smart vision lights LWE150 *Mini-Light* LINEAR LIGHT WASHDOWN

PRODUCT DATA SHEET

multi drive™

Warranty	Compliant	Compliant	Rated	Connector
10 YEAR	IEC 62471	CE RoHS	IP 68	5-PIN M12

PRODUCT HIGHLIGHTS

- ✓ Built-in Multi-Drive™ allows the light to work in continuous operation or OverDrive™ strobe mode
- ✓ SafeStrobe™ technology ensures protected operation of LEDs
- ✓ Washdown light with 316 stainless-steel enclosure
- ✓ 5-pin M12 quick connect
- ✓ Built-in driver
- ✓ PNP and NPN trigger signal input

PRODUCT DESCRIPTION

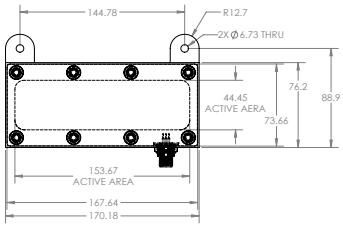
The LWE150 features a stainless-steel enclosure specially designed for food industry and washdown environments where water and harsh detergents are present. The LWE150 has an integrated Multi-Drive™ constant-current driver that operates continuous operation or in OverDrive™ strobe mode, depending on wiring configuration. NPN or PNP trigger signals can be used to control the pulse of the light. Intensity of the light can be controlled via 1–10VDC analog signal line.

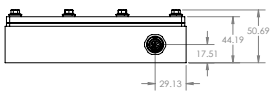
PRODUCT SPECIFICATIONS

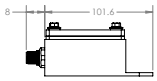
	CONTINUOUS OPERATION	OVERDRIVE™ OPERATION
Electrical Input	24VDC +/- 5%	
Input Current	Max. 412 mA	Max. 2.80 A
Wattage	Max. 10 W	Max. 68 W
PNP Line	4 mA @ 4VDC | 10 mA @ 12VDC | 20 mA @24VDC	
NPN Line	15 mA @ Common (0 VDC)	
OverDrive™ Mode	**Not applicable**	Connect pin 5 to GND (see Wiring Configuration for more information)
Strobe Duration	**Not applicable**	Min. 10 µs | Max. 50 ms (see SafeStrobe™ Technology for more information)
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	0º–40ºC (32º–104ºF)	
IP Rating	IP68	
Weight	760 g	
Compliances	CE, RoHS, IEC 62471	

PRODUCT DRAWING

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





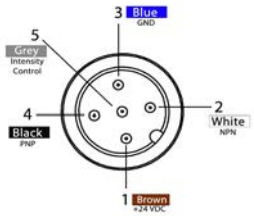


RESOURCE CORNER

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)

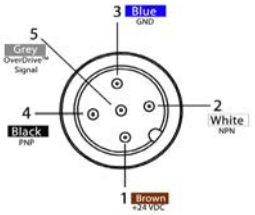
Pins	Function	Signal	Wire Color
1	Power In	+24VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10VDC**	GREY*

** 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 +24VDC (pin 1) **or** NPN (pin 2) can be tied to Ground (pin 3).*

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 requirement.)

OVERDRIVE™ STROBE 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*

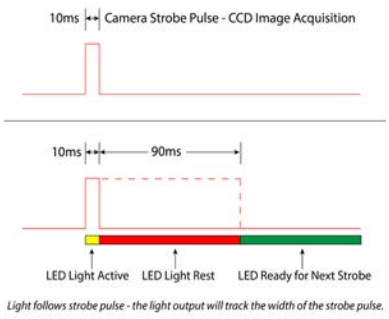
** Some cables use green/yellow for pin 5*

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

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.

MULTI-DRIVE™

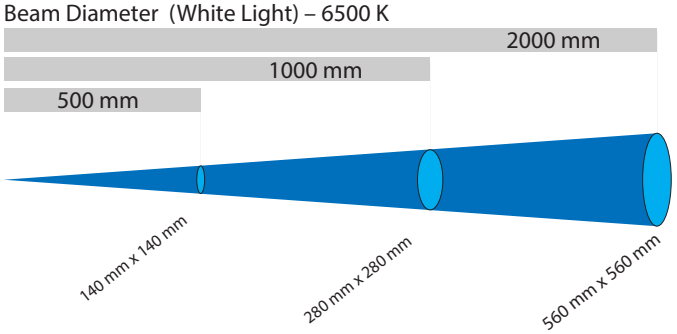
Multi-Drive™ offers the best of both worlds. Continuous operation and OverDrive™ mode (HIGH output strobe/pulse) are available in a single light. Other advantages of Multi-Drive™ include faster imaging and capture/freeze motion on high-speed lines.

