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# MINI-BEAM SME312 Expert Series

Original Instructions
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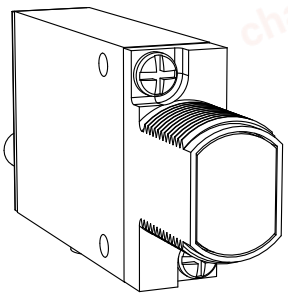


Chapter Contents

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# Chapter 1 Features

Microprocessor-based TEACH mode photoelectric sensors



U.S. patent(s) issued or pending

- TEACH-mode sensors in the popular MINI-BEAM package
- Easy push-button programming automatically adjusts sensitivity to optimal setting
- Multiple sensing modes include retroreflective, polarized retro, clear object detection, diffuse, divergent, and convergent, plus glass and plastic fiber optic models
- Fast, 500 microsecond (0.5 millisecond) output response
- Bipolar NPN (sinking)/PNP (sourcing) outputs
- Easy output programming eliminates the need for Light or Dark Operate selection
- Separate TEACH input allows remote programming by an external device, such as a switch or process controller
- LED status indications for received signal strength (using Banner's AID™ function), power ON, and output state
- Green Stability indicator flashes when received signal level approaches the switching threshold, also indicates Power ON
- Integral 2 m (6.5 ft) cable or 5-pin M12 quick-disconnect (QD) connector, depending on model; 9 m (30 ft) cable models are also available

**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

Standard 2 m (6.5 ft) cable models are listed. To order the 9 m (30 ft) cable model, add suffix “W/30” to the model number (for example, SME312LV W/30.) To order the 5-pin M12 QD models, add suffix “QD” (for example, SME312LVQD). Models with a QD connector require a mating cable.

*Retroreflective mode models*

| Model | Sensing Mode | Range or Focus[1] | Connection |
|---|---|---|---|
| SME312LVQD | Retroreflective, Visible red, 650 nm | 5 m (15 ft) | 5-pin M12 quick disconnect (QD) |
| SME312LP | Polarized retroreflective, Visible red, 650 nm | 10 mm to 3 m (0.4 in to 10 ft) | 2 m (6.5 ft) cable |
| SME312LP W/30 | | | 9 m cable |
| SME312LPQD | | | 5-pin M12 QD |
| SME312LPC | Polarized retroreflective, Visible red, 650 nm (clear object) | 1 m (3.3 ft) with supplied reflector | 2 m (6.5 ft) cable |

Continued on page 4

[1] Sensing ranges vary according to the efficiency and reflective area of the retroreflector(s) used. (Retroreflective tape is not recommended for use with Clear Object Detection models.) See *Accessories* and the Banner Engineering catalog for more information.


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Continued from page 3

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312LPC W/30 | | | 9 m cable |
| SME312LPCQD | | | 5-pin M12 QD |

*Diffuse mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312D | Diffuse, Infrared, 880 nm | 380 mm (15 in) | 2 m (6.5 ft) cable |
| SME312D W/30 | | | 9 m cable |
| SME312DQD | | | 5-pin M12 QD |
| SME312DV | Diffuse, Visible red, 650 nm | 1100 mm (43 in) | 2 m (6.5 ft) cable |
| SME312DVQD | | | 5-pin M12 QD |
| SME312W | Divergent Diffuse, Infrared, 880 nm | 130 mm (5 in) | 2 m (6.5 ft) cable |
| SME312WQD | | | 5-pin M12 QD |

*Convergent mode models*

| Model | Sensing Mode | Range or Focus | Spot Size at Focus | Connection |
|---|---|---|---|---|
| SME312CV | Convergent, Visible red, 650 nm | 16 mm (0.65 in) | 1.3 mm (0.05 in) | 2 m (6.5 ft) cable |
| SME312CVQD | | | | 5-pin M12 QD |
| SME312CV2 | Convergent, Visible red, 650 nm | 43 mm (1.7 in) | 3.0 mm (0.12 in) | 2 m (6.5 ft) cable |
| SME312CV2QD | | | | 5-pin M12 QD |
| SME312CVGQD | Convergent, Visible green, 525 nm | 16 mm (0.65 in) | 1.0 mm (0.04 in) | 5-pin M12 QD |
| SME312CVB | Convergent, Visible blue, 475 nm | 16 mm (0.65 in) | 1.8 mm (0.07 in) | 2 m (6.5 ft) cable |
| SME312CVBQD | | | | 5-pin M12 QD |
| SME312CVW | Convergent, Visible white, 450–650 nm | | | 2 m (6.5 ft) cable |
| SME312CVWQD | | | | 5-pin M12 QD |

*Glass fiber-optic mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312F | Glass Fiber Optic, 880 nm infrared | Range varies by sensing mode and fiber optics used | 2 m (6.5 ft) cable |
| SME312FQD | | | 5-pin M12 QD |
| SME312FV | Glass Fiber Optic, Visible red, 650 nm | | 2 m (6.5 ft) cable |
| SME312FVQD | | | |
| SME312FVG | Glass Fiber Optic, Visible green, 525 nm | | 2 m (6.5 ft) cable |
| SME312FVGQD | | | 5-pin M12 QD |
| SME312FVBQD | Glass Fiber Optic, Visible blue, 475 nm | | 5-pin M12 QD |
| SME312FVW | Glass Fiber Optic, Visible white, 450–650 nm | | 2 m (6.5 ft) cable |
| SME312FVWQD | | | 5-pin M12 QD |

*Plastic fiber-optic mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312FP | Plastic Fiber Optic, Visible red, 650 nm | Range varies by sensing mode and fiber optics used | 2 m (6.5 ft) cable |

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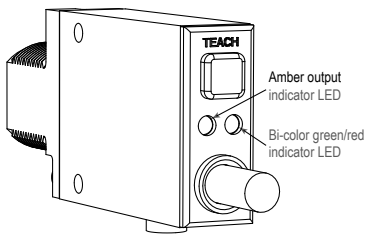
Continued from page 4

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312FP W/30 | Plastic Fiber Optic, Visible blue, 475 nm | | 9 m cable |
| SME312FPQD | | | 5-pin M12 QD |
| SME312FPB | | | 2 m (6.5 ft) cable |
| SME312FPBQD | | | 5-pin M12 QD |
| SME312FPWQD | Plastic Fiber Optic, Visible white, 450–650 nm | | 5-pin M12 QD |

For a list of discontinued models, see Discontinued Models.

