QS18E Clear Object Detection with IO-Link Product Manual

Original Instructions
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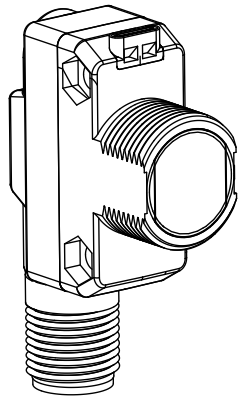
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Chapter 1 Features

Expert™ Coaxial Polarized Retroreflective Sensor for Clear Object Detection with IO-Link



- Reliably detects clear, transparent, or opaque objects — including PET, glass containers, and transparent films
- Coaxial optics enable reliable detection of targets to the face of the sensor with no dead zone
- ClearTracking automatic compensation algorithm provides long and reliable operation by compensating for dust buildup and ambient temperature changes
- Fast response speed with low jitter for high-speed bottling and packaging applications
- Bright, visible red light spot makes alignment easy
- 3 user-selectable thresholds optimize performance to the type of object being detected
- Easy configuration of the sensor by remote teach input or tactile push button
- Convenient mounting options available for 18 mm barrel or side mount
- Bright indicator LEDs show operating status from 360°
- IP67-rated ABS housing
- IO-Link with programmable PNP/NPN output and input configurations using IO-Link

WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

Clear object polarized retroreflective sensing mode models

Model	Range	Channel 1	Channel 2	Connector
QS18EK6XLPC	0 to 1.3 m (0 to 4.2 ft) on BRT-40X19 0 to 2.0 m (0 to 6.5 ft) on BRT-60X40C 0 to 3.0 m (0 to 9.8 ft) on BRT-92X92C	IO-Link, Push/pull output, programmable PNP or NPN output	Multi-function remote input/output, programmable PNP or NPN	2 m (6.5 ft) cable

Integral 2 m (6.5 ft) unterminated cable models are listed.

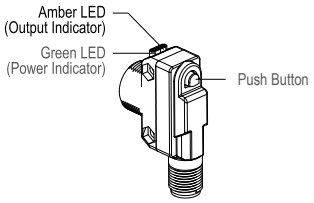
- The 9 m (30 ft) PVC cable model, QS18EK6XLPC W/30, is no longer available for order, but is covered by the contents of this manual.
- To order the 4-pin M12 integral quick disconnect model, add the suffix "Q8" to the model number. For example, QS18EK6XLPCQ8.
- To order the 150 mm (6 in) PVC cable model with a 4-pin M12 quick disconnect, add the suffix "Q5" to the model number. For example, QS18EK6XLPCQ5.

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- To order the 4-pin M8 integral quick disconnect model, add the suffix "Q7" to the model number. For example, QS18EK6XLPCQ7.
- To order the 150 mm (6 in) PVC cable model with a 4-pin M8 quick disconnect, add the suffix "Q" to the model number. For example, QS18EK6XLPCQ.

Overview

The Banner QS18 sensor is a high-performance clear object detection sensor with an IO-link and multifunction output.



The polarized coaxial optical design ensures reliable detection of transparent, translucent, and opaque targets at any distance between the sensor and the reflector. Low contrast sensing applications include PET bottles, glass containers, and shrink wrap. The sensor can also be used to detect optical surfaces such as: LCD panels with built in polarizing films, solar panels, and semiconductor wafers.

Indicators (Two LEDs: One Green, One Amber)

Sensor Condition (Run Mode)	Green LED	Amber LED
Output OFF	ON	OFF
Output ON	ON	ON
Notification — Sensor needs to be reconfigured for reliable detection	Flashing at 5 Hz	ON/OFF
Notification — Push button has been locked out	Flashes 4 times and returns to solid on	ON/OFF

Specifications

Supply Voltage and Current
10 V DC to 30 V DC (10% max. ripple) at 30 mA

Emitter LED
Visible red, 625 nm

Repeatability
100 µs

Supply Protection Circuitry
Protected against reverse polarity and transient overvoltages

Output Protection Circuitry
Protected against false pulse on power-up and continuous overload or short-circuit of output

Output Configuration
Channel 1: IO-Link, Push/pull output, configurable PNP or NPN output
Channel 2: Multi-function remote input/output, configurable PNP or NPN

Output Response Time
Momentary delay on power-up, < 0.5 s, output does not conduct during this period
400 µs ON/OFF

IO-Link Interface
Supports Smart Sensor Profile: Yes
Baud Rate: 38400 bps
Process Data Widths: 16 bits
IODD Files: Provides all programming options of button and remote input wire, plus additional functionality. Please see the IO-Link Datamap document for more details.

Indicators
Two LEDs (1 green, 1 amber)
Green solid: Indicates power applied and sensor ready
Green flashing: Indicates sensor operating in marginal state, in need of reconfiguration
Amber solid: Indicates output conducting

Construction
ABS housing, PMMA window

Mounting Torque
Nose mount: 18 mm mounting nut, 20 lbf·in (2.3 N·m)
Side mount: Two M3 screws, 5 lbf·in (0.6 N·m)

Connections
PVC-jacketed 4-conductor 2 m (6.5 ft) or 9 m (30 ft) unterminated cable, or 4-pin M12 or 4-pin M8 quick-disconnect (QD), either integral or 150 mm (6 in) pigtail, are available. QD cordsets are ordered separately.

