LightOx PhotoReact 365

User Manual

Applies to **PhotoReact 365** Model

CE

LIGHTOX®

lightox.co.uk

Contents

PhotoReact 365

Designed in the United Kingdom; manufactured in Singapore

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CE

User Manual

1. Introduction

The **PhotoReact 365** is a benchtop instrument that provides even, directed and reproducible UV illumination at 365 nm suitable for photochemical and photobiological reactions.

The user can control parameters of intensity and energy delivery rate and time. LED health over time is monitored using an in-built UV sensor enabling the user to produce rapid, reproducible results. This instrument is suitable for high-throughput screening in multiwell plates, providing researchers with a tool to screen high numbers of compounds and reactions essential for drug discovery.

Key Features

- The PhotoReact 365 is a bench top instrument for the acceleration of photochemical and photobiological reactions
- Instrument suitable for use with a standard size culture multi-well plate (85.5 mm x 128 mm) or single 95 mm round dish
- User selected light output from 0 mW/cm^2 to maximum (approx. 13.0 mW/cm^2)
- Variance less than 1 mW/cm^2 (at 100% power) and 0.5 mW/cm^2 (at 50% power) across the well plate surface
- User control of total power output
- Light intensity and temperature monitors included that records measurements every second during operation
- Data export as .csv files
- Device has locking lid that reduces user exposure to harmful light rays

2. Safety

Prior to use, the operator should thoroughly read the instructions for use. Using this device without reading and understanding the instructions for use may result in operator injury or damage to the equipment.

The device contains powerful LEDs that produce bright UV light. The device should only be used with the locking lid in place. Do not bypass the lock activation switch as looking into the device when activated may result in damage to eyes or to exposed skin.

Only use the device with appropriate dishes or plates. Proper care must be taken during setup and operation to prevent injury to operators and other personnel or damage to the unit.

The unit is equipped with multiple safety features including a lock activation switch that will not permit UV emission when the lid is not in place.

3. System Overview

The **PhotoReact 365** is a device that can deliver a specific amount of light to a sample plate in a controlled environment. Controlling the power (light intensity) and irradiation time (seconds) enables specific energy across the whole sample plate.

The **PhotoReact 365** will provide an even illumination, using light sources that allow for controlled intensity and wavelengths to be delivered to the sample plate.

The **PhotoReact 365** includes a UV sensor to monitor the health and light output of the LEDs. LEDs will diminish in power slowly over time and the inbuilt sensor allows the user to monitor the functionality of the LEDs in their instrument. The irradiance output and UV sensor are factory calibrated. Re-calibration of the system is possible. Contact the manufacturer for further information.

3.1. Warnings

The PhotoReact 365 produces UV light. Injury to the eyes or skin can result from UV exposure. It is the responsibility of the user to follow all applicable safety guidelines in prevention of injury or damage to the unit. Never bypass the lid locking switch.

No modification of this equipment is allowed.

Never open or remove the bottom cover of the base unit or control unit.

The PhotoReact 365 unit requires adequate airflow to maintain proper cooling. Ensure the ventilation slots on the side of the unit are unobstructed.

Not for domestic use. In accordance with EN 55011: 2009 +A1:2010 the PhotoReact 365 is a Class A product. In a domestic enviroment this product may cause radio interference in which case the user may be required to take adequate measures.

If the PhotoReact 365 is used in a manner not specified within this manual, the protection provided by the equipment might be impaired.

It is the responsibility of the user to follow all applicable safety guidelines in prevention of injury or damage to the unit.

It is the responsibility of the user to assess and mitigate any hazards that may result from experimental reactions.

It is the responsibility of the user to assess and mitigate any hazards that may result from addition of volatile or flammable materials. Users shall comply with all applicable safety and accident-prevention procedures for laboratory work.

Device intended for a variety of chemical and biological reactions; Device to be used by trained operator in a laboratory setting.

Heavy – Product with its packaging is over 7 kg.
Appropriate manual handing guidelines should be followed.

Power supply cannot be replaced.

