Banner's full line of adjustable-field background suppression sensors offer reliable detection of objects regardless of color, reflectivity, surface irregularities or background conditions. Versatile housing styles and a variety of mounting accessories make installation quick and easy, while a simple screwdriver adjustment on all models allows precise setup of sensing range. In a choice of three rugged housings, these high-performance adjustable-field sensors deliver an exceptional solution for the vast majority of tough sensing applications.

**Precise and Reliable Adjustable-Field Sensing in Three Housing Styles**

Banner offers a wide range of adjustable-field sensors for various applications. Here are some key features:

- **Background Suppression Technology**: Advanced technology to ignore objects beyond the sensing field cutoff.
- **Long-range Models**: Models with a sensing range up to 2000 mm.
- **Short-range Models**: Models for detecting thinner objects closer to the background.
- **Easy Adjustment**: Screwdriver adjustment for precise setting of cutoff.
- **Visible Red LED/Laser**: Available for easy sensor alignment.
- **Solid-state Complementarity/Bipolar D/A Outputs**: Compatible with relay type output models.
- **Cross-talk Immunity**: Immune to multiple sensors in close proximity on some models.
- **Sealed Housing/Protected Circuitry**: Suitable for rugged environments, IP67 rated.
- **Models with dc/ac/dc Supply Voltage**: Available for various power requirements.
Adjustable-Field Sensors with Background Suppression

### WORLD-BEAM® QS18
- Rugged, compact housing for mounting in confined spaces.
- Sensing range up to 300 mm.
- Laser module with a narrow-effective beam for small-object detection and precise position control.
- Simple multi-turn screw adjustment of cutoff distance.
- Short-range models for detecting thinner objects closer to the background.
- Side mount and threaded back mounts for mounting versatility.

### WORLD-BEAM® QS30
- Midsize right-angle housing with 30 mm threaded lens in side mount.
- 128 element photo receiver for superior performance up to 600 mm.
- Linear multi-turn screw adjustment of cutoff distance.
- Improved temperature compensation to minimize cutoff distance variation due to ambient temperature changes.

### QS60
- Robust, fullsize housing with integrated side mounts.
- Full-featured sensor for long-range sensing from 200 to 2500 mm.
- Laser models for small part detection from long distance.
- Two-turn, logarithmic adjustment of sensing cutoff point.
- Easy push-button programming of light/dark operate, and output timing options.
- Models for dc or ac operation.

### Background Suppression

**Application Setup Example**

\[ X = \text{Distance to Object} \]
\[ Y = \text{Minimum Separation Between Object and Background} \]

1. Object
2. Conveyer
3. Background

- Operates in diffuse mode, detecting light returned by the object but ignoring light returned by the background.
- Provides reliable detection when conditions behind the object are changing or the object is close to a background.
- Ideal where the background condition cannot be controlled, or the background is a standard diffuse-mode sensor impractical.

### Background Suppression Sensor Comparison (Visible Red LED and Laser Models)

<table>
<thead>
<tr>
<th>Sensor</th>
<th>QS18</th>
<th>QS30AF</th>
<th>QS60</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjustable Range</strong> (Cutoff)</td>
<td>LED: 15 to 40 mm</td>
<td>Laser: 30 to 150 mm (Class 1)</td>
<td>50 to 600 mm</td>
</tr>
<tr>
<td><strong>Supply Voltage</strong></td>
<td>10 to 30V dc</td>
<td>10 to 30V dc</td>
<td>10 to 30V dc</td>
</tr>
<tr>
<td><strong>Response Time</strong></td>
<td>LED: 2.5 ms</td>
<td>Laser: 700 µs</td>
<td>5.0 ms</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>LED: 250 µs</td>
<td>Laser: 130 µs</td>
<td>750 µs</td>
</tr>
<tr>
<td><strong>Output Timing Options</strong></td>
<td>—</td>
<td>Contact/Factory</td>
<td>—</td>
</tr>
<tr>
<td><strong>Crosstalk Prevention</strong></td>
<td>Excellent</td>
<td>Excellent</td>
<td>Basic</td>
</tr>
</tbody>
</table>

**Visible Red LED**

- High-visibility, unobtrusive light signal.
- Easily visible from distances up to 300 mm.
- Suitable for low-light applications.

