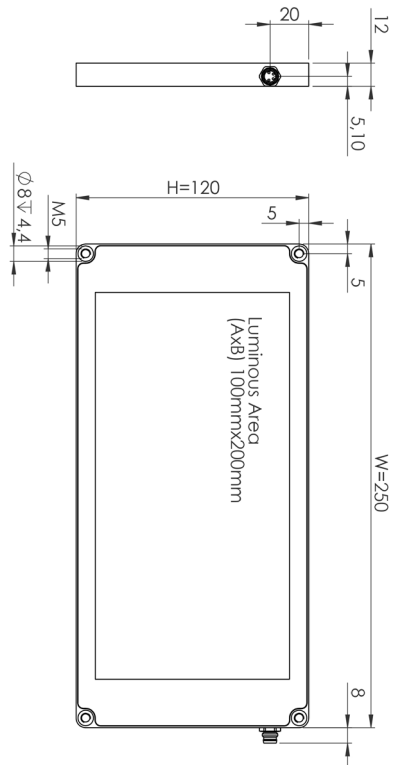


## Mechanical Integration

The light is equipped with 4 combined mounting positions of M5 threaded holes and M4 through holes. It can be used to fix the lighting to the specified position. To secure a long live time additional heat transfer measurements at the holding positions are highly recommended.

### Example: Model DBL-1020

More 2D and 3D drawings can be found online:  
[www.mbj-imaging.com/](http://www.mbj-imaging.com/)



Specification	Backlight Series
Operating temperature	10°C to 30°C
Certifications	CE, RoHS
Degree of protection	IP54
Humidity	30% to 70%

## Safety Notes

Before working with this unit, read the warning and application instructions carefully and completely before operating the device.



1. The device is designed for indoor use only.
2. **Light** – Due to the risk of flash burn of the eyes it is not recommended to look directly into the light source. The lighting must be switched off before installation and/or maintenance. The device must not be used when a failure may cause a personal injury.
3. **Heat** - In case of insufficient heat dissipation or when running the light in flash mode with a too high duty cycle, the surface temperature may exceed 60 °C. Keep off flammable materials at any time.
4. **Electricity** - The housing is electrically isolated from the ground of the power supply. Exceeding the permissible input voltage  $U_{in}$  or  $U_{LED(+)}$  can lead to the destruction of the device or to a significant shortening of the lifetime of the LEDs in the device.
5. **Usage** – Please prevent mechanical stress to the light surface during operation. This will lead to an inhomogenous light emission.
6. **Cleaning** - The light emission surface has to be cleaned with a standard glass cleaner and a soft cleaning cloth. Do not use other material for cleaning as it will damage the device.

03196.02 Manual MBJ Backlight DBL-Series, August 2022

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## Operating Manual Technical Data

# Backlight Series



### Model Sizes in Series

The light is available in the following sizes <sup>1)</sup>

DBL-0510	DBL-1010	DBL-1020
DBL-2020	DBL-2030	

1) Size definition: DBL-0510 refers to a luminous area of 50 mm x 100 mm.

### Possible LED Colors

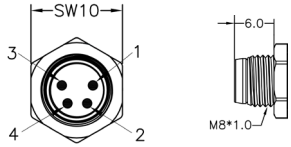
LED	Abbr. <sup>1)</sup>	Peak Wavelength <sup>2)</sup>
White	-WT	5000 K, CRI80
Red	-RD	near 625 nm
Infrared	-IR	near 850 nm
Green	-GN	near 525 nm
Blue	-BE	near 465 nm
Yellow	-YE	near 580 nm

1) Color option will be added to the model name after the size information. DBL-1010-IR refers to a backlight with 850 nm infrared light.

2) This is an approximated value. The exact value also depends on LED temperature and LED current.

## Electrical Connection

The lighting is equipped with an 4 pin M8x1 connector.



Pin	Color <sup>1)</sup>	Standard (-s)	Direct (-x) <sup>2)</sup>
1	brown	24 VDC	LED (+)
2	white	Dim	LED (+)
3	blue	Trigger	LED (-)
4	black	Ground	LED (-)

1) wire color of MBJ lighting cable

2) connection to 24VDC without external LED controller may destroy the unit

## Additional Information:

Pin3 (Trigger) is an 'active high' input signal with 5...24V=ON and 0...1V=OFF, it is a high resistance current sink with 0.2 mA for 5V and 5 mA for 24V

Pin2 (DIM) is used as brightness control and operation mode switch, it is a high resistance current sink with 0.2 mA for 5V and 1 mA for 24V.

