

CLARIUS[®]

LED Illuminators



THE CLARIUS GUIDE TO CCTV LIGHTING

WHITE PAPER

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MOST CRIMES HAPPEN AT NIGHT

One of the biggest challenges faced by a security professional is to ensure that video footage is 100% effective. This is made certain by making sure that there is always enough illumination on a given scene. Therefore, it is crucial to have high quality illumination during the hours of darkness. An easy way to achieve accurate and reliable CCTV footage is through the use of effective LED illuminators on-site.

Key factors when specifying LED illumination:

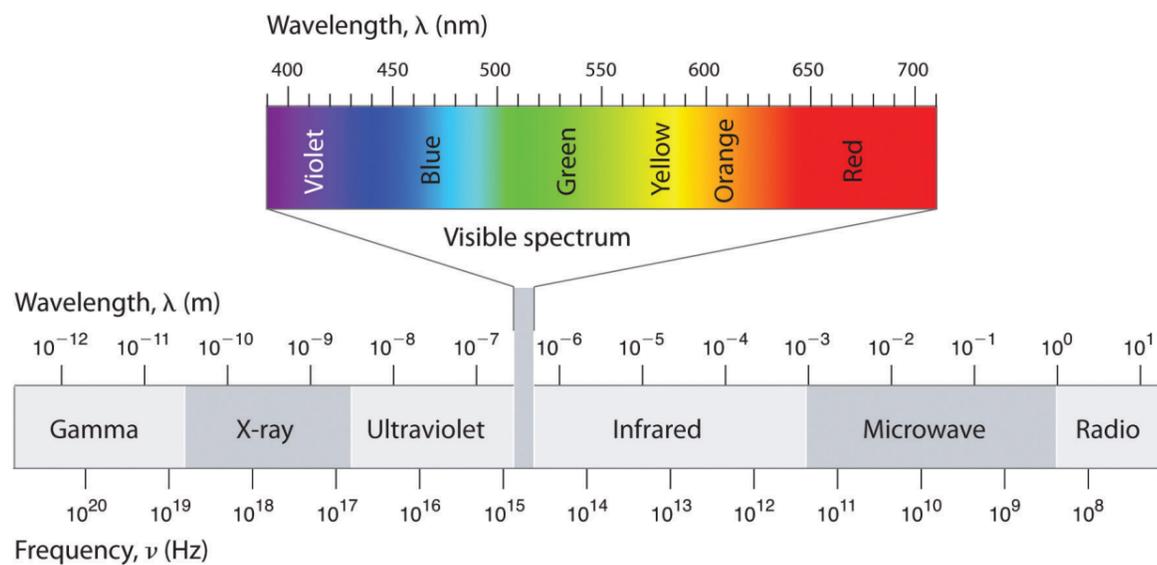
- **Coverage distance** - ensuring that there is enough light output for your illuminator(s) to provide enough illumination on the scene.
- **Field of view angle** - determining the horizontal field of view angle from the camera and illuminator(s) to the scene will help in the selection of the most suitable illuminator(s) for the job. If you know your camera chip size and lens configuration then determining the horizontal field of view angle is straightforward.
- **Diffuser lenses** - It is important to consider the need for diffuser lenses with your chosen illuminator(s) in order to help best achieve even illumination across a scene. The use of interchangeable diffuser lenses can enable the installer to quickly change the field of view angle of an illuminator if necessary.
- **Reliability, maintenance and running costs** - major deciding factors in choosing one LED illuminator manufacturer over another is the reliability of their product, the ease of installation and the long term running costs.
- **Wavelength** - selecting Infra-Red and/or White-Light LED illuminator(s) for your project will be determined by the application and camera type used on-site. Infra-Red illuminators are normally used for discrete covert applications and/or with monochrome CCTV cameras. White-Light illuminators are normally preferred when the scene is required to be illuminated for people walking at night or to deter them from entering the area. Normally coloured CCTV cameras are chosen for these applications.

WHAT IS LIGHT

Light is electromagnetic radiation within a certain portion of the electromagnetic spectrum. The word light usually refers to visible light, which is visible to the human eye and is responsible for the sense of sight. Visible light is usually defined as having a wavelength in the range of 400nm to 700nm. Often, Infra-Red and ultraviolet are also called light. Infra-Red 850nm and 940nm are commonly used in night time CCTV surveillance cameras.

The human eye is tuned to the visible light part of the electromagnetic spectrum, typically 400nm (violet) to 700nm (red). Human eyes best operate in the middle of the visible light spectrum detecting green colours easily, whilst being able to detect certain colour reds and violets. Unlike the human eye, CCTV cameras are able to see beyond the visible light spectrum in particular Infra-Red wavelengths i.e. 850nm and 940nm. The larger the Infra-Red wavelength the more covert the light is deemed to be in the field.

Whilst light still remains a scientific phenomenon in the world of Physics by exhibiting properties of both particle and wave, it is light's ability to be reflected off different surfaces and refracted through camera lenses, which make it useful for CCTV purposes. When light hits a surface it is typically reflected, diffused and absorbed or a combination of these effects. Typically the smoother an objects surface, the greater the reflection of light. Metal objects generally have excellent reflective properties, whilst objects with rough surfaces, such as concrete, typically have poor reflectivity.



COLOUR

It was not until the 17th century that Sir Isaac Newton discovered and proved that objects do not hold their own colours. When in fact the colour that an object appears to hold is simply a direct result of the visible wavelengths that are reflected. For example, when visible light shines down onto grass, the chlorophyll pigments within the grass blades do not absorb the green wavelengths but instead reflect them. Hence, when our eyes detect green wavelengths being reflected off the grass blades, human eyes determine the grass as being green in colour.

At night when the sun is not shining, an area will appear dark and black in colour to human eyes. However, when Infra-Red light illuminators are used in dark areas, human eyes cannot detect this part of the electromagnetic spectrum, therefore the area still remains dark to humans. CCTV cameras are able to detect monochrome colours from surfaces that are reflecting Infra-Red light. Hence the reason Infra-Red illuminators are often used at night to provide covert surveillance without causing light pollution.



SURFACES

Surfaces can have a real impact on the quality of CCTV footage. Diffusion, reflection and absorption are three key factors that determine how light interacts in a scene.

Diffusion relates to how the light is scattered when passing through objects. Reflection occurs when light hits a surface and bounces back. Surfaces that are uneven and textured will scatter the light in many different directions, in comparison smooth surfaces such as a mirror, provide a more focused reflection back to the CCTV camera.

Absorption is experienced when light is absorbed by the surface it is falling onto. A surface that appears dark, even when light falls onto it, is a surface that absorbs a lot of light. When light is absorbed the light energy is absorbed and dissipated as heat. A surface that appears a solid colour when light falls onto it is a surface that absorbs some light but not all. A surface that shines white in colour when light falls onto it is a surface that reflects all of the light.

Therefore, it is crucial to think about the scene's surfaces when choosing your illuminator size and light output power to help determine how much light output that you may lose in a given scene.

Fig.1 - Diffusion

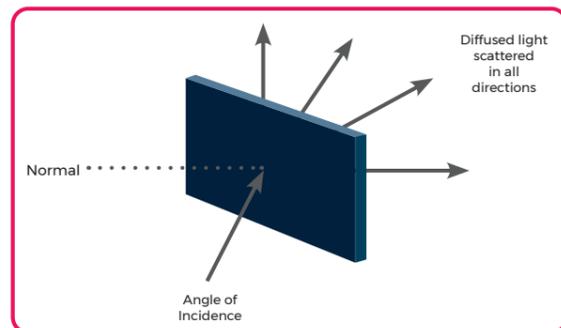


Fig.2 - Reflection

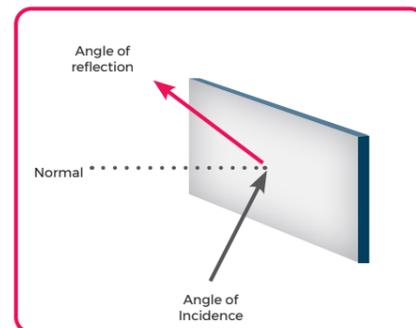
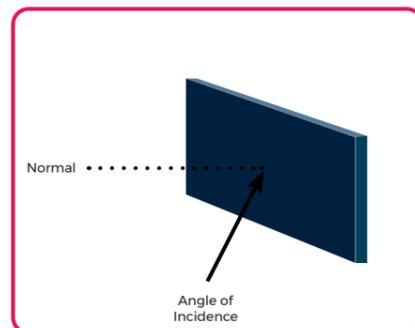


Fig.3 - Absorption



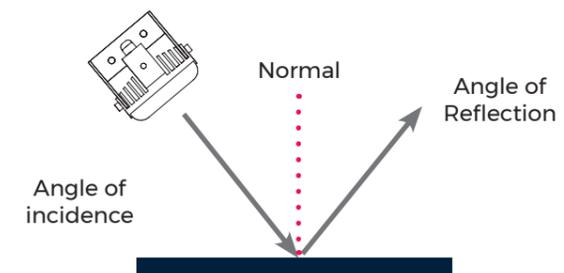
REFLECTION

There are three types of reflection, Specular, Diffuse and Retro-reflection.