Operating Conditions
–40 °C to +70 °C (–40 °F to +158 °F)
95% at +50 °C maximum relative humidity (non-condensing)

Environmental Rating
IP67

Application Notes
If the push button does not appear to be responsive, perform the push button enable procedure

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Factory Default Settings

Setting	Factory Default
Sensing Mode	Transparent Mode
Output Logic	Dark Operate
Offset Percent	16%
Push Button	Unlocked
Auto Compensation	Disabled
OFF Delay	Disabled
Pin 4 Output	IO-Link Enabled Detection Output (Push-pull)
Pin 2 Output	Detection Output: High speed output when using IO-Link on Pin 4 (PNP)

Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Turck Banner LTD Blenheim House
Blenheim Court
Wickford, Essex SS11 8YT
GREAT BRITAIN

Required Overcurrent Protection

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	2.0	30	0.5

FCC Part 15 Class A for Unintentional Radiators

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

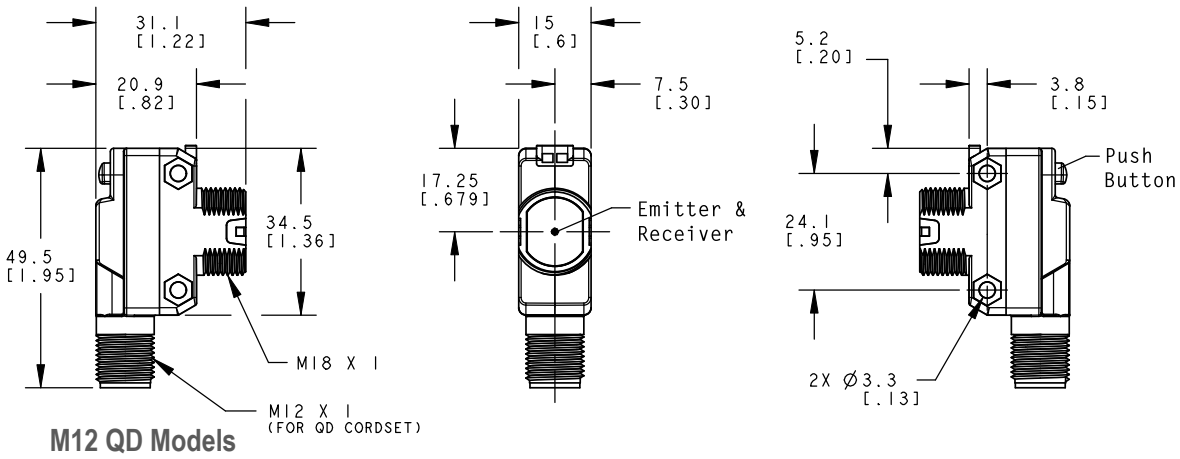
Industry Canada ICES-003(A)

This device complies with CAN ICES-3 (A)/NMB-3(A). Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

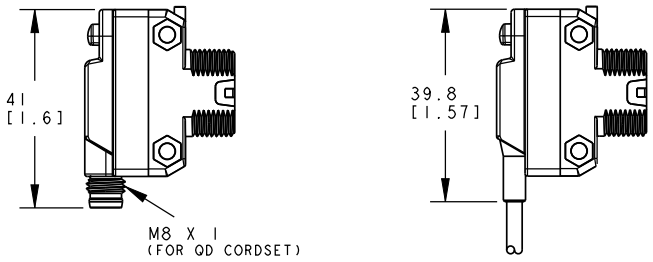
Cet appareil est conforme à la norme NMB-3(A). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

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Dimensions



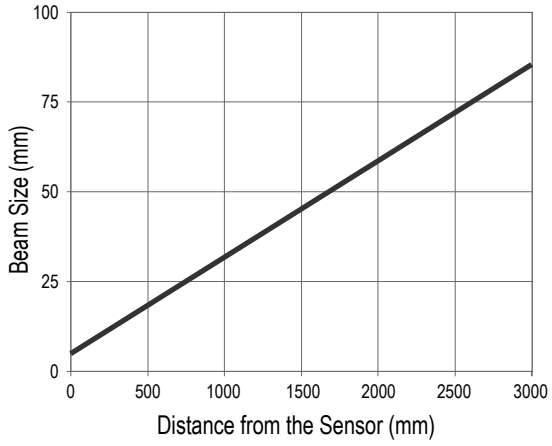
M12 QD Models



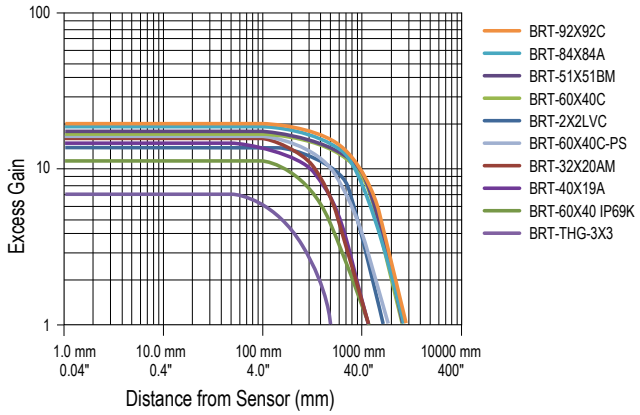
M8 QD Models **Cable Models**

Performance Curves

Spot size vs. distance



Excess gain



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Chapter 2 Installation

Installing and Mounting the Sensor for Low Contrast Applications

Reliable transparent object detection depends on the sensor always detecting the object as "dark state" and the reflector as the "light state". Using a recommended reflector, and proper orientation of the sensor to the reflector, is key to good clear object detection. Optimize the reliable detection of transparent and clear objects by applying the following steps when mounting the sensor and selecting a retroreflective target.

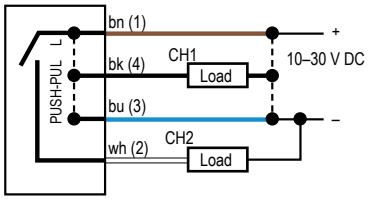
1. If a bracket is needed, mount the sensor onto the bracket.
2. Mount the sensor (or the sensor and the bracket) to the equipment at the desired location. Do not tighten at this time.
3. Align the sensor's light spot to the middle of the retroreflector.
4. Mount the retroreflector perpendicular to the sensor optical axis (± 5°).
5. Tighten the screws to secure the sensor (or the sensor and the bracket) to the aligned position.

Mounting Considerations for Opaque Objects with Mirror-Like Surfaces—To minimize the potential for reflections from mirror-like objects affecting the sensor, it is best to side-mount the sensor.

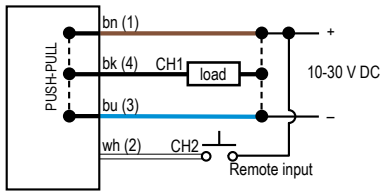
Wiring Diagrams

Follow the wiring diagram that is appropriate for your application.

