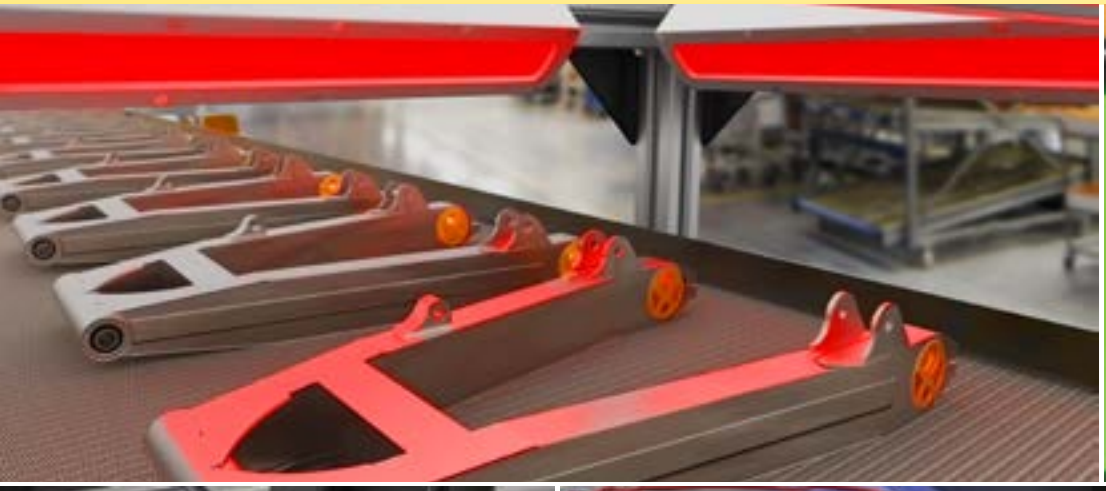
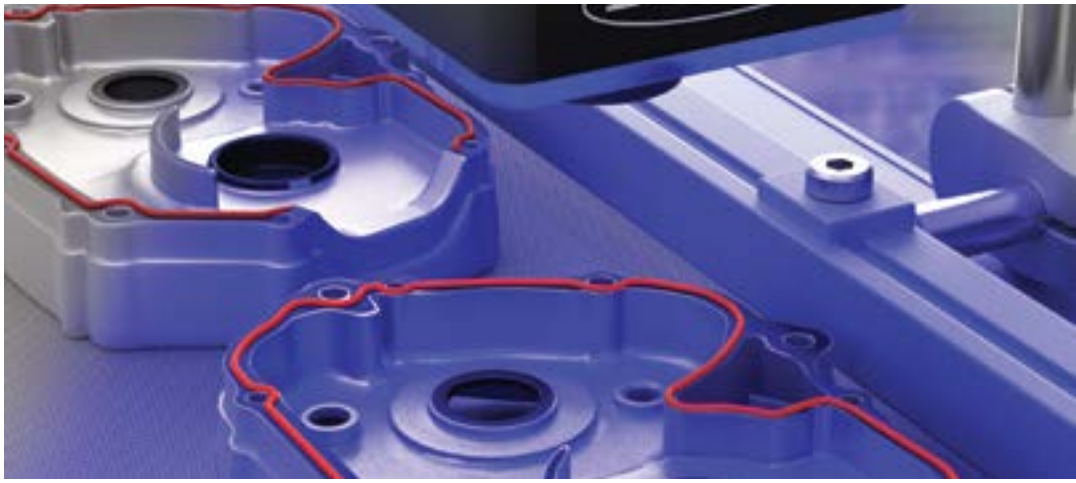
Vision Lighting

BANNER®

more sensors, more solutions





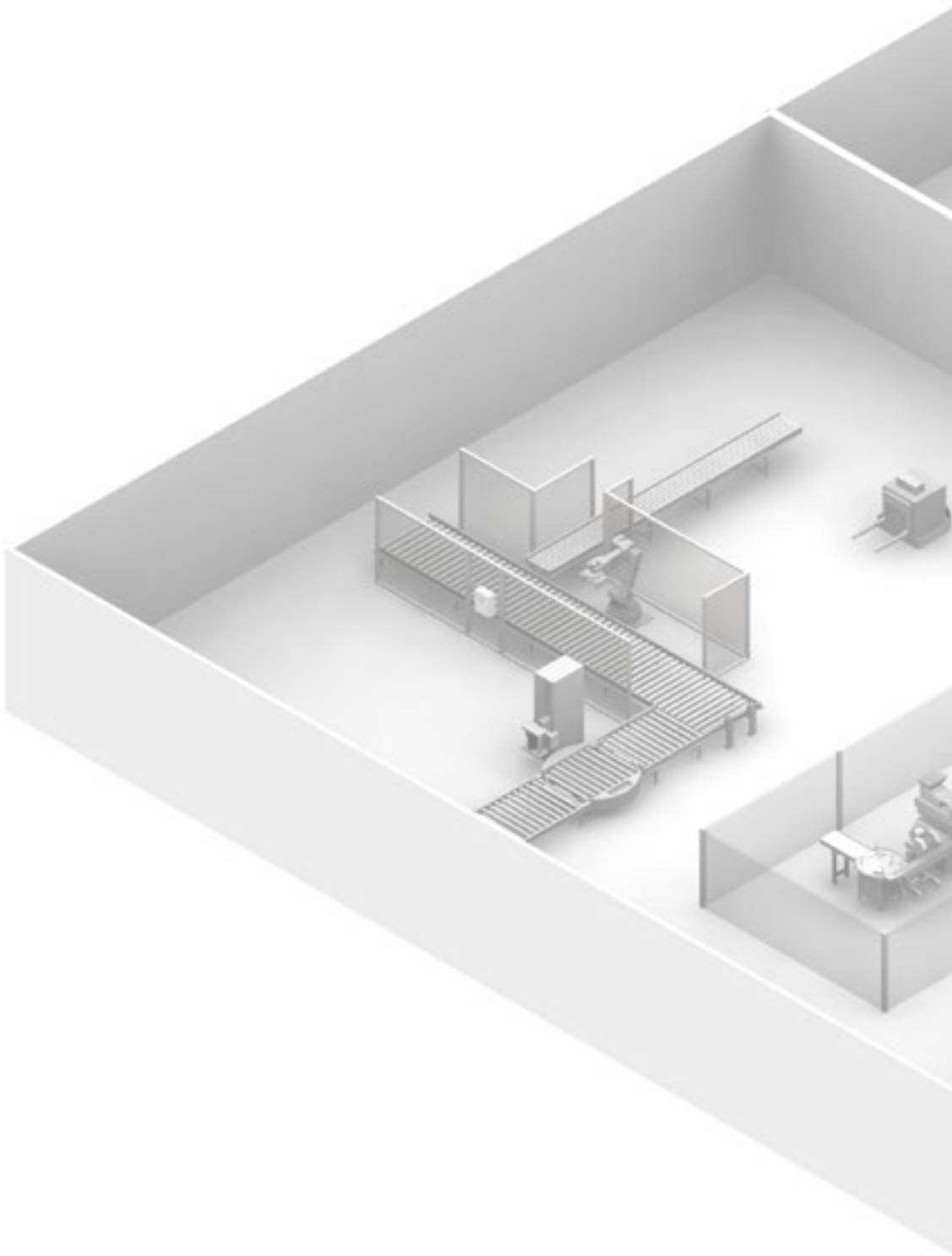
Why Banner Vision Lighting

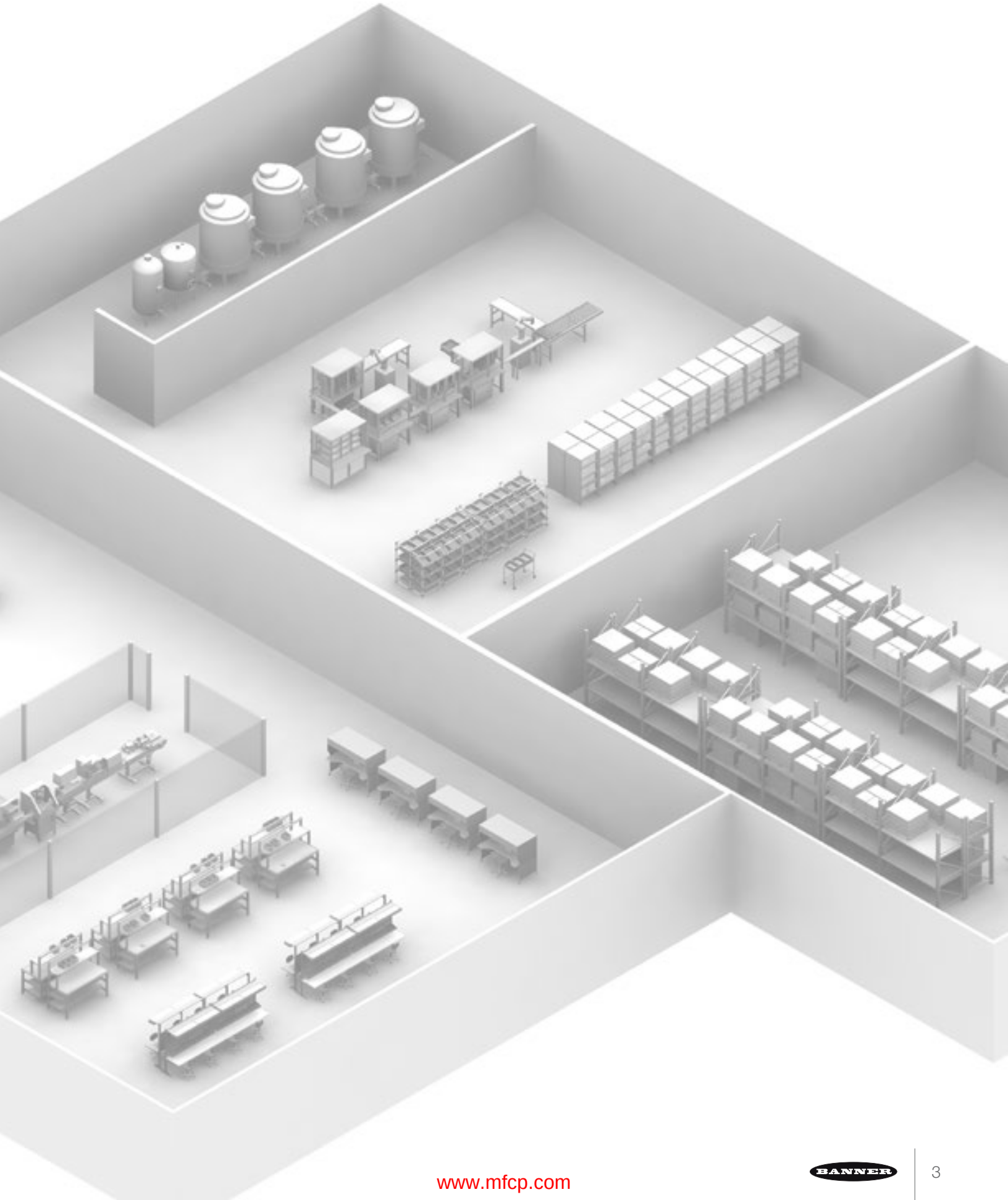
With over ten years of lighting experience Banner is been committed to developing new and innovative solutions, delivering products of the highest quality, fulfilling the needs of each customer, and operating with honesty and integrity. Banner's expanding offering of vision lights help you:

Reduce Labor Costs

Improve Accuracy and Quality

Increase Production Rate





Key Tasks of Vision Lights

Machine vision systems are used as quality control to ensure critical inspection and measurement. They evaluate the image of the object—not the object itself—to get the correct lighting arrangement from the start. To optimize image quality, a dedicated light source should be used in any vision application. Dedicated lighting optimizes contrast between the target object or feature and its background.

