

# Lighting Tools Exterior

Chapter 8  
Lighting management



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**Siteco® Light Control (SLC)**

Luminaire controller for mast installation  
Page 8.6



Luminaire controller for luminaire installation  
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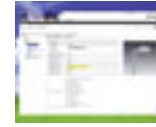
Luminaire controller for luminaire  
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Communication module  
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Light sensor  
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Software  
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**Siteco® Servicebox**

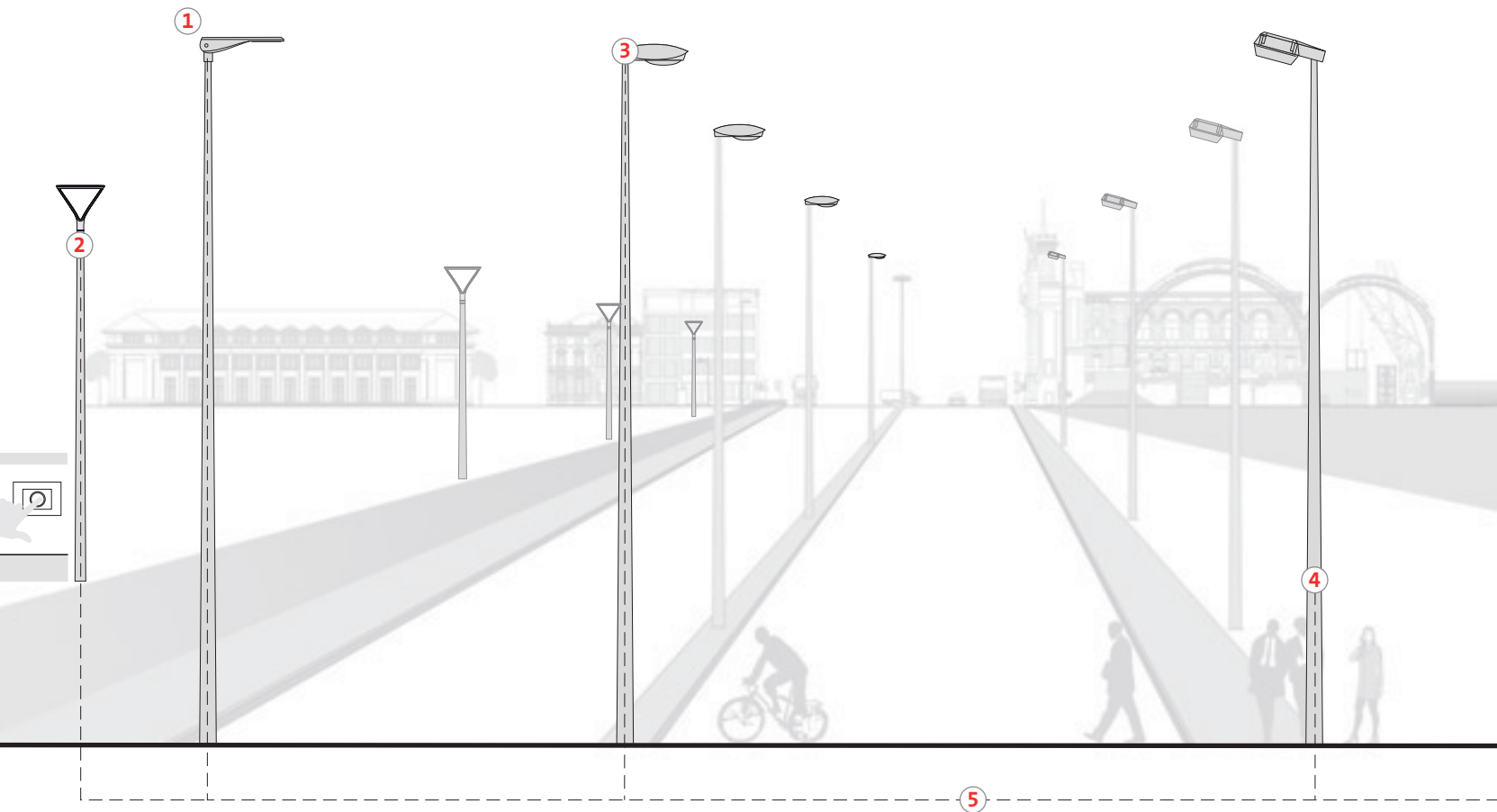
Siteco® Servicebox  
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**Functional packages for Siteco LED Outdoor Luminaires**

Functional packages  
Page 8.14





**5 PowerLine**

PowerLine uses the 230V supply cable between luminaire controller and communication module as the transmission medium. Additional control wires are not required.

**1 – 4 Luminaire controller**

The luminaire controller is available in two designs: for installation in luminaires or for mounting to masts. Both are ideal for either retrofitting existing systems or for new systems. Thanks to modular design they can be adapted to nearly all customer requirements. The luminaire controller can switch luminaires and reduce luminous flux for power reduction to any levels. It also measures supply voltage, current, power factor, wattage, operating hours and energy consumption.