# Overview

MINI-BEAM® Expert™ is a complete family of sensors, all housed in the popular, robust and compact rectangular housing. Their large push button and easy-to-see indicators provide easy configuration, alignment, and monitoring during use.




**Retroreflective and Polarized Retroreflective Mode** models are excellent for sensing relatively small items where opposed-mode sensing is not possible. They are recommended for relatively clean environments where high excess gain is not required. Polarized models filter out unwanted reflections.

**Polarized Retroreflective Mode – Clear Object Detection** models reliably detect the presence of clear objects.

**Diffuse Mode** models are excellent for sensing objects of adequate size and reflectivity at short range. Divergent models are useful for sensing small items and translucent or transparent materials at close range. The SME312DV sensors effectively sense specular surfaces like semi-conductor wafers, disk drive media, glass and machined surfaces. The collimated optics of the SME312DV also permits the sensor to be mounted against clear container walls, view ports and other types of optical “feed-throughs.”

**Convergent Mode** models are a good choice for counting adjacent radiused objects and for accurate position sensing. Blue, green and white beam models are recommended for color mark sensing.

**Glass Fiber Optic** models are an excellent option for sensing in tight or otherwise inaccessible areas. Fibers withstand vibration and shock and are immune to electrical noise. Glass fibers withstand high temperatures, extreme moisture and corrosive materials. Glass fibers are not recommended for applications requiring bending or repeated flexing (see plastic fiber models). Visible beam models are recommended for color mark sensing.

**Plastic Fiber Optic** models are an excellent option for sensing in tight or otherwise inaccessible areas. Fibers withstand vibration and shock and are immune to electrical noise. Plastic fibers function well at temperatures from –30° to +70° C (–20° F to +158° F), and stand up to repeated flexing. Most are easy to shorten in the field, for custom installations. Plastic fibers are not recommended for severe environments (see glass fiber models). Plastic fiber optic sensors are recommended for color mark sensing.

## Status Indicators

Normal sensor operation is called RUN mode. Sensor configuration (setting the sensitivity threshold and selecting output ON and OFF conditions) is performed in TEACH mode. The two LED indicators (bi-color green/red and amber) have distinct roles in the two operation modes. If contrast is marginal, the bi-color indicator will flash green to indicate instability. If this occurs, reconfigure or realign the sensor, or clean the sensor or fiber lenses.

The Signal Strength indicator is Banner’s exclusive AID™ (Alignment Indicating Device). Its pulse rate increases as the received light signal strength increases (during programming). This feature simplifies accurate alignment during TEACH mode, and gives a relative indication of sensing contrast between the light and dark conditions.

| LED | RUN Mode | TEACH Mode |
|---|---|---|
| Solid green | Power is on | |

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Continued from page 5

| LED | RUN Mode | TEACH Mode |
|---|---|---|
| Flashing green | Sensed light level is approaching sensing threshold[2] | |
| Solid red | | Sensor “sees” its own modulated light source; pulse rate is proportional to the received light signal strength[3] |
| Amber on | Outputs conducting | Ready to TEACH output ON condition |
| Amber off | Outputs not conducting | Ready to TEACH output OFF condition |

## Remote Configuration

The remote function can be used to configure the sensor remotely or to disable the push button for security. Connect the gray wire of the sensor to ground (0 V DC), with a remote programming switch connected between them. Pulse the remote line according to the diagrams in the configuration procedures. The length of the individual programming pulses is equal to the value T where: 0.04 seconds ≤ “T” ≤ 0.8 seconds

# Specifications

**Supply Voltage and Current**
10 V DC to 30 V DC (10% maximum ripple) at less than 45 mA, exclusive of load

**Supply Protection Circuitry**
Protected against reverse polarity and transient voltages

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

**Output Response Time**
Sensors will respond to either a “light” or a “dark” signal of 500 microseconds or longer duration, 1 kHz maximum

One second delay on power-up; outputs do not conduct during this time

**Adjustments**
Push-button TEACH mode sensitivity setting; remote TEACH mode input is provided

**Indicators**
Two LEDs: amber and bi-color green/red

**Repeatability**
100 microseconds (all models)

**Construction**
Reinforced thermoplastic polyester housing, totally encapsulated, oring seal, acrylic lenses, and stainless steel screws.

**Connections**
PVC-jacketed 5-conductor 2 m (6.5 ft) or 9 m (30 ft) unterminated cable, or 5-pin M12 quick-disconnect (QD) fitting, depending on the model. QD cables are ordered separately.

**Application Notes**
The first condition presented during TEACH mode becomes the output ON condition.

**Output Configuration**
Bipolar: One current sourcing (PNP) and one current sinking (NPN) open-collector transistor

**Output Rating**
150 mA maximum each output at 25° C, derated to 100 mA at 70° C (derate ≈1 mA per °C)

Off-state leakage current: less than 5 µA at 30 V DC

ON-state saturation current: less than 1 V at 10 mA; less than 1.5 V at 150 mA

**Environmental Rating**
IP67

**Operating Conditions**
–20 °C to +70 °C (–4 °F to +158 °F)

90% at +50 °C maximum relative humidity (non-condensing)

**Certifications**

**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 |

[2] This is the Stability indicator, which signals when maintenance, realignment, or reconfiguration is needed during RUN mode.
[3] The faster the pulse rate, the stronger the light signal.