LED illumination has become the universal standard for machine vision. It is reliable, requires minimal maintenance, is easy to assemble and comes in a variety of colors, or wavelengths, such as red, blue, green, IR and UV.

In addition to identifying the correct type of illumination, ensuring that the light is consistent for every single measurement is critical in ensuring repeatable measurements.

Factors affecting consistency of illumination:

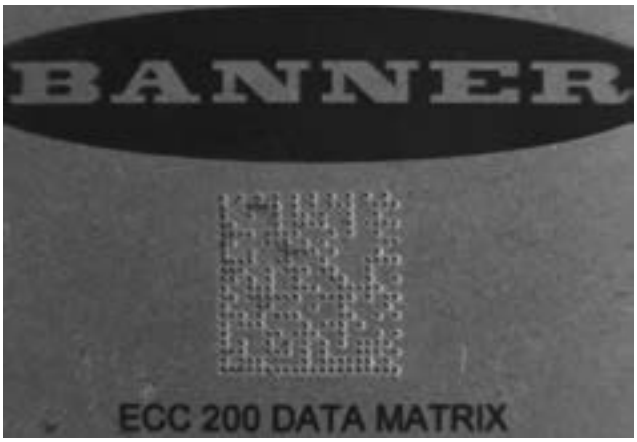
- Age of light
- Variations in lighting and camera exposure
- Temperature of the light
- Variations in drive to the light
- Ambient light
- Timing of pulsed lighting

Optimizing Image Quality

To optimize image quality, a dedicated light source should be used in any vision application. Dedicated lighting:

- Optimizes contrast between the target object or feature and its background,
- Provides uniform lighting conditions that allow image capture to be unaffected by ambient lighting in the factory environment, and
- Simplifies image analysis by creating high contrast between the “good” and the “bad” feature of interest

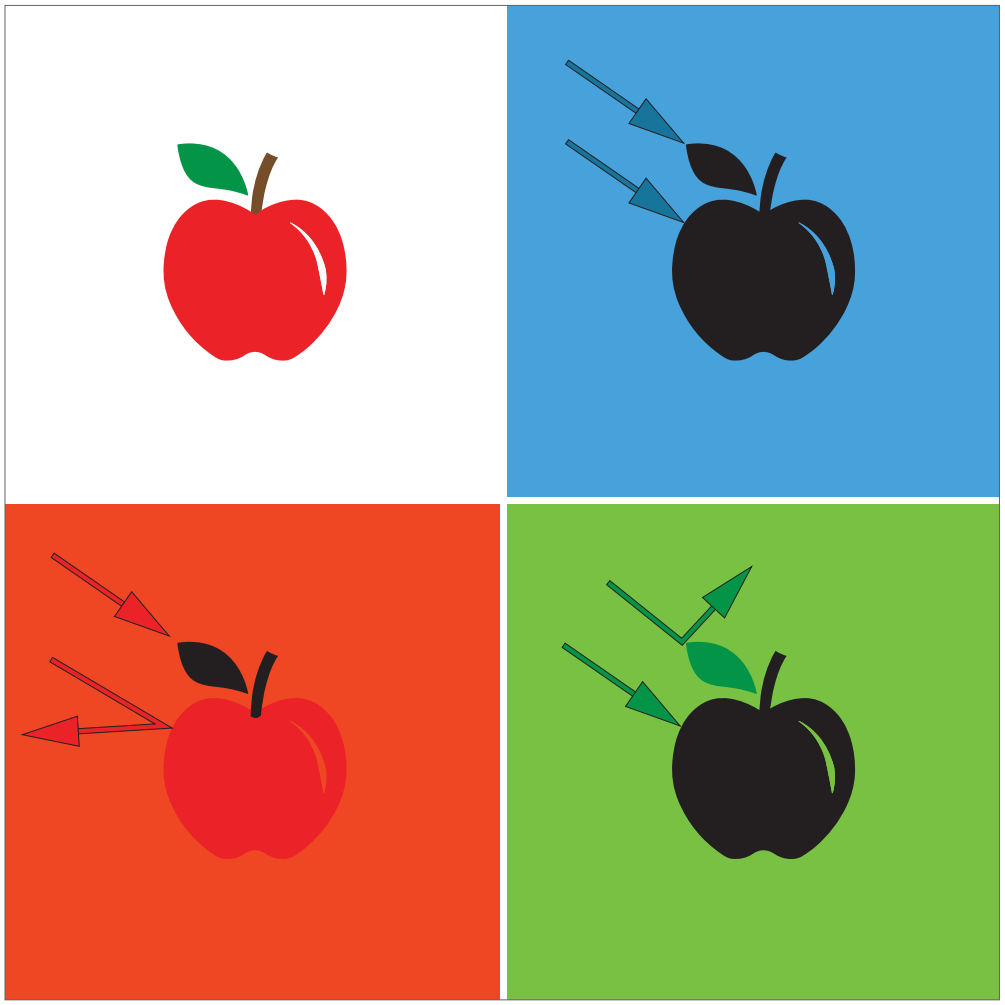
Without Lighting



With Vision Lighting

Choosing the Right Color

In addition to choosing the right lighting technique, different wavelengths of light can also be used to create additional contrast, draw out features of interest, or reduce the visibility of insignificant features.



in red light, the apple appears red because it reflects the light. The leaves however appear black.

in blue light, the apple and the leaves appear black

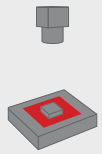
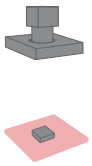
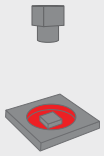
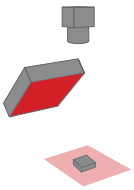
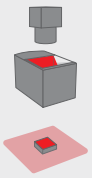
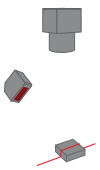
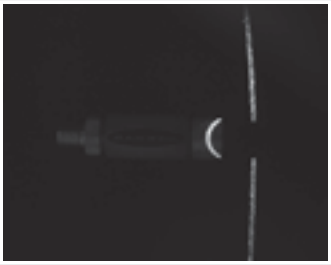
in green light, the apple appears black because no red light is reflecting on it, but the leaves now look green..

Infrared (IR) Light

Infrared (IR) light can be used to hide insignificant features by reducing the contrast of certain objects. For example, some types of ink that appear dark in the visible spectrum reflect large amounts of IR light. In these cases, ink may disappear in a grayscale image—an effect that can be used to hide certain insignificant features.

Ultraviolet (UV) Light

Ultraviolet (UV) light can be used to draw out features of interest when there is very little contrast from the background, such as beads of clear adhesive on a part. Shining UV light on the adhesive may create a glowing effect (fluorescence) that makes the adhesive stand out clearly from the background.

Lighting Techniques	What the Camera Sees	Description
		**Backlights** The part being inspected is placed between the camera and a bright, even light source. The result creates a silhouette of the target which is useful in edge detection, part presence and measurement applications.
		**Ring Lights** A ring light is affixed to the camera and both items can be mounted as one piece for convenience. This setup is good for relatively small parts or close up applications.
		**Low Angle Ring Lights** Also called a dark field illuminator, this specialty light has its LEDs mounted in a ring, pointing toward the part almost perpendicular to the camera's direction of view. Low Angle Ring lights create shadows and bright spots to detect changes in depth.
		**Directional Lights** Directional lights, in whatever style, create shadows to detect changes in depth, illuminate specific surface angles, and avoid glare of reflective surfaces when directed at an angle away from lens.
		**On-Axis Lights** On-axis, or coaxial, lights generates light that travels along the same axis as the camera's direction of view. The camera looks down from the top, through the On-Axis light, to the target part below. This technique can be use to eliminate shadows, inspect shiny object or inspect for height changes.
		**Structured Lights** A laser line generator is an example of a structured lighting scheme. This technique uses a high quality, uniform laser line to infer the presence of a difficult to see target. As a three-dimensional part passes through the laser line's path, the image of the laser becomes distorted so the camera can detect the part.
		**Heavy Duty Lights** Our portfolio of heavy duty lights includes products suitable for use in washdown environments, hazardous locations, and high temperature applications. We offer a variety of waterproof devices that are resistant to common cleaning chemicals, as well as products that are resistant to cutting oils and fluids."