**1 Luminaire with Premium functional package**

Luminaire designed for use with Siteco® Light Control; the luminaire controller is already integrated. The complete functional spectrum for operation and monitoring of the luminaire can be used.

**2 Luminaire with Plus functional package**

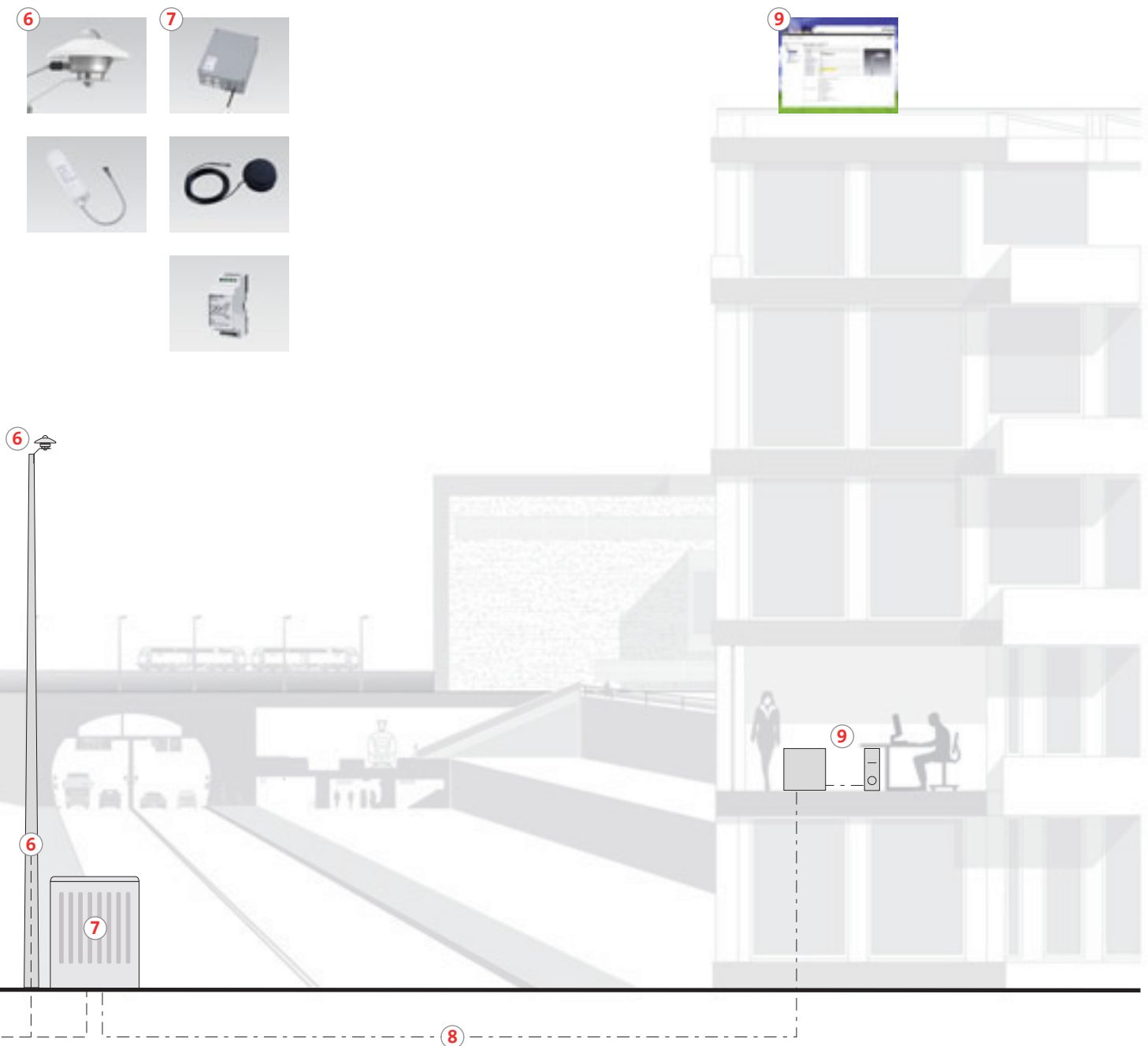
This becomes a Premium variant luminaire by upgrading a luminaire controller.

**3 – 4 Luminaire with dimmable ECG**

By upgrading a luminaire controller, the luminaire can be prepared for integration into the SLC management system. In this way all SLC functions for control and monitoring become available. This is only limited by lamp manufacturer specifications (e.g. dimming range of conventional lamps).

**3 – 4 Luminaire with LLCG**

With the same luminaire controller (as the luminaire with dimmable ECG) the luminaire with magnetic ballast can be integrated into the SLC management system. The luminaire controller for installation in masts operates as a conventional ripple control receiver or as a PowerLine device, and can switch the luminaire and control the reducing relay.



### 8 Transmission To server

Transmission from the communication module to the server and back is on the IP level via GMS/GPRS modem. Further transmission paths such as ethernet or optical waveguide are possible.

### 6 External light sensor

Detects illuminance in the range of 1...150000 lx (0...2000W/m<sup>2</sup>). Luminaires can be switched directly via the sensor coupler according to freely definable hysteresis values, or the variable measurement value made available via PowerLine for central or decentral evaluation, or suitable devices be controlled directly.