**Visible Red Laser**

- Laser module with a narrow-effective beam for small-object detection and precise position control.
- Simple multi-turn screw adjustment of cutoff distance.
- Short-range models for detecting thinner objects closer to the background.
- Side mount and threaded back mounts for mounting versatility.

### Adjustable-Field Sensors with Foreground Suppression

- Reliable detection of objects of varying color and size when background is fixed.

Available in two popular WORLD-BEAM® housing models:
- Compact QS18 with a choice of 40 or 200 mm sensing range.
- Midsize QS30 with an extended sensing range up to 400 mm.

Visit www.bannerengineering.com or call 1-888-373-6767 for additional information.
Adjustable-Field Sensors with Background Suppression

**WORLD-BEAM® QS18**
- Rugged, compact housing for mounting in confined spaces.
- Sensing range up to 300 mm.
- Laser models with a narrow-effective beam for small object detection and precise position control.
- Simple null turn screw adjustment of cutoff distance.
- Short range models for detecting thinner objects closer to the background.
- Side mount and threaded back mounts for mounting versatility.

**WORLD-BEAM® QS30**
- Midsize right-angle housing with 30 mm threaded lens in side mount.
- 128 element photo receiver for superior performance up to 600 mm.
- Linear null turn screw adjustment of cutoff distance.
- Improved temperature compensation to minimize cutoff distance variation due to ambient temperature changes.

**Q60**
- Robust, fullsize housing with integrated side mounts.
- Full-flared sensor for long range sensing from 200 to 2000 mm.
- Laser models for small part detection from long distance.
- Two-turn, logarithmic adjustment of sensing cutoff point.
- Easy push button programming of light/dark operate and output timing options.
- Models for dc or ac/dc operation.

---

**Background Suppression Application Setup Example**

\[ \begin{align*}
X & = \text{Distance to Object} \\
Y & = \text{Minimum Separation Between Object and Background}
\end{align*} \]

1. Object
2. Conveyor
3. Background

Set cutoff distance approximately midway between farthest target and the closest background.

- Operates in diffuse mode, detecting light returned by the object but ignoring light returned by the background.
- Provides reliable detection when conditions behind the object are changing or the object is close to a background.
- Ideal where the background condition cannot be controlled, or the background is a standard diffuse-mode sensor impractical.

---

**Background Suppression Sensor Comparison (Visible Red LED and Laser Models)**

<table>
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<tr>
<th>Sensor</th>
<th>QS18</th>
<th>QS30AF</th>
<th>Q60</th>
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<tbody>
<tr>
<td>Adjustable Range (Cutoff)</td>
<td>15 to 40 mm</td>
<td>30 to 150 mm (Class 1)</td>
<td>50 to 250 mm (Class 2)</td>
</tr>
<tr>
<td>Laser</td>
<td>30 to 150 mm (Class 1)</td>
<td>50 to 250 mm (Class 2)</td>
<td></td>
</tr>
<tr>
<td>LED: 200 to 1000 mm</td>
<td>Laser: 200 to 1400 mm (Class 1)</td>
<td>200 to 2000 mm (Class 2)</td>
<td></td>
</tr>
<tr>
<td>Output (depends on model)</td>
<td>Bipolar NPN &amp; PNP</td>
<td>Bipolar NPN &amp; PNP</td>
<td>Bipolar NPN &amp; PNP</td>
</tr>
<tr>
<td></td>
<td>Complementary Bipolar NPN &amp; PNP</td>
<td></td>
<td>SPDT or SPST</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>10 to 30 V dc</td>
<td>10 to 30 V dc</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>Response Time</td>
<td>2.5 ms</td>
<td>5.0 ms</td>
<td>5.0 ms</td>
</tr>
<tr>
<td>Laser: 700 µs</td>
<td>DC models: 2.0 ms</td>
<td>AC/DC models: 1.5 ms</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>5.0 ms</td>
<td>500 µs</td>
<td></td>
</tr>
<tr>
<td>LED: 250 µs</td>
<td>Laser: 130 µs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Timing Options</td>
<td>Contact/Fixed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crosstalk Prevention</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Basic</td>
</tr>
</tbody>
</table>