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™ strobe mode has **up to eight times** the power of continuous operation.

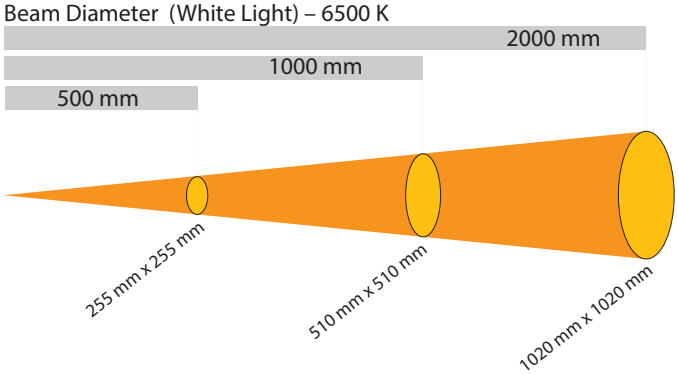
LIGHT PATTERNS

Smart Vision Lights recommends the LWE150 be used at a working distance between 300 mm and 4000 mm.

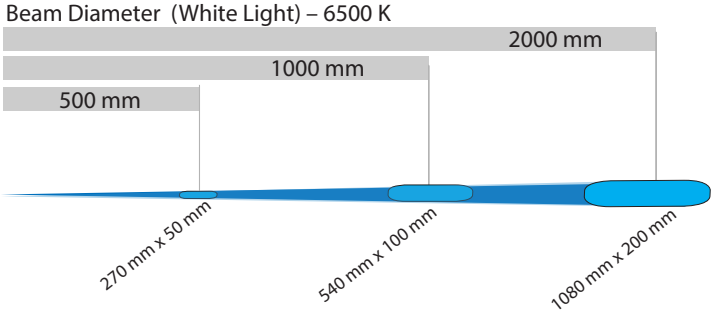
Beam Diameter (White Light) – 6500 K



Beam Diameter (White Light) – 6500 K



Beam Diameter (White Light) – 6500 K



LIGHTING PATTERN FOR THE LWE150 **with Narrow (Standard) Lenses**

Working Distance	Pattern (80% - 100% measured intensity) (H = Horizontal, V = Vertical)
500 mm (19.7")	140 mm (~5.5") H x 140 mm (~5.5") V
1000 mm (39.4")	280 mm (~11") H x 280 mm (~11") V
2000 mm (78.8")	560 mm (~22") H x 560 mm (~22") V

Typical Output Performance	Illuminance (Lux)
Distance = 500 mm	6600
Illuminance measurement taken on White Lights, 5700 K	

LIGHTING PATTERN FOR THE LWE150 **with Wide (W) Lenses**

Working Distance	Pattern (80% - 100% measured intensity) (H = Horizontal, V = Vertical)
500 mm (19.7")	255 mm (~10") H x 255 mm (~10") V
1000 mm (39.4")	510 mm (~20") H x 510 mm (~20") V
2000 mm (78.8")	1020 mm (~40") H x 1020 mm (~40") V

Typical Output Performance	Illuminance (Lux)
Distance = 500 mm	4800
Illuminance measurement taken on White Lights, 5700 K	

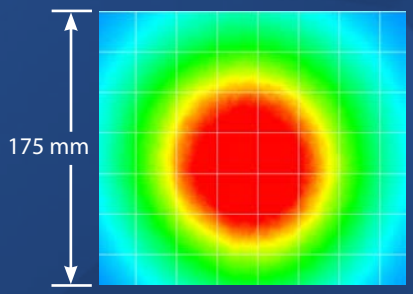
LIGHTING PATTERN FOR THE LWE150 **with Line (L) Lenses**

