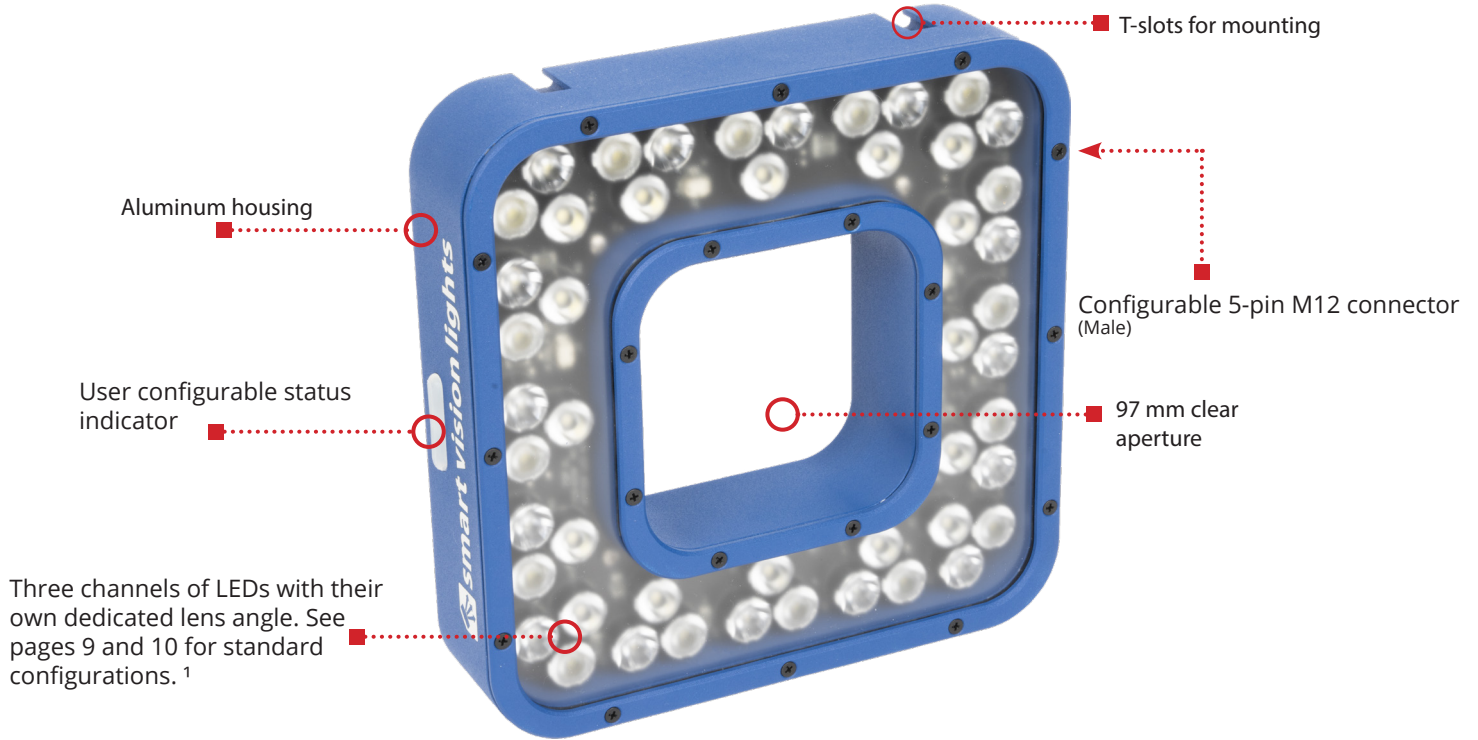


# RTF200

## Ring Light TUNABLE FIELD OF VIEW



The RTF200, a SmartVisionLink™-enabled light, features three independently adjustable beam angle lighting channels. When used with the BTM-1000 Bluetooth accessory and the SmartVisionLink™ app, lighting channels can be set to produce unique beam-angle combinations - optimizable for many different applications over a wide range of working distances and field of view requirements.

### RTF200 HIGHLIGHTS

Warranty <b>10 YEAR</b>	Tested <b>IEC 62471</b>	Compliant <b>CE ROHS</b>	Rated <b>IP 65</b>	Connector <b>5-PIN M12</b>
--------------------------------	--------------------------------	---------------------------------	---------------------------	-----------------------------------

- ✓ Three independently tunable beam angle channels
- ✓ Ability to switch and mix channels to adjust working distance and illumination angle<sup>2</sup>
- ✓ SmartVisionLink™-enabled to allow for easy intensity adjustment in both continuous and OverDrive™ strobe modes.
- ✓ Ability to electronically control intensity for the entire light or for each of the three LED channels if using BTM-1000 Bluetooth Module<sup>3</sup>
- ✓ Multi-Drive™ provides both OverDrive™ and continuous mode functionality.



