

Manual LD-PS/5 and LED pulsing system (LPS) without integrated synchronizer

General remarks

The LD-PS/20 & LD-PS/40 (without synchronizer) is a laser diode array emitting light at 450 nm. It can be toggled by an external synchronizer with up to 200 kHz.

Hardware setup



Figure 1: The LPS (using a LED array) and the LD-PS/5 (using a laser diode).

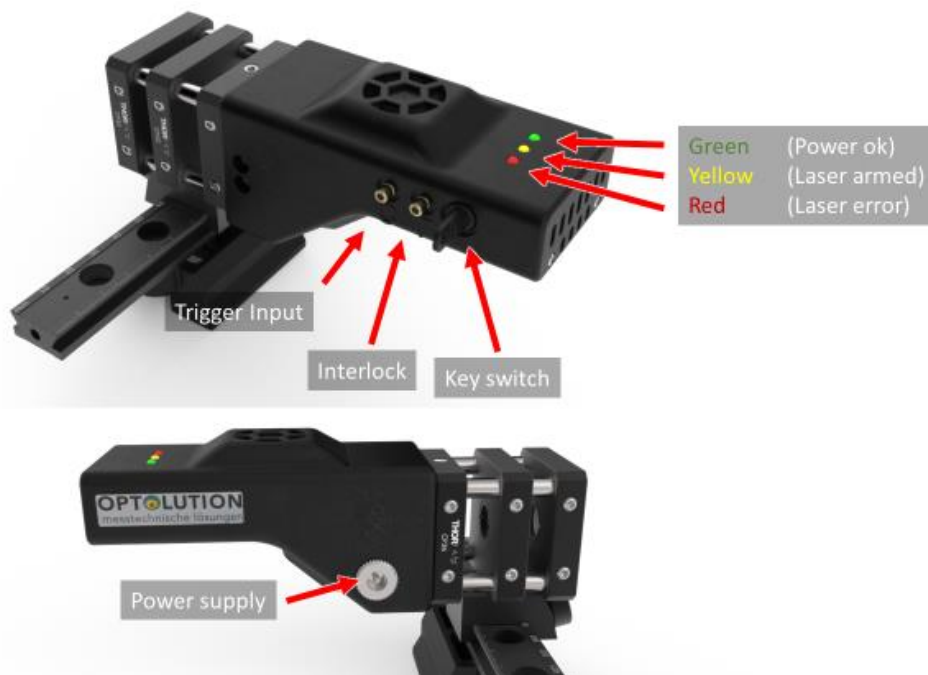


Figure 2: The available connections on the device.

- Insert the 7.5 VDC power plug. The green LED and the integrated fans will turn on.
- Connect the trigger input (“C”) to a suitable synchronizer (0 V = laser off, 3-5 V = laser on).
- Connect the interlock cable to a suitable mechanical switch (normally open, e.g. door switch). **WARNING: When the two wires from the interlock cable are connected, then the laser is ready to emit light. ALWAYS wear safety glasses! ALWAYS make sure that the laser light hits a suitable beam dump (e.g. a thick matte black metallic object).**
- Turn the key switch clockwise (to position “II”) to arm the laser.
- If the interlock is closed and the key switch is in position “II” (clockwise), then the yellow LED will turn on, indicating that the laser is controlled by the external trigger signal.

Interlock

The cables of the interlock should be connected to a proper door switch (normally open). When someone opens the door (switch opens), the laser will turn off immediately.

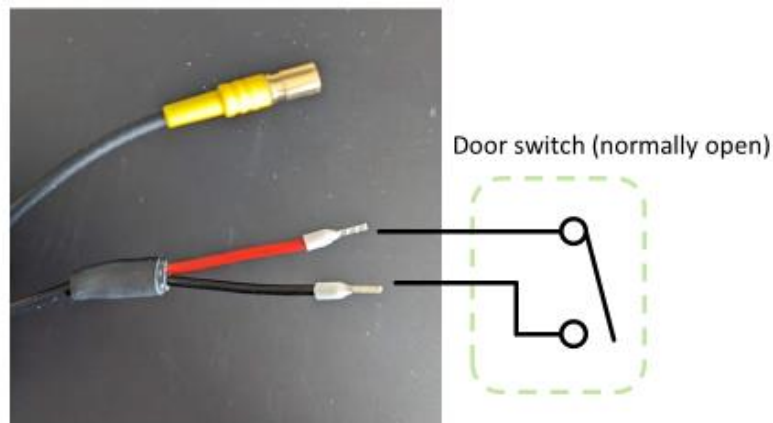


Figure 3: The interlock connection

LEDs

There are three LEDs on the top of the device, indicating the following:

- Green LED: Power OK
- Red LED: Laser driver error
- Yellow LED: Laser armed, ready to listen to trigger signals

Optics



Figure 4: Light sheet optics.

The light sheet optics consists of several elements: **The cylindrical lens must not be rotated.** If you need to rotate the light sheet, then rotate the whole laser, not the cylindrical lens. To adjust the sheet thickness and focus distance, move the central lens element. Keep the optics free from dust, otherwise the lenses might be damaged. Installing a bandpass filter (450 nm \pm 40 nm) in the camera is highly recommended, as the exposure of the camera is longer than the laser pulses.

External TTL control (synchronizer input)

- The laser is designed to accept a TTL signal from a synchronizer. The synchronizer input is connected through a voltage divider to the enable pins of the laser driver IC.
- **A voltage between 3.0 V (minimum) and 5.0 V (maximum)** applied to the synchronizer input **will enable light emission.**
- **A voltage between 0.0 V (minimum) and 1.0 V (maximum)** applied to the synchronizer input **will disable light emission.**
- The maximum toggle frequency is 200 kHz
- Do not supply voltages below 0 V or above 5 V to the synchronizer input!
- The lasers thermal setup is designed to operate at a maximum duty cycle of 50%. The maximum pulse length is 10 ms. It is the user's responsibility to follow these limitations. Operating the laser at higher duty cycles will reduce the life time of the laser diode.
- The laser drivers toggle the anode of the laser diode. The cathode of the laser diode is connected through a relay to GND. The relay is only closed when the two wires of the interlock cable are connected and the key switch is turned to position "II".