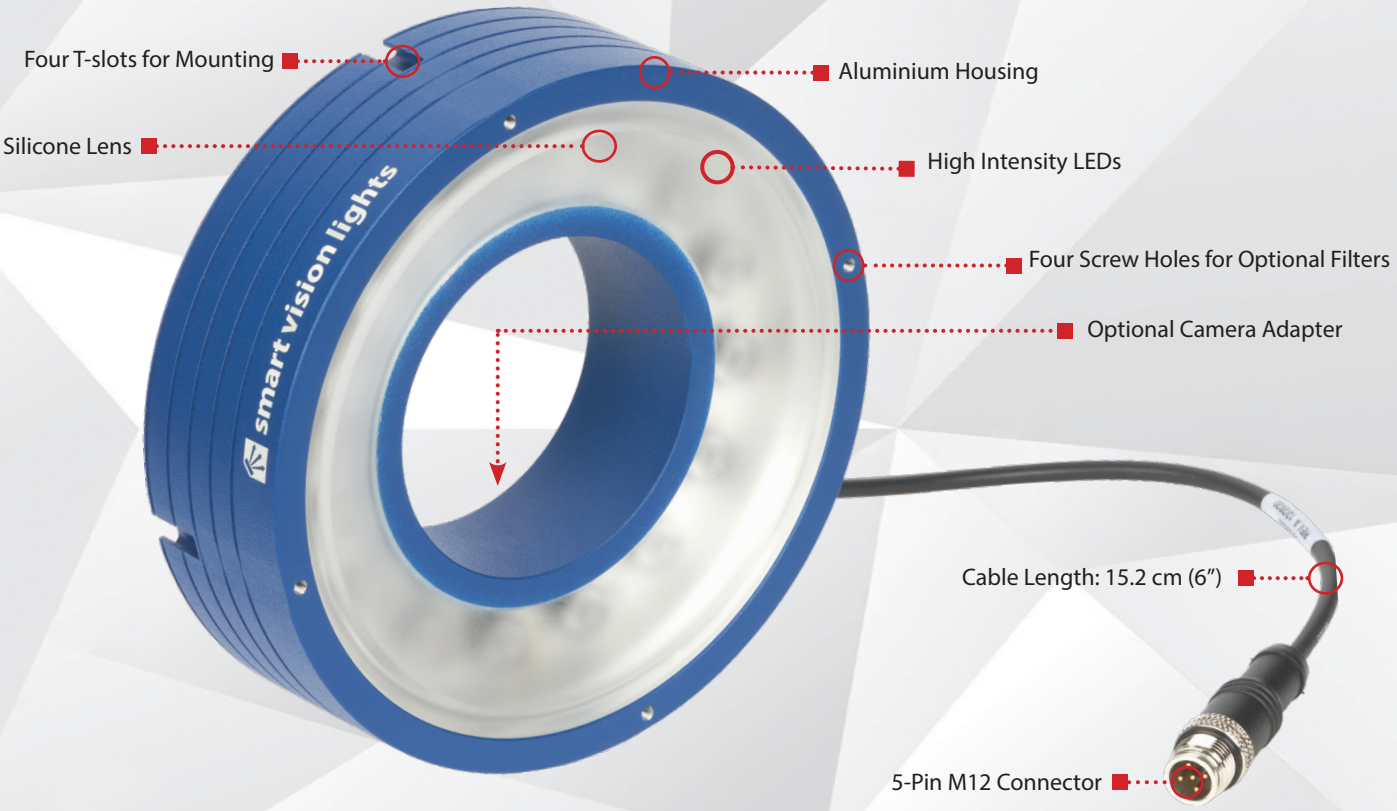
smart vision lights

RMX140 *Ring Light*

MULTI-DRIVE™

PRODUCT DATA SHEET



multi drive™

Warranty	Tested	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™ strobe mode
- ✓ Silicone lens offers high transmission across a broad spectrum
- ✓ PNP and NPN strobe input
- ✓ Over-current protection
- ✓ 5-pin M12 quick connect

PRODUCT DESCRIPTION

The built-in driver on the RMX140 Series features Multi-Drive™, which allows the user to operate the light in constant operation or OverDrive™ strobe mode depending on the wiring method. The industry-standard 5-pin M12 connector makes for simple wiring. The 1–10 V analog signal line gives the user total control over intensity in continuous operation mode. Grounding the signal will put the light into OverDrive™ strobe mode. The silicone lens offers high-transmission across a broad spectrum.

