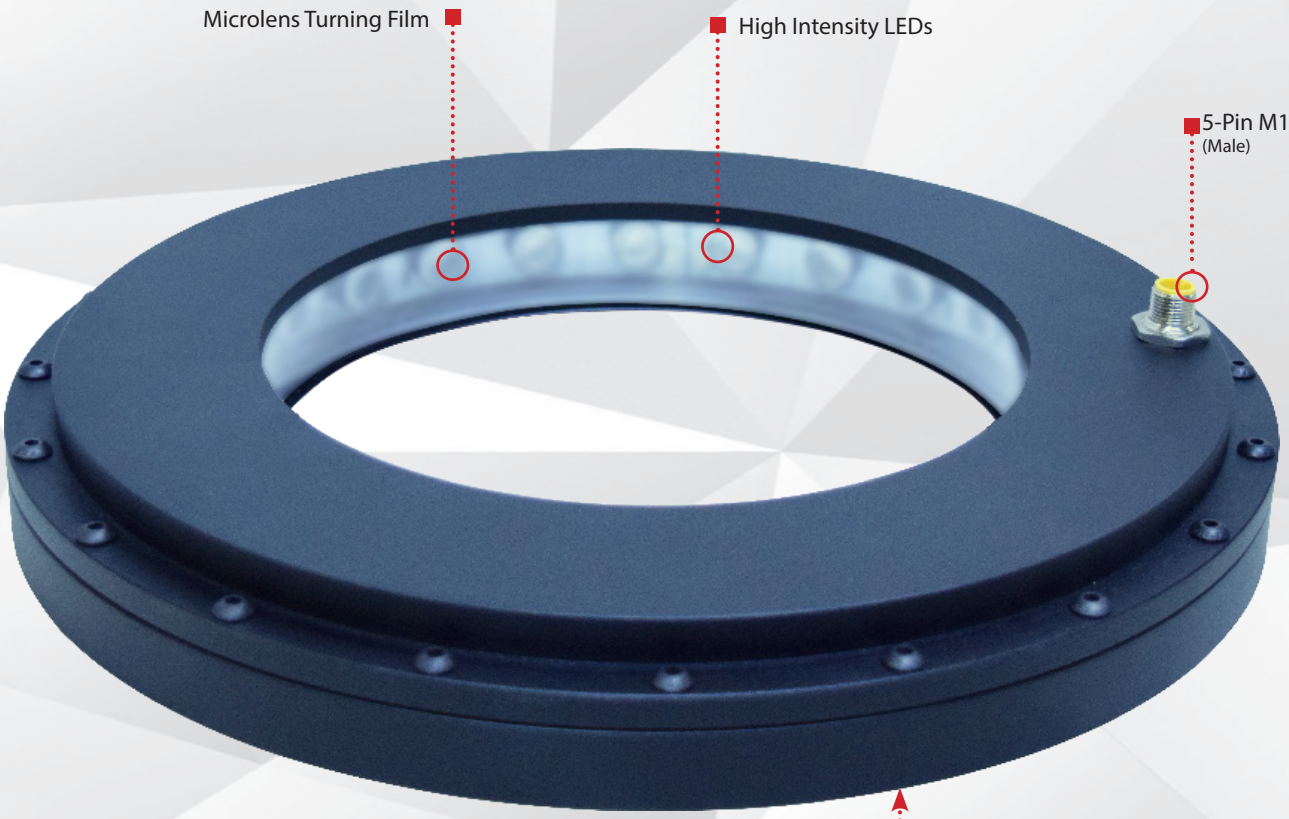
smart vision lights DFLW-200 *Dark Field* RING LIGHT

MULTI-DRIVE™ | WASHDOWN

PRODUCT DATA SHEET



multi drive™

Warranty	Compliant	Compliant	Rated	Connector
10 YEAR	IEC 62471	CE RoHS	IP 68	5-PIN M12

PRODUCT HIGHLIGHTS

- ✓ Built-in Multi-Drive™ allows the light to work in continuous operation or OverDrive™ strobe mode
- ✓ Microlens turning film directs a beam of light at a 25° angle towards an object, resulting in a high concentration and uniform field of illumination
- ✓ SafeStrobe™ technology ensures protected operation of LEDs
- ✓ Built–in driver
- ✓ PNP and NPN trigger signal input

Rev. 2020/11/25

PRODUCT DESCRIPTION

The DFLW-200 Dark Field Washdown Ring Light is IP68 rated and comes in an anodized black aluminum housing. The built-in Multi-Drive™ driver allows the light to work in continuous operation or OverDrive™ strobe mode, depending on the wiring configuration. The industry-standard 5-pin M12 connector makes for simple wiring. The 1–10V DC analog signal line gives the user total control over intensity in continuous operation mode. Grounding the analog signal line put the light into OverDrive™ strobe mode.

