UV Monitoring appliance

UV_Controller_1

Description

The UV_Controller_1 module was specifically developed to monitor the power output of ultraviolet emitting luminescent lamps.

It features a high precision photodiode input amplifier, two customer adjustable switching points as well as a relay output.

This module can be easily mounted to panels requiring just a rectangular mounting hole according to DIN 43700.

For simplified mounting and replacing we use a pluggable screw terminal system.

Fig. 1: Front panel view

Features

- supply voltage range 12 V … 18.0 V DC with surge and polarity protection
- low power consumption (< 0.5 W @ 24 V DC)
- measurement range (photocurrent) 0 … 500 nano ampere
- 3 LED display for actual intensity and state indication
- integrated warm up delay to overcome starting problems
- indication of wrong set points and over current
- switching levels (adjustable) 0 … 100 %
- relay output 250 V AC / 2 A free floating

Important Notes

Please consider any possible action to protect the sensitive photodiode input against electrostatic discharge (ESD). Not to do so may damage the appliance and voids warranty.

Please also check that there is no ground loop on the photodiode input connection as this may give wrong measurements.

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Operation

Each LED has two states: steady state and blinking. These six states of operation where listed in the following table and described in more detail afterwards.

Led	***Steady***	***Blinking***
Red	Light power to low [< 50 %]* (not exceeded lower set point)	Warm up delay is running [5 seconds]**
Yellow	Light power between low and high set point [≥ 50 % and < 70 %]*	Low set point exceeded high set point (high set point must be above low set point)
Green	Light power above high set point [> 70 %]*	Light power overflow (exceeds measurement range)

**these values where preset by the manufacturer*
***please check if this delay suits your application; please inform us if you need other delays*

Start up / Power on

Immediately after power up of the module the warm up delay countdown starts. This is indicated by the blinking red LED. After 5 seconds the photocurrent from the monitoring photodiode must exceed at least the low set point otherwise the relay is switched on to indicate the low UV power state.
If the light power exceeds the low set point in time, the yellow or green LED is switched on and the relay resides off.

Normal operation

In normal operation the photodiode input is continually sampled, filtered and compared with the set points. The fixed hysteresis of 2.3 % ensures save switching under almost all operating conditions.

Error Conditions

There are three typical error conditions.

- Steady Red: this indicates that the light power is to low. This can happen if the lamp is too old, defect or doesn't warm up quick enough.
- Blinking Yellow: this indicates that the set points where to close together or the high set point is smaller than the low set point
- Blinking Green: the lamp gives so much power that the input amplifier is overdriven. Please mount the photodiode less close to the lamp.

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Electrical connection

All screw terminals are placed on the backside of the module; please see figure 2. The low and high set point potentiometers are just between the sensor input and the relay output connector. These can be adjusted with a small screw driver between zero (left end) and 100 % (right end).

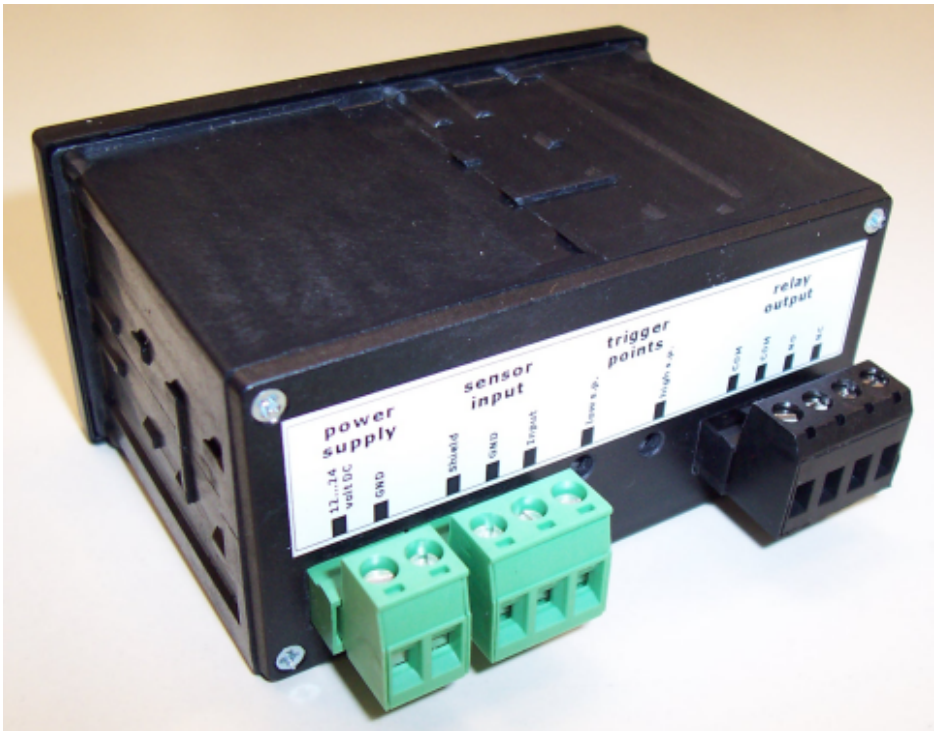

Fig. 2: Backside view, electrical connections

The following table should clarify how to connect everything right, listing order is left to right according to figure 2.

Terminal group	***Name***	***Description***
power supply	12 … 24 Volt DC GND	Power supply positive pole Power supply ground
sensor input	shield GND input	sensor and cable shield photodiode ground (positive input) photodiode signal (negative input)
trigger points	low s.p. high s.p.	low set point high set point
relay output	COM COM NO NC	common contact common contact normal open (closes on low lamp power condition) normal closed (opens at low lamp power condition)

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Physical Dimensions

Parameter	*Unit*	*Value*
Panel width x height	mm	96 x 48
Module depth	mm	63
Mounting hole width x height	mm	92 x 45

Absolute Maximum Ratings

Exceeding these limits may decrease lifetime or destroy the module or parts of it immediately.

Parameter	*Unit*	*Value*
Operation Temperature range *	°C	0 … +70
Storage Temperature range *	°C	-25 … +85
Supply voltage (DC)	V	+30
Relay contact voltage	V (AC)	250
Relay switched current	A (AC)	2

**in non condensing environment only*

Electrical Characteristics

(at 25 °C unless otherwise noted)

Parameter	*Unit*	*min*	*Value typ*	*max*
Supply voltage	V	11	24	30
Power dissipation *(at 24 V supply voltage, depends on relay & LED state)*	W	0.1	0.4	0.5

Analogue signal

Parameter	*Unit*	*min*	*Value typ*	*max*
Photocurrent range*	nA		0 … 500	
Low / High set point in percent of max. photocurrent	%		0 … 100	
Hysteresis on both set points	%	2.3	2.43	2.5

**the corresponding optical power and optical power density strongly depends on the specific spectra of your UV lamp and therefore has to be calculated for each particular application*

All technical data in this datasheet are preliminary and may be subject to change at any time without notice. Please visit our website to gather the latest version of this file. Although we reviewed these data very carefully there may be errors. Without written approval you must not use this appliance in applications where men or animals may be injured in case of failure or malfunction of this device.

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