

US LIGHTING TRENDS • KNOWLEDGE CENTER

US LIGHTING TRENDS

Knowledge Center

Final Upload Package: 10 Resource Centers

This master document contains the exact base copy, CMS metadata, FAQs, internal-link targets and upload notes for all ten launch resource centers.

Package Index

1. Lighting Design Resource Center • </resources/lighting-design/>
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9. Emergency Lighting Resource Center • </resources/emergency-lighting/>
10. Data Center Lighting Resource Center • </resources/data-center-lighting/>

CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/lighting-design/

SEO title: Lighting Design Resource Center | Photometrics, Layouts, Controls & Best Practices

Meta description: Explore lighting design fundamentals, photometric studies, fixture selection, visual comfort, controls integration, codes, standards and best practices.

H1: Lighting Design Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Designing better lighting for better buildings.

Primary CTA: Explore the definitions and practical guides below

Lighting Design Resource Center

Lighting design brings architecture, engineering, technology and human experience together. A successful design does more than illuminate a room. It helps people see comfortably, supports the work performed in the space, reinforces the architecture, manages energy use and creates a maintainable system for the building owner.

The US Lighting Trends Lighting Design Resource Center gives lighting designers, engineers, architects, contractors, distributors and facility teams a practical starting point for planning, evaluating and delivering lighting projects. Use this hub to understand core design concepts, navigate project documents, review photometric information and connect lighting choices with controls, codes and long-term building performance.

Why This Topic Matters

- Improve visibility and visual comfort
- Match light levels and distribution to the intended task
- Control glare, contrast and reflected brightness
- Coordinate luminaires with architecture and building systems
- Reduce connected load and operating energy
- Create flexible scenes and control zones
- Support commissioning, maintenance and future changes

Start with the project requirements

Document the space type, visual tasks, user needs, hours of operation, ceiling and mounting conditions, available daylight, maintenance access, budget and applicable codes. A design brief should distinguish required performance from preferences and identify who will approve the result.

Confirm the workplane or surfaces that matter. A design for office desks, warehouse rack faces, retail displays and pedestrian paths will not use the same calculation planes, distributions or priorities.

Core lighting quantities

Illuminance describes the light reaching a surface and is commonly reported in footcandles or lux. Luminance relates to the brightness of a surface in a viewing direction. Lumens describe total source output, while candela

Commented [DG1]: Are we providing these concepts and addressing how to navigate documents? Terminology may be too specific given our deliverable and need to be cautious about over-promising. How are we going to maintain / upload?

Commented [JK2R1]: Set a timetable and one every quarter - editors have to do it

describes intensity in a particular direction. Designers use these measures together rather than treating any one value as a complete description of quality.

Uniformity, contrast and vertical illumination should be reviewed alongside average illuminance. An acceptable average can conceal bright and dark areas, while strong vertical illumination may be essential for faces, shelves, signs or rack labels.

Photometric analysis

A photometric study predicts how selected luminaires will distribute light within a modeled environment. Inputs include luminaire photometric files, geometry, mounting height, aiming, reflectance, maintenance assumptions and the calculation grid.

Use the study to test fixture quantity, spacing, distribution, glare risk and uniformity before equipment is ordered. Record assumptions clearly so contractors and reviewers understand what the calculation does and does not represent.

Light quality and visual comfort

Select correlated color temperature, color rendition and optical control for the application. CRI can provide a familiar color-rendering reference, while TM-30 information can add detail about fidelity and saturation.

Manage glare through luminaire selection, shielding, placement, luminance balance and aiming. Unified Glare Rating can support indoor evaluation, but UGR is a calculated result for a room and observer condition, not a universal label that guarantees comfort in every installation.

Layered lighting and fixture selection

Combine ambient, task, accent and decorative layers when the project calls for different visual functions. Select distributions and lumen packages that deliver useful light rather than focusing only on total lumens or wattage.

Review dimensions, mounting, finish, voltage, driver, dimming, emergency options, environmental ratings, photometry, serviceability and warranty for the exact catalog configuration.

Controls and daylight

Develop the control concept with the lighting layout. Identify zones, sensors, daylight areas, schedules, scenes, manual interfaces and integration points. Early coordination prevents control zones from conflicting with room use or daylight patterns.

The sequence of operations should state how the system behaves during occupancy, vacancy, normal schedules, after-hours use, daylight changes and loss of normal power.

Design documentation and review

Coordinate the lighting plan, reflected ceiling plan, fixture schedule, specifications, controls narrative, one-line diagrams, details and calculations. Resolve differences before bid and identify the basis of design and substitution requirements.

During submittal review, compare the proposed catalog number, photometry, dimensions, ratings, controls compatibility, finish and accessories with the design requirements.

Commissioning and handover

Verify zoning, sensor coverage, timeouts, dimming limits, daylight response, scenes, schedules and emergency behavior. Record final settings and provide owner training, as-built information and a clear path for future adjustments.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Illuminance?](#)
- [What is Luminance?](#)
- [What is Footcandle?](#)
- [What is Lux?](#)
- [What is Lumens?](#)
- [What is Candela?](#)
- [What is Beam Angle?](#)
- [What is Uniformity Ratio?](#)
- [What is UGR?](#)
- [What is Glare?](#)
- [What is CRI?](#)
- [What is TM-30?](#)
- [What is Layered Lighting?](#)
- [What is Photometric Study?](#)
- [What is Fixture Schedule?](#)
- [What is Basis of Design?](#)
- [What is Lighting Commissioning?](#)

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What is lighting design?

Lighting design is the process of planning light, luminaires and controls to support visual tasks, comfort, safety, architecture, energy goals and building operations.

What is a photometric study?

A photometric study is a computer-based prediction of lighting performance using product photometric data, space geometry and documented assumptions.

What is the difference between illuminance and luminance?

Illuminance describes light reaching a surface. Luminance describes the directional brightness of a surface as viewed by an observer.

Why is glare control important?

Excessive brightness or contrast can create discomfort or reduce visibility. Glare control is therefore part of fixture selection, placement and luminance balancing.

When should controls be designed?

Controls should be developed with the lighting layout so zoning, sensors, daylight areas, interfaces and sequences support the intended use of the space.

About US Lighting Trends

US Lighting Trends provides product news, market intelligence, technology insights and practical guidance for professionals who design, specify, sell, install and manage lighting systems across North America.

