By Les Simmonds

Megapixel Camera Lenses and Image Quality

Recently I have been voicing concern about the quality of some lenses being used and/or proposed for use on megapixel cameras. In addition to this, I also found that there are some very poor performing megapixel cameras out there with new, and potentially confusing, vices.

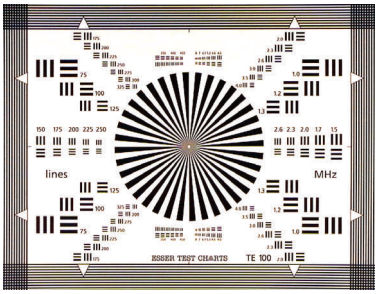
It has been known for some time that normal CCTV lens resolution varies between 350 TVL and 480 TVL (notwithstanding a few variations to this). In basic terms, the higher resolution is about half the resolution you would expect from a 1.5 megapixel camera. So, you don't have to be Einstein to realise that standard CCTV lenses are not an option if you want performance equal to the megapixels you have purchased.

Unfortunately, most sellers of megapixel cameras are selling "pixels", not "image quality". They may, or may not, be aware of lens and camera quality issues. So buyer, beware!

The major CCTV lens manufactures are now supplying megapixel lenses but, in most cases, they are not stating how many megapixels a particular lens is manufactured for. There would be a great difference in the quality of a lens manufactured for 1.5 megapixel cameras and a lens manufactured for 5 megapixel cameras. So the major CCTV lens manufactures might be a reasonable place to start, but try to get a statement of how many megapixels the lens is actually manufactured for.

One of the major lens manufacturers who give you the right information is Fujinon. They currently offer a manual iris/fixed focal length range of 1.5 megapixel and 5.0 megapixel rated manual iris lenses, which originate from machine vision applications.

Also, Fujinon is currently testing a prototype vari-focal megapixel lens for CCTV applications. However, Fujinon will not be releasing this product until they are satisfied that the nominated resolution is provided 'right across' the image.



Many of the camera manufacturers have given no consideration in their design of their day/night dual CCD megapixel cameras to the substantial optics required to provide 5 megapixel resolution at the CCD. The 'night' CS mount in these casings is physically too close to the 'daytime' CS mount for the physical size of a quality 5 megapixel manual iris lens and the interference of any auto iris motor appendage is another consideration that is sometimes forgotten.

The ability to digitally zoom in on previously recorded data has advantages in certain applications, but the images we are sighting, replicating longer focal length equivalents, are still no match for the sharpness of a quality zoom/telephoto lens and normal CCTV camera combination.

Some of the megapixel camera manufactures are also supplying lenses they manufacture themselves which are fixed to the camera. This is a bit like going to your local basket weaver to repair your car. So this might not be a good option.

Other matters for concern with some megapixel cameras are:

- The alignment of the chip and lens - (this can be lens position, or lens and chip not being parallel).

- CS lens mounts not being the correct distance from the chip – (this makes it very difficult or even impossible to set back focus on a zoom lens).

- Some of the megapixel cameras being offered are really machine vision cameras without IR filters over the chip as is the case with CCTV cameras – (image quality will be very low and at dusk and dawn (high IR periods) the image might even bloom).

Additional issues are network bandwidth and image storage, but they are another story, for this article we will stay at the camera end of the system as there are enough problems there.

There is no doubt that megapixel cameras with appropriate lenses are suitable for some CCTV applications, but the poor results of several trials I recently witnessed cause me to believe that sellers, or specification writers, or end users may not be aware of the potential lens problems, and the displayed vices, which appear with certain megapixel cameras and applications.

There is a place in the CCTV industry for megapixel cameras and the applications for them will certainly grow, but there is no doubt that good quality normal CCTV cameras have plenty of life in them yet for the majority of CCTV applications.

When I get time I will be using my many years of professional television experience to carry out detailed tests on megapixel cameras and the lenses used for such and then publish the results in SE&N. Current indications are that you can expect some real fireworks then.

Les Simmonds is an independent CCTV consultant.

Email:
les@cctvconsultants.com.au

Web:
www.cctvconsultants.com.au

This article was originally published in Security Electronics and Networks Magazine Australia.