Channel 1 = IO-Link, Channel 2 = PNP Output (factory default)



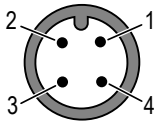
Channel 1 = IO-Link, Channel 2 = PNP Remote Input



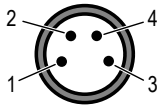
Key

1. Brown
2. White
3. Blue
4. Black

Sensor Pinout M12 Models (Male)



Sensor Pinout M8 Models (Male)

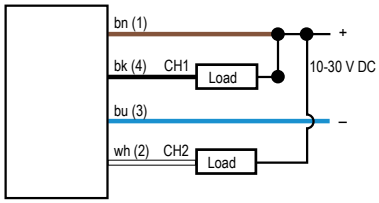


NOTE: NPN/PNP and Remote Input configurations are programmable using IO-Link.

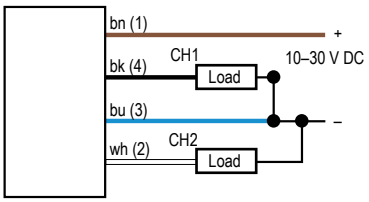
NOTE: Enable the remote input wire function using IO-Link. The default for the remote input wire function is Detection Output.

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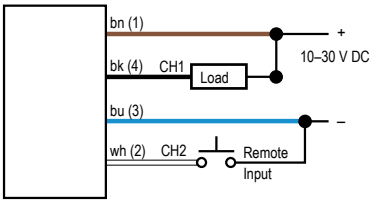
Channel 1 = NPN Output, Channel 2 = NPN Output



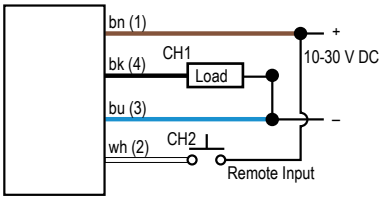
Channel 1 = PNP Output, Channel 2 = PNP Output



Channel 1 = NPN Output, Channel 2 = NPN Remote Input



Channel 1 = PNP Output, Channel 2 = PNP Remote Input



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Chapter 3 Configuration Instructions

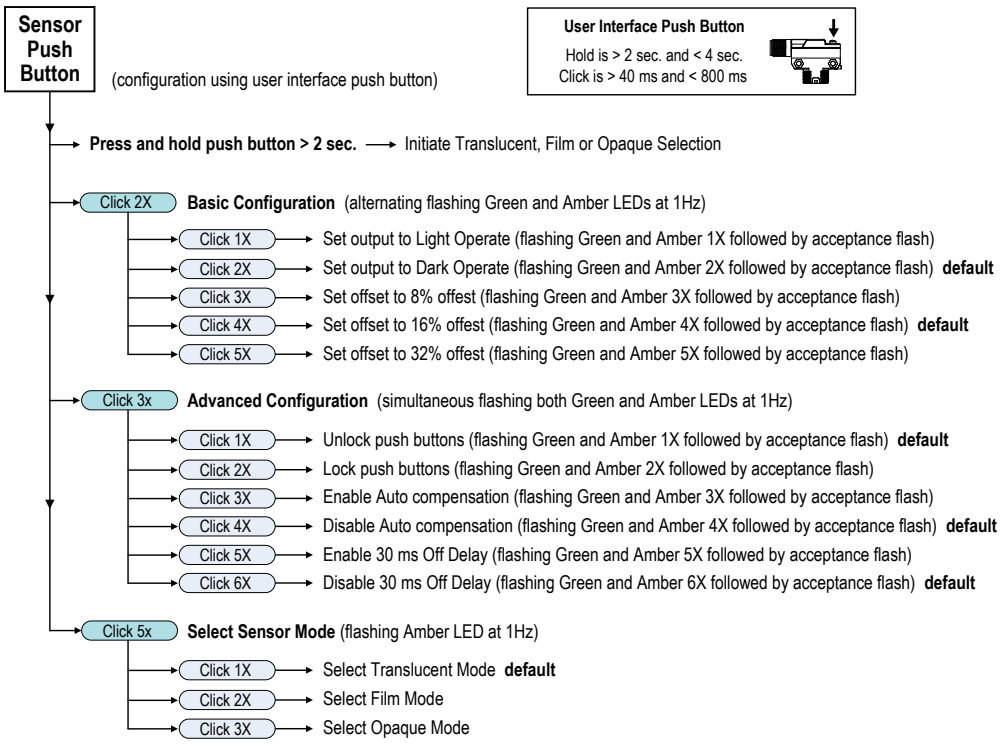
Sensor Configuration

Sensor configuration can be performed using IO-Link, the push button, or the remote input wire once enabled through IO-link. Options include three sensing modes: Transparent, Film, and Opaque. Other configuration options include: output delay timing, health output, offset percentages, and the ClearTracking auto compensation algorithm. For more detail, see the IO-Link IODD package (p/n 198215), which includes an IO-Link Data Map, on the Banner Website at http://www.bannerengineering.com.

Push Button Configuration

Use the push button to configure the sensor. Click the push button according to Push Button Input Flowchart. After a configuration has been selected the sensor flashes both the green and amber LED to show which configuration was selected followed by a rapid flashing of both the green and amber LED in unison to show acknowledgement and acceptance of the configuration.

