Architectural illumination aims to reveal the existing form of a building and create links between it and the landscape, defining a unique identity while respecting the living environment of people.

**Lighting objectives**

Lighting can transform the night-time appearance of a building or landscape. The aesthetics, usability and desirability of a structure or place can be increased by good lighting design. To achieve this, there must be a clear understanding between all parties on the objectives of the night-time scene.

Architectural illumination has three main categories:

- **Historical** - buildings and structures of special historic interest
- **Contemporary** - modern and “industrial” premises
- **Ambience** - parks, precincts and water features

All three share the same three broad lighting design objectives: appearance, performance and safety.

Most buildings and their surroundings have a purpose, whether it is commercial or tourism, historical aesthetic or modern. The lighting needs to enhance the brand image, to bring out the beauty of the architecture and open the surrounds to confident exploration and enjoyment. A well lit approach can provide an enhanced appearance whilst satisfying the requirements for safety of those using the space and those who own it.

When translating these objectives into lighting criteria there are several considerations. Firstly, since the visual size of the details to be seen are generally large low levels of lighting tend to be sufficient. Secondly the lighting of vertical surfaces assumes more importance outdoors.

Picture 1: Bridge of Avignon, FR
Photo: © Christophe Canadell
Noctibene Agency

Picture 2: Torre Alemanna, IT
Photo: © Fabio Baraldi
Architect: Vincenzo Russo

Picture 3: Pont Audemer, FR
Lighting Design: AGENCE ON
Architectural Illumination

Architectural illumination is one of those subjects which needs to be defined before it can be understood. It differs from other forms of exterior lighting in a number of key aspects, some of which can be lengthy to explain. So perhaps our starting point should be to categorise the various applications.

**Functional illumination** is where light is used to enable people to carry out a task in a particular area. Typically, the area around a security access gate would require functional lighting.

**Promotional illumination** serves a different purpose, which is to attract the attention of a viewer, and to encourage further involvement — lighting an advertising billboard would fall into this category.

**Architectural illumination** is quite different from either of the above. The requirement here is to reveal detail differently from the daytime, to create links between architectural features of buildings and landscapes defining a specific identity whilst respecting the living environment of people. It is an area in which the designer needs creativity, intuition and flair.

At Thorn we begin with the idea of light itself before progressing to specific products. Creating aesthetic appeal, conveying messages and meanings, facilitating orientation, maximising safety, conserving energy and establishing how particular light sources will interact with building surfaces are all important considerations. Our aim is to bring art and science together, to encourage creativity, not blandness, and to craft an imaginative lighting solution that balances emotional impact with the functional aspects of the project.

That’s why we offer ranges from which almost any architectural lighting requirement may be met. By applying this brochure, including eControl guidance on 15 ways to make energy efficient lighting easy, economic prosperity and citizen well-being can be improved and the impact on the environment reduced.

**Why Thorn Lighting?**
As a trusted global supplier of professional outdoor and indoor lighting with integrated controls, we have years of experience in luminaire development. Leveraging our research and development facilities, we actively work to raise lighting standards and are uniquely placed to combine the latest light source technology with our specialist expertise in optical and luminaire design.

When you’re lighting facades, structures or amenity spaces with our products you can achieve a solution where aesthetics, optical performance, energy consumption and maintenance are all in perfect balance.

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Picture: Place des Epars à Chartres, FR. 
Architects: Paysagist Atelier Jacqueline Osty, 
Lighting Design: Roger Narboni, 
Concepto Agency. 
Photo: © Xavier Boymond
Criteria

There are a number of variables that must be taken into account when selecting architectural illumination equipment. These can be grouped into: ‘function factors’ and ‘emotion factors’. Functional factors relate to the physical and operational characteristics of the lighting system, whereas emotional factors are those that affect user’s evaluation and can be harder to ascertain.

The ‘function’ factors

Placement
To start an outdoor lighting design you need to know the principal viewing position or approach to the building or area being lit. Don’t confuse this with the general aiming orientation for the main lights. This direction should be different from the most common viewing direction for the building, otherwise no shadows will then be visible and the scene will appear flat. The direction of light can be used either to emphasise or flatten detail.

Dazzle or “disability glare” can be avoided with careful positioning and aiming. The additional use of hoods, spill rings and louvres for screening lamps from sight at normal viewing angles are often used, but will reduce performance. Distraction or “discomfort glare” can be overcome by increasing the mounting height, aiming the peak intensity of these floodlights at angles below 70° to the downward vertical and, where possible, increasing background ambient light levels.

How much light?
Most exterior lighting guides give maintained illuminance values for specific applications but this is not what we actually see. Illuminance is a measure (lux) of the quantity of light that falls on a surface. It does not depend on the surface properties of what is being lit. A dark and light surface next to each other could be receiving the same amount of illuminance but the brightness would be quite different. The light surface would look brighter. Surface reflectance is influential in our perception of the brightness of surfaces. Brightness is subjective whereas Luminance, the light reflected from a surface, can be measured (cd/m²), and can be considered to be objective. Consequently in determining quantities of light for outdoor applications there is a mixture of references to luminance, reflectance and illuminance.

Architectural illumination is particularly subjective and will depend upon the relative brightness of the surroundings or character of the area, often known as district brightness. To avoid overlighting and abrasive light the lighting industry has issued guidance notes, including specific recommended luminance levels which relate to average and maximum illuminance values for the lighting of a series of environmental zones, ranging from dark landscapes to bright inner city areas.

Fig. 3 The ratio between the average luminance and the maximum luminance will determine the degree of contrast in the subject. This is referred to as the luminance contrast ratio. In the case of a building facade lit to an average level of 10 cd/m², the highlighting of a small portion to a luminance of 30 cd/m² will only just be noticeable. Increase the luminance to 50 cd/m² and the effect becomes more dramatic.

Remember that these ratios relate to the amount of light reflected from the surfaces. If the building facade is red brick with a given reflectance factor of 0.3 and a feature is a white plaque with a reflectance of 0.9, and they are lit to the same illuminance, there will be a brightness ratio of 1:3. To make things easier suggested illuminances can be given for a range of typical materials for use in preliminary design based on the use of a ‘white’ light source. See Fig 1 and 2.

Fig 1 Illuminance onto a surface, Luminance off the surface
Fig 2 The smaller square of higher reflectance is brighter.