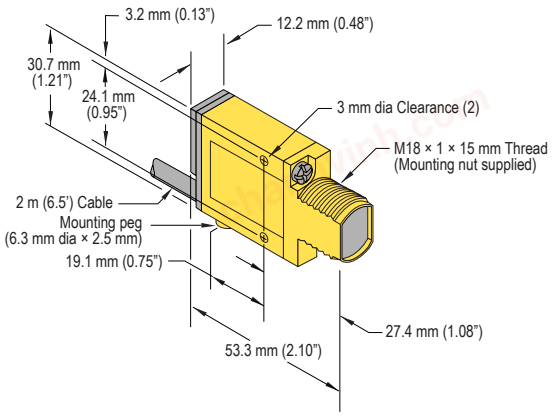

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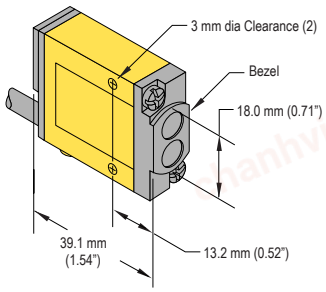


# Dimensions

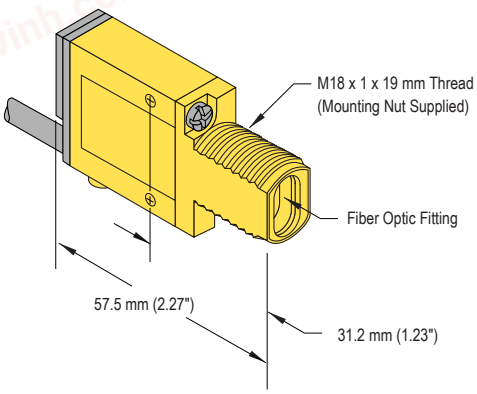
### Cabled Models
(Suffix E, EL, EPD, R, RL, RPD, LV, LVAG, LP, LPC, D, C, C2, CV, CV2, CVG, CV2G, CVB, CV2B, CVW)



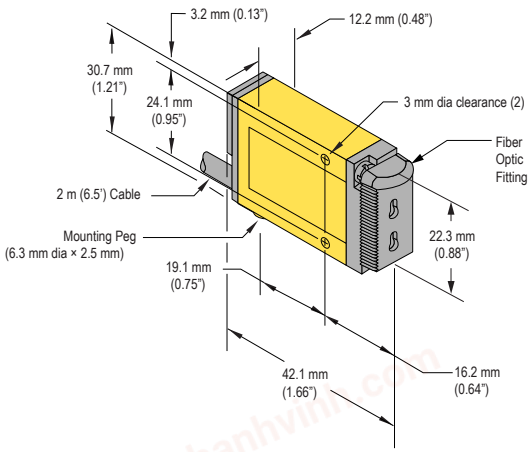

### Divergent Diffuse Models
(Suffix DBZ and W)



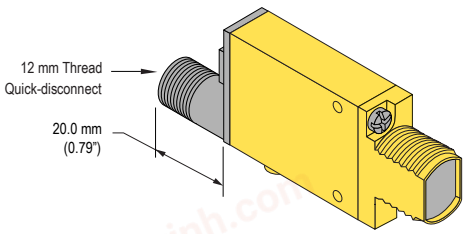

### Glass Fiber Models
(Suffix F, FV, FVB, FVG, FVW)




### Plastic Fiber Models
(Suffix FP, FPB, FPG, FPH, FPW)




### QD Models





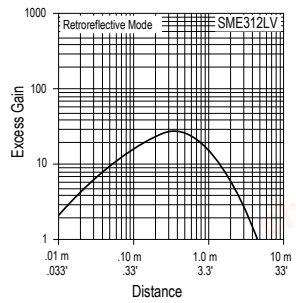
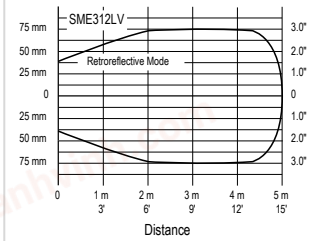
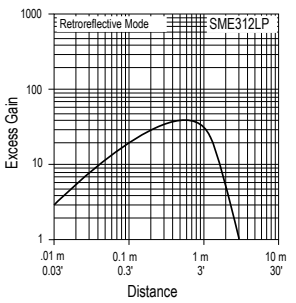
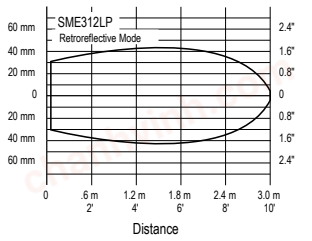
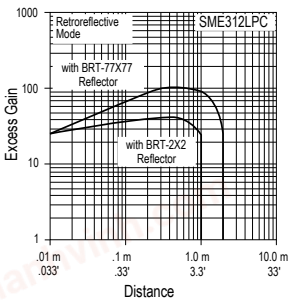
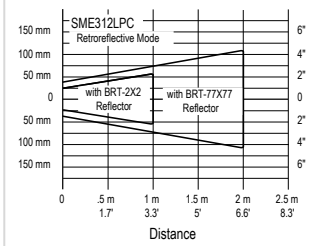
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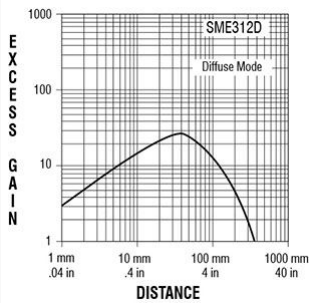
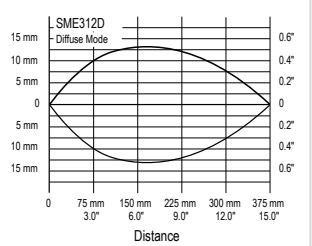
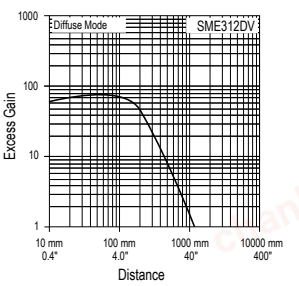
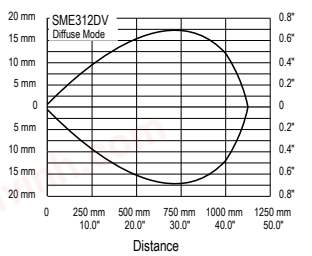
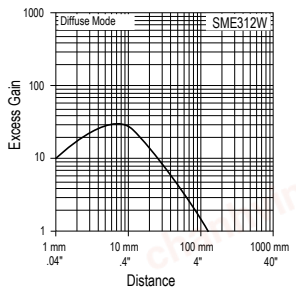
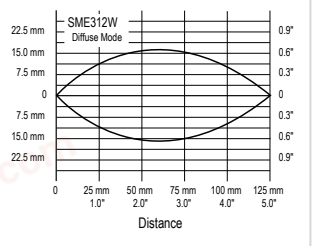