<sup>1</sup> Contact Smart Vision Lights for custom lens angles  
<sup>2</sup> Only while using the SmartVisionLink™ app  
<sup>3</sup> BTM-1000 sold separately

## SPECIFICATIONS

	Continuous Operation	OverDrive Operation
<b>Electrical Input</b>	24 VDC +/- 5%	
<b>Input Current</b>	Max. 1500 mA	Peak 15 A charge rate
<b>Input Power</b>	Max. 36 W	Peak 360 W during strobe
<b>PNP Trigger</b>	1.6 mA @ 4VDC   5.1 mA @ 12VDC   11.4 @ 24VDC	
<b>NPN Trigger</b>	9.9 mA @ Common (0VDC)	
<b>Trigger Input</b>	PNP > +4 VDC (24 VDC max.) to activate <b>or</b> NPN > GND (<1 VDC) to activate ( <b>not both</b> )	PNP > +4 VDC (24 VDC max.) to activate <b>or</b> NPN > GND (<1 VDC) to activate ( <b>not both</b> )
<b>Mode Control</b>	Connect pin 5 to 1-10 VDC (10 - 100% output); 24 VDC (Max)	Connect pin 5 to GND (See wiring configuration for more information)
<b>Strobe Duration</b>	Min. 30 $\mu$ s   Max. $\infty$	Min. 10 $\mu$ s   Max. 50 ms
<b>Strobe Trigger Latency</b>	10 VDC = 11 $\mu$ s 5 VDC = 15 $\mu$ s 3 VDC = 20 $\mu$ s 1 VDC = 45 $\mu$ s	5 $\mu$ s
<b>Strobe Frequency</b>	Max 4 kHz or 1 / Duty Cycle as calculated, whichever is less. <sup>1</sup>	
<b>Duty Cycle</b>	Not applicable	Max. 10% <sup>1</sup>
<b>Analog Intensity</b>	The output is adjustable from 10% - 100% of intensity limit by a 1 - 10 VDC signal. Jumping pin 5 to pin 1 will provide maximum intensity. Intensity can be remotely adjusted via SmartVisionLink™ <sup>2</sup>	
<b>Connection</b>	5-pin M12 connector	
<b>Operating Temperature</b>	-10° - 40° C (14° - 104° F)   RH max 80% non-condensing humidity	
<b>Storage Temperature</b>	-20° to 70° C (-4° to 158° F)   RH max 80% non-condensing humidity	
<b>IP Rating</b>	IP65	
<b>Weight</b>	3.75 lbs   1.70 kgs	
<b>Compliances (Pending)</b>	UL, CSA, FCC, CE	
<b>Warranty</b>	10 years <sup>3</sup>	

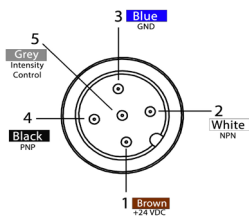
<sup>1</sup>See page 4 for more information

<sup>2</sup>SmartVisionLink™ requires the purchase of the BTM-1000 bluetooth module, sold separately, and the SmartVisionLink™ app, free to download on the Apple App and Google Play stores.

<sup>3</sup>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	+24VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10VDC	GREY

For maximum intensity, 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).

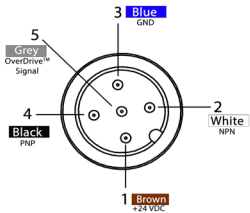
**For proper light function, apply either a PNP or NPN signal, not both.**

**Failure to supply light with correct input current will result in inconsistent lighting behavior.**

(see Product Specifications for requirements)

# WIRING CONFIGURATION (continued)

## OVERDRIVE OPERATION MODE



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

To enable OverDrive™ mode, tie pin 5 to pin 3.

**Failure to supply light with correct input current will result in inconsistent lighting behavior.**

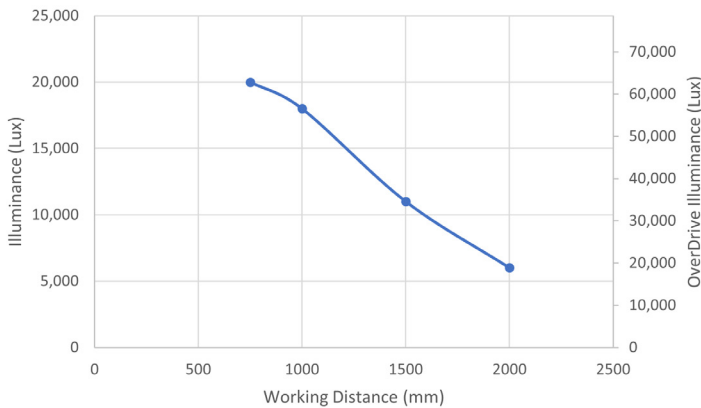
(see Product Specifications for requirements)