The Effect of Luminance Contrast Ratio

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1</td>
<td>Not Noticeable</td>
</tr>
<tr>
<td>1:3</td>
<td>Just Noticeable</td>
</tr>
<tr>
<td>1:5</td>
<td>Low Drama</td>
</tr>
<tr>
<td>1:10</td>
<td>High Drama</td>
</tr>
</tbody>
</table>

Fig 3
**Surfaces**

How much light you direct on to a building is less important than how much is reflected back from it and how this is reflected. What you will see is dependent on roughness and reflectance factors of a given surface – darker, more textured surfaces need more light than pale, smooth surfaces. For instance, a red surface would need a lot more light to look as bright as it is.

The same is true when colour is used, but is complicated by "colour absorption". The colour of a building has a colour, or in many cases a mixture of colours. Different types of lamp will give differing colour renditions. Light sources which are monochromatic, or strongly biased towards a small range of colours, will only reveal some of the colour’s resident in the structure. Using for instance a low pressure sodium lamp (monochromatic yellow) on a red surface would be pointless because the lamp has no red content and there would be almost no visible effect on the lit surface. At the same time, lighting a strongly coloured surface, for instance trees with green foliage, with matching colour light will produce "colour saturation", where the natural colour of the lit subject is reinforced. "White" sources (which contain a representation of the full spectral range) are therefore necessary for materials which are required to be seen close to their appearance in natural light. It is not only the lightness of the building surface which is important, but also the degree of specularity. Matt surfaces have the advantage of reflecting light in all directions so when buildings are lit from a low or ground level the apparent brightness when viewed at ground level can be relatively high. However, reflections from specular surfaces such as marble and stainless steel can present difficulties as when projectors are installed at ground level the reflected component is directed into the sky and away from the observer.

**Lamp types**

The most common lamps used for architectural lighting are powerful high-intensity discharge (HID) sources, metal halide and high-pressure sodium, although dimming is not reliable and the latter’s quality does not distinguish colours clearly. The excellent colour rendition and brilliant light of mini tungsten halogen means that it continues to be used, but selectively due to poor efficiencies and lamp life LED being the most common replacement. The linear fluorescent has high lumen efficacy and a wide choice of colour temperatures and colours, but this relatively large, diffused, light source does not lend itself to providing narrow beam distributions in long throw projectors and is therefore more suited to wall washing and guidance tasks. As performance improves and costs fall, LEDs have rapidly become the lamp of choice. Their unique qualities – instant start, high efficacy, compact size, long life, reliable performance in cold temperatures, good colour rendition and dimmability/colour control - are perfect for most applications. A further attribute of LEDs is that their light is emitted in a specific direction. Thus modern optical designs, materials and techniques can deliver more controlled light distributions and maximise performance.

**Maintenance**

Even when the most suitable lamp and luminaire combination has been selected, the energy costs can still be reduced by regular maintenance. Floodlights with a re-positioning lock system are instance reflects well, but ‘dirt coated dark brick’ would need a lot more light to look as bright.

**Colour appearance and colour rendering**

Within “near white” light, as a general rule provided by fluorescent, tungsten halogen, metal halide and LED light sources, there is variation by colour temperature, this will change the appearance from warm to cool, the higher the temperature, the “cooler” the light.

A safe and simple design approach is to use warm colour appearance light sources with warm coloured materials and use cool colour appearance light sources with cool coloured materials. For example, red brickwork would be sympathetically lit by high pressure sodium lamps (which have a yellow bias among a limited spectrum output) with a colour temperature of about 2000K, but could look rather dull with metal halide lamps with a colour temperature of over 5000K.

There is also a scale of colour rendering properties expressed as a “CRI” or “Ra” figure (0–100) - again the higher the number, the more accurate the colour rendering. A classification of a light source of Ra80 and above will indicate good colour rendering. Lamps of good colour rendering will make a scene look natural whereas lamps of poor colour rendering will distort some colours making the appearance of a scene unnatural.
Colours
Coloured lighting has a dramatic effect on the way people react to the scene. Strong colours reinforce the nature of a busy area, while softer colours induce a more relaxed response. Using different light sources or colour mixing RGB LEDs can produce colour contrasts and allows a distinction to be made between two parts of a building or space. Both methods can also simulate shadow, moonlight and sunrise/sunset.

District brightness
The degree to which an object is accentuated depends upon the contrast between the object and its background. To achieve a desired emphasis the luminance of the object has to be related to the district brightness. The light levels used on a structure or natural feature should be in harmony with the light levels of the surrounding area. For example, a country church may need little more than moonlight levels to make its presence felt whereas a building lit to this level in the centre of a city would hardly be noticed.
Beam control
Floodlights have a light distribution which is related to the shape of the reflector. A round reflector will produce a conical beam, symmetrical between vertical and horizontal axes. This is known as a “circular” type and is useful for long-throw requirements, typically to pick out a single feature. A rectangular reflector, curved in one direction only, will produce a beam which is “asymmetrical” between its two axes – useful for lighting areas rather than small points. But it is rare that an “off the peg” floodlight will give the precision required. Constraints in mounting positions will often generate a need for a “modified” beam, and add-on accessories such as refractor glasses and holographic films which vary the beam shape, are vital in getting the right result. Manufactured from thin film substrates holographic films can be placed above LEDs to soften or dramatically re-shape the beam. Their high transmission efficiencies far exceed that of glass or plastic material. Used as “beam shapers” they can expand a circular beam or stretch it to a linear line of light.

Contrast
In an exterior scene it is the highlights and shadows that bring contrast and achieve modelling; these are created by the direction (a function of the geometry of the installation) and the intensity of the light. Spaces and structures that feature areas of light and shade are generally preferred by observers and considered more interesting. Light naturally attracts, so highlighting key features will help an observer relate to the structure. Care should be taken to only light those details that are required, as too many highlights will destroy the effect and either make the structure appear bland and uninteresting or disjoined and incoherent. Completeness is also important and care should be taken to avoid “floating” appearances where the upper part of a building is lit but the lower level is not, removing the connection with the ground.

The impressions of a lit area are subjective and cannot be measured. Designers mainly rely on experience, supplemented if necessary by daytime photographs, computer visual simulations, scale models and site experiments, to achieve the desired results.

Colour temperatures
The colour appearance of a light source can evoke a warm or cool atmosphere depending on the choice of colour temperature of the source. The spectral distributions of light emitted by typical ‘white’ lamps show quite notable differences from warm to cool, so that you can produce subtle contrasts in colour appearance.
To help you through the process of understanding, specifying, installing and maintaining good quality, energy efficient lighting, we recommend you take advantage of our eControl programme.

