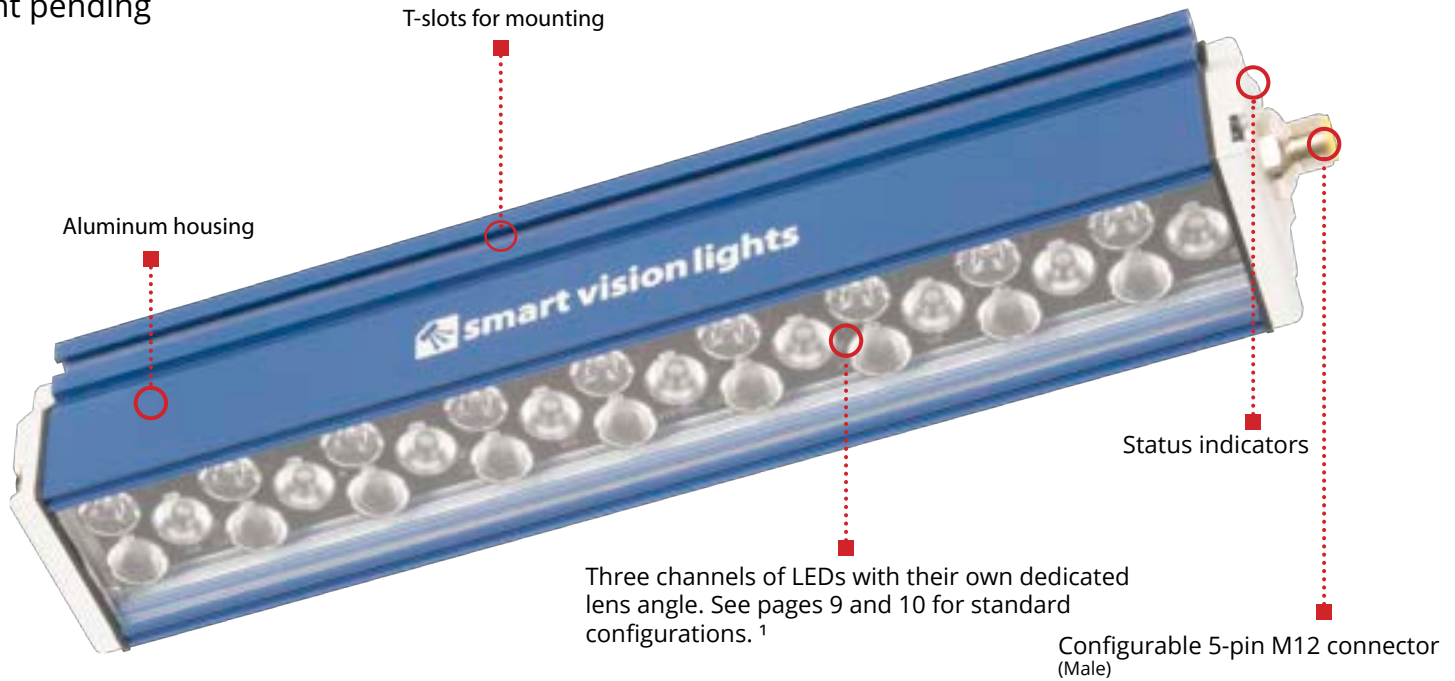


LTF SERIES* Linear Light TUNABLE FIELD OF VIEW

*Patent pending



The LTF (Linear Tunable Field Of View) series (patent pending) 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.

LTF SERIES HIGHLIGHTS

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

- ✓ Three independently tunable beam angle channels
- ✓ Ability to switch and mix channels to adjust working distance and illumination angle²
- ✓ SmartVisionLink™-enabled to allow for easy intensity adjustment in both continuous and OverDrive™ strobe modes.
- ✓ Ability to control intensity for the entire light or for each of the three LED channels if using BTM-1000 Bluetooth Module³
- ✓ Multi-Drive™ provides both OverDrive™ and continuous mode functionality.
- ✓ Available in four models: LTF300, LTF600, LTF900, and LTF1200



