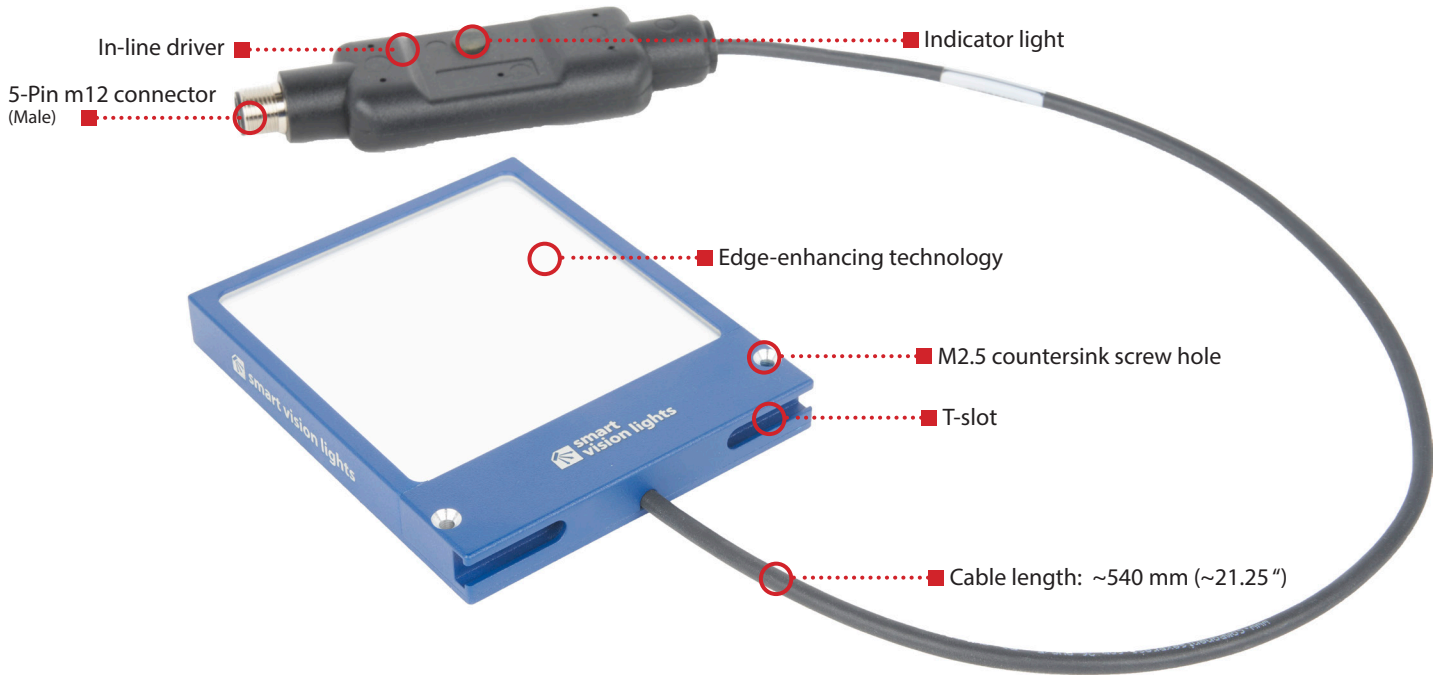


# MBL Series Mini Backlight

## EDGE-ENHANCING



The MBL Series of backlights are mini back lights with an ultra-slim design. Edge-enhancing technology is built-in to provide maximum contrast to backlit objects, providing the ability to get sharp images of round and highly reflective objects. The MBL Series are Multi-Drive™ lights capable of being adjusted remotely from a smart phone or tablet through SmartVisionLink<sup>1</sup>.

## MBL SERIES HIGHLIGHTS

Warranty <b>10 YEAR</b>	Tested <b>IEC 62471</b>	Compliant <sup>2</sup> <b>CE ROHS</b>	Rated <sup>3</sup> <b>IP 50</b>	Connector <b>5-PIN M12</b>
--------------------------------	--------------------------------	--	--	-----------------------------------

- ✓ Small form factor for easy installation
- ✓ Edge-enhancing technology built-in for high contrast inspections
- ✓ Comes in four sizes. 25x25, 50x50, 75x75, 100x100<sup>4</sup>
- ✓ Built-in Multi-Drive™ driver provides ability to easily switch between continuous operation and OverDrive™ strobe mode.

<sup>1</sup>SmartVisionLink™ requires the BTM-1000 bluetooth module, sold separately, and the free SmartVisionLink™ app.

