smart vision lights

LZE300 Direct Connect LINEAR LIGHT

MULTI-DRIVE™

PRODUCT DATA SHEET

multi drive™

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

PRODUCT HIGHLIGHTS

- ✓ Connect up to six lights in a line without loss of uniformity
- ✓ 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 zones when using BTM-1000 Bluetooth Module
- ✓ Standard LZE300 has a 12 LED configuration
- ✓ NanoDrive™ allows the light to be fully on in less than 500 ns

PRODUCT DESCRIPTION

The LZE300, a SmartVisionLink™-enabled linear light, has the same features and functions as the LXE300, with the addition of communication with a SmartVisionLink™ managing device, such as the BTM-1000. When the LZE300 is connected to the BTM-1000, its intensity can be fully controlled, either for the entire light or for each of the three LED zones. Individual zones may also be turned off. Direct connect or daisy-chain together up to six LZE300s within a single string of lights to create 18 individual zones with adjustable intensity levels. The standard LZE300 has a 12 LED configuration.

PRODUCT SPECIFICATIONS

	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Electrical Input	24VDC +/- 5%	
PNP Line	4 mA @ 4VDC | 10 mA @ 12VDC | 20 mA @24VDC	
NPN Line	15 mA @ Common (0VDC)	
OverDrive™ Strobe Mode	**Not applicable**	Connect pin 5 to GND (see Wiring Configuration for more information)
Strobe Duration	**Not applicable**	Min. 10 µs | Max. 50 ms
Duty Cycle	**Not applicable**	Max. 10%
Strobe Input	**Not applicable**	PNP: +4VDC or greater to activate NPN: GND (<1VDC) to activate
Continuous Operation Mode	NPN can be tied to ground **OR** PNP can be tied to 24VDC (not both)	**Not applicable**
On/Off Input	PNP: +4VDC or greater to activate NPN: GND (<1VDC) to activate	**Not applicable**
Connection	5-pin M12 connector	
Ambient Temperature	-18º–40º C (0º–104º F)	
IP Rating	IP65	
Weight	~660 g	
Power Supply	A separate power supply for OverDrive™ mode (high-pulse operation) is recommended. *(see Input Current for value)*	
Compliances	CE, RoHS, IEC 62471	
Warranty	UV LEDs have a 2 year warranty, all other LEDs have a 10 year warranty. For complete warranty information, visit smartvisionlights.com/warranty	

The standard LZE300 has a 12 LED configuration.

	STANDARD (12 LEDs)
Input Current (Continuous Operation)	Max. 850 mA
Input Current (OverDrive™ Strobe Mode)	Max. 4.7 A (During Strobe)
Wattage (Continuous Operation)	Max. 20 W
Wattage (OverDrive™ Strobe Mode)	Max. 110 W (During Strobe)

SMARTVISIONLINK™

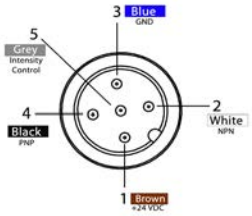
SmartVisionLink™ provides a way for a light to communicate with an app on a mobile device or tablet. This technology allows users to adjust the intensity of the light in both continuous operation and OverDrive™ strobe mode. By connecting the BTM-1000 Bluetooth module to a light that is SmartVisionLink™-enabled,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

RESOURCE CORNER

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

WIRING CONFIGURATION

CONTINUOUS OPERATION MODE



Pin layout for light (male connector)

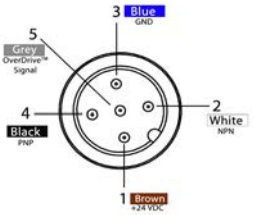
Pins	Function	Signal	Wire Color
1	Power In	+24VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1–10VDC	GREY*

For the light to function properly, apply either a PNP or NPN signal, not both.

