Data centre

Lighting application guide

MADE IN THE UK

Thorlux Lighting

Contents

Practical, energy-efficient data centre lighting

Introduction

For over 80 years, Thorlux Lighting has manufactured increasingly sophisticated luminaires in the Birmingham region. Over the last 20 years, the company has focused on high technology products, including the development of its first electronic energy-saving lighting control system in the mid-1990s. Huge investment in design and testing facilities in Worcestershire has now put Thorlux at the forefront of its market sector.

Innovating sustainable lighting solutions for a brighter future.

Check out our social media

Why choose Thorlux?

Made in the UK

Thorlux Lighting, the largest company in the FW Thorpe Plc group, is proud that over 90% of its products are manufactured in the UK.

Lighting management

The SmartScan lighting management system incorporates building management functions including occupancy profiling and air quality sensing. The addition of Built Environment Analytics also gives users a greater understanding of how their facility performs in operation.

Building safety and compliance

The Thorlux SmartScan wireless emergency testing system ensures full compliance and peace of mind.

Delivering full energy performance reports, emergency lighting status, luminaire status and management of emergency lighting testing dates/times.

Ease of maintenance

SmartScan *(see page 22)* allows the user to view full luminaire status. LED PCBs and modules are replaceable should a failure occur.

Five year warranty

A genuine warranty with genuine value. A long and stable history reassures Thorlux customers that its warranty is meaningful.

Low total cost of ownership

Thorlux luminaires are rapid to install, energy efficient, low maintenance and have a long lifespan resulting in a truly cost effective solution over the lifetime of the installation.

Quality and reliability

Rigorous product testing is essential in maintaining our reputation for reliability and quality. All Thorlux materials, components, subassemblies and finished products are subject to stringent quality control, as demonstrated by the company's BS EN ISO 9001:2015 (Quality management systems) certification.

Energy saving

Thorlux lighting controls combine maintained illuminance, daylight dimming and presence detection to maximise energy savings, in some instances in excess of 80%. SmartScan allows users to monitor their energy performance data and complete operational information for all SmartScan standard and emergency luminaires. This information is displayed on the SmartScan website which can be accessed from anywhere using a computer, laptop, tablet or smartphone.

Environmentally friendly

For the last two decades, Thorlux has worked hard to reduce its environmental impact. Investment in our plant and equipment has allowed Thorlux to reduce its carbon emissions, for example, 100% of electricity use comes from renewable sources, including self-generation through 3,138 photovoltaic panels installed on the roof of the facility. But recognising there is still much to do, Thorlux has set an independently verified target of achieving net-zero emissions by 2040.

Complete data centre lighting service

Thorlux offers its customers a complete lighting system design and supply solution for new and refurbished lighting system projects. Thorlux provides a professional service that covers all aspects of product selection, compliance with standards, supply and commissioning. With a comprehensive range and the flexibility to modify products to suit particular requirements, Thorlux is an experienced and skilful lighting partner for data centre operators.

www.thorlux.com/applications/data-centres

Scan here to view the data centre lighting section on the Thorlux website

Lighting design

The award-winning Thorlux design team develops a comprehensive lighting plan based on your building drawings or CAD models. Luminaires and controls are selected for each area according to usage and required light levels defined in current standards. Thorlux can then propose options for new lighting systems, prioritising cost effectiveness, low cost of ownership and user comfort. This will also include ROI periods and lifecycle calculations.

Some customers wish to produce their lighting schemes; for this reason, Thorlux is a partner of both DIALux and Relux. These lighting design software packages and the Thorlux luminaire database are downloadable from the Thorlux website.

Commissioning

Thorlux offers a professional on-site commissioning service to ensure that products are configured to provide the desired performance and return on investment. Commissioning begins with identifying the end-user's project requirements and ends with ensuring that the installed systems satisfy these requirements. Commissioning of lighting is now an integral part of the requirements for new buildings and major refurbishments under Building Regulations Part L.

Supply

When the plan is agreed, Thorlux will build the new fittings. Making luminaires to order ensures that waste is kept to a minimum, reducing embodied carbon. 90% of all Thorlux products are designed and manufactured in its UK factory in Redditch, Worcestershire. This provides Thorlux with the flexibility to fast-track orders and supply products to meet important deadlines.

User training

The final step of the process is to train all applicable personnel to operate, maintain and monitor the new lighting system. This includes using the SmartScan web platform, diagnosing issues, and customising functionality. This protects against attempted overrides or bypasses and helps ensure buy-in from all relevant parties.

Technical support

The Thorlux Technical Services department is available to answer all queries regarding Thorlux products and their use in specific applications.

Experts in data centre lighting design

There are clear benefits to letting the award-winning Thorlux lighting design team handle the creation of your new scheme. The team has years of experience in designing efficient, effective lighting schemes for data centres around the world, including approximately twenty mega/hyperscale data halls and other colocation data centres. This service covers internal and external lighting design, helping sites achieve LEED environmental certification and reducing environmental impact.

Optimal lighting

An optimally lit environment helps staff to be more productive and reduces errors in the workplace, as well as helping to prevent accidents. Presence detection ensures lights will only be active when an area is in use.

Compliance assurance

Thorlux designers are experienced in dealing with all relevant local regulations and will help to ensure your site is fully compliant. Your project manager will keep you appraised of all relevant information.

Ensuring safety

Emergency lighting is an essential life safety system - getting the design and functionality wrong can result in fines or even prosecution. Automated testing and record-keeping can help keep you and your site safe.

Local support available in many territories

As a leading designer and manufacturer of controlled lighting systems, Thorlux Lighting has supplied and supported data centre projects around the world.
With extensive experience in lighting hyperscale and colocation data centres around the world, Thorlux offers a complete package for managers and operators:

- Comprehensive lighting design - Manufacture to order - On-site commissioning - Local and remote technical support

Mega/hyperscale data halls lit.

LIGHTING RECOMMENDATIONS

Data hall

Data halls usually use a hot aisle/cold aisle layout. In its simplest form, this design involves lining up server racks in alternating rows with cold air intakes facing one way and hot air exhausts facing the other.

The ambient temperature in cold aisles is usually between 15–30°C, while in hot aisles, it may be between 20–40°C. Designers must carefully select the correct luminaires to cope with the thermal environment. Technicians require good levels of vertical illumination to work on computer racks; specifications vary between 200 lux and 500 lux a metre above the floor, with similar vertical values on the racks.

