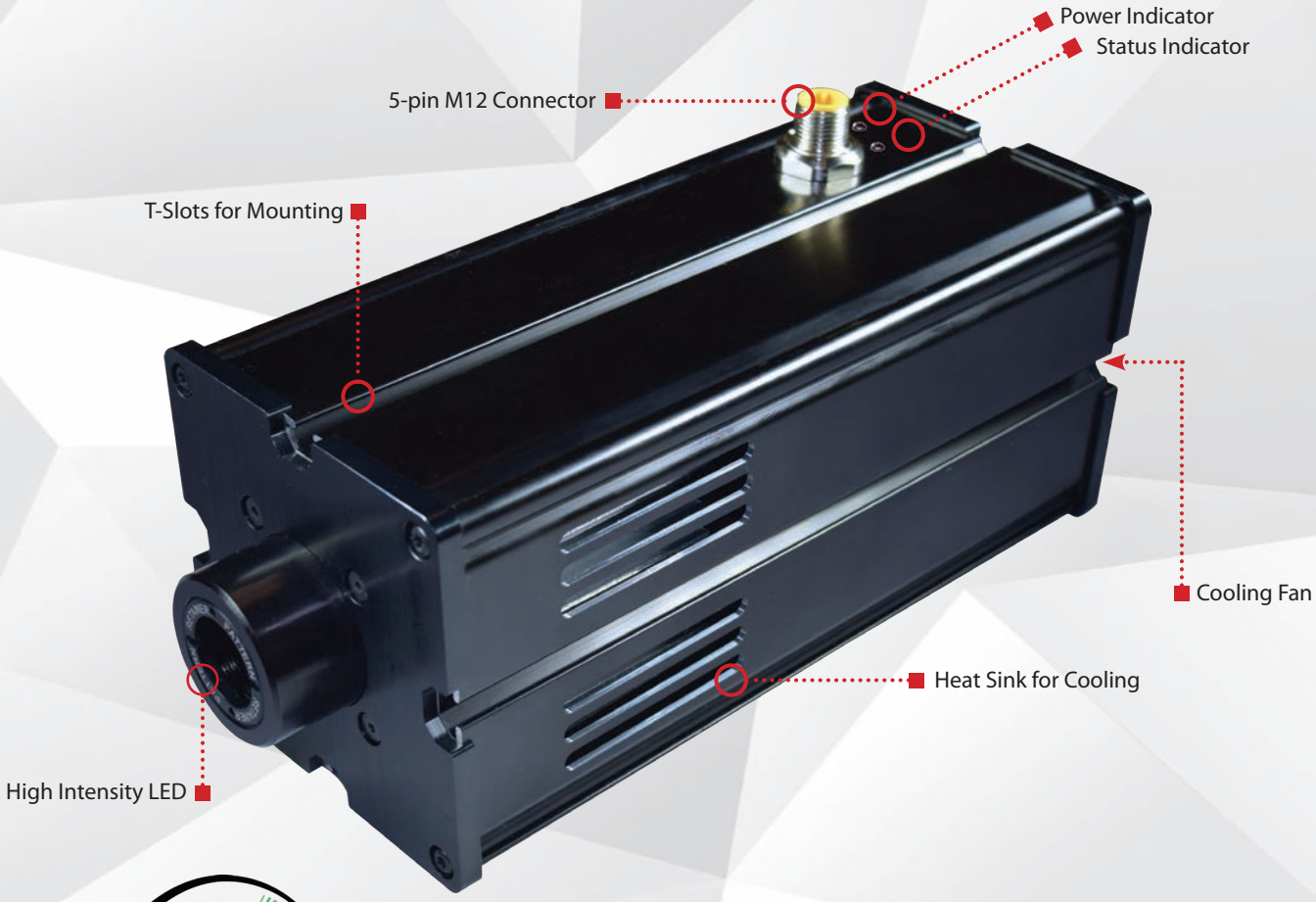
smart vision lights

SXP80 *Structured Light Projector*

PRODUCT DATA SHEET



nanoDrive™

Warranty	Compliant	Compliant	Connector
3 YEAR	IEC 62471	CE RoHS	5 PIN M12

PRODUCT HIGHLIGHTS

- ✓ Built-in NanoDrive™ delivers full power to the light in 500 nanoseconds for either continuous or OverDrive™ strobe operation
- ✓ 5-pin M12 industrial standard connector
- ✓ PNP and NPN trigger signal input
- ✓ Multiple interchangeable patterns available
- ✓ Accepts standard C-Mount lenses

