# LIGHT MANAGEMENT SYSTEMS

## LIMAS • RFL • LIMAS Air • LIMAS Line

SCHUCH

# LIMAS Light Management Systems for industrial areas

## LIMAS Air Radio-based Light Management System

**In many areas of an industrial or commercial enterprise, there is considerable potential for saving energy. By using new technology, a lot can usually be achieved here - especially in lighting systems.**

This is how intelligently controlled LED lighting performs to a noticeable reduction in costs and, in the sense of a sustainable corporate management, to a significant reduction in $CO_2$ emissions.

With the radio-based LIMAS Air light management system, you can now make your lighting system smart in no time at all, easily and without any additional installation work.

### Main features

It is not uncommon for production processes to change, and as a result, lighting requirements as well. If industrial interior areas are used differently, the lighting systems must also be adapted to the new visual tasks. The LIMAS Air light management system offers a high degree of flexibility and enables quick adaptation to new requirements.

The lights equipped with LIMAS Air communicate via a radio-based mesh network. Mesh networks organize themselves decentrally and are „self-healing" - should a luminaire/ component fail, the communication takes place automatically via a functioning „neighbor". This mode of operation ensures a high level of reliability for the entire system.
By integrating various sensors, the lights can be controlled efficiently and according to requirements, which leads to significantly reduced operating times and thus also to considerable cost savings. In addition, the service life time of the luminaires is extended.

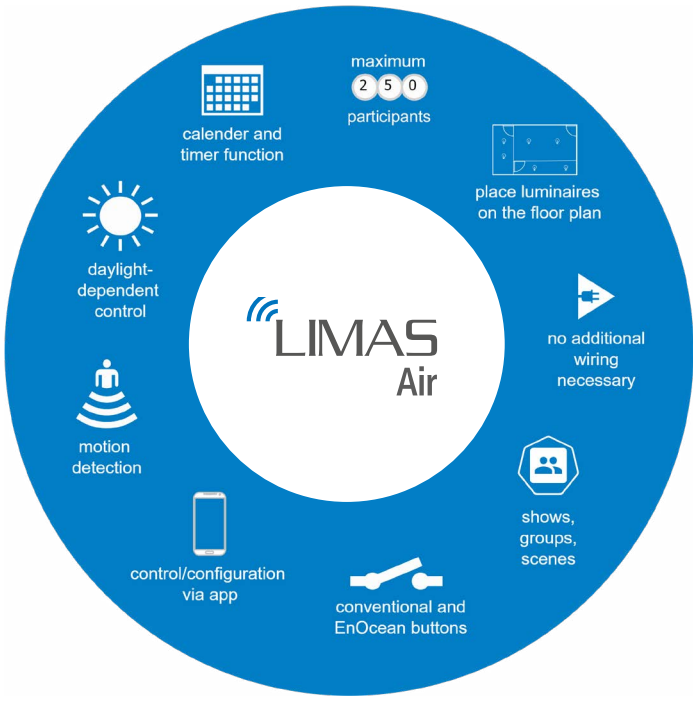
### Advantages

- Modular
- Tailor-made and expandable
- Comfortable
- Flexible
- Easily controllable
- Reliable
- Future-proof
- Sustainable and cost-efficient
  → reduction of energy consumption and thus reduced $CO_2$ emissions

## Functionality

**SCHUCH high-bay light fittings in DIMD version** can be interconnected by using the LIMAS Air radio module. The radio module can be connected quickly and easily to all DIMD high-bay light fittings by means of a FastConnect connection (Plug & Play). LIMAS Air is also available for our dust- and **waterproof light fittings**. In this case, no additional radio module is required. All components needed for an interconnected lighting environment are already included in the luminaire itself. This innovative integration offers the highest level of convenience and efficiency without compromising on quality. Networking through the LIMAS Air radio module or the integrated radio capability in our dust- and waterproof light fittings eliminates the need for additional wiring, saving not only effort but also valuable time and money. The lighting installation is thus made intelligent and flexible without the complexity of additional wiring. LIMAS Air opened the door to modern control options and created a smart environment for lighting requirements. Based on CASAMBI® radio technology and the Bluetooth radio standard, the lighting system can be reliably controlled with low power consumption and a long range. If DALI light fittings with a CASAMBI® radio module are already part of an existing system, they can also be integrated. Using the free CASAMBI® app, the system is set up simply and intuitively via smartphone or tablet. Various sensors (e.g. motion- or daylight-dependent) and actuators (e.g. push-buttons) specially developed for the industry can be integrated accordingly and grouped flexibly. - An overall comfortable and user-friendly control system.


## Features




- Up to 250 participants (luminaires, pushbuttons and sensors) in one mesh network
- Various scenarios programmable
  → easy and quick regrouping if requirements change
- Daylight-dependent control
- Control via motion detection
- Animations can be implemented
  (sequence of scenes or transition between scenes)
- Calendar and timer function
- Integration of battery- and wireless EnOcean pushbuttons
- Integration of conventional pushbuttons
- User-friendly user interface with floor plan display and location display of luminaires and components
- Readout of luminaire data
  (energy consumption, device version, dimming curve, etc.)
- Monitoring of the system with automatic failure notification
- Optional solution with gateway for central control and monitoring of the lighting system
- LIMAS Air lighting installation can be combined and controlled with wired DALI luminaires using the LIMAS Line PRO system