¹ Contact Smart Vision Lights for custom lens angles

² Only while using the SmartVisionLink™ app

³ BTM-1000 sold separately

SPECIFICATIONS

	Continuous Operation	OverDrive Operation
Electrical Input	24 VDC +/- 5%	
Input Current	Max. 1.27 A per 300 mm segment	Max. 12.1 A per 300 mm segment
Input Power	Max. 30.5 W per 300 mm segment	Max. 290 W per 300 mm segment
PNP Trigger	2 mA @ 4VDC 7 mA @ 12VDC 13.4 mA @ 24VDC	
NPN Trigger	12 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)
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 μ s Max. ∞	Min. 30 μ s Max. 50 ms
Strobe Trigger Latency	10 μ s	6 μ s
Strobe Frequency	Max 4 kHz or 1 / Duty Cycle as calculated, whichever is less. ¹	
Duty Cycle	Not applicable	Max. 10% ¹
Status Indicators	User configurable via SmartVisionLink™	
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 limit can be remotely adjusted via SmartVisionLink™ ²	
Connection	5-pin M12 connector	
Operating Temperature	-10° to 40° C (14° to 104° F) RH max 80% non-condensing humidity	
Storage Temperature	-20° to 70° C (-4° to 158° F) RH max 80% non-condensing humidity	
IP Rating	IP65	
Weight	LTF300: 1.8 lbs (~816 g) LTF600: 3.2 lbs (~1.45 kg) LTF900: 4.8 lbs (~2.17 kg) LTF1200: 6.5 lbs (~2.95 kg)	
Compliances	CE, IEC-62471, RoHS	
Warranty	10 years ³	

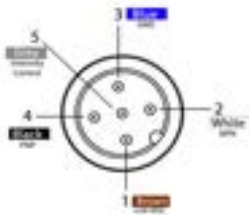
¹See page 5 for more information

²SmartVisionLink™ 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.

³See 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).

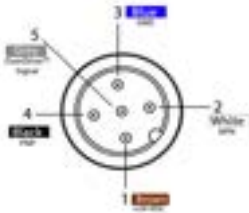
For proper light function, apply either a PNP or NPN signal, not both.

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



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	OverDrive™ Signal	Ground	GREY

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

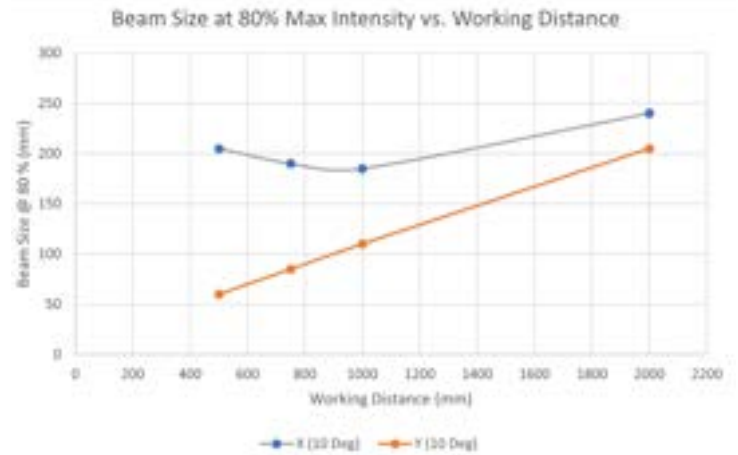
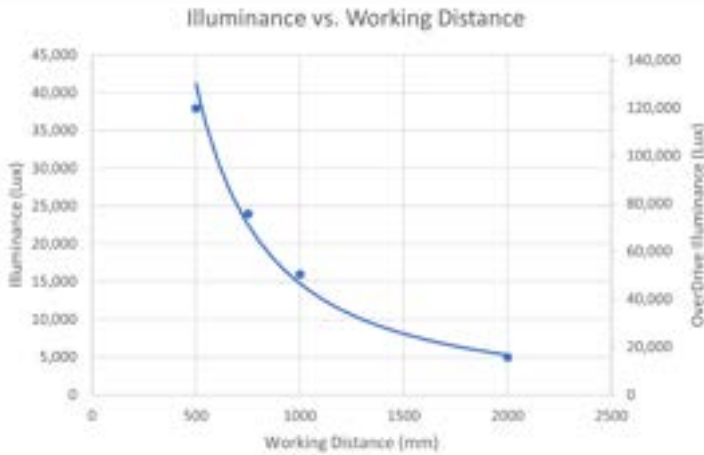
For proper light function, apply either a PNP or NPN signal, not both.

