RZL225 Ring Light
MULTI-DRIVE

T-Slot Mount

Aluminum Housing

Mechanically Adjustable LED Panels

143.64 mm X 53.64 mm Clear Aperture

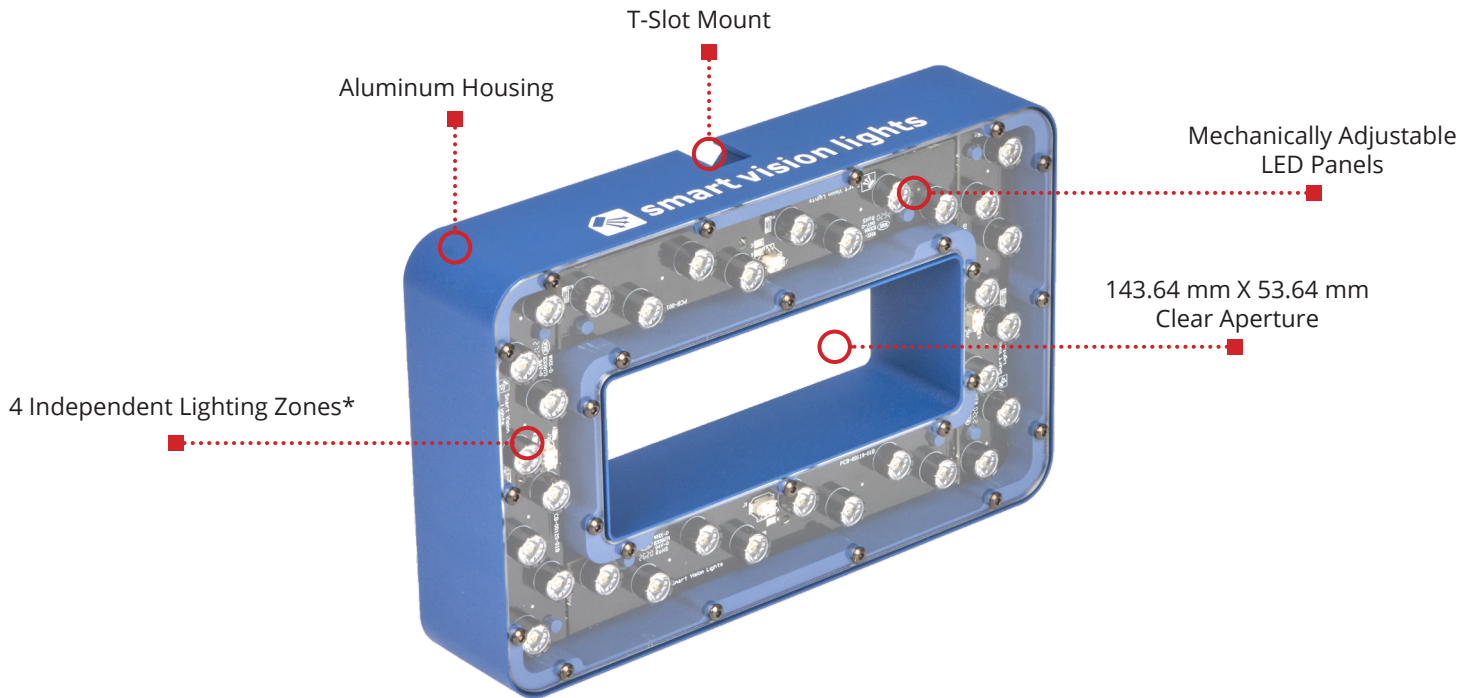4 Independent Lighting Zones*

The RZL225 ring light features mechanically adjustable field of view as well as 4-zone independent lighting control using SmartVisionLink™**. The integrated NanoDrive™ LED current driver provides user-selectable continuous and OverDrive™ lighting modes.

RZL225 HIGHLIGHTS

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

✔ Mechanically adjust illumination angle by up to 20 degrees

✔ 4 independently controlled zones

✔ SmartVisionLink-enabled to allow for easy intensity adjustment

✔ Greater flexibility when determining camera / light field of view

✔ Reduces the need for multiple lights

Smart VisionLink™

nano drive™

*Only while using the SmartVisionLink™ app
**SmartVisionLink requires purchase of the BTM-1000 bluetooth module

