



PHILIPS
dynamalite

Networked Controls

Signal Dimmers

DALI lighting control solutions

A new benchmark for intelligent lighting.

Entering the age of digital lighting

The evolution of lighting controls

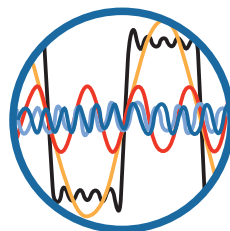
At one point in time, lighting control meant lighting or blowing out a candle. As technology developed, it meant flicking a simple switch. Today, lighting control is a powerful tool used to transform environments and enhance people's lives.

The transition from analog to digital lighting control has been critical to the advancement of this field. With digital lighting control, buildings can be brought to life faster and more affordably than ever before.

Analog lighting control



Separate groups of lighting fixtures use significantly more cabling, making them more complex to install, maintain, and troubleshoot.



Analog dimming signals are imprecise and susceptible to electrical interference.



Different analog fixtures produce an inconsistent dimming response and only provide a fixed color temperature, which can negatively impact comfort, productivity, and health.

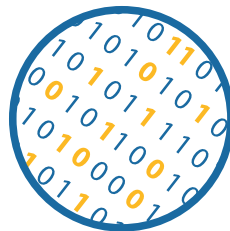


Changes require manual rewiring, causing disruption to occupants and adding considerable labor costs.

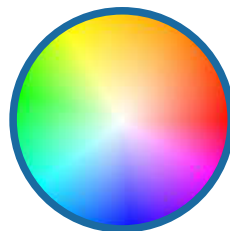
Digital lighting control



Simplified polarity-agnostic wiring is cheaper and easier to install, while automated performance monitoring and fault diagnosis improves reliability and reduces maintenance costs.



Robust digital signaling and standardized driver responses provides accurate dimming and color control.



Additional features such as tunable white and RGB, controlled by user input and/or automated daylight routines, keep occupants comfortable, energized, and focused.



Lighting groups can be reconfigured instantly with no wiring changes or physical intervention, eliminating disruptions while saving time and money.



Dynalite in the digital age

Philips Dynalite has empowered smart buildings across the globe for over 30 years with its suite of connected lighting solutions.

A pioneer in this field, we developed DyNet in 1989 to provide scalable digital control solutions. More than just a communication protocol or network architecture, DyNet enables seamless, decentralized collaboration between controllers, interfaces, sensors, gateways, and software applications to deliver robust, reliable operation at any scale.

The growth of LED technology means that lighting can now transition to a fully digital network. By embracing DALI architecture and leveraging our experience with modern methods of lighting control, we have added significant functionality, scaling tools, and commissioning methods to enhance our systems to meet the needs of any project.

Advantages of digital systems

The establishment of the DALI industry standard completed the missing digital link, allowing full digital communication between the control system and each lamp driver.

Digital lighting enables facility managers to modify lighting groups without making any physical changes to the wiring. From a remote connection, lighting changes can be made to meet the demands of flexible floor space with just the click of a mouse. Digital lighting also brings extra dimensions of control such as tunable white and RGB that would require considerably more cabling using analog methods.

To leverage the advantage of smart digital lighting, a control system needs to support driver status querying and other related services provided by sensors, dry contacts, and lamp drivers. It must then present this information in an intuitive and meaningful way through user-friendly tools.

What is DALI?

DALI stands for Digital Addressable Lighting Interface. DALI is a true open protocol and the lighting industry standard used by the majority of manufacturers. The DALI standard, specified in IEC standard 60929, ensures compatibility of lighting products from different manufacturers.

The DALI system was created by leading lighting manufacturers who recognized the need for a common interface, and is engineered to meet the challenges of lighting control – more flexibility, greater control, scalability, and faster installation.

Why DALI?

DALI improves on the unidirectional broadcast-like operation of 1-10V analog control. It allows digital two-way communication so that devices can report on their health, status, and other information.

Wiring is very simple; DALI power and data is carried by the same pair of wires. DALI wiring is polarity-agnostic, eliminating the wiring errors common in 1-10V systems.

DALI allows drivers on the same network to be addressed individually and assigned dynamically to virtual lighting groups. With DALI, architects and designers can create high-performance lighting solutions that are perfectly matched to the needs of the building's occupants.

