

## SENSORS

### Proximity Sensor

**This type of sensor uses an electronic field to detect when an object is near.** There is no physical contact between the object and the sensor. Inductive proximity sensors detect only metal objects. Capacitive proximity sensors can sense both metallic and non-metallic objects.

Think of a manufacturing process where the alignment of a part is critical. A proximity sensor can be used to make sure the part is aligned within a certain tolerance. If the part is not properly aligned, the proximity sensor will be triggered.

This type of sensor is generally used to sense at distances less than one inch.



FIGURE 3: PROXIMITY SENSOR TYPES

### Photoelectric Sensor

**This type of sensor uses light to detect the presence or absence of an object.** A *Thru-Beam* photoelectric sensor uses two devices (a light source and a detector) facing each other. Detection occurs when an object blocks or breaks the beam of light passing between them [Figure 4]. A *Retro-Reflective* (Reflex) sensor emits a light beam that is reflected back to the sensor from a retroreflector. When an object blocks the beam between the sensor and the retroreflector, detection occurs [Figure 5]. A *Diffuse Reflective* sensor emits a light beam that must be reflected back to it by the target object itself for detection to occur [Figure 6]. We'll cover more on these types of photoelectric sensors later in this module.

Most electric garage door openers include a photoelectric sensor for safety reasons. If the photoelectric sensor's beam is broken (by a child for example) as the door is going down, the sensor signals the door opener to reverse the direction of the door.

While environmental factors can affect photoelectric sensors, these devices have a long sensing range. The objects they detect can be of any material.