<sup>2</sup>Pending

<sup>3</sup>Pending

<sup>4</sup>Size is based off of the area of illumination and is measured in millimeters.



# SPECIFICATIONS

	Continuous Operation		OverDrive Operation	
Electrical Input	24 VDC +/- 5%			
Input Current	MBL-25x25: Max 0.2 A	MBL-75x75: Max 0.4 A	MBL-25x25: Peak 0.3 A during strobe	MBL-75x75: Peak 2.3 A during strobe
	MBL-50x50: Max 0.33 A	MBL-100x100: Max. 500 mA	MBL-50x50: Peak 1.1 A during strobe	MBL-100x100: Peak 5 A during strobe
Input Power	MBL-25x25: Max 4.8 W	MBL-75x75: Max 9.6 W	MBL-25x25: Peak 7.2 W during strobe	MBL-75x75: Peak 55 W during strobe
	MBL-50x50: Max 7.9 W	MBL-100x100: Max 12 W	MBL-50x50: Peak 26 W during strobe	MBL-100x100: Peak 120 W during strobe
PNP Trigger	2 mA @ 4VDC   7 mA @ 12VDC   13.4 mA @ 24VDC			
NPN Trigger	12 mA @ Common (0VDC)			
Trigger Input	PNP > +3.3 VDC (24 VDC max.) to activate <b>or</b> NPN ≥ GND <1VDC to activate ( <b>not both</b> )			
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	Min. 30 μs   Max. ∞		Min. 30 μs   Max. 50 ms	
Strobe Frequency	Not applicable		Max 4 kHz or 1 / Duty Cycle as calculated, whichever is less. <sup>1</sup>	
Strobe Trigger Latency	10 μs		6 μs	
Duty Cycle	Not applicable		Max 10% <sup>1</sup>	
Indicator Light	Turns green when powered up			
Analog Intensity	The output is adjustable from 10% - 100% of intensity limit by a 1 - 10 VDC signal. Jumpering pin 5 to pin 1 will provide maximum intensity. Intensity can be remotely adjusted via SmartVisionLink™ <sup>2</sup>			
Connection	5-pin M12 connector			
Operating Temperature	-10° to 40° C (14° - 104° F)   80% RH non-condensing			
Storage Temperature	-20° to 70° C (-4° - 158° F)   80% RH non-condensing			
IP Rating (Pending)	IP50			
Weight	MBL-25x25: ~0.1kg   0.25lbs		MBL-75x75: ~0.22 kg   0.45 lbs	
	MBL-50x50: ~0.13 kgs   0.30 lbs		MBL-100x100: ~0.27 kgs   0.60 lbs	
Compliances (Pending)	FCC, CE, CSA, KC, UL61010, RoHS, REACH, WEEE, IEC 62471			
Warranty	10 years <sup>3</sup>			

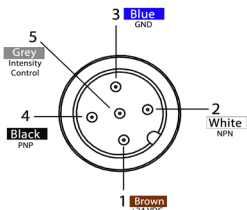
<sup>1</sup>See page 4 for more information

<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 +24 VDC.

For continuous mode: PNP (pin 4) can be tied to +24 VDC (pin 1) **or** NPN (pin 2) can be tied to Ground (pin 3).

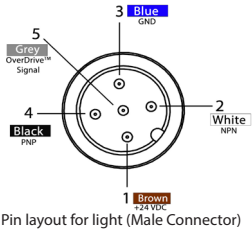
For proper light function, apply either a PNP or NPN signal, not both.

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

(See Product Specifications for requirements)

## WIRING CONFIGURATION

### 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.

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)

## EYE SAFETY

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

### Notice

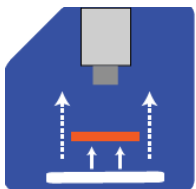
**Exempt Group:** No photobiological hazard to eyes or skin even for continuous, unrestricted use. Applicable for wavelengths 625 and 850.

### Caution

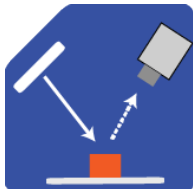
**Risk Group 1:** Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to eyes. Safe for most applications except prolonged exposure. Applicable for wavelengths 470 and WHI.

