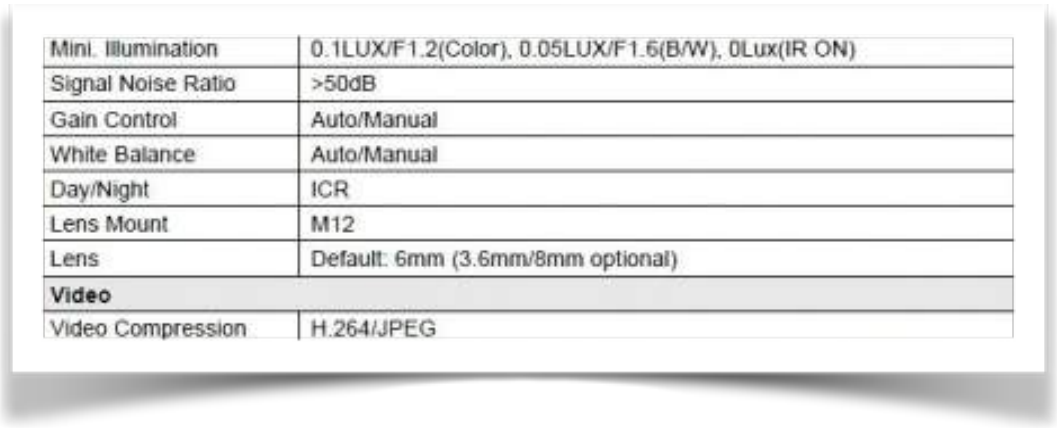
Camera Performance

Seeing Past The Datasheets



Mini. Illumination	0.1LUX/F1.2(Color), 0.05LUX/F1.6(B/W), 0Lux(IR ON)
Signal Noise Ratio	>50dB
Gain Control	Auto/Manual
White Balance	Auto/Manual
Day/Night	ICR
Lens Mount	M12
Lens	Default: 6mm (3.6mm/8mm optional)
Video	
Video Compression	H.264/JPEG

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Introduction

It is important to remember, when weighing up the purchase of a video surveillance camera, that the value of any solution is about more than just the number of features listed on the back of a product datasheet.

Whilst on the surface a succession of bullet points may appear to add-up, unfortunately, camera manufacturers are not always on the same page when spelling out the detail of these capabilities.

This 'performance disconnect' has all too often frustrated users with cameras which simply don't fit the bill. Rather than taking camera datasheets at face value, it makes sense to dive under the surface and ask questions regarding true camera performance, particularly in three key areas:

- **Low Light**
- **Wide Dynamic Range**
- **Video Compression**.

Low Light Performance

Take four cameras from four manufacturers. Compare the sensitivity section in the data sheets. It's likely all four will have very similar values: performance down to 0.05 lux. What camera manufactures don't tell you, is that most cameras are not tested with standard settings for low light performance. That translates to the four cameras giving completely different video performance results in real life, in the same light conditions. Yet they are all the same in the data sheet!

Another factor when it comes to low light performance, a significant trend has been the move to have cameras maintain their colour mode, even at night. The downside, which vendors don't tend to mention in their datasheets, is that staying in colour mode can result in more noise, lower detail, and object blurring under high motion due to low shutter speeds.

Standard HD Camera

IndigoVision Ultra Camera

Given the potential pitfalls, there is a strong case for adopting a camera which automatically goes to black and white at night, for example in a pitch black - 0.1 lux - scenario. With the drive for higher and higher resolution in cameras, without low light performance being handled correctly, there are more and more cases where sites have upgraded to HD (High Definition) cameras only to discover when night falls that - thanks to the levels of noise generated – the resulting images are no better than those from the SD (Standard Definition) cameras they replaced.

Digital Zoom

Standard HD Camera

Digital Zoom

IndigoVision Ultra Camera

Wide Dynamic Range

Alongside low light performance, another feature where it pays to venture beyond the information in a datasheet is WDR (Wide Dynamic Range). WDR was developed to allow cameras to cope with a mixture of very bright and very dark areas in a single scene. The result of good WDR is high image detail in both dark and bright areas.

Although WDR should bring better quality video, it is actually tricky to implement. WDR performance is dependent not only on the quality of the sensor being used but, crucially, the associated video processor. Time and again, WDR is an area which proves the point about not relying too heavily on headline figures. It is perfectly possible, in this context, for two cameras to have the same specifications on paper and completely different results when installed.

Issues to look out for with some types of WDR include: overexposed washed out images so it is difficult to identify detail, colour smearing, and edges that are too sharp due to over-processing.

Digital Zoom

Digital Zoom

Standard HD Camera

Digital Zoom

Digital Zoom

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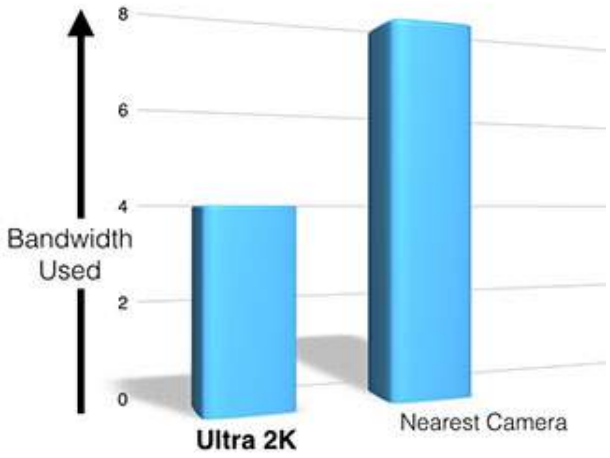
Video Compression

Another aspect which requires further investigation is video compression. As camera resolutions have now increased to HD, so has the levels of video data - or bandwidth - being generated by cameras. Video compression performance is vital in keeping a lid on network bandwidth and IP video storage costs - bad video compression performance equals high bandwidth on the network and higher storage costs.

H.264 is one of the most commonly used formats for the compression video content and is widespread in video security cameras. It is a standard that provides a number of “tools” that will compress video to a standard format for distribution over networks. What “tools” a manufacture implements is down to how good the processor is on the camera. The better the processor, more “tools” will be used which will result in lower bandwidth for the same quality video. As a result, when we talk about video compression performance on a datasheet different cameras will say use H.264 video compression but you will find they deliver completely different results in bandwidth and storage utilisation.



The roll-out of so-called 'Smart H.264' is also something to factor in. This dynamically adjusts video encoding parameters, based on the video content, so the video quality may be reduced in areas which are not of so much interest or at certain times of the day. A case in point here is our ACF (Activity Controlled Frame-rate) whose first iteration appeared nearly a decade ago. ACF is a unique IndigoVision camera technology meaning storage requirements are reduced by up to 90%, without compromising video quality.

Summary

To conclude, the upshot is that camera datasheets should definitely be treated with caution. They can be a starting point in the search for a solution, but the fact is that, time and again, laboratory and field testing have demonstrated that the implementation of features vary widely from camera-to-camera, whatever the impression that might have been given by their respective datasheets.

So when it comes to Low Light, Wide Dynamic Range and Video Compression performance ask the manufacturer for real life examples on how their cameras perform. That way, you will be better prepared against poor camera performance.