



## MBJ HDF Series Horizontal Ringlights Instruction Manual

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Operating Manual Technical Data  
Horizontal Ring lights



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## HDF Series Horizontal Ring lights

### Model Sizes in Series

The lights available in the following sizes 1)

HDF-05	HDF-07	HDF-10
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1. Size definition: HDF-10 refers to an inner light diameter of 100 mm.

### Possible LED Colors

LED	Abbr.1)	Peak Wavelength2)
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

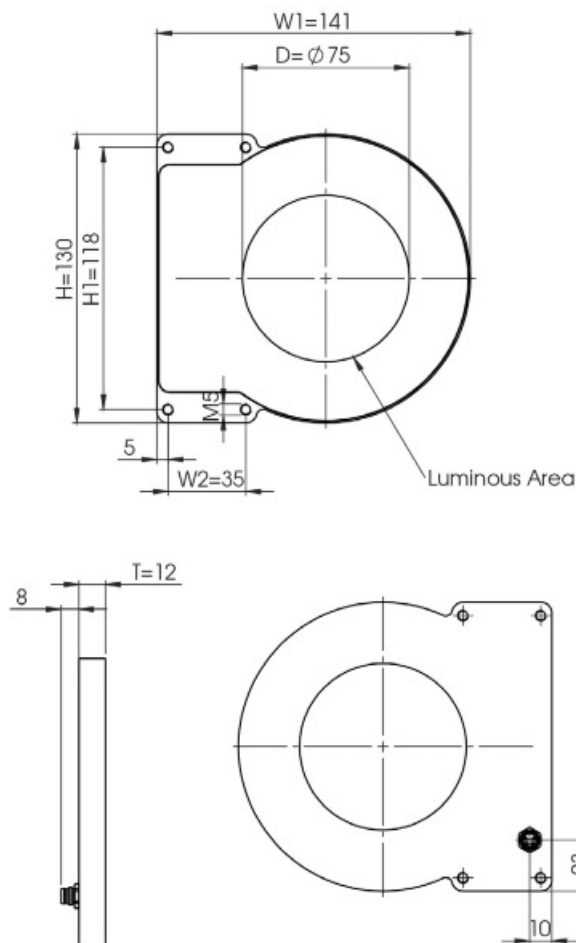
1. Color option will be added to the model name after the size information. HDF-07-RD refers to a horizontal ring light with 625 nm red light.
2. This is an approximated value. The exact value also depends on LED temperature and LED current.

## 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 lifetime additional heat transfer measurements at the holding positions is highly recommended.

Example: Model HDF-07

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



Specification	Horizontal Ringlight 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.

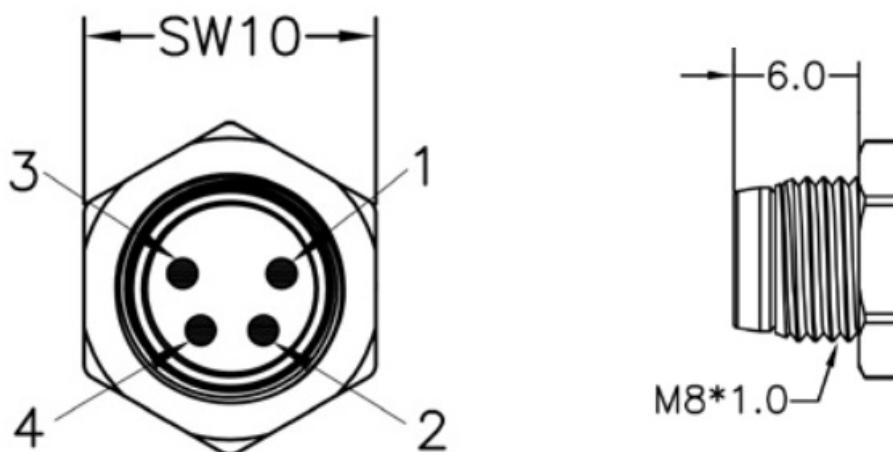


1. The device is designed for indoor use only.
2. Light – Due to the risk of flash burn of the eyes it is not recommended to look directly into the light source. The lighting must be switched off before installation and/or maintenance. The device must not be used when a failure may cause a personal injury.
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 a 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.

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### Electrical Connection

The lighting is equipped with an 4 pin M8x1 connector.



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

- wire color of MBJ lighting cable
- connection to 24VDC without external LED controller may destroy the unit

### Additional Information:

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

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

For the 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
24 V	steady light 1)
1...10 V	steady light with brightness control 2)
24 V	triggered light
GND	triggered flash light with max. 20 ms and up-to 100 % more light intensity 3)

