

UV-LED smart

Operating Manual

Version: 1.1.3

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1 Change History

Date	Version	Changed by	Changes
30.10.2013	1.0.0	Paravia	Preparation
12.05.2014	1.0.1	Paravia	corrected section "importing profiles"
27.10.2014	1.0.2	Uhl	corrected trigger operation
15.12.2014	1.0.3	Paravia	Update Software V1.1
10.06.2015	1.1.2	Paravia	Update TI Driver and quite program
01.12.2015	1.1.3	Paravia	Change to 24V, Status feedback

2 Symbol Overview



meaning:
Failure to follow the instruction could result in injury to the user.



meaning:
Failure to follow the instruction could result in damage to the device.



meaning:
Instruction is to be considered for regular operation.

3 Safety Information

General

Low voltage devices such as the LED-400_{Solo} in general can have dangerous voltage carrying parts as well as hot surfaces. All work for transport, installation, start up, maintenance and service have to be done by properly skilled and responsible professionals (comply with EN 50110-1 (VDE 0105-100); IEC 60364). Non-appropriate behaviour can lead to serious injuries and damages.

Intended Use

The equipment is made for industrial use only. It complies with harmonized standards of the EN 60034 series (VDE O53O). Using the equipment in explosive environment is prohibited.

Installation, starting up, operation, maintenance and service can only be done by properly skilled and trained professionals considering all safety regulations and standards.

Liability:

Damages resulting from non-intended use or non-authorized interventions lead to the termination of any rights to claim warranty or liability of the manufacturer.

Exclusion of warranty:

The use of any non-original spare parts terminates warranty.

Environmental protection:

Note that defective parts containing environmentally harmful substances have to be disposed accordingly.

Radiation Safety

The equipment contains an LED that emits invisible UV-A radiation. Work according to safety rules for UV radiation.

UV radiation is invisible! The light you may see is just luminescence caused by the UV. Mostly, luminescence is much weaker than the exciting UV!

UV-A light may lead to cataract formation in the eye lens and to photo-retinitis. Always use proper UV protection goggles when operating the device. The UV-A also causes pigmentation and ageing of skin. Please use proper clothing, gloves and/or sun-screen in dependence on exposure. Avoid irradiating skin or eye directly! UV irradiance in the spot is several hundred times higher than that of sunlight!

This device was classified to risk group 3 (High Risk) according to DIN EN 62471:2009-03 „Photobiological safety of lamps and lamp systems“.

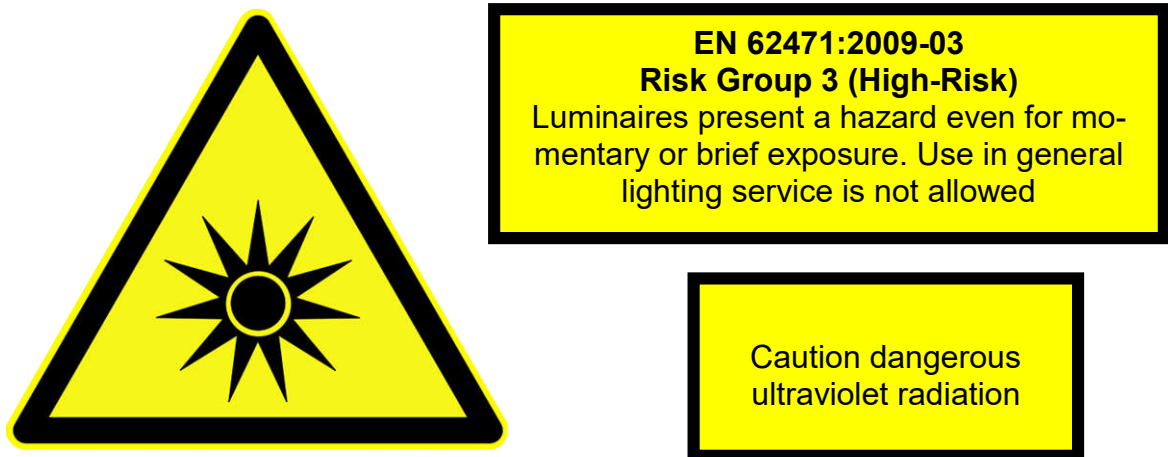


Figure 1: Safety information

Note on safety

The risk assessment for the workplace is the customer responsibility.

For this purpose measurements / assessments according to DIN EN 14255-1:2005-06 "Measurement and assessment of personal exposures to incoherent optical radiation - Part 1: Ultraviolet radiation emitted by artificial sources in the workplace" are necessary. The DIN 14255-1 itself contains no limits. These are given in the "DIRECTIVE 2006/25/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation)".



There is a risk of photochemical or thermal damage of the eye, retinal damage of the eye and erythema. The operating staff is to be trained appropriately.

For protection of the operating staff, do not look into the LED and do not expose the skin continuously to UV/VIS radiation.



The light source flashes at power-on for a period of max. 0.5s.
Do not look into the LED and do not expose your skin to UV radiation.

4 Commissioning

Installation

Unpack all components and remove the packaging material.

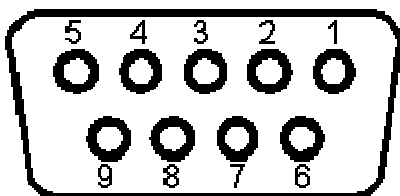
The power adaptor of the UV LED smart is to be operated with an AC voltage of 100 to 264 V ~ with a frequency of 50-60 Hz. The power consumption is max. 6 W.

A trigger signal or footswitch, the PC or the power adaptor can be connected to the breakout box.

Install the software smartUV and then connect the breakout box with the PC.

The breakout box is implemented as a virtual COM port named "UVsmart". If the UV LED smart cannot be found during the initial start, please check the settings of the COM port in the software.

Trigger



The exposure can be started via an external trigger or footswitch. For this purpose, connect the pushbutton to PIN 1 and PIN 5.



Only use a pushbutton or isolated contact. An own voltage supply is not necessary and not possible.

Cooling

The UV LED smart needs no cooling during its operation in an ambient temperature of $<40^{\circ}\text{C}$ and a duty cycle (Einschaltdauer) $\text{ED} < 50\%$. With higher ambient temperatures or $\text{ED} \geq 50\%$, a cooling might be necessary. This can be taken out by e.g. the flow (Anströmen) of cooling air or heat conduction.

Avoid any cooling below the dew point.

Condensing water can corrode the LED tip or damage it otherwise.



The maximum housing temperature can reach $> 60\text{ }^{\circ}\text{C}$. These high temperatures can be reached in the manual operation with permanent operation, and there is a risk of skin burns in case of contact.

Status feedback

The light source flashes when switching to the set operating mode:

3 x blinking: set profile mode

1 x long signal: continuous operation set



The light source flashes at power-on for a period of max. 0.5s.
Do not look into the LED and do not expose your skin to UV radiation.

Reset

If the UV-LED isn't flashing after power-on or isn't reaction on keystroke / trigger, press the reset button on the bottom of the breakout box. Alternative:

Disconnect the UV- LED from mains for at least 5 minutes

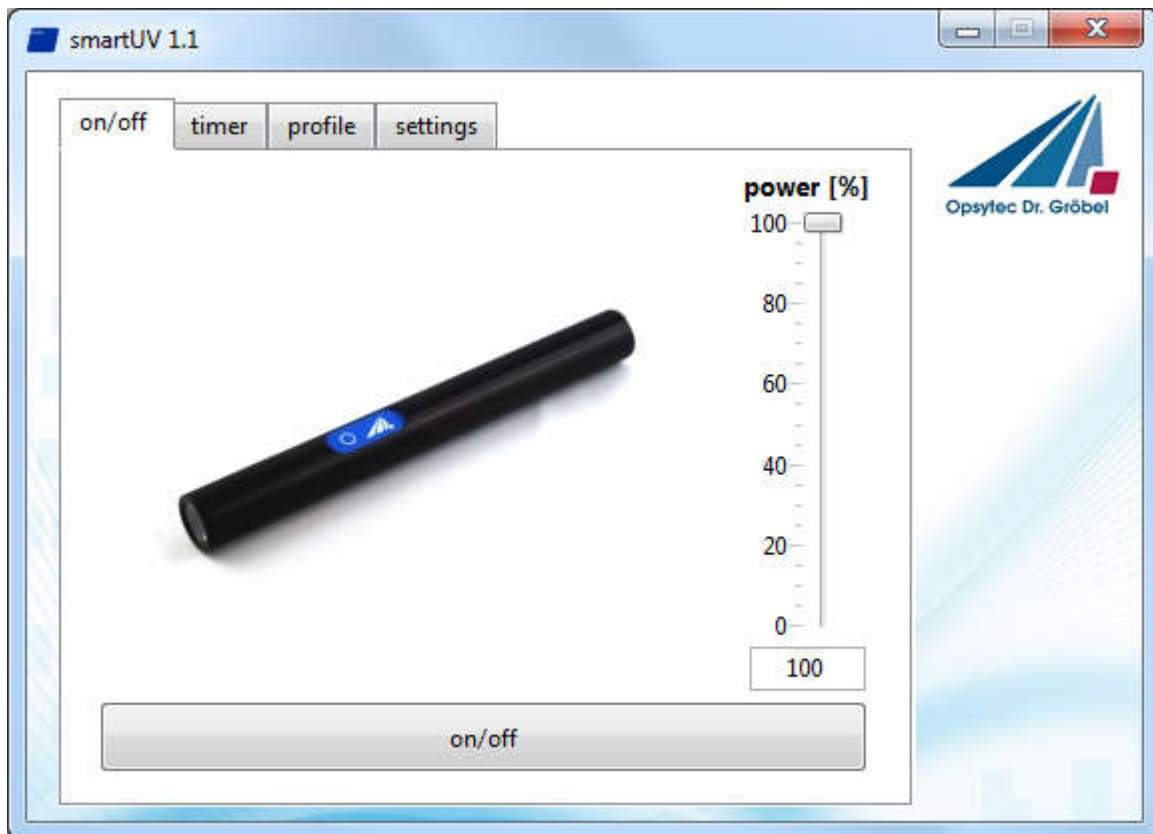
Pull thereby also USB connection

Program the LED again via the PC, if necessary

5 Operating the Software

Starting the Software

When starting the software, the UV LED is connected.



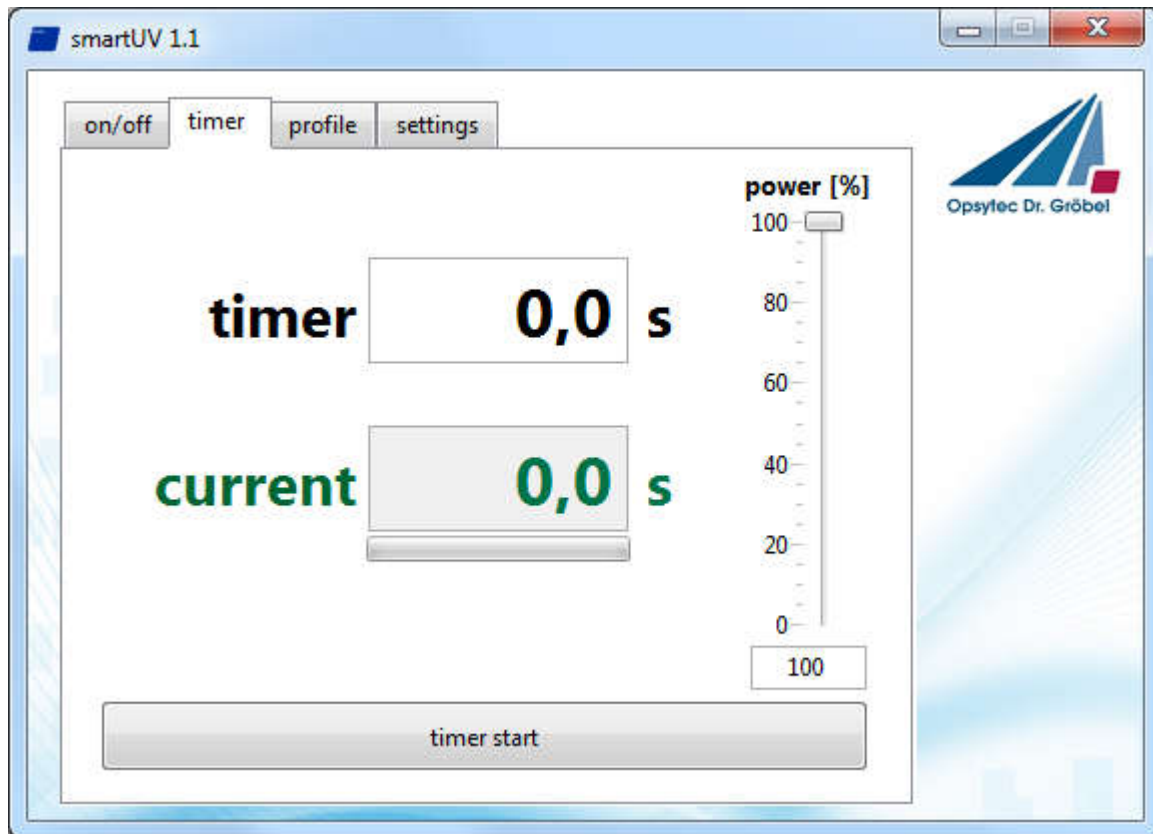
If the UV LED smart cannot be found, check the setting of the COM port in the tab “Settings” and confirm the button “connect”.

