measurement results and choose your calculation methods.
5. **Report** - create a report of the measurement and calculation results.

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Figure 31. The Session tree.



Create and Save a Session

1. Click the application menu tab.
2. Click the **New session** button under **New & Recent**.
3. Click **Save As** or **Save** in the **Home** ribbon.
4. In the **Save as session** window, select the folder where you want to save the session.

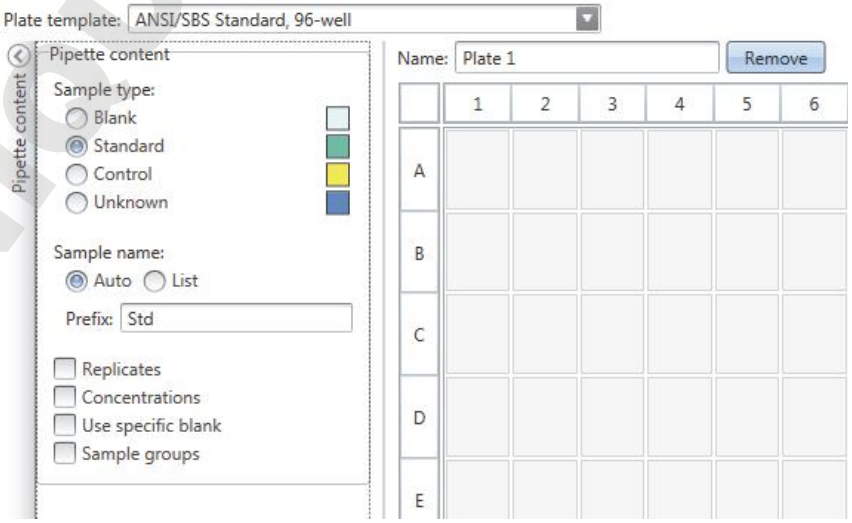
   The sessions are saved in the SkanIt Software database.
5. Give the session a name and click **Save**.

Plate Layout

This is where you tell the software which wells to measure (or dispense) and what kind of samples you have in the microplate. The **Pipette content** section is where you define the sample properties. The virtual pipetting section is where you add the samples to the plate.

You can leave the Plate Layout empty. The instrument then measures the whole plate automatically.

Figure 32. The Pipette content section (left.) and virtual pipetting section (right.) in the Plate Layout.



Define the Samples for the Plate

1. Click **Plate Layout** in the **Session tree**.

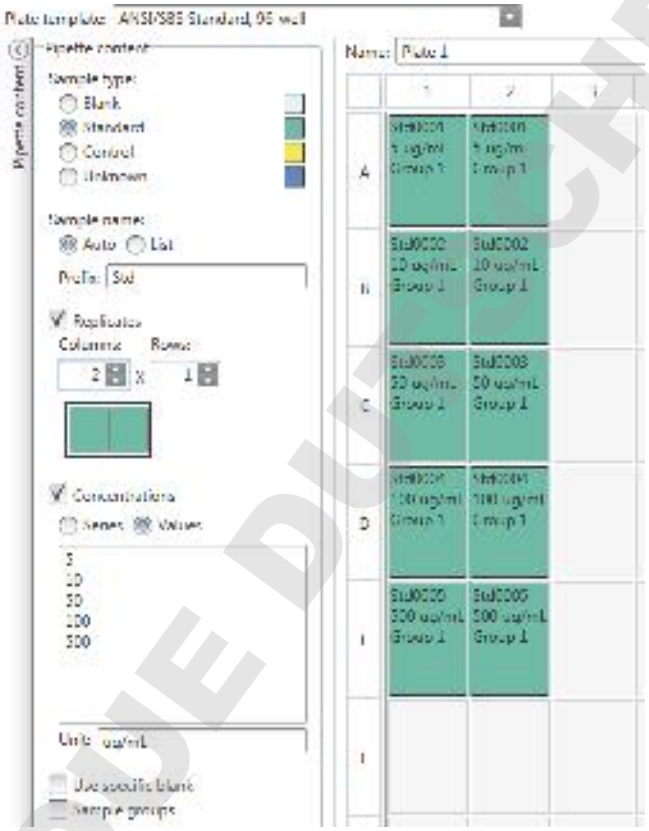
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2. Select the plate template from the drop-down list.
3. Select the **Sample type** and sample properties.
4. Click the plate wells with the virtual pipette (your cursor) to add the samples.