---

**WORLD-BEAM® QS18 Sensors**

<table>
<thead>
<tr>
<th>Sensing Mode/LED Model*</th>
<th>Range</th>
<th>Output</th>
<th>Connection</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS18VNAF30005S</td>
<td>Adj. Cutoff: 30 to 350 mm</td>
<td>NPN</td>
<td>2-pin Euro Pigtail QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS18VPMAF30005S</td>
<td>Adjust. Cutoff: 15 to 40 mm</td>
<td>NPN</td>
<td>4-pin Euro Pigtail QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS18ABAF30005S</td>
<td></td>
<td>Bipolar NPN &amp; PNP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QS18VNAF40005S</td>
<td></td>
<td>NPN</td>
<td>2-pin Euro Pigtail QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS18VPMAF40005S</td>
<td></td>
<td>NPN</td>
<td>4-pin Euro Pigtail QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS18ABAF40005S</td>
<td></td>
<td>Bipolar NPN &amp; PNP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QS18VNLAFDSF</td>
<td>Adjust. Between: 15 to 150 mm</td>
<td>NPN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QS18VPNLAFDSF</td>
<td></td>
<td>NPN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QS18VNLAF50005S</td>
<td>Adjust. Between: 15 to 250 mm</td>
<td>NPN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QS18VPNLAF50005S</td>
<td></td>
<td>NPN</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* LED models: A model with a 2D requires a mating cordset. For a 5-pin Euro-style QD, refer to QS30AF600. In 200 to 2000 mm range models, a change to QD, add suffix QDS1800 to the 200 to 2000 mm model number (example, QS18VPMAF30005QDS1800).

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**Q60 Sensors**

<table>
<thead>
<tr>
<th>Sensing Mode/LED Model*</th>
<th>Range</th>
<th>Output</th>
<th>Connection</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS30AFAF3000D5</td>
<td>Adjust. Cutoff: 50 to 1600 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>5-pin Euro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60AFAF3000D5</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6AF3000Q</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6AF3000Q1</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6AFQ5</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>5-pin Euro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6Q5</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6Q5</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6Q51</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
<tr>
<td>QS60BBB6Y51</td>
<td>Adjust. Cutoff: 200 to 1400 mm</td>
<td>Bipolar NPN &amp; PNP</td>
<td>4-pin Micro QD</td>
<td>10 to 30 V dc</td>
</tr>
</tbody>
</table>

* LED models: A model with a 2D requires a mating cordset. For a 5-pin Euro-style QD, refer to QS30AF600. In 200 to 2000 mm range models, a change to QD, add suffix QDS1800 to the 200 to 2000 mm model number (example, QS18VPMAF3000QDS1800).

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- Fluorescent light and crosstalk immunity for reliable sensing.
- Sealed housing and protected circuitry for rugged environments, IP67 rated.

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More information online at [www.bannerengineering.com](http://www.bannerengineering.com)
Three Housing Styles
for a Wide Range of Applications and Industries

- Packaged food detection on conveyor line
- Part level monitoring in feeder bowl
- Feature and edge detection
- Label placement and cap verification in packaging
- Linen and textile detection in laundry machines
- Through-the-roller tote detection
- Product flow control
- Error-proofing

40-plus years of sensor design experience, quality control, sales support and cost-effective solutions:
- Banner quality products with global availability
- Rapid customization with most products shipping in 3 days or less
- Industry’s largest force of application engineers to solve your toughest challenges
- More than 3,000 factory and local field representatives to serve you

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- Advanced background suppression technology to ignore objects beyond the sensing field cutoff
- Long-range models with a sensing range up to 2000 mm
- Short-range models for detecting thinner objects closer to the background
- Easy screwdriver adjustment for precise setting of cutoff
- Visible red LED or laser for easy sensor alignment
- Solid-state complementary or bipolar discrete output, or e/m relay output models
- Crosstalk immunity to allow multiple sensors in close proximity on some models
- Sealed housing and protected circuitry for rugged environments; IP67 rated
- Models with dc or ac/dc supply voltage