REV   03/31/21

SPECIFICATIONS

	Continuous Operation	OverDrive Operation
Electrical Input	24 VDC +/- 5%	
Input Current	Max. 1.8 A	Max. 12 A
Power	Max 43.2 W	Max. 288 W
PNP Trigger	4 mA @ 4VDC | 10 mA @ 12VDC | 20mA @ 24VDC	
NPN Trigger	15 mA @ Common (0VDC)	
Trigger Input	PNP > +4 VDC (24 VDC max.) to activate **or** NPN ≥ GND (<1VDC) to activate **(not both)**	PNP > +4 VDC (24 VDC max.) to activate **or** NPN ≥ GND (<1VDC) to activate **(not both)**
OverDrive Mode	**Not applicable**	Connect pin 5 to GND (See wiring configuration for more information)
Strobe Duration	Min. 1 μs | Max. ∞	Min. 1 μs | Max. 50 ms
Duty Cycle	**Not applicable**	Max. 10%
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	IP50 (IP65 available)	
Weight	1.2 kg	
Compliances	CE, FCC, RoHS, REACH, WEEE	
Warranty	10 years*	

See SmartVisionLights.com/warranty for details

WIRING CONFIGURATION

CONTINUOUS OPERATION MODE
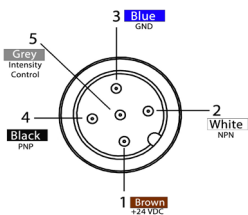
Pin layout for light (Male Connector)

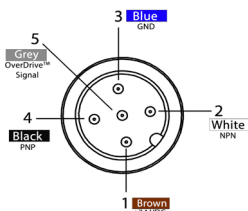| Pins	Function	Signal	Wire Color
1	Power In	+24 VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10 VDC	GREY

For maximum intensity, it is possible to tie pin 5 to pin 1 at +24VDC.
*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).*

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	+24 VDC	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 inconsistent lighting behavior.
(see Product Specifications for requirements)

LENSES

Additional lens options available upon request.

WIDE
Wide lenses are standard.
Wide, 30° angle lenses project a large area of illumination to create a floodlight effect for short working distances.

30°
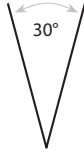
NARROW
Narrow lenses are optional.
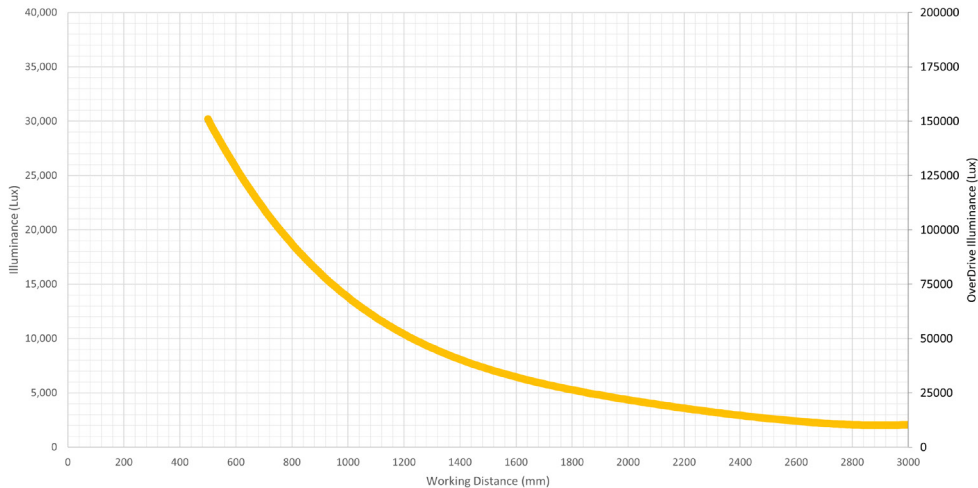Narrow, 14° angle lenses project a narrow beam of illumination and are used for long working distances.

14°

LIGHTING PATTERNS

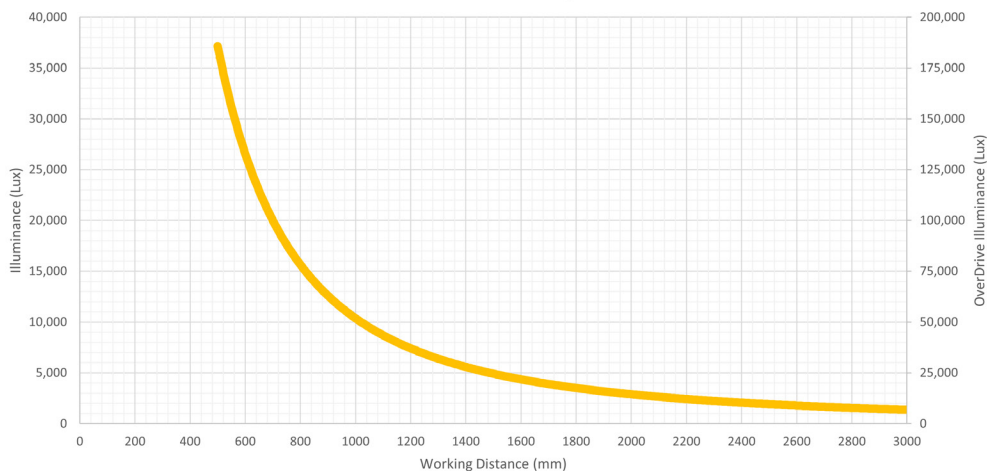Smart Vision Lights recommends the RZL225 be used at a working distance between 300 mm to 4000 mm.