Failure to supply light with correct input current will result in inconsistent lighting behavior.
(see Product Specifications for requirements)

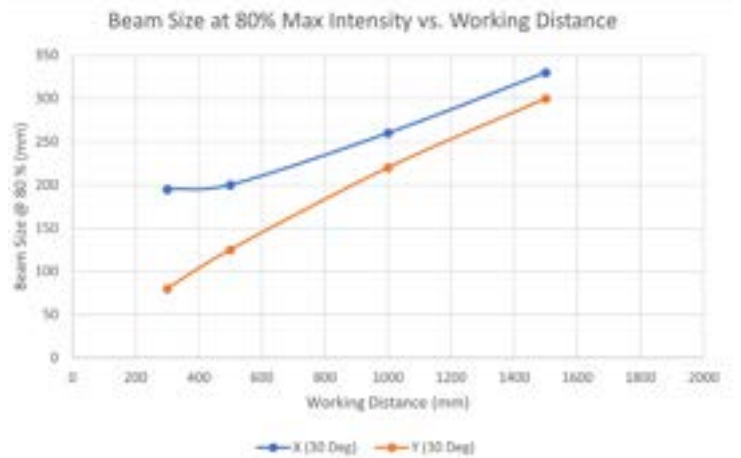
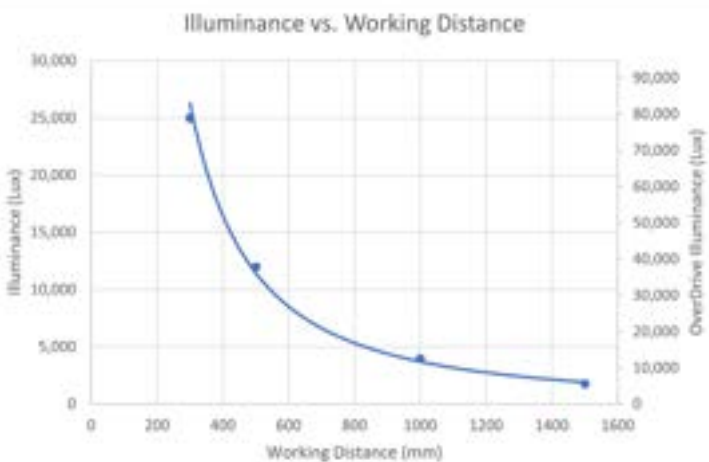
LIGHTING PATTERNS