PRODUCT SPECIFICATIONS

	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Electrical Input	24 V DC +/- 5%	
Input Current	Max. 510 mA	Peak 4.5 A during strobe
Input Power	Max. 12.5 W	Peak 108 W during strobe
PNP Trigger	2.8 mA @ 4 V DC | 8.8 mA @ 12 V DC | 13.4 mA @24 V DC	
NPN Trigger	14.4 mA @ Ground (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	Minimum 30 us | Maximum ∞	Minimum 30 us | Maximum 50 ms
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
Connection	5-pin M12 connector	
Operating Temperature	-10° - 40° C (14° - 104° F) | RH max 80% non-condensing humidity	
Storage Temperature	-20° to 70° C | RH max 80% non-condensing humidity	
IP Rating	IP65	
Weight	365 g	
Compliances	CE, RoHS, IEC 62471	
Warranty	10 years*	

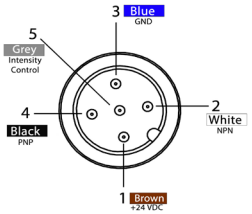
*See SmartVisionLights.com/warranty for more information

RESOURCE CORNER

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

WIRING CONFIGURATION

CONTINUOUS OPERATION MODE



Pin layout for light (male connector)

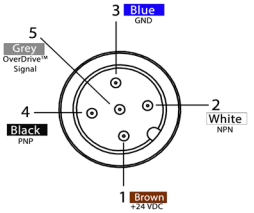
Pins	Function	Signal	Wire Color
1	Power In	+24VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10 V DC**	GREY*

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 non-repeatable lighting.
(See Product Specifications for requirement.)

** 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).*

OVERDRIVE™ STROBE 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*

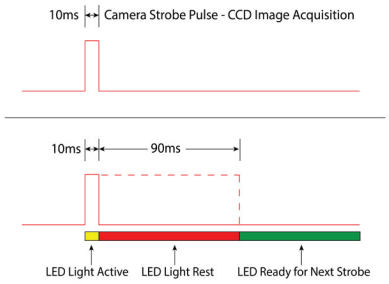
Failure to supply light with correct input current will result in non-repeatable lighting
(See Product Specifications for requirement.)

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

DUTY CYCLE (OVERDRIVE™ MODE ONLY)

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

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

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

$$0.1 = 0.0001 \times 1000$$

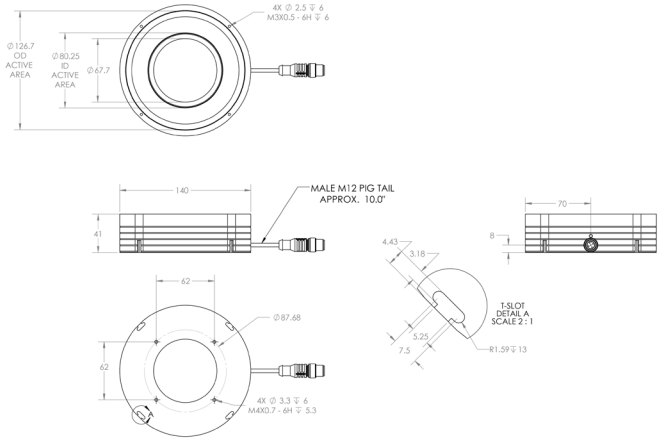
Duty Cycle is 10% (0.1)

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.

