

## UV-LED LedControl S / 5S / 16S



LEDControl 5S

LEDControl S

The use of ultraviolet-curing adhesives and compounds is constantly increasing. With the LedControl S UV LED controller, you remain flexible for future requirements.

Due to the modular design, one UV LED lamp, up to five or even up to 16 UV LED lamps with different wavelengths can be operated and individually adjusted with one LEDControl S.

For applications such as bonding, potting or fluorescence excitation, the wavelengths 365, 385, 395, 405 and 450 nm are available. With the variety of wavelengths, you remain particularly flexible and can upgrade and change over at any time. With several UV LED lamps, the irradiation can also be ideally homogenized to achieve the best possible uniformity.

With the intelligent UV LED control, the power of the ultraviolet LED lamps can be individually adjusted between 2% and 100%. A timer for irradiation times between 0.01 s and 9999 s is already integrated. Continuous operation or externally triggered operation are also available as options.

The LEDControl S works either as master or slave and is cascable.

Remote control can be done via RS485, USB or RS232 for each channel and enables the use in industrial production. Other digital and analog inputs are also available as an option. Additional digital and analog PLC inputs are also available as an option.

The very high irradiances of up to 39,000 mW/cm<sup>2</sup> distinguish the UV-LED spots and allow extremely short process times. For this purpose, the UV-LED is focused at the desired working distance.

With the UV-LED series L we offer air-cooled high-power LED modules for the LedControl. The SFL series is water-cooled and available with even higher power.

### APPLICATIONS

- Industrial UV curing and bonding
- IC Encapsulation
- UV sealing
- Hairline / leak detection using fluorescence markers
- Fluorescence Spectroscopy
- Surface Inspection

## TECHNICAL DATA LEDCONTROL S

<b>Number of UVLED-Spots</b>	1 spot (LedControl S)
	5 spot (LedControl 5S)
	16 spot (LedControl 16S)
<b>Functions</b>	2 to 100%, each spot separate timer, continuous operation
	Master /slave mode
<b>Display</b>	graphical, 128 x 64 px
<b>Connections</b>	Interlock
<b>Interface option</b>	dimming in (0-10V), common
	Trigger (IN/OUT), common
<b>Terminals, Interface option</b>	Galvanically isolated
<b>Signals, Interface option</b>	24 V, 5 mA max
<b>Programming, optional</b>	RS485, RS232 or USB
<b>Dimensions</b>	185 x 251 x 100 mm (S)
	305 x 358 x 145 mm (S,5-16S)
<b>Operating temperature</b>	5 to 40 °C
<b>Storage temperature</b>	-10 to 60 °C
<b>Humidity</b>	< 80%, non-condensing
<b>Internal security circuit</b>	Over-temperature, LED N.C.
<b>Power (el.)</b>	100 W - 2000 W
<b>Mains</b>	100 - 240 V, 50/60 Hz

## UV-LED-LAMPS SERIES L AND SFL



## UV-LED-LAMPS SPOT P



The LEDControl can be controlled via the rear programming interface (USB, RS485 or RS232). Communication takes place as ASCII communication, which is illustrated below using the example of „Switching on“:

- control transmits: LOnOff: 1!
- LedControl answers: LOnOff: 1 (CRC-16)

Each channel can be individually controlled. The LedControl sends only when requested by the controller.

Via the other interface option LED powers can be set together for all channels (0-10V), LEDs on / off (trigger IN 24V) and the status (trigger OUT 24V) can be set and queried. This option is suitable for simple system integration with common signals.

### Example commands:

- LAnzahlICH? Request number of channels
- LAnzahlICH? Request connected channels
- LSelect: 0 1 !? Set active channels
- LPowerSet: 000.0 033.7!/? Set power
- LTriggerOnOff: 11!/? Set trigger input active
- LFirmware? Request firmware version



programming software

## LEDCONTROL S WITH SAFETY OPTION PL-READY

In order to design machines safely and to meet the requirements of the Machinery Directive 2006/42/EC, safety functions are required in the control systems. Typically, the required Performance Level PLr is determined for each safety function. This is where the first difficulty begins during the planning and commissioning of UV systems, namely determining the severity of the injury, the frequency and duration of exposure, and how to avoid the uv hazard.

In the short term, UV exposure of the skin leads to erythema, elastosis and/or skin cancer. In contrast, UV exposure of the eye can lead to photokeratitis, conjunctivitis and cataractogenesis. If e.g. skin cancer is considered, it is a severe, usually irreversible injury.

In this context, Directive 2006/25/EC „Artificial Optical Radiation“ allows regular exposure up to a daily exposure limit of 30 J/m<sup>2</sup>. It is therefore possible to minimize the severity of the injury by the duration and intensity of exposure without having to comply with an absolute zero exposure. If the exposure limit is maintained, it is expected that healthy adult individuals can be exposed repeatedly without acute adverse effects. For example, short-term exposure may result in reversible injury such as mild erythema, i.e., sunburn, in the event of an error.

However, the delimitation is not certain and measures / safety functions are necessary in any case. For this purpose, e.g. measurements on existing installations are possible and useful.

