

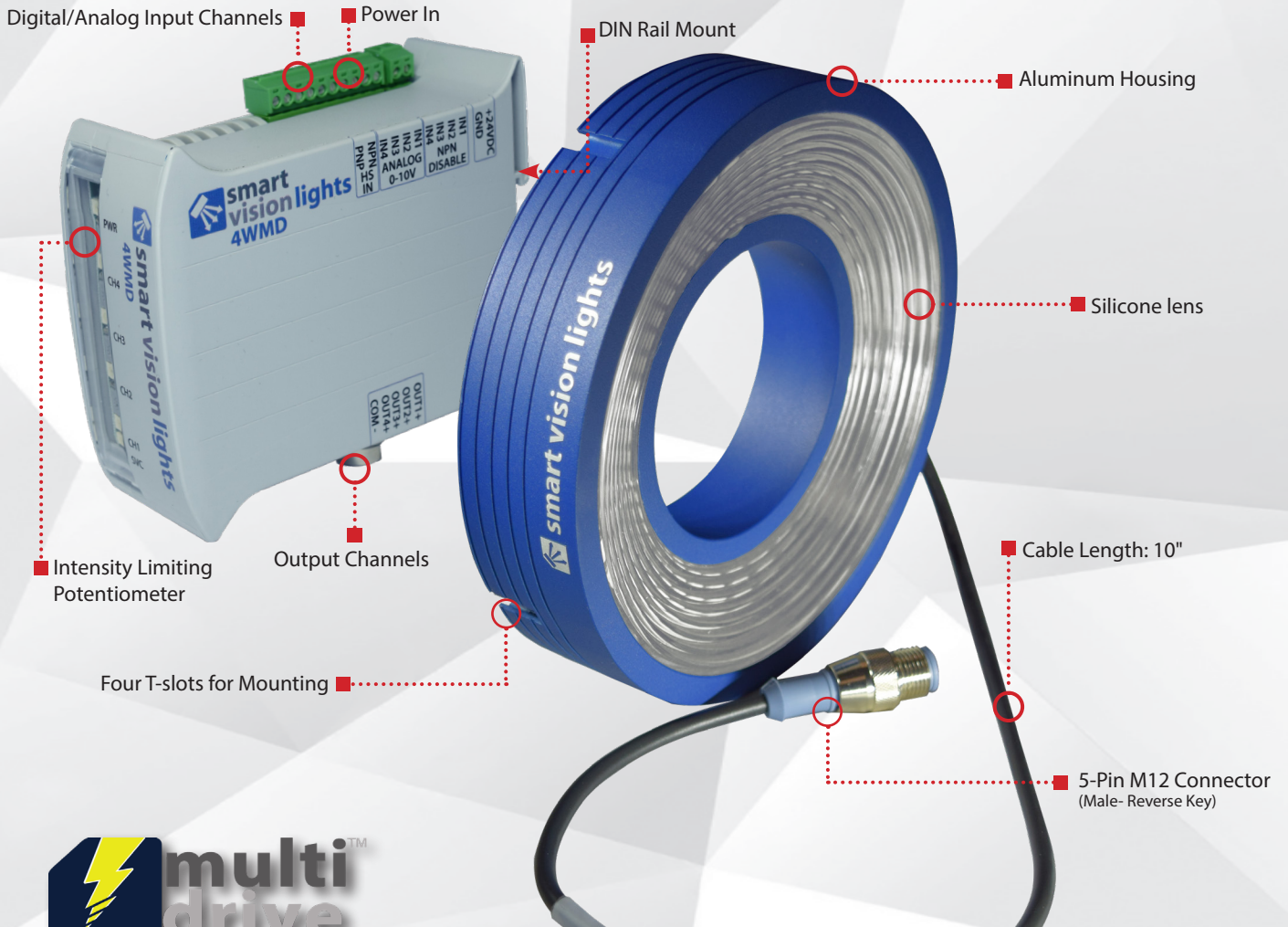


**smart
vision lights**

RMX140-RGBW *Miniature "Mini"* RING LIGHT KIT

RGBW LIGHT / DRIVER

P R O D U C T D A T A S H E E T



Warranty 10 YEAR	Tested IEC 62471	Compliant CE RoHS	Rated IP 65*	Connector 5-PIN M12
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*Light only, 4WMD not IP rated

PRODUCT HIGHLIGHTS

- ✓ Kit includes the RMX140-RGBW AND 4WMD-250 for tuning individual wavelengths
- ✓ PNP and NPN high speed trigger signal input
- ✓ 5-pin M12 quick connect (reverse key)
- ✓ Silicone lens
- ✓ Over-current protection





PRODUCT DESCRIPTION

RMX140 (RGBW)

The compact and powerful RMX140-RGBW Mini Ring Light is a small to mid-range working distance ring light. The RMX140-RGBW series features an aluminum housing and is IP65 rated. Each wavelength can be tuned independent of the other wavelengths, allowing for the light to output any color.