PRODUCT DESCRIPTION

The SXP80 Series is among the highest intensity based projectors available in the market. With the ability to produce a thin and well-defined light pattern, the SXP80 performs with intensities comparable to that of laser projectors but without the speckle and can be used both far-field and near-field applications. The projector features Smart Vision Lights' newest high-speed, high-output, driver technology as well as forced-air cooling. NanoDrive provides very fast high energy strobe capabilities with on/off times as short as 500 ns, as well as the highest-intensity continuous operation available. Multiple interchangeable pattern styles are available, along with optional custom patterns.

PRODUCT SPECIFICATIONS

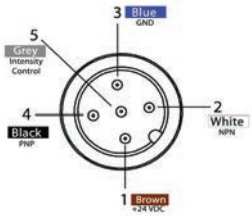
	CONTINUOUS OPERATION	OVERDRIVE™ STROBE MODE
Electrical Input	24VDC +/- 5%	
Input Current	Max. 4.0 A	Max. 8.8 A
Wattage	Max. 96 W	Max. 211 W
PNP Line	4 mA @ 5VDC | 8 mA @ 10VDC | 15 mA @24VDC	
NPN Line	15 mA @ Ground (0VDC)	
OverDrive™ Strobe Mode	**Not applicable**	Connect pin 5 to GND (see Wiring Configuration for more information)
Strobe Duration	**Not applicable**	Min. 10 µs | Max. 50 ms (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	
Power Indicator	Lights up green when power is applied	
Status Indicator	Lights up green when activated and red when the light is in fault condition	
Ambient Temperature	0º–40º C (32º–104ºF)	
Weight	960 g	
Compliances	CE, RoHS, IEC 62471	
Warranty	3 year warranty. For complete warranty information, visit smartvisionlights.com/warranty.	

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)

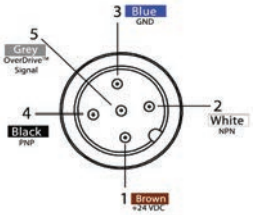
Pins	Function	Signal	Wire Color
1	Power In	+24VDC	BROWN
2	NPN	Sinking Signal	WHITE
3	GND	Ground	BLUE
4	PNP	Sourcing Signal	BLACK
5	Intensity Control	1-10VDC**	GREY*

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 requirement.)

** Some cables use green/yellow for pin 5*
*** For maximum intensity, it is possible to tie pin 5 to pin 1 at +24 V DC.*
*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™ 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*

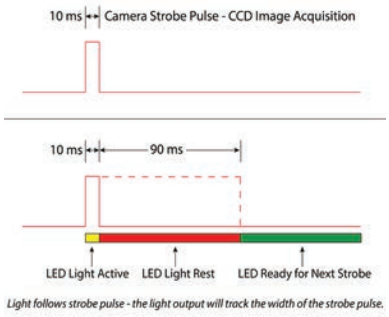
Failure to supply light with correct input current will result in non-repeatable lighting
(See Product Specifications for requirement.)

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

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.

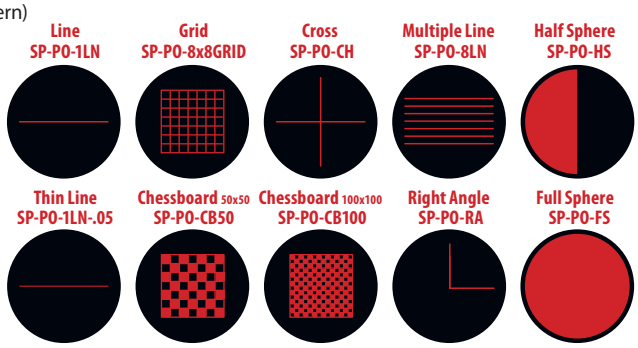
LIGHT INTENSITY

Operation	Typical Output Performance	Illuminance (Lux)
Continuous Mode	Distance = 100 mm	458,000
OverDrive™ Mode	Distance = 100 mm	916,000
Illuminance measurement taken on White Lights, 5700 K		

Light measurement acquired using a 35 mm Tamron lens.

