



Lighting Controls solutions for offices

Philips LightMaster maximizes comfort and
minimizes energy with KNX.



PHILIPS

sense and simplicity

Adding expertise to industry standard solutions

Philips is synonymous with the creation of sophisticated, user friendly and energy-efficient lighting control solutions for a wide range of industry sectors. Philips experience in light sources and controls now adds this recognized lighting know-how to the open world of KNX and DALI, to provide maximum energy savings, comfort & flexibility.

As an industry-leading innovator for over 25 years; Philips control systems are the solution of choice for a wide range of energy management and architectural lighting control applications.

The Philips LightMaster range now brings additional solutions to the KNX world including:

- dimming actuator solutions that allow the user to decide which lighting protocol output they want to work with, including DALI addressed, DALI broadcast, DSI and 1-10v.
- a true structured cabling solution to bring the benefits of faster installation, commissioning and reduced costs.
- the benefits of being able to add sensors and dry contact user interfaces to the DALI line, reducing installation costs in field wiring.
- low profile aesthetics to the sensor range, reducing ceiling clutter without compromising performance.

The Philips LightMaster office based controls system is fully scalable and suited to both large and small installations.

Convergent technology produces outstanding application control

The Philips LightMaster range takes both the KNX and DALI open communication protocols and by adding their acknowledged controls and lighting expertise, are able to get a better result for all stakeholders in the office, hospitality and retail segments over what is available in the market today. Additional flexibility is available through both DIN rail and structured cabling solutions.

LightMaster uses the latest developments in the DALI MultiMaster approach – where user interfaces as well as lighting ballasts are available on the DALI bus and now provides the KNX world with these additional design and installation benefits.

KNX is a worldwide standard for applications in home and building control, ranging from lighting, blind and shutter control to full building management systems including HVAC.

ETS (Engineering Tool Software) is a manufacturer independent configuration tool to design and configure intelligent home and building control installations with the KNX system.

DALI (Digital Addressable Lighting Interface) is a technical standard for network-based systems that controls lighting in buildings. It was established as a successor for 0-10V lighting control systems and as an open communication standard, alternative to Digital Signal Interface (DSI). The DALI standard, which is specified in the IEC 60929 standard for fluorescent lamp ballasts, encompasses the communications protocol and electrical interface for lighting control networks.

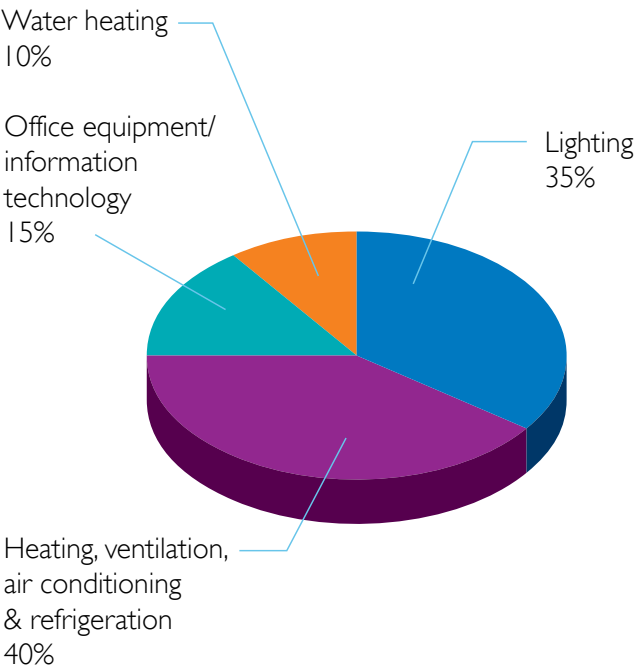


Why invest in lighting?

For the Office segment in particular, lighting is seen as 'low hanging fruit' for reducing operational costs, saving energy, lowering your carbon footprint and contributes significantly to Green Building Certification. So whether you are a specifier, a builder, a systems integrator, a facility manager or a building tenant or owner, you'll find very tangible payback and productivity improvement opportunities through upgrading your existing installation or 'designing in' controls in your next project.

- The installation of energy-efficient lighting (such as LED) in new buildings is not enough. New and existing light sources, when combined with improved optics in luminaires, provide far greater 'efficiency'. But the inclusion of controls ensures the 'effectiveness' of the installation.
- 80% of the lighting in buildings is old technology and the addition of controls can give immediate savings and operational efficiencies that will enhance the users experience and provide a better bottom line for the business.
- Only 1% of buildings use lighting controls such as basic presence detection and daylight controls.

Office Energy Consumption



Lighting can improve wellbeing and performance

Today's workforce faces far more change than ever before and therefore the challenge for employers is to design work environments that can best meet the needs of 21st century workers and ensure maximum levels of wellbeing as well as performance. The modern office needs more than just good lighting design to cope with these needs. Specifiers and designers also need to consider human performance and productivity issues.

Also it is no longer socially acceptable or commercially astute to burn all of the lighting throughout the day and for half the night, yet a feeling of personal security and wellbeing must be protected.

“Lighting controls will improve your bottom line as well as the wellbeing and performance of your organization”

Key Benefits of office controls

Energy Savings

The right light at the right time and place

Benefits	Features
Use sunlight	Daylight regulation
Lights on only when needed	Occupancy control Smart scheduling
Right light level	Task tuning Daylight regulation
Flexible energy use	Load shedding

Flexibility

Be ready for now and the future

Benefits	Features
Reduced cost of flexibility	Manage your layout changes via software
Monitor system health	Monitor (almost) failures
One user interface	Control of all ambient elements from one interface
Measure and control	Full insight in operation, energy usage and management

Comfort

Create the perfect environment for tasks and scenes

Benefits	Features
Optimal light for task/scene	Personal control Dynamic (colour) control
User in control	Personal control
Comfort and safety	Corridor linking Open plan background lighting Integration with blinds

Increased flexible control and fully scalable

Philips LightMaster maximizes energy efficiency and comfort with traditional occupancy sensing and daylight harvesting strategies, but also introduces a range of new strategies for increased flexibility, user comfort and security.

End-to-end lighting solutions

Philips specializes in the provision of end-to-end intelligent lighting control systems, rather than just products. We know that the critical link between light sources and a fully integrated environment is the control capability. The LightMaster control infrastructure supports the fully integrated environment that is encompassed in the KNX and DALI industry standards.

When combined with the broad selection of Philips Lighting's energy-efficient luminaires, the LightMaster range of controls will allow users to create not only an energy 'efficient' solution, but also an 'effective' one with the distinctive ability to transform office environments.

“Philips LightMaster control solutions are infinitely scalable and will suit any commercial application”



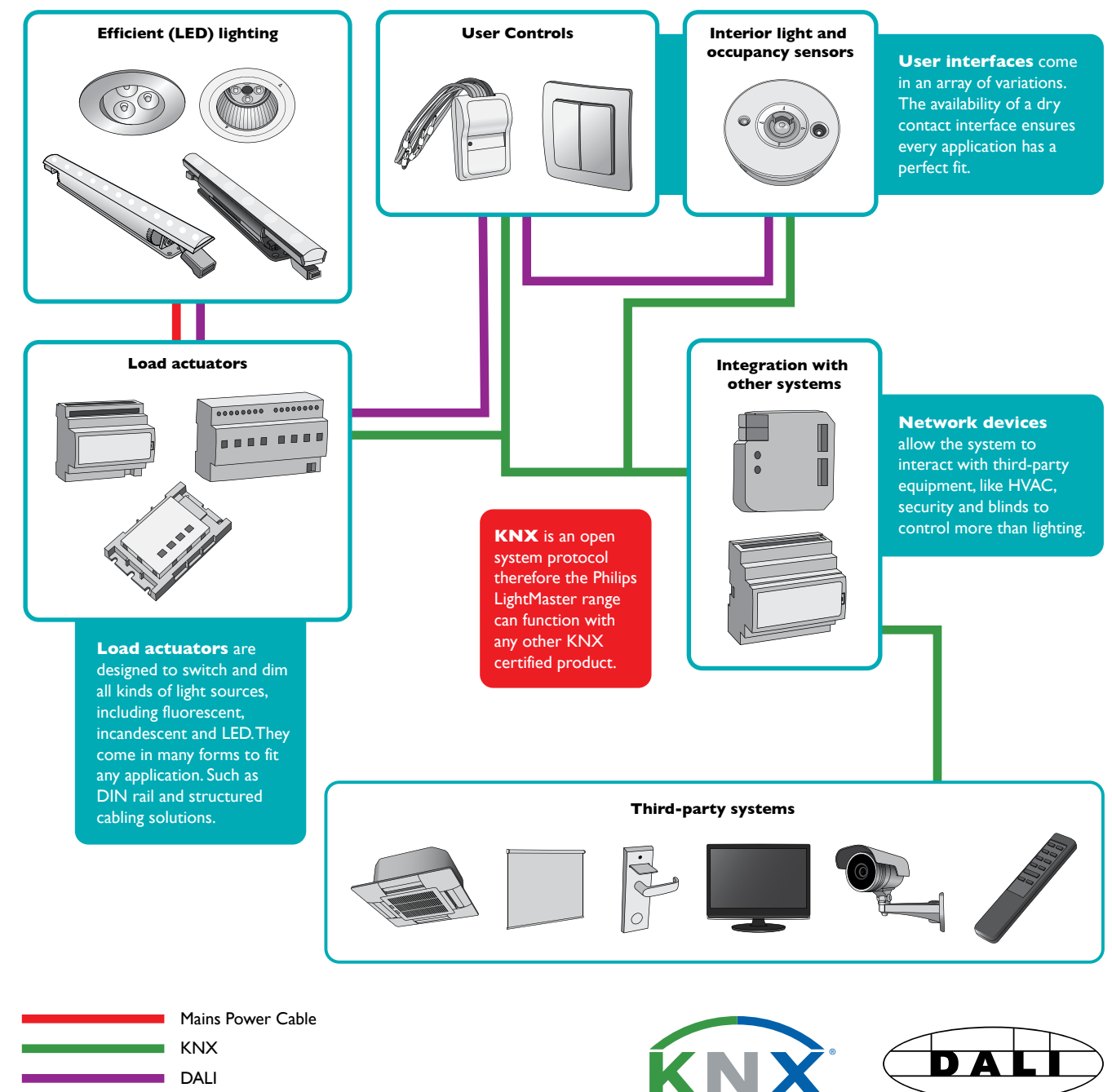
The Philips LightMaster Solution

The Philips LightMaster range has been developed to ensure easy integration into today's modern office environment, for either retrofit or new installations by maximizing the effectiveness of KNX and DALI.

