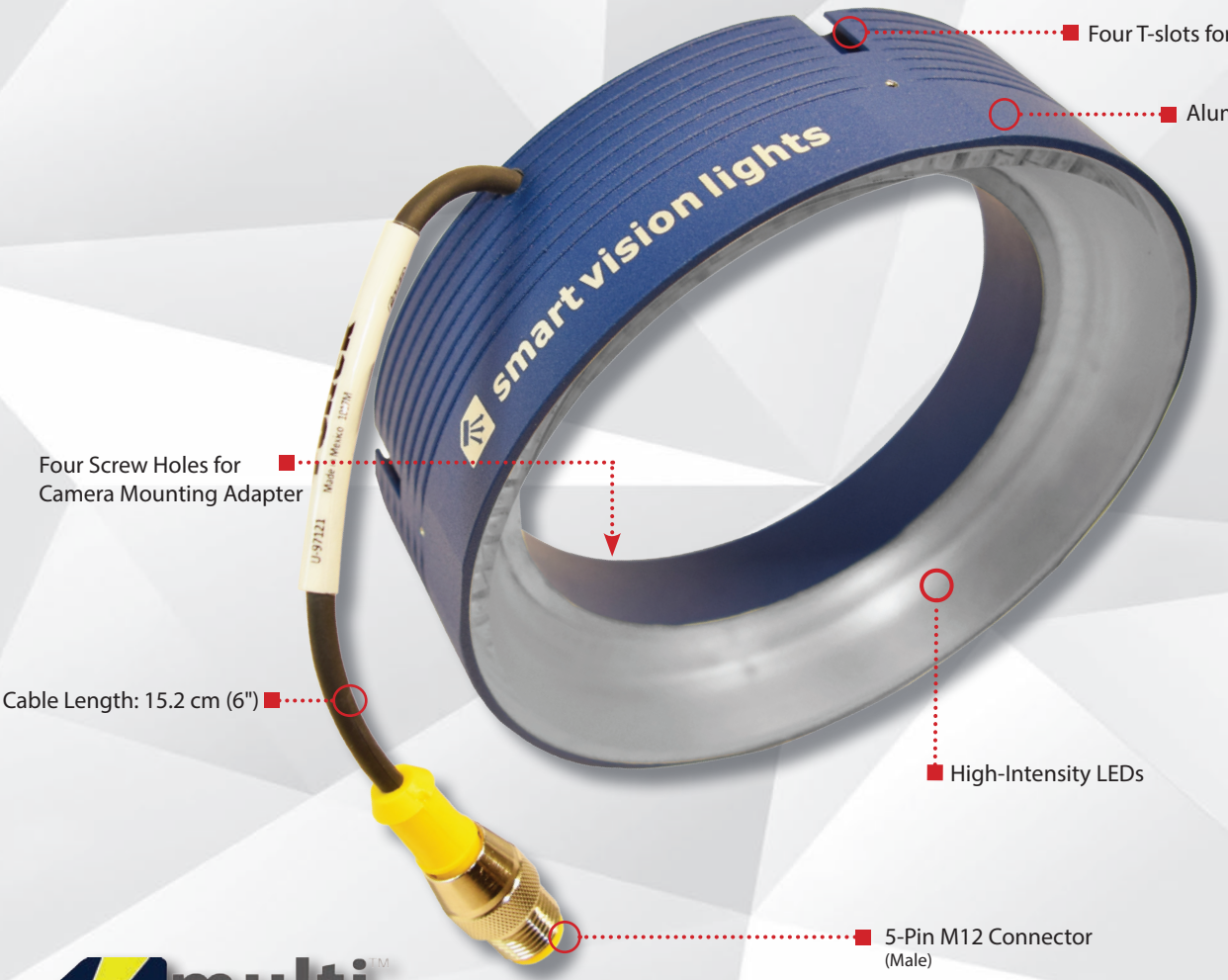
smart vision lights

RM140 *Miniature "Mini"* RING LIGHT

LOW-ANGLE | MULTI-DRIVE™

PRODUCT DATA SHEET



multi drive™

Warranty	Compliant	Compliant	Rated	Connector
10 YEAR	IEC 62471	CE RoHS	IP 65	5-PIN M12