PATTERNS

Standard patterns available. Patterns are interchangeable.
Part number e.g SP-PO-1LN (for a line pattern)



CUSTOM PATTERNS

Custom patterns can be etched to meet your needs.

Custom patterns specifications

- Square pattern boundaries: 8 mm maximum width/height
- Round pattern boundaries: 11 mm maximum diameter
- Minimum Feature size: 20 microns

Please contact SVL for a form for specifying your custom pattern requirements

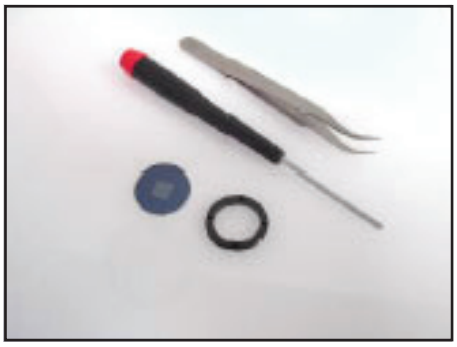
Custom pattern examples

3 x 3 grid
no border

Full circle

6 x 6 grid
with borders

PATTERN REPLACEMENT



Screwdriver or tweezers are recommended to remove retaining ring, but **are not included**. Retaining Ring will turn clockwise to install and counter-clockwise to remove. There are two small holes and two slots in ring to install/remove. Install the shiny metal side of pattern towards the LED

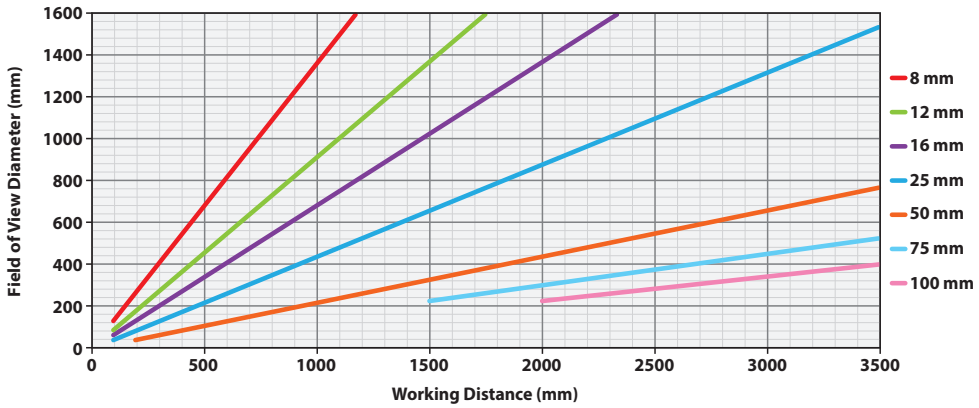
LENSES

Lenses	
Part Number	**Description**
CLENS0006	Tamron 1/1.8" Format 2MP 6 mm Megapixel Lens
CLENS0008	Tamron 1/1.8" Format 2MP 8 mm Megapixel Lens
CLENS0012	Tamron 1/1.8" Format 2MP 12 mm Megapixel Lens
CLENS0016	Tamron 1/1.8" Format 2MP 16 mm Megapixel Lens
CLENS0025	Tamron 1/1.8" 25 mm F/1.6 with Lock for Megapixel Cameras
CLENS0050	Tamron CCTV 50 mm Lens

STANDARD LENS CONFIGURATION

For lens options using a standard configuration use chart 1.

CHART 1: FOV-VS-WD
For Different FL Lenses



FOV = Field of View Diameter
FL = Focal Length
WD = Working Distance
PS = Pattern Size
M = Magnification

To estimate the Focal Length (FL) required for Working Distance (WD) and Field of View (FOV).

1. Use Chart 1 to estimate the Focal Length (FL) required for Working Distance (WD) and Field of View (FOV).
2. Use the equations below to determine the pattern size (PS), magnification, FOV, and FL relations

Magnification	**Finding Focal Length**
M = FOV/PS	M = WD/FL

For estimation only. User should determine best spacer/lensing options for application.

If the required Working Distance (WD) and/or Field of View (FOV) cannot be achieved with the standard view configuration (Chart 1), use chart 2 or chart 3 to help determine the spacer and lens combination.

