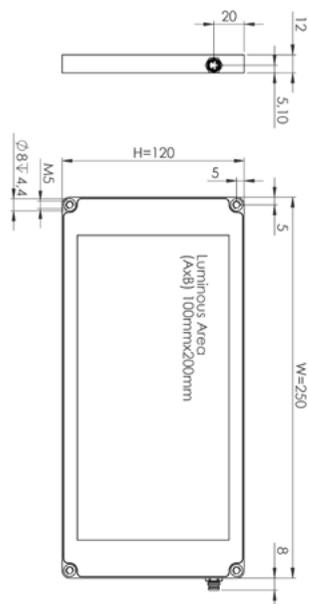


Mechanical Integration

The light is equipped with M5 threaded holes (M4 through holes) for various mounting positions. To secure a long lifetime, 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/



Specification	Backlight Series
Operating temperature	10°C to 45°C ¹⁾
Certifications	CE, RoHS
Degree of protection	IP54/IP67 ²⁾
Humidity	30% to 70%

1) Maximum of 30°C is recommended for steady light operation w/o additional heat transfer measurements. For max. 45°C a good thermal connection is mandatory. Max. of 45°C is also permissible for flash light operation with a max. 10% duty cycle.

2) MBJ LED lights are protected against the ingress of solids and water in accordance with the selected protection class and applicable standards. Permanent protection against liquids containing solvents, such as cleaning agents, machine emulsions or other lubricants, cannot be guaranteed. IP classification is only valid with a connected cable (MBJ cable recommended).

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 inhomogeneous 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.
7. **Installation** – The service life of the LED can be maximized by avoiding heat build-up. To achieve this, the lighting should be installed with a good thermal connection. Please screw the cables hand-tight, do not overtighten.

03196.03 Manual MBJ Backlight DBL-Series, May 2024

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Operating Manual
Technical Data

Backlight Series



Model Sizes in Series

The light is available in the following sizes ¹⁾		
DBL-0510	DBL-1010	DBL-1020
DBL-2020	DBL-2030	DBL-3030

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

Possible LED Colors

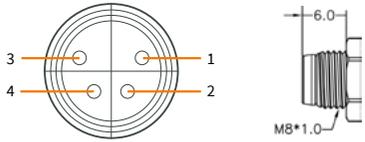
LED	Abbr. ¹⁾	Peak Wavelength ²⁾
White	-WT	5000 K, CRI80
Red	-RD	near 625 nm
Infrared	-IR	near 850 nm
Green	-GN	near 525 nm
Blue	-BE	near 465 nm
Yellow	-YE	near 580 nm

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

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.



Without Controller (-x)

Pin	Color ¹⁾	Direct (-x) ²⁾
1	brown	LED (+)
2	white	LED (+)
3	blue	LED (-)
4	black	LED (-)

- 1) Wire color of MBJ lighting cable. For the connection it is recommended to use the MBJ lighting cable with a maximum length of 10 m.
- 2) Connection to 24VDC without external LED controller may destroy the unit.

Integrated Controller (-s)

Supported operation modes with the integrated LED controller

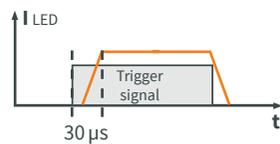
Pin	Steady light	Brightness control (Dim)	Triggered Light	Flash light
1	24VDC			
2	24VDC	1...10V	24VDC	GND
3	24VDC	24VDC	Trigger	Trigger
4	GND			

1. Steady light



Current is fixed depending on the respective lighting model.

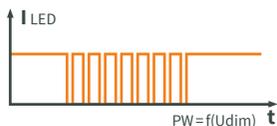
3. Trigger



Trigger (Pin 3) it is a high resistance current sink with 0.2 mA for 5 V and 5 mA for 24 V

High = 5...24 V=ON
Low = 0...1 V=OFF

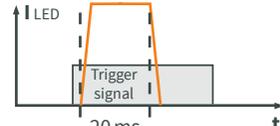
2. Brightness control



Dim (Pin 2) is used as analogue brightness control and operation mode switch. It's a high resistance current sink with 0.2 mA for 5 V and 1 mA for 24 V.

Control voltage Udim: 1...10 VDC
Internal PWM frequency: 3.8 kHz
Min. cam. exposure time: 5 ms

4. Flash light



Triggered flash light with overdrive current and time-out for LED protection.

Max. flash time: 20 ms
Min. flash time: 100 µs
Latency (trigger -> LED ON): approx. 30 µs
Max. trigger frequency: 1 kHz
Max. duty cycle: 25 %

Specification	DBL-0510	DBL-1010	DBL-1020	DBL-2020	DBL-2030	DBL-3030
Optical parameter						
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	300 mm x 300 mm
Light emission	Rectangular light field with side-fired LED's, 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					
Electrical parameter						
Available interfaces	-s with integrated LED Controller and 4 operation modes; -x with direct LED access (external LED control is required)					
Uin for -s Version	24 VDC +/- 5 %					
U _{LED(+)} range for -x version ¹⁾	WT / BE / YE: 17 ... 20 VDC; GN: 20 ... 23 VDC; RD: 12 ... 15 VDC; IR: 9 ... 12 VDC					
Typical Power (-s version)						
Steady light operation (white / red / IR) ²⁾	6 W / 5 W / 6 W	11 W / 9 W / 10 W	17 W / 13 W / 15 W	23 W / 16 W / 20 W	28 W / 20 W / 25 W	34 W / 24 W / 30 W
During ON time at flashed light operation ³⁾	15 W	31 W	46 W	50 W	62 W	74 W
Recommended LED current (-x version)						
Steady light (100 % duty cycle)	300 mA (450 mA for IR)	600 mA (900 mA for IR)	900 mA (1350 mA for IR)	1200 mA (1800 mA for IR)	1500 mA (2250 mA for IR)	1800 mA (2700 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 (1350 mA for IR)	2400 mA (1800 mA for IR)	3000 mA (2250 mA for IR)	3600 mA (2700 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 (1350 mA for IR)	3600 mA (1800 mA for IR)	4500 mA (2250 mA for IR)	5400 mA (2700 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 (2700 mA for IR)	4800 mA (3600 mA for IR)	6000 mA (4500 mA for IR)	7200 mA (5400 mA for IR)
General parameter						
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	320 mm x 350 mm x 12 mm
Weight	250 g	380 g	600 g	1100 g	1600 g	2400 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 www.mbj-imaging.com					

- 1) Lower voltage value refers to steady light, higher voltage value refers to flash light, please see max. allowed current in the rows below.
- 2) Power for Blue / Yellow is comparable to White, Power for Green is approx. 1,2 times higher.
- 3) Triggered flash light with max. 20 ms and up to 100 % more light intensity, calculated for White.

Application Samples for (-s) controller