Push Button Input Flowchart



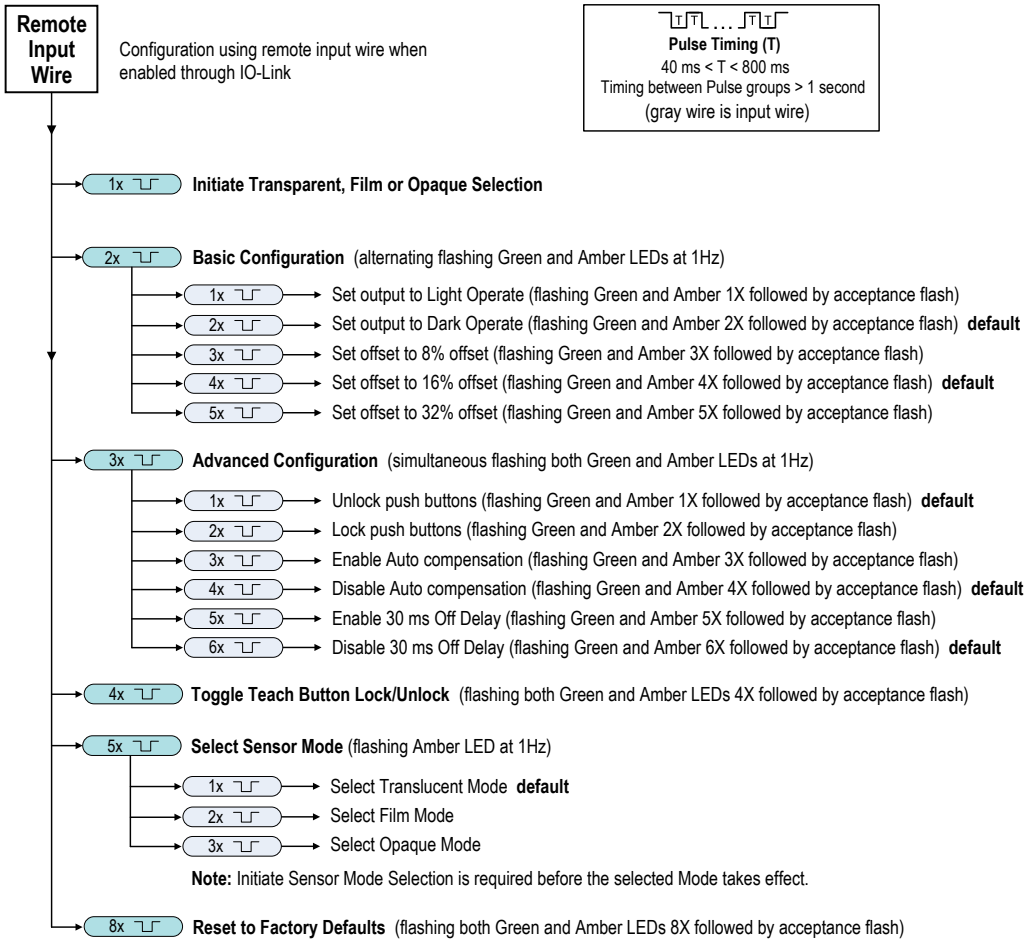
Note: Initiate Sensor Mode Selection is required before the selected Mode takes effect.

Remote Input Configuration

Enabling the remote input wire is done using IO-Link. Use the remote input function to configure the sensor remotely. Connect the white wire of the sensor as shown in the wiring diagram. Pulse the remote line according to the Remote Input Flowchart. After a configuration has been selected, both the green and amber LEDs will flash to show which configuration was selected, followed by a rapid flashing of both the green and amber LED in unison to show acknowledgement and acceptance of the configuration.

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Remote Input Flowchart



Select Sensing Mode

By default, the sensing mode is set to Transparent. To select either Film or Opaque mode, follow these steps.

1. Access the Select Sensing Mode.

Method	Action		Result
Push Button	Click the button 5-times.		Select Sensing Mode enabled (Amber LED flashes at 1 Hz).
Remote Line	Pulse the remote line 5-times.		

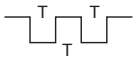
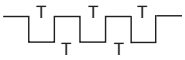
2. Select the desired sensing mode.

Method	Sensing Mode	Action		Result
Push Button	Transparent	Click the button 1-time.		The selected sensing mode is enabled.
	Film	Click the button 2-times.		

Continued on page 11

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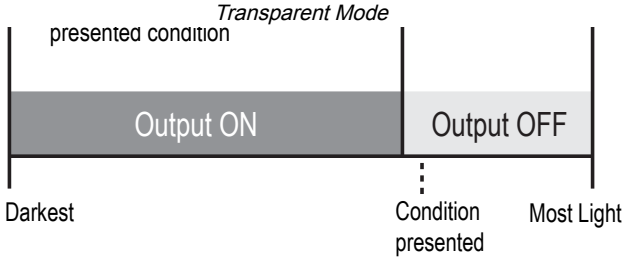
Continued from page 10

Method	Sensing Mode	Action		Result
	Opaque	Click the button 3-times.		
IO-Link	Transparent	Set BDC1 Mode using IO-Link.	IO-Link®	
	Film	Set BDC1 Mode using IO-Link.	IO-Link®	
	Opaque	Set BDC1 Mode using IO-Link.	IO-Link®	
Remote Line	Transparent	Pulse the remote line 1-time.		
	Film	Pulse the remote line 2-times.		
	Opaque	Pulse the remote line 3-times.		

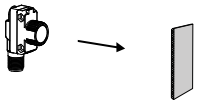
Transparent Mode Set

Use Transparent mode for low contrast applications where the object is not present during the teach process. Transparent mode is the default sensing mode and is best for most clear object detection applications.

Example Applications For Offset Percentages	
8%	Recommended for very low contrast applications with stable environmental conditions.
16%	Recommended for most clear object detection applications in typical machine industrial environments.
32%	Recommended for high contrast detections such as brown or green bottles, or opaque objects. This setting tolerates environmental challenges such as vibrations and dust build-up.



1. Prepare the sensor.

Method	Action	Result
Push Button, IO-Link, and Remote Line	Clear the light path to the reflector.	

2. Access Transparent mode and set the sensing condition.

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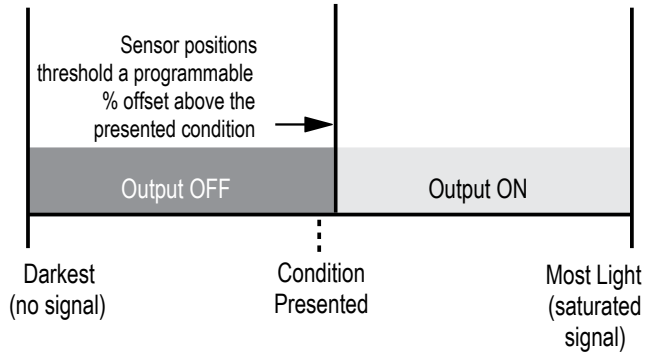
Method	Action		Result
Push Button	Press and hold the button 2 to 4 seconds.		**Transparent Mode Configuration Accepted** **Green LED Indicator:**Flashes 3 times. **Green and Amber LED Indicators:**Acceptance Flash—both LEDs flash 5 times rapidly in unison. The sensor returns to Run mode with Transparent mode as the sensing condition. **Transparent Mode Configuration Not Accepted** If there is not enough return signal the sensor will perform an Opaque mode configuration indicated by: **Green and Amber LED Indicators:**Flash 2 times. **Green and Amber LED Indicators:**Acceptance Flash—both LEDs flash 5 times rapidly in unison and the Green LED will continue to flash. The sensor is not ready for transparent detection due to insufficient light from the reflector, but is ready for maximum range Opaque object detection. Re-optimize alignment, check the reflector size for required range, and re-configure the sensor for transparent object detection.
IO-Link	Send Single Value Teach command using IO-Link.	IO-Link®	
Remote Line	Pulse the remote line 1-time.	T	

Film Mode Set

Film mode is useful when the transparent target cannot be removed from the light path during the teach procedure. This is common on continuous web processes such as shrink wrapping machinery. The sensor learns the dark state with the web present and switches the output if the web breaks or runs out.