PRODUCT DRAWING

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



LIGHT PATTERNS

Smart Vision Lights recommends the RMX140 be used at a working distance between 100 mm to 500 mm.

LIGHTING PATTERN FOR THE RMX140 **with Narrow 10° Lenses**

Continuous Operation Mode	
Typical Output Performance	Illuminance (Lux)
Distance = 200 mm	34,000
Illuminance measurement taken on White Light — 5700K	

OverDrive™ Mode	
Typical Output Performance	Illumination (Lux)
Distance = 200 mm	272,000
Illuminance measurement taken on White Light — 5700K	

LIGHTING PATTERN FOR THE RMX140 **with Narrow 30° Lenses**

Continuous Operation Mode	
Typical Output Performance	Illuminance (Lux)
Distance = 150 mm	40,000
Illuminance measurement taken on White Light — 5700K	

OverDrive™ Mode	
Typical Output Performance	Illumination (Lux)
Distance = 150 mm	320,000
Illuminance measurement taken on White Light — 5700K	

LIGHTING PATTERN FOR THE RMX140 **with Standard 50° Lenses**

Continuous Operation Mode	
Typical Output Performance	Illuminance (Lux)
Distance = 120 mm	25,000
Illuminance measurement taken on White Light — 5700K	

OverDrive™ Mode	
Typical Output Performance	Illumination (Lux)
Distance = 120 mm	200,000
Illuminance measurement taken on White Light — 5700K	

LIGHTING PATTERN FOR THE RMX140 **with Wide 80° Lenses**

Continuous Operation Mode	
Typical Output Performance	Illuminance (Lux)
Distance = 100 mm	35,000
Illuminance measurement taken on White Light — 5700K	

OverDrive™ Mode	
Typical Output Performance	Illumination (Lux)
Distance = 100 mm	280,000
Illuminance measurement taken on White Light — 5700K	

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.

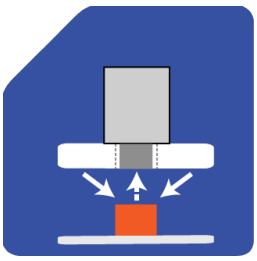
The Multi-Drive feature allows the user to run the light continuously or in OverDrive at the maximum allowed intensity by simply setting the product configuration. OverDrive operation has **up to five times** the power of continuous operation.

SAFESTROBE™ TECHNOLOGY

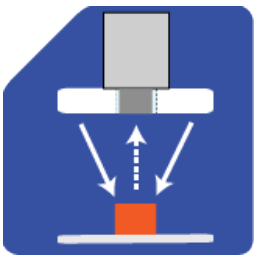
SafeStrobe™ is a unique technology that applies safe working parameters to ensure high current LEDs are not damaged by driving them beyond their limits, such as maximum strobe time or duty cycle. This is especially beneficial for overdriving our high current LEDs.

ILLUMINATION

RMX140 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, 850, and 940.

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, 505, 530, and WHI.

Caution

Risk Group 2: UV emitted from this product. Eye or skin irritation may result from exposure. Use appropriate shielding. Does not pose optical hazard if aversion responses limit exposure. Applicable for wavelengths: 365 and 395

PART NUMBER

RMX140 – □□□ – □□□

COLOR:

LENS:

Leave blank for Standard (50°)

N10 = Narrow (10°)

N30 = Narrow (30°)

W80 = Wide (80°)

Additional wavelengths available upon request
365 and 395 only available in 10° and 30° lenses

Part Number Examples:

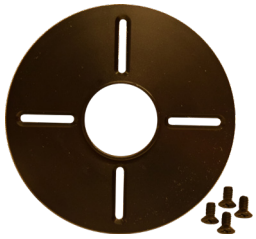
RMX140-625	(RMX140, 625 nm Red Wavelength)
RMX140-WHI-N10	(RMX140, 625 nm Red Wavelength, 10° Narrow lenses)

MOUNTING

Mounting options include four T-slots and four M4 threaded holes on the RMX140.

