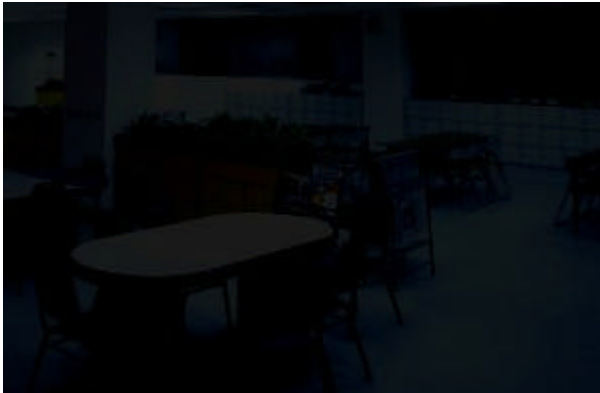


WHAT DOES THE LUX VALUE MEAN ? WHAT ARE YOU REALLY PAYING FOR ?

Q: What is Minimum illumination? What is Sensitivity ? What does 0.0001 lux stands for.

A: Minimum illumination is a way to measure the sensitivity of a camera. It is used to determine how low can the illumination be and still produce a useable image. This value has been widely misinterpreted and misstated as there is no industry standard for describing lux values. Each major CCD manufacturer has their own way of testing the sensitivity of their CCD cameras.



Not a useable picture - but specs are sometimes represented that would effectively produce this type of an image.



A useable picture, with well stated and documented specifications would allow you to determine the results you want to achieve and to decide if that is the camera for you.

The most effective and accurate way to measure minimum illumination is called target illumination. Target illumination tells us how much light is actually received by the imaging plane of the camera where CCD surface is located.

Although the definition is clear, there are three major parameters which will dramatically change the result of the measurement.

PARAMETERS FOR DETERMINING ACCURATE AND TRUTHFUL LUX RATINGS

F stop - F stop of the lenses used for the camera under test conditions - *often this will be the only number stated and does not give a true indication of the actual picture*

that would be reproduced using the stated specifications. F stop is the parameter used to measure the capability of a lens to collect light. A high quality lens can collect more light and therefore direct more light to the CCD sensor. A lens of F1.4 will collect 2 times more light than a F 2.0 lenses. A F/1.0 lenses will collect 100 times more light than a F/ 10 lens. It is important to specify the F stop of the lenses used during the test, or not the reading will be useless.

Color temperature - Color temperature of the light source is also known as the spectral range. - Color temperature is the parameter used to express the spectrum output from a light source. A light source of 3200K contains mostly spectrum around 600nm to 900nm, and a light source of 9300K contains mostly spectrum around 300 to 500 nm. Different color temperatures will alter the testing result. The SONY HAD CCDs fall in the visible range, whereas, the new EXView now has extended sensitivity in the IR range. It will depend upon which range you are measuring as to how this will effect sensitivity.

IRE - IRE level of video amplitude. This is probably the least stated specification but will also have a great effect on the final image. Maximum amplitude of video output from a CCD camera normally should be set at 100 IRE or 700mV. **A video in 100 IRE means that it will fully drive a monitor to expressed best image with best brightness and contrast.** A video with 50IRE means that the final image will have only half of the contrast. A 30 IRE means that the final image will have only 30% of original amplitude (210mV) and only 30% of the contrast and brightness needed to produce the best image. It is generally accepted that a 30 IRE is a minimum value for a meaningful image.

Automatic gain is often used to boost the IRE but this results in additional noise. An automatic gain camera will have noise level on 10 IRE while AGC kick up to max gain, hence will provide 3:1 (3 x 10IRE) or 10dB S/N ratio. A camera measured under 10 IRE will **appear** to be 10 times better than measuring read under 100 IRE. **So a reading without defining IRE level is actually useless.**

Reflection ratio - Reflection ratio of the object and its background. This number is often much less stated compared to the other three parameters which are more essential. But is described here to show that the actual object used for testing can have an effect on the results.

Reflection ratio of the object and its background will significantly alter the measurement and the final image. An object with 100% reflection rate will generate 100 times more light on target plane than an object with 1% reflection rate. This could be compared to imaging a white sheet of paper and then imaging a black sheet of paper. The white paper will reflect back much more of the light than the black paper.

HOW ARE THESE PARAMETER DESCRIBED?

ASTROVID 2000	ASTROVID STELLACAM	ASTROVID STELLACAM EX
F Stop (F) , Color Temp, (K) IRE, LUX	Planetary- F/1.2, 5600K, 30 IRE 0.01 lux	Planetary - F/1.2, 5600K, 30IRE 0.005 lux ,
F/1.2, 5600K, 30 IRE, 0.01 lux	Integration mode - F/0.8 , 5600K, 10 IRE 0.0001 lux	Integration Mode - F/0.8, 5600K 10IRE 0.00005 lux

FINALLY, If you see specs for camera that appear to be much better than other cameras, especially when those specs are stated in cameras that are much less expensive than other cameras, they are most likely questionable and have been overstated.

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