# LIGHTING PATTERNS

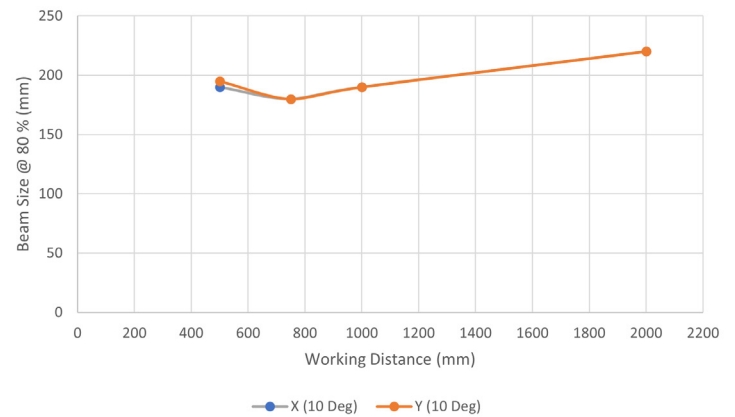
Smart Vision Lights recommends the RTF200 be used at a working distance between 200 mm to 2000 mm. Illuminance values taken on white light - 5700K

## 10° lighting patterns

Illuminance vs. Working Distance  
10 Deg

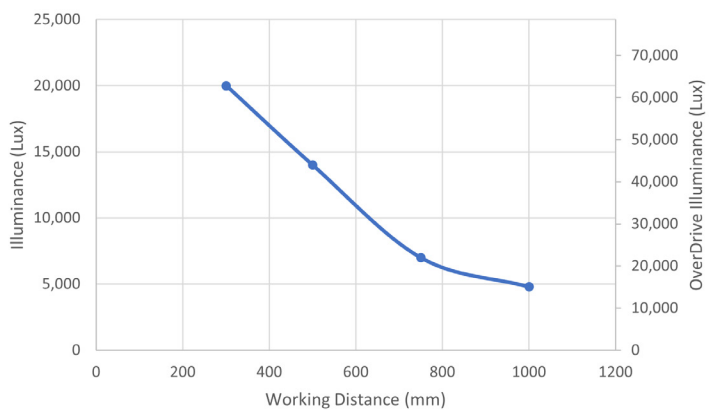


10 Deg  
Beam Size at 80% Max Intensity vs. Working Distance

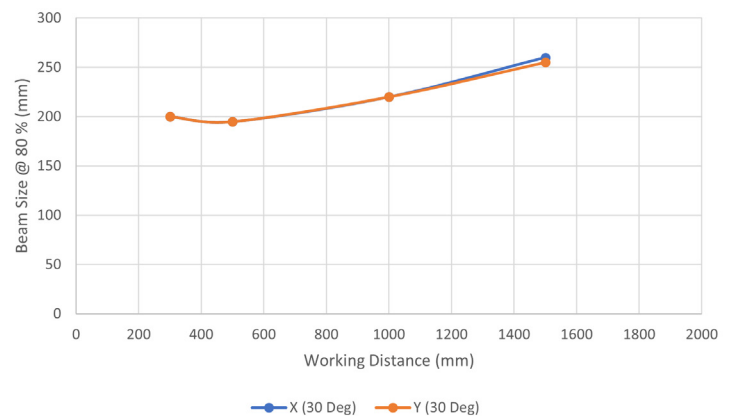


## 30° lighting patterns

Illuminance vs. Working Distance  
30 Deg



30 Deg  
Beam Size at 80% Max Intensity vs. Working Distance

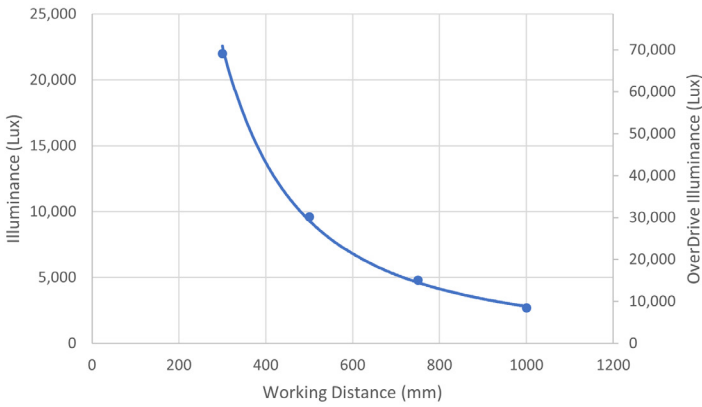


## LIGHTING PATTERNS (continued)

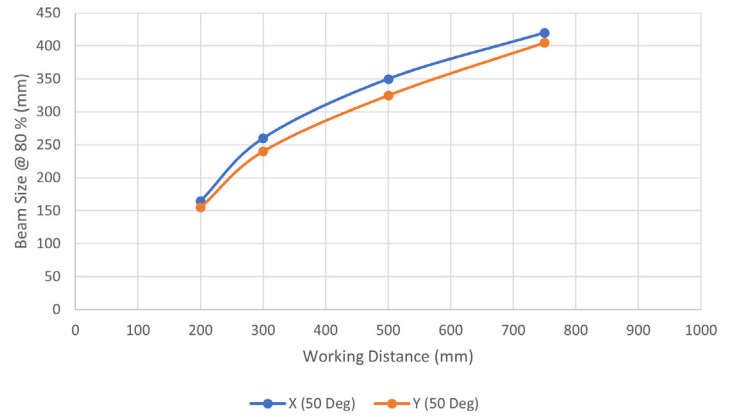
Smart Vision Lights recommends the RTF200 be used at a working distance between 300 mm to 1000 mm. Illuminance values taken on white light - 5700K