For emergency lighting guidance please see page 18

Thorlux recommends

Cold aisle luminaires

A-Line

Multi-purpose corrosion-resistant LED luminaires. Capable of ambient temperatures up to 50°C

IP66 IK06/ IK07/ IK09/ IK10

Kanby LED Controller

LED controller luminaires

IP40

Welby XL

High efficiency easy install luminaires for industry

IP20

Hot aisle luminaires

A-Line

Multi-purpose corrosion-resistant LED luminaires. Capable of ambient temperatures up to 50°C

IP66 IK06/ IK07/ IK09/ IK10

Kanby LED Controller

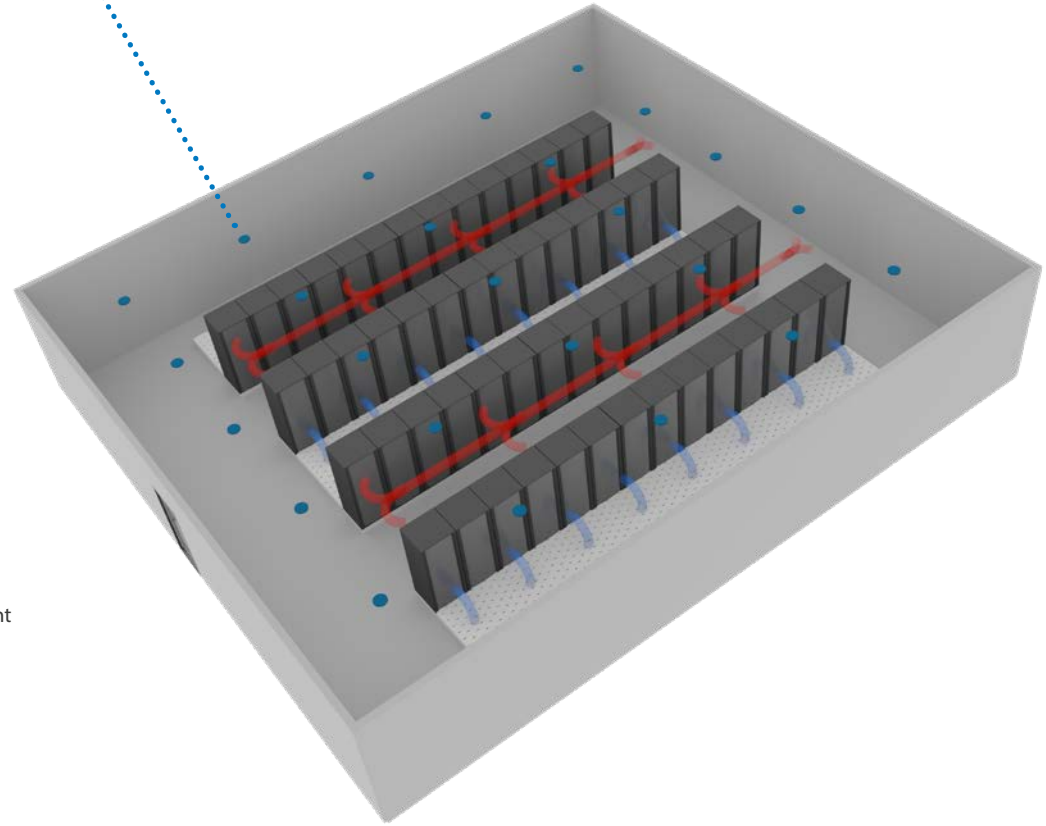
LED controller luminaires

IP40

Welby XL

High efficiency easy install luminaires for industry

IP20



Avenue luminaires

A-Line

Multi-purpose corrosion-resistant LED luminaires. Capable of ambient temperatures up to 50°C

IP66 IK06/ IK07/ IK09/ IK10

Kanby LED Controller

LED controller luminaires

IP40

Welby XL

High efficiency easy install luminaires for industry

IP20

Zipline ECO

Continuous LED lighting system for industrial applications

IP20

Zipline

Continuous LED lighting system for commercial applications

IP20

Product thumbnails are interactive.

Scan here to view all available products.

LIGHTING RECOMMENDATIONS

Plant rooms

Data centres rely on their mechanical plant to keep racks cooled and to remove particles from the air. For this reason, data centre sites have large plant rooms, often with high ambient temperatures and humidity. These factors must be taken into consideration when selecting luminaires for plant areas.

For emergency lighting guidance please see page 18

Thorlux recommends

Luminaires

A-Line

Multi-purpose corrosion-resistant LED luminaires. Capable of ambient temperatures up to 50°C

