



**General Purpose Photoelectric Sensor**





## Big Performance Big Capability

The **TINY-EYE®** Miniature Photoelectric Sensor “unlocks the door” to big cost savings with its ability to perform many industrial sensing tasks. Changing the lens changes the sensing mode. **TINY-EYE®** utilizes our “quick-change” optical blocks, allowing the **TINY-EYE®** to be used in multiple sensing modes.

**TINY-EYE®**'s unique lensed optical blocks are molded of solid optical grade, high-impact plastic. This innovation concept helps to prevent condensation or fog buildup on the inside of the lens. Multiple varieties of optical blocks are available for operating the **TINY-EYE®** in either the retroreflective, polarized (non-glare), proximity, opposed, fiberoptic, or convergent sensing modes. A simple change of the optical block can be very useful in determining the best sensing mode for use in your specific sensing task. These inexpensive, interchangeable optical blocks reduce the inventory burden of replacement parts and eliminate the need for discarding a complete sensor in the case of damage to the optical block.

Many design features have been incorporated into the **TINY-EYE®** to prevent mechanical or electrical damage, and to provide trouble-free operation. The rugged case is molded of high-impact polycarbonate. To prevent electrical mishaps, the sensors are protected from reverse polarity.



### Features

- 500 microsecond Speed of Response
- 10 to 30 VDC Operating Voltage (5 VDC Operating Voltage available Consult Factory)
- Pulse Modulated
- Reverse Polarity Protected
- Both NPN and PNP Outputs
- Red or Infrared Light Sources
- Step-Function Remote Sensitivity Adjustment
- Rugged and Waterproof

### Benefits

- Lower inventory costs
- Reduce maintenance costs
- Improve machine throughput
- Flexible and affordable

### Applications

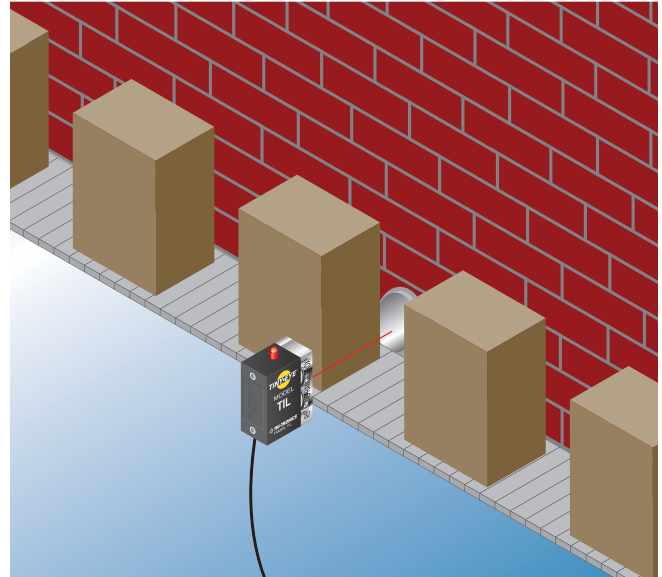
- Product detect
- Object absence/presence
- Inspection trigger
- Printing/Marking/Coding