# Performance Curves

*Retroreflective mode sensors*

| Excess Gain | Beam Pattern | Excess Gain | Beam Pattern |
|---|---|---|---|
|  |  |  |  |
|  |  | | |

*Diffuse mode sensors*

| Excess Gain | Beam Pattern | Excess Gain | Beam Pattern |
|---|---|---|---|
|  |  |  |  |
|  |  | | |

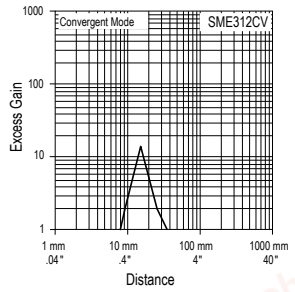
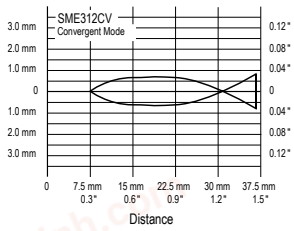
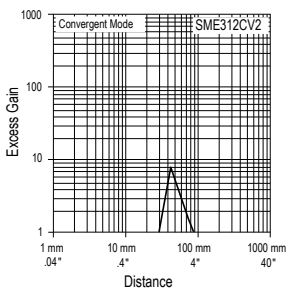
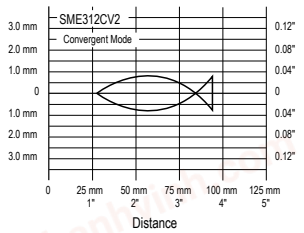
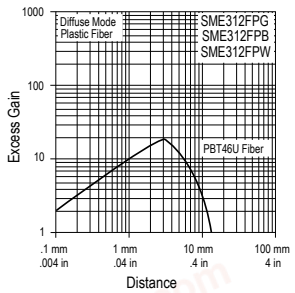
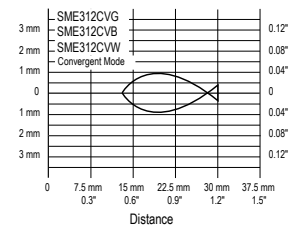
Diffuse-mode performance based on 90% reflectance white test card.


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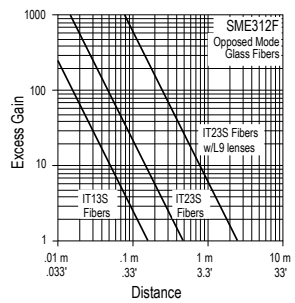
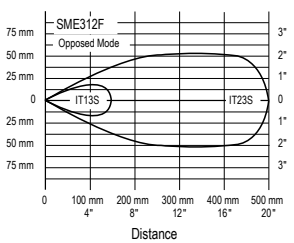
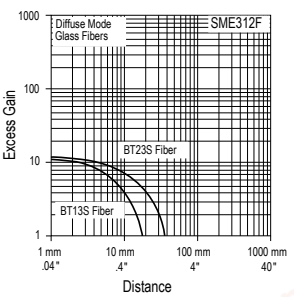
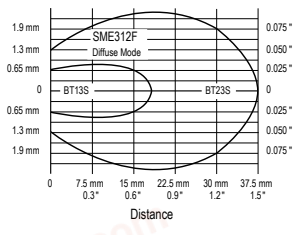
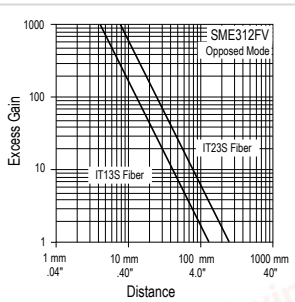
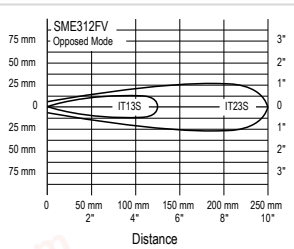
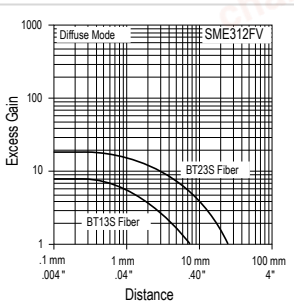
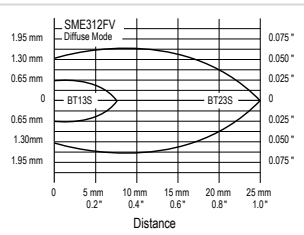
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*Convergent mode sensors*

| Excess Gain | Beam Pattern | Excess Gain | Beam Pattern |
|---|---|---|---|
|  |  |  |  |
|  |  | | |

*Glass fiber-optic mode sensors*

| Excess Gain | Beam Pattern | Excess Gain | Beam Pattern |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

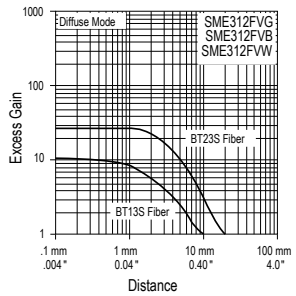
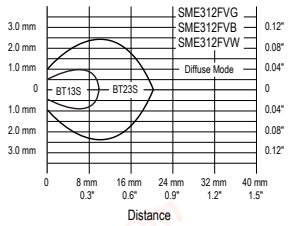
Continued on page 10


