

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 $+70^{\circ}$ C (-20° F to $+158^{\circ}$ 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 yellow) 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 | |
| Flashing green | Sensed light level is approaching sensing threshold* | |
| Solid red | | Sensor “sees” its own modulated light source; pulse rate is proportional to the received light signal strength** |
| Yellow on | Outputs conducting | Ready to TEACH output ON condition |
| Yellow off | Outputs not conducting | Ready to TEACH output OFF condition |

* This is the Stability indicator, which signals when maintenance, realignment, or reconfiguration is needed during RUN mode.

** The faster the pulse rate, the stronger the light signal.

Remote Configuration

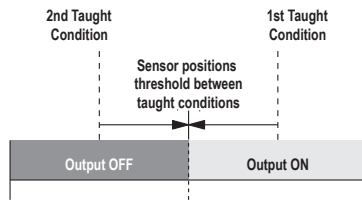
The remote function may be used to configure the sensor remotely or to disable the push button for security. Connect the gray wire of the sensor to ground (0V dc), with a remote programming switch connected between them. Pulse the remote line according to the diagrams in the configuration procedures.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

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.

Static Teach

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 \leq "Click" \leq 0.8 seconds); Remote line (0.04 seconds \leq "T" \leq 0.8 seconds)

1. Access TEACH mode.

| Method | Action |
|---------------|---------------|
|---------------|---------------|

| | |
|------------------------|--|
| Via push button | Press and hold push button until the bi-color (green/red) indicator begins to flash red, or turns OFF. |
|------------------------|--|

| | |
|------------------------|--|
| Via remote line | No action required; sensor is ready for 1st sensing condition. |
|------------------------|--|

Push button method only: The yellow LED is on. The red LED pulses to indicate relative received signal strength. The sensor is ready for the output ON condition.

2. Teach the first sensing condition.

| Method | Action |
|---------------|---------------|
|---------------|---------------|

| | |
|------------------------|--|
| Via push button | Present the first sensing condition and click the push button. |
|------------------------|--|

| | |
|------------------------|---|
| Via remote line | Present the first sensing condition and single-pulse the remote line. |
|------------------------|---|

The yellow 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.

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

| Method | Action |
|---------------|---------------|
|---------------|---------------|

| | |
|------------------------|---|
| Via push button | Present the second sensing condition and click the push button. |
|------------------------|---|

| | |
|------------------------|--|
| Via remote line | Present the second sensing condition and single-pulse the remote line. |
|------------------------|--|

If the teach is accepted the green LED is on (or flashes if the signal is close to the switching threshold) and the yellow LED is off until the sensing condition changes; the sensor registers the output OFF condition, positions the threshold, and returns to RUN mode.

If the teach is not accepted, the yellow 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.

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.

Enabling or Disabling 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.

Specifications

| General | Outputs |
|--|--|
| Supply Voltage and Current 10 to 30V dc (10% maximum ripple) at less than 45 mA, exclusive of load | Output Configuration Bipolar: One current sourcing (PNP) and one current sinking (NPN) open-collector transistor |