BANNER®

more sensors, more solutions

New Products

Second Edition

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IO Link Products

IO-Link®

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Q4X Series

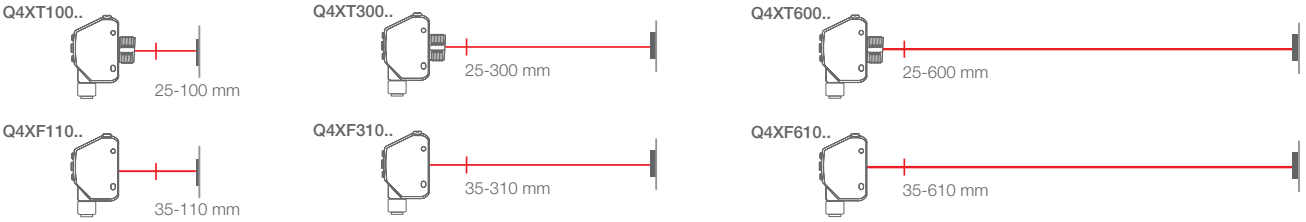
Versatile, Rugged, Laser Measurement Sensor

Easy-to-Use

- Save time and money with the Q4X Series which is **ready to measure right out of the box**
- A simple user experience from installation to setup
  - Bright spot for easy alignment
  - Three push buttons simplify setup
  - Intuitive menus
- Four-digit display **shows distance to target in mm**
- **FDA-grade stainless steel** is suitable for IP69K washdown environments

Superior Performance

- A powerful problem-solving sensor with advanced functions including:
  - Remote teach
  - Background suppression
  - Laser inhibit
  - Cross-talk avoidance
- Versatile Dual Mode uses both distance and intensity measurements to:
  - Error proofing part placement
  - Detect clear objects
  - Detect objects beyond 600 mm
- **Best-in-class excess gain** allows the sensor to see black targets at a 600 mm range
- Durable housing rated **IP69K**
- Superior ambient light resistance



Height: 57 mm
Width: 18 mm
Depth: 44 mm

Height: 57 mm
Width: 18 mm
Depth: 34 mm

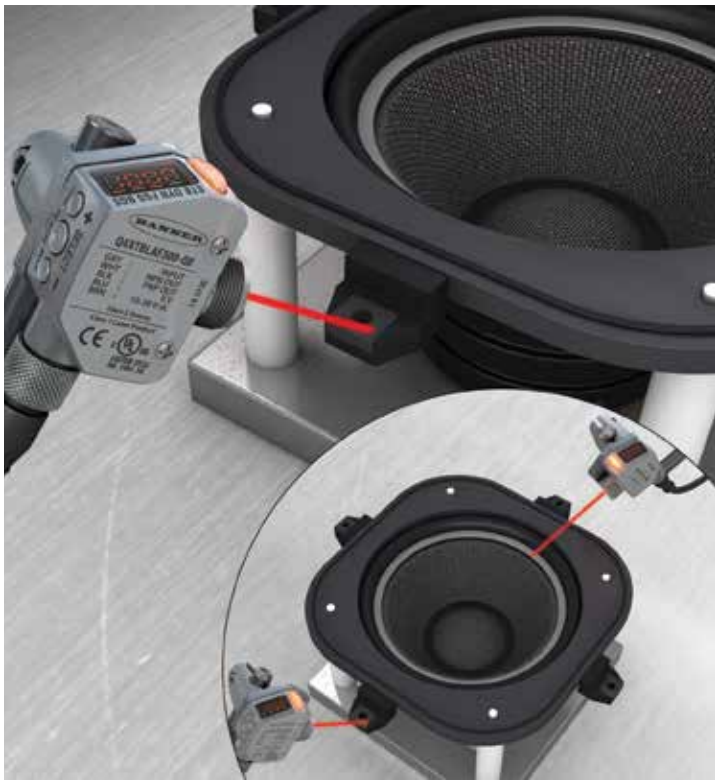
Detecting a thin light target on a light background

Discrete

	Output	Range	Model
	Bipolar	300 mm	**Q4XTBLAF300-Q8**
	Bipolar	100 mm	**Q4XTBLAF100-Q8**
	PNP	310 mm	**Q4XFPLAF310-Q8**
	NPN	310 mm	**Q4XFNLAF310-Q8**
	PNP	110 mm	**Q4XFPLAF110-Q8**
	NPN	110 mm	**Q4XFNLAF110-Q8**

Dual Discrete with IO-Link®

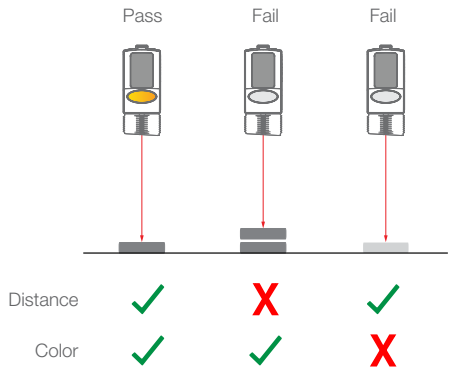
	Range	Model
	600 mm	**Q4XTKLAF600-Q8**
	300 mm	**Q4XTKLAF300-Q8**
	100 mm	**Q4XTKLAF100-Q8**
	610 mm	**Q4XFKLAF610-Q8**
	310 mm	**Q4XFKLAF310-Q8**
	110 mm	**Q4XFKLAF110-Q8**



Detecting black parts on a black background

Sample Applications

- Error-proofing
- Multicolor foil packaging
- Black foam on black plastic
- Black rubber in front of metal
- Clear objects without using a reflector