N14 Lens, 0° Illumination Angle

Illuminance and Working Distance

W30 Lens, 0° Illumination Angle

Illuminance and Working Distance

BEAM PATTERNS*

Smart Vision Lights recommends the RZL225 be used at a working distance between 300 mm to 4000 mm.
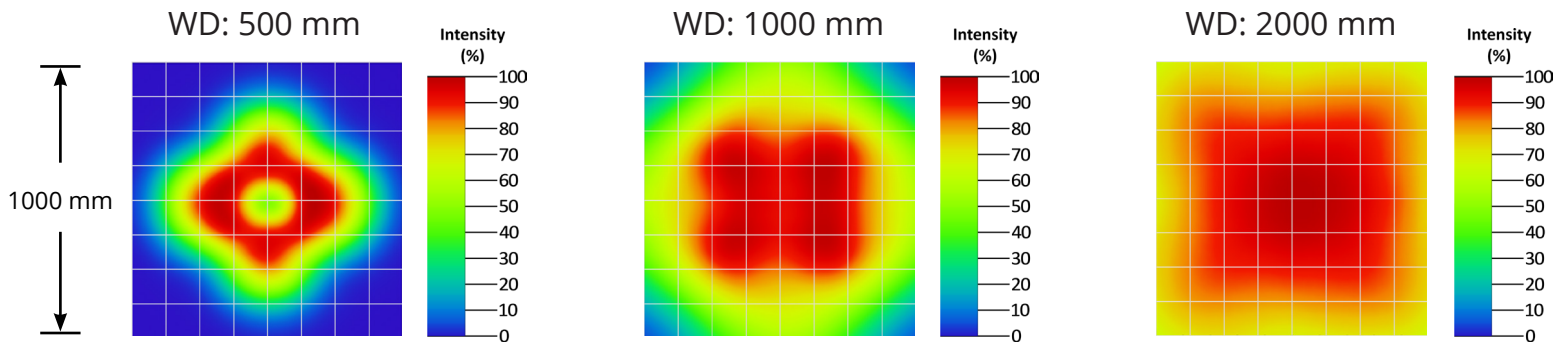*An expanded beam patern chart can be found on the RZL225 product page at SmartVisionLights.com/products/RZL225/*

ALL LIGHTING PATTERNS PRODUCED WITH EACH OF THE FOUR ZONES SET TO FULL INTENSITY
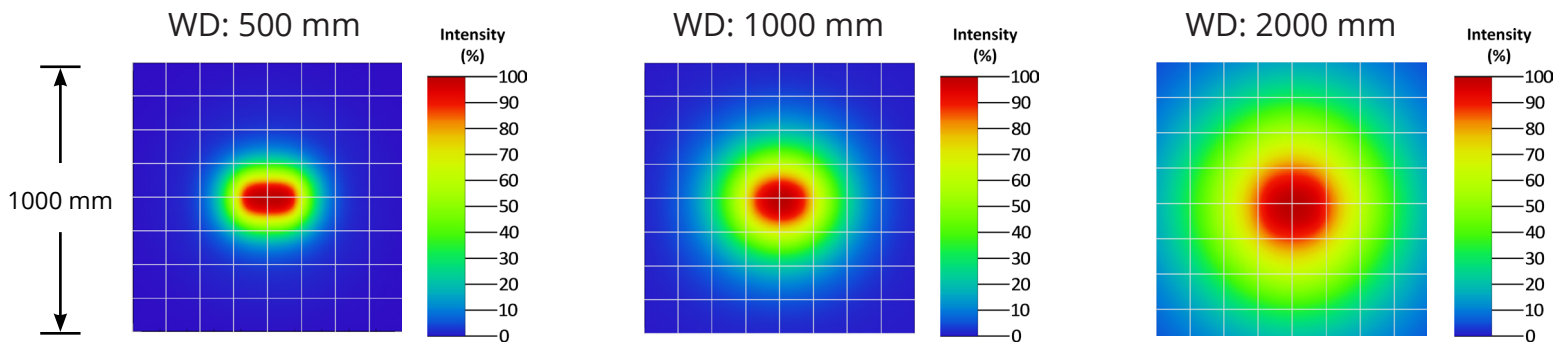
W30 Lens, 0° Illumination Angle