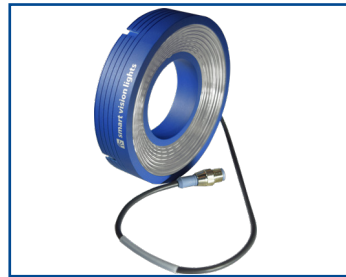
4WMD

The 4WMD permits up to four independent channels to be tuned individually. The 4WMD has independent tuning controls and built-in Multi-Drive™, allowing for the intensity range to be set from 10%–100% for continuous operations or OverDrive™ strobe mode. In addition, when in continuous operation mode, the intensity can be adjusted using the analog signal line. Disabling a channel will turn off the wavelength tied to that channel. Each output channel has its own tuning control located on the front of the driver.



WHAT'S INCLUDED

When you order a RMX140-RGBW the following item is included:



RMX140
RING LIGHT

When you order a RMX140-RGBW-KIT the following items are included:



RMX140
RING LIGHT

+



4WMD-250
DRIVER



RESOURCE CORNER

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



PRODUCT SPECIFICATIONS

RMX140-RGBW

PER CHANNEL	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Maximum LED Input Current	100 mA	1.0 A
Input Connector	5-pin M12 connector (male — reverse-key)	
Strobe	Not applicable	Max. 50 ms
Duty Cycle	Not applicable	Max. 10%
Ambient Temperature	0°–45°C (32°–114°F)	
Weight	~365g	
IP Rating	IP65	
Warranty	10 year. For complete warranty information, visit smartvisionlights.com/warranty	
Compliances	CE, RoHS, IEC 62471	

NOTE:

The RMX140-RGBW requires an external driver, such as the recommended 4WMD-250.

4WMD-100 Driver

PER CHANNEL	Standard
Electrical Input	24VDC +/- 5%
Electrical Input Connector	2-position screw terminal blocks – 14 AWG max wire size
Input Current	Max. 800 mA
Input Power	Max. 19.2 W
Operating Current (No Load)	70 mA
Number of Input Channels	4
Input Connector	10-position screw terminal block – 14 AWG max wire size (4 for channel control, 4 for analog, and 2 for PNP/NPN strobing/trigger)
Trigger Input	PNP trigger: +4VDC or greater to activate (max 26VDC) NPN trigger: GND (<1VDC) to activate
Input Channel Current	PNP input: 4 mA @ 4VDC 10 mA @ 12VDC 20 mA @ 24VDC NPN input: 15 mA @ Ground (0VDC)
Analog Intensity	Continuous Operation: The output is adjustable from 10%–100% of intensity by applying 1–10VDC signal OverDrive™ Strobe Mode: Apply 0VDC
Output Channels	4 channels for LED tuning control
Output Connectors	One 5-pin M12 reverse-key connector 5-position screw terminal block – 14 AWG max wire size
Indicator Lights	Power on = Green light Individual channels = Yellow light Service = Red light
Mounting	DIN rail
Dimensions	H = 102 mm (4.0"), L = 119 mm (4.7"), W = 45 mm (1.8")
Operating Temperature	-10° - 40° C (14°-104° F) RH max 80% non-condensing humidity
Ambient Humidity	0%–95% noncondensing
Weight	~233 g
Compliances	CE, RoHS
Terminal Block Plugs (Included with 4WMD)	2-position terminal block plug 5-position terminal block plug 10-position terminal block plug
Warranty	3 year. For complete warranty information, visit smartvisionlights.com/warranty

TOTAL INPUT PER UNIT (MAX)	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Input Current	440 mA	3.4 A
Input Power	10.5 W	82 W