IP66 IK06/ IK07/ IK09/ IK10

Kanby LED Controller

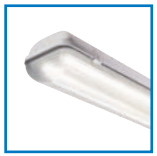
LED controller luminaires

IP40

Kanby Evo

Narrow body LED controller luminaires

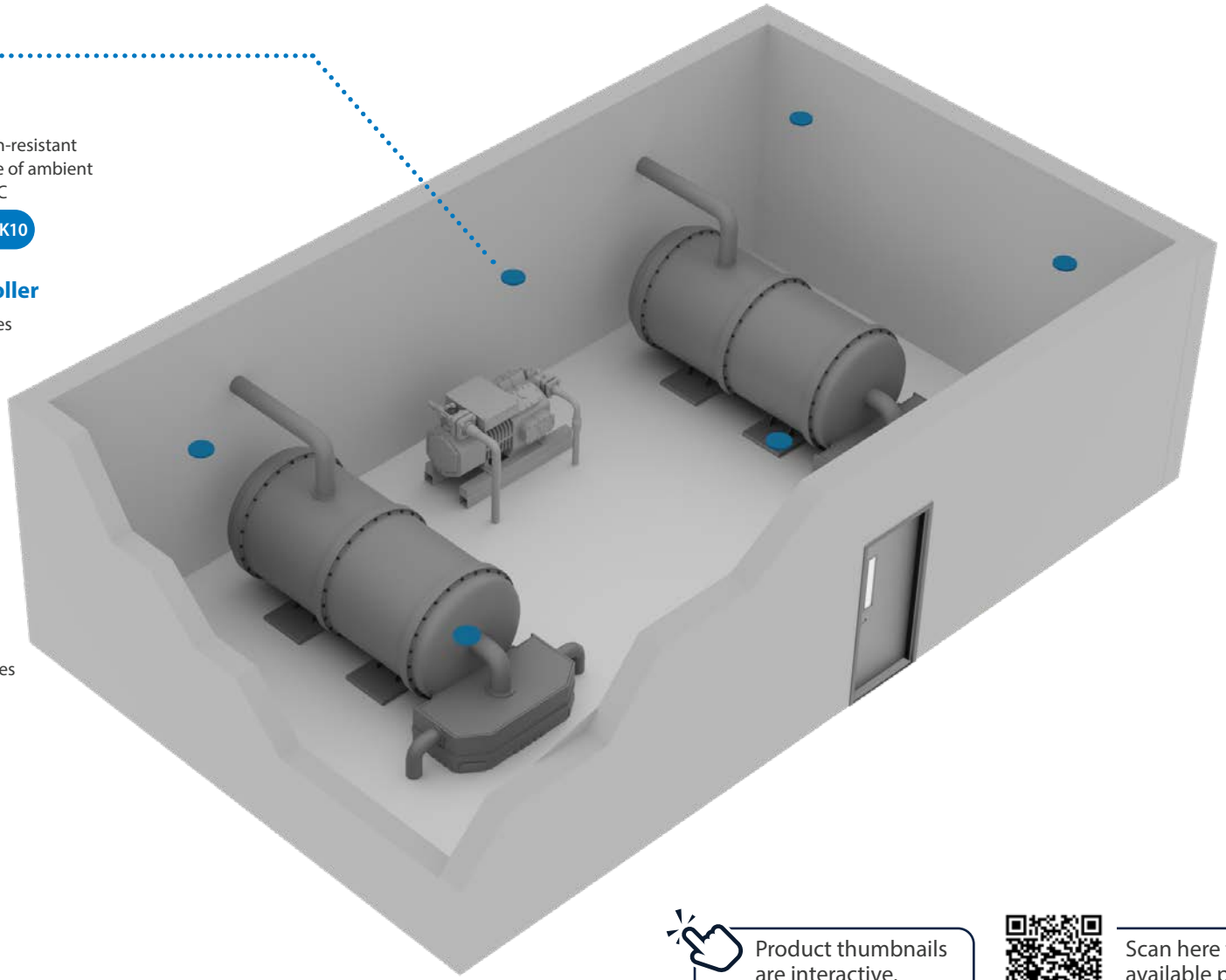
IP40



Thoroproof

Corrosion-resistant polycarbonate luminaires

IP65 IP54 SMART VERSION



Product thumbnails are interactive.

Scan here to view all available products.

LIGHTING RECOMMENDATIONS

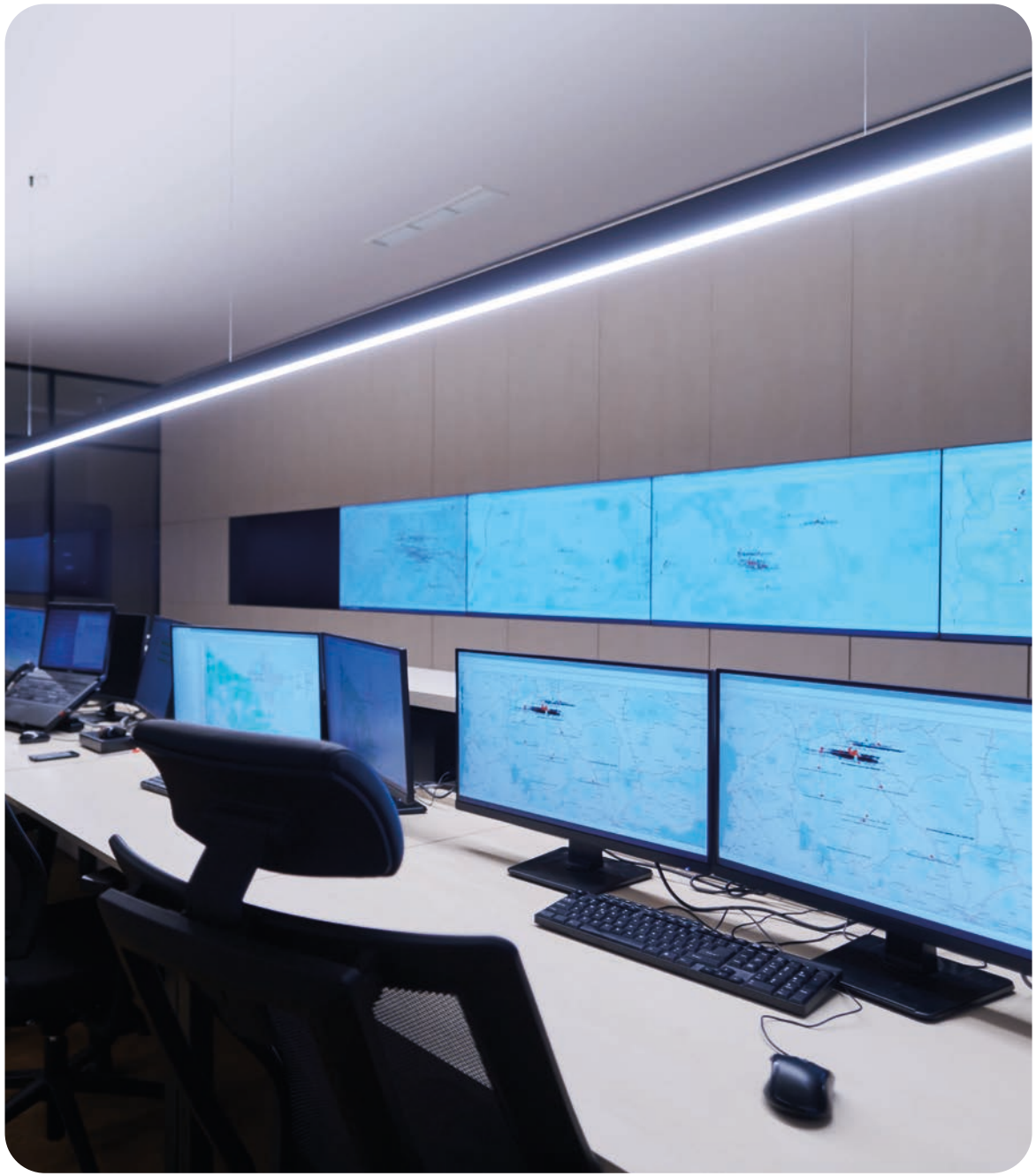
Office space

The lighting scheme for a control room needs to be carefully designed to ensure that displays are free from glare, with good contrast and clarity. Luminaires must be selected and positioned so operatives have light exactly where they need it, allowing them to use their controls while avoiding glare on the visual displays.

Luminaires should comply with the luminance limits outlined in EN12464-1 and CIBSE Lighting Guide 7 (Office Lighting). Observing these requirements will ensure user comfort and avoid distracting reflections on computers and other display screens. The limits vary from 1,500 cd/m^2 to 3,000 cd/m^2 depending on the type of screen and software used.

Designers must also calculate the Unified Glare Rating (UGR), which should not typically exceed an index of 19 for office workspaces. Thorlux designers are fully versed in current CIBSE guidance, and the company manufactures a range of luminaires that meet these requirements.

For emergency lighting guidance please see page 18



Thorlux recommends

Luminaires

Hi-Style

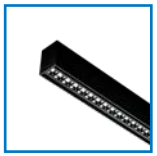
High performance recessed LED luminaires with either opal or low glare optics.