WD: 500 mm WD: 1000 mm WD: 2000 mm
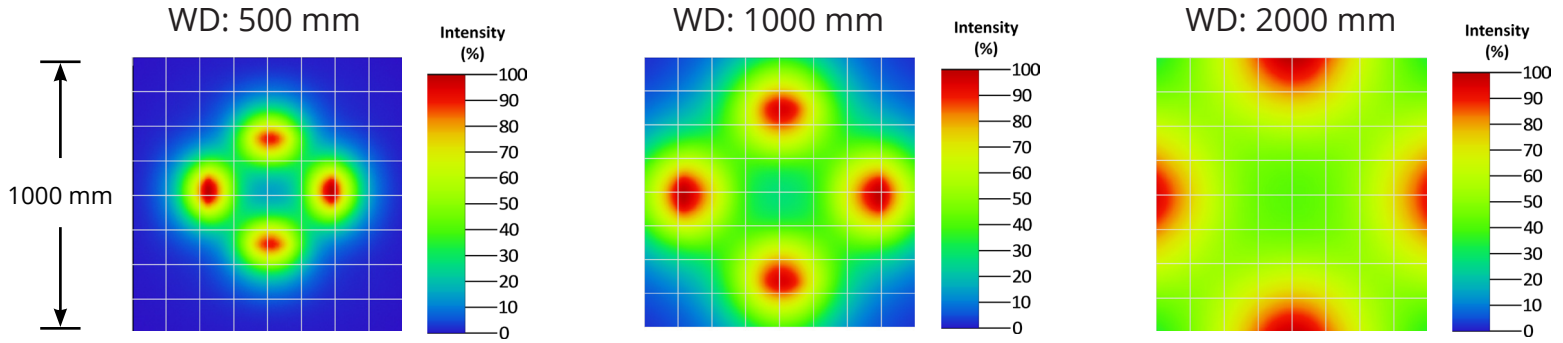
W30 Lens, 15° Illumination Angle

WD: 500 mm WD: 1000 mm WD: 2000 mm

N14 Lens, 0° Illumination Angle

WD: 500 mm WD: 1000 mm WD: 2000 mm
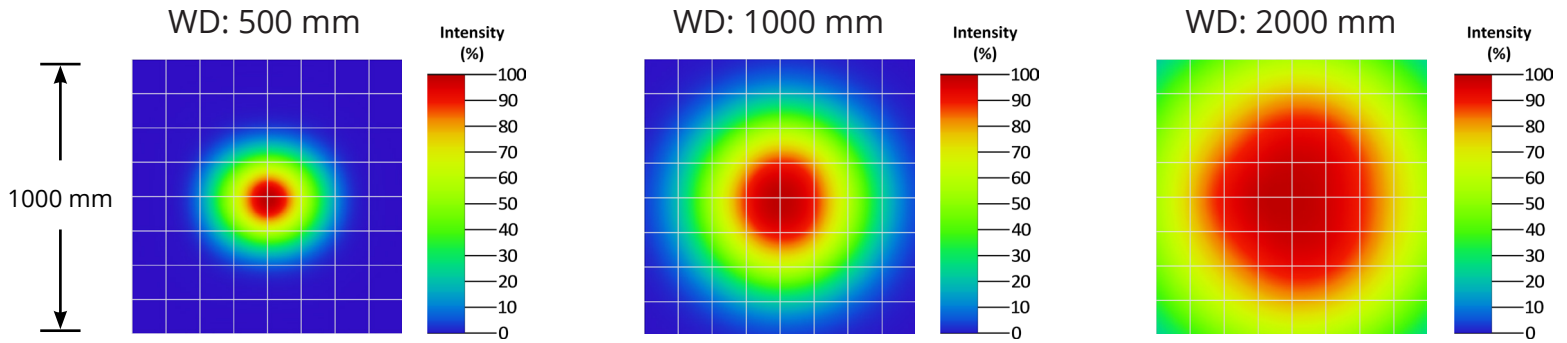
smart vision lights

BEAM PATTERNS (CONTINUED)

Smart Vision Lights recommends the RZL225 be used at a working distance between 300 mm to 4000 mm.