PRODUCT HIGHLIGHTS

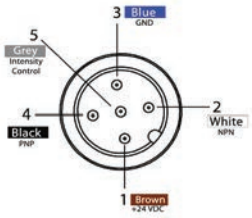
- Built-in Multi-Drive™ allows the light to work in continuous operation or OverDrive™ mode
- Low-angle ring light for dark field applications
- Built-in driver; no external wiring needed
- PNP and NPN strobe input
- Over-current protection
- 5-pin M12 quick connect

PRODUCT SPECIFICATIONS

	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Electrical Input	24 V DC +/- 5%	
Input Current	Max. 510 mA	Max. 4.5 A
Wattage	Max. 12.5 W	Max. 105 W
PNP Line	4 mA @ 4 V DC | 10 mA @ 12 V DC | 20 mA @24 V 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)*
OverDrive™ Strobe Duration	**Not applicable**	Min. 10 µs | Max. 50 ms
OverDrive™ Duty Cycle	**Not applicable**	Max. 10%
Strobe Input	**Not applicable**	PNP: +4 V DC or greater to activate NPN: GND (< 1 V DC) to activate
Continuous Operation Mode	NPN can be tied to ground **OR** PNP can be tied to 24 V DC (not both)	**Not applicable**
On/Off Trigger Input	PNP: +4 V DC to activate NPN: GND (<1 V DC) to activate	**Not applicable**
Connection	5-pin M12 connector	
Ambient Temperature	-18º–50º C (0º–122º F)	
IP Rating	IP65	
Weight	365 g	
Power Supply	Use an adequate power supply for your application when using OverDrive™ mode. (*See "Input Current" for value*)	
Compliances	CE, RoHS, IEC 62471	

WIRING CONFIGURATION

CONTINUOUS OPERATION MODE



Pin layout for light (male connector)

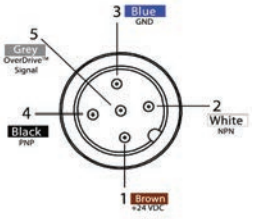
Pin	Function	Signal	Wire Color
1	Power In	+24 V DC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1–10 V DC	GREY*

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 requirements)

**On some cables, pin 5 is green-yellow*
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).*

OVERDRIVE™ OPERATION MODE



Pin	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*

Failure to supply light with correct input current will result in nonrepeatable lighting
(see "Product Specifications" for requirements)

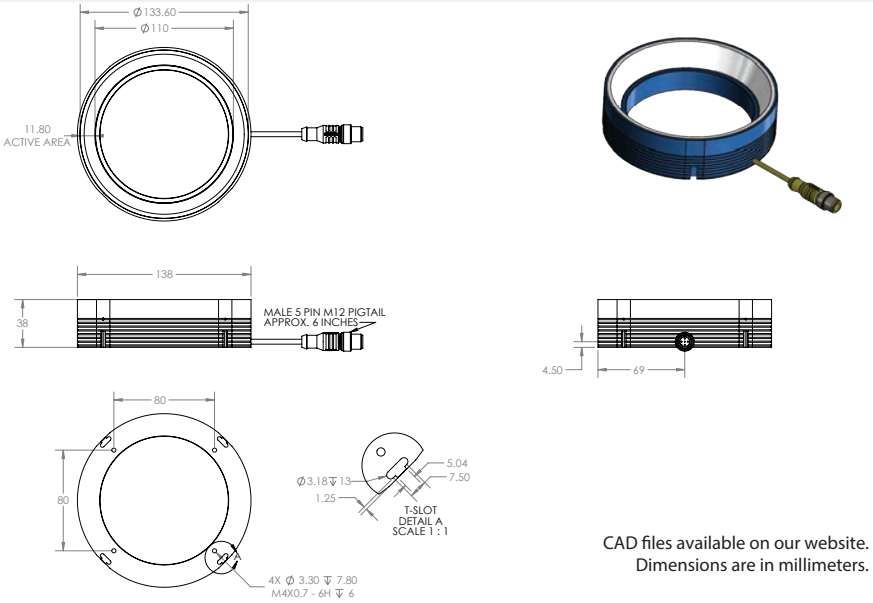
** On some cables, pin 5 is green-yellow*

RESOURCE CORNER

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

Smart Vision Lights
2359 Holton Road
Muskegon, MI 49445
P: +1 231.722.1199 | F: +1 231.722.9922
smartvisionlights.com
techsupport@smartvisionlights.com
Open: Monday–Friday | 8 a.m.–5 p.m. ET

PRODUCT DRAWING



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

LIGHT PATTERNS

Smart Vision Lights recommends that the RM140 be used at a working distance between 50 mm and 200 mm.