Upload Notes for the Web Team

- Use the SEO title and meta description exactly as supplied, then verify character display in the CMS preview.
- Use one H1 only. Convert each main section to H2 and each FAQ question to H3.
- Create a visible table of contents that links to the major H2 sections.
- Add “Reviewed by” and “Last reviewed” fields before publication.
- Link each featured definition once its destination page is live. Do not publish broken placeholder links.
- Populate related-article and related-product modules dynamically where the CMS supports it.
- Keep sponsored placements clearly labeled and separate from the independent editorial explanation.
- Before publication, have a qualified reviewer verify standards-, code-, program- and life-safety-dependent statements.

CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/lighting-controls/

SEO title: Lighting Controls Resource Center | DALI, Sensors, NLC & Smart Buildings

Meta description: Learn about DALI, DALI-2, D4i, Bluetooth Mesh, occupancy sensors, daylight harvesting, networked lighting controls and smart building integration.

H1: Lighting Controls Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: A practical guide to controlling, connecting and commissioning lighting systems.

Primary CTA: Explore the definitions and practical guides below

Lighting Controls Resource Center

Lighting controls have developed from switches and time clocks into connected systems that can dim, schedule, sense, monitor and coordinate lighting across a building or portfolio. Controls can respond to occupancy, daylight, user input and operating schedules while sharing selected information with other building systems.

This resource center helps designers, contractors, distributors, integrators and facility managers understand control strategies, communication methods, sensors, project documentation and commissioning. The goal is not to promote one architecture, but to help project teams select and deliver a system suited to the building, users and operational capabilities.

Why This Topic Matters

- Reduce unnecessary lighting operation
- Provide manual control and scene flexibility
- Support automatic shutoff and daylight response
- Enable fixture-level or zone-level management
- Improve maintenance visibility and fault reporting
- Coordinate lighting with building automation
- Collect useful energy or occupancy information where appropriate

Define the control intent

Begin with the spaces, users and operating scenarios. Identify which lights must switch or dim together, where manual control is needed, how occupants should override automatic actions and what should happen after hours.

Translate the intent into a sequence of operations that covers normal occupancy, vacancy, schedules, daylight response, demand events and loss of normal power.

Standalone and networked controls

Standalone controls operate locally and may include wall dimmers, occupancy sensors, vacancy sensors, photocells and time switches. They can be effective when the space and sequence are simple.

Networked lighting controls connect luminaires, sensors, interfaces and software. Depending on the system, networking can enable centralized configuration, monitoring, analytics, remote changes and integration with other building platforms.

Occupancy and vacancy sensing

Occupancy sensors automatically signal that a space is occupied. Vacancy sensors normally require manual-on operation and provide automatic shutoff. Technologies include passive infrared, ultrasonic, microwave and dual-technology sensing.

Coverage patterns, mounting, partitions, airflow, sensitivity and timeout settings influence performance. Commission the sensor in the real space rather than relying only on a catalog coverage diagram.

Daylight-responsive control

Daylight harvesting reduces or switches electric lighting when usable daylight is available. Open-loop sensors generally view daylight, while closed-loop sensors respond to the combined light level within the controlled area.

Successful daylight control depends on zoning, sensor location, calibration, dimming behavior and occupant expectations. Define how the system returns to normal operation when daylight changes.

Wired communication and DALI

DALI is a standardized digital protocol for communication between lighting control devices and control gear. It supports addressing, grouping, scenes, dimming and status communication. DALI-2 certification is intended to improve interoperability through verified testing of eligible devices.

D4i extends DALI-2 for intelligent luminaires by standardizing selected luminaire, energy and diagnostics data and provisions for compatible sensors or network nodes. Confirm certification and required features for the exact device.

Wireless controls

Wireless lighting controls can reduce dedicated control wiring and simplify selected retrofit or reconfiguration projects. Bluetooth Mesh and Zigbee are examples of technologies used in connected lighting systems.

Review network architecture, commissioning ownership, cybersecurity, device compatibility, gateway needs, radio coverage, update policies and long-term support before selection.

Building integration and PoE

BACnet gateways or native interfaces can exchange selected lighting information with a building management system. Power over Ethernet lighting can deliver power and data through compatible Ethernet infrastructure.

Integration should define which system owns schedules, alarms, overrides and data. The team should also document fail-safe behavior and responsibilities across electrical, controls and IT scopes.

Commissioning and operations

Test every control zone and representative operating condition. Verify sensor coverage, low-end dimming, schedules, scenes, daylight response, overrides, emergency behavior and system integration.

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Provide final settings, credentials, backups, network documentation and training. A sophisticated control system produces value only when the owner can operate and maintain it.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Lighting Control?](#)
- [What is DALI?](#)
- [What is DALI-2?](#)
- [What is D4i?](#)
- [What is 0-10V Dimming?](#)
- [What is Bluetooth Mesh?](#)
- [What is BACnet?](#)
- [What is PoE Lighting?](#)
- [What is Networked Lighting Controls?](#)
- [What is Luminaire-Level Lighting Controls?](#)
- [What is Occupancy Sensor?](#)
- [What is Vacancy Sensor?](#)
- [What is PIR Sensor?](#)
- [What is Ultrasonic Sensor?](#)
- [What is Daylight Harvesting?](#)
- [What is Scene Control?](#)
- [What is Demand Response?](#)

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Display the newest and most relevant USLT articles assigned to this resource-center category.

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Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What are lighting controls?

Lighting controls are devices and software used to switch, dim, schedule, sense, monitor or otherwise manage lighting operation.

What is DALI?

DALI is a standardized digital communication protocol used between lighting control devices and compatible control gear.

What are networked lighting controls?

Networked lighting controls connect devices so they can coordinate functions such as zoning, sensing, scheduling, configuration and monitoring.

What is daylight harvesting?

Daylight harvesting adjusts electric lighting in response to available daylight within defined zones.

Why is commissioning essential?

Commissioning verifies that installed devices, zoning, settings and sequences match the design intent and actual use of the space.

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/led-technology/

SEO title: LED Technology Resource Center | Drivers, LM-80, TM-21 & Performance

Meta description: Understand LED drivers, modules, thermal management, lumen maintenance, LM-80, TM-21, dimming, reliability and LED product selection.

H1: LED Technology Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Understanding the components and performance behind modern LED lighting.

Primary CTA: Explore the definitions and practical guides below

LED Technology Resource Center

LED technology is the foundation of most new lighting products, but the LED package is only one part of a complete system. Drivers, optics, thermal pathways, controls, mechanical construction and operating conditions all influence delivered light and useful life.

This resource center explains the components, measurements and qualification information used to evaluate LED products. It is designed for professionals who specify, quote, install or maintain LED lighting and need to move beyond headline wattage and lumen claims.