N14 Lens, 15° Illumination Angle

WD: 500 mm

WD: 1000 mm

WD: 2000 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 and 850
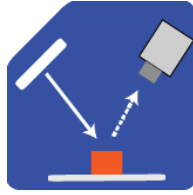
Caution

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 and WHI.

ILLUMINATION

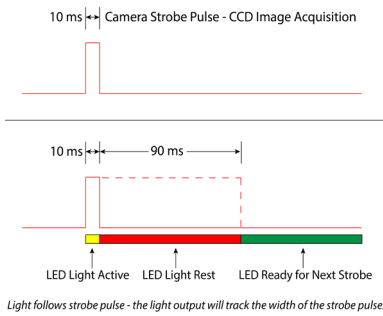The RZL225 Series of Ring Lights works best for:
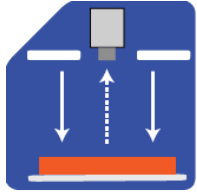
Direct

Bright Field

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).

10 ms — Camera Strobe Pulse - CCD Image Acquisition

10 ms — 90 ms

LED Light Active   LED Light Rest   LED Ready for Next Strobe

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)

Note: Strobe time is limited by the strobe rate.

MOUNTING

Four screw holes are located on the bottom of the light for easy mounting.
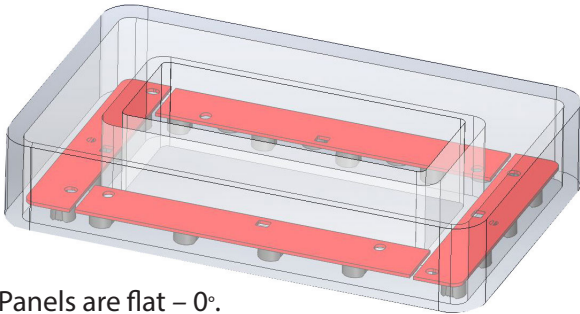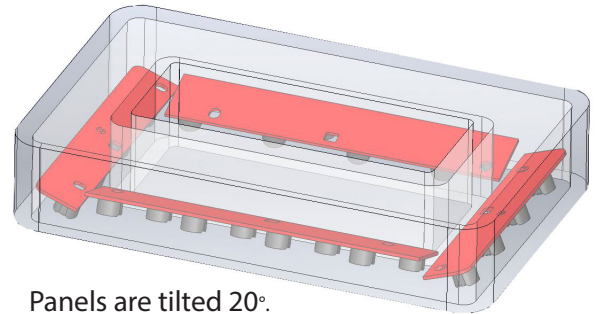Four M4 screws included with light.

ADJUSTABLE FIELD OF VIEW

The RZL225 has four LED panels, each with adjustable tilt (0° to 20°) using adjustment screws on the back of the light.

TOP VIEW

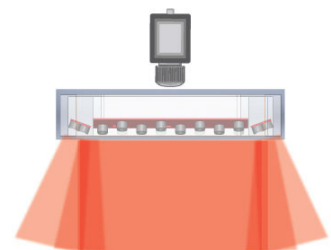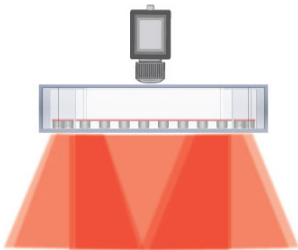Panels are flat – 0°.

Panels are tilted 20°.