- DALI is an industry standard.
- Simpler and faster installation.
- Communicate with lamps and lamp groups.
- Feedback on lamp status.
- Lamp life tracking.
- Rearrange lamp grouping with software.
- Control light intensity and color temperature.
- Optimize energy savings.
- Lighting control flexibility.
- Lamp and driver failure reporting.
- Compatibility and interchangeability.
- Emergency lighting and battery testing.



DALI today

The Digital Illumination Interface Alliance (DiiA) continues to evolve DALI standards to meet modern-day lighting control needs.

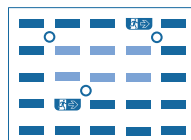
DALI

DALI covers a wide range of different physical attributes and logical functionality



SIMPLIFIED WIRING

DALI is a robust protocol that allows the use of cost-effective twin cabling and star wiring for project flexibility, and hassle-free installation next to mains wiring, making it perfect for field wiring requirements. Dedicated wiring and standardized baud rates ensure reliable, error-free communication without the risk of interference inherent to wireless control systems.



BUS CAPACITY

A single DALI bus can manage up to 64 light points that can be individually assigned to up to 16 addressable areas. Each DALI driver can be moved from one addressable area to another with a simple software configuration change, eliminating any need for rewiring.



LIGHTING DESIGN

As DALI is the lighting industry's leading open protocol with a wide selection of lamps and drivers, lighting designers have greater flexibility in selecting the perfect lighting option to meet each project's needs.



DALI POWER SUPPLY

The DALI bus must be connected to a certified network power supply that supports all communication between DALI devices. Each DALI bus supports a maximum of 250 mA. Multiple power supplies should never be used.



LIGHTING SCENES

Each of the 16 addressable areas supports up to 16 scenes, defining each lighting point's brightness and fade time from 1 second to 16 minutes.



ROBUST PERFORMANCE

As a DALI network uses basic isolation from mains, all DALI ports need to withstand a potential exposure to mains supply and self-shutdown to restart after a short circuit has been cleared.

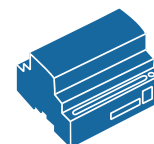


FAILURE NOTIFICATION

Querying the current status of individual drivers and lamps allows the control system to directly test if a lamp or driver has prematurely failed, streamlining maintenance and maximizing uptime.

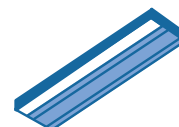
DALI-2

The introduction of DALI-2 certification provides the market with assurance that those devices have been independently tested and verified to meet stringent performance expectations.



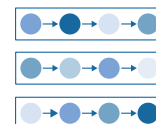
DALI LOAD CONTROLLERS

Load controllers with native DALI-2 functionality provide DALI bus management, configuration, control and status queries, for devices such as drivers, interfaces and sensors.



DALI-2 LAMP DRIVERS

Lamp drivers with native DALI-2 functionality deliver a consistent industry standard for lighting performance and greater operational flexibility than ever before.



COLOR CONTROL

Along with basic dimming (part 207), DALI now supports tunable white and full RGBWAF (part 209) control of both individual lighting points and scenes, adding a dimension of light control previously only available to advanced theatrical lighting systems.



DEVICES ON THE DALI BUS

All DALI devices connect to the same bus as the lamp drivers, reducing the cost and complexity of installation on any project. DALI input devices such as sensors and user interfaces allow the control system to respond to changes in occupancy, ambient light levels, or other environmental conditions, with no additional physical wiring beyond the existing DALI bus.



EMERGENCY LIGHTING

DALI part 202 enables control and battery rundown testing of emergency lighting fixtures.



D4i DIGITAL ILLUMINATION

D4i is the latest standard from the DiiA designed to give greater visibility and feedback to the control system of lighting performance.



LUMINAIRE DATA

DALI part 251 enables polling of drivers for additional data such as light output, CCT (Correlated Color Temperature) and CRI (Color Rendering Index), light distribution, lamp color and more.



ENERGY DATA

DALI part 252 enables querying of each driver's power consumption for reporting and monitoring.



DIAGNOSTIC DATA

DALI part 253 gives insight into lighting performance and is a leading indicator of potential issues for preventative maintenance.