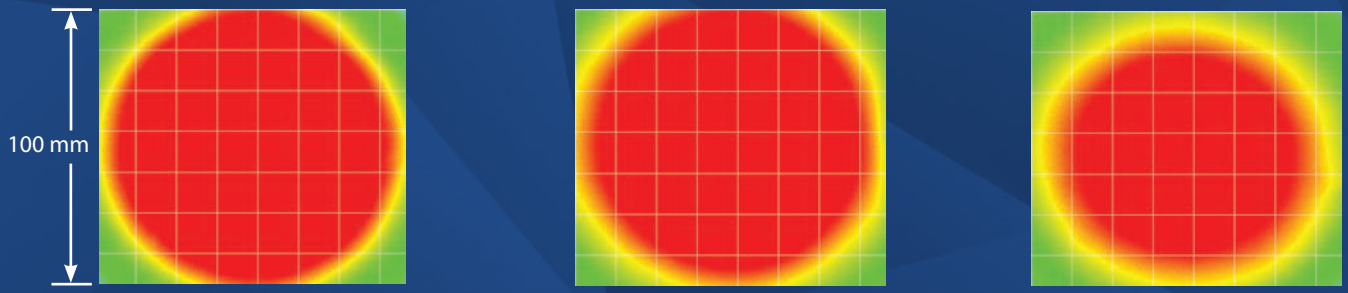
LIGHTING ILLUMINATION FOR THE RM140

Continuous Operation Mode	
Typical Output Performance	Illumination (Lux)
Distance = 100 mm	19,200
Illumination measurement taken on white light–4800K	

OverDrive™ Mode	
Typical Output Performance	Illumination (Lux)
Distance = 100 mm	159,000
Illumination measurement taken on white light–4800K	

The RM140 Mini Ring Light produces a uniform light pattern.

WD = Working Distance



WD = 50 mm | WD = 100 mm | WD = 200 mm

(Grid set to 15 mm x 15 mm)

MULTI-DRIVE™

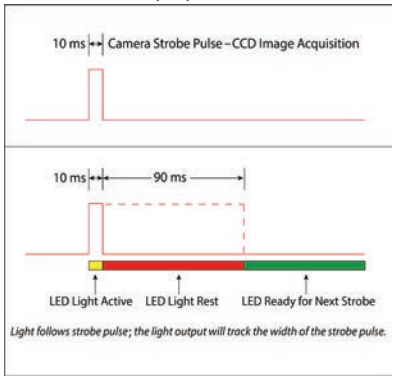
Multi-Drive™ offers the best of both worlds. Continuous operation and OverDrive™ mode (HIGH output strobe/pulse) are available in a single light. Other advantages of Multi-Drive™ include faster imaging and capture/freeze motion on high-speed lines.

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™ operation has **up to ten times** the power of continuous operation.

DUTY CYCLE (OVERDRIVE™ MODE ONLY)

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

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



Calculating Rest Time

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

Example

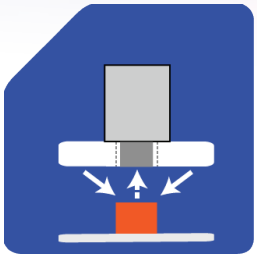
$$RT = \frac{10\ ms}{.1} - 10\ ms = 90\ ms$$

Rest Time is 90 ms for 10 ms Strobe Time

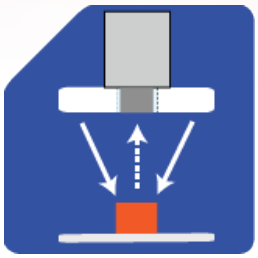
Maximum Duty Cycle for OverDrive™ light is 10% (0.1)

ILLUMINATION

RM140 Series of Mini Ring Lights works best for:



Dark Field



Radial

EYE SAFETY

According to IEC 62471:2006. Full documentation 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.