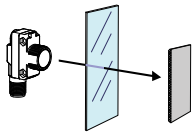
Example Applications For Offset Percentages	
8%	Recommended for very low contrast applications with stable environmental conditions.
16%	Recommended for most clear object detection applications in typical machine industrial environments.
32%	Recommended for high contrast detections such as brown or green bottles, or opaque objects. This setting tolerates environmental challenges such as vibrations and dust build-up.

Film Mode



1. Prepare the sensor.

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Method	Action	Result
Push Button, IO-Link, and Remote Line	Align the light path to the reflector through a plastic film.	

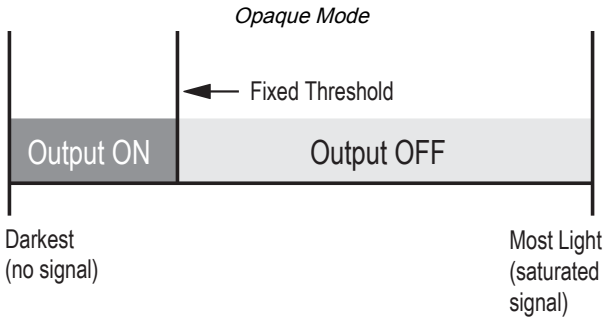
2. Access Film mode and set the sensing condition.

Method	Action		Result
Push Button	Press and hold the button 2 to 4 seconds.		<u>Film Mode Configuration Accepted</u> **Green LED Indicator:**Flashes 3 times. **Green and Amber LED Indicators:**Acceptance Flash - both LEDs flash 5 times rapidly in unison. The sensor returns to Run mode with Film mode as the sensing condition. <u>Film Mode Configuration Not Accepted</u> If there is not enough return signal the sensor will perform an Opaque mode configuration indicated by: **Green and Amber LED Indicators:**Flash 2 times. **Green and Amber LED Indicators:**Acceptance Flash - both LEDs flash 5 times rapidly in unison and the Green LED will continue to flash. The sensor is not ready for film detection due to insufficient light from the reflector, but is ready for maximum range Opaque object detection. Re-optimize alignment, check the reflector size for required range, and re-configure the sensor for film detection.
IO-Link	Send Single Value Teach command using IO-Link.	IO-Link®	
Remote Line	Pulse the remote line 1-time.		

Opaque Mode Set

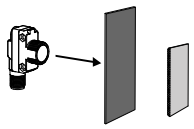
Opaque mode is recommended for long range detection of opaque (light blocking) targets. When Opaque mode is used, the sensor operates at maximum sensing range regardless of the taught condition.

> **NOTE:** The sensor's light spot is made brighter for 60 seconds to assist in aligning the sensor to the reflector. This is particularly useful for long range applications.



1. Prepare the sensor.

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Method	Action	Result
Push Button, IO-Link, and Remote Line	Present either the clear light path or blocked light path. Both are acceptable.	

2. Access Opaque mode and set the sensing condition.

Method	Action		Result
Push Button	Press and hold the button 2 to 4 seconds.		**Opaque Mode Configuration Accepted** **Green LED Indicator:**Flashes 3 times. **Green and Amber LED Indicators:**Acceptance Flash - both LEDs flash 5 times rapidly in unison, and the Green LED is on solid. The sensor returns to Run mode with high excess gain settings.
IO-Link	Send Single Value Teach command using IO-Link.	IO-Link®	
Remote Line	Pulse the remote line 1-time.		

IO-Link Interface

IO-Link® [1]is a point-to-point communication link between a master device and sensor. Use IO-Link to parameterize sensors and transmit process data automatically.

For the latest IO-Link protocol and specifications, see www.io-link.com.

Each IO-Link device has an IODD (IO Device Description) file that contains information about the manufacturer, article number, functionality etc. This information can be easily read and processed by the user. Each device can be unambiguously identified via the IODD as well as via an internal device ID. Download the QS18's IO-Link IODD package (p/n 198215) from Banner Engineering's website at www.bannerengineering.com.

Banner has also developed Add On Instruction (AOI) files to simplify ease-of-use between the QS18, multiple third-party vendors' IO-Link masters, and the Logix Designer software package for Rockwell Automation PLCs. Three types of AOI files for Rockwell Allen-Bradley PLCs are listed below. These files and more information can be found at www.bannerengineering.com.

Process Data AOIs—These files can be used alone, without the need for any other IO-Link AOIs. The job of a Process Data AOI is to intelligently parse out the Process Data word(s) in separate pieces of information. All that is required to make use of this AOI is an EtherNet/IP connection to the IO-Link Master and knowledge of where the Process Data registers are located for each port.

Parameter Data AOIs—These files require the use of an associated IO-Link Master AOI. The job of a Parameter Data AOI, when working in conjunction with the IO-Link Master AOI, is to provide quasi-realtime read/write access to all IO-Link parameter data in the sensor. Each Parameter Data AOI is specific to a given sensor or device.

IO-Link Master AOIs—These files require the use of one or more associated Parameter Data AOIs. The job of an IO-Link Master AOI is to translate the desired IO-Link read/write requests, made by the Parameter Data AOI, into the format a specific IO-Link Master requires. Each IO-Link Master AOI is customized for a given brand of IO-Link Master.

Add and configure the relevant Banner IO-Link Master AOI in your ladder logic program first; then add and configure Banner IO-Link Device AOIs as desired, linking them to the Master AOI as shown in the relevant AOI documentation.