SIDE VIEW

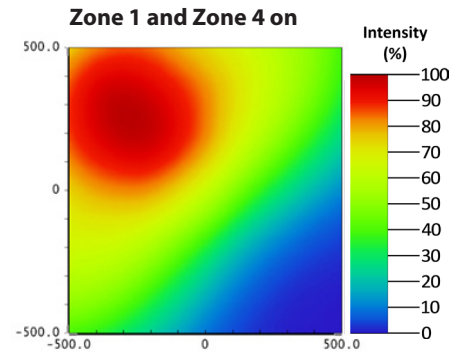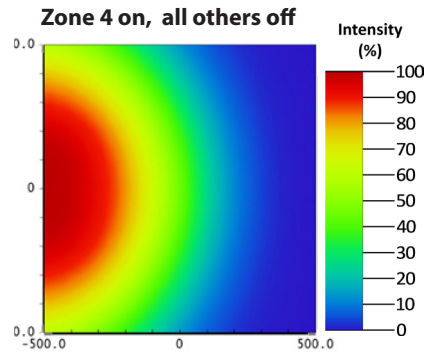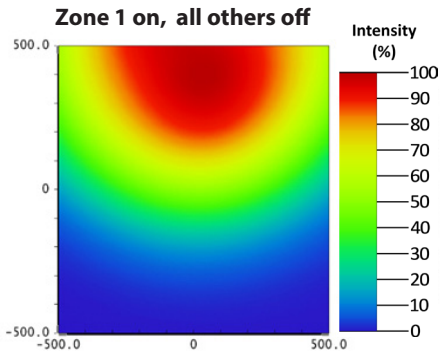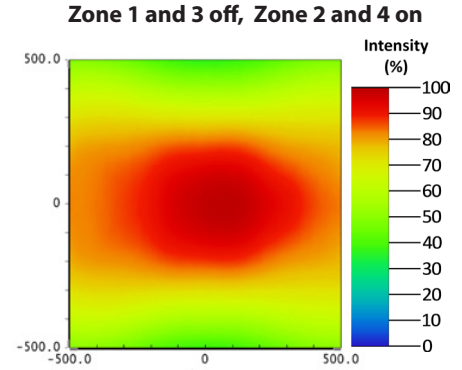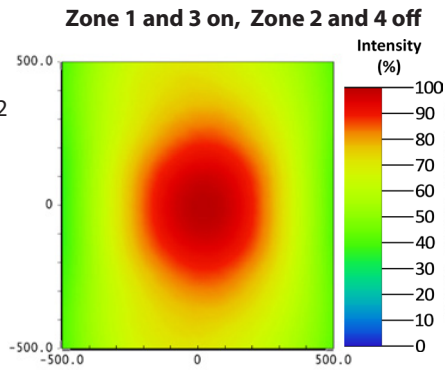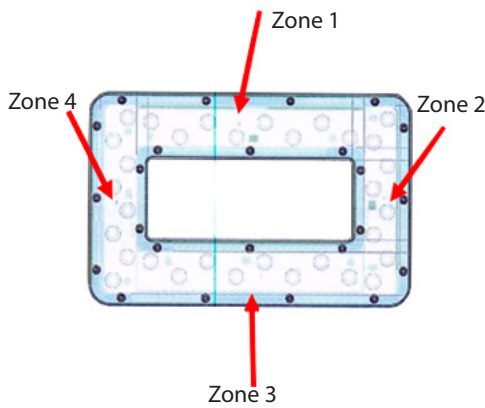Panels are flat – 0°.

Panels are tilted 20°.

ADJUSTING INTENSITY & ZONE CONFIGURATION*

*See next page for more information
The RZL225 is divided into four lighting zones. Each zone intensity level can be set independently of the other zones using an external controller such as the BTM-1000** with the SmartVisionLink™ app.

Working Distance is at 2000 mm | Lights are Angled at 15 Degrees

Zone 1
Zone 4
Zone 2
Zone 3

Zone 1 and 3 on, Zone 2 and 4 off

Zone 1 and 3 off, Zone 2 and 4 on

Zone 1 on, all others off

Zone 4 on, all others off

Zone 1 and Zone 4 on

**BTM-1000 sold seperately

SmartVisionLink™

With integrated SmartVisionLink™, the RZL225 can be used with Smart Vision Light's Bluetooth module (BTM-1000*). Users can install the SmartVisionLink™ app on Android or Apple phones and tablets to configure lighting parameters for each of the four lighting zones. Zone parameters include 10-100% intensity for both continuous and OverDrive™ strobe modes, as well as zone-disable. After parameters are set and saved, the BTM-1000 can be removed from the RZL225 and settings will be retained in RZL225's static memory. The SmartVisionlink™ app is available at no cost from the Google Play Store or Apple's App Store.

*The BTM-1000 is sold separately.
**Feature is accessible only with the BTM-1000 or other external controllers
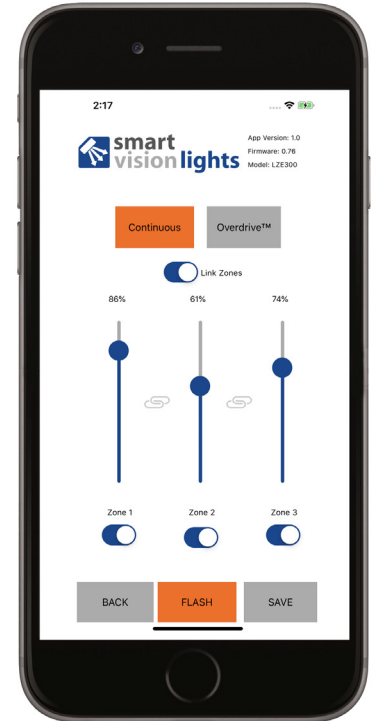
CONNECTING A BTM-1000

The BTM-1000 can be connected directly to a light or attached to a jumper cable that is connected to a light. Once the light's intensity is set to a desired level, the BTM-1000 can be removed from the light or cable.

