

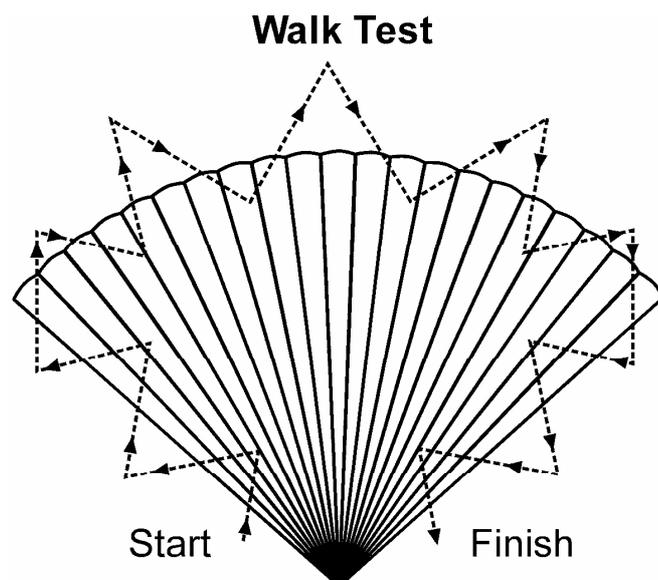
Passive Infrared Sensors



Passive Infrared Sensors (PIR sensors) can be thought of as a kind of infrared camera that remembers the amount of infrared energy focused on its surface. Once power is applied to the PIR, the electronics in the PIR shortly settle into a quiescent state and energize a small relay. This relay controls a set of electrical contacts that are usually connected to the detection input of a burglar alarm control panel. If the amount of infrared energy focused on the pyroelectric sensor changes within a configured time period, the device will switch the state of the alarm relay. The alarm relay is typically a "normally closed (NC)" relay, also known as a "Form B" relay.

A person entering a monitored area is detected when the infrared energy emitted from the intruder's body is focused by a Fresnel lens or a mirror segment and overlaps a section on the chip that had previously been looking at some much cooler part of the protected area. That portion of the chip is now much warmer than when the intruder wasn't there. As the intruder moves, so does the hot spot on the surface of the chip. This moving hot spot causes the electronics connected to the chip to de-energise the relay, operating its contacts, thereby activating the detection input on the alarm control panel.

Conversely, if an intruder were to try to defeat a PIR, perhaps by holding some sort of thermal shield between himself and the PID, a corresponding 'cold' spot moving across the face of the chip will also cause the relay to de-energise — unless the thermal shield has the same temperature as the objects behind it.



Infrared energy is able to reach the pyroelectric sensor through the window because the plastic used is transparent to infrared radiation (but only translucent to visible light). This plastic sheet also prevents the intrusion of dust and/or insects from obscuring the sensor's field of view, and in the case of insects, from generating false alarms.

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