Permanent Operation

The UV LED can easily be switched on and off at the PC with the button “LED on / off”. The performance can be set between 0% and 100% via the slide control.

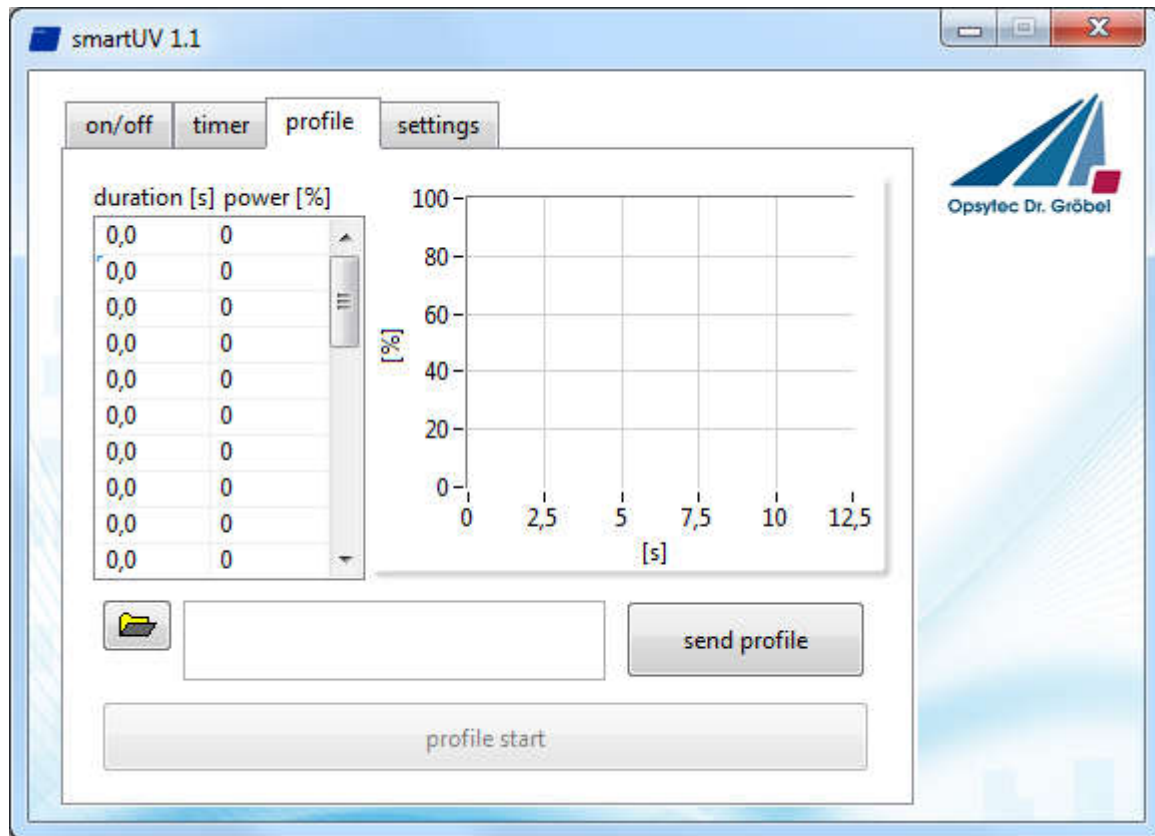
Timer

The UV LED can be controlled by PC in permanent operation mode. Therefore a useful timer is available. Set timer duration and performance and press timer start to start irradiation. Press button again to stop irradiation.



Profiles

The UV LED smart offers a profile mode for an adjustable, reproducible exposure of the samples. In the profile mode, dynamic exposures, i.e. exposures with temporally variable irradiance, and exposures with constant irradiances are possible. The user interface, with the function groups, is illustrated below.



Activate the profile mode by button “send profile”.



The exposure is taken out in the profile mode by pressing once the button or creating the trigger signal, as long as the button is pressed / the trigger is active. In that case, the profile is continuously repeated.
The exposure is taken out on the PC only once and is not repeated.

Setting the irradiation profile

The irradiation profile is shown in the table and the graph. Changes are editable directly in the table.

Furthermore, profiles can be imported via text files. To select a text file, click on the folder icon at the bottom. The text file must be two-columned and tab-separated, and must have **exactly 29 time and irradiance values**.

The first column contains the exposure time; the second column contains the irradiance. Note: The text files can be generated in Microsoft Excel via any text editor or via the function “Save as” as a “text (tab-separated) (*.txt)”.

Example:

```
1.0 100
1.0 0
1.0 100
```

0
0
...

The first step is 100% performance for 1 second, followed by 1 second with 0% and 1 second with 100% performance. Please note that the duration must be > 0. Otherwise all the consecutive steps will be ignored.