### 50° lighting patterns

Illuminance vs. Working Distance  
50 Deg

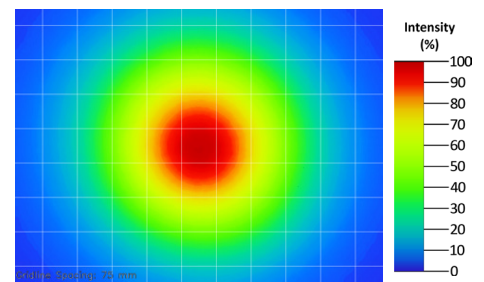
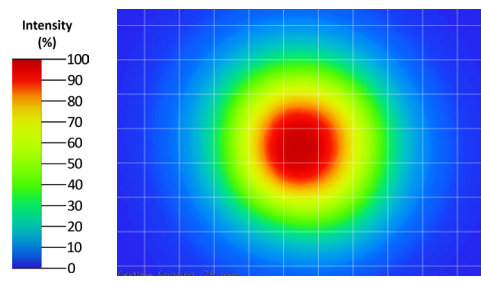
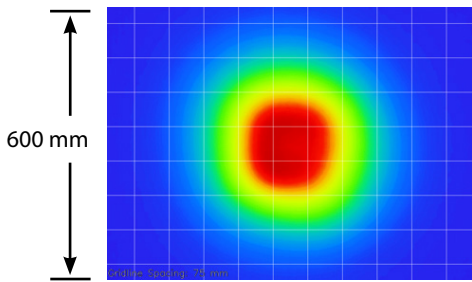


50 Deg  
Beam Size at 80% Max Intensity vs. Working Distance

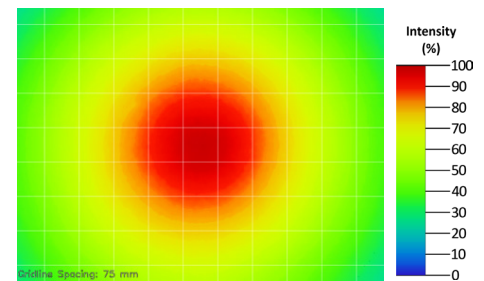
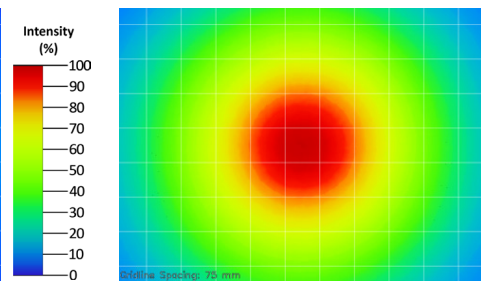
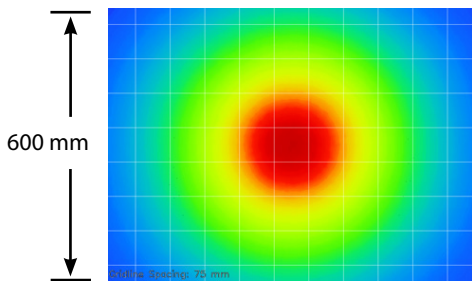


## BEAM PATTERNS

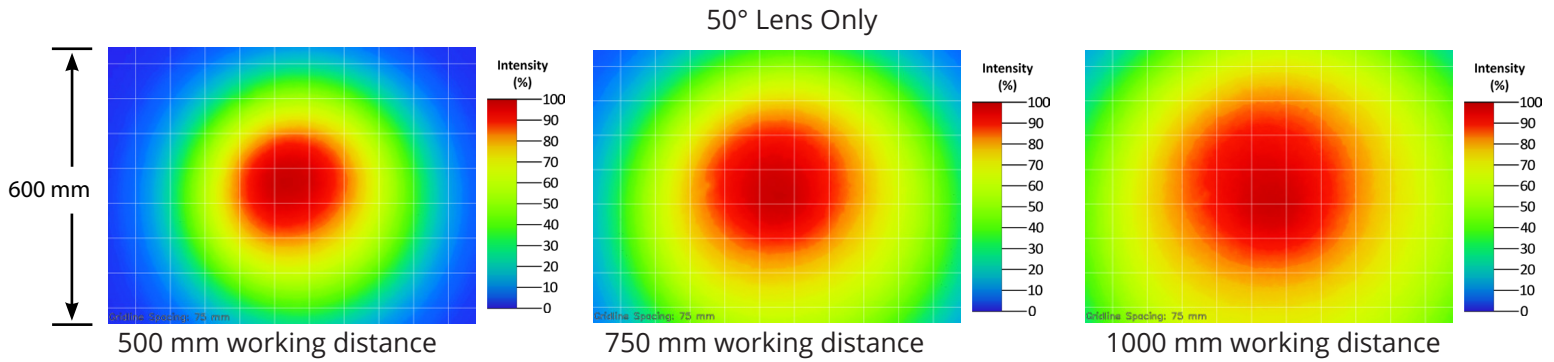
### 10° Lens Only



### 30° Lens Only

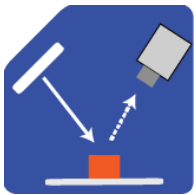


## BEAM PATTERNS (continued)

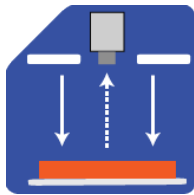


## ILLUMINATION

The RTF200 works best for:



Bright Field

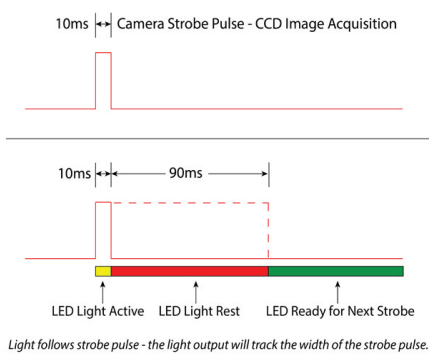


Direct Lighting

## 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).



### 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)**

**Maximum Strobe Frequency is 1 / calculated duty cycle or 4,000 strokes per second, whichever is less.**

## MOUNTING

T-slots are located along the top and bottom of the RTF200 light.

The RTF200 comes with two M8-1.25 x 12 mm screws and two M8 x 1.25 T-nuts.



T-slots for mounting



## MULTI-DRIVE™

Multi-Drive™ provides both continuous and OverDrive™ modes from a single integrated driver. Users can select the lighting mode via the input wiring configuration. With OverDrive™, the light can be strobed at up to 10 times the intensity\* of continuous mode.

\*See lighting section for more information on this light's OverDrive values.



## 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.

## LENS OPTICS

The following are the available lens options for the RTF200. Please see pages 9 and 10 for how these lenses can be configured.

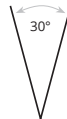
### NARROW

Narrow, 10° angle-cone lenses create a narrow beam of illumination and are used for long working distances.



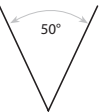
### WIDE (30°)

Wide, 30° angle-cone lenses create a large area of illumination. They create a floodlight effect and can be used for shorter working distances.



### WIDE (50°)

Wide, 50° angle-cone lenses create the largest area of illumination. They create a floodlight effect and can be used for the shortest working distances.



## EYE SAFETY

According to IEC 62471: 2006. Full documentation available upon request with purchase of product.




### 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.

## PART NUMBER AND CONFIGURATION GUIDE

**RTF200** —  —  — 

**COLOR:**  


**LENS CONFIGURATION\*:**  
 Leave blank for 153  
 111  
 131  
 313  
 333  
 353

**LINEAR POLARIZER:**  
 Leave blank for none  
 LPI = Factory Installed

**Part Number Examples:**  
**RTF200-625-111** RTF200, 625 nm Red Wavelength, 111 Configuration  
**RTF200-470-LPI** RTF200, 470 nm Blue Wavelength, Standard Configuration, Linear Polarizer

*Additional wavelengths and lens options available upon request. See pages 9 and 10 for more information.*

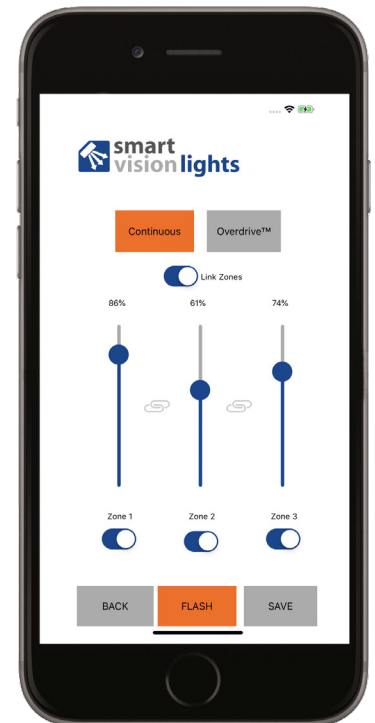
*\*Lens configuration numbers determine the channel's beam angle.*  
 1 = 10°  
 3 = 30°  
 5 = 50°

## SMARTVISIONLINK™

The RTF200 is SmartVisionLink™-enabled and is designed so intensity can be adjusted using the SmartVisionLink™ app. The RTF200 has three built-in channels, allowing for each channel's intensity to be set independently. Individual channels can also be turned off. Each channel has its own field of view. By adjusting each channel's intensity, the RTF200 field of view can be tuned remotely.

SmartVisionLink™ provides a way for a light to communicate with an app on a mobile device or tablet. This technology allows users to adjust the intensity of the light in both continuous operation and OverDrive™ strobe mode. By connecting the BTM-1000 Bluetooth module to a light that is SmartVisionLink™-enabled, a user can adjust parameters for the light. The SmartVisionLink™ app is available free to download in the Apple App and Google Play Stores.