Bottle fill level measurement

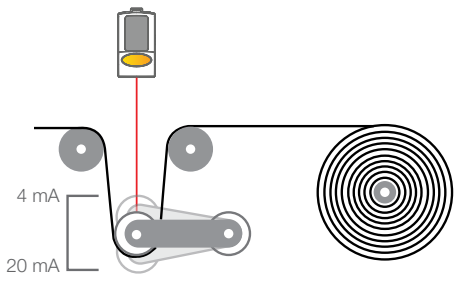
Spot weld inspection

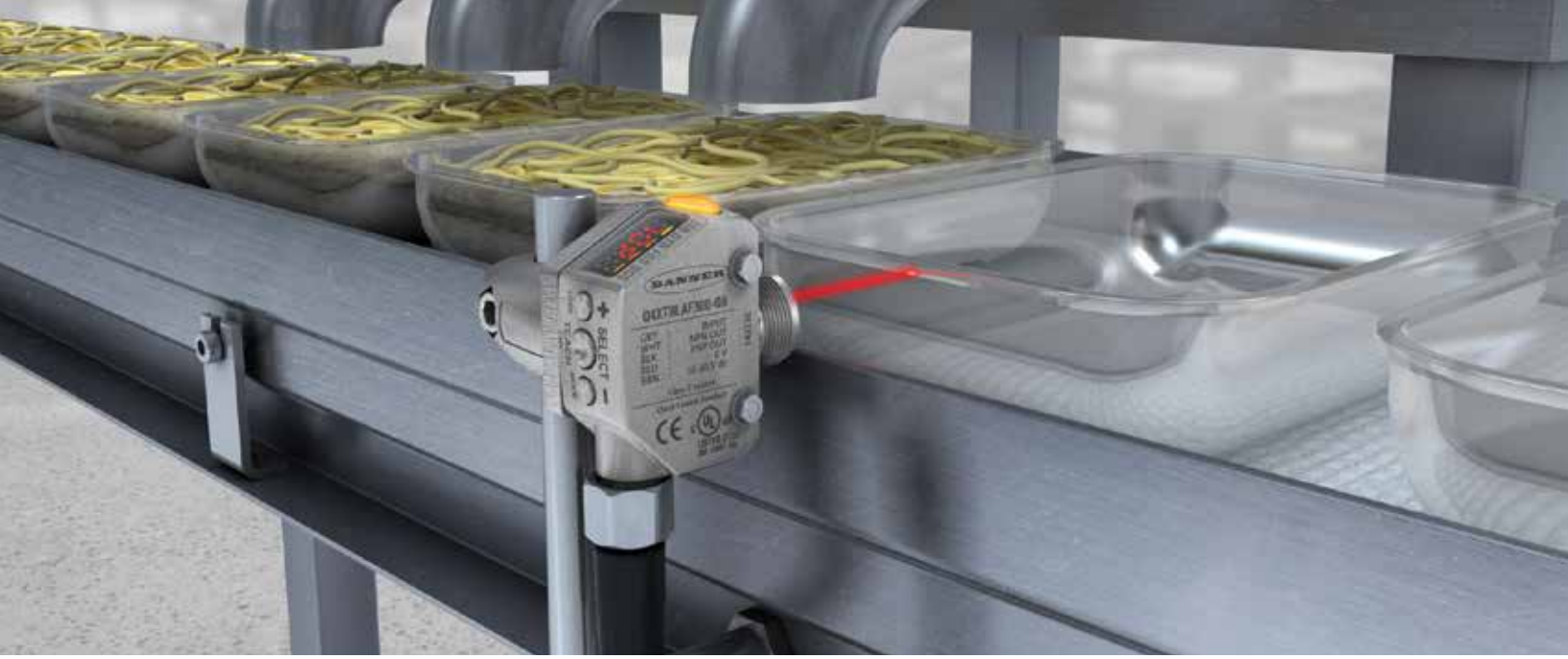
Analog

	Output	Range	Model
	4 to 20 mA	300 mm	**Q4XTILAF300-Q8**
	4 to 20 mA	100 mm	**Q4XTILAF100-Q8**
	0 to 10 V	300 mm	**Q4XTULAF300-Q8**
	0 to 10 V	100 mm	**Q4XTULAF100-Q8**
	4 to 20 mA	310 mm	**Q4XFILAF310-Q8**
	4 to 20 mA	110 mm	**Q4XFILAF110-Q8**
	0 to 10 V	310 mm	**Q4XFULAF310-Q8**
	0 to 10 V	110 mm	**Q4XFULAF110-Q8**

Continuous Measurement Applications

- Fill level indication
- Roll diameter
- Loop control
- Thickness/height verification





Clear plastic food container detection in a sanitary environment

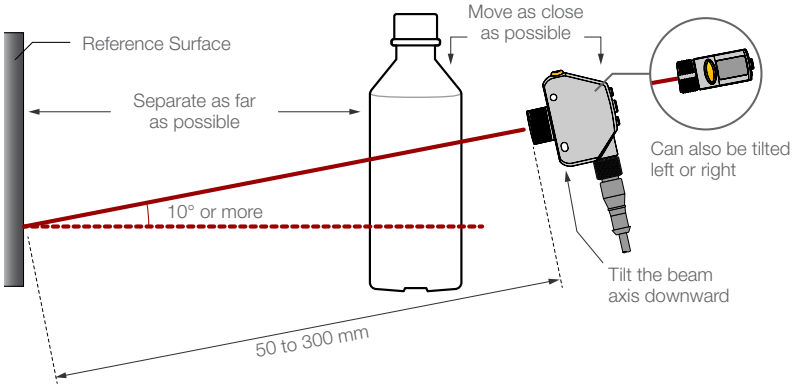
Simplified Interface for Clear Object

	Output	Range	Model*
	Bipolar	300 mm	**Q4XTBCOD300-Q8**
	PNP	310 mm	**Q4XFPCOD310-Q8**
	NPN	310 mm	**Q4XFNCOD310-Q8**

* Discrete models with a simplified user interface designed specifically for clear object detection applications

Clear Object Applications

- Clear plastic bottling lines
- Food containers/trays
- IV liquid bags
- Pharmaceutical vials



Detecting clear plastic PET bottles

LTF Series

12 Meter Laser Measurement Sensor

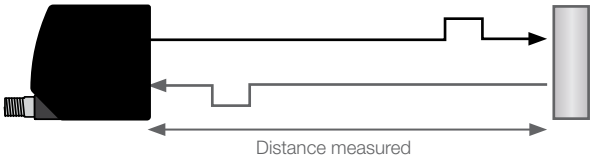
Superior Performance

- A powerful distance measuring sensor with **advanced functions** including:
  - Remote teach
  - High excess gain for seeing really dark targets
  - Laser power control for accurately measuring shiny targets
  - Laser inhibit
  - Cross-talk avoidance
  - Fast response speed
  - Delay timers
- Sensing range of 50 to 12,000 mm
- Durable housing rated **IP67**
- Superior resistance to ambient light sources

Precision Measurement

- Detects dark targets at 7 meters and white targets at 12 meters
- Repeatability of <5 mm
- Accuracy of +/- 10 mm

Time-of-Flight Measurement



The LTF sensor uses time-of-flight measurement, emitting a pulsed light, measuring the amount of time for the light to reflect off the object and return to the sensor to calculate the distance. This enables sensing in long-range applications across a wide variety of targets.

Height: 77 mm
Width: 26 mm
Depth: 56 mm

Loop control on a calendering machine

LTF Series

Output	Range	Model
4 to 20 mA Analog and (1) NPN/PNP Discrete	12 m	**LTF12IC2LDQ**
0 to 10 V Analog and (1) NPN/PNP Discrete	12 m	**LTF12UC2LDQ**
Dual Discrete (NPN/PNP configurable) with IO-Link	12 m	**LTF12KC2LDQ**

Long Range Measurement Applications

- Roll diameter
- Loop control
- Automated storage
- Presence/absence
- Palletizer
- Transfer press
- Robot end effector
- Fill Level

Detecting black parts on a shiny background

LE Series

Laser Measurement Sensor

Easy-to-Use

- Ready to **measure right out of the box**
- Easy alignment with a visible laser
- Multiple teach options simplifies setup for any application
- Convienient setup with a two-line, eight-character display

Superior Performance

- Measurement **range up to 1 m**
- Measurement **resolution down to 0.02 mm**
- Smaller laser spot for detecting small features or larger spot for averaging across uneven surfaces
- **Excellent repeatability and accuracy** for challenging targets, from black rubber to shiny metal
- Advanced measurement modes reduce PLC programming required to find average, minimum or maximum measurements

