

The Beginner's Guide to Motion Sensors



Introduction

A motion sensor (or motion detector) is the linchpin of your security system, because it's the main device that stays one step ahead of the burglars. Like something from Mission Impossible, motion sensors may use multiple technologies to detect movement in an area, sensing when someone's in your home. If a sensor is tripped, a signal is sent to your security system's control panel, which connects to your monitoring center, alerting you and the monitoring center that something's amiss at home.

This guide will answer all your questions about motion sensors: the different types, proper placement, and how to use them.



The Role of Motion Sensors in Your Home Security

Motion sensors stand guard, ready to alert you to all kinds of situations, such as movement in your living room, windows or doors being opened or closed, or a broken window. Motion sensors can:

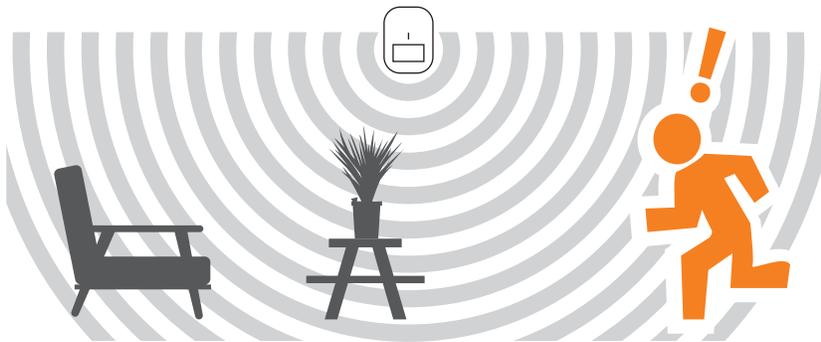
- Alert you when your teen breaks curfew
- Ring a doorbell when someone approaches the front door
- Alert you when kids enter restricted areas in the home, like the basement, workout room, or medicine cabinet
- Save energy by using motion sensor lighting
- Notify you if pets enter areas where they're not supposed to be

When it comes to choosing motion sensors, let your imagination run wild. Motion sensors can do so much more than protect your home from intruders. We'll go into the specifics in more detail throughout this guide. First, we'll talk about the types of motion sensors and how they work.

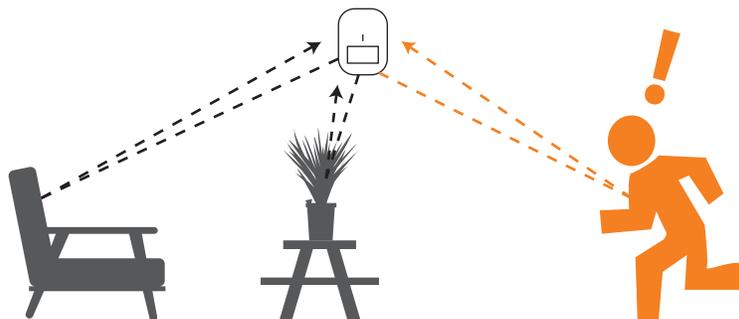
Types of Motion Sensors

There are two types of motion sensors: **passive sensors** and **active sensors**. Each uses different technology to detect motion in the designated area. Passive sensors do not emit energy, but read changes in energy in the surrounding area. Active sensors emit one of three kinds of energy to identify motion in the surrounding area: infrared light, microwave radiation, or sound waves. If you love detailed descriptions and technological language, read our breakdown of the different kinds of motion sensors below:

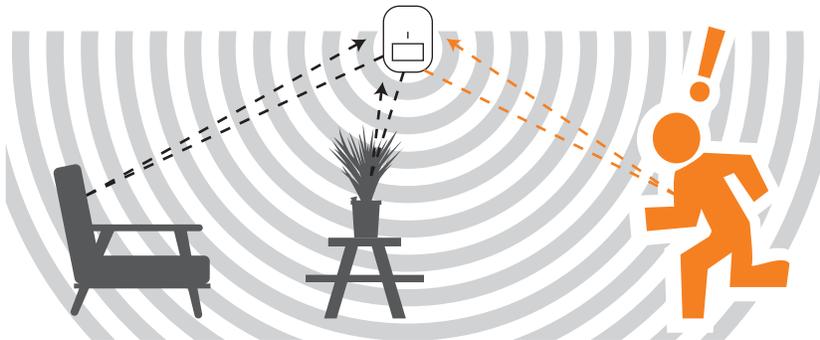
Passive Infrared (PIR): Detects body heat (infrared energy). Passive infrared sensors are the most widely used motion sensors in home security systems. When your system is armed, your motion sensors are activated. Once the sensor warms up, it can detect heat and movement in the surrounding areas, creating a protective “grid.” If a moving object blocks too many grid zones and the infrared energy levels change rapidly, the sensors are tripped.