4. System Components

The PhotoReact 365 is comprised of the following:

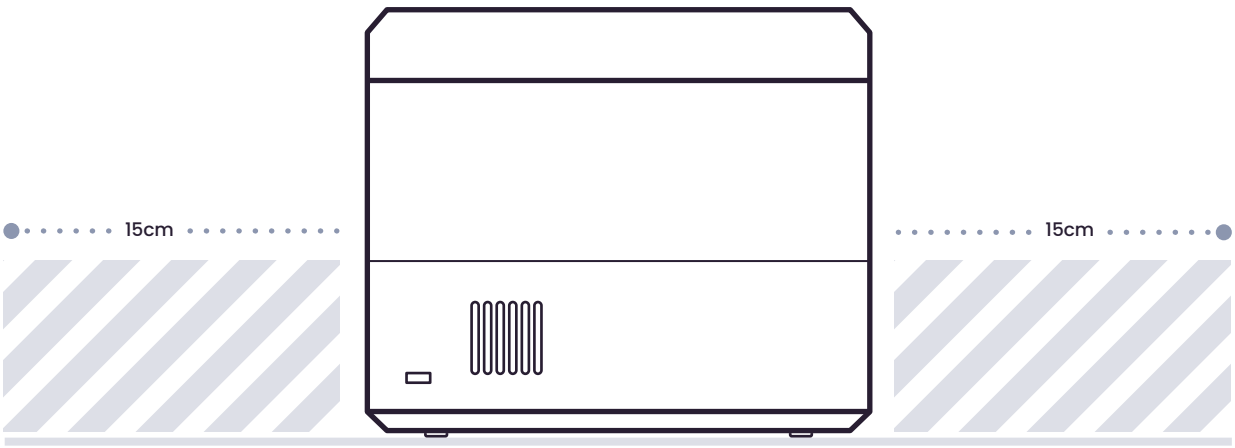
1. Base Unit
2. Removable, locking lid
3. Control Unit
4. USB cable connecting Control Unit to Base Unit
5. Power Supply

4.2. Choosing a Location

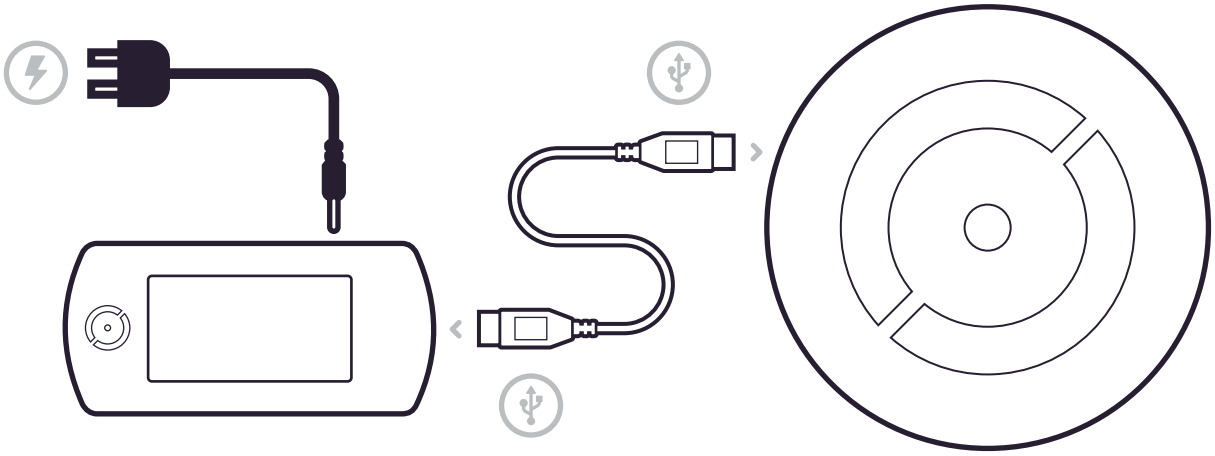
Place the **PhotoReact 365** on a flat surface on its neoprene feet with at least 15 cm of space between the perimeter of the instrument and the nearest object.

The **PhotoReact 365** is designed to work at ambient room temperature.

Transport the **PhotoReact 365** in a horizontal position and avoid significant jarring of the instrument whilst on the worktop.