### 7 Communication module

The communications module integrated within the switch cabinet

- controls the luminaire controller
- collects information from the luminaires and
- directs this to the central server

Phase coupler for 3-phase coupling of PowerLine signal.  
Antenna for improving GSM/GPRS signal.

### 9 Central server and user software

The central server saves information and makes this data available for further use. The user software is for configuration and for monitoring the lighting system.

## Siteco® Light Control (SLC)

The innovative Siteco® Light Control (SLC) management system can control and monitor outdoor lighting systems individually and according to requirements. The system improves traffic safety, and also reduces energy consumption, light pollution and operating costs.

Siteco Light Control is based upon PowerLine technology with which existing and new lighting systems can be expanded to become communication data networks, without the need for installing additional control cables.

Via remote monitoring, the condition of each luminaire can be tested at any time, luminaire failures can be precisely located and logging of consumption data and error analysis is possible anytime. Feedback messages enable optimisation of maintenance processes.

The luminaire controller enables all luminaires that are not accordingly equipped to be upgraded and integrated into the Siteco® Light Control management system. The luminaire controller is suitable for luminaires with ECG, with dimmable ECG (1...10V or DALI), luminaires with magnetic ballast and luminaires with reducing relay. This opens up new chances for energy saving and reduction of operating costs. For example by flexible dimming of the lighting, for example when more light than normal is required for places where accidents have occurred or with bad weather conditions, but also with moonlit nights and low traffic densities when less light is needed.

With the use of open, standardised interfaces and protocols, Siteco® Light Control offers maximum compatibility and investment security.

This makes SLC especially suitable for the subsequent, successive retrofitting of existing lighting systems. Maximum benefit is achieved from the first minute in new, completely implemented installations.

### Convenient, expandable, future-proof: The system and its components

#### Successive upgrading or complete entry

Do the benefits for use of intelligent lighting control with Siteco® Control sound convincing? In that case you can already lay the foundation for starting with the new technology.

According to investment capacity or concrete budget planning, various models are possible for the future-proof replacement or upgrading of your outdoor lighting installation.

#### First model: successively creating the basis

With the breakdown of defect ripple control receivers you must invest anyway. The best solution is to go with an intelligent product. With the exchanging of defective devices for Siteco® Light Control luminaire controllers you successively create the basis for system transformation.

Until the upgrading of the system, the luminaire controllers for most installation function as normal ripple control receivers. The upgrade to PowerLine control devices can follow at the same time or at a later date.

#### Second Model: correct switching with a new installation.

With the planning and design of new lighting installations you are confronted with a decision: with which control components should the installation be fitted? With the decision for Siteco® Light Control luminaire controllers and communication modules you'll be making the right choice. With this local network you create the conditions for upgrading to intelligent lighting control with Siteco® Light Control.

**Third Model: using all advantages right away**

To immediately make use of all advantages that intelligent lighting control can offer, install the complete system. The following procedures are required:

1. Equipping of the light points with PowerLine compatible luminaire controllers and dimmable ECGs.
2. Deploying an infrastructure with communication modules
3. Establishing an IT structure within the administration (software, central server, training etc.)

**The investment in complete equipping will definitely pay off. Only with the fully implemented system is it today possible to achieve targets such as reduction of energy, light immission, CO<sup>2</sup> output and operating costs.**

**The integration of additional services**

Until now only the use of intelligent lighting management has been discussed. For the transfer of data, Siteco® Light Control uses open and standardised interfaces and protocols, beginning with the 1...10V interface or DALI between luminaire controller and ballast, LONWorks® between luminaire controller and communication module and XML/SOAP between communication module and the central server and PC. But because it uses open standard protocols, Siteco® Light Control can integrate a range of further applications.

**Siteco® Light Control – the most important facts at a glance**

for 230V/50Hz mains voltage

**Control function:**

- luminaire switching
- dimming of suitable luminaires and light sources
- processing of signals from various information sources such as light sensors or external signal sources such as relay contacts, SPS control etc.
- integrated time switching programme, integrated calendar
- twilight-controlled switching and dimming via light sensor
- processing of measurement values of up to 10 decentrally installed light sensors
- luminous flux tracking, compensating for luminous flux degradation with ageing of luminaires

**Monitoring function – Measurement and feedback for:**

- current
- voltage
- power factor
- wattage
- energy consumption
- operating hours
- status of luminaire
- automated alarm messages via SMS or mail when individual threshold values are exceeded or fallen below
- data export to other IT systems

**Data transmission:**

Communication via PowerLine. Data transmission is via open and standardised interfaces and protocols. This makes SLC open for future integration of further applications such as:

- monitoring of traffic lights
- automatic counting of traffic
- control of parking ticket machines and traffic control according to availability of free parking spaces

LONMARK® certified



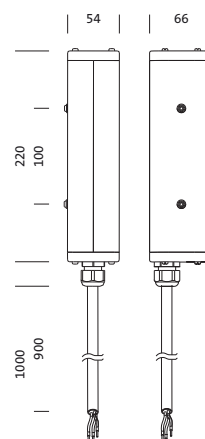
**Siteco® Light Control luminaire controller | for mast recessing**