Tip You can add multiple samples at a time by dragging the pipette across the wells.

To clear or edit a well, right-click on the well.

Figure 33. Example: To add a series of standard samples (concentrations 5,10, 50, 100 and 500 ug/mL), with two replicates side by side, select the pipette content parameters as shown below, and add samples to the plate by painting the wells with the virtual pipette:

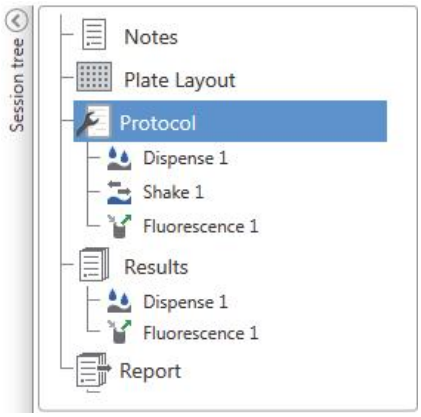


Protocol

This is where you define which actions the instrument performs.The instrument runs the actions in the order as listed under the protocol.

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Figure 34. In this example the instrument first dispenses liquid to the wells, then shakes the plate, and then measures the fluorescense.

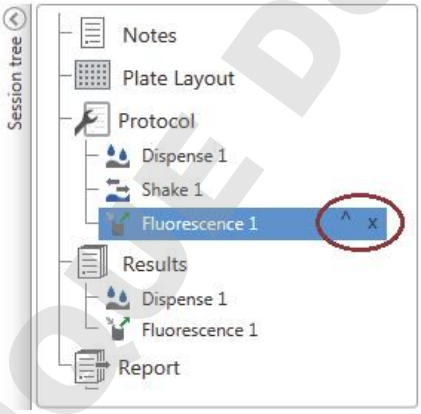


Define a Protocol

1. Click **Protocol** in the **Session tree**.
2. Select the action from the **Protocol** ribbon. The action appears in the **Session tree**.
3. Define the action parameters, e.g., measurement wavelength.

   To change the order of the actions, click the action you want to move, then click the small arrowhead to move it up or down.

Figure 35. To move the action up or down, click the arrowhead icon. To remove the action, click the x-mark.



Protocol Actions

Select the protocol actions from the **Protocol** ribbon.

Note The software automatically detects the instrument configuration and shows only those actions that are available.

Figure 36. The Protocol ribbon for adding actions.



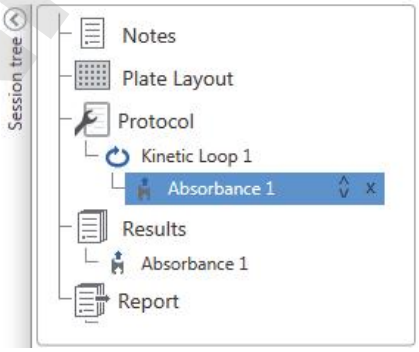
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Table 4. Protocol actions and descriptions.

Action	Description
Absorbance	Measures absorbance.
Absorbance Spectrum	Measures the absorbance spectrum for a wavelength range.
Fluorescence	Measures fluorescence intensity.
Fluorescence Spectrum	Measures the fluorescence spectrum for a wavelength range.
Luminescence	Measures luminescence.
Luminescence Spectrum	Measures the luminescence spectrum for a wavelength range.
AlphaScreen®	Measures the AlphaScreen® signal.
TRF	Measures time-resolved fluorescence.
TRF Spectrum	Measures time-resolved fluorescence spectrum for a wavelength range.
Kinetic Loop	Executes sub-steps several times in defined time intervals in a kinetic measurement.
Well Loop	Executes sub-steps for as many wells at a time as you have selected as a well count.
Area Selection	Executes sub-steps for only part of the defined wells in the plate layout. Area definition is not necessary when all of the defined wells in the plate layout are measured.
Shake	Shakes the microplate to mix the liquid in the wells.
Dispense	Dispenses a given volume of liquid into wells.
Pause	Pauses the protocol.
Run Plate Out / In	Runs the plate in or out in the middle of a protocol.

Tip To perform a kinetic measurement, add the measurement step as a sub-step of the kinetic loop.

Figure 37. An example of a kinetic absorbance measurement.