IP20 ABOVE CEILING | IP40 BELOW CEILING

SkyPro

Low glare polycarbonate diffuser luminaires

IP20 ABOVE CEILING | IP44 BELOW CEILING



Flexbar

Slimline, low glare linear luminaires

IP40

Flexbar Diffuser

Slimline, linear luminaires

IP20

Product thumbnails are interactive.

Scan here to view all available products.

LIGHTING RECOMMENDATIONS

Roof space

Data centres often have extensive exterior roof areas with large plant items such as diesel-powered generators, fuel storage and air conditioners. Linking these items may involve additional pipework, ducts, and cable trays. As a result, navigation can be difficult.

These areas require lighting for staff to find their way safely. It provides security, prevents theft or vandalism, and enables maintenance and fault rectification. Bulky items cast shadows, making a general floodlighting scheme impractical and challenging the designer. The best approach is to use strategically placed localised lighting, which can be wall-mounted or installed on the support structure.

For emergency lighting guidance please see page 18

Thorlux recommends

Luminaires

Mercian

High performance wall mounted luminaires

IP65 IK10

Prismalette 360

Vandal-resistant circular luminaires

IP66 IK10++

Realta

High performance luminaires designed to minimise light pollution and energy consumption

IP66 IK06/IK10/IK10++

Realta Micro

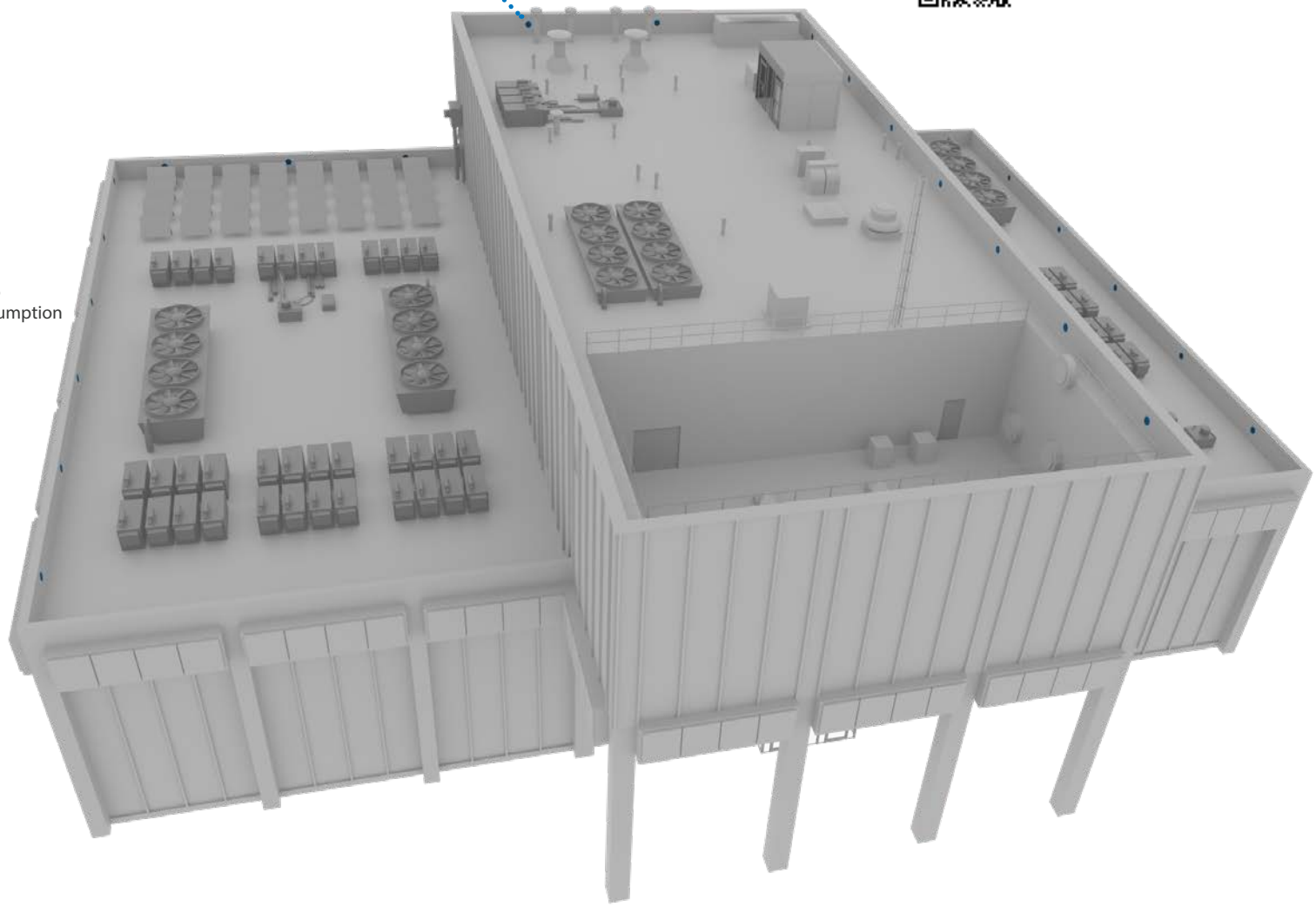
Low light level, wall mounted luminaires

IP66 IK11

Vandalux

Vandal-resistant sealed luminaires

IP66



Product thumbnails are interactive.

Scan here to view all available products.

Emergency lighting

The provision of emergency lighting in data centre applications is determined by the site's use, size, and complexity. The mounting height of emergency luminaires is a major consideration. Maintenance access is essential, so luminaires should be installed at manageable mounting heights, for example, on walls or clamped onto pillars.

Emergency luminaires should meet the same ingress protection standards as general lighting. In some areas, the ambient temperature may not be appropriate for self-contained emergency fittings, or a very high emergency light level is required due to the nature of the task(s). This is where central battery systems (CBS) can effectively meet the space's requirements.

Thorlux offers a comprehensive range of emergency lighting control solutions, from standalone emergency to full wireless control and monitoring systems.

The emergency lighting design must take into account the following:

- Escape route signs
- Stairs
- Changes in floor level
- Changes in escape route direction
- Corridor intersections
- First aid posts
- Fire alarm call points or firefighting equipment
- Final exit doors to a place of safety
- Moving stairways and walkways
- Toilet facilities exceeding eight m^2
- Toilet facilities for disabled use
- Motor generator, control and plant rooms
- Manual release controls for electronically locked doors
- Escape equipment for disabled people
- Refuges and call points
- Other areas deemed necessary by a risk assessment

SMARTSCAN

Emergency

Self-testing emergency luminaires with integral battery for three-hour emergency operation. Wireless communication and web connectivity for automatic scheduled testing, luminaire status and test history reporting.

w/Self-Test Emergency

Self-testing emergency luminaires with integral battery for three-hour emergency operation.

