Application Focus: Lighting for Mobile Surveillance Systems

Raytec is a world leader in LED lighting for safety and security. VARIO2 is our range of award-winning LED illuminators designed to enhance the performance of any video surveillance system. In this Application Focus, we explore the lighting requirements for sites using mobile surveillance units and identify some key elements to consider when specifying lighting for these systems.

What Is a Mobile Surveillance System?

Mobile surveillance units are network security systems, usually containing cameras, lighting, and other hardware. They are usually installed as a temporary measure and designed to be easily moved from place to place or redeployed to different sites.

These mobile surveillance units are usually developed and configured by a specialist provider and deployed on a contract hire basis to different clients.

When would a mobile surveillance solution typically be deployed?

1. When there's no external power source available on site, deploying a mobile surveillance system with its own power source can be an effective solution.

   Typically used for remote sites during their construction, for example a wind farm, the mobile surveillance unit can be equipped with solar panels or a backup generator to power the surveillance hardware.

2. When surveillance of a site is only needed on a temporary basis, and installing a fixed solution is not viable or cost effective.

   Temporary surveillance is often required for events such as exhibitions and outdoor concerts. If a venue lacks its own video surveillance system, or the fixed infrastructure does not match the surveillance needs of the event, mobile solutions provide a fast and cost-effective method of surveillance.

Where Are Mobile Surveillance System's Used?

The types of sites requiring mobile surveillance are wide and varied. Here we outline some typical examples, but all tend to have similar security goals for protection and general surveillance.

- **Wind Farms**

  During the construction of a wind farm large amounts of materials used to construct the turbines are often stored on-site. These materials, such as copper cables, are of high value and susceptible to theft. With the construction of these projects often time-sensitive, delays caused by theft of materials could be hugely detrimental.

  Because wind farms are generally located in remote locations, the site might not have its own external power source. Mobile surveillance units which are self-powered (via solar panels or a generator) provide an effective way of monitoring a site and allow 24/7 surveillance of storage and construction areas. The presence of a mobile surveillance unit alone may be enough to ward-off potential intruders, while a White-Light deterrent could also be triggered to provide further protection.

- **Agricultural Monitoring**

  Rural crime is an evolving issue facing farmers and landowners, and can include livestock theft, arson, drug production, and fly-tipping. Mobile surveillance systems can act as a deterrent to rural crime.

  Many mobile surveillance system providers offer remote monitoring as a part of their service. Remote motoring by the system provider can be extremely valuable for farmers or landowners who don't have the time or resources to monitor the surveillance footage themselves.

- **Event Safety**

  Public safety is a crucial part of large-scale event planning. Today, compliant planning typically requires the support of video surveillance systems to execute a safe and successful event. Mobile surveillance systems can be swiftly deployed in multiple locations. They provide an effective method of monitoring crowd safety from a remote location, reducing the amount of manpower needed on the ground. Crucially, mobile surveillance provides a more cost effective and flexible solution for short-term events than investing in a fixed system.

Why is Lighting Needed for Mobile Surveillance?

For the cameras to be effective and provide useful images to security staff, day or night, additional high-quality illumination is essential for any mobile surveillance system. Not only does the performance of the system rely on the camera and lens, but also on the quantity, quality, and distribution of available light.

In most cases where a mobile surveillance unit is deployed, 24/7 surveillance is required. With the majority of crime happening during the hours of darkness, it is a necessity that high-quality images can be obtained during these hours.

Specifying Lighting for Mobile Surveillance

When specifying lighting to be used as part of a mobile surveillance system there are several factors to consider.

Light Type

Infra-Red and White-Light

850nm Infra-Red (IR) is the most common type of light used for mobile surveillance and the wavelength we would always recommend to achieve the best images. IR omits zero light pollution, and crucially, it allows the camera to covertly capture night-time images without alerting potential intruders or giving off visible light which may assist them in committing their crime.

Once the camera has detected an intruder the site may choose to raise an alarm and White-Light can be deployed as a flashing deterrent to ward off an intruder. Alternatively, it could be used to provide additional information (such as the colour of their clothing) and support a positive identification of the individual.

Hybrid Illuminators

Because an end-user may demand the use of both Infra-Red and White-Light as part of their surveillance requirements, we recommend you consider the use of Hybrid illuminators when designing mobile surveillance solutions.

Hybrid illuminators provide an all-in-one solution. They combine the performance of two separate Infra-Red and White-Light illuminators into a single unit and allow users to switch seamlessly between wavelengths. This means a single illuminator can be used both for covert surveillance and as a White-Light deterrent, reducing capital expenditure.

