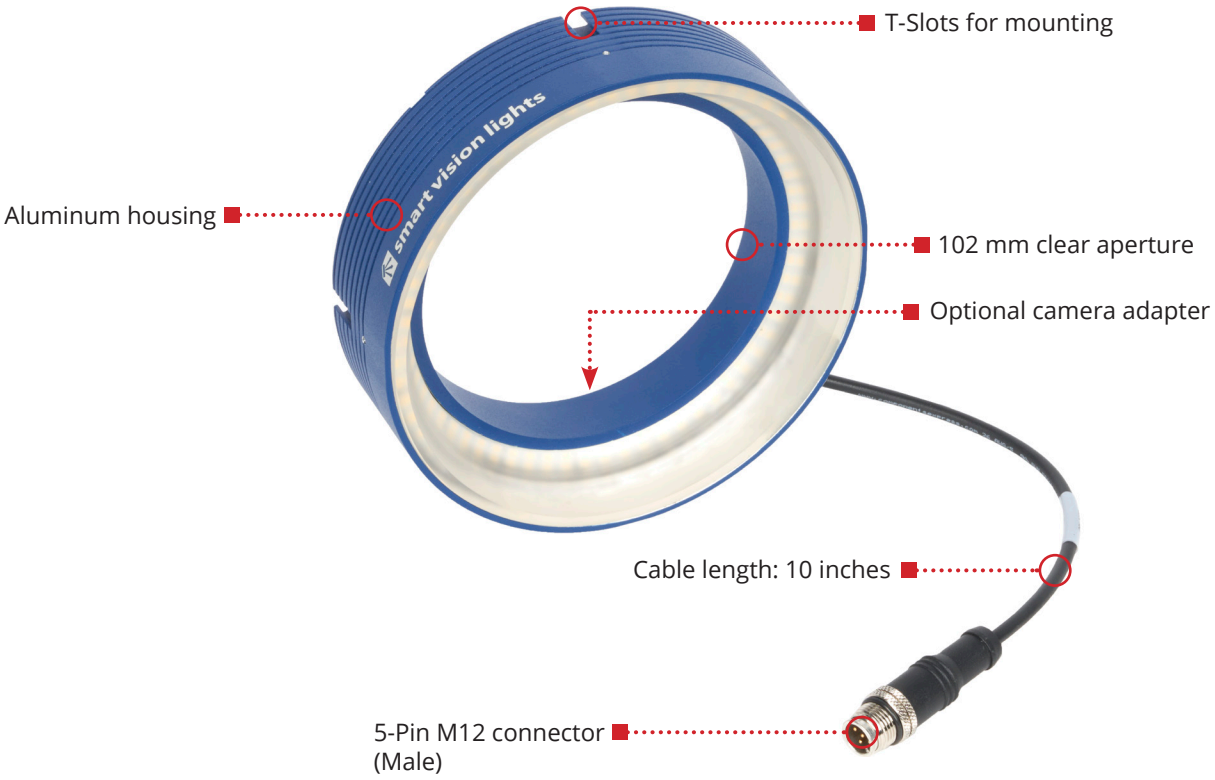
RM140 Miniature Ring Light
LOW-ANGLE | MULTI-DRIVE™



The RM140 is a ring light featuring an integrated Multi-Drive™ driver which operates in either continuous or OverDrive™ mode, depending on the input wiring configuration. NPN or PNP triggers can be used to control the light for either strobed or continuous operation. Light intensity can be controlled via the 1 - 10VDC analog intensity line.

Warranty	Tested	Compliant	Rated	Connector
10 YEAR	IEC 62471	CE ROHS	IP 50	5-PIN M12

RM140 HIGHLIGHTS

- ✔ Built-in Multi-Drive™ allows the light to work in continuous or OverDrive™ mode
- ✔ Industrial aluminum housing
- ✔ Low-angle ring light for dark field applications

