



Smart Sensing Solutions Since 1954



Small and Economical





**Big Performance
Big Capability**

The **TINY-EYE®** Miniature 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, fiber optic, or convergent sensing modes. A change of the optical block can be useful in determining the best sensing mode for use in specific sensing tasks. 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 30VDC Operating Voltage (5VDC 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

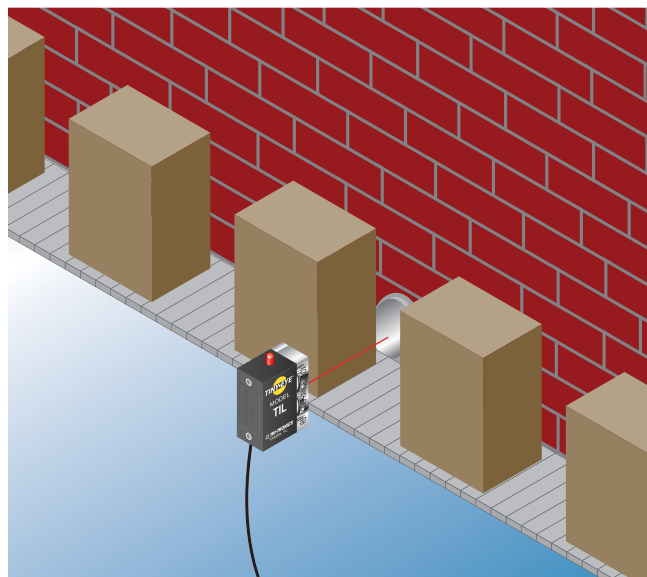
Applications

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

Typical Applications

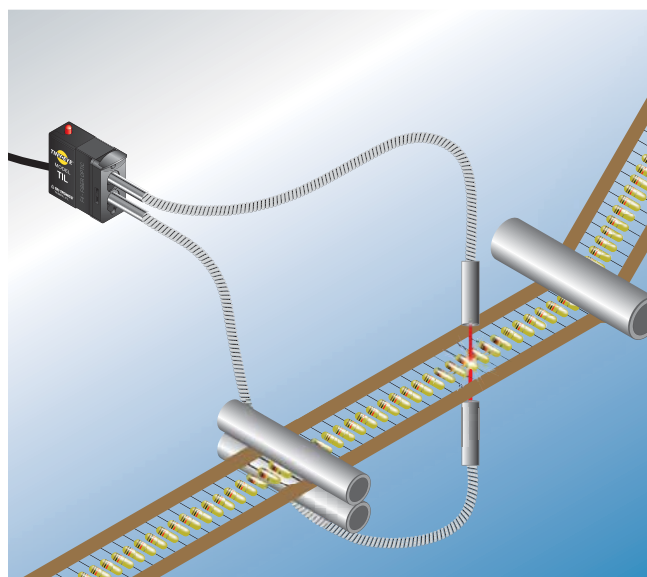
Limited Space

The **TINY-EYE®**, as its 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.



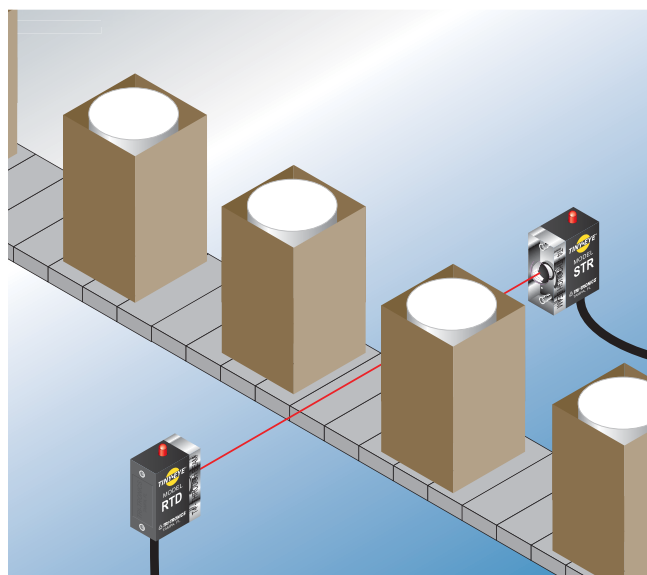
Small Parts Detection:

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

Name of Sensor

2

General Application Photoelectric Sensors

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.

