

Considerations When Selecting A Camera

B/W or Color?

Until recently B/W cameras accounted for the majority of the CCTV market. Their combination of high quality and low cost made them the obvious choice for system's use. They offer high resolution of between 400 to 700 lines, and low light sensitivity of .02 lux or better. They are also automatically IR sensitive for use with supplemental or existing sources IR lighting. They are priced lower than color cameras but their cost savings do not stop there. The support equipment used with B/W cameras costs considerably less also. For example a B/W multiplexer costs less than a color version. The same cost comparison could be made for B/W vs. color quad splitters and monitors. Generally speaking you can put together a high B/W CCTV system that will remain trouble free for years to come at a free price.

Color equipment has recently made tremendous advances. The cameras now range from moderate 350-line resolution with 1 lux of sensitivity to 550 lines of resolution with .03 lux of sensitivity, many color cameras are classified as day/night allowing them to give you good color pictures by day, and then switching to a high quality B/W picture at night. Color cameras can now be IR sensitive, a feature that was unheard of not too long ago.

In addition, DSP (digital signal processing) has made color cameras easy to use while taking many of the cameras (and decisions) away from the installer. On the price side color cameras have been coming down in cost along with their associated support equipment like multiplexers, quad splitters and monitors. Items like DVRs and VCRs don't care if a camera is color or B/W so the cost of these items remains constant. A color system today will still cost about 30% more than a similar B/W, but to many people it is well worth it to see color images, like they see on their home TV sets. Just remember that color is less forgiving than B/W. A marginal installation that displayed a great B/W picture may not stand up to a color signal.

Incorrect cable, connectors, splitters and power are just some of the items to watch out for when going color.

Resolution and Angle of Coverage

Resolution refers to a camera's ability to see detail, while the Angle of Coverage deals with how much area is being placed onto the monitor for viewing. Normally we think about these two specifications separately, but when designing a system it is best to combine them. The highest resolution camera will not be able to identify a person's face if the camera is watching an area 100' in width, whereas the lowest resolution cameras will give you facial identification if the camera is only viewing the width of the doorway. Always try to match the covered area to the surveillance objective. If you are asked to cover a large parking lot there is no set formula to accomplish this. You must find out what your customer expects the camera to see. A single normal resolution camera can show a large parking lot if the objective is to see how crowded it is. A single high-resolution camera will add some detail to the scene and begin to show certain details of the cars and the people walking around. Multiple cameras, each showing smaller areas of the parking lot will be required if you want details of what the people are doing and what they look like. Speed Domes offer the ability for a single camera to cover large areas with varying amounts of detail. They accomplish this by panning, tilting and zooming either under operator control or through pre-programmed sequences. The drawback of Speed Domes is high initial cost and the fact that they can only watch one area at a time, leaving other areas vulnerable.

How far will the camera see?

A camera will see to infinity. If you point the camera towards the moon, it will see it. What the customer really wants to know is how far the camera will see with clarity. It is your job to find out the distance and width that the customer needs to see. Do they want to recognize a face or see if a large truck is in the parking lot? This will determine the mm of the lens and the area of coverage. These are various methods for determining what size lens to use in various circumstances, including lens wheels and computer programs. Here is a short summary of coverage for the most popular lens sizes.

Angles (in degrees) of select lenses on 1/3" and 1/4" format cameras

	1/3" Format				1/4" Format		
<i>Lens mm</i>	<i>Horizontal Degrees</i>	<i>Vertical Degrees</i>	<i>Diagonal Degrees</i>		<i>Horizontal Degrees</i>	<i>Vertical Degrees</i>	<i>Diagonal Degrees</i>
2.5 mm	90	72	101		65	51	85
2.9 mm	80	64	92		57	44	77
3 mm	77	62	90		56	43	75
3.6 mm	67	53	80		47	36	65
4 mm	63	48	74		43	33	60
6 mm	44	33	53		29	22	42
8 mm	34	26	41		22	17	32
12 mm	23	16	28		15	11	21
16 mm	17	13	21		11	8	16