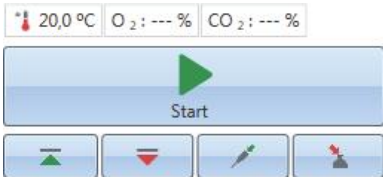


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Start a Measurement

1. Click the **Start** button.

   Figure 38. The Start button.

2. Write a name for the session in the **Session Name** field.

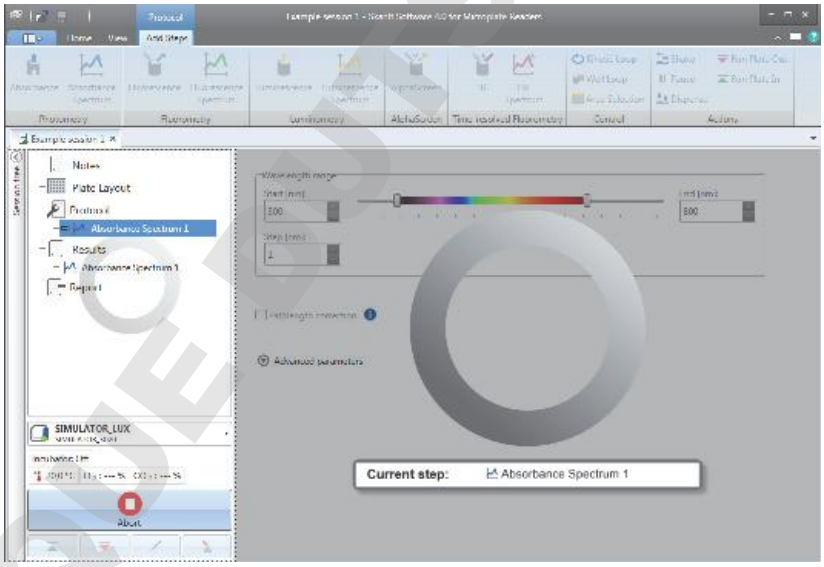
   This step is skipped if you have previously named the session.

3. Click **Save** to start the measurement. The software indicates the action it is running.

4. Click the action under **Results** to watch the measurement results during the run.

   If you need to stop the run, click **Abort**. The results measured up to that point are saved.

   Figure 39. An Absorbance Spectrum measurement.

IMPORTANT Do not open the measurement chamber door during a measurement. The dispenser sliding cover can be open.

Results

This is where you can view the measurement results and perform calculations. You can also export measurement and calculation data to use outside SkanIt Software.

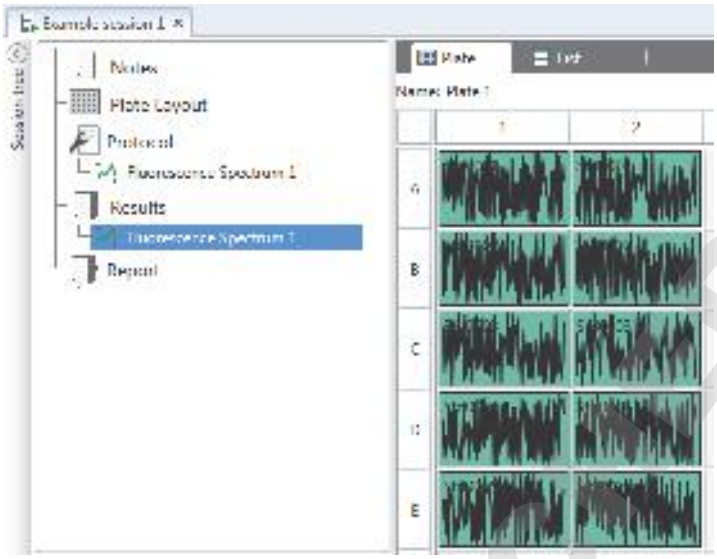
View the Results

1. Click the measurement step under **Results** in the **Session tree**.

2. Click the **Plate** or **List** tab to view the results.

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Figure 40. The results of a Fluorometric Spectrum measurement with the Plate view open.



Export Results to Excel

1. In the **Results** view click on the **Export to Excel** tab.
2. Save the data.

Tip You can export the data of several steps into the same file by creating a report. You can create result reports in Excel, PDF, XML and TXT formats.

Calculations

The software has built-in calculations that you can use to process data. You can add calculations either before or after a measurement. You can add several calculations to a measurement and also nest calculations.