LE550

100 mm

1000 mm

Spot Size
12.1 x 4.9 mm

Resolution
1.0 mm

LE250

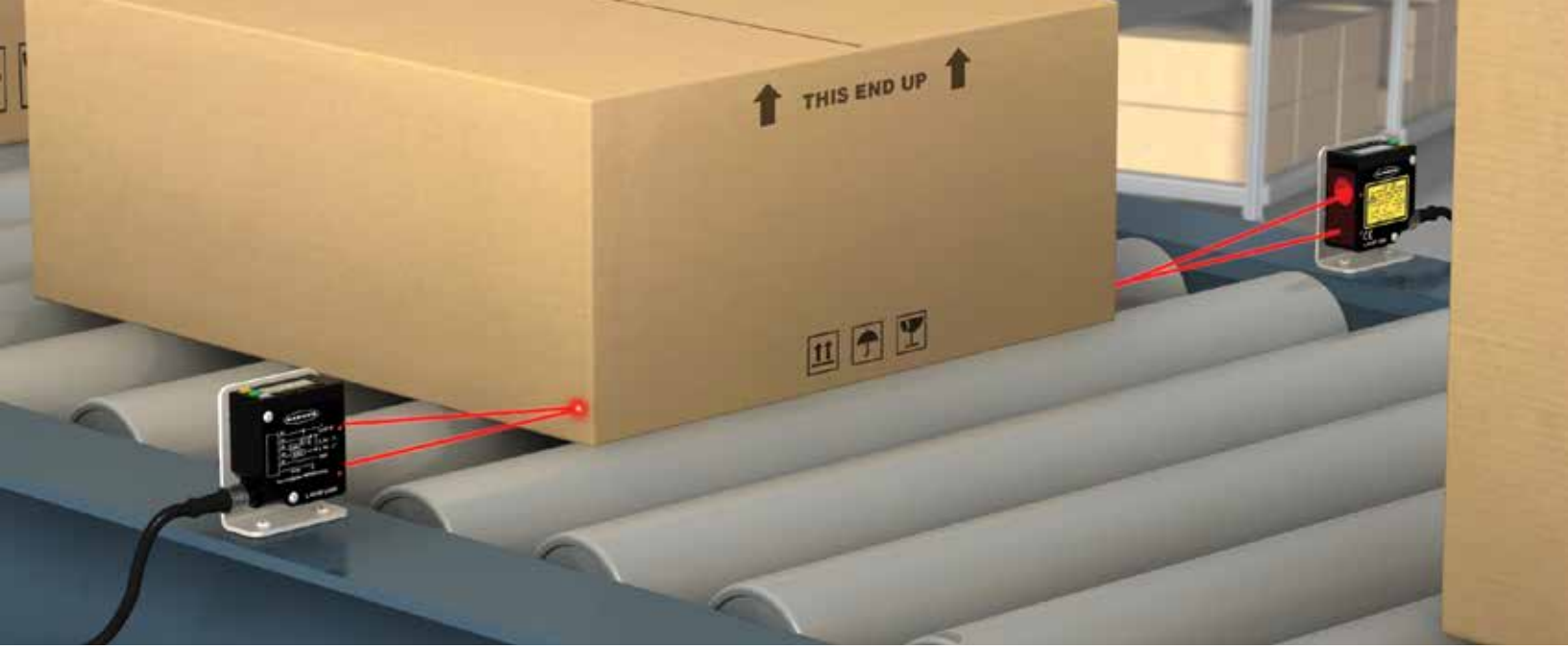
100 mm

400 mm

Spot Size
1.2 x 0.9 mm

Resolution
0.2 mm

Height: 77 mm
Width: 26 mm
Depth: 56 mm



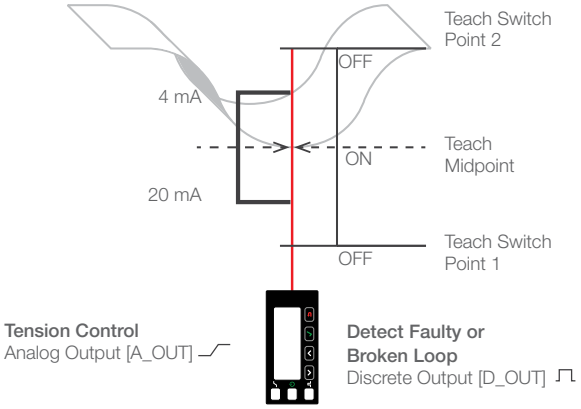
Measuring box width for sorting

LE Series

Output	Range	Model
(2) NPN/PNP discrete	400 mm	**LE250DQ**
4 to 20 mA analog and (1) NPN/PNP discrete	400 mm	**LE250IQ**
0 to 10 V analog and (1) NPN/PNP discrete	400 mm	**LE250UQ**
IO-Link and (1) PNP discrete	400 mm	**LE250KQ**
(2) NPN/PNP discrete	1000 mm	**LE550DQ**
4 to 20 mA analog and (1) NPN/PNP discrete	1000 mm	**LE550IQ**
0 to 10 V analog and (1) NPN/PNP discrete	1000 mm	**LE550UQ**
IO-Link and (1) PNP discrete	1000 mm	**LE550KQ**

Precision Measurement Applications

- Presence or absence detection
- Roll diameter monitoring
- Loop tension control
- Part size verification
- Part positioning



Monitoring sheet metal roll diameter

Q3X Series

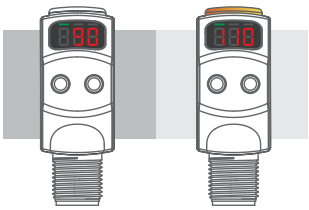
Versatile, Rugged, Laser Contrast Sensor

Easy-to-Use

- Save time and simplify set up with two tactile buttons
- The **three-digit display** can be inverted for a clear readout during setup or inspections
- Easy mounting and precise alignment with an adjustable mounting bracket
- Fixed-field models with **background suppression capabilities** ignore changing background conditions
- The multi-function remote input line can be used for remote teach, laser power inhibit, and cross-talk avoidance

High-Performance Detection

- High-speed part detection as fast as 250 µs, capturing up to **2,000 events per second**
- Angled three-digit display shows a **clear intensity readout** that is easily viewed from multiple vantage points
- Short-range models available with both diffuse and fixed background suppression making them two sensors in one
- Bright laser spot for easy setup



Can detect small changes in contrast from up to 300 mm away

Height: 49 mm
Width: 18 mm
Depth: 37 mm

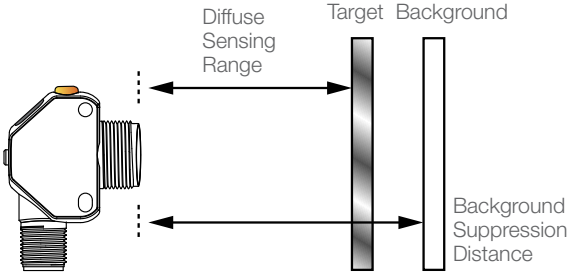
Bottle label verification with background suppression

Q3X Series

Contrast Sensing Range	Background Suppression Distance	Model
0 to 300 mm	NA	**Q3XTBLD-Q8**
0 to 50 mm	60 mm	**Q3XTBLD50-Q8**
0 to 100 mm	120 mm	**Q3XTBLD100-Q8**
0 to 150 mm	190 mm	**Q3XTBLD150-Q8**
0 to 200 mm	280 mm	**Q3XTBLD200-Q8**

Contrast Applications

- High-speed registration mark detection
- Label presence verification
- Verifying small part placement



Ignores backgrounds, including shiny metal, while reliably detecting small contrast changes (by model)

