Creating a new benchmark for energy savings, occupancy comfort and flexibility.

DALI lighting control solutions

Creating a new benchmark for energy savings, occupancy comfort and flexibility.
Where once the ‘green office’ was something of a buzz word, the passing of new government legislation now demands that all building owners and landlords demonstrate the energy efficiency rating of their building.

The revolutionary DALI lighting control system delivers unparalleled performance, easy installation and maintenance, maximum control and flexibility and increased energy savings, making it one of the easiest ways for building managers and owners to achieve higher energy efficiency ratings.

DALI provides simplified communication and installation, yet maximum control and flexibility. Wiring is simpler. Installation costs are lower.

What’s more, it allows architects and designers to create high-performance lighting that is perfectly matched to the needs of the building’s occupants.

“DALI provides simplified installation and communication, yet maximum control and flexibility. Wiring is simpler. Installation costs are lower.”
Optimizing energy savings
Simple to install and commission, a DALI lighting control system can monitor and control lighting within a commercial office environment, which significantly reduces the use of energy. Energy costs are lowered through daylight harvesting and standard controls such as dimming and occupancy sensors. Rather than depend on staff to turn off the lighting, the intuitive DALI system does it for you.

The system also allows facility managers and building owners to receive status reports so they can monitor energy savings and adjust lighting where necessary.

An intuitive DALI system also delivers lower maintenance costs.

A comfortable work environment
Savings in energy bills aside, the more effective the lighting control in an office, the more comfortable it is for the occupants. The DALI lighting control system allows lighting to be customized to each work environment and gives occupants control of their own lighting. The continuous automatic adjustment of lighting in response to changing ambient light levels provides occupants with a constant light level. More comfortable lighting helps to enhance workplace productivity and efficiency.

Compatibility and interchangeability
DALI was designed by leading lighting manufacturers to offer a standard to the lighting market that complies with all requirements and solves complex lighting tasks in a simple and cost-effective manner.

DALI allows interchangeability of different manufacturers’ devices and controls to create a lighting system. This includes ballasts, control systems, sensors, controllers, switches and emergency and exit signs.

Lighting flexibility
With DALI, design and user flexibility is dramatically improved over conventional, proprietary systems.

A DALI control lighting system can be scaled from a single room to a complete commercial office building. Each ballast can be individually controlled as well as belong to any or all of 16 different groups.

When building occupancy needs change, the DALI system can easily be reconfigured without the need for complex and costly rewiring.

A green office for the future
A DALI lighting control system can help deliver a higher energy efficiency rating for commercial office spaces. Increasingly, tenants and buyers are demanding buildings with a better environmental performance, demonstrated by a high energy efficiency rating, because it means their power bills are less and they can meet their company sustainability goals.

DALI sets the standard
DALI is an industry standard protocol that allows DALI-compliant components from different manufacturers to be mixed and matched together seamlessly into complete systems.

The DALI standard, specified in IEC standard 60929, is one of the world’s preferred standards.
The daily cycle of lighting within a typical office

The energy requirements throughout a 24-hour cycle in an office environment vary. Coordinating the different services within a Philips lighting control system allows an automated event-based strategy, which maximizes energy efficiency and creates a comfortable and productive work environment.

“An automated event-based strategy maximizes energy efficiency and occupancy comfort throughout the daily cycle.”
DALI lighting controls system

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**Begin shut down**
- Close all blinds for thermal insulation
- Adjust presence sensors to 15 minute time-out for more aggressive energy management strategy

**Sunset**
- Close west blinds
- Turn core lighting to 90%
- Turn up lighting to 90%
- Disable perimeter daylight harvesting

**Afterhours mode**
- Turn off all area lighting that have not had an extended lighting request
- Disable air conditioning
- Adjust all presence sensors to 5 minute time-out for most aggressive energy management
- Re-test all areas that have extended lighting every half hour until all areas have been shut down.

**Testing for after hours mode**
- Flash lighting to indicate area is about to be shut down
- Register staff requests for extended lighting through user interfaces.

**Background lighting**
- Switch off all corridor lighting after associated area lighting has been switched off
- Dim reception lighting to 15% for after hours re-entry
Understanding the importance of lighting control

One of the biggest challenges facing commercial building owners is reducing the day-to-day operating costs of a building while maintaining occupant comfort.

Too much or too little lighting can impact on occupant comfort levels and productivity.

Intelligent lighting control systems allow building owners to create inviting and functional office environments that improve light quality, enhance efficiency and productivity and optimize energy use.

Lighting control systems empower individuals to have direct control over their work environment and also allow users to plan for future layout and occupancy changes.

Think of it as a system that allows a building to make intelligent decisions about the optimum delivery of light. Lighting controls can switch lights off when no one is around, automatically adjust lighting levels based on the amount of natural daylight in the space and turn off or dim lights, based on the daily cycle of the office.

The perfect control of lighting means that the least possible amount of light is supplied when needed.

It’s easy to see how automatic lighting control can deliver significant bottom-line savings in energy costs as well as ensuring optimum comfort for occupants.

What is DALI?

DALI stands for Digital Addressable Lighting Interface. In other words, it is a worldwide standardized digital lighting interface.

The DALI standard, specified in IEC standard 60929, ensures interchange ability and compatibility of lighting products from different manufacturers.

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

What can DALI MultiMaster do for lighting?

Good lighting design has to include good control design and there’s no better control solution than DALI MultiMaster.

Put simply, DALI MultiMaster is a two-way communication system that brings digital technology to lighting. Every aspect of lighting can be incorporated into a DALI MultiMaster control solution.

DALI can control a single light fitting or a defined group of light fittings within a network. It brings remarkable flexibility to lighting systems. Previous generations of lighting control techniques depended on two or more data networks to be wired throughout the project for the different lamps and user interfaces within the system.

DALI MultiMaster allows for light fittings and user interfaces to use the same data network effectively reducing cabling by half.
A DALI system helps reduce day-to-day running costs of a building while increasing occupancy comfort.

Above: A typical office includes many different controls that need to be connected in the simplest way possible.

Typical Floor Plan
This diagram illustrates how an office floor with controls can achieve efficiency and effectiveness.
The advantages of a DALI office lighting control system

The DALI system at work
Traditional DALI allows for individual light fittings to be controlled and grouped together into logical areas. The DALI protocol allows for a maximum of 64 fittings on a single network and the network can be broken up into 16 different possible areas.

Shown on the right is an example of 64 DALI light fittings connected in a single network, which is divided into seven different areas.

Standby Power Management
The DALI network only controls the output level of the lamps. Once a lamp has been instructed by the control system to 0%, it’s still consuming a standby current consumption.

Individual lamp standby power consumption may not seem significant, but multiply the number of lamps within one project and it is considerable.

Without a power management strategy, this standby power consumption does not stop, 24 hours a day, 365 days a year.

The Philips Controls Dynalite portfolio solution eliminates the need for standby power consumption when the lamps are in the “Off” state, thus allowing greater savings and true energy management.

Unlimited scalability with multiple DALI networks
The DALI specification details how to operate a single network. However, most projects require multiple DALI networks operating together to create a single seamless lighting system solution.

The Dynalite portfolio allows unlimited scalability by combining multiple DALI networks into one system. Any single area can be supported by multiple DALI networks that are coordinated via a single user interface.

Above: A single DALI network consisting of up to 64 fittings can be divided into multiple control zones.

Controlling more than DALI
Sometimes a project does require more than DALI. For instance, lighting groups that require phase cut dimming, switching control or blind integration, will need more than a DALI system.

All Philips devices in the Dynalite portfolio support Dynet communication, which allows a unit to communicate directly to any other unit on the Dynet network without additional network gateways or central micro controllers.

This network topology supports the full range of Dynalite integration gateways, user interfaces, sensors and other types of load controllers.

“Easily control an entire building or multiple small tenancies.”
Grouped lighting and emergency light monitoring

The DALI specification allows for a maximum of 64 lamps per network, which can be broken up into 16 different groups, each with its own lighting scene. The diagram below shows all the fittings directly connected to each other.

DALI emergency exit fittings are also compatible, allowing for scheduled testing of the lamp and battery with the Philips Dynalite Mapview head-end software. This makes the monitoring of emergency exit fittings easy.

Understanding DALI hardware and wiring

A DALI system normally consists of DALI compatible light fittings and a DALI controller. In the example below, the DALI system has all fittings connected in one network and the DALI emergency exit fittings are also compatible, allowing for scheduled testing of the lamp and battery with the Philips Dynalite Mapview head-end software. This makes the monitoring of emergency exit fittings easy.

Reduce network cabling by up to 50%

Using the existing DALI bus for lighting control system user interface communication, effectively reduces the required network cabling by half. As the user interfaces are still networked devices, they can issue commands to change any lighting group on its own DALI network or any other lighting group within the Philips Dynalite portfolio network.
Introducing the innovative DALI MultiMaster range

Maximizing the DALI network advantages

Philips has developed a dedicated range of products in its Dynalite portfolio that provide the scalability and feature-set of our system. Below is an outline of the product features that combine to produce a new benchmark in office lighting control.

Gateway Controller
DDBC120-DALI
- Supports full DALI network of 64 fittings.
- Allows for 10 Dynalite user interfaces on the DALI bus.
- Device is fully self contained requiring no external devices for power or to be part of the DALI network.
- Built-in DALI power supply and DALI transmitter. No external devices required.
- Built-in 20A lighting power relay for removing standby power consumption when lighting is not needed.
- Directly integrated into the Philips Dynalite network Dynet.

Dry Contact Interface
DPMi940-DALI
- 4 x Dry contact inputs.
- Fully DALI network compatible with no need for extra power supply.
- All settings are software configurable allowing for remote programming.
- Able to control multiple DALI groups, fitting and other Philips Dynalite load controllers.
- Supports a wide range of selectable functions lighting scene select, ramping, area join or start event.
- Fully powered from the DALI network.

Multifunction Sensor
DUS804C-DALI
- Multifunction sensor supporting PIR and measured light level detection.
- Fully DALI network compatible with no need for extra power supply.
- All settings are software configurable allowing sensors to have different responses throughout a 24-hour work cycle.
- Able to control multiple DALI groups, multiple DALI networks and other Philips Dynalite portfolio load controllers.
- Supporting multiple functions such as performing daylight harvesting once motion has been detected.
- Fully powered from the DALI network.
Simple network cabling means lower installation costs

The Philips Dynalite portfolio of user interfaces connect directly to the same network bus as other DALI devices. There is no need for additional network or power wiring, which removes the need to run multiple networks across the office space for the lighting control system.

On any single DALI network, a total of 10 Dynalite user interfaces can be mounted. These devices do not use the fittings of the DALI addressing system, allowing for the full use of 64 DALI fittings. Using the existing DALI bus means up to 50% less network cabling.

**DALI fittings**
- All fittings must be DALI compatible.
- A total of 64 fittings can be controlled on a single DALI universe. If control over more fittings is required, an additional DALI controller will be needed.
- Power to the fitting is supplied by the DDBC120-DALI.
- The DALI group addressing can be changed by the DDBC120-DALI unit with Envision software.
- Full DALI reporting on current lamp status is available. Reports on tests can be generated with Envision software.

**DALI emergency**
- All emergency and exit fittings must be DALI compatible.
- Including emergency and exit lighting, a total of 64 fittings can be controlled on a single DALI universe. If control over more fittings is required, an additional DALI controller will be needed.
- Some emergency and exit fittings use two DALI addresses per fitting. See manufacturers data sheet for details.
- Power to the fitting is supplied by the DDBC120-DALI.
- The DALI group addressing can be changed by the DDBC120-DALI unit.
- Full DALI emergency reporting on current lamp status is available.
- Reports of testing can be generated with Envision software.