Failure to supply light with correct input current will result in non-repeatable lighting
(see Product Specifications for requirements)

** Some cables use green/yellow for pin 5*
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).*

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*

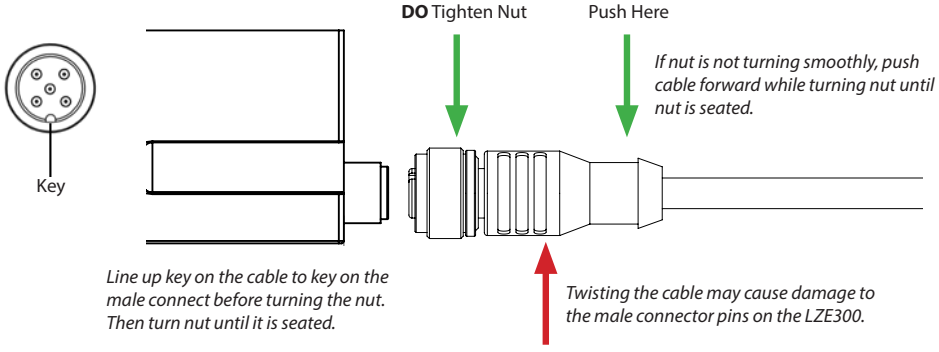
Failure to supply light with correct input current will result in non-repeatable lighting
(see Product Specifications for requirements)

** Some cables use green/yellow for pin 5*

CONNECTING A 5-PIN M12 CABLE

WARNING:

When connecting a 5-pin M12 cable to the male connector on the LZE300, do not twist the cable. Tighten the nut only. Twisting the cable will result in damage to the pins.

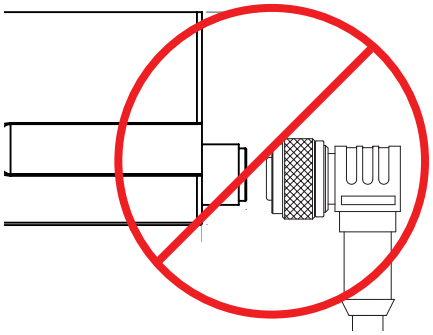


WARNING:

Smart Vision Lights does not recommends using a right angle cable with the LZE300.

If a right angle cable is required, do not rotate the connector or cable.

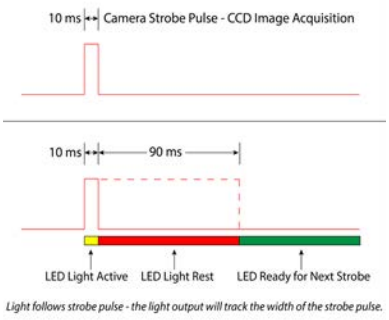
Damage caused by a right angle cable will result in the warranty being voided.



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).



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

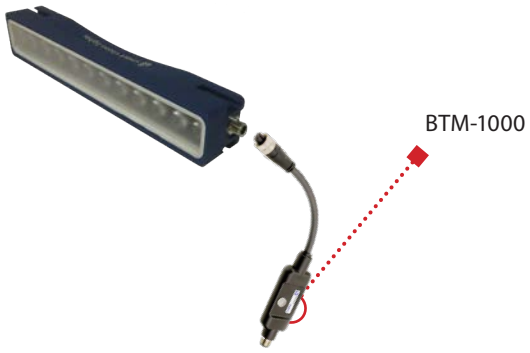
Four screw holes are located on the bottom of the light for easy mounting.


Four M5 screws included with light.

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 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.



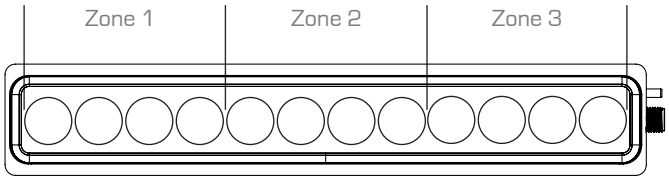
MANAGING MULTIPLE LIGHTS

Using the SmartVisionLinks™ app, a user is able to adjust intensity levels for a string of up to 6 lights. Each light or each zone in a multi-zone light are able to have its intensity adjusted independently of the other lights and zones. When direct connecting six LZE300 the user is able to manage 18 individual zone intensities.