## ILLUMINATION

The MBL Series works best for:



Backlight

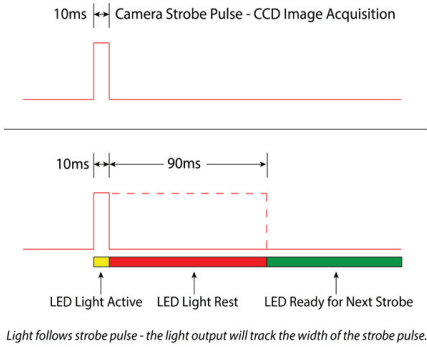


Bright Field

## 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).



### 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)

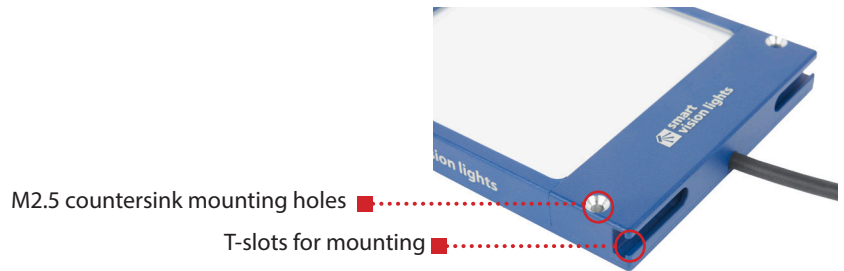
**Maximum Duty Cycle for OverDrive™ light is 10% (0.1)**

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

## MOUNTING

T-Slots are located along the bottom of the MBL Series lights.

The MBL Series comes with 2 screws and 2 nuts.



## 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.

\*Please see lighting section for more information on OverDrive values for this light.



## 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.

## SMARTVISIONLINK™

The MBL Series is SmartVisionLink™-enabled and is designed so intensity can be adjusted using the SmartVisionLink™ app.

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.

The BTM-1000 Bluetooth module acts as an intensity limiting device. Intensity levels set and saved by the module are intensity limits, or ceilings, that the analog signal will then modify.

For example, assume the intensity level is set to 50% by the BTM-1000. If the analog signal is set to 10% intensity, the intensity of the light will be 10% of the 50% ceiling, rather than 10% of the lights total limit.



## OPTICAL PERFORMANCE

Illuminance values taken at surface of the light using white light - 5700K.

### Surface Illuminance (Lux)

	Continuous Operation	OverDrive Operation
<b>MBL-25x25</b>	190,000	2,180,000
<b>MBL-50x50</b>	140,000	302,000
<b>MBL-75x75</b>	78,600	392,000
<b>MBL-100x100</b>	42,000	255,000

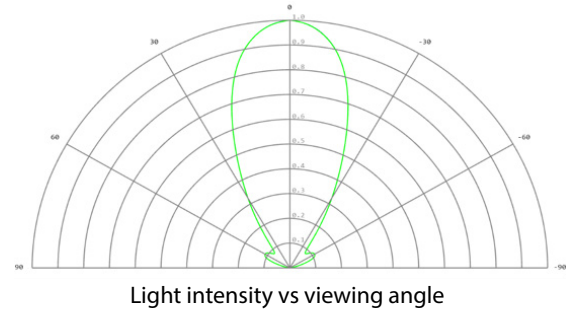
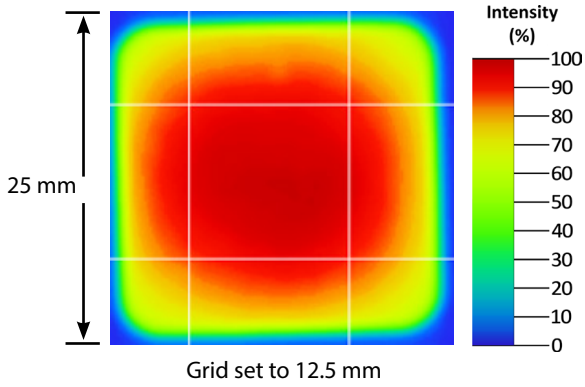
### Peak Luminance (Cd/m<sup>2</sup>)

	Continuous Operation	OverDrive Operation
<b>MBL-25x25</b>	168,000	1,930,000
<b>MBL-50x50</b>	125,000	270,000
<b>MBL-75x75</b>	74,357	370,840
<b>MBL-100x100</b>	34,204	207,665