Specular

When a surface is completely smooth it reflects like a mirror and is said to be specular. The angle of incidence is equal to the angle of reflection.

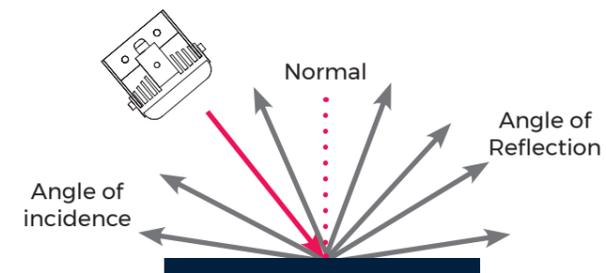
Fig.4 - Specular



Diffuse

When a surface has irregularities it reflects in all directions. A diffuse reflective surface can scatter light in all directions in equal amounts. This is known as Lambertian reflectance. Most objects reflect light in this way.

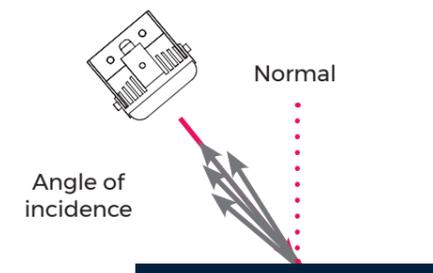
Fig.5 - Diffuse



Retro-reflection

Retro-reflective surfaces reflect light back in the direction it originated. Typical examples of this are vehicle number plates and road signs. This is not a natural phenomenon and only occurs with specially designed man-made materials.

Fig.6 - Retro-reflection



REFLECTION IN PRACTICE

It should be noted that a camera, or a human eye, does not use the light on a scene as detected by a light meter, but the amount of light reflected back off the objects in the scene.

Different materials have different levels of reflectance which also differ with Infra-Red and White-Light. Typical examples are shown in the table below.

Material	Infra-Red Reflectance %	White-Light Reflectance %
Metal	60	70
Stone	7	6
Foliage	25	4
Cotton Black	35	1
Cotton White	35	45
Nylon Black	15	1

Lighting for CCTV differs greatly from lighting designed for people. Lighting designers attempt to give a fixed light level in a particular area, for example 10 Lux. But this design assumes the person will be in the scene. With CCTV the light which reaches the camera can be reflected from the scene located a long distance away.



The image on the left shows an internal scene where most of the materials have a similar reflectance level. Giving a relatively uniform image.

In contrast, the image on the right is much less uniform with a large variance in the reflective properties of the objects in the scene. Resulting in bright and dark areas.

LIGHT SOURCES

All CCTV cameras are dependent on high quality light, both day and night. Incandescent and halogen lamps can be used for CCTV purposes. However, these light sources are energy inefficient. Such bulb types use a lot of power of which typically 10% is related to the light output and the other 90% is wasted as heat energy. This makes them expensive to run and maintain. Today, most end-users have stopped using halogen or incandescent light bulbs with CCTV cameras.

Fluorescent lamps are much more energy efficient. However, due to their construction and operation they produce a pulsating effect that is detected by CCTV cameras on screen.

High intensity discharge (HID) lamps do provide good colour rendition in CCTV applications and can provide up to 12,000 hours. One disadvantage of using HID lamps is that they are prone to a slow start up time of typically 2-3 minutes, meaning they cannot be turned on immediately after being turned off. Low pressure sodium lamps give off a yellow glow, whereas metal halide lamps provide cool clear White-Light.

Light emitting diodes, LEDs, are semiconductor diodes that can emit a narrow band of light. LEDs are a fast growing alternative lighting solution for CCTV applications and are an extremely reliable and efficient light source. Most illuminators that utilise LEDs can have an operational life in excess of 10 years.

Surface mount technology, SMT, has advanced LED technology to the point where dual LED SMT packages are now being used by some manufacturers to produce very efficient LED illuminators to enhance CCTV surveillance at night.



HID



Metal Halide



Halogen

INFRA-RED OR WHITE-LIGHT?

One of the first decisions a CCTV designer faces is choosing between Infra-Red and White-Light illumination.

As Infra-Red does not contain colour visible to humans it cannot be used with colour cameras. To view Infra-red, monochrome or day/night cameras are required. CCTV cameras using Infra-Red only provide monochrome images. Infra-Red is ideal for applications that require covert surveillance or where visible light must be avoided for reasons of light pollution.

GJD designs LED illuminators in two standard wavelengths of 850nm and 940nm. Semi covert 850nm is most commonly used as it gives the best images because camera sensors are more sensitive at this wavelength. 940nm is covert but results in much shorter distances due to a reduction in camera sensitivity. A reduction of 40% in achievable distance can be expected when using 940nm.

If the end-user requires colour images then the only option is White-Light. GJD's Clarius White-Light LED illuminators provide light output that matches the visible spectrum, unlike low pressure sodium lighting, which gives a yellow/orange light. Using incorrect lighting with a CCTV system can degrade performance by giving inaccurate colour rendition.

White-Light can also be used as a visible deterrent warning potential intruders and preventing crime.

WHITE-LIGHT ILLUMINATION

White-Light LED illuminators are normally the preferred choice when the end-user wishes to observe an area where they want to provide both ambient light for both passersby and to act as a visible deterrent to intruders, as well as providing enough light for the observing CCTV cameras.

White-Light LED illuminators have an array of light emitting diodes that have the ability to produce visible light across the whole spectrum between 400nm and 700nm. Typically, manufacturers of White-Light LED illuminators offer cool White-Light illuminators to provide optimum colour rendition for CCTV cameras.

Fig.7 - White-Light illuminators

Clarius Single Panel



100W Mains Floodlight



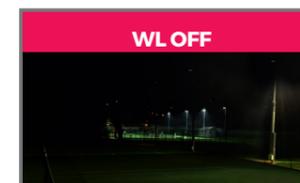
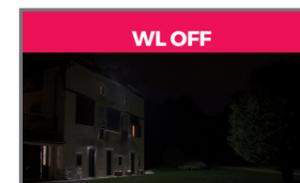
Advantages of Infra-Red

