PRODUCT HIGHLIGHTS

- Capable of producing up to 5000 strobes per second
- Pulse energy of up to 2000 W when LEDs are active
- Built-in driver
- PNP and NPN trigger signal input
- SafeStrobe™ technology ensures protected operation of LEDs

SmartVisionLights.com
PRODUCT DESCRIPTION

The XR256 Series High-Speed Strobe Light is a high speed, high power, pulse-initiated or pulse following strobe with a maximum output of 5000 strobes per second and a pulsed energy rating of 2000 W. The XR256 offers eight manually controlled settings between a 20 µs to 1000 µs strobe pulse duration in pulse-initiated mode and features a preprogrammed 2% duty cycle. The XR256 Series also features SafeStrobe™ technology protects LEDs from overheating and premature degradation.

PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Input</td>
<td>24 VDC +/- 5%</td>
</tr>
<tr>
<td>Input Current</td>
<td>Max current 20 A for max. 15 ms</td>
</tr>
<tr>
<td>Wattage</td>
<td>Up to 2000 W</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>Max 2%</td>
</tr>
<tr>
<td>Strobe/Pulse</td>
<td>Light will trigger on leading edge of pulse</td>
</tr>
<tr>
<td>Strobe Rate</td>
<td>Max. 5000 strobes per second (see SafeStrobe™ Technology for more information)</td>
</tr>
<tr>
<td>Yellow Indicator LED</td>
<td>Over temperature — Cool down mode active</td>
</tr>
<tr>
<td>Green Indicator LED</td>
<td>Power on</td>
</tr>
<tr>
<td>Red Indicator LED</td>
<td>LED strobe indicator</td>
</tr>
<tr>
<td>Pulse-Initiated Strobe</td>
<td>8 Settings: 20 µS — 1000 µS</td>
</tr>
<tr>
<td>Time Delay ON</td>
<td>1 µS — Full ON</td>
</tr>
<tr>
<td>Pulse Following Strobe</td>
<td>Light will track strobe pulse – Max. strobe of 40 ms</td>
</tr>
<tr>
<td>Connection</td>
<td>5-position screw terminal block (5-position terminal block plug included)</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>0°-40°C (32°-104°F)</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP50</td>
</tr>
<tr>
<td>Weight</td>
<td>~1820g</td>
</tr>
<tr>
<td>Compliances</td>
<td>CE, RoHS, IEC 62471</td>
</tr>
<tr>
<td>Warranty</td>
<td>10 year warranty. For complete warranty information, visit smartvisionlights.com/warranty.</td>
</tr>
</tbody>
</table>

WIRING CONFIGURATION

The XR256 comes with a 5-position terminal block plug.

**Wired for Pulse Initiated**

<table>
<thead>
<tr>
<th>Pins</th>
<th>Function</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power In</td>
<td>+24 VDC</td>
</tr>
<tr>
<td>2</td>
<td>NPN</td>
<td>NOT USED</td>
</tr>
<tr>
<td>3</td>
<td>PI</td>
<td>Pulse Initiated</td>
</tr>
<tr>
<td>4</td>
<td>PNP</td>
<td>NOT USED</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Pin layout for light (Male Connector)

**Wired for Pulse Following**

<table>
<thead>
<tr>
<th>Pins</th>
<th>Function</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power In</td>
<td>+24 VDC</td>
</tr>
<tr>
<td>2</td>
<td>NPN</td>
<td>Pulse Following</td>
</tr>
<tr>
<td>3</td>
<td>PI</td>
<td>NOT USED</td>
</tr>
<tr>
<td>4</td>
<td>PNP</td>
<td>Pulse Following</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Signal input must be a sourcing PNP input. Strobe duration controlled by adjustment dial.

Signal input can be a sinking NPN or sourcing PNP.

RESOURCE CORNER

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

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Hours: Monday–Friday | 8am–5pm ET
**USING THE XR256**

The XR256 high-speed strobe light is capable of producing up to 5000 strobes per second (SPS). The strobe can be either pulse-initiated or pulse following, adding versatility. Pin 2, NPN, is the sinking input in the pulse-following mode. Pin 4, PNP, is the sourcing input in the pulse-following mode. To pulse the LEDs, the XR Series of LED lights uses stored electrical energy. When LEDs are active, the XR256 has a pulse energy of 2000 watts. The XR256 light has a pulsed LED die current of 180 amps.

The XR256 light has 288 mm² (144 of 2 mm² high-power die) of LED die running at up to 2000 W. For comparison, a standard LED light for machine vision has on average 6–12 mm² of LED die running a 6–12 Watts.

The XR Series features an LED die temperature monitor that will temporarily shut down the light if the LEDs exceed the maximum running temperature of 80°C. The LED die will gain heat based on the LED duration and SPS. A high duty cycle or long durations with high SPS will cause the heat to rise in the die.