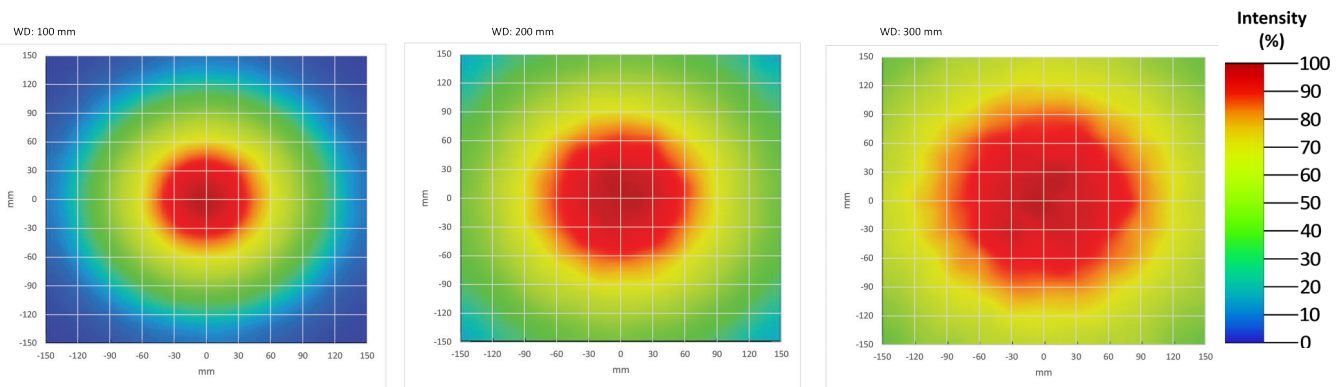


WORKING DISTANCE

Smart Vision Lights recommends using the RM140-RGBW at a working distance between 100 mm and 500 mm.

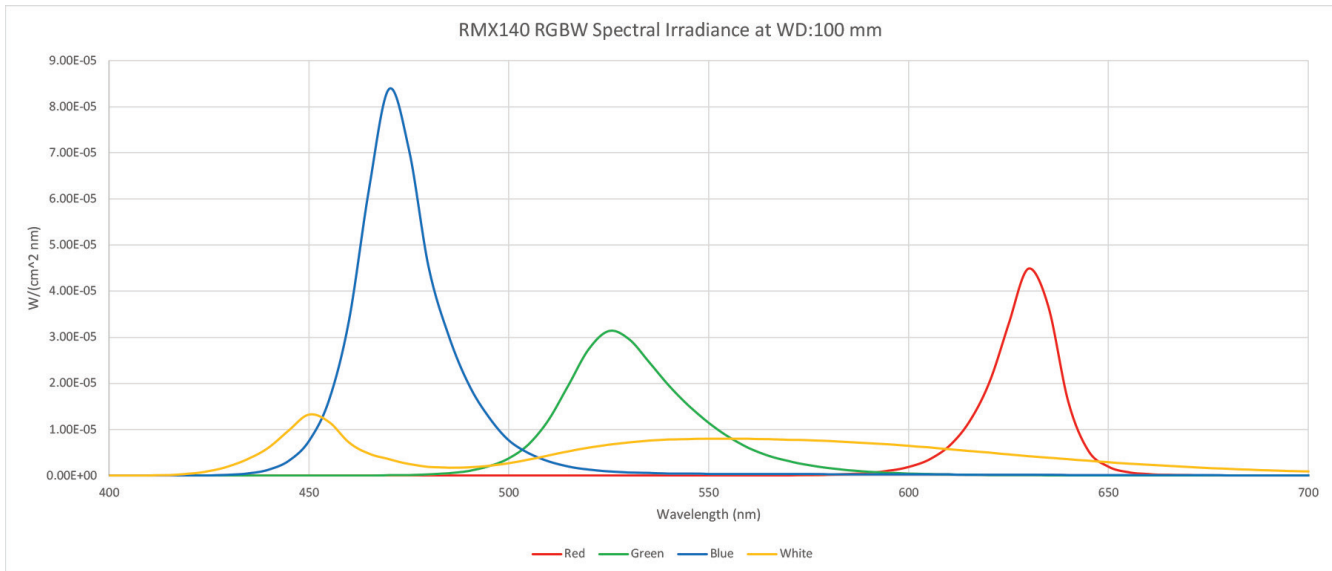


LIGHT PATTERNS



Color Channel	CIE 1931		Approximate values at WD 100mm			
	x	y	CCT	Dominant Wavelength (nm)	Irradiance (mW/cm ²)	Illuminance (Lux)
Red	0.695	0.305	-	622	0.9	1870
Green	0.208	0.733	-	535	1.2	6427
Blue	0.125	0.097	-	474	4.2	1936
White	0.337	0.359	5340	560	2.1	4372