- Longer distances than White-Light
- Zero light pollution
- Covert detection



Advantages of White-Light

- Provides full colour images
- Multi-purpose for people & CCTV
- Easy to set up



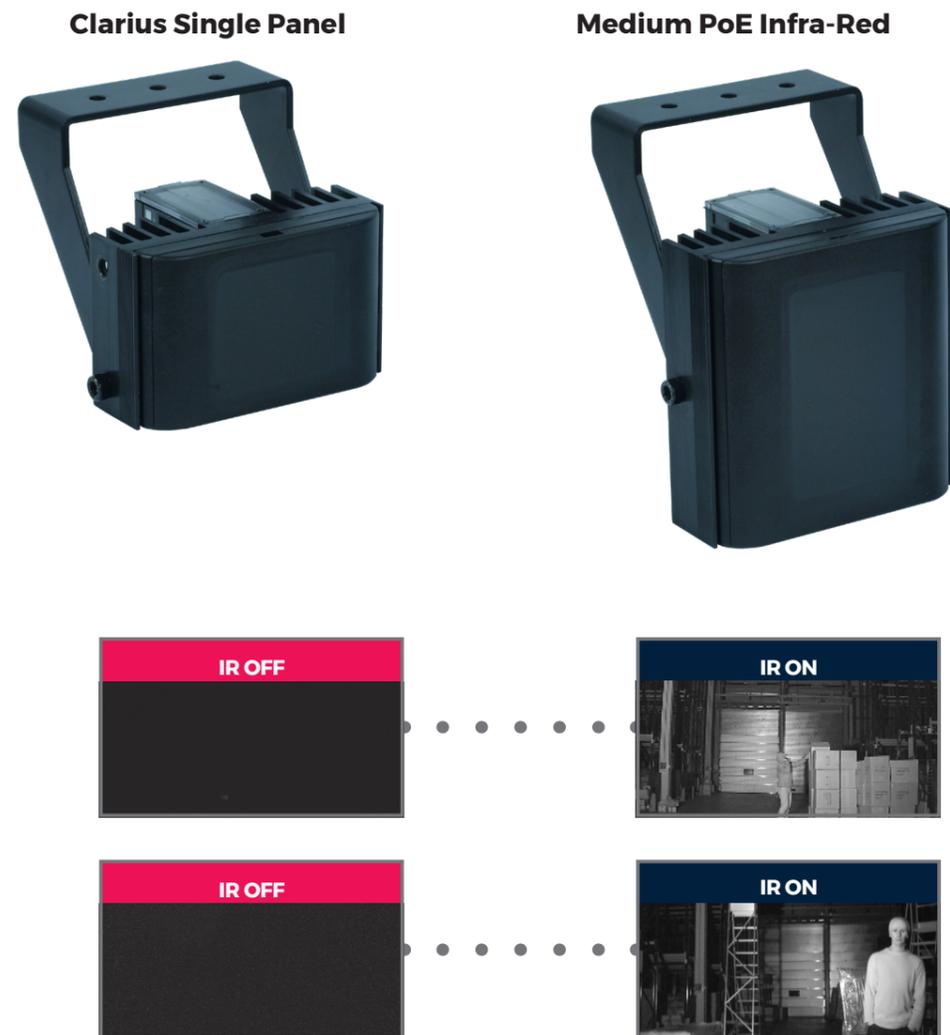
INFRA-RED ILLUMINATORS

Infra-Red LED illuminators are normally the preferred choice when the end-user wishes to observe an area where they do not want additional light pollution at night, but still need to be able to observe the scene for movement and intruders.

Infra-Red LED illuminators have an array of light emitting diodes that have the ability to produce covert Infra-Red light. Typically, manufacturers of Infra-Red LED illuminators offer 850nm Infra-Red semi-covert illuminators and 940nm Infra-Red covert illuminators.

Regardless of whether a monochrome or a day-night CCTV camera is being used by the end-user, if Infra-Red LED illumination is being used on a scene then the CCTV images will always be monochrome.

Fig.8 - Infra-Red illuminators



INVERSE SQUARE LAW

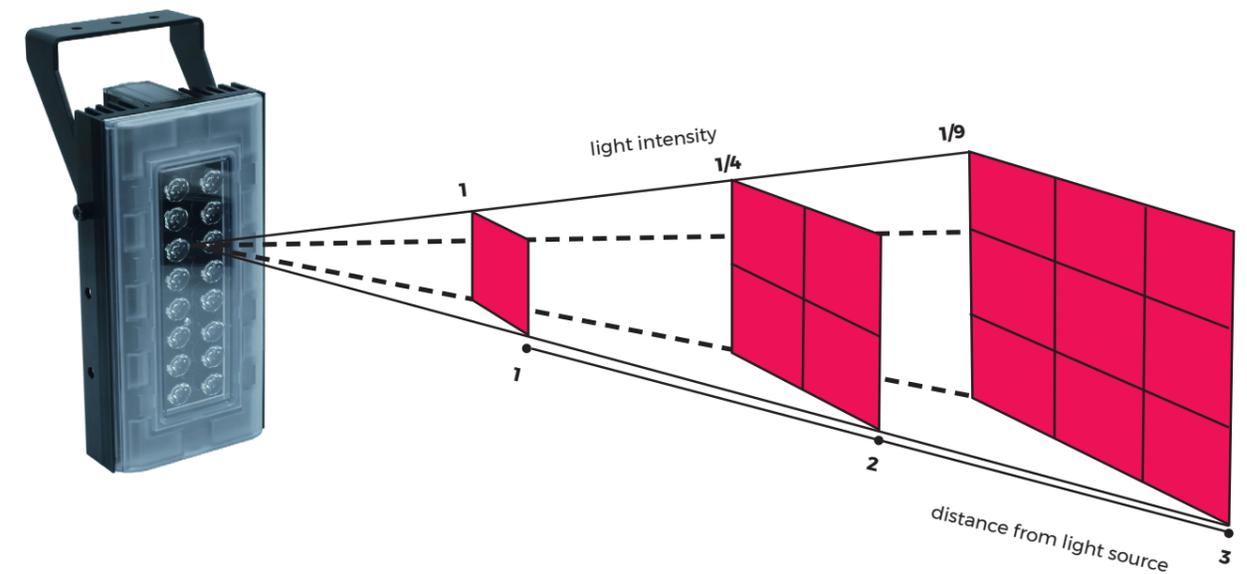
Light intensity output from an illuminator over a given distance is based on the inverse square law. Light obeys the inverse square law, which ultimately impacts on the performance of a CCTV system.

In simple terms the inverse square law works as follows: if you double the distance to target you reduce the light intensity to one quarter; if you halve the distance to target you quadruple the light intensity on the scene. This applies to both Infra-Red and White-Light illuminators.

The general rule when selecting an illuminator is the greater the coverage distance, the larger the illuminator.

If we take the inverse square law and extrapolate it, we can determine distance multipliers. Take a single illuminator which will cover a certain distance, then it will take four illuminators to cover double the distance. Two illuminators together will cover 40% extra distance and three illuminators together will cover 70% extra distance.

Fig.9 - Inverse square law



BEAM PATTERNS

Beam patterns

When choosing an illuminator it is important that the field of view of the CCTV camera and the LED illuminator are matched as close as possible. Modern day LED illuminators can be specified with 10°, 30°, 60° and 95° optics, or the end-user can opt for an interchangeable diffuser illuminator or even a dual panel illuminator, where the field of view angle can be varied on scene.

If the light output of the illuminator is too narrow it will produce 'white out' or glare in the middle of the picture.

If the light beam of the illuminator is too wide it will be outside the camera's field of view and ultimately reduce the viewing distance as energy is wasted.

Fig.10 - Light beam too narrow

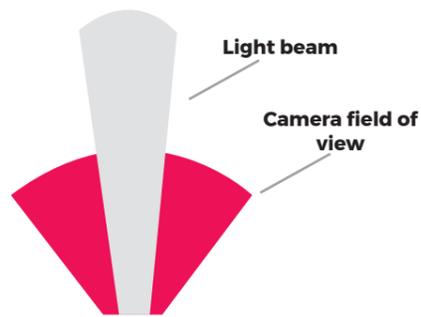


Fig.11 - Light beam too wide

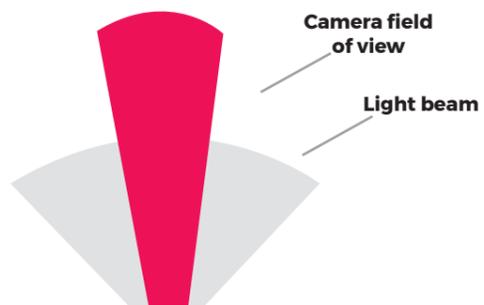
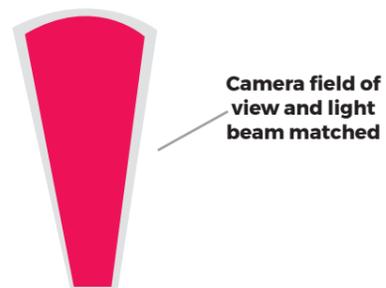


Fig.12 - Matched camera FOV and light beam



ADJUSTABLE ILLUMINATION

The Clarius® Plus range of illuminators includes a new interchangeable lens diffuser system; which allows the user to quickly and easily alter the angle of illumination. Elliptical beam profiles allow more light to be delivered where it is needed, allowing both longer distances and minimal light wastage. The system also helps to prevent overexposure of foreground objects.

As standard the illuminator includes interchangeable lenses to deliver 10°, 30°, 60° and 95° elliptical beam profiles.