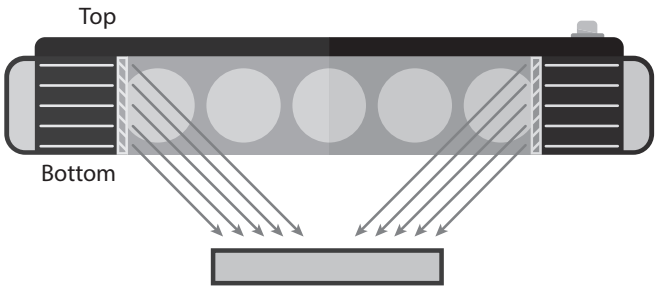
PRODUCT SPECIFICATIONS

	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Electrical Input	24V DC +/- 5%	
Input Current	Max. 1.48 A	Max. 12.35 A
Wattage	Max. 35.5 W	Max. 296.4 W
PNP Line	4 mA @ 4V DC | 10 mA @ 12V DC | 20 mA @24V DC	
NPN Line	15 mA @ Ground (0 V DC)	
OverDrive™ Strobe Mode	**Not applicable**	Connect pin 5 to GND (see Wiring Configuration for more information)
Strobe Duration	**Not applicable**	Min. 10 µs | Max. 50 ms (see SafeStrobe™ Technology for more information)
Duty Cycle	**Not applicable**	Max. 10%
Strobe Input	**Not applicable**	PNP: +4V DC or greater to activate NPN: GND (<1V DC) to activate
Continuous Operation Mode	NPN can be tied to ground **OR** PNP can be tied to 24V DC (not both)	**Not applicable**
On/Off Input	PNP: +4V DC or greater to activate NPN: GND (<1V DC) to activate	**Not applicable**
Connection	5-pin M12 connector	
Ambient Temperature	0º–45ºC (32º–114ºF)	
IP Rating	IP68	
Weight	120 g	
Compliances	CE, RoHS, IEC 62471	

MICROLENS TURNING FILM

When combined with high-power LEDs, the microlens turning film directs a beam of light at a 25° angle toward the object, resulting in a high concentration and uniform field of illumination. This technique allows for a large-diameter dark field ring light to have an extended working distance while maintaining light intensity and uniformity.

The microlens requires the bottom of the light to be pointed towards the object being inspected. The bottom is the side without the connector.



RESOURCE CORNER

Additional resources, including CAD files, videos, and application examples, are available on our website.

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smartvisionlights.com
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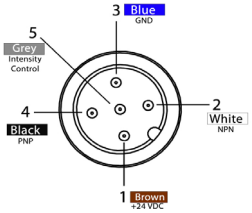
Hours: Monday — Friday | 8 am–5 pm ET

WIRING CONFIGURATION

CONTINUOUS OPERATION MODE



Pin layout for light (male connector)

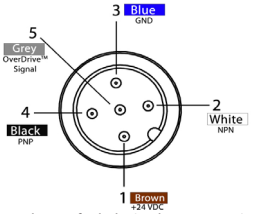
Pins	Function	Signal	Wire Color
1	Power In	+24 V DC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10 V DC**	GREY*

** Some cables use green/yellow for pin 5*
*** For maximum intensity, it is possible to tie pin 5 to pin 1 at +24 V DC.*
For continuous mode: PNP (pin 4) can be tied to +24 V DC (pin 1) ***or*** *NPN (pin 2) can be tied to Ground (pin 3).*

For the light to function properly, apply either a PNP or NPN signal, not both.

Failure to supply light with correct input current will result in nonrepeatable lighting.
(See Product Specifications for requirement.)

OVERDRIVE™ STROBE MODE



Pin layout for light (male connector)

Pins	Function	Signal	Wire Color
1	Power In	+24 V DC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	OverDrive™ Signal	Ground	GREY*

** Some cables use green/yellow for pin 5*

Failure to supply light with correct input current will result in nonrepeatable lighting.
(See Product Specifications for requirement.)

LIGHT PATTERNS

Smart Vision Lights recommends the DFLW-200 be used at a working distance between 20 mm and 75 mm.