**LIGHT PATTERNS**

**LIGHTING PATTERN FOR THE XR256 with Standard 14° Lenses (14)**

<table>
<thead>
<tr>
<th>Working Distance mm (inches)</th>
<th>Pattern (80%–100% measured intensity) mm (inches)</th>
<th>Typical Output Performance</th>
<th>Illumination (Lux)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 mm (~19.7&quot;)</td>
<td>155 mm (~7&quot;) D</td>
<td>Distance = 500 mm</td>
<td>700,000</td>
</tr>
<tr>
<td>1000 mm (~39.4&quot;)</td>
<td>360 mm (~14&quot;) D</td>
<td>Illumination measurement taken on White Light, 5700 K</td>
<td></td>
</tr>
</tbody>
</table>

**LIGHTING PATTERN FOR THE XR256 with Wide 80° Lenses (W80)**

<table>
<thead>
<tr>
<th>Working Distance mm (inches)</th>
<th>Pattern (80%–100% measured intensity) mm (inches)</th>
<th>Typical Output Performance</th>
<th>Illumination (Lux)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 mm (~19.7&quot;)</td>
<td>4400 mm (~173&quot;) D</td>
<td>Distance = 500 mm</td>
<td>177,000</td>
</tr>
<tr>
<td>1000 mm (~39.4&quot;)</td>
<td>8800 mm (~346&quot;) D</td>
<td>Illumination measurement taken on White Light, 5700 K</td>
<td></td>
</tr>
</tbody>
</table>

Additional light output measurements available upon request.
Each number on the dial represents a strobe light pulse rate in microseconds (μs). When setting the dial to 250, for example, the light will pulse for 250 μs. The light will pulse for this length of time once it receives a PNP rising edge signal (the sourcing signal between 4 VDC and 24 VDC).

Setting the dial hand to “Auto” will automatically pulse the light for a set length of time. To set the length of time, turn the light on, point the dial hand to the desired length of time. Keep the dial hand on the desired time for three seconds and then position the dial hand on “Auto”. The light will be set to the length of time selected. When the light is set to Auto, no PNP signal (sourcing signal) is used. The light will pulse for the desired length of time and then enter into a rest period set using a 2% duty cycle. The light will repeat these two steps for as long as the light is on. For example, if light has been set to Auto at a rate of 20 μs, the light will pulse for 20 μs, rest for 98 μs, then repeat the active and rest periods.

Strobe Durations:
- 20 μs pulse
- 50 μs pulse
- 100 μs pulse
- 250 μs pulse
- 500 μs pulse
- 750 μs pulse
- 1000 μs pulse

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.

NARROW (14)
Narrow-angle lenses project a narrow beam of illumination. They can be used when longer distances are needed.

WIDE 30/50/80
Wide-angle lenses project a large area of illumination and can be used when short working distances are needed.

SAFESTROBE™ TECHNOLOGY
INDICATOR LIGHTS

Strobe Active Indicator (Red)
Over Temperature Indicator (Yellow)
Power Indicator (Green)
PRODUCT DRAWING

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

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, 530, and WHI.

ILLUMINATION

XR256 Series of Strobe Lights works best for:

- Bright Field
- Direct

SmartVisionLights.com
PART NUMBER

XR256 - □□□□ - □□□□

COLOR:
XR256, 625 Red Wavelength, Standard (Wide) Lenses

LENS:
XR256-625 XR256, 625 Red Wavelength, Standard (Wide) Lenses
XR258-WHI-W80 XR256, White, Wide 80° Lenses

Part Number Examples:

XR256-625 XR256, 625 Red Wavelength, Standard (Wide) Lenses
XR258-WHI-W80 XR256, White, Wide 80° Lenses

Additional wavelengths and lens options available upon request.

MOUNTING

Mounting options include eight T-slots and eight M4 threaded holes.

Includes:
Two M5 x 10 mm screws and two M5 T-nuts included.

Mounting Options:
T-slots = M5 x 0.8 mm T-nut
Threaded screw holes = M4 screws

DUTY CYCLE (OVERDRIVE™ MODE ONLY)

This section applies only for 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

980 μs = \(\frac{20 \mu s}{0.02}\) - 20 μs

Rest Time is 49 μs for 10 μs Strobe Time

Calculating Strobe Rate

\[
SR = \frac{D}{ST}
\]

SR = Strobe Rate (strokes per second)
ST = Strobe Time (seconds)
D = Duty Cycle

Example

200 = \(\frac{0.02}{0.0001}\)

Strobe Rate is 200 strobes per second

Calculating Duty Cycle

\[
D = ST \times SR
\]

SR = Strobe Rate (strokes per second)
ST = Strobe Time (seconds)
D = Duty Cycle

Example

0.02 = 0.0001 x 200

Duty Cycle is 2% (0.02)

Note: Strobe time is limited by the strobe rate.

SmartVisionLights.com
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 ILLUMINATION**

- **Projector**
- **Dark Field**
- **Radial**
- **Bright Field**
- **Direct**
- **Axial**
- **Line**
- **Diffuse Panel**
- **Backlight**

**COMMON 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.

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.