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

10° lighting patterns



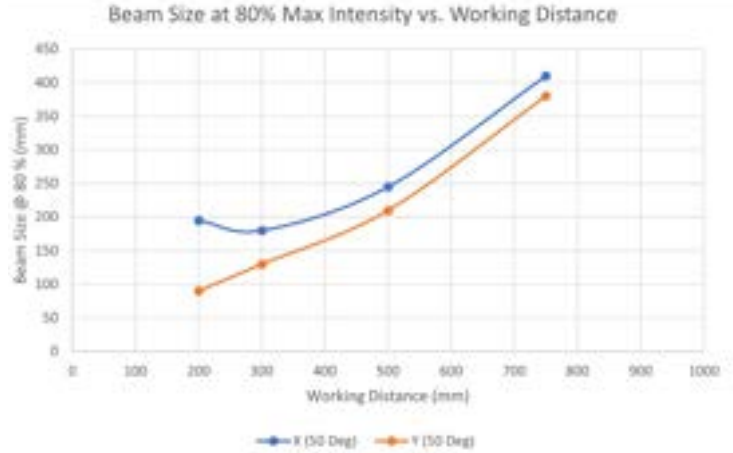
30° lighting patterns



LIGHTING PATTERNS

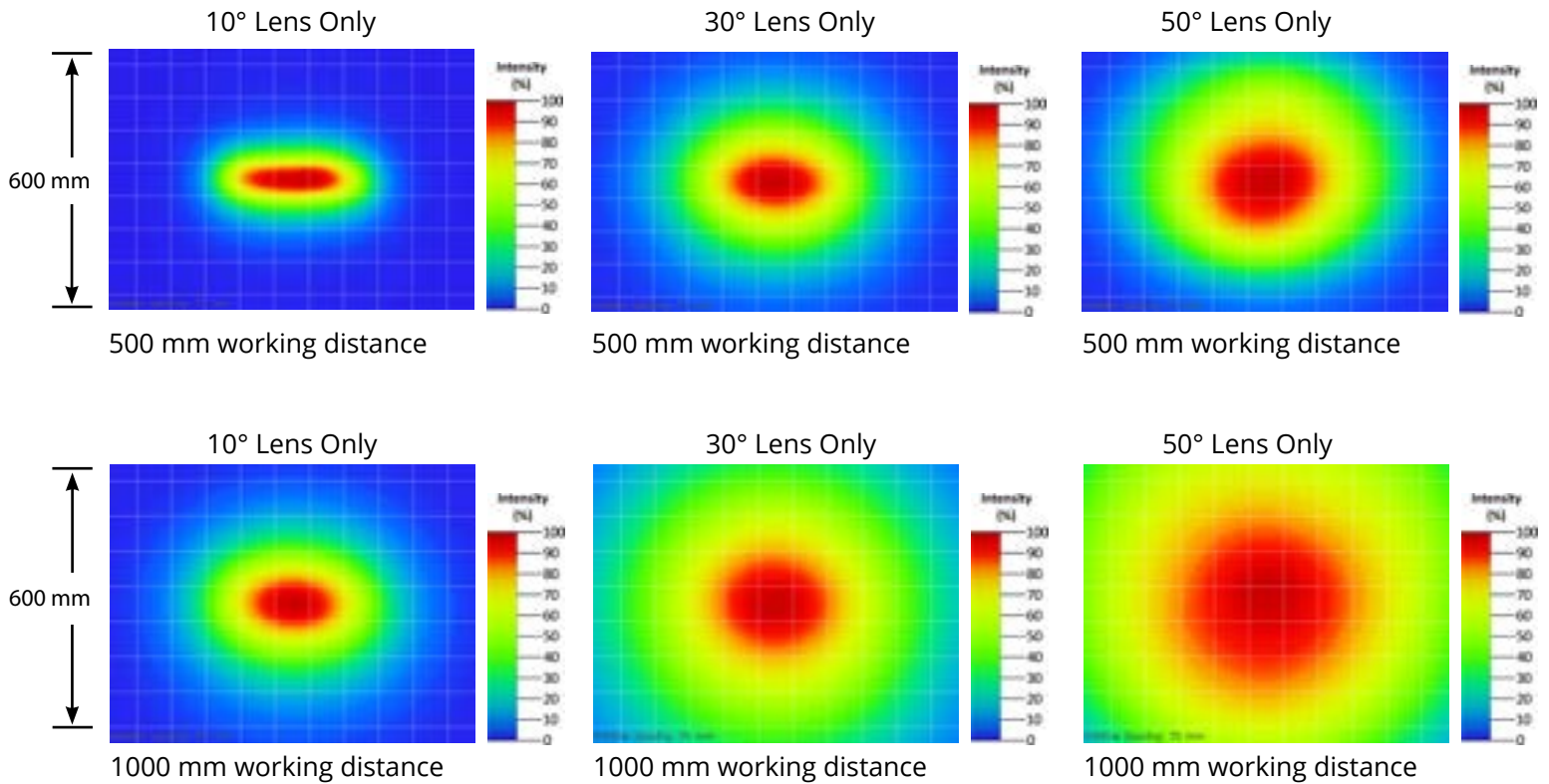
Smart Vision Lights recommends the LTF series be used at a working distance between 300 mm to 1000 mm. Illuminance values taken on white light - 5700K

50° lighting patterns



BEAM PATTERNS

An expanded beam pattern chart can be found on the LTF product page at SmartVisionLights.com/products/LTF/



LENS OPTICS

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

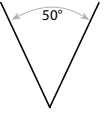
NARROW

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



WIDE (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.



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.



MOUNTING

T-Slots are located along the bottom and sides of the LTF Series light.

