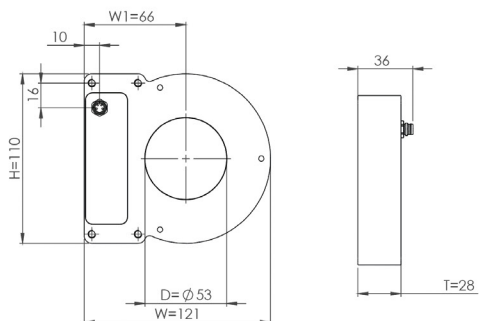


## Mechanical Integration

The lights are equipped with 4 combined mounting positions of threaded or 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.

### Model ARL-10

More 2D and 3D drawings can be found online:  
www.mbj-imaging.com



Specification	Angled Ringlight
Operating temperature	10°C to 30°C / 45°C <sup>1)</sup>
Certifications	CE, RoHS
Degree of protection	IP54 <sup>2)</sup>
Humidity	30% to 70%

- 1) Max. of 30°C is recommended for steady light operation w/o additional heat transfer measurements, for max. 45°C a 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 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.

Have the illuminators commissioned only in compliance with the specified protective measures. It is essential that you comply with the permissible ambient conditions. The lighting must be switched off before installation and/or maintenance. The device must not be used when a failure may cause personal injury.



1. The device is designed for indoor use only.
2. **Light** – Due to the risk of irritation of or damage to the eyes or skin it is not recommended to look directly into the light source.
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 get hot. Do not touch the product during operation or immediately after it is turned off. Keep off flammable materials at any time and allow for sufficient heat dissipation.
4. **Electricity** – The housing is electrically isolated from the ground of the power supply. Operate only with the permissible current. Exceeding the permissible current 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.

03590.00 Manual MBJ Angled Ringlight, April 2023

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## Operating Manual Technical Data

# Angled Ringlight



### Model Sizes in Series

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

ARL-10

1) Size definition refers to the outer luminous area diameter in cm.

### 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

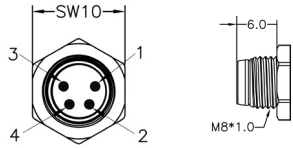
1) Color option will be added to the model name after the size information.

ARL-10-WT refers to an angled ringlight with 5000 K white 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 0.2mA for 5V and 5mA for 24V.

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

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

## 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 24 V 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 µs,

maximum recommended clock speed is 1 kHz

maximum recommended duty cycle is 25 %

minimum recommended flash time is 100 µs

Specification	ARL-10
<b>Optical parameter</b>	
Luminous area (ID-OD)	62 mm - 101 mm
Light emission	Ring shaped light field with direct light emission in a 45° inward angle
Recommended use	Commonly used for partial brightfield applications. Emphasizes surfaces structures. Angled edges are highlighted, slight recesses illuminated.
Recommended light working distance	30 mm - 200 mm
<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)
Uin for -s Version	24V DC +/- 5%
ULed(+) 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>	11 W / 9 W / 6 W
During ON time at flashed light operation <sup>4)</sup>	31 W
<b>Recommended LED current (-x version)</b>	
Steady light (100% duty cycle)	600 mA (900 mA for IR)
Flash light (50% duty cycle, < 500 ms pulse)	1200 mA (900 mA for IR)
Flash light (25% duty cycle, < 50 ms pulse)	1800 mA (900 mA for IR)
Flash light (10% duty cycle, < 5 ms pulse)	2400 mA (1800 mA for IR)
<b>General parameter</b>	
Dimension (H x W x D) <sup>5)</sup>	110 mm x 121 mm x 28 mm
Lens hole diameter [Ø]	53 mm
Weight	420 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. 20ms and up to 100% more light intensity, calculated for White.

5) w/o connector

## Application Samples for (-s) controller