**DUS804C-DALI**
- Sensor transmits messages directly onto the DALI network.
- The sensor is powered directly from the DALI network requiring no additional cabling.
- Capable of motion detection and light level measurement at the same time.
- Able to control fittings located on different DALI universes.
- All device settings are configured remotely through the DALI network by Envision software. No manual adjustment is required.

**DPMI940-DALI**
- 4 x Dry Contact input interface for DALI network.
- Able to transmit messages directly onto the DALI network.
- The DPMI940-DALI is powered from the DALI network requiring no additional cabling.
- Able to control fittings located on different DALI universes.
- All device settings are configured remotely through the DALI network by Envision software. No manual adjustment is required.

“Up to 50% less network cabling that you’ll never touch again.”
DALI MultiMaster brings functionality to every project

Often a project floor layout is not known until the late stages of construction, which means electrical installers need to change the DALI bus to match the desired floor plan, ensuring that each area does not cross the physical boundary from one DALI network into another.

The DALI MultiMaster system overcomes these restrictions by directly connecting each of the load controllers in the electrical switchboard via Dynet.

This allows the Dynalite system to coordinate multiple DALI networks into one seamless system. So, a sensor physically connected in one DALI network can control a fitting in another; reducing the number of user interfaces and allowing for unlimited area shapes and sizes.

In the example below, each colored area represents a potential area within a project. Two of the required control areas have crossed from one physical DALI network into another. The Dynalite system can automatically manage the logical areas so that the DALI network physical boundaries are no longer a restriction. Intuitive head-end software allows users the freedom to change lighting zones easily.
Tray Pan – the freedom to control individual work environments

In a typical office environment, DALI’s ability to control individual light fittings empowers occupants to automatically control task lighting. Tray Pan is a program that resides in the task bar of an individual’s computer and communicates to the Dynalite server to carry out requests. Tray Pan can be set to dim the lighting when the computer screen saver activates or turn the lighting off when the computer has been turned off. With task lighting connected back to the lighting control system, there’s no risk of lights being left on all weekend.

Sophisticated head-end software

Every device on the Philips portfolio Dynalite lighting control system can be managed from one central location. Dlight III software allows users to have a floor plan overview of the site showing all areas of control. The software allows users to edit scheduled events, override current lighting, rezone areas and run lamp tests.
Integrate DALI MultiMaster into an entire system solution

The DALI MultiMaster system complements the many features and product options available within the Dynalite portfolio of Philips lighting controls solution offers.

The DALI MultiMaster can be used in conjunction with other devices to control non-DALI light fittings and integrate with other elements of a project including blinds and AV systems.

This diagram shows how the DALI MultiMaster can become part of the whole system solution. A direct connection with any other device in the Dynalite system gives the complete flexibility of DALI and the full features of Dynet.

With a direct connection to the Dynet network, the DALI MultiMaster controllers can be in direct communication with any other device, requiring no additional gateways or commissioning tools.

Above: DALI MultiMaster becomes another solution to the Philips Dynalite lighting control system.
Superior control brought to you by Philips

Philips through its Dynalite portfolio of controls solutions already supports a wide range of load controllers, user interfaces and integration gateways, which offer seamless compatibility and configuration by the one commissioning tool – EnvisionProject software.

Load controllers for every job
A complete range of load controllers for dimming of all lamp types and heavy-duty relay devices for any switching requirements. Control types supported are:

- Leading Edge dimming
- Trailing Edge dimming
- 1-10V, DSI, DALI broadcast
- LED Pulse Width Modulation
- Switching control

Smart user interfaces
Bring the power of the Dynalite system with a touch of a single button. One multifunction sensor reduces ceiling clutter:

- Pushbutton panel
- Touchscreens
- Timer clocks
- Multifunction Sensors (Ultrasonic, PIR, IR and Lux)

High performance Integration Gateways
Coordinating multiple systems to perform together ensures the system is easy to use and easily configured. High level of integration into many different BMS protocols.

- BACnet
- LON
- RS232 / RS485
- Ethernet
- Somfy
- Low level volt-free
- KNX