REV 07/07/26

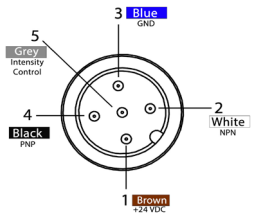
SPECIFICATIONS

	Continuous Operation	OverDrive Operation
Electrical Input	24 VDC +/- 5%	
Input Current	Max. 510 mA	Peak 4.5 A
Input Power	Max. 12.5 W	Peak 108 W
PNP Trigger	2.8 mA @ 4 VDC | 8.8 mA @ 12 VDC | 17.6 mA @ 24VDC	
NPN Trigger	14.4 mA @ Common (0VDC)	
Trigger Input	PNP > +4 VDC (24 VDC max.) to activate **or** NPN > GND (<1VDC) to activate **(not both)**	
Mode Control	Connect pin 5 to 1-10 VDC (10 - 100% output); 24 VDC (Max)	Connect pin 5 to GND (See wiring configuration for more information)
Strobe Duration	Min. 30 µs | Max. ∞	Min. 30 µs | Max. 50 ms
Strobe Trigger Latency	10 µs	6 µs
Strobe Frequency	Max 4 kHz or 1 / Duty Cycle as calculated, whichever is less.[1]	
Duty Cycle	Not applicable	Max. 10%[1]
Analog Intensity	The output is adjustable from 10% - 100% of intensity limit by a 1 - 10 VDC signal. Jumpering pin 5 to pin 1 will provide maximum intensity.	
Connection	5-pin M12 connector	
Operating Temperature	-10° to 40° C (14° to 104° F) | RH max 80% non-condensing humidity	
Storage Temperature	-20° to 70° C (-4° to 158° F) | RH max 80% non-condensing humidity	
IP Rating	IP50	
Weight	~0.80 lb | ~365 g	
Compliances	CE, IEC-62471, RoHS	
Warranty	10 years[2]	

[1]See page 4 for more information
[2]See SmartVisionLights.com/warranty for details.

WIRING CONFIGURATION

CONTINUOUS OPERATION MODE



Pin layout for light (Male Connector)

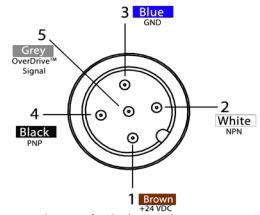
Pins	Function	Signal	Wire Color
1	Power In	+24VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10VDC	GREY

For maximum intensity, tie pin 5 to pin 1 at +24 VDC.
*For continuous mode: PNP (pin 4) can be tied to +24 VDC (pin 1) **or** NPN (pin 2) can be tied to Ground (pin 3).*

For proper light function, apply either a PNP or NPN signal, not both.

Failure to supply light with correct input current will result in inconsistent lighting behavior.
(see Product Specifications for requirements)

OVERDRIVE™ OPERATION MODE



Pin layout for light (Male Connector)

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

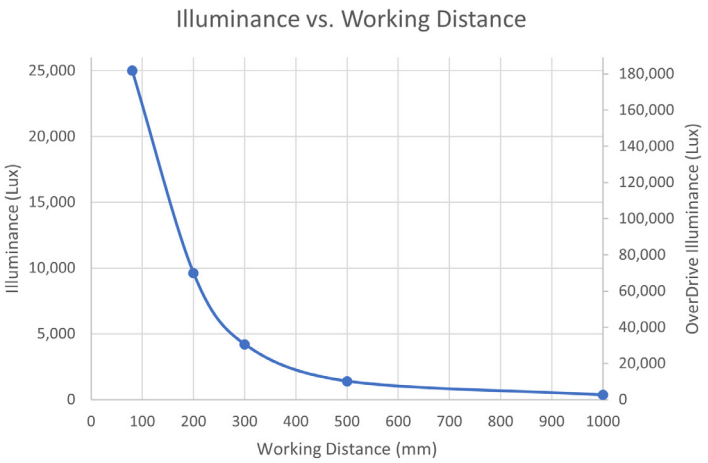
To enable OverDrive™ mode, tie pin 5 to pin 3.

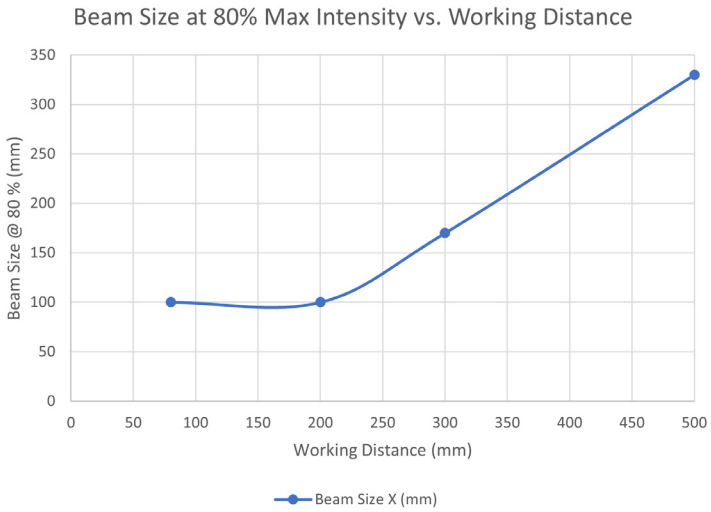
For proper light function, apply either a PNP or NPN signal, not both.