Creating smart buildings through digital lighting

Developing DALI

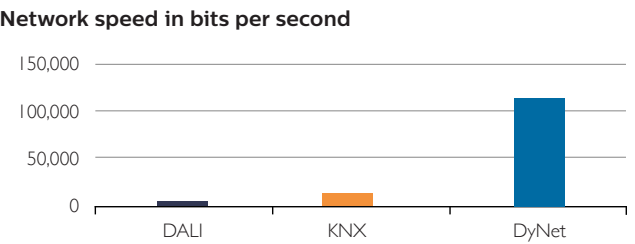
DALI is managed by a consortium of 260 of the world's leading lighting organisations, making it a truly universal protocol for field lighting control. From its inception to the present day, Signify and Philips Dynalite continue their active contribution to its ongoing development and promotion.

DALI development has progressed beyond basic dimming with the addition of many new features such as tunable white, full color control, lamp checking, driver status monitoring, emergency battery testing, driver energy usage, driver running temperature, UI inputs, occupancy reporting, and environmental light level monitoring.

Cost-effective cabling and flexible installation ensure that DALI caters to the physical realities of project installation and maintenance. However, the available bandwidth and

per-bus device and area limits mean that DALI communication is relatively slow compared to other lighting systems.

The advanced communication capability of Dynalite devices enables DyNet to transfer data between devices at higher speeds than the industry average. This allows multiple DALI networks to be mapped onto a single DyNet system with no lag, enabling seamless network scaling and outstanding performance.

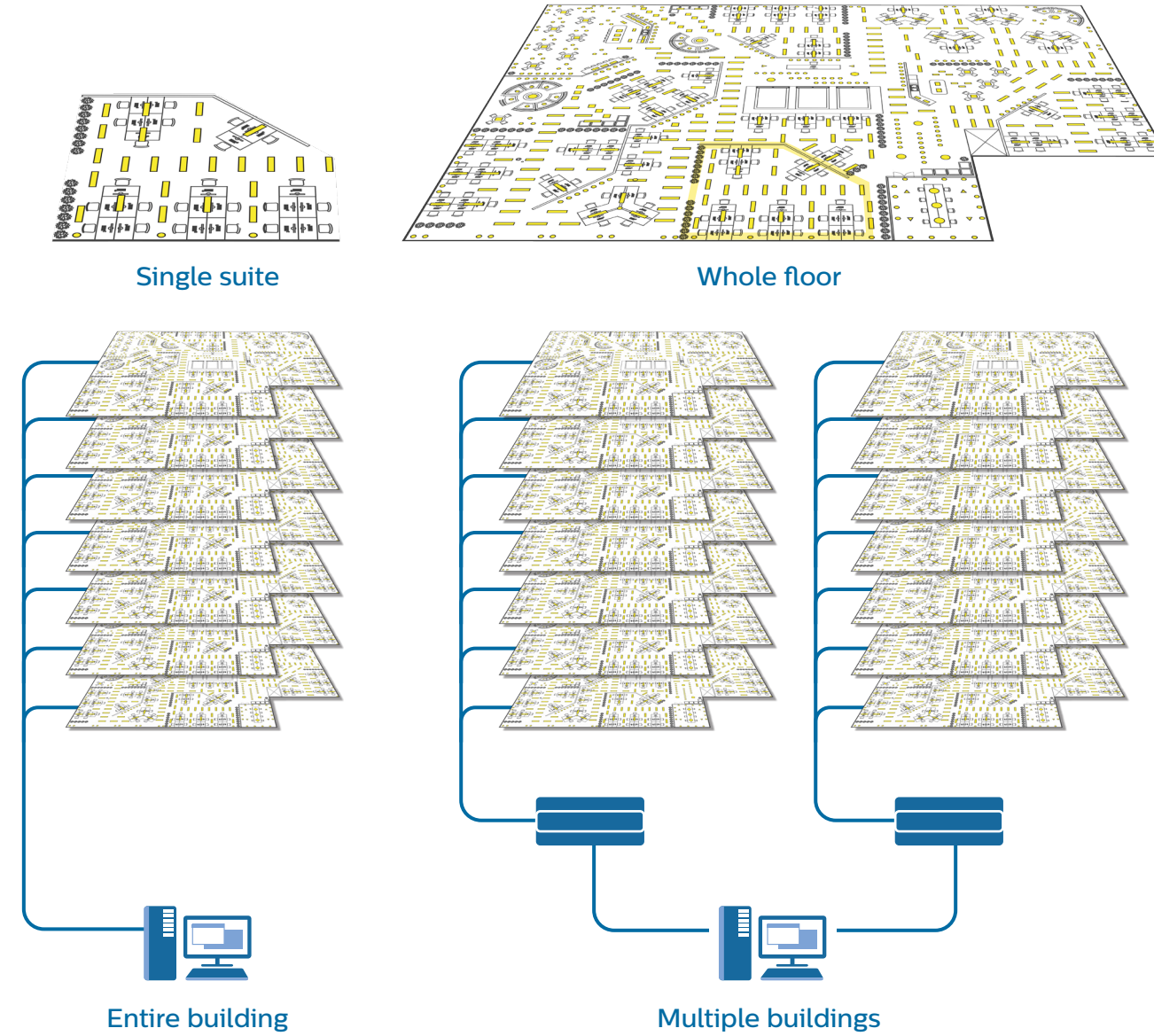


Scaling DALI

Since its introduction, DALI has brought significant changes to the lighting control market by delivering a true universal field communication protocol. However, on its own DALI has no way to coordinate lighting control between networks. The DALI specification does not define any communication, addressing, or logical linking options between separate physical networks, instead treating each DALI bus of 64 fittings as an isolated standalone system. Scaling DALI to meet larger project requirements means adding more standalone DALI networks, which quickly becomes cumbersome without the means to connect and coordinate them into a coherently responsive system.

Dynalite's DyNet protocol elevates DALI beyond its physical and logical limitations, linking multiple DALI networks together to reach the required scale by mapping DALI addresses to the much larger DyNet address pool. This creates scalable, addressable multi-network group, with simplified configuration. Additional control methods can share the same DyNet addressing layer, including non-DALI lamps, sensors, interfaces, motorized blind/curtain controls, and other integrated solutions for a range of hybrid control possibilities.

Turning a collection of separate networks into a unified system that effortlessly delivers the embedded benefits of the DALI protocol to any project, no matter how large, is where Philips Dynalite truly shines.

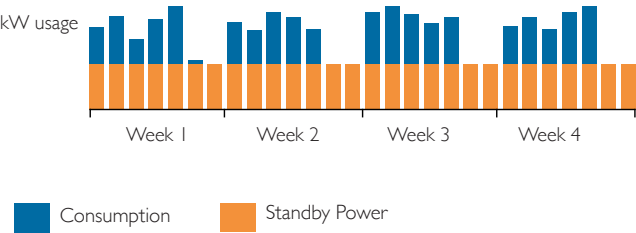


Philips Dynalite has applications in projects of all scales, from single suites to multi-campus buildings.

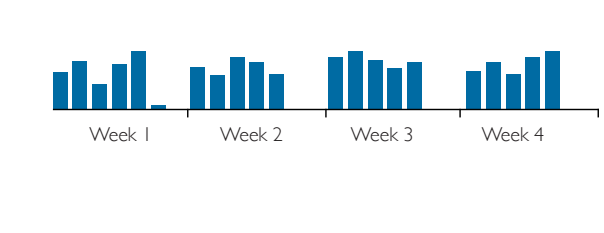
Dynalite enhancing DALI



Without standby power management



With standby power management



Eliminating standby power

The lights may be off, but the power still flows. Even with the lamps off, wired or wireless smart drivers still consume around 0.5 Watts in standby mode, waiting for their next command that may be hours, days, or even weeks away. Large projects can easily involve thousands of lamps that are off most of the time, but still collectively consume significant standby power for no benefit. Philips Dynalite DALI controllers include a power relay for each DALI bus. This relay opens whenever all drivers on the bus are

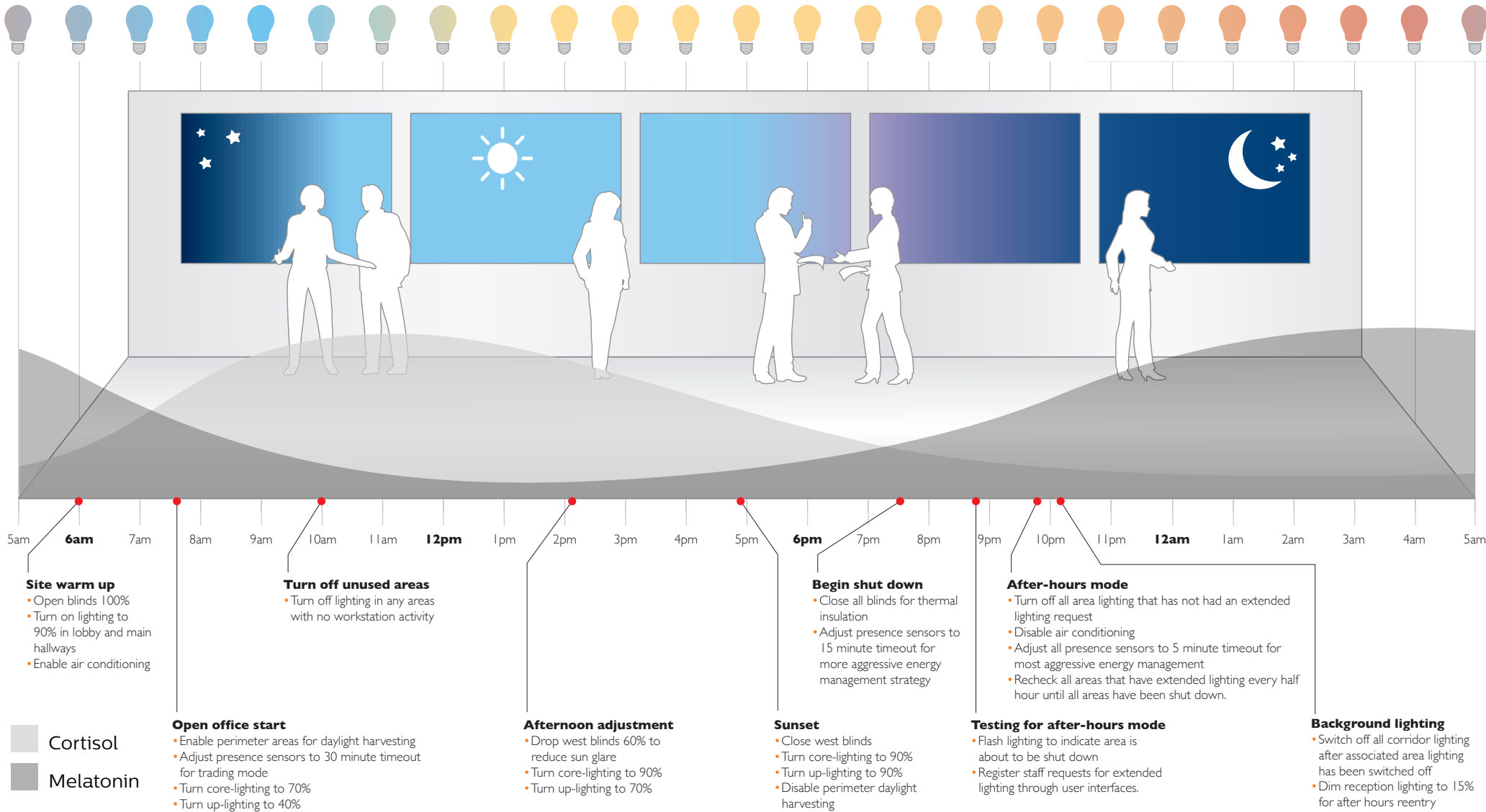
turned off, eliminating standby power consumption. When the lights are turned on, the controller automatically restores power to the bus, delivering the same functionality without wasting power. An additional benefit of isolating DALI driver power while the lamps are off is reduced thermal wear on the drivers, which improves their life span. Eliminating the heat produced by standby power consumption also reduces demand on HVAC systems, resulting in even greater energy savings.



