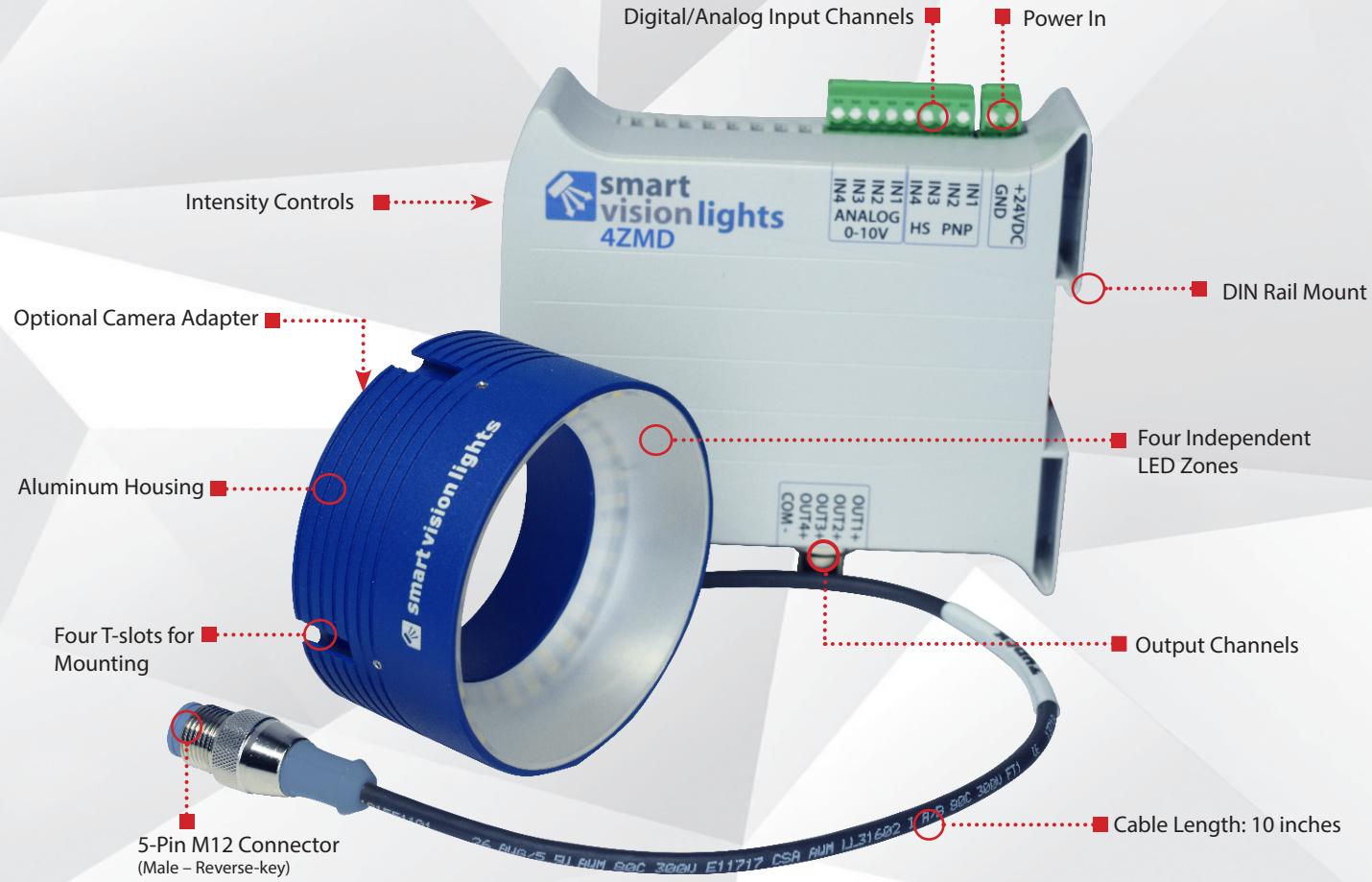
RM75-4Z *Miniature "Mini"* RING LIGHT KIT

FOUR-ZONE LIGHT

PRODUCT DATA SHEET



RM75-4Z-KIT includes the light and 4ZMD-100.

Warranty	Compliant	Compliant	Rated	Connector
10 YEAR*	IEC 62471	CE RoHS	IP 50*	5-PIN M12

* see page 3 for details.