Failure to supply light with correct input current will result in inconsistent lighting behavior.
(see Product Specifications for requirements)

LIGHTING PATTERNS

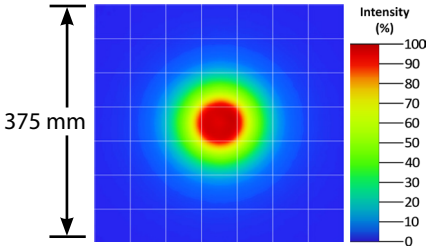
The RM140 is recommended to be used at a working distance between 50 mm to 200 mm. **Illuminance values taken on white light - 5700K**



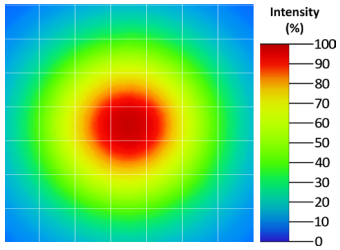


BEAM PATTERNS

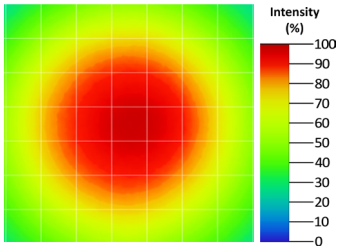
The RM140 is recommended to be used at a working distance between 80 mm to 500 mm. **Illuminance values taken on white light - 5700K**



Working Distance: 80 mm



Working Distance: 300 mm



Working Distance: 500 mm

EYE SAFETY

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

Notice

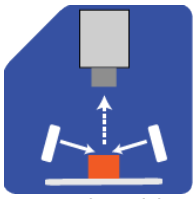
Exempt Group: No photobiological hazard to eyes or skin even for continuous, unrestricted use. Applicable for wavelengths 625

Caution

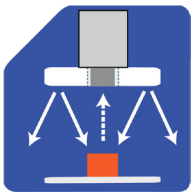
Risk Group 1: Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to eyes. Safe for most applications except prolonged exposure. Applicable for wavelengths 470, 530, and WHI.

ILLUMINATION

The RM140 works best for:



Dark Field

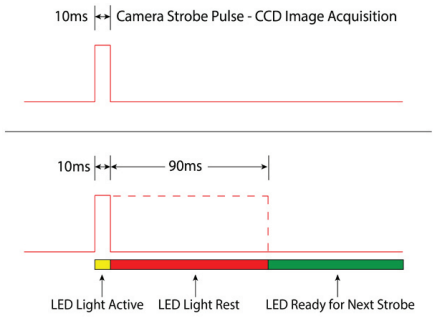


Radial

DUTY CYCLE

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

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)

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

Maximum Strobe Frequency is 1/ calculated duty cycle or 4,000 strobes per second, whichever is less.

MULTI-DRIVE™

Multi-Drive provides both continuous and OverDrive™ modes from a single integrated driver. Users can select the lighting mode via the input wiring configuration. With OverDrive, the light can be strobed at up to 10 times the intensity* of continuous mode.

*See lighting section for more information on this light's OverDrive values.

SAFESTROBE™

SafeStrobe™ is a unique technology that applies safe working parameters to ensure high current LEDs 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 LEDs.

MOUNTING

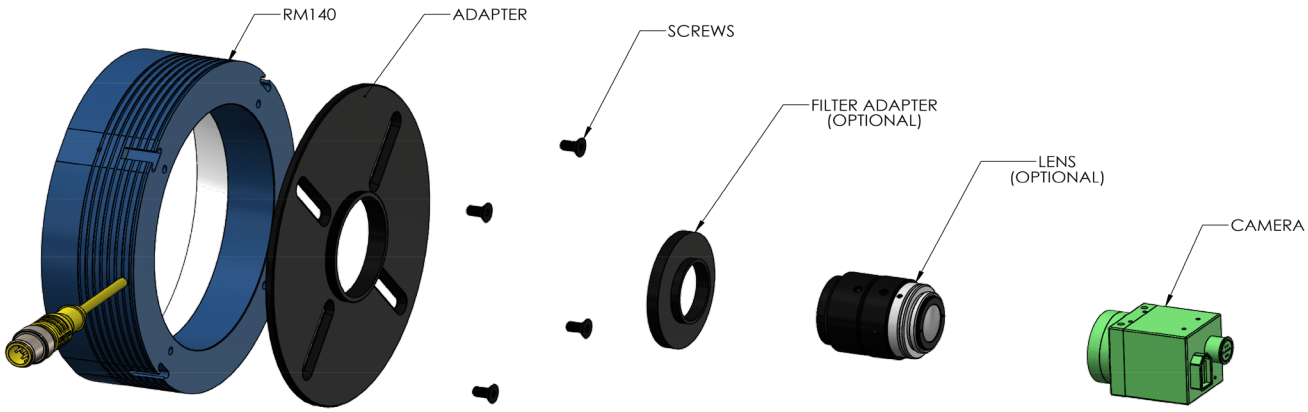
Mounting options include four (4) Tslots and four (4) M4 threaded holes on the RM140 mini ring light.

Hardware included with light:
(2) M4 x 8 mm screws (Hex)
(2) M5 x 10 mm screws (Hex)
(2) M5 T-Nuts



Optional Camera Mounting Adapter	
	The optional ADP0002-KIT can be used to mount a camera or lens directly to the RM140.

CAMERA MOUNTING ADAPTER



PART NUMBER GUIDE

RM140 – □□□

COLOR:

WHI | 470 | 530 | 625 | 850

Part Number Examples:
RM140-625 (RM140, 625 Red Wavelength)

Additional wavelengths available upon request

ACCESSORIES

Step-Up Kits *



Lens Thread Size	Part Number
25 mm	SU25.5-46
27 mm	SU27-46
30.5 mm	SU30.5-46
34 mm	SU34-46
35.5 mm	SU35.5-46
37 mm	SU37-46
39 mm	SU39-46
40.5 mm	SU40.5-46
43 mm	SU46-46

Step-Down Kits



Lens Thread Size	Part Number
49 mm	SD49-46
52 mm	SD52-46
55 mm	SD55-46
58 mm	SD58-46
62 mm	SD62-46
67 mm	SD67-46
72 mm	SD72-46