CHART 2: Working Distance Using Lens Spacers

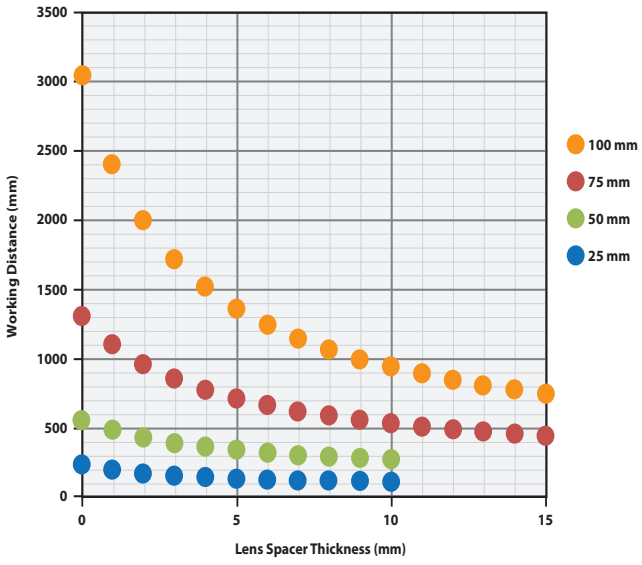
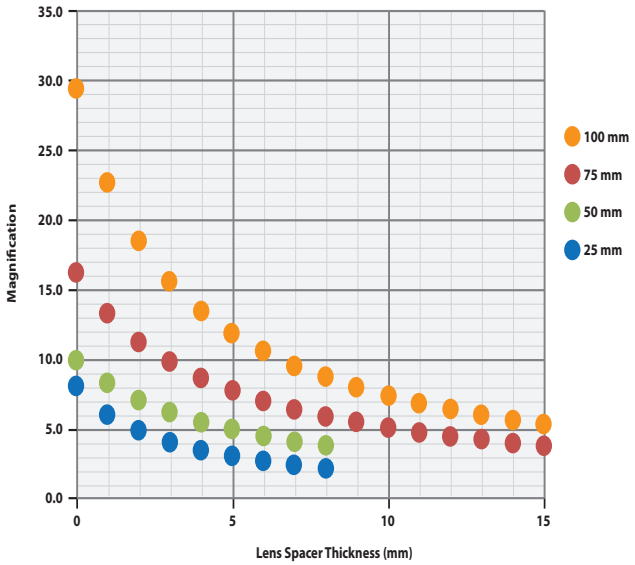


CHART 3: Projected Pattern Magnification Using Lens Spacers



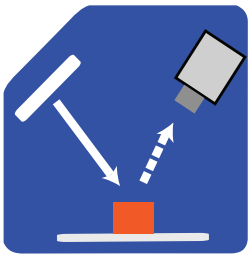
For estimation only. User should determine best spacer/lensing options for application.

NANODRIVE™

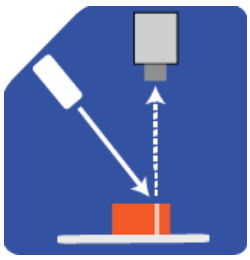
NanoDrive™ is the latest LED driver technology developed by Smart Vision Lights. To keep up with faster image acquisition by high-speed cameras, lighting applications require light sources to reach full intensity in the shortest amount of time. To meet this demand, we developed NanoDrive™ to deliver tens of amps to the LEDs within 500 nanoseconds or less, allowing the light to reach its full LED power/light intensity faster than ever before. And like its predecessor, the Multi-Drive™, the NanoDrive™ can operate in either continuous or OverDrive™ strobe mode. NanoDrive™ technology is patent-pending.

ILLUMINATION

SXP80 series of lights works best for:



Bright Field



Projector

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.

EYE SAFETY

According to IEC 62471:2006. Full documentation upon request

Notice

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

Caution

Risk Group 1: Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to eye. Safe for most applications except prolonged exposures. Applicable for wavelengths: 470, 530, and WHI.

PART NUMBER

SXP80 – □□□

COLOR:

WHI | 470 | 530 | 625

Part Number Examples:

SXP80-625 SXP80, 625 nm Red Wavelength

Patterns and lenes should be are ordered separately if required
See page 4 of the data sheet for details
Contact SVL if you require a custom pattern

Additional wavelengths options available upon request.

MOUNTING

Every side of the light features a T-slot for easy mounting.
Each light comes with two M5 screws and two T-nuts.