The pigtail end of the BTM-1000 is connected directly to the light or to the cable attached to the light - sold separately.

smartvisionlights.com

USING SMARTVISIONLINK™

Adjusting Intensity
Select the serial number of the light you want to adjust. The light will flash to identify itself. On the light manager screen, there is an option to flash the light to identify it.

You have the option to adjust the intensity levels for both continuous operation and OverDrive™ strobe mode. These are independent of each other and both settings can be saved.

Adjusting a Channel
Slide the scroll bar up or down to adjust the intensity. Intensity can be set between a range of 10%–100%. If you wish to turn off a channel, uncheck that channel. Unchecking a channel will set that channel to inactive (greyed out).

Adjusting All Channels
To adjust all channels, check the "Link Channels" checkbox. Once checked you will have the ability to adjust all channels together. Simply slide any active channel scroll bar up or down to adjust all active channels intensities. If a channel is inactive (unchecked), that channel will not adjust.

Flash
Flash will toggle the light on/off when Continuous is selected. The light will flash if in OverDrive™. This is useful when identifying a light.

Link Channels
Allows for linking of channel intensity, so all channel intensities can be adjusted at one time. When linked and the channel with the highest intensity level reaches 100%, remain channels intensity levels cannot be adjusted any higher. The same is true for the lowest intensity level, when it reaches 10%, the other intensity levels cannot be adjusted any lower.

Save
When you have the intensity level for each channel of the light set, press the save button. This will save all settings for that individual light.

Back
When you have everything saved, press the back button to go back to the list of connected lights.

Disconnect
When all lights are set to desired intensity levels, disconnect from the BTM-1000 by pressing Disconnect.

PAIRING TO A PHONE / TABLET

To pair the BTM-1000 with a phone or tablet, first download the SmartVisionLights™ app. Open the app and press the connect button. The app will search for any BTM-1000's in the area. A list of available BTM-1000 with their unique ID numbers will be displayed. Select the BTM-1000 you want to pair too. A list of lights connected to that BTM-100 will be displayed.
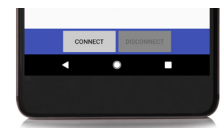
When a BTM-1000 is paired, the blue and red communication LEDs will flash.

LED Color	Indicator
Green	Power On
Red	Data Transmission Out (Light to App)
Blue	Data Transmission In (App to Light)

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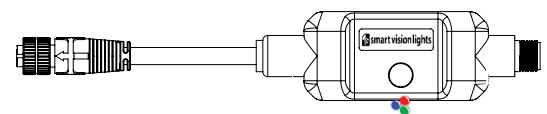
NANODRIVE™

To keep up with faster image acquisition by high-speed cameras, lighting applications require light sources to reach full intensity in a shorter amount of time. To meet this demand, the NanoDrive™ has been developed to deliver full power to a light in 500 nanoseconds or less. The NanoDrive™ is designed to allow tens of amps to reach the LEDs within nanoseconds, resulting in a light reaching its full LED power / light intensity within that time frame. All NanoDrive™ lights are able to be set to continuous or OverDrive modes, depending on user configuration. NanoDrive™ technology is patent-pending.

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.

PART NUMBER GUIDE

RZL225 — ☐☐☐ — ☐☐☐

COLOR:
WHI 470 625 850

LENS:
Leave blank for standard (Wide)

N14 = Narrow

Part Number Examples:

|	
RZL225-625	RZL225, 625 nm Red Wavelength, Standard (Wide) Lenses
RZL225-WHI-N14	RZL225, White Wavelength, Narrow Lens