ZONE CONFIGURATION

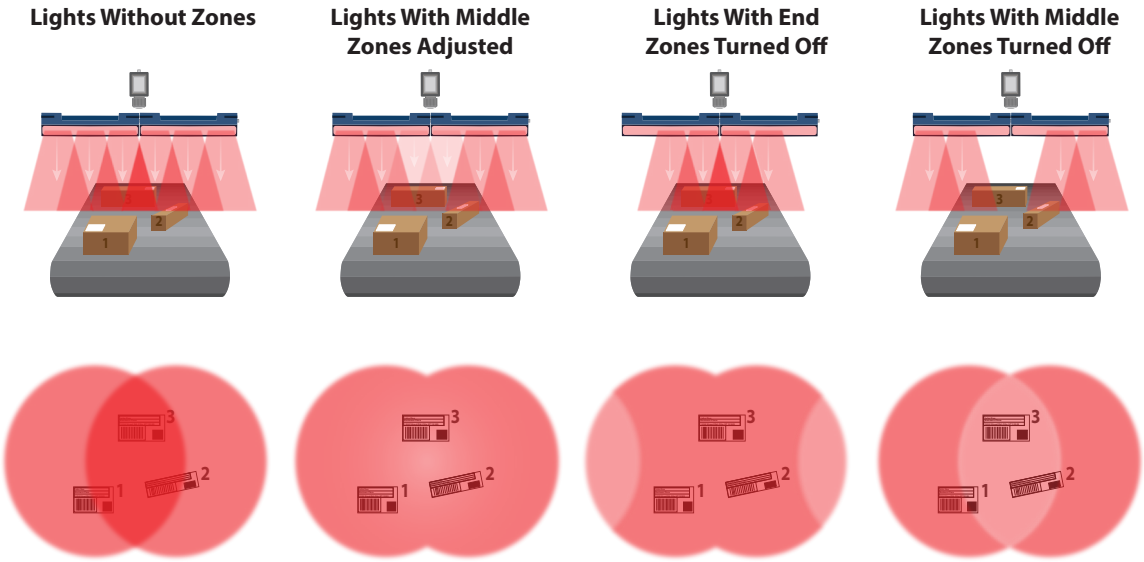
The LZE300 is divided into 3 zones. Each zone intensity level can be set independent of the other zones using the SmartVisionLink™ app and controller, such as the BTM-1000 (Bluetooth module). Each zone is 100 mm in length.

Zone 1 is located at the end with the female connector.



UNDERSTANDING ZONES

The LZE300 is a light that is SmartVisionLink™-enabled and is designed so intensity can be adjusted using the SmartVisionLink™ app. The LZE300 has 3 built-in zones, allowing for each zone intensity to be set independent of the other zones. Individual zones can also be turned off. Being able to adjust zones within a single light can help reduce hot spots and ensure even uniformity across a string of lights.



LED COLOR ACCURACY

To ensure accurate color matching between lights, Smart Vision Lights features a color consistent, 3-step MacAdam ellipse LED package with a nominal 5700 K color temperature.

LIGHT PATTERNS

Smart Vision Lights recommends the LZE300 be used at a working distance between 300 mm to 4000 mm.

LIGHTING PATTERN FOR THE STANDARD LZE300 **with Narrow (10°) Lenses**

Working Distance mm (inches)	Pattern (80% – 100% Measured Intensity)
500 mm (19.7")	200 mm (~7.8") H x 140 mm (~5.5") V
1000 mm (39.4")	400 mm (~15.7") H x 280 mm (~11") V
2000 mm (78.8")	800 mm (~31.5") H x 560 mm (~22") V

Operation	Illuminance (Lux)	
	1 Zone	All Zones
Continuous Operation	13,000	23,000
OverDrive™ Strobe	56,000	100,000

Illuminance measured at 500 mm from light.