Why This Topic Matters

- Compare product performance on a consistent basis
- Match drivers and dimming methods with control systems
- Understand lumen maintenance and life projections
- Evaluate thermal conditions and ambient ratings
- Reduce color mismatch and visible depreciation
- Select serviceable products for the application
- Interpret qualification and test documentation more carefully

How an LED system works

A light-emitting diode is a semiconductor device that produces light when current flows through it. LED packages may be arranged on modules, boards or arrays and combined with optics to form a useful distribution.

The complete luminaire includes power conversion, thermal management, optical control, housing, wiring and selected controls. Product performance should therefore be evaluated at the luminaire level as well as the LED-source level.

LED packages and modules

Surface-mount device LEDs are used in many linear and planar products. Chip-on-board LEDs place many dies on a shared substrate to create a concentrated emitting area. Modules may include boards, connectors and thermal or optical components.

Package format influences source size, optical design, thermal behavior and serviceability. It does not by itself determine product quality.

LED drivers

An LED driver converts and regulates incoming power for the LED load. Constant-current drivers are common with higher-power modules, while constant-voltage supplies are often used with products that include current regulation, such as selected LED tape systems.

Confirm input voltage, output range, load compatibility, dimming protocol, low-end performance, flicker, inrush current, power quality, ambient rating and expected life.

Thermal management

LEDs and drivers generate heat that must be managed through conduction, convection and radiation. Junction temperature and component case temperatures affect output, color and life.

Use products within their rated ambient conditions and preserve required clearances. Enclosures, insulation, high ceilings, hot aisles and limited airflow can create conditions different from a standard laboratory environment.

Lumen maintenance and useful life

LEDs commonly depreciate gradually. L70, L80 and L90 identify operating points at which output has declined to 70, 80 or 90 percent of initial output under defined conditions.

These values do not describe every failure mode of a complete luminaire. Driver failures, color shift, controls, connectors, seals and environmental exposure also influence useful life.

LM-80 and TM-21

IES LM-80 is a method for measuring lumen maintenance and related changes of LED packages, arrays or modules under controlled test conditions. IES TM-21 provides a method for projecting long-term lumen maintenance from LM-80 data.

LM-80 does not test a complete luminaire, and TM-21 projections depend on test duration and temperature. Review the relationship between the tested source, in-situ temperatures and the proposed product.

Color consistency and shift

Initial color consistency may be described using chromaticity tolerances or SDCM steps. Color can also shift over time because of source, optical, thermal or material changes.

Continuous rows, wallwashing and white architectural surfaces make mismatch particularly visible. Confirm initial tolerance and long-term color information when appearance is critical.

Selecting an LED product

Compare delivered lumens, distribution, input power, efficacy, color metrics, controls, ratings, photometry, markings, serviceability, warranty and current qualification status for the exact catalog number.

Avoid replacing a conventional source solely by wattage. Validate mounting, spacing, glare, thermal conditions and controls using application-specific calculations and samples where needed.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is LED Lighting?](#)
- [What is LED Driver?](#)
- [What is Constant Current Driver?](#)
- [What is Constant Voltage Driver?](#)
- [What is COB LED?](#)
- [What is SMD LED?](#)
- [What is LED Module?](#)
- [What is Thermal Management?](#)
- [What is Heat Sink?](#)
- [What is Junction Temperature?](#)
- [What is L70?](#)
- [What is L80?](#)
- [What is L90?](#)
- [What is LM-80?](#)
- [What is TM-21?](#)
- [What is Lumen Depreciation?](#)
- [What is Color Shift?](#)
- [What is SDCM?](#)

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What is an LED driver?

An LED driver converts and regulates electrical power for an LED load and may also provide dimming, communication or protection functions.

What is LM-80?

LM-80 is an IES method for measuring lumen maintenance and related changes of LED packages, arrays or modules under controlled conditions.

What is TM-21?

TM-21 is an IES method used to project long-term lumen maintenance from LM-80 test data.

Does L70 equal luminaire life?

No. L70 describes a lumen-maintenance point and does not include every possible component or system failure.

Why does thermal management matter?

Operating temperature affects LED output, color, driver performance and the useful life of electronic components.

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/human-centric-lighting/

SEO title: Human-Centric Lighting Resource Center | Circadian, Tunable White & Color Quality

Meta description: Explore human-centric lighting, circadian strategies, tunable white, dim-to-warm, spectral power distribution, CRI, TM-30 and visual comfort.

H1: Human-Centric Lighting Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Designing light around visual needs, comfort and daily experience.

Primary CTA: Explore the definitions and practical guides below

Human-Centric / Circadian Lighting Resource Center

Human-centric lighting is a broad approach that places people, tasks and experience at the center of lighting decisions. It considers visual performance and comfort while also recognizing that the timing, intensity, duration and spectrum of light exposure can influence nonvisual responses.

This resource center helps readers distinguish established lighting practice from oversimplified product claims. It connects color quality, daylight, glare, controls, tunable systems and circadian-informed strategies in a practical framework for workplaces, healthcare, education, hospitality and residential environments.

Why This Topic Matters

- Support clear vision and task performance
- Improve comfort through glare and luminance control
- Provide appropriate color appearance and rendition
- Offer adaptable scenes for different activities
- Coordinate electric light with daylight and schedules
- Evaluate nonvisual goals without making unsupported health claims
- Give occupants understandable and useful control

Begin with visual needs

Human-centered design starts with visibility, contrast, glare control, color, adaptation and the needs of the people using the space. Age, task difficulty, screen use, time of day and individual preference can affect a successful solution.

Do not allow a circadian feature to compensate for poor basic lighting. A system should first provide safe, comfortable and usable illumination.

Color temperature and spectrum

Correlated color temperature describes the apparent warmth or coolness of nominally white light. Spectral power distribution shows how radiant power is distributed across wavelengths. Two sources with the same CCT can have different spectra and color-rendering behavior.

Select CCT and spectrum in relation to materials, tasks, daylight, time of use and design intent rather than using a universal warm-or-cool rule.

Color rendition

CRI provides a familiar average comparison with a reference source, while TM-30 adds metrics and graphics that help describe fidelity, gamut and hue shifts. Individual colors such as strong red may matter in healthcare, food, retail and hospitality.

Review relevant metrics and, for critical environments, evaluate samples in the actual materials and lighting conditions.

Tunable white and dim-to-warm

Tunable white systems vary the CCT of white light through controls and can support scene setting, personal preference or time-based programs. Dim-to-warm products reduce CCT as output is lowered to emulate the familiar behavior of dimmed incandescent light.

Specify control interfaces, range, dimming behavior, calibration, zoning and the relationship between output and color. Confirm that controls and drivers remain compatible across the full operating range.