Siteco® Light Control luminaire controller for installation in mast | for connection of luminaires with ECG DALI, dimmable ECG (1..10V) or magnetic ballast and luminaires with reducing relay; control of luminaire controller according to version via LON PowerLine or ripple control technology\*; with pre-assembled cable for connection at cable junction box | plastic housing, grey

Protection rating: IP54  
 Insulation class: II  
 Power consumption with transmission operation: S= 6.7VA  
 Standby power consumption: S= 1VA  
 Surge voltage strength: 6KV  
 Switching capacity: P<sub>max</sub>= 400W

\* for factory-set programming for control via ripple control technology, additional information regarding protocol, pulse code and frequency used by customer is required

IP 54



Article	Wt. (kg)	Order No.
luminaire controller, ripple control protocol, recessed in mast	0.2	5EA3CRE
luminaire controller, LON Powerline and ripple control protocol, recessed in mast	0.6	5EA3CLE
luminaire controller, LON Powerline protocol, recessed in mast	1.0	5EA3CUE

- please order mounting bracket separately if required  
 - please order additional SLC lighting management components separately if required  
 Accessories (for details see page 8.11)

Article	Wt. (kg)	Order No.
mounting bracket, recessed in mast or to the mounting rail	0.2	5EA0Y00B01

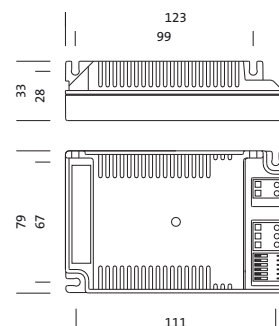


**Siteco® Light Control luminaire controller | for installation in luminaire**

Siteco® Light Control luminaire controller for installation in luminaire | for connection of luminaires with ECG DALI, dimmable ECG (1..10V), ECG or magnetic ballast and luminaires with reducing relay; control of luminaire controller via LON PowerLine; with connection terminals | plastic housing, white

Protection rating: IP20 (IP65 with supplementary housing)  
 Insulation class: II  
 Power consumption with transmission operation: S= 6.7VA  
 Standby power consumption: S= 1VA  
 Surge voltage strength: U = 6KV  
 Switching capacity: P<sub>max</sub>= 150W

IP 20



Article	Wt. (kg)	Order No.
luminaire controller, LON Powerline protocol, recessed in the luminaire	0.4	5EA2CUE

- please order inductivity for absorption with ECG luminaires separately if required  
 - please order empty housing separately if required  
 - please order additional SLC lighting management components separately if required

Accessories (for details see page 8.11)

Article	Wt. (kg)	Order No.
inductor, recessed in the luminaire	1.0	5EA2Y00K04
housing	0.3	5EA6Y00G01



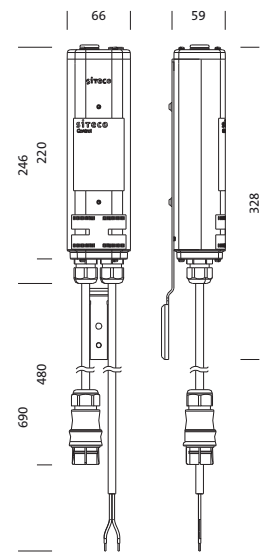
### Siteco® Light Control luminaire controller for DL®10 or DL®20 luminaire | for mast recessing

Siteco® Light Control luminaire controller for installation in mast | for connection of luminaire DL®10 and DL®20 | control of luminaire controller via LON PowerLine; with pre-assembled cables for connection at cable junction box and at the luminaire ECG | plastic housing, white

Protection rating: IP54  
 Insulation class: II  
 Power consumption with transmission operation: S= 6.7VA  
 Standby power consumption: S= 1VA  
 Surge voltage strength: U = 6KV

IP 54  

Article	Wt. (kg)	Order No.
luminaire controller, LON Powerline protocol, recessed in mast	0.2	5EA3CUD101



### Siteco® Light Control communications module | for wall mounting

Siteco® Light Control communication module for wall surface-mounting | as link between luminaire controller and central management software | connection to luminaires via LON PowerLine, to control centre via XML/SOAP, and according to version via GSM/GPRS modem, optical waveguide connection or RJ45 ethernet | aluminium housing, silver grey (RAL 7001)

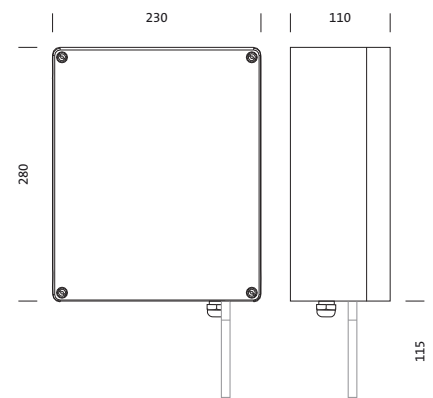
Protection rating: IP65  
 Insulation class: I  
 Power consumption with transmission operation: S= 12VA  
 Standby power consumption: S= 7VA  
 Surge voltage strength: 6KV