The LTF comes with two T-bolts, two washers, and two nuts



EYE SAFETY

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

Notice

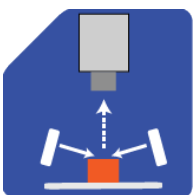
Exempt Group: No photobiological hazard to eyes or skin even for continuous, unrestricted use. Applicable for wavelengths 625 and 850.

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, 530, and WHI.

ILLUMINATION

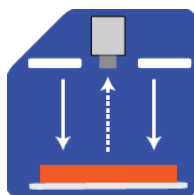
The LTF series works best for:



Dark Field



Bright Field

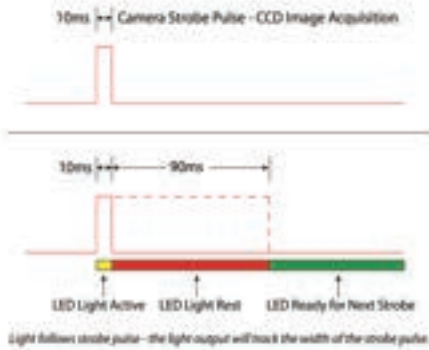


Direct Lighting

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.

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.

SMARTVISIONLINK™

The LTF series is SmartVisionLink™-enabled and is designed so the intensity limit can be adjusted using the SmartVisionLink™ app. The LTF series has three built-in channels, allowing for each channel's intensity limit to be set independently. Individual channels can also be turned off. Each channel has its own field of view, determined by the light configuration. By adjusting each channel's intensity limit, the LTF series field of view can be tuned remotely. The LTF series comes with user-programmable status indicators. Status indicator colors can be selected via the pin configurator tab of 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.

Learn more at SmartVisionLights.com/SmartVisionLink



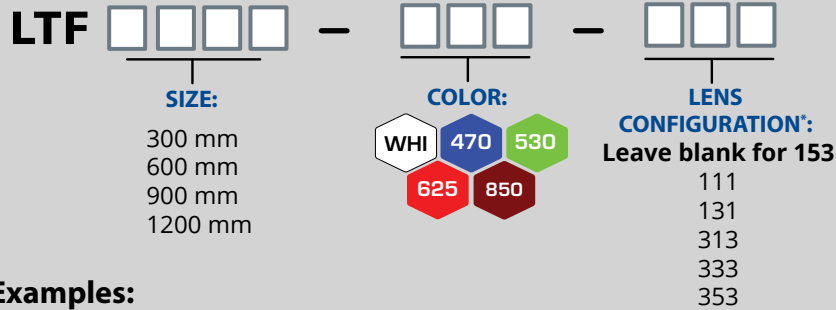
CONNECTING A BTM-1000

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.



PART NUMBER AND CONFIGURATION GUIDE



Part Number Examples:

- LTF300-625** LTF, 300 mm, 625 nm Red Wavelength, Standard Configuration
- LTF600-470-111** LTF, 600 mm, 470 nm Blue Wavelength, 111 configuration

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


ACCESSORIES

Power Cables




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

Mount



Description	Part Number
3-Axis Pan and Tilt Mount	PB300-M5

SmartVisionLink™



Description	Part Number
Bluetooth Module	BTM-1000


Mounting Kit



Description	Part Number
M5x12 mm T-bolt	SC0161
Stainless Steel Nycon Insert Lock Nut	NU0022
Stainless Steel Flat Washer	WA0018

Light comes with two T-bolts, two nuts, and two washers.

Linear Polarizer



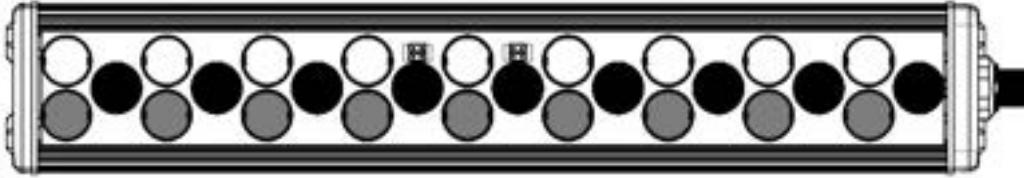
Description	Part Number
LTF300 Linear Polarizer Kit	LTF300-LP
LTF600 Linear Polarizer Kit	LTF600-LP
LTF900 Linear Polarizer Kit	LTF900-LP