Circadian-informed lighting

Circadian-informed lighting considers the pattern of light exposure across the day, including intensity, spectrum, timing and duration. Daylight is an important part of the overall exposure.

Project teams should define the intended outcome, the metric or design method being used and the limits of the evidence. General educational content should not be presented as medical advice or a guaranteed health result.

Daylight and controls

Daylight can provide high levels of vertical illumination and strong time-of-day cues, but it also introduces glare and variability. Coordinate shading, façade design, electric lighting and daylight-responsive controls.

Simple, understandable control is important. Occupants should know how to use scenes and overrides, while facility teams should be able to adjust schedules and settings.

Application considerations

Healthcare projects may prioritize patient comfort, staff tasks, observation and nighttime operation. Educational projects may require varied scenes and strong daylight coordination. Workplaces may focus on screen comfort, flexibility and user control.

No single spectral recipe fits every space or population. Document the context, operating schedule and design assumptions.

Verification and post-occupancy review

Commission tunable ranges, scenes, schedules, sensor response and overrides. Confirm that the installed output and color behavior match the design intent.

Post-occupancy feedback can identify scenes that are confusing, uncomfortable or unused and provide a basis for adjustment.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Human-Centric Lighting?](#)
- [What is Circadian Lighting?](#)
- [What is CCT?](#)
- [What is Spectral Power Distribution?](#)
- [What is CRI?](#)
- [What is High-CRI Lighting?](#)
- [What is TM-30?](#)
- [What is Rf?](#)
- [What is Rg?](#)
- [What is R9?](#)
- [What is Tunable White?](#)
- [What is Dim-to-Warm?](#)
- [What is Color Consistency?](#)
- [What is SDCM?](#)
- [What is Glare?](#)
- [What is Visual Comfort?](#)

Related Content Modules

Related US Lighting Trends articles

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Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What is human-centric lighting?

Human-centric lighting is a broad design approach that considers visual performance, comfort, experience and potential nonvisual responses to light.

What is circadian lighting?

Circadian lighting refers to strategies that consider the timing, amount, duration and spectrum of light exposure in relation to daily biological timing.

Is tunable white the same as circadian lighting?

No. Tunable white is a technology that changes white-light CCT. A circadian strategy also depends on exposure, timing, duration, spectrum and the application.

What is the difference between CRI and TM-30?

CRI provides an average color-rendering comparison, while TM-30 provides additional fidelity, gamut and hue-shift information.

Should human-centric lighting make health claims?

Educational and project content should avoid unsupported medical claims and should state the intended design goal and evidence limits clearly.

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/electrical-contractors/

SEO title: Electrical Contractor Lighting Resource Center | Takeoffs, Controls & Commissioning

Meta description: Practical lighting guidance for electrical contractors covering takeoffs, submittals, controls, installation, commissioning, retrofits and closeout.

H1: Electrical Contractor Lighting Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Practical tools for bidding, installing and turning over lighting projects.

Primary CTA: Explore the definitions and practical guides below

Electrical Contractor Lighting Resource Center

~~Lighting projects now combine luminaires, digital drivers, sensors, networks, software, emergency functions and code-required controls. Electrical contractors must coordinate these elements while managing scope, labor, documentation, schedule and product availability.~~

~~This resource center focuses on the contractor workflow from takeoff and bid review through submittals, installation, commissioning and closeout. It gives project teams a common vocabulary for identifying risk before equipment is ordered or installed.~~

Commented [DG3]: I don't think this section is needed

Commented [JK4R3]: Can we leave to un plus is above my pay grade I don't know how to manage .We can get there but lets get this up g=first

Why This Topic Matters

- Build a complete and traceable project scope
- Identify controls, emergency and accessory requirements early
- Reduce substitutions that create photometric or compatibility problems
- Coordinate mounting, circuits and network responsibilities
- Improve commissioning and acceptance-test readiness
- Limit rework and change orders
- Deliver useful closeout documents to the owner

Review the complete bid set

Do not count symbols in isolation. Reconcile lighting plans, reflected ceiling plans, fixture schedules, specifications, details, controls narratives, one-lines, addenda and alternates.

Create a scope checklist covering luminaires, lamps, poles, mounting hardware, controls, sensors, gateways, software, programming, emergency equipment, testing, training and documentation.

Lighting takeoffs and quotations

Record quantities by fixture type and exact project condition. Note ceiling type, mounting, voltage, controls option, emergency option, finish, accessories and lead-time risk.

Clarify exclusions and assumptions in distributor and subcontractor quotes. A low fixture price can be offset by missing controls, mounting kits, whips, programming or freight.

Commented [DG5]: Given the array of AI takeoff tools and other estimating tools that are now available, what about listing / linking to those companies with a disclaimer that we do not endorse these tools and contractors / distributors need to do their own due diligence and should verify output.

Submittals and substitutions

The submittal package should identify the exact catalog configuration and include relevant product data, photometry, drawings, ratings, controls information and certifications.

For substitutions, provide a clear comparison against the basis of design, including dimensions, distribution, lumens, wattage, color, glare, listings, controls, emergency behavior, warranty and installed-cost impacts.

Installation coordination

Coordinate luminaires with ceilings, structure, ducts, sprinklers, cable tray, containment, furniture and access panels. Verify field dimensions for continuous linear systems, custom fixtures and poles.

Separate normal, emergency and control wiring responsibilities. Confirm device addressing, communication topology, gateway locations and IT requirements before rough-in.

Controls installation

Follow the approved controls drawings and sequence. Label devices, zones, panels and network components consistently. Preserve polarity, topology, conductor class and separation requirements applicable to the selected system.

Document deviations before they are concealed. Unplanned rewiring or device swaps can make programming and troubleshooting much harder.

Commissioning and acceptance testing

Support functional tests by completing installation, energizing devices, correcting deficiencies and providing access to spaces. Verify sensor coverage, dimming, schedules, scenes, daylight response, overrides and emergency operation.

Requirements vary by code, program and jurisdiction. Identify who is authorized to perform required acceptance procedures and what forms are needed.

Retrofit projects

Survey existing voltage, circuits, fixture condition, dimensions, controls, ambient temperature, emergency functions and hazardous or wet-location requirements. Measure existing light levels when the project depends on maintained performance.

Confirm incentive pre-approval and disposal requirements before commitment. Include patching, ceiling repair, lifts, shutdowns and working-hour restrictions in the plan.

Closeout and turnover

Provide as-built drawings, fixture and controls schedules, warranties, test reports, programming files, credentials, training materials and recommended maintenance information.

A complete turnover package reduces callbacks and helps the owner preserve intended performance.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Lighting Takeoff?](#)
- [What is Fixture Schedule?](#)
- [What is Reflected Ceiling Plan?](#)
- [What is Lighting Specification?](#)
- [What is Basis of Design?](#)
- [What is Approved Equal?](#)
- [What is Substitution Request?](#)
- [What is Value Engineering?](#)
- [What is Submittal Package?](#)
- [What is Product Data Sheet?](#)
- [What is Shop Drawing?](#)
- [What is Lighting Commissioning?](#)
- [What is Acceptance Testing?](#)
- [What is Punch List?](#)
- [What is Lighting Retrofit?](#)

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What should a lighting takeoff include?

A lighting takeoff should reconcile quantities with fixture schedules, specifications, controls, accessories, emergency options, addenda and alternates.

What should be checked in a substitution?

Compare the exact proposal with the basis of design for photometry, dimensions, electrical characteristics, controls, ratings, finish, warranty and project impacts.

Who commissions lighting controls?

Responsibilities vary by project. The contract documents should identify programming, startup, functional testing, acceptance testing, documentation and training responsibilities.

Why should controls be coordinated before rough-in?

Early coordination defines wiring, topology, device locations, gateways and ownership and reduces concealed-work changes.

What belongs in closeout?

Closeout should include as-builts, schedules, warranties, test reports, settings, programming files, access information and training materials.

About US Lighting Trends

US Lighting Trends provides product news, market intelligence, technology insights and practical guidance for professionals who design, specify, sell, install and manage lighting systems across North America.

Upload Notes for the Web Team

- Use the SEO title and meta description exactly as supplied, then verify character display in the CMS preview.
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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/lighting-distributors/

SEO title: Lighting Distributor Resource Center | Product Selection, Quotes, Rebates & Controls

Meta description: Resources for lighting distributors covering fixture schedules, product qualification, quotations, controls, rebates, substitutions and project support.

H1: Lighting Distributor Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Helping distributors support faster, more accurate lighting decisions.

Primary CTA: Explore the definitions and practical guides below

~~Lighting Distributor Resource Center~~

~~Lighting distributors connect manufacturers, agents, contractors, specifiers and owners. The role extends beyond product availability to interpreting schedules, building accurate quotations, coordinating controls and substitutions, verifying qualification and managing complex project logistics.~~

~~This resource center gives distributor teams a practical framework for supporting project business and retrofit opportunities while protecting margin and reducing avoidable order errors.~~

Commented [DG6]: I don't think we need this section. Lighting is bought through showrooms, lighting distributors, ESCOs, specifiers, direct from manufacturer, retail, electrical distributors, MRO distributors, dealers, etc so I don't think we want to do "preference"

Why This Topic Matters

- Translate project documents into accurate bills of material
- Verify exact configurations and product qualifications
- Identify missing accessories, controls and services
- Improve substitution and value-engineering support
- Coordinate lead times, releases and logistics
- Help contractors navigate rebate documentation
- Develop expertise in connected lighting and controls

Read the project documents

Start with the fixture schedule, plans, specifications, details, controls narrative, addenda and alternates. Identify basis-of-design products, approved manufacturers, performance criteria and submission deadlines.

Flag conflicts and incomplete information early. Do not assume that a generic family cut sheet proves compliance for the required catalog number.

Build an accurate quotation

Quote the exact voltage, lumen package, distribution, CCT, color quality, driver, dimming, emergency option, mounting, finish and accessories. Include controls hardware, software, startup and training when they are within scope.

State freight, taxes, escalation, storage, release requirements, substitutions, exclusions and validity clearly. Separate optional alternates so the contractor can compare them.

Product qualification and rebates

Verify current qualification at the model level using the program administrator's database. Qualification claims and program rules can change, and eligibility may depend on installation, baseline, pre-approval or customer class.

Treat rebates as conditional until the serving program confirms the project. Preserve documentation needed for application, inspection and payment.

Substitution and value engineering

A credible alternate compares performance and project impact, not only price. Provide photometric files and calculations when distribution, spacing or maintained light levels could change.

Identify differences in dimensions, mounting, controls, ratings, appearance, warranty and lead time. A transparent comparison builds trust with contractors and specifiers.

Controls selling and support

Controls opportunities may include sensors, zone controllers, gateways, software, startup, commissioning and integration. Define which partner provides design, programming and technical support.

Train sales and project teams to ask about sequences, zones, occupancy, daylight, emergency behavior, IT requirements and owner operations.

Project logistics

Coordinate submittal approval, release dates, manufacturing lead time, color samples, mockups, partial shipments, site storage and damaged-goods procedures.

Maintain a revision-controlled fixture and controls schedule so ordering reflects the latest approved documents.

Retrofit and audit support

Support contractors with existing-condition surveys, product matching, photometric comparisons, energy assumptions and incentive documentation.

Clarify whether the recommendation is a one-for-one replacement or a redesigned layout. LED distributions and lumen packages may change the required quantity or spacing.

Develop category expertise

Create internal specialists for controls, exterior, emergency, industrial, decorative and connected systems. Use the US Lighting Trends dictionary and resource hubs to train sales teams and link technical education with relevant products.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Fixture Schedule?](#)
- [What is Basis of Design?](#)

US LIGHTING TRENDS • KNOWLEDGE CENTER

- What is Approved Equal?
- What is Substitution Request?
- What is Value Engineering?
- What is Product Data Sheet?
- What is DLC?
- What is DLC Premium?
- What is Qualified Products List?
- What is Utility Rebate?
- What is Prescriptive Rebate?
- What is Custom Rebate?
- What is LED Driver?
- What is Networked Lighting Controls?
- What is Design-Assist?

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

How should a distributor read a fixture schedule?

Use the schedule with plans, specifications, details, controls documents and addenda. Confirm each exact configuration and project condition.

How is rebate eligibility verified?

Check the current program rules and applicable qualified-products database for the exact model and installation before promising an incentive.

What makes a strong alternate?

A strong alternate documents price and schedule while also comparing photometry, dimensions, controls, ratings, appearance, warranty and installation impacts.

What controls information is needed for a quote?

Identify zones, device types, communication method, gateways, software, startup, programming, commissioning and integration responsibilities.

How can distributors reduce order errors?

Use revision control, exact catalog strings, approved submittals, written assumptions and a final cross-check of accessories, voltage, controls and mounting.

About US Lighting Trends

US Lighting Trends provides product news, market intelligence, technology insights and practical guidance for professionals who design, specify, sell, install and manage lighting systems across North America.

Upload Notes for the Web Team

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/lighting-codes-compliance/

SEO title: Lighting Codes, Rebates & Compliance Resource Center | ASHRAE, IECC & DLC

Meta description: Understand lighting power density, automatic controls, ASHRAE 90.1, IECC, Title 24, DLC qualification, utility rebates and compliance documentation.

