



CCTV Basics

CCTV is now the fastest growing sector in the Security Industry. In the past it was assumed by many that CCTV was either too complicated or too expensive and therefore was not something we in the traditional burglar alarm business should get involved in. Also there was reluctance on the part of the customer to utilise CCTV. Early systems often did not deliver the result promised and there was concern with regards to privacy issues. Over the years CCTV equipment has become far more affordable and simpler to install. Properly designed and installed systems can now provide results beyond the customer's expectations and CCTV is now an accepted, even desired, component of security. In places such as banks and jewellery stores CCTV is now mandatory in order to get insurance cover.

To design and install quality, effective CCTV systems we need to understand a few basic principles. The most important thing to remember is CCTV does not "protect" anything. A CCTV system is a visual assessment tool used either during or after the fact. Never lead your customer to believe he will be protected by the system you are about to install. The presence of CCTV may deter a would-be perpetrator and/or help identify the suspect. But it does not provide protection.

Before you can begin to design a CCTV system you must spend time with your customer and understand fully why he wants a CCTV system and what he expects it to do for him. A requirement like "I want to view the parking lot" can mean many different things. Does he just want to see if the lot is full and it is time to put up the "Lot Full", sign or does he want to be able to read the licence plates of the individual vehicles at night in colour? If you understand his needs you will then be able to provide the correct system to meet his expectations. More often than not the customer's expectations far exceed his needs and in discussion, the true requirement can be determined. These meetings will help decide on the number of cameras required to do the job, where they will be placed and which lenses will be required.

Probably the most common mistake made is the use of too few cameras. The customer often tells us that he wants one camera in the corner to view the whole area. We can easily achieve this by using a wide-angle lens which will display from wall to wall. But in order to cover this wide area we lose all detail. Anybody in the picture appears as a small object and we cannot make out whom it is. If the customer wishes to tell who is in the room we will need two, three or even more cameras, each with a narrower lens covering a smaller area so that the person appears larger and in more detail. The human eye is a marvellous thing. At any one time we can see things in the foreground, middle ground and background. In order to achieve the same amount of information from a CCTV system we would require about 9 cameras.

So we can now see that the number of cameras used with the correct fields of view is of prime importance. It is of no value to offer the latest and greatest high-res., low-light, colour camera if the object is just not seen. The actual amount of visual information that you end up with is determined by the lens and the angle of view, not the camera. No amount of digital enhancement with today's digital video recorders can reproduce an image that was not recorded in the first place.

The majority of cameras in use today are 1/3rd inch CCD although many of the integrated dome cameras may be 1/4-inch or even 1/8-inch. Let's consider the 1/3-inch cameras. An 8mm lens can be thought to provide a "standard" view, which is closest to that which you would see if you stood where the camera will



be. We are often asked to read license plates or identify someone. Practical experience has shown that to achieve this satisfactorily we should restrict the view to just 15 feet across. Anything wider and we lose the ability to read the plate or identify the person. A “standard” 8mm lens at 25 feet out provides a horizontal view of 15 feet, good enough for our needs in this case. At 50 feet out the 8mm lens will show 30 feet across and we will no longer be able to read the plate. The important factor is the width of view, not the distance from the scene. Simple math shows that a 4mm lens at 12.5 feet out, or a 16mm lens at 50 feet out, provides a 15-foot view, etc.

Proper lens selection together with the correct quantity of quality cameras is the key to satisfying your customer’s needs.

Editor’s note. Since this article first appeared we are beginning to see the introduction of megapixel cameras. These cameras, together with the new analytical software available, have revolutionized traditional CCTV thinking. With time, as these megapixel cameras become more readily available and more affordable, we will experience a shift away from traditional analog cameras to this new technology. But at time of writing the vast majority of CCTV installations are still utilizing analog cameras. Whichever technology we use, analog or megapixel, we still need to understand and meet the customer’s expectations. Technology does not replace the personal communication with the customer nor the importance of providing the correct solution to meet his needs.

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