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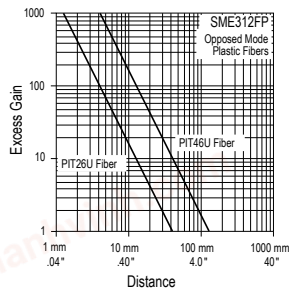
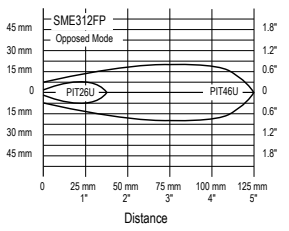
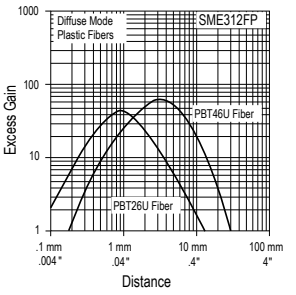
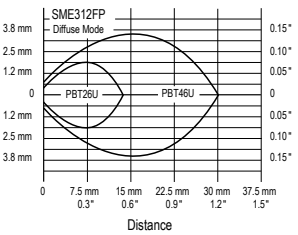
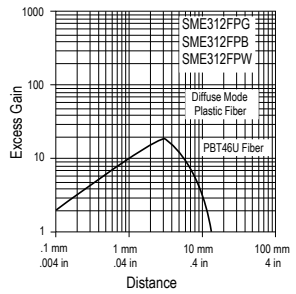
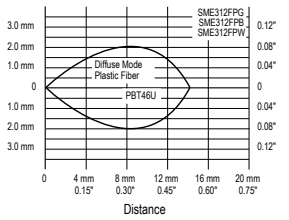


Continued from page 9

| Excess Gain | Beam Pattern | Excess Gain | Beam Pattern |
|---|---|---|---|
|  |  | | |



*Plastic fiber-optic mode sensors*

| Excess Gain | Beam Pattern | Excess Gain | Beam Pattern |
|---|---|---|---|
|  |  |  |  |
|  |  | | |




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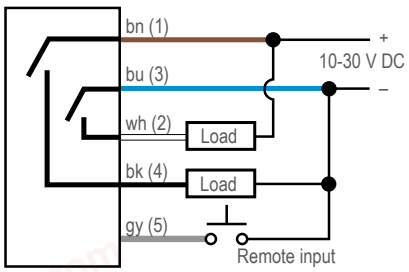


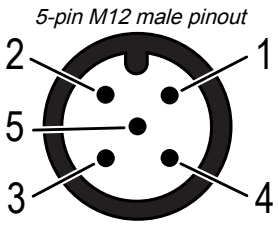
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Wiring ..... 11
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# Chapter 2 Installation

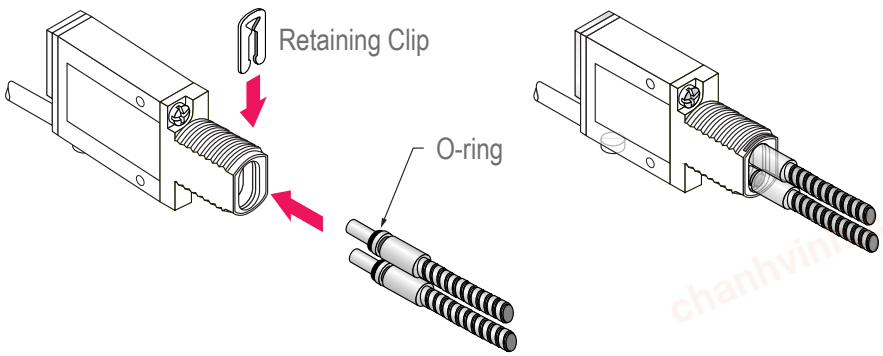
## Wiring




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

## Installing the Glass Fibers in MINI-BEAMs




1. Install the O-ring (supplied with the fiber) on each fiber end, as shown in the drawing.
2. While pressing the fiber ends firmly into the ports on the sensor front, slide the U-shaped retaining clip (supplied with the sensor) into the slot in the sensor's barrel, until it snaps into place.


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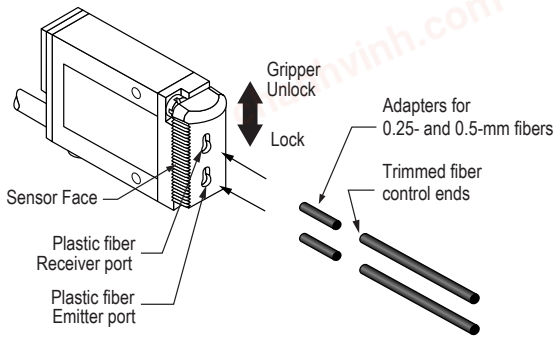
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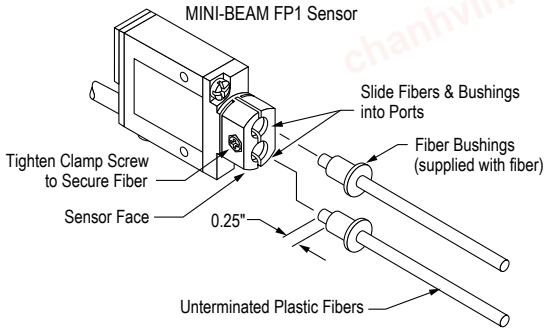
# Installing Plastic Fibers on a MINI-BEAM

Follow these instructions to install plastic fibers into your sensor. MINI-BEAMS may have either a fiber gripper or a clamp screw. **MINI-BEAM** and **ECONO-BEAM** sensors for use with plastic fiber optic assemblies include sensors with the letters **FP** in their model number.

*MINI-BEAM with fiber grippers*




*MINI-BEAM with clamp screws*




1. Prepare the sensor ends of the fibers (see Cut the Plastic Fiber).
2. Prepare the sensor for the fibers.
   - For models with a fiber gripper: Unlock the fiber gripper as shown in the figure and apply the appropriate fiber adaptors to the fiber, if needed.
   - For models with a clamp screw: Loosen the clamp screw on the sensor face.
3. Insert the plastic fibers.
   - For models with a fiber gripper: Gently insert the prepared fiber ends into the ports as far as they will go.
   - For models with a clamp screw: Align the fiber ends flush with the ends of the bushings as shown. Hold the bushings to the fibers and slide both into the sensor ports. Push the fiber an additional 1 inch through the bushing.
4. Lock in the fibers.
   - For models with a fiber gripper: Slide the fiber gripper back to lock, as shown in the figure.
   - For models with a clamp screw: Tighten the clamp screw to secure the fibers.