# Typical Applications



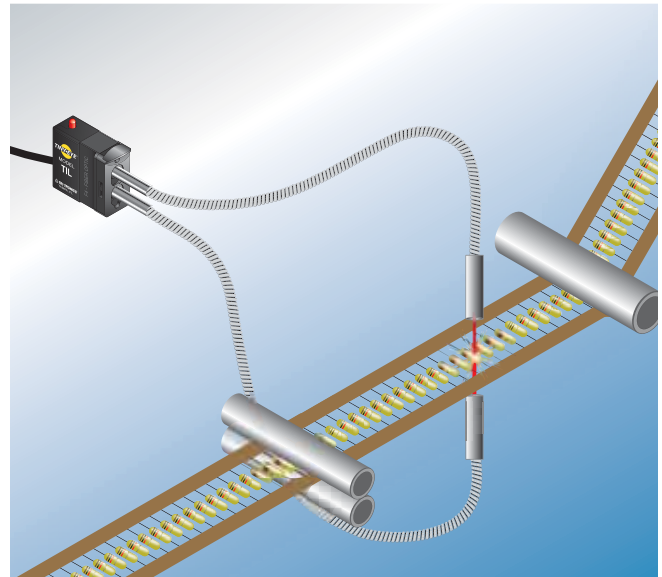
## Limited Space

The **TINY-EYE®**, as it's name implies, is small and compact...allowing for installation in the most mechanically demanding applications. Since there is no adjustment on the **TINY-EYE®**, there is no need to access the sensor at the sensing sight. Providing a wire for making adjustments in three modes...High, Medium, and Low range...enables the sensor to be adjusted from a remote location.



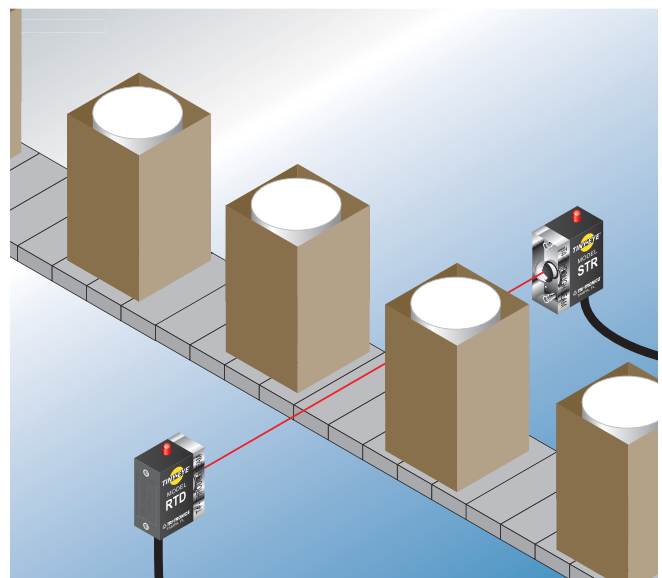
## Small Parts Detection:

The **TINY-EYE®** has the same features as most of our other miniature sensors; Interchangeable Optical Blocks. The sensor can be fitted with a fiber optic, retroreflective, short/long range proximity, or convergent optical blocks. This enables the **TINY-EYE®** to be used in many different applications requiring an even smaller mechanical or physical profile.



## Opaque Objects:

One of the most powerful through-beam sensors available, the **TINY-EYE®** can span a range of 25+ feet. In many applications where the requirement calls for a small package with big performance, the solution is an expensive laser sensor. This sensor meets the both requirements at a much more reasonable cost, removing the burden of higher inventory investments and higher maintenance fees.