4.3. Connecting the Power Cord and USB cable



Insert the one end of the USB cable from the USB port on the right side of the Control Unit.

Insert the other end of the USB cable into the USB port on the Base Unit.

Insert the power supply terminal into the power connector port on the controller unit. Insert the power supply plug into a standard mains AC outlet.

Warning: Risk of electrical shock

Before plugging into mains power visually inspect the power supply plug and cable to ensure there is no damage.
If there are signs of damage **do NOT use.**

Note: There are two USB ports on the control unit. **The right hand port** should be used to connect the USB cable on the control unit to the USB port on the base unit. If the USB cable is incorrectly connected to the data port on the back side of the control unit, the instrument will not function.

5.1. Setup

Operation

Once the power cord and the USB cables are connected the **PhotoReact 365** Base Unit and Control Unit are ready for operation.

The display start-up screen is shown below. The touch screen buttons are **New experiment**, **Rerun experiment** and the system **Settings** button.

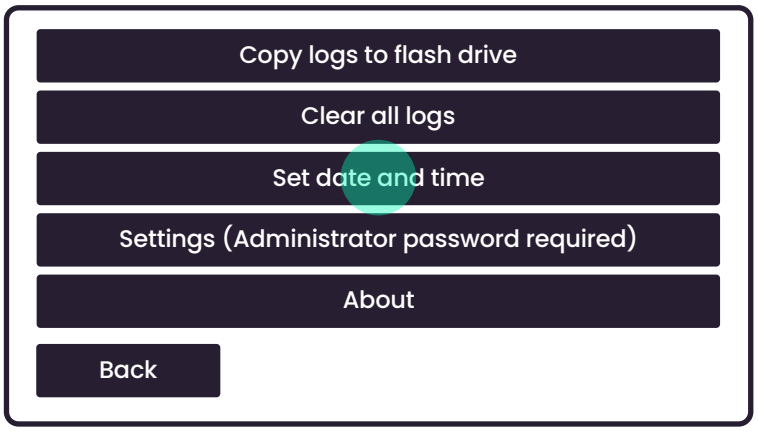
New experiment allows the user to input new settings.

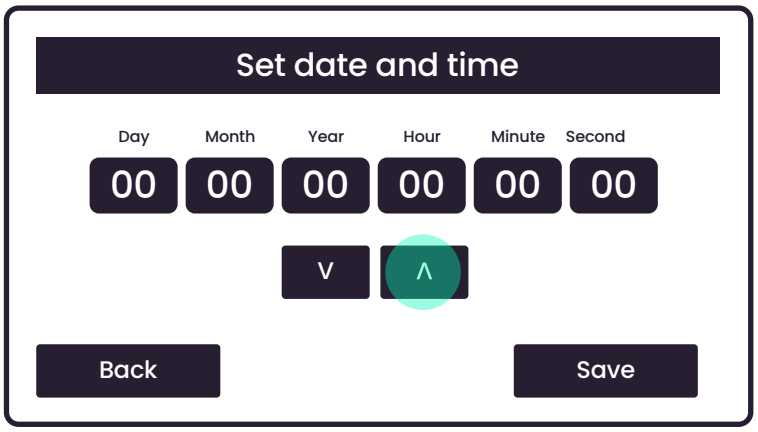
Rerun experiment allows the user to reuse settings from a previously run experiment.

When setting up the **PhotoReact 365** for the first time, the time and date should be set by the user. Touch the **systems setting button** on the start up screen.

5.2. Setting the date/time

Operation





Select the **Set date and time** button and use the up and down toggle buttons to set the date (day, month and year) and time (hour, minute and second) in two digit format.

Select **Save** to save the user inputs into the memory.

Note: once the date/time is set, this action should not need to be repeated.