High-speed registration mark detection

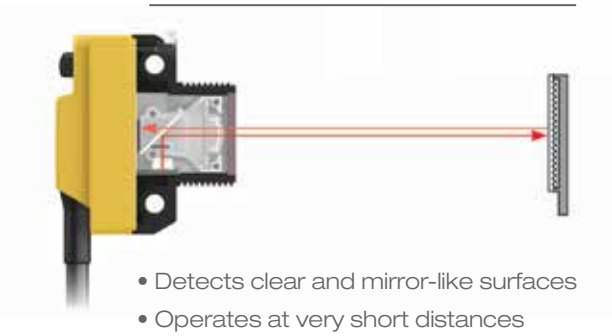
QS18 Series

Reliable Clear Object Detection Sensor

Easy-to-Use

- Save time and simplify setup with a pushbutton teach or potentiometer
- 18 mm threads or side mount holes for easy installation
- **Small LED spot size** for tight installations
- Detect from the object to the face of the sensor with **no blind spot**

Coaxial Optics



- Detects clear and mirror-like surfaces
- Operates at very short distances from the reflector
- Enables very precise leading edge detection

Superior Performance

- Coaxial optics allow for reliable clear object detection
- Response speeds as fast as 400 µs ON/OFF
- Banner's ClearTracking algorithm provides reliable operation by compensating for dust build up anwd ambient temperature changes (*Expert* models only)
- IP67-rated housing

Height: 35 mm
Width: 15 mm
Depth: 31 mm

Clear bottle detection

QS18 *Expert*™ Clear Object Detection

Adjustment	Output	Connector	Model
Pushbutton	NPN	2 m Integral Cable	**QS18EN6XLPC**
	PNP	2 m Integral Cable	**QS18EP6XLPC**
	NPN	M12 4-pin Euro QD	**QS18EN6XLPCQ8**
	PNP	M12 4-pin Euro QD	**QS18EP6XLPCQ8**
	NPN	M8 4-pin metal QD	**QS18EN6XLPCQ7**
	PNP	M8 4-pin metal QD	**QS18EP6XLPCQ7**

QS18 Clear Object Detection

Adjustment	Output	Connector	Model
Potentiometer	NPN	2 m Integral Cable	**QS18VN6XLP**
	PNP	2 m Integral Cable	**QS18VP6XLP**
	NPN	M12 4-pin Euro QD	**QS18VN6XLPQ8**
	PNP	M12 4-pin Euro QD	**QS18VP6XLPQ8**
	NPN	M8 4-pin metal QD	**QS18VN6XLPQ7**
	PNP	M8 4-pin metal QD	**QS18VP6XLPQ7**

Three User-Selectable Thresholds

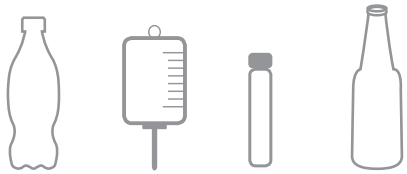
Optimize the sensor's performance to detect small changes in the amount of light received.

8%

Glass

Wrapping Film

16%



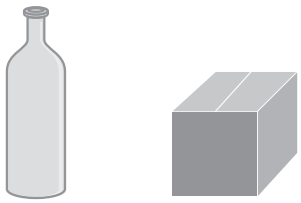
PET Bottles

IV Bags

Glass Vials

Glass Bottles

32%



Colored Glass Bottles

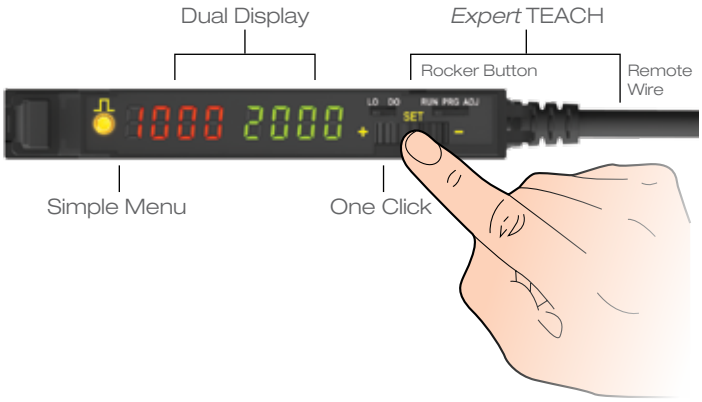
Boxes

DF-G Series

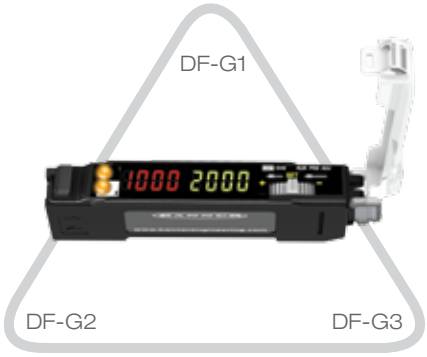
Broad Selection of World Class Fiber Amplifiers

Easy-to-Use

- Simple push button Teach
- Rocker switch for manual adjustment
- **Easy-to-read display** shows both the current signal strength and switching threshhold



General Purpose



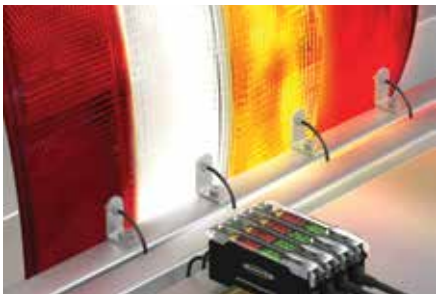
High Speed **High Power**

DF-G Series

- DF-G1: Expert teach and set methods ensure optimal gain and threshold
- DF-G2: Ideal for short duration events with 10 µs response speed
- DF-G3: Ideal for long range sensing, low contrast and precise positioning

IO-Link®

Application Specific



Light Receiver: DF-G1

- External light source monitoring
- Error-proofing and functional verification of light emitting assemblies.

Small Object: DF-G2

- Pill counting
- Small part counting

Color LED's: DF-G2/DF-G3

- Infrared: Long range
- Red, blue, green or white for registration mark detection

Water Detection: DF-G3

- 1450 nm Infrared wavelength to enhance contrast of clear liquids
- Reliable detection of presence or absence of water-based liquids

Dual Discrete: DF-G3

- Part size verification
- Detect two events with one sensor using a dual bifurcated fiber

Analog: DF-G3

- Web guiding
- Contrast matching
- Intensity monitoring

IO-Link®: DF-G1/DF-G2 DF-G3

- Remote teach
- Remote monitoring snd data collection
- Remote configuration lownload and adjustment

Energy Efficient Light Resistance: DF-G3

- Stable detection in industrial lighting environment

Dense Sensing Point Environment: DF-G3

- Cross talk avoidance algorithm allows multiple sensors to work in close proximity
- Includes synchronization wire for up to six sensors to avoid mutual interference

Fiber Optics

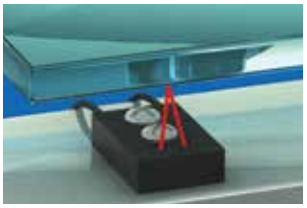
Vantage Line

- Competitively priced standard plastic and glass fibers
- Most models offer PVC overmold flex relief
- OEM friendly packaging