PRODUCT HIGHLIGHTS

- ✓ Independently control four individual zones built into a single light
- ✓ Kit available that includes the 4ZMD-100 driver for adjusting individual zones intensity
- ✓ Built-in individual intensity control channels for either continuous operation or OverDrive™ strobe mode
- ✓ PNP high-speed strobe input
- ✓ Built-in over-current protection
- ✓ 5-pin M12 (reverse-key)

PRODUCT DESCRIPTION

RM75-4Z

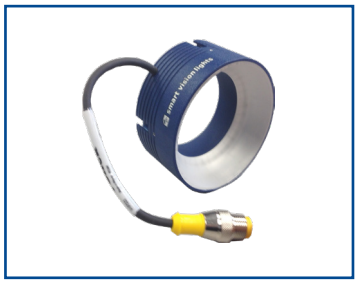
The compact and powerful RM75-4Z Mini Ring Light is a low-angle ring light that provides a blended angle for a broad range of lighting. The RM75-4Z has four zones, making it a quadrant light that can have each individual zone controlled independently of one another.

4ZMD-100

The 4ZMD is an external driver that permits control of up to four separate light zones either independently or simultaneously, in any combination. The 4ZMD has independent intensity controls and built-in Multi-Drive™, allowing a range to be set from 10%–100% for continuous operation or OverDrive™ strobe mode. **The maximum continuous current for the 4ZMD-100 is 100 mA when connected to the RM75-4Z.**

WHAT'S INCLUDED

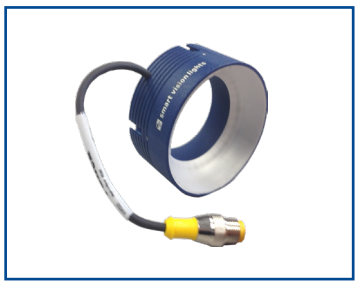
When you order a RM75-4Z mini ring light, such as the RM75-4Z-WHI, the following item is included:



RM75-4Z requires an external constant current driver with maximum 100 mA per channel.

RM75-4Z
MINI RING LIGHT

When you order a RM75-4Z mini ring light kit, such as the RM75-4Z-WHI-KIT, the following items are included:



+

RM75-4Z
MINI RING LIGHT

4ZMD-100
DRIVER

RESOURCE CORNER

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

PRODUCT SPECIFICATIONS

RM75-4Z

PER ZONE	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Input Current	100 mA	1.0 A Peak during Strobe Maximum: strobe duration = 50 ms , Duty cycle = 10%
Input Connection	5–pin M12 connector (male – reverse-key)	
Operating Temperature	-10° - 40° C (14°-104° F) | RH max 80% non-condensing humidity	
Storage Temperature	-20° - 70° C (-4°-158° F) | RH max 80% non-condensing humidity	
Weight	~135 g	
IP Rating	IP65	
Warranty	10 years	
Compliances	CE, RoHS, IEC 62471	

4ZMD

OUTPUT PER CHANNEL	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Electrical Input	24VDC +/- 5%	
Input Current	Max. 440 mA	Max. 3.3 A
Input Power	Max. 10.6 W	Max. 79.2 W
Operating Current (No Load)	70 mA	
Electrical Input Connector	2-position screw terminal block — 14 AWG max wire size	
Number of Input Channels	4	
Input Connector	8-position screw terminal block — 14 AWG max wire (4 for PNP and 4 for analog)	
Input Channel Current	PNP input: 2.8 mA @ 4VDC | 8.8 mA @12VDC | 17.6 mA@ 24VDC	
Strobe Duration	Min. 10 µs | Max. ∞ ms	Min. 10 µs | Max. 50 ms (see SafeStrobe™ Technology for more information)
Duty Cycle	N/A	Max. 10% (see Duty Cycle for more information)
Analog Intensity	The output is adjustable from 10%–100% of intensity limit by applying 1–10VDC signal	OverDrive™ Strobe Mode: Apply 0 VDC
Output Channels	4 channels for light zones	
Output Connector	5-pin M12 connector (female – reverse-key)	
Status Indicator	Power on = Green light Individual channel = Yellow light Service = Red light	
Mounting	DIN rail	
Operating Temperature	-10° - 40° C (14°-104° F) | RH max 80% non-condensing humidity	
Storage Temperature	-20° - 70° C (-4°-158° F) | RH max 80% non-condensing humidity	
Weight	~230g	
Warranty	3 years*	
Compliances	CE, RoHS	