For the connection it is recommended to use the MBJ lighting cable with a maximum length of 10m.

## Integrated Controller (-s)

Supported operation modes with the integrated LED controller

Pin 2 (Dim)	Operation mode
24V	steady light <sup>1)</sup>
1...10V	steady light with brightness control <sup>2)</sup>
24V	triggered light
GND	triggered flash light with max. 20 ms and up-to 100% more light intensity <sup>3)</sup>

1) Pin 3 (Trigger) needs permanent 24V to activate steady light mode.

2) PWM with 3.8 kHz clock is used, recommended minimal camera exposure is 5 ms.

3) Latency between trigger and LED light ON is about 20...30  $\mu$ s, the maximum recommended clock speed is 1 kHz, the maximum recommended duty cycle is 25% and the minimum recommended flash time is 100  $\mu$ s.

Specification	DBL-0510	DBL-1010	DBL-1020	DBL-2020	DBL-2030
<b>Optical parameter</b>					
Luminous area (A x B)	50 mm x 100 mm	100 mm x 100 mm	100 mm x 200 mm	200 mm x 200 mm	200 mm x 300 mm
Light emission	rectangular light field with side fired LED, diffuse emission and homogeneity >90%				
Recommended use	commonly used as backlight, placed closely behind the object, e.g. for contour measurement				
Recommended light working distance	1 mm - 100 mm				
Luminous Flux of white LEDs <sup>1)</sup>	27 lm				
Radiant Power of red LEDs <sup>1)</sup>	39 mW				
Radiant Power of IR LEDs <sup>1)</sup>	80 mW				
<b>Electrical parameter</b>					
Available interfaces	-s with integrated LED Controller and 4 operation modes; -x with direct LED access (external LED control is required)				
U <sub>in</sub> for -s Version	24 VDC +/- 5%				
U <sub>LED(+)</sub> range for -x version <sup>2)</sup>	WT / BE / YE: 17 ... 20 VDC; GN: 20 ... 23 VDC; RD: 12 ... 15 VDC; IR: 9 ... 12 VDC				
<b>Typical Power (-s version)</b>					
Steady light operation (white / red / IR) <sup>3)</sup>	6 W / 3 W / 2 W	11 W / 9 W / 6 W	17 W / 13 W / 9 W	23 W / 17 W / 12 W	29 W / 20 W / 15 W
During ON time at flashed light operation <sup>4)</sup>	15 W	30 W	44 W	44 W	56 W
<b>Recommended LED current (-x version)</b>					
Steady light (100% duty cycle)	300 mA (450 mA for IR)	600 mA (900 mA for IR)	900 mA (1200 mA for IR)	1200 mA (1500 mA for IR)	1500 mA (1800 mA for IR)
Flash light (50% duty cycle, < 500 ms pulse)	600 mA (450 mA for IR)	1200 mA (900 mA for IR)	1800 mA (1200 mA for IR)	2400 mA (1500 mA for IR)	3000 mA (1800 mA for IR)
Flash light (25% duty cycle, < 50 ms pulse)	900 mA (450 mA for IR)	1800 mA (900 mA for IR)	2700 mA (1200 mA for IR)	3600 mA (1500 mA for IR)	4500 mA (1800 mA for IR)
Flash light (10% duty cycle, < 5 ms pulse)	1200 mA (900 mA for IR)	2400 mA (1800 mA for IR)	3600 mA (2400 mA for IR)	4800 mA (3000 mA for IR)	6000 mA (3600 mA for IR)
<b>General parameter</b>					
Dimension (H x W x D)	100 mm x 120 mm x 12 mm	120 mm x 150 mm x 12 mm	120 mm x 250 mm x 12 mm	220 mm x 250 mm x 12 mm	220 mm x 350 mm x 12 mm
Weight	250 g	380 g	600 g	1100 g	1600 g
Material	Anodized aluminum housing with PMMA light cover				
Connector	M8x1 socket, 4 pin, male (for pinning details refer to chart "Electrical Connection")				
Accessories	For cable, mounts and LED controller please check <a href="http://www.mbj-imaging.com">www.mbj-imaging.com</a>				

1) Values are approximate with a +/- 7% tolerance.

2) Lower voltage value refers to steady light, higher voltage value refers to flash light, please see max. allowed current in the rows below.

3) Power for Blue / Yellow is comparable to White, Power for Green is approx. 1.2 times higher.

4) Triggered flash light with max. 20 ms and up to 100% more light intensity, calculated for White.

## Application Samples for (-s) controller

