

Tips on Creating Awesome Night Vision Digital SLR Photos



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Today's digital SLR cameras offer the photographer full control of aperture, shutter speed and ISO settings enabling the capture of excellent usable images in low light that were not otherwise possible. However, in many situations such as photographing scenes at night with very little ambient light, or telephoto photography at night at a distance, even the best digital SLR cameras simply do not have sufficient sensitivity to capture adequate images. In these situations, night vision modules such as those described here are the ideal accessory. This article provides important guidelines for producing awesome night-time photos when using a night vision module-enabled digital SLR camera.



By adding a night vision module to a digital SLR camera, night turns into day. Follow these guidelines to assure the best possible image quality.

Because of the increased availability of high performance digital SLR cameras, capturing excellent photographs at night is now easier than ever. With full control of aperture and shutter speed settings as well as electronic gain (ISO), the photographer has the opportunity to capture images in low light that were not otherwise possible.

However, in many low-light and night-time situations, digital SLR cameras simply do not have sufficient sensitivity to capture adequate images. For one thing, with the ever-decreasing size of pixels, it's remarkable that light sensitivity has not substantially worsened with each new generation of camera (since light sensitivity is directly proportional to detector pixel area). But, fortunately, there's been a lot of camera development on noise reduction so sensitivity has kept pace if not improved slightly with the decreasing pixel area. Regardless of these changes, it remains that a sufficiently long exposure time cannot be used because either there is movement in the scene or the camera is moving (by being handheld or on a vehicle in motion) so long exposure times would result in blurring. For situations such as photographing scenes at night with very little ambient light, or telephoto photography at night at a distance, even the best digital SLR camera will be unable to produce adequate photographs without blur.



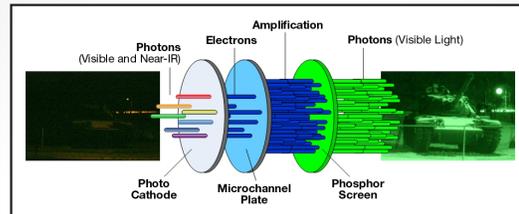
[In these situations, a night vision module such as those described here are the ideal accessory \(\[www.nightvisioncameras.com\]\(http://www.nightvisioncameras.com\)\).](#)

Such a device fits between the SLR objective lens and the camera body and amplifies the light that is captured by the objective lens, projecting an amplified (but entirely green) image onto the digital camera's image sensor. The result is up to 10 F-stops of improvement, a dramatic change enabling many applications that are otherwise impossible to photograph. The module transforms moonlit or starlit scenes into bright, high resolution images that are easily photographed.

HOW IT WORKS

AstroScope transforms dark scenes into bright, high resolution images that can be easily photographed without the need for additional lighting or longer exposure times.

The objective lens focuses the minute amounts of available light onto the faceplate of its internal central intensification unit that converts the photons to electrons. The internal electron flux is then amplified and the electrons are accelerated so that when they impinge on the output phosphor, a bright green image is created. The image is then focused onto the internal detector of the digital SLR camera.



Learn more at: www.hownightvisionworks.com

The following are some guidelines to help assure that the Night Vision digital photos are the best possible.

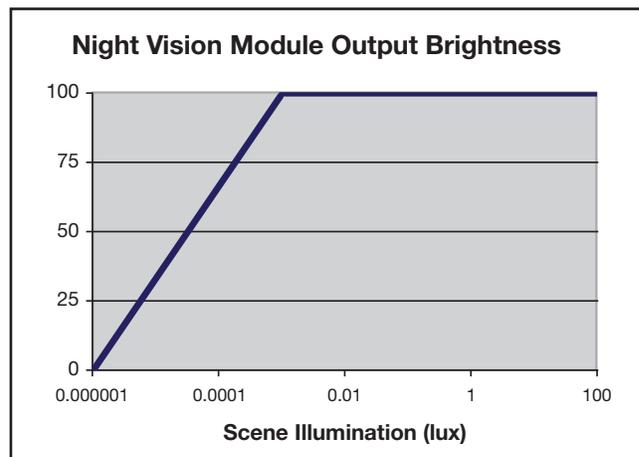
Exposure Mode

Select Manual exposure mode (“M”). Not “Automatic”, “Aperture Priority”, “Shutter Priority”, “Program” or any of the other special modes. In low light, you’ll want to manually open the lens iris to permit the most light to fall on the night vision module’s sensitive photocathode.



Shutter Speed Setting

You’ll want to set the camera’s shutter speed so that it is just long enough that there will be no blur due to motion, usually about 1/30th second. Longer exposure times will usually result in blur (for handheld applications). Shorter exposure times may provide some improvement if excessive motion is a concern but could unnecessarily darken the image due to the reduction of light being acquired from the night vision module’s image intensifier. While the output brightness from an image intensifier increases with increasing scene illumination, at higher scene illuminations, the image intensifier’s output brightness reaches a maximum value and remains constant as shown in the accompanying chart. (The limitation on the output brightness protects troops wearing night vision goggles from being blinded when viewing a bright light). Since this maximum brightness is not very bright (about 2 foot lumens), it is unlikely that the digital camera’s sensor will be saturated as a result. So, faster shutter speeds are not necessary as a method to limit the light accumulation.