Standard Emergency

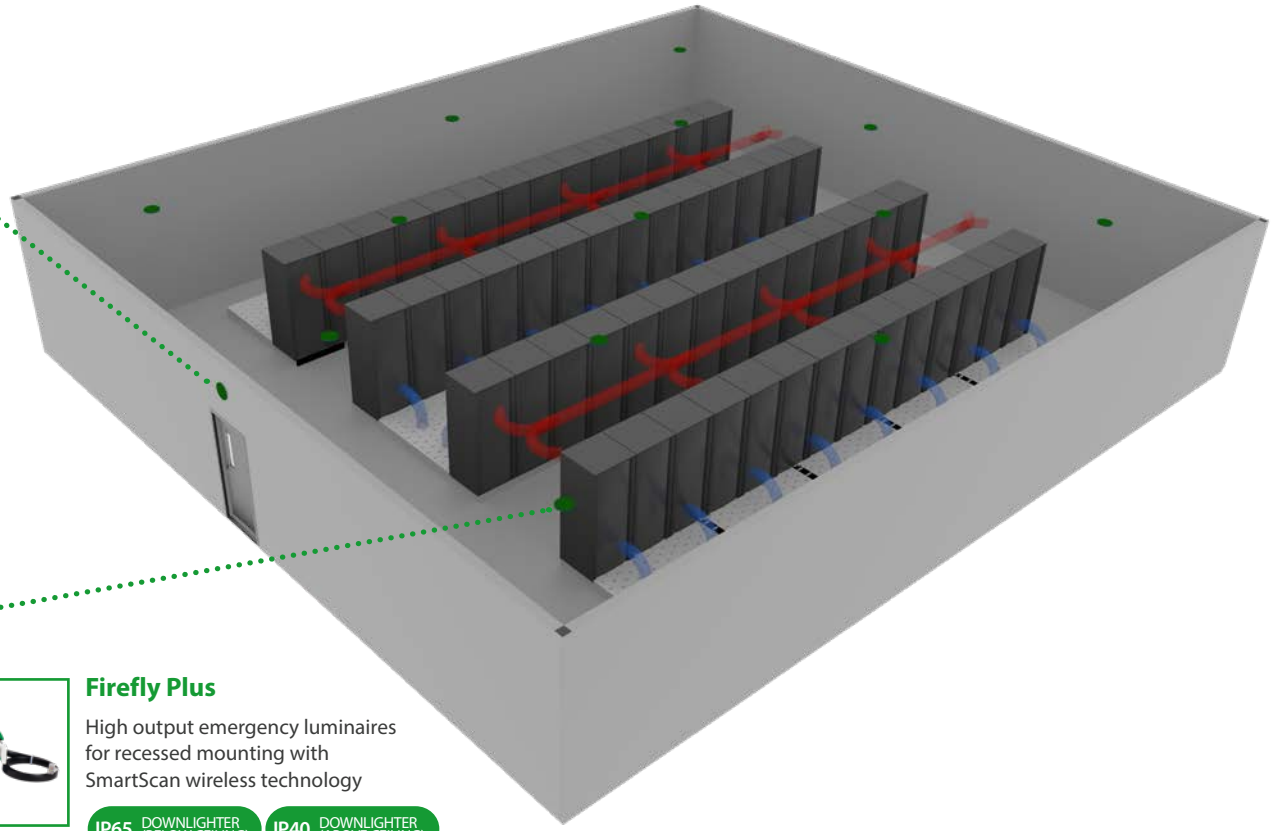
Emergency luminaires with integral battery for three-hour emergency operation.

Central battery system

For more information contact your local sales engineer.

Thorlux recommends

Most Thorlux luminaires have an integral emergency option, including high output non-maintained luminaires ideal for greater mounting heights.



Exit signage

Lexi

Edge-lit emergency exit signs with SmartScan wireless communication version

IP40

Lexi-65

IP65 LED emergency luminaires with SmartScan wireless communication version

IP65 IK10

Escape route

Firefly

Emergency luminaires for recessed mounting with SmartScan wireless communication version

IP65 DOWNLIGHTER (BELOW CEILING) IP40 DOWNLIGHTER (ABOVE CEILING)

Firefly Plus

High output emergency luminaires for recessed mounting with SmartScan wireless technology

IP65 DOWNLIGHTER (BELOW CEILING) IP40 DOWNLIGHTER (ABOVE CEILING)

Firefly Surface

Emergency luminaires for surface mounting with SmartScan wireless communication version

IP54 SQUARE VERSION IP66 CIRCULAR VERSION

Product thumbnails are interactive.

Scan here to view all available products.

