Maximizing energy savings with control over light

Philips Integrated Controls portfolio

PHILIPS

Rapidly rising energy costs and environmental scrutiny, together with the demands of citizens for safer and more attractive living environments, create a complex challenge for modern municipalities. The challenges of outdoor lighting are not limited to government bodies - private sector companies also strive to reduce energy and maintenance expenditures. These challenges can be met with control over light - reducing the light levels during off-peak hours to lower energy costs.

In addition to immediate energy savings, lowering the light levels during off-peak hours minimizes light pollution, improving quality of life for local residents. Finding the right outdoor controls solution depends on the customer's needs and existing application infrastructure. The Philips integrated controls portfolio offers a wide range of options with different levels of user oversight, giving control over light for both conventional and LED systems.

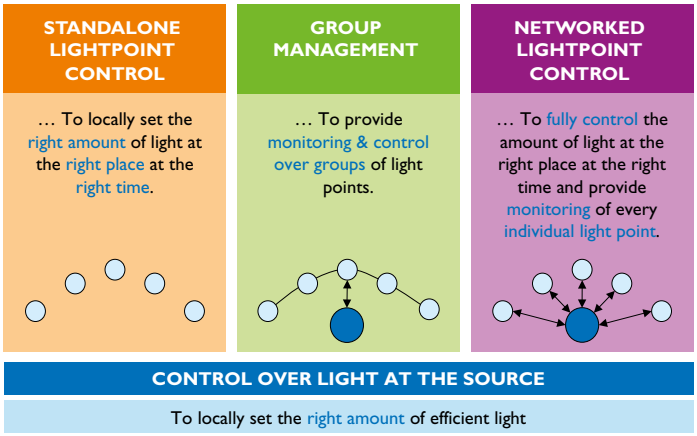

Figure 1. Light control categories

Benefits

- Maximize energy savings
- Reduce light pollution
- Flexibility of use
- Reduce total cost of ownership
- Peace of mind on product performance

Features

- A wide selection of integrated dimming protocols
- Adjustable Light Output (ALO); select the light level which is right for each application
- Constant Light Output (CLO); ensure stable light levels without wasting energy
- Xtreme standard: long lifetime, robust protection against moisture, vibration and temperature extremes
-

Applications

- Street and urban lighting
- Highways
- Rural roads
- Parking lots
- Area lighting

Figure 2. Effect of dimming on the street

Full light in the evening

Lower light level late at night

STANDALONE LIGHTPOINT CONTROL

Looking to realize immediate energy savings without major changes or investments in new infrastructure? Then standalone controls are the best choice. Standalone controls operate in an autonomous manner, enclosed in the luminaire, dimming the light based on a pre-defined schedule, based on the on and off times. All the necessary components are integrated into the light point, and there is no need for any maintenance work such as battery replacement or re-synchronization. For both conventional and LED light sources, Philips offers a choice of single- or multi-step dimming. Some systems are equipped with an override feature which can be used to go to full illumination when already in dimming mode.

LumiStep

Average energy savings 

The easiest way to achieve light on demand is utilizing drivers with LumiStep dimming. LumiStep is a single level, step-dimming protocol which can reduce energy use by up to 25%. The light level of each luminaire is dimmed down to 50% during specific hours of the night. When the installation's on- and off- times are synchronized with sunset and sunrise, LumiStep automatically determines the night midpoint. The dimming protocol offers a choice of a 6 or 8 hour dim period[1]. The 6-hr setting will provide full light until the night midpoint, and then dim for 6 hours before going back 100%. The 8 hour schedule will start dimming 2 hours before and continue for 6 hours after the midpoint.

[1] For complete information, please refer to the Design-in Guide for the selected product.

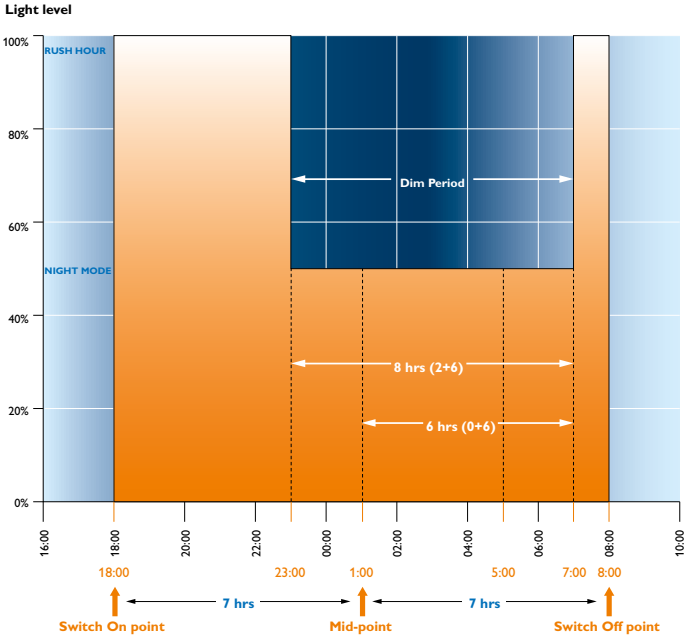

Figure 3. LumiStep dimming protocols

Integrated Dynadimmer

Average energy savings

The integrated Dynadimmer functionality provides multi-step dimming, delivering energy savings of up to 40%. The combination of five flexible dim periods and dimming levels[2] make it easy to customize a virtually endless array of dimming profiles. Any level can be configured for any duration, making it possible to provide very low light levels in the middle of the night, high levels at peak times and medium levels during the transitional periods. It also enables a reduction in the standard light level at peak times in case of over-lighting. All Dynadimmer schedules work around a midpoint, calculated based on the system's on and off times[3].

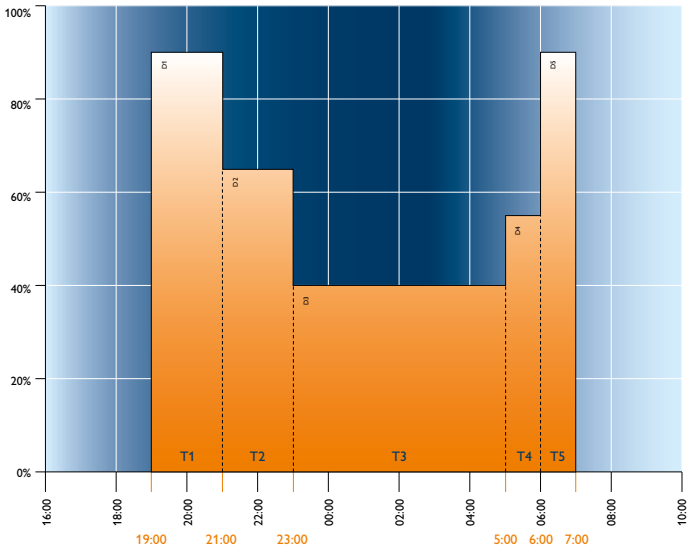

Figure 4. Sample Dynadimmer schedule

If an integrated solution is not available or cannot be used (e.g. fluorescent lighting), Philips enables the same functionality with a standalone solution – the Dynadimmer 1-10 V, which works with any 1-10 V gear.

For more information about this product, please visit www.philips.com/dynadimmer.

[2] 100 to 10% of light and power levels for LEDs; Please refer to Table 1 for individual product details.

[3] For complete information, please refer to the Design-in Guide for the selected product.

GROUP MANAGEMENT

For customers looking for a more flexible solution, one which enables central control over a group of light points, the choice will depend on existing infrastructure. These types of solutions require additional wiring (pilot line) or a dedicated power grid (mains dimming). However, if the necessary infrastructure is already in place, these solutions are very easy to install, providing immediate monitoring (subject to cabinet controller features) and control over groups of light points.

LineSwitch

Average energy savings

For conventional lighting systems, LineSwitch is a step-dim solution which enables users to dim (to a predefined level) groups of light points via dedicated pilot line wiring. A cabinet controller signals to the driver via the pilot line, and LineSwitch changes the light level for all the luminaires connected to that cabinet. When dimming via integrated Dynadimmer instead of the pilot line, LineSwitch can be used to override the Dynadimmer schedule whenever necessary (e.g. via central switch or presence detector).

Dimming via 1-10 V

Average energy savings

Philips Xitanium LED drivers and HF-Regulator fluo gear are equipped with 1-10 V dimming protocol. When connected to a central controller, the protocol can provide continuous dimming. The protocol can dim down to 10% of light output, delivering substantial energy savings during off-peak hours. Combined with a switch device unit (SDU), 1-10 V duplicates the dimming function of LineSwitch for cabinet control. It is also possible to combine 1-10 V products with a standalone Dynadimmer. When dimming via integrated Dynadimmer, 1-10 V can be used to override the Dynadimmer schedule whenever necessary (eg. via central switch or presence detector).

AmpDim

Average energy savings

Mains-based dimming on electromagnetic ballasts has been in use for over 15 years. By lowering the mains voltage, light output is reduced proportionally. The same benefit is now available in Philips electronic HID gear and LED drivers with the new AmpDim (amplitude dimming) functionality. A cabinet controller signals the driver to lower the light output via a reduction in the amplitude of the mains voltage. The driver interprets the lower amplitude as a signal to reduce the light levels. Unlike mains dimming for EM systems, AmpDim preserves the lifetime and reliability of the light source.

NETWORKED LIGHTPOINT CONTROL

Control via DALI

Average energy savings

Philips offers both eHID and LED drivers which can be connected to a variety of network control systems via **DALI**. DALI stands for Digital Addressable Lighting Interface, a global open standard communication protocol which defines commands for lighting components[4]. DALI creates two-way communication between each light point in the installation and the network node or controller of a Central Monitoring System (CMS). The system provides control over the lighting and monitors light source and driver status, and enables remote configuration and diagnostics.
All Philips LED and HID DALI-enabled drivers ensure a future-proof solution. In addition to DALI, these products offer a choice of dimming protocols. The lighting installation can deliver immediate energy savings with integrated Dynadimmer, and later upgrade to a telemanagement system which will provide detailed data on energy use, component status, lifetime and much more, all without replacing existing luminaires components.

CONTROL OVER LIGHT AT THE SOURCE

Light control means more than dimming the lights. In addition to the wide choice of dimming options, there are two features which enable control over light at the source. Philips now offers options for energy savings even if the light level remains fixed throughout the night.

Lifetime lumen management

Average energy savings

All light sources experience lumen depreciation - a reduction in light output over time. To ensure the minimum required light levels at lamp's end of life, most lighting designs are calculated based on the light level at end of the useful life (normally the L70 point: 70% of the initial lumens for LED). This means that the system consumes more power than necessary, wasting as much as 15% of energy on average during their lifetime. The **Constant Light Output** (CLO) functionality compensates for this light loss, ensuring that both LEDs and HID lamps will always deliver the necessary light level. By taking into account the lumen depreciation, the driver can be programmed to start at a dimmed level for a new luminaire and gradually increase power over the lifetime of the light source, saving energy and extending the lifetime of the system.

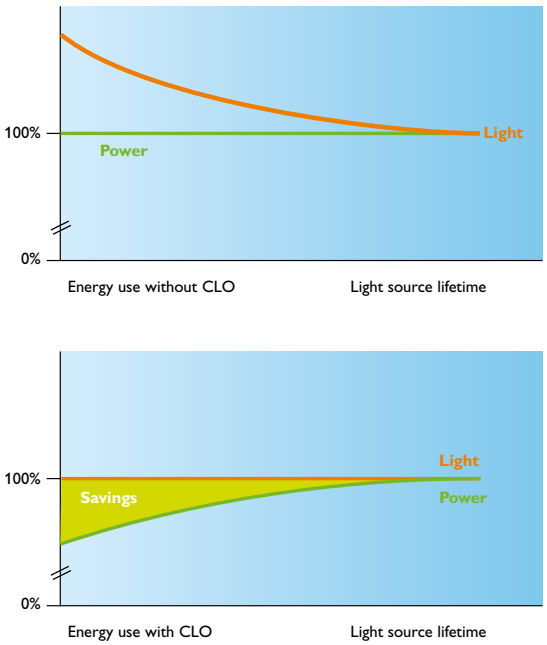

Figure 5 . Energy savings with Constant Light Output

Fine-tuning light level

Average energy savings 

When the light level requirement for a particular solution falls in-between the lumen packages delivered by standard lamp types, it is possible to customize the power level of the lamp with Adjustable Light Output (ALO). The ALO feature can be programmed to the desired light level, creating a virtual lamp with wattage in the range of 100% - 66% of the specified power[5]. For example, ALO can transform the popular CosmoPolis 45 W lamp into a CosmoPolis 30 W. Using the ALO feature prevents unnecessary light pollution, and can achieve a 25% reduction in energy use for conventional lamps.

For LED modules, these benefits can be realized via Adjustable Output Current (AOC)[6]. Driving the LED module at a lower current controls the lumen output of the LEDs.

[4] http://www.dali-ag.org/
[5] Using ALO impacts the dimming range.
[6] For more information on programming Xitanium LED drivers, please refer to the Design-in Guide.

HID lamp dimming characteristics

Light source	Power	Light	Min dim level		Color rendering index		Color temperature		Time to fade…	
		output	Power	Light	100%	Min dim	100%	Min dim	Down to dim	Up to 100%
	(W)	(lm)	(%)	(%)	(R_a)	(R_a)	(K)	(K)	(sec)	(sec)
CosmoPolis	45	4.725	66	55	72	60	2.800	2.800	82	6
	60	6.800	60	50	72	60	2.800	2.800	90	6
	90	10.450	60	50	62	60	2.800	2.800	90	6
	140	16.500	60	50	72	60	2.800	2.800	90	6
CDM Elite MW	210	22.100	60	50	90	80	3.000/4.000	> 3.000	90	6
	315		60	50	90	80	3.000/4.000	> 3.001	90	6
CDO	50	4.150	70	60	80	> 65	2.800	3.400	56	4
	70	7.500	70	60	80	> 65	2.800	3.400	56	4
	100	10.700	60	50	80	> 65	2.800	3.400	90	6
	150	16.500	60	50	80	> 65	2.800	3.400	90	6
	250	28.300	60	50	80	> 65	2.800	3.400	90	6
SON	50	4.400	60	50	20	< 10	2.000	< 2000	40	5
	70	6.600	40	35	20	< 10	2.000	< 2000	57	5
	100	10.700	35	20	20	< 10	2.000	< 2000	65	5
	150	18.000	35	20	20	< 10	2.000	< 2000	65	5
	250	33.300	35	20	20	< 10	2.000	< 2000	65	5

Product specifications

Light source	Product type	Lumi-Step	Integrated Dynadim-mer	Line-Switch	1-10 V	Amp-Dim	DALI	Constant Light Output	Adjustable Light Output	Adjustable Output Current
LEDs	Xitanium 75W 0.70A 1-10V 230V sXt				X					
	Xitanium 150W 0.35A 1-10V 230V sXt				X					
	Xitanium 150W 0.70A 1-10V 230V sXt				X					
	Xitanium 150W 1.05A 1-10V 230V sXt				X					
	Xitanium 75W .35/.41/.53A 1-10V 230V sXt				X					X
	Xitanium 75W .35/.41/.53A LS 230V sXt	X								X
	Xitanium 150W .35/.41/.53A 1-10V 230V sXt				X					X
	Xitanium 150W .35/.41/.53A LS 230V sXt	X								X
	Xitanium 75W 0.70A AOCM 1-10V GL-Y sXt				X					X
	Xitanium 40W 0.53A Prog+ GL-J sXt	X	X		X	X	X	X		X
	Xitanium 40W 0.7A Prog+ GL-J sXt	X	X		X	X	X	X		X
	Xitanium 75W 0.7A Prog+ GL-Z sXt	X	X		X	X	X	X		X
	Xitanium 75W 0.35-0.7A GL Prog sXt	X	X		X		X	X		X
	Xitanium 75W 0.35-0.7A GL Prog+ sXt	X	X		X	X	X	X		X
	Xitanium 75W 1.05A Prog+ GL-F sXt	X	X		X	X	X	X		X
	Xitanium 100W 0.53A Prog+ GL-Z sXt	X	X		X	X	X	X		X
	Xitanium 100W 0.70A Prog+ GL-Z sXt	X	X		X	X	X	X		X
	Xitanium 150W 0.20-0.35A Prog+ GL-H sXt	X	X		X	X	X	X		X
	Xitanium 150W 0.70A Prog+ 230-H sXt	X	X		X	X	X	X		X
	Xitanium 150W 0.35-0.7A GL Prog sXt	X	X		X		X	X		X
	Xitanium 150W 0.35-0.7A GL Prog+ sXt	X	X		X	X	X	X		X
	Xitanium 150W 1.05A Prog+ GL-F sXt	X	X		X	X	X	X		X
Cosmo-Polis	DynaVision LumiStep Xtreme 45W to 140W	X								
	DynaVision Prog Xtreme 45W to 140W		X	X		X	X	X	X	
CDM	DynaVision Prog Xtreme 210W CDM		X	X		X	X	X	X	
CDO	DynaVision Prog Xtreme 50W to 250W		X	X		X	X	X	X	
SON	DynaVision Prog Xtreme 50W to 250W		X	X		X	X	X	X	

Ordering & packing data: Standalone Controls

Product name	GPC	Ordering code (EOC)	Box quantity
LLC7210/00 Controller Dynadimmer 1-10V	9137 003 34303	8727900 854701 00	48
LLC7220/00 Dynadimmer 1-10V SELV	9137 003 38503	8727900 881387 00	48
KIT7210/00 Dynadimmer Programming Kit	9137 003 34703	8711500 998095 00	1
LCC7210/00 Dynadimmer USB PC Cable	9137 003 34603	8727900 900576 00	25
SDU 01/H 220-240V	9137 006 37066	8711500 880802 00	20
SDU 01/L 220-240V	9137 006 37166	8711500 880819 00	20