H1: Lighting Energy Codes, Rebates & Compliance Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: A practical starting point for lighting energy requirements and incentive programs.

Primary CTA: Explore the definitions and practical guides below

Lighting Energy Codes, Rebates & Compliance Resource Center

Lighting projects are influenced by adopted energy codes, local amendments, product qualification programs and utility incentives. The applicable rules depend on jurisdiction, project type, code edition, serving utility and program requirements.

This resource center explains the main concepts that designers, contractors, distributors and owners should identify. It is educational guidance only. Project teams should verify the current adopted code, authority requirements and program documents for every project.

Why This Topic Matters

- Identify power and control requirements early
- Avoid relying on the wrong code edition or jurisdiction
- Coordinate compliance documents with the permit set
- Verify model-specific product qualification
- Protect incentive eligibility before purchase or installation
- Plan acceptance testing and commissioning responsibilities
- Connect energy savings with building-performance goals

Determine what governs the project

Identify the authority having jurisdiction, adopted energy code edition, local amendments, project scope and compliance path. New construction, additions, alterations and repairs may be treated differently.

Do not assume a model code or the newest edition is automatically in force. Confirm requirements with the project professional and authority.

Lighting power density

Lighting power density is connected lighting wattage per unit of floor area. Codes may provide building-area or space-by-space allowances and may address exemptions or additional allowances.

Use exact input wattage and defined areas. Coordinate decorative, display, task and exterior lighting with the applicable calculation rules.

Required control functions

Common code concepts include manual control, automatic shutoff, occupancy or vacancy sensing, scheduling, daylight-responsive control, multilevel control and exterior-lighting control.

The exact requirement depends on the adopted code, occupancy, space and project scope. Document zoning and the sequence of operations so the installer and tester can verify compliance.

ASHRAE 90.1 and IECC

ANSI/ASHRAE/IES Standard 90.1 and the International Energy Conservation Code are widely used bases for commercial building energy requirements. Jurisdictions select editions and may modify them.

Review the applicable text and compliance forms rather than relying on a generalized checklist.

California Title 24

California building energy requirements include detailed lighting and controls provisions and selected acceptance procedures. Requirements depend on the applicable code edition and project.

Use current California Energy Code materials and determine required documentation and qualified acceptance testing before construction.

DLC qualification

The [DesignLights Consortium](#) develops technical requirements and qualified-products lists for commercial lighting and networked controls. DLC Premium is a higher-performance classification within applicable requirements.

Qualification does not automatically guarantee a rebate, suitability or code compliance. Confirm the exact model, current listing and serving program rules.

Utility incentives

Prescriptive rebates offer defined incentives for eligible measures. Custom incentives use calculated or measured savings and often require more engineering documentation.

Programs may require pre-approval, baseline evidence, invoices, inspections and customer eligibility. Verify requirements before equipment is committed or installed.

Compliance, testing and records

Maintain schedules, calculations, controls narratives, submittals, qualification records, test reports and as-built settings.

Commissioning and acceptance testing verify that installed controls and sequences operate as required. Responsibilities should be assigned before bid.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Lighting Power Density?](#)

Commented [DG7]: Need hyperlinks to the pertinent organizations

Commented [DG8]: Given that there are 100s of utility rebates (by utility, different ones within utilities, etc) should we link to Briteswitch and Encentiv Energy as resources to learn more ... link to tools that they have?

- What is ASHRAE 90.1?
- What is IECC?
- What is California Title 24 Lighting?
- What is Energy Code Compliance?
- What is Automatic Shutoff?
- What is DLC?
- What is DLC Premium?
- What is Qualified Products List?
- What is Utility Lighting Rebate?
- What is Prescriptive Rebate?
- What is Custom Rebate?
- What is Demand Reduction?
- What is Measurement and Verification?
- What is Environmental Product Declaration?

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

Which lighting energy code applies?

The applicable code depends on the jurisdiction, adopted edition, local amendments and project scope. Confirm it with the project team and authority having jurisdiction.

What is lighting power density?

Lighting power density is connected lighting power per unit of floor area, calculated under the rules of the applicable compliance method.

Does DLC qualification guarantee a rebate?

No. A serving program may use DLC qualification as one condition, but program, customer, measure and timing requirements also apply.

What is a prescriptive rebate?

A prescriptive rebate provides a predefined incentive for an eligible measure that meets the program's stated conditions.

Why identify acceptance testing early?

Early identification clarifies required procedures, credentials, forms, access and corrective work before closeout.

About US Lighting Trends

US Lighting Trends provides product news, market intelligence, technology insights and practical guidance for professionals who design, specify, sell, install and manage lighting systems across North America.

Upload Notes for the Web Team

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/outdoor-lighting/

SEO title: Outdoor Lighting Resource Center | Site, Roadway, DarkSky & Smart Lighting

Meta description: Explore parking, roadway, pedestrian and area lighting, BUG ratings, glare, light trespass, DarkSky principles, adaptive controls and smart street lighting.

H1: Outdoor & Site Lighting Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Better outdoor lighting through distribution, restraint and control.

Primary CTA: Explore the definitions and practical guides below

Outdoor & Site Lighting Resource Center

Outdoor lighting supports movement, orientation, work, commerce and community activity after dark. A successful design provides useful illumination while controlling glare, spill light, uplight, energy use and environmental impact.

This resource center covers area, parking, roadway, pedestrian, façade, sports and smart street lighting. It helps designers, contractors, distributors, municipalities and owners connect photometric performance with site conditions, community needs and responsible nighttime lighting.

Why This Topic Matters

- Support nighttime visibility and orientation
- Provide light at entrances, conflict areas and work zones
- Control glare for drivers, pedestrians and neighbors
- Limit light trespass and unnecessary uplight
- Reduce energy with scheduling and adaptive control
- Coordinate poles, foundations, utilities and landscape
- Plan maintenance and connected-system operations

Start with the site

Document roadways, pedestrian routes, entrances, property lines, adjacent uses, mounting locations, landscape, obstructions, grades and environmental sensitivities.

Define who uses the site, at what times and for which tasks. Different areas may require different distributions, levels and control schedules.

Photometric design

Evaluate horizontal and vertical illumination, uniformity, glare and the relationship between mounting height, spacing and distribution. Average illuminance alone does not describe visibility or comfort.

Use current photometric files for the exact luminaire and orientation. Model property lines, façades and sensitive boundaries as well as the primary task area.

BUG ratings

BUG ratings classify Backlight, Uplight and Glare zones using zonal lumen data. They help describe where an outdoor luminaire sends light, but suitable limits depend on orientation, mounting and the application.