[1] IO-Link® is a registered trademark of PROFIBUS Nutzerorganisation e.V.

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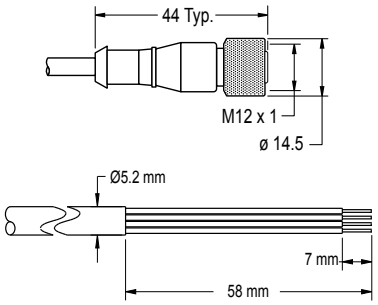
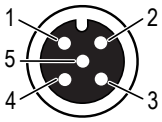
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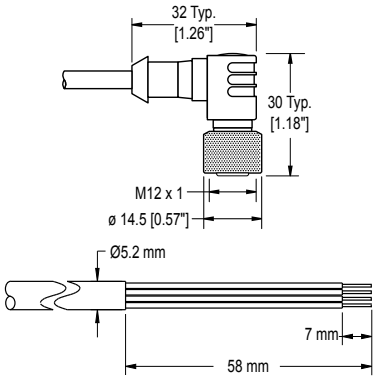
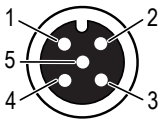
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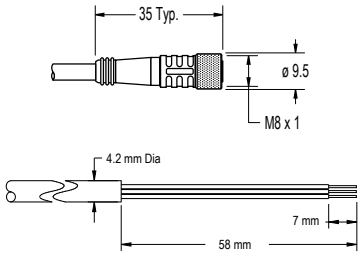
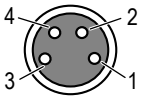
Cordsets

Use the M12 cordsets with the QS18 models with an M12 quick disconnect connector. Use the M8 cordsets with the QS18 models with an M8 QD.

4-pin Single-Ended M12 Female Cordsets (datasheet p/n 235937)				
Model	**Length**	**Dimensions (mm)**	**Pinout (Female)**	
BC-M12F4-22-1	1 m (3.28 ft)			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Unused c UL us LISTED
BC-M12F4-22-2	2 m (6.56 ft)			
BC-M12F4-22-5	5 m (16.4 ft)			
BC-M12F4-22-8	8 m (26.25 ft)			
BC-M12F4-22-10	10 m (30.81 ft)			
BC-M12F4-22-15	15 m (49.2 ft)			
BC-M12F4-22-20	20 m (65.61 ft)			
BC-M12F4-22-25	25 m (82.02 ft)			
BC-M12F4-22-30	30 m (98.42 ft)			

4-pin Single-Ended M12 Female Right-Angle Cordsets (datasheet p/n 235937)				
Model	**Length**	**Dimensions (mm)**	**Pinout (Female)**	
BC-M12F4A-22-1	1 m (3.28 ft)			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Unused c UL us LISTED
BC-M12F4A-22-2	2 m (6.56 ft)			
BC-M12F4A-22-5	5 m (16.4 ft)			
BC-M12F4A-22-8	8 m (26.25 ft)			
BC-M12F4A-22-10	10 m (30.81 ft)			
BC-M12F4A-22-15	15 m (49.2 ft)			

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4-pin Single-Ended M8 Female Cordsets (datasheet p/n 236623)				
Model	**Length**	**Dimensions (mm)**	**Pinout (Female)**	
BC-M8F4-24-0.5	0.5 m (1.64 ft)			1 = Brown 2 = White 3 = Blue 4 = Black
BC-M8F4-24-1	1 m (3.28 ft)			
BC-M8F4-24-2	2 m (6.56 ft)			
BC-M8F4-24-5	5 m (16.4 ft)			
BC-M8F4-24-8	8 m (26.25 ft)			
BC-M8F4-24-10	10 m (30.81 ft)			

Retroreflectors

BRT-51X51BM

- Square, acrylic target
- Reflectivity Factor: 1.5
- Temperature: –20 °C to +50 °C (–4 °F to +122 °F)
- Micro-prism geometry
- Optional brackets are available
- Reflector size: 51 mm × 51 mm
- Approximate size: 51 mm × 61 mm × 6.2 mm
- Two 4.6 mm diameter slots for mounting
- CAD Files: DXF, PDF, IGS, STP



BRT-60X40C and **BRT-60X40CM** (Microprism)

- Rectangular, acrylic target
- Reflectivity Factor: 1.4
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Optional brackets are available
- Approximate size: 40 mm × 60 mm
- **BRT-60X40C** CAD Files: DXF, PDF, IGS, STP
- **BRT-60X40CM** CAD Files: DXF, PDF, IGS, STP



BRT-92X92C

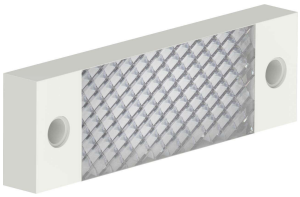
- Square, acrylic target
- Reflectivity Factor: 3.0
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Optional brackets are available
- Reflector size: 92 mm × 92 mm
- Approximate size: 100 mm × 100 mm × 9 mm
- Two 3.5 mm diameter mounting holes
- CAD Files: DXF, PDF, IGS, STP



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BRT-40X19A

- Rectangular, acrylic target
- Reflectivity Factor: 1.3
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Reflector size: 18 mm × 40 mm
- Approximate size: 18 mm × 60 mm × 7.3 mm
- Two 4 mm diameter mounting holes, 50 mm centers
- CAD Files: DXF, PDF, IGS, STP



BRT-60X40IP69K

- Rectangular, acrylic target (color is amber)
- Reflectivity Factor: 0.7
- Temperature: –20 °C to +140 °C (–4 °F to +284 °F)
- Chemically resistant
- IP69K washdown rated
- Optional brackets are available
- Approximate size: 40 mm × 60 mm
- CAD Files: DXF, PDF, IGS, STP



BRT-60X40C-PS

- Rectangular, polystyrene target
- Reflectivity Factor: 1.1
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Optional brackets are available
- Chemically compatible with hydrogen peroxide
- Yellow back
- Approximate size: 40 mm × 60 mm



2-inch retroreflective tape, 2.5 m (100 in)

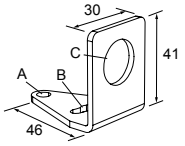
Model	Reflectivity Factor	Maximum Temperature	Size
BRT-THG-2-100	0.7	+60 °C (+140 °F)	50 mm (2 in) wide, 2.5 m (100 in) long