LIGHTING PATTERN FOR THE STANDARD LZE300 **with Wide (25°) Lenses**

Working Distance mm (inches)	Pattern (80% – 100% Measured Intensity)
500 mm (19.7")	240 mm (~9.4") H x 170 mm (~6.7") V
1000 mm (39.4")	480 mm (~18.9") H x 340 mm (~13.4") V
2000 mm (78.8")	960 mm (~37.8") H x 680 mm (~26.7") V

Operation	Illuminance (Lux)	
	1 Zone	All Zones
Continuous Operation	3,400	8,600
OverDrive™ Strobe	14,800	37,000

Illuminance measured at 500 mm from light.

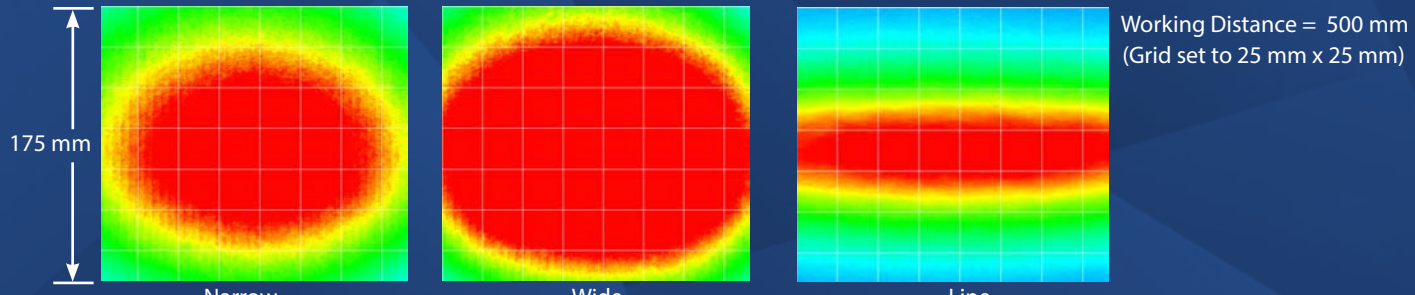
LIGHTING PATTERN FOR THE STANDARD LZE300 **with Line Lenses**

Working Distance mm (inches)	Pattern (80% – 100% Measured Intensity)
500 mm (19.7")	310 mm (~12.2") H x 55 mm (~2.1") V
1000 mm (39.4")	620 mm (~24.4") H x 110 mm (~4.3") V
2000 mm (78.8")	1240 mm (~48.8") H x 220 mm (~8.7") V

Operation	Illuminance (Lux)	
	1 Zone	All Zones
Continuous Operation	6,800	18,000
OverDrive™ Strobe	29,500	78,000

Illuminance measured at 500 mm from light.

The LZE300 Linear Light produces a uniform light pattern.



Working Distance = 500 mm
(Grid set to 25 mm x 25 mm)

MULTI-DRIVE™

Multi-Drive™ offers the best of both worlds. Continuous operation and OverDrive™ mode (HIGH output strobe/pulse) are available in a single light. Other advantages of Multi-Drive include faster imaging and capture/freeze motion on high-speed lines.

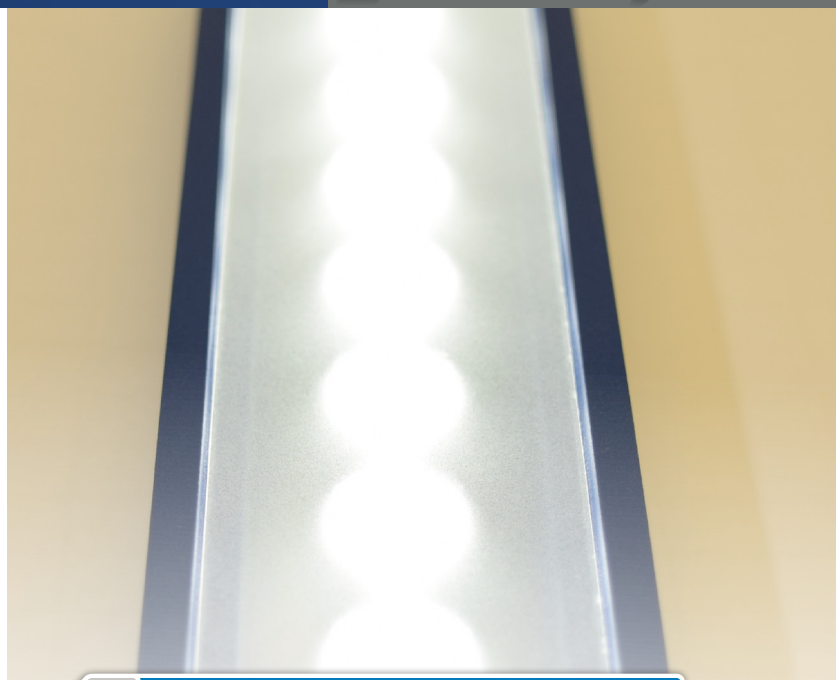
The Multi-Drive feature allows the user to run the light continuously or in OverDrive at the maximum allowed intensity by simply setting the product configuration. OverDrive operation has **over four times** the power of continuous operation.