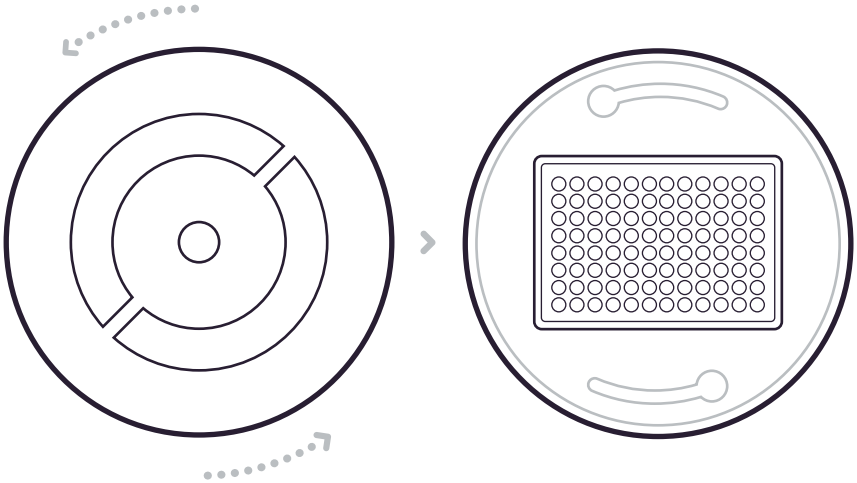
5.3. Performing an irradiation experiment

Placing Sample Plate

Remove the **PhotoReact 365** lid by turning the lid counter-clockwise fully until it stops and lift the lid upwards with two hands.

Take the lid off, place the multi-well or tissue culture plate on top of the glass surface in preferred orientation.

Note: Please place sample plate gently as the top plate is made of glass.



Take lid off

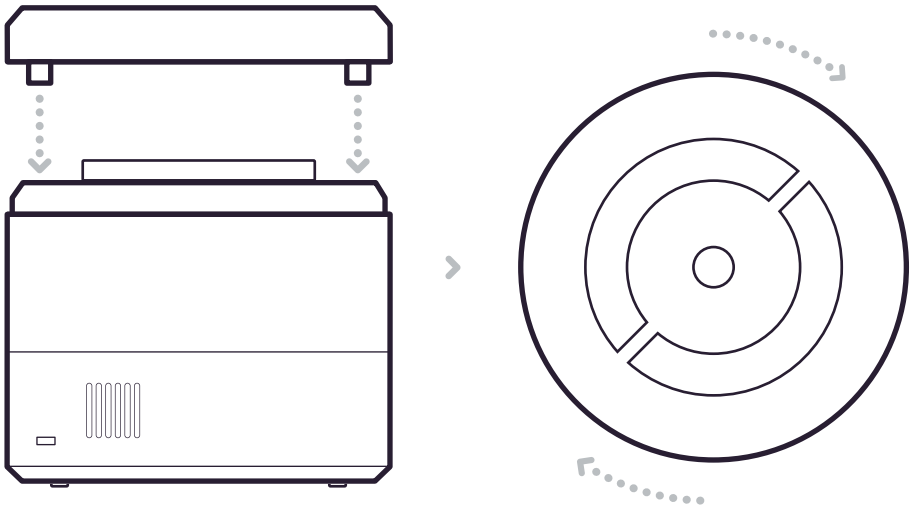
Place sample plate

5.3. Performing an irradiation experiment

Locking Lid

Replace the lid ensuring the lid locking pins align with the round holes on the Base Unit. Turn the lid clockwise fully to lock the lid into place.

Note: The **PhotoReact 365** will not function unless the lid is fully engaged in the lock position.



Replace lid

Lock lid

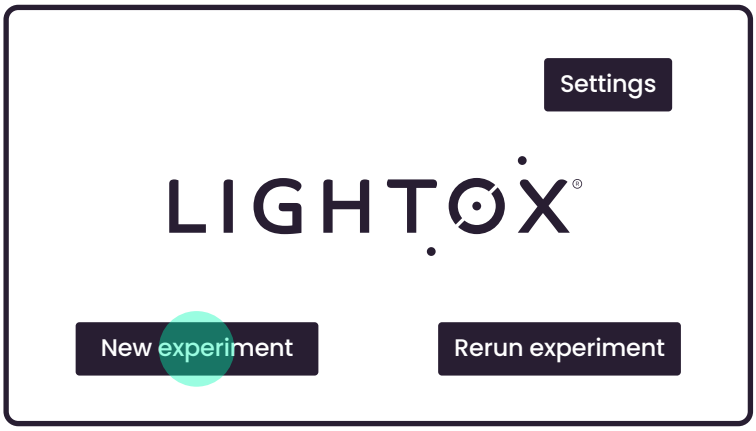
5.3. Performing an irradiation experiment

Running Experiment. Step 1.

