

## **Product specification for the electronic drive unit Ocean R1 500mW**

### **General description**

LightLab's drive unit Ocean R1 (ordering code: 15006) is a 6-channel, customized, cost optimized drive unit specifically developed and intended to drive UV chip light sources based on LightLab's EEE Light® technology.

Since the UV chips using the EEE Light® technology will deliver a UV output power directly proportional to the electrical input power, the drive unit is designed to deliver and maintain a constant power (i.e. not constant voltage or constant current). This is done independently for each channel to allow for minor differences between chips, thus allowing for precise UV dose control.

### **Functional description**

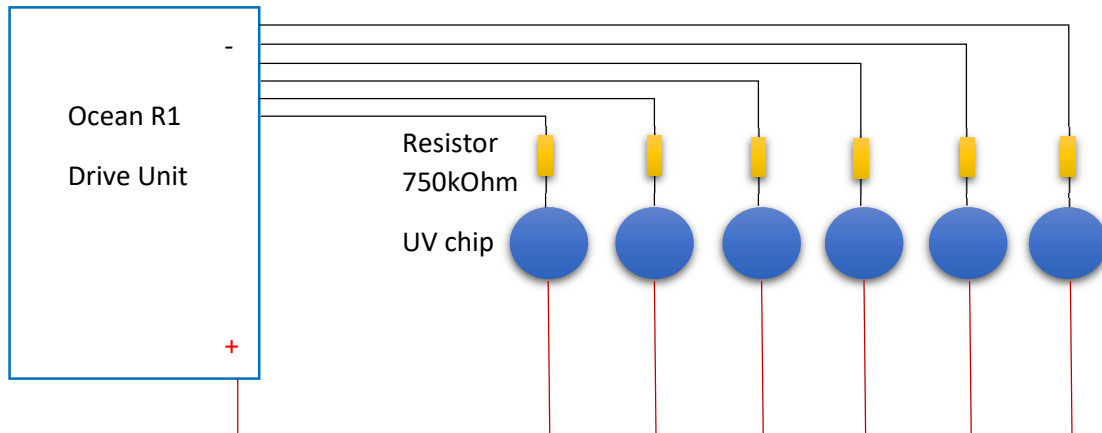
The drive unit is powered by mains (240V, 50Hz) and delivers 500mW per output channel (each serving as input to the LightLab EEE® UV chips). The mains connection is implemented using a 3-pole PCB mounted contact.

The drive unit delivers constant power, independently for each UV chip. The power outputs are kept constant within  $\pm 10\%$  independent of time, operating point and specific UV chip. The power output channels use a common positive HV connection and a separate negative connection for each UV chip.

The drive unit is designed and optimized for a minimum 10 000 hours guaranteed operational lifetime, is RoHS compliant and designed to comply CE regulations, specifically with EMC & EMI regulations. The drive unit is designed to be switched on/off at least 30 000 times (mains).

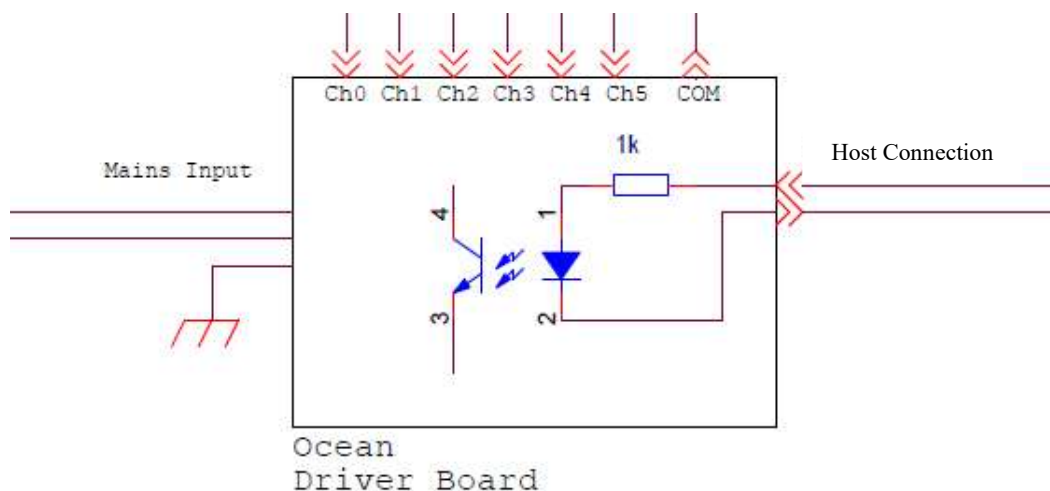
Failsafe mechanisms are implemented. A short circuit detection for each channel is implemented as well as a failsafe for overvoltage. If an operating point over 8.5kV is reached, the drive unit Ocean R1 will no longer increase the voltage but will not shut down. Should the operating point for some reason reach 9kV, a shutdown is initiated.

The drive unit is designed to support up to 3m cable connection between the UV chips and the drive unit. In order to minimize disturbance on the precise power control feedback loop, a series resistor of 750kOhm is recommended on for each channel, implemented on the UV chip side.



### Communications interface

To support control from a system host, electrical signaling is implemented. The interface is galvanically separating host and drive unit using an optocoupler. The interface is 3-wire, (a pullup resistor required on host side). The signal level is 5V and it enables the host to turn the drive unit on/off without necessarily braking mains connection. It also will allow rudimentary failure messaging from the drive unit.



## Software configurations

The drive unit may be preset by software (firmware) parameters. The possible configurations are (Note: this is done by LightLab):

- On time, default 1min
- Off time, default 1min
- Operating time, default 2hours

## Specification

Below is described what the drive unit must deliver. Margins for component variations are not included.

	Min	Nom	Max		Comments
<b>Power input</b>					
Input Voltage	196	230	265	VAC	50Hz
<b>High Voltage Outputs</b>					
Number of channels		6			One common HV connection
Power Output	450	500	550	mW	Per chip
DC Output Voltage	6.0		8.5	kV	An overvoltage at 9.0kV is implemented (power down)
Absolute maximum voltage			9.0	kV	Over UV chip
<b>Power efficiency @ 7kV, 0.5W</b>	70			%	
<b>Startup time</b>			2	s	To 90% of full power
<b>Physical dimensions</b>	83 x 55 x 22			mm	(L x W x H) active area. Connectors are in addition
<b>Temperature, ambient, storage</b>	-20		60	C	
<b>Temperature, ambient, operational</b>	5		60	C	
<b>Humidity (RH)</b>			85	%	Storage, operational