

Overview

What are Photomicrosensors?

A Photomicrosensor is a small photoelectric sensor with an amplifier built into it that is used primarily as a component for building into equipment. Like any ordinary photoelectric sensor with a built-in amplifier, it is used, for example, in applications to detect passing objects or in positioning applications. The sensing object is most often a piece of metal called a "dog". When the dog enters the sensing area, it is optically detected by the Photomicrosensor, which outputs a signal.

Features

Photomicrosensors have the following advantages over ordinary photoelectric sensors with built-in amplifiers

(1) Many Different Shapes in One Model Series

The EE-SX67 Series, for example, has models with eight different slot configurations, allowing the customer to choose the best configuration for the installation position.

(2) Low Price

Ratings and performances are limited to those required for building into equipment, and the required IP degree of protection is easier to achieve, making prices very reasonable.

(3) Downsizing Is Possible with the Sensing Distances Required for Building into Equipment

The standard sensing distances (slot width) are specifically intended to be used for building into equipment. Slot-type Sensors, for example, have a 3.6 mm or 5 mm sensing distance. Diffuse-reflective and Limited Reflective Sensors have a sensing distance of less than 5 mm, and Retroreflective and Through-beam Sensors, less than 1 m.

(4) Indicator Lighting Mode

The indicator on many Photomicrosensors lights when light is incident. Some Photomicrosensors have specific models on which the indicator lights when light is interrupted. When lighting the indicator for position adjustment applications of Slot-type Sensors, for example, it may be more convenient to use a model that lights the indicator when light is interrupted. When using the indicator to check the power supply status, on the other hand, it may be convenient to use a model that lights the indicator when light is incident.

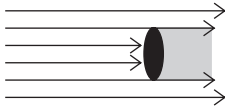
(5) Other Specifications: Degree of Protection and Output Current

A waterproof structure is not required because it is assumed the Photomicrosensors will be built into other equipment, and the output current rating can be kept low. Also, most models can operate on a 5-VDC power supply.

Operating Principles

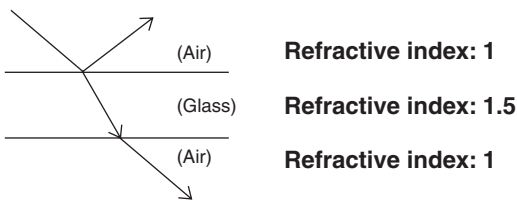
(1) Properties of Light Rectilinear Propagation

When light travels through air or water, it always travels in a straight line. The slit on the outside of a Through-beam Sensor that is used to detect small objects is an example of how this principle is applied to practical use.



Refraction

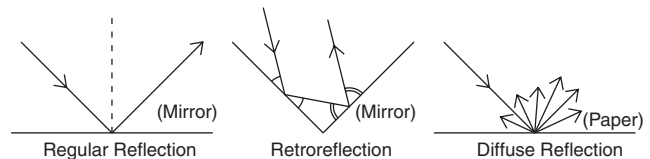
Refraction is the phenomenon of light being deflected as it passes obliquely through the boundary between two media with different refractive indices.



Reflection (Regular Reflection, Retroreflection, and Diffuse Reflection)

A flat surface, such as glass or a mirror, reflects light at an angle equal to the incident angle of the light. This kind of reflection is called regular reflection. Retroreflectors (also called a corner cube) take advantage of this principle by arranging three flat surfaces perpendicular to each other. "Retro" means "to return toward the source." The light reflected off the reflectors travels back towards the emitter, thus the term "retroreflective".

Matte surfaces, such as white paper, reflect light in all directions. This scattering of light is called diffuse reflection. This principle is the sensing method used by Diffuse-reflective Sensors.

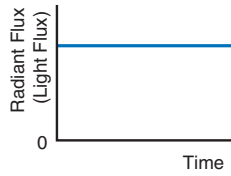


(2) Light Sources

Light Generation

<Non-modulated Light>

Non-modulated light facilitates high-speed response by continuously radiating a constant amount of light. There is the drawback, however, of susceptibility to external light interference.



<Modulated Light>

Modulated light is not affected by sunlight, light from incandescent bulbs, and other external light interference. An LED emitter is pulse-lighted, and the received signal is processed to remove the DC component.

