Specifications

SUPPLY VOLTAGE
- 12 T0 24 VDC
- Polarity Protected

CURRENT REQUIREMENTS
- 85 mA (exclusive of load)

OUTPUT TRANSISTOR
- (1) NPN and (1) PNP output transistor
- NPN: Sink up to 150 mA
- PNP: Source up to 150 mA
- Momentary short circuit protected
- Output transistors turn “ON” when mark is in view
- Anti-pulsing on power-up

RESPONSE TIME
- Minimum duration of input event:
- Light state response: 50 microseconds
- Dark state response: 140 microseconds
- Leading edge variation: less than 20 microseconds

HYSTERESIS
- Less than 400 millivolts for maximum sensitivity and resolution

LED LIGHT SOURCE
- Choice of color:
  A. White - Broadband Spectrum (CMSWL)
  B. Green - 550 nm (CMS)
  C. Blue - 480 nm (CMSB)
  D. Red - 660 nm (CMSR)

LIGHT IMMUNITY
- Pulse modulated to provide extremely high immunity to ambient light

PULSE STRETCHER TIMER (Optional)
- Provides minimum of 10 milliseconds output duration

OFFSET/EDR®CLUTCH KNOB ADJUSTMENT
- Sets initial level on Contrast Indicator in relation to mid-scale switch point of 5 – functions as sensitivity adjustment
- Controls Enhanced Dynamic Range circuit (EDR®) which functions to avoid glare effect

LIGHT/DARK SWITCH
- Dark position for dark mark; Light position for light mark

INDICATORS
- OUTPUT INDICATOR - Red LED illuminates when output transistors are “ON”
- EDR INDICATOR – Intensity of Green LED provides indication of where in the dynamic operating range the offset / EDR adjustment has been set
  FULLY LIT: Operating near saturation
  OFF: Operating near maximum sensing range
- CONTRAST INDICATOR – Displays returned contrasting light levels (background vs. mark)

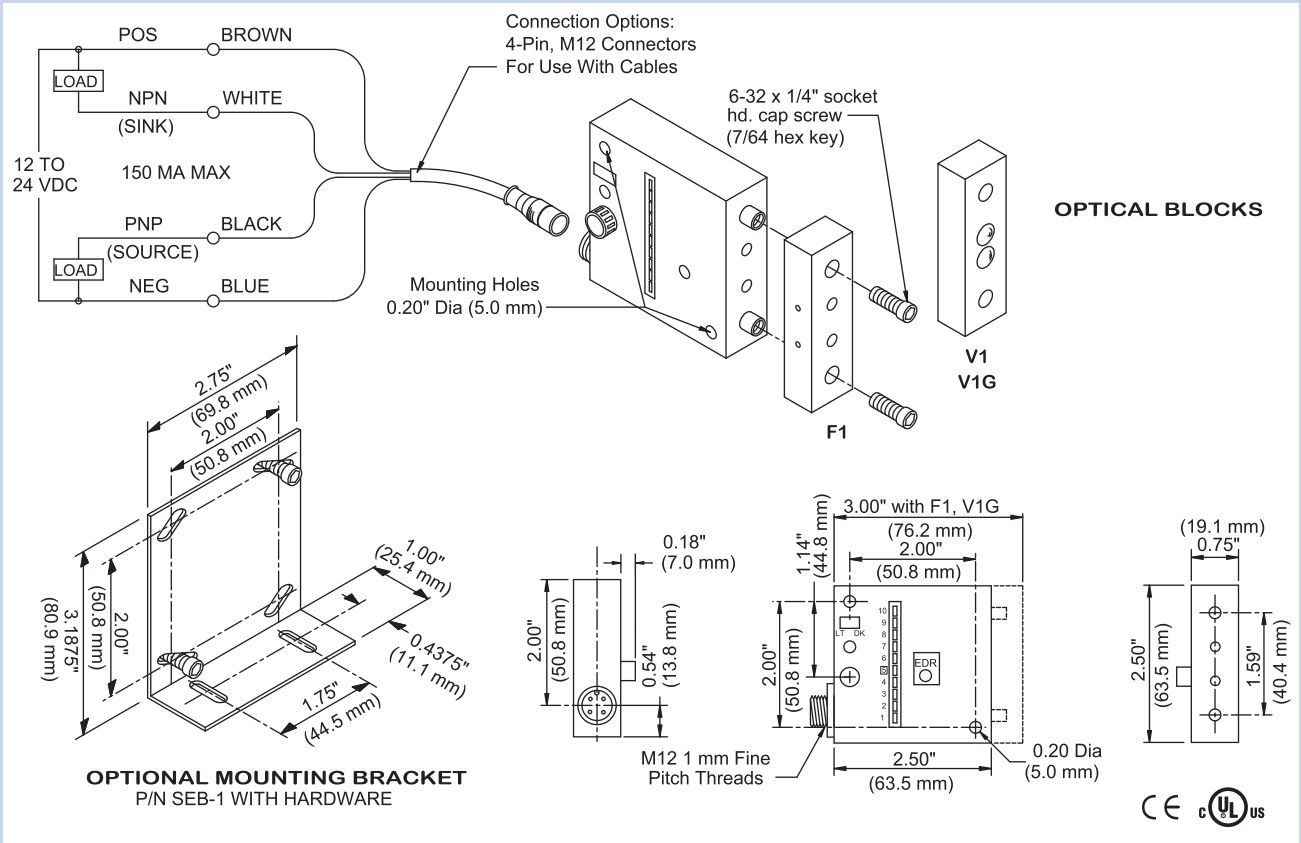
AMBIENT TEMPERATURE
- -40°C to 70°C (-40°F to 158°F)