PART NUMBER

RM140 – □□□

COLOR:

WHI | 470 | 530 | 625

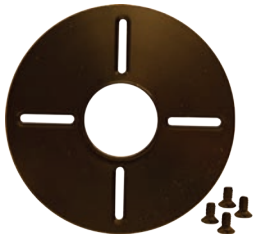
Part Number Examples:
RM140-625 (RM140, 625 Red Wavelength)

Additional wavelengths available upon request

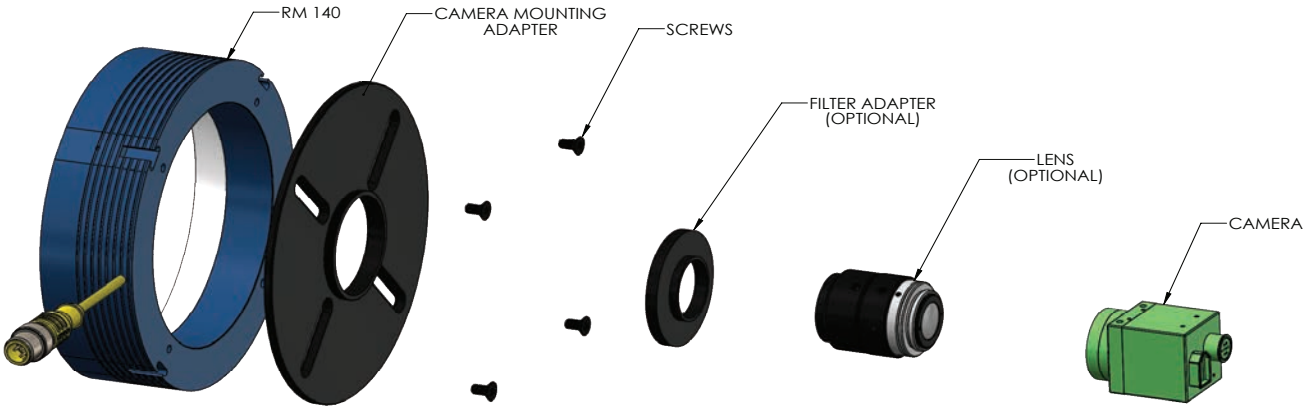
MOUNTING

Mounting options on the RM140 include four T-slots and four M4 threaded holes.

Hardware included with light:
(2) M4 x 8 mm screws (hex)
(2) M5 x 10 mm screws (hex)
(2) 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



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

Power Adapters *

Description	Part Number
AC, 24 Volt, 1.7 Amp	T1 Power Supply

* **European Versions Available** (Add -EURO to end of T1 or T2. Example T1-EURO Power Supply)

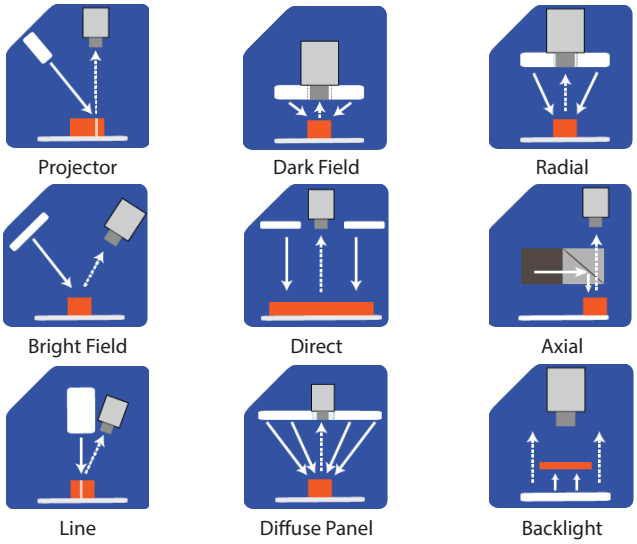
GLOSSARY

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

TERMINOLOGY

OverDrive™ Lights include an integrated high-pulse driver for complete LED light control.
Continuous Operation Lights stay on continuously.
Multi-Drive™ Combines continuous operation and OverDrive™ strobe (high-pulse operation) mode into one easy-to-use light.
Built-In Driver The built-in driver allows full function without the need for an external controller.
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.
Diffusers Used to widen the angle of light emission, reduce reflections, and increase uniformity.

TYPES OF ILLUMINATIONS



COLOR/WAVELENGTH 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

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