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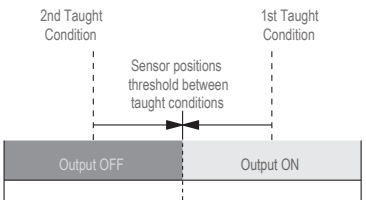


Chapter Contents

Configure Static TEACH Mode ..... 13
Enable or Disable the Push Button ..... 14

# Chapter 3 Configuration Instructions

## Configure Static TEACH Mode




The two sensing conditions may be presented in either order. The condition presented first is the condition for which the output will energize (the “Output ON” target).

Sensitivity is automatically set (and optimized) when teaching the sensor the ON and OFF conditions. When the push button is clicked, the sensor samples each sensing condition and registers it into memory. After the second sensing condition is registered, the MINI-BEAM Expert automatically sets the sensitivity to the optimum value for the application, and then returns to RUN mode.

Push button (0.04 seconds ≤ “Click” ≤ 0.8 seconds); Remote line (0.04 seconds ≤ “T” ≤ 0.8 seconds)

1. Access TEACH mode.

| Method | Action | Result |
|---|---|---|
| Push button | Press and hold the push button until the bi-color (green/red) indicator begins to flash red, or turns OFF. | The amber LED is on. The red LED pulses to indicate relative received signal strength. The sensor is ready for the output ON condition. |
| Remote line | No action required; sensor is ready for 1st sensing condition. | |

2. Teach the first sensing condition.

| Method | Action | Result |
|---|---|---|
| Push button | Present the first sensing condition and single-click the push button. | The amber LED is off. The red LED pulses to indicate relative signal strength. The sensor registers the output ON condition and is ready for the output OFF condition. |
| Remote line | Present the first sensing condition and single-pulse the remote line. | |

3. Teach the second sensing condition and return to RUN mode.

| Method | Action | Result |
|---|---|---|
| Push button | Present the second sensing condition and click the push button. | If the teach is accepted the green LED is on (or flashes if the signal is close to the switching threshold) and the amber LED is off until the sensing condition changes; the sensor registers the output OFF condition, positions the threshold, and returns to RUN mode.<br><br>If the teach is not accepted, the amber LED is on and the red LED pulses to indicate the relative received signal strength. The sensor returns to its wait state and is ready for the first sensing condition. |
| Remote line | Present the second sensing condition and single-pulse the remote line. | |

**NOTE:** The sensor returns to RUN mode if the first TEACH condition is not registered within 90 seconds. TEACH mode may be cancelled before either the first or second condition by holding the push button depressed for more than two seconds.


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# Enable or Disable the Push Button

In addition to its programming function, the remote line may be used to disable the push buttons for security. Disabling the push buttons prevents undesired tampering with the sensor configuration settings.

1. Connect the sensor's gray wire.
2. Four-pulse the remote line to enable or disable the push button.

   The sensor toggles between enable and disable settings and returns to RUN mode.

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Mounting Brackets ..... 16

# Chapter 4 Accessories

## Retroreflective Targets

Banner offers a wide selection of high-quality retroreflective targets. See your current Banner Engineering Corp catalog for complete information on available models. Sensing range will vary, according to the retroreflector's efficiency and reflective area.

- For long-range applications, model BRT-77X77C reflector provides a range up to 2 m (6.5').
- For clear object detection (low-contrast applications): reflector model BRT-2X2 is recommended; one comes bundled with each SME312LPC(QD) sensor.
- Polarized sensors require corner-cube type retroreflective targets only; reflective tape is not recommended.

Before installing retroreflective tape, clean the mounting surface with an isopropyl alcohol wipe.

Optional brackets for mounting reflective targets are available. See the Accessories section of your current Banner catalog or our website at www.bannerengineering.com.

**BRT-2X2**

- Square, acrylic target
- Reflectivity factor: 1.0
- Maximum temperature: +50 °C (+122 ºF)
- Optional brackets are available
- Reflector size: 51 mm × 51 mm
- Approximate size: 51.3 mm × 61 mm
- Two 4.2 mm diameter slots for mounting
- CAD files: DXF, PDF, IGS, STP

**BRT-2X2-25** Qty 25

**BRT-2X2-100** Qty 100



**BRT-77X77C** and **BRT-77X77CT**

- Square, acrylic target
- Reflectivity Factor: 2.0
- Temperature: –20 °C to +60 °C (–4 °F to +140 °F)
- Optional brackets are available
- Approximate size: 84.5 mm × 84.5 mm × 9 mm
- Two 3.5 mm diameter mounting holes
- Model **BRT-77X77CT** includes mounting tape
- CAD Files: DXF, PDF, IGS, STP



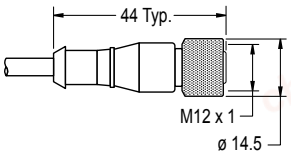
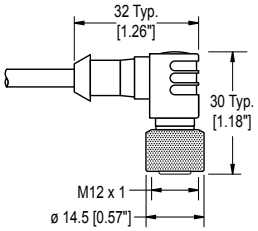
| | |
|---|---|
| **BRT-TVHG**<br>• Reflectivity factor: 0.8<br>• Max. Temperature: +60 °C (+140 °F) | Retroreflective tape is available in a variety of sizes and shapes; see your Banner Catalog for more information.<br>Not recommended for use with clear object detection sensors. |