*See SmartVisionLights.com/warranty for more information

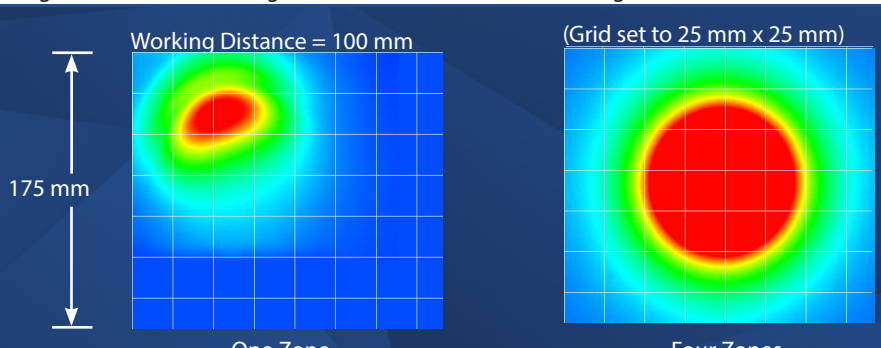
LIGHT PATTERNS

LIGHTING ILLUMINATION FOR THE RM75-4Z

Continuous Operation Mode		
Typical Output Performance	Illuminance (Lux)	
	1 Zone	All Zones
Distance = 100 mm	5500	20,000
Illumination measurement taken on White Light, 4800K		

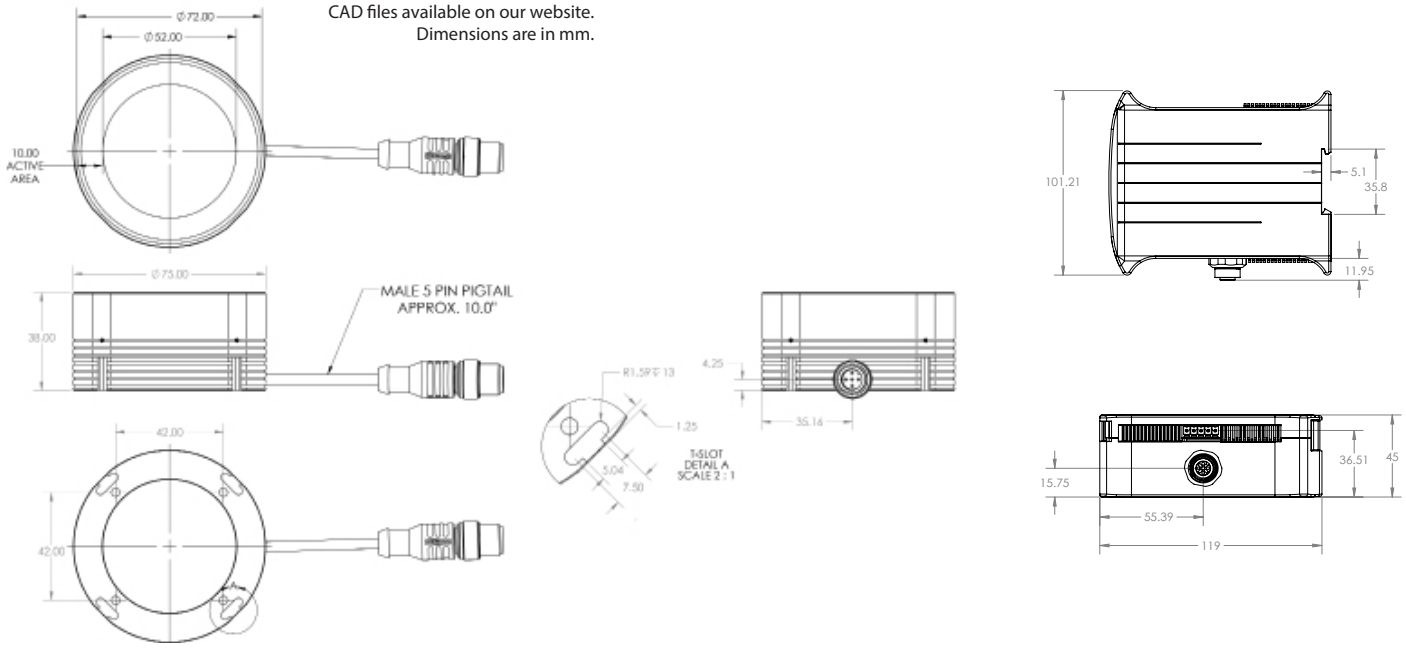
OverDrive™ Mode		
Typical Output Performance	Illuminance (Lux)	
	1 Zone	All Zones
Distance = 100 mm	55,000	200,000
Illumination measurement taken on White Light, 4800K		