# Optical Block Selection

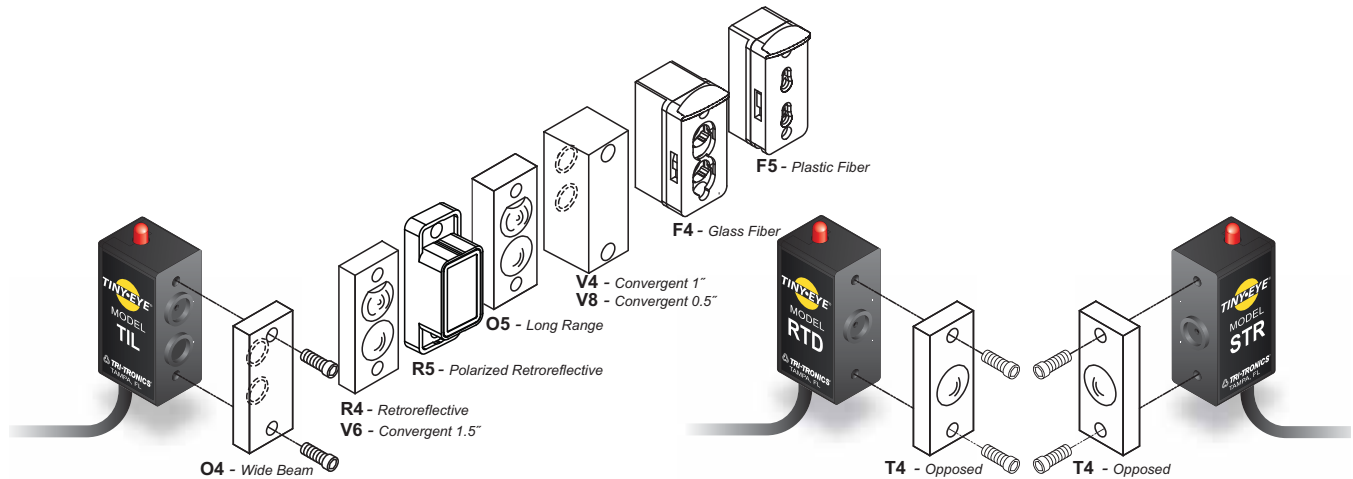


Interchangeable optical blocks provide for universal application of the **TINY-EYE®** to any sensing applications from large object sensing to finite sensing of small parts, and product inspection tasks.

TINY-EYE®

2

General Application Photoelectric Sensors



## Type O4 Proximity

Wide beam optics useful for short-range sensing of transparent, translucent, opaque, or irregular shaped shiny objects.

## Type O5 Proximity

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

## Type R4 Retroreflective

Very narrow beam optics designed to sense reflectors or reflective materials at long range. Designed for Beam Break sensing.

## Type R5 Polarized Anti-Glare Retroreflective

Polarized to reduce response to "hot spot" glare from shiny surface of detected object. Use with visible light source.

## Type F4 Glass Fiberoptics

Adapter for use with a wide variety of glass fiber optic light guides for both the proximity and opposed sensing modes.

## Type F5 Plastic Fiberoptics

Adapter for use with a wide variety of plastic fiber optic light guides for both the proximity and opposed sensing modes

## Type V4 Convergent 1" "V" Axis

Useable range of 1" to 5".

## Type V6 Convergent 1.5" "V" Axis

Useable range of 1.5" to 8".

## Type V8 Convergent .5" "V" Axis

Useable range of .25" to 5" Narrow beam optics useful for sensing small parts. Also useful for proximity sensing to minimize response to reflected light from background objects..

## Type T4 Opposed Optical Blocks

Uses separate Light Source/Receiver. Designed for extra long-range sensing

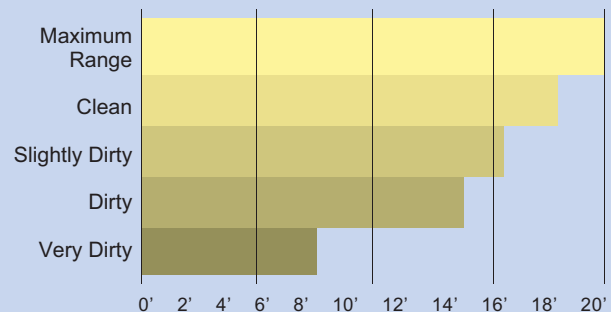
## Light Source Selection

**TINY-EYE®** Sensors offer a selection of either Infrared (invisible), or High Intensity Red (visible) light sources.

**Infrared** – Invisible light source recommended for opaque object sensing. The IR LED provides long-range sensing capabilities and maximizes the ability to penetrate contaminated lenses.

**High Intensity Red** – recommended for long-range proximity sensing and for use with plastic fiber optic light guides.

Example: **Model TILR4 (Retroreflective)**



### Environmental Useful Range

If the maximum range of a retroreflective sensor is rated at 20 feet and your sensing site environment is dirty, the specified maximum range would decrease by 30%, to a useful range of 14 feet.

## Thru-Beam Light Source Receiver Models

1. Select Light Source model based on light source required:  
STIT4 = Infrared Light Source  
STRT4 = Red Light Source
2. Select Receiver Model based on light source required:  
RTL4 = Light-On Receiver  
RTDT4 = Dark-On Receiver

## Sensor Models

1. Select Sensor Model based on light source required:  
TI = Infrared Light Source; TR = Red Light Source
2. Select Dark/Light Output  
D = Dark-On Output; L = Light-On Output
3. Select Operational Voltage:  
Blank = 10 to 30 VDC, 5 = 5 VDC
4. Select Optical Block based on mode of operation required.