Next, on the display start-up screen of the Control Unit, select either **New experiment** or **Rerun experiment**.

After selecting **New experiment** enter the experiment name using the touch keyboard on the next screen.

Select **Save** to bring up the experiment settings screen shown below.



5.3. Performing an irradiation experiment

Running Experiment. Step 2.

The following settings can be customised.

Duration:
(Time; MM:SS) up to 30:00

Irradiance:
from 0 mW/cm2
to the maximum
(approx. 13.0 mW/cm2)

Energy:
from 0 mW/cm2
to approx. 23,400.0 mJ/cm2

Note: (Duration) X (Irradiance) = Total Energy

Note: The instrument is factory calibrated with max irradiance approx. 13.0 mW/cm2

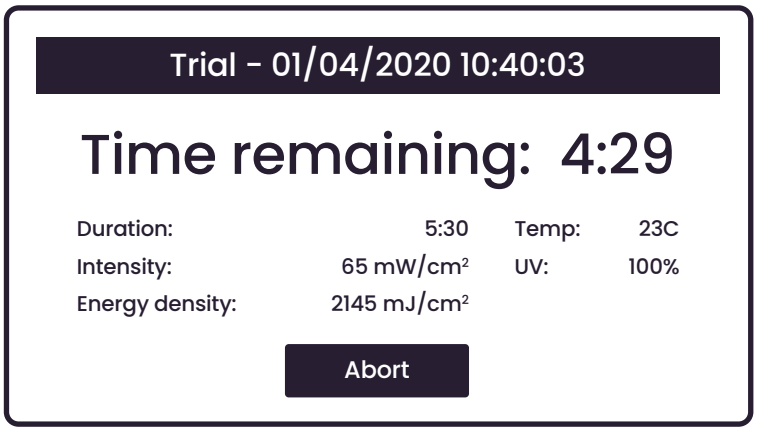
First, enter the Duration using the top two sliders then press the **Hold** button to the right of the top sliders. Next use the middle slider to set the irradiance. The total Energy delivered will be automatically calculated by the software.

Alternatively, the user can set the total Energy delivered by selecting this setting first and applying the **Hold** setting. Then, using the either the Irradiance or Duration slider to control the Irradiance or the total time respectively. The software will automatically calculate the third parameter and set it accordingly.

Press **Run** to start the set programme.

5.3. Performing an irradiation experiment

Running Experiment. Step 3.



If operating correctly the fans will turn on and the experiment run screen will be shown as above.

Warning: Risk of UV LIGHT

Exposure may result in injury to eyes or skin. Do not look into the light, use skin and eye protection as necessary

Note: While the experiment is running, the time remaining, and readings from the temperature and UV sensors are displayed.

Note: If the lid is removed during an experiment, the LEDs will automatically turn off for safety, but the fans will continue to run and the user will be prompted to re-close the lid to continue the experiment.

After completion of the experiment the software will automatically reset to the start screen. A log file of experimental parameters and readings will be created and automatically saved on the instrument.

See section 5.5 for download instructions.

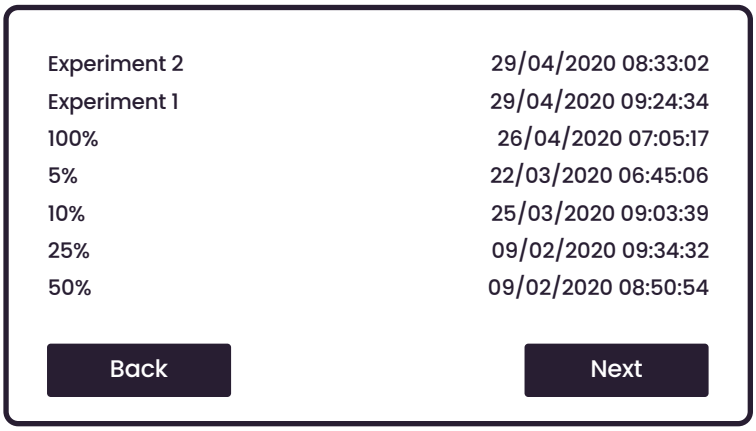
5.4. Re-running an experiment

Operation

Warning: Risk of UV LIGHT

To re-run an experiment using the same experimental parameters, select **Rerun experiment** on the display start-up screen.