Bio-dynamic lighting

Philips Dynalite controllers can control the light intensity and the color temperature of DALI lamps. This delivers a more natural indoor lighting experience by mimicking the natural daylight cycle with a slow transition from a low level blue-white light in the morning, to high level white light in the middle of the day and then to a low level warm red-white light in the evening.

Automatic control system actions



Our proprietary lighting recipes



Standard:

This setting activates standard bright white light designed to help your employees stay alert while carrying out their daily activities.



Presentation:

This setting generates warmer color temperature light at lower intensities to enhance discussions and presentations.



Focus:

Cooler color temperatures at higher intensity levels provide illumination designed to help employees focus on the task at hand.



Calm:

This setting is recommended for creative and brainstorming sessions where cooperation and engagement is desired.

Beyond DALI



Wide range of load controllers

Philips Dynalite offers a variety of controllers to support flexible hybrid control solutions including relay switching, DALI, 1-10V, PWM LED lighting, phase-cut dimming, motorized blinds, fan coil units, and more.

High-capacity modular load controllers

The Dynalite DMC range provides an all-in-one solution for projects with large lighting groups that require high-capacity outputs. Choose any combination of output modules including 1-10V, software-selectable phase-cut dimmers, relays, and DALI controllers to tightly match your project's load requirements.

Part of a team

The value of hybrid network control depends on the components and their unified cooperation as part of a larger system.

Dynalite products are designed from the ground up with this in mind, combining robust individual performance with seamless integration for a streamlined, intuitive user experience.

Consistent design

Regardless of controller type, Dynalite devices are designed with consistent orientation and terminal layout to simplify installation, wiring, maintenance, and troubleshooting.

Our architecture benefits any project, and the savings quickly scale up with project size and complexity.



Supply Outputs Network Sign-on

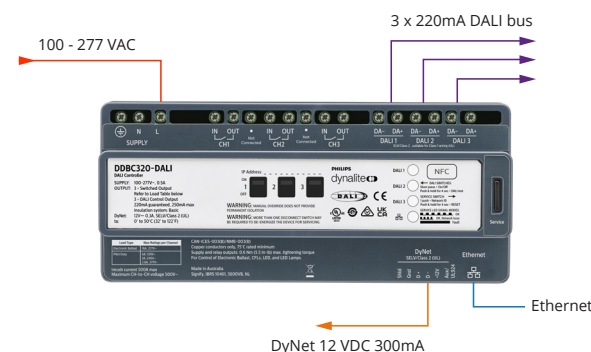
Network communication

All Philips Dynalite devices use the same DyNet port, allowing direct communication with each other. Firmware and software configuration is upgradable over the network without requiring physical access to devices. The Dynalite System also does not require any central processors, protocol gateways, IT infrastructure, or cloud connections to perform its core functions. Each Dynalite DALI input device communicates directly to its controller, which then rebroadcasts messages to other Dynalite devices as needed.



Accessories not required

Dynalite DALI controllers are mains-powered, contributing network power to the DyNet bus while independently powering each DALI bus. This eliminates the cost of external DALI power supplies while simplifying the installation process.



Compatibility



Our control systems are fully flexible and have a rich library of features to handle anything from standard LED lighting with occupancy sensing up to multi-building hybrid solutions catering to many different types of spaces and applications.

Our controllers are compatible with a wide range of DALI drivers and devices including fluorescent drivers, electronic low voltage transformers, LED fixtures, emergency lighting fixtures and Philips Dynalite DALI sensors and user interfaces.

Integration



Philips Dynalite provides a native hybrid solution with DALI tightly integrated into the system. Dynalite overcomes DALI size limitations by overlaying DALI with DyNet addressing allowing multiple DALI networks

to be presented alongside non-DALI control elements. This ensures DALI controllers, devices, and drivers provide coherent, consistent responses on the Dynalite network in the same way as native DyNet devices.

Our control systems can be fully integrated with a variety of building management systems, motorized window coverings, AV, HVAC, Security, and other third-party systems. Philips Dynalite unlocks the full potential of DALI by coordinating system responses with additional inputs from the BMS, scheduling and management software, and third-party systems.

Reliability



The Dynalite product range is the result of over 30 years of active research and development to meet real-world applications in multiple markets and segments. Every Dynalite device,

feature, and function is designed and developed in-house, with rigorous testing of core functions as well as full system cross-testing with the rest of our range.