Brackets

SMB18A

- Right-angle mounting bracket with a curved slot for versatile orientation
- 12-ga. stainless steel
- 18 mm sensor mounting hole
- Clearance for M4 (#8) hardware
- CAD Files: DXF, PDF, IGS, STP

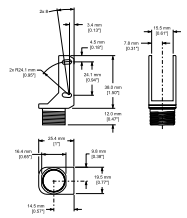
Hole center spacing: A to B = 24.2
Hole size: A = ø 4.6, B = 17.0 × 4.6, C = ø 18.5



SMBQS18Y

- Die-cast bracket for 18 mm holes
- Includes metal hex nut and lock washer
- Allows ± 8° for cabled sensors
- CAD Files: DXF, PDF, IGS, STP

Hole size: A = ø 15.3



Continued on page 18

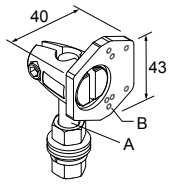
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SMBQ4X..

- Swivel bracket with tilt and pan movement for precision adjustment
- Easy sensor mounting to extruded rail T-slots
- Metric and inch size bolts are available
- Side mounting of some sensors with the 3 mm screws included with the sensor
- SMBQ4XFA CAD Files: DXF, PDF, IGS, STP
- SMBQ4XFAM10 CAD Files: DXF, PDF, IGS, STP

B = 7 × M3 × 0.5
Bolt thread (A): 3/8 - 16 × 2¼ in for SMBQ4XFA; M10 - 1.5 × 50 for SMBQ4XFAM10; n/a; no bolt included. Mounts directly to 12 mm (½ in) rods for SMBQ4XFMA1



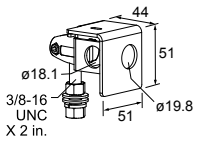
SMB18AFA..

- Protective, swivel bracket with tilt and pan movement for precision adjustment
- Easy sensor mounting to extruded rail T-slots
- Metric and inch size bolts available
- Mounting hole for 18 mm sensors

Hole size: B = ø 18.1

Bolt Thread (A):

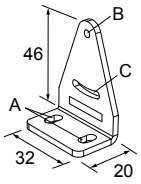
SMB18AFA = 3/8 - 16 × 2 in
CAD Files: DXF, PDF, IGS, STP
SMB18AFAM10 = M10 - 1.5 × 50
CAD Files: IGS, STP



SMB312S

- Stainless steel 2-axis, side-mount bracket
- CAD Files: DXF, PDF, IGS, STP

A = 4.3 × 7.5, B = diam. 3, C = 3 × 15.3



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Chapter 5 Product Support and Maintenance

Repairs and Translations (No Field-Replaceable Parts)

English

Contact Banner Engineering for troubleshooting of this device. **Do not attempt any repairs to this Banner device; it contains no field-replaceable parts or components.** If the device, device part, or device component is determined to be defective by a Banner Applications Engineer, they will advise you of Banner's RMA (Return Merchandise Authorization) procedure.

```
IMPORTANT: If instructed to return the device, pack it with care. Damage that occurs in return
shipping is not covered by warranty.
```

Obtain assistance with product repairs by contacting your local Banner Engineering Corp distributor or by calling Banner directly at (763) 544-3164. Access literature translated into your native language on the Banner website at www.bannerengineering.com or contact Banner directly at (763) 544-3164.

Deutsch

Wenden Sie sich zur Fehlerbehebung dieses Geräts an Banner Engineering. **Versuchen Sie nicht, Reparaturen an diesem Banner-Gerät vorzunehmen. Das Gerät enthält keine am Einsatzort auszuwechselnden Teile oder Komponenten.** Wenn ein Banner-Anwendungstechniker zu dem Schluss kommt, dass dieses Gerät, ein Teil oder eine Komponente davon defekt ist, erhalten Sie von dem Techniker Erläuterungen zu Banners RMA-Verfahren (Return Merchandise Authorization) für die Warenrückgabe.

```
WICHTIG: Wenn Sie der Techniker anweist, das Gerät zurückzusenden, verpacken Sie es bitte
sorgfältig. Transportschäden bei der Rücksendung werden von der Garantie nicht abgedeckt.
```

Unterstützung bei Produktreparaturen erhalten Sie von Ihrem örtlichen Banner Engineering Corp Händler oder direkt von Banner unter Tel. (763) 544-3164. Die in Ihre Muttersprache übersetzte Literatur finden Sie auf der Banner-Website unter www.bannerengineering.com oder kontaktieren Sie Banner direkt unter Tel. (763) 544-3164.

Français

Pour plus d'informations sur le dépannage du produit, contactez Banner Engineering. **Ne tentez pas de réparer ce dispositif Banner. Il ne contient aucun composant ou pièce qui puisse être remplacé sur place.** Si un ingénieur de Banner conclut que le dispositif ou l'une de ses pièces ou composants est défectueux, il vous informera de la procédure à suivre pour le retour des produits (RMA).

```
Important : Si vous devez retourner le dispositif, emballez-le avec soin. Les dégâts
occasionnés pendant le transport de retour ne sont pas couverts par la garantie.
```

Pour vous aider lors de la réparation de produits, contactez votre distributeur Banner local our appelez directement Banner au (763) 544-3164. La documentation traduite dans votre langue est disponible sur le site internet de Banner www.bannerengineering.com ou contactez directement Banner au (763) 544-3164.

Italiano

Per le procedure di individuazione e riparazione dei guasti di questo dispositivo, contattare Banner Engineering. **Non tentare di riparare questo dispositivo Banner, in quanto non contiene parti o componenti sostituibili dall'utente.** Se il dispositivo, una parte del dispositivo o un componente del dispositivo viene riscontrato difettoso da un tecnico Banner, il nostro personale vi comunicherà la procedura da seguire per ottenere l'autorizzazione al reso.

```
Importante: Se si ricevono istruzioni di rispedire il dispositivo al produttore, imballarlo con
cura. I danni dovuti al trasporto non sono coperti dalla garanzia.
```

Per assistenza nelle riparazioni dei prodotti, contattare il distributore locale Banner Engineering Corp o contattare direttamente Banner al numero (763) 544-3164. È possibile accedere alla documentazione tradotta nella propria lingua madre sul sito Web Banner all'indirizzo www.bannerengineering.com o contattare direttamente Banner al numero (763) 544-3164.