Speciality Fibers

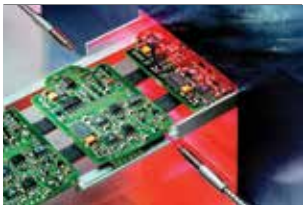
Array & Slot

Durabend & High Flex



Convergent

SteelSkin



High Temperature

Liquid

QM42VT Vibration Sensors

Vibration & Temperature Monitoring

Vibration Monitoring

- **Predictive maintenance** made easy by high accuracy vibration (RMS velocity) and temperature measurements
- Easily **monitor machine health** by sending information wirelessly
- **Detect problems earlier** to avoid machine failures and delays
- Manufactured with a robust zinc alloy housing

QM42VT Sensors

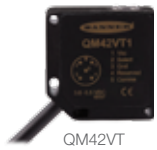
Description	Model
Vibration and temperature via 1-wire serial interface	**QM42VT1**
Vibration and temperature via RS-485 Modbus	**QM42VT2**

Vibration Monitoring Applications

- Motors
- Pumps
- Compressors
- Fans
- Blowers
- Gear boxes

Wireless Network

QM42VT or K50U mounted on your machine



QM42VT

K50U

1. Choose the Node that is right for your application

Up to six Nodes per sensor

Battery-powered

2. Choose a matching Gateway (Modbus/TCP to Ethernet/IP converter, user-selectable serial interface)

Height: 42 mm
Width: 13 mm
Depth: 42 mm

K50U Ultrasonic Sensor

Wireless Level and Tank Monitoring

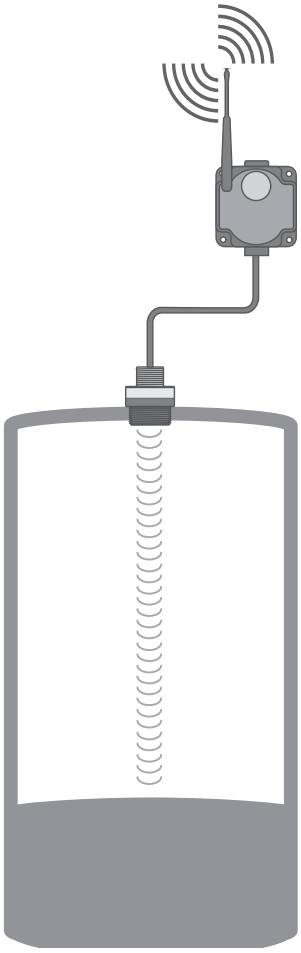
Level and Tank Monitoring

- Provides a distance measurement from the target to the sensor
- Monitor wirelessly to **avoid long cable runs**
- Built-in temperature compensation for reliable measurement
- Sensing range from 300 mm to 3 m
- Threaded housing for **easy installation**

K50U Sensors

Description	Model
Ultrasonic sensor with 1-wire serial interface	K50UX1RA
Ultrasonic sensor that functions as a modbus slave device via RS-485	K50UX2RA

Diameter: 50.0 mm
Connection: 1¼ NPT
Depth: 59.5 mm



Ideal for monitoring portable tanks

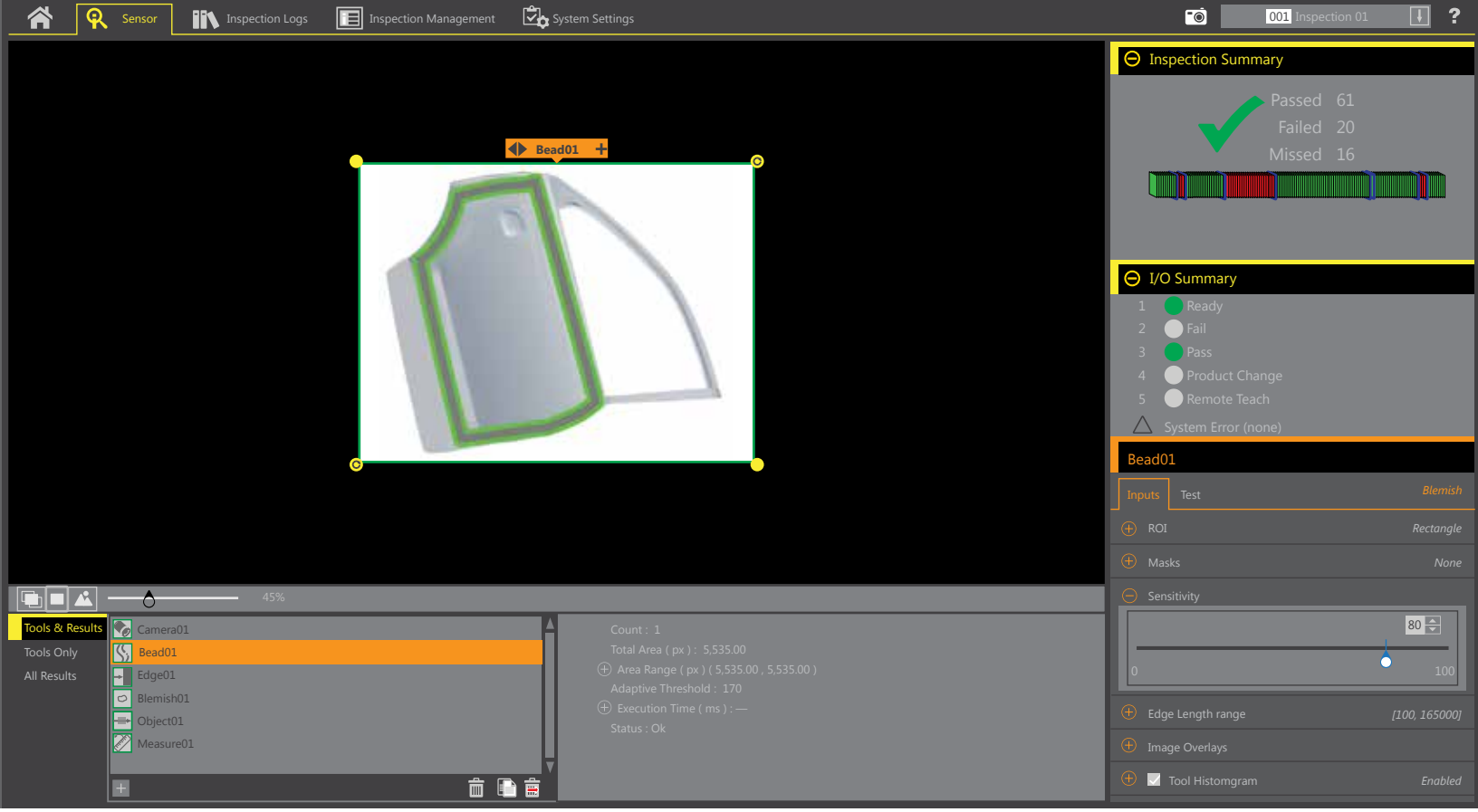
VE Smart Camera

Compact and Durable Camera with Intuitive Software

Superior Performance

- Two-line, eight-character display and push buttons enable troubleshooting and camera status
  - Perform product change or trigger
  - Change or view IP address, MAC address or speed
  - View firmware, focus number or status
- **Robust, aluminum housing** for harsh environments
- Ethernet connector with **GigE transfer capability**
- C-mount lens to suit a variety of applications
- Optional lens cover provides an IP67-rated solution