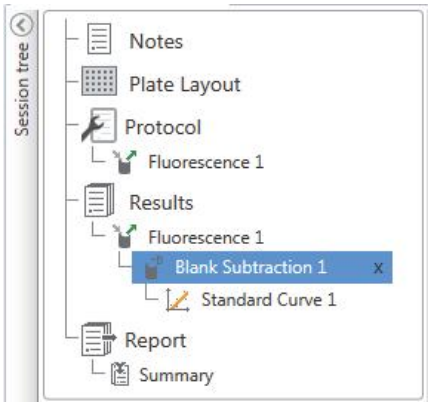
The calculation uses the result data that is directly above it in the **Session tree**.

Add a Calculation

1. Select the results step in the **Session tree** that you want to use as the source data for the calculation.
2. Click the calculation action on the **Results** ribbon. The action appears in the **Session tree**.
3. Define the calculation parameters (if needed).
4. Click the **Plate** or **List** tab to view the calculation results.
5. Click **Save**.

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Figure 41. In this example the Fluorescence Measurement data is the source data for the Blank Subtraction calculation, and Blank Subtraction data the source for Standard Curve.



Calculation Actions

Select the calculation actions from the **Results** ribbon.

Figure 42. The Results ribbon for adding calculations.



Table 5. Calculation actions and descriptions.

Action	Description
Blank Subtraction	Subtracts the average blank value from all of the samples.
Average, SD, CV%	Calculates the average, standard deviation (SD) and the coefficient of variation (CV%) of sample replicates.
Basic Calculation	Performs simple calculations, such as subtractions, multiplications and divisions.
Dilution Factor	Multiplies the results of the unknown samples by dilution factors defined in the plate layout.
Normalization	Normalizes the data of a sample group to a B_0 reference sample. The results are shown in percentages.
Pathlength Correction	Normalizes absorbance measurement data to correspond to a 10 mm pathlength (= standard cuvette).
Standard Curve	Calculates the concentrations of samples based on a standard curve generated from a standard sample series.
Dose Response	Calculates the concentration at which, e.g., 50% of a measured sample activity is lost (= ED50).
Kinetic	Offers different kinds of calculations for kinetic data.

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Table 5. Calculation actions and descriptions.

Action	Description
Spectral	Offers different kinds of calculations for spectral data.
Multipoint	Offers different kinds of calculations to reduce multipoint measurement results in each well to one result per well.
Classification	Divides samples into separate categories based on user defined limit values.
Quality Control	Checks the validity of the assay, e.g., against known control samples.
Custom Formula	Lets you create custom calculations.
Graph	Creates graphs from the result data.

Report

You can create a result report including both measurement and calculation data. You can export the result report to Excel, PDF, XML and TXT formats.

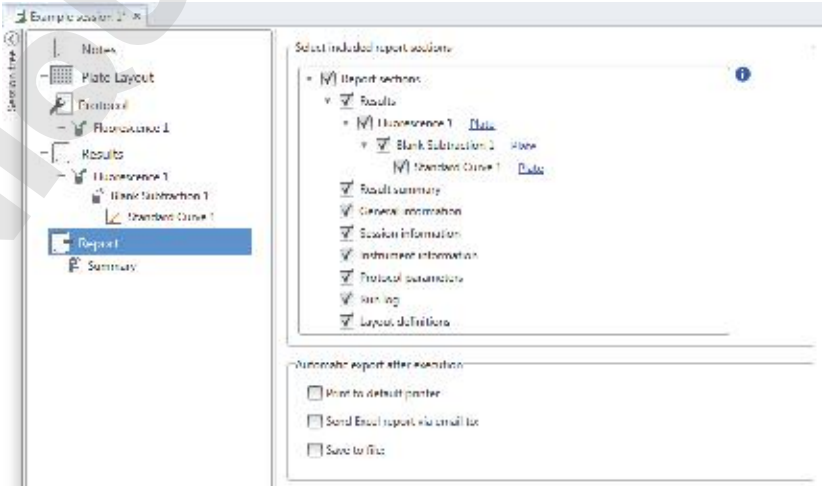
A summary table is automatically created under Report. The summary table shows only the measurement and calculation results of end-point measurements. Kinetic, spectral or multipoint results are not included in the result summary.

You can export any data by selecting the individual result sections to the report.

Create a Data Report

1. Click **Report** in the **Session tree**.
2. Check the sections you want to include in the report from the **Report sections** list.

Figure 43. The Report pane open with Report sections checked.