Smart Vision Lights recommends using the RM75-4Z be used at a working distance between 50 mm and 200 mm.



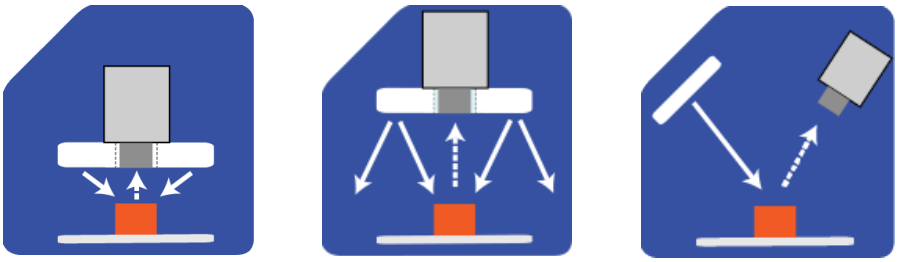
PRODUCT DRAWING

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



ILLUMINATION

RM75-4Z Series of Mini Ring Lights works best for:



Dark Field | Radial | Bright Field

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.

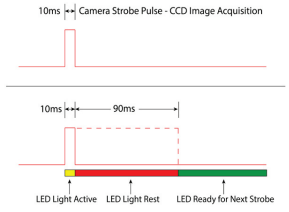
SAFESTROBE™ TECHNOLOGY

SafeStrobe™ 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. SafeStrobe™ is built into the 4ZMD.

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 (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.

OUTPUT CONFIGURATION

Using the Reverse-Key 5-pin M12 Connector

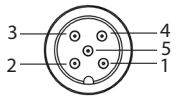
When connecting a Smart Vision Lights four-zone (quadrant) lights to the 4ZMD, a reverse-key 5-pin M12 cable is required. All Smart Vision Lights four-zone (quadrant) lights come equipped with a 5-pin reverse-key connector.

The reverse-key 5-pin M12 connector simplifies connecting lights to the 4ZMD , with very little wiring needed.

NOTE:

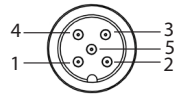
Smart Vision Lights uses reverse-key cables that have a blue-grey tip on the connectors.

4ZMD



Reverse-Key 5-pin M12 Connector
(female)

RM75-4Z



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	Green/Yellow

INPUT CONFIGURATION

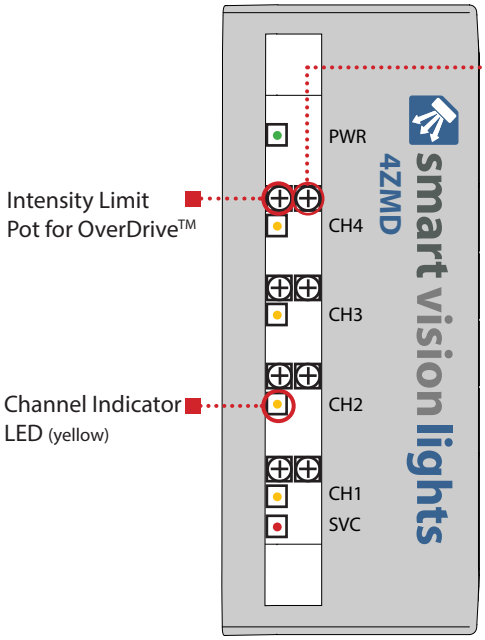
Using Input Terminal Block

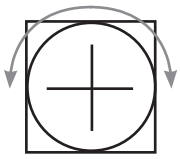
Input terminal block is also used when connecting to the LED Light Manager (LLM). Smart Vision Lights recommends using the cable provided (part number: IC-400) to connect the 4ZMD driver to the LLM.