Fig.13 - Interchangeable diffuser lenses

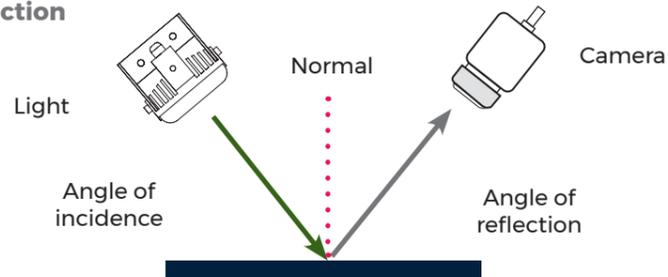


CAMERA MOUNTING POSITIONS

Specular Reflection

This is not very common and is only seen in more specialised applications like machine vision.

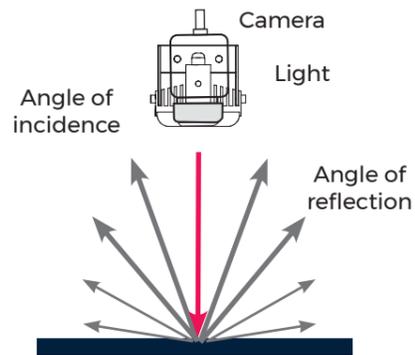
Fig.15 - Specular reflection



Diffuse Reflection

Diffuse surfaces will reflect in all directions but the reflected light is stronger when the light hits the object square. Therefore, it is recommended that the camera is located near the illuminator looking directly at the target. This will avoid the camera seeing excessive shadows.

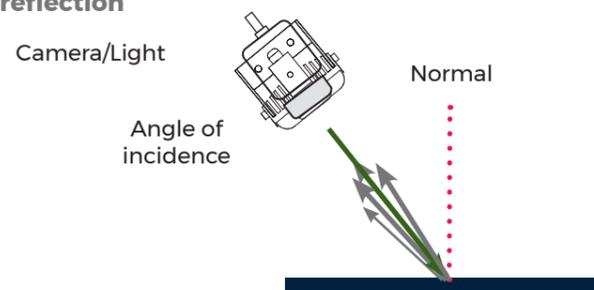
Fig.16 - Diffuse reflection



Retro-reflection

As mentioned on page seven, retro-reflection is mostly used when illuminating vehicle number plates and road signs. Camera location is critical as almost all the reflected light returns to the source. Hence the camera and the illuminator must be positioned together.

Fig.17 - Retro-reflection



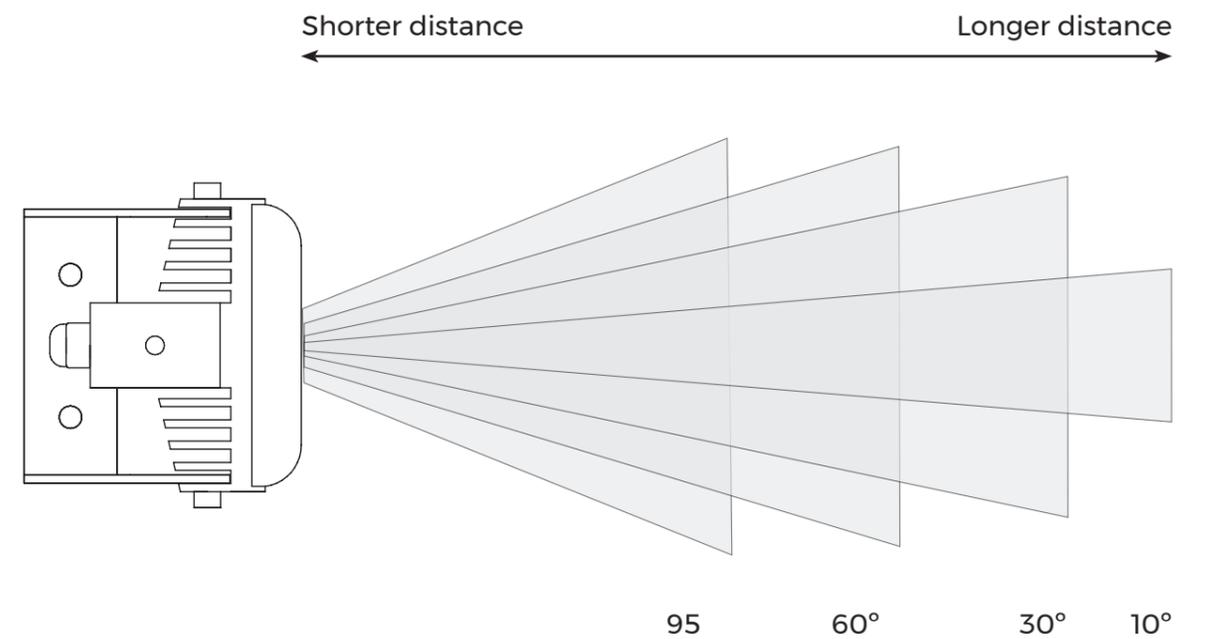
LIGHT OUTPUT

The light output that is produced by the LEDs in an illuminator can be controlled in several ways. Most illuminators allow the intensity of the light that is being projected onto a scene to be controlled by either remotely dialling into the illuminator or by manually adjusting the illuminator itself. This is achieved by either increasing or decreasing the LED power. The illuminator's LED light output can also be controlled in terms of both direction and intensity through the use of both optics and diffusers.

Optics are normally placed on top of Surface Mount LEDs in order to channel the light into a certain direction of field. Most LED illuminator manufacturers offer a range of optics in order to provide narrow or wide beam angles of light. Narrow beam angles are typically considered 10 to 30 degrees, medium beams 50 to 80 degrees and wide angle beams 100 to 180 degrees.

Diffusers are another method of controlling the beam angle of an illuminator. GJD provides an interchangeable diffuser option with its Clarius Plus illuminators. Various diffuser inserts are provided so that the end user can adjust the light beam angle on scene to suit the application.

Fig.18 - Illuminator distance vs field of view optics angle



MEASURING LIGHT

Measuring light

Lumens is a unit of light measurement otherwise known as luminous flux. The international system of units uses Lux as the units for Lumens. Lumens is simply the illuminous flux per unit area, or more simply how much light falls per unit area. Lux is only applicable to White-Light or simply 400-700nm. On a bright sunny day, a person can expect to find a Lux level outside anywhere between 10,000 to 1000,000 Lux. Compared to an overcast day, which can reduce the outside Lux level by a factor of 10, therefore somewhere between 1,000-10,000 Lux. During twilight hours Lux level can fall to 1 to 100 Lux. A full moon at night will only deliver a Lux level of 0.1 Lux. Normal street lighting will typically produce around 5 Lux.

Infra-Red unlike White-Light is normally measured in thousandths of a Watt, more commonly referred to as milliwatts (mW). The unit of power is a Watt in the international system of units, after the Scottish inventor James Watt. Infra-Red LED illuminators can have their Infra-Red light output measured in mW per square metre, thus enabling performance to be measured and for comparisons to be made against different Infra-Red illuminators.

It is worth noting that LEDs are more energy efficient than incandescent or halogen illuminators, therefore the ratio of the light output over the illuminator power consumption will be higher.



Image showing typical lux metre

CAMERA LENS V CHIP SIZE

Camera lens vs chip size FOV angle

When selecting an LED illuminator it is important to consider both the CCTV camera that you will be using, including the camera's chip size and the size of the camera's lens. Using simple trigonometry you can determine the required LED illuminator's optic size required to achieve a matched field of view angle.

The table in Fig.19 can be used to help determine the required illuminator's optic size based on your CCTV camera specification.

Fig 19 - Optics selection

Lens Size	Camera Chip Size			
	1/4"	1/3"	1/2"	2/3"
2.8mm	60° Optics	100° Optics	120° Optics	120° Optics
4mm	60° Optics	100° Optics	100° Optics	100° Optics
6mm	30° Optics	60° Optics	60° Optics	100° Optics
8mm	30° Optics	60° Optics	60° Optics	60° Optics
12.5mm	30° Optics	30° Optics	30° Optics	60° Optics
16mm	10° Optics	30° Optics	30° Optics	30° Optics
25mm	10° Optics	10° Optics	30° Optics	30° Optics
50mm	10° Optics	10° Optics	10° Optics	10° Optics

PTZ AND DOME CAMERAS

Pan and tilt zoom cameras and dome cameras are commonly mounted on to corners of buildings or on top of poles. Such cameras offer the ability to pan across a scene and zoom into potential intruders.

If a PTZ or dome camera is mounted on to a corner of a building, the camera will be able to provide a coverage angle of 270 degrees. Such coverage angle can be matched with two Clarius LED illuminators as shown in Fig.20.