Export a Result Report Manually

1. Click the PDF, Excel, XML, or TXT format on the **Results** ribbon to export the report.

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2. Save the report.

   The report automatically opens in the format you choose.

Export a Result Report Automatically

You can set the software to export the report automatically after the run to a specific destination.

Before you run a session, you need to select the report content and where to export the report.

1. Click **Report** in the **Session tree**.
2. Check the **Save to file** box in the **Automatic export fter execution** pane.
3. Name the file and click **Browse** to select the destination folder and the file format.
4. Save the session.

   The next time you start the session, a report is automatically saved in the destination folder you selected.

Saved Sessions

There are two different kinds of saved sessions:

a. A session that is saved before you have run it.

   A session that you have saved but have not run does not have measurement data. You can edit all of the content.

b. A session that has been run.

   A session that has been run is automatically saved. You cannot edit the protocol, but you can edit all other content. A green arrowhead icon indicates a saved session with measurement data.

Figure 44. A session with measurement data (green icon) and without measurement data (no icon).



Open an Existing Session

You can open a recent session, or an older session.

Open a Recent Session

1. Click **New & Recent** on the application menu.
2. Select a recent session from the **Open recent session** list.

   The session opens in the **Session tree**.

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Open an Older Session

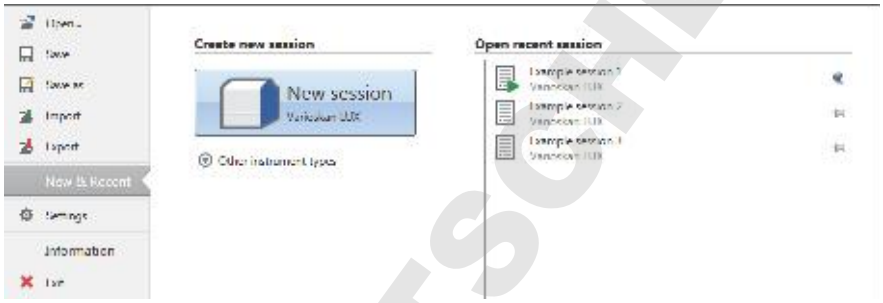
1. Click **Open** on the application menu.
2. Select the session from the **Session Browser** window.

   You can use the **Advanced search** to find a specific session quickly.

Pin Your Favorite Session

Click the recent session to pin it as a favorite session. The favorite session then stays on the recent session list.

Figure 45. In this example the first session under Open recent session is marked as favorite.

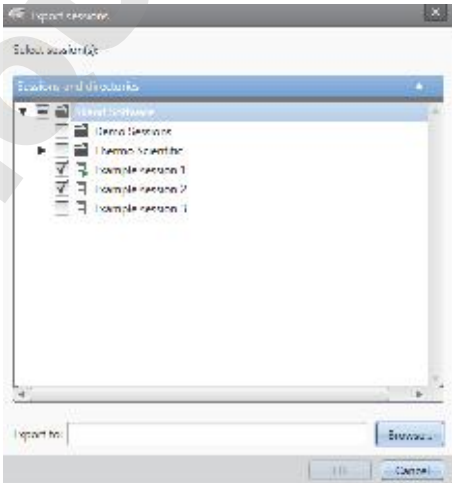


Export a Session

To copy a session, or multiple sessions, from one SkanIt Software database to another, you need to export them first. Exporting a session creates a file with an *.ska extension, which you can import to another PC with SkanIt Software installed. You cannot open the exported session outside SkanIt Software.

1. Open the application menu.
2. Click **Export**. The **Export session** window opens.

   Figure 46. The selected sessions and export folder.



3. Check the session(s) you want to export.
4. Click **Browse** to select the Windows folder you want to export the session(s) to.
5. Select the file name in the **Save As** window and click **Save**.

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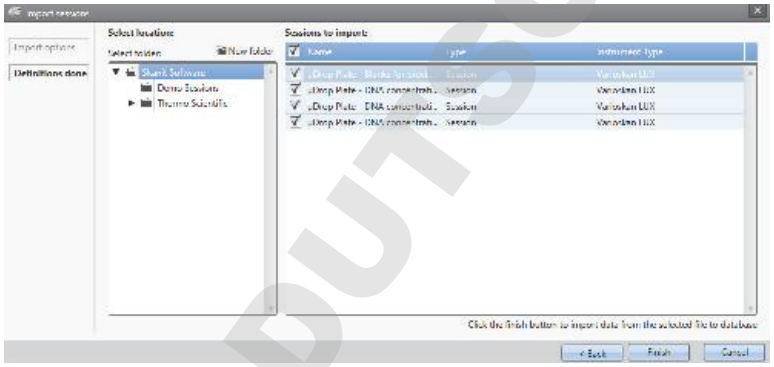
6. Click **Ok**.

