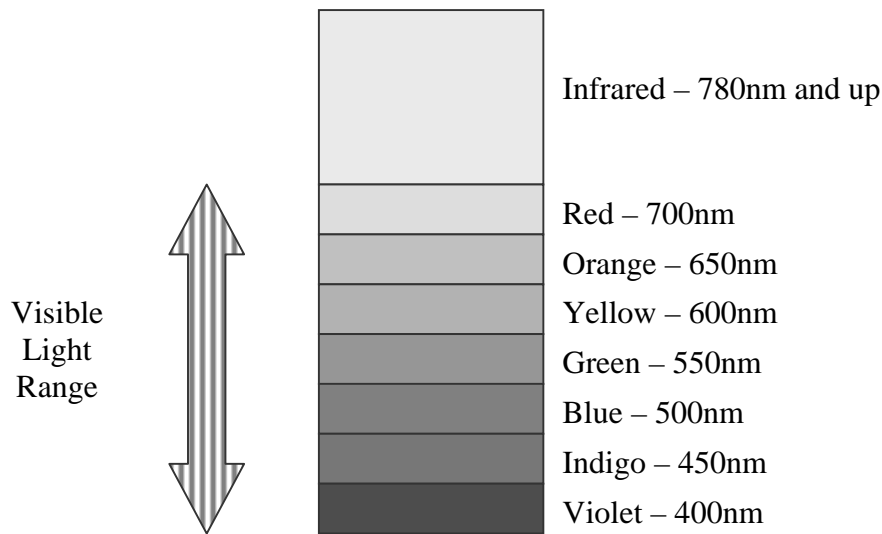


Infrared Illuminators

Infrared illuminators emit light in the infrared range of the spectrum. Infrared light is above 780nm (nanometers) on the light spectrum. It is invisible to the human eye, but is viewable by most black and white CCTV cameras.

Light Frequency



Infrared Illumination Light Sources

Infrared illuminators have two primary light sources: bulb and LED. Bulb type illuminators are typically larger and have a higher power requirement. They typically have a longer range than LED type, but have a shorter life span (up to 4000 hours). The bulbs on most units are replaceable and relatively inexpensive. LED type illuminators are typically smaller and have a much lower power requirement. They typically have a shorter range than bulb type, but a much longer life span (up to 100,000 hours). The LEDs on these units are usually not

NationalTrainingCenter.net

replaceable. These units should be connected to a photocell to turn them on only when they are needed (nighttime/dark conditions). This will help to extend the useful life of the device. The photocell may be integral to the unit or external.



Bulb Type Illuminator



LED Type Illuminator

Illuminator Frequency

Illuminators are available in multiple frequencies, the choice of which depends upon your application and the camera it is being used with. Illuminators in the 940nm range put out light that is completely invisible to the human eye. This frequency is referred to as covert. Illuminators in the 850nm to 880nm have a dim, soft red glow at the light source. This frequency range is referred to as semi-covert.

Some black and white cameras are sensitive to higher ranges of the infrared spectrum than others. Using a 940nm illuminator with a camera only sensitive to 880nm would be a waste of money. The camera must be able to “see” light in the range of the illuminator for it to be effective. The application may also determine the

frequency of the illuminator used. A soft, dim red glow may be totally unacceptable in some applications.

Illuminators and Color Cameras

Illuminators are ineffective when used with conventional color cameras. Conventional color cameras have a filter that helps keep the picture color correct by blocking out light above the visible range. Some day/night cameras remove or turn off this filter when they go into black and white mode. Most are still not sensitive to the true infrared frequencies (above 780nm) but some can work with light in the near-infrared frequencies. Some infrared illuminator vendors have introduced near-infrared illuminators to work with cameras in these applications. These illuminators produce light in the 740nm range and have a red glow the intensity of a traffic light. They do not work with all day/night cameras so the manufacturer should be consulted before purchasing.

Wattage and Pattern

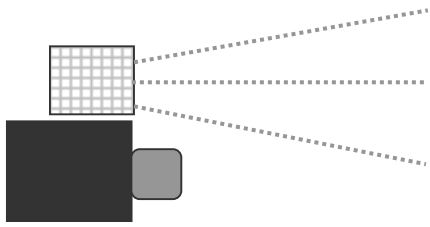
Illuminators come in varying wattage and coverage patterns. Actual performance will vary depending upon the camera used. A good rule of thumb is 1 watt of power per linear foot of coverage. A camera viewing a target area 100 feet away should use a minimum of a 100-watt illuminator. More wattage is even better. The pattern of the illuminator should match the lens. A wide pattern illuminator will illuminate a wider area but a shorter distance, a narrow pattern illuminator will illuminate a narrower area but a longer distance.

Illuminator Safety

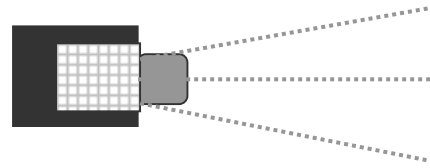
Extreme care should be exercised when working with infrared illuminators. An illuminator should also be powered down while being installed or serviced. The iris of the human eye only responds to visible light. Looking into a 500-watt infrared light source is like looking into a 500-watt light bulb without your iris closing to block the light. The effects usually do not appear until hours after the exposure. The effects are similar to watching arc welding without eye protection. Mild exposure can feel like you have sand in your eyes, severe exposure can cause temporary or permanent blindness.

Illuminator Placement

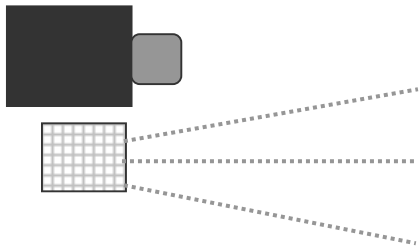
The illuminator can be placed next to the camera or on top of the camera, but should never be located beneath the camera or the in the field of view of the camera. Illuminators can produce a lot of heat, and heat rises. Placing the illuminator beneath the camera may damage the camera when the unit warms up. Placing the illuminator in the field of view of the camera is the same as placing a visible light source in the field of view. If the light shines into the camera the picture will wash out or bloom.



Acceptable – On Top Of Camera



Acceptable – Next To Camera



Unacceptable – Beneath Camera



Unacceptable – In Front Of Camera

Illuminator Applications

Infrared illuminators cost significantly more than conventional illumination. It is almost always more cost effective to provide visible lighting. Of course there are applications where visible lighting is not desired or permitted. Some residential areas prohibit bright lights under light pollution ordinances. Seaside communities where sea turtles nest often prohibit the use of any outside lighting during nesting season. Covert surveillance applications (especially law enforcement) may require complete darkness to catch criminals in the act. Infrared illuminators are sometimes used to fool criminals into thinking they are in near or complete darkness in order to document their activities.

This document is part of a complete book entitled:
CCTV System Design & Installation

By Charles Aulner and Bryan McLane
COPYRIGHT © 2005 Charles Aulner and National Training Center, Inc.

Used by permission of the Author

To order the complete copy of this and other books, visit
www.NationalTrainingCenter.net

National Training Center provides the very best in training resources to the Security professional. These resources include:

- Training manuals and references
- Live classroom training
- Online classroom training (instructor led)
- Online training (self-paced)

We support and encourage NICET Certification



NationalTrainingCenter.net

The Very Best in
Training and Books

(702) 648-8899