## Areas of application

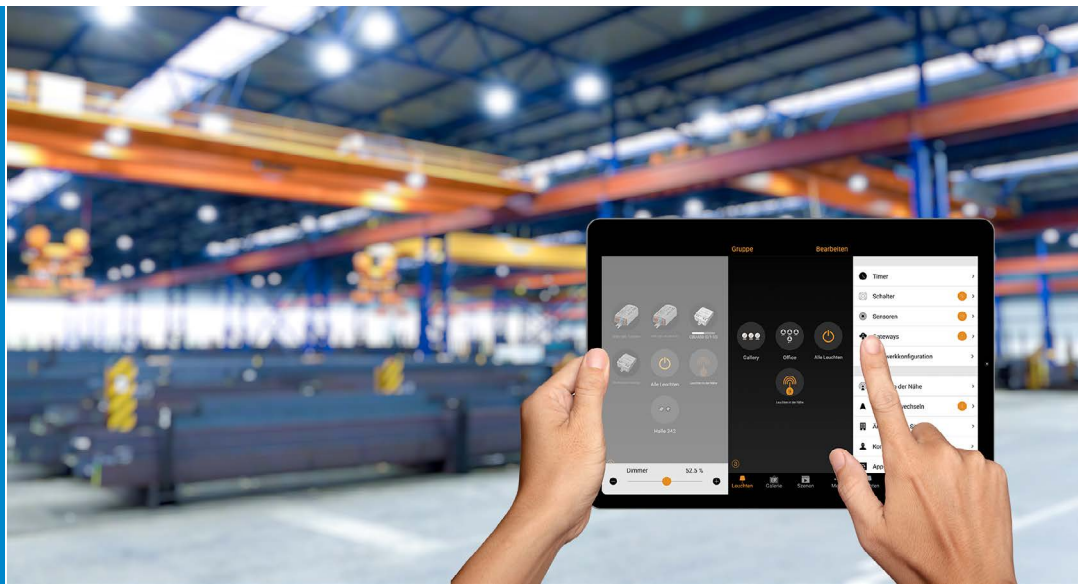
Industry

Parking garages

Commercial enterprises

Production halls

Warehouses & logistics

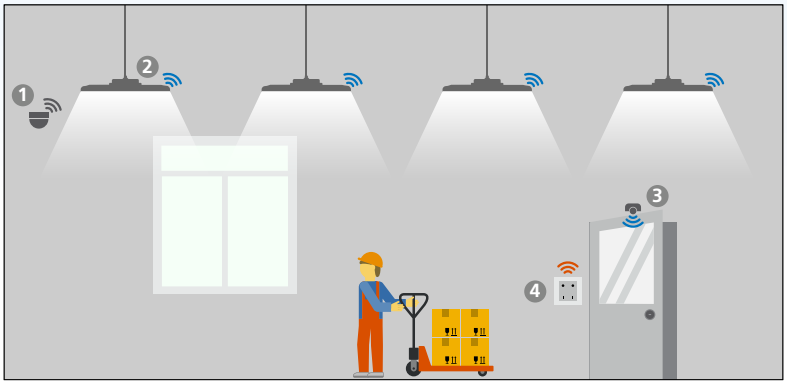


## Schematic representations of possible energy savings potential

For an optimal lighting level and associated maximum energy savings, the motion detector and daylight sensor should always be combined. By a pushbutton the lighting can be manually overridden/ switched at any time.

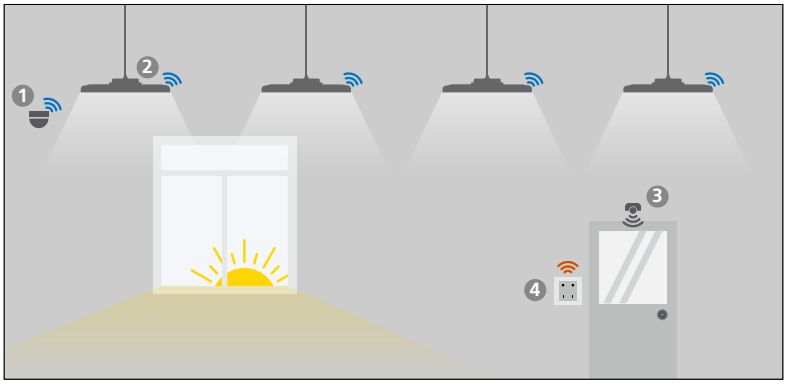
1 Daylight sensor 2 Luminaire with LIMAS Air radio module 3 Motion detector 4 Pushbutton

### Presence detection

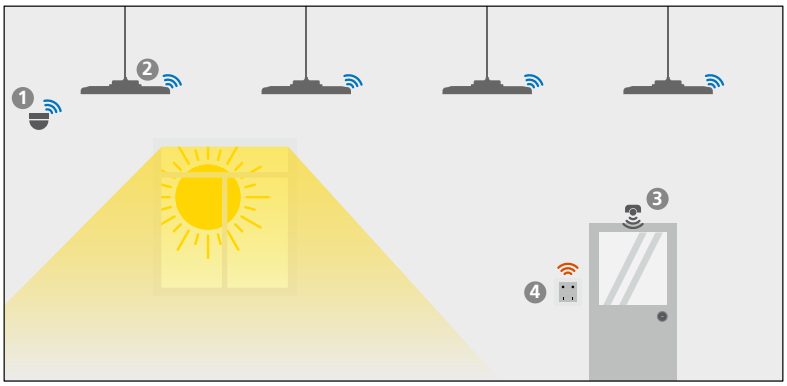



The motion detector ensures that the lighting is only switched on when people or objects with a temperature difference to the surroundings are present. In case of absence, the lighting is either completely switched off or dimmed to a preset level (such as 10%).

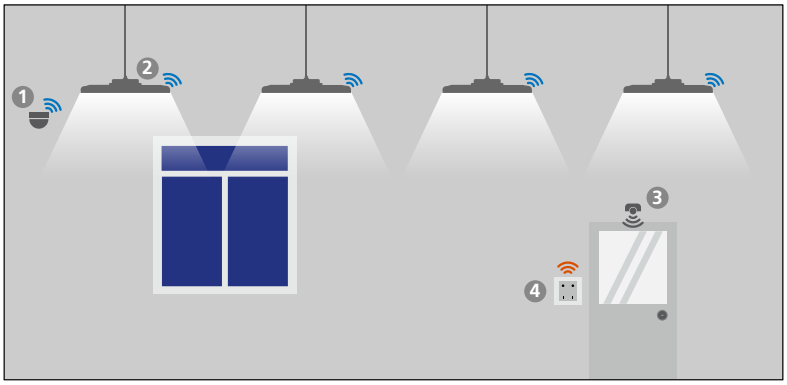
### Daylight control




Depending on the amount of daylight, the light sensor dims the lighting to the desired level.



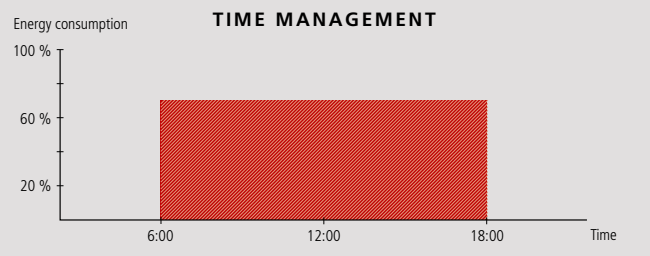

When there is sufficient daylight the sensor switches the lighting completely off.