If a PTZ or dome camera is mounted on to a pole, the camera will be able to provide a coverage angle of 360 degrees. Such coverage angle can be matched with two Clarius LED illuminators as shown in Fig.21.

Fig.20 - Corner of a building

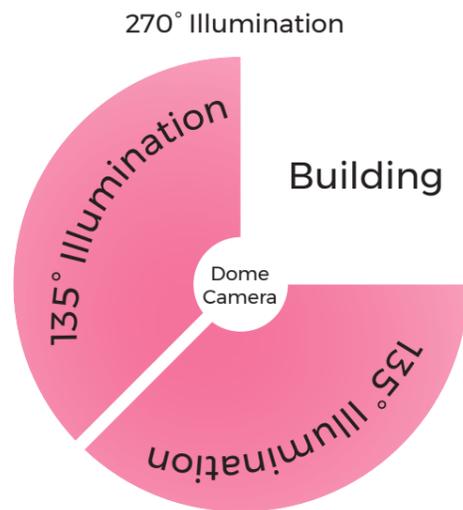
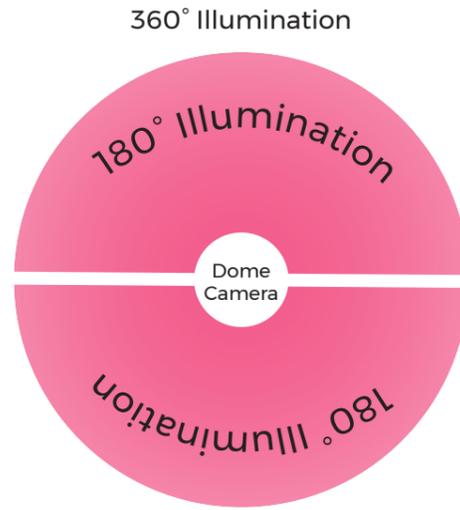


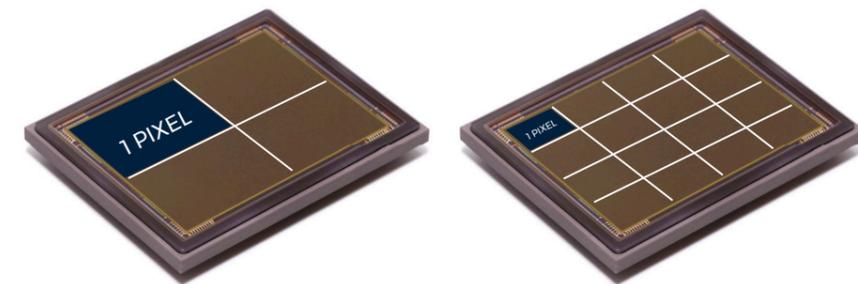
Fig.21 - Pole mounted



MEGAPIXEL CAMERAS

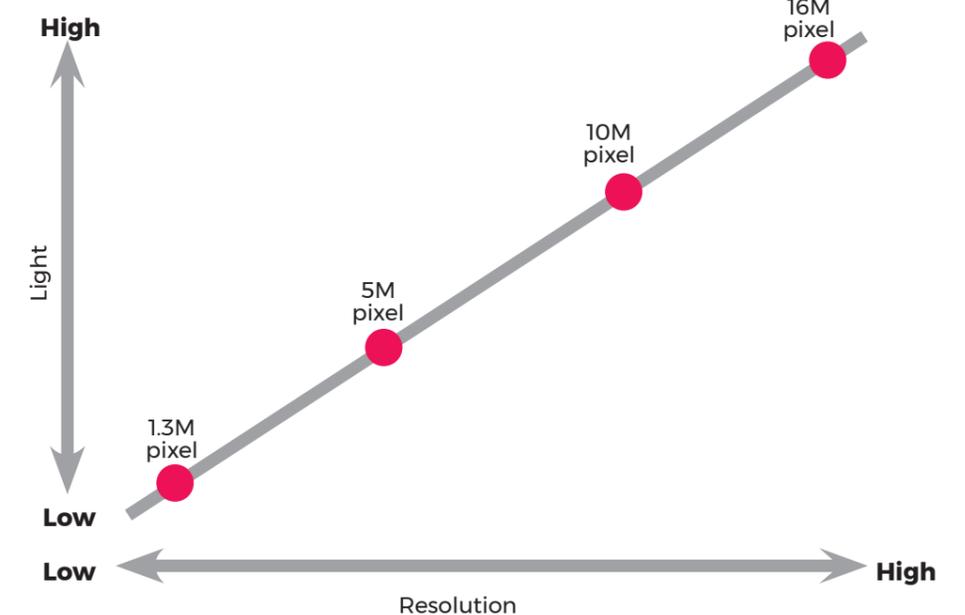
All CCTV cameras require light to be able to produce a picture from the scene. In recent years, CCTV cameras have been built with larger megapixel chips in order to produce superior resolution. However, if all other variables remain the same, as the resolution of the camera increases its sensitivity to light decreases.

Fig.22 - Pixels



For example the sensor on the right has four times the resolution of the sensor on the left. But the size of the individual pixels is much smaller hence it is less capable of collecting light. The lower resolution chip will therefore perform better in low light conditions.

Fig.23 - Light vs camera resolution



Owing to the relationship between camera resolution and light sensitivity, it is clear that lighting for professional CCTV systems is becoming more important as the resolution of modern cameras increase.

Remember, the higher the camera resolution, the more light is required to give quality images.

WHICH Clarius ILLUMINATOR ?

CLARIUS ILLUMINATORS

The Clarius® Plus range of illuminators includes a new interchangeable lens diffuser system; which allows the user to quickly and easily alter the angle of illumination. Elliptical beam profiles allow more light to be delivered where it is needed, allowing both longer distances and minimal light wastage. The system also helps to prevent overexposure of foreground objects.

As standard the illuminator includes interchangeable lenses to deliver 10°, 30°, 60° and 95° elliptical beam profiles. *

*Other angles available on request.

CLARIUS® PLUS



CLARIUS® IP



CLARIUS® HYBRID



SPECIALIST



ACCESSORIES



Clarius PLUS Infra-Red LED Illuminators



Small IR Illuminator

Medium IR Illuminator

Large IR Illuminator

Extra Large IR Illuminator

Small PoE IR Illuminator

Medium PoE IR Illuminator

IS-8 850nm*		IM-8 850nm*		IL-8 850nm*		IX-8 850nm*		IS-8-P 850nm*		IM-8-P 850nm*		SPECIFICATIONS	
Distance		Distance		Distance		Distance		Distance		Distance		CONSTRUCTION	
10° - 132m (434ft) 30° - 66m (217ft) 60° - 42m (138ft) 95° - 21m (69ft)		10° - 187m (614ft) 30° - 94m (307ft) 60° - 60m (195ft) 95° - 30m (98ft)		10° - 228m (748ft) 30° - 114m (374ft) 60° - 73m (238ft) 95° - 36m (119ft)		10° - 262m (859ft) 30° - 131m (429ft) 60° - 83m (273ft) 95° - 42m (137ft)		10° - 101m (332ft) 30° - 51m (166ft) 60° - 32m (106ft) 95° - 16m (53ft)		10° - 187m (614ft) 30° - 94m (307ft) 60° - 60m (195ft) 95° - 30m (98ft)		Robust high quality aluminium extrusion	
FOV		FOV		FOV		FOV		FOV		FOV		PHOTOCELL	
10° - 23m (76ft) 30° - 35m (116ft) 60° - 49m (159ft) 95° - 46m (151ft)		10° - 33m (107ft) 30° - 50m (164ft) 60° - 69m (225ft) 95° - 65m (213ft)		10° - 40m (131ft) 30° - 61m (201ft) 60° - 84m (275ft) 95° - 79m (260ft)		10° - 46m (150ft) 30° - 70m (230ft) 60° - 96m (316ft) 95° - 91m (298ft)		10° - 18m (58ft) 30° - 27m (89ft) 60° - 37m (122ft) 95° - 35m (115ft)		10° - 33m (107ft) 30° - 50m (164ft) 60° - 69m (225ft) 95° - 65m (213ft)		Adjustable 20 - 70 Lux	
CONSUMPTION		CONSUMPTION		CONSUMPTION		CONSUMPTION		CONSUMPTION		CONSUMPTION		ILLUMINATION	
15W		26W		39W		52W		12W		25W		Adjustable 10% - 100%	
RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		OPERATING TEMPERATURE	
ALT-30-24		ALT-30-24		ALT-60-24		ALT-60-24		Any IEEE 802.3af Injector		Any IEEE 802.3af Injector		-50° to 50°C (-58° to 122°F)	
RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		MOUNT	
ALT-30-24		ALT-30-24		ALT-60-24		ALT-60-24		Any IEEE 802.3af Injector		Any IEEE 802.3af Injector		Powder coated stainless steel wall mount	
RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		INPUT	
ALT-30-24		ALT-30-24		ALT-60-24		ALT-60-24		Any IEEE 802.3af Injector		Any IEEE 802.3af Injector		12-32V DC or 24V AC +/-10%	
RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		IP RATING	
ALT-30-24		ALT-30-24		ALT-60-24		ALT-60-24		Any IEEE 802.3af Injector		Any IEEE 802.3af Injector		IP66 in accordance with EN60529;1992	
RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		RECOMMENDED PSU		ELECTRONICS	
ALT-30-24		ALT-30-24		ALT-60-24		ALT-60-24		Any IEEE 802.3af Injector		Any IEEE 802.3af Injector		High efficiency surface mount high power Dual Core LED's™ with advanced current limited integral control circuitry	