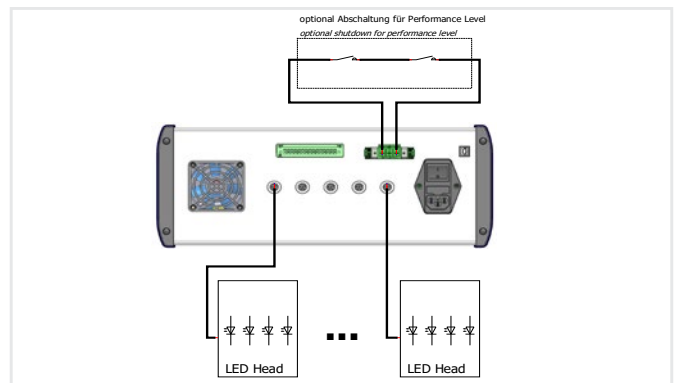
During the planning phase, however, measurements are not possible, or can only be estimated with additional effort. Therefore, a higher, required Performance Level PLr is often demanded.

The PLready safety option works with a safety extra-low voltage (SELV) of 48 VDC, which is safely isolated by an external circuit and can switch off the LED modules completely in the event of a fault.

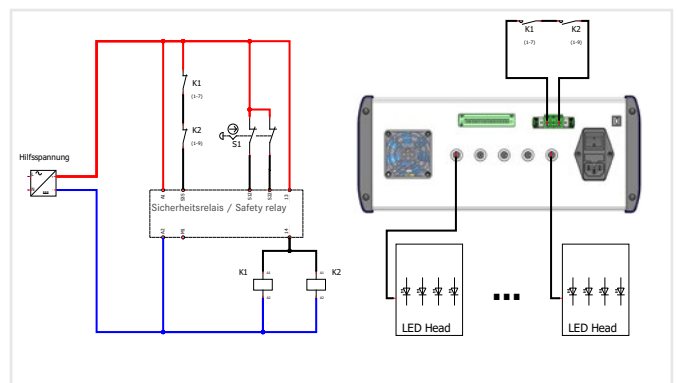
If the specification of a performance level is desired, this can be realized by the extension PL+. PL+ is suitable up to PL category 4, according to EN ISO 13849-1 and SIL 3 according to EN 62061, if cross-circuits in the control to the LED module as well as in the sensor circuit can be excluded.

A two-channel safety door monitoring with automatic start is shown as an example.

The advantage over the simple isolation of the DC voltages is the monitoring of the external contactors. The connection example is suitable up to category 4, PL e (EN ISO 13849-1) or SIL 3 (EN 62061), if cross-connections in the control to the actuator as well as in the sensor circuit can be excluded.



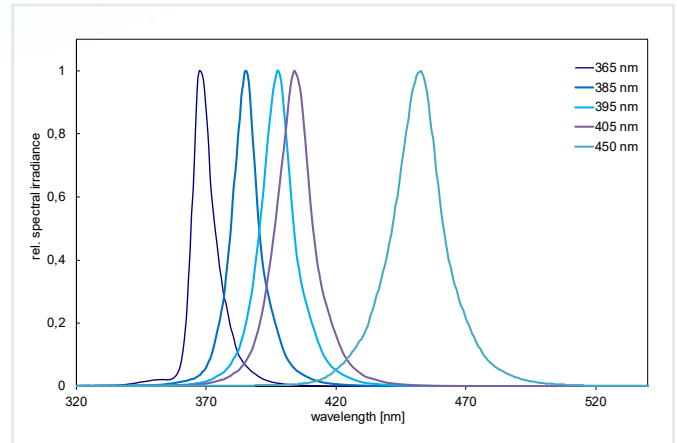
Connection example



Connection example for PL KAT 4

## LED-LAMP COMMON TECHNICAL DATA

<b>Wavelength</b>	365, 385, 395, 405 o. 450nm
<b>Emission, peak tolerance</b>	+/- 5 nm
<b>Emission, FWHM</b>	10 - 20 nm
<b>Lifetime</b>	20.000 h, typical
<b>Classification</b>	risk group 3 according DIN EN 62471:2009-03
<b>Operating temperature</b>	5 to 40 °C
<b>Storage temperature</b>	-10 to 60 °C
<b>Humidity</b>	< 80%, non-condensing



Typical UV-LED-lamp spectra

## PART NUMBERS

<b>LEDCONTROL S</b>	8606 10B1
<b>LEDCONTROL 5S</b>	8606 10B5
<b>LEDCONTROL 16S</b>	8606 10B16
<b>UV-LED Series L xxx nm</b>	see sep. data sheet
<b>UV-LED Series SFL xxx nm</b>	see sep. data sheet
<b>UV-LED Spot P xxx nm</b>	see sep. data sheet

<b>Programming interface RS485</b>	860609-RS485 *
<b>Programming interface RS232</b>	860609-RS232 *
<b>Programming interface USB</b>	860609-USB *
<b>Safety option PLready PLready</b>	860609PL
<b>Test and control software</b>	860609-SW
<b>SPS-Schnittstellenoption (I/O)</b>	860609-CP

\* Includes Interface option (I/O)

## SCOPE OF DELIVERY

LedControl S, mains cable, manual. Remote sample software for immediate testing if supplied with pro-

gramming interface. Please specify LED type, wavelength, optics if applicable and options.

## SAFETY

The equipment contains LEDs that emit UV-A radiation and blue light. UV radiation is invisible. The light you 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 aging of the skin. Please use proper clothing, gloves, and/or other personal safety equipment depending on exposure. Avoid irradi-

ating skin or eyes directly! UV irradiance in the spot is several hundred times higher than that of sunlight!

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

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