

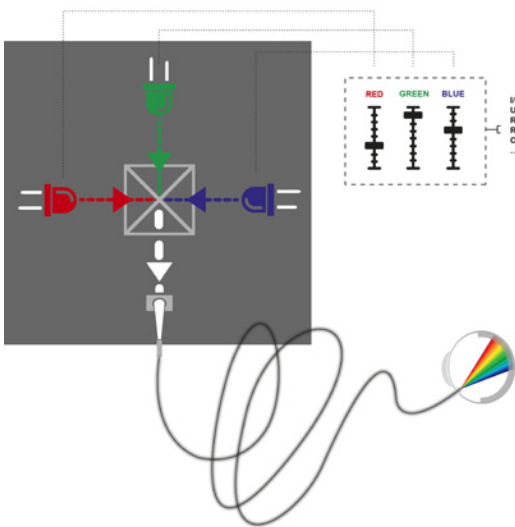
**OEM RGB and White LED Illumination Modules.**  
**High Output Illumination for Medical Applications.**





# Medical LED Modules: RGB and White Light Illumination.

For surgical applications in ophthalmology the use of fibers that are on the order of 700  $\mu\text{m}$  or less is typical. This allows the least invasive solution for the patient and is therefore highly desirable. The use of these small diameters with any illumination source is challenging due to the difficulty of coupling the light into the fibers.

Berliner Glas has developed an OEM high output illumination module that is capable of efficiently coupling LED light sources into even the smallest light guides or fibers.

LEDs have significant advantages over Xenon sources including longer life, energy efficiency, and in the case of the Berliner Glas modules, the ability to tune the color temperature of the light for better diagnostic information.



-  **High light output:** 40 lumens at the end of a thin light guide of 20 gauges realized with RGB LED
-  **Compact design:** enables easy integration in customer application or customer system
-  **Flexible color values:** Tunable light colors
-  **System independent:** Light source can be adapted to light guides from different manufacturers

## Applications

- Endo-illumination
- Medical endoscopy
- Microscopy
- Boroscopy

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## Optical Specifications

|                       |  |
|-----------------------|--|
| Lamp                  | optional RGB or white  |
| Luminous flux         | 40 lumen measured at the end of an 1 m optical fiber with a diameter of 20 gauge and a NA of 0.5 |
| Color temperature     | white: approx. 6,500 K   |
| Color rendering index | white: Ra >75 (typically)  |
| Coupling optics       | according to customer request  |

## Electrical Specifications

|                             |  |
|-----------------------------|--|
| Reverse polarity protection | yes  |
| Overheat protection         | yes  |
| Current monitoring          | yes  |
| Adjustment luminous flux    | feed forward control, customized closed-loop control is possible |
| Electronical shutter        | optional turn off of the LED in case of missing light fiber      |
| Fan control                 | optional   |
| Remote control              | USB 2.0 and 3.0 interface  |

## Mechanical Specifications

|                        |                                   |
|------------------------|-----------------------------------|
| Dimensions (l x w x h) | 48 x 50 x 120 mm                  |
| Weight                 | from approx. 200 g                |
| Optical fiber pin      | according to customer request     |
| Cooling                | optional active or passiv cooling |

## Environmental Conditions

|                       |                        |
|-----------------------|------------------------|
| Operating temperature | 0–40 °C                |
| Operational altitude  | max. 2,000 m           |
| Storage temperature   | -20–60 °C              |
| Relative humidity     | 30–90 %, noncondensing |

## Features on Request

- Customized coupling unit for other fiber diameters
- Additional coupling of other colors to adjust the color temperature
- Microprocessor controlled displays with value for:
  1. LED temperature (with optional cut-off switch in case of overheating)
  2. Hour meter
  3. Log book (protocol)
 Additional customer-specific displays implementable