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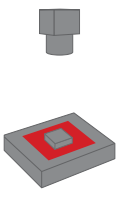


Backlights

- Creates silhouette for maximum contrast
- Determines the shape and size of target objects
- Offers a highly diffused surface and uniform brightness, with lower intensity than other lights
- Provides the most robust lighting for measuring and gauging
- Highlights through-holes in target objects

Standard Backlights

Example Model Number: LEDRB75X150PW2-XQ

Light	Color	Type of Light	Lighted Area Size (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	B	75X150	P	W	2	–	X	Q

- **B** = Blue (470 nm, ±5 nm)
- **G** = Green (525 nm, ±10 nm)
- **I** = Infrared (850 nm)
- **R** = Red (633 nm, ±6 nm)
- **W** = White (5700 K, ±1100 K)

B = Backlight

75X150
150X150
225X150
300X150

P = Plastic

W = White Plastic

X = Fixed

Q = 5-pin M12/Euro QD

QD models require a mating cordset

Bar Backlights

Example Model Number: LEDRLB145XW6-XQ

Light	Color	Type of Light	Lighted Area (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	LB	145	X	W	6	–	X	Q

- **B** = Blue (475 nm, ±5 nm)
- **G** = Green (525 nm, +10/-5 nm)
- **I** = Infrared (850 nm)
- **R** = Red (625 nm, ±5 nm)
- **W** = White (6500 K, +600/-500 K)

LB = Linear Array Backlight

145 = 161 x 35
290 = 307 x 35
435 = 452 x 35
580 = 598 x 35
870 = 889 x 35
1160 = 1180 x 35

X = IP50

W = White Plastic

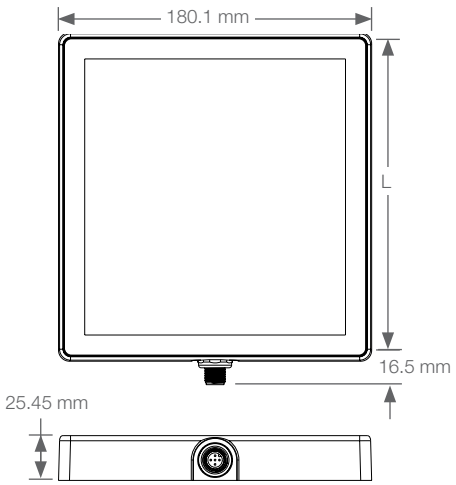
X = Fixed

Q = 5-pin M12/Euro QD

QD models require a mating cordset

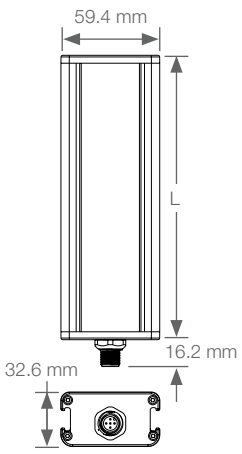
Supply Voltage	24 V DC
White Lux @ 0 m	Standard: 45,000 Lux Bar: 52,000 Lux
Construction	Standard: Black Valox™ housing; acrylic window Bar: Black anodized aluminum; acrylic window
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	Standard: IEC IP67 Bar: IEC IP50
Useful life	Standard: B50/L50 Lifetime > 100,000 hours (Infrared, Red) B50/L50 Lifetime > 90,000 hours (Blue, Green, White) Bar: When operated within specifications, output will decrease less than 30% after 50,000 hours
Strobing/Control	Continuous or strobed operation
Certifications	

Standard Models

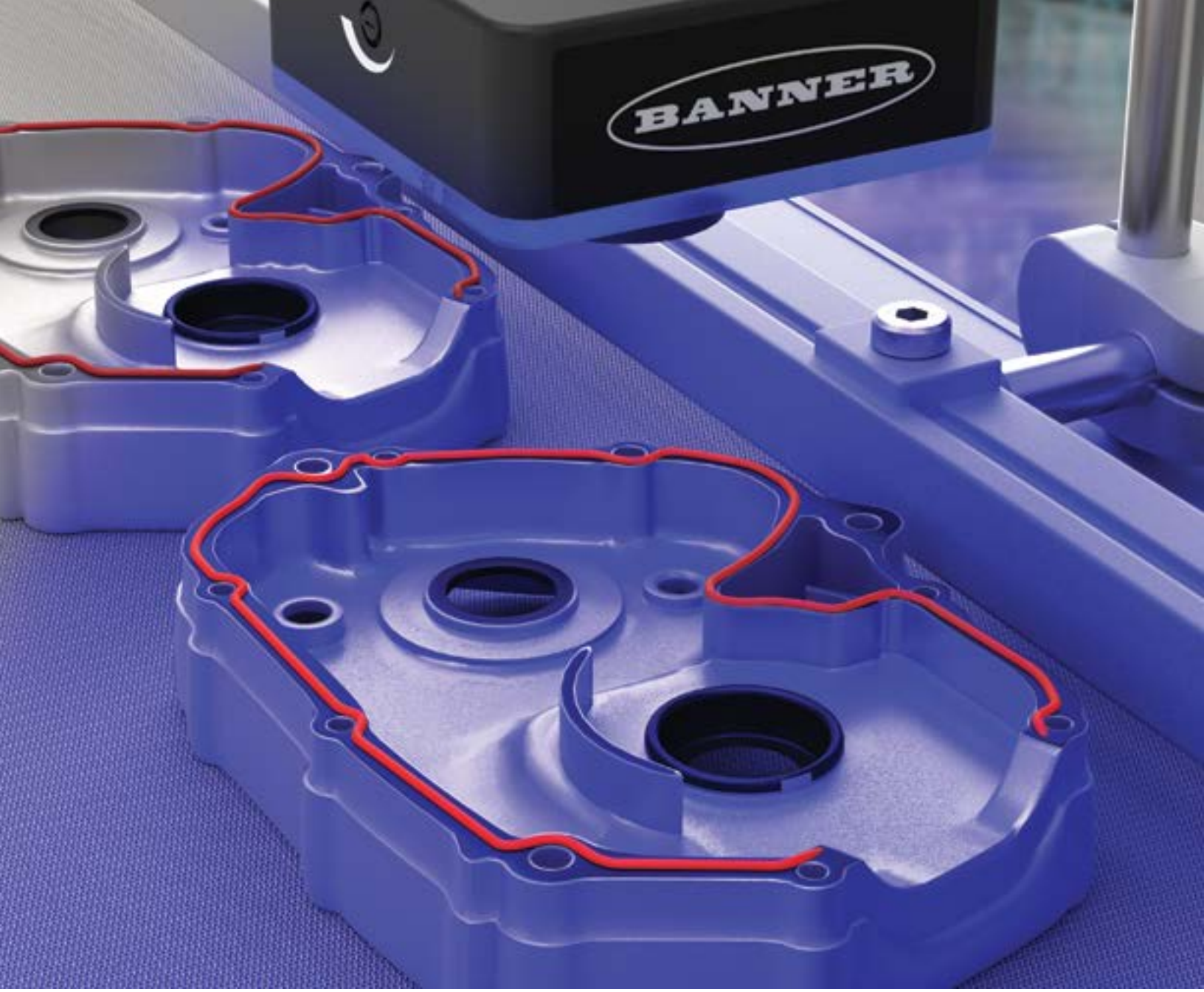


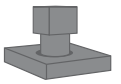
Array Area	Length "L"
75 x 150 mm	105.1 mm
150 x 150 mm	188.9 mm
225 x 150 mm	272.7 mm
300 x 150 mm	356.6 mm

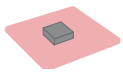
Bar Models



Array Length	Length "L"
145 mm	171 mm
290 mm	316.5 mm
435 mm	462 mm
580 mm	607.5 mm
870 mm	898.5 mm
1160 mm	1189.5 mm







Ring Lights

- Easy integration between camera and light
- Brightly illuminates from a small form factor
- Mounts directly to the camera and centers the light on the image
- Brightly illuminates small objects
- Reduces shadows on images with protrusions

Ring Lights

Example Model Number: LEDRR70XD5-XQ

Light	Color	Type of Light	Size (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	R	70	X	D	5	–	X	Q

- **B** = Blue (470 nm, ±5 nm)
- **G** = Green (525 nm, +10/-5 nm)
- **I** = Infrared (850 nm)
- **R** = Red (625 nm, ± 5 nm)
- **W** = White (6500 K, +600/-500 K)
- **UV395** = UV (395 nm, +5/-0 nm)