SAFESTROBE™ TECHNOLOGY

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.

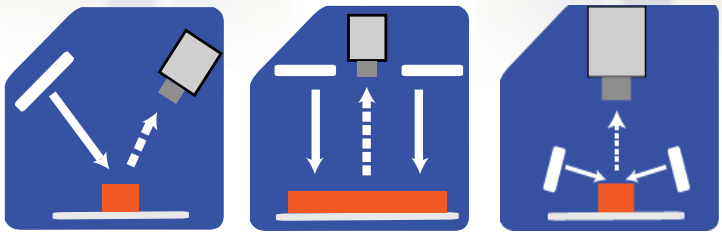
NANODRIVE™

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. NanoDrive™ technology is patent-pending.



ILLUMINATION

LZE300 Series of Linear Lights works best for:



Bright Field | Direct Lighting | Dark Field

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, 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.

Notice

Risk Group 1: UV emitted from this product. Minimize exposure to eyes and skin. Use appropriate shielding. Safe for most applications except prolonged exposures. Applicable for wavelength 395.

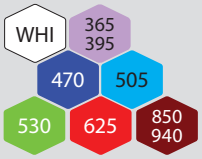
Caution

Risk Group 2: UV emitted from this product. Eye or skin irritation may result from exposure. Use appropriate shielding. Does not pose optical hazard if aversion responses limit exposure. Applicable for wavelength 365.

PART NUMBER

LZE300 – □□□ – □ – □□□ – □□

COLOR:



LENS:

Leave blank for standard (narrow)

W = Wide

L = Line

LINEAR POLARIZER:

Leave blank for none

LPI = Factory Installed

CONNECTOR:

Leave blank for Direct Connect

DC = Daisy-Chain

PG = Plug

SWIR SHORTWAVE INFRARED

This light is available in our SWIR LEDs

Additional wavelengths and lens options available upon request.

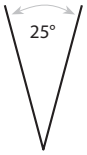
Part Number Examples:

LZE300-625	LZE300, standard (12 LEDs), 625 nm Red Wavelength, Standard (Narrow) Lenses
LZE300-WHI-W	LZE300, standard (12 LEDs), White, Wide Lenses
LZE300-470-W-LPI	LZE300, standard (12 LEDs), 470 nm Blue Wavelength, Wide Lenses, Linear Polarizer Installed, Direct Connect
LZE300-470-W-LPI-DC	LZE300, standard (12 LEDs), 470 nm Blue Wavelength, Wide Lenses, Linear Polarizer Installed, Daisy-Chain

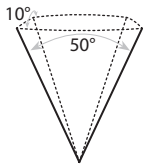
STANDARD LENS OPTICS

NARROW
Narrow lenses are standard.
Narrow, 10° angle cone lenses are standard. Standard lenses projects a narrow beam of illumination and are used for long working distances.

WIDE
Wide, 25° angle cone lenses projects a large area of illumination. They create a floodlight effect, can be used for short working distances.



LINE
Line, with a 10° width and a 50° fan angle projects a thin, narrow beam of illumination.



Additional lens options available upon request.

