

Case Study: Lighting for Domes



Most crimes happen at night, yet this is when CCTV systems are most vulnerable. Research indicates that fully functional Domes are most at risk because of a lack of 'fit for purpose, dedicated lighting'. Providing illumination for domes is a challenge because the light does not follow the movement of the camera.

WHY IS LIGHTING A PROBLEM FOR FULLY FUNCTIONAL DOMES? -

There are two main issues to consider when providing lighting for Domes.

Firstly, fitting illumination to a Dome camera is more difficult than fitting illumination to a pan and tilt system. Dome lighting cannot be fitted to follow the movement of the camera. Consequently, many installations simply omit the use of dedicated lighting, or pass the responsibility (and of course the revenue) to the electrician to fit general wide area illumination which is not fit for purpose.

The net result is that the night-time performance of dome cameras is compromised by a lack of dedicated CCTV lighting. Often the end user is simply asked to accept the quality of night-time pictures given from ambient light sources such as street lighting. The need for dedicated CCTV lighting is clear. Ambient lighting can actually reduce the picture quality of many systems by producing uneven illumination, bad colour rendition and "hot spots" within the image. Of course, this is hardly surprising given that street lighting and other on scene sources are not designed for the CCTV camera. The extra investment in CCTV lighting can double the effectiveness of a Dome system, providing high quality images 24/7, not just during daylight conditions.

The second problem with Dome cameras is their sensitivity. Dome cameras tend to use smaller CCD's, and are often fitted with smoked domes, leading to lower performance in low light conditions. Fully functional Domes are also frequently supplied with integral zoom lenses that have a higher F-stop and further reduce light transmission. They are not as efficient as full format lenses. This makes it even more important for dome cameras to be accompanied with high performance, dedicated CCTV lighting.

GENERAL CONSIDERATIONS

COLOUR OR MONOCHROME? Are colour or monochrome images preferred at night? In many instances the end user would prefer colour images but care must be given to provide true colour with a colour corrected illuminator. For example, many installers will be familiar with the yellow light provided by low pressure sodium street lighting. Using incorrect White-Light can actually damage the performance of a CCTV system leading to inaccurate colour rendition – a camera is only as good as the available illumination.

Infra-Red should be used where White-Light would be too intrusive, where covert lighting is needed, or where longer illumination distances are required. Of course, many cameras now switch between colour during the day and mono for night time operation to give the best of both worlds.

TECHNICAL TIP

White-Light is actually a combination of lights in the visible spectrum between 400-700nm. When these colours are found together they are perceived as White-Light. Infra-Red is a light just beyond the visible spectrum that the monochrome camera can see but the human eye cannot. It is typically 700-1,000nm.



Raylux - White-Light

Raytec provide a full range of Infra-Red and White-Light illuminators for use with any CCTV camera.



Raylux - Infra-Red

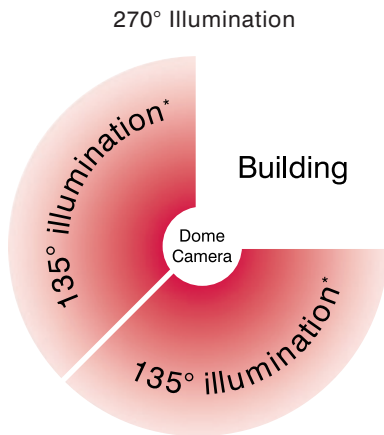
MAINTENANCE AND RUNNING COSTS - CCTV Lighting should always be energy efficient and provide low maintenance. With traditional bulb based lighting, operational costs significantly overshadow the cost of purchase and installation. Consider a 500W flood light that achieves an average bulb life of 3 months. The electrical costs are astronomical and every three months there are additional costs for labour and replacement bulbs.

New solid state LED technology available offers significant savings on running and maintenance costs. LED illuminators have a life expectancy beyond 10 years and require no ongoing maintenance. However, not all LED illuminators are created equal. New surface mount technology (SMT) LED's deliver even greater product life and greater efficiency levels.

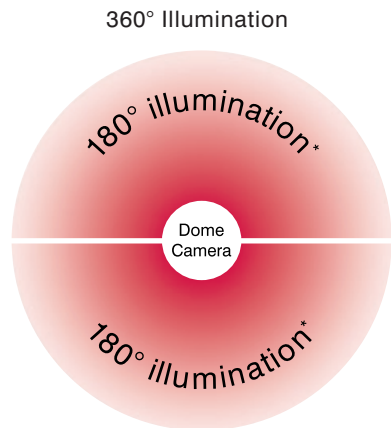
THE SOLUTIONS

1: WIDE ANGLE LIGHTING - Achieving 360° degree lighting for Domes has traditionally been very expensive, requiring multiple illuminators. However, Raytec have recently launched a series of wide angle illuminators purpose designed for fully functional Domes. The new wide angle illuminators are available in RAYMAX (Infra-Red) and RAYLUX (White-Light) variations and are fitted with Adaptive Illumination™ providing vari-focal lighting. Adaptive Illumination™ is a new concept introduced and patented by Raytec allowing the installer to adjust the horizontal beam angle on site to match the specific needs of the installation.

The specialist wide angle illuminators provide 120 to 180° degree illumination meaning it is now possible to illuminate up to 360 degrees at significantly less cost and with less installation effort than ever before using only 2 illuminators. Wide angle illumination is technically the best solution to Dome illumination providing purpose designed, even illumination fitted at the camera.



*provided by 120-180° Adaptive Illumination™



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2: TARGET AREA ILLUMINATION - When a Dome is only concerned with specific security “hot-spots”, to limit light pollution, or to meet budgetary restraints, illumination can be targeted at specific vulnerable areas. Typically the Dome will track these areas on a pre-set tour and lighting can be used to illuminate each pre-set position such as an entrance point, or a very low lit area.

This method allows for greater distances to be covered with narrower angle illuminators. Using Adaptive Illumination™ the exact beam angle from the illuminator can be adjusted on site to suit each pre-set position.

3: LOCAL AREA ILLUMINATION - If lighting cannot be fitted at the dome then it can be positioned at sensitive areas to flood the area of concern. This is local area illumination and the critical factor is to ensure that, when the dome is zoomed into the scene, the full screen is well illuminated.

SUMMARY

Lighting is critical to the performance of every CCTV system, especially those using fully functional Domes. Recent developments in wide angle illuminators make 360° degree illumination a real possibility for the first time and installers also have the option of providing Target Area Illumination or Local Area Illumination where needed. Every dome camera now has the opportunity to be fitted with dedicated CCTV lighting to maximise performance.