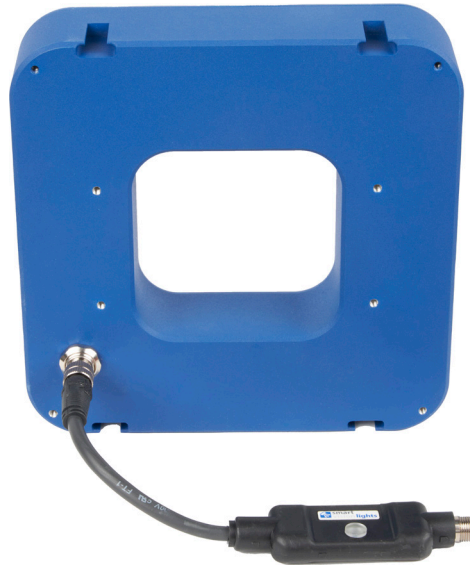
Learn more at [SmartVisionLights.com/SmartVisionLink](http://SmartVisionLights.com/SmartVisionLink)




## CONNECTING A BTM-1000

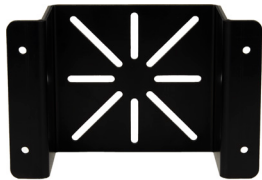
The BTM-1000 can be connected directly to a light or attached to a jumper cable that is connected to a light. Once the light's intensity is set to a desired level, the BTM-1000 can be removed from the light or cable.

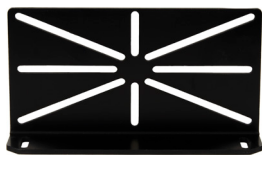
The pigtail end of the BTM-1000 is connected directly to the light or to the cable attached to the light - sold separately.



## ACCESSORIES

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

Bracket	
	
Description	Part Number
Mounting Bracket	BKT0036

Bracket	
	
Description	Part Number
Mounting Bracket	BKT0037

Mounting Kit	
	
Description	Part Number
M8-1.25 x12 mm screw	SC0030
M8 x 1.25 T-nut	NU009

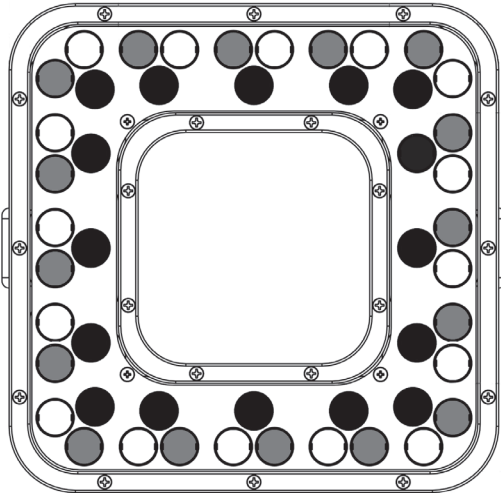
Light comes with two screws and two T-nuts.

SmartVisionLink™	
	
Description	Part Number
Bluetooth Module	BTM-1000

## LENS OPTIONS

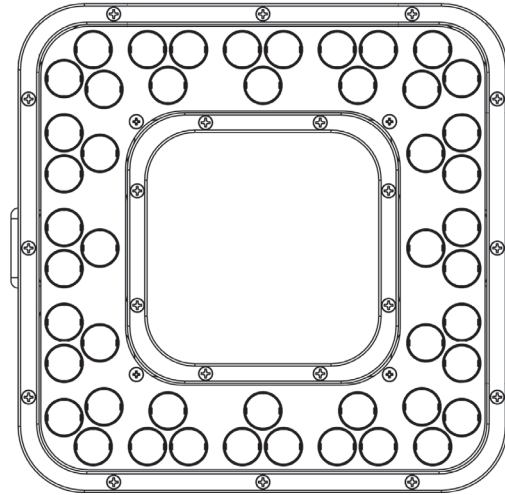
The following is a diagram of the lens options. For questions on the best configuration for your application, please contact your sales representative.