ISO Setting

While back in the days of photographic film, ISO was a characteristic that described film sensitivity to light, today, ISO is related to electronic gain of the digital camera's sensor. Since increasing the gain will amplify the low light level images, even with a night vision module, lower light scenes will become visible. However, there are disadvantages to setting the ISO too high. As with all electronic circuits at high gain, image noise can degrade image quality. As such, set the camera's ISO to a value as high as you can while still acceptable image noise levels. Usually, the minimum value would be 800, but some cameras deliver perfectly usable images at ISO 1600, 3200 or even 6400 (on some recent Nikons).



Manual Focus

When using a night vision module, select Manual Focus mode (usually a small lever switch on or near the objective lens mount). Manual focus gives you greater control over how the focus appears. Since night vision modules are generally grainy, the image grain can confuse the SLR camera's focus sensors. Also, realize that these focus sensors will be staring at the output of the night vision module so the grainy artifacts will not be affected by the focus position of the objective lens (which is located on the front of the night vision module).



Use Stabilized Lenses

A camera's image stabilization feature permits the photographer to use slower shutter speeds without resulting in blur due to camera shake. Note that there are two primary techniques for image stabilization: optical stabilization (where a small element inside the lens moves in order to stabilize the image projected on the camera's detector) and digital stabilization (which take advantage of extra rows and columns on the perimeter of the detector, shift the image an appropriate amount to stabilize certain types of motion).

Normally, the optical image stabilizers, though more expensive, are preferable since they better remove the blur component of the motion. When using a night vision module, the main disadvantage of the digital stabilization is that the image is blurred on the input of the night vision module resulting in some blur on the intensified output image. So, optical stabilization is preferred.



Lens Aperture

The basics still apply for night vision intensified low-light photography. In low-light situations, you'll want to select the fastest objective lens set to the lowest F-stop setting. (The lowest F-stop value indicates that the iris is opened up fully and will gather the most ambient light possible for that lens).



Infrared Illuminator

Sometimes, even with a night vision module, it's simply too dark to obtain a good quality photograph at night. A dark and cloudy night with no ambient light is one example. Since the night vision module is merely a light amplifier, if there is no light from the stars and sky or from city lights reflecting from clouds, the night vision module will not be effective. In order to photograph without the use of a flash or visible light source, a near-infrared light source can be used that emits light that can be seen by the night vision module but is invisible to the naked eye. Unlike some digital camera sensors which have some near-infrared response, night vision modules are most sensitive to the near infrared wavelength range and consequently these light sources can significantly enhance the night-time image and render night photography possible despite the lack of sufficient visible illumination.

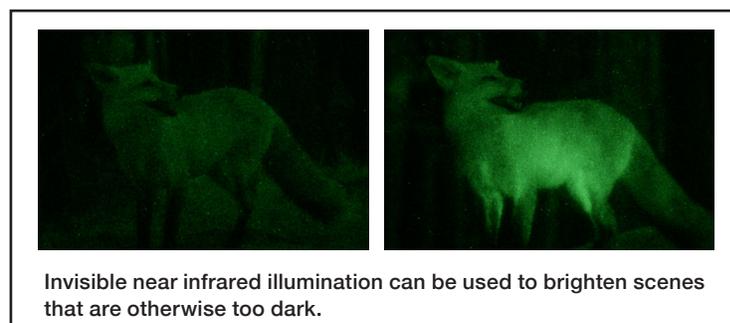


Image Cropping

Because image intensifiers have automatic electronic gain features to maintain a constant light output, the presence of bright lights in the field-of-view (such as headlights or street lamps) may have the affect of decreasing the unit's overall light gain. This is similar to back-illuminated scenes for un-intensified photography, but even more important because of the significant impact on light gain that could result. This affect may cause the other regions in the image to darken to an unacceptable level. If possible, do your best to exclude non-important bright lights from the field of view.



Turn Off All Camera Visible/ Audible Functions

For covert night vision photography, don't forget to disable all camera lighting and sound functions. (For example: disable flash, any red eye reduction mechanisms, auto focus assist, LCD preview, and all audible signals).

Use a Tripod

When handheld use is not required, select an exposure time long enough that the movement of objects under observation does not result in image blur. As with un-intensified photography, long exposures require that you hold your camera perfectly still to avoid blurring. A tripod is a perfect accessory. If one is not available, try bracing your camera against a stationary object like a tree or wall. In order to avoid the blur that results from finger pressing the camera shutter release (which can cause enough movement to blur a photo), use the camera's timer.

For more information on our Products visit:

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