Opposed Block



Type T4
Opposed
Uses separate Light Source/Receiver.
Designed for extra long-range sensing

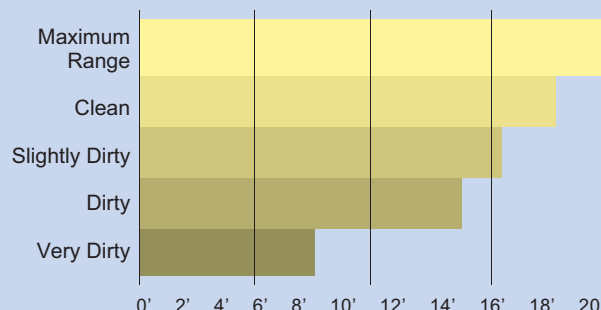
Light Source Selection

TINY-EYE® sensors offer a selection of either Infrared, or high intensity Red 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 the sensing site environment is dirty, the specified maximum range would decrease by 30%, to a useful range of 14 feet.

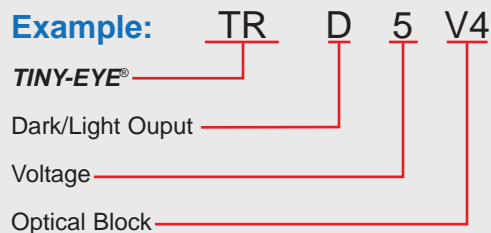
How to Specify

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 30VDC,
5 = 5VDC
4. Select Optical Block based on mode of operation required.

Through-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:
RTLT4 = Light-On Receiver
RTDT4 = Dark-On Receiver



Accessories

Mounting Brackets



TEB-1
Vertical Mount



TEB-2
Horizontal Mount

Fiber Optic Mounting Brackets



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



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



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

Lens Kit



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

Screw Mount Reflectors



78P
Screw Mount
4.4in x 1.9in
(111.8mm x 48.3mm)



AR3
Screw Mount
3in (76.2mm) diam.



AR4060
Screw Mount
(40.5 x 60mm)



AR6151, AR6151G
Screw Mount
(Chemical Resistant
Glass Cover)
2.4in x 2.0in
(61 x 51mm)



AR46
Screw Mount
(46mm) diam.

Prismatic High Performance Reflectors

Features

OUTPUT INDICATOR

Red LED illuminates when outputs are ON.

MOUNTING HOLES

4-40 tapped inserts

CABLE

6 ft (1.8m) 5-wire cable

INTERCHANGEABLE OPTICAL BLOCK

Choice of ten Optical Blocks - O4, O5, R4, R5, F4, F5, V4, V4A, V6, V8
See Sensing Ranges for best choice.



Opposed Mode Receiver/Light Source Features

T4 OPTICAL BLOCK

Comes standard on opposed mode models

BEAM ALIGNMENT INDICATOR

Red LED illuminates when beam is aligned.

MOUNTING HOLES

4-40 tapped inserts
See accessories for mounting brackets.

CABLE

6 ft (1.8m) 5-wire cable

OUTPUT INDICATOR

Red LED illuminates when outputs are ON.

MOUNTING HOLES

4-40 tapped inserts

CABLE

6 ft (1.8m) 4-wire cable



Range Guidelines

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

Type F4 with .125in diam. Glass Fiber Optic Bundle

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

Type F5 with .040in diam. Plastic Fiber Optics

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

Type T4 Opposed Mode – Light Source/Receiver

Light Source	Receiver	Max. Range
STIT4	RTLT4	25ft
STIT4	RTDT4	25ft
STRT4	RTLT4	20ft
STRT4	RTDT4	20ft

NOTES:

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

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

Specifications

POWER REQUIREMENTS

- Sensors 10 to 30VDC @ 35mA Max
- Receivers 10 to 30VDC @ 15mA Max
- Light Source 10 to 30VDC @ 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 24VDC Supply)

Mid-Range - no connection required. (12 to 24VDC Supply)
Low Range - connect wire lead to NEGATIVE. (12 to 24VDC 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)

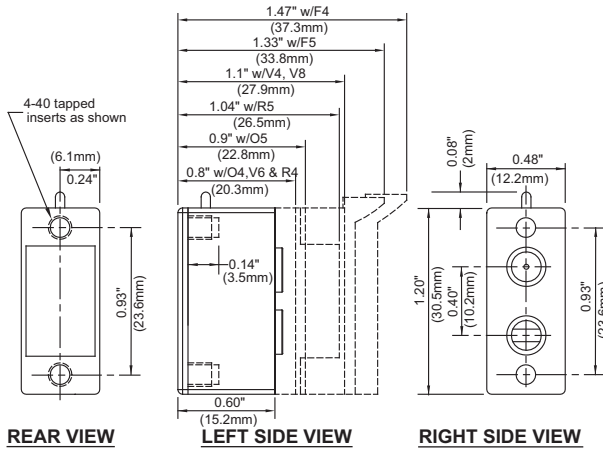
RUGGED CONSTRUCTION:

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

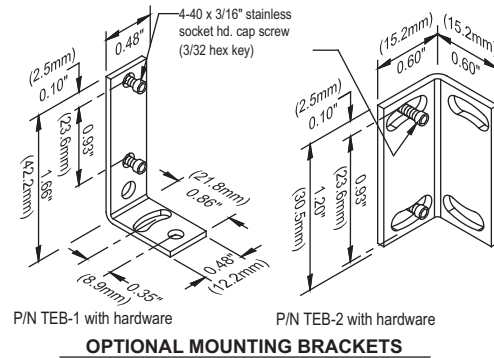
LED LIGHT SOURCE WAVELENGTH:

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

Dimensions



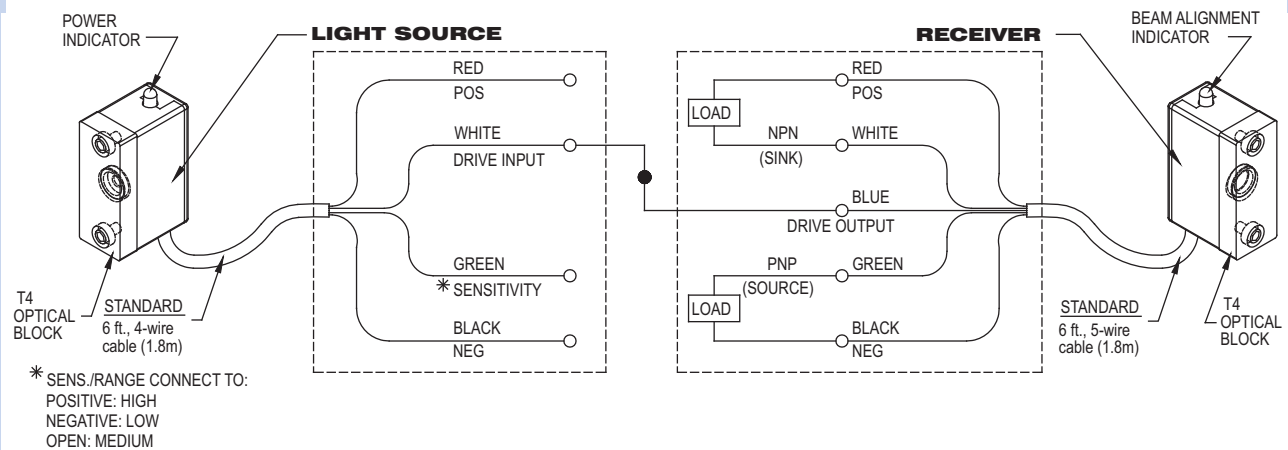
TINY-EYE® SENSOR MODELS



CE

Connections

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



Connections

ALL TINY-EYE® SENSOR MODELS