IP 65  

Article	Wt. (kg)	Order No.
communication unit, GSM/GPRS-Modem	4.4	5EA1BUM
communication unit, CAT5/RJ-45	4.4	5EA1BUF
communication unit, fiber optic Single-Mode-modem	4.4	5EA1BUG1
communication unit, fiber optic Multi-Mode-modem	4.4	5EA1BUG2

Accessories (for details see page 8.11)

Article	Wt. (kg)	Order No.
phase coupler	0.1	5EA5Y00K01
antenna with coaxial cable, approx. 3m, pre-assembled	0.1	5EA5Y00K03
cut of relay	0.1	5EA5Y00S01





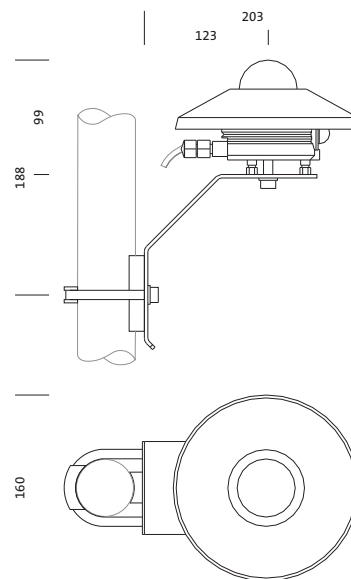
**Siteco® Light Control light sensor | for mast or wall mounting**

Siteco® Light Control light sensor for mast or wall surface-mounting | for connection to light sensor coupler | light sensor detects the daylight and supplies variable measurement value to the sensor coupler | aluminium housing with PC cover, white; mounting bracket and mast clamp of galvanised steel; sensor unit cover of glass

Protection rating: IP65  
 Insulation class: II  
 Measurement range: 1..150klx (0..2000W/m²)

(incl. connection cable with UV-resistant insulation, l=10m; cable pluggable at both ends)

IP 65  



Article	Wt. (kg)	Order No.
<b>light sensor, surface-mounted to mast, to the wall</b>	1.0	<b>5EA1FSE01</b>

- please order light sensor coupler separately

Mandatory accessories (for details see page 8.9)

Article	Wt. (kg)	Order No.
<b>sensor coupler, LON Powerline protocol, recessed in mast</b>	1.0	<b>5EA3CUE102</b>





### Siteco® Light Control light sensor coupler | for mast recessing

Siteco® Light Control light sensor coupler for installation in mast | for connection of light sensor (LonWorks® PowerLine) | switching of luminaires according to freely defined hysteresis values or forwarding of the variable measurement value for central or decentral evaluation | bidirectional data exchange of sensor coupler via LON PowerLine; with pre-assembled cable for connection at cable junction box | plastic housing, grey

Protection rating: IP54

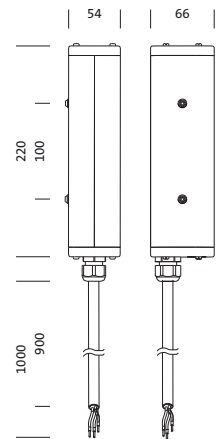
Insulation class: II

Power consumption with transmission operation: S= 6.7VA

Standby power consumption: S= 1VA

Surge voltage strength: U = 6KV

IP 54  



Article	Wt. (kg)	Order No.
sensor coupler, LON Powerline protocol, recessed in mast	1.0	5EA3CUE102

- please order light sensor separately
- please order mounting bracket separately if required
- please order additional SLC lighting management components separately if required

Mandatory accessories (for details see page 8.11)

Article	Wt. (kg)	Order No.
mounting bracket, recessed in mast or to the mounting rail	0.2	5EA0Y00B01





#### Siteco® Light Control software | for control and monitoring of light points

Siteco® Light Control management software | for control and monitoring of light points: definition of luminaires and luminaire groups; storage of switching profiles (such as switching times and dimming values); setting of alarm rules for monitoring and messaging | graphic visualisation of complete system: electronic documentation; integration of static maps | Data export: CSV file.; interface to lux data; import of master data from SAP

#### System requirements:

Microsoft XP/2003 server | Linux  
Language: German | English

Article	Wt. (kg)	Order No.
software	1.0	5EA055



## Luminaire controller accessories

### Inductivity to luminaire controller for installation in luminaire (not shown)

for absorption of interference transmitted by ECG; for improving PowerLine wanted signal | housing of PC, cast | installation in luminaire, M8 threaded bolt | protection rating: IP 20

Type

Inductivity

Order No.

5EA2Y00K04



### Supplementary housing to luminaire controller, for luminaire installation

housing for separate mounting of luminaire controller if neither mast nor luminaire installation is possible | housing of PC, grey | 2 x screw fastening for protection rating IP65

Type

Housing

Order No.

5EA6Y00G01

### Mounting bracket for luminaire controller, for installation in mast (not shown)

for installing luminaire controller to C-rail in mast | galvanised sheet steel

Type

Mounting bracket

Order No.