Height: 88 mm
Width: 67 mm
Depth: 41 mm



Intuitive Software

Vision Manager Software is easy to configure with powerful functions. Download at bannerengineering.com

- **Runtime editing** allows for quick inspection changes on the fly to reduce costly downtime
- An emulator to assist with offline building and troubleshooting of applications
- **EtherNet/IP, Modbus/TCP and PROFINET** for seamless communication on the manufacturing floor

VE Smart Camera

Resolution	Imager	Model
2MP, 1600 x 1200	Grayscale	**VE202G1A**
1.3MP, 1280 x 1024	Grayscale	**VE201G1A**
WVGA, 752 x 480	Grayscale	**VE200G1A**

Vision Applications

- Inspect: Verify correct parts, labels or components are present
- Count: Confirm the number of parts found
- Measure: Measure distances or angles to validate size or location of parts
- Detect: Find edges and determine part location
- Flaw Detection: Inspect for flaws, such as scratches on a part
- Uniformity: Check for consistent application of sealant or adhesives

Detecting a line of adhesive on a vehicle door panel

LED color options

WLS27 Series

Industrial LED Light Bar

Advanced Design

- Rugged, water-resistant **IP66, IP67 and IP69K** design
- **Cascade models** for connecting multiple lights end-to-end, minimizing wiring
- Energy efficient for overall cost savings
- Optional snap clips for **easy installation** and repositioning
- Ability to adjust the lights to Hi/Lo/Off
- **Automatic temperature protection** built into the unit protects the life of the product
- Eight different lengths and **dual-color** models available

Applications

- Laminar airflow applications requiring a round shape
- Marine environments
- Car wash
- Food and beverage processing equipment

Length (mm)	Lumens (Typical @ 25 °C)						Typical Wattage* (Watts)
	Cool White	Warm White	Red	Green	Blue	Yellow	
145	325	325	55	180	40	50	3.6
285	650	650	110	360	80	100	7.2
430	975	975	165	540	120	150	11.0
570	1300	1300	220	720	160	200	14.6
710	1625	1625	275	900	200	250	18.5
850	1950	1950	330	1080	240	300	22.1
990	2275	2275	385	1260	280	350	25.9
1130	2600	2600	440	1440	320	400	29.8

*Typical operating wattage is measured at 24 V dc

Length: 145 - 1130 mm
Width: 27 mm
Depth: 27 mm

WLB92 Series

Industrial LED Light Bar

LED color options

High-Quality LED Lighting

- Increase worker productivity and ergonomics with bright, high-quality, uniform light
- Durable light stands up to difficult environments with a **rugged metal housing** and shatterproof light cover
- **Energy efficient** for overall cost savings
- Easy installation with a variety of mounting brackets: surface, swivel, snap and hanging
- All models include built in dimmable control
- AC models are DLC qualified with a five year warranty
- Six color options available

Applications

- Economical lighting solution for low- and mid-bay areas
- Machine and work cell illumination
- Quality inspections requiring bright even lighting

Lighted Length (mm)	Lumens (Typical @ 25 °C) Daylight White	AC Models Typical Wattage* (Watts)	DC Models Typical Wattage* (Watts)
550	3130	34	35
1100	6500	70	70

* Typical operating wattage is measured at 120 V ac or 24 V dc, depending on model

DC models

AC QD models

AC Conduit models

Length: 550 or 1100 mm
Width: 97 mm
Depth: 104 mm

LED Indicators

Bright, Rugged and Highly Visible Indicators

Variety of Shapes and Sizes

- Rugged, **water-resistant housing** made of UV-stabilized material
- Bright, uniform indicators appear gray when OFF to eliminate false indication from ambient light
- A variety of shapes and size have a long lifetime with zero maintenance
- Audible, daylight visible, and wireless integration options on select models

Illuminated Touch Buttons

Ergonomic, Visual and Sealed Operator Touch Buttons

unlit model shown

Simple Operation

- Excellent immunity **prevents tripping from water and foreign materials**; they even work with gloves
- Variety of logic functions available
- Rugged housings with high IP ratings
- Bright, uniform indicators appear gray when OFF to eliminate false indication from ambient light
- Multiple colors available
- **Perfect for pick-to-light operations**
- Wireless integration options on select models

TL70 Tower Light

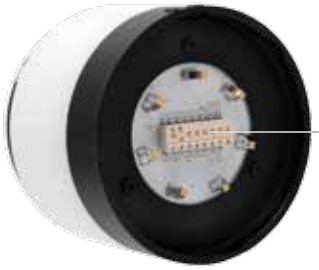
Large, Modular Tower Lights

LED color options

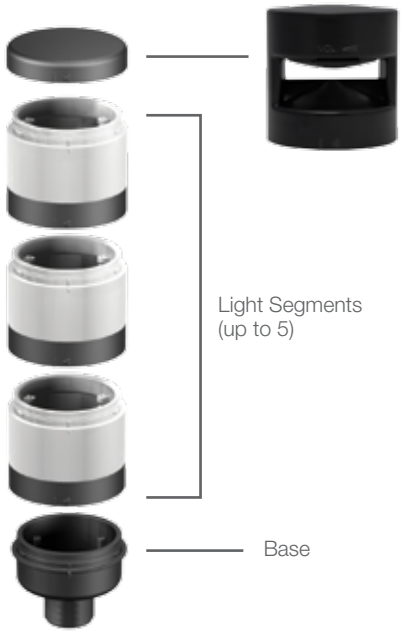
Superior Design

- **Preassembled or modular models** to suit application needs
- Light segments have user-selectable solid ON or flashing
- Up to **five colors plus audible** in one device
- Rugged, water-resistant IP65 housing with UV-stabilized material
- Bright, uniform indicator segments appear gray when off to eliminate false indication from ambient light
- Housings available in either black or gray
- **Wireless options** available

Simple Set Up



DIP Switch Settings

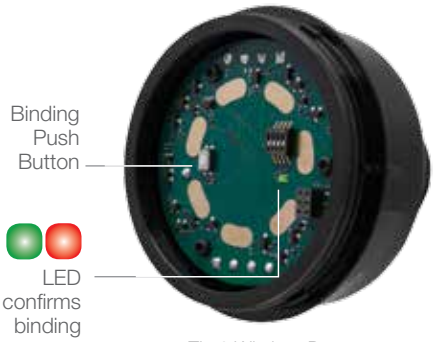


Audible Options
- Audible (92 dB)
- Loud Audible (101 dB)
- Multi Tone (101 dB)
- Programmable Audible (coming soon)

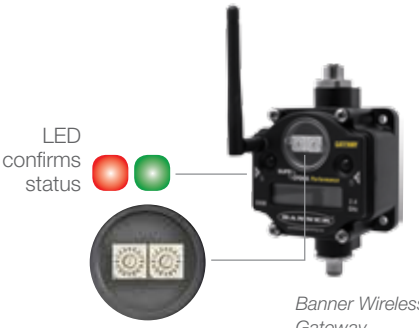
Height: 46-243 mm
Width: 70 mm
Depth: 70 mm

Modular Tower Lights with Wireless Communication

1. Bind Base to Gateway

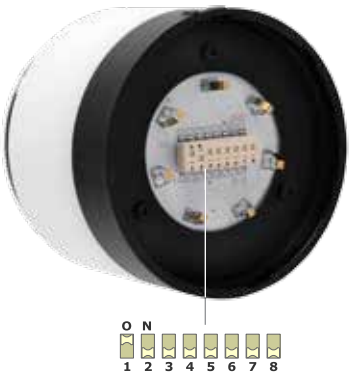


TL70 Wireless Base



Banner Wireless Gateway

2. Build Light Segments



DIP Switch Settings

TL70 Light Segments

3. Map Base to Gateway

Banner Wireless Gateway

TL70 Wireless Module Light

Tower Lights

Premium high-brightness and audible tower lights

IO-Link®

LED color options

Audible
max. intensity
92 db @ 1 meter (typical)

Sealed Audible
max. intensity
94 db @ 1 meter (typical)

Sealed Omni-Directional Audible
Standard: max. intensity
99 db @ 1 meter (typical)
Intensity Adjust: max. intensity
95 db @ 1 meter (typical)

DXM

Industrial Wireless Controller

- **Control wireless networks**, consolidate networks, create a network backbone
- **Programmable** to solve specific applications
- **Ethernet** and cellular connectivity
- Send alert messages
- Create local logs
- Relay register data to the cloud

DXM100 Controller

Description	Frequency	Model
Controller with DX80 Gateway preconfigured as a protocol converter	900 MHz	**DXM100-B1R1**
Controller with DX80 Gateway preconfigured as a protocol converter	2.4 GHz	**DXM100-B1R3**
Controller with MultiHop Data Radio	900 MHz	**DXM100-B1R2**
Controller with MultiHop Data Radio	2.4 GHz	**DXM100-B1R4**

Predictive Maintenance Monitoring: monitor equipment to detect problems early and avoid additional damage and unplanned downtime

Environmental Monitoring: minimize material loss by monitoring temperature and humidity in climate controlled areas

Productivity Solutions: create call-for-parts/service and pick-to-light systems to increase productivity and reduce error

Height: 86 mm
Width: 105 mm
Depth: 60 mm

Compatible Wireless Products

Performance I/O Nodes
and MultiHop Modbus I/O

Vibration and
Temperature Sensors

K50U
Ultrasonic Sensors

Temperature and
Humidity Sensors

Q45 Wireless
Nodes

TL70 Wireless
Tower Lights

For more information, visit bannerengineering.com.

XS26-2

Expandable Safety Controller

XS26-2 Expandable Safety Controller

- **Up to eight expansion I/O modules** can be added as your automation needs grow or change
- Choose from six expansion modules available to suit your application with a variety of safety inputs, solid-state safety outputs and safety relay outputs
- **Simulation mode and live display** feature allows testing and active monitoring of I/O on a PC
- **Free configuration software**
- Standard communications including EtherNet/IP, Modbus/TCP, and ProfiNet
- Non-expandable controller includes two dual-channel safety outputs and 26 input terminals (eight convertible to outputs)

SC26-2

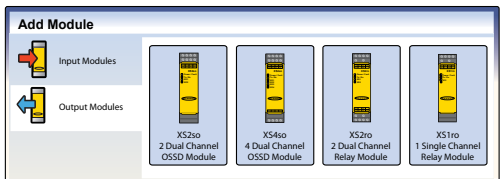
Safety Controller

- Designed for smaller applications where cost is at a premium
- Intuitive programming includes logic functions for easy implementation
- Non-expandable controller includes two dual-channel safety outputs and 26 input terminals (eight convertible to outputs)

Build Your System & Select Equipment

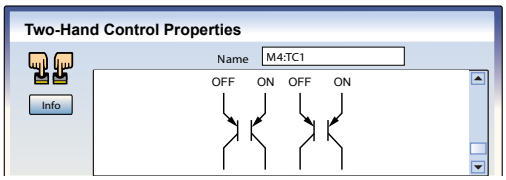
Configure a system in minutes

1. Add up to eight modules

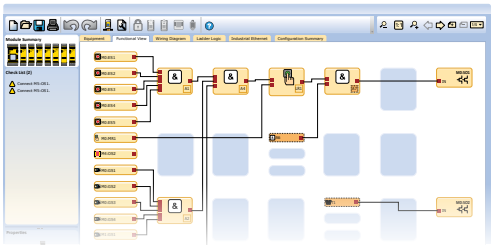


2. Add safety devices

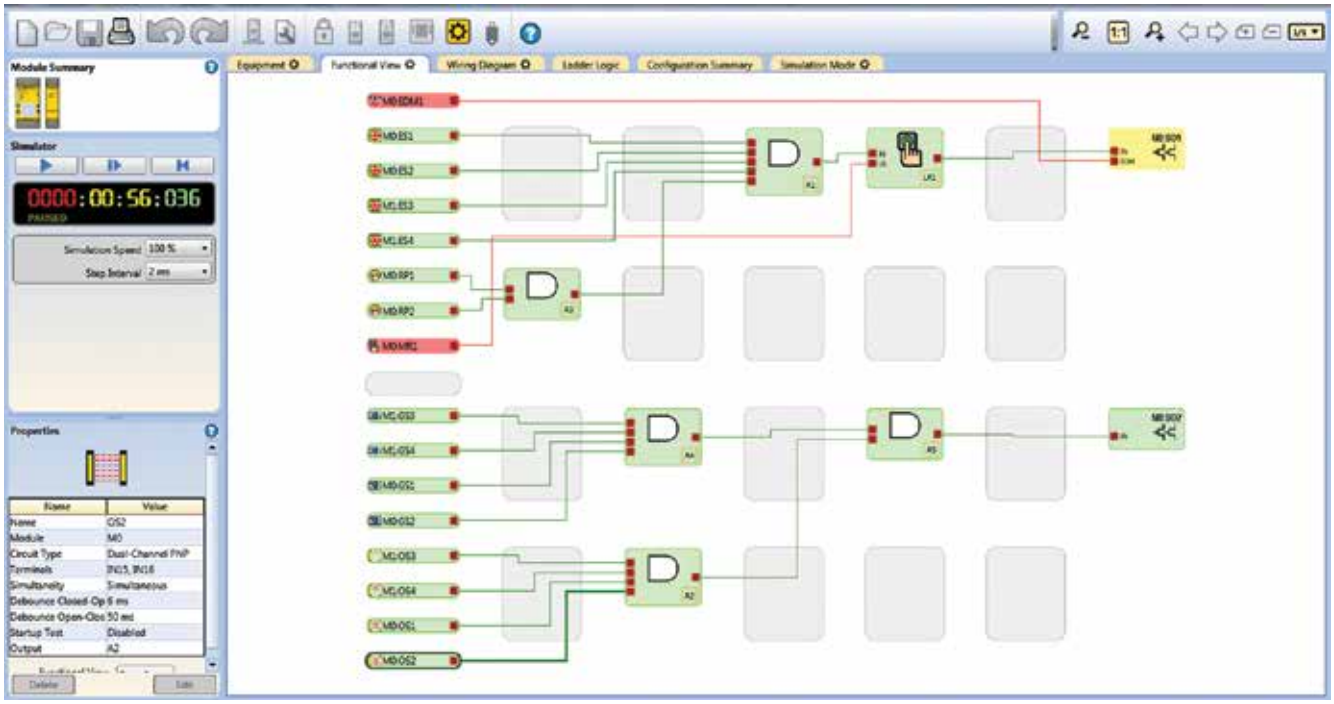
3. Select safety device properties



4. Configure your system

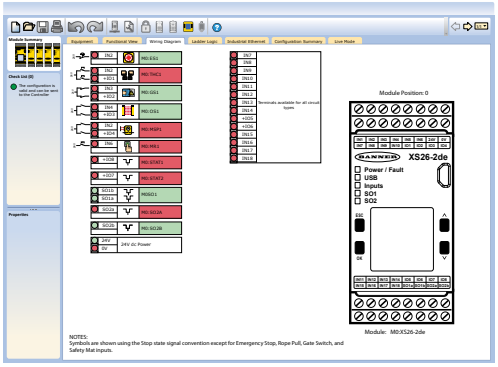


Simulation Mode - Functional View

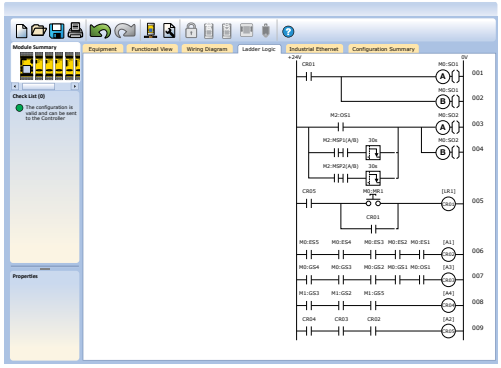


The icon based configuration environment allows straightforward machine safeguarding development which can be tested on your PC by activating the Simulation Mode feature

Wiring Diagram in Live Mode



Ladder Logic



EZ-SCREEN® LS

Simple, Rugged, Safety Light Screen

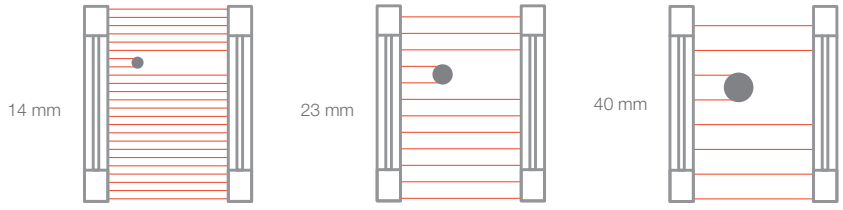
Superior Performance

- Built to withstand challenging environments common to both manufacturing and packaging—rated IP65 and IP67
- No blind zone design provides **end-to-end sensing** to eliminate gaps in detection
- A **12 m range** with three available resolutions: 14, 23 and 40 mm
- Standard pairs, cascade systems and extensive accessories to suit a wide variety of safeguarding configurations
- Addition of remote or integrated indication lights on cascade models provides clear communication of system status

Easy-to-Use

- **Alignment indicators** are highly visible and intuitive diagnostics simplify setup, facilitate troubleshooting and streamline installation
- **Metal end caps**, thick aluminum housing and a recessed window to avoid damage from impact
- Remote fixed blanking available on cascade models allows for greater flexibility in dynamic applications
- **Automatic cascade configuration** requires no PC software, DIP switches or additional devices for quick, easy setup
- **Optical synchronization** eliminates the need for a wired connection between emitter and receiver

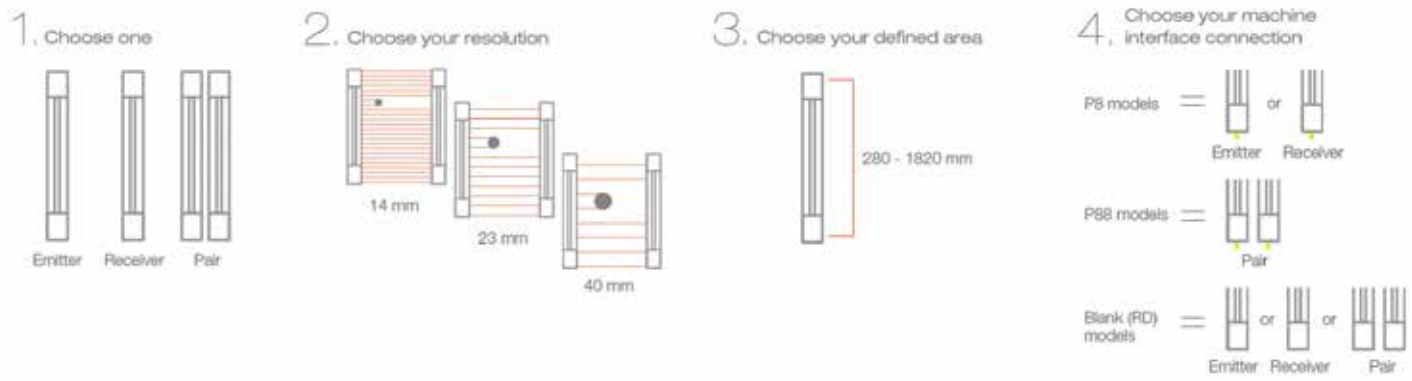
Available in Three Resolutions:

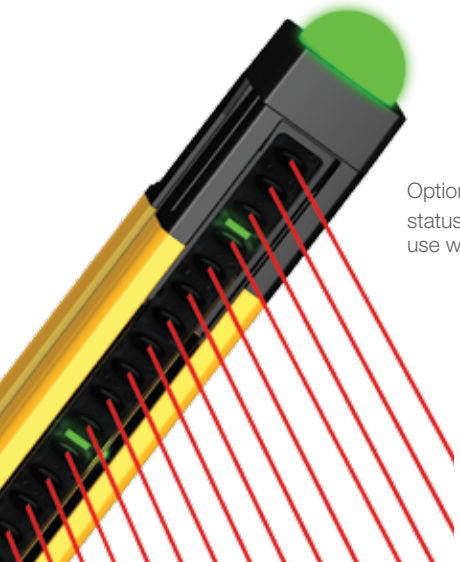


Height: 280 mm - 1820 mm
Width: 36 mm
Depth: 45 mm

Angled safeguarding of a power press

Build a System:





Optional EZLSA-K30LGR status indicator available for use with cascade receivers

Safety Applications

- Dual-operator robotic work station
- Safeguarding of power press
- Small assembly station protection

IO-LINK Products

IO-Link®

Designed to facilitate communication between sensors/actuators from different manufacturers and higher-level systems, the fieldbus-independent IO-Link serial communication protocol offers a uniform standard that applies to all manufacturers.

EZ-ARRAY®

Q4X

QS18
COD

DF-G1
DF-G2
DF-G3

LTF

TL50

LE

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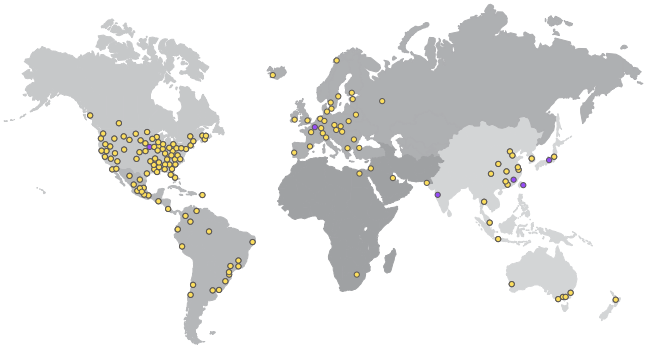

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