At night, when no daylight is available, the lighting is set to 100% or to a different preset level.

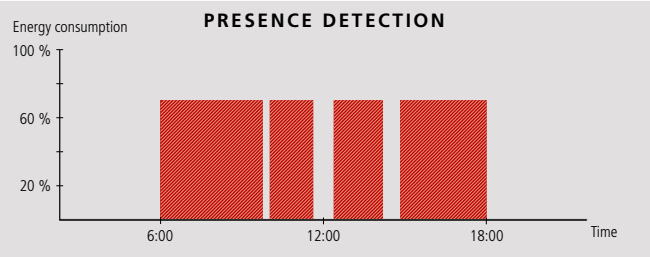
## Energy savings potential

The smarter the lighting system, the greater the savings.
If luminaires are only switched on when they are needed, this has many advantages: energy costs are reduced, $CO_2$ emissions are lowered, resources are saved and the service life of the luminaires is extended. The more concretely the duration and the intensity of need for artificial light are defined, the better the efficiency potential of LED lighting can be exploited.



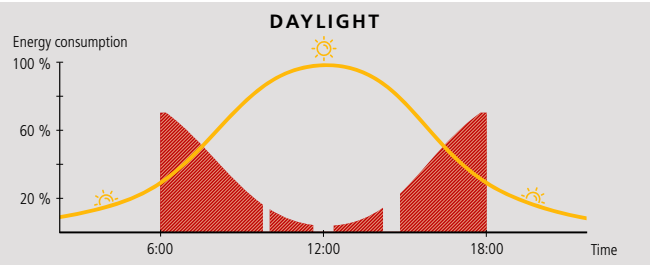

The light fittings are switched on continuously in the production hall during the entire operating time.

→ **Minor savings, as the luminaires are only switched off outside working hours.**




Motion detectors capture the presence of people in the production facility. During breaks or when no movement is detected, the lighting remains switched off.

→ **Increased savings as the light system is controlled according to demand during working hours.**




Daylight sensors measure the brightness in the production hall. This varies due to incident sunlight during the course of the day. The entire lighting system is continuously adapted to this and dimmed accordingly.

→ **Optimum savings, as each luminaire only provides as much artificial light as necessary.**

## Control components

| | | |
|---|---|---|
| **LIMAS Air FM** | 90547 9001 | CASAMBI® radio module with FastConnect quick-connector for controlling DIMD luminaires |
| **LIMAS Air FM MK** | 90547 9002 | CASAMBI® radio module with FastConnect quick-connector and 1m cable |

## System components

| Type | Art.-No. | | Figure |
|---|---|---|---|
| **LIMAS Air BM/DS IR LPH max. 14m** | 90547 9005 | Motion and light sensor for a mounting height of max. 14m and a detection area of up to 28m diameter. | 1 |
| **LIMAS Air BM/DS IR LPH max. 12m** | 90547 9006 | Motion and light sensor for a mounting height of max. 12m and a detection area of max. 3m x 15m. | |
| **LIMAS Air BM/DS IR LPH max. 20m** | 90547 9007 | Motion and light sensor for a mounting height of max. 20m and a detection area of max. 5m diameter. | |
| **LIMAS Air BM/DS IR LPH max. 2,2m** | 90547 9008 | Motion and light sensor for a mounting height of max. 2.2m and a detection area of max. 5m diameter. | 2 |
| **LIMAS Air TAST INTER UP max. 4 KONT** | 90547 9009 | Push-button interface for connecting up to 4 analogue push-button contacts. Intended for mounting in a flush-mounted box. | 3 |
| **LIMAS Air DALI PS/C** | 90547 9010 | Radio module with DALI power supply and broadcast control of up to 60 ECGs (total current 120mA). Power supply 230V. | 4 |
| **LIMAS Air TAST UP max. 4 KONT** | 90547 9011 | Battery-free 4-fold „EnOcean" wireless pushbutton. When the button is pressed, energy is generated to supply the button electronics. | 5 |
| **RFL LIMAS Air HUB TRI** | 90546 9013 | Light management controller (2.4 GHz mesh network) with radio antenna and RFL base. | 6 |

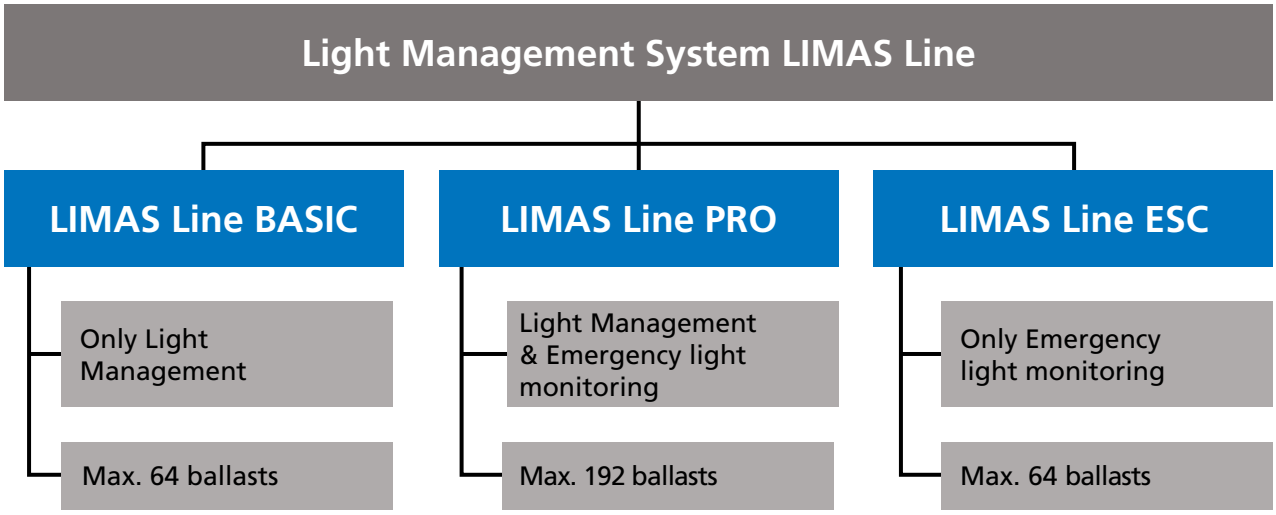
# LIMAS Line

## Wired DALI - Light Management Systems

Diverse activities in a room, different frequentation of areas and zones as well as day and season changing lighting conditions hold a high energy and $CO_2$ saving potential in lighting.
Individually adapted light through intelligent lighting control is not only of great advantage from an economic and ecological point of view, it also focuses on the different needs of people.

