

How to select and use infrared illuminators?

The importance of choosing Infrared Illuminator is the compatibility of the camera and illuminator, lens, cover, power supply etc. In the design of programme for the integrated system, the engineer should consider to design the whole sets of equipment as a low intensity infrared night vision surveillance systems. It is incorrect for people who first buy cameras, lens, covers, power supply and even install them before purchase the infrared illuminator, people should pay attention to the following issues.

1. Use black and white cameras, color cameras or special transformed ordinary colour cameras.

CCD image sensors have very wide spectral range photosensitive, the photosensitive spectrum includes not only the visible area, but also extended to the infrared area. To use this feature, the camera could be used under invisible conditions at night, and the infrared illuminator will support the CCD image sensor to get clear image. Ordinary colour cameras can transmit colour signal from the CCD output signal devices separate from the three green-blue-red base color video signals, and then synthetic colour television signals. The photosensitive can only be installed in the visible spectral region, if it is possible to achieve the transformation of its infrared light region sensory functions through its CCD infrared filtering glass, the front infrared can penetrate into the 850nm infrared filtering glass or without infrared filtering glass.

(Pay attention! Without infrared filtering glass color change may lead to cameras.)

With the advances of technology, the current market colour day and night conversion camera is used a cut-over two CCD or a CCD digital circuits used for the cut over, but the existence of black and white illumination is higher, some of the shortcomings effects of colour will gradually be eliminated. The infrared sensitive of Low intensity colour and infrared camera is four times higher than normal camera. With the trend of lower costs, it will become the trend.

2. Select an 850nm infrared camera with low intensity respondent.

Low intensity means that the optical brightness degree when the light of scene and the video signal output electricity balance of the camera reach a special low range. To measure the parameters should specify the size of the camera's aperture F. For example, using a F1.2 lens when the illumination is 0.02Lux, the scope of the video camera output signal is 50%-33% of the standard scope 700mv, we say that the camera with the low illuminance of 0.02Lx/F1.2. Some camera manufacturers give different aperture F, the lowest illuminance. When the low illuminance of the camera is higher than infrared illuminator requested, the effective distance infrared lights will be affected. Users should be reminded that the sale of camera technology in market marked the low illuminance with two abnormal ways, one is that the camera manufacturers marked the low illuminance target surface, which is the illuminance of CCD image sensor, and it features with low illumination more than 10 times more than the scenery; Another one is the false illuminance quoted by some camera manufacturers or distributor. Currently, some economical black and white

video cameras have the low illuminance of 0.01~0.02Lx, but in fact 0.1~0.2Lx only. If the infrared illuminator require a camera with 0.02Lx, it will affect the effective irradiation distance, and purchase a 0.02Lux camera will need twice cost of a 0.1~0.2Lx cameras. In this case there are two options, to spend more money in camera, but less in infrared illuminator; or on the contrary. Experimental verification that the former option is more economical for outdoor long distance.

3. Size and specification of CCD camera

The size of a CCD camera is becoming smaller, and in the current market there are 1/2 ", 1/3 ", 1/4 " CCD cameras. The bigger size of the camera, the more transmission of light. For example, the effective infrared lights distance is tested with the 1/2 " CCD camera, if you use 1/3 " CCD or 1/4 " CCD camera, the distance will be effective. The light transmission of 1/3 " CCD camera is only 44% of the 1/2 "CCD camera. Choose colour black and white clock automatic conversion should particular paying attention to the selection of the camera with 1/3 " CCD, because most cameras in the market is with 1/4" CCD.

4. Selection of lens

The smaller of the aperture F of the lens, the greater the effects footage - ray hole.

5. Required functions of cameras and lens

With automatic electronic shutter function, AGC functions, and automatic aperture of the lens, the cameras can accommodate large range of illuminance changes in day and night.

6. Power supply

Frontier video surveillance system equipment should be integrated into the power supply design. The working current of the infrared illuminator is sensitive with the power supply voltage and different length of cables determined different decay of DC voltage. When you are using a number of infrared light with various distance between the control room, a focus power supply of DC12V may cause a high voltage of the infrared illuminator which is near the control room and low voltage which is far away from the control room. In addition, the deviation of adjusting supply voltage will cause over high voltage and the life time of infrared illuminator will shorten or burn off; low voltage infrared illuminator will find power shortage. It is proposed that adapt an AC220V supply or a one to one DC voltage power supply. This kind of DC supply has stable output of current in some DC voltage power net or voltage fluctuations with a voltage stabilization of AC100V-245V to assure the reliable and stable power of the radiation of infrared illuminator.

In addition, please take into account the following factors, to choice a good distance of radiation of infrared illuminator.

1.The low intensity of the cameras. What is the lowest intensity mean here? The video signal value of camera is 1V, the standard value is 0.7V, and the video signal value of lowest intensity is 1/3-1/2 of the standards for planting. In this case, camera cannot see as in bright day light under a lowest intensity situation.

2.Verify the image level of the camera at the lowest intensity through the measurement card of the video signal, the black and white alternate with the code for black reflectivity is near 0%, 89.9% more than the rate of white reflection. But in fact we do not have such conditions, such as: the reflection rate and contrast of leaves and grass is low, we cannot have a clear image.

3.Low intensity is given by the camera while also providing relative value of F requirements. The zoom lens generally be with a maximum photography 1:F only, which is the minimum at aperture F (f actual size of the aperture), $F=f/D$, if D for the constant ratio, when f focal length widen 10 times, F is becoming big (f actual size becomes small). Transmition of light will be greatly affected.

4.In the use of automatic aperture lens, AGC or automatic electronic shutter camera, the aperture F of lens will be changed. For example, there are features near the camera, reflecting light back to the camera glare, or light exposures the cameras, this camera's sensitivity will be reduced at that time and the automatic aperture size will become small, transmition of light will be greatly affected. Therefore, the application shall be automatically fitted accurately adjust its automatic current balance, DC automatic control mode in the camera's lens aperture scale resistance video automatic control mode, aperture lens adjustment.

5.Defensive cover also have an impact on the effectiveness of infrared illuminator. Infrared light transmit through different media, transmissivity and reflectivity are also different. Different window glass, especially automatic defrost coated glass, will attenuate the infrared radiation, so they should choose the Windows layer glass.

6.Some manufacturer and distributor give power only without infrared lights irradiated distance which is a very vague concept. Beside the power consumption that transfer into the infrared light energy, there are losses of heat and power, circuit, light source, infrared light filtering glass efficiency, and so on. The same power infrared illuminator, the radiation distance may be great different. With the rapid development of infrared night vision systems, the number of infrared illuminator suppliers will increase, but this kind of products are not be produced as easy as people imaging. The technology, instrumentation of facilities conditions are vary from them, so I hope the buyer and user can compare these, choose your need and want professionally. To use infrared illuminator firstly is to read the user manual carefully, especially to ensure the personal safety equipment attention matters. Inspection the point I told previously such as the compatibility and the interfering impact of factors. Users should not arbitrarily increase supply voltage, Infrared illuminator is designed to considered the full play of their irradiance and its security reliability. Increase supply voltage, may burn out the it. Also arbitrarily break up is not allow. If so, the manufacturers may not be responsible for maintenance. If infrared light problems you should contact with the manufacturers or supplier first.