Select the experiment name from the list. Use the **Next** button to scroll through additional pages of experimental names.



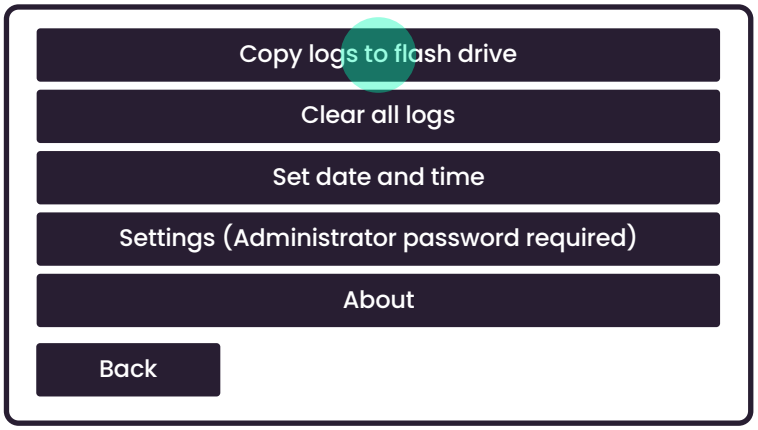
Note: the list of names is ordered by time and date with the most recent experiments displayed at the top of the list.

After selecting the name, the next screen will allow the user to modify the parameters and experimental name by selecting the **Modify** button or to re-run the experiment without changes by selecting **Run**.

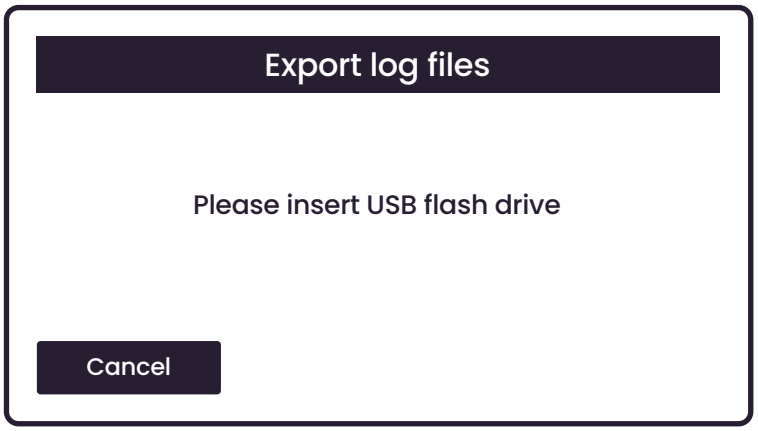
5.5. Downloading experimental data

Copy logs to flash drive. Step 1.

To download data files to a flash drive, press the **systems setting button** on the start up screen.

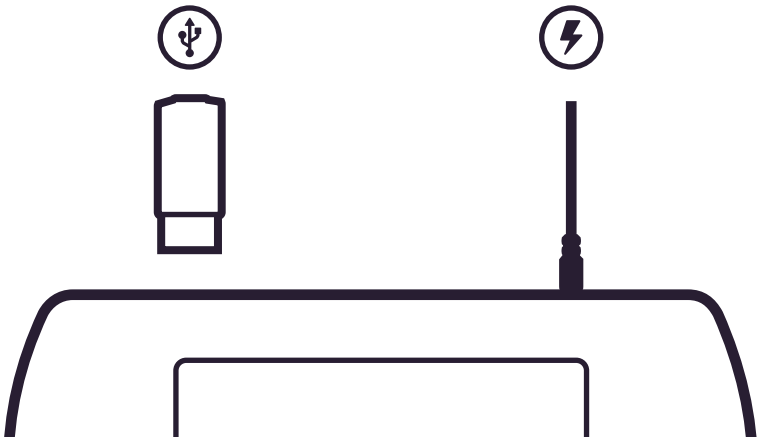


On the settings screen, press the **Copy logs to flash drive** button, to display the export log files screen:



5.5. Downloading experimental data

Copy logs to flash drive. Step 2.