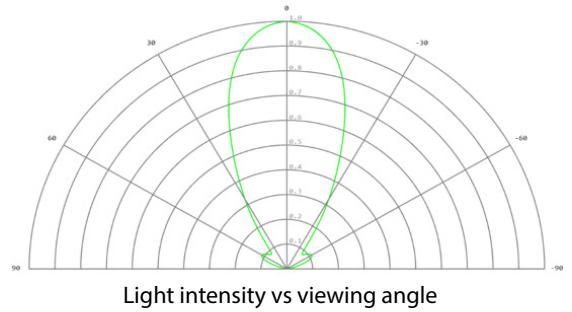
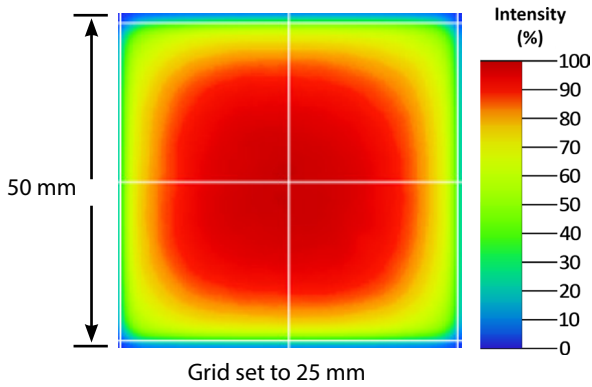
## BEAM PATTERNS

The MBL Series offers a diffuse light pattern. Beam patterns show surface of the light using white light - 5700K.

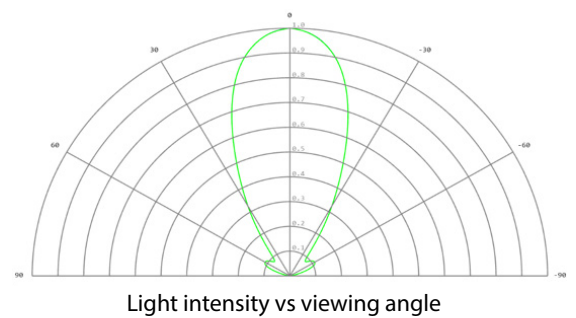
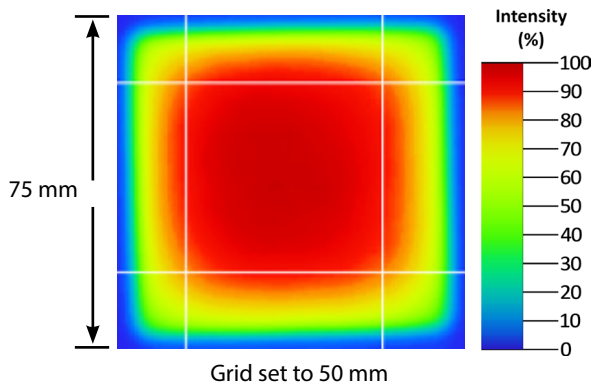
### MBL-25x25



### MBL-50x50

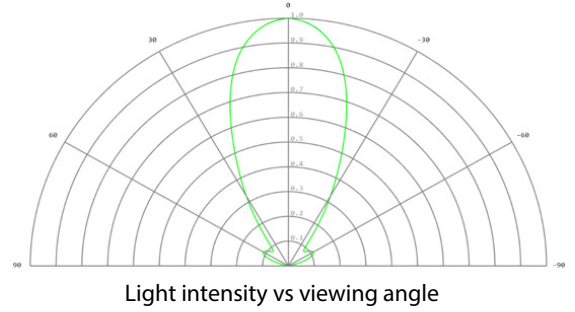
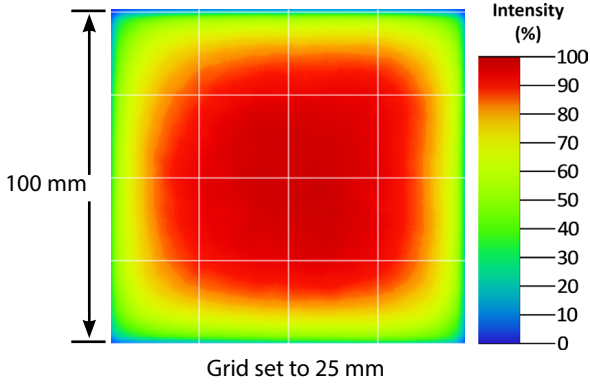