R = Ring Light

70

X = Not sealed

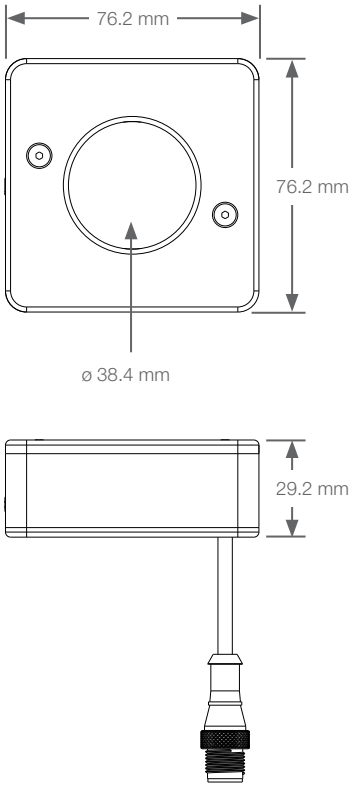
D = Diffused clear plastic

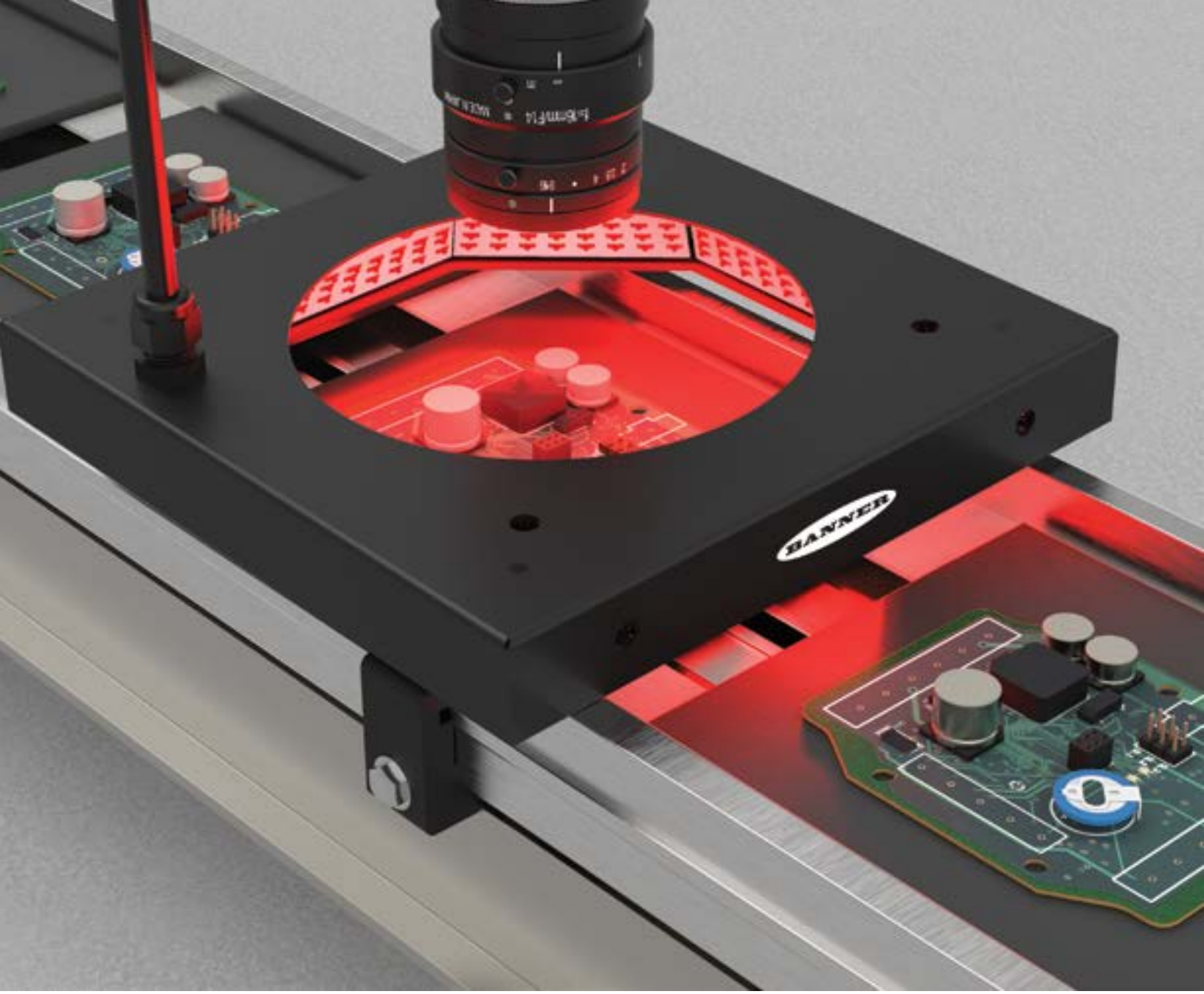
X = Fixed
P = Potentiometer

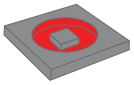
Q = 0.15 m 5-pin M12/Euro Pigtail QD
M = 0.3 m cable with 3-pin M8/Pico connector

QD models require a mating cordset

Supply Voltage	24 V DC
White Lux @ 0.5 m	5,150 lux
Construction	Housing: Black anodized aluminum Window: Acrylic
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IP50
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	CE cULus LISTED







Low-Angle Ring Lights

- Illuminates from an angle nearly perpendicular to object
- Emphasizes surface irregularities such as dust, dents, scratches and other surface defects
- Highlights slight height differences such as etching, solder balls and embossing

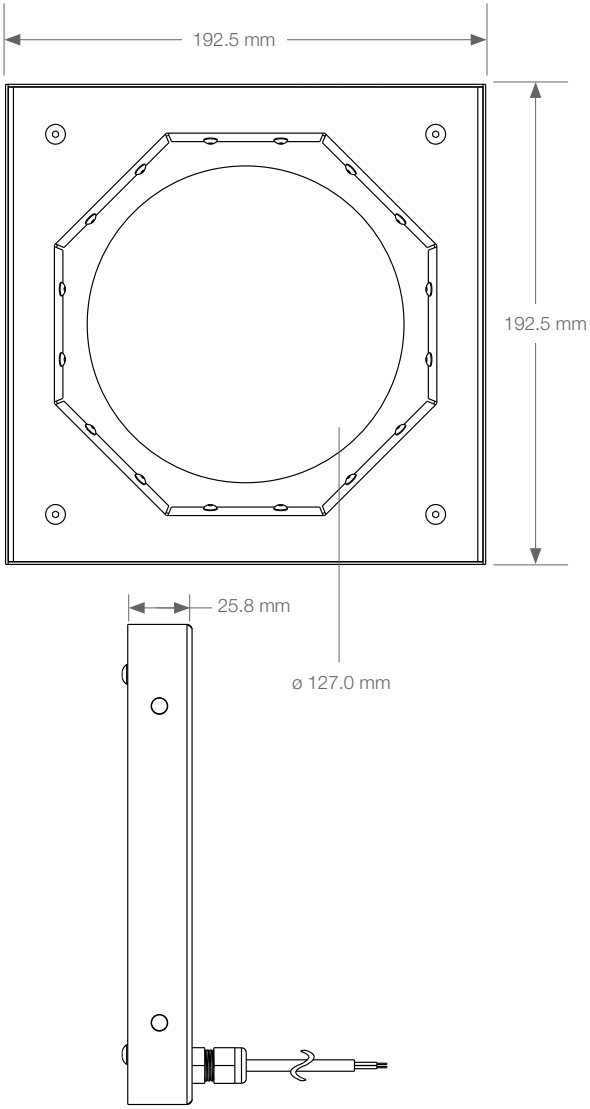
Low-Angle Ring Lights

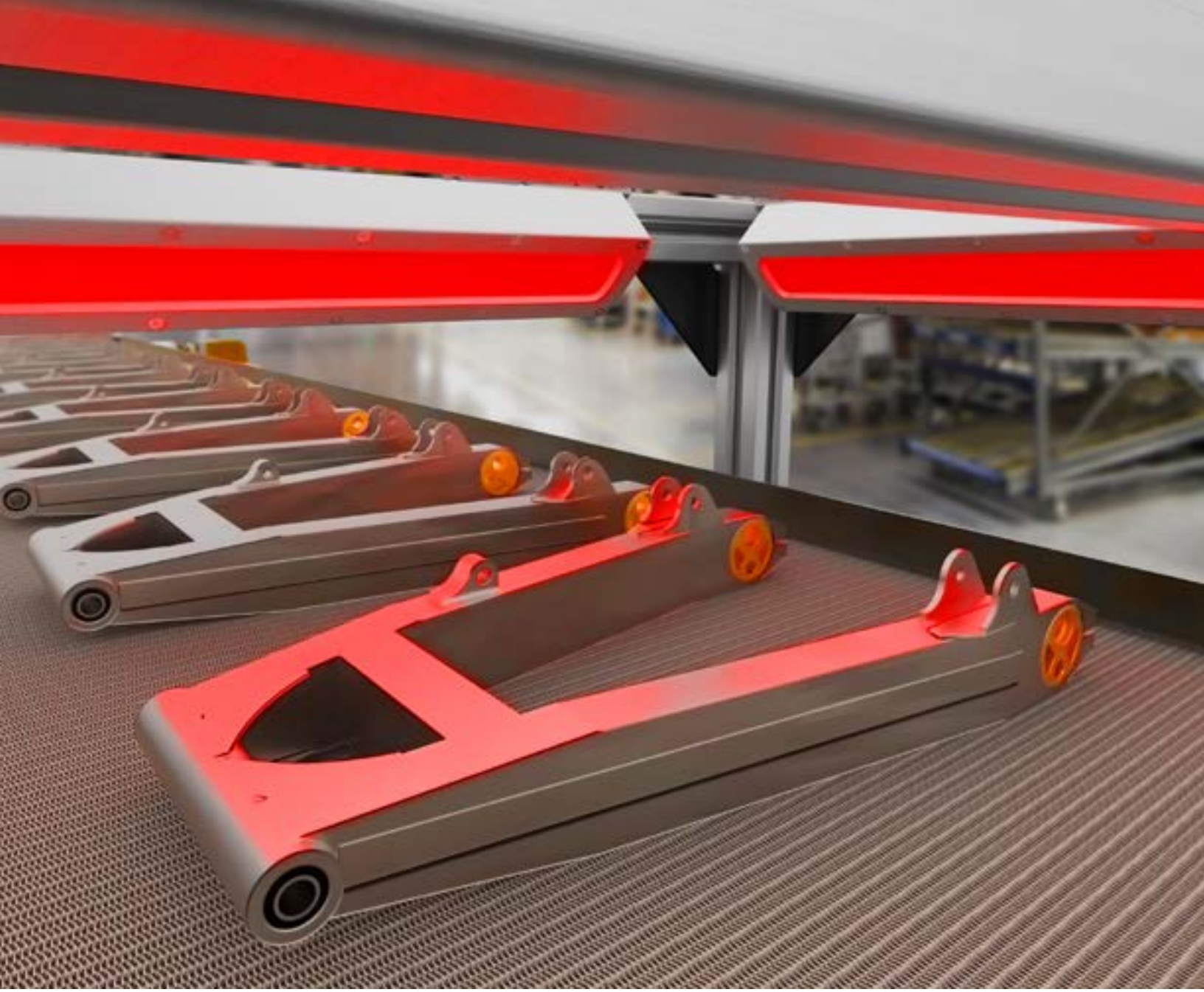
Example Model Number: LEDRI1503M

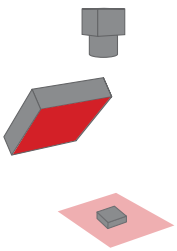
Light	Color	Type of Light	Size (mm)		Connector
LED	R	I	150	–	3M

- **R** = Red (640 nm)
- **I** = Infrared (880 nm)
- **I** = Low Angle Ring Light
- **150** = ø 150
- **3W** = 2 m cable
- **3M** = 2 m cable with 3-pin M8/Pico connector

Supply Voltage	24V DC
Construction	Housing: aluminum with black anodizing
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Useful life	When operated within specifications, output will decrease less than 20% after 20,000 hours and less than 30% after 30,000 hours (based on continuous operation)
Strobing/Control	Continuous or strobed operation
Certifications	CE







Directional Lights

- Provides even illumination in a concentrated area
- Creates shadows or glare to detect changes in depth, depending on mounting
- A wide variety of directional light styles are available including: Bar, Area, and Spot to fit the specific application needs
- High-intensity lighting for distances greater than 300 mm

Bar Light

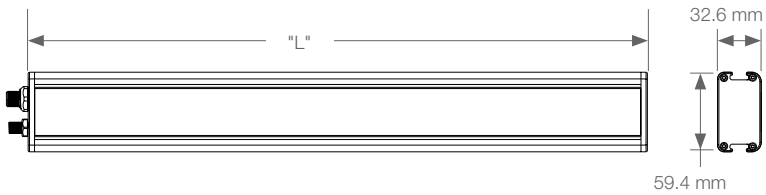
Example Model Number: LEDRLA290XD6-XQ

Light	Color	Type of Light	Lighted Length (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	LA	290	X	D	6	–	X	Q

- **LA** = Linear Array
- **145**** / **290** / **435** / **580** / **870** / **1160**
- **X** = Not sealed
- **P** = Plastic clear
  G = Glass clear
  D = Diffused clear plastic
- **X** = Fixed
  PL = Pot & 0-10 V Analog wire (Strobe polarity = Low)
  PH = Pot & 0-10 V Analog wire (Strobe polarity = High)
- **Q** = 5-pin M12/Euro Integral QD
  QD models require a mating cordset
- **B** = Blue (475 nm, ±5 nm)
  G = Green (525 nm, +10/-5 nm)
  I = Infrared (850 nm)
  R = Red (625 nm, ±5 nm)
  W = White (6500 K, +600/-500 K)
  UV365 = UV (395 nm, +5/-0 nm)*
  UV395 = UV (395 nm, +5/-0 nm)