**153 (Standard)**



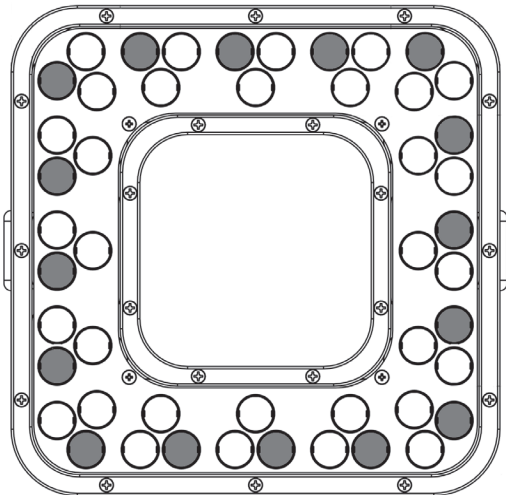
- 10°
- 50°
- 30°

**111**



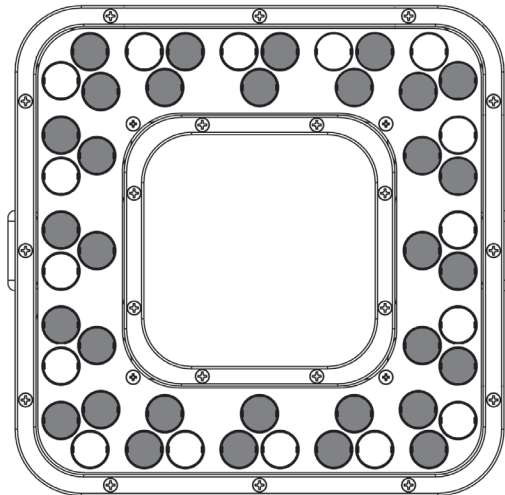
- 10°

**131**



- 10°
- 30°

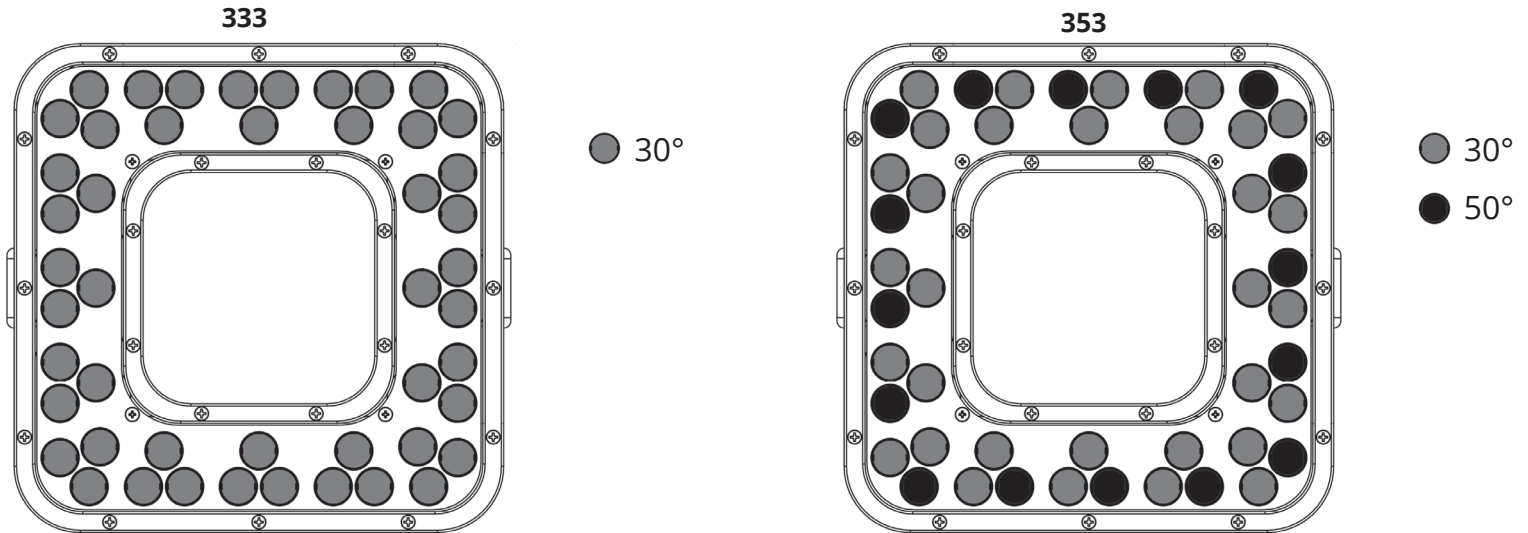
**313**



- 30°
- 10°

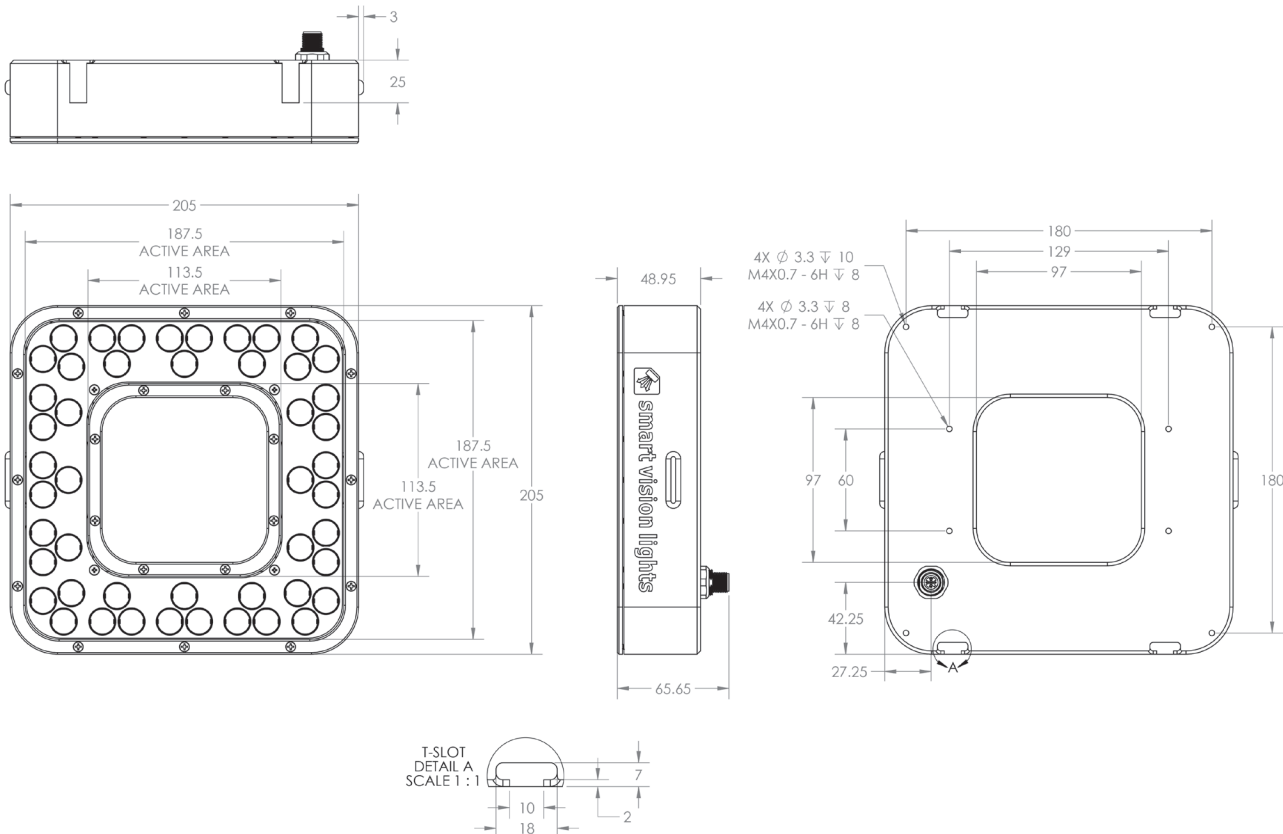
## LENS OPTIONS

The following is a diagram of the lens options. For questions on the best configuration for your application, please contact your sales representative.



## PRODUCT DRAWINGS

\*CAD files available on our website  
Drawings are in mm



## GLOSSARY

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

### TERMINOLOGY

**Continuous Operation** The light stays on continuously.

**OverDrive™** Integrated driver that produces a high-current strobe to the LEDs to drive them beyond their nominal continuous operation output.

**Multi-Drive™** Integrated driver that combines continuous operation and OverDrive™ strobe mode

**NanoDrive™** Integrated driver that provides fast switching where the light can go from off to on in less than 500 ns.

**Built-in Driver** The driver contained within the light that controls the current to the LEDs and provides PNP, NPN, and analog dimming controls.

**SmartVisionLink™** Integrated feature that enables lighting control through the Bluetooth module and app.

**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** Widens the angle of emission by scattering light in all directions.

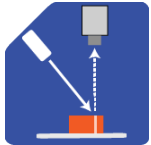