MicroWave (MW): Sends out microwave pulses and measures the reflection off a moving object. They cover a larger area than infrared sensors, but they are vulnerable to electrical interference and are more expensive.



Dual Technology Motion Sensors: Motion sensors can have combined features in an attempt to reduce false alarms. For example, a passive infrared (PIR) sensor could be combined with a microwave sensor. Since each operates in different areas of the spectrum, and one is passive and one is active, Dual Technology motion sensors are not as likely as other types to cause false alarms, because in order for the alarm to be triggered, both sensors have to be tripped. However, this does not mean that they never cause false alarms.



Area Reflective Type: Emits infrared rays from an LED. Using the reflection of those rays, the sensor measures the distance to the person or object and detects if the object is within the designated area.

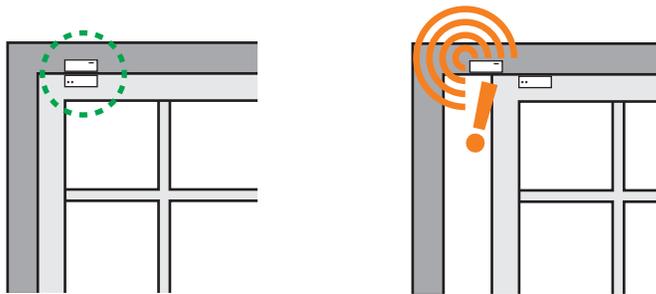
Ultrasonic: Sends out pulses of ultrasonic waves and measures the reflection off a moving object.

Vibration: Detects vibration. These can be purchased or easily made at home. A homemade vibration sensor uses a small mass on a lever, which is activated by a switch to an alarm when it vibrates. Homemade motion sensors can work, but they can also be unreliable.

Other Motion Sensor Features

Wireless Motion Sensors: Today, most motion sensors are wireless. Wireless sensors are very easy to set up. They do not require drilling, and they communicate with the other security system components wirelessly.

Contact Motion Sensors (door/window): Most contact motion sensors are passive infrared sensors. They trigger an alarm if the protected door or window is opened while the system is armed.



Pet Immune Motion Sensors: A passive infrared sensor can be set up to ignore animals up to a certain weight. A dual technology motion sensor is more resistant to false alarms caused by animals because it requires two sensors to be triggered in a manner determined by the manufacturer. They can be set up to ignore a large animal or multiple small animals without setting off a false alarm. Some sensors have a sensitivity level that can be adjusted for families with very active animals.

Video Motion Sensors: Combines video cameras with advanced signal processing. Some recordable motion sensors start recording when they sense motion. Cameras controlled by motion sensors can save you memory storage by not recording hundreds of hours of useless footage—they only capture the important stuff.

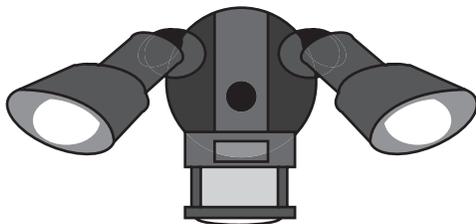
If that list of techno-speak has tired you out (or if you glossed over it), don't worry. Although the specifics behind motion sensors may prove interesting for the technologically savvy, all most of us really need to know is how motion sensors help us. Check out the next section to see what we mean.



Double-edged Motion Sensors

Despite their name, motion sensors have many uses besides just sensing motion. Motion sensors are often paired with other types of technology for a dual function that leads to all kinds of cool uses. Case in point: if you have a motion sensor paired with a security camera or a lighting fixture, you can program them to turn on only when motion is detected. Here are some examples of how motion sensors can be used with other technology for optimal security:

Motion-sensor lights: Motion-sensor lights are perfect for the outside of your home. When it's dark and someone's lurking outside your home, motion-sensor lights will automatically come on. This means you save money on electricity because you don't have to keep your lights on all night if you don't want to. Additionally, motion-sensor lights can be used inside your home, too. You can program your security system so that lights will come on when motion is detected to make it look like someone's home, to scare off intruders, or to brighten up a room to snag clear footage of an intruder on camera.



Motion-sensor cameras: You can set up your motion-sensor camera to only record when motion is detected, so you only have important events recorded and you don't have to sift through hours of unwanted footage. Many times, you can also set up your camera so that you receive an instant text or email alert if motion is detected, and you can view camera footage remotely from your smartphone or other web-enabled device.



Motion-sensor alerts: Motion sensors can be used for more than catching intruders. If you have monitoring with instant text or email alerts, you can set up motion sensors on medicine cabinets, liquor cabinets, gun safes, or other restricted areas, so if anyone tries to open a restricted area, you'll get a text or email alert. You'll never have to worry if your kids are getting into off-limits stuff without your knowledge.