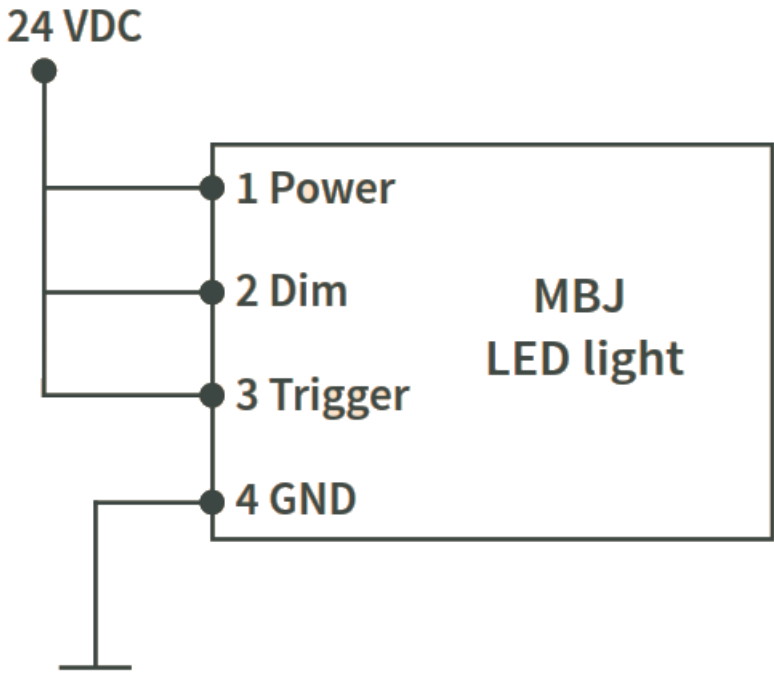
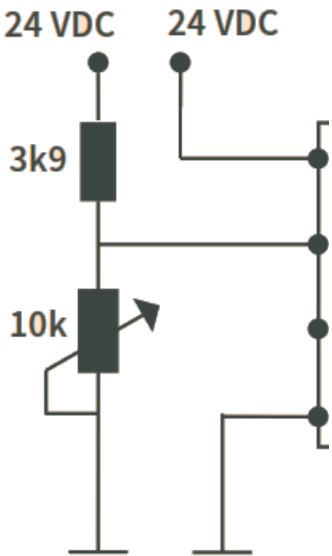
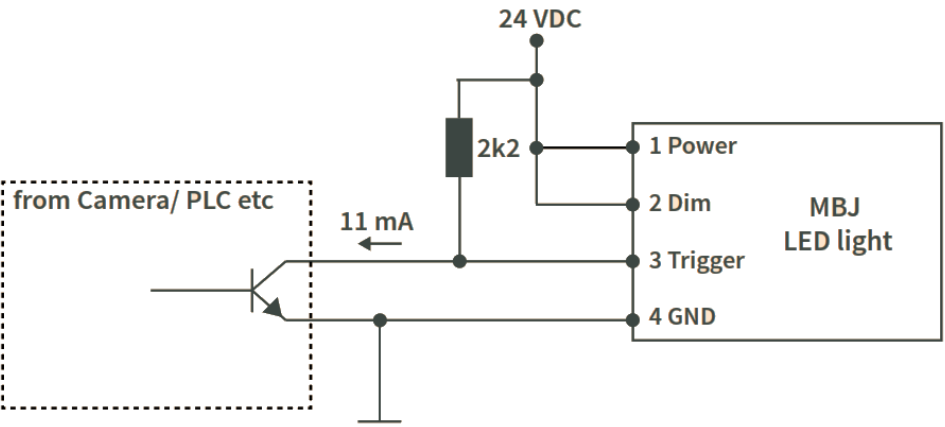
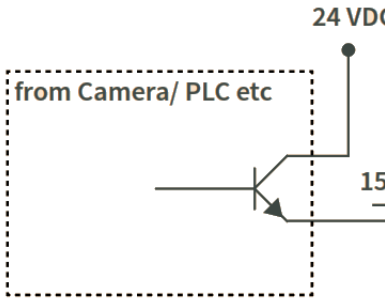
1. Pin 3 (Trigger) needs permanent 24 V to activate steady light mode
2. PWM with 3.8kHz clock is used, recommended minimal camera exposure is 5ms
3. Latency between trigger and LED light ON is about max. 30µs, the maximum recommended clock speed is 1 kHz, the maximum recommended duty cycle is 25 % and the minimum recommended flash time is 100 µs

Specification	HDF-05	HDF-07	HDF-10
Optical parameter			
Luminous area (ID)	50 mm	75 mm	100 mm
Light emission	Horizontal, side fired ring light with slightly diffuse light emission		
Recommended use	used mainly for darkfield applications		
Recommended light working distance	1 mm – 30 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 %		
ULed(+) range for -x version2)	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	6 W / 3 W / 2 W		
During ON time at flashed light operation	16 W		
Recommended LED current (-x version)			
Steady light (100 % duty cycle)	300 mA (450 mA for IR)		
Flash light (50 % duty cycle, < 500 ms pulse)	600 mA (450 mA for IR)		
Flash light (25 % duty cycle, < 50 ms pulse)	900 mA (450 mA for IR)		
Flash light (10 % duty cycle, < 5 ms pulse)	1200 mA (900 mA for IR)		
General parameter			
Dimension (H x W x D)	130 mm x 141 mm x 12 mm	130 mm x 141 mm x 12 mm	130 mm x 141 mm x 12 mm
Weight	360 g	330 g	300 g
Material	Black anodized aluminum housing with PMMA light guide		
Connector	M8x1 socket, 4 pin, male (for pinning details refer to chart “Electrical Connection”)		
Accessories	For cable and external LED controller: please check <a href="http://www.mbj-imaging.com">www.mbj-imaging.com</a>		

1. Values are approximate with +/- 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.

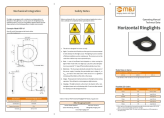
4. Triggered flash light with max. 20 ms and up to 100 % more light intensity, calculated for White.

## Application Samples for (-s) controller

Steady light	Steady light with brightness control
	
Triggered light with NPN sinking output (inverted strobe signal, open collector)	Flashed light with PNP sourcing
	

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## Documents / Resources



**[MBJ HDF Series Horizontal Ringlights](#)** [pdf] Instruction Manual  
HDF-05, HDF-07, HDF-10, HDF Series Horizontal Ringlights, HDF Series, HDF Series Ringlights, Horizontal Ringlights, Ringlights

## References

-  [imaging.com is for sale | www.brandforce.com](#)
-  [MBJ - LED Beleuchtungen für industrielle Bildverarbeitung](#)