# Application Focus: Perimeter Protection

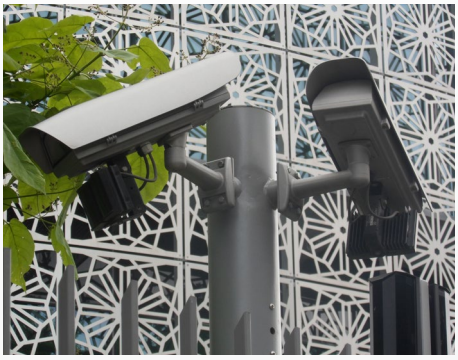
Raytec are world leaders in LED lighting for safety and security. VARIO2 is our range of award winning LED illuminators designed to enhance the performance of any security system. In this Application Focus, we explore the lighting requirements for sites using perimeter protection systems, and identify some of the key elements to consider when specifying lighting for these applications.

## Why is Lighting Needed for Perimeter Protection?

Often one of the first lines of defence, a typical high-security site will use cameras to surround the perimeter fence line and may also use several other security devices as part of the system. For the cameras to be effective and provide useful images to security staff, day or night, high quality illumination is essential.

From private property, to large critical infrastructure sites, the types of sites requiring perimeter protection are wide and varied, but all tend to have common security goals. They're deployed to;

- Restrict access
- Detect and deter crime
- Protect important assets



From critical infrastructure to private property, perimeter protection systems are used in a wide variety of applications.

# Specifying Lighting for Perimeter Applications

In this section we take you through the key things to consider when specifying an illuminator for use as part of a perimeter protection system.

## Light Type

### Infra-Red and White-Light

Infra-Red (IR) illumination is the most common type of light used around a perimeter fence line. IR omits zero light pollution (so not to disturb the surrounding area), but crucially, it allows the camera to capture night-time images covertly, without alerting potential intruders or giving them light to work by.

Once the camera has detected an intruder, the site may choose to raise an alarm. This is where White-Light is often deployed; automatically triggered as a flashing deterrent to ward off an intruder, or used to provide accurate positive identification of the intruder. Only using White-Light when it's needed ensures light pollution is kept to a minimum while still providing optimum levels of security.

In some instances, White-Light may still be chosen to illuminate the entire perimeter, but due to light pollution, and the fact that the camera is more receptive to IR, means White-Light is often preferred as a deterrent.

### Hybrid

Another option which specifiers should consider is the use of Hybrid illuminators. Hybrid illuminators provide an all-in-one solution, combining both IR and White-Light into a single unit. This means one illuminator can be used for both covert surveillance, and as a White-Light deterrent.

As a 2-in-1 solution, Raytec's VARIO2 Hybrid doesn't compromise on performance, achieving the same power and distance as two dedicated illuminators. Hybrid allows the user to control the wavelength and switch seamlessly between IR and White-Light.

## Quality and Distance

Perimeter fence lines often cover large areas, so distance and coverage of an illuminator is one of the main things for a specifier to consider. However, it's also equally important to consider how the illuminator will assist the camera in obtaining the highest quality images.

### Understanding Distances

Illuminators able to deliver longer distances may allow cost savings by reducing the total number of illuminators across the site. It may also allow the user to reduce costs in terms of the numbers of cameras, lighting columns, cabling and other ancillary equipment needed as part of the installation.

Manufacturers publish data regarding the distances in which their illuminators can achieve, however it's important to understand that between different manufactures, the image quality produced at the same quoted distance could vary significantly. Reputable manufacturers should be able to provide in-depth performance data about their illuminators, while carrying out a detailed lighting design is always recommended to ensure the required light levels are achieved.

Despite claimed figures, distances and image quality can vary between manufacturers. Raytec have developed the industry's first video surveillance light standard – POWERS. Download the POWERS e-book to see how we reach our claimed distances and how illuminator performance can be compared across manufacturers.

CLICK TO DOWNLOAD >

### Hot Spot Reduction

One way to help ensure a good image is to select an illuminator which uses technology which reduces hot spots and provides an even image across the entire scene. Raytec's VARIO2 range uses Hot-spot Reduction Technology (HRT) to deliver a highly diffused, elliptical beam shape which targets the light where it's needed. This supports longer distances, minimises light wastage, and ensures even distribution of light throughout the scene. The HRT system also prevents over-exposure of foreground objects; light uniformity is crucial in ensuring hot spots are minimised.

## Network lighting

### Hardware Integration

Modern perimeter surveillance systems often consist of several IP enabled devices, intended to work together to provide high levels of security. Typically, these include;

- IP cameras
- Passive Infra-Red sensors (PIR)
- Laser detectors
- Fibre optic fence sensors

For applications using these kinds of devices, specifying an IP enabled illuminator capable of providing an automated lighting response, is essential. For example, if a PIR sensor detects movement from an intruder, an alarm could be raised to automatically turn on the White-Light (so the intruder can be positively identified) or put the lamps into deterrent mode (to ward off the intruder).

### Camera Analytics

Providing an effective way to determine if unwanted or suspicious behaviour is occurring in a cameras field of view, more and more sites are using camera / video analytics as part of their perimeter surveillance systems. However, camera analytics are only as effective as their ability to provide a consistent, clear image. This is where lighting plays an important role.

