TRI-TRONICS®

Smart Sensing Solutions Since 1954

OPTI-EYE®

Miniature DIN Rail Mountable Sensor

OPTI-EYE®

The **OPTI-EYE®** Sensor is high performance and versatile when applied to tough industrial sensing tasks. The OPTI-EYE provides a combination of high gain and high speed of response (500 microseconds). High gain enables the sensor to resolve low contrast sensing tasks. High speed response provides resolution of the exact position of objects traveling at high speed.

The OPTI-EYE® offers many unique features including a range adjustment (light source intensity) and three LED setup indicators. The range adjustment allows operation over a wide dynamic range. The green beam status LED indicator illuminates when the received light level exceeds the sensor's light state switch point. The yellow light intensity LED indicator displays the intensity of the sensor's light source and provides the installer an idea of where in the overall dynamic operating range the adjustment has been set (this is particularly important when using the invisible IR light source). The red output LED illuminates when the output transistors are in the ON state. Setting up and adjusting the sensor is as easily as monitoring the status of three LED indicators.

With seven interchangeable optical blocks; DIN rail, side, and bracket mounting; as well as cable or connector version options, the OPTI-EYE is versatile, low cost, general purpose sensors available. Opti-mal for most high contrast sensing applications.

Features
- 500 microseconds response time
- Potentiometer range adjustment
- Cable or quick disconnect
- NPN and PNP outputs
- DIN rail, bracket, or through-hole mounting
- Interchangeable Optical Blocks

Benefits
- Easy to use
- Lower maintenance costs
- Reduce downtime
- Improve machine throughput

Applications
- High speed counting
- Product/object detector
- Inspection sensing
- Product Orientation
- Labeling
- Printing/Marking/Coding

Five Mounting Options

OPTI-EYE®

1. Snap Mount onto a DIN rail with Universal Bracket Model DRB-1

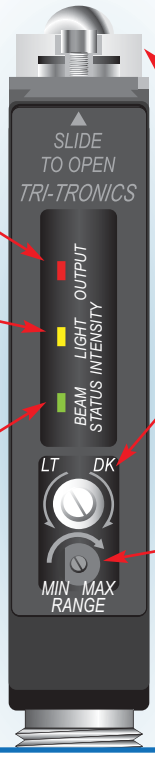
2. Screw mount at sensing site with Universal Bracket Model DRB-1

3. Through-hole mount with 18mm threaded barrel adapter Model TA-18 and MB-18

4. Screw mount with L-shaped stainless steel Bracket Model SEB-3

5. Screw mount directly to the machine

Features



OUTPUT INDICATOR
Red LED illuminates when outputs are ON.

LIGHT SOURCE INTENSITY INDICATOR
YELLOW LED illuminates proportionally to the Light Source intensity as determined by the Range adjustment.

BEAM STATUS INDICATOR
GREEN LED illuminates when received light level exceeds the sensor's light state switch point.

INTERCHANGEABLE OPTICAL BLOCK
See Sensing Ranges for best choice.

LIGHT/DARK ON SWITCH
Turn all the way counter clockwise for Light On operation.
Turn all the way clockwise for Dark On operation.

RANGE ADJUSTMENT
15 turn Light Source intensity control

Light Source Guidelines

INVISIBLE INFRARED LIGHT SOURCE (880nm)

A. Best choice in most opaque object sensing tasks.
B. Provides longest possible sensing range.
C. Best choice in penetrating lens contamination.
D. Preferred for use with small glass fiber optic light guides
Note: Not recommended for plastic fiber optic light guides.
E. Best for sensing dark colored (black, blue, green, etc.) objects in the proximity mode.
F. Useful in penetrating containers for verification of contents, or detecting overlapped splices in dense materials.

RED LIGHT SOURCE (660nm)

A. Best choice for use with plastic fiber optic light guides.
B. Useful when sensing translucent objects in proximity mode.
C. Useful when sensing transparent objects in fiber optic retroreflective mode.
D. Can be polarized for retroreflective sensing to reduce proxing on shiny objects.
E. Opposed fiber optic light guides can be polarized for sensing some translucent plastic containers.
F. Used as red filter for color perception advantages.

Optical Block Selection

Convergent V-Axis Blocks

Narrow beam optics useful for proximity sensing to minimize response to reflected light from background objects.

V4
Convergent 1in V-Axis
Useable range of 1in to 5in.

V4A
Convergent 1in V-Axis, Apertured
Useable range of 1in to 5in.

V6
Convergent 1.5in V-Axis
Useable range of 1.5in to 8in.

V8
Convergent .5in V-Axis
Useable range of .25in to 5in.

Proximity Blocks

O4
Proximity
Wide beam optics useful for short-range sensing of a variety of objects.

O5
Proximity
Narrow beam optics useful in long-range sensing of medium to large size objects.

Retroreflective Blocks

R4
Retroreflective
Narrow beam optics designed to sense reflectors or reflective materials at long range.

R5
Polarized Anti-Glare Retroreflective
Polarized to reduce response to hot-spot glare from shiny surfaces. Use with visible light source.