LIGHTING RECOMMENDATIONS

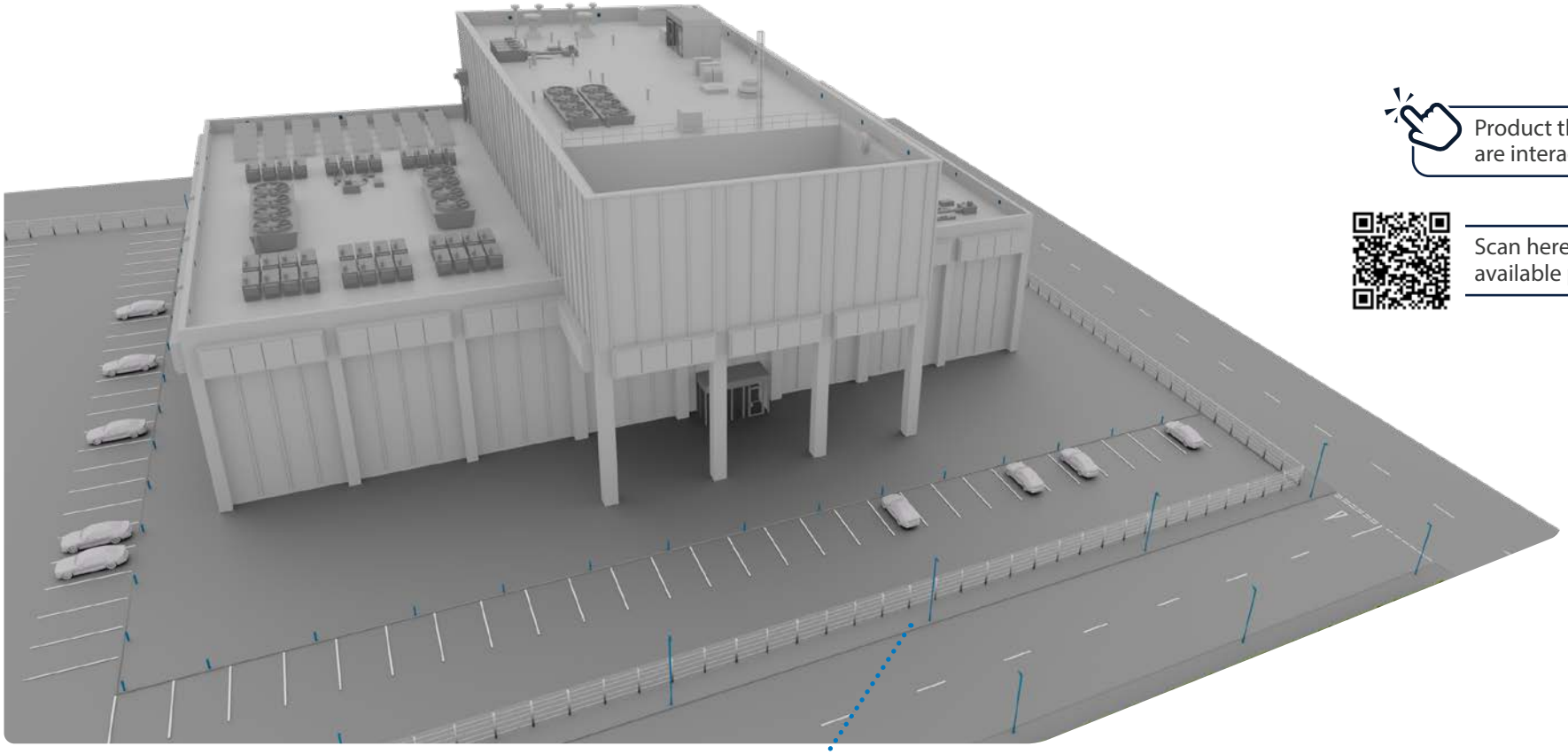
External areas and car park

Data centres must be secure to protect valuable equipment and ensure uninterrupted access to data. Good external lighting deters break-ins and is essential for patrolling security personnel. However, an overly lit building can be counterproductive as it advertises its presence to passers-by.

Furthermore, light pollution is a common problem, so external luminaires must be carefully selected to limit spill lighting and upward light. Thorlux has extensive experience in this area and can help with obtrusive light and environmental impact studies, plus EN12464-2 compliance and LEED certification. Thorlux external luminaires have excellent BUG ratings, with DarkSky certification for the new Acorn floodlight.

CCTV requires adequate vertical illumination for facial recognition, especially near entrance doors. Modern infra-red cameras can cope with low light levels but often struggle with sharp luminance changes. Careful placement will provide uniform lighting whilst ensuring luminaires are out of the camera's field of view. Thorlux designers can advise on allowing for CCTV functionality in lighting designs.

For emergency lighting guidance please see page 18



Product thumbnails are interactive.

Scan here to view all available products.

Thorlux recommends

Luminaires

Acorn

Highly sustainable exterior floodlight

IP65 IK07

Prismalette 360

Vandal-resistant circular luminaires

IP66 IK10++

Starbeam

LED floodlights and street lights

IP66 IK10

Mercian

High performance wall mounted luminaires

IP65 IK10

Realta

High performance luminaires designed to minimise light pollution and energy consumption

IP66 IK06/IK10/IK10++

Starflood

High performance mini LED floodlights

IP66 IK10

Lighting management systems

Thorlux offers a comprehensive range of lighting management systems from basic presence detection, through to full wireless control and monitoring systems.

SMARTSCAN

SMARTSCAN INTERNAL

Integrated intelligent lighting management maximising energy savings for internal applications through movement detection and daylight sensing with convenient user control.

SMARTSCAN EXTERNAL

Integrated intelligent lighting management maximising energy savings for external applications through movement detection and daylight switching with timed override via the SmartScan Website.

SMARTSCAN RADAR

High frequency sensor technology built onto the LED light engine for applications where the luminaire aesthetics and impact rating are important factors. Maximising energy saving through presence detection, photocell control and user control timed override via the SmartScan Website.

SMARTSCAN EMERGENCY

Self-testing emergency luminaires with centralised, web-based testing and reporting options to ensure compliance with local standards.