### MBL-75x75



## BEAM PATTERNS (continued)

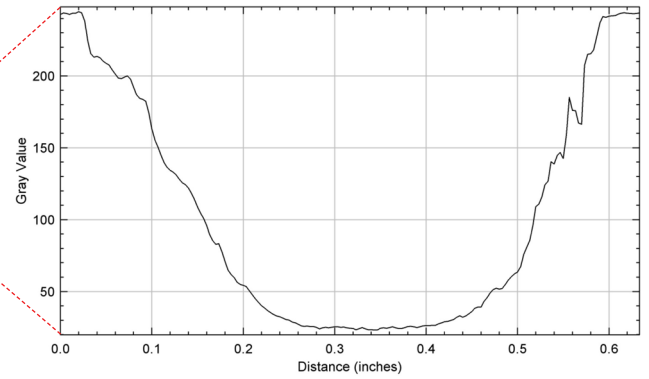
### MBL-100x100



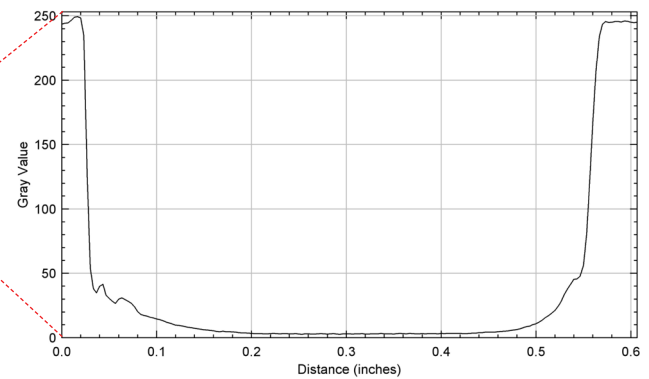
## EDGE-ENHANCING TECHNOLOGY

The MBL Series comes with built-in edge-enhancing technology that dramatically increases contrast in backlit images.

### Standard Backlight



### Edge-Enhanced Backlight



## PART NUMBER GUIDE

**MBL** –        **X**        –       

**SIZE (L x W):**

25 x 25

50 x 50

75 x 75

100 x 100

**COLOR:**

WHI

470

625

850


**Part Number Examples:**


**MBL-50x50-WHI** MBL, 50x50 mm, white


**MBL-100x100-625** MBL, 100 x 100 mm, 625 nm red wavelength

*Sizes listed are in millimeters.*

## ACCESSORIES

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

SmartVisionLink™	
	
Part Number	Description
BTM-1000	Bluetooth Module

Replacement Mounting Kit	
	
Description	Part Number
Mounting Screw	SC0077
Mounting Nut	NU0011

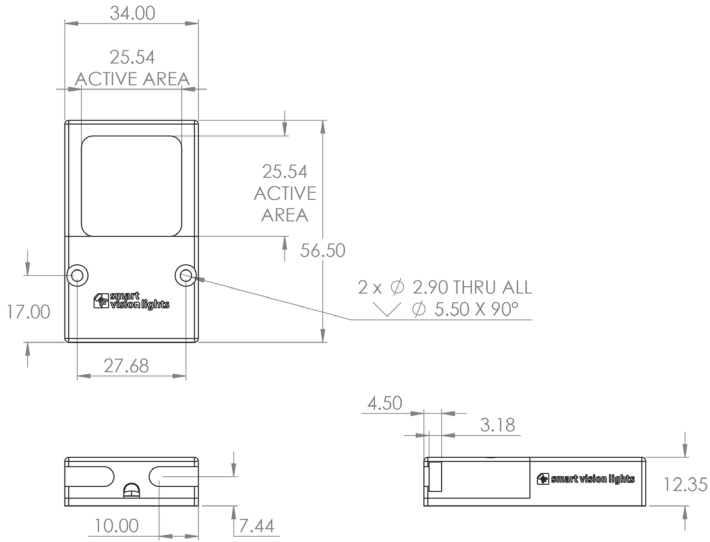
Light comes with two screws and two nuts.