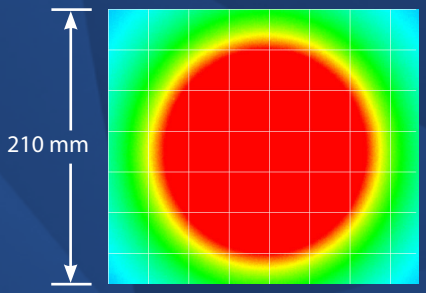
LIGHTING ILLUMINATION FOR THE DFLW-200

Continuous Operation Mode	
Typical Output Performance	Illuminance (Lux)
Distance = 25 mm	60,000
Illuminance measurement taken on White Light, 4800 K	

OverDrive™ Mode	
Typical Output Performance	Illuminance (Lux)
Distance = 25 mm	330,000
Illuminance measurement taken on White Light, 4800 K	

The DFLW-200 Ring Light produces a uniform light pattern.

WD = Working Distance Grid set to 30 mm x 30 mm



WD = 25 mm

MULTI-DRIVE™

Multi-Drive™ offers the best of both worlds. Continuous operation and OverDrive™ mode (HIGH output strobe/pulse) are available in a single light. Other advantages of Multi-Drive™ include faster imaging and capture/freeze motion on high-speed lines.

The Multi-Drive™ feature allows the user to run the light continuously or in OverDrive™ at the maximum allowed intensity by simply setting the product configuration. OverDrive™ strobe mode has **up to eight times** the power of continuous operation.

SAFESTROBE™ TECHNOLOGY

SafeStrobe™ technology is a unique technology that applies safe working parameters to ensure high-current LED's are not damaged by driving them beyond their limits, such as maximum strobe time or duty cycle. This is especially beneficial for overdriving our high-current LED's.

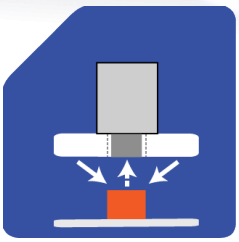
MOUNTING

Mounting options include four M6 threaded holes located on the DFLW-200.

Hardware included with light:
(2) M6 screws (hex)

ILLUMINATION

The DFLW-200 Dark Field Ring Lights works best for:



Dark Field

EYE SAFETY

According to IEC 62471:2006. Full documentation available upon request.

Notice

Exempt Group: No photobiological hazard to eyes or skin even for continuous, unrestricted use. Applicable for wavelength 625.

Caution

Risk Group 1: Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to eyes. Safe for most applications except prolonged exposure. Applicable for wavelengths 470, 530, and WHI.

PART NUMBER

DFLW-200 – □□□ – □□

COLOR:

WHI | 470 | 530 | 625 | 850

HOUSING

Leave blank for Anodized Black Aluminum

SS = Stainless Steel

Part Number Examples:

DFLW-200-625 (DFLW-200, 625 nm Red Wavelength)

DFLW-200-625-SS (DFLW-200, 625 nm Red Wavelength, Stainless Steel housing)

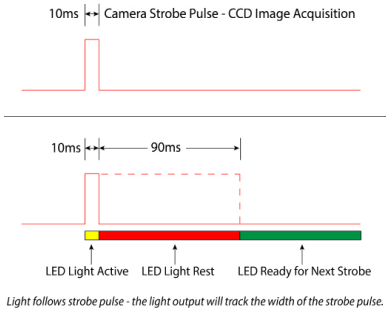
Additional wavelength and lens options available upon request

DUTY CYCLE (OVERDRIVE™ MODE ONLY)

This section applies only if light is in OverDrive™ strobe mode.

Maximum Duty Cycle for OverDrive™ light is 10% (0.1)

The Duty Cycle (D) is related to the Strobe Time (ST) and Rest Time (RT).



Light follows strobe pulse - the light output will track the width of the strobe pulse.

Calculating Rest Time

$$RT = \frac{ST}{D} - ST$$

RT = Rest Time
ST = Strobe Time
D = Duty Cycle

Example

$$90\ ms = \frac{10\ ms}{.1} - 10\ ms$$

Rest Time is 90 ms for 10 ms Strobe Time

Calculating Strobe Rate

$$SR = \frac{D}{ST}$$

SR = Strobe Rate (strobes per second)
ST = Strobe Time (seconds)
D = Duty Cycle

Example

$$1000 = \frac{0.1}{0.0001}$$

Strobe Rate is 1000 strobes per second

Calculating Duty Cycle

$$D = ST \times SR$$

SR = Strobe Rate (strobes per second)
ST = Strobe Time (seconds)
D = Duty Cycle

Example

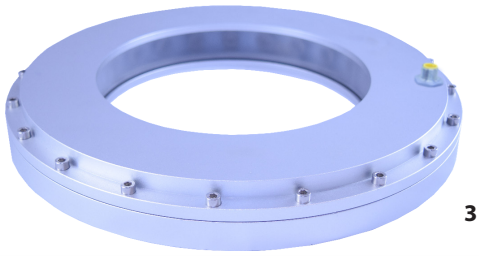
$$0.1 = 0.0001 \times 1000$$

Duty Cycle is 10% (0.1)

Note: Strobe time is limited by the strobe rate.