LLM Output Channels	4ZMD Input Channels
DO1	PNP IN1
DO2	PNP IN2
DO3	PNP IN3
DO4	PNP IN4
DO5/AO1	Analog 1
DO6/AO2	Analog 2
DO7/AO3	Analog 3
DO8/AO4	Analog 4

ADJUSTING INTENSITY

The 4ZMD allows for the control of up to four individual channel intensity levels. Depending on how each channel is wired, its intensity can be adjusted for either continuous operation or OverDrive™ strobe mode. Each channel intensity can be adjusted either in continuous operation or OverDrive™ strobe mode, but not both modes simultaneously. Each channel has a yellow indicator light that will illuminate when the channel is active.





270° turn pot
Clockwise = Increase intensity limit
Counterclockwise = Decrease intensity limit

NOTE:

When in continuous operation, channel intensity can be individually adjusted using 1–10VDC on the analog input, within the limit set by the potentiometer

NOTE:

When managing the 4ZMD with the LED Light Manager (LLM), turn the intensity pots on the front of the 4ZMD fully clockwise to ensure intensity is completely controlled by the LLM.

UNDERSTANDING ZONES

The RM75-4Z has four individual built-in zones, making it a quadrant light. Each zone acts independently. Using the 4ZMD, zones can be set to continuous on, off, any intensity level in between, and even OverDrive™ strobe mode. Intensity levels can be set by programming the LLM to control the zone or by using the intensity controls on the front of the 4ZMD (see Managing Zones and Adjusting Intensity).

The RM75-4Z allows any combination of the four zones to be turned on at the same time, including adjacent and opposing zones.

One Zone | Two Zones | Three Zones | Four Zones | Opposing Zones

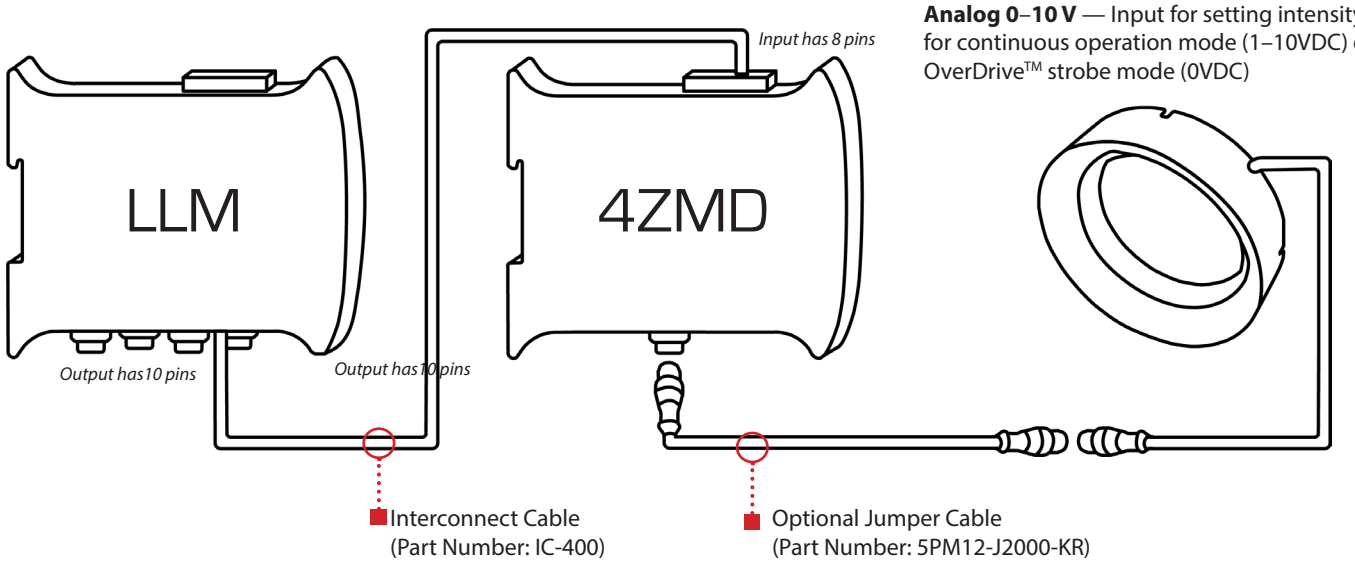
MANAGING ZONES

Connect the LLM to the 4ZMD driver. The LLM allows for easy control of each individual zone. The event programmed within the LLM can contain multiple sequences. Users can set each zone independently to continuous on, off, any intensity level in between, and even OverDrive™ strobe mode.