Clarius PLUS White-Light LED Illuminators



Small WL Illuminator

Medium WL Illuminator

Large WL Illuminator

Extra Large WL Illuminator

Small PoE WL Illuminator

Medium PoE WL Illuminator

VS-CW

Distance

10° - 81m (264ft)
30° - 47m (154ft)
60° - 34m (110ft)
95° - 20m (66ft)

FOV

10° - 14m (46ft)
30° - 25m (83ft)
60° - 39m (127ft)
95° - 44m (144ft)

LUMEN OUTPUT	1200lm
CONSUMPTION	15W
RECOMMENDED PSU	ALT-30-24

VM-CW

Distance

10° - 114m (374ft)
30° - 67m (218ft)
60° - 48m (156ft)
95° - 29m (94ft)

FOV

10° - 20m (65ft)
30° - 36m (117ft)
60° - 55m (180ft)
95° - 62m (204ft)

LUMEN OUTPUT	2400lm
CONSUMPTION	26W
RECOMMENDED PSU	ALT-30-24

VL-CW

Distance

10° - 139m (456ft)
30° - 81m (266ft)
60° - 58m (190ft)
95° - 35m (114ft)

FOV

10° - 24m (80ft)
30° - 43m (143ft)
60° - 67m (220ft)
95° - 76m (249ft)

LUMEN OUTPUT	3600lm
CONSUMPTION	39W
RECOMMENDED PSU	ALT-60-24

VX-CW

Distance

10° - 160m (524ft)
30° - 93m (305ft)
60° - 67m (218ft)
95° - 40m (131ft)

FOV

10° - 28m (92ft)
30° - 50m (164ft)
60° - 77m (252ft)
95° - 87m (286ft)

LUMEN OUTPUT	4450lm
CONSUMPTION	52W
RECOMMENDED PSU	ALT-60-24

VS-CW-P

Distance

10° - 68m (223ft)
30° - 40m (130ft)
60° - 28m (93ft)
95° - 17m (56ft)

FOV

10° - 12m (39ft)
30° - 21m (70ft)
60° - 33m (107ft)
95° - 37m (122ft)

LUMEN OUTPUT	1100lm
CONSUMPTION	12W
RECOMMENDED PSU	Any IEEE 802.3at Injector

VM-CW-P

Distance

10° - 114m (374ft)
30° - 67m (218ft)
60° - 48m (156ft)
95° - 29m (94ft)

FOV

10° - 20m (65ft)
30° - 36m (117ft)
60° - 55m (180ft)
95° - 62m (204ft)

LUMEN OUTPUT	2400lm
CONSUMPTION	25W
RECOMMENDED PSU	Any IEEE 802.3at Injector

SPECIFICATIONS

CONSTRUCTION	Robust high quality aluminium extrusion
PHOTOCELL	Adjustable 20 - 70 Lux
ILLUMINATION	Adjustable 10% - 100%
OPERATING TEMPERATURE	-50° to 50°C (-58° to 122°F)
MOUNT	Powder coated stainless steel wall mount
INPUT	12-32V DC or 24V AC +/-10%
IP RATING	IP66 in accordance with EN60529:1992
COLOUR TEMPERATURE	5700K (6000K and 6500K options available to order)
COLOUR RENDERING INDEX	Typ.80
ELECTRONICS	High efficiency surface mount high power Dual Core LED's™ with advanced current limited integral control circuitry

Clarius PLUS IP LED Illuminator

The Clarius® Plus IP is an internet protocol connected illuminator with an integrated web browser interface.

The range incorporates the latest surface mount LED's with enhanced optical output and outstanding reliability, to deliver high quality night-time images.

The Clarius® Plus IP includes an interchangeable lens diffuser system; which allows the user to quickly and easily alter the angle of illumination. Elliptical beam profiles allow more light to be delivered precisely where it is needed, allowing longer distances to be reached and minimising light wastage. The system also helps to prevent overexposure of foreground objects.

As standard the illuminator includes interchangeable lenses to deliver 10°, 30°, 60° and 95° elliptical beam profiles.



OSRAM
LEDs
Included



Hybrid IP IR/WL LED Illuminator

The Clarius® Hybrid IP is a high-performance combined infra-red and white light illuminator. Incorporating the latest surface mount LED's with enhanced optical output and outstanding reliability, delivers excellent night-time images.

The Clarius® Hybrid IP is an internet protocol connected illuminator with integrated web browser interface. The range includes an interchangeable lens diffuser system; which allows the user to quickly and easily alter the angle of illumination.

Elliptical beam profiles allow more light to be delivered where it is needed, illuminating longer distances and minimising light wastage. The system also helps to prevent overexposure of foreground objects.

As standard the illuminator includes interchangeable lensing to deliver 10° circular, 30°, 60 & 95° elliptical beam profiles.

OSRAM
LEDs
Included



Medium IP IR Illuminator

Medium IP WL Illuminator

IM-8-IP 850nm

Distance
10° - 187m (614ft)
30° - 94m (307ft)
60° - 60m (195ft)
95° - 30m (98ft)

FOV
10° - 33m (107ft)
30° - 50m (164ft)
60° - 69m (225ft)
95° - 65m (213ft)

IM-9-IP 940nm

Distance
10° - 115m (376ft)
30° - 65m (213ft)
60° - 40m (131ft)
95° - 20m (66ft)

FOV
10° - 20m (66ft)
30° - 35m (114ft)
60° - 46m (152ft)
95° - 44m (143ft)

CONSUMPTION	25W
RECOMMENDED PSU	Any IEEE 802.3at Injector

VM-CW-IP

Distance
10° - 114m (374ft)
30° - 67m (218ft)
60° - 48m (156ft)
95° - 29m (94ft)

FOV
10° - 20m (65ft)
30° - 36m (117ft)
60° - 55m (180ft)
95° - 62m (204ft)

CONSUMPTION	25W
RECOMMENDED PSU	Any IEEE 802.3at Injector
LUMEN OUTPUT	2400lm
COLOUR RENDERING INDEX	Typ. 80
COLOUR TEMPERATURE	5700K (6000K and 6500K options available to order)

SPECIFICATIONS

CONSTRUCTION	Robust high quality aluminium extrusion
PHOTOCELL	Adjustable 20 - 70 Lux
ILLUMINATION	Adjustable 10% - 100%
OPERATING TEMPERATURE	-50° to 50°C (-58° to 122°F)
MOUNT	Powder coated stainless steel wall mount
INPUT	PoE+ (IEEE802.3at)
IP RATING	IP66 in accordance with EN60529:1992
ELECTRONICS	High efficiency surface mount high power Dual Core LED's™ with advanced current limited integral control circuitry

SUPPORTED SOFTWARE/NVRS/CAMERAS



We are continuously testing and updating our integration, so if you miss your favourite VMS or camera please email info@gjd.co.uk

Medium HYBRID Illuminator

Large HYBRID Illuminator

INFRA-RED DISTANCES

HM-8CW-IP

Distance	FOV
10° - 101m (332')	18m (58')
30° - 51m (166')	27m (89')
60° - 32m (106')	37m (122')
95° - 16m (53')	35m (115')