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# Cordsets

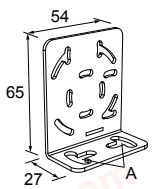
| 5-Pin Single-Ended M12 Female Cordsets | | | | |
|---|---|---|---|---|
| **Model** | **Length** | **Style** | **Dimensions** | **Pinout (Female)** |
| **MQDC1-501.5** | 0.5 m (1.5 ft) | Straight |  |  1 = Brown<br>2 = White<br>3 = Blue<br>4 = Black<br>5 = Gray |
| **MQDC1-503** | 0.9 m (2.9 ft) | | | |
| **MQDC1-506** | 2 m (6.5 ft) | | | |
| **MQDC1-515** | 5 m (16.4 ft) | | | |
| **MQDC1-530** | 9 m (29.5 ft) | | | |
| **MQDC1-560** | 18 m (59 ft) | | | |
| **MQDC1-5100** | 31 m (101.7 ft) | | | |
| **MQDC1-506RA** | 2 m (6.5 ft) | Right-Angle |  | |
| **MQDC1-515RA** | 5 m (16.4 ft) | | | |
| **MQDC1-530RA** | 9 m (29.5 ft) | | | |
| **MQDC1-560RA** | 19 m (62.3 ft) | | | |

# Mounting Brackets

**SMB46L**

- Right-angle
- L bracket
- 14-ga. 316 stainless steel
- CAD Files: DXF, PDF, IGS, STP

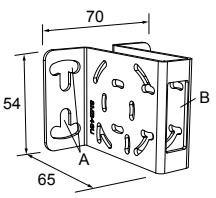
**Hole center spacing:** A = 16.0
**Hole size:** A = 16.5 × 18.7




**SMB46U**

- Right-angle
- U bracket for sensor protection
- 14-ga. 316 stainless steel
- CAD Files: DXF, PDF, IGS, STP

**Hole center spacing:** A = 16.0
**Hole size:** A = 16.5 × 18.7, B = 34.0 × 13.0



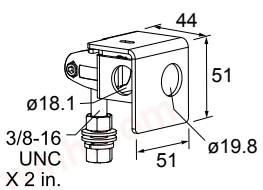

**SMB18AFA..**

- 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





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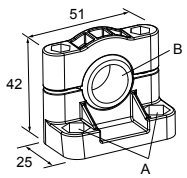
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**SMB18SF**

- 18 mm swivel bracket with M18 × 1 internal thread
- Black thermoplastic polyester
- Stainless steel swivel locking hardware included
- CAD Files: DXF, PDF, IGS, STP

**Hole center spacing:** A = 36.0
**Hole size:** A = ø 5.3, B = ø 18.0

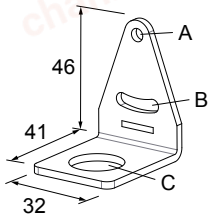



**SMB312PD**

- 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 × 4.6, C = ø 18.5

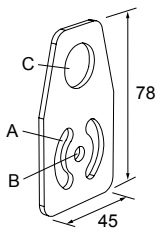
**NOTE:** Not for use with plastic fiber optic sensors




**SMBAMS18P**

- Flat SMBAMS series bracket with 18 mm hole
- Articulation slots for 90+° rotation
- 12-ga. (2.6 mm) cold-rolled steel
- CAD Files: DXF, PDF, IGS, STP

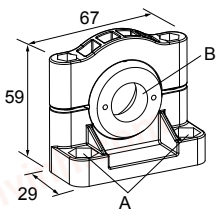
**Hole center spacing:** A = 26.0, A to B = 13.0
**Hole size:** A = 26.8 × 7.0, B = ø 6.5, C = ø 19.0




**SMB3018SC**

- 18 mm swivel side or barrel-mount bracket
- Black reinforced thermoplastic polyester
- Stainless steel swivel locking hardware included
- CAD Files: DXF, PDF, IGS, STP

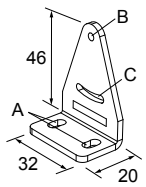
**Hole center spacing:** A = 50.8
**Hole size:** A = ø 7.0, B = ø 18.0




**SMB312S**

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

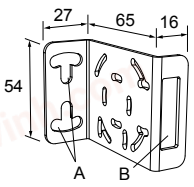
A = 4.3 × 7.5, B = diam. 3, C = 3 × 15.3




**SMB46S**

- Right-angle
- S bracket
- 14-ga. 316 stainless steel
- CAD Files: DXF, PDF, IGS, STP

**Hole center spacing:** A = 16.0
**Hole size:** A = 16.5 × 18.7, B = 34.0 × 10.0





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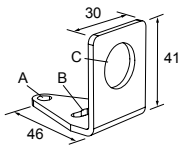
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**SMB18A**

- 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

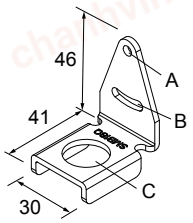
**Hole center spacing:** A to B = 24.2
**Hole size:** A = ø 4.6, B = 17.0 × 4.6, C = ø 18.5




**SMB18Q**

- Right-angle flanged bracket
- 18 mm sensor mounting hole
- 12-ga. stainless steel
- CAD Files: DXF, PDF, IGS, STP

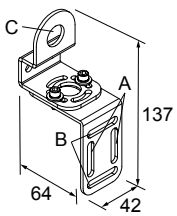
**Hole center spacing:** A to B = 24.2
**Hole size:** A = ø 4.6, B = 17.0 × 4.6, C = ø 19.0




**SMB18UR**

- 2-piece universal swivel bracket
- 300 series stainless steel
- Stainless steel swivel locking hardware included
- Mounting hole for 18 mm sensor
- CAD Files: DXF, PDF, IGS, STP

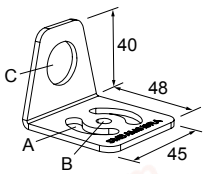
**Hole center spacing:** A = 25.4, B = 46.7
**Hole size:** B = 6.9 × 32.0, C = ø 18.3




**SMBAMS18RA**

- Right-angle SMBAMS series bracket with 18 mm hole
- Articulation slots for 90+° rotation
- 12-ga. (2.6 mm) cold-rolled steel
- CAD Files: DXF, PDF, IGS, STP

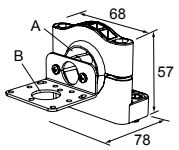
**Hole center spacing:** A = 26.0, A to B = 13.0
**Hole size:** A = 26.8 × 7.0, B = ø 6.5, C = ø 19.0




**SMB30SK**

- Flat-mount swivel bracket with extended range of motion
- Black reinforced thermoplastic polyester and 316 stainless steel
- Stainless steel swivel locking hardware included
- CAD Files: DXF, PDF, IGS, STP