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Español

Comuníquese con Banner Engineering para solucionar de problemas de este dispositivo. **No intente ninguna reparación a este dispositivo de Banner, contiene piezas o componente que no se pueden cambiar en terreno.** Si algún ingeniero de aplicaciones de Banner determina que el dispositivo, alguna de las piezas o alguno de los componentes del dispositivo está defectuoso, le informará el procedimiento de autorización de devolución de mercancía (RMA, por sus siglas en inglés) de Banner.

Importante: Si se le solicita devolver el dispositivo, empáquelo con cuidado. Puede haber daños durante el envío de devolución que no estén cubiertos por la garantía.

Para reparaciones de productos, por favor contacte a su distribuidor local de Banner Engineering o llame a Banner directamente al 00 1 (763) 544-3164. Vea la literatura traducida en su idioma en el sitio web Banner en www.bannerengineering.com o comuníquese con Banner directamente al 00 1 (763) 544-3164.

中国人

如需对本装置进行故障排查，请联系邦纳。**请勿尝试自行维修该邦纳装置；本装置不包含任何可在现场更换的部件或组件。** 若经邦纳应用工程师确认设备、设备部件或组件存在缺陷，他们将告知您邦纳退货授权 (RMA) 流程。

重要注意事项： 如被要求退回装置，请妥善包装后寄回。退货运输过程中发生的损坏不在保修范围内。

请联系当地的 Banner Engineering Corp 经销商或直接致电 Banner +1 (763) 544-3164，以获得产品维修帮助。请访问邦纳网站 www.bannerengineering.com 或直接拨打 +1 (763) 544-3164 联系邦纳，获取翻译成您母语的资料。

한국인

이 장치의 문제를 해결하려면 Banner Engineering에 문의하십시오. **이 Banner 장치에는 현장에서 교체할 수 있는 부품 또는 구성품이 없으므로 수리를 시도하지 마십시오.** Banner 애플리케이션 엔지니어가 장치, 장치 부품 또는 장치 구성품에 결함이 있는 것으로 판정하면, Banner의 RMA(제품 반송 승인)절차에 대해 안내해 드립니다.

중요: 제품을 반송하도록 안내 받으셨다면 잘 포장해주십시오. 반송 도중에 발생한 손상은 보증 서비스가 적용되지 않습니다.

제품 수리에 대한 지원은 지역 Banner Engineering Corp 대리점에 문의하거나 Banner에 직접 (763) 544-3164로 문의하실 수 있습니다. 사용자의 모국어로 번역된 자료는 Banner 웹사이트 www.bannerengineering.com에서 액세스하거나 Banner에 직접 (763) 544-3164로 문의하실 수 있습니다.

日本語

この装置のトラブルシューティングについては、バナーエンジニアリングにお問い合わせください。**このバナー装置には、現場では交換できない部品またはコンポーネントが含まれているため、修理を試みてはいけません。** バナーのアプリケーションエンジニアが装置、装置の部品、または装置のコンポーネントに欠陥があると判断した場合、バナーのRMA（返品承認）手続きについてお知らせします。

重要 ： 返品を指示された場合は、装置を丁寧に梱包してください。返品時に発生した破損は保証の対象外となります。

製品の修理については、最寄りのBanner Engineering Corp代理店にお問い合わせいただくか、米国+1 (763) 544-3164まで直接お電話でお問い合わせください。バナーのウェブサイト（www.bannerengineering.com）でお客様の言語に翻訳された資料にアクセスするか、米国+1 (763) 544-3164まで直接お電話でお問い合わせください。

čeština

Pro řešení problémů se zařízením kontaktujte společnost Banner Engineering. **Neprovádějte žádné opravy zařízení Banner. Neobsahují žádné komponenty nebo části, které by byly vyměnitelné.** Pokud je zařízení, jeho část nebo díl označen technikem společnosti Banner jako poškozený, bude Vám doporučeno vyplnit reklamační RMA protokol.

Důležité: Pokud byl vydán požadavek na vrácení zařízení, pečlivě ho zabalte. Poškození vzniklé při dopravě není považováno za záruční opravu.

Pokud produkt potřebuje opravu, vyžádejte si pomoc od místního distributora společnosti Banner Engineering Corp nebo přímo na telefonním čísle (763) 544-3164. Dokumentaci přeloženou do vašeho jazyka si vyhledejte na webových stránkách společnosti Banner na adrese www.bannerengineering.com nebo se obraťte přímo na společnost Banner na telefonním čísle (763) 544-3164.

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Polski

W celu rozwiązania problemów z urządzeniem należy skontaktować się z działem technicznym firmy Banner Engineering. **Pod żadnym pozorem nie próbuj naprawiać tego urządzenia firmy Banner; nie zawiera ono części ani elementów, które można wymieniać samodzielnie.** Jeśli urządzenie, jego część lub element zostaną uznane za wadliwe przez inżyniera technicznego Banner, poinformuje on użytkownika o firmowej procedurze zwrotu towaru (RMA) firmy Banner.

```
Ważne: Jeśli urządzenie ma zostać zwrócone, należy je starannie zapakować. Uszkodzenia powstałe
podczas odsyłki nie są objęte gwarancją.
```

Aby uzyskać pomoc w zakresie naprawy produktu, należy skontaktować się z lokalnym dystrybutorem Banner Engineering Corp lub zadzwonić bezpośrednio do firmy Banner pod numer (763) 544-3164. Dostęp do literatury przetłumaczonej na swój język ojczysty można uzyskać na stronie internetowej firmy Banner pod adresem www.bannerengineering.com lub kontaktując się bezpośrednio z firmą Banner pod numerem (763) 544-3164.

Português

Entre em contato com a Engenharia da Banner para a solução de problemas deste dispositivo. **Não tente fazer nenhum reparo neste dispositivo Banner; ele não contém peças ou componentes substituíveis em campo.** Se um técnico de aplicações da Banner determinar que o dispositivo, peça ou componente do dispositivo está com defeito, ele o informará sobre o procedimento de RMA (Autorização de Devolução de Mercadoria) da Banner.

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