SMARTSCAN

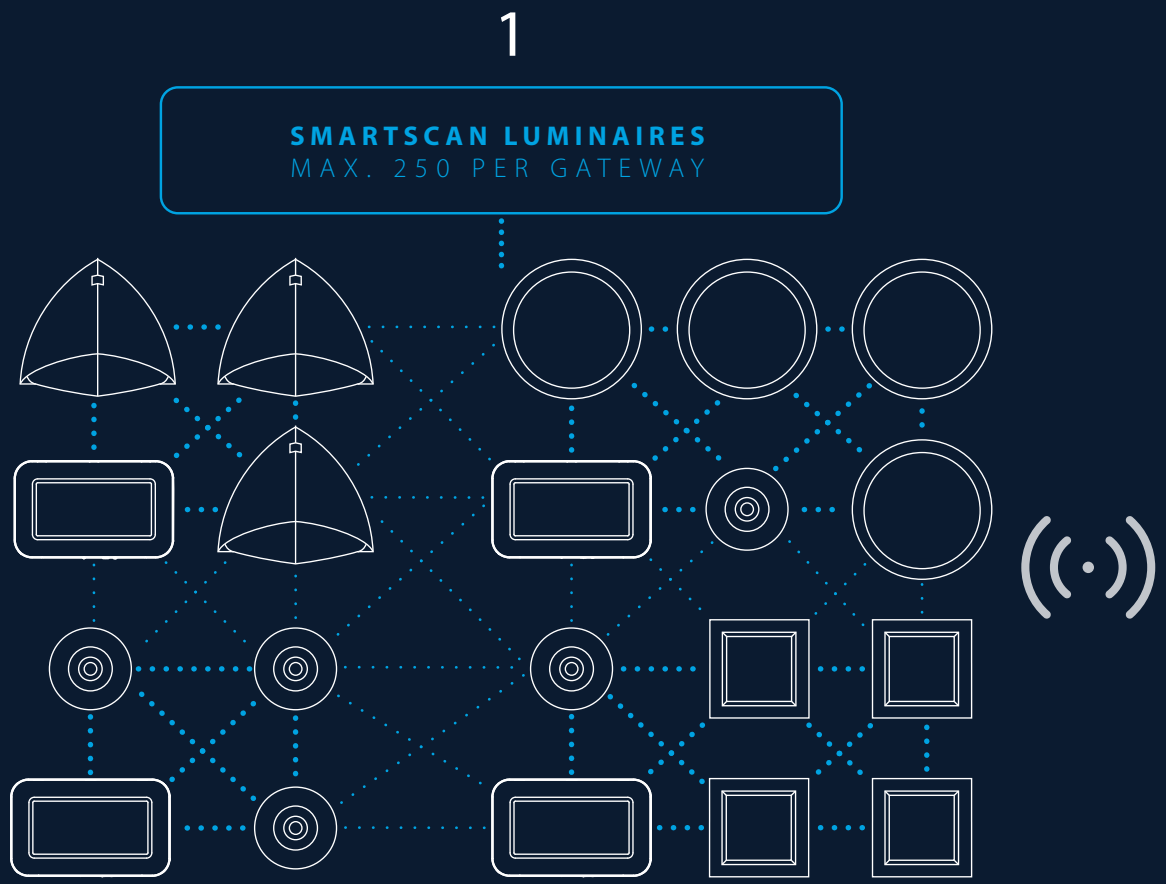
Lighting management systems

Lighting energy consumption within data hall areas can be significant. The SmartScan lighting management system makes the most of maintained illuminance, daylight dimming and presence detection to ensure optimum energy savings, often measured in real applications to exceed 80%. SmartScan also monitors the performance of all luminaires so any fault can be reported promptly to the maintenance teams.

1 Compatible SmartScan Internal, SmartScan Radar, SmartScan External and SmartScan Emergency luminaires wirelessly communicate with each other.

2 The Gateway transmits energy performance and status reports for standard and emergency luminaires to the SmartScan web server.

3 Users can view status and operational information on any Internet enabled device.



2

SMARTSCAN GATEWAY

SMARTSCAN WEB SERVERS

3

YOUR DEVICE

Scan here to view lighting management systems.

What is SmartScan Analytics?

A comparatively recent requirement is to combine data from different building systems to inform analysis of the building's performance.

To accommodate this Thorlux have developed the SmartScan Analytics platform. This unique system uses either locally obtained data from sensors and devices or APIs to collate data into one portal, where users can analyse different data sets.

The result is a software-based platform that uses the SmartScan software portal to provide the following tenant enhancements:

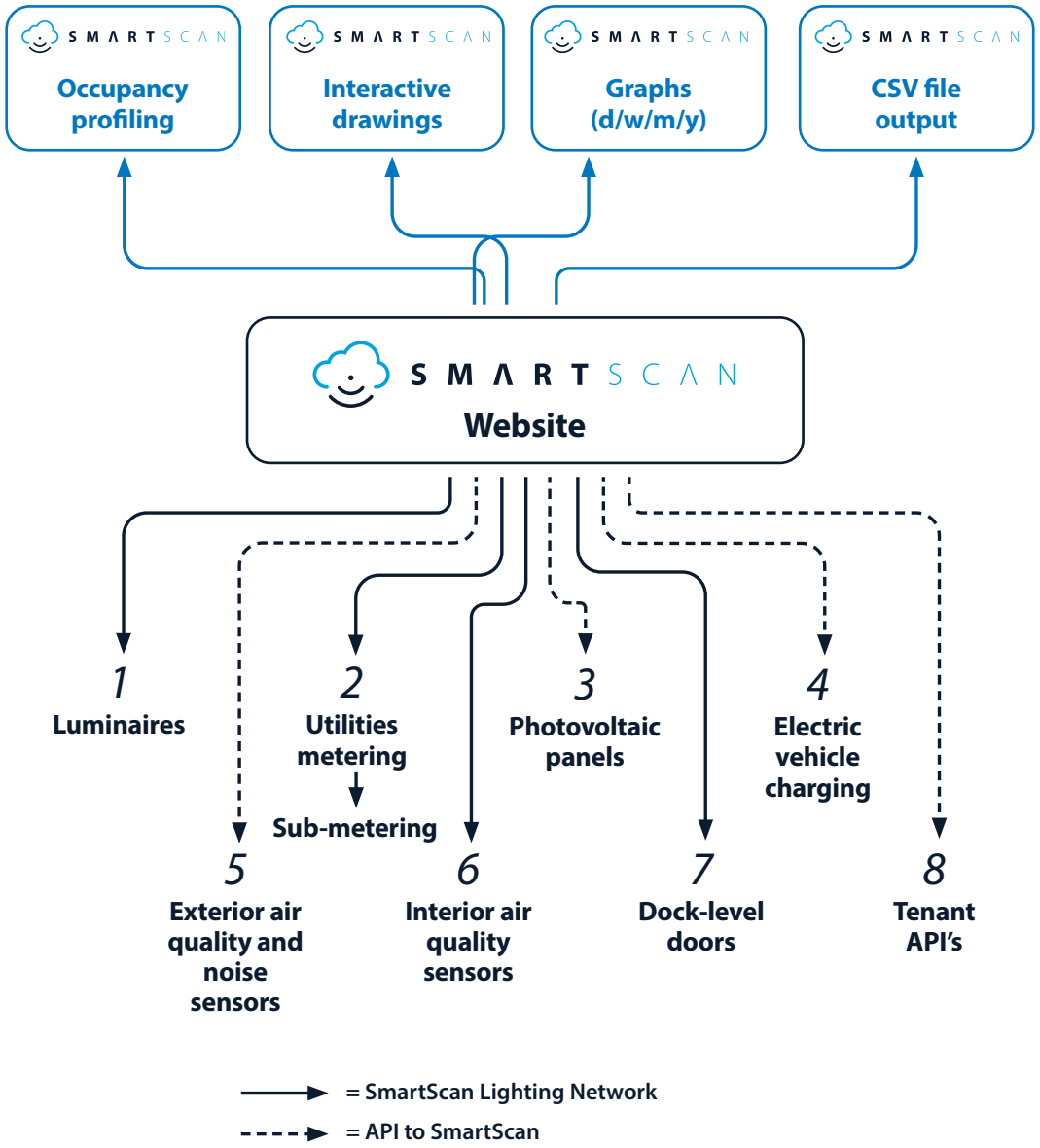
- Integral sensors within the luminaires enable movement detection below every point independent of output (in other words when the luminaire is off). Luminaires dim and turn on/off based on daylight level and movement.

- Uses the lighting network to carry other service or asset communications, removing unnecessary network duplication costs.

By installing specialist sensors, dataloggers and volt-free contacts on other assets or services with pre-written APIs (Application Programming Interface), the SmartScan portal will capture this data for analytics.

SmartScan Analytics monitors:

POWERED BY SMARTSCAN



Specialist solutions and customised luminaires

Every data centre building has unique lighting requirements and challenges, and many projects will require some degree of customisation.

Thorlux is a data centre lighting specialist with extensive experience providing tailored solutions for the sector. Its in-house manufacturing capability allows for flexible design and production, building luminaires specifically for the task, or modifying existing designs.

