SECURCOM
TECHNOLOGIES INC.

# How Motion Detection Cameras Work

Motion detected recording is a feature on all our DVR recorders. The DVR monitors camera images and decides when it thinks there is movement. To do this the DVR looks at individual image frames and compares them to the previous one. If it sees differences, then motion is assumed to have taken place. It is the DVR not the cameras which is looking for movement.
Monitoring your data centers and building access points with CCD cameras can represent a boon to your overall security, but you need to know a little about camera terminology to make the best use of them. Don't think about "aim and shoot" when you think about these cameras. Think, instead, about how you might go about detecting motion in a series of still images.

First off, let's examine the term "CCD". This stands for "charge-coupled device". A CCD is a silicon chip with a surface that is divided into light-sensitive pixels. When light hits these pixels, tiny electric charges are generated. With enough of these pixels, you can get a fairly high resolution image. With adequate "sensitivity" (a term to be defined further down in this article), you can detect motion even in a dimply lit room.

Initially designed as a memory device, CCD became a good choice for image sensing because of its ultra sensitivity to light. Astronomers used the technology because it was as much as 100 times as sensitive as film and allowed previously invisible objects to be viewed.

Digital cameras can use CCD or CMOS (complementary metal–oxide–semiconductor) circuitry. However, CCD produces higher quality images. Thus, security cameras generally use CCD technology.

The difference between digital cameras and security cameras is in their basic way of working. Digital cameras store images when you tell them to. Security cameras only provide images (save and transmit them) when they detect motion. And motion detection is basically the process of comparing sequential images and determining whether the differences between them represent motion. If there are significant differences between two consecutive images, the cameras "conclude" that there has been motion within the camera view. They do this based on a couple important settings -- sensitivity and percentage.

Most, if not all, surveillance cameras will give you the option of selecting a particular area within the viewing screen to be monitored. In other words, you can say that you only want to detect motion in one area -- say the door or window.

There are two types of image changes that can occur. We can have an overall change in the pixels as we would if the lights in the room went on or off. If the room has windows through which incoming light will enter, you probably don't want to generate motion detection photos just because the sun is setting. So, you can select a "sensitivity" setting that provides a contrast setting and determines how much of a change should be reported.

You can also select how much of a change in your overall viewing area or within one or more sub-areas of interest represent motion. Maybe you want to detect a man-sized change -- something that affects 50% of the pixels in an area of interest, but you don't want to respond to a mouse running across the floor.

Setting the sensitivity and percentage settings on cameras in your data center or office space can be time-consuming. After all, you want to know when something or someone is moving through your space, but you probably don't want 300 images every time someone walks through the door. Similarly, you probably don't want to be looking through shots of your office space every time a light goes on or off or a fan blows the drapes. Generating too many images can be as bad as generating too few because people will stop looking at them. Setting up your cameras to detect what you want to know about and nothing else is nearly impossible, but you can probably strike a balance that has you looking through mostly at things that matter and only half or a quarter as many "false positives".