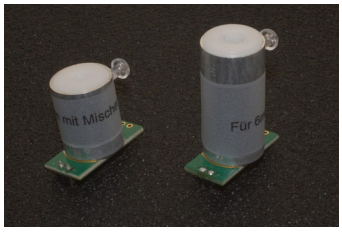
LED module for thick fiber illumination

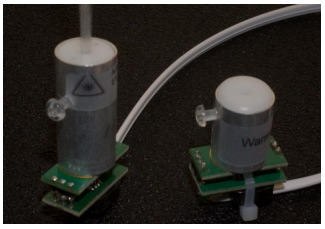
Description:

This power LED module is developed as an LED light source for the illumination of so called “thick fibers”, i.e. optical fibers comprising a diameter of 2 to 6mm.

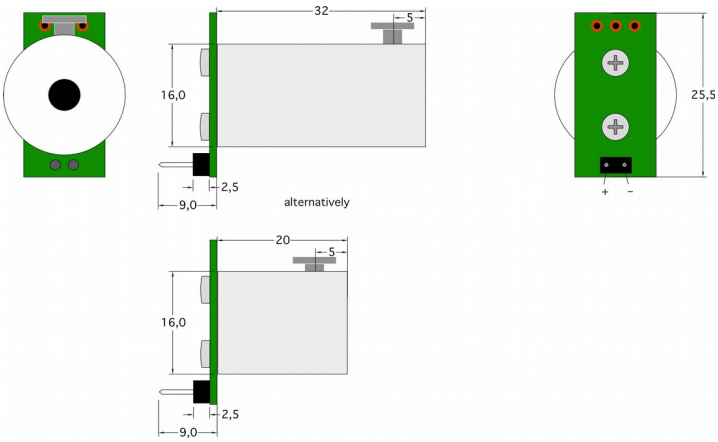
- the housing consists of a 16mm diameter aluminium cylinder with a length of 20mm or 32mm. The 32mm housing should be chosen, if the LED shall operate with high currents of >350mA.
- an internal optical coupling mechanism suitable for fiber bundles and thick core fibers as well,
- a plastic screw to fix the fiber,
- a ferrule diameter between 3mm and 6mm for fibers with various diameters, or *alternatively, precrimped fiber alignment ferrules,*
- an LED driver electronics that is fixed to the LED modules, if low voltage operation and the brightness dimming is required.



20mm and 32mm housing LED module (no driver electronics)



20mm and 32mm housing LED module with driver electronics



Technical drawing LED module

The fiber alignment ferrule has a diameter between 3mm and 6mm, as an alternative precrimped fiber alignment ferrules with a variable diameter can be used.

The aluminium housing serves as heat sink. It distributes thermal energy generated by the LED.

Electric connection:

Module without driver electronics:

The module comprises a 2 pole male connector that contacts directly LED anode and cathode. Depending on the integrated LED a forward voltage between 2V and 3,5V occurs at a typical LED DC currents of 350mA.

Especially in combination with the 32mm aluminium housing LED DC currents of 500mA, 700mA and even 1A are feasible.

Please notice: **In any case a LED module may not be driven with constant voltage, but needs a constant DC current driver.**