5EA0Y00B01

## Communication module accessories



### Antenna

external antenna for improving transmission and reception quality of communication module with GSM/GPRS modem (5EA1BUM) | incl. pre-assembled connection cable, l = 3m, plug for connection to antenna input | plastic housing, black | outdoor installation | transmitting power: max 10W | gain: 1.0 dB, GSM frequencies: 900MHz | 1800MHz

Type

Supplementary antenna

Order No.

5EA5Y00K03



### Cutoff relay

for detection of external 230V control signals (e.g. twilight switch) via the communication module | with 2 changeover contacts | for installation in distribution box, recess depth 1.5  
Protection rating: IP 20  
Contact load:  
min. 1mA/1V DC | max. 7A

Type

Cutoff relay

Order No.

5EA5Y00S01



### Phase coupler

for 3-phase coupling of PowerLine wanted signal in the 230 V mains | for increasing capacitive coupling between 3 phase conductors; for minimising signal absorption during transmission | galvanically separated coupling in/coupling out of wanted signal | for installation in distribution box, recess depth 2  
Protection rating: IP 20 | insulation class: I

Type

Phase coupler

Order No.

5EA5Y00K01

## Siteco® Servicebox

The Siteco® Servicebox enables parameterisation of the LED operating electronics to be carried out for all Siteco LED road luminaires with the Plus functional package. Lighting levels can be set for flexible parameterisation of luminous flux, and also reduction values of the two-step, time-dependent luminous flux control and up to 4 times for luminous flux control. The switching logic for power reduction with the 230V control signal can also be reversed.

Integration of the Siteco® Servicebox in the luminaire cable is implemented with mounted luminaire directly at the cable junction box in the mast via a Y connection cable, or beforehand with the unmounted luminaire. The values for the corresponding luminaire can be individually defined and stored in the luminaire.

The previously set values of a luminaire can be transferred to the Siteco® Servicebox as a single parameter file. These data can then be transferred at a later time to further luminaires of the same type, ensuring rapid, uniform setting of all LED luminaire heads of a road section.

These settings can be carried out even more quickly and simply with the control software on a PC to be transferred as a complete parameter file via USB to the Siteco® Servicebox. Connected to the interface in the luminaire, these parameters can be completely transferred by the Siteco® Servicebox to the operating electronics of the luminaire.

- + a single parameterising tool for all Siteco LED road luminaires with Plus functional package
- + weather-resistant applications thanks to high protection rating
- + luminaire parameterisation is possible by installer without special system knowledge
- + setting of luminaire parameters either at mounted luminaire or in the workshop
- + quick, economic modification of luminaire parameters by connecting the Siteco® Servicebox via mast doors
- + copy function: parameters of a luminaire can be simply and rapidly transferred to further luminaires
- + reading out of luminaire operating data and parameters, data management with PC



### Housing

Plastic housing, black; plug-in coupling with protection cap | IP54 protection rating

### Electrics

Siteco® Servicebox with plug-in coupling and Y-cable (cable set for looping in of Siteco® Servicebox into the luminaire cable at mast doors or in workshop) | with mounted luminaire: luminaire cable with corresponding plug-in coupling required ('mast cable set') | Siteco® Servicebox with mini-USB for connection to PC



### Siteco® Servicebox | for LED road luminaires with Plus functional package

Siteco® Service Box for parameterising the operating electronics of all Siteco LED road luminaires of the 'Plus' version | maximum energy efficiency via individual adaptation of lighting level, switching time and reduction level | setting of static colours and dynamic colour sequences\* with corresponding luminaires

Protection rating: IP54

Insulation class: II

(incl. software | incl. Y-cable for looping the Service Box into luminaire supply cable | incl. mini-USB interface for connection to PC)

\* software included in Service Box, updates possible via PC | adoption of complete colour sequences and software updates via USB interface

IP 54  

Article

Wt. (kg)

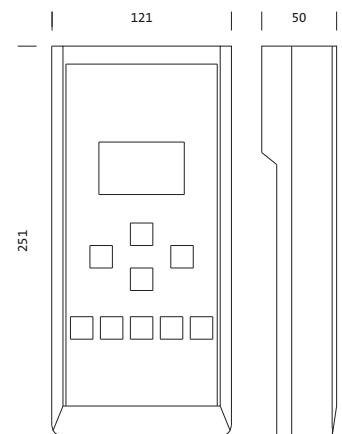
Order No.

Siteco® Servicebox, for Plus version

2.4

5EA6TEF01

- for parameterising of mounted luminaires: luminaire cable with corresponding plug-in coupling required ('mast cable set')



### Siteco® Architainment Suite

The Siteco® Architainment Suite software enables you to simply and conveniently modify settings for DL® 10 luminaires on a PC and create 3 dynamic colour sequences each with up to 100 single or bi-colour images (scenes).