Originally conceived to promote electronic dimming and indoor control systems, eControl has now been expanded to cover all our outdoor energy focused initiatives products and services (including those above). If you are considering migrating to the latest energy efficient technologies, eControl advice is available on request. Within this philosophy we have developed 15 easy ways to save energy, for the full frame work see below.

15 ways to make energy efficient lighting easy

When considering energy efficiency and lighting it is important that it is not considered in isolation. A lighting installation has a basic requirement to provide a sufficient amount of light to allow a task to be performed efficiently and safely. Requirements for this are given in standards such as EN 12464 (Lighting of workplaces), EN 13201 (road lighting), EN 1838 (emergency lighting), etc. In addition, as well as providing good task illumination the lighting installation should provide light of a good enough quality to provide a pleasant and fulfilling environment for the occupants of a space. The ideal is to provide these two aspects in as energy efficient way as possible.

Energy efficiency is a complex set of interactions and relationships linked to technology, physical environment, social behaviour and work requirements. However we can consider energy efficiency may generally be split into four main areas:

### Technology

- **Lamp efficacy**
  - How efficiently a lamp converts electricity into light (lm/W)

- **Ballast classification**
  - Controls the electricity supply to the lamp (Energy Efficiency Index EEI)

- **Luminaire distribution**
  - Light is controlled and emitted from a luminaire using optics which bend and shape the light to the correct location

- **System efficacy**
  - The combination of optical and thermal control within the luminaire (luminaire lm/W)

### Control

- **Presence/Absence**
  - Presence: Lights automatically turn on and off with movement.
  - Absence: Lights automatically turn off and have to be manually switched on.

- **Daylight**
  - Artificial lighting responds to the natural light conditions

- **Constant illuminance**
  - A function designed to produce correct lighting levels for the duration of the maintenance period

- **Task/Scene setting**
  - Allows the user to set scenes and adapt the lighting to different aesthetics and tasks

- **Timed off**
  - Automatic cut-off can be installed to turn all lights off during unoccupied hours

### Application

- **Task lighting**
  - Lighting the task areas with the correct amount of light

- **Zoning of lighting**
  - Lighting is zoned according to area use

- **Maintenance schedule**
  - Maintenance must be performed in response to product age, performance and environment

- **Waste light**
  - Any light which does not hit the intended target is waste light

### Environment

- **Reflectance**
  - Light is reflected from the surface within the space

- **Visible smart metering**
  - Results of actions can be quickly seen as increased or decreased energy use
Product Focus
Contrast 2 LED

High light output in a compact and discreet design with a wide choice of light effects created using different light distributions and accessories

- Performance
- Compactness
- Complete flexibility
Product Focus
Contrast 2 LED

A compact architectural floodlight range combining high output LEDs of predefined beams offering complete flexibility

- Innovative, compact design with integral gear for the Medium and Large sizes (static or dynamic versions). Small versions use remote gear boxes.
- Exceptional modularity with LED colours, light distributions, accessories and light outputs in three body sizes.
- Manual dimming on monochromatic versions (Medium and Large) and DMX controls on RGB versions for a variety of lighting effects.
- All sizes are available with a remote gear box (on request) for countries with temperatures reaching 50°C.

Applications
- Illumination and façades

Lamp Information
- Small size: 4 LEDs, Medium size: 12 LEDs, Large size: 36 LEDs.
- 40,000 hours @ L70 To 25°C or 50°C depending on the version.
- From 9 to 18W for the small versions. Up to 62 Lm/W. LED module efficacy: 92 lm/W for 4000K at 1A.
- From 27 to 46W for the medium versions. Up to 54 Lm/W. LED module efficacy: 92 lm/W for 4000K at 1A.
- From 95 to 126W for the large versions. Up to 61 Lm/W. LED module efficacy: 105 lm/W for 4000K at 700mA.
- Colour temperature 3000K and 4000K for all sizes. 6000K only available for the Large version. Other colour temperatures on request.
- CRI 80 minimum for the 3000 and 4000K. Typical CRI 70 for the 6000K.

Ways of lighting

Contrast 2 LED can be installed on the ground, in recessed boxes, on walls or on dedicated columns.

- Offset from surface.
- Offset from ground recessed boxes.
- Pedestrian application with mast fixation or wall fixation.
- Wall washing.
- Accentuation.
- Illumination from a column.
Light distributions

A choice of predefined light beams: circular, elliptical or asymmetrical.
Standard beam angles range from 8° to 50°x50° for the Medium and Large sizes.
The Small size has angles of 12°, 32° and 44x12°.

Standard versions:
Small and Medium versions are available in whites (3000K and 4000K), colours (R, G and B) and RGB DMX. Amber, 2700K and 6000K on request.
Large version is available in white (3000K, 4000K and 6000K) and RGB DMX versions. Other colours: R, G, B, A and 2700K on request.
For all sizes, RGBW, RGBA or tunable white are available on request.

<table>
<thead>
<tr>
<th>Light distribution shape</th>
<th>Beam angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Medium/Large</td>
</tr>
<tr>
<td>Circular</td>
<td>12°</td>
</tr>
<tr>
<td></td>
<td>32°</td>
</tr>
<tr>
<td>Elliptical</td>
<td>44 x 12°</td>
</tr>
<tr>
<td>Asymmetrical</td>
<td></td>
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Light distribution with holographic films

• A choice of light shaping holographic films and accessories to create a range of static or dynamic lighting effects with minimal light loss and glare (see below)
• Holographic films available in 1x60°, 5x30° and 60x60°
• Standard Monochromatic Medium and Large size floodlights have an integral user-adjustable control to vary light output on site
• We recommend using holographic films with circular light beams. It is more effective to install a holographic on an intensive light beam. The wider the light beam the less efficient the flux value and light effect.
**Product Focus**

**Contrast 2 LED**

### Materials/Finish

**Body:** die-cast painted aluminium EN AC 47100 DF sanded, silver grey 150  
**Glass:** tempered glass, 4mm thick  
**Gasket:** EPDM  
**Screws:** stainless steel  
Medium and Large high ambient temperature bodies are pre-wired with 1.5m cable.