* UV365 can only be used with glass window
** Intensity adjusment not available on 145 mm length

Supply Voltage	24 V DC
White 1160 mm Lux @ 0.5 m	23,420 lux
Construction	Black anodized aluminum
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP50
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	CE cULus LISTED



Array Length	"L"
145 mm	171 mm
290 mm	316.5 mm
435 mm	462 mm
580 mm	607.5 mm
870 mm	898.5 mm
1160 mm	1189.5 mm

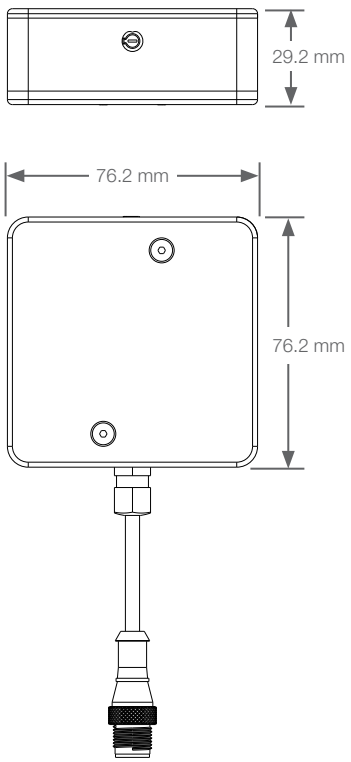
Area Light

Example Model Number: LEDRA70XD5-XQ

Light	Color	Type of Light	Size (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	A	70	X	D	5	–	X	Q

- **A** = Area Light
- **70**
- **D** = Diffused clear plastic
- **X** = Fixed; **P** = Potentiometer
- **Q** = 5-pin M12 Euro integral QD; **M** = 2 m cable with 3-pin M8/ Pico connector
- QD models require a mating cordset
- **B** = Blue (475 nm, ±5 nm)
- **G** = Green (525 nm, +10 nm/-5 nm)
- **I** = Infrared (850 nm)
- **R** = Red (625 nm, ±5 nm)
- **W** = White (6500 K, +600/-500 K)
- **UV395** = UV (395 nm, +5/-0 nm)
- **X** = Not sealed

Supply Voltage	24 V DC
White Lux @ 0.5 m	7,030 lux
Construction	Housing: Black anodized aluminum Window: Acrylic
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP50
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	CE, cULus LISTED



Spot Light

Example Model Number: LEDRS50L5-XQ

Light	Color	Type of Light	Angle		Connector
LED	R	S50	L5	–	XQ

- **B** = Blue (475 nm, ±5 nm)
- **G** = Green (525 nm, +10/-5 nm)
- **I** = Infrared (850 nm)
- **R** = Red (625 nm, ±5 nm)
- **W** = White (6500 K, +600/-500 K)
- **UV395** = UV (395 nm, +5/-0 nm)

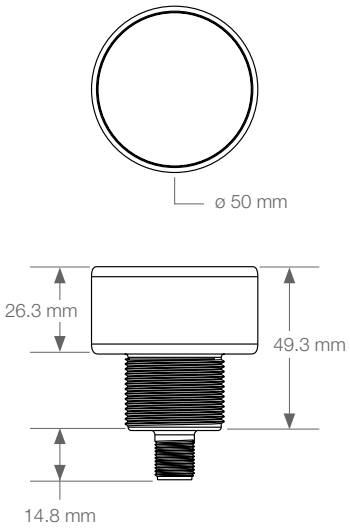
S50 = Spot

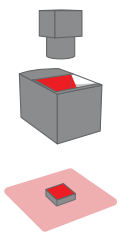
- **L5** = ± 5° (smaller, more focused)
- **L11** = ± 11° (larger spot for all but IR models)
- **L14** = ± 14° (larger spot for IR models only)
- **L20** = ± 20° (largest spot for all but IR models)

- **XQ** = 5-pin M12/Euro integral QD
- **Blank** = 2 m Integral Cable

QD models require a mating cordset

Supply Voltage	12 to 30 V DC
White ±5° Lux @ 0.5 m	3,500 Lux
Construction	Black anodized aluminum
Operating Temperature	–20 to +50 °C (–4 to +122 °F)
Environmental Rating	IEC IP67, IP69K per DIN 40050-9
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	CE c UL us LISTED





Coaxial Lights

- Provides more uniform illumination than a ring light
- Delivers collimated illumination in the same optical path as camera
- Evenly illuminates flat reflective surfaces
- Features models with anti-reflective glass dust covers

Coaxial Light

Example Model Number: LEDRO100M

Light	Color	Type of Light	Size (mm)	Cover	Connector
LED	R	O	100	M	

- **B** = Blue (470 nm)
- **G** = Green (525 nm)
- **I** = Infrared (880 nm)
- **R** = Red (630 nm)
- **W** = White (3200 K, +800/-600 K)

O = On-Axis Light

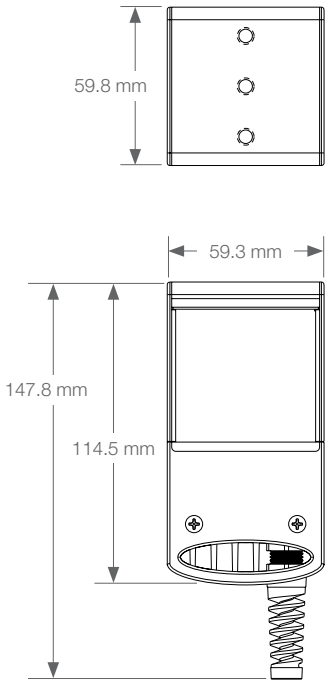
100 = 100 x 100
50 = 50 x 50

M = No Dust Cover
M-D = With Dust Cover

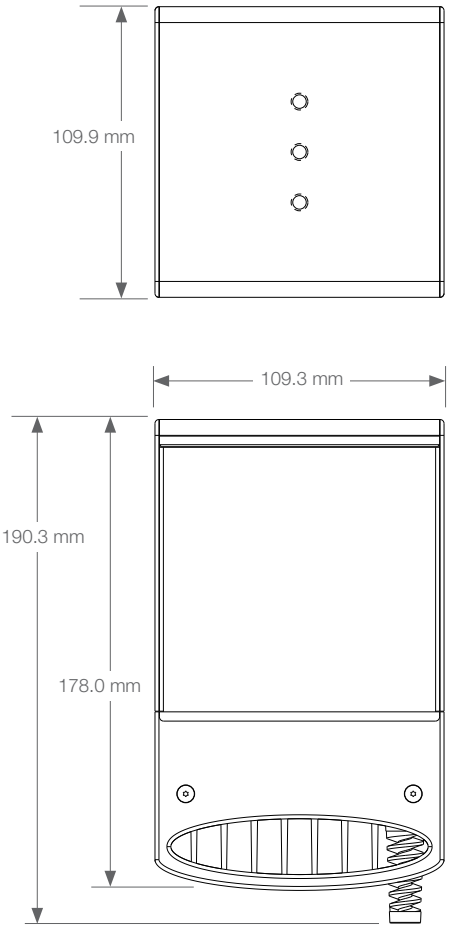
Blank = 0.6 m Sable with 3-pin M8/Pico Connector

Supply Voltage	24 V DC
White Lux @ 0.5 m	50 mm: 70 Lux 100 mm: 350 Lux
Construction	Housing: aluminum with black anodizing Beam Splitter: optical glass with optical coatings on both sides Diffuser: high-precision cast acrylic Dust Cover: optical glass with broadband anti-reflective coating (425 nm to 675 nm) (some models)
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Useful life	When operated within specification, output will decrease less than 20% after 10,000 hours and less than 30% after 20,000 hours
Strobing/Control	Continuous or strobed operation
Certifications	CE, c UL us LISTED

50 mm Models



100 mm Models



Lights for Industrial Environments

- Washdown LED Lights are sealed, smooth, and durable enough to handle the most intense applications.
- Housing options include nickel plated aluminum, 316 stainless steel or plastic bodies with multiple window options.
- Illuminates small to large areas with an even pattern of light and no shadows

Sealed Bar Light

Example Model Number: LEDRLA290AD6-XQ

Light	Color	Type of Light	Lighted Length (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	LA	290	A	D	6	–	X	Q

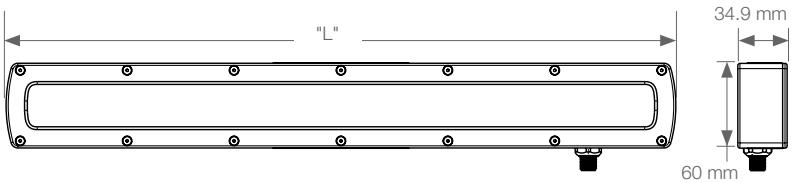
- **LA** = Linear Array
- **290**, **435**, **580**
- **A** = Nickel-plated Aluminum
  SS = 316 Stainless Steel
- **P** = Plastic clear
  G = Glass clear
  D = Diffused clear plastic
- **X** = Fixed
- **Q** = 5-pin M12 Euro Integral QD

QD models require a mating cordset

- **B** = Blue (475 nm, ±5 nm)
- **G** = Green (525 nm, +10/-5 nm)
- **I** = Infrared (850 nm)
- **R** = Red (625 nm, ±5 nm)
- **W** = White (6500 K, +600/-500 K)
- **UV365** = UV (365 nm, +5/-0 nm)*
- **UV395** = UV (395 nm, +5/-0 nm)

* UV365 can only be used with glass window

Supply Voltage	24 V dc
White 580 mm Lux @ 0.5 m	23,420 Lux
Construction	Nickel-plated aluminum or 316 stainless steel
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP68
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	CE, cULus LISTED



Array Length	"L"
290 mm	328 mm
435 mm	474 mm
580 mm	621 mm

Sealed Area Light

Example Model Number: LEDRA70AD5-XQ

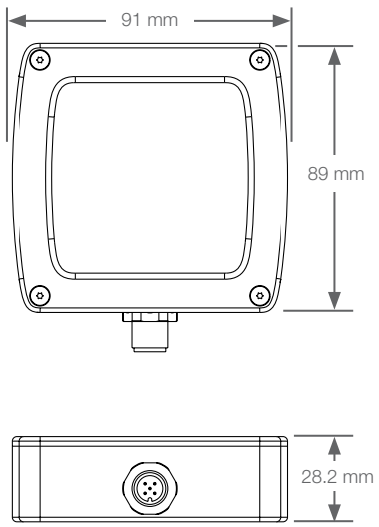
Light	Color	Type of Light	Size (mm)	Housing	Window	Relative Intensity		Intensity Adjustment	Connector
LED	R	A	70	A	D	5	–	X	Q