RUGGED CONSTRUCTION
- Chemical resistant, high impact polycarbonate housing
- Waterproof, ratings: NEMA 4X, 6P and IP67
- Epoxy encapsulated for mechanical strength

Product subject to change without notice.
Consult Factory for RoHS Compliance.

Connections and Dimensions

SMARTEYE®COLORMARK™II



Setup Guide *Registration Mark Sensing Using Fiberoptic Light Guides*

TRI-TRONICS CMS Series Sensors are easier to set up than conventional color sensors because of their unique built-in **Contrast Indicator**™. Examples of setup instructions for various materials are shown below.

Opaque Material (Non-Foil)

1. Position fiberoptic light guide to view material looking straight down. (See Fig.1)
2. Place background in view of fiberoptic light guide.
3. Adjust **"offset"** as follows...

   A – For dark mark on light background, adjust for a reading of "10" on the Contrast Ind icator with the background in view.

   B – For light mark on dark background, adjust for a reading of "1" on the Contrast Indicator with the background in view.
4. Set light/dark switch in the position that turns the "mark" indicator off.
5. Move mark into view. Note the new contrast reading. If this reading has deviated from the initial reading by 4 to 5 bars or more, enough contrast exists for proper detection.

Foil Material

1. Position fiberoptic light guide as follows:

   A – For a black or dark mark on shiny foil, position light guide to view material looking straight down.(See Fig. 1)

   B – For white or light mark on shiny foil, position light guide to view material looking on a 45° angle. (See Fig. 2)
2. Place mark in view of fiberoptic light guide.
3. Adjust "offset" as follows:

   A – For black or dark mark on shiny foil, adjust for a reading of "1" when the black mark in view.

   B – For white or light mark on shiny foil, adjust for a reading of "10" when the white mark is in view.
4. Set light/dark switch in the position that turns the mark indicator "ON" when the mark is in view.
5. Move mark out of view. With the background in view, note the new contrast reading. If this reading has deviated from the initial reading by 4 to 5 bars or more, enough contrast exists for proper detection.

Transparent Material

1. Position fiberoptic light guide to view material looking straight down.
2. Place background (transparent area) in view of fiberoptic light guide.
3. Adjust "offset" for a reading of 9 or 10 on the Contrast Indicator.
4. Set light/dark switch in the position that turns the mark indicator off.
5. Move the mark into view. Note the new contrast reading. If this reading has decreased or deviated from the initial reading by 6 to 8 bars or more, enough contrast exists for proper detection.

Hints and Tips:

1. False tripping or erratic operation is usually caused by excessive web flutter, wrinkles or variations in material back ground color or marks. Minor adjustments of the "offset" can help to eliminate erratic operation.
2. If the surface of opaque (non-foil) material is extremely shiny, consider placing fiberoptic light guide into the 45° angle position. (See Fig. 2). The position that results in the maximum contrast deviation as displayed on the Contrast Indicator will give the most reliable performance.
3. A metal guide plate for the material to flow across provides several necessary advantages:
   A – Helps to iron out wrinkles.
   B – Helps to eliminate web flutter.
   C – Provides shiny background when sensing marks on transparent material.

Fig. 1 Straight Position

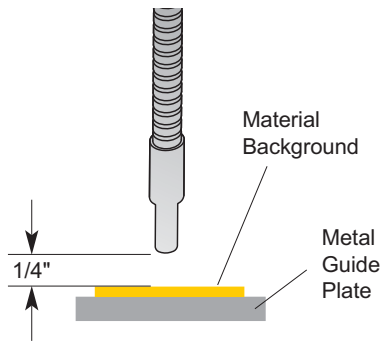


Fig. 2 45º Angle Position