### Connection boxes for:

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 2 Small: die-cast painted aluminium EN AC 44100 KF sanded silver grey 150</td>
<td></td>
</tr>
<tr>
<td>Gasket: EPDM</td>
<td></td>
</tr>
<tr>
<td>Screws: stainless steel</td>
<td></td>
</tr>
<tr>
<td>1 to 4 Small or 1 Small RGB: die-cast painted aluminium EN AB 47100 sanded silver grey 150</td>
<td></td>
</tr>
<tr>
<td>Gasket: rubber/neoprene</td>
<td></td>
</tr>
<tr>
<td>Screws: stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

### Holographic films

**Frame:** die-cast painted aluminium EN AC 44100 KF sanded silver grey 150  
**Film:** PC sheet (2mm) plus PC holographic film (0.27mm)

### Installation/Mounting

Floodlight is fully adjustable on a stirrup. Stirrup fixed to mount by central bolt through Ø15mm hole and 2 x Ø8mm holes for the Medium and Large sizes.  
Small versions fixed via central bolt hole Ø15mm and 1 x Ø8mm hole.  
Aiming simplified by indicator on stirrup, locked via central Ø6mm Allen screw for all sizes.  
Easy installation of a maximum of 2 accessories: holographic films plus visor or holographic films plus glare shield for Medium and Large sizes.  
Holographic films plus visor for the Small. No glare shield for the Small version.

### Medium and Large

Easy access to power supply on the product rear for monochromatic Medium and Large sizes and manual potentiometer adjustment.  
Entry via 3 Allen screws.  
Easy access to power supply and DMX card on the product rear for RGB DMX Medium and Large sizes. Entry via 3 Allen screws.

### Small

Remote gear box for the monochromatic and RGB DMX Small versions.  
Entry via 4 Allen screws on the gear box for up to 2 Small floodlights and via 6 screws on the gear box for up to 4 Small floodlights.  
Small monochromatic: Pre-wired with H07RN-F cable, 1.5m long.  
Small RGB DMX: Pre-wired with H07RN-F cable, 1.5m long.

Gear box for 2 Small monochromatic: 4 cable glands including through wiring.  
Gear box for 4 Small monochromatic: 6 cable glands including through wiring.  
Gear box for 1 Small RGB DMX: 5 cable glands for through wiring mains and DMX.  
Cable glands for Ø8-13mm cable.  
Attachments and ground recessed boxes available.  
No LED module replacement.

### Specification

To specify state:  
A range of compact floodlights in 3 sizes, offering high light outputs with a wide choice of light distributions, LED colours and accessories to cover all applications. Manual dimming on Medium and Large monochromatic versions adjustable on site. Dynamic RGB DMX versions for all sizes.  
As Thorn Contrast 2 LED.

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**Holographic film adjustment**

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Twilight temperature of use and locations 0 - 95% humidity

<table>
<thead>
<tr>
<th>Standard</th>
<th>Colour</th>
<th>RGB</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
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<tr>
<td>Large</td>
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High ambient temperature country

<table>
<thead>
<tr>
<th>Remote gear box</th>
<th>Indoor and Outdoor use</th>
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<tr>
<td>White</td>
<td>Colour</td>
</tr>
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<td></td>
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<tr>
<td>Medium</td>
<td></td>
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<tr>
<td>Large</td>
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</table>

Maximum distance from the Contrast 2 body to connection box

<table>
<thead>
<tr>
<th>Standard</th>
<th>DMX</th>
<th>RGB</th>
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</thead>
<tbody>
<tr>
<td>Monochromatic</td>
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</tr>
<tr>
<td>Connection box for up to 2 Small</td>
<td>Connection box for up to 4 Small</td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>Medium</td>
<td>Large</td>
</tr>
<tr>
<td>1 x Small</td>
<td>3 x Small</td>
<td>4 x Small</td>
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<tr>
<td>105m</td>
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Flux data

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<td>Simple dimming</td>
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<td></td>
<td></td>
<td>R</td>
<td>G</td>
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<td>Small Standard and High ambient temperature version</td>
<td>12°</td>
<td>Lumens</td>
<td>270</td>
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<td></td>
<td>Total Power</td>
<td>9W</td>
<td>12W</td>
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<td></td>
<td>Medium</td>
<td>32°</td>
<td>44x12°</td>
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<tr>
<td></td>
<td>Total Power</td>
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<td>12W</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>24°</td>
<td>Lumens</td>
</tr>
<tr>
<td></td>
<td>Total Power</td>
<td>9W</td>
<td>12W</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>36°</td>
<td>Lumens</td>
</tr>
<tr>
<td></td>
<td>Total Power</td>
<td>9W</td>
<td>12W</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>8x16°</td>
<td>Lumens</td>
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<td>Total Power</td>
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<td>Lumens</td>
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<tr>
<td></td>
<td>Total Power</td>
<td>76W</td>
<td>95W</td>
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</table>
**Product Focus**

Contrast 2 LED

**Ordering Guide - Standard versions**

**Small**
Delivered without gear box.

For monochromatic versions, two gear box options are provided: one for up to 2 small units and one for up to 4 small units.

The white versions are driven by 1A and the coloured monochromatic versions are driven by 0.7A. Please select the correct connection box version when ordering.

For RGB DMX versions, you need to order the power supply/DMX gear box. No manual dimming possible.

**Medium and Large**
Delivered complete with power supply for monochromatic versions and power supply/DMX card for the RGB DMX versions. Other RGBW, RGBA and tunable white versions available on request. DALI versions on request. Other light distributions on request.

**High ambient temperature versions:**
With this option, all products are with remote gear box. No manual dimming possible. For RGB DMX versions, you need to order the power supply/DMX gear box.

**Small - Indoor and Outdoor use**

**Medium - Indoor and Outdoor use**

<table>
<thead>
<tr>
<th>Total angle opening</th>
<th>Description</th>
<th>Wt (kg)</th>
<th>SAP Code</th>
<th>Cat. No.</th>
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**Monochromatic**

<table>
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<tr>
<th>Bodies</th>
<th>Description</th>
<th>Wt (kg)</th>
<th>SAP Code</th>
<th>Cat. No.</th>
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**Connection boxes**

<table>
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<th>Wt (kg)</th>
<th>SAP Code</th>
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**Large - Indoor and Outdoor use for the RGB versions. Only outdoor use for the white versions.**

**Monochromatic**

<table>
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<th>Bodies</th>
<th>Description</th>
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**Connection boxes**

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**Accessories**

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Data is subject to change due to the continuous progress of LED characteristics. To check the effect on the luminaire, please contact us or visit our website.
Data is subject to change due to the continuous progress of LED characteristics. To check the effect on the luminaire, please contact us or visit our website.

### Ordering Guide - High ambient temperature versions

**Small**
Delivered without gear box.
For monochromatic versions, two gear box options are provided: one for up to 2 small units and one for up to 4 small units.
The white versions are driven by 1A and the coloured monochromatic versions are driven by 0.7A.
Please select the correct connection box when ordering.
For RGB DMX versions, you need to order the power supply/DMX gear box SAP code 96261426.