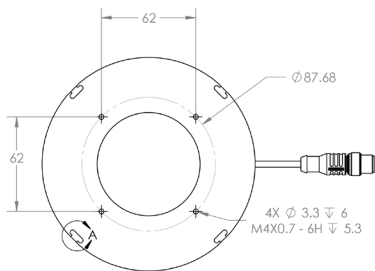
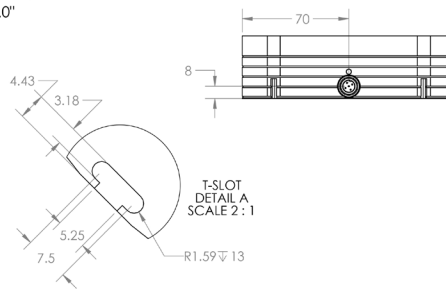
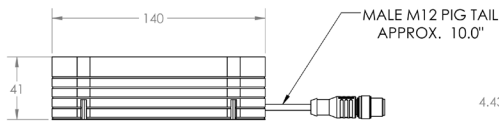
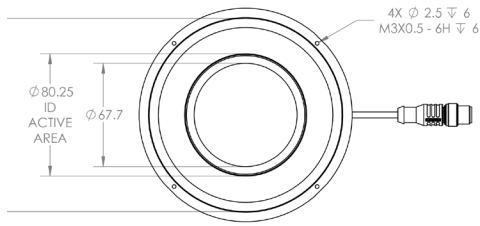
*Based on a working distance of 100 mm



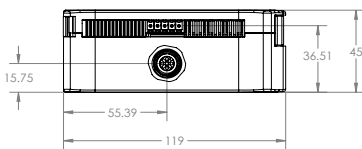
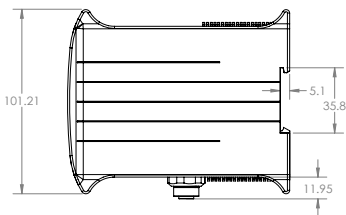
PRODUCT DRAWING

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

RMX140-RGBW

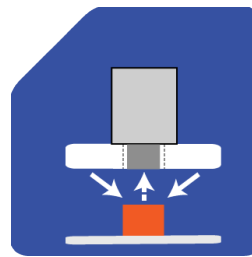


4WMD-250

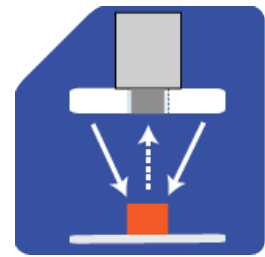


ILLUMINATION

RMX140-RGBW Series of Ring Lights works best for:



Dark Field



Radial

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: 470, 530, 625 and WHI when all four wavelengths are on at the same time.



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 when using maximum strobe time or duty cycle. SafeStrobe™ is especially beneficial when overdriving our high-current LEDs.



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.



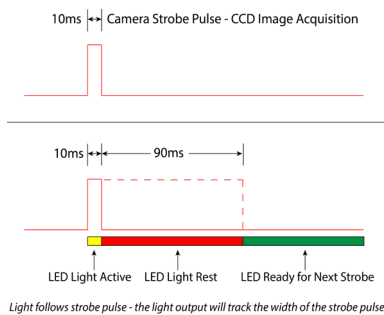
The Multi-Drive™ feature allows the user to run the light continuously or in OverDrive™ at the maximum allowed intensity by simply setting the product configuration. OverDrive™ strobe mode has **up to ten times** the power of continuous operation.



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).



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 (strokes per second)
ST = Strobe Time (seconds)
D = Duty Cycle

Example

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

Strobe Rate is 1000 strokes per second

Calculating Duty Cycle

$$D = ST \times SR$$

SR = Strobe Rate (strokes 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)

Note: Strobe time is limited by the strobe rate.



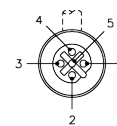
OUTPUT CONFIGURATION

Using the Reverse-Key 5-pin M12 Connector

When connecting a Smart Vision Lights™ RGBW light to the 4WMD, a reverse-key 5-pin M12 cable is required. All Smart Vision Lights™ RGBW lights come equipped with a 5-pin reverse-key connector.