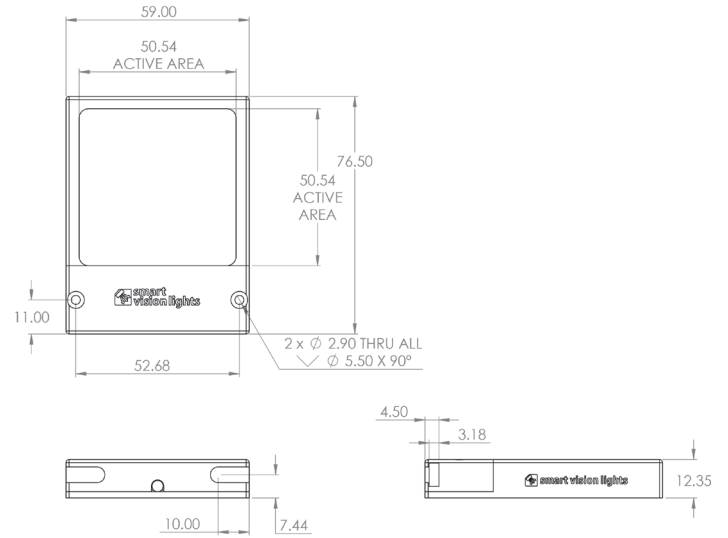
# PRODUCT DRAWINGS

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

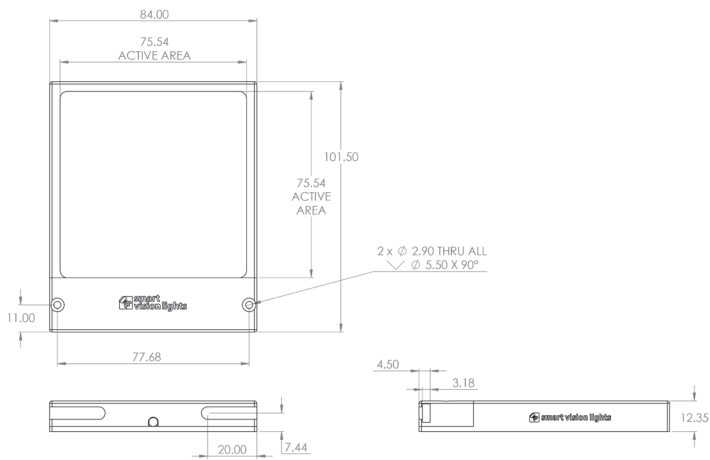
**MBL-25x25**



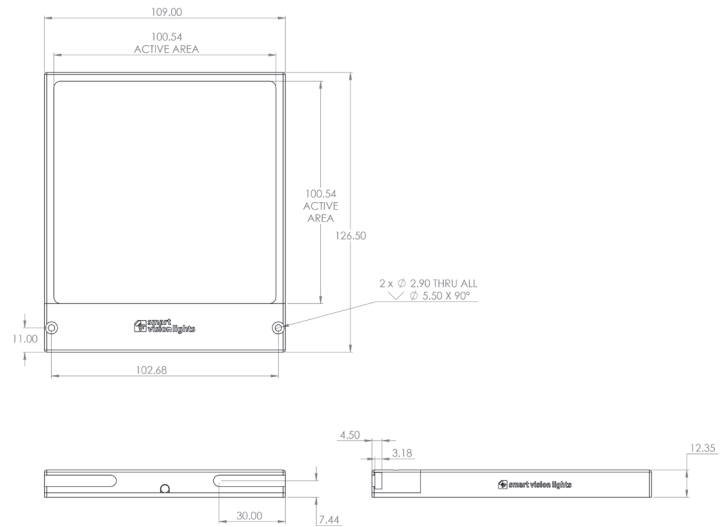
**MBL-50x50**



**MBL-75x75**



**MBL-100x100**



## 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.

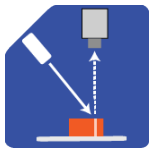
**Pattern Area Lighting** Modulated lighting pattern placed over a backlight's surface used to enhance defect detection on transparent and glossy surfaces

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

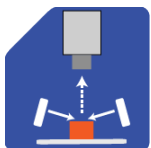
**Direct Connect** Connect lights in a series without the use of cables.

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

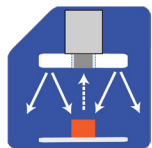
### TYPES OF ILLUMINATION



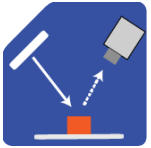
Projector



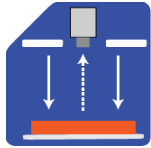
Dark Field



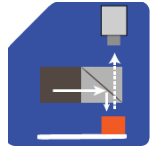
Radial



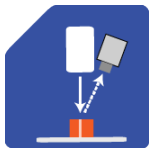
Bright Field



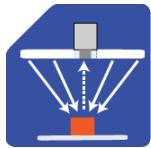
Direct



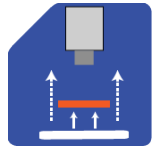
Axial



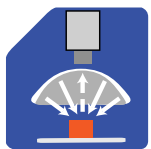
Line



Diffuse Panel



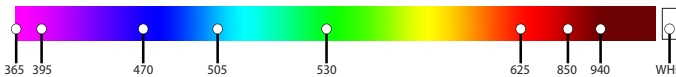
Backlight



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