**LIMAS - Line is available in three different versions:**

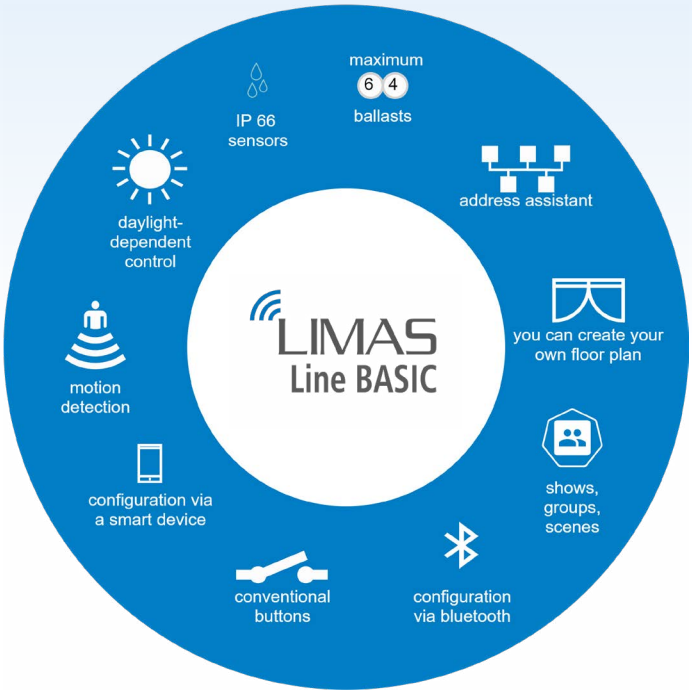
- **BASIC - standard version**
- **PRO - extended version**
- **ESC - for central monitoring of self-contained emergency lights**



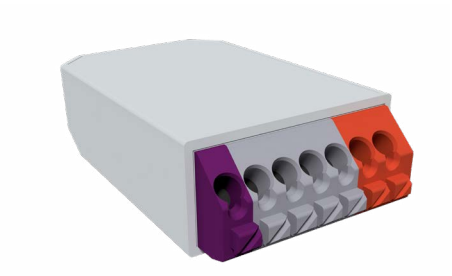
# LIMAS Line BASIC

## The standard version with all basic functions

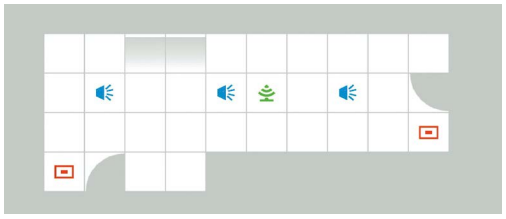





**LIMAS Line BASIC**
**enables fully automated, dynamic light and thus offers a high degree of individuality.**
The sensors register every deviation from the predefined values and report them to the controller, which reacts immediately. If, for example, the incidence of daylight changes, the lux value of the artificial light is adjusted accordingly. Swirching on / off in the event of presence or absence is fully automated too.It is also possible to link the light settings of different zones and rooms with one another. The user himself does not notice the lively communication between the sensors and the controller. Everything that he perceives is needs-based, always optimally adjusted illuminance, which is activated at all times where and when he needs it.



User interface in the app:
exemplary floor plan design



The LIMAS Line BASIC light management system is configured via Bluetooth using a smart device (Android or iOS). All this requires is a free app. If this is installed, the room to be illuminated can be recreated in the form of a rudimentary floor plan and then equipped and configured accordingly with lights, sensors and buttons.

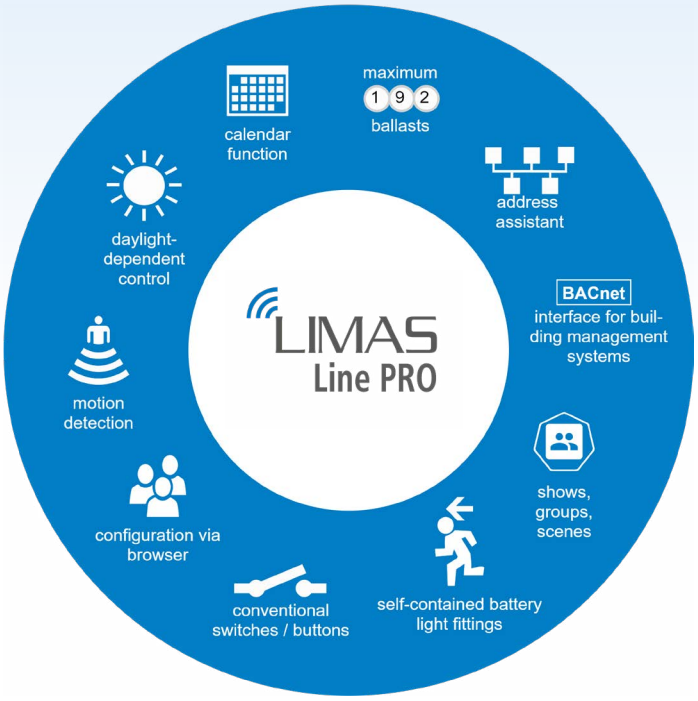
**All DIMD-Light Fittings from the SCHUCH portfolio can be controlled by LIMAS Line BASIC.**

## Features and advantages

- 64 ballasts (max.) can be controlled and monitored per system
- Daylight-dependent control
- Motion detection
- Configuration via smart device (smartphone / tablet)
- Easy integration of new light fittings
- Flexibility by simply changing dimming profiles and group assignments
- Conventional buttons can be integrated
- Integration of IP 66 sensors
- DALI2 sensors & actuators from third-party suppliers can be integrated

# LIMAS Line PRO

## The extended version that simply has more to offer




**LIMAS Line PRO**
**allows easy addressing and grouping of luminaires, the integration of standard pushbutton switches and sensor-based automation.**
In addition to DALI (DIMD) light fittings, this system can also be used to control and monitor all self-contained emergency light fittings (MA-Z, DIMDI and DI) in the SCHUCH portfolio.
The configuration and control is done by PC without additional software - a browser is sufficient. The connection between a PC and LIMAS Line PRO can either be via an existing network or by establishing a peer-to-peer connection. There is no internet connection required to operate the system.