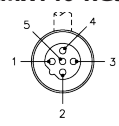
With very little wiring needed, the reverse-key 5-pin M12 connector simplifies connecting lights to the 4WMD.

4WMD



Reverse-Key 5-pin M12 Connector (female)

RMX140-RGBW



Reverse-Key 5-pin M12 Connector (male)

5-pin M12 Connectors Pin Layout

Pin	Channel	Color
1	Common	Brown
2	1	White
3	2	Blue
4	3	Black
5	4	Gray

NOTE:

Smart Vision Lights™ uses reverse-key cables that have a blue-grey tip on the connectors. A 2 meter version of the cable is included when ordered (Part number: 5PM12-J2000-KR)



DISABLE A CHANNEL

If one or more wavelengths are not needed, the channels associated with the wavelength can be disabled. Disabling a channel will turn off the wavelength. To disable a channel, connect that channel to ground (GND).

Example: To disable channel 4, connect NPN Disable IN 4 to GND.

Input Connectors (top of 4WMD)

HS IN		Analog 0–10 V				NPN Disable				Power In	
PNP	NPN	IN 4	IN 3	IN 2	IN 1	IN 4	IN 3	IN 2	IN 1	GND	+24V DC
□	□	□	□	□	□	□	□	□	□	□	□

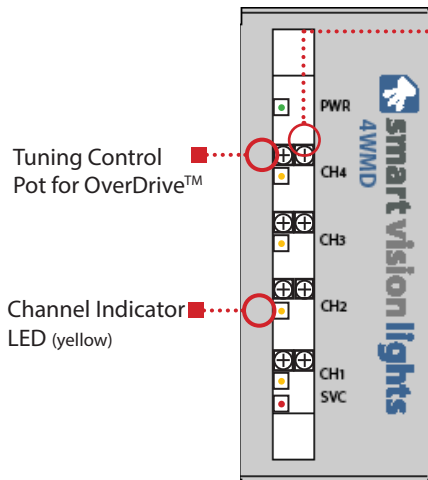
NOTE:

All channels are enabled by default.

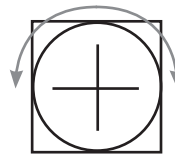


TUNING WAVELENGTHS

The 4WMD allows for the tuning of up to four individual wavelength intensities. Depending on its configuration, a channel can tune the output intensity of a given wavelength for either continuous operation or OverDrive™ strobe mode. Each channel can be tuned for continuous operation or OverDrive™ strobe mode. **Continuous operation and OverDrive™ cannot be used simultaneously.** Each channel has a yellow indicator light that illuminates when the channel is active.



Tuning Control Pot for Continuous



270° turn pot

Clockwise = Increase intensity

Counterclockwise = Decrease intensity

NOTE:

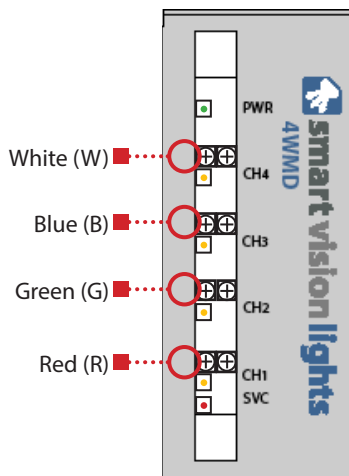
When in continuous operation, channel intensity can be individually adjusted using 1–10V DC on the analog input.

For maximum intensity, analog input can be tied to 24V DC.



WAVELENGTH ASSIGNMENT

When connecting the RMX140-RGBW to the 4WMD, wavelength are set to be controlled as followed.



Pin	Channel	Wavelength
1	-	-
2	1	White (W)
3	2	Blue (B)
4	3	Red (R)
5	4	Green (G)



PART NUMBER

RMX140 – RGBW –



KIT

Kit includes light and external driver

Part Number Examples:

- RMX140-RGBW** RMX140-RGBW (light only)
- RMX140-RGBW-KIT** RMX140-RGBW light and 4WMD-100 external driver



MOUNTING THE RMX140-RGBW

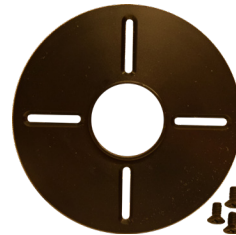
Mounting options include four T-slots and four M4 threaded holes on the RMX140-RGBW.