SHORTWAVE IR (SWIR)

Shortwave infrared (SWIR) lighting is a great option when visible light is not feasible for your application. Invisible to the human eye, SWIR wavelengths range from 1050 mm to 2500 nm. They are similar to visible wavelengths in that a wavelength is either reflected or absorbed by the object it is illuminating. This allows for a strong contrast when inspecting objects, essential for high-resolution imaging. A SWIR camera is required for use of a SWIR wavelength light.

SWIR SHORTWAVE INFRARED

When to Use a Linear Polarizers?

Polarizing filters can reduce reflections on specular surfaces.

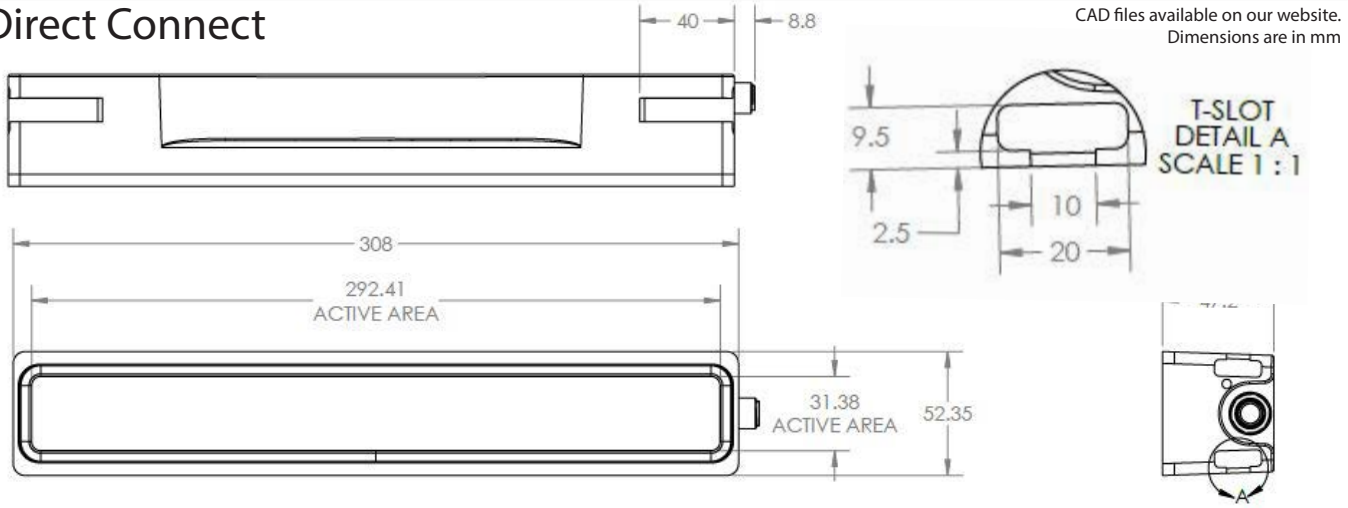
A Linear Polarizer has a typical transmission of 38% while blocking 62% of the light not in the polarization plane.

WARNING: Running a light in continuous operation while using a polarizer with certain wavelengths (ex. white, blue) may result in burning of the polarizer.