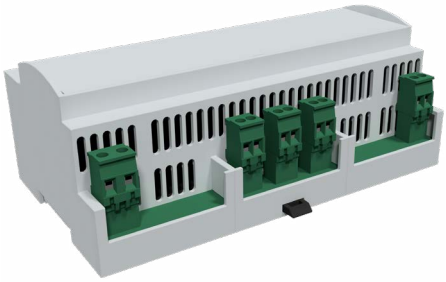
**All DIMD, MA-Z, DIMDI and DI-Light Fittings from the SCHUCH portfolio can be controlled by LIMAS Line PRO.**

### Regulation according to needs

LIMAS Line PRO offers the possibility to integrate sensors. In addition to the presence-dependent control by temperature differences (PIR sensor), daylight-dependent control of the lighting can also be taken into account. Thanks to different detection areas, this is also the right solution for industrial halls.

### Automation through calendar function

With the calendar function, day and time-specific lighting settings (scenes) are possible. This can include both: one-off events and annually recurring days (e.g. public holidays) can be saved.



### Individual control

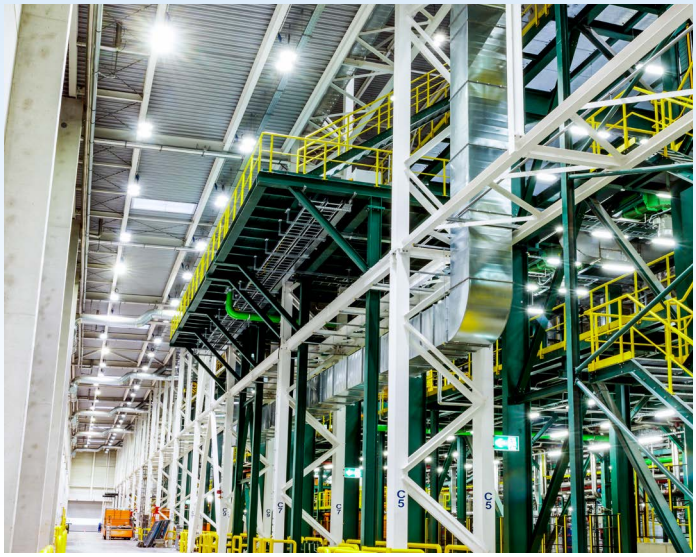
A converter is required to connect conventional switches or buttons. A maximum of four switches / buttons can be connected to each converter. The compact design of the converter allows it to be easily placed in surface and flush-mounted boxes.

### Monitoring of self-contained emergency light fittings

When integrating self-contained emergency luminaires, function and duration tests can be carried out at any time and thus a central monitoring can be realized (look at DIN VDE V 0108-100-1).
The results of the emergency lighting tests are documented centrally and can be exported.

## Features and advantages

- 192 ballasts (max.) can be controlled & monitored per system
- Daylight-dependent control
- Motion detection
- Control / configuration via PC (LAN connection)
- Emergency light monitoring
- User-friendly operating interface for the consumer
- Intuitive installation by the assembly personnel
- Easy integration of new light fittings into the system
- Calendar function for the configuration of daily / time-specific lighting settings (scenes)
- Flexibility by simply changing dimming profiles & group assignments
- No DALI power supply system required
- DALI2 sensors & actuators from third-party providers can be integrated
- IP66 sensors
- Conventional switches / buttons can be integrated
- Integration of the light management system in a higher-level building management system (BACnet protocol)
- Up to 5 Contollers (max. 960 light fittings) can be combined to form a system network



High Bay light fitting control by using the calendar function -
In addition to full days, time-specific settings can also be selected. If, for example, all lighting is to be switched to 100% only during working hours

Integration of emergency luminaires with self-contained batteries -
Emergency luminaires can be used with the following three types of circuit: Continuous light, standby light and controlled light.

## Control components

| Type | Art.-No. | | Figure |
|---|---|---|---|
| **LIMAS Line BASIC SCS** | 90545 0005 | DALI2 controller for controlling up to 64 devices. | 1 |
| **LIMAS Line PRO SCE** | 90545 0031 | DALI2 controller for controlling up to 192 devices. Monitoring of single battery emergency lights possible. | 2 |
| **LIMAS Line ESC** | 90545 0042 | 7-inch touch panel/controller to monitor up to 64 single-battery emergency lights. | 3 |

## System components

| Type | Art.-No. | | Figure |
|---|---|---|---|
| **LIMAS Line IC** | 90545 0015 | DALI-2 input controller with 4 independent inputs for connection of floating contacts/buttons. | 4 |
| **LIMAS Line DALI PS 240mA** | 90545 0016 | DALI bus power supply with max. 240mA. | 5 |
| **LIMAS Line BM/DS PIR 2,5-2,8m R STE** | 90545 0035 | Infrared DALI2 motion detector including light sensor for mounting heights of 2.5-4m. | |
| **LIMAS Line BM/DS PIR 4,0-14,0m R STE** | 90545 0036 | Infrared DALI2 motion detector including light sensor for heights up to 14m. | 6 |
| **LIMAS Line BM/DS PIR 4,0-16,0m Q STE** | 90545 0037 | Infrared DALI2 motion detector with light sensor for mounting heights up to 16m. | |
| **LIMAS Line BM/DS PIR 1,8-2,5m RH STE** | 90545 0038 | Infrared DALI2 motion detector with light sensor for vertical wall mounting for height up to 2.5m. | |
| **LIMAS Line BM/DS PIR 2,5-5,0m Q STE** | 90545 0039 | Infrared DALI2 motion detector with light sensor. For a mounting height of up to 5m and a maximum detection area of 6m x 23m. | |
| **LIMAS Line BM/DS HF 2,0-4,0m R STE** | 90545 0040 | HF DALI2 motion detector with light sensor for a mounting height of up to 4.8m and a maximum diameter of the detection area of 8m. | 7 |
| **LIMAS Line MK4x10A** | 90545 0041 | Four potential-free relays, switchable with DALI. Suitable for signaling test and system states of single battery emergency lights. | 8 |
| **LIMAS Line ESC PS** | 90545 0043 | 24V power supply for the LIMAS Line ESC controller. | 9 |