Camera analytics will often require increased light levels compared to standard applications. Even the best cameras will still produce noisy images in darkness that will seriously impact the performance of camera analytics and create false alarms. No light = no camera analytics.

At Raytec, we have many years of experience in designing lighting solutions designed to be used in conjunction with camera analytics.

Watch our video to see how network lighting can be used to create smarter systems for perimeter surveillance.

CLICK TO WATCH >

### Software Integration

Specifiers should also consider the security management platform their site is using to monitor and control cameras, illuminators and other devices across the site. In terms of specifying an illuminator, it's important to choose one which can be integrated with the security management platform in use by the site. For example, if a site is using Milestone's XProtect platform, the chosen illuminator should be capable of being integrated into that system, so it can be controlled easily and lighting responses set-up to be triggered by other detection devices.

Raytec have a number of software plug-ins which facilitate integration of VARIO2 IP illuminators with a host of security management platforms.

## Other Considerations

### Easy Specification & Commissioning

For any surveillance project, choosing a luminaire that is easy to specify and install will save time and money during the initial phases of a project through to commissioning.

### Interchangeable Lens

The use of interchangeable lenses, where beam angles can be altered on-site, is ideal for perimeter applications. It means one product can be used for several different areas and provides installers with greater levels of flexibility.

VARIO2's interchangeable lens system (ILS) allows the angle of illumination to be quickly and precisely adjusted by changing the lens insert to match the camera's field of view. VARIO2 can achieve angles from 10-120 degrees to provide full scope of the scene.

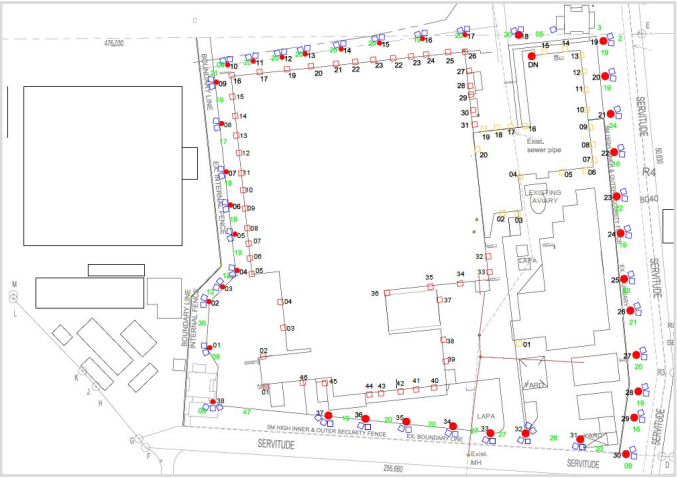
This kind of flexibility is particularly useful when illuminating the corners of a perimeter fence, where wider beam angles are generally required. It also helps an installer to overcome any obstacles as part of the set-up, such as the illumination of gatehouses or other areas situated along the perimeter. An illuminator with an interchangeable lens helps the installer to achieve the perfect picture every time.

## Lighting Design

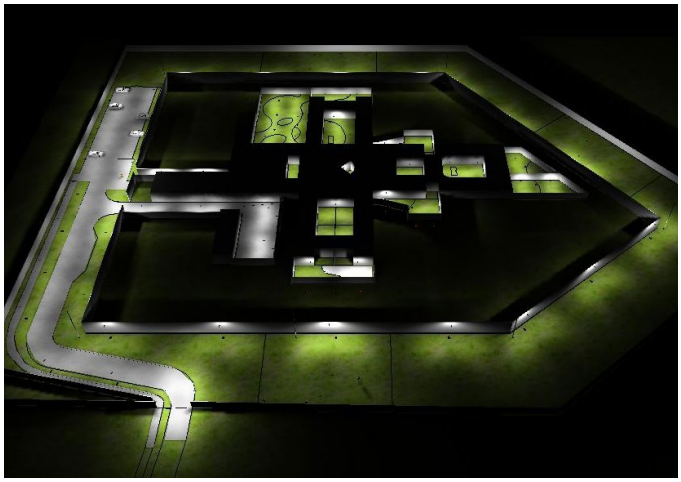
Lighting design should be considered an essential part of specifying lighting for a perimeter security application. Undertaking a lighting design helps to ensure the correct light levels are achieved across the site, and are essential for cameras to be able to capture high quality images. This provides specifiers with peace of mind and no surprises at the point of commissioning.

For an installer, a lighting design also provides a useful reference which becomes an important document during the installation and commissioning process. A thorough lighting design will help an installer use the correct lamp in the correct position and orientation.

For most perimeter applications, a 2D design is used to plot the individual lamps onto the site plan and indicate the direction and spread of illumination.  Where White-Light is being deployed, a 3D design can also be used to provide the customer with a visual representation of the final appearance of the installed lighting solution.




2D Perimeter Design



3D Perimeter Design using White-Light

**CONTACT OUR LIGHTING DESIGN TEAM >**

If you have a requirement for LED lighting to be used as a part of a perimeter protection system, we'd love to hear from you. Raytec and our people have many years of experience in designing lighting solutions for high-profile, high-security applications.

You can call us on **+44 (0) 1670 520 055**, or email Raytec Global at **sales@raytecled.com** or Raytec Americas at **ussales@raytecled.com**