We aim for flawless performance, in any combination, at any scale, with zero dependence on third-party add-ons. This strategy allows us to deliver complete systems with consistent installation, streamlined commissioning, and incredibly reliable operation.

Network security:



Network security is an ever-growing concern, and lighting control networks are no different. As part of the Signify group, Philips Dynalite is committed to rigorous security standards across our DALI controller range.

Dynalite devices with Ethernet ports incorporate dedicated TPM-based certificate storage and TLS encryption, with no 'developer' ports left exposed on any device. Firmware is securely loaded onto all new devices before they leave our factory to prevent the introduction of unauthorized modifications or backdoors.

Single-master communication



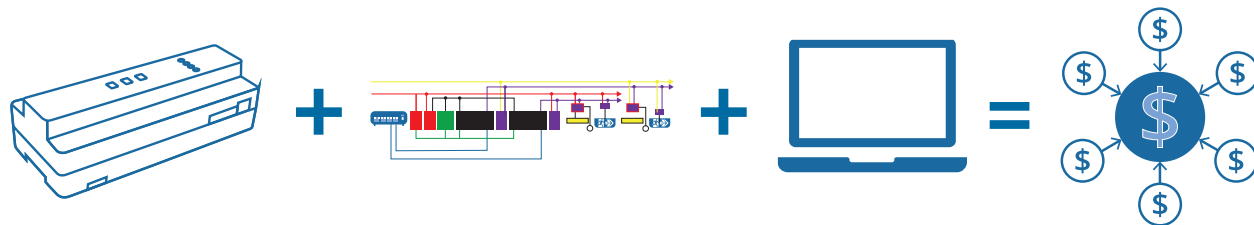
A single-master network architecture enables the application controller to coordinate communication from each input device

on the DALI network. It is through this direct network device management that the Dynalite System achieves rock-solid stability and scale for all devices.

Device cost versus total system cost

System deployment challenges

Within any network system design, the off-the-shelf cost of components rarely reflects the total system cost. Other systems rarely advertise that their devices require additional peripherals to provide network power, translate messages, organize multiple devices or can only be networked in a very limited way. Moreover, some may require direct physical access, additional plugins, multiple third-party commissioning tools or a cloud connection to gain access to each device's configuration.



A network device has an off-the-shelf cost. However, this is not the only cost associated with delivering an interconnected control system.

Some systems must be supplemented with supporting accessories, adding cost to installation and consuming valuable distribution board real estate.

Then there is the cost of device configuration. After installation, devices need to be addressed and identified on the network and then configured to assign specific functionality.

Only once all of these steps have been taken into consideration can the true system cost be recognized.

Leading the way with transparent, holistic pricing

Philips Dyalite overcomes these system deployment challenges by taking a holistic approach to system deployment.

All of Dyalite's control devices are completely self-supporting with direct mains power, internal DALI and network power supplies, and direct communication to all devices without the need for a central processor or cloud connectors. This means there are no additional third-party components required to make our products work, and that our off-the-shelf component costs more accurately reflect the total system costs.

Dyalite devices can be fully programmed over the network and our commissioning software is ready to setup any combination of devices for any project. With direct access to all device configurations, the system can be configured from a project floor-plan perspective, breaking away from the need to micro-manage individual components and enabling powerful template tools for faster deployment.



DALI Controllers



DDBC120-DALI Single-master DALI Driver Controller

Enabling a full DALI universe including tunable white drivers, DALI sensors and user interfaces.

The Philips Dynalite DDBC120-DALI delivers cost-effective control of DALI drivers through provision of a full universe of 64 DALI drivers. It includes a feed-through relay for saving power on the DALI driver mains supply. The controller communicates seamlessly with Philips Dynalite DALI sensors and user interface devices.



DDBC320-DALI 3-universe Single-master DALI Driver Controller

Enabling three full DALI universes including tunable white drivers, DALI sensors and user interfaces.

The Philips Dynalite DDBC320-DALI features three DALI outputs, allowing control of up to 192 DALI devices. It includes a three feed-through relays for saving power on the DALI driver mains supply.