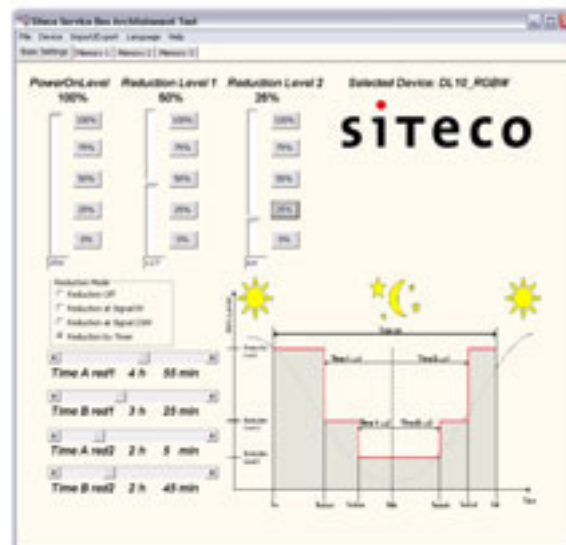
The settings can be loaded to the Siteco® Servicebox via USB and subsequently transferred from this to the DL® 10 luminaire on-site. Settings read out from the luminaire can be modified according to needs and conveniently read back into one or several luminaires.

The Siteco® Architainment Suite is supplied as an executable programme; installation on the computer is not required.

The software is installed on every Siteco® Servicebox or can be downloaded for free via the following link:

[www.siteco.de](http://www.siteco.de) → Service → Download → Software → PC-Tools → Architainment Suite

Siteco® Architainment Suite has been tested for the following operating systems: Windows XP, Vista.



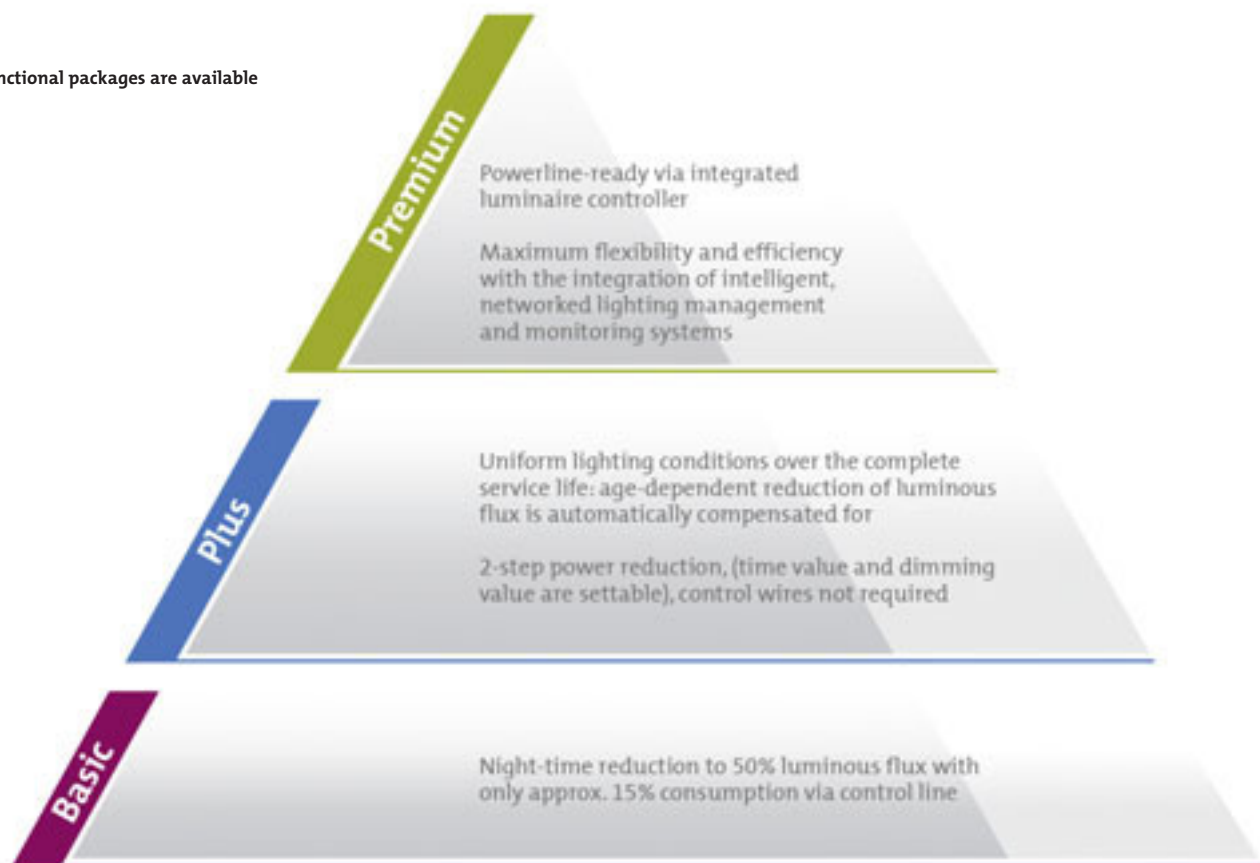
# Functional packages for Siteco LED Outdoor Luminaires

Intelligent control functions are a part of all Siteco LED outdoor luminaires. With such intelligence integrated into the LED operating electronics, the efficiency potential of LEDs can be optimally exploited. The control functions make use of the outstanding feature of LED light sources to reduce luminous flux without loss in order to maximise energy and cost savings. The control functions of Siteco LED outdoor luminaires are summarised in three different functional packages: Basic,

Plus and Premium. The values for luminous flux are either factory-set (Basic package), can be individually set with the Siteco Service Box (Plus package) or centrally set via Siteco® Light Control (Premium package).