Linear polarizer not available for the LTF1200

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)



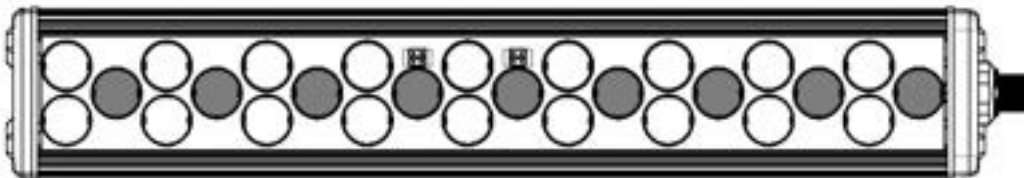
-  10°
-  50°
-  30°

111



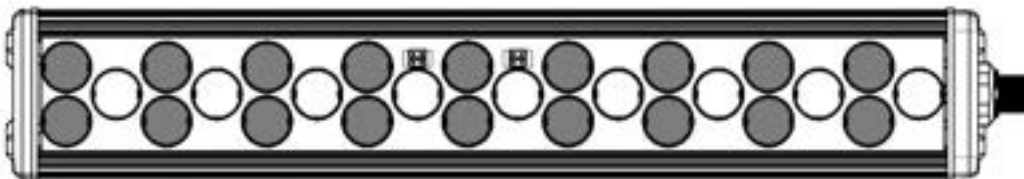
-  10°


131



-  10°
-  30°

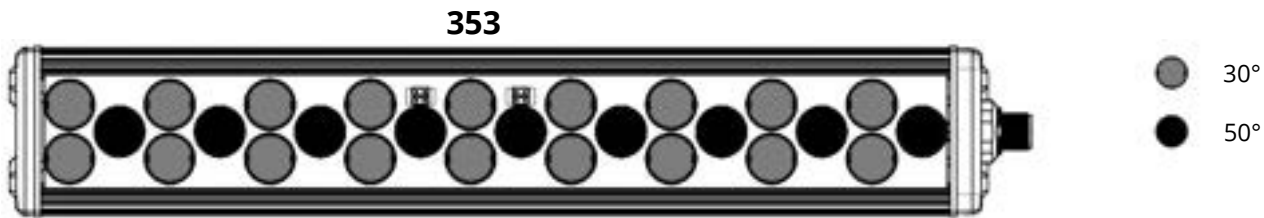
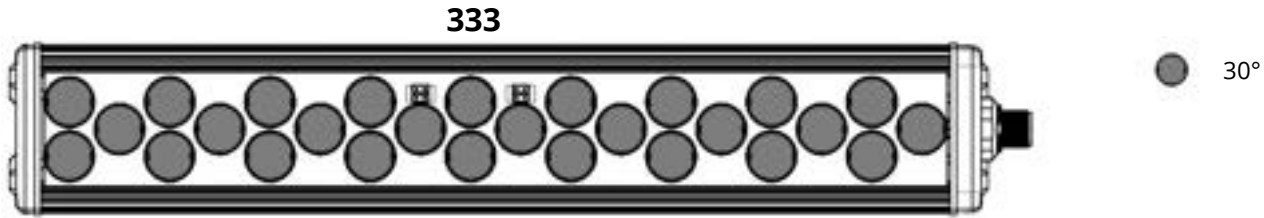
313