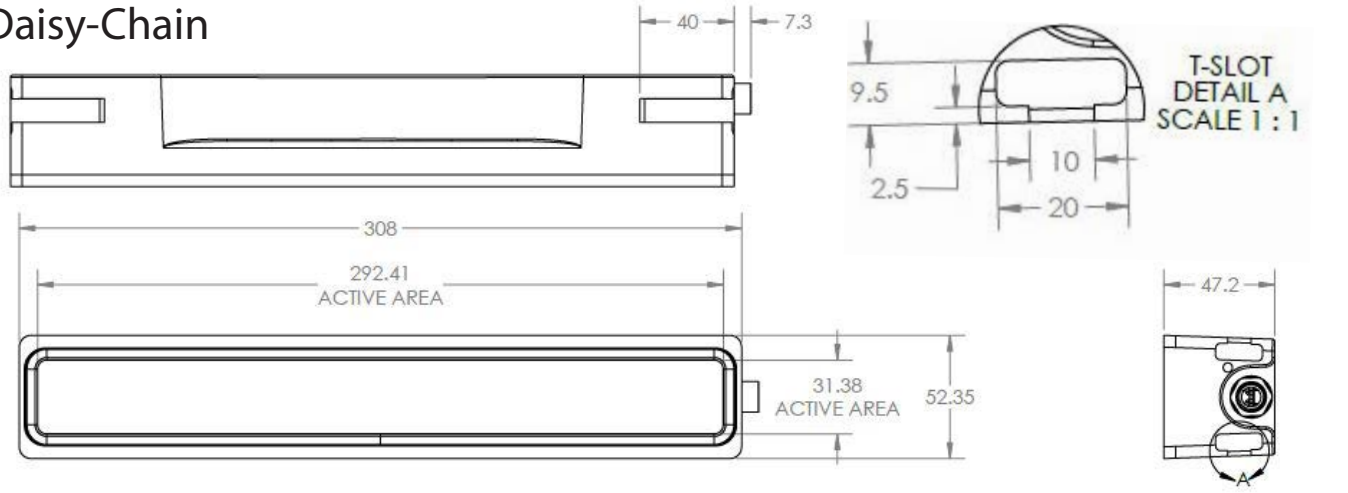
PRODUCT DRAWING

Direct Connect

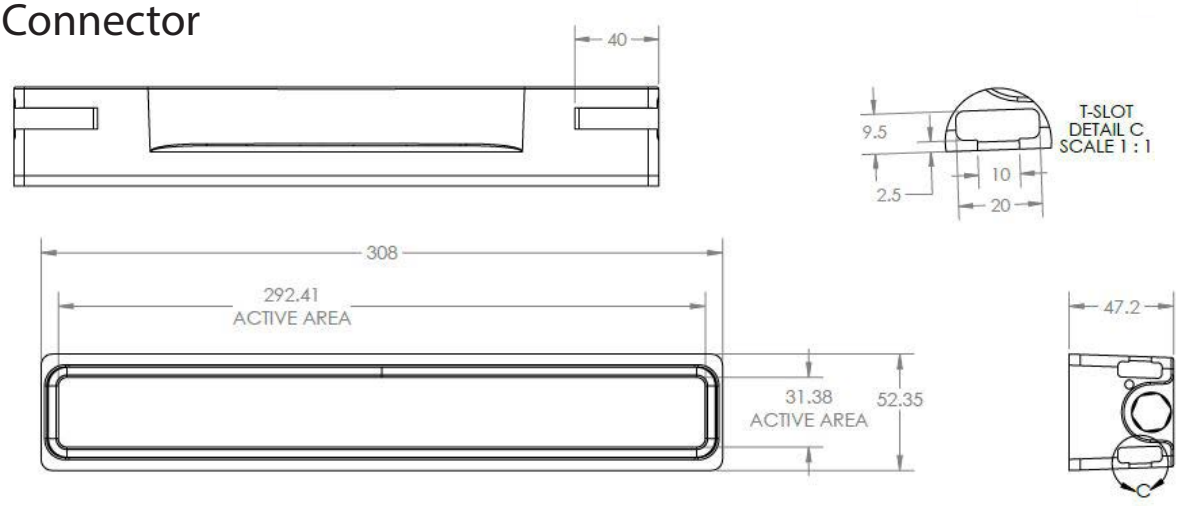
CAD files available on our website.
Dimensions are in mm



Daisy-Chain

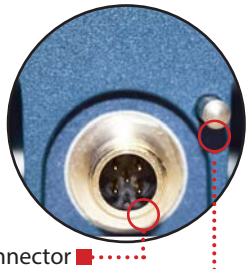


Plug Connector

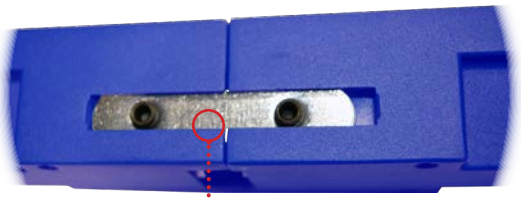


DIRECT CONNECT

The LZE300 allows for connecting lights together with no additional cables. Lights are directly connected together, with no space between the lights. Up to six LZE300 lights can be directly connected together.