Power Cables



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

Camera Mounting Adapter



Description	Part Number
Adapter	ADP0002-KIT

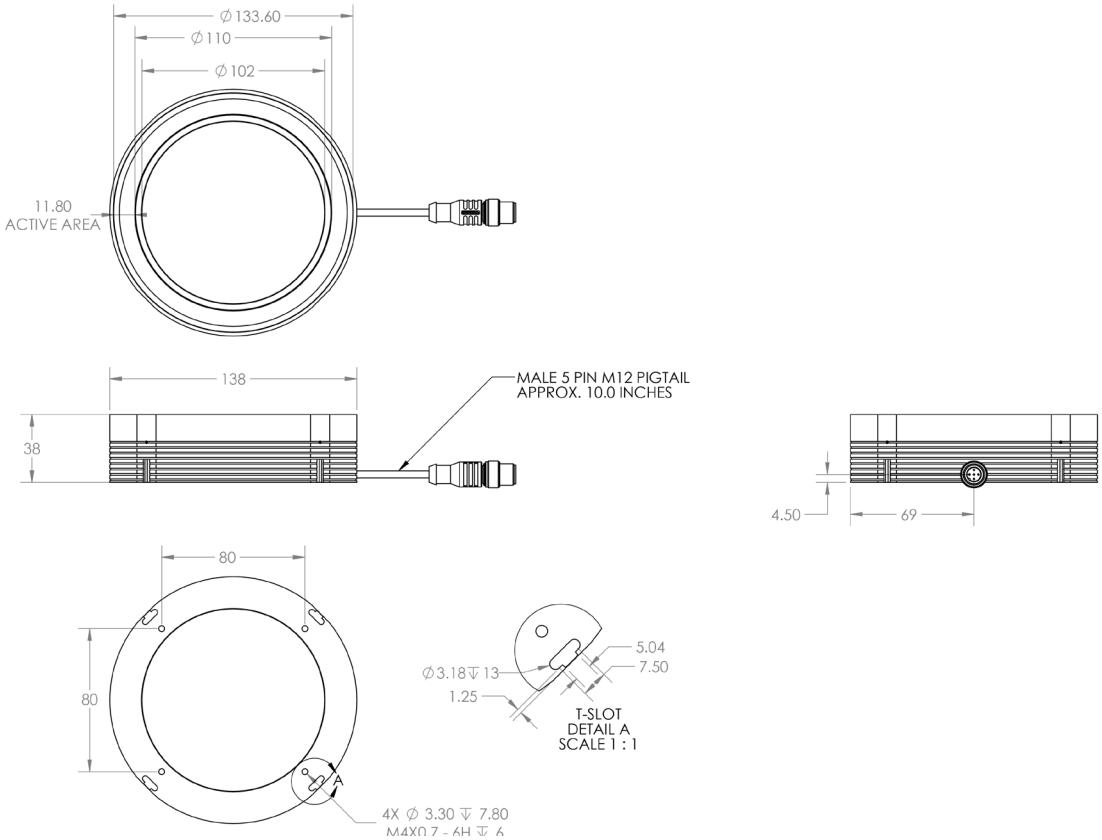
Camera Adapter



Description	Part Number
Camera Adapter	DF34.9-46
Camera Adapter	DF55-46
Camera Adapter	DF60-46
Camera Adapter	DF60.75-46

PRODUCT DRAWINGS

*CAD files available on our website
Drawings are in mm



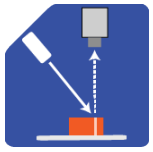
GLOSSARY

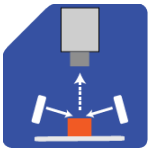
This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific light.

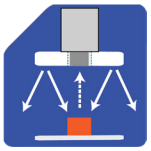
TERMINOLOGY

Continuous Operation The light stays on continuously.
OverDrive™ Integrated driver that produces a high-current strobe to the LEDs to drive them beyond their nominal continuous operation output.
Multi-Drive™ Integrated driver that combines continuous operation and OverDrive™ strobe mode
NanoDrive™ Integrated driver that provides fast switching where the light can go from off to on in less than 500 ns.
Built-in Driver The driver contained within the light that controls the current to the LEDs and provides PNP, NPN, and analog dimming controls.
SmartVisionLink™ Integrated feature that enables lighting control through the Bluetooth module and app.
Camera to Light Connect the light directly to the camera, without the need for additional controllers or equipment.
Polarizers Filters that reduce reflections on specular surfaces.
Diffusers Widens the angle of emission by scattering light in all directions.
Pattern Area Lighting Modulated lighting pattern placed over a backlight's surface used to enhance defect detection on transparent and glossy surfaces
SafeStrobe Limiter to keep the light in safe working parameters.
Direct Connect Connect lights in a series without the use of cables.
Daisy Chain Connect lights in a series with the use of cables.

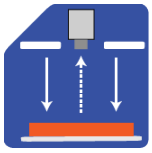
TYPES OF ILLUMINATION

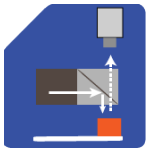

Projector

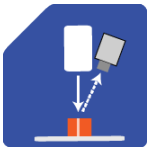

Dark Field

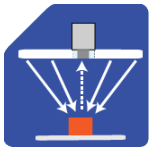

Radial

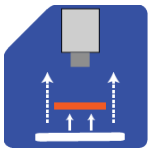

Bright Field

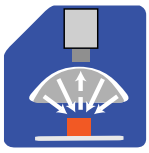

Direct


Axial


Line

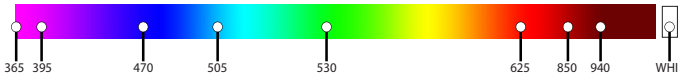

Diffuse Panel


Backlight


Dome
"Light Tent"

COMMON COLOR / WAVELENGTHS LEGEND

Wavelengths options range from 365 nm to 1650 nm.*
Additional wavelengths available for many light families.



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

SWIR SHORT WAVE INFRARED

Shortwave Infrared LEDs are available in 1050 nm, 1200 nm, 1300 nm, 1450 nm, 1550 nm, and 1650 nm.*

Check Part Number section to see if **this light is available in SWIR wavelengths.*

ASR American Systems Registrar

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17021-1 MANAGEMENT SYSTEMS CERTIFICATION BODY

ISO 9001:2015 Certified QMS

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