The Philips LightMaster range now brings additional solutions to the KNX world including:

- dimming actuator solutions that allow the user to decide which lighting protocol output they want to work with, including DALI addressed, DALI broadcast, DSI and 1-10v.
- a true structured cabling solution to bring the benefits of faster installation, commissioning and reduced costs.
- the benefits of being able to add sensors and dry contact user interfaces to the DALI line, reducing installation costs in field wiring.
- low profile aesthetics to the sensor range, reducing ceiling clutter without compromising performance.

The Philips LightMaster office based controls system is fully scalable and suited to both large and small installations.



Comprehensive office control using the Philips Lightmaster Range

The Philips LightMaster range has been developed to ensure easy integration into today's modern office environment, for either retrofit or new installations by maximizing the effectiveness of KNX and DALI. This enables greater flexibility so installations can benefit from the best of both of these systems.

User Interfaces

Button Panels

A local control panel allows occupants to adjust the lighting control system to suit their requirements. This enables users to intuitively initiate and interact with various functions required of the control system. Philips LightMaster panels bring the full power of the control system to the single touch of a button. One button press can instantly change the look and feel of the whole environment.

Sensors

Offering the ability to interact with project spaces passively, the Philips LightMaster sensor range brings the features of motion detection and light level detection into one unit, in a compact and aesthetic solution. Each of the features can be operating at the same time, allowing automation scenarios such as turning on the lights after detecting motion and then dimming the lighting level once the available sunlight has been measured, providing additional energy savings. Combining each of these functions into the one device reduces the need for many different types of sensors cluttering the ceiling space.

Load Actuators

The heart of the automation system, the Philips LightMaster range of load actuators directly drive all the different lighting groups within a project and allow the system to be compatible with any lamp type and lighting control protocol. Philips LightMaster load actuators are the ideal choice for combining feature rich lighting control requirements with superior build quality to continuously perform problem free. A combination of load actuator devices can be selected to work seamlessly together to achieve common project design goals. Each device can store over a hundred preset scenes, allowing the recall of complex switching logic from simple network messages. As the required preset scenes are stored within each device, the commissioning process and network messages are simplified. The Actuator range also supports a variety of output circuit combinations, suiting any project requirement.

Relay Actuators

As one of the most popular forms of lighting control, relay actuators can provide the most impact to energy management and lighting control. Available in DIN rail configuration, the units are suitable for installation within a switchboard enclosure.

Dimmer Actuators

The Philips LightMaster range of Open Protocol Dimmer Actuators are capable of transmitting all industry standard ballast protocols (DALI addressable, DALI broadcast, DSI and 1-10V). They are available in both DIN rail and structured cabling configurations, to allow for flexible installation.

Network Devices

Dry Contact Interfaces (DCIs)

Philips LightMaster DCI's are designed to allow mechanical switches and relays to interface to the KNX network. The function of each input is programmable and the small size of the product combined with the inputs being presented makes it perfect for installation behind multi-gang switch grids. In addition to being used as a simple dry contact interface, these DCI's have a 'motion detector' mode that turns a third-party motion detector into a fully featured KNX sensor.

Line Coupler

The Philips LightMaster line coupler can be used to link a line to a second line in order to extend the network or it can be used to link a line to a main line (or backbone). In this respect it provides electrical isolation and message (telegram) filtering.

Network Power Supply

The Philips LightMaster KNX power supply provides the installed bus components with energy and to ensure robust and reliable bus communications.

The Philips LightMaster open communication product selector

LightMaster Switch Range

PIPE-KNX-2P, PIPE-KNX-4P

Contemporary design and smart operation are just two factors integrated into the LightMaster PIPE-KNX-2P & 4P switch panel range. With a very flexible base module component, both specifiers and installers get more functionality to control complex functions in all types of commercial buildings. Straight switching as well as multifunction combinations including dimming, blind and scene control can all be achieved. All of these factors add up to provide maximum comfort for users as well as minimum energy management possibilities for building operators and owners. Available in two position and four position options with engraving opportunities available on a project basis.



LightMaster Multifunction Sensors

PLOS-CM-KNX, PLOS-CM-DALI

The PLOS-CM-KNX & PLOS-CM-DALI are low profile recessed flush mount 360° ceiling mount sensors that combine PIR motion detection and PE ambient light level detection – in the one device. In applications such as office buildings these universal sensors can be used to detect motion and switch on the lights or a preset lighting scene. When rooms are unoccupied, lights can be automatically dimmed or switched off to provide energy savings. These units also incorporate a segmented click-up bezel surrounding the motion sensor element. This enables a portion of the sensing field to be readily masked to prevent nuisance detection from adjacent doorways or corridors. In situations where it is critical to maintain precise lighting control for individual workspaces, such as an office workstation, the sensors facilitate maintained illuminance and daylight harvesting.

The PLOS-CM-KNX is powered directly by the KNX network. The PLOS-CM-DALI is powered directly by the DALI network that is running between the DALI light fittings, thus eliminating the need for additional network field wiring.