HM-9CW-IP

Distance	FOV
10° - 62m (204')	11m (36')
30° - 30m (98')	16m (53')
60° - 18m (60')	21m (70')
95° - 9m (30')	20m (66')

WHITE-LIGHT DISTANCES

Distance	FOV
10° - 68m (223')	12m (39')
30° - 40m (130')	21m (70')
60° - 28m (93')	33m (107')
95° - 17m (56')	37m (122')

INFRA-RED DISTANCES

HL-8CW-IP

Distance	FOV
10° - 187m (614')	33m (107')
30° - 94m (307')	50m (164')
60° - 60m (195')	69m (225')
95° - 30m (98')	65m (213')

HL-9CW-IP

Distance	FOV
10° - 115m (376')	20m (66')
30° - 65m (213')	35m (114')
60° - 40m (131')	46m (152')
95° - 20m (66')	44m (143')

WHITE-LIGHT DISTANCES

Distance	FOV
10° - 114m (374')	20m (65')
30° - 67m (218')	36m (117')
60° - 48m (156')	55m (180')
95° - 29m (94')	62m (204')

SPECIFICATIONS

CONSTRUCTION	Robust high quality aluminium extrusion	
PHOTOCELL	Adjustable 20 - 70 Lux	
ILLUMINATION	Software adjustable 10% - 100% with pulse modes	
OPERATING TEMPERATURE	-50° to 60°C (-58° to 140°F)	
MOUNT	Powder coated stainless steel wall mount	
INPUT	Medium	Large
	PoE (IEEE802af)	PoE+ (IEEE802.3at)
IP RATING	IP66 in accordance with EN60529:1992	
ELECTRONICS	High efficiency surface mount high power Dual Core LED's™ with advanced current limited integral control circuitry	

SUPPORTED SOFTWARE/NVRS/CAMERAS



We are continuously testing and updating our integration, so if you miss your favourite VMS or camera please email info@gjd.co.uk

Clarius Star LED Illuminator

The Clarius Star is a high-quality LED floodlight designed for all outdoor lighting applications.

Modern aesthetics specifically designed to cater for the high-end residential and commercial markets and an adjustable bracket with the ability to pan and tilt help the Clarius Star stand out in the marketplace.

With a two year warranty and a 2500+ lumen output, it is the ideal replacement for older 250/300W halogen floodlights, as well as being environmentally friendly.

Features include:

- Adjustable bracket to tilt and pan light
- Adjustable detection range between 4m to 12m, with 120° detection angle (Floodlight with PIR Sensor)
- Time on adjustable between 10 seconds and 10 minutes
- Pre-wired with high quality 1m cable
- Luxeon Cool white (5700k) LEDs
- Vandal-proof polycarbonate diffuser
- Average life expectancy of over 5 years
- IP65 rated



Floodlight without PIR



Floodlight with PIR

Mains White-Light Floodlight

OSRAM

LEDs
Included



VCS-20

VCS-20-PIR

DESCRIPTION	LED Floodlight without PIR (20W)	LED Floodlight with PIR (20W)
HOUSING COLOUR	Black	Black
LENS	Frosted	Frosted
LUMENS	2500 +	2500 +
VOLTAGE	170-240VAC 50Hz	170-240VAC 50Hz
IP RATING	IP65	IP65
ADJUSTABLE OUTPUT	✓	✓
DETECTION CIRCUIT	N/A	Passive Infra-Red (PIR)
PIR ANGLE	N/A	120°
PIR RANGE	N/A	12m
ACTIVATION TIME	N/A	10 Secs - 10 Mins
MOUNTING BRACKET	✓	✓
OVERRIDE OPTION	✓	✓
WEIGHT	0.9Kg	0.9Kg
DIMENSIONS	241mm (w) x 61mm (H) x 153mm (D)	241mm (w) x 61mm (H) x 161mm (D)

SPECIFICATIONS

CONSTRUCTION	Robust high quality aluminium extrusion
PHOTOCELL	Adjustable 20 - 70 Lux
ILLUMINATION	Adjustable 10% - 100%
OPERATING TEMPERATURE	-30° to 50°C (-86° to 122°F)
MOUNT	Powder coated stainless steel wall mount
INPUT	170-240 VAC 50Hz
ELECTRONICS	High efficiency surface mount high power LUXEON LEDs

CMF-CW60-50W

CMF-CW60-100W

CMF-CW60-200W

	50W Floodlight	100W Floodlight	200W Floodlight
INPUT VOLTAGE	AC100-240V 50 / 60Hz	AC100-240V 50 / 60Hz	AC100-240V 50 / 60Hz
POWER	50Watts	100Watts	200Watts
POWER FACTOR	0.95	0.95	0.95
LEDs	High quality Osram LEDs	High quality Osram LEDs	High quality Osram LEDs
BEAM ANGLE	60°	60°	60°
LUMINOUS FLUX	≈7,500lm, Cool white 6000K	≈15,000lm, Cool white 6000K	≈30,000lm, Cool white 6000K
COLOUR RENDERING INDEX	Ra = 90	Ra = 90	Ra = 90
EXPECTED LIFETIME	50000Hr+	50000Hr+	50000Hr+
PRESSURE VENT	Yes	Yes	Yes
HOUSING	High thermal conductivity aluminium and Polycarbonate encapsulated lens module	High thermal conductivity aluminium and Polycarbonate encapsulated lens module	High thermal conductivity aluminium and Polycarbonate encapsulated lens module
DIMENSIONS	203 x 292 x 62mm	277 x 292 x 62mm	428 x 292 x 62mm
WATERPROOF RATING	IP65	IP65	IP65
IMPACT RATING	IK09	IK09	IK09
AMBIENT TEMPERATURE	-25 °C to +50 °C	-25 °C to +50 °C	-25 °C to +50 °C
WARRANTY	3yrs	3yrs	3yrs

Clarius Accessories

POWER SUPPLIES

The Clarius® range of power supply units are IP67 rated, constant voltage devices ideal for powering the Clarius® range of LED lighting products.

They feature a regulated 24V DC output supplying continuous full rated current to load. The universal mains input voltage allows the power supply to be used across a wide geographical area while the highly efficient switch mode design ensures low operating costs and cool running.

They are available in four power variants from 30W to 150W, providing enough power for multiple units if required.



30W DC Power Supply

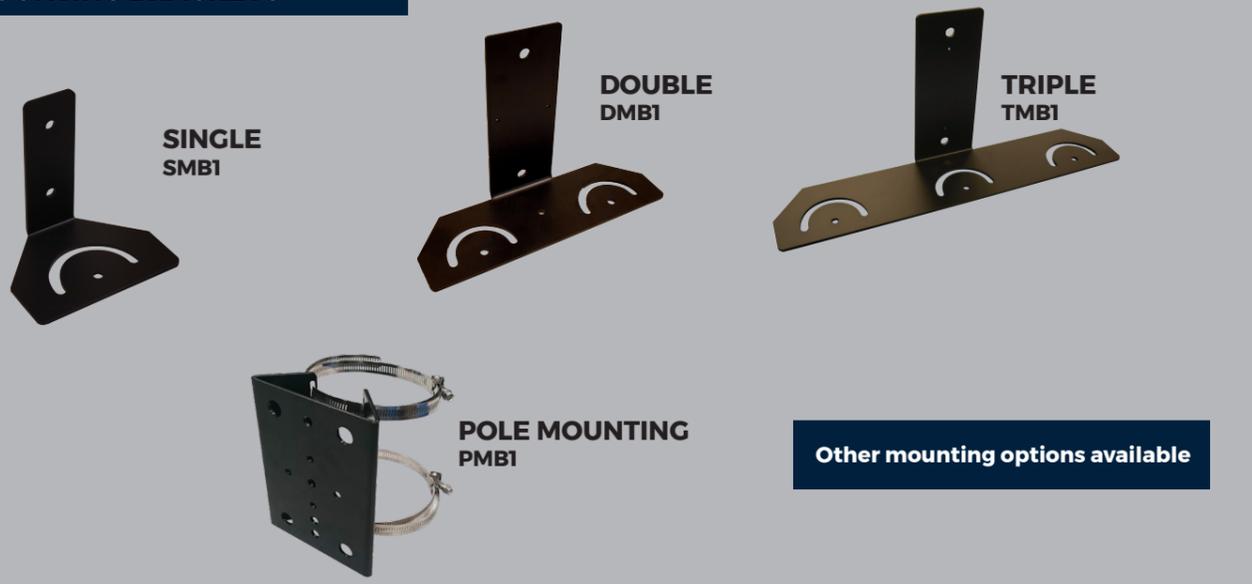
60W DC Power Supply

100W DC Power Supply

150W DC Power Supply

Product Code	ALT-30-24	ALT-60-24	ALT-100-24	ALT-150-24
Power	30W	60W	100W	150W
Output	24V DC / 1.25A	24V DC / 2.5A	24V DC / 4.2A	24V DC / 6.25A
Input	100-250V AC 50/60 Hz	100-250V AC 50/60 Hz	100-250V AC 50/60 Hz	170-250V AC 50/60 Hz
Rating	IP67	IP67	IP67	IP67
Dimensions	200W x 20H x 29Dmm	150W x 44H x 63Dmm	214W x 44H x 63Dmm	214W x 44H x 63Dmm