## Range Guidelines

### TINY-EYE® MODELS

OPTICAL BLOCK TYPES	TIL/TID (Infrared)	TRL/TRD (Red)
O4 Proximity	2 in.	1.5 in.
O5 Proximity	18 in.	16 in.
R4 Retroreflective	20 ft.	20 ft.
R5 Polarized Retroreflective	N/A	7 ft.
V4, V4A Convergent	1 in.	1 in.
V6 Convergent	1-1/2 in.	1-1/2 in.
V8 Convergent	.5 in.	.5 in.

### Type F4 with .125 in. diam. Glass Fiberoptic Bundle

Proximity	1-1/2 in.	1 in.
Proximity w/ UAC-15 Lens	8 in.	6 in.
Opposed	6 in.	3 in.
Opposed w/ UAC-15 Lens	15 ft.	15 ft.

### Type F5 with .040 in. diam. Plastic Fiberoptics

Proximity	N/A	1/2 in.
Opposed	N/A	2 in.
Opposed w/ HLA-1 Lens	N/A	4 ft.

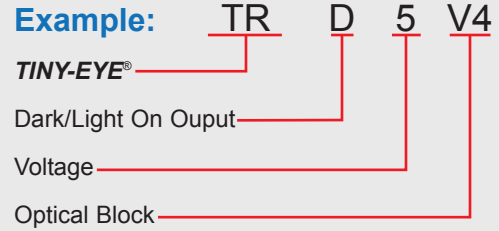
### Type T4 Opposed Mode – Light Source/Receiver

Light Source	Receiver	Max. Range
STIT4	RTL4	25 ft.
STIT4	RTDT4	25 ft.
STRT4	RTL4	20 ft.
STRT4	RTDT4	20 ft.

#### NOTES:

- PROXIMITY tests utilizes a 90% reflective white target.
- RETROREFLECTIVE tests utilizes a 3½ diam. round reflector Model AR-3.

\*Maximum ranges at 24 VDC. (Varies with supply voltage)



## POWER REQUIREMENTS

- Sensors 10 to 30 VDC @ 35mA Max
- Receivers 10 to 30 VDC @ 15mA Max
- Light Source 10 to 30 VDC @ 20mA Max

*NOTE: All devices equipped with reverse polarity protection*

## OUTPUT TRANSISTORS (SENSORS/ RECEIVERS)

- NPN (1) and PNP (1) Output Transistors provided
- NPN: Sink up to 100mA
- PNP: Source up to 100mA

## RESPONSE TIME: (SENSORS/RECEIVERS)

500 microseconds (light or dark)

## LIGHT IMMUNITY: (SENSORS/RECEIVERS)

Pulse modulated to provide extremely high immunity to ambient light

## SENSING RANGE:

Sensing range determined by model type, mode of sensing, optical block selected, and supply voltage

## SENSITIVITY/RANGE ADJUSTMENT:

Adjusting light source intensity by termination of designated wire lead (Blue for Sensors/Green for Light Sources) determines sensitivity/range setting  
Maximum Range - connect wire lead to POSITIVE. (12 to 24 VDC Supply)

Mid-Range - no connection required. (12 to 24 VDC Supply)

Low Range - connect wire lead to NEGATIVE. (12 to 24 VDC Supply)

**NOTE: Continuous adjustment can be accomplished by connecting the wire lead to a remote potentiometer. Consult factory**

## AMBIENT TEMPERATURE:

- -30°C to 70°C (-22°F to 158°F)

## RUGGED CONSTRUCTION:

- High impact polycarbonate housing
- Waterproof, NEMA 4X, 6P and IP67
- Encapsulated for mechanical strength