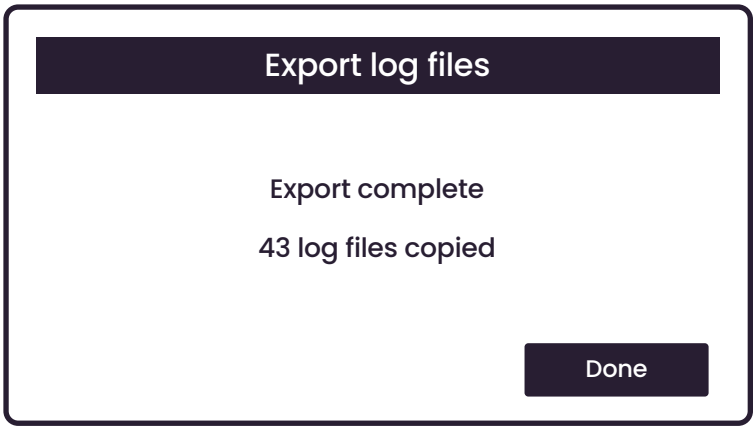
Insert a USB drive into the Data Port on the back of the Control Unit, next to the power connector.

Once inserted, the Control Unit will automatically start downloading log files to the USB Drive:

5.5. Downloading experimental data

Copy logs to flash drive. Step 3.

Once all files are downloaded an 'Export complete' prompt will display:



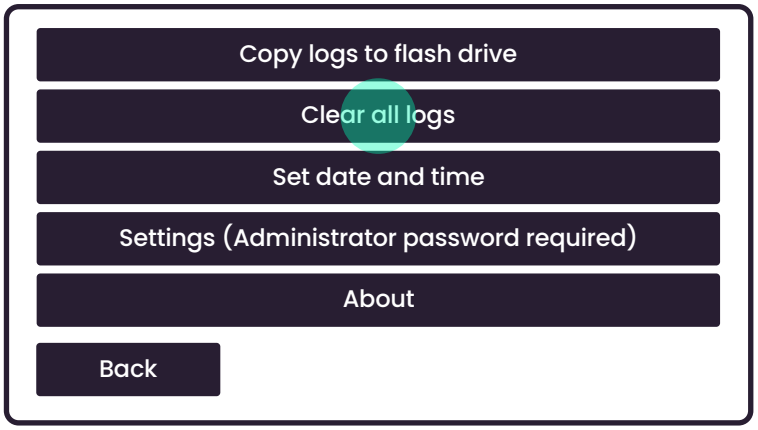
It's now safe to remove the USB drive, and press the **Done** button to be taken back to the settings screen.

Note: The file size for each log is very small (<1Kb).

5.5.1 Clearing log files

Clear all logs

At any time, it's possible to clear all log files from the controller. Typically you'll do this after downloading the files to the USB drive. To clear all log files select the **Clear all Logs** button on the settings screen:

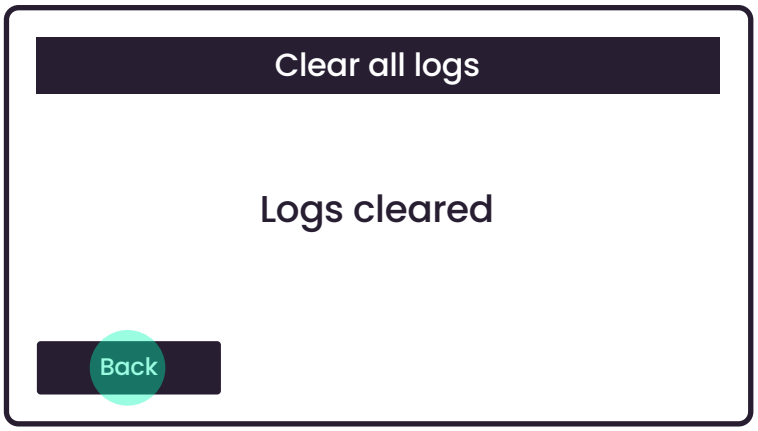


To permanently delete all log files from the controller, press the **Clear logs** button.