-  30°
-  10°

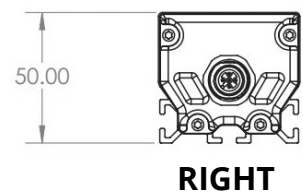
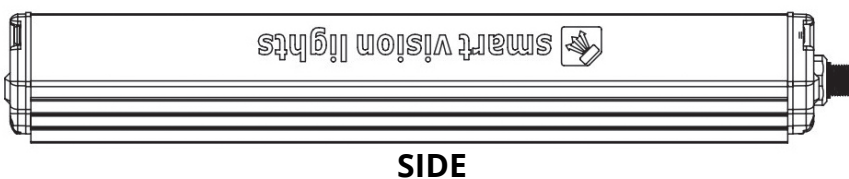
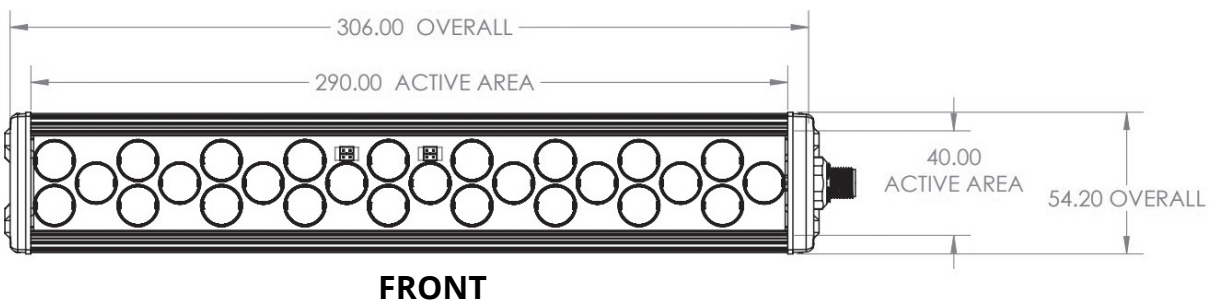
LENS OPTIONS (continued)

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



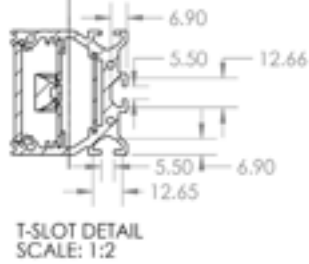
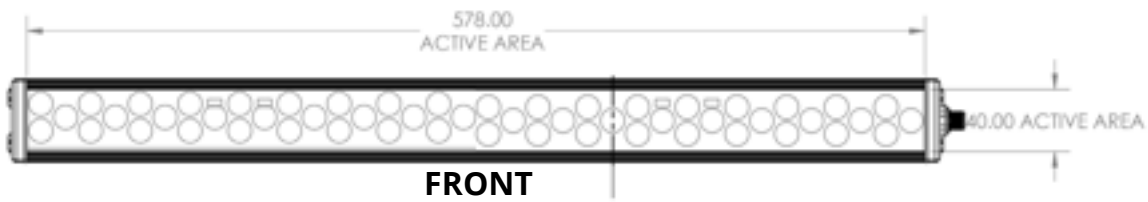
PRODUCT DRAWINGS (LTF300)

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



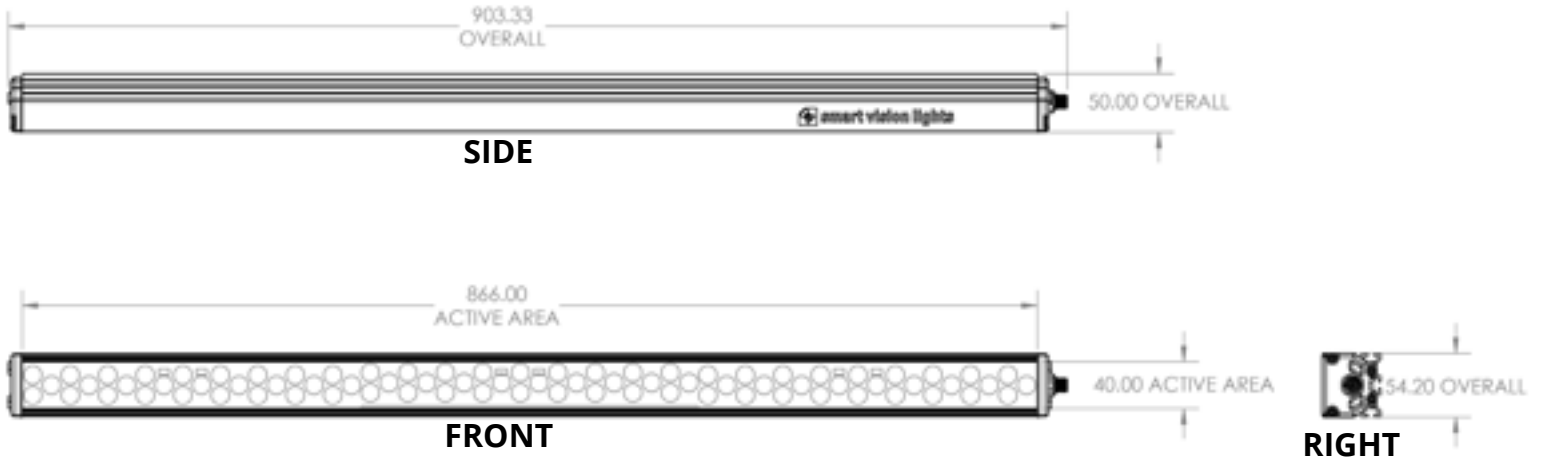
PRODUCT DRAWINGS (LTF600)