Dry Contact Interfaces

PPMI4-DALI, PPMI4-KNX

Each device is a four-input dry contact interface, designed to allow mechanical and electronic switches to interface directly with the KNX or DALI MultiMaster networks. They can be used as a simple dry contact interface for low level integration to third-party systems such as security and air conditioning so that the lighting can be coordinated together with other services found within a project. The function of each input is programmable and the small size of the product makes it perfect for installation within a wall box.

The PPMI4-KNX is powered directly by the KNX network. The PPMI4-DALI is powered directly by the DALI MultiMaster network that runs between the DALI light fittings, thus eliminating the need for additional network field wiring.



“Load actuators, user interfaces and network devices that seamlessly integrate to deliver comfort and energy benefits to any office”

LightMaster Line Coupler

PLC-KNX

The Philips PLC-KNX is designed for cost-effective optical isolation of KNX networks. The two opto-isolated KNX ports enable the PLC-KNX to implement a main line and line topology, with each line being electrically isolated from the others so a fault in one section of the network will be contained. It is a 'passive' device that does not require programming.



LightMaster Network Power Supply

PPS640-KNX

The PPS640-KNX is a regulated power supply with an integrated Bus choke, designed to provide network DC supply to the KNX network. The switchmode design allows the device to be used with a wide range of supply voltages without the need for a manual selector setting. The PPS640-KNX is housed in a 6 unit DIN rail mount enclosure that has a circuit breaker profile. This enables the device to be installed in all types of electrical equipment enclosures, including those with cover apertures specifically designed for circuit breakers.



LightMaster Relay Actuators

PDRC416FR-KNX, PDRC816FR-KNX , PDRC1216FR-KNX

These relay actuators are designed to control any type of switched load and are available in 4, 8 & 12 pole configuration. The power circuit is of a 'feed through' design and is electrically equivalent to a 4, 8 or 12 pole contactor, with the additional advantage of each pole being separately controllable via the KNX network.

The relay actuators are DIN rail mountable, designed to be installed in a switchboard next to the circuit breakers feeding the circuits to be controlled. Each channel is fitted with a hardware override switch which is accessible from the front panel.

The LightMaster relay actuator range generally does not require an additional power supply unless synchronous switching of several channels is necessary.



LightMaster Structured Cabling Dimmer Actuator

PLPC905GL-3-KNX, PLPC905GL-3-HD-KNX, PLPC905GL-4-KNX, PLPC905GL-4-HD-KNX

These devices are standard protocol dimmer actuators designed for direct installation within ceiling cavities with power and communications connections via a structured cabling solution. Each control output supports DALI broadcast, DALI addressed, 1-10V and DSI protocols. For ease of installation and maintenance the device incorporates structured wiring connectors, which enables the unit to be readily connected without the use of tools.

The device can be readily integrated with a Building Management System (BMS) via the KNX control network, making it ideally suited to commercial installations where a cost-effective control solution is required. The device design provides easy connection without the use of tools and is available for 3 or 4 pole Wieland power wiring and 2 pole communication wiring systems. It is also available with optional HD – Heavy Duty relays for applications where high inrush currents occur.



LightMaster Dimmer Actuator

PDLPC416FR-KNX

This device is a standard protocol dimmer actuator designed to provide cost-effective control of dimmable luminaires. Each of the four control outputs support DALI broadcast, DALI Addressed, 1-10V and DSI protocols. The control signals can be programmed to operate in tandem with the four internal switched outputs, which will automatically isolate the power circuit when all associated channels are at 0%. This feature is useful for energy savings applications, as DALI ballasts draw a significant amount of power when the lamps are turned off via a DALI command.

The device is DIN rail mountable, designed to be installed in a switchboard next to the circuit breakers supplying power to the controlled lighting circuits. The device contains an integral DALI bus power supply, removing the need for the provision of a separate external power supply which reduces costs in both hardware and labor as well as reducing switchboard wiring complexities.



LightMaster DALI MultiMaster Dimmer Actuator

PDBC120-DALI-KNX

The DALI MultiMaster Actuator is designed for cost-effective control of DALI compatible lamp drivers, providing a full universe of 64 DALI channels. It provides communication to the KNX network and DALI MultiMaster devices such as sensors and dry contact interfaces. Direct DALI to KNX mapping means that the DALI-imposed limits, such as the maximum of 16 groups, are seamlessly overcome allowing for a fully scalable network solution.

This device is DIN rail mountable, designed to be installed in a switchboard that is supplying power to the controlled lighting circuits. The device contains an integral DALI bus power supply, removing the need for the provision of a separate external power supply which reduces costs in both hardware and labor as well as reducing switchboard wiring complexities.



Open-minded, open communication

LightMaster sets a new benchmark for maximizing comfort whilst minimizing energy use with KNX and DALI.

Fully scalable and robust

Multiple KNX network lines can be linked together to form one larger system. A main line and line network topology allows for both scalable and robust network architecture. Many different integration opportunities are available via the KNX standard as well as gateways to third-party systems. With integration, the BMS can trigger timed events and check the current system status.

The introduction to the KNX world of a fully structured cabling solution brings big benefits for all stakeholders in project delivery, installation and operations.

Philips LightMaster load actuators can be used simultaneously on the same KNX network to control other types of lighting with options including: DALI Addressable, DALI Broadcast, DSI and I-10V for other styles of dimmable lamps and window blind control and relay actuators for any type of switch load.

Intelligent network connections

All Philips LightMaster range network devices are connected together using the industry standard KNX approach. This allows all the LightMaster devices to pass messages between each other on the KNX network as well as onto the DALI network via the DALI load actuators. User interface panels, including third-party devices can be connected via the LightMaster KNX and DALI Dry Contact Interfaces to directly change the current lighting control settings. The DALI MultiMaster solution reduces field installation costs by having sensors and dry contact user interfaces available on the DALI network.

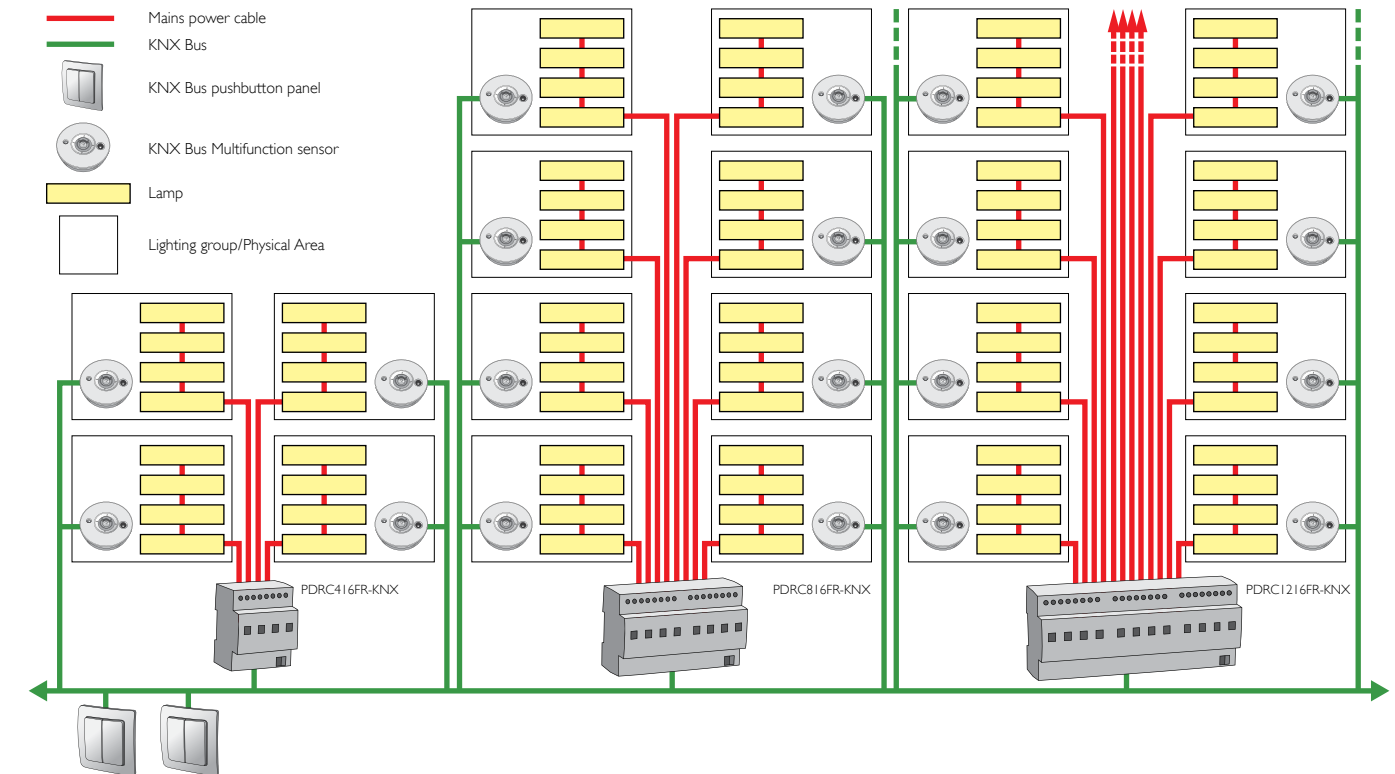
Ultimate control from a single panel

From any one lighting control panel an end-user can take control of the whole system if required. This can be useful for turning off all the lighting at the end of the day. Sensors will automatically adjust the lighting depending on detected motion or the current measured light level. A sensor can not only control its own logical area but also pass messages onto adjacent areas holding on corridor lighting or taking light level measurement for multiple logical area control. In developing the LightMaster range Philips have a range of products that utilize not only the KNX network, but also the DALI lighting control network to communicate between user interfaces such as sensors and pushbutton panels. This not only reduces the system complexities but can also cut the required network field wiring by more than half.



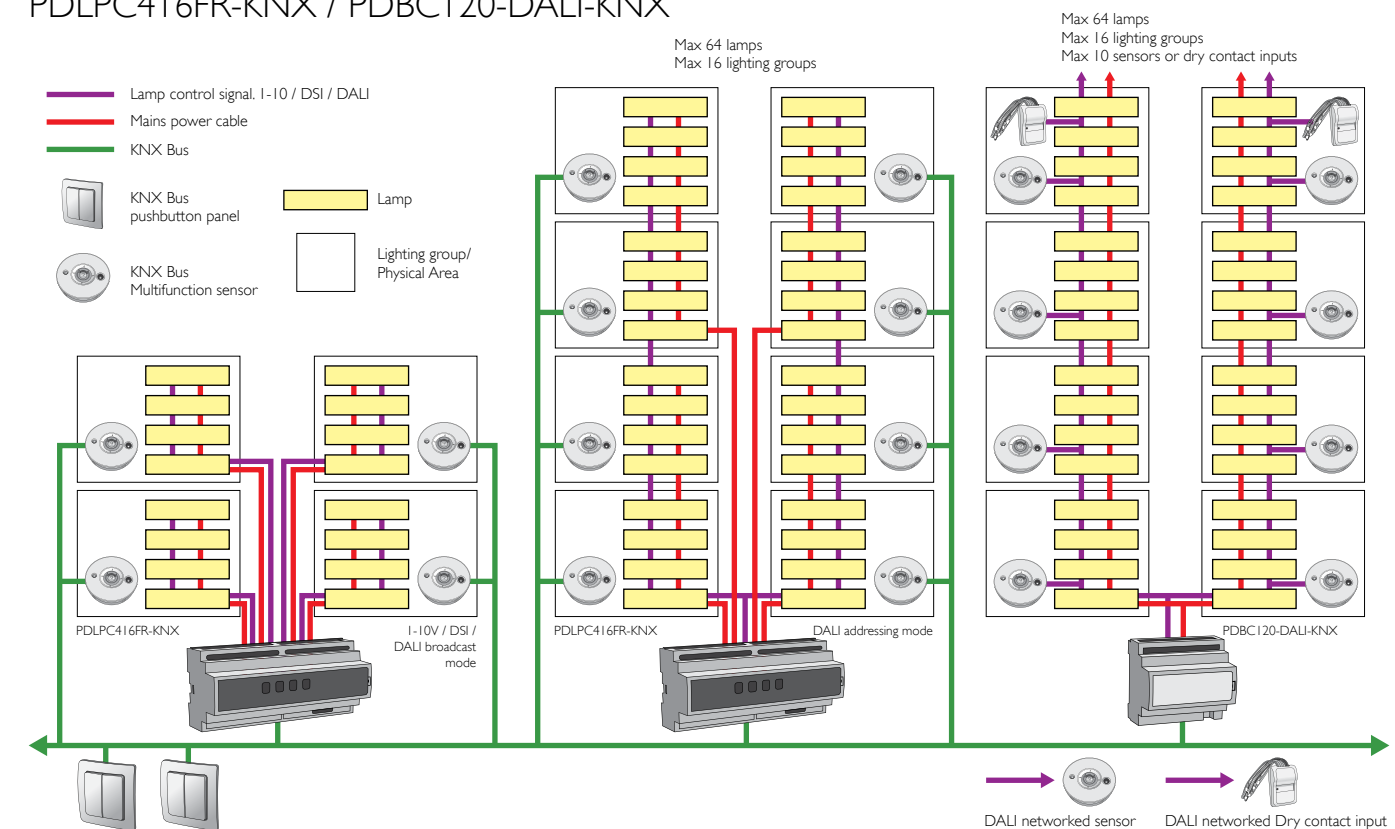
Switching Actuator control solutions

PDRC4|6FR-KNX / PDRC8|6FR-KNX / PDRC12|6FR-KNX



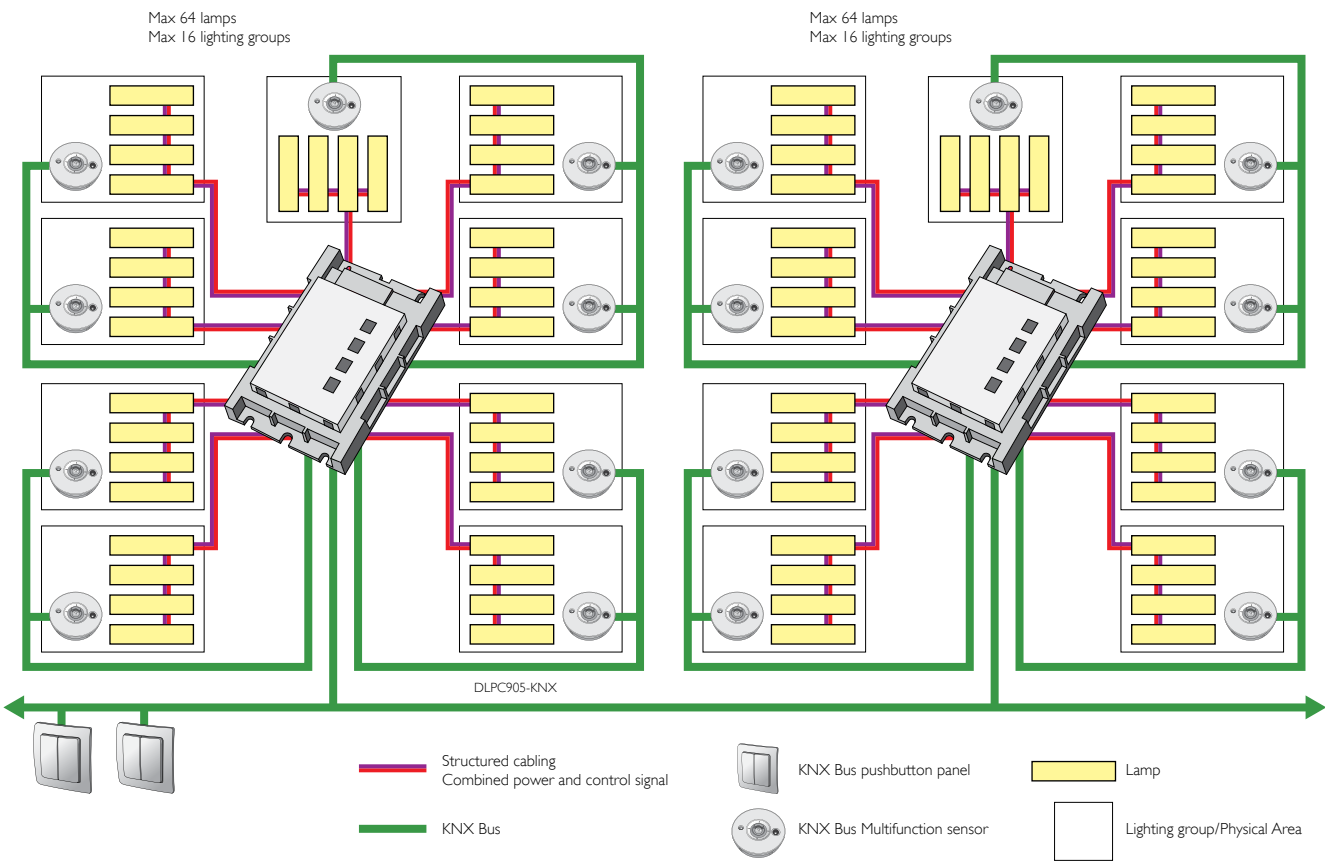
Dimming control solutions

PDLPC4|6FR-KNX / PDBC120-DALI-KNX

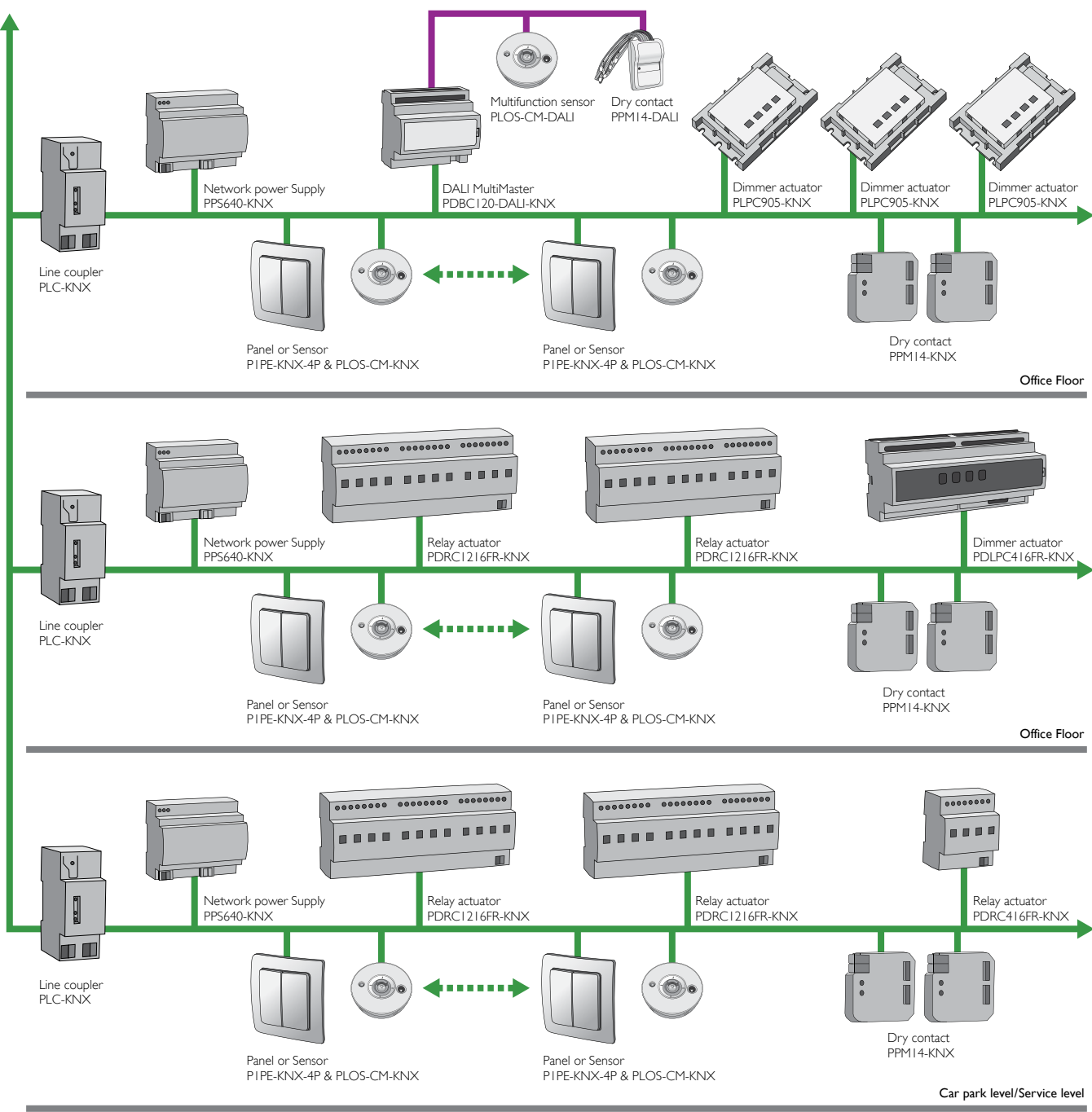


Dimming control and structured cabling solutions

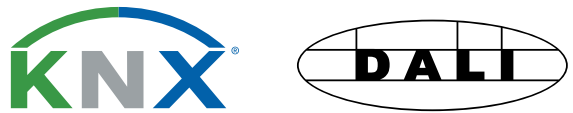
PLPC905GL-3-KNX, PLPC905GL-3-HD-KNX & PLPC905GL-4-KNX,
PLPC905GL-4-HD-KNX