- **A** = Area Light
- **70**
- **B** = Blue (475 nm, ±5 nm)
- **G** = Green (525 nm, +10/-5 nm)
- **I** = Infrared (850 nm)
- **R** = Red (625 nm, ±5 nm)
- **W** = White (6500 K, +600/-500 K)
- **UV365** = UV (365 nm, +5/-0 nm)*
- **UV395** = UV (395 nm, +5/-0 nm)
- **A** = Nickel-plated Aluminum
- **SS** = 316 Stainless Steel
- **P** = Plastic clear
- **G** = Glass clear
- **D** = Diffused clear plastic
- **X** = Fixed
- **P** = Potentiometer
- **Q** = 5-pin M12 Euro Integral QD

QD models require a mating cordset

* UV365 can only be used with glass window

Supply Voltage	24 V DC
White Lux @0.5 m	18,550 Lux
Construction	Nickel-plated aluminum or 316 stainless steel
Operating Temperature	0 to +50 °C (+32 to +122 °F)
Environmental Rating	IEC IP68
Useful life	When operated within specifications, output will decrease less than 30% after 50,000 hours for visible and IR models; 20,000 hours for UV models
Strobing/Control	Continuous or strobed operation
Certifications	CE, cULus LISTED



WLC60 Heavy-Duty Light

Example Model Number: WLC60XW340GAQ

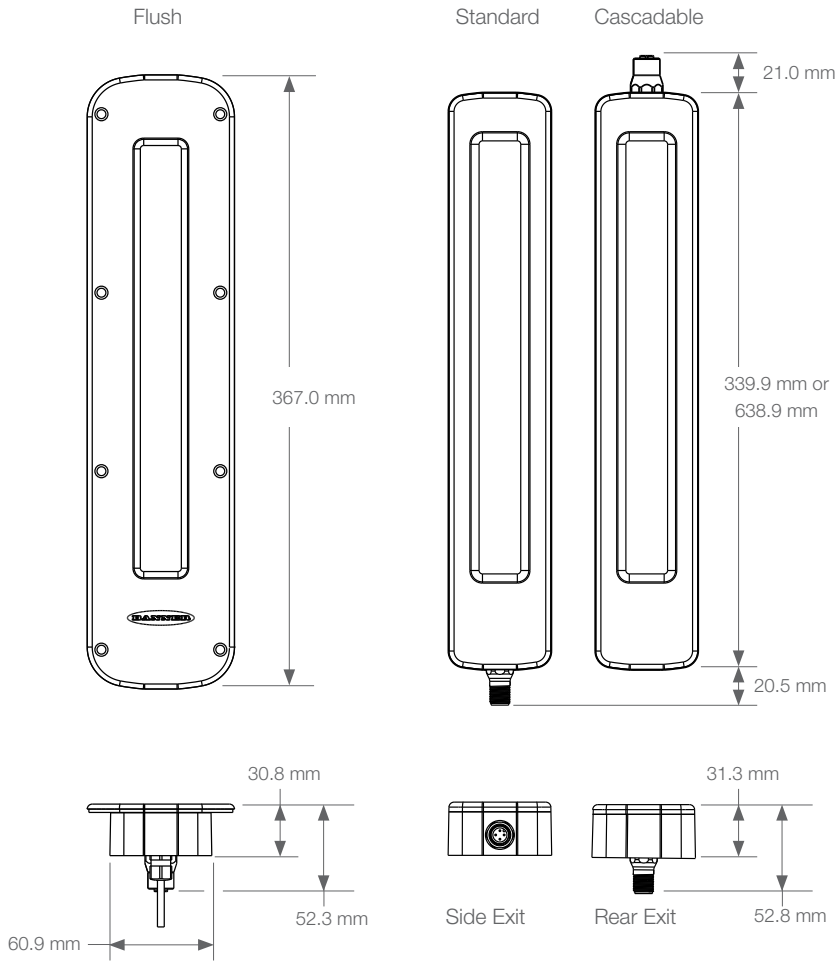
Light	Cascadable	LED Color	Lighted Length (mm)	Window	Mounting Type	Construction	Connector Exit	Connector
WLC60	X	W	340	G		A		Q

- **Cascadable:** **C** = Cascadable*; **X** = Non-Cascadable
- **LED Color:** **W** = Cool White (6200 K, +300/-200 K)**; **WW** = Warm White (3000 K, +200/-100K); **R** = Red (625 nm, ±5 nm); **G** = Green (525 nm, +10/-5 nm); **B** = Blue (475 nm, ±5 nm); **Y** = Yellow (590 nm, ±5 nm)
- **Lighted Length (mm):** **340**†; **640**
- **Window:** **Blank** = Polycarbonate; **G** = Borosilicate Glass
- **Mounting Type:** **Blank** = Base Mount; **F** = Flush Mount
- **Construction:** **A** = Nickel-Plated Aluminum; **SS** = 316 Stainless Steel
- **Connector Exit:** **Blank** = Side Exit; **R** = Rear Exit
- **Connector:** **Blank** = 2 m Integral Cable; **Q** = 4-pin M12 Euro Integral QD

QD models require mating cordset

* Cascading not available for stainless steel models
** Stainless steel models only available in cool white
† Rear exit and stainless steel models available in 340 mm length only

Supply Voltage	12 to 30 V DC
White 640 nm Lux @ 0.5 m	8,925 Lux
Construction	Housing: Nickel-plated aluminum or 316 Stainless steel Window: Polycarbonate or Borosilcate Glass
Operating Temperature	–40 °C to +50 °C (–40 °F to +122 °F) at the max. intensity setting –40 °C to +70 °C (–40 °F to +158 °F) at any of the dim settings
Environmental Rating	IEC IP67, JIS C IP68G, IP69K per DIN 40050-9
Useful Life	When operating within specifications, output will decrease less than 30% after 60,000 hours
Strobing/Control	Strobing is unavailable, however, certain models have PWM functionality that can act as strobing Please visit our website for more information.
Certifications	CE, cULus LISTED



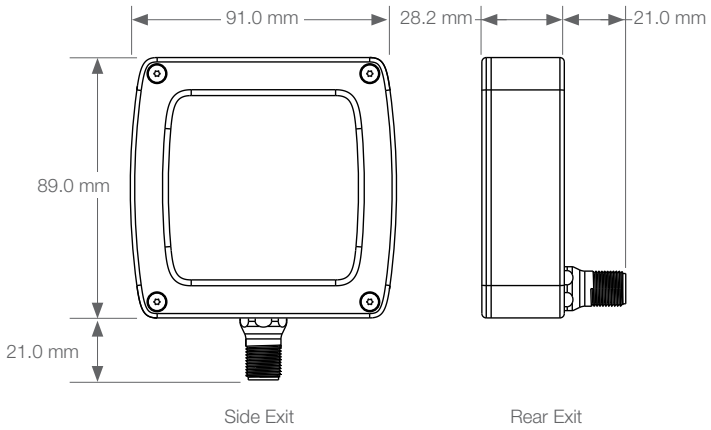
WLC90 Heavy-Duty Light

Example Model Number: WLC90WGL15Q

Family	LED Color	Window	Lensing	Connector Exit	Connector
WLC90	**W**	**G**	**L15**		**Q**
	W = Cool White (6200 K, +300/-200 K)	**Blank** = Polycarbonate **G** = Borosilicate Glass	**L8** = ± 8° **L15** = ± 15° **L30** = ± 30°	**Blank** = Side Exit **R** = Rear Exit	**Blank** = 2 m Integral Cable **Q** = 4-pin M12 Euro Integral QD

QD models require mating cordset

Supply Voltage	12 to 30 V DC
White ±8° Lux @ 0.5 m	22,348 Lux
Construction	Housing: Nickel-plate aluminum Window: Polycarbonate or borosilicate glass
Operating Temperature	-40 to +70 °C (-40 to +158 °F)
Environmental Rating	IEC IP67/IP68g/IP69K per DIN 40050
Useful life	When operating within specifications, output will decrease less than 30% after 60,000 hours
Strobing/Control	Strobing is unavailable, however, certain models have PWM functionality that can act as strobing Please visit our website for more information.
Certifications	CE cULus LISTED



WLA Area Lights

Example Model Number: WLAW105X180L11Q

Family	LED Color	Array Size (mm)	Window	Lensing	Connector
WLA	W	105X180		L11	Q

LED Color
- **W** = Cool White (6500 K, +600/-500 K)**
- **WW** = Warm White (3000 K, +200/-100K)
- **R** = Red (625 nm, ±5 nm)
- **G** = Green (525 nm, +10/-5 nm)
- **B** = Blue (465 nm, ±10 nm)
- **Y** = Yellow (590 nm, ±5 nm)

Array Size (mm)
- **105X180**
- **190X180**
- **275X180**
- **360X180**

Window
- **Blank** = Clear Plastic
- **D** = Diffused Plastic
- **E** = Encapsulated in Polyurethane*

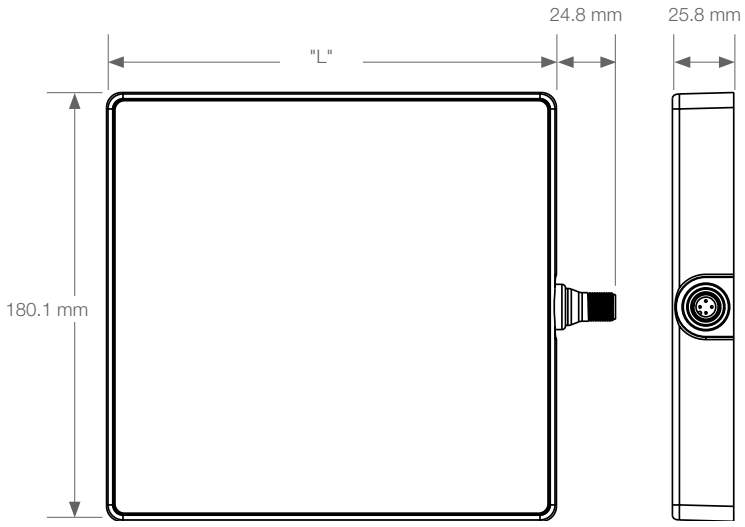
Lensing
- **Blank** = No Lenses
- **L11** = ± 11°
- **L22** = ± 22°
- **L30** = ± 30°