**Pattern Area Lighting** Modulated lighting pattern placed over a backlight's surface used to enhance defect detection on transparent and glossy surfaces

**SafeStrobe** Limiter to keep the light in safe working parameters.

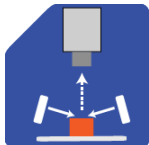
**Direct Connect** Connect lights in a series without the use of cables.

**Daisy-Chain** Connect lights in a series with the use of cables.

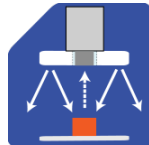
### TYPES OF ILLUMINATION



Projector



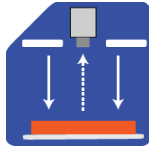
Dark Field



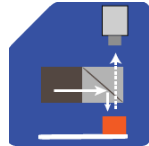
Radial



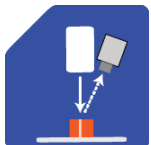
Bright Field



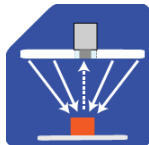
Direct



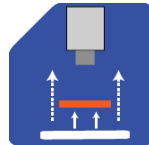
Axial



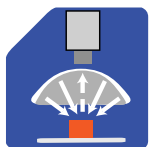
Line



Diffuse Panel



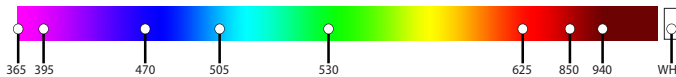
Backlight



Dome  
"Light Tent"

### COMMON COLOR / WAVELENGTHS LEGEND

Wavelengths options range from 365 nm to 1650 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, 1550 nm, and 1650 nm.\*

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



ISO 9001:2015 Certified QMS