MOUNTING BRACKETS



CASE STUDY SOLAR FARMS PROTECTED WITH ILLUMINATORS

Solar farms are large-scale systems of solar photovoltaic (PV) panels, used to generate electricity. The farms often cover vast areas of land in rural areas, therefore it is essential that effective perimeter detection is in place to protect the infrastructure. GJD was employed to manufacture reliable security lighting to work in conjunction with the CCTV system on a solar farm in Cambridgeshire, to provide optimum security.

Challenge

The Cambridgeshire solar farm required intelligent detection lighting and a CCTV solution for a 13MW PV installation. Major project specifications included reliable security lighting, even in adverse weather conditions, accurate angle illumination and a light range of up to 95 metres. Given the nature of the project, it was also important the selected lighting used very low power consumption, without compromising on quality and efficiency.

Detection solution

GJD worked closely with AGE CCTV Systems and the project manager at the solar farm to select the most suitable security lighting for the project. After careful consideration it was decided the high performance, Infra-Red Clarius® IM illuminator was the perfect lighting solution, as it is specifically designed to provide world class leading performance, long life and ultra-low maintenance.

Gary Whiteman, Director of AGE CCTV Systems commented: "AGE choose Clarius® LED illuminators from GJD to complement our CCTV system as it provides competitively priced, high performance LED lighting in a rural environment".

Incorporating the latest surface mount LEDs with enhanced optical output and outstanding reliability, the Infra-Red Clarius® IM illuminator delivers high quality night-time images, as well as working in conjunction with black and white or day and night cameras, providing a light invisible to the human eye, but fully visible to the CCTV camera.

Each unit is fitted with integrated control circuitry to carefully control LED output, delivering consistent illumination for the farm and a projected working life in excess of 10 years.

Key facts

- Infra-Red Clarius® IM illuminators were installed on site
- IP67 weather proof rating
- Low power consumption (26W)
- Latest SMT LED Technology
- Distances up to 95 metres



IR OFF



IR ON



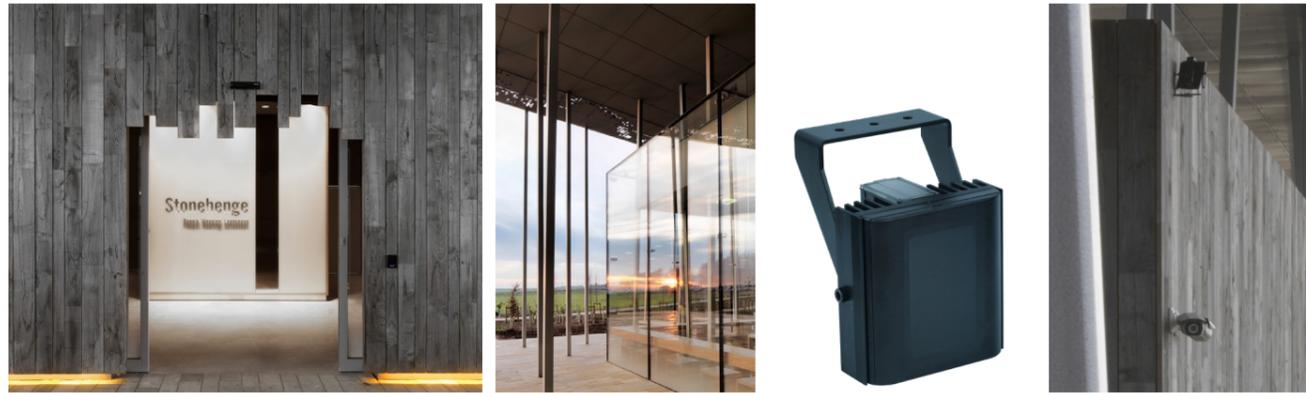
CASE STUDY STONEHENGE VISITORS CENTRE, WILTSHIRE

GJD Manufacturing protects “one of the Wonders of the World”

The prehistoric Stonehenge site is one of Britain’s most popular tourist attractions. In an effort to restore the famous world heritage site, Stonehenge underwent a massive £27 million renovation project.

Challenge

This is the largest capital project even undertaken by English Heritage. Owing to the high scale of the scheme, Stonehenge required a high-end, sophisticated perimeter detection and security system.



Solution

GJD worked closely with Wessex Fire and Security to manufacture and install the new security system for the Stonehenge site.

Infra-Red Clarius® illuminators were perfect for the customer’s specific requirements, as they work in conjunction with black and white or day and night cameras, providing a light invisible to the human eye, but fully visible to the CCTV camera.

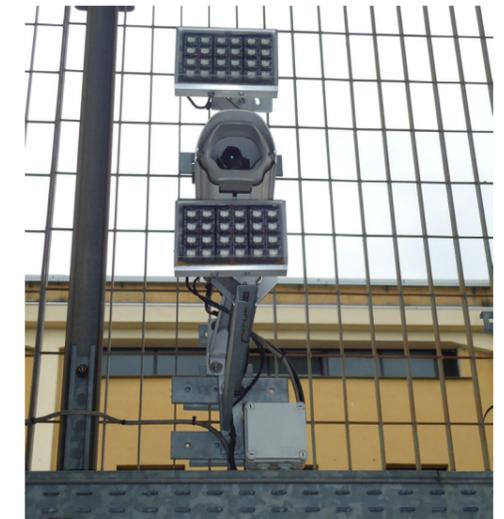


CASE STUDY ILLUMINATORS AT ITALY’S MAIN CARGO PORT

Clarius® White-Light illuminators have recently been installed at one of Italy’s main cargo ports. These bespoke illuminators were specially designed in conjunction with Aitek S.p.A., the new container code recognition system, to provide 24 hours surveillance of cargo containers passing through checkpoint locations.

The LEDs of the White-Light illuminators are pulsed at high current by the CCTV cameras, which are constantly scanning for information on the side of containers passing in and out of the port.

“We are very satisfied with Clarius® illuminators both in terms of performance and reliability” stated Massimo Massa, Project Manager at Aitek S.p.A.



GJD is an award winning UK manufacturer, designer and supplier of professional external detector equipment, as well as Infra-Red and White-Light LED Illuminators.

Our security solutions rapidly identify and validate genuine alerts, identify false alarm signals and optimise the call-out of responders, making our products a truly valuable asset to both people and properties in all industry sectors across the world.

We understand that security is not a 'one size fits all' approach. By listening to and working closely with our customers and partners, we are able to create security solutions to match exact requirements.

We have highly knowledgeable engineers available to carry out detailed site assessments to provide tailored presence detection, LED illumination and security lighting systems.

If you would like more information about this service, please contact your GJD Sales Manager.



Quality is everything

GJD's core competency is its ability to design, develop and manufacture innovative products by utilising the latest technology, all in-house at our site in Heywood, Greater Manchester.

A fundamental benefit of manufacturing in-house means that all of our products go through stringent testing procedures to verify the functionality, quality and reliability of finished products. All of our products are industry compliant with the latest regulations including ISO 9001:2015, CE, UL, RoHS, REACH, WEEE and BS8418.



Engineer training

Become a GJD certified installer with our comprehensive product training. Our course ensures you stay up to date with the latest GJD technology, whilst providing you with specific product expertise, installation tips and technical support.

CONTACT INFORMATION

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SUPPORT



Free guidance documents



Free engineer workshop



Free UK and international technical support



Free warranty on all GJD products



Industry experts providing field support



Bespoke marketing and PR support from our team of experienced professionals

SOCIAL MEDIA