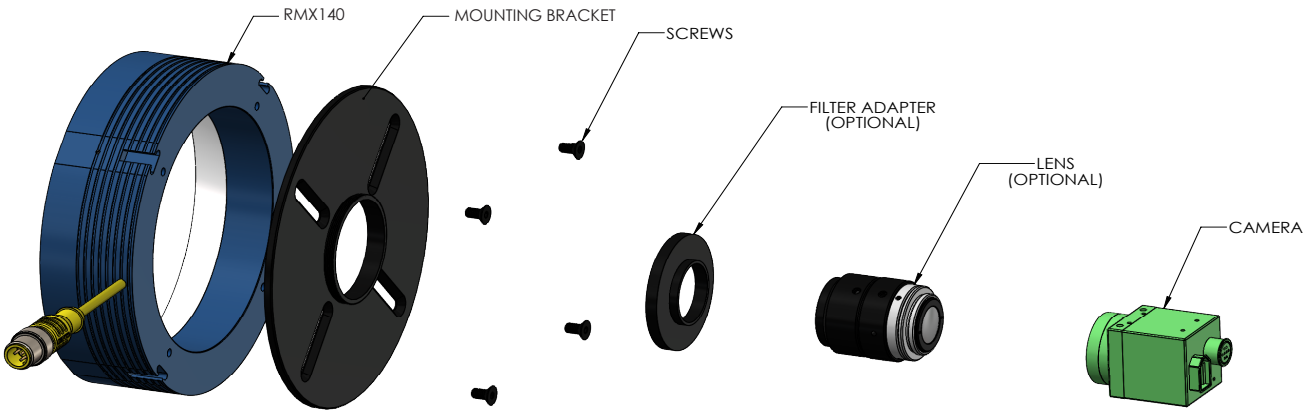
Hardware included with light:
(2) M4 x 8 mm screws (Hex)
(2) M5 x 10 mm screws (Hex)
(2) M5 T-Nuts

Optional Mounting Equipment



The **optional ADP0002-KIT** can be used to mount a camera or lens directly to the RMX140.

CAMERA MOUNTING ADAPTER



ACCESSORIES

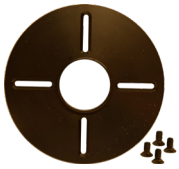
Step-Up Kits

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

Mounting Bracket



Description	Part Number
Camera Mount	ADP0002-KIT

Mounting Bracket

Description	Part Number
Mount Bracket	BKT0030-KIT

Camera Adapter

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

Power Cables

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

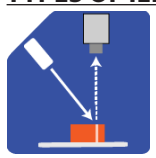
GLOSSARY

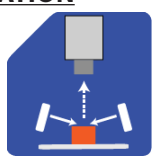
This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific light.

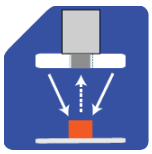
TERMINOLOGY

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 of 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.
Diffuser Used to widen the angle of light emission, reduce reflections, and increase uniformity.

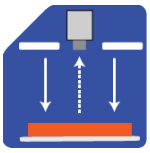
TYPES OF ILLUMINATION

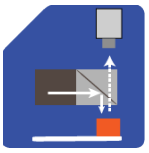

Projector

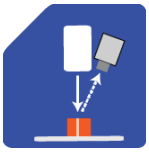

Dark Field

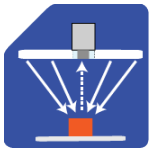

Radial

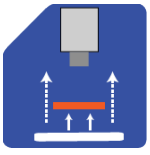
Bright Field


Direct


Axial

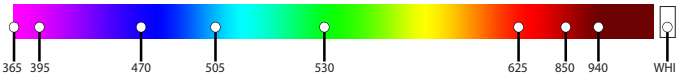

Line


Diffuse Panel


Backlight

COMMON COLOR/WAVELENGTHS LEGEND

Wavelengths 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 SHORTWAVE **INFRARED**

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

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

Authorized Distributor

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919-545-2500

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Pittsboro, NC 27312