5.5.1 Clearing log files

Clear all logs Continued

Logs will be deleted and once cleared a message 'Logs cleared' will display. Press the **Back** button to return to the settings screen.



5.6. Termination, Turning the Unit "Off"

Unplugging the unit or switching off the unit while it is running will cause no harm to the system, nor will it cause an unsafe condition.

NOTE: This will abort the test and no test record will be stored.

Unplug the power supply or switch off the mains power at the end of use.

6. System Information

To display system information press system settings button on the start screen and then **About** on the system information screen.

7. Proper Care and Handling

Remove the **PhotoReact 365** and accessories from packaging upon arrival.

Visually inspect all components supplied and immediately notify the supplier of any defects detected.

7.1 Cleaning, Disinfection & Disposal

Warning: Risk of Electrical shock

Always ensure the system is turned off and unplugged before and during cleaning.

- Clean and disinfect the external housing with a mild detergent.
- Wipe with mild detergent, do not spray.
- Never clean any internal electronics with liquid cleaners. If necessary, remove all dust from external surfaces with dry compressed air.
- In the event of a spillage follow local safety regulations
- **PhotoReact 365** units should be disposed of via local and applicable regulations based on the intended use.

SYSTEM DISMANTLING | WEEE Directive

In accordance with European Union directive on the management of waste electrical and electronic equipment (WEEE), this product must not be disposed of in unsorted municipal waste at the end of its life. It must be taken to a collection and recycling centre.

For further information, go to **SigmaAldrich.com/weee**

8. Maintenance

The **PhotoReact 365** is designed to operate without any user maintenance required. No user-changeable fuses are included. There are no user-serviceable parts included.

If issue observed consult section 9 Troubleshooting.

Warning: Risk of UV LIGHT

During maintenance there may be greater exposure to UV light resulting in injury to eyes or skin.

Do not look into the light, use skin and eye protection.

Maintenance only to be performed by trained approved operator.

9. Troubleshooting

Q: My screen does not display LightOx logo on startup.

A: Unplug the power supply (or turn power off at supply), wait at least 10 seconds and reinsert (or switch on) the power supply.

Q: My screen displays a "STORAGE NOT FOUND" warning on start up.

A: Unplug the power supply (or turn power off at supply), wait at least 10 seconds and reinsert (or switch on) the power supply.

Q: My UV sensor displays a reading over 100% during a test.

A: It's possible the UV sensor will report a value slightly over 100% during the first few months of use. The instruments are calibrated at assembly to set 100% as the maximum output of the instrument.

Power supply, enviromental conditions and other factors can slightly increase the efficiency of an LED, leading to a small increase in power. The UV sensor only acts as an LED health check for the user, it is not in a feedback loop. Fluctuations in the reading will not affect your results.

10. Technical Data

Base Unit with Lid

Diameter: 21.0 cm
Height: 18.5 cm
LED wavelength: 365 nm

Control Unit

Width: 21.0 cm
Height: 5.4 cm
Depth: 9.0 cm

Weight: Approximately 6.4 kg (base unit with lid) and 1.2 kg (controller)
Power supply input: 100-240V, 50/60 Hz, 0.8A (AC) and fluctuations up to 10% of the nominal voltage
Power supply output: 12V (DC), 3A

Warranty period of 1 year or 5,000 operations, whichever occurs soonest.

Ambient conditions for operation

Suitable for indoor, commercial use only, e.g. laboratories and testing stations.

Temperature: 15° to 40°C (41° to 104°F)

Rel. humidity: 0% to 80% non-condensing for temperatures up to 31°C (88°F) decreasing linearly to 50% at 40°C (104°F)

Air pressure: 700 hPa to 1060 hPa

Pollution Degree 2: Normally only nonconductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

Altitude: 0-2000m

Ambient conditions for storage (in shipping packaging)

Temperature: -20° to +50°C (-4° to 122°F)
Rel. humidity: 0% to 100%, non-condensing

Contact

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