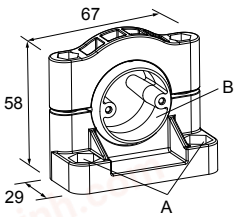
**Hole center spacing:** A=50.8
**Hole size:** A=ø 7, B=ø 18




**SMB30SUS**

- Side-mount swivel with extended range of motion
- Black reinforced thermoplastic polyester
- Stainless steel swivel locking hardware included
- CAD Files: DXF, PDF, IGS, STP

**Hole center spacing:** A=50.8, B=24.1
**Hole size:** A=ø 7, B=ø 7.6





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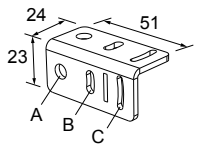
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**SMB312B**

- Stainless steel 2-axis, bottom-mount bracket
- Includes mounting foot
- CAD Files: DXF, PDF, IGS, STP

A = diam. 6.9, B = 4.3 × 10.5, C = 3.1 × 15.2





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# Chapter 5 Product Support and Maintenance

## Troubleshooting

If the MINI-BEAM Expert's Power LED alternately flashes red/green, this indicates a microprocessor memory error. To clear the error, re-teach the sensor or cycle the power ON and OFF and re-teach the sensor. If this does not solve the problem, or if it occurs frequently, replace the sensor.

## 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.


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**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.

**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.

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**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。


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**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.

**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.

**Importante:** Se for instruído a devolver o dispositivo, embale-o com cuidado. Os danos ocorridos no transporte de devolução não são cobertos pela garantia.

Obtenha assistência para reparos do produto entrando em contato com o distribuidor local da Banner Engineering Corp ou ligando diretamente para a Banner no telefone (763) 544-3164. Acesse a literatura traduzida para seu idioma nativo no site da Banner em www.bannerengineering.com ou entre em contato diretamente com a Banner pelo telefone (763) 544-3164.

**Türkçe**

Bu cihazda sorun giderme işlemleri için Banner Engineering ile iletişime geçin. **Bu Banner cihazını onarmaya çalışmayın; cihaz sahada değiştirilebilir parça veya bileşen içermez.** Bir Banner Uygulama Mühendisi tarafından cihazın, cihazın bir parçasının veya bir cihaz bileşeninin kusurlu olduğu tespit edilirse, Banner RMA (İade Mal Yetkilendirme) prosedürü hakkında bilgilendirilirsiniz.

**ÖNEMLİ:** İade etmeniz istenirse, cihazı dikkatli bir şekilde paketleyin. İade nakliyesinde meydana gelecek hasarlar garanti kapsamında değildir.

Yerel Banner Engineering Corp distribütörünüzle iletişime geçerek veya doğrudan (763) 544-3164 numaralı telefondan Banner'ı arayarak ürün onarımlarıyla ilgili yardım alın. Ana dilinize çevrilmiş dokümanlara www.bannerengineering.com adresindeki Banner web sitesinden erişebilir veya (763) 544-3164 numaralı telefondan doğrudan Banner ile iletişime geçebilirsiniz.

# Discontinued Models

The following models are no longer available for order but are still covered by the information in this document.

*Retroreflective mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312LV | Retroreflective, Visible red, 650 nm | 5 m (15 ft) | 2 m cable |


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*Diffuse mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312DV W/30 | Diffuse, Visible red, 650 nm | 1100 mm (43 in) | 9 m cable |
| SME312W W/30 | Divergent Diffuse, Infrared, 880 nm | 130 mm (5 in) | 9 m cable |

*Convergent mode models*

| Model | Sensing Mode | Range or Focus | Spot Size at Focus | Connection |
|---|---|---|---|---|
| SME312CV W/30 | Convergent, Visible red, 650 nm | 16 mm (0.65 in) | 1.3 mm (0.05 in) | 9 m cable |
| SME312CV2 W/30 | Convergent, Visible red, 650 nm | 43 mm (1.7 in) | 3.0 mm (0.12 in) | 9 m cable |
| SME312CVG | Convergent, Visible green, 525 nm | 16 mm (0.65 in) | 1.0 mm (0.04 in) | 2 m (6.5 ft) cable |
| SME312CVG W/30 | | | | 9 m cable |
| SME312CVB W/30 | Convergent, Visible blue, 475 nm | 16 mm (0.65 in) | 1.8 mm (0.07 in) | 9 m cable |
| SME312CVW W/30 | Convergent, Visible white, 450–650 nm | | | 9 m cable |

*Glass fiber-optic mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312F W/30 | Glass Fiber Optic, 880 nm infrared | Range varies by sensing mode and fiber optics used | 9 m cable |
| SME312FV W/30 | Glass Fiber Optic, Visible red, 650 nm | | 9 m cable |
| SME312FVG W/30 | Glass Fiber Optic, Visible green, 525 nm | | 9 m cable |
| SME312FVB | Glass Fiber Optic, Visible blue, 475 nm | | 2 m (6.5 ft) cable |
| SME312FVB W/30 | | | 9 m cable |
| SME312FVW W/30 | Glass Fiber Optic, Visible white, 450–650 nm | | 9 m cable |

*Plastic fiber-optic mode models*

| Model | Sensing Mode | Range or Focus | Connection |
|---|---|---|---|
| SME312FPG | Plastic Fiber Optic, Visible green, 525 nm | Range varies by sensing mode and fiber optics used | 2 m (6.5 ft) cable |
| SME312FPG W/30 | | | 9 m cable |
| SME312FPGQD | | | 5-pin M12 QD |
| SME312FPB W/30 | Plastic Fiber Optic, Visible blue, 475 nm | | 9 m cable |
| SME312FPW W/30 | Plastic Fiber Optic, Visible white, 450–650 nm | | 9 m cable |

# Contact Us

Banner Engineering Corp. | 9714 Tenth Avenue North | Plymouth, MN 55441, USA | Phone: + 1 888 373 6767

For worldwide locations and local representatives, visit www.bannerengineering.com.

# Banner Engineering Corp Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been


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defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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