

Comparison of Watt Stopper's Patented Dual Technology Sensor vs. Microphonics

Overview:

The following describes the misconception and disadvantages of the Microphonics technology when used to compare against a Dual Technology sensor that incorporates both Passive Infrared (PIR) and Ultrasonic technologies combined together.

History:

Watt Stopper introduced the Lighting Controls Industries first Dual Technology sensor back in 1991. Watt Stopper's model DT-100 revolutionized the market. It combined the best of both worlds into one platform to deliver the most effective Motion Detecting sensor the industry has ever seen. This was accomplished by taking two Motion Detecting Technologies, and combining them. The combination of two Motion Detecting Technologies allowed a user to install a single motion detector in spaces where two had traditionally been used previously.

Today this combination of Motion Detecting technologies is the choice of the industry's top Specifiers as they have come to realize and appreciate the value to their clients with enhanced performance and maximum energy savings by making sure that lighting loads are switched off when a room or area becomes vacated.

Explanation of Passive Infrared:

Passive Infrared is a Motion Detecting technology that "looks" for changes in background temperatures. Example: a person walking in a room has a body temperature of 98.6 give or take and as that person walks, the Passive Infrared technology compares the 98.6 to the background temperature of the wall which might be approximately 72 degrees. Understand that the source of heat **MUST** be moving against a cooler background. It requires heat and motion to activate. This is how the sensor eliminates false activations. You must first have heat and then you must have motion. Why motion? Without the motion requirement, the sun shining through a window onto a desk top might be seen as a warm item in a room and switch the lights on. Now with the motion requirement, only until that warm item then begins to move, will the sensor allow the lights to be switched on.

Infrared detects motion best when a sensor is in front of you and you are making left to right or right to left motions.

Explanation of Ultrasound:

Just like Passive Infrared, Ultrasound is a Motion Detecting technology. Where it differs from PIR, Ultrasound is an active technology as it generates a High Frequency Signal that is transmitted into the space to seek out motion. As motion is detected, the motion changes the return time of the High Frequency signal and validates that a room or space is still occupied. The advantage of Ultrasound is that it can detect the presence of people that are not in direct line of site such as in cubicles or around corners or even in restroom stalls. Ultrasound is also unique in its ability to detect hand motion, whereby Passive Infrared is better at detecting arm or full body motion. This is a true advantage over other technologies.

Ultrasound detects motion very well with forward and back motions.

Watt Stopper Dual Technology Sensor with Passive Infrared & Ultrasound

Watt Stopper is credited with the development of the most effective Dual Technology sensor on the planet. Our patented Dual Technology sensor has become an industry standard and many manufacturers have raced to introduce their own version. The true advantage was taking two proven Motion Detecting technologies and combining them together in a single Motion Detector. This combination provides unmatched performance in occupant detection to ensure activation of lighting or other systems when a room is occupied. It also ensures that energy savings will be maximized by switching off lighting loads when the room is vacated. Unlike all other brands, The Watt Stopper Dual Technology sensor requires both technologies to be satisfied before allowing lighting loads to be switched on. This is how Watt Stopper solved the false triggering typically associated with single technology sensors or other dual technology sensors on the market that only use PIR to trigger the lighting. Additionally, should you encounter an issue of some sort in the space, the Watt Stopper Dual Technology sensor logic can be reconfigured on the spot to overcome the source of interference.

Ultrasound vs. Microphonics

In a white paper that was introduced recently that compared Microphonics to Ultrasound, the author makes many assertions about false tripping associated with Ultrasound. Of course they want you to believe that Ultrasound cannot be used successfully in a space. Ultrasound was the first technology ever to be used in a Motion Detector for the control of lighting and has been in use successfully for some thirty plus years. If it were really such a problem, why

then is it used by all the major Motion Detector manufactures in the lighting controls industry with one exception. Take a guess !

Understand that any sensor utilizing any technology by any manufacturer can be installed in such a way that causes false tripping. This was more prevalent going back a few years. Today, most manufacturers have done a pretty good job at education in the proper use and installation of these products. Yes you can still have a situation that can cause a false activation but it cannot be limited to an Ultrasonic Motion Detector as this white paper would have you believe. As an example, the author suggests that Ultrasonic sensors will turn on the lighting every time the air conditioning switches on. Well, it is possible especially if you don't read the installation instructions that are furnished by the manufacturer. The rule of thumb is to maintain a distance of four to six feet from an air supply register whenever possible. Put a Passive Infrared sensor right next to an air supply register and the same can be said about false triggering.