STAINLESS-STEEL VERSION

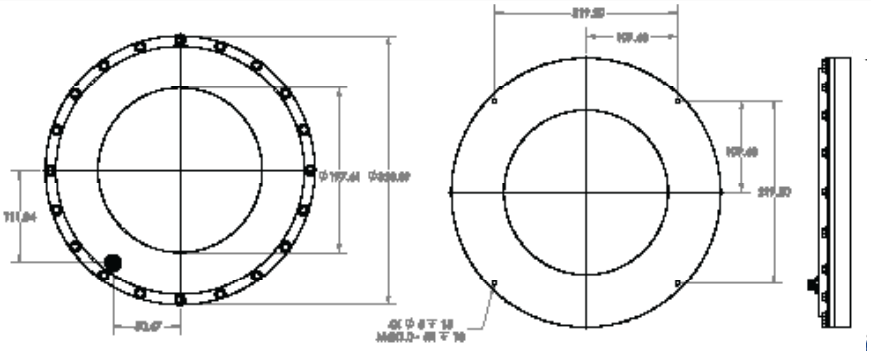
The DFLW-200 is available in a stainless-steel housing. Stainless-steel housing is recommended for any food grade application.
Lead time for the stainless-steel version of the DFLW-200 is longer than that of the anodized black aluminum housing version.



316 Stainless-Steel Housing

Add - SS to end of part number for Stainless-Steel

PRODUCT DRAWING



CAD files available on our website.
Dimensions are in mm.

ACCESSORIES

Power Cables

Lengths	Part Number
5 m	5PM12-5
10 m	5PM12-10
15 m	5PM12-15

Power Cables (Washdown)

Lengths	Part Number
15 m	W5PM12-15

Washdown cables have a 316 stainless-steel connector(s).

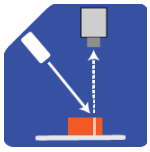
GLOSSARY

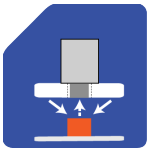
This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific light.

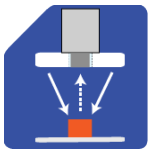
TERMINOLOGY

OverDrive™ Light includes an integrated high-current strobe driver for complete LED light control.
Continuous Operation Light stays on continuously.
Multi-Drive™ Combines continuous operation and OverDrive™ strobe (high-current strobe operation) modes into one easy-to-use light.
Built-In Driver The built-in driver allows full function without the need of an external driver.
Camera to Light Connecting the light directly to the camera, without the need for additional controllers or equipment.
Polarizers Filters that reduce reflections on specular surfaces.
Diffuser Used to widen the angle of light emission, reduce reflections, and increase uniformity.

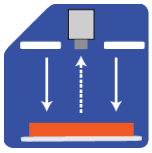
TYPES OF ILLUMINATIONS

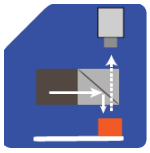

Projector

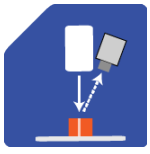

Dark Field

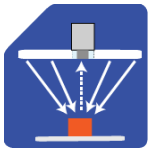

Radial

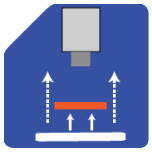

Bright Field


Direct


Axial

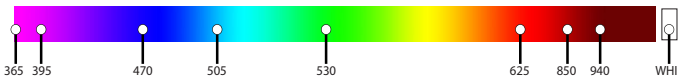

Line


Diffuse Panel


Backlight

COMMON COLOR/WAVELENGTHS LEGEND

Wavelength options range from 365 nm to 1550 nm.
Additional wavelengths available for many light families.



See Part Number section for **this light's available standard wavelengths.*

SWIR SHORT WAVE INFRARED

Short Wave Infrared LEDs are available in 1050 nm, 1200 nm, 1300 nm, 1450 nm, and 1550 nm.