KNX Bus structure



“Introducing LightMaster structured cabling solutions to KNX”



Philips LightMaster Range

Feature Overview

Energy saving, Flexibility and Comfort

		Energy Saving	Flexibility	Comfort
Occupancy Control Feature	Description			
Delay Timer	When no movement is detected, this feature first dims the lights to a background level for a set time period to notify that the lights will soon switch OFF, and then switch all lights OFF after another timeout period.	●		
Step Over Pattern	Will activate or maintain desired light levels in multiple areas adjacent to where occupancy has been detected. This feature offers flexibility in setting up lighting behavior in corridors, large open office areas and public areas where areas may overlap. The feature also assists in creating a sense of security and wellbeing for occupants after hours.	●	●	●
Background Level for Open Plan	Also known as adjacent area standby, this feature is used in larger areas equipped with multiple sensors (e.g. modern open plan offices). It can activate or maintain a background lighting level in an open plan office while at least one of the work islands is still occupied. When the last work island area becomes unoccupied, the lights in the open plan will switch off (with a delay). Additionally, this feature can enable tuning of the area to provide a balance between occupancy comfort and energy savings. An example of this is by fully illuminating the occupied areas whilst dimming the light to a standby level in adjacent unoccupied areas.	●		●
Corridor Hold-on	Links areas like offices, meeting rooms or classrooms to a corridor (exit path). Makes certain that the corridor is switched on if one of the areas is still in use. Furthermore, it can dim the lights in the corridor when it is unoccupied if people are still present in the neighboring rooms, for a perfect balance between safety and energy savings	●		●
Cascaded Corridor Hold-on	The exit path lighting can be cascaded, to create multiple dependencies. This feature will allow cell offices to keep corridors lit, corridors to keep lift/lobbies lit, lift/lobbies to keep reception area's lit, etc.	●		●
Personal Control Feature	Description			
Manual Light Control	In many situations building occupants may not wish to rely on the automatic daylight harvesting function as the available daylight or illumination levels present will suffice. Having manual light level control enables the occupant to switch or adjust the lighting level to their personal preference or return to automated control when desired.		●	●
Panels/Switches	The obvious way of providing personnel or local control is via the provision of switch panels at the point of entry into areas or zones. Allowing the occupant to decide to turn on the lights or not when they enter the area is a simple energy management practice. If the lights are turned on, then the system will still turn off the lights after they leave following a predetermined time-out period.		●	●

		Energy Saving	Flexibility	Comfort
Light Level Control Feature	Description			
Switching	Ability to switch the lights ON and OFF from a flexible choice of networked devices.	●		●
Dimming	Ability to dim the lights from a flexible choice of networked devices. This can be achieved by a protocol (or signal) to a lamp driver (DALI addressable, DALI Broadcast, DSI, or 1-10V). It can also be achieved by power control or phase control dimmers.	●	●	●
Scene Setting Task Tuning	One of the most efficient methods of saving energy is to provide only the level of light that is required for the task at hand. This is achieved by enabling a 'scene' for a particular task and can significantly improve the personal comfort of the occupant. Examples of this would include scenes enabled in a meeting room for presentation, meeting or discussion situations.	●	●	●
Daylight Harvesting Maintained Illuminance	Through the use of light level detection, this feature adjusts the level of artificial lighting required at any given time, especially in areas that experience high levels of daylight i.e. adjacent to window.	●		●
Corridor-Row Offset	Zones adjacent to windows receive more daylight than those closer to the core of the building including corridors in open space offices. This feature enables the luminaires in the window areas and the core areas to be defined by a ratio. The window area luminaires are dimmed to a lower level than the luminaires in corridor or core areas. The area in-between is dimmed to a pre-defined percentage considering both window and core area levels. This function is identified as corridor row offset.	●		●
Time Control Scheduling Feature	Description			
Time Control/ Scheduling	Many lighting functions are time of day dependant for example, the level of light required for office cleaning or during a security scan walk-through, is considerably lower than that required during normal office hours. Scheduling allows lights to be switched ON, OFF, dimmed or behave differently according to a specific schedule. This can be adjusted for weekends, public holidays or other shut down periods. Requires KNX timers that are available from many third-party vendors.	●	●	
Specialized Control Feature	Description			
Load Shedding	This function allows some or all luminaires to dim or switch off when the buildings energy consumption is in excess of predefined limits. This maximum limit can be static or dynamically set, possibly by the energy provider. When configured correctly, security, personal safety and comfort are maintained at the highest levels possible. This function is implemented, through a dry contact interface integrated via the KNX network.	●		
Emergency Linking	Makes it possible to link various systems, e.g. fire and security, to the lighting system so as to ensure lighting is switched on during emergencies. This function is implemented, through a dry contact interface integrated via the KNX network.		●	●



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