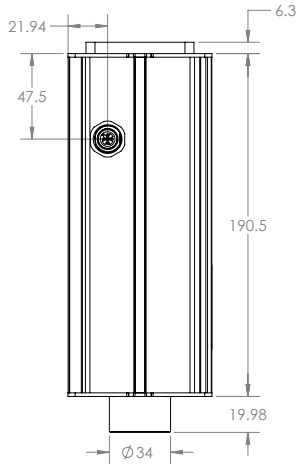
M5 Screws

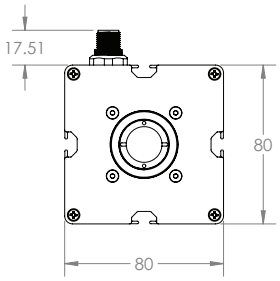
T-nuts
80/20 #14122

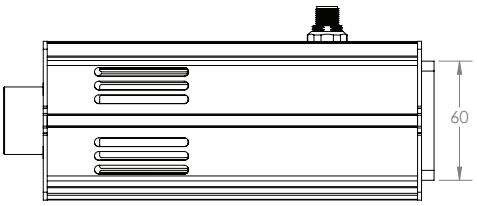
T-slot for mounting

PRODUCT DRAWING

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







ACCESSORIES

Power Cables

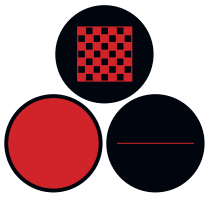
Lengths	Part Number
5 m	5PM12-5
10 m	5PM12-10
15 m	5PM12-15

Replacement Filter

Part Number

ELEC0005
Call for replacements

Patterns



Part Number

See lenses and patterns section for options.

Lenses

Part Number

See lenses and patterns section for options.

Lens Spacers

Lens Spacer Size	Part Number
0.5 mm	LENS SPACER-0.5
1.0 mm	LENS SPACER-1.0
2.0 mm	LENS SPACER-2.0
5.0 mm	LENS SPACER-5.0
10.0 mm	LENS SPACER-10.0
15.0 mm	LENS SPACER-15.0
20.0 mm	LENS SPACER-20.0
25.0 mm	LENS SPACER-25.0
30.0 mm	LENS SPACER-30.0
35.0 mm	LENS SPACER-35.0
40.0 mm	LENS SPACER-40.0
45.0 mm	LENS SPACER-45.0
50.0 mm	LENS SPACER-50.0

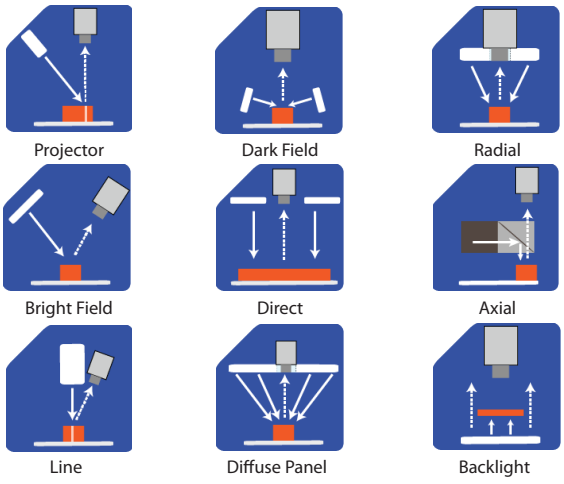
GLOSSARY

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

TERMINOLOGY

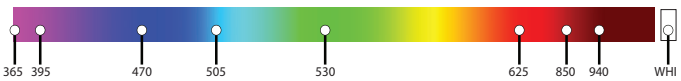
Built-in Driver The built-in driver allows full function without the need of an external controller.
Camera to Light Connecting the light directly to the camera, without the need for additional controllers or equipment.
Continuous Operation Lights stay on continuously.
Diffuser Used to widen the angle of light emission, reduce reflections, and increase uniformity.
Multi-Drive™ Combines continuous operation and OverDrive™ strobe (high-pulse operation) mode into one easy-to-use light.
NanoDrive™ The industry's leading driver, delivering full power to the light in 500 nanoseconds or less, while still allowing the light to operate in either continous or OverDrive™ strobe mode.
OverDrive™ Lights include an integrated high-pulse driver for complete LED light control.
Polarizers Filters that reduce reflections on specular surfaces.

TYPES OF ILLUMINATIONS



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**

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