Ordering & packing data: Integrated Controls

Light Source	Product name	GPC	Ordering code (EOC)	Box quantity
LEDs	Xitanium 75W 0.70A 1-10V 230V sXt	929000705503	871829115061900	10
	Xitanium 150W 0.35A 1-10V 230V sXt	913701218202	872790092882200	10
	Xitanium 150W 0.70A 1-10V 230V sXt	913701211603	871829115008400	10
	Xitanium 150W 1.05A 1-10V 230V sXt	929000704712	871829112343900	10
	Xitanium 75W .35/.41/.53A 1-10V 230V sXt	913701215002	872790092491600	10
	Xitanium 75W .35/.41/.53A LS 230V sXt	913701215102	872790092492300	10
	Xitanium 150W .35/.41/.53A 1-10V 230V sXt	913701215302	872790092493000	10
	Xitanium 150W .35/.41/.53A LS 230V sXt	913701215402	872790092494700	10
	Xitanium 75W 0.70A AOCM 1-10V GL-Y sXt	929000708003	871829122053400	10
	Xitanium 40W 0.53A Prog+ GL-J sXt	929000710303	871829124505600	12
	Xitanium 40W 0.7A Prog+ GL-J sXt	929000708803	871829124503200	12
	Xitanium 75W 0.7A Prog+ GL-Z sXt	929000710103	871829124515500	12
	Xitanium 75W 0.35-0.7A GL Prog sXt	929000702302	871829111887900	10
	Xitanium 75W 0.35-0.7A GL Prog+ sXt	929000704903	871829114995800	10
	Xitanium 75W 1.05A Prog+ GL-F sXt	929000708903	871829121200300	10
	Xitanium 100W 0.53A Prog+ GL-Z sXt	929000710403	871829124517900	12
	Xitanium 100W 0.70A Prog+ GL-Z sXt	929000708703	871829124519300	12
	Xitanium 150W 0.20-0.35A Prog+ GL-H sXt	929000707503	871829118368600	6
	Xitanium 150W 0.70A Prog+ 230-H sXt	929000710503	871829123045800	6
	Xitanium 150W 0.35-0.7A GL Prog sXt	929000702202	872790078351300	10
	Xitanium 150W 0.35-0.7A GL Prog+ sXt	929000705103	871829114996500	10
	Xitanium 150W 1.05A Prog+ GL-F sXt	929000709003	871829121198300	10
CosmoPolis	DV LS8 Q can Xt 45 CPO	913700691266	871829166898500	12
	DV LS8 Q can Xt 60 CPO	913700691366	871829166900500	12
	DV LS8 Q can Xt 90 CPO	913700691466	871829166902900	12
	DV LS8 Q can Xt 140 CPO	913700691566	871829166904300	12
	DV LS6 Q can Xt 45 CPO	913700691666	871829166906700	12
	DV LS6 Q can Xt 60 CPO	913700691766	871829166908100	12
	DV LS6 Q can Xt 90 CPO	913700691866	871829166910400	12
	DV LS6 Q can Xt 140 CPO	913700691966	871829166912800	12
	DV Prog Q can Xt 45 CPO	913700692866	871829166914200	12
	DV Prog Q can Xt 60 CPO	913700685766	871829124149200	12
	DV Prog Q can Xt 90 CPO	913700685866	871829124151500	12
	DV Prog Q can Xt 140 CPO	913700685966	871829124153900	12
CDM Elite MW	DynaVision Prog Xt 210 CDM	9137 006 76966	871829122269900	6
CDO	DV Prog Q can Xt 50 CDO	913700692966	871829166916600	12
	DV Prog Q can Xt 70 CDO	913700693066	871829166918000	12
	DV Prog Q can Xt 100 CDO	913700693166	871829166920300	12
	DV Prog Q can Xt 150 CDO	913700693266	871829166922700	12
SON	DynaVision Prog Xt 250 SON	9137 006 76766	8718291 219910 00	6
	DV Prog Q can Xt 50 SON	913700693366	871829166924100	12
	DV Prog Q can Xt 70 SON	913700693466	871829166926500	12
	DV Prog Q can Xt 100 SON	913700693566	871829166928900	12
	DV Prog Q can Xt 150 SON	913700693666	871829166930200	12
	DynaVision Prog Xt 250 SON	913700676766	871829112738300	6

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Date of release: April 2013

Printed in the Netherlands