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



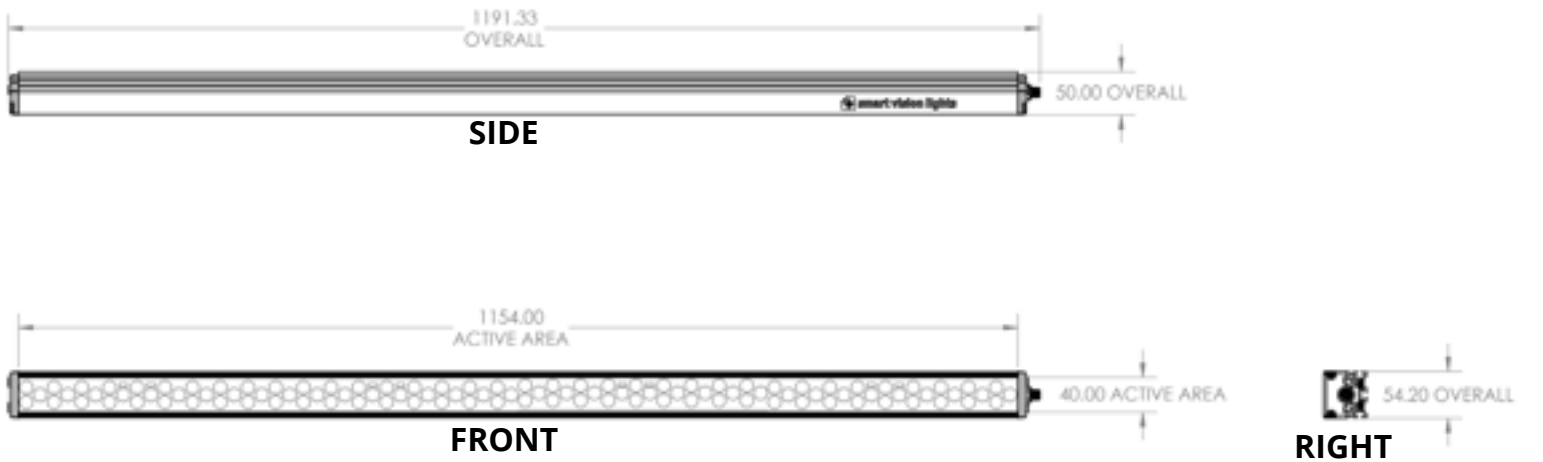
PRODUCT DRAWINGS (LTF900)

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



PRODUCT DRAWINGS (LTF1200)

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.

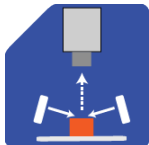
Direct Connect Connect lights in a series without the use of cables.

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

TYPES OF ILLUMINATION



Projector



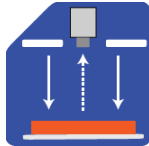
Dark Field



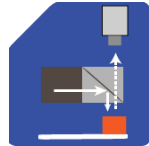
Radial



Bright Field



Direct



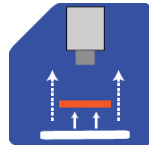
Axial



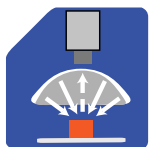
Line



Diffuse Panel



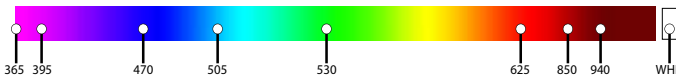
Backlight



Dome
"Light Tent"

COMMON COLOR / WAVELENGTHS LEGEND

Wavelength 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.