## LED LIGHT SOURCE WAVELENGTH:

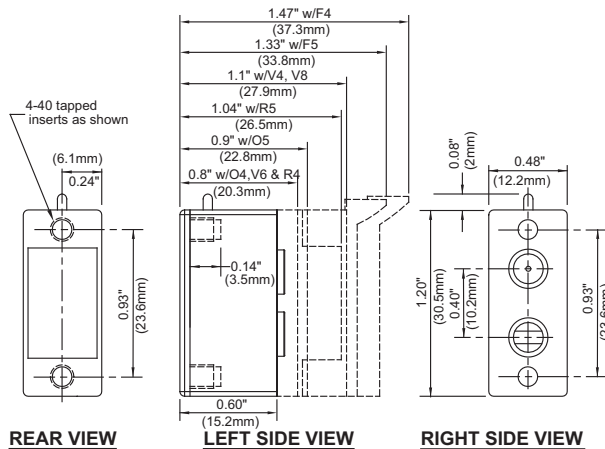
- Infrared = 880nm
- High intensity red = 660nm

## Accessories See Dimensions drawing

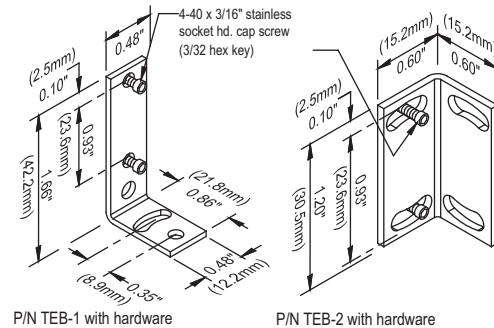
### Model Description

TEB-1	Vertical mount Tiny-Eye Mounting Bracket
TEB-2	Horizontal Mount Tiny-Eye Mounting Bracket

## Dimensions



## TINY-EYE® SENSOR MODELS

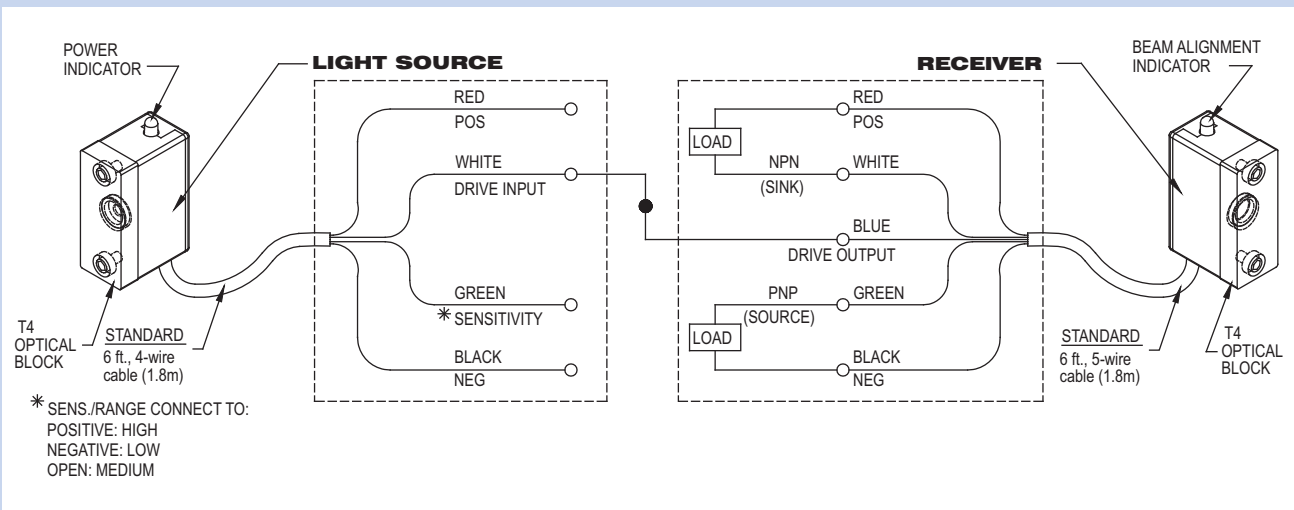


OPTIONAL MOUNTING BRACKETS

CE

## Connections

## TINY-EYE® LIGHT SOURCE/RECEIVER MODELS - OPPOSED MODE



## Connections

## ALL TINY-EYE® SENSOR MODELS