Working Distance	Pattern (80% - 100% measured intensity) (H = Horizontal, V = Vertical)
500 mm (19.7")	270 mm (~10.6") H x 50 mm (~2") V
1000 mm (39.4")	540 mm (~21.3") H x 100 mm (~4") V
2000 mm (78.8")	1080 mm (~42.6") H x 200 mm (~8") V

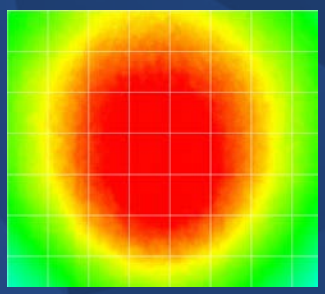
Typical Output Performance	Illuminance (Lux)
Distance = 500 mm	11,400
Illuminance measurement taken on White Lights, 5700 K	

The LWE150 Linear Light produces a uniform light pattern.

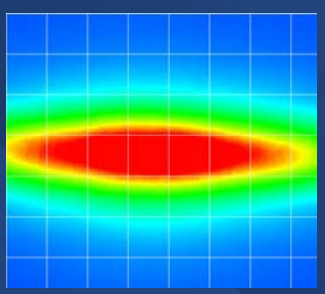
Working Distance = 500 mm Grid set to 25 mm x 25 mm



Narrow



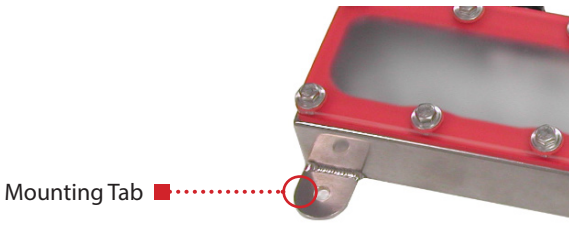
Wide

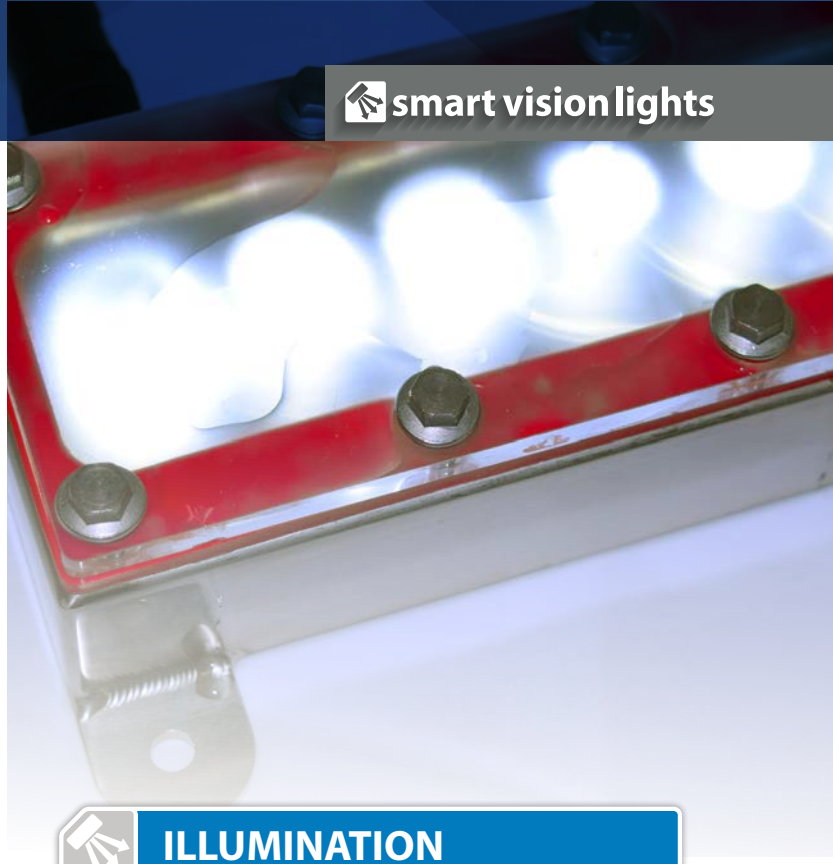


Line

MOUNTING

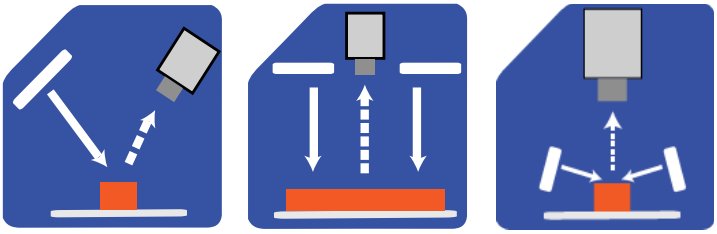
The LWE150 features 2 stainless-steel tabs welded directly to the housing for simple yet versatile mounting options.