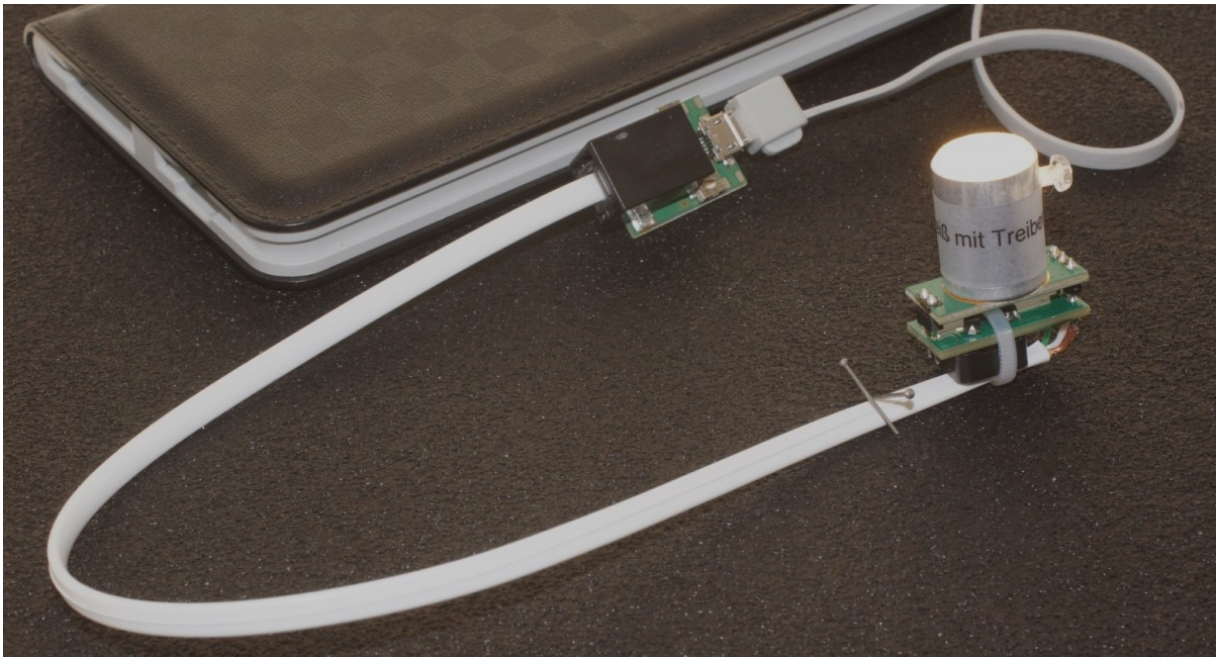
Module including driver electronics:
Each module comprises a 3 electric wire connection.

The 3 electric wires are connected as follows:

- wire 1 (colour black or white): ground,
- wire 2 (colour red or brown): positive supply voltage
- wire 3 (colour green): multi purpose control pin LED [see dimming options below]

If the module is used without dimming, wire 1 and wire 2 are connected to an arbitrary power supply with 5V to 12V voltage. From this the driver electronics generates a 350mA constant current with an efficiency of about 80%. Please ask for modules operating with LED currents of 500mA and higher.

For dimming the LED brightness it is feasible to connect the 3 electric wires via a 4P4C connector (RJ-10) with a central switching board that is power supplied via an USB micro connector to a 5V supply (powerbank, USB plug-in power supply). The switchboard comprises a variable resistor that allows dimming.



LED module including driver electronics connected with switchboard and power supply

Attention!	**Voltage on wire 3 MUST NOT exceed 6V! A higher voltage will disturb the internal regulation and might destroy the module!**
Attention!	**To ensure safety (e.g. against short circuits on the wire) we recommend using a fuse or polyfuse directly after the battery, e.g. on the switchboard!**

Dimming options:

Option	**Remarks**
No dimming	Leave control pins open
Resistive dimming	A variable resistor of 0 .. 200 kΩ to GND can be used to control the brightness from 0 to 100%
PWM dimming	Connect 3.3 or 5V PWM signal on input Attention! Voltage on pin MUST NOT exceed 6V!
Voltage dimming (not recommended)	Connect voltage to control brightness: 0 .. 0.3V: LED off 0.3 .. 2.5V: brightness from 0 to 100% 2.5 .. 5V: LED on Attention! Voltage on pin MUST NOT exceed 6V!

Electric parameters:

		typ.	max.
Power supply voltage [V]:	4,7	5	12
Max. LED current [mA]:		350	
DC DC efficiency [%]:		80	
Control pin input voltage [V] (absolute maximum)	0		6

Colours/optical wavelengths:

The LED module is available with a number of opticals wavelengths or colours.

Commonly used colours for illumination applications are:

- red (640nm),
- green (520nm),
- blue (460nm),
- white, and
- warm white.

For technical applications UV (365nm) and IR (730nm) are available. Please ask, if you have special requirements.

Attention:

PowerLED generate light with an optical intensity that can be harmful to the human eye.

Therefore, never look into the opening of the LED module during operation!