# LIMAS Line ESC

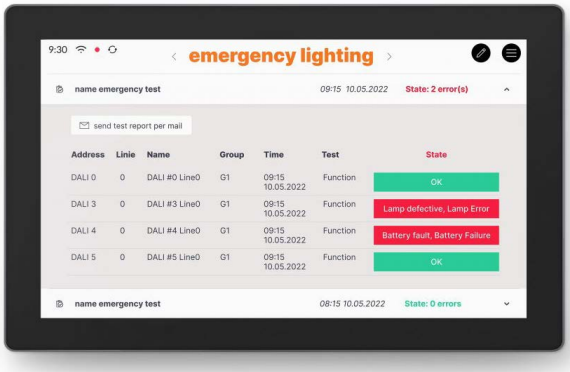
## Monitoring of self-contained emergency lights according to *DIN VDE V 0108-100-1*


**LIMAS Line ESC**
**allows *DIN VDE V 0108-100-1* compliant, central monitoring of single-battery emergency lights.**

- exclusively for monitoring single-battery emergency light fittings
- emergency light fittings can be switched with general lighting switches via L', special converters or DALI lines to the switch are not required

The panel automatically starts the function and operating duration tests and displays the system status and any error messages centrally. The time and frequency of the tests can be set individually with the help of the calendar function. When connected to the internet, error messages can be automatically forwarded to the user by e-mail. As the light fittings are provided with addresses and are named, an exact localisation of faults, and thus an optimal maintenance of the entire system, is possible. For documentation purposes, the test reports can be exported by e-mail. Operation and set-up is intuitive via the touchscreen display. An external PC is not necessary for control. LIMAS Line ESC allows monitoring of up to 64 single-battery emergency light fittings on one DALI line. The system can be expanded with up to three additional DALI lines. Two DALI addresses can be specified for fault signalling. This allows to transfer the error status to a higher-level system via relay modules. All MA-Z, DIMDI and DI single-battery emergency light fittings from the SCHUCH portfolio can be monitored with LIMAS Line ESC.
The LIMAS Line ESC system provides a user interface, that displays the current status and test results of the single-battery emergency lighting system. For convenient monitoring and functional testing, tests can be scheduled and automated. The test results are logged and, if desired, sent by e-mail. A 7 inch touch screen provides an easy operation of the system. With its customisable settings and technical specifications, it offers flexibility and reliability for use in different environments.

**All MA-Z, DIMDI and DI self-contained emergency light fittings from the SCHUCH portfolio can be monitored with LIMAS Line ESC.**




## The most important differences to LIMAS Line PRO

- monitoring of up to 64 light fittings
- mounting on a flush-mounted box
- operation via the integrated touch screen panel, no PC required
- supply via 24V or Power Over Ethernet - POE

# LIMAS Light Management Systems for outdoor areas

## Light on Demand by intelligent lighting control

**Light only where it is needed, only when it is essential, only as bright as necessary and only as long as it is required - with the help of a light management system, the efficiency potential of LED technology can be optimally exploited.**

Intelligent, demand-controlled light saves a great deal of energy costs and is extremely environmentally friendly and sustainable thanks to the considerable reduction in $CO_2$ emissions associated with it. In addition, the networking of the light points opens up a wide range of options for implementing smart city applications, provides an overview of the most important system parameters and enables proactive, targeted maintenance and troubleshooting. Therefore, both when renovating and installing new outdoor lighting systems, the question of the use of a light management system should always be discussed.
But when is the right time to use it?

Directly with the new installation or renovation of the conventional lighting has started, or should you wait a few more years? Perhaps the financial resources are lacking at the time of the renovation or you would like to start with a small test installation to gain experience. There is no clear answer to this question. But no matter how you decide, one thing is certain: once standard luminaires have been installed, simple retrofitting or conversion to a light management system is no longer possible.

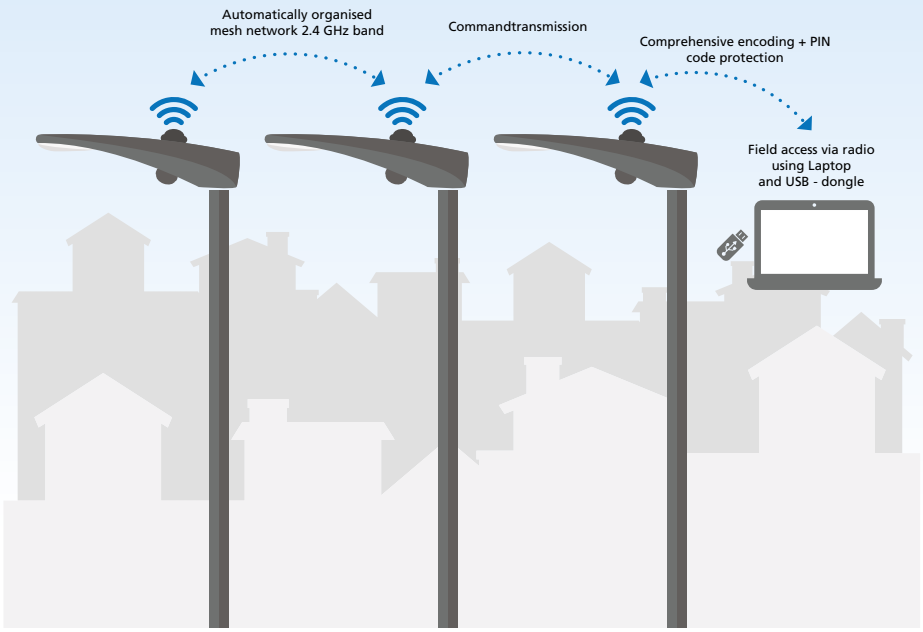
### Benefits

***(D)** = Solution with USB dongle **(C)** = Solution with Cloud Connection*

| | |
|---|---|
| **(D) + (C)** | **Optimised energy savings** through light on demand |
| **(D) + (C)** | **Easy cost control** through energy consumption metering |
| **(D) + (C)** | **Evaluation and export** of read or saved luminaire data |
| **(C)** | **Proactive, targeted maintenance and failure elimination** through the light fittings' automatic failure reporting and location display |
| **(D) + (C)** | **User-friendly interface** with graphic display of the light fittings' operating status, energy consumption, function and location |
| **(D) + (C)** | **Flexibility** thanks to straightforward wireless modification of dimming profiles, together with easy integration of new light fittings into the system with a self-organising mesh network |
| **(C)** | **Time and date updates via time server** for time dependent dimming |
| **(D) + (C)** | **Central control and (with (C) automatic) monitoring** of every single light point |
| **(D) + (C)** | **No additional wiring required** |
| **(C)** | **Access to all system functions** at any time and from anywhere in the world via the Internet |

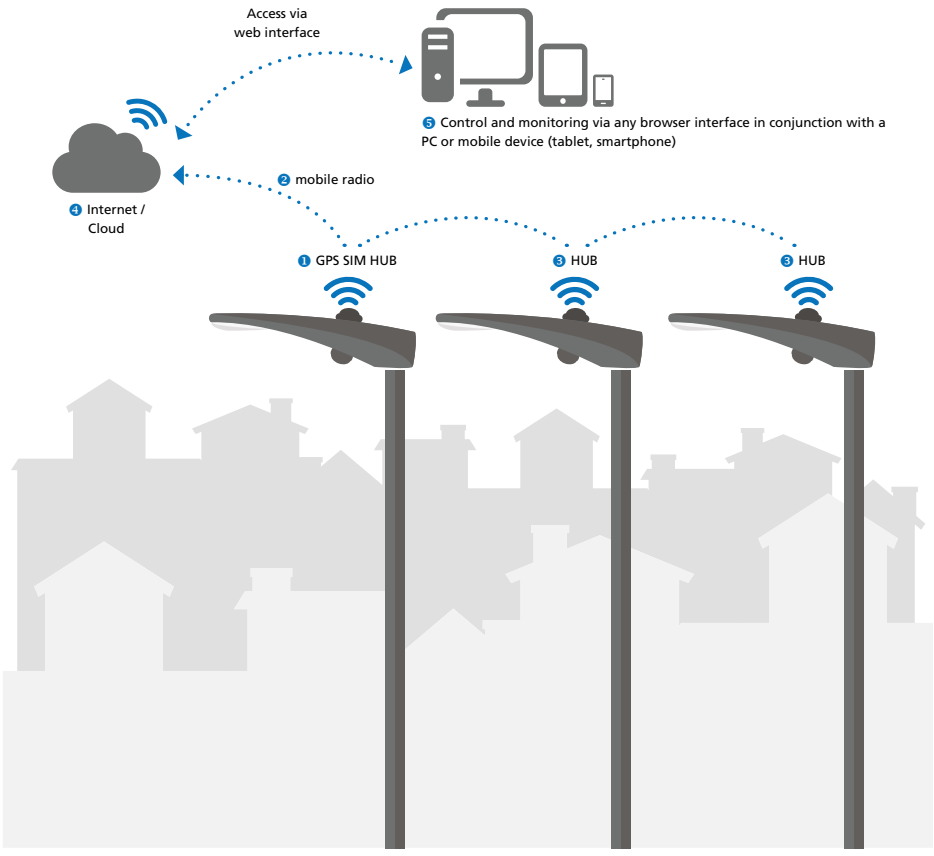
## Version with USB dongle (standalone solution, no cloud connection)

With this system solution, the luminaires can be programmed and read out on site in the field using a USB dongle and Windows PC/tablet.
The luminaire parameters such as dimming level, run-on time and behaviour in the event of motion detection are stored in the radio controls/HUBs. The luminaires can be operated without a connection to the USB dongle. Both items also each contain a photocell for a twilight switch. Here, one HUB is defined as the master brightness sensor in the field, which transmits the correspondingly measured brightness value to all other HUBs in the field (slave).
At least one GPS SIM HUB is required for time-accurate switching via the light management system. This HUB supplies the integrated GPS antenna and the connection to satellites in the neighbourhood the exact time and forwards it to neighbouring HUBs via radio. HUBs via radio.




## Version with RFL LIMAS HUB3 G2 GPS SIM (cloud connection)

With this system solution, the luminaires can be programmed, read out and monitored remotely using cloud access via any Internet browser and any operating system ❺. The GPS SIM HUB ❶ uses its integrated SIM card ❷ to wirelessly connect neighbouring HUBs ❸ to the cloud ❹.
The GPS SIM HUB uses the integrated GPS antenna and the connection to satellites in the vicinity to provide the exact time and forwards this to neighbouring HUBs via radio. The exact position is also recorded using satellite technology.
The luminaire parameters such as dimming level, run-on time and behaviour in the event of motion detection are stored in the radio controls/HUBs. The HUBs of the luminaires therefore continue to work independently even without a connection to the cloud. Both items each contain a photocell for twilight switching.
Here, one HUB is defined as the master brightness sensor in the field, which transmits the correspondingly measured brightness value to all other HUBs in the field (slave).

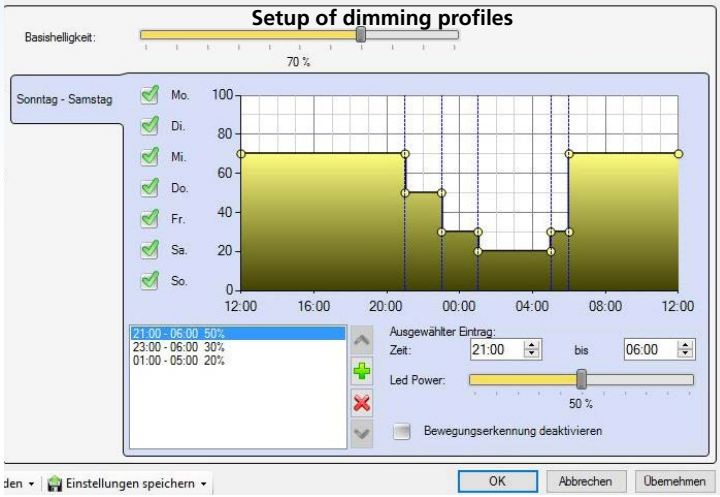


## System functions

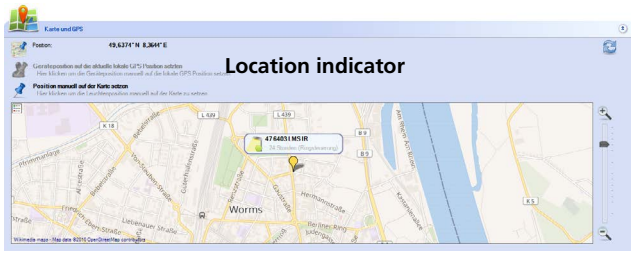
- **Freely configurable dimming profiles**
  based on time of day, duration, dimming level and motion profile
- **Real-time access to the light fittings**
  for Instant-On or to alter dimming profiles as required
- **Integrated constant luminous flux function**
  to keep the luminous flux constant over the LEDs' entire service life
- **Energy consumption metering**