Connector
- **Blank** = 2 m Integral Cable
- **Q** = 4-pin M12 Euro Integral QD

QD models require mating cordset

* Encapsulated models only available in cool white with no lenses

Supply Voltage	12 to 30 V DC
White 360 x 180 mm ±11° Lux @ 0.5 m	21,000 Lux
Construction	Housing: PBT Window: Acrylic or polyurethane Connector: Nickel-plated brass or PVC-jacketed cable
Operating Temperature	-20 to +50 °C (-4 to +122 °F)
Environmental Rating	Plastic: Rated IEC IP67 and IP69K, per DIN 40050 Polyurethane: Rated IEC IP67, IEC IP68, IP69K per DIN 40050
Strobing/Control	Strobing is unavailable, however, certain models have PWM functionality that can act as strobing Please visit our website for more information.
Certifications	Encapsulated models not UL listed



"L"
105.1 mm
188.9 mm
272.7 mm
356.6 mm

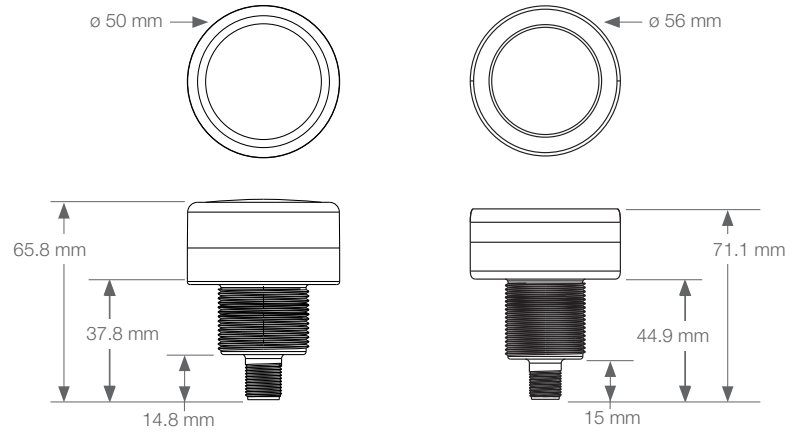
WL50S Spot Light

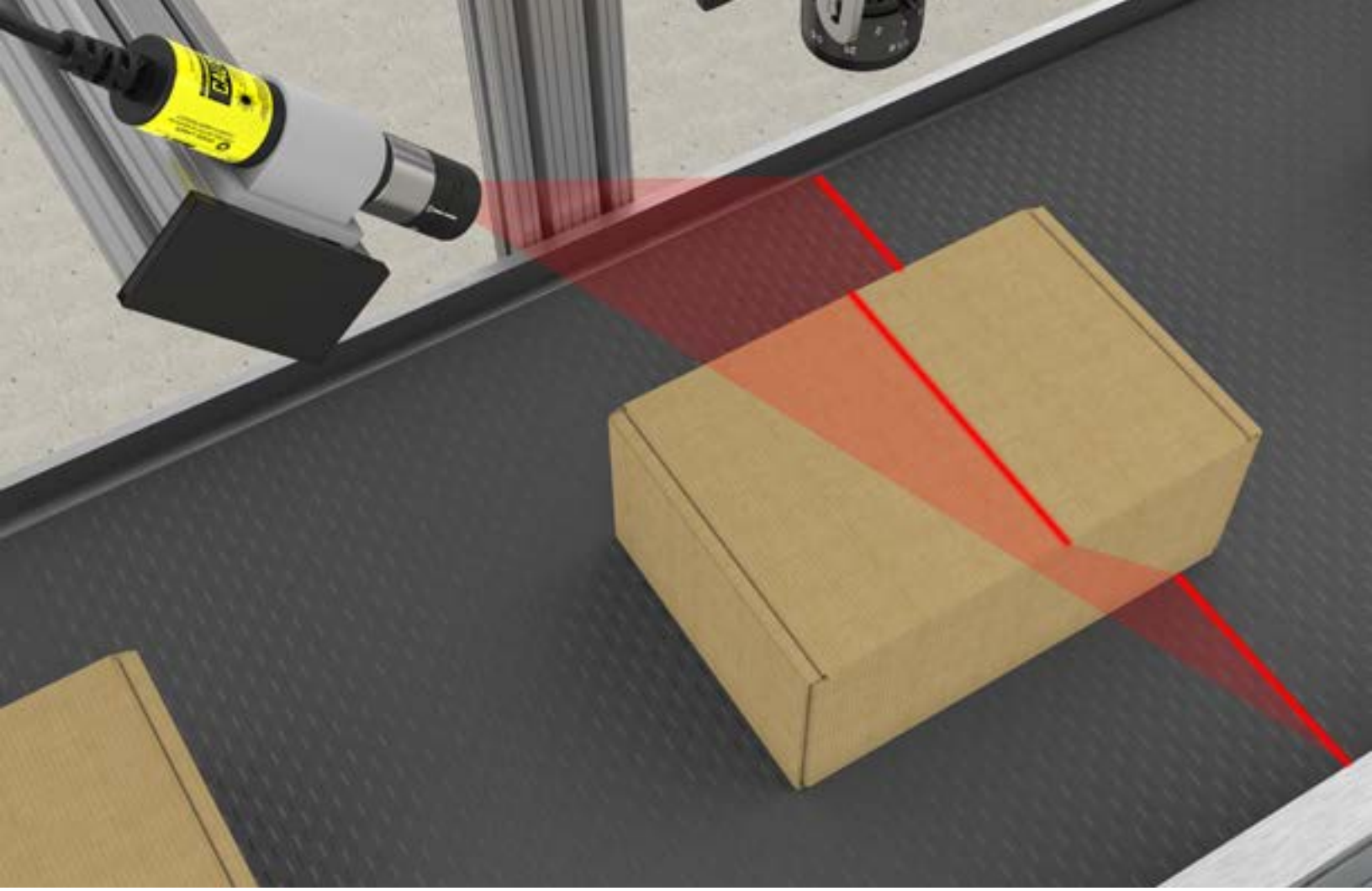
Example Model Number: WL50SWL5Q

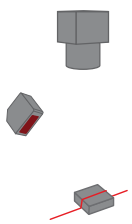
Family	LED Color	Housing	Window Material	Lens Angle	Connector
WL50S	W			L5	Q
	W = White **G** = Green **R** = Red	**Blank** = Black Anodized Aluminum **SS** = Stainless Steel	**Blank** = Acrylic **G** = Glass*	**L5** = ±5° (small) **L11** = ±11° (large) **L20** = ±20° (largest)	**Blank** = 2 m Integral Cable** **Q** = 4-pin M12 Euro Integral QD QD models require mating cordset

* Only available on stainless steel models
** Only available on anodized aluminum models

Supply Voltage	12 to 30 V DC
White ±5° Lux @ 0.5 m	3.500 Lux
Construction	Housing: Black anodized aluminum or Stainless Steel with FDA-grade silicone gasket and Viton® o-ring seal Window: Polycarbonate or glass window Connector: Nickel-plated QD connector or PVC-jacketed cable Mounting Nut: Black zinc-plated steel or Stainless Steel
Operating Temperature	-20 to +50 °C (-4 to +122 °F)
Environmental Rating	IEC IP67/IP68g/IP69K per DIN 40050
Certifications	CE cULus LISTED





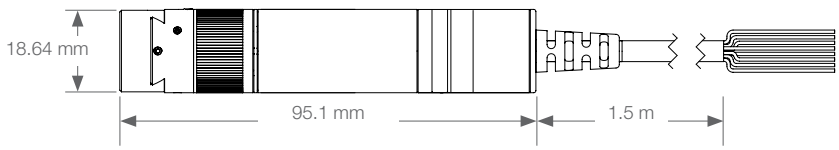


Structured Lights

- Provides more uniform illumination than a ring light
- Delivers collimated illumination in the same optical path as camera
- Evenly illuminates flat reflective surfaces

LLG660P10A60II
Laser Line Generator

660 nw, 10 mW, 60 degree fan angle, Class II CDRH,
0.5 m cable with flying leads



Accessories

Brackets

SMBBSSM
Used with Area Lights & Backlights

SMBAMS70A
Used with Area Lights

SMBAMS70AS
Used with Sealed Area Lights

SMBLASRA

SMBLAXRA*

SMBLAXU*

Used with Bar Lights

*Use SMBLAXRA and SMBLAXU to create swivel bracket

SMB30A

SMB30SC

SMB30FA

SMBAMS30P

SMB30MM

SMBAMS30RA

Used with Spotlights

SMBBSRA

SMBWLAMAG

Used with WLA

LMBWLC60F

LMBWLC60RA

LMBWLC60RAS

LMBWLC60MAG

Used with WLC60

LMBWLC90PT

SMBAMS70AS

Used with WLC90

Cordsets

M12/Euro-Style
Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDC20-506RA**)

Nickel-Plated Nut	Stainless Steel Nut
MQDC20-506 2 m (6.5') **MQDC20-515** 5 m (15') **MQDC20-530** 9 m (30')	**MQDC20SS-506** 2 m (6.5') **MQDC20SS-515** 5 m (15') **MQDC20SS-530** 9 m (30')

M12/Euro-Style
Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDC1-506RA**)

4-Pin	5-Pin
MQDC-406 2 m (6.5') **MQDC-415** 5 m (15') **MQDC-430** 9 m (30')	**MQDC1-506** 2 m (6.5') **MQDC1-515** 5 m (15') **MQDC1-530** 9 m (30')

4-Pin M12/ Euro-Style Washdown
Straight connector models only

4-Pin	5-Pin
MQDC-WDSS-0406 2 m (6.5') **MQDC-WDSS-0415** 5 m (15') **MQDC-WDSS-0430** 9 m (30')	**MQDC-WDSS-0506** 2 m (6.5') **MQDC-WDSS-0515** 5 m (15') **MQDC-WDSS-0530** 9 m (30')

4-Pin M12/Euro-Style
Double-Ended (straight male/ straight female connectors)

MQDEC-401SS-PUR
0.3 m (1')
MQDEC-403SS-PUR
1 m (3')
MQDEC-406SS-PUR
2 m (6.5')

3-Pin Pico-Style
Straight connector models listed

Nickel-Plated Nut	Stainless Steel Nut
—	**PKGV3M-4** 4 m (13')
PKG3M-5 5 m (16')	—
PKG3M-7 7 m (23')	**PKGV3M-7** 7 m (23')
PKG3M-10 10 m (33')	**PKGV3M-10** 10 m (33')

Pico-Style Double-Ended
Straight connector models listed

PKG3M-.35-PSG3M
0.35 m (1 ft)
PKG3M-2-PSG3M
2 m (6.5 ft)

Pico-Style Splitter
Straight connector models listed. One 3-pin Pico QD and one 4-Pin Euro QD.