**Medium and large**
Bodies delivered complete pre-wired with 1.5m cable.

### Small - Indoor and Outdoor use

<table>
<thead>
<tr>
<th>Total angle opening</th>
<th>Description</th>
<th>Wt (kg)</th>
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<tr>
<td>12°</td>
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<td>1.1</td>
<td>96261327</td>
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<tr>
<td>24°</td>
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<td>S/4 60X60°</td>
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<td>S/8 180°</td>
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### Medium - Indoor and Outdoor use

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### Large - Indoor and Outdoor use

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<tr>
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<td>LED VISOR</td>
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<td>CT2LV</td>
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</table>

**Contrast 2 LED S** Small version
**Contrast 2 LED M** Medium version
**Contrast 2 LED L** Large version
**NG** No Gear
**DI** Glass
**FB** In ground box
**BU** Blue
**RD** Red
**GN** Green
**CRI 80 and 4000K**
**CRI 80 and 3000K**
**2 ENDs driven at 700mA**
**CBBOX MONO** Connection box for Small monochromatic LED colours except whites
**CBBOX WHITE** Connection box for Small white versions
**LV** Louvre
**LR** Adjustable refractor holographic lens
**K1** High ambient temperature versions

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Data is subject to change due to the continuous progress of LED characteristics. To check the effect on the luminaire, please contact us or visit our website.
This lx value indicates an approximate value of average illuminance for the Contrast Large with 4000°K LED. For the 3000°K version this value could be reduced about 9%. For the 6000°K version this value could be increased about 20%.

Large versions

Large versions with accessory
Product Focus
Contrast 2 LED

Medium versions

This lx value indicates an approximate value of average illuminance for the Contrast Medium with 4000°K LED. For the 3000°K version this value could be reduced about 9%.
This lx value indicates an approximate value of average illuminance for the Contrast Small with 4000°K LED. For the 3000°K version this value could be reduced about 9%.
Product Focus
Contrast 2 LED

An aesthetically innovative modern pedestrian column with customisation options to enrich individual project identity

- Unique shape complements the innovative design of Contrast 2 LED
- Wooden or metal infills available. The metal sheets can be printed for project customisation (Fig. C, D, E and F)
- Diagonal cut-out at the top of the column allows a tilting angle of up to 60° for flexible light placement (Fig. A & B)
- The bottom of the column features a multifunctional diagonal cut profile, which aside from serving a technical function, can be customised with either sublimation transfer or the addition of clear or bright colour reflection when Contrast 2 LED is switched on

Materials
Column in steel S235.
The pole is of a rectangular to a semi-rectangular shape in:
Galvanized steel
Powder coated steel with 1 RAL
Powder coated steel with 2 RAL which can be outside/inside or the stand up part only.
The semi-rectangular shape can be filled with wood or metallic insert with customised sublimation transfer.
For more information, contact your Thorn sales representative.

Dimensions
Heights: 4m, 5m and 6m
4/5m: section 200 x 120mm.
6m: section 300 x 150mm.
Door dimensions: 500 x 90mm on the mast rear.

Installation
Easy installation with 2 screws using the standard stirrups of Contrast 2 LED.
Height: 4 m
Luminaires: 1 Medium and 1 Small

Height: 5 m
Luminaires: 1 Medium and 1 Small

Height: 5 m
Luminaires: 2 Medium

Height: 6 m
Luminaires: 1 Large and 3 Small

Height: 6 m
Luminaires: 1 Large and 1 Medium

Height: 6 m
Luminaires: 2 Large

Fig. A - The top of the column showing the cut out profile

Fig. B - Tilting angle of up to 60° for flexible light placement

Diagonal cut profile
Top of column
An aesthetically innovative square conical column providing decoration and function

- Innovative square conical column providing a decorative alternative to the classic cylindrical frame.
- The column is available plain or with six flat notches. The notches support Contrast 2 LED fixation and add further decorative appeal to scenic applications (Fig. A and B).
- Floodlight orientation can be adjusted according to the required effect.
- The high column can accommodate four large Contrast 2 LED luminaires as standard, with additional quantities available depending on the installation environment.
- Various fixation types with frames available for a wide range of applications (Fig. C & D) plus mast extension.

**Materials**

Column in steel S235. Supplied in 1 part for 10m and 2 parts for upper versions. Galvanised steel and powder coated steel with 1 RAL.

For more information, contact your Thorn sales representative.

**Dimensions**

10m with base section: 210 x 210mm
12m with base section: 255 x 255mm
14m with base section: 300 x 300mm
Door dimensions: 500 x 90mm

**Installation**

Easy installation with 2 screws using the standard stirrups of Contrast 2 LED.

For installation of more than 4 Contrast 2 LED, contact your Thorn sales representative for a validation study.
Fig. A and B - The notches support Contrast 2 LED

Fig. E

Fig. F

Height: 10 m
Luminaires: 4 Large

Height: 10 m
Luminaires: 4 Large

Height: 12 m
Luminaires: 4 Large

Height: 14 m
Luminaires: 4 Large
Ways of lighting

These sections are a guide to applications and suitable luminaires with brief comments where considered useful. Because of the wide range of applications it is necessary to analyse the visual requirements of each and choose the lamps and luminaires carefully in order to produce the best results.

The most common applications can be grouped into five general categories:

- Off-set
- Accentuation
- Wall washing
- Guidance
- Light effects

Thorn can offer several luminaire types to produce attractive and dramatic results economically. Broadly classified according to the way in which the light is distributed or controlled they include: floodlights, spotlights, linear wall grazers, wall washers, ground and wall recessed units (shielded, un-shielded and directional), colour changers and columns. The majority are offered with a wide selection of styles, finishes, sizes and attachments. Additionally, digital control units are offered to produce specific LED colours or create colour changing LED effects. Where rapid scene or dynamic colour change is required use DMX protocol controls and luminaires. For slower scene change or simple dimming DALI is an alternative.
In the case of a building facade where there is an opportunity to “off-set” equipment some distance away, lighting from the main direction of view will create a flat appearance to the building. Whereas setting the lighting to come onto the building at a glancing angle with respect to the main direction of view will produce strong shadows and marked highlights, consequently the building will be given the appearance of depth.