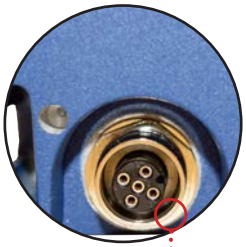


The part number **LXJ-2DTN** is required to directly connect two or more LZE300 together.



*For this type of connection, be sure to leave the suffix blank when filling out the part number.
Ex. LZE300 - 625 - W - LPI = LZE300, 625 nm, Wide Lens, Linear Polarizer Installed, Direct Connect

DAISY-CHAIN

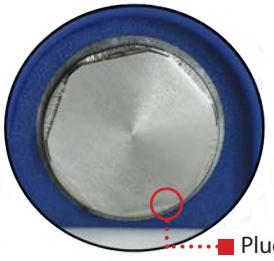


Daisy-chain allows for a 5PM-12 jumper cable to be used when connecting LZE300 lights together. Lights are able to be spaced apart from each other. Up to six LZE300 lights can be daisy-chained together.

LZE300 can be daisy-chained together using a jumper cable. (See accessories)

*For this type of connection, be sure to use a -DC suffix when filling out the part number.
Ex. LZE300 - 625 - W - LPI - DC = LZE300, 625 nm, Wide Lens, Linear Polarize Installed, Daisy Chain

PLUG



If multiple units are not going to be used, a plug termination can be ordered. To get this option, use a -PG suffix on the product number.
Ex. LZE300 - 625 - W - LPI - PG = LZE300, 625 nm, Wide Lens, Linear Polarize Installed, Plug

ACCESSORIES

Power Cables

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

Jumper Cables (Only for Daisy Chaining)

Lengths	Part Number
300 mm	5PM12-J300
1000 mm	5PM12-J1000
2000 mm	5PM12-J2000

Mount

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

Connector (Only for Direct Connect)

Description	Part Number
Set of 2 Connectors	LXJ-2DTN

SmartVisionLink™

Part Number	Description
BTM-1000	Bluetooth Module

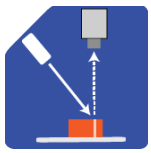
GLOSSARY

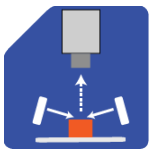
This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific light.

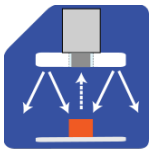
TERMINOLOGY

OverDrive™ Lights include an integrated high-pulse driver for complete LED light control.
Continuous Operation Lights stay 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.
Diffuser Used to widen the angle of light emission, reduce reflections, and increase uniformity.

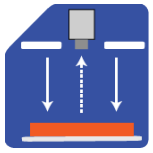
TYPES OF ILLUMINATIONS

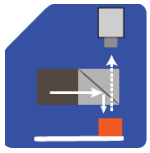

Projector

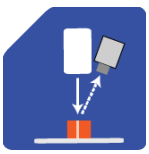

Dark Field

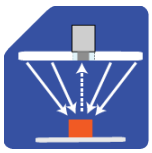

Radial

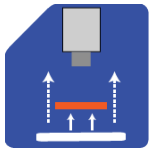

Bright Field


Direct


Axial

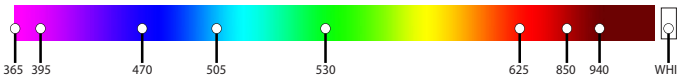

Line


Diffuse Panel


Backlight

COMMON COLOR/WAVELENGTHS LEGEND

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



See Part Number section for **this light's available standard wavelengths.*

SWIR SHORT WAVE **INFRARED**

Short Wave Infrared LEDs are available in 1050 nm, 1200 nm, 1300 nm, 1450 nm, and 1550 nm.