Transfer the profile into the UV LED smart with the button “send profile”. This process takes a few seconds. Now the profile is permanently saved.

Start irradiation by button “profile start”.



The maximum step length is 25s.
Split a longer irradiation in several single steps.

Settings

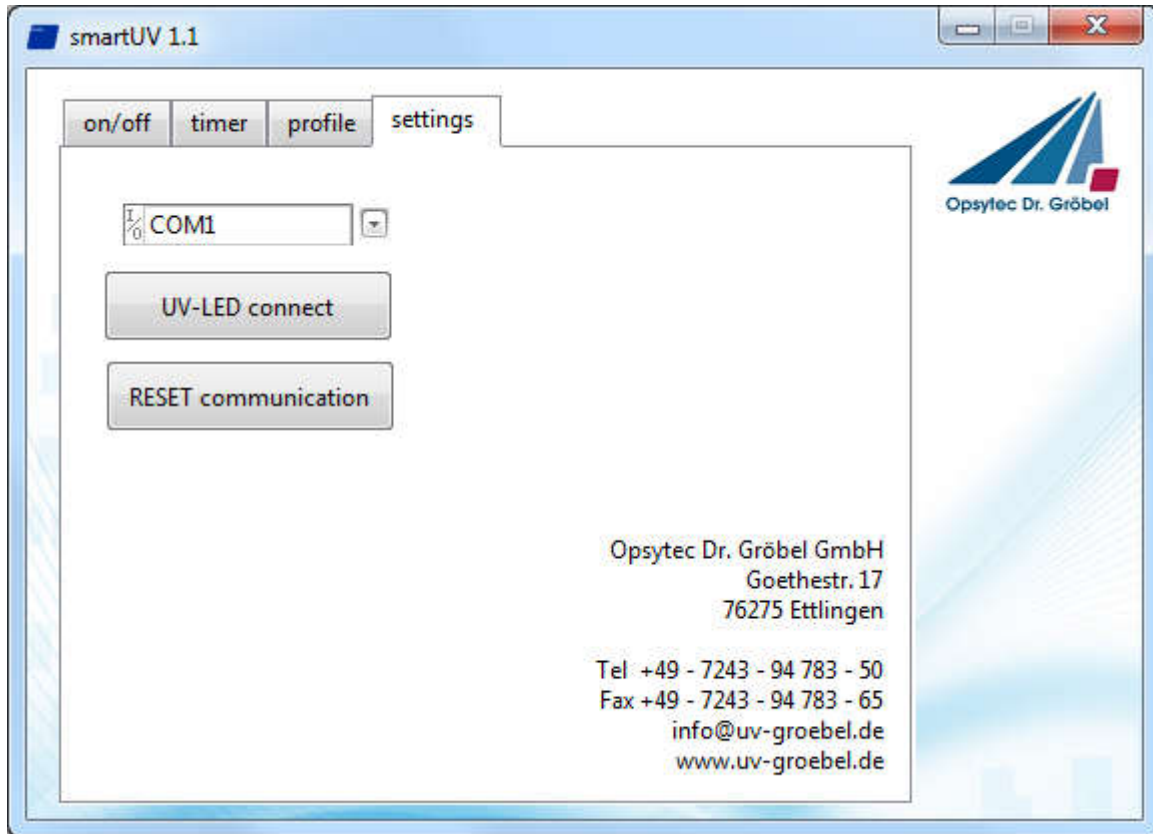
Once the UV LED smart is successfully connected, this COM port is automatically saved. If the module is not identified, please check the COM port on the page “Settings” and press the button “Connect”.

The software saves the settings in a text file under C: \ OpSyTec-Daten \ UVLED Smart\COM.INI. This can be edited with any text editor. When using Microsoft, please use the setting “Text Only” (*.txt).

This ini-file defines the COM port Default.
Example (when using COM port 2):

```
COM2
```

If no COM port is displayed or the UV LED smart is not listed, check the installation and / or the device manager (Windows Control Panel).



If the COM port is listed, but the UV LED smart cannot be identified, you can reset it via „RESET Communication“.

6 Operation without any PC

The UV LED smart can be operated without any PC at the breakout box or at the optional power adaptor. Here, the operating mode that was last set at the PC will be executed.

In permanent operation, the UV LED is active, when the pushbutton/footswitch (optional) is pressed or a trigger signal is present.

In the profile operation, the profile is repeated until the pushbutton is pressed. The same applies for the trigger signal.

Pre-set the desired operating mode at the PC. This mode will be permanently saved in the UV LED smart.