Completeness of floodlighting is important in that the whole building and its setting should be revealed. This may include the return walls to the main facade, the roof and the full height of any projection from the roof such as chimneys or adjacent walls, trees or shrubbery. The main floodlights usually need supplementing to give completeness and avoid a ‘floating’ appearance. Buildings can appear to float if the base of the building is shadowed or under lit. Wherever possible, luminaires should be hidden from view by being installed behind existing structures or purpose-built features, or recessed in ground boxes.

Great medieval and classic architecture is characterised by facades with predominantly vertical characteristics. The style can be emphasised by applying illumination from the left and right side of the facade using medium beam floodlights. Generally, due to fairly light coloured surface material, the shadows formed by sharply oblique lighting are too strong and create too distinct a contrast. In-fill lighting from the opposite direction using wide-beam floodlights will reduce the contrast and soften the appearance.

In contrast, many modern high rise office and hotel blocks have a markedly horizontal emphasis, often including elements that project slightly, like window ledges or continuous bands that run across the facade from one side of the building to the other. Floodlights placed close to the facade and aimed upward will produce bands of dark shadow above the projection. Supplementary lighting may be placed upon the ledge to soften or eliminate the shadow, or alternatively, the floodlights have to be moved away from a close-offset position so that a greater distance exists between the facade and the light source.

With spec-built office blocks and factory units, facades that are basically flat are often encountered. The achievement of any shadow effects may only be possible by placing the luminaires at exceptionally close-offset positions as a certain unevenness in the brightness patterns across the facade could produce a degree of visual interest. Alternatively, luminaires may be able to be installed at the top of the building directing narrow beams of light downwards. Another possibility is to place low power luminaires at suitable positions at different levels of the building directed downwards or sideways. Beware of glass facades which reflect light directly into the sky and yet show little or no luminance themselves. Floodlights including the new Contrast 2 LED can also be used with accessories to create different types of light beams.
Product range For more information on your desired product please select from below:

- OSQ
  www.thornlighting.co.uk/OQSE

- Contrast R
  www.thornlighting.co.uk/CONR

- Contrast C
  www.thornlighting.co.uk/CONC

- Contrast 2 LED (Large)
  www.thornlighting.co.uk/CON2

- Contrast 2 LED (Medium)
  www.thornlighting.co.uk/CON2

- Qba
  www.thornlighting.co.uk/QBAL

- Sensa DMX
  www.thornlighting.co.uk/SEND

Please note: Accessories can be added to create different beam effects.
1

Offset

Project Examples

Torre Alemanna, IT. © Fabio Baraldi | Contrast LED + accessory

Ville de Brionne, FR. © Agence Luminocité | Contrast, QBA, E/Fact and Band

Avignon Bridge, FR. © Christophe Canadell Noctabene | Satin, Qba LED and Contrast LED
Offset Project Examples

Brionne, FR | Contrast, QBA, E/Fact and Band
Theatre of Phenix, Valenciennes, FR. Concepto Agency | Contrast LED

Foggia Cathedral, IT. © Fabio Boraldi | Contrast LED, Qba, Corniche, Graffiti, D-CO LED
Ways of lighting

2

Accentuation

When lighting statues or sculpture, modelling is usually important to reveal the form and details of the structure and make it stand out from its surroundings. The main differentiation between natural daylight and artificial floodlighting is that daylight always has a downward direction, while floodlighting can be aimed from almost any direction, but is more usually these days aimed upwards. This means that features on the surface of a structure will have shadows reversed from the daytime view, and a structure can take on a very different appearance at night as a result.

Establishing a principle viewing position is an important first step. Once agreed then a typical treatment is to use a key light at about 45°, if that is possible, with a less intense softer fill in light from the other side. An even more three dimensional effect can be given by introducing back lighting, although care is needed not to cause glare to observers at the preferred viewing position. Just using a key light alone can look harsh and stark. In the situation where there is an object that people are expected to walk around then lighting from three directions could be appropriate given slightly stronger emphasis in one direction. (Fig. 1)

Works in light coloured materials are normally revealed best when brighter than the background, but dark statues, like bronzes, are often better in silhouette.

The shadows of a lit object can in some circumstances be part of the overall effect. Where different coloured light sources are being used shadows from one light source can be lit and coloured by another light source. Shadows can help to define the three-dimensional form of an object or building and create a contrast between highlights in the field of view. (Fig. 2) Light directed at a fairly shallow angle, close offset, can provide strong shadows to a three-dimensional structure. These strong shadows can be softened by lighting from the opposite direction to fill in the shadows. The illuminance only needs to be a tenth to a third of the key light. (Fig. 3) Experiment on site to get the best lighting effect. In amenity areas over use of shadows should be avoided as this reduces people’s sense of security within the space.

A facade is often designed to incorporate features such as balconies or galleries that may project forward or be recessed into the facade. Normally, offset floodlights are employed to prevent excessively dark shadows being formed, but if lack of available space in front of the facade prevents their use, supplementary illumination will have to be placed inside the balcony space or incorporated within the building to create the shadow.

Constraints in mounting position or specific application requirements often require a modified beam distribution or intensity. Additional beam shaping optical components are useful in getting the correct result, as is the ability to set the maximum output of the floodlight to suit to the overall scheme using in built manual dimming like Contrast 2 LED Large and Medium with manual potentiometer in monochromatic versions.
Product range For more information on your desired product please select from below:

Contrast Mini Pinspot
www.thornlighting.co.uk/CONM

Contrast Pinspot
www.thornlighting.co.uk/CONP

Contrast R
www.thornlighting.co.uk/CONR

Contrast 2 LED (Medium)
www.thornlighting.co.uk/CON2

Contrast 2 LED (Small)
www.thornlighting.co.uk/CON2

Qba
www.thornlighting.co.uk/QBAL

Milo
www.thornlighting.co.uk/MILO

D-CO LED Flood
www.thornlighting.co.uk/DCOF

Sensa DMX
www.thornlighting.co.uk/SEND

Please note: Accessories can be added to create different beam effects
Ways of lighting

Wall washing

Providing a wash of light across surface-orientated structures

Here is a simple test you can try for yourself. Take a torch outside at night, and shine it directly at brickwork - you will see the colour and the shape of the bricks! Now place the torch close to the building surface, and direct the light across the surface - you will see the texture also. This wall washing technique is known as “grazing”, and is effective in showing details of structures, not just the texture, but also accentuating shape and form as well as adding depth. It also simplifies the lighting of architectural detail. Grazing has the added advantage for occupied buildings, such as offices and hotels, that there is very little light penetration into the building to cause annoyance or discomfort to the occupants.