ILLUMINATION

LWE150 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

LWE150 – □□□ – □ – □□□

COLOR:

WHI | 365 395 | 470 | 505 | 530 | 625 | 850 940

LENS:

Leave blank for standard (narrow)

W = Wide

L = Line

LINEAR POLARIZER:

Leave blank for none

LPI = Factory Installed

Part Number Examples:

LWE150-625	LWE150, 625 nm Red Wavelength, Standard (Narrow) Lenses
LWE150-WHI-L	LWE150, White, Line Lenses
LWE150-470-W-LPI	LWE150, 470 nm Blue Wavelength, Wide Lenses, with Linear Polarizer installed

SWIR SHORT WAVE INFRARED

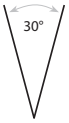
This light is available in our SWIR LEDs
(1050 nm, 1200 nm, 1300 nm, 1450 nm, 1550 nm)

** Line lens optic not available for UV wavelengths.*
Additional wavelengths and lens options available upon request.

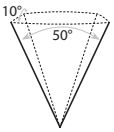
STANDARD LENS OPTICS

NARROW
Narrow lenses are standard.
Narrow 14° angle cone lenses are standard. Standard lenses create a narrow beam of illumination and are used for long working distances.

WIDE
Wide 30° angle cone lenses create 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.*

SAFESTROBE™ TECHNOLOGY

SafeStrobe™ technology is a unique technology that applies safe working parameters to ensure high-current LED's 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 LED's.

When to Use a Linear Polarizer?

Polarizing filters can reduce reflections on specular (Dielectric or non-metal) 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 standard polarizer with certain wavelengths (ex. white, blue) may result in burning of the polarizer.

ACCESSORIES

Power Cables

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

Jumper Cables (Daisy Chain)

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

Power Cables (Washdown)

Lengths	Part Number
15 m	W5PM12-15

Jumper Cables (Daisy Chain) (Washdown)

Lengths	Part Number
300 mm	W5PM12-J300
2000 mm	W5PM12-J2000

Washdown cables have a 316 stainless-steel connector(s).

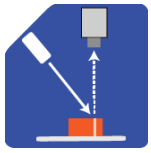
GLOSSARY

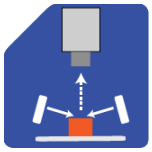
This glossary covers all Smart Vision Lights product families; some content in this section may not apply to this specific light.

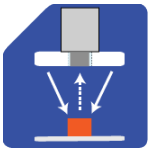
TERMINOLOGY

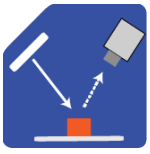
OverDrive™ Light includes an integrated high-current strobe driver for complete LED light control.
Continuous Operation Light stays on continuously.
Multi-Drive™ Combines continuous operation and OverDrive™ strobe (high-current strobe operation) modes into one easy-to-use light.
Built-In Driver The built-in driver allows full function without the need of an external driver.
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.

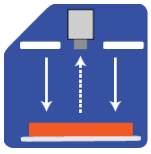
TYPES OF ILLUMINATIONS

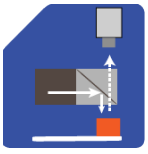

Projector

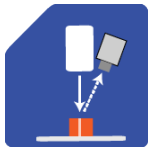

Dark Field

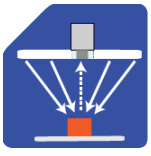

Radial

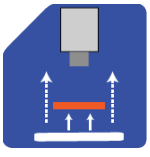

Bright Field


Direct


Axial

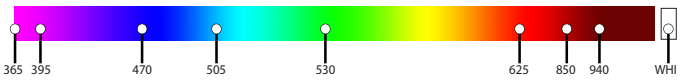

Line


Diffuse Panel


Backlight

COLOR/WAVELENGTHS LEGEND

Wavelength 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**

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.*