Motion-sensor response: You can set up various responses when motion is detected—the sky’s the limit. Some people buy “fake dog” sensors, so that if motion is detected near a back door or garage, a recorded dog bark will start playing, hopefully scaring off intruders.



If you’re having motion sensors professionally installed, make sure to talk to your installer about equipment options for dual-technology sensors. If you’re installing yourself, consider all your options before ordering your equipment, and read our next section on how to set up motion sensors for best results.

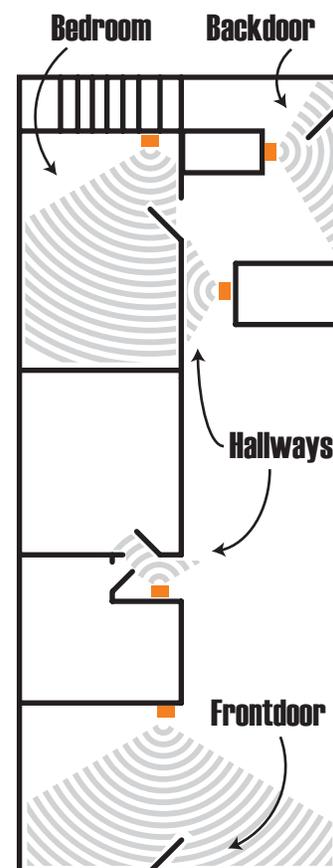
Best Practices for Mounting Sensors

If you choose a system that requires professional installation, the installer will set up your sensors for you, while you sit back and relax. However, if you go with a DIY home security system, you are responsible for setting up your sensors. Before you install motion sensors, make sure to read the installation instructions, since they will help you choose the best places to put sensors. Some DIY systems also give you electronic prompts or have you call a representative who will walk you through the setup process, so you're not alone.

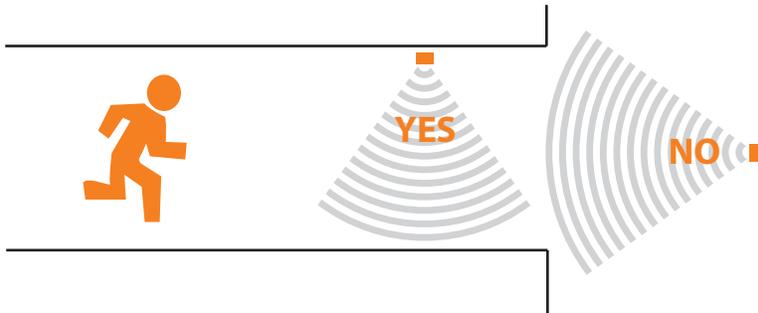
Keep in mind that despite the many awesome aspects of motion sensors, they aren't error-proof, and there are instances in which there could be false alarms. False alarms are usually caused by electrical failures, user error, poor application engineering, power surges, lightning, and faulty equipment. They can also be triggered by animals, insects, and foliage.

Reading instructional manuals is not usually considered the most entertaining activity, but the best thing you can do to increase the effectiveness of your sensors and prevent false alarms is to read the instructions that come with your sensors. Also, consider the following motion sensor placement tips:

1. Keep PIR sensors 10–15 feet away from heating vents, where the sunlight shines in, and radiators. If a motion sensor detects a swift change in heat, even that of a cloud passing quickly over direct sunlight shining into your living room, it could be tripped.
2. Place motion sensors at “choke-points”—areas where people have to walk through, like the stairwell or main hallway. That way, an intruder will trip the sensor regardless of where they are headed. Intruders usually go right for the master bedroom, so put a sensor near that room or other rooms where you have valuables, like the study.
3. Walk through your house and assess where intruders are most likely to enter, and what path they would take. Keep in mind that most motion sensors can detect between 50 and 80 feet. Most burglars enter the home through a front or back door, patio door, or garage door, so it's advisable to place the sensors near those areas.



4. Motion sensors work best when the intruder walks parallel to the sensor, not toward it. For example, in a hallway you tend to walk parallel to the walls, not directly toward them. Find walls that an intruder would walk alongside, like a hallway or narrow pathway that leads to a room.



If you have any questions while installing your motion sensors and you got your equipment from a security company, you can always call customer service. Most DIY installation security companies also walk you through a process to test your equipment.

Conclusion

Motion sensors have a wide variety of uses, and it's good to know your options before deciding on which ones to use in your home. For more information on security systems or if you have any further questions about motion sensors, visit us at www.safewise.com or email us at info@safewise.com. Good luck with your motion sensor search!

About SafeWise

At SafeWise, we're on a mission to help make your home and community safe. We save your time and sanity through our resources and honest reviews of safety and security products—so you can quickly and easily get the information you need to protect yourself, your family, and your community.

Check out [Safewise.com](https://www.safewise.com) for more details on specific security companies and to compare security companies side-by-side.



safewise 

Copyright © 2013 SafeWise