More conventional wall washing aims to maintain coherence across the whole of the façade. By mounting luminaires at regular intervals – or continuously in the case of linear luminaires – the walls are gently “washed” with even illumination. This soft, glare-free ambient lighting can create visual interest and in many situations also provide general surround lighting to the area, due to reflection.

Luminaire spacings, especially where linear units meet, and selected beam shapes play a key role in determining whether a wall is evenly illuminated or not. Distinct cut-off lines can be used purposely to help visual communication and impact the visual rhythm of a space.

Wall washing lighting usually requires a larger number of low powered luminaires than that used for greater offset distances. Wherever possible, luminaires should be recessed or hidden from view.

Floodlights like Contrast 2 LED can be used with an accessory to create an ellipsoidal light beam particularly suitable for cornice wall washing.
**Product range** For more information on your desired product please select from below:

### Linear floodlights

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<tr>
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<td>Satin</td>
<td><a href="http://www.thornlighting.co.uk/SATN">www.thornlighting.co.uk/SATN</a></td>
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<td>Corniche</td>
<td><a href="http://www.thornlighting.co.uk/CRNC">www.thornlighting.co.uk/CRNC</a></td>
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<td>Haline²</td>
<td><a href="http://www.thornlighting.co.uk/HALN">www.thornlighting.co.uk/HALN</a></td>
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</table>

*Please note: Accessories can be added to create different beam effects*

### Recessed

<table>
<thead>
<tr>
<th>Product</th>
<th>Website</th>
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</thead>
<tbody>
<tr>
<td>Mica</td>
<td><a href="http://www.thornlighting.co.uk/MICA">www.thornlighting.co.uk/MICA</a></td>
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<tr>
<td>E/Fact</td>
<td><a href="http://www.thornlighting.co.uk/EFCT">www.thornlighting.co.uk/EFCT</a></td>
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<tr>
<td>D-CO LED Recessed</td>
<td><a href="http://www.thornlighting.co.uk/DCOR">www.thornlighting.co.uk/DCOR</a></td>
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### Floodlights

<table>
<thead>
<tr>
<th>Product</th>
<th>Website</th>
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<tbody>
<tr>
<td>Qba</td>
<td><a href="http://www.thornlighting.co.uk/QBAL">www.thornlighting.co.uk/QBAL</a></td>
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<tr>
<td>Contrast R</td>
<td><a href="http://www.thornlighting.co.uk/CONR">www.thornlighting.co.uk/CONR</a></td>
</tr>
<tr>
<td>Contrast 2 LED</td>
<td><a href="http://www.thornlighting.co.uk/CON2">www.thornlighting.co.uk/CON2</a></td>
</tr>
</tbody>
</table>

*Senta DMX*  
www.thornlighting.co.uk/SEND
Wall washing

Project Examples

Torre Alemanna, IT. © Fabio Baraldi, Architect: Vincenzo Russo | Corniche

Mosquée Roubaix, FR | Mica
Project Examples

National Glass Centre, UK | Contrast LED

Vallex Garden Hotel, RU | Contrast LED

Castello Cacconi Pierlungo, Vito d’Asio, IT. © Fabio Baraldi | Mica
Wall washing

Project Examples
Catello Ceconi Pielungo, Vito d’Asio, IT. © Fabio Baraldi | Mica
Creating guidance with ground or wall recessed lighting

Recessed luminaires can be used for defining pathways and routes for pedestrians. Where people are likely to follow a prescribed route a sequence of "beacons" can lead the eye and footsteps. For marking out routes, use minimum wattage lamps. Entrances, paths, intersections, steps and seating areas can all be marked, and precise directional control is possible to prevent light pollution. By night they guide and define routes, by day they continue to provide a visual waymark.

Recessed wall luminaires can be an attractive alternative to ground type units as well as more practical in marking changes of level. It needs to be established that a cavity can be made for the luminaires and that provision can be made for electrical connections. The shape of the luminaire, round, square or rectangular, can be selected to complement the architecture. Recessed luminaires are also less susceptible to vandalism than bollards that might be considered for pathway lighting.

A wide variety of recessed and surface mounted luminaires are now available, for ground and wall mounting. Various combinations of coloured light sources, and directional grilles can be attached allowing the creation of many different visual effects. Also, consider using directional "windows" to direct the light output near to the horizontal.

Lighting equipment should be chosen which is in keeping with the public nature of the area. An impression of brightness, warmth and unity is desirable, particularly throughout the circulation spaces. Colour should be natural and people not inconvenienced by glare.

An aspect to take into account is the surface temperature of the luminaire. Young children could be particularly vulnerable to injury if they touch some luminaires. There are low temperature luminaire options available to avoid this possibility.
**Product range** For more information on your desired product please select from below:

- **Linn**
  *www.thornlighting.co.uk/LINN*

- **Via**
  *www.thornlighting.co.uk/VIAW*

- **Jalon**
  *www.thornlighting.co.uk/JALN*

- **E/Fact**
  *www.thornlighting.co.uk/EFCT*

- **Mica**
  *www.thornlighting.co.uk/MICA*

- **D-CO LED Recessed**
  *www.thornlighting.co.uk/DCOR*

- **Sensa DMX**
  *www.thornlighting.co.uk/SEND*
Guidance
Project Examples

Vallex Garden Hotel, RU | Band and Mica
Guidance

Project Examples

Liverpool University, UK | Mica

Parc de Château des Longues Allées, FR. © Adhoc | E/Fact

Torre Alemanna, IT. © Fabio Baraldi | Mica, Contrast and Corniche
Ways of lighting

Light effects

The character of architectural illumination, friendly or formal, intimate or spacious, relaxed or celebratory, depends to a great extent on the emotional reaction created by the lighting effects employed. Thus, the designer seeks to use light to dramatically reshape the architecture or natural landscape.

Outdoor lighting does not need to attempt to duplicate the daytime appearance of the building or object since the main direction of light is usually reversed. The best decorative lighting installations are those which exploit these differences rather than minimise them.

The lighting of columns provides a good example of lighting to create an effect. A row of columns can be lit from the front, side and the rear to give a silhouette. It is better to use light to bring out form than to flatten out to a two dimensional appearance.

The designer must consider the visual impact and the key viewing positions. A number of lighting techniques can then be employed, including: patterns of light, shade and colour; varying the mounting position / height of equipment; changing luminaire types and styles; and altering local illuminances. A site survey is almost always essential to establish the primary viewpoint, together with existing floor and wall textures, and to ensure that the installation does not clash with existing ambient lighting. Care must always be taken to avoid excessive glare or spill light causing annoyance or hazards.