Use BUG information with site calculations and shielding options rather than as a substitute for a complete design.

DarkSky-responsible lighting

Responsible outdoor lighting uses light only where, when and at the level needed. It limits uplight, glare, trespass and unnecessary spectral impact.

Good practice combines distribution, shielding, careful aiming, appropriate output, curfews and controls. Product labels alone do not guarantee a responsible installation.

Application areas

Parking and area lighting require vehicle and pedestrian visibility, controlled glare and property-line consideration. Roadway lighting also considers pavement, conflict zones and transportation geometry.

Pedestrian-scale lighting should support faces, paths and wayfinding without placing bright sources in normal lines of sight. Sports and floodlighting require careful aiming, flicker review and spill control.

Wildlife-sensitive sites

Wildlife response varies by species, habitat, season and spectrum. Coordinate with current local and wildlife-agency requirements for coastal, park, bridge and sensitive-habitat projects.

Control timing, intensity, distribution and spectrum. Do not rely only on a general “wildlife-friendly” product description.

Adaptive and connected controls

Adaptive outdoor lighting changes output according to time, activity, traffic or other inputs. Smart street-lighting systems may add monitoring, energy data and fault reporting.

Define dimming schedules, fail states, communications, cybersecurity, asset ownership, maintenance workflow and integration responsibilities.

Installation and maintenance

Coordinate pole foundations, wind loading, surge protection, grounding, branch circuits, controls, aiming and access.

Maintain an asset schedule with pole, luminaire, driver, control node, circuit and location information. Verify aiming and control schedules after installation.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Area Lighting?](#)

US LIGHTING TRENDS • KNOWLEDGE CENTER

- What is Roadway Lighting?
- What is Parking Lot Lighting?
- What is Pedestrian-Scale Lighting?
- What is Bollard Lighting?
- What is Floodlighting?
- What is Sports Lighting?
- What is BUG Rating?
- What is Uplight?
- What is Backlight?
- What is Light Trespass?
- What is Skyglow?
- What is DarkSky-Responsible Lighting?
- What is Adaptive Outdoor Lighting?
- What is Smart Street Lighting?
- What is Wildlife-Friendly Lighting?
- What is Photocell Control?

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What is a BUG rating?

BUG is a photometric classification of backlight, uplight and glare zones for an outdoor luminaire in a defined orientation.

What is light trespass?

Light trespass is light falling beyond the property or area intended to be illuminated.

What makes outdoor lighting DarkSky responsible?

Responsible design limits unnecessary light through placement, shielding, appropriate output, spectrum, timing and control.

What is adaptive outdoor lighting?

Adaptive outdoor lighting changes output or operation in response to time, activity, traffic, occupancy or environmental inputs.

Why are vertical light levels important outdoors?

Vertical illumination can support recognition of people, signs and obstacles and should be considered with horizontal illuminance and glare.

About US Lighting Trends

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Upload Notes for the Web Team

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/emergency-lighting/

SEO title: Emergency Lighting Resource Center | Egress, Exit Signs, Power & Testing

Meta description: Understand emergency egress lighting, exit signs, batteries, inverters, generators, transfer, controls, inspection, testing and closeout.

H1: Emergency Lighting Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: A practical overview of emergency illumination and project coordination.

Primary CTA: Explore the definitions and practical guides below

Emergency Lighting Resource Center

Emergency lighting supports safe egress and other designated functions when normal power is lost. The system may involve unit equipment, central inverters, generators, transfer equipment, emergency circuits, listed controls and illuminated exit signs.

This resource center explains core concepts for designers, contractors, distributors and facility teams. Requirements vary by building, occupancy, jurisdiction and adopted code. Project-specific design and approval should be performed by qualified professionals and the authority having jurisdiction.

Commented [DG9]: Emergency is a very small % of the market

Why This Topic Matters

- Maintain illumination for required egress paths
- Identify emergency power sources and transfer behavior
- Coordinate normal and emergency lighting controls
- Select equipment suitable for the environment and runtime
- Provide accessible testing and status indication
- Document circuits, devices and maintenance procedures
- Reduce life-safety deficiencies at inspection and turnover

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Define the required function

Identify egress paths, exit access, exits, discharge areas, stairs, changes in level and other locations requiring emergency illumination under the applicable requirements.

Distinguish code-required emergency functions from owner-selected standby or business-continuity lighting. The two may share infrastructure only when permitted and properly designed.

Emergency power approaches

Unit equipment includes local batteries and charging components. Central inverter systems can supply selected lighting circuits. Generators may supply emergency or standby distribution through transfer equipment.

The appropriate approach depends on required transfer, duration, load, maintenance, architecture and the facility's power system.

Exit signs

Exit signs identify the path to an exit and may use internal illumination, external illumination or approved photoluminescent approaches depending on the governing requirements.

Coordinate visibility, directional arrows, mounting, normal and emergency power, and obstructions created by later construction or furnishings.

Controls and listed interfaces

Emergency luminaires may also participate in normal dimming or switching. The design must ensure required emergency illumination is available during loss of normal power and that control components are suitable for the intended function.

Document relay, transfer, bypass and control behavior clearly. Test normal operation, loss of normal power and restoration.

Photometric and circuit coordination

Emergency calculations should use the applicable criteria, calculation paths and assumptions. Coordinate fixture locations with actual egress routes and avoid relying on luminaires that may be blocked by racks, containment or architecture.

Identify circuits and power sources on drawings and schedules. Labeling should support testing and maintenance.

Testing and inspection

Develop a test plan covering self-test equipment, manual tests, central systems, generators, controls and records. Required intervals and procedures depend on the applicable regulations and equipment.

Do not allow difficult access, missing labels or undocumented controls to prevent effective testing.

Maintenance and replacement

Batteries, lamps, drivers, inverters and monitoring systems require inspection and eventual replacement. Maintain records of tests, deficiencies and corrective action.

When replacing a luminaire or driver, verify that emergency compatibility, charging, transfer and output remain compliant with the listed system.

Closeout

Provide as-built circuiting, equipment schedules, test results, operating instructions, battery information, warranties and training.

Facility staff should know how to initiate tests, interpret indicators, access records and escalate deficiencies.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Emergency Lighting?](#)

- What is Egress Lighting?
- What is Exit Sign?
- What is Unit Equipment?
- What is Emergency Ballast?
- What is Emergency LED Driver?
- What is Central Lighting Inverter?
- What is Generator-Backed Lighting?
- What is UPS-Supported Lighting?
- What is Transfer Switch?
- What is Automatic Load Control Relay?
- What is Self-Test Emergency Lighting?
- What is Emergency Lighting Testing?
- What is Path of Egress?
- What is Standby Lighting?