Hardware included with light:

- (2) M4 x 8 mm screws (hex)
- (2) M5 x 10 mm screws (hex)
- (2) T-nuts



Optional Mounting Equipment



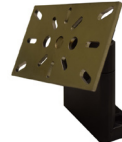
The **optional ADP0002-KIT** can be used to mount a camera or lens directly to the RMX140-RGBW.

Optional Camera Mounts

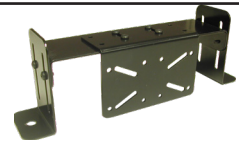
Easily mount your camera with RMX140-RGBW attached to any fixture using one of these brackets.



BKT0030



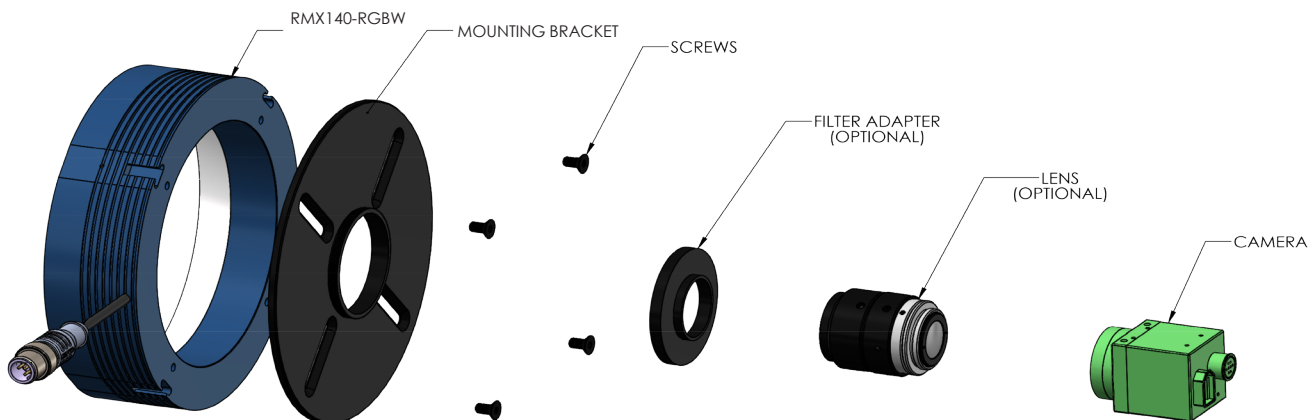
PB30-M10



BKT0006




CAMERA MOUNTING ADAPTER FOR RMX140-RGBW

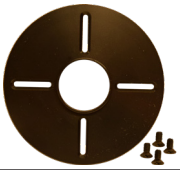





ACCESSORIES


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

Jumper Cable	
	
Lengths	Part Number
2000 mm	5PM12-J2000-KR



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.

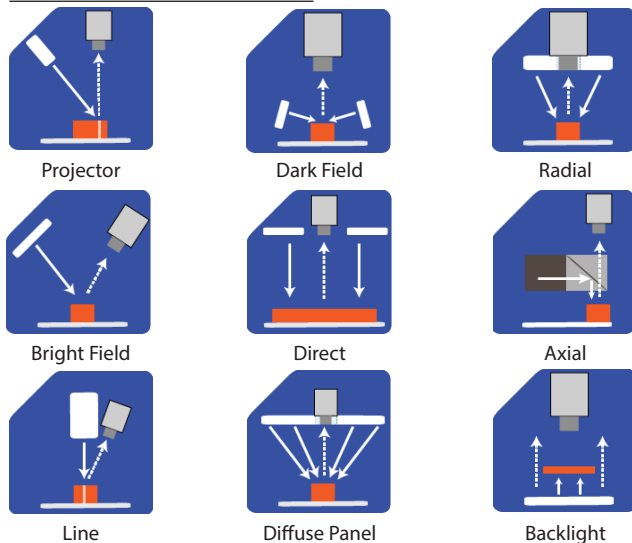
Built-In Driver The built-in driver allows full function without the need of an external controller.

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.

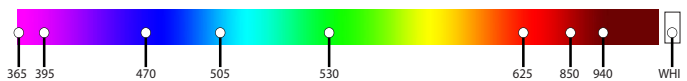
Diffuser Used to widen the angle of light emission, reduce reflections, and increase uniformity.

TYPES OF ILLUMINATION



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.



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.