We all appreciate the effort that the author goes through to make us aware of the short comings of Ultrasound even if there is some embellishment of the facts. But what I don't understand is why he fails to mention why the installation instructions of the Microphonics units instruct you not to place the sensor near an air supply diffuser (*see addendum highlighted area for detail*). This one is very troubling because in the white paper we are told that the Microphonics unit is self adapting and only listens to leading edge noises filtering out background noise. Hmm. So which one is it? Is it affected or not? The instructions say that the sensitivity will be reduced by the background sounds of the HVAC diffuser. Doesn't that mean that this unit will also false trigger because it cannot "hear" you? Also as the author indicated the sound level of their products is not field adjustable, whereas ultrasonic sensors typically are. Therefore the only solution they have to address false triggering is to relocate the unit, which is much more labor intense than making a simple field adjustment on the unit to the sensitivity level. The author would have been well served to read his own installation instructions prior to putting pen to paper and creating this document.

There is also some discussion about the Ultrasound leaving the space and detecting occupants in an adjacent hallway. Here again, proper placement would not have the sensor installed so close to an open door that the signal travels beyond the intended area of control. The signal from an Ultrasonic sensor actually dissipates in the air over distance and diminishes in intensity as it "bounces" around the room. Very similar to a ball in travel as it strikes the banks on a pool table. For the record, a Passive Infrared sensor will also detect occupants in an adjacent hallway if it is placed too close to an open door.

There are many comparisons to Ultrasound and how Microphonics eliminates the false activations. Actually, even if we were to believe the claims made, the comparison is somewhat flawed. After all, they are comparing their Dual Technology product up against a single technology Ultrasonic product. They are careful not to conduct a head to head comparison to Watt Stopper's Dual Technology sensor. They go on to say that that the microphone portion of their sensor cannot turn lights on by itself. I find this interesting because there is much effort made to convey a message of superior technology. The unit is tuned to "hear" the types of noises that humans create and ignores building noises. I question this claim and ask myself these questions:

- 1) If the microphone is tuned to only hear human noises, why then is it not capable of being used as a stand along technology like Ultrasound? Why must it be used only when paired with Passive Infrared?
- 2) If the microphone is tuned to hear human noises, does that not also raise the very concern that was previously mentioned about detecting occupants in an adjacent hallway? How does the microphone know to disregard the other human noises in the hallway? And when this technology is installed in a wall switch version, is it now installed within inches of an open door and much further away from the human noises that it should be listening for?

Wasted Energy

It seems at least on the surface that there is a huge potential for extended energy waste by a product that might just hold the lights on well after the room has been vacated due to hearing similar human type noises from adjacent rooms or hallways.

There is a mention of "potential interference" with white boards or hearing aids "if sensors are outside of appropriate frequency band".

The Lighting Controls Industry has been using Ultrasound as one of the accepted technologies for over 30 years. The frequency band ranges from 22 kHz to 40 kHz. This is the range that ALL lighting controls manufacturers use and have since the inception of the product. Ultrasound is a stable technology platform and once installed, requires very little to no maintenance. They rarely if ever go out of spec so once again, the author would have you believe that these units are not reliable. If there is a report of a clash of technology with white boards, it is typically do to a whiteboard that operates on Ultrasound that has ventured into the lighting control industries frequency band. This is the same technology by the way that the author is trying so hard to convince you to avoid?

Remember, white boards are new to the market. The sensors however have been around for 30 plus years. There are many whiteboard manufacturers out there but only one that we are aware of that has ever reported an issue. If you are using a Watt Stopper Dual Technology sensor, you can rest comfortably in knowing that we can work with any whiteboard currently on the market. A simple logic change will solve any concerns. That's why the Watt Stopper's Dual Technology sensor is the industry favorite. It can be adapted to just about any environment.

Should the concern be a hearing aid, it is typically the hearing aid that has fallen out of spec and not the sensor and quite frankly, that was years ago. Today the hearing aid manufacturers are producing products that are more reliable and fall more in line with the human hearing range so reports of widespread issues with hearing aids are simply one lighting controls manufacturers attempts to distort the facts. Reports about white board issues are rare and hearing aids even rarer.

Summary:

The white paper tries to instill a sense of concern in the minds of those that may read the document. The author would also have you believe that Ultrasound is an inferior technology when in fact it is superior to that of an inexpensive microphone when it comes to occupancy detection.

You should understand that the Dual Technology sensor by Watt Stopper revolutionized the industry by bringing to market the most effective motion detector ever developed. There is at least one manufacturer however that hopes that customers like you do not know what they are getting when they ask for a Dual Technology sensor. Most customers assume that they are getting a product that has Dual (two) Motion Detecting technologies. If you specify a Dual Technology sensor that utilizes both Infrared and Ultrasound, you will get what you were expecting. If however you end up with a Dual Technology sensor that only utilizes a single Motion Detecting technology coupled with a microphone, you have to ask the question why.

After all, why would you want something that does not use Dual Motion Detecting technologies in a product that is called a Dual Technology MOTION DETECTOR !

Addendum: