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# TOMORROWS CITY: STREET LIGHTS AHEAD



The lights have turned "green" for a new generation of street lighting.

Which is energy-efficient and can be used with pioneering and innovation intelligence.

Light. When needed. As much as needed.

# Light

# When needed

# As much as needed

Smart. Sustainable. Efficient.

INTELLIGENT STRE

FIXED LIGHT CONT

**REMOTE CONTROL** 

**REMOTE CONTROL** 

VOLUME BASED LI

LIGHT ON DEMAND

**OFFICES AND BUIL** 

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#### 4 INTELLIGENT STREET LIGHTING

# The lights have turned "green" for a new generation of street lighting.

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The environment, energy, climate change and climate protection are bigger issues than ever for mankind. With regard to lighting, this means the further development of energy-saving concepts, future-proof lighting management systems and individual, digital, automated Smart City solutions are becoming increasingly important.

Energy consumption an therefore operating costs can be significantly reduced by targeted dimming of LED Lights without having to compromise on comfort and safety. In addition to reduced energy consumption, dimming also extends the service life of your luminaires and makes a valuable contribution to reduced light pollution.

### **ENSURING THE RIGHT APPROACH** 5

## esave is revolutionizing your street lighting

Public lighting ensures safe and pleasant streets and roads, but is not limited to this application area. Many different infrastructure objects are illuminated at night, however this might not always be necessary.

#### FIXED LIGHT CONTROL:

Intelligent, stand-alone lighting management system for lighting needs, based on individual environmental influences

#### INTELLIGENT LIGHTING CONTROL:

Intelligent, stand-alone lighting management system based on real-time data from sensors.

- Light on Demand
- Volume based Light Control

#### **REMOTE CONTROLLED LIGHTING:**

Intelligent lighting management system based on real-time data and with remote access via a gateway.

#### **REMOTE CONTROLLED LIGHTING:** WITHOUT A GATEWAY

Intelligent lighting management system based on real-time data and with direct remote access to the respective Cellular street light controls.

### Independent, intelligent street lighting

Luminaires which are equipped with an esave control can automatically connect via a wireless network as soon as the power is switched on. Via Laptop or tablet equipped with an esave SL-Control USB-Stick an installation can be directly configured, controlled and monitored on site. For convenience, the user is supported by the user-friendly Windows software. This makes complicated configurations easy and intuitive.

### Benefits

- Once-off purchase cost for the SLC-USB stick incl. software license (no further license fees)
- Automatic, regular updates without additional cost
- Data is stored directly in the luminaire. (no permanent internet connection necessary)

## **Cloud-based, intelligent street lighting**

The SL-Gateway is a small device placed in the proximity of an SL-Control installation. The SL-Gateway establishes a connections between an esave SL-Control wireless network and the esave SL-Control server. The esave server collects the data and presents it on the user-friendly webplatform. Lighting installations can be monitored, configured and controlled centrally from the office or on the road. Operators do not need to be within wireless range of the installation. SL-Control is a cloud-based Light Management Platform with a user-friendly interface. It visualizes, and analyzes all measurement results and provides an overview of all information.

### Benefits

#### • Display of the current luminaire status data

- Evaluation of traffic volume
- Display of energy consumption
- Remote monitoring of the installation



Operational cost savings through real-time monitoring and real-time maintenance

### More than just communication

The highest global security standard is provided by mobile networks. Our latest generation of street light controls can additionally communicate via mobile networks. The street light controls are equipped with an integrated SIM card. By using the cellular network, the individual street light controls can connect to a nearby cellular tower and connect directly to our SL-Control server.

To ensure backwards compatibility, the controls can communicate via the integrated mesh network as well. Just like the previous generations, the installation can also be accessed with a laptop or tablet equipped with an esave SL-Control USB-Stick and configured, controlled and monitored on site.

### Benefits

- Display of the current luminaire status data
- Evaluation of traffic volume
- Display of energy consumption
- Operational cost savings through real-time monitoring and real-time maintenance
- Remote monitoring of individual controllers without gateway

## Newly revolutionized Ring Control

The SLC-RC Switch is a DIN rail mounted street light controller. Which is mounted in the control cabinet instead of a ring control. The integrated Cellular connection enables synchronization of current measurement data from the esave SL-Control application. Its three integrated relays receive control instructions from this measurement data to change their output state accordingly. Cloud connectivity allows the SLC-RC Switch to be remotely controlled and configured.

In addition, a smart meter can be connected to the SLC-RC switch to display, monitor and report the energy consumption.

### Benefits

- Replacement for Ring Controller luminaires by esave SL-Control
- Smart meter integration for energy monitoring
- Integrated SIM card and GNSS receiver
- Three potential-free relay contacts



• Replacement for Ring Controller for on-site and/or remote control of connected street

gy monitoring eceiver

### **Intelligent Perception of our Environment**

The volume-based light control solution from esave makes your lighting system even more intelligent. The lighting system is equipped with sensors to detect traffic density. When it recognizes increased traffic density (e. g., during rush hours or for a special event such as a football match) a higher level of light intensity will automatically be activated, providing better visibility and safety.

The idea behind esaves Light on Demand solution is very simple: Each luminaire is equipped with a motion sensor that registers whether there is traffic on the street or not. Once the sensor registers analogue movement in the illumination area, light intensity is automatically increased to a higher level and a message is sent to the next luminaire(s) in line, which also increase light intensity before the pedestrian or vehicle reaches the next luminaire position.



### LIGHT ON DEMAND 11

### 12 **OFFICES AND BUILDINGS**

## **Smart Control**

Smart Lighting Solutions from esave can put lights on a central control system and provide optimal amounts of light in office buildings based on daylight and motion.

# Savings

An Intelligent Lighting System will turn lights on or off at scheduled times, dim or brighten lights in accordance with the amount of daylight, and automatically turn them off when a room is unoccupied, resulting in energy cost savings up to 90%.



# Well-being and productivity

It is a well-known scientific fact that environment influences our mood and productivity. Equipped with environmental sensors, any office facility can easily become modern office space with a focus on employee well-being:

• Deploy right lighting – neither blindingly bright nor too dim — and provide eye-pleasing illumination

Poor lighting: yellow or orange from traditional lamps, can cause eyestrain, blurred vision and headaches. Bright, glare-free LED lighting can improve concentration levels, helping avoid operational errors.

- Simple factors like light colors have a significant impact on brain activity, mental and physical energy. These can be stimulated with coloured light to add a pop of energy to chill-out areas.
- CO<sub>2</sub>, humidity, and temperature sensors will check air quality in the room and inform your employees, or even signal an HVAC system directly, to make adjustments based on real-time building occupancy levels.

### 14 | LIGHT ON DEMAND

Good light is much more than simply illuminating streets, rooms and other objects. If luminaires are equipped with a motion sensor, the light is always a step ahead. Those who use Light on Demand benefit from significantly lower energy cost and increased lighting comfort. Make your building more responsive and smarter. Various lights can be configured, controlled and managed by using our controls. They will be on a central control system and provide an optimal amount of light in office buildings based on daylight and motion.

With our latest development it's possible to build our intelligence into a light switch. This can be used when a group of lights should illuminate a room to 100% for a certain time. The "Light on Demand" configuration can be completely overridden with the light switch. After a certain time or if pressed again, the light switch turns off and the conventional configuration is used.



### MANUAL OVERRIDE SWITCH 15

### 16 **LIGHTING IS AN ENTRYWAY TO IOT BUILDINGS**

IoT-enabled lighting can provide information about where employees prefer to work and how they move during the day. Real-time and historical analytics will provide insights about space usage, offering possibilities for space optimization and keeping energy cost as low as possible. In case of a fire you will be able to check where the people were, possibly saving lives. Thus, an IoT-ready connected lighting system will open new perspectives to transform your office facility into a Smart Office and the building itself can become an essential part of the Smart City. With swarm intelligence, luminaires are transformed into intelligent lighting systems. This technology brings advantages, especially in the areas of energy efficiency, lighting comfort and flexibility. Luminaires can adapt to the amount of daylight, people, time and many other aspects. If there are only a few people left in a room, almost all lights switch off. Luminaires which are located in the immediate vicinity of people stay on.



### SWARM INTELLIGENCE | 17

# Efficiency, Safety & Comfort

Public Lighting ensures safe and pleasant streets and roads, but is not limited to this application area. Many different infrastructure objects are illuminated at night, however this might not be really necessary all the time. There is a portfolio of lighting solutions for infrastructure to reduce energy consumption to the optimal level, increasing comfort and safety while staying environment-friendly.



## **IoT-Ready solutions**

Internet of Things (IoT) makes it possible to collect and evaluate data from every node. This can increase operational efficiency and reduce effective energy consumption. IoT can also make life safer: It becomes possible to avoid fluctuating temperatures, exhaust fumes and humidity in parking spaces, signposts can light up in a case of an accident, temperature-sensitive road markers can change colours to warn of ice on the road, and exciting new functionalities become possible every day.

## **Comfort & Savings**

Thanks to integrated motion sensors, the control system sends a signal to the lighting network to dim luminaires when inactive. It can also be programmed to different light levels depending on the amount of daylight. If special sensors are used, the light intensity can be adapted to special conditions.

# Special sensors recognize,

- Somebody entering a parking garage, commercial district, tunnel, bridge, etc.
- Pedestrians waiting to cross the street
- Bus stops can be illuminated when people sit there for safety and comfort, and alerting bus drivers to stop from a distance
- Monument lighting and festival lighting can be programmed to provide a special atmosphere as specifically required



# Plug and Play - upgrade your lights

The esave Zhaga Control can be operated in combination with any luminaire, which is equipped with a Zhaga Socket (Lumawise Endurance S socket from TE-Connectivity). the final operator can subsequently retrofit the luminaire easily via plug and play.





#### SLC-HUB203-C (CELLULAR)

The latest generation of the SLC-Hub family, is equipped with an additional SIM card. The SLC-Hub203-C remains backwards compatible, thanks to the integrated mesh network.

The controls generate an automatically organizing 2.4 GHz mesh network. Through the SIM card, the respective street lights can be directly added to the web platform.

The SLC-Hub is D4i ready / Type A device.

### **COMPATIBLE SENSORS:**

• esave PIR-Zhaga Sensor (ST oder HS)

#### D4I READY SENSORS (ACCORDING TO EN 62386)

- Legrand wattstopper FDP-301
- Tridonic PSensor SSI31



#### SLC-MOTION203-C (CELLULAR)

The latest generation of the SLC-Motion family, is also equipped with an additional SIM card. Like its predecessor, it continues to combine the esave SLC-Hub and PIR5 Zhaga sensor. It combines the intelligent street light control with the "light on demand" solution in one product.

The SLC-Motion203-C remains backwards compatible, thanks to the integrated mesh network. Through the SIM card, the respective street lights can be directly added to the web platform.

The SLC-Hub is D4i ready / Type A device.

#### MODELS

- esave SLC-Motion203-C ST
- esave SLC-Motion203-C HS



### SLC-HUB103

The esave SLC-Hub103 offers operational specialists a smart, flexible and cost-effective control. From static long-term to dynamic high-performance projects, the SLC-Hub exceeds monitoring demands of today and tomorrow.

The SLC-Hub is D4i ready / Type A device.

### COMPATIBLE SENSORS:

• esave PIR-Zhaga Sensor (ST oder HS)

### D4I READY SENSORS (ACCORDING TO EN 62386)

- Legrand wattstopper FDP-301
- Tridonic PSensor SSI31





### SLC-MOTION103

The new SLC-Motion enables an easier implementation of the smart solution. Like its predecessors, the SLC-Hub and PIR5 Zhaga Sensor, it was designed for the Zhaga interface and can be attached to the luminaire within a few seconds. It combines the intelligent street light control with the "light as required" solution in one product.

The SLC-Hub is D4i ready / Type A device.

### MODELS

- esave SLC-Motion103 ST
- esave SLC-Motion103 HS

### Our smart solution for ring control

# Tell your lamp what it has to do

The esave Street Light Control can be used with all major electronic control equipment and reduces energy consumption and maintenance costs to an absolute minimum.



#### SLC-RC SWITCH203-C (CELLULAR)

The SLC-RC-Switch is a small device which is mounted in a electric cabinet instead of a ring control. Via the esave SL-Control application it's possible to synchronize current measured data, such as ambient brightness. The SLC-RC Switch can react to this measurement data and change its output state accordingly. Additionally, an electricity meter can be attached to measure energy consumption. Furthermore, the cloud allows the user to fully configure and remotely control the device.



#### SLC-AC UND DC

The Street Light Control (type SLC-AC and SLC-DC) is a compact device that can be easily embedded in any LED street light and used with all major electronic control equipment. The Street Light Control is easily combined with a variety of external devices, creating a platform for numerous Smart City services.



#### SLC-CORE100

The SLC-Core100 can be easily integrated into your customised electronical circuit and assembled on your PCB (printed circuit board). It contains the heart of the SL-Controller in the smallest footprint, thus allowing full control of the luminaire. It will give your hardware new opportunities through an integrated mesh network and various light control functions.

### **INTEGRABLE CONTROLLER** 25



### SLC-CORE103

The SLC-Core102 and its integrated antenna make your luminaire or sensor intelligent within a very short development time. It can be easily assembled on your PCB and can be expanded and combined as required with your hardware. Thanks to its integrated antennas and the antenna amplifier, no additional antenna is required.

### Light, where and when is needed

For the luminaires to function intelligently, the lighting should operate according to curent traffic needs. Networked luminaires

can be managed centrally and brightness can be increased as needed when one or more objects are detected.

• By using different sensor data, improvements in lighting quality can be achieved, traffic safety increased and energy savings maximized.



#### PIR SENSORS

PIR motion sensors are based on Passive Infrared Technology. They detect motion as a result of differences in the surrounding temperatures: if an object with a temperature different than the surroundings enters into the detection area, the sensor reacts.



#### LIGHTRADAR SENSOR

LightRadar Sensor is an object tracking system that uses radar technology to characterize the motion of an object. It is designed for use with a wide range of applications due to the use of algorithms to differentiate between pedestrians, cyclists, motorbikes, cars and trucks.

## Intelligent Perception of our Environment

- By using the Motion and CO<sub>2</sub> sensors together in office areas, as well as in factory or production areas, air quality can be monitored to improve employee productivity and workplace safety.
- By combining different technologies in one solution, investment costs can be saved



#### METEODATA

The weather station records temperature, brightness and wind speed. Additionally, a rain sensor is installed on the top. The Meteodata can be used to read, visualize and analyze weather data. Thanks to the integrated esave SLC-Core, the Meteodata connects automatically to the mesh network.



#### PIR ZHAGA SENSOR

The PIR Zhaga Motion sensor can be combined with an esave SLC-Hub. Together they are a solution for the intelligent control of outdoor public lighting, converting a conventional system into a smart connected lighting svstem.

The PIR Zhaga Sensor is not D4i Ready and pin 4 of the Zhaga connector must be connected.



#### CO2 SENSOR

Carbon dioxide is a key indicator of indoor air quality. Thanks to new energy standards and better insulation, houses have become increasingly energy efficient, but the air quality can deteriorate rapidly. Active ventilation is needed to maintain a comfortable and healthy indoor environment, and to improve the well-being and productivity of the inhabitants. Sensirion's SCD30 offers accurate and stable CO<sub>2</sub>, temperature and humidity monitoring

### **ENVIRONMENTAL SENSORS** 27



#### PARTICULATE MATTER SENSOR

The Particulate Matter (PM) Sensor represents a new technological breakthrough in optical PM sensors. The measurement principle is based on laser scattering and makes use of Sensirion's innovative contamination-resistance technology. Integration into the esave wireless network is straightforward and the sensor can be easily retrofitted. Sensor data can be evaluated on the SL-Control web platform and air quality monitored.

# esave

# for the sake

# of our environment

- Reduced light pollution
- Preservation of biodiversity
- Environmentally friendly



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