Specifying a Hybrid illuminator also provides each mobile unit with greater flexibility, meaning one mobile system can fulfil the requirements of various customers with different surveillance needs, without having to swap out the lighting.

VARIO2 Hybrid:
1 Product 2 Illuminators

Hybrid reduces the number of illuminators used on-site, saves running costs and provides a quicker, more dynamic security response.

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Configurability

The nature of a mobile surveillance system requires it to be flexible and able to adapt to different surveillance applications.

Interchangeable Lens

Choosing an illuminator with an interchangeable lens system, where beam angles can be altered on-site, allows the angle of illumination to be quickly and easily tailored to different scenarios. For mobile surveillance, this means each system can be quickly adapted when being redeployed or moved to a different location on-site.

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 a full scope of the scene.

Power Adjust

Illuminators with integrated command and control technology provides users with greater levels of flexibility and help mobile surveillance systems to be more dynamic in the field.

As with the angle of illumination, the quantity of light will also differ between applications and will be determined by the distance and angle of illumination required.

Insufficient light levels will mean parts of the scene may be too dark for detection, while too much light could mean overexposure and a loss of detail (especially of foreground objects). An illuminator with a power adjust function means the power can tailored to each application. This could either be done on-site during commissioning (see Remote Control section below) or remotely if using an illuminator with IP capability.

Remote Control

While providers can monitor surveillance footage remotely, they are also likely to be involved in the set-up and commissioning of the unit. Illuminators with remote control capability can help to make the commissioning process more straightforward.

Raytec's VARIO2 illuminators come with an optional hand-held VARIO remote control for quick and easy setup from ground level. This includes the ability to fine tune the illumination to ensure the best possible images are being obtained. It may involve altering photocell settings or adjusting the power of the illuminator (as discussed above).

Network Lighting

One of the big attractions of mobile surveillance is the provider's ability to monitor surveillance footage remotely on behalf of the end-user. Using the example of agricultural surveillance from earlier, the farmer or landowner is unlikely to have the time or resource to monitor the surveillance themselves. This is where IP-enabled lighting is hugely beneficial.

Hardware Integration

Modern mobile surveillance systems often consist of several IP-enabled devices, intended to seamlessly work together to provide high levels of security and a dynamic surveillance solution for the end-user.

Specifying an IP-enabled illuminator as part of the system, capable of providing an automated lighting response, is essential. For example, a PIR sensor could detect movement from an intruder and raise an alarm to automatically turn on the White-Light illumination. This would allow the intruder to be positively identified, or it could be used to put the lamps into a deterrent mode to ward them off. A lighting response like this can be triggered automatically, or the operator also has the flexibility to manually control and adjust the lighting if needed.

Software Integration

Specifiers should also consider the security management platform their site is using to monitor and control cameras, illuminators, and other devices used as part of the system. Specifying an illuminator which integrates with your security management platform will ensure it can be controlled easily, and for lighting responses to be triggered by other detection devices.

Raytec has several software plug-ins that facilitate the integration of VARIO2 IP illuminators with a host of security management platforms.

Check out the integration plug-ins available on our website.

CLICK HERE TO VIEW THEM >

Camera Analytics

Providing an effective way to determine if unwanted or suspicious behaviour is occurring in a camera's field of view, the use of camera or video analytics often play an important role as part of a mobile surveillance system.

However, camera analytics are only as effective as their ability to provide a consistent, clear image, and lighting is critical to this. Camera analytics generally require increased light levels compared to standard applications. A perfectly lit scene with an even spread of light allows the analytics software to accurately identify subjects on scene and trigger alarms. These alarms can be used to alert a control centre or the local police. In darkness, even the best cameras will still produce noisy images that will seriously impact the performance of camera analytics and create false alarms.

No light = no camera analytics.

Other Considerations

Power Input

As mentioned earlier, mobile surveillance systems deployed in remote locations may be reliant on the use of solar panels or a generator to provide power. In these cases, low-voltage lighting is a necessity.

Even Raytec's most powerful VARIO2 illuminators are available with a low voltage input (12-24V AC/DC or 24V AC/DC) as standard and many are also available as PoE variants (power over ethernet) that allow them to be powered from the network infrastructure.

Hot Spot Reduction

Mobile surveillance providers can help to ensure a good image is achieved by selecting an illuminator that uses technology to reduce hot spots.

Raytec's VARIO2 range uses Hot-spot Reduction Technology (HRT) to deliver a highly diffused, elliptical beam shape that 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.