Related Content Modules

Related US Lighting Trends articles

Display the newest and most relevant USLT articles assigned to this resource-center category.

Related products

Display products that directly support the topic. Keep editorial and sponsored placements clearly labeled.

Manufacturer and industry resources

Link to relevant manufacturer profiles, standards bodies, qualification databases and original USLT research.

Newsletter call to action

Get lighting products, strategies and market insights from US Lighting Trends.

Frequently Asked Questions

What is emergency lighting?

Emergency lighting provides required illumination for egress or other designated emergency functions when normal power fails.

Is standby lighting the same as emergency lighting?

Not necessarily. Standby lighting may support continuity or convenience, while emergency lighting must meet the applicable life-safety requirements.

Can emergency luminaires be dimmed during normal operation?

Some systems allow normal control, but the emergency design must ensure required operation during loss of normal power using suitable listed components and sequences.

Who determines testing requirements?

Testing requirements come from the applicable adopted codes, standards, authority and equipment instructions.

What should be included at turnover?

Provide as-builts, circuits, equipment schedules, test records, operating instructions, warranties and staff training.

About US Lighting Trends

US Lighting Trends provides product news, market intelligence, technology insights and practical guidance for professionals who design, specify, sell, install and manage lighting systems across North America.

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CMS Publishing Fields

Page status: Ready for editorial and technical review

Suggested URL: /resources/data-center-lighting/

SEO title: Data Center Lighting Resource Center | Data Halls, Aisles, Controls & Emergency Power

Meta description: Explore data center lighting for white space, rack aisles, hot and cold containment, NOCs, emergency power, controls, security and commissioning.

H1: Data Center Lighting Resource Center

Eyebrow: US Lighting Trends Knowledge Center

Hero subhead: Lighting guidance for reliable, maintainable mission-critical facilities.

Primary CTA: Explore the definitions and practical guides below

Data Center Lighting Resource Center

Data center lighting must support installation, inspection, maintenance, security and emergency movement without interfering with cooling, containment, cable management or mission-critical operations. Requirements vary across hyperscale, colocation, enterprise and edge facilities.

This resource center focuses on the lighting-specific coordination issues that matter in data halls, network operations centers, electrical rooms, support spaces and exterior security zones. It is built for designers, contractors, distributors, owners and operations teams.

Why This Topic Matters

- Provide useful vertical light on rack faces and labels
- Coordinate luminaires with trays, busway, piping and containment
- Reduce unnecessary operation through granular controls
- Select equipment for ambient and maintenance conditions
- Separate code-required emergency functions from continuity goals
- Support remote monitoring and maintainable asset records
- Protect commissioning and turnover in a high-consequence environment

Understand the facility and operating model

Document data-hall layout, rack orientation, containment type, overhead and underfloor services, maintenance tasks, support rooms, security zones and normal occupancy patterns.

Identify owner standards and redundancy expectations. Some requirements are operational preferences rather than universal code rules and should be labeled accordingly.

White-space and aisle lighting

Prioritize useful illumination on rack faces, labels, equipment and walking surfaces. Vertical illumination and glare control may be more important than a high horizontal average.

Coordinate linear rows or other luminaires with aisle geometry, containment roofs, cable tray and busway. Test representative layouts when equipment creates complex shadows.

Hot and cold aisle coordination

Hot-aisle environments may expose equipment to elevated ambient temperatures. Cold-aisle systems may place luminaires within or above containment structures.

Verify product ambient ratings, access, airflow implications, wiring paths and sensor positions. Avoid equipment that prevents removal of containment panels or service access.

Network operations centers

NOCs and control rooms are screen-intensive spaces. Use luminance balance, low reflected glare, scene flexibility and understandable controls to support continuous monitoring.

Coordinate desk and video-wall layouts, daylight, indirect lighting and after-hours scenes.

Controls and energy

Data halls can be lightly occupied for long periods. Occupancy-based zoning, dimming and scheduling can reduce lighting energy and heat while restoring light promptly for personnel.

Use sensing coverage appropriate to long aisles and containment. Define timeout, minimum level, manual override and fail behavior.

Emergency and continuity lighting

Coordinate code-required egress lighting with rack layouts, containment and changing paths. Separately define any UPS-supported or generator-backed lighting needed for operational continuity.

Document transfer behavior, circuit classification, runtime assumptions and testing. Redundancy is a project risk decision and should not be confused with emergency-code compliance.

Security and exterior lighting

Security lighting should support people, cameras, gates and loading activity while controlling glare and property-line spill. Coordinate with surveillance and access-control teams.

Avoid excessive brightness that degrades camera imagery or creates deep contrast.

Monitoring, commissioning and turnover

Connected systems may report energy, faults or asset status. Define data ownership, gateways, cybersecurity review and the response process for alarms.

Commission normal controls, power-loss scenarios, emergency operation, integration and remote monitoring. Provide as-built zones, circuits, addresses, settings, credentials and training.

Featured Definitions

Use these as internal links to the US Lighting Trends Lighting Industry Dictionary. Link only after the destination page is live.

- [What is Data Center Lighting?](#)
- [What is White Space Lighting?](#)

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- What is Hot-Aisle Lighting?
- What is Cold-Aisle Lighting?
- What is Rack-Aisle Lighting?
- What is Mission-Critical Lighting?
- What is Network Operations Center Lighting?
- What is UPS-Supported Lighting?
- What is Generator-Backed Lighting?
- What is Data Center Emergency Lighting?
- What is Maintenance Lighting?
- What is Underfloor Lighting?
- What is Containment-Compatible Lighting?
- What is High-Ambient-Temperature Luminaire?
- What is Data Hall Occupancy Controls?
- What is Lighting Redundancy?
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Frequently Asked Questions

What is white-space lighting?

White-space lighting illuminates the active data hall where racks, servers and related IT equipment are installed.

What should data-hall lighting prioritize?

The design should support rack-face and label visibility, walking surfaces, maintenance, glare control and coordination with containment and services.

Should all data-center lighting be UPS supported?

There is no universal requirement. Code-required emergency functions and owner continuity goals must be defined separately for the specific facility.

Why are occupancy controls useful in data halls?

Granular controls can reduce lighting operation and heat in lightly occupied zones while restoring light for personnel activity.

What should commissioning include?

Verify normal zones, sensors, schedules, power-loss behavior, emergency functions, integration, monitoring and final documentation.

About US Lighting Trends

US Lighting Trends provides product news, market intelligence, technology insights and practical guidance for professionals who design, specify, sell, install and manage lighting systems across North America.

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