CSB-UNT213M831F1241††
Branches = 0.3 m (1ft)
Trunk = Flying leads

†† Enables strobe signal from P4 while obtaining power from an external source

Pico-Style Splitter
Straight connector models listed

CSB-M831M831†
Branches = 0.20 m (0.65 ft)
Trunk = 0.20 m (0.65 ft)

† Powers 2 lights from one *P4* sensor

PSDINA-24
Special Lights Power supply 24V DC; Power supply 24V DC

PSD-24-4
Class 2 Power Supply
Input: 90-264 V ac 1.5A
Output: 24 V DC 3.9A
2 m (6.5') 4-Pin Euro Connector

Polarizing Filters

Description	Models
Linear Polarizing filter kit for 80 x 80 Area Lights and 70 x 70 Backlights	LEDAPFK
Linear Polarizing filter kit for 90 mm IP68 Ring Lights	LEDRPFK90
Linear Polarizing filter kit for 145 mm Bar Lights (IP50)	LEDLAPFK145
Linear Polarizing filter kit for 290 mm Bar Lights (IP50)	LEDLAPFK290
Linear Polarizing filter kit for 435 mm Bar Lights (IP50)	LEDLAPFK435
Linear Polarizing filter kit for 580 mm Bar Lights (IP50)	LEDLAPFK580
Linear Polarizing filter kit for 870 mm Bar Lights (IP50)	LEDLAPFK870
Linear Polarizing filter kit for 1160 mm Bar Lights (IP50)	LEDLAPFK1160
Linear Polarizing filter kit for 70 mm High-Intensity Area Lights	LEDAPFK70
Linear Polarizing filter kit for 70 mm High-Intensity Ring Lights	LEDRPFK70
Linear Polarizing filter kit for 70 mm IP68 High-Intensity Area Lights	LEDAPFK70S
Linear Polarizing filter kit for 50mm High-Intensity Spot Lights	LEDS50PFK

Window Replacements and Lighting Diffusers

Use With	Models
Clear Glass	
70 mm Sealed IP68 High-Intensity Area Lights	LEDA70SW-G
145 mm IP50 Bar Lights	LEDLA145XW-G
290 mm IP50 Bar Lights	LEDLA290XW-G
290 mm Sealed IP68 Bar Lights	LEDLA290SW-G
435 mm IP50 Bar Lights	LEDLA435XW-G
435 mm Sealed IP68 Bar Lights	LEDLA435SW-G
580 mm IP50 Bar Lights	LEDLA580XW-G
580 mm Sealed IP68 Bar Lights	LEDLA580SW-G
870 mm IP50 Bar Lights	LEDLA870XW-G
1160 mm IP50 Bar Lights	LEDLA1160XW-G
White Plastic	
70 x 70 mm Red Backlights	LEDBW
70 x 70 mm Infrared Backlights	LEDBIW
85 x 220 mm Red Backlights	LEDBWL
85 x 220 mm Infrared Backlights	LEDBIWL

White Plastic Diffuse	Models
70 mm Sealed High-Intensity Area Lights	LEDA70SWDW-P
145 mm IP50 Bar Lights	LEDLA145XWDW-P
290 mm IP50 Bar Lights	LEDLA290XWDW-P
290 mm Sealed IP68 Bar Lights	LEDLA290SWDW-P
435 mm IP50 Bar Lights	LEDLA435XWDW-P
435 mm Sealed IP68 Bar Lights	LEDLA435SWDW-P
580 mm IP50 Bar Lights	LEDLA580XWDW-P
580 mm Sealed IP68 Bar Lights	LEDLA580SWDW-P
870 mm IP50 Bar Lights	LEDLA870XWDW-P
1160 mm IP50 Bar Lights	LEDLA1160XWDW-P

Use With	Models
Clear Plastic	
70 mm Sealed High-Intensity Area Lights	LEDA70SW-P
145 mm IP50 Bar Lights	LEDLA145XW-P
290 mm IP50 Bar Lights	LEDLA290XW-P
290 mm Sealed IP68 Bar Lights	LEDLA290SW-P
435 mm IP50 Bar Lights	LEDLA435XW-P
435 mm Sealed IP68 Bar Lights	LEDLA435SW-P
580 mm IP50 Bar Lights	LEDLA580XW-P
580 mm Sealed IP68 Bar Lights	LEDLA580SW-P
870 mm Sealed IP50 Bar Lights	LEDLA870XW-P
1160 mm IP50 Bar Lights	LEDLA1160XW-P
Clear Plastic Diffuse	
70 mm High-Intensity Ring Lights	LEDR70CDW
70 mm High-Intensity Area Lights	LEDA70CDW
70 mm Sealed IP68 High-Intensity Area Lights	LEDA70SCDW-P
145 mm IP50 Bar Lights	LEDLA145XCDW-P
290 mm IP50 Bar Lights	LEDLA290XCDW-P
290 mm Sealed IP68 Bar Lights	LEDLA290SCDW-P
435 mm IP50 Bar Lights	LEDLA435XCDW-P
435 mm Sealed IP68 Bar Lights	LEDLA435SCDW-P
580 mm IP50 Bar Lights	LEDLA580XCDW-P
580 mm Sealed IP68 Bar Lights	LEDLA580SCDW-P
870 mm IP50 Bar Lights	LEDLA870XCDW-P
1160 mm IP50 Bar Lights	LEDLA1160XCDW-P

Vision Solutions by Banner

Vision Sensors

Robust yet easy-to-use self-contained vision sensors perform automated inspections that previously required costly and complex vision systems. The iVu and iVu Color Image Sensors are used to monitor parts for type, size, orientation, shape, location, and color or color variations. The device can be set up and monitored using an integrated or remote touchscreen or with a PC.

Smart Cameras

Banner's free and easy-to-use Vision Manager Software provides a number of tools and capabilities that enable VE Series Smart Cameras to solve a wide range of vision applications, such as item detection, part positioning, feature measurement and flaw analysis. Available in resolutions up to 5 MP to solve a variety of applications.

Barcode Readers

Banner Engineering provides advanced barcode reading capabilities for traceability in a wide variety of industries. We offer rugged, reliable solutions that ensure quality, improve efficiency, and enable accurate inventory management.

Imager-based barcode readers reliably read 1D and 2D barcodes in any orientation. Banner Engineering offers code reading solutions that can reliably decode difficult-to-read, low quality, and damaged codes—as well as codes printed on highly reflective surfaces.

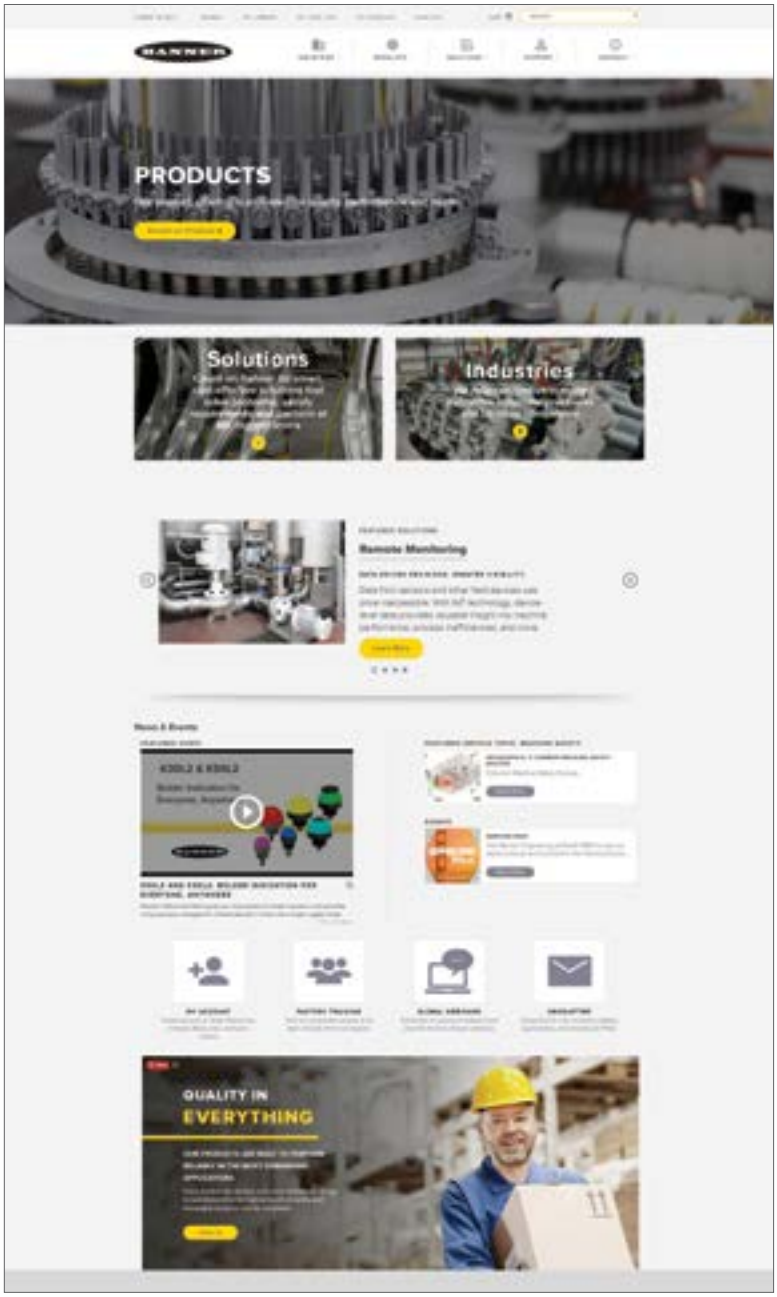
Vision Lenses

Vision products combine high-performance tools, intelligent features, and an intuitive user interface for automated inspection applications. The vision systems are easy to use and customizable for specific machines and tasks. Adding vision lenses to industrial applications enhances overall performance and provides accurate detection for a wide variety of vision applications.

Vision System Camera Bandpass Filters

Bandpass filters allow you to control what your camera is seeing with greater contrast and a higher transmission for a reduced cost when compared to the conventional interference filter. Ideal for LED or laser diode application use.

Additional sensors, indicator lights, cordsets, brackets, and other accessories available at bannerengineering.com



Trigger Sensors

Signal Tower Lights

Indicator Lights

Touch Buttons

How to Reach Us

Global Sales and Support

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Banner has a network of more than 3,500 factory and field representatives around the world ready to help you. Our highly skilled application engineers and industry experts are ready to support you wherever you are. For a complete listing, go to bannerengineering.com and find your local Banner Representative.

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more sensors. more solutions

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