



DID YOU KNOW SALES TIPS From DSC®

How DSC motion detectors work...

Most modern day motion detectors use a PIR (Passive Infrared) element to measure and detect changes in the infrared spectrum. The hotter an object is, the more infrared energy it will produce. A PIR simply measures the input energy and creates an output when a change in temperature is detected

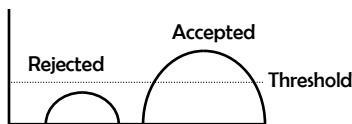
A PIR element alone will not be effective in detecting motion over any significant distance. A lens is required to focus infrared energy from a number of points onto the PIR element.

Different lens patterns are available for different applications. For example, a standard wall-to-wall lens will have focal points divided somewhat equally in each layer for the entire coverage pattern. A pet immune lens will block the layer of focal points directed down to the floor. A long range lens will have the majority of focal points directed straight out so that motion far away is detected.

When a person enters the coverage pattern, the person will most likely be a different temperature than the background. Typically, clothing is approximately 82F and bare skin is 92F but this can change depending on the clothing, the temperature from where the person is coming from and what type of physical activity was performed by the person recently, just to name a few.

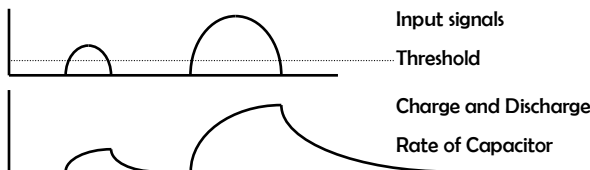
As the person moves across the coverage pattern, the person will change the temperature detected at a focal point. The PIR element will create an output in proportion to the temperature change detected. This output is often referred to as a 'pulse'.

Every PIR detector uses some sort of signal processing to determine if the pulses created by the PIR element indicate that motion is present. All PIR's have a threshold to filter out background noise and signals created by minor temperature fluctuations:

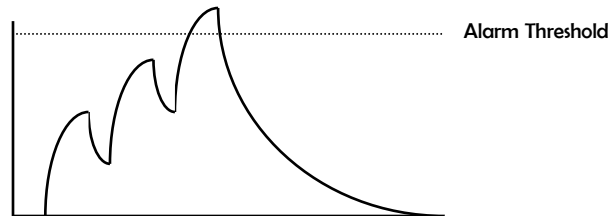


Pulse count detectors do not qualify the signal received. Any signal that exceeds the threshold is considered a pulse. There is no qualification made as to the size and duration of the signal. A pulse count detector will indicate an alarm condition if a number of pulses (typically 2 or 3) are detected within a set time period.

The DSC motion detectors also uses a threshold, but when a signal exceeds the threshold, the detector qualifies the signal by examining the size and duration of the signal. The pulse is used to charge a capacitor in direct proportion to the input pulse.



As an object moves through the coverage pattern, pulses will be received as the object crosses different focal points. Each of these pulses will increase the charge on the capacitor. If no pulse is present, the capacitor will discharge at a predetermined rate. If enough pulses are received, the capacitor will charge past the alarm threshold and the motion detector will violate (trip).

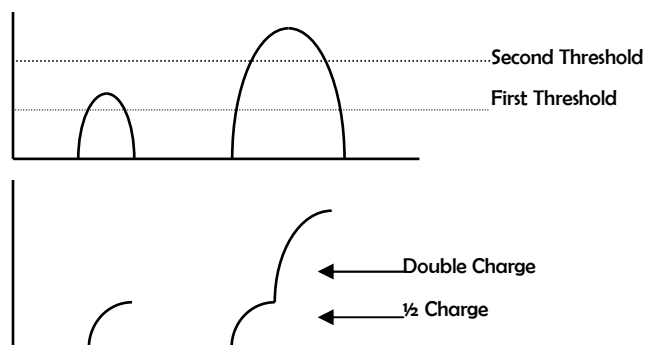


The number of pulses required to charge the capacitor above the alarm threshold will depend on the size and duration of the individual pulses. The capacitor will fully discharge within 10 seconds if no input pulses are detected.

To reduce false alarms created by environmental conditions, DSC introduced Multi Level Signal Processing. The first threshold is the same as before. It is used to filter out background noise and signals created by small temperature variations. The second threshold is used to identify and process questionable pulses, pulses that exceed the rejection threshold but are not large enough to be clearly identified as human movement within the coverage area.

The second threshold was set by analyzing data from a countless walk tests under varying conditions; different speeds, different clothing, different temperatures etc... If a signal exceeds the second threshold, it is either due to human movement in the coverage area, or a comparable temperature change created by some other condition.

To deal with these signals, the detector will only charge the capacitor at half the normal rate for signals that exceed the first threshold but not the second. To compensate for this, the detector will charge the capacitor at double the normal rate for signals that exceed the second threshold.



A PIR element will only create an output pulse when a temperature change is detected. The size of the output pulse depends on several factors, including the amount of temperature change. As the background or ambient temperature approaches that of a human being (approximately 88F), the output pulses from the PIR element will become smaller as the difference in temperature becomes smaller. Most PIR detectors will suffer a decrease in the coverage pattern as a result.

The DSC motion detectors incorporate temperature compensation to combat this. A thermistor is used to sample the ambient temperature and input this information into a microprocessor. The microprocessor then controls the amplification of the input signal using a predetermined algorithm or look up table.