DDBC516FR Signal Dimmer Controller

Flexible control of 1-10V and DALI drivers

The Philips Dynalite DDBC516FR is a five-channel device for controlling DALI drivers. It includes five feed-through relays for saving power on the DALI driver mains supply. Each control output is selectable to DALI broadcast, DALI addressable, DSI or 1-10V.



DDBC1200 Signal Dimmer Controller

Multi-protocol control solution

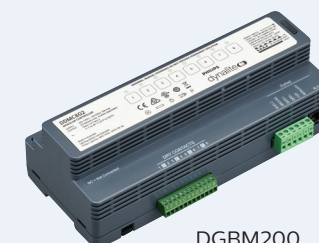
The Philips Dynalite DDBC1200 features 12 independent output channels, each selectable to DALI Broadcast, DSI or 1-10 V.



DBC905 Signal Dimmer Controller

Easy to install controller with flexible mounting options

The Philips Dynalite DBC905 is a nine-channel signal dimmer controller, designed for use with DALI, DSI or 1-10V dimmable drivers and direct installation within ceiling cavities. The device incorporates structured wiring connectors, to enable ready connection without the use of tools.



DGBM200
2 CH
Ballast
module

DDMC802 with DGBM200 module

Control different load types with one device

The Philips Dynalite DDMC802 provides up to eight configurable output channels, controlled by up to four interchangeable control modules. A selection of control modules is available for different load types. The DGBM200 module supports DALI209 tunable white in broadcast mode.



DMD310-CE /
DMD316-CE

DMD316-UL /
DMD316FR-UL

DMC2/DMC4 with a range of DMD modules

Control different load types with one device

The Philips Dynalite DMC2 provides multichannel control via two interchangeable output modules. The device is available with a variety of control modules to handle various load types and capacities.

The Philips Dynalite DMC4 provides multichannel control via four interchangeable output modules. The device is available with a variety of control modules to handle various load types and capacities.

DALI Input Devices



DUS360CR-D Multifunction Sensor

Low-profile recessed 360° ceiling DALI network sensor
The Philips Dynalite DUS360CR-D is a recess mountable 360° multifunction sensor that combines motion detection (PIR) and ambient light level detection (PE) in one device. The DUS360CR-D is powered and communicates to the networked control system via the DALI bus.



DUS360CS-D Multifunction Sensor

Surface mount 360° ceiling DALI network sensor
The Philips Dynalite DUS360CS-D is a surface mountable 360° multifunction sensor that combines motion detection (PIR), infrared remote control reception (IR) and ambient light level detection (PE) into one device. The DUS360CS-D is powered and communicates to the networked control system via the DALI bus



DUS30LHB-D Multifunction Sensor

Long-range high bay DALI network sensor
The Philips Dynalite DUS30LHB-D is a 30 degree multifunction sensor that combines motion detection (PIR) and ambient light level detection (PE) in one device. The sensor uses the DALI protocol for power and communications to a network control system, eliminating the need for additional network field wiring. This sensor is useful for long-range detection.



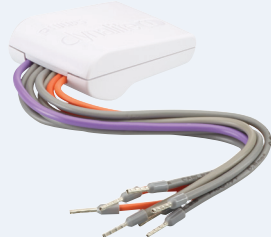
DUS90WHB-D Multifunction Sensor

Wide angle high bay DALI network sensor
The Philips Dynalite DUS90WHB-D is a 90° multifunction sensor that combines motion detection (PIR) and ambient light level detection (PE) in one device. The sensor uses the DALI protocol for power and communications to a network control system, eliminating the need for additional network field wiring. This is a wide angle, general purpose sensor.



DUS90AHB-D Multifunction Sensor

Aisleway high bay DALI network sensor
The Philips Dynalite DUS90AHB-D is a 90° multifunction sensor that combines motion detection (PIR) and ambient light level detection (PE) in one device. The sensor uses the DALI protocol for power and communications to a network control system, eliminating the need for additional network field wiring. This sensor is ideal for overhead mounting between warehouse shelving.



DPMI940-D Dry Contact Interface

Four-way DALI dry contact interface
The Philips Dynalite DPMI940-D is a dry contact interface with four inputs, designed to allow mechanical and electronic switches to interface directly with a Philips Dynalite controller on the DALI network.



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