Import a Session

You can import a session, or multiple sessions, that have been exported with SkanIt Software. Files that can be imported have an *.ska extension.

1. Open the application menu.
2. Click **Import**. The **Import session** window opens.
3. Browse to the file location.
4. Select the file and click **Open**.
5. Click **Next**.
6. Select the session(s) you want to import and click **Finish**.

Figure 47. The session selection in the Import data window.



7. The imported session opens.

   The software adds the imported session(s) to the **Open recent session** list under **New & Recent**.

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Safety and Maintenance

This chapter includes the general and instrument safety guidelines and maintenance checklist.

General Safety Guidelines

- The instrument is for laboratory research use only.
- Observe proper laboratory safety precautions; wear protective clothing and follow approved laboratory safety procedures.
- Follow Good Laboratory Practice (GLP) to guarantee reliable analyses.

Instrument Safety

- Follow the preventative maintenance instructions to keep the instrument in the best condition. Go to Maintenance Checklist.
- Observe all safety symbols and markings on the instrument.
- Do not open any covers except the dispenser sliding cover or measurement chamber door when the instrument is plugged in a power source.
- Do not open the measurement chamber door manually when the instrument is in operation (LED indicator orange).
- Do not push the plate tray in manually unless the instrument is switched off.
- Do not force a microplate into the instrument.

Instrument Requirements

Check the instrument requirements before you install it.

Table 6. Instrument requirements

Operating conditions	10°C to 40°C Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C Indoor use only.

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Mains power supply	100-240 Vac, 50/60 Hz, nominal
Power consumption	200 VA maximum

Safety Specifications

The safety specifications are also met under the environmental conditions listed in the table below in addition to or in excess of those stated in the operating conditions.

Table 7. Safety specifications

Altitude	< 2000m
Temperature	5°C to 40°C
Humidity	Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40%.
Mains supply fluctuations	±10% from nominal
Installation category (overvoltage category)	II according to IEC 60664-1*
Pollution degree	2 according to IEC 60664-1**

*) The installation category (overvoltage category) defines the level of transient overvoltage which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example in CAT II, which is the category used for instruments in installations supplied from a supply comparable to public mains, such as hospital and research laboratories and most industrial laboratories, the expected transient overrvoltage is 2500 V for a 230 V supply and 1500 V for a 120 V supply.

**) The pollution degree describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only non-conductive pollution, such as dust, occurs with the exception of occasional conductivity caused by condensation.

Emergency Situations

In emergency situations:

1. Switch off the instrument.
2. Unplug the instrument form the power supply.
3. Carry out corrective measures.

Note Do not disassemble the instrument.

For more help, contact authorized technical service or your local Thermo Fisher Scientific representative.

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Instrument Maintenance

Clean the instrument after each use.

1. Switch the instrument off with the tray out.
2. Wipe the surface of the tray with a soft cloth or tissue paper moistened with distilled water, mild detergent (SDS, sodium dodecyl sulfate) or a soap solution.
3. Disinfect any spilled infectious agents with 70% ethanol or another disinfectant.
4. Push the tray back into the instrument.
5. Check the dispensers for leaks and correct any problems.

Maintenance Checklist

Table 8. Maintenance checklist

Maintenance	Daily	Weekly	Monthly	Yearly	If required
Keep the instrument clean.	•				
Clean the instrument case and reagent basin.		•			
Clean the measurement chamber.			•		
Clean the tray.					•
Change the 8 well plate strip priming vessel after 250 tip primings if the priming is 10µl and after 2500 tip primings if the priming volume is 1µl.		•	•		
Clean the dispensing base.					•
Clean the fluorescence bottom reading optics.					•
Clean the absorbance optics.					•
Clean the LAT module.					•
Clean the LAT base.					•
Clean the dispensers.	•	•			
Replace the dispenser tubings.					•
Replace the dispensing tip.					•
Replace the dispenser syringe.					•
Ensure proper shutdown.	•	•			
Service the instrument.				•	

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