For more information about the LLM, visit smartvisionlights.com/products/llm.

WIRING CONFIGURATION

Input Channels for 4ZMD
Power In — Power source
HS PNP — High-speed PNP strobing/trigger
Analog 0–10 V — Input for setting intensity for continuous operation mode (1–10VDC) or OverDrive™ strobe mode (0VDC)



PART NUMBER

RM75-4Z – □□□ – □□□

COLOR:
WHI 470 530 625

KIT
Kit includes light and external driver

Additional wavelengths available upon request.
Individual parts can be ordered for replacement upon request.

Part Number Examples:

RM75-4Z-625	RM75-4Z, 625 nm red wavelength (light only)
RM75-4Z-625-KIT	RM75-4Z, 625 nm red wavelength and 4ZMD-100 external driver

MOUNTING THE RM75-4Z

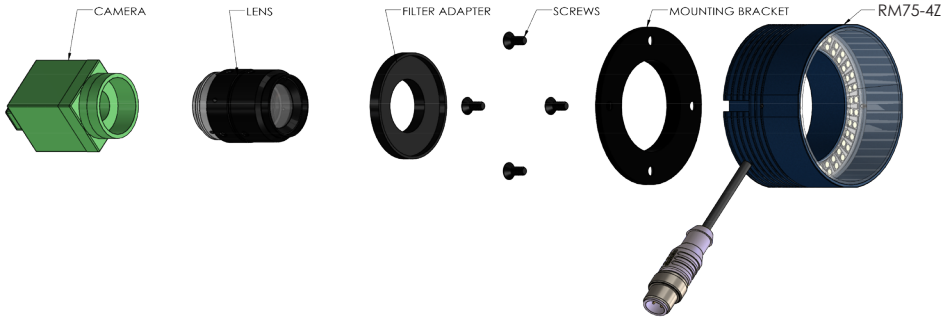
Mounting options include four T-slots and four M4 threaded holes on the RM75-4Z.

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 ADP0001-KIT** can be used to mount a camera or lens directly to the RM75-4Z.

CAMERA MOUNTING ADAPTER FOR RM75-4Z



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

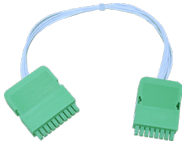
Step-Down Kits

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

Jumper Cable

Lengths	Part Number
2000 mm	5PM12-J2000-KR

Interconnect Cable*



Lengths	Part Number
400 mm	IC-400

*For connecting an LLM to the 4ZMD

Mounting Bracket

Description	Part Number
Camera Mount	ADP0001-KIT

Camera Adapter

Description	Part Number
Camera Adapter	DF55-46

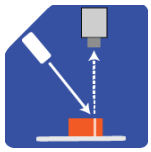
GLOSSARY

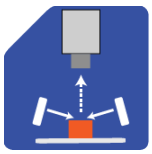
This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific light.

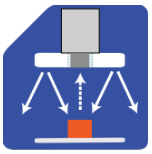
TERMINOLOGY

OverDrive™ Lights include an integrated high-pulse driver for complete LED light control. OverDrive™ light part numbers start with OD.
Continuous Operation Light stays 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.
Diffusers Used to widen the angle of light emission, reduce reflections, and increase uniformity.

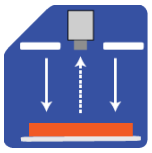
TYPES OF ILLUMINATION

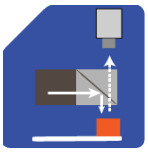

Projector

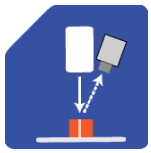

Dark Field

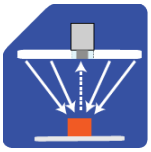

Radial

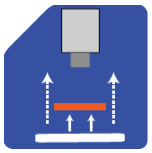

Bright Field


Direct


Axial

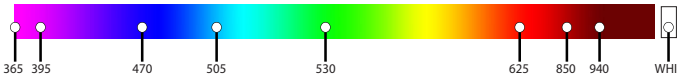

Line


Diffuse Panel


Backlight

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 SHORT WAVE **INFRARED**

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