LUX METER

iLUX
WITH A
POWERLINE INTERFACE

Developed for the purpose of street lighting and lighting in proximity to buildings, this controller/ sensor unit, which features standardised powerline communication, permits control of lighting systems using a lighting-level sensor that is triggered by atmospheric conditions. Individually programmable and updateable, iLUX fulfils all tasks of a modern light management system and is thus an extremely safe investment. The broad measuring range of the light sensor just as its special design and isolation from the communication unit are all responsible for the unit's impressive degree of accuracy. The sensor is pre-calibrated for delivery and, thanks to its digital interface, enables access to measured values in a range from 0 to 64 kLux.

Depending on the measured lux values, the user then controls outdoor lighting via the measured values in digital form, to which end network variables in accordance with Lonmark® are used. Information can be transferred throughout the street lighting network so that different requirements can be met to suit the specific type of street.

Technical Details:

- Standby power consumption < 1.0 W.
- Interoperable controller with network variables in acc. with Lonmark® guidelines.
- Powerline communication: C/B band in acc. with Cenelec 50065-1
- ANSI CEA 709.1, 709.2 or EN 14908-1, EN 14908-2.
- Configurable and updateable.
- Suitable for integration into a light management system just as for standalone operation.
- Intuitive software-led configuration.
- Simple configuration transfer via a powerline interface

Typical Applications:

- Street lighting, lighting in proximity to buildings
- Lighting for pedestrian crossings, in parks, just as on main roads and side streets
- Car parks, bus stops and stations
- Company premises, warehouses, sports facilities

iLUX – Intelligent Lux Meter with a Powerline Interface

Technical Details

intelligent Lux Meter	**186253**
Type	iLUX
Input voltage	200 V AC to 250 V AC
Frequency	50 Hz (+1% / –2%)
Power consumption	< 1,0 W
Communication	
Communication type	using the power supply (powerline), in acc. with Cenelec 50065-1
C band	primary Band 125 – 135 kHz
B band	secondary Band 95 – 115 kHz
Data transfer USA	ANSI CEA 709.1, ANSI CEA 709.2
Data transfer Europe	EN 14908-1, EN 14908-2
Slot	Digital interface for communicating with the light sensor
Output	
Switched output	2x for connecting luminaires or power-reduction relays
Switched current	In total 4A, $\lambda = 0,8$
Switching cycles	50.000, function (4A, $\lambda = 0,8$)
Generally programmable	Yes
Generally configurable	Yes
Switched output luminaire	2 x for connecting a luminaire
Controller terminal	1,5 mm² 900 mm
Conductor type	fine-stranded with wire end sleeves
Firmware update	via powerline
Configuration	via powerline
Control and monitoring parameters	Switch on/off
Capture of measured data	Lux
Software interface	Interoperable in acc. with Lonmark®. Use of network variables and configuration parameters, repeat function
Software interface	based on Lonmark®-Variablen
Measured value	LNS® as well as repeat-capable network integration
SNVT_Lux	0 to 64 kLux, made available for decentralised evaluation
SNVT_switch	direct control of LonWorks® devices
Connection sensor	electrically isolated from the evaluation unit
Sensor	
Accuracy	Cos error between 0 and 80 ° < 8%
F1 error	< 9 %
Non-linearity	< 9 %
Temperature dependency	< 0,1 % / °C
Long-term stability	(1 year): <|±3| %
Temperature influence	< 0,1 % / °C
Sensitivity	1 Lux to 150 kLux
Sensor detection range	corresponds to 0 to 2000 W/m²
Solid angle	2 π sr
Connection cable	UV-resistant cable, connectable at both ends, 10 m in length
Casing iPC-Lux	
Material	Polycarbonate (PC) casing
Dimensions (LxWxH)	250 mm x 60 mm x 55 mm
Weight	460 g
Degree of protection	IP54
Operating temperature range	– 25 °C to + 80 °C
Storage temperature range	– 25 °C to + 85 °C
Humidity	90 % non-condensing

The values detailed in this data sheet can change due to technical innovations; such changes will be made without separate notification.
Further detailed information can be found at: www.vossloh-schwabe.com.

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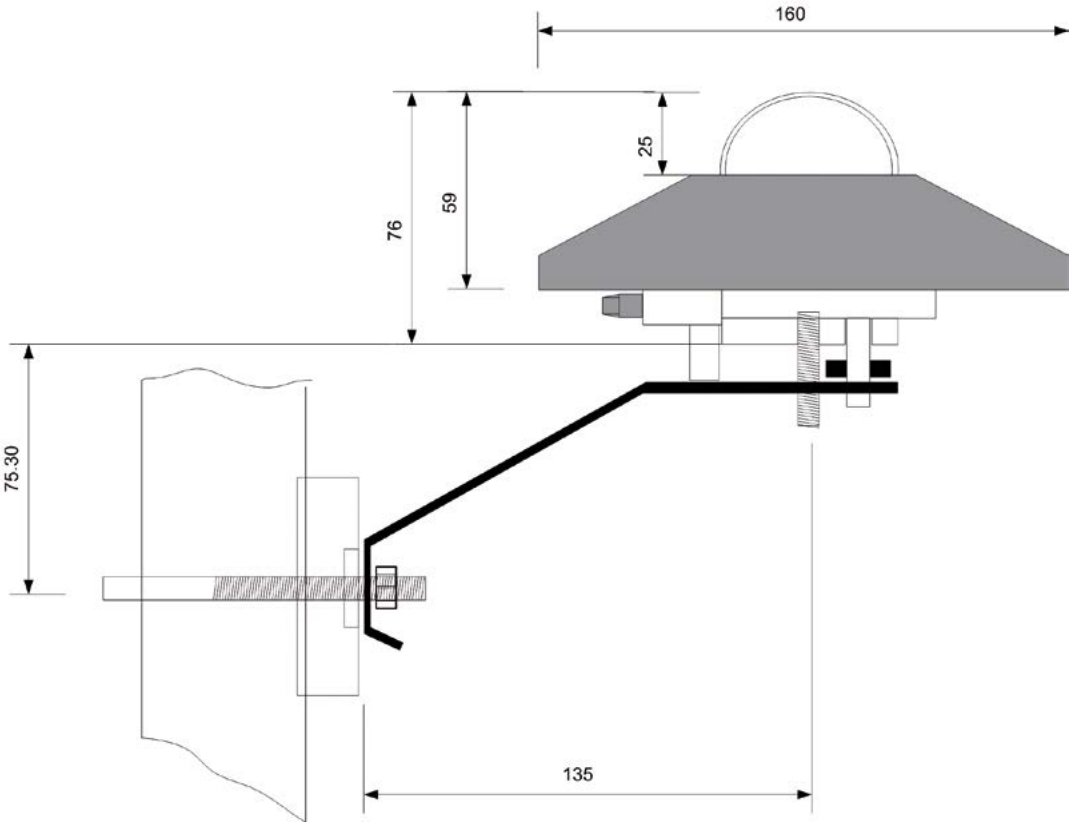
iLUX – Intelligent Lux Meter with a Powerline Interface

Surge voltage resistance	4 kV / 1,2 / 50
Standards	DIN EN 61037
Protection class	II
Casing Sensor	
Cover	Aluminium, PC
Sensor unit	Protected with opaque glass
Dimensions (LxWxH)	165 mm / 165 mm / 104 mm
Weight without mounting bracket	900 g
Weight of mounting bracket	300 g
Degree of protection	IP65

Dimensions (mm)



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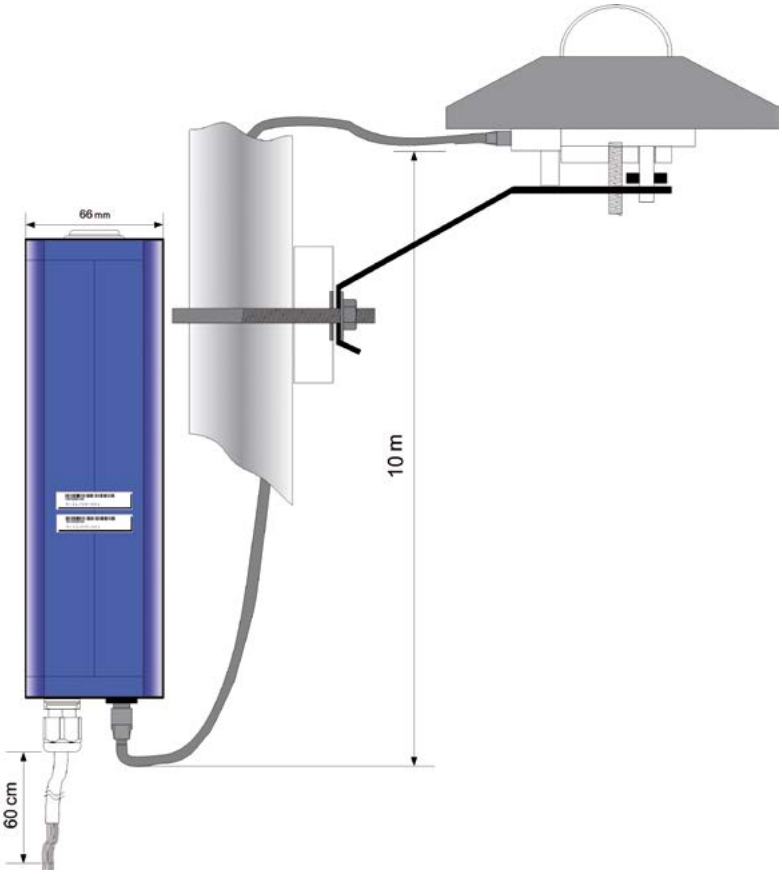
iLUX – Intelligent Lux Meter with a Powerline Interface

Weather-proof light sensor with mounting bracket for attachment to a street lighting pole or on a wall plus a spirit level for directional adjustment.



Casing

The extremely compact design of the iPC-Lux facilitates installation in any luminaire pole. The cable between the pole controller and light sensor is fitted with high-quality connectors at both ends.

iPC-Lux with an iLUX Interface

The iPC-Lux controller is designed for installation in a luminaire pole and is fitted with an interface for connection of an iLUX sensor. Coupled with optional firmware updates, the configurability of the application makes it a very safe investment. When operated within a LonWorks® powerline network, the iLUX sensor makes measured data directly available in the form of SNVT_Lux. When operated in standalone mode, the unit permits direct lighting control in line with configurable light-threshold switching values via two relay contacts. Adding a contactor downstream even enables control of larger lighting systems.

The threshold values that trigger the two relays to be switched on or off are separately configurable.

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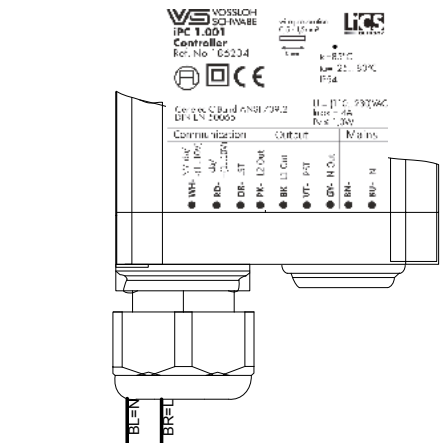
iLUX – Intelligent Lux Meter with a Powerline Interface

Connection terminal for powerline operation



Codes and IEC 60757

Colour	German Codes		IEC 60757	Config.
Black	SW	sw	BK	L1 Out
Brown	BR	br	BN	L
Blue	BL	bl	BU	N
Pink	RS	rs	PK	L2 Out

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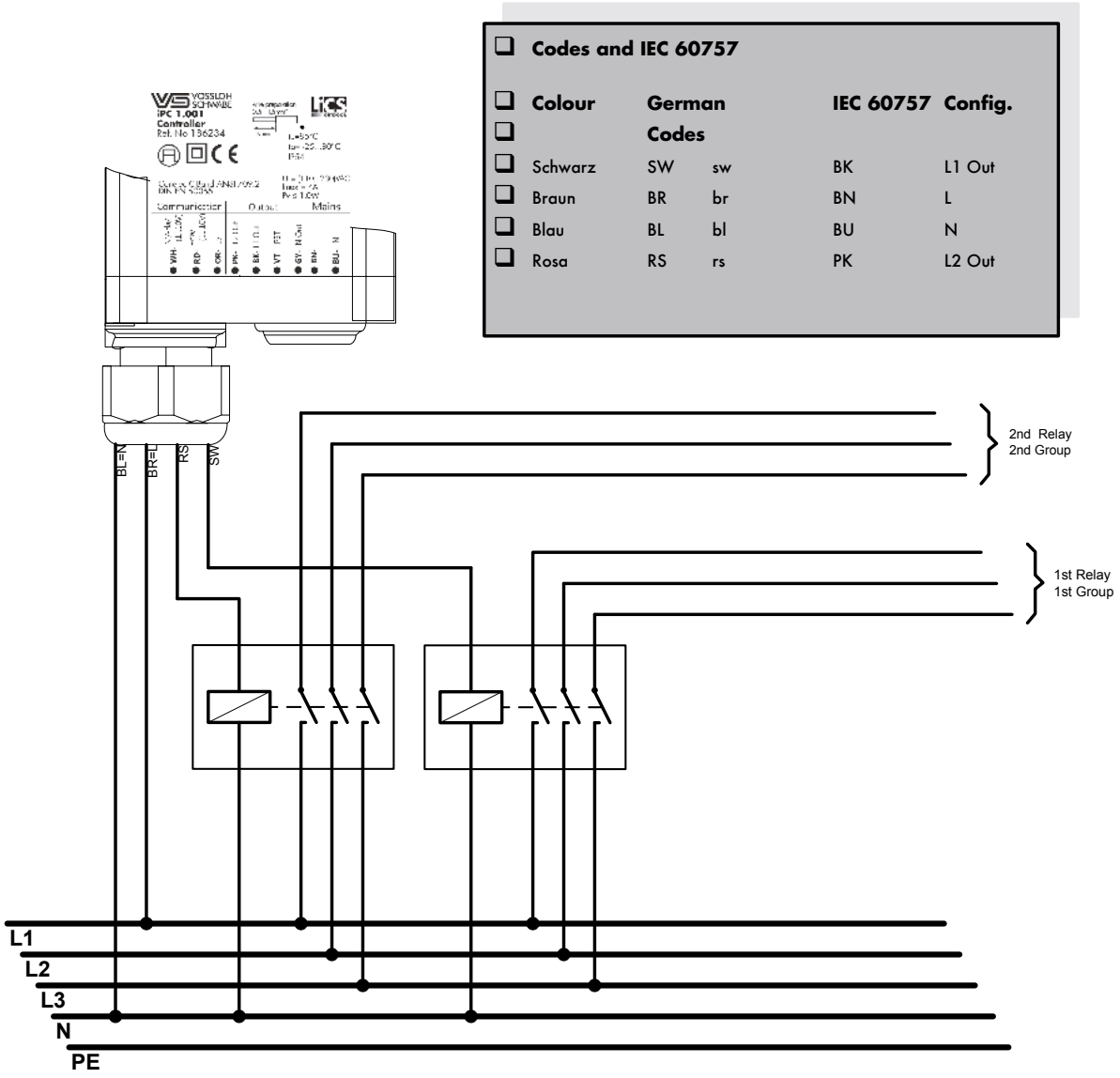
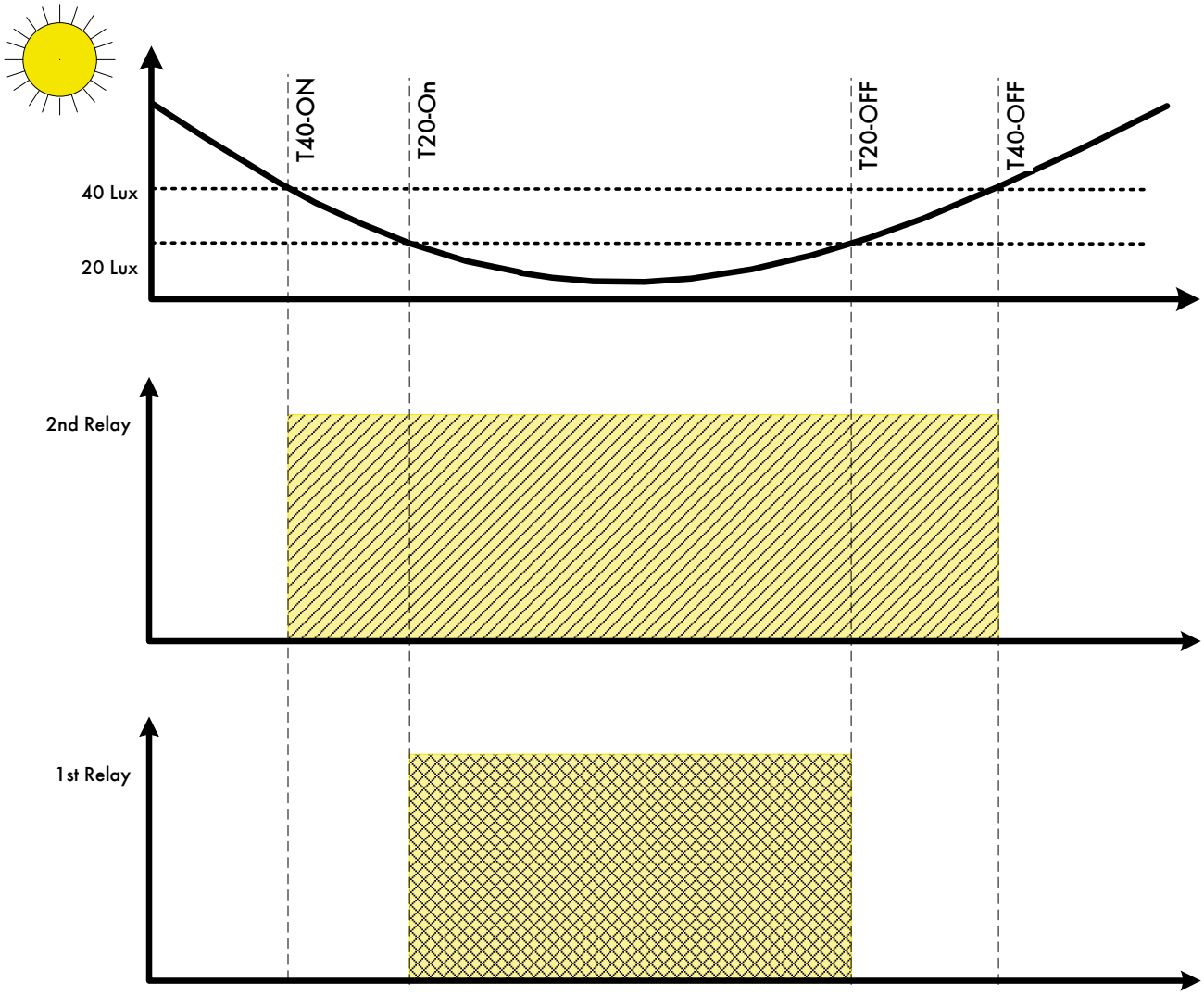
iLUX – Intelligent Lux Meter with a Powerline Interface

Direct control of luminaire groups



iLUX – Intelligent Lux Meter with a Powerline Interface

Control of two luminaire groups dependent on adjustable digital threshold values



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iLUX – Intelligent Lux Meter with a Powerline Interface

Lonmark® Profil

In line with the mentioned ANSI and EN specifications, the controller is fitted with an interoperable network interface, which makes it possible to establish heterogeneous networks. The definition of the precise data structure for data transfer purposes is similar to the Lonmark® definition. As a light sensor profile for outdoor applications is not available, a profile has been created in line with the requirements on the basis of Lonmark® guidelines that enables control of interoperable light management systems. Once integrated into an LMS network, the iLUX lux meter delivers data in SNVT_Lux form and directly switches luminaires in accordance with the set threshold values via the SNVT_Switch.

Accessories

The iPL-NI is a powerline network interface that is used if the iLUX lux meter needs to be configured at a later date without it being intended for operation within a network. The 230 V AC power supply cable can be used to effect data communication between a notebook or PC and the iLUX unit. The operating system of the notebook or PC needs to be Microsoft Windows XP or higher. Vossloh-Schwabe provides this special tool for configuration purposes as well as for firmware updates.

Ref. No.: 186265.02

Sales Text

Network-capable, multifunctional, intelligent built-in luminaire pole controller with powerline communication, standalone function and iLUX sensor. Suitable for use in street lighting, lighting in proximity to buildings as well as industrial lighting. The controller enables luminaire control with the help of a switched lighting or mains cable. The controller is configurable and updateable.

Text for Invitations to Tender

Powerline-capable controller for installation in a luminaire with a light sensor for controlling luminaires in street lighting, lighting in proximity to buildings as well as industrial lighting using a non-switched mains cable in combination with a sensor or with a control line. Data transfer is possible in accordance with the ANSI CEA (709.1, 709.2) and EN 14908(-1, -2) standards. The controller communicates in accordance with Lonmark® guidelines. In line with the LON philosophy and the Lonmark® definition, the controller is fitted with all applications required for control as well as for data and limit value calculation purposes. Cenelec-compliant bidirectional LON powerline communication is effected in accordance with DIN EN 50065-1 using the C band (primary; 125 … 140 kHz) and B band (secondary; 95 … 125 kHz). The built-in pole controller provides two switched outputs for turning luminaires amounting to 4 A in total on or off as well as for controlling a power switch. The switchpoints are pre-configured for 40 Lux and 20 Lux, but can be reconfigured at any time via an optional powerline interface and the matching software.
Electrical specifications: mains voltage 230 V (10%), frequency 50 Hz (+1% / -2%), nominal current 4 A max. in total for relays 1 and 2, power consumption 1 VA (standby) / 6.75 VA (transmission mode), surge voltage resistant up to 4 kV/1.2/50 in acc. with DIN EN 61037, protection class II.

Climatic capacity: operating temperature –25 °C to + 80 °C, storage temperature –25 °C to +85 °C. Polycarbonate (PC) casing. Dimensions (L/H/W) 93 mm / 58 mm / 30 mm. Weight 400 g, degree of protection IP54. Synchronisable real time clock. Interoperable software interface, use of network variables and configuration parameters in acc. with Lonmark®. When operated in optional standalone mode, automatic lighting control is effected directly or with the help of a power switch.

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iPC

INTELLIGENT POLE CONTROLLER (BUILT-IN)

Developed for use in street lighting and lighting in the vicinity of buildings, the iPC operates with a standardised power line for communication purposes and enables control of magnetic and electronic ballasts fitted with a 1–10 V/DALI interface. Individually programmable and updateable, the controller provides all the functions of a modern light management system and thus ensures a high degree of investment protection. If the controller is temporarily operated in stand-alone mode or if the network is temporarily down due to maintenance work, the basic function parameters of the light management system will be retained for control purposes and with that will yield approximately the same energy saving without energy-consumption values being lost.

Further Advantages

- Standby consumption: < 1.0 W
- Interoperable luminaire controller in acc. with the OLC Lonmark® profile
- Power line communication using a C/B frequency band in acc. with CENELEC 50065-1
- ANSI CEA 709.1, 709.2 and EN 14908-1, EN 14908.2
- Stand-alone mode: 10 dimming levels with individual dimming sequences
- Luminaires can be switched off when connected to a switched lighting cable
- Intuitive software-based configuration
- Burning in high-pressure discharge lamps following lamp exchange
- Lighting can be switched on with a delay and switched off earlier with individual dimming sequences
- Compensation of reduction in luminous flux with freely definable values for lamp service life as well as start and end levels
- Adjustable control input to suit various tasks
- Up to 10 time-dependent, synchronisable dimming levels with individual dimming sequences can be set via the control line and the control input
- Connection of various sensors such as motion sensors, key switches and light sensors
- Optionally available with an audio frequency ripple control receiver to enable migration of existing systems

Typical applications

- Street lighting and lighting in the vicinity of buildings
- Car parks, bus stops and railway stations
- Company premises, warehouses
- Sports facilities

iPC Light Controller

Technical Details

Electronic Light Controller	**186234**
Type	iPC
Input voltage	200 V AC – 250 V AC
Mains frequency	50 / 60 Hz (+1 % / –2 %)
Power consumption	< 1.0 W
Communication	Via the power supply line (power line) in acc. with CENELEC 50065-1
C Band	Primary band 125 – 140 kHz
B Band	Secondary band 95 – 125 kHz
Data transfer (USA)	ANSI CEA 709.1, ANSI CEA 709.2
Data transfer (Europe)	EN 14908-1, EN 14908-2
Optional plug-in	Audio frequency ripple control receiver
Filter frequencies	100 Hz … 1.7 kHz
Protocols	On request
Bit patterns	On request
Galvanic isolation	No electrical isolation from input to output (as soon as the electronic ballast is connected to the iPC, the control input ceases to be electrically isolated)
Switching current	4 A, λ = 0.8
Switching cycles	50,000 switching operations per function (I, λ)
Programmable	Yes
Configurable parameters	Yes
Switching output luminaire	2 x for connecting several luminaires
Control output power-reduction relay	1x to address an electronic power reduction relay (control current ≤ 10 mA, not protected against short-circuiting)
Control output EB	1 x DALI or 1 – 10 V: short-circuit-proof, suitable for respective ballasts, DALI bus master interface for max. 4 ballasts
Connection	1.5 mm², 900 mm
Conductor type of the connection terminals	Stranded with ferrule bare end of core
Firmware update / Parameter config.	Via power line
Control and monitoring parameters	Switch on and off, reduction
Capture of measured data	Voltage, current, power factor, output, energy, temperature, lighting hours with an accuracy of better than 1%
Software interface	Interoperable in acc. with the Lonmark® OLC profile, use of network variables and configuration parameters, repeatable
Operating temperature range t_c	–25 to +80 °C
Storage temperature range	–25 to +85 °C
Humidity	90% non-condensing
Surge voltage protection	4 kV / 1.2 / 50 in acc. with DIN EN 61037
Degree of protection	IP65
Casing material	PC
Dimensions (W x H x D)	66.4 x 249.9 x 54 mm
Weight	400 g
Country of origin	Made in Germany

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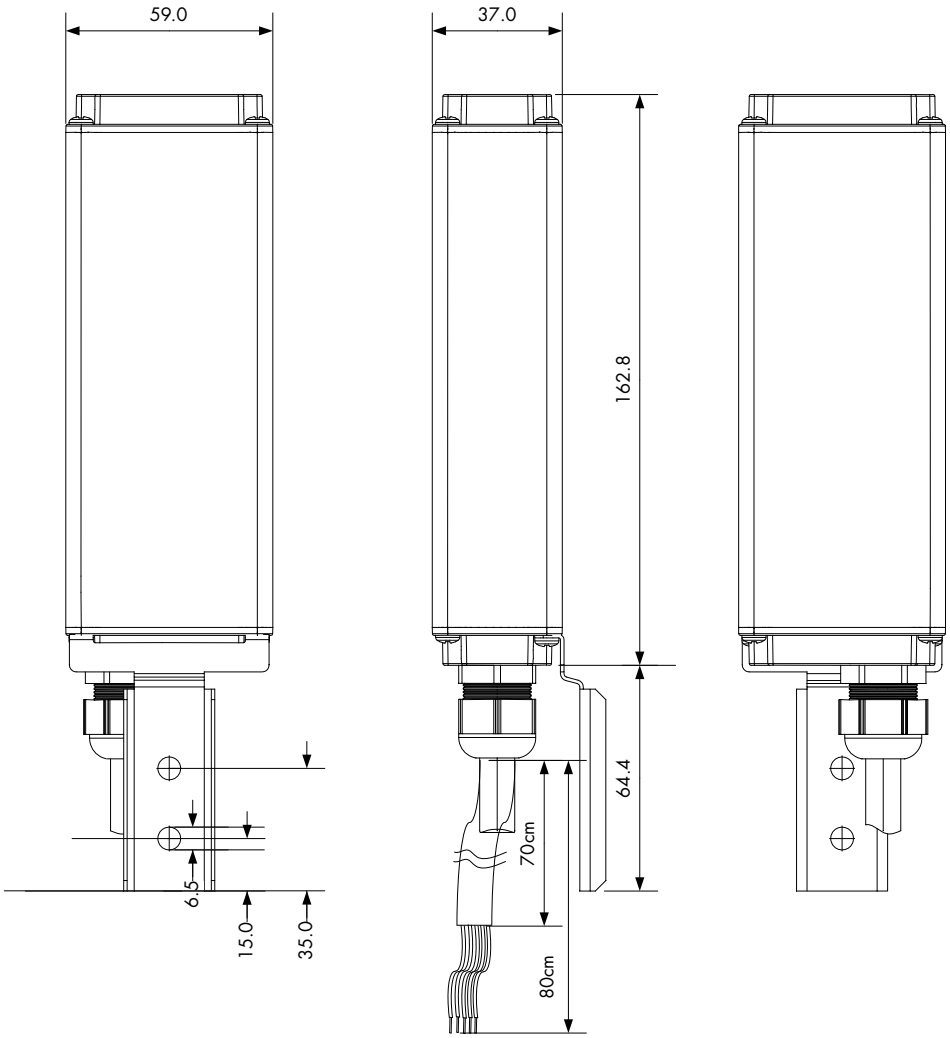
iPC Light Controller

Dimensions (mm)



The 1–10 V/DALI output of the built-in pole controller enables control of 4 (max.) electronic ballasts to enable effective control of luminaire groups or, for instance, LEDs for R, G, B and W. The digital control input ceases to be electrically isolated as soon as an electronic ballast is connected to the controller. The configurable parameters of the applications as well as optional firmware updates ensure a high degree of investment protection. Also, OEM- and customer-specific versions can be protected against unauthorised distribution with a special software key. Please contact your VS representative for more information on this function. As soon as an electronic ballast is connected to the iPC, the control input ceases to be electrically isolated.

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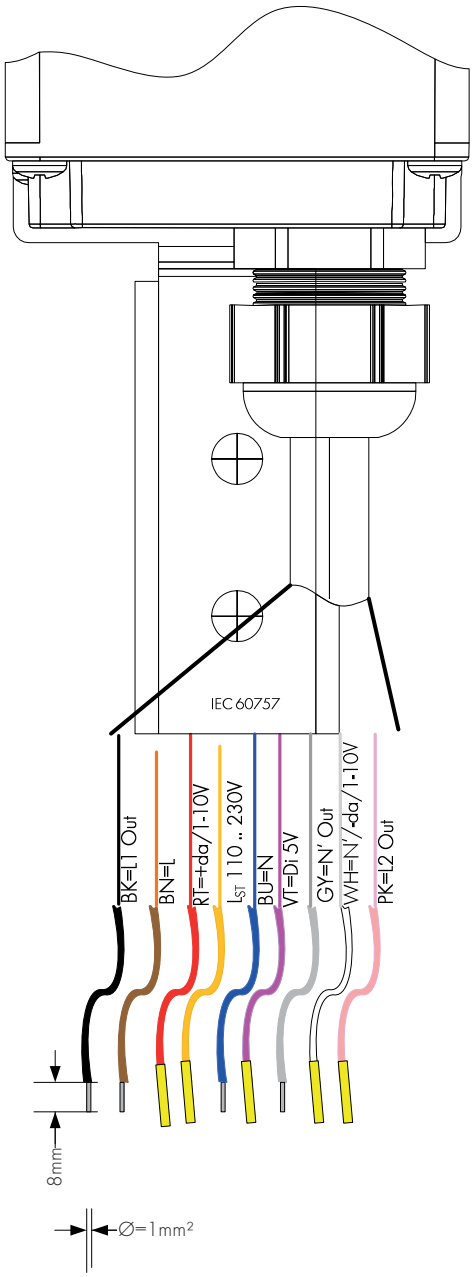
iPC Light Controller



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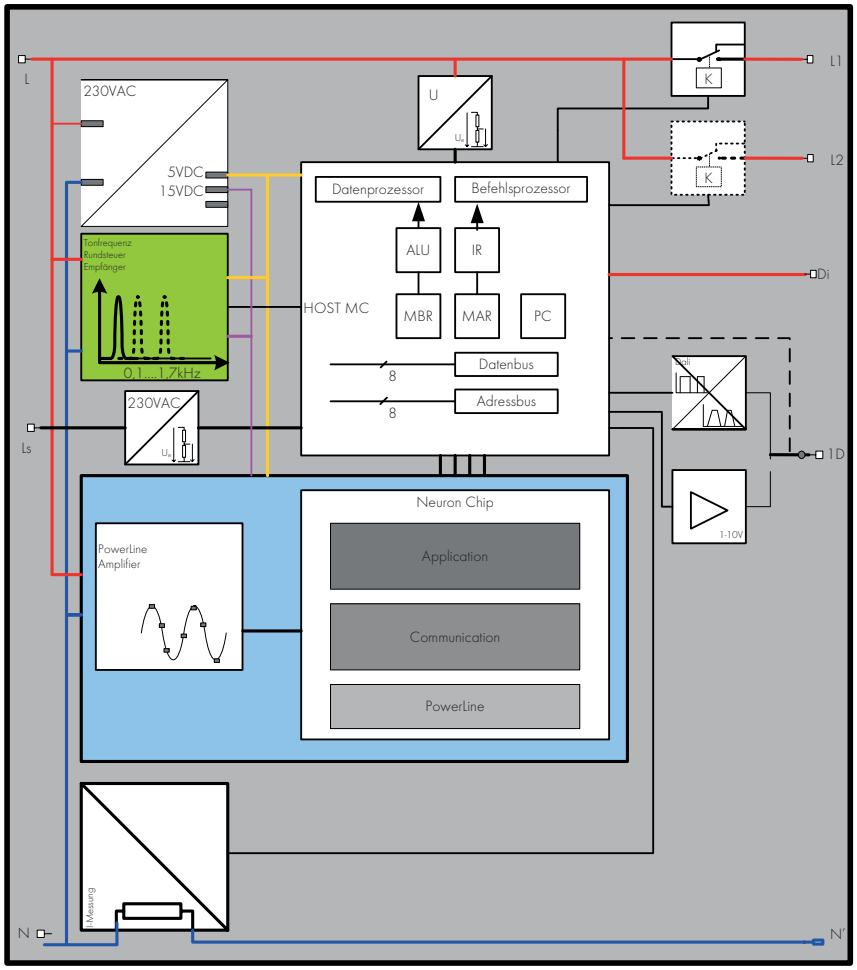
iPC Light Controller

Circuit Diagram

L Power supply

Control input for external sensors

Zero voltage supply



Relay for 1st luminaire

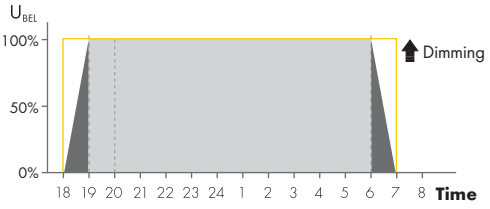
Optional: 2nd relay for a 2-lamp luminaire

Digital input 5V

+da/1-10V / DALI control output

Zero measured

Functions



DOO (Dimmed ON/OFF)
The lighting system can be programmed to ensure the lighting level of luminaires slowly increases to the desired brightness upon being switched on and to dim down within a certain timeframe before switching off.

The brightness of modern luminaires based on LED technology can also be increased slowly up to a defined lighting level immediately after they have been switched on. This function enables a brightness-dimming/-increasing sequence of 36 minutes (max.) to be set.

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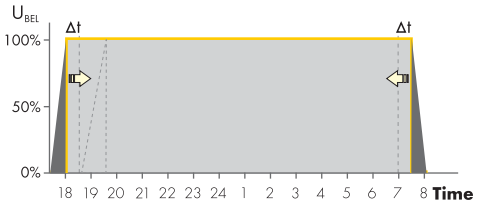
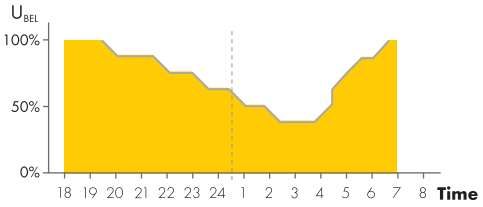
iPC Light Controller

Functions

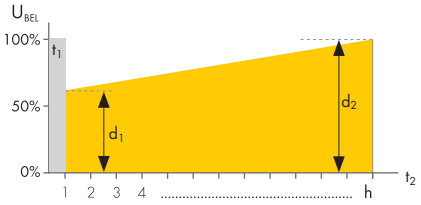


DPC (Delayed Switching for Pedestrian Crossing)
The lighting system can be programmed to switch on after a certain delay and switch off earlier in areas just outside of pedestrian crossing zones.

For instance, street lighting is typically to be activated at 40 lux within pedestrian crossing zones, but at a lower lux level in areas outside of this zone. If the cabling infrastructure needed to set up such a system is missing, the iMCU controller can emulate a similar effect thanks to its ability to "learn". Pedestrian crossing zones can be switched for a longer period, whereas the remaining lighting can be switched independently and/or dimmed after a certain "learning" period.



ISD (Intelligent Switching Time Dimming)
Intelligent, timer-controlled periods of dimmed light
A season-specific reference value is derived from the period of time the lighting cable is switched on. In line with this reference value, the controller can manage the lighting system with up to 10 dimming levels and dimming sequences. Accidental (erroneous) configurations that can arise, for instance, during maintenance work, are suppressed by the controller as it ignores short lighting periods of less than 6 hours and long periods of more than 18 hours.



MFF (Maintenance Factor Function)
Maintenance factor function: reduction of the degree to which the luminous flux decreases over the service life of the light source

Lamps age; mirrors and glass luminaire covers get dirty. This unwanted effect is compensated over the service life of the lamp to ensure a constant luminous flux. The effect can be combated by quantifying the expected decrease in luminous flux over the lamp's service life, which helps to save energy costs. This function can also be used to precisely set the luminaire to suit the lighting task if the lighting level would otherwise be too high as a result of a substitute luminaire.

t_1
Period of time during which a lamp is burned in, i.e. the time during which it must not be dimmed (typically 100 hours).

t_2
Service life of the lamp expressed in x1000 hours.

d_1
Dimming value at the time of commissioning. The set value is shown in %.

d_2
Dimming value at the end of the lamp's service life. The value is shown in %.

L_{ST} (Control input)
Control input with configurable behaviour and effect on the DALI/1–10 V output and the relay's two-way contact.

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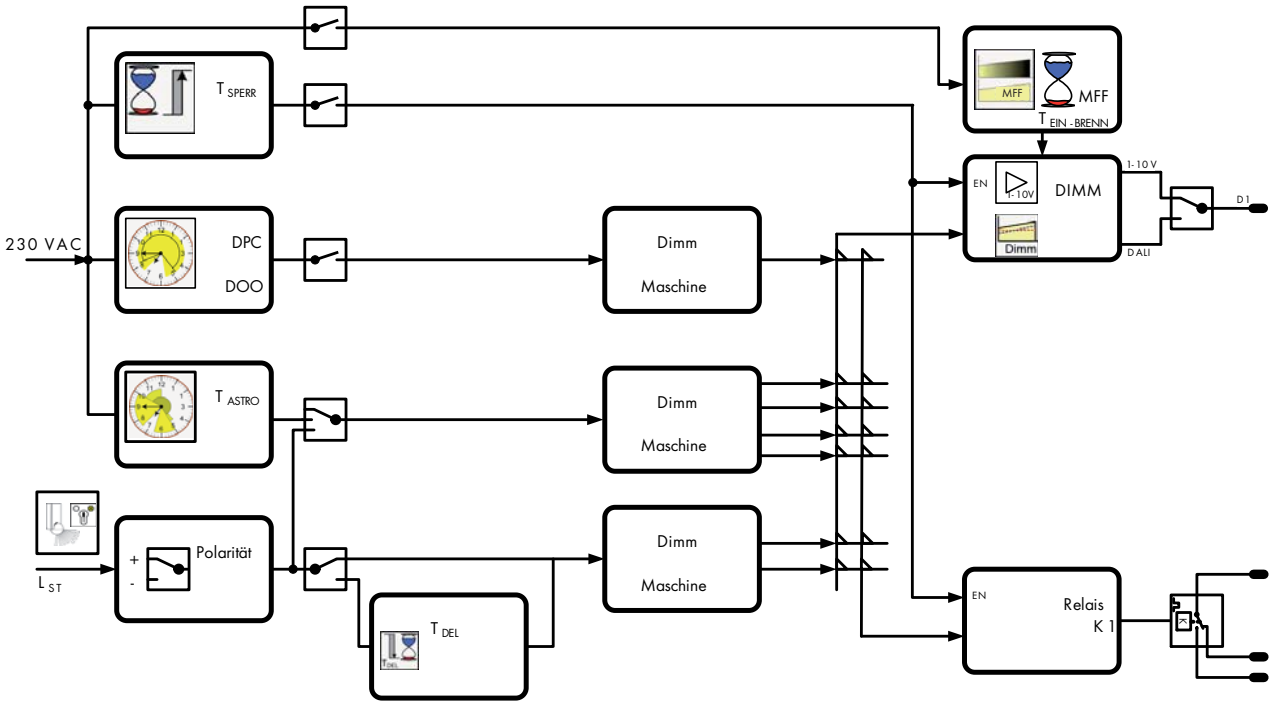
iPC Light Controller

Configuration and Graphic User Interface

If the controller is initially operated without a light management system, the configuration process is undertaken using a programming tool. Despite being a highly complex piece of technology, the controller's intuitive software interface makes it both user-friendly and easy to configure. The GUI enables direct configuration via the power line. If the controller is integrated into a light management system, the same functions are available, but the parameters are configured from a central control point and lighting control is web-based. In this case, time control using the "synthetic" midnight is only used as a redundant application.



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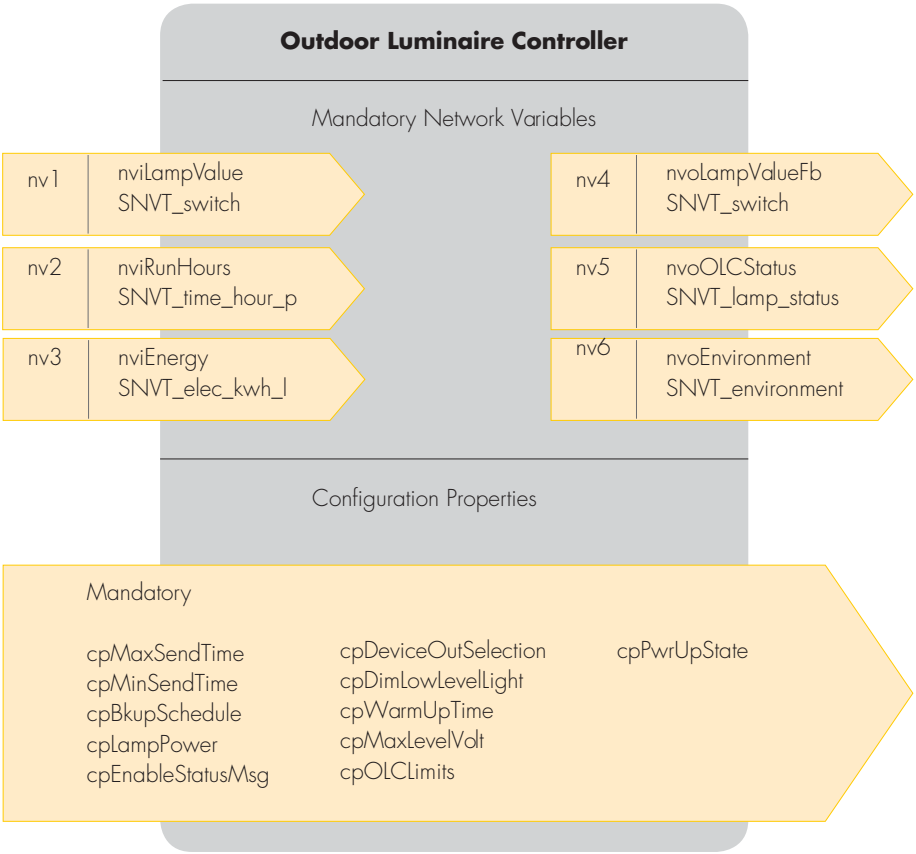
iPC Light Controller

Lonmark® OLC Profile



In accordance with the mentioned ANSI and EN specifications, the controller is fitted with an interoperable network interface, which is essential for setting up heterogeneous networks. The definition of the exact data structure for data transfer purposes is fixed in accordance with the Lonmark definition in line with the so-called OLC profile (Outdoor Luminaire Controller). Controllers that are manufactured in line with this standard, even if produced by different manufacturers, can be integrated into a common network.

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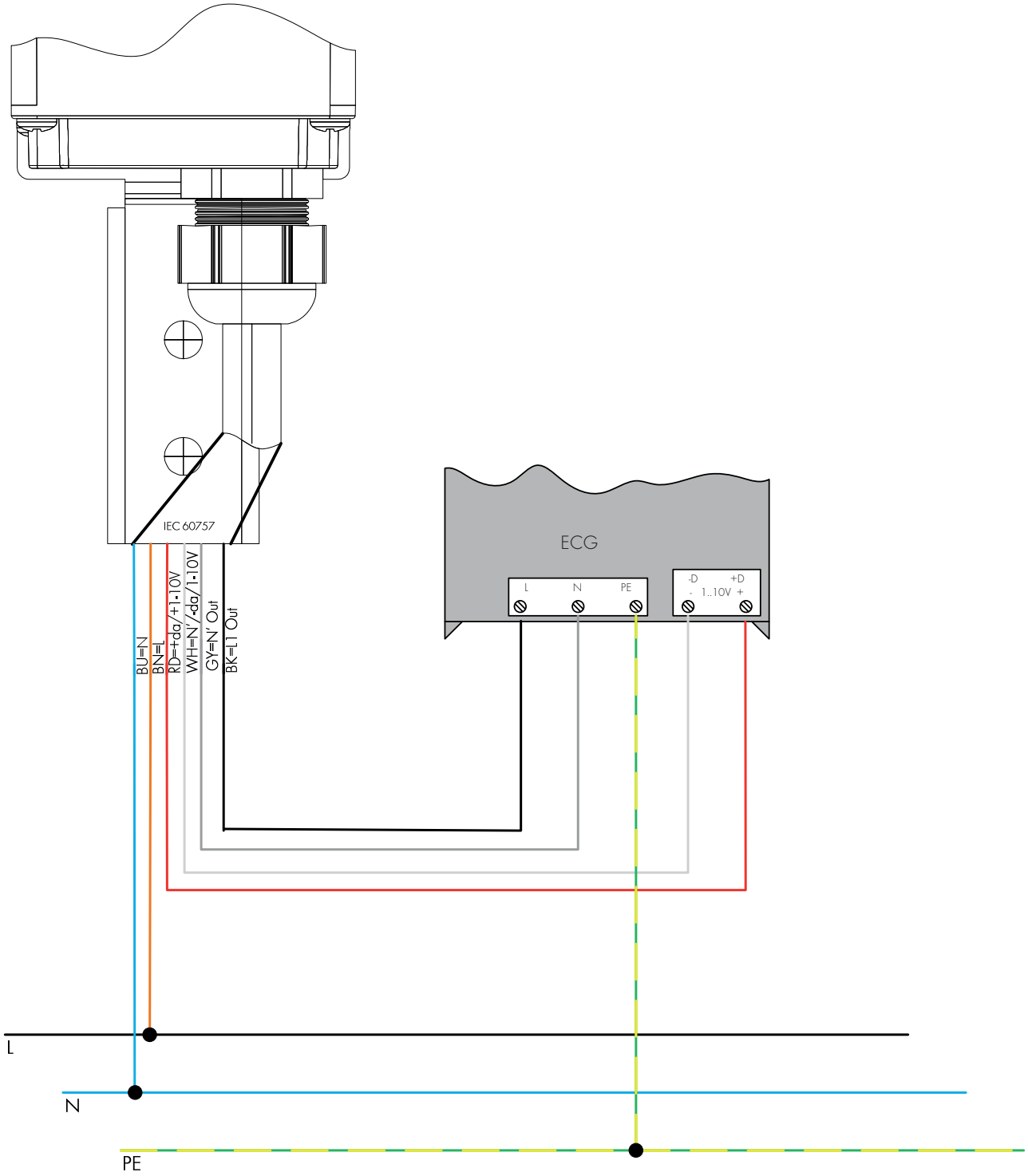
iPC Light Controller

Connection of electronic ballasts with a 1–10 V/DALI control input

Apart from being able to address all commonly available ballasts, the controller also makes it possible to completely switch off electronic ballasts if connected to a switched lighting cable. Luminaires operated with 1–10 V electronic ballasts, in particular, acquire an important additional function as a result of being switched off.



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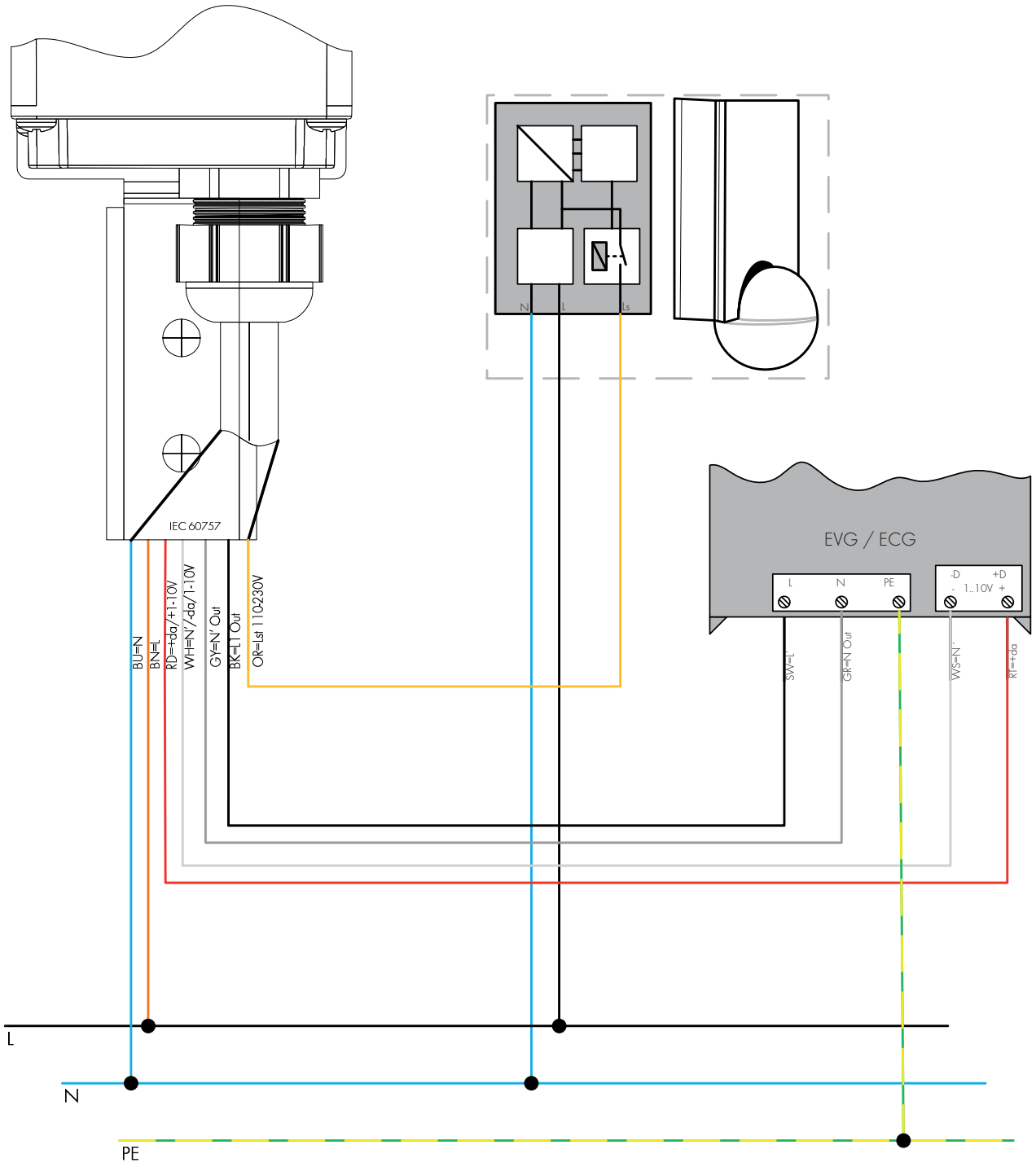
iPC Light Controller

Control using the L_{ST} control input via a motion sensor or control line

The L_{ST} input is designed for 230 V AC. Different functions can be used depending on the given configuration. When using a motion sensor, the lighting period can be defined in the controller. If motion is detected again during this period of time, the lighting period will restart for the specified time.



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iPC Light Controller

Sales Text

Network-capable, multifunctional, intelligent built-in pole controller featuring power line communication, stand-alone functionality and an optionally available audio frequency ripple control receiver that is suitable for street lighting, lighting in the vicinity of buildings and industrial (high-bay) lighting. The iPC enables control of luminaires operated with standard electromagnetic ballasts, standard electromagnetic ECO ballasts as well as electronic ballasts with a 1–10 V or a DALI interface. The controller permits control of luminaires if connected to a switched lighting or mains cable. All kinds of sensor can be used with the universal control input. Ballasts with a DALI interface are addressed using a broadcast command, which removes the need for commissioning the electronic ballast. The controller is configurable and updateable. Key parameter values such as voltage, current, output, energy and lighting hours are captured for transfer to a central control point for evaluation. When the controller is operated in stand-alone mode, it is possible to set 10 switching times that are derived on the basis of the daily operating period; individual dimming sequences and dimming levels can be set for each of these 10 switching times. The 230 V AC control input permits the superimposed use of up to 10 time-dependent dimming levels and dimming sequences. Furthermore, when used in sensor mode, the holding time for motion sensors can be freely and retriggerably defined. When used in areas outside of pedestrian crossings, this special configuration makes it possible to delay or bring forward the point in time when luminaires are switched off. Time offset, dimming sequences as well as dimming levels can be freely defined.

Text for Invitation to Tender

Power-line-capable controller for integration into luminaires, available with an optional audio frequency ripple control receiver. The iPC enables control of luminaires in street lighting and lighting in the vicinity of buildings that are operated using a switched lighting cable or an unswitched mains cable in combination with a sensor or a control line. Data transfer is undertaken in accordance with the ANSI CEA (709.1, 709.2) and the EN 14908(-1, -2) standards. The controller communicates using the OLC-Lonmark® profile. In line with the LON philosophy and the OLC Lonmark® definition, the controller is equipped with the requisite applications to enable control as well as calculation of data and limit values. Luminaires operated with a magnetic ballast, optionally with a power reduction relay, or with an electronic ballast with a 1–10 V or DALI control input can be connected and addressed. In accordance with CENELEC and DIN EN 50065-1, bi-directional LON power line communication is effected using the C band (125…140 kHz) for primary communications and the B band (95…125 kHz) for secondary communications. The built-in luminaire controller features a switched output that makes it possible to turn a luminaire of up to 4 A on/off as well as to address an electronic power reduction relay with a control current of max. 10 mA. To enable electronic ballasts to be addressed, the controller also features a configurable, short-circuit-proof control output (Imax 15 mA) for a DALI or 1–10 V output. Used as a bus master during DALI operation, commands are transmitted to electronic ballasts in broadcast mode. Optionally (configured) individual electronic ballasts can also be addressed via an allocated short address. The controller is suitable for ballasts fitted with a galvanically isolated input, but that lose their basic electrical isolation when connected to the controller.

Electrical specifications: mains voltage 230 V (10%), mains frequency 50 Hz (+1% / –2%), nominal current max. 4 A, power consumption 1 VA (standby) / 6.75 VA (transmission mode), surge voltage protection 4 kV / 1.2 / 50 in acc. with DIN EN 61037, protection class II. Measuring accuracy: voltage Ueff, current Ieff, output Peff, upwards of 1% in acc. with upper range value, energy kWh better than 1%, temperature, phase shift cos ≤ 0.02°. Climatic conditions: operating temperature –25 °C to +80 °C, storage temperature –25 °C to +85 °C. Polycarbonate plastic casing. Dimensions (W/H/D): 93 mm / 58 mm / 30 mm. Weight: 400 g, degree of protection: IP20. Synchronisable real-time clock. Interoperable software interface, use of network variables and configuration parameters in acc. with Lonmark®, control and monitoring parameters: switching on and off, power reduction/dimming, lighting hours, input voltage, current to the ballast/electronic ballast, phase shift cos(phi), calculated power uptake and energy consumption. Configuration and monitoring of limit values for voltage, current, capacitor effect (only with magnetic control gear). Optionally extendable current measuring range via externally calibrated current converters in steps of 10 A to 100 A. The decline in luminous flux over the lamp's service life can be compensated. Start and end values as well lamp service life values can be freely configured. For new lamps, the entire superimposed dimming function can be switched off in a lamp- and lighting-hour-dependent manner.

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iPC Light Controller

During optional stand-alone operation, the dimming level is automatically calculated and tracked, which enables energy-optimised operation via the lamp's lighting hours as well as by adjusting over-dimensioned luminaires to suit specific lighting tasks. When in operating mode, the controller can be connected to a switched lighting cable or an unswitched network cable in combination with a sensor or a control line. Given typical use when connected to a switched lighting cable, the controller "learns" what time it is by itself based on the periods of time it was switched on during the first three days of operation; the detected time of day is then used to derive the real-life switching times. Up to 10 freely configurable times of day are available for setting the EB's dimming values. The switching status of the relay, the dimming value and the dimming sequence is individually configurable on the basis of the time set in the Parameters section. The 230 V AC control input can be used to influence the internally calculated switching and dimming function. The control input initiates up to 10 timers that exert superimposed control over the sequence of the relay's switching status, the dimming value as well as the dimming sequence. Per timer, the switching status of the relay, dimming value and dimming sequence can be individually configured. The decline in luminous flux over the lamp's service life can be compensated.

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iLC

Intelligent Luminaire Controller (Built-in)

Developed for use in street lighting and lighting in the vicinity of buildings, the iLC uses standardised power line communication to control magnetic and electronic ballasts with a 1–10 V or a DALI interface.

Individually programmable and updateable, it performs all the tasks of a modern light management system and thus ensures a high degree of investment protection.

If the controller is temporarily operated in stand-alone mode or if the network is temporarily down due to maintenance work, the basic function parameters of the light management system will be retained for control purposes and with that will yield approximately the same energy savings without energy-consumption values being lost.

Additional Advantages

- Interoperable luminaire controller in line with the OLC Lonmark® profile
- Power line communication using the C/B band in acc. with CENELEC 50065-1
- Standardized data transfer acc. to ANSI CEA and EN
- Operation as part of a light management system or in stand-alone mode
- Intuitive software-based configurable and updateable
- Luminaires can be switched off when connected to a switched lighting cable
- Standby consumption less than 1 W
- Adjustable control input to suit various tasks
- Connection of various sensors such as motion sensors, key switches and light sensors
- 10 dimming levels with individual dimming sequences to attain the desired dimming level can be set in stand-alone mode
- Lighting can be switched on with a delay and switched off earlier with individual dimming sequences
- Compensation of reduction in luminous flux with freely definable values for lamp service life as well as start and end levels
- Burning in of high-pressure discharge lamps following lamp replacement

Typical Applications

- Street lighting and lighting in the vicinity of buildings
- Car parks, bus stops and railway stations
- Company premises, warehouses
- Sports facilities

Light Controller iLC

Technical Data

Electronic Light Controller	**186233**
Type	iLC
Input voltage	110–250 V AC
Mains frequency	50 Hz (+1 % / –2 %)
Power consumption	< 1 W
Communication	Via the power supply line (power line) in acc. with CENELEC 50065-1
C Band	Primary band 125–140 kHz
B Band	Secondary band 95–125 kHz
Data transfer (USA)	ANSI CEA 709.1, ANSI CEA 709.2
Data transfer (Europe)	EN 14908-1, EN 14908-2
Galvanic isolation	No electrical isolation from input to output (as soon as the electronic ballast is connected to the iLC, the control input ceases to be electrically isolated)
Switching current (at λ = 0.8)	4 A
Switching cycles (at λ = 0.8)	50,000 switching operations per function
Programmable	Yes
Configurable parameters	Yes
Switching output luminaire	1x
Low-voltage control input	1 x 5 V DC suitable for sensors with "Open Collector" output or potential free relay output
High-voltage control input	230 V AC
Control output EB	1 x DALI, 1–10 V or PWM: short-circuit proof, suitable for respective ballasts, DALI bus master interface for max. 4 ballasts
Connection	0.5–1.5 mm²
Conductor type of the connection terminals	Single, stranded
Firmware update / Parameter config.	Via power line
Control and monitoring parameters	Switch on and off, reduction
Capture of measured data	Voltage, current, power factor, output, energy, temperature, lighting hours with an accuracy of better than 1%
Software interface	Interoperable in acc. with the Lonmark® OLC profile, use of network variables and configuration parameters, repeatable
Operating temperature range t_c	–25 to +80 °C
Storage temperature range	–25 to +85 °C
Mean time between failure	50,000 h
Humidity	90% non-condensing
Surge voltage protection	4 kV / 1.2 / 50 in acc. with DIN EN 61037
Degree of protection	IP20
Protection class	Suitable for luminaires of protection class I and II
Casing material	PC
Dimensions (WxHxD)	93 x 58 x 30 mm
Weight	100 g
Country of origin	Made in Serbia

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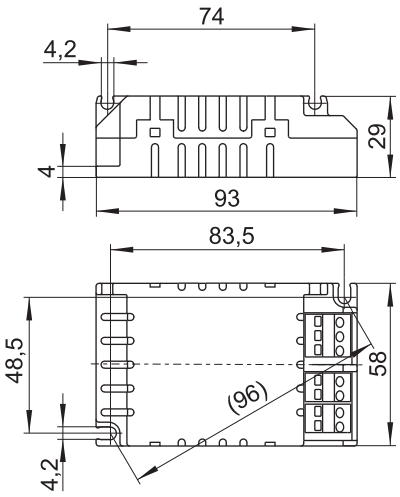
Light Controller iLC

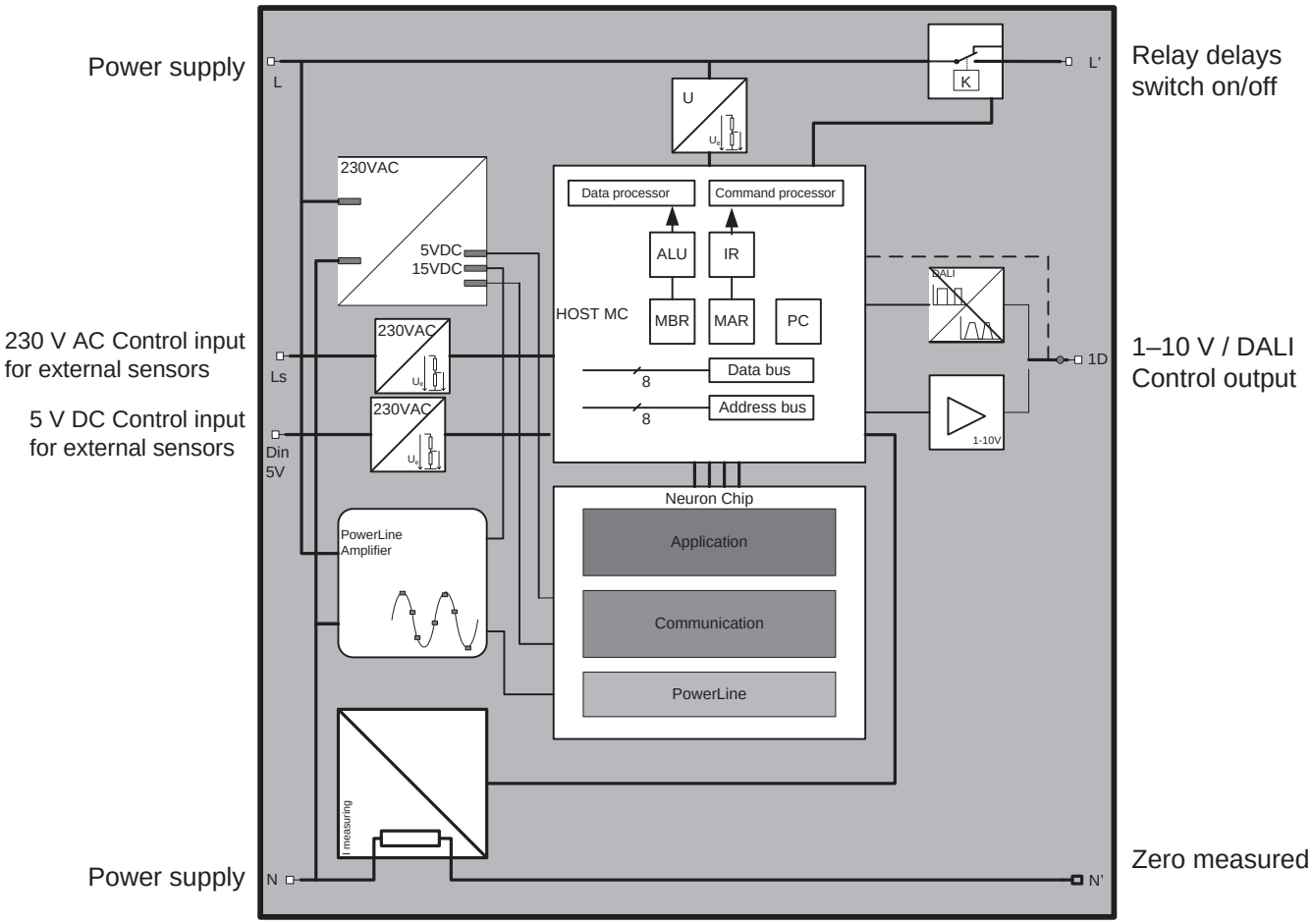
Dimensions



- The Controller is designed for built-in into luminaires.
- The 1–10 V/DALI output of the built-in luminaire controller enables control of 4 (max.) electronic ballasts to permit effective control of luminaire groups or, for instance, LEDs for R, G, B and W.
- The digital control input ceases to be electrically isolated as soon as an electronic ballast is connected to the controller.
- The configurable parameters of the applications as well as optional firmware updates ensure a high degree of investment protection.
- Also, OEM- and customer-specific versions can be protected against unauthorised distribution with a special software key.

Please contact your VS representative for more information on this function. As soon as an electronic ballast is connected to the iLC, the control input ceases to be electrically isolated.

Circuit Diagram



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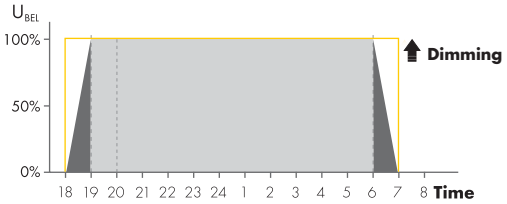
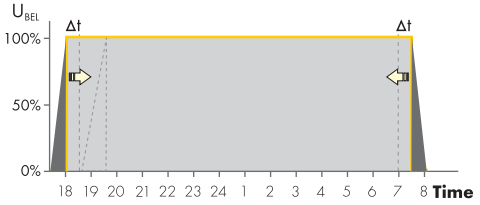
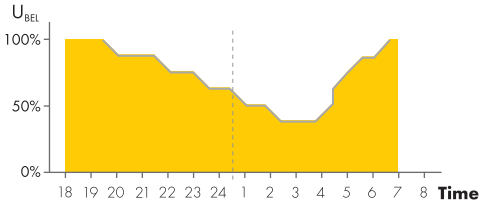
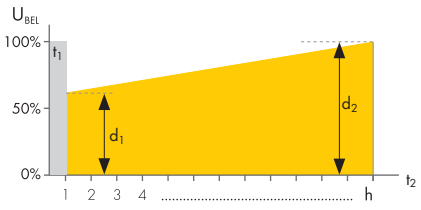
Light Controller iLC









t_1 Period of time during which a lamp is burned in, i.e. the time during which it must not be dimmed (typically 100 hours).

t_2 Service life of the lamp expressed in x1000 hours.

d_1 Dimming value at the time of commissioning. The set value is shown in %.

d_2 Dimming value at the end of the lamp's service life. The value is shown in %.

L_{ST} (Control input) Control input with configurable behaviour and effect on the DALI/1-10 V output and the relay's two-way contact.

Functions

DOO (Dimmed ON/OFF)
The lighting system can be programmed to ensure the lighting level of luminaires slowly increases to the desired brightness upon being switched on and to dim down within a certain timeframe before switching off. The brightness of modern luminaires based on LED technology can also be increased slowly up to a defined lighting level immediately after they have been switched on. This function enables a brightness-dimming/-increasing sequence of 36 minutes (max.) to be set.

DPC (Delayed Switching for Pedestrian Crossing)
The lighting system can be programmed to switch on after a certain delay and switch off earlier in areas just outside of pedestrian crossing zones.

For instance, street lighting is typically activated at 40 lux within pedestrian crossing zones, but at a lower lux level in areas outside of this zone. If the cabling infrastructure needed to set up such a system is missing, the iLC controller can emulate a similar effect thanks to its ability to "learn". Pedestrian crossing zones can be switched for a longer period, whereas the remaining lighting can be switched independently and/or dimmed after a certain "learning" period.

ISD (Intelligent Switching Time Dimming)
Intelligent, timer-controlled periods of dimmed light

A season-specific reference value is derived from the period of time the lighting cable is switched on. In line with this reference value, the controller can manage the lighting system with up to 10 dimming levels and dimming sequences. Accidental (erroneous) configurations that can arise, for instance, during maintenance work, are suppressed by the controller as it ignores short lighting periods of less than 6 hours and long periods of more than 18 hours.

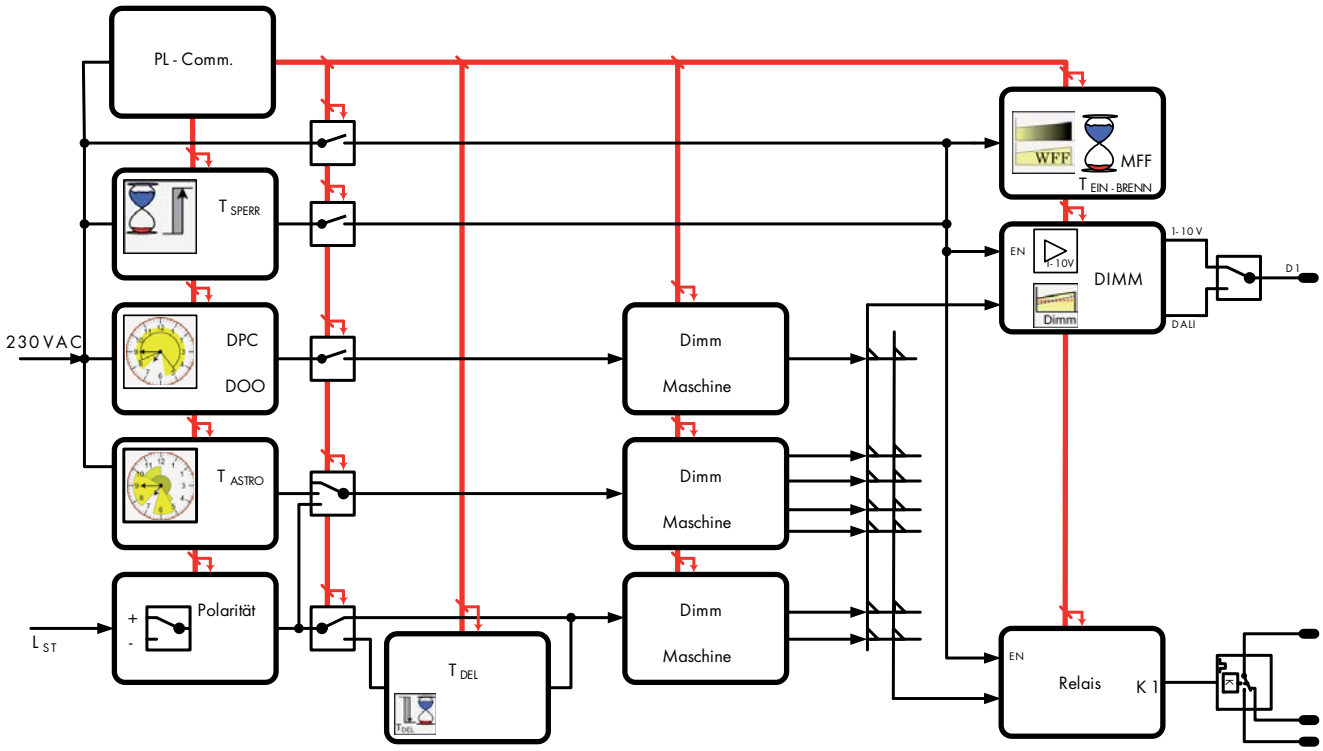
MFF (Maintenance Factor Function)
Maintenance factor function: reduction of the degree to which the luminous flux decreases over the service life of the light source.

Lamps age; mirrors and glass luminaire covers get dirty. This unwanted effect is compensated over the service life of the lamp to ensure a constant luminous flux. The effect can be combated by quantifying the expected decrease in luminous flux over the lamp's service life, which helps to save energy costs. This function can also be used to precisely set the luminaire to suit the lighting task if the lighting level would otherwise be too high as a result of a substitute luminaire.

Light Controller iLC

Configuration and Graphic User Interface

If the controller is initially operated without a light management system, the configuration process is undertaken using a programming tool. Despite being a highly complex piece of technology, the controller's intuitive software interface makes it both user-friendly and easy to configure. The GUI enables direct configuration via the power line. If the controller is integrated into a light management system, the same functions are available, but the parameters are configured from a central control point and lighting control is web-based. In this case, time control using the "synthetic" midnight is only used as a redundant application.



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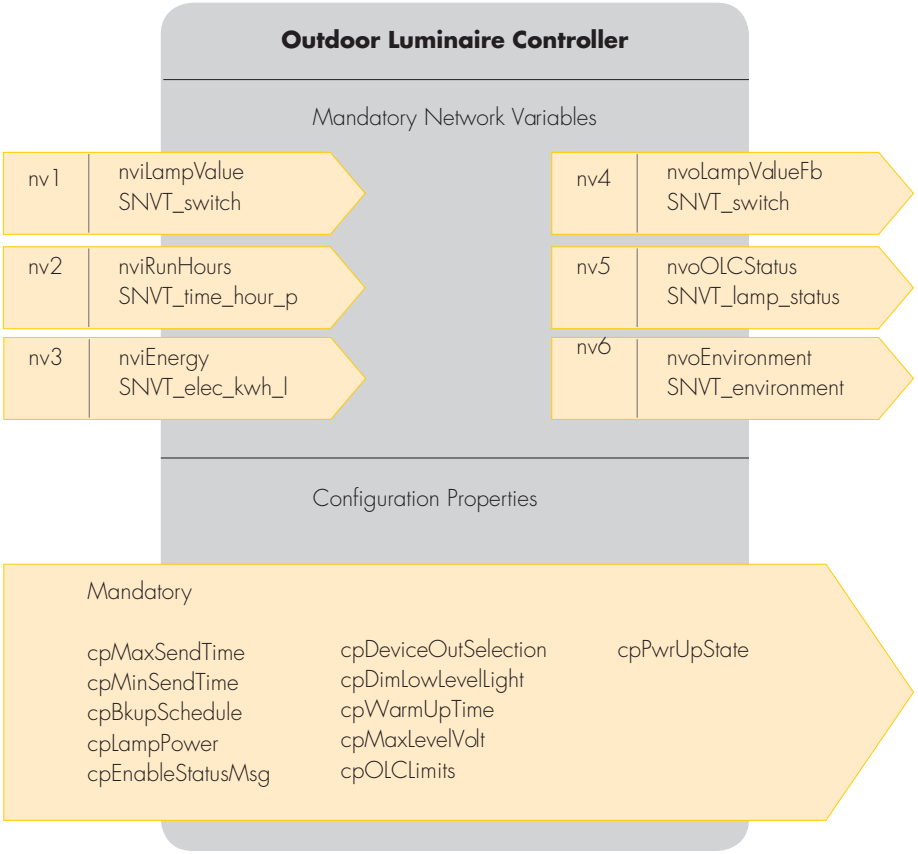
Light Controller iLC

Lonmark® OLC-Profile



In accordance with the mentioned ANSI and EN specifications, the controller is fitted with an interoperable network interface, which is essential for setting up heterogeneous networks. The definition of the exact data structure for data transfer purposes is fixed in accordance with the Lonmark® definition in line with the so-called OLC profile (Outdoor Luminaire Controller). Controllers that are manufactured in line with this standard, even if produced by different manufacturers, can be integrated into a common network.

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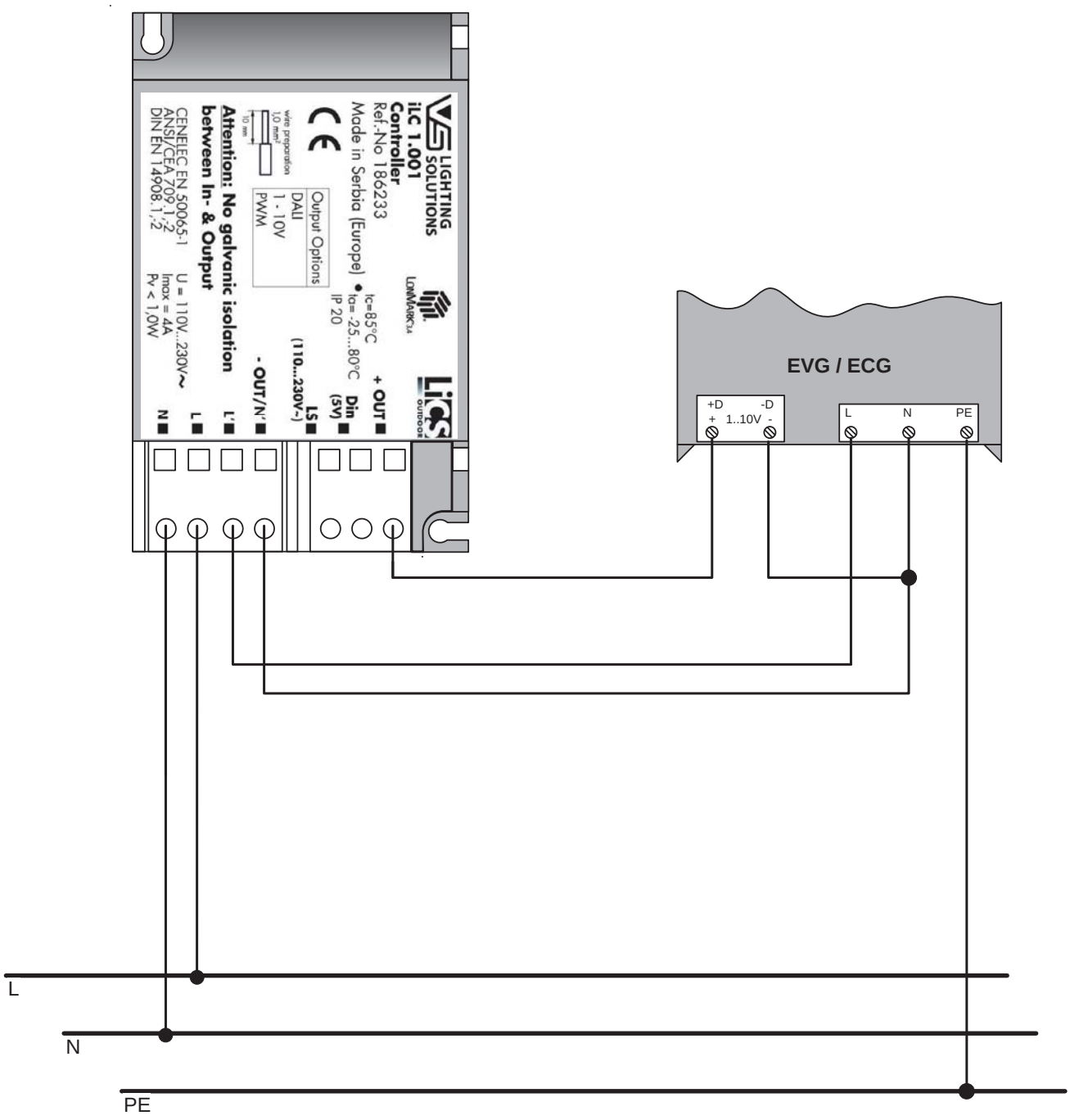
Light Controller iLC

Connection of electronic ballasts with a 1–10 V/DALI control input

Apart from being able to address all commonly available ballasts, the controller also makes it possible to completely switch off electronic ballasts if connected to a switched lighting cable. This provides luminaires operated with 1–10 V electronic ballasts, in particular, with an important additional function.



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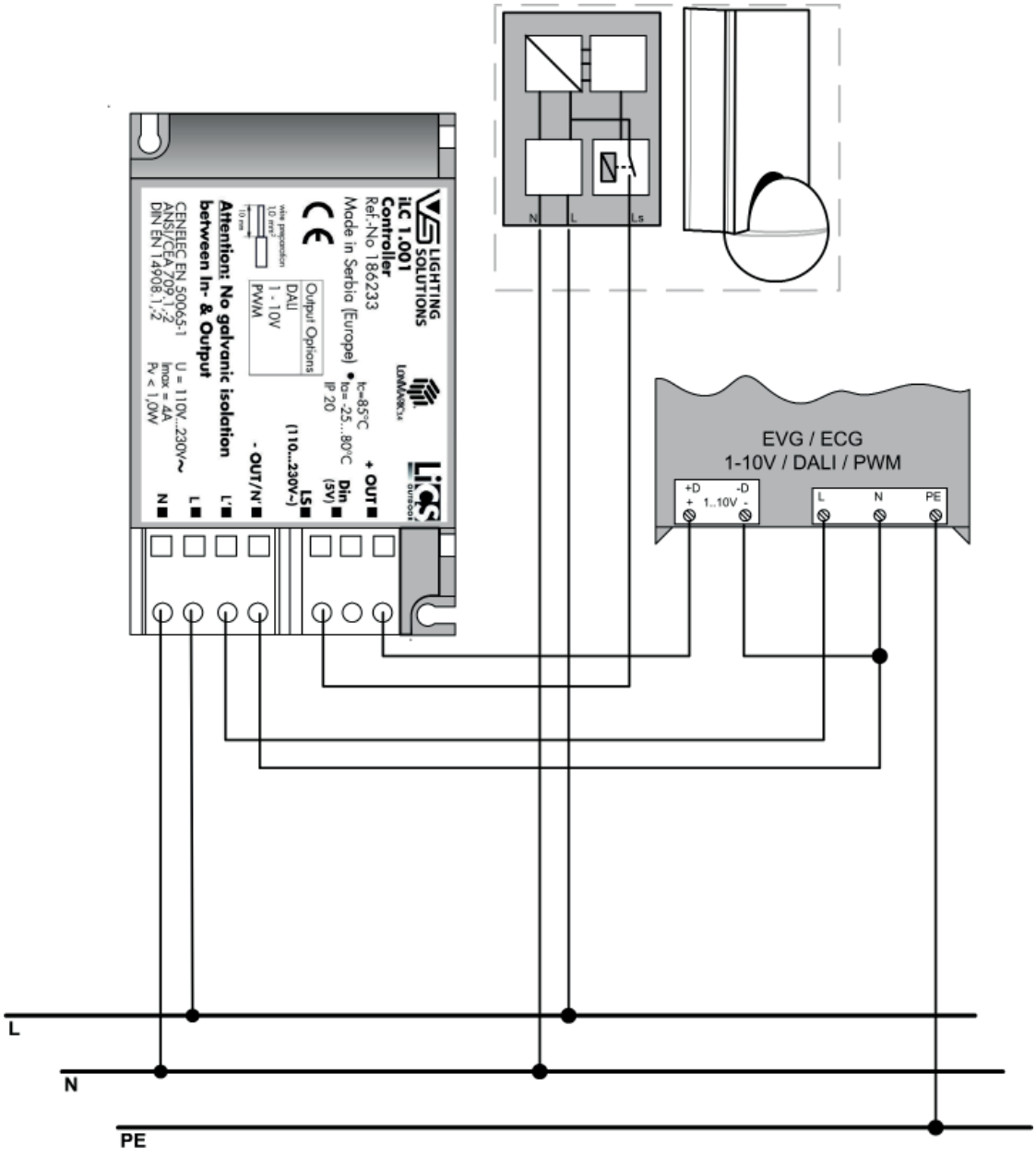
Light Controller iLC

Control using the L_{ST} control input via a motion sensor or control line

The L_{ST} input is designed for 110–250 V AC. Different functions can be used depending on the given configuration. When using a motion sensor, the lighting period can be defined in the controller. If motion is detected again during this period of time, the lighting period will restart for the specified time.



Sales Text

Network-capable, multifunctional, intelligent luminaire controller featuring power line communication and extended stand-alone functionality that is suitable for use in street lighting, lighting in the vicinity of buildings as well as industrial (high-bay) lighting. The iLC enables control of luminaires operated with standard electromagnetic ballasts as well as electronic ballasts with a 1–10 V or a DALI interface. The controller permits control of luminaires if connected to a switched lighting or mains cable. All kinds of sensor can be used with the universal control

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Light Controller iLC

input. Ballasts with a DALI interface are addressed using a broadcast command, which removes the need for commissioning the electric ballast. The controller is configurable and updateable. Key parameter values such as voltage, current, output, energy and lighting hours are captured and transferred to a central control point for evaluation. When the controller is operated in stand-alone mode, it is possible to set 10 switching times that are derived on the basis of the daily operating period; individual dimming sequences and dimming levels can be set for each of these 10 switching times. The 230 V AC control input permits the superimposed use of up to 10 time-dependent dimming levels and dimming sequences. Furthermore, when used in sensor mode, the holding time for motion sensors can be freely and retriggerably defined. When used in areas outside of pedestrian crossings, this special configuration makes it possible to delay or bring forward the point in time when luminaires are switched off. Time offset, dimming sequences as well as dimming levels can be freely defined.

Text for Invitation to Tender

Power-line-capable controller for integration into luminaires that permits control of luminaires used in street lighting and lighting in the vicinity of buildings that are operated using a switched lighting cable or an unswitched mains cable in combination with a sensor or a control line. Data transfer is undertaken in accordance with the ANSI CEA (709.1, 709.2) and the EN 14908 (-1, -2) standards. The controller communicates using the OLC Lonmark® profile. In line with the LON philosophy and the OLC Lonmark® definition, the controller is equipped with the requisite applications to enable control as well as calculation of data and limit values. Luminaires operated with an electronic ballast with a 1–10 V or DALI control input can be connected and addressed. In accordance with CENELEC and DIN EN 50065-1, bi-directional LON power line communication is effected using the C band (125…140 kHz) for primary communications and the B band (95…125 kHz) for secondary communications. The built-in luminaire controller features a switched output that makes it possible to turn a luminaire of up to 4 A on/off. To enable electronic ballasts to be addressed, the controller also features a configurable, short-circuit-proof control output (I_{max} 15 mA) for a DALI or 1–10 V output. Used as a bus master during DALI operation, commands are transmitted to electronic ballasts in broadcast mode. Optionally (configured) individual electronic ballasts can also be addressed via an allocated short address. The controller is suitable for ballasts fitted with a galvanically isolated input, but that lose their basic electrical isolation when connected to the controller.

Electrical specifications: mains voltage 110–250 V (10%), mains frequency 50 Hz (+1% / –2%), nominal current max. 4 A, power consumption 1 VA (standby) / 6.75 VA (transmission mode), surge voltage protection 4 kV / 1.2 / 50 in acc. with DIN EN 61037, suitable for luminaires of protection class I and II. Measuring accuracy: voltage U_{eff}, current I_{eff}, output P_{eff}, upwards of 1% in acc. with upper range value, energy (kWh) better than 1%, temperature, phase shift cos ≤ 0.02°. Climatic conditions: operating temperature –25 °C to +80 °C, storage temperature –25 °C to +85 °. Polycarbonate plastic casing. Dimensions (WxHxD) 93x58x30 mm. Weight: 100 g, degree of protection: IP20. Synchronisable real-time clock. Interoperable software interface, use of network variables and configuration parameters in acc. with Lonmark®, control and monitoring parameters: switching on and off, power reduction/dimming, lighting hours, input voltage, current to the electromagnetic ballast/electronic ballast, phase shift cos(phi), calculated power uptake and energy consumption. Configuration and monitoring of limit values of voltage, current, capacitor effect (only with magnetic control gear). Optionally extendable current measuring range via externally calibrated current converters in steps of 10 A to 100 A. The decline in luminous flux over the lamp's service life can be compensated. Start and end values as well as lamp service life values can be freely configured. For new lamps, the entire superimposed dimming function can be switched off in a lamp- and lighting-hour-dependent manner.

During optional stand-alone operation, the dimming level is automatically calculated and tracked, which enables energy-optimised operation over the lamp's lighting hours as well as by adjusting over-dimensioned luminaires to suit specific lighting tasks. When in operating mode, the controller can be connected to a switched lighting cable or an unswitched network cable in combination with a sensor or a control line. Given typical use when connected to a switched lighting cable, the controller "learns" what time it is by itself based on the periods of time it was switched on during three days of operation; the detected time of day is then used to derive the real-life switching times. Up to 10 freely configurable times of day are available for setting the EB's dimming values. The switching status of the relay, the dimming value and the dimming sequence is individually configurable on the basis of the time set in the Parameters section. The 110–230 V AC control input can be used to influence the internally calculated switching and dimming function. The control input initiates up to 10 timers that exert superimposed control over the sequence of the relay's switching status, the dimming value as well as the dimming sequence. Per timer, the switching status of the relay, dimming value and dimming sequence can be individually configured. The decline in luminous flux over the lamp's service life can be compensated. Start and end values as well lamp service life values can be freely configured. For discharge lamps, the entire superimposed dimming function can be switched off in a lamp- and lighting-hour-dependent manner. The controller can delay switching on a luminaire and can switch it off earlier. Dimming sequences and dimming levels are adjustable. External tools can be used for configuration and updating purposes. All stand-alone functions are configurable via the power line and with that can also serve as a backup or as an intelligent additional application for a decentralised light control point. Power consumption during operation totals < 1 W.

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iDC

INTELLIGENT DATA CONCENTRATOR

Vossloh-Schwabe's iDC data concentrator forms an intelligent interface between the central control technology and any luminaire controllers in the field. As a major connecting element of the light management system, the iDC enables direct access to every luminaire controller via a standardised power line in accordance with CENELEC 50061 and EN14901.-1, -2. Furthermore, the product enables decentralised use of key central control functions in order to additionally guarantee the autonomous and self-sufficient operation of the system. Typical applications include street lighting, lighting near buildings featuring direct integration via an OPC client/server architecture and tunnel lighting with the option of a self-monitoring redundant cold-standby architecture.

BASIC iDC VERSION WITH A GPRS MODEM AND AN IP CAT5 INTERFACE (TYPE 186230)

The basic version of the iDC is equipped to enable transmission via GPRS and an IP/Cat5 cable network. The version currently enjoying the most widespread use can be connected to devices in the field via the extensive mobile communications networks of the various providers. To enable the iDC to be integrated into the mobile network and enable data transfers, an additional SIM card is required that must provide a monthly data transfer volume that suits the intended level of use. Depending on the specific application and network size, data volumes of 30 to approx. 300 MB can be expected. Either in parallel or alternatively, the iDC can also be integrated into an IP network using a Cat5 cable. If it is known from the outset that the iDC will primarily be operated using direct IP integration, version 186237 should be selected.

iDC Data Concentrator

Technical Details

Intelligent Data Concentrator	**186230**
Type	iDC
Physical Details	
Casing	Aluminium, AlSi12 (Fe)
Dimensions (W x H x D)	280 x 230 x 112 mm
Weight	4,400 g
Degree of protection	IP65
Boreholes	2* PG screw connections (25 x 1.5 mm)
	2* PG screw connections (32 x 1.5 mm)
	2* PG screw connections (20 x 1.5 mm)
Operating temperature	–25 °C to + 60 °C
Storage temperature	–25 °C to + 85 °C
Mains voltage	230 V (+ 10 %), 50 Hz (+ 1 % / – 2 %)
Power consumption	average 7 W
Surge protection	externally extended 4 kV 1.2 / 50 better than stipulated by DIN EN 61037
Protection class	I
Aerial connection	FME male for external aerial
Interfaces	
	2 digital inputs 30 V AC/DC Optionally extendable using a cut-off relay for 230 V AC
Outputs	2 relays 230 V AC 10 A
Inputs	2 impulse input counters, S0 in acc. with DIN 43 864
Ethernet Port	10/100BaseT, auto-selecting, auto polarity
RS232 Interface	GSM/GPRS Modem
Power line communication	in acc. with CENELEC EN50065-1, primary using the C band (125–140 kHz), secondary using the B band (95–125 kHz)
Data transfer	single-, bi- or tri-phase
Data transfer USA	Protocol: ANSI CEA 709.1, Transceiver: ANSI CEA 709.2
Data transfer EU	Protocol EN 14908-1, Transceiver EN14908-3
Software Interface	
	interoperable, use of network variables and configuration parameters in acc. with LonMark®
Data transfer	repeating, with dynamic supervision of the communication path Data
Transfer	master/slave for max. 200 luminaire controllers
Communication	to the main computer; protocol TCP/IP SOAP/XML
Wireless communication	GPRS/ GSM/EDGE modem frequency range: 850/900/1800/1900 MHz GPRS and EDGE in the multi-slot class 12, depending on the provider: GPRS 86kBps, EDGE class 12, 36kBps
Internet Service	Transparent TCP, UDP, http, FTP, SMTP, POP3
SIM Card holder	DELIVERED WITHOUT A SIM CARD; please contact your service provider

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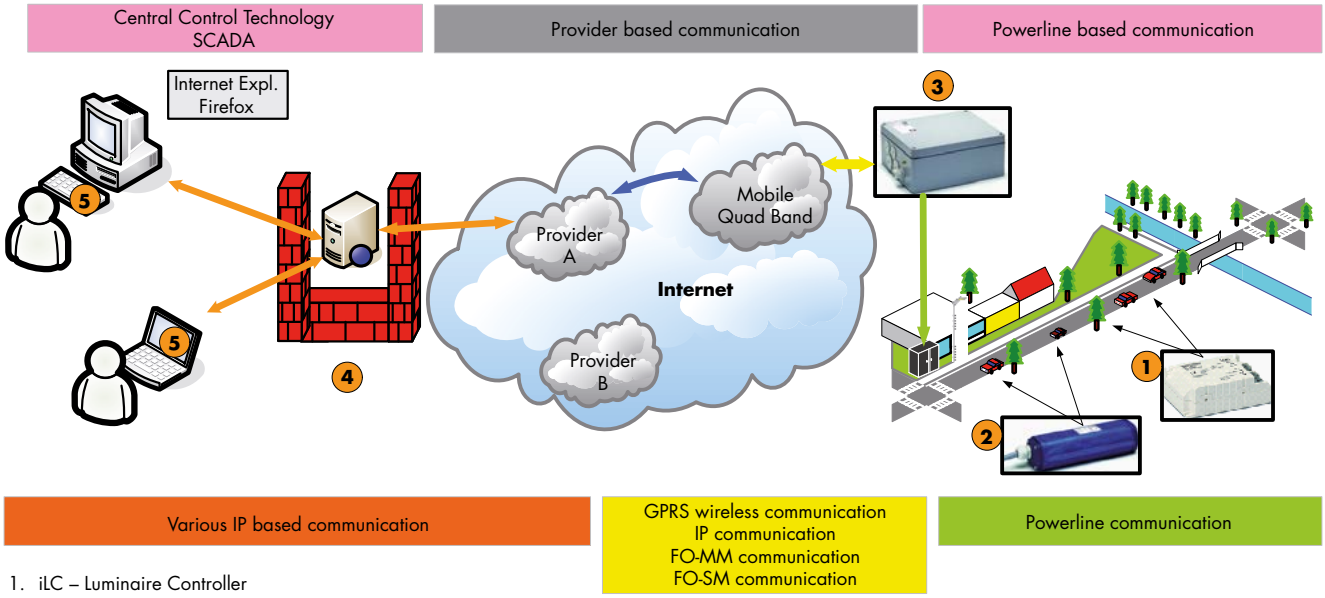
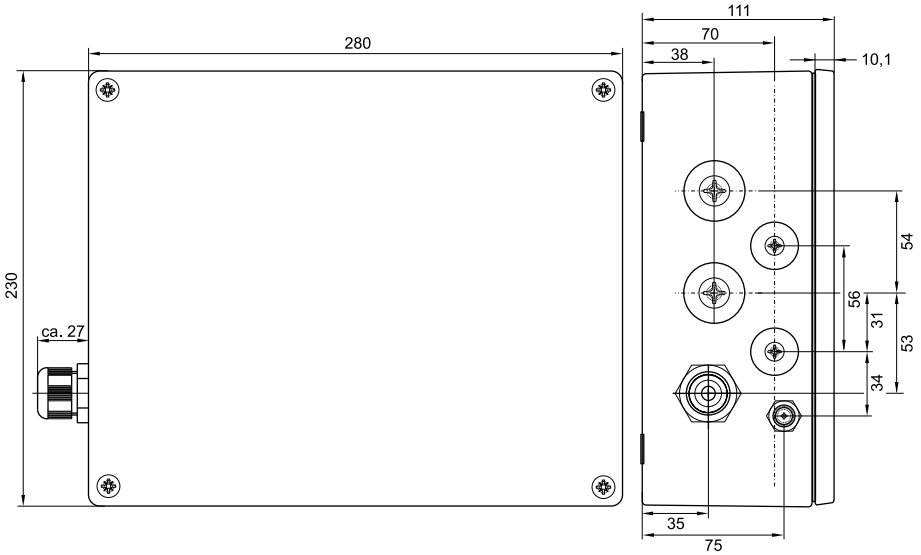
iDC Data Concentrator

Overview



1. iLC – Luminaire Controller
2. iPC – Pole Controller
3. iDC – Data Concentrator (quad band modem)
4. iLIC – Server
5. PC – PC/Notebook, Internet Explorer/Firefox

Dimensions (mm)



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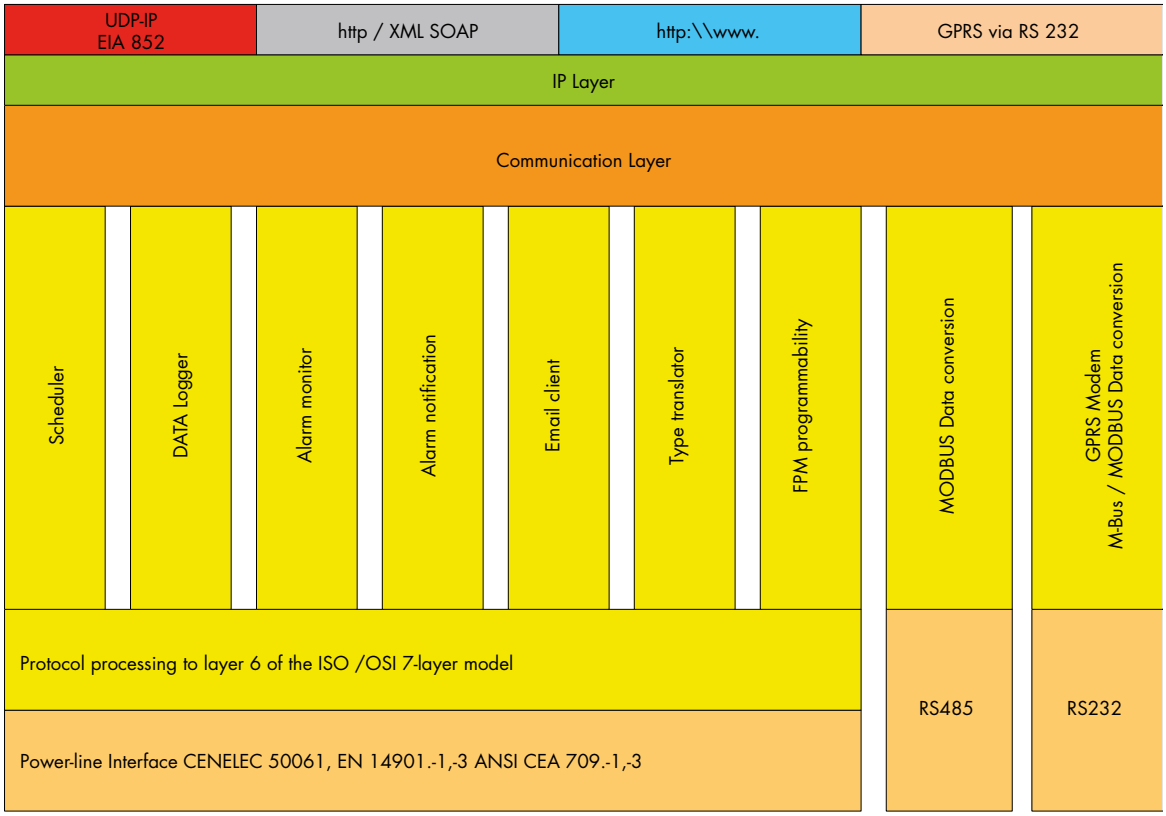
iDC Data Concentrator

The iDC's Local Application Intelligence

Thanks to its integrated smart server, the iDC is equipped with the key applications that enable it to be integrated into a light management system. Safe and reliable operation of the system as a whole is largely dependent on the architecture of the lighting control system. If the transmission channel between the control technology and the iDC fails, this usually results in the subsequent failure of all downstream components. To avoid this and ensure a certain degree of redundancy, astronomically controlled schedulers can be activated in the iDC that will, after a certain delay, then perform the respective function.

A similar safeguard is provided for recording data generated by luminaire controllers. The smart server of the iDC contains locally integrated data loggers which are capable of recording generated data, even for days at a time, and can then transfer these data to the control technology, usually on a daily basis, but just as easily after a few days in the event of a communication breakdown. Most importantly, though, no data are lost. As the system is designed for universal use, it can be configured to suit highly disparate applications. The applications shown in the chart are integral parts of the iDC's local intelligence and can be remotely configured using the available communication channels. The open nature of the data interface is properly documented in accordance with the XML/SOAP conventions as well as the W3C consortium and WSDL (Web Service Description Language).



Functions

Real-time clock: with a power reserve, synchronisable, incl. astronomical calendar
Time synchronisation: optional server-based (SNTP) time synchronisation. (Provided technical conditions exist.) Email: email client to send predefined information.
Data logger: monitors process data of the luminaire controller
Alarm: monitors process data; triggers defined actions
Timer-based control: planning and activation of repetitive control tasks
IO converter: converts digital input signals into process data and vice versa.
Operating system: updateable
Programmable: yes

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iDC Data Concentrator

Software

Easy parameter configuration and installation is ensured by the software for commissioning luminaire controllers in accordance with LonMark® specifications. Only in connection with the iDC.

The iDC is optionally available in the following versions:

iDC-IP
Ref. No.: 186237
Difference from the basic version: delivered without a GPRS modem

iDC100 Sm
Ref. No.: 186239
Difference from the basic version: delivered with a media converter for single-mode optical fibres
- Interface LWL interface
- 1x100 base FX, SM cable, SC sockets
- Single-mode fibre (SM) 9/1251Jm 0...32.5 km
- 16 dB/km link budget at 1300 nm
- A=0.4 dB/km, 3 dB reserve,
- D=3.5 ps/(nm x km)

iDC100-mm
Best.-Nr.: 186238
Difference from the basic version: delivered with a media converter for multimode optical fibres
- Interface LWL interface 1x100 base 1FX, MM cable, SC sockets
- Multimode fibre (MM) 50/1251Jm 0....5000 m
- 8 dB link budget at 1300 nm
- A=1 dB/km, 3 dB Reserve, B=800 MHz x km
- Multimode fibre (MM) 62.5/1251 Jm 0....4000 m
- 11 dB link budget at 1300 nm A=1 dB/km, 3 dB reserve, B=500 MHz

Sales Text
Data concentrator for managing power-line-capable luminaire controllers based on LonWorks® technology for sub-distribution or substation installation. As the connecting link between the central control point and the luminaire controllers, the iDC enables online communication via open, standardised protocols on both the IP and the field level. Fitted with local applications that are specific to lighting applications, the iDC is also capable of intelligently managing the systems in offline mode. This requires a data logger, a limit-value monitor, schedulers, an email client, a real-time clock as well as a WEB server with a programming interface. Versions with GPRS, IP/Cat5 and an optical fibre interface for single- or multimode technology are also available for integration into different infrastructures.

Text for Invitations to Tender
Wall-mounted data concentrator for managing luminaire controllers in accordance with the OLC LonMark® profile via a LON power line. Depending on the specific product, communication to the central control technology can be optionally effected via:

a) GPRS/GSM modem (850/900/1800/1900 MHz, data transfer GPRS multi-slot Class 12) using the TCP/IP protocol with XML/SOAP-embedded messages. (Basic version of the iDC.)
b) IP Cat5 cable
c) Single-mode optical fibre
d) Multi-mode optical fibre
Bidirectional LON power line communication in acc. with DIN EN 50065, primary: C band (125-140 kHz); secondary: B band (95-125 kHz). Protocol in line with ANSI CEA 709.1, Transmission in line with ANSI CEA 709.3. Data transfer: Europe EN 14908-1, 3

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iDC Data Concentrator

Text for Invitation to Tender (cont.)

The iDC is suitable for 230 V (+/- 10%) mains voltage with a frequency of 50 Hz (+1%/-2%). Standby power consumption: 7 W, during operation: 12 W, depending on type of operation. By virtue of the application, the iDC is fitted with additional hierarchical protection to ensure a special level of surge protection of up to 4kV 1.2/50, which serves to prevent electronics failure. Operating temperature: –25 °C to + 60 °C, storage temperature –25 °C to + 85 °C. To ensure optimum EMC shielding, the iDC is delivered in a RAL 7001-varnished aluminium casing, with dimensions (W/H/D) of 280/230/112 mm and a weight of 4,400 g. The real-time clock with a power reserve and astronomical calendar can be synchronised via an SNTP server. A data logger, an alarm monitor as well as alarm notification are available in the form of special applications for the purpose of recording data using LonWorks® technology. Parameters are configured via the internal web interface or the XML/SOAP interface. Logged data and alarm messages can be sent by email.

Operating options:
- switched lighting cable
- unswitched lighting cable
- 1- to 3-phase voltage supply and signal coupling

The following interfaces are available:
RS-232 interface (9-pole) for commissioning and maintenance; two optical, decoupled digital inputs; two relay outputs (10 A); two S0 impulse inputs, compliant with DIN 43 864. Ethernet port 10Base-T via an RJ45 jack.
Protection class I, degree of protection: IP65, secure connection of the supply voltage via PG screws. Connection lead not included in the scope of delivery. Two further openings with M25 and M32 threads (plugged upon delivery) are optionally available on each iDC for feeding through additional cables. SIM card for GPRS is not included in the scope of delivery. Voltage supply is single-phase. Signal coupling can be 1-, 2- or 3-phase. Using the internal phase-coupler, 3-phase signal distribution is superimposed over the lighting cable and effected via selective filters in the C/B bands of the CENELEC frequency range.

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COUPLING UNIT

iCCU

Developed to enable powerline coupling of electrically isolated supply networks, the product permits C-/B-band data transfer in accordance with Cenelec EN-50065-1.

Technical Details:

- Standby consumption of 0.0 W
- C-/B-band powerline communication in acc. with Cenelec EN-50065-1.
- ANSI CEA 709.1 , 709.2 or EN 14908-1, EN 14908-2
- Voltage-proof up to 3 kV
- Also suitable for standalone operation as part of a light management system.
- No software-based configuration required.
- Connection with an NH fuse possible on request

Typical Applications:

- Lighting in proximity to buildings, street lighting
- Company premises, warehouses, sports facilities

iCCU – Intelligent, Capacitive Coupling Unit

Technical Details

Capacitive Coupling Unit	**186345.02**
Input voltage	200 V AC to 250 V AC
Net frequency	50 Hz (+1% / –2%)
Power consumption	0,0W
Communication	
Powerline	Via the power supply line in acc. with Cenelec 50065-1
C band	primary band: 125 – 140 kHz
B band	secondary band: 95 – 125 kHz
Data transfer USA	ANSI CEA 709.1, ANSI CEA 709.2
Data transfer Europe	EN 14908-1, EN 14908-2
Electrical isolation	No input-to-output potential separation. Phase connections must be correct when coupling supply networks.
Connection cable	1 mm², length: 800mm
Conductor type of the connection cable	fine-stranded
Configuration	not required
Operation in	Powerline networks with and without a repeating function
Scope of delivery	High voltage silicone lead with open cable ends
Climatic Conditions	
Operating temperature range Tc	–25 °C to +80 °C
Lagertemperaturbereich	–25 °C to +85 °C
Resistance against surge voltage	3 kV
Standard	DIN EN 61037
Protection Class	I
Degree of Protection	IP65
Weight	770g
Dimensions (LxWxH)	180 x 94 x 60mm

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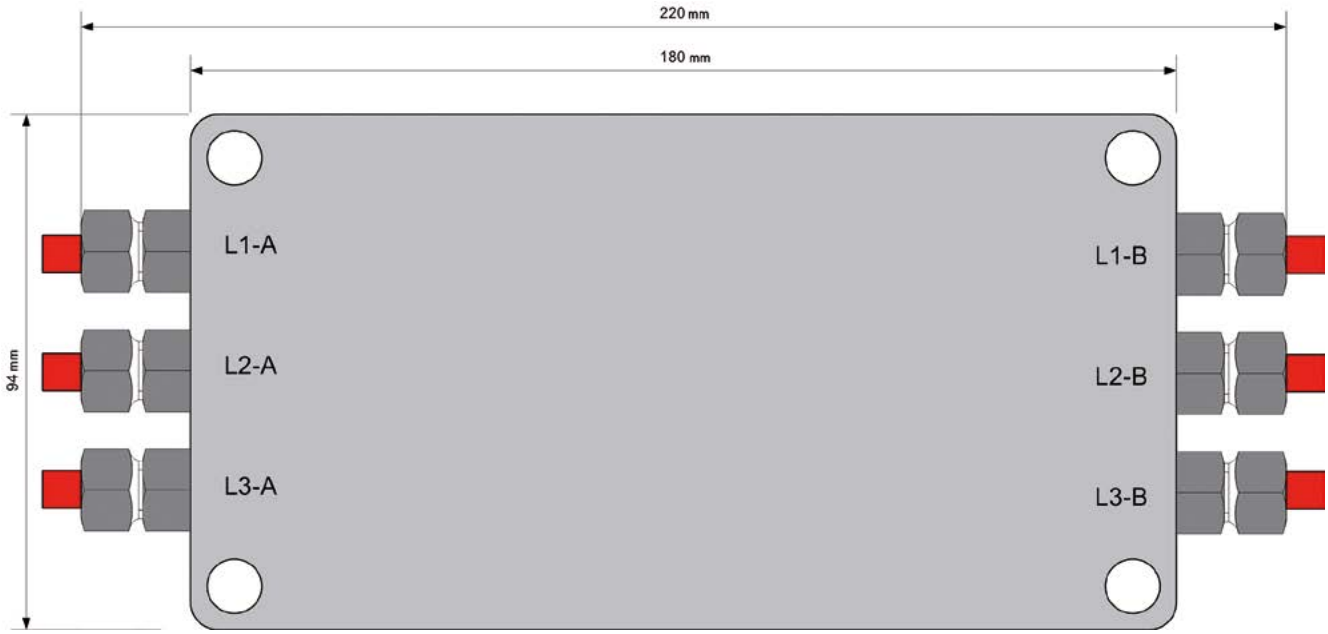
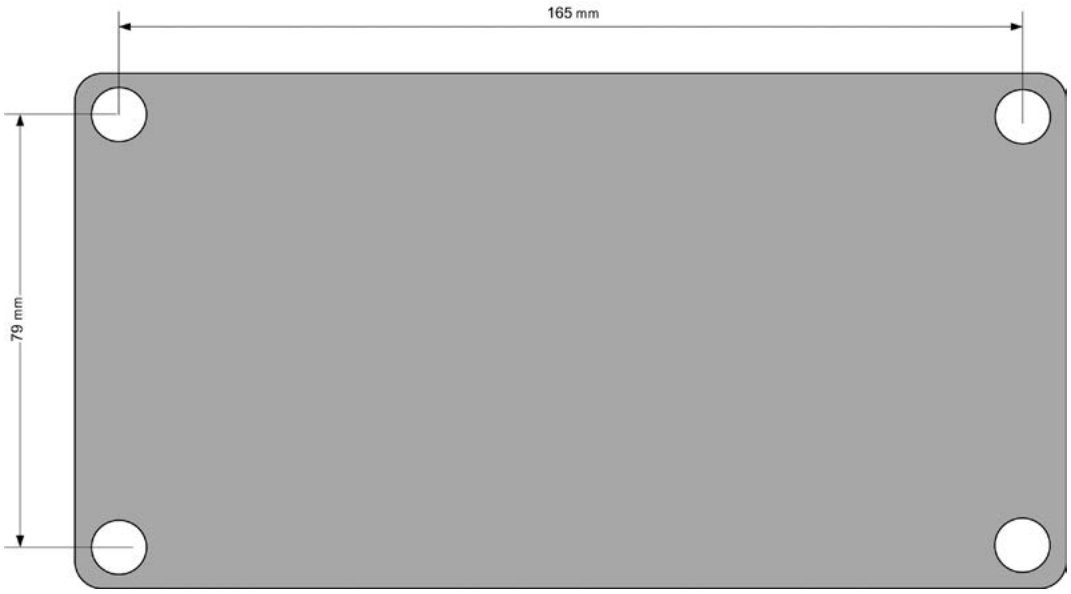
iCCU – Intelligent, Capacitive Coupling Unit

Dimensions



Drill Holes



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iCCU – Intelligent, Capacitive Coupling Unit

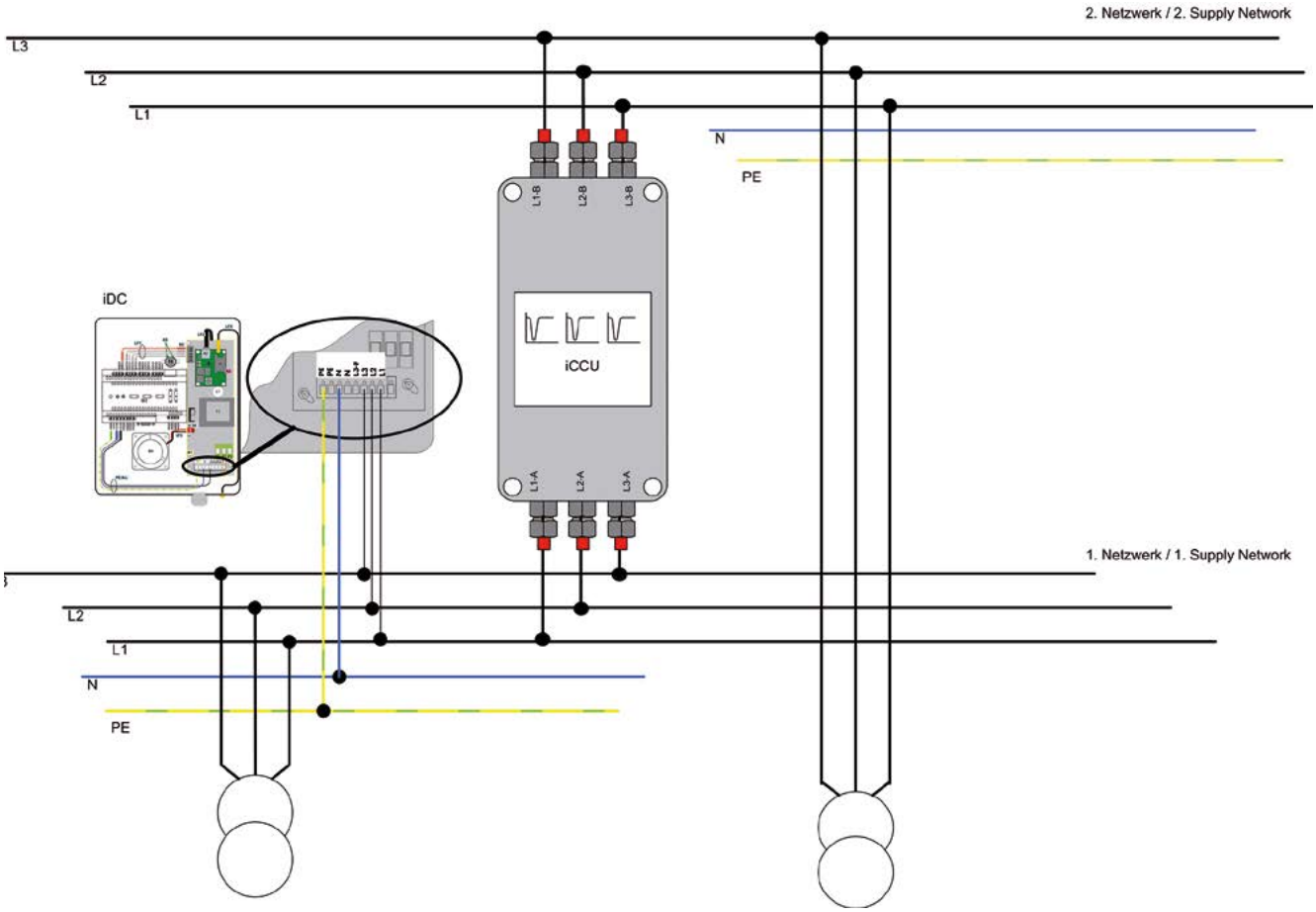
Casing

The extremely compact design of the unit facilitates installation in just about any sub-distribution.

Connection

The two supply networks are connectable using the high-voltage silicone cable.

Application No. 1



The iCCU can be used to couple the powerline signal into a further network.

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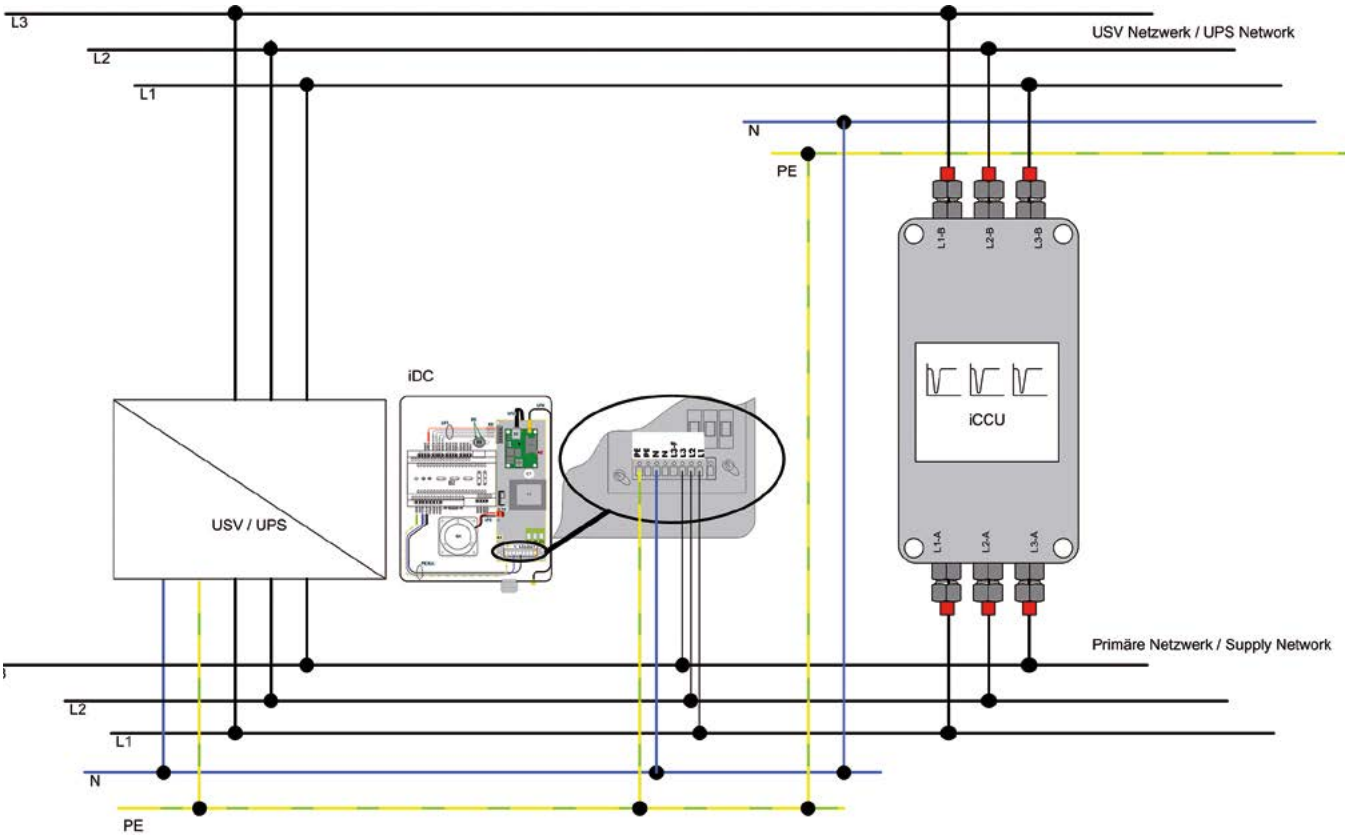
iCCU – Intelligent, Capacitive Coupling Unit

Application No. 2



The iCCU can be used to couple the powerline signal into a UPS-supported network.

Sales Text

Intelligent, capacitive coupling unit for powerline communication. Capable of standalone operation, suitable for lighting in proximity to buildings, street lighting and industrial lighting. Powerline signals are transferred using the B/C frequency range in acc. with Cenelec specifications. The unit is suitable for direct installation without requiring configuration and is transparent for data transfer purposes. Important: the unit draws no power when operated in standby mode. Care must be taken to avoid phase reversal when connecting the 230 V AC control inputs/outputs. For applications in the field of street lighting, the unit can also be provided with NH fuse inserts on request

Text for Invitations to Tender

Intelligent, capacitive coupling unit for powerline communication. Capable of standalone operation, suitable for lighting in proximity to buildings, street lighting and high-bay industrial lighting. Powerline signals are transferred using the B/C frequency range in acc. with Cenelec specifications. The unit is suitable for direct installation without requiring configuration and is transparent for data transfer purposes. Important: the energy draws no power when operated in standby mode. Care must be taken to avoid phase reversal when connecting the 230 V AC control inputs/outputs. For applications in the field of street lighting, the unit can also be provided with NH fuse inserts on request. Data transfer is possible in accordance with the ANSI CEA (709.1, 709.2) or the EN 14908(-1, -2) standard. Cenelec-compliant, bidirectional LON powerline communication is effected in the C band (primary; 125 ... 140 kHz) or the B band (secondary; 95 ... 125 kHz) in accordance with DIN EN 50065-1.

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iCCU – Intelligent, Capacitive Coupling Unit

Text for Invitations to Tender (cont.)

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The unit is suitable for electrically isolated coupling of three-phase 400 V AC supply networks, although care must be taken to ensure correct phase connection.

Electrical data: mains power (230 V (10%), frequency 50 Hz (+1%/-2%), power consumption 0 VA (standby) / (data transfer operation), resistance to surge voltage 2 kV/1.2/50 in acc. with DIN EN 61037, protection class I. Climatic capacity: operating temperature – 25 °C to + 65 °C, storage temperature – 25 °C to + 85 °C. Polycarbonate (PC) casing. Dimensions (L/H/W): 330 mm / 55 mm / 95 mm. Weight: 770 g; degree of protection: IP65.

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iLIC

INTELLIGENT LUMINAIRE IN-FORMATION CENTRE

The software enables both control of street lighting systems and capture of specific data on the basis of a Lonmark OLC luminaire controller as well as an intelligent Data Concentrator (iDC). This makes it easy to query and display technical data such as current, voltage, cos (phi), output, energy consumption, lighting hours as well as status updates regarding individual components and the entire lighting system. The tree-like structure of the system permits the display and visualisation of large data volumes in a structured manner, broken down by city, suburb and street.

Typical Applications

- Street lighting and lighting near buildings
- Outside the confines of lighting at pedestrian crossings
- Multi-storey car parks, bus/tram stops and stations
- Company premises, warehouses
- Sports facilities

iLIC Software

Product Information

Communication between the software and the infrastructure is effected via the standardised internet protocol (IP with embedded XML/SOAP structure). As standard features, the protocol provides the basis for high availability and communication security, but also comes with the necessary investment protection thanks to the broad hardware support it ensures. The web server (4) hosting the iLIC software can use any kind of transmission technology to complete the communication chain via the intelligent data concentrator iDC (3) in the field, which acts as a gateway for communicating with the luminaire controllers (1 and 2). Examples of such transmission technology are fibre optics (SM/MM), GSM/GPRS, KAT5, DSL/ADSL, satellite connection, etc..

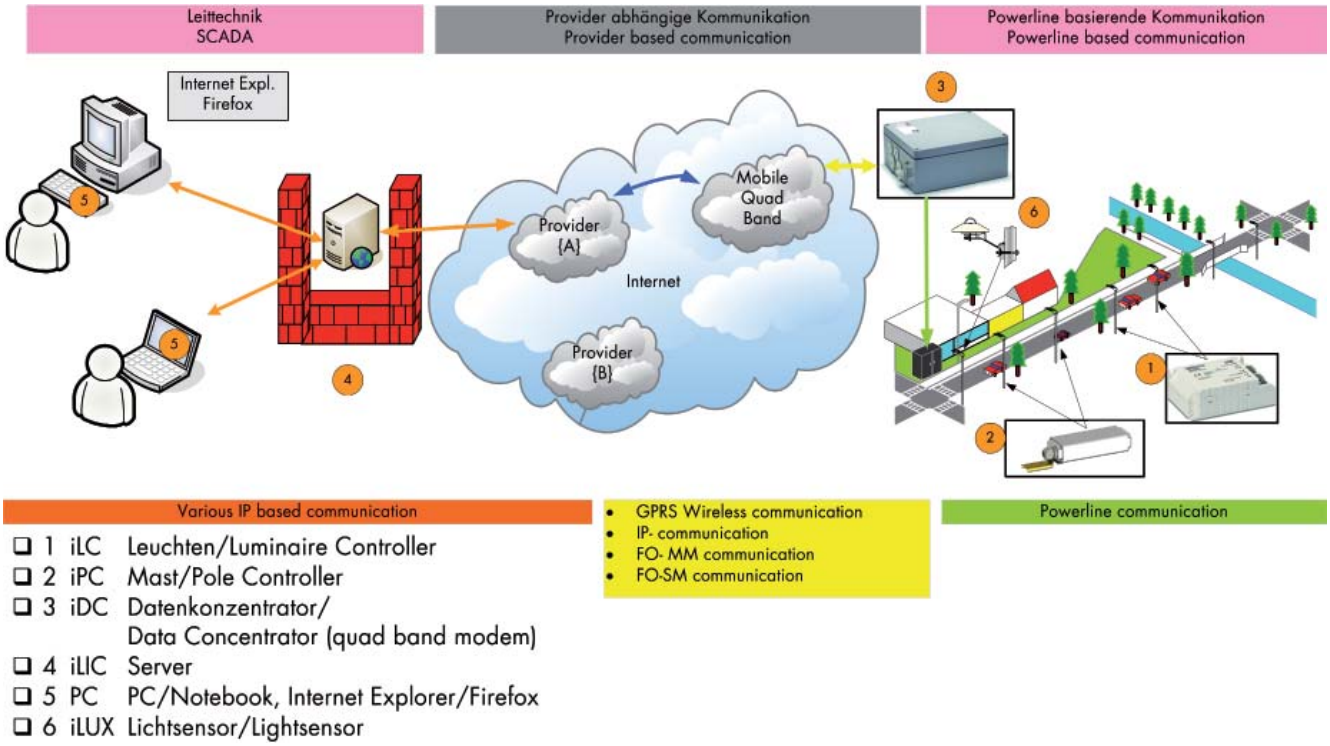
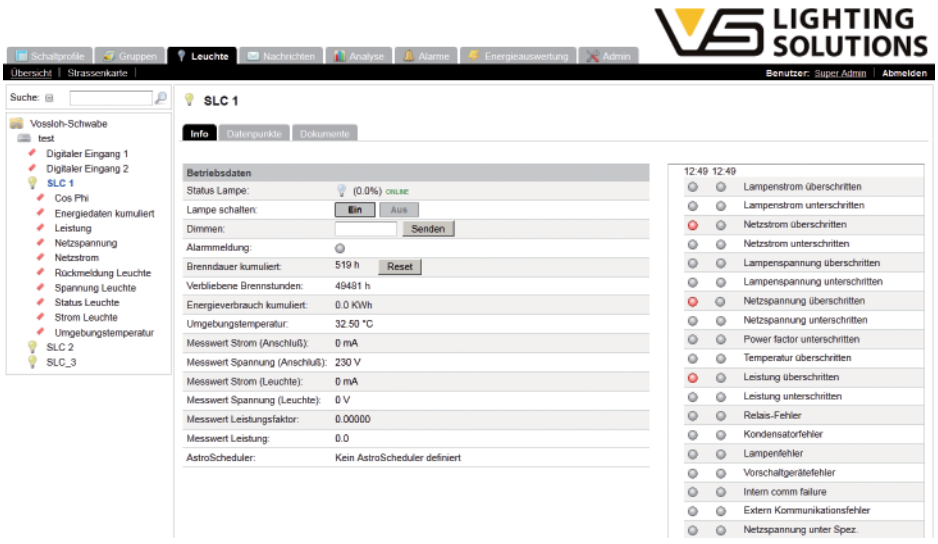


Image: Infrastructure



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iLIC Software

The software runs on Microsoft XP – Windows 8 as well as on Linux operating systems and can therefore be operated via internet clients such as Microsoft Internet Explorer or Firefox in multi-user mode. All necessary software components such as the databank, mail server and application server can be installed using an installation routine delivered on a CD-ROM. To avoid conflict with other programs, the software should be installed on a separate server or operated in a VMware-encapsulated environment.

The software provides superordinate functions for iDC control distributed in the field.

- Switching of individual luminaires or luminaire groups, incl. specification of switching times,
- and processing of signals from floating web-server contacts.
- Integrated timer program and its decentralisation.
- Addressing floating web-server relay contacts.
- Visualisation of data log files.

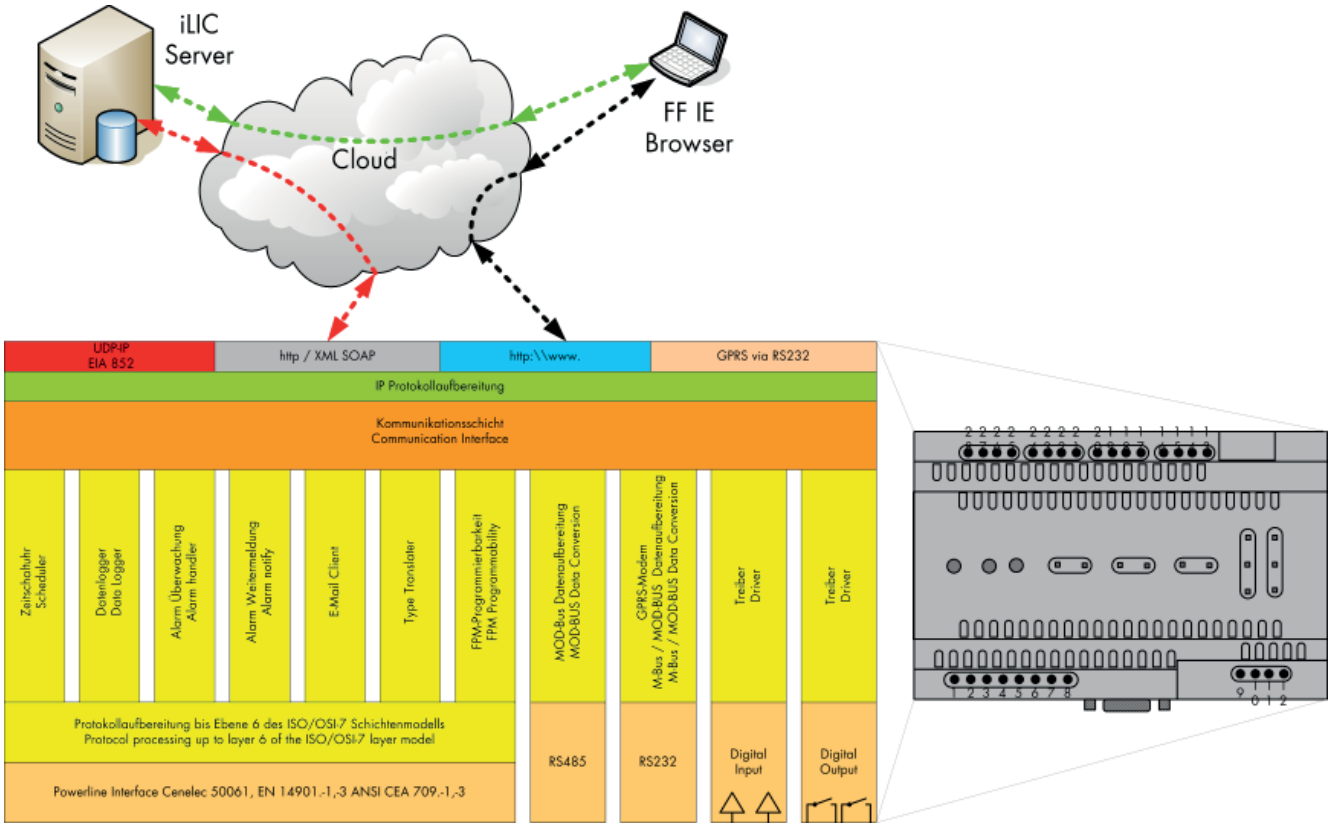

Image: Overview of control functions and data traffic

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iLIC Software

Alarm Manager

- Evaluation of all available data points with regard to threshold values such as current, insufficient or excess voltage, phase availability or time values such as lighting hours.
- Alarm manager for email services and text messaging** (**= additional service required).
- Parallel notification of the iDC by up to 4 receivers.
- Monitoring of connection times.

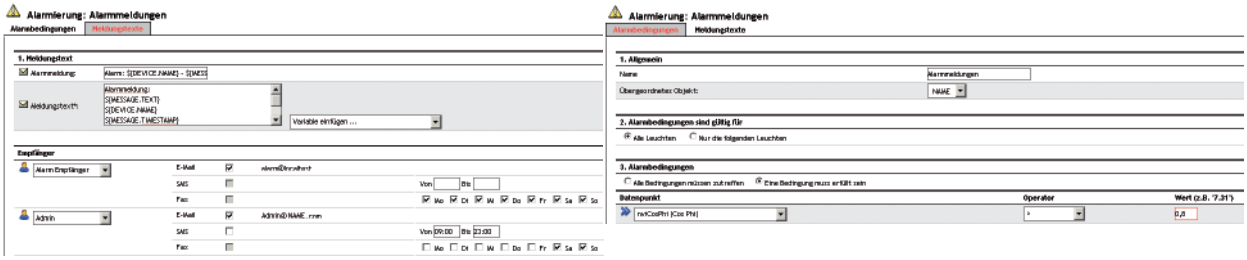

Image: Alarm manager, Alarm text

Information Centre

- News centre with process updates and alarm functions.
- Acknowledgement of updates.
- News filtering function.
- Data point plotter.
- Electronic document file.
- Integration of static maps.

Data Analysis

- Free selection of up to 8 data points.
- Freely definable time period.
- Display in colour.
- Zoom function via mouse highlight.

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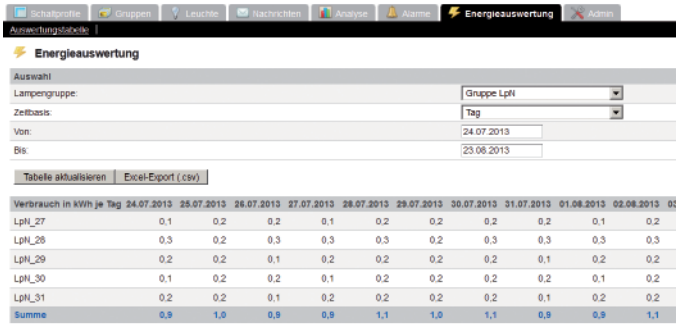
iLIC Software

Energy Analysis

- Analysis selection on the basis of a defined group.
- Freely definable time period.
- Billing period on a daily or monthly basis.
- Export to a *.CSV file.



Verbrauch in kWh je Tag	24.07.2013	25.07.2013	26.07.2013	27.07.2013	28.07.2013	29.07.2013	30.07.2013	31.07.2013	01.08.2013	02.08.2013
LpN_27	0,1	0,2	0,2	0,1	0,2	0,2	0,2	0,2	0,1	0,2
LpN_28	0,3	0,2	0,3	0,3	0,3	0,2	0,3	0,3	0,3	0,3
LpN_29	0,2	0,2	0,1	0,2	0,2	0,2	0,2	0,1	0,2	0,2
LpN_30	0,1	0,2	0,2	0,1	0,2	0,2	0,2	0,2	0,1	0,2
LpN_31	0,2	0,2	0,1	0,2	0,2	0,2	0,2	0,1	0,2	0,2
Summe	0,9	1,0	0,9	0,9	1,1	1,0	1,1	0,9	0,9	1,1

Data export and interfaces to other IT systems

- XML/SOAP interface to the iDC communication module.
- Data export as a CVS file for billing purposes.
- Web-service interface.
- Data interface ready for Lux data*.
- Import of existing master data from SAP*.

Administration

- User administration with varying user rights (multi-client-capable).
- Administering devices (place, street, luminaire, luminaire group, controller, data point).
- Hierarchical structures, which makes it possible to display access rights.

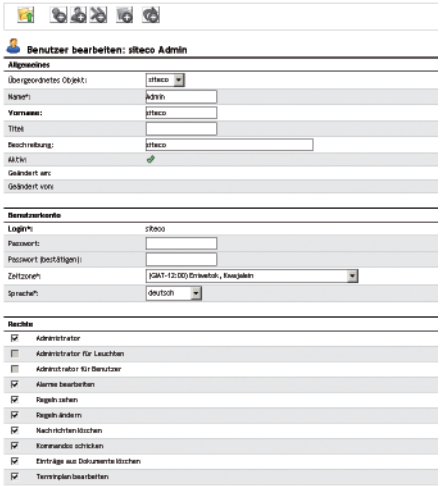


Image: Administration

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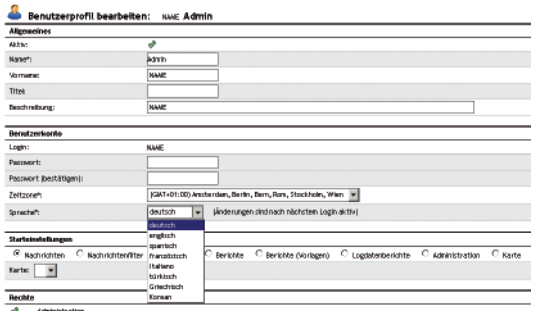
iLIC Software

Additional Features

- Languages: German, English (further languages available*).
- Graphic display of operating states*.
- Scalability: clustering support*.



* = ready, available on project basis.

Sales Text

Java-based web-server application for control and data evaluation of lighting systems on the basis of an iDC (intelligent Data Concentrator), which features a tree-like structure. The software supports control of individual luminaires as well as groups. Defined luminaire groups form the basis for switching and dimming profiles, as well as for evaluating their energy consumption. The software is multi-client-capable and offers numerous analysis, alarm and news functions, which offer a variety of escalation levels with associated messaging in the event of a system problem.

Text for Invitations to Tender

Java-based web-server application for control and data evaluation of lighting systems on an iDC (intelligent data concentrator) basis. The program organises a lighting system in a tree-like structure and enables visual display of large data volumes and data points. Functions are generally structured with the help of tabs such as Admin, Luminaire, Group, Switching Profile, News Analysis, Alarms and Energy Evaluation, as well as associated property-related submenus. The application is capable of supporting multiple clients and makes it possible to precisely limit functions in line with the property structure of the actual company as well as any external persons that are to be given access. The data point of a luminaire can be displayed in a freely available map. Measured data will be available either off- or online, depending on the operational state of the lighting system. Logged data are processed in graphic form and, thanks to a timestamp, also provide a quick graphic analysis option in the form of curve, line or bar graphs.

It is possible to define an astronomical calendar under consideration of geographical data (latitude and longitude) as well as switching priorities for daytime and night-time operation to switch the lighting system off or on at sunup and sundown, respectively. Further options include defining a switching offset to adjust to "civil dusk", exporting a defined astronomical calendar using a superordinate management program and displaying parameters.

The program is delivered on a USB drive or CD and contains all components in the form of an installation routine. The program is available for Linux derivatives or Microsoft OS (XP to Windows 8). In terms of hardware, a state-of-the-art PC should be used. Precise security requirements should be clarified directly with the IT department.

LIGHTING SOLUTIONS
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