How to create coloured lighting?
One way is to use coloured lamps, and while this is a useful solution, it has limitations as if you want to change the colour, you need to replace the lamp/luminaire. Economic constraints will probably mean that the colour is installed for a long time, with no realistic means of variation.

The more traditional method is to use lamps with a white light output, and use a colour filter on the front of the light. This has the benefit of being able to remove or change the filter. The downside is that colour filters only transmit their own colour – i.e. a blue filter stops the emission of everything except blue light, with consequently reduced amounts of light and lowering of efficiency.

The best solution is to use dynamic colour change lighting, enabled by the use of RGB colour mixing LEDs and programmed and controlled by electronic DMX devices.

Floodlights including the new Contrast 2 LED can also be used with accessories to create different types of light beam effects on the ground.
Product range For more information on your desired product please select from below:

Floodlights  Wall mounted

Contrast R  QBA  Contrast 2 LED  Cesar  Axyl
www.thornlighting.co.uk/CONR  www.thornlighting.co.uk/QBAL  www.thornlighting.co.uk/CON2  www.thornlighting.co.uk/CESA  www.thornlighting.co.uk/AXYL

Recessed

D-CO LED Recessed  Efact  Mica  Senso DMX
www.thornlighting.co.uk/DCOR  www.thornlighting.co.uk/EFCT  www.thornlighting.co.uk/MICA  www.thornlighting.co.uk/SEND

Please note: Accessories can be added to create different beam effects
Light effects
Project Examples
Project Examples

Arena, Niort, FR | Neo Light Agency | Alumet Stage

Rouen Market, FR | Alumet

Palladio, Villa Veneta IT | Photo Fabio Baraldi | Alumet
Stand alone DMX controller and associated devices for the implementation of DMX networks in outdoor applications

- Simple creation and autonomous display of lighting scenarios
- Scene recall via internet astronomical clock or remote push buttons
- Simple and discreet indoor touch screen panels
- Comprehensive range of splitters and accessories

Applications

- Buildings and surrounds
- Wall washing

Design notes

Scenario recall is achieved through:

- Selection buttons on the controller itself
- Programming of the time period thanks to the internal astronomical clock and calendar
- The use of the Sensa DMX adaptor portx8 (SAP code: 96291604) and remote triggers (commutor, relays etc). Space has been allowed inside the Controller box for the adaptor port.

The use of the DMX splitter (SAP code: 96261602) between Controller and luminaires is strongly recommended for its preventative protection (lightning surge, etc), in addition to the extension potential it provides. Space has been allowed inside the Controller box for the splitter.

Default settings

The DMX Controller is supplied with 8 pre-set scenarios. This allows for the validation of the cabling of the installation, as well as the implementation of simple and immediate scenarios without the need for commissioning.

<table>
<thead>
<tr>
<th>Scenario number</th>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>Slow change of colours</td>
</tr>
<tr>
<td>3</td>
<td>Red</td>
</tr>
<tr>
<td>4</td>
<td>Yellow</td>
</tr>
<tr>
<td>5</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Cyan</td>
</tr>
<tr>
<td>7</td>
<td>Blue</td>
</tr>
<tr>
<td>8</td>
<td>Magenta</td>
</tr>
</tbody>
</table>

Sensa DMX Software

The Sensa DMX Controller box is supplied complete with the Sensa architectural lighting software CD and USB cable. The software is compatible with Windows XP/Vista/Seven 32/64-bit / 64Kb memory, 512 DMX channels, 255 scenes.

Software also available for download from: www.thornlighting.co.uk.
**DMX CONTROLLERS**

Stand alone DMX controller using the DMX512 protocol. Supplied with Sensa DMX software.

**DMX SPLITTERS**

Splitters provide preventative protection of the DMX Controllers, they also enable the extension of DMX networks both in distance and number of luminaires.

**ACCESSORIES**

Power supply for DIN rail splitter and DMX Controller. DMX cable specifically designed for DMX networks. The adaptor x8 enables the use of remote triggers, such as the pre-wired switch supplied with 8 preset scenarios. After. The adaptor x8 enables the use of remote triggers.

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### Ordering guide

<table>
<thead>
<tr>
<th>SAP Description</th>
<th>Description</th>
<th>SAP Code</th>
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<tbody>
<tr>
<td><strong>DMX Controllers</strong></td>
<td></td>
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<tr>
<td>SENSA DMX CONTROLLER BOX IP65</td>
<td>Stand alone DMX Controller kit in IP65 box</td>
<td>96261598</td>
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<tr>
<td>SENSA DMX CONTROLLER KIT</td>
<td>Stand alone DMX Controller kit for DIN rail</td>
<td>96261600</td>
</tr>
<tr>
<td>SENSA DMX TS CONTROLLER BLACK</td>
<td>Black wall mounted touch screen DMX Controller</td>
<td>96261606</td>
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<tr>
<td>SENSA DMX TS CONTROLLER WHITE</td>
<td>White wall mounted touch screen DMX Controller</td>
<td>96261599</td>
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<tr>
<td><strong>DMX Splitters</strong></td>
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<td>SENSA DMX SPLITTER X4</td>
<td>4 output DMX Splitter for DIN rail</td>
<td>96261602</td>
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<tr>
<td>SENSA DMX SPLITTER 4X IP65</td>
<td>4 output DMX Splitter in IP65 box</td>
<td>96241229</td>
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<td><strong>Accessories</strong></td>
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<tr>
<td>SENSA DMX POWER SUPPLY</td>
<td>24V power supply for DIN rail</td>
<td>96261603</td>
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<tr>
<td>SENSA DMX CABLE DMX512</td>
<td>DMX 512 cable</td>
<td>96261601</td>
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<tr>
<td>SENSA DMX ADAPTOR PORT X8</td>
<td>8 port trigger adaptor for DIN rail</td>
<td>96261604</td>
</tr>
<tr>
<td>SENSA DMX SWITCH 8 POS PREWIRED 3M</td>
<td>8 position pre-wired switch</td>
<td>96264082</td>
</tr>
</tbody>
</table>

End of line terminations (¼W resistance at the end of each DMX line) are not included in the Sensa DMX Range.

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### Typical installation structures

**Sensa DMX for a small installation:** DMX controller alone (optional adaptor port shown)

**Sensa DMX for a medium installation:** DMX controller with splitter (optional adaptor port shown)

**Sensa DMX for a large installation:** DMX controller with splitters in cascade (optional adaptor port shown)
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