This flexibility can mean ensuring a quick installation to minimise disruption, dealing with high or low external ambient temperature, or addressing local light pollution concerns. Crucially, your new system will always maximise energy efficiency and lighting effectiveness.

Let our specialist team solve your lighting problems.

How to specify your lighting supplier

1. The supplier shall be independently assessed and certified to ISO 9001 (Quality Management Systems).

2. The supplier shall be responsible for its environmental activities and demonstrate genuine concern, as proven by independent assessment and certification to ISO 14001 (Environmental Management Systems).

3. The supplier shall prioritise the welfare of the workforce and site visitors, as proven by independent assessment and certification to ISO 45001 (Occupational Health and Safety Management Systems).

4. The supplier shall prioritise the protection of sensitive data, as proven by independent assessment and certification to ISO 27001 (Information Security).

5. The supplier shall provide Certificates of Conformity demonstrating compliance with European legislation directives 2006/95/EC, 2004/108/EC and 2011/65/EU.

6. Photometric test information shall be available using independently assessed equipment.

7. The supplier shall offer a commissioning service using in-house, trained technicians and then provide a commissioning certificate.

8. All products will be tested before despatch, including safety earth circuit continuity, high-voltage electrical strength testing, full circuit functionality including dimming, and checks on current drawn.

9. Products and services shall be backed by a comprehensive 5-year warranty - the supplier will have an established history and track record.

10. The supplier will have an established plan for achieving net-zero greenhouse gas (GHG) emissions in line with the Paris Agreement on Climate Change. This plan will be assessed and validated to SBTi standards.

Sustainability

On a journey to net-zero by 2040

For the last two decades, Thorlux Lighting, as part of the FW Thorpe Plc Group, has worked hard to reduce its environmental impact, and we are proud of the progress made.

But, recognising that there is still much to do to safeguard the environment and avoid the worst effects of climate change, Thorlux and the FW Thorpe Plc Group have set a target to reach net-zero greenhouse gas (GHG) emissions by 2040, ten years before the UK government's 2050 net-zero target.

NET ZERO BY 2040

A validated net-zero target

FW Thorpe Plc has committed to reaching net-zero greenhouse gas emissions across the value chain by 2040.
The Science Based Targets initiative (SBTi) has validated these science-aligned targets:.

Near-term target

FW Thorpe Plc commits to reducing absolute scope 1 and 2 GHG emissions by 57.5% by FY2030 from a FY2021 base year. FW Thorpe Plc also commits to reducing absolute scope 3 GHG emissions by 25% within the same timeframe.

Long-term target

FW Thorpe Plc commits to reducing absolute scope 1 and 2 GHG emissions by 90% by FY2040 from a FY2021 base year. FW Thorpe Plc also commits to reducing absolute scope 3 GHG emissions by 90% within the same timeframe.

Thorlux Lighting has been carbon neutral since 2012 through a combination of measures. Company-wide initiatives such as energy use minimisation, self-generation through solar photovoltaic (PV) units, and renewable energy procurement have reduced Thorlux's carbon footprint, whilst trees in our award-winning carbon offsetting afforestation project sequester the remaining carbon dioxide produced.
Our carbon-neutral status is independently verified as per ISO 14064-1.

Sustainability at Thorlux

Our commitment to sustainability and the environment

Sustainability and the environment have been at the core of Thorlux for many years and we have always been committed to doing the right thing for both people and the planet.

We have worked hard to reduce our environmental impact of our manufacturing and selling activities, and consider carefully the implications our products have during their life and at the end of their life. Through our environmental monitoring programme, which is independently certified to the environmental management standard ISO 14001, we continually measure and improve our environmental credentials.

"Thorlux has a long-standing commitment to tackling global environmental challenges, principally through its core business of manufacturing energy efficient lighting equipment. The company has a genuine desire to become a more sustainable business.

"Over the last two decades, at Thorlux we have sought to address our carbon impact by working towards carbon neutrality for our manufacturing and distribution operations. It gives me huge pleasure that our hard work and ambitions have paid off in achieving our carbon neutral status both now and historically.

"But our work doesn't stop here. By assessing our carbon impact right across our manufacturing and value chain then setting science-based targets in line with the Paris Agreement on climate change, our goal is ultimately to reach zero carbon status well before the UK's target for achieving net zero carbon emissions by 2050. Watch this space."

Michael Allcock

FW Thorpe Group Chairman

Innovating sustainable lighting solutions for a brighter future

INDUSTRIAL LUMINAIRES
COMMERCIAL LUMINAIRES
FLOODLIGHTING LUMINAIRES
ARCHITECTURAL LUMINAIRES
HEALTHCARE LUMINAIRES
HAZARDOUS AREA LUMINAIRES
RETAIL AND DISPLAY LUMINAIRES
CONTROLS AND SYSTEMS

A DIVISION OF F.W. THORPE PLC

Thorlux Carbon Offsetting Project:
www.thorlux.com/trees

The information given in this catalogue is typical and must not be interpreted as a guarantee of individual product performance and/or characteristics. We reserve the right to alter specifications and designs without prior notice.

Thorlux Lighting
Merse Road
North Moons Moat
Redditch
Worcestershire
B98 9HH
England

T +44 (0)1527 583200
F +44 (0)1527 584177
E thorlux@thorlux.co.uk
W www.thorlux.com

Direct UK Sales Line: 01527 583222

Thorlux Lighting Ireland
Unit G6
Riverview Business Park
Nangor Road
Gallanstown
Dublin 12
Ireland

T +353 (0)1 460 4608
F +353 (0)1 460 4609
E thorlux@thorlux.ie
W www.thorlux.ie

Thorlux Lighting Australasia Pty Ltd.
31 Cross Street
Brookvale
Sydney
NSW 2100
Australia

T 1300 04 32 32
T +61 (0)2 9907 1261
E thorlux@thorlux.com.au
W www.thorlux.com.au

Registered No. ABN 139 400 507

SchahlLED Lighting GmbH
Max-Planck-Str. 9
85716 Unterschleißheim
Deutschland

T +49 (0)89 90 11 98 20
E info@schahlled.de
W www.schahlled.de

bsi ISO 9001 Quality Management Systems CERTIFIED FM 10913 · ISO 14001 Environmental Management CERTIFIED EMS 532104 · ISO/IEC 27001 Information Security Management CERTIFIED IS 803960 · ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 704131

Woodland Carbon CO_2de

SUSTAINING MEMBER Society of Light and Lighting

LIGHTING INDUSTRY ASSOCIATION

MADE IN THE UK

Lighting Council AUSTRALIA MEMBER

PN 3855B May. 25