ACCESSORIES

Power Cables	
Lengths	**Part Number**
5 m	5PM12-5
10 m	5PM12-10
15 m	5PM12-15

Bracket	
Description	**Part Number**
Mounting Bracket	BKT0031

SmartVisionLink™	
Description	**Part Number**
Bluetooth Module	BTM-1000

PRODUCT DRAWINGS

*CAD files available on our website
  Drawings are in mm

TOP

FRONT

RIGHT

BOTTOM

smart vision lights
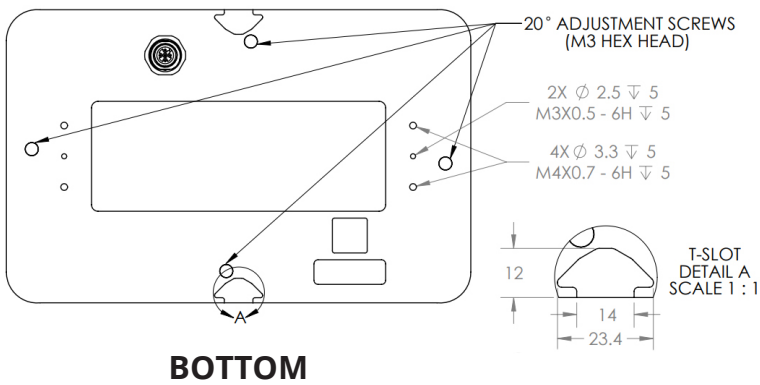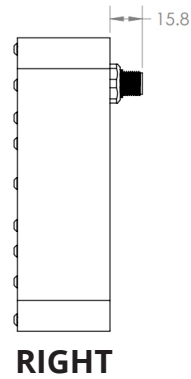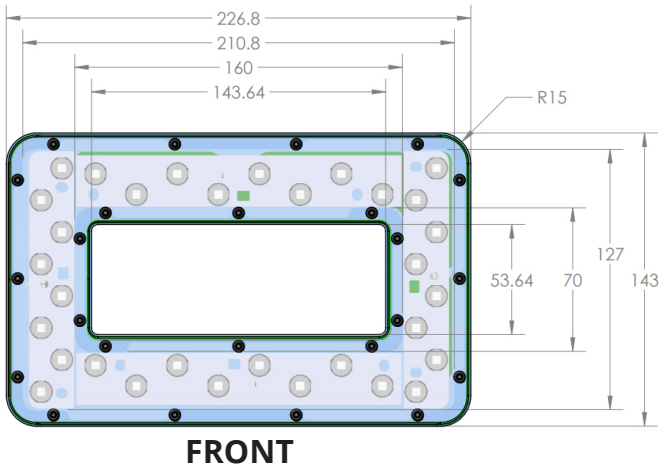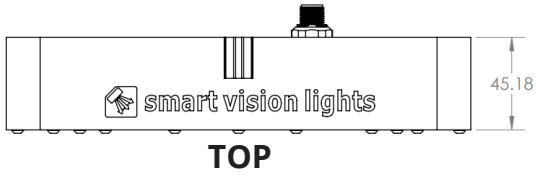
GLOSSARY

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

TERMINOLOGY

OverDrive™ Light includes an integrated high-pulse driver for complete LED light control.
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 Connect the light directly to the camera, without the need for additional controllers or equipment.
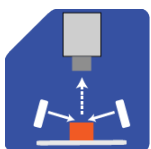**Polarizers** Filters that reduce reflections on specular surfaces.
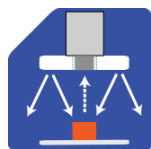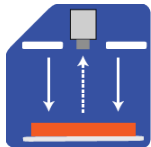**Diffusers** Used to widen the angle of light emission, reduce reflections, and increase uniformity.
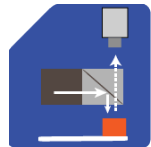
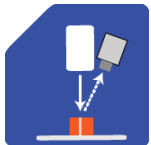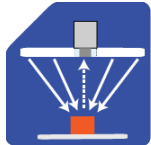## TYPES OF ILLUMINATION
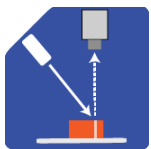
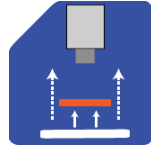Projector

Dark Field

Radial

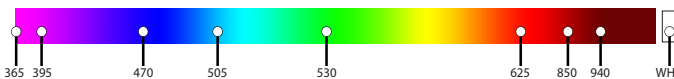Bright Field

Direct

Axial

Line

Diffuse Panel

Backlight

COMMON COLOR/WAVELENGTHS LEGEND

Wavelengths options range from 365 nm to 1550 nm.*
Additional wavelengths available for many light families.

365 395   470   505   530   625 850 940   WHI

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.*

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

ASR
American Systems
REGISTRAR

ANAB
ANSI National Accreditation Board
A C C R E D I T E D
ISO/IEC-17021-1
MANAGEMENT SYSTEMS
CERTIFICATION BODY

ISO 9001:2015 Certified QMS

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