Fiber Optic Blocks

F4
Glass Fiber Optics
Adapter for use glass fiber optic light guides.

F5
Plastic Fiber Optics
Adapter for use plastic fiber optic light guides.

Sensing Range Guidelines

1in = 25.4mm / 1ft = 0.3048 meters

Convergent / Proximity / Retroreflective			Glass Fiber Optics			Plastic Fiber Optics		
OPTICAL BLOCKS	IR	RED	OPTICAL BLOCKS	IR	RED	OPTICAL BLOCKS	IR	RED
V4, V4A	1in (25.4mm)	1in (25.4mm)	**Opposed Mode**			**Opposed Mode**		
V6	1.5in (38.1mm)	1.5in (38.1mm)	F4	8in (203.2mm)	4in (101.6mm)	F5	N/A	2in (50.8mm)
V8	0.5in (12.7mm)	0.5in (12.7mm)	F4 w/lens	20ft (6.1m)	18ft (5.5m)	F5 w/lens	N/A	2ft (0.6m)
O4	5in (127mm)	2.5in (63.5mm)				F5 w/right angle lens	N/A	1ft (0.3m)
O5	3ft (0.9m)	1.5ft (0.5m)	**Proximity Mode**			**Proximity Mode**		
R4	20+ft (6.1m)	18+ft (5.5m)	F4	3in (76.2mm)	1.25in (31.75mm)	F5	N/A	5in (127.0mm)
R5	N/A	10ft (3.0m)	F4 w/lens	6in (152.4mm)	3in (76.2mm)	F5 w/lens	N/A	1ft (0.3m)

Note: Proximity tests utilized a 90% reflective white target. Retroreflective tests utilized a 3in diameter round reflector, Model AR3.

Note: Proximity tests utilized a .125in diameter fiber bundle.

Note: Proximity tests utilized a .040in diameter fiber bundle.

How To Specify

OPTI-EYE®

1. Select sensor model based on light source required
   OI = Infrared
   OR = Red
2. Select connection required:
   Blank = Cable
   C = Connector
3. Select Optical Block based on mode of sensing required (see Range Guidelines)

Example: O R C V4

- **OPTI-EYE®**
- Light Source
- Connection
- Optical Block

Accessories

4-Wire Shielded MicroCable, M12

SEC-6
6ft (1.8m) cable

SEC-15
15ft (4.6m) cable

SEC-25
25ft (7.62m) cable

RSEC-6
6ft (1.8m) right angle connector

RSEC-15
15ft (4.6m) right angle connector

RSEC-25
25ft (7.6m) right angle connector

4-Wire Extension Cable, M12

BX-10
10ft (3.1m) extension cable

BX-25
25ft (7.62m) extension cable

5-Wire Unshielded Cable, M12

GSEC-2MU
6.5ft (2.0m) cable

GSEC-5MU
16.4ft (5.0m) cable

FMB-1
(8.4mm diam.) Standard Fiber Optic Mounting Bracket

FMB-2 (5.1mm diam.) Miniature Glass Fiber Optic Mounting Brackets

FMB-3 (3.1mm diam.) Miniature Plastic Fiber Optic Mounting Brackets

TA-18
18mm Adapter

MB-18
18mm Bracket, for use with TA-18

DRB-1
Din Rail Bracket

SEB-3
Opti-Eye Stainless Bracket Assembly

LK-4
Lens Kit (includes F4, F5, O4, O5, R4, R5, V4, V4A, V6, V8 alan wrenches and screws)

Specifications

OPTI-EYE®

SUPPLY VOLTAGE
- 12 to 24VDC
- Polarity Protected

CURRENT REQUIREMENTS
- 60mA (exclusive of load)

OUTPUT TRANSISTORS
- (1) NPN and (1) PNP output transistors:
  NPN: Sink up to 150mA
  PNP: Source up to 150mA
- Momentary short circuit protected
- Outputs protected from pulsing during power up
- Light/Dark switch determines output status:
  LT = Light ON operate
  DK = Dark ON operate

RESPONSE TIME
- Minimum duration of input event:
  500 microseconds

HYSTERESIS
- Set for Medium-to-Low contrast application

LED LIGHT SOURCE
- Choice of color: Infrared = 880nm or
  Visible Red = 660nm

LIGHT IMMUNITY
- Responds to sensor's pulse modulated
light source – immune to most ambient light

RANGE ADJUSTMENT
- 15 turn Light Source intensity control

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

INDICATORS
- OUTPUT INDICATOR
  RED LED illuminates when the output transistors are in the ON state as determined by the Light/Dark switch
- BEAM STATUS INDICATOR
  GREEN LED illuminates when received light level exceeds the sensor's light state switch point
- LIGHT SOURCE INTENSITY INDICATOR
  YELLOW LED illuminates proportionally to the Light Source intensity as determined by the Range adjustment

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

RoHS Compliant
Product subject to change without notice

Connections and Dimensions OPTI-EYE® SENSOR