The Plus and Premium versions offer the widest spectrum of efficient control of LED luminaires according to requirements.

Three functional packages are available



**Basic functional package**

Power reduction, overheat protection

The advantages:

- wired luminous flux reduction (twilight switching)
- two factory-set luminous flux levels (100%/50%)

**Plus functional package**

Power reduction, overheat protection, constant luminous flux control, flexible luminous flux parameterisation, time-dependent luminous flux control, digital communication interface

The advantages:

- precise parameterisation of the luminaire to the ambient conditions or application is possible
- additional functions for optimising light points can be set
- configured via the Siteco® Servicebox
- no additional control components required

**Premium functional package**

Power reduction, overheat protection, constant luminous flux control, flexible luminous flux parameterisation, time-dependent luminous flux control, Siteco® Light Control

The advantage:

- control and automatic monitoring of each light point possible from a central control point
- no additional cabling or control wires required
- reduction of maintenance paths and costs
- improved safety via adaptation of lighting according to specific traffic situations



### Power reduction

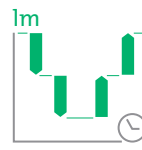
All Siteco LED luminaires are equipped with an intelligent connection for detection of power reduction via a switched control wire (230V).

Factory setting with power reduction via control wire:

Control voltage = 230V → 100% luminous flux

Control voltage = 0V → 50% luminous flux (twilight switching).

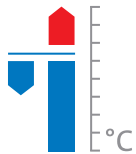
The switching logic can be reversed by the Siteco® Servicebox with the Plus version. If no control wire exists the luminaire emits 100% luminous flux (connection remains free).



### Time-dependent luminous flux control

Siteco LED outdoor luminaires with the Plus functional package allow reducing the light and therefore energy consumption automatically and without external control components in the late evening hours.

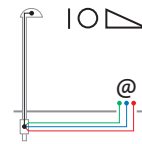
Based on the nominal burning period of the previous five days the luminaire calculates an artificial (virtual) midnight. On the basis of this midnight value, time windows can be defined in which the luminaire is reduced in one or two steps to freely settable lighting levels. Because of the constant internal updating of the nocturnal burning hours the luminaire adapts automatically to the seasonally varied burning durations.



### Overheat protection

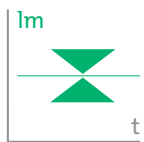
The temperature of the LED module and operating electronics is permanently monitored. With excessive temperature the lighting level and consumption is automatically reduced and the luminaire can cool down.

When a lower temperature threshold is attained the luminaire returns to the original lighting and consumption level. This function is purely a protective function to secure the long service life despite possible operating errors (e.g. unintended daytime switching with very high ambient temperatures or with direct sunlight). During operation within the predefined specifications, luminaire temperatures remain safe.



### Digital communication interface

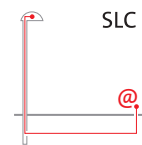
This function represents the interface between the luminaire and the external world. It enables all required parameters such as lighting level, reduction control via control wire and automatic night-time reduction to be modified according to needs via the Siteco® Servicebox. Connection to higher-level control systems is also via this interface (on request).



### Constant luminous flux control

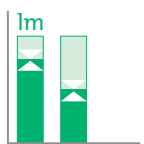
All light sources, including LEDs, are subject to luminous flux degradation with the progression of the service life. This must be taken into account in the planning phase and the system must be correspondingly over-planned. This leads to excessive illuminance and energy waste.

The Siteco constant luminous flux control counteracts this degradation, and continuously adds to the output of the LEDs. Luminous flux remains constant over the service life. The light source degradation factor is 1, the maintenance factor is increased. In this way, over-planning is no longer necessary. This means energy-optimised and standard-compliant lighting is available at all times.



### Siteco® Light Control

Connection to Siteco® Light Control enables connecting luminaires to our modern, future-fit control system. Without additional cabling, each light point can be individually triggered from a central control point and controlled and monitored according to needs and with maximum flexibility and energy efficiency. Data transmission is via the existing power network via a standard LON protocol. By integrating additional sensors the system can also be expanded according to requirements. Consumption values are recorded and logged, and any luminaire faults are registered automatically via e-mail or SMS. Maintenance plans can be set up as desired and maintenance trips optimised.



### Flexible luminous flux parameterisation

By the binding to fixed wattages with conventional lamps (e.g. 70 W, 100 W, 150 W) only in rare cases is the calculated result of a lighting installation achieved. The next higher wattage must be specified, the system is overlit, energy is wasted.

With flexible luminous flux setting the light level can be adapted individually and precisely to the calculated result. Both the activation value and reduction value (twilight switching) can be adapted according to requirements.



You can find detailed information about Siteco® Light Control from page 2