**Optional:**

- Motion detection with a motion sensor (Light on Demand)
- Optimised On/Off with daylight sensor
- Time, date, parameter and positon monitoring via GPS receiver and GPS-enabled control unit, together with automatic failure notifications with location information

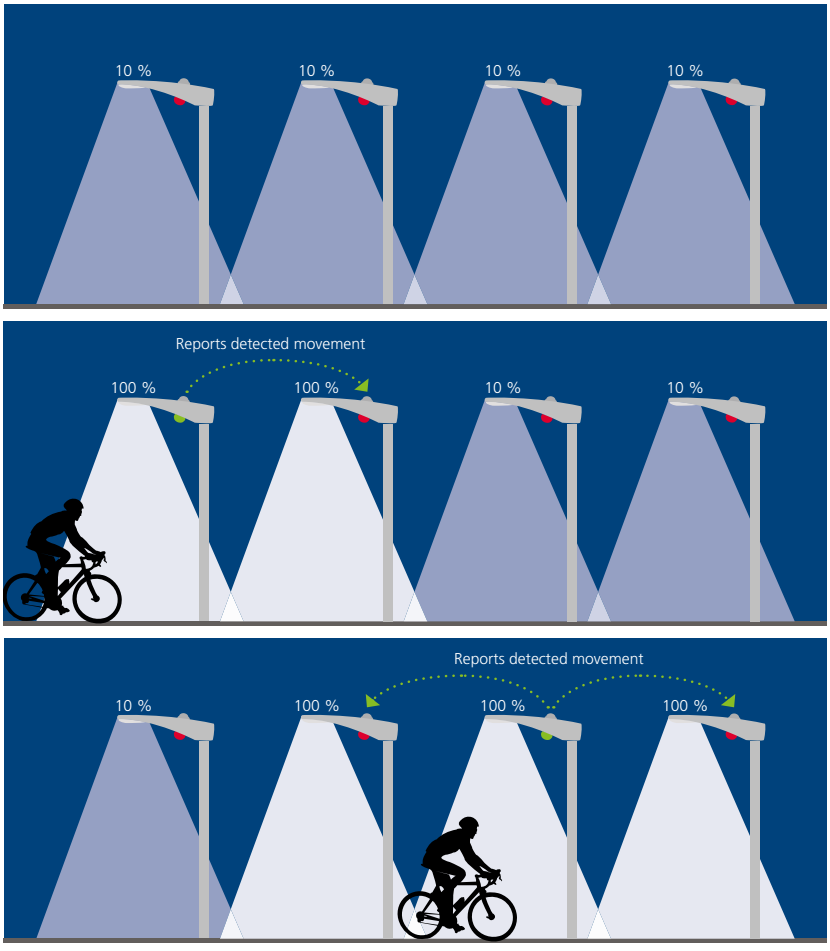


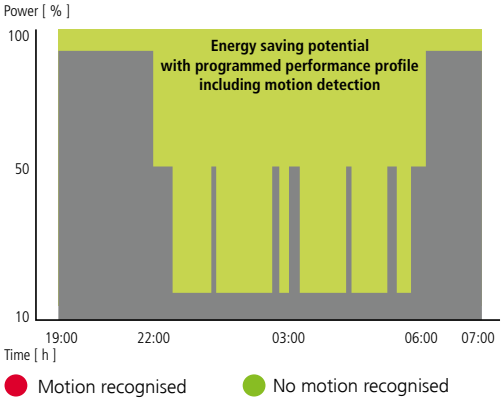





## Motion detection - Light on Demand

If a road user passes an RFL luminaire with HUB and motion sensor, this is detected by the motion sensor and, depending on the programming, the luminaire switches from background level 10% to 100% illuminance with a defined follow-up time, e.g. 1 minute.
Neighbouring luminaires can be linked via the light management system in order to set up a leading light. As soon as a motion sensor of a luminaire detects an object in conjunction with a radio control system, the neighbouring luminaires in the street are also switched to a higher lighting level via radio.




The road with cyclists is only used here as an example to clarify the general process.


A hub (also called „node") is a network device that connects such several devices within a (radio) network. In network technology, it serves as a distributor for the data packages. This will create a wireless local area radio network (‚Mesh').

# RFL - Light Fittings

## Ready for the future

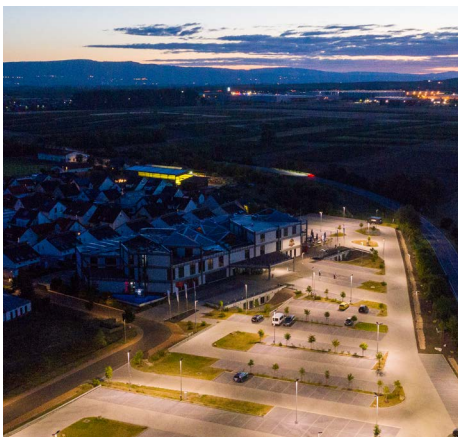
**You have the choice - you determine the timing, because luminaires in RFL version (Ready for Light Management System) are prepared for retrofitting light management components and sensors.**
One or two Zhaga-compliant sockets integrated into the light fitting housing enable the required system components to be installed at a later date without tools. The use of autarkic sensors without a connection to a light management system is also possible with the RFL luminaires at any time (stand-alone solution).
Thanks to the standardization of the socket according to Zhaga Book 18, you are not tied to a specific light management system. In theory, you have the freedom to choose from all manufacturers who also use standardized Zhaga sockets for their components.
Of course, you can also equip RFL light fittings immediately during the initial installation with the corresponding light management components. If RFL LIMAS HUBs are used (see system components), RFL luminaires can also be combined with LIMAS light fittings.

**Almost all SCHUCH outdoor light fittigs are available in RFL version (see chapter "Outdoor Light fittings").**

## In general the following versions are possible

- RFL**O**: with Zhaga socket on the **top side of the housing** for subsequent retrofit of light management components e.g. a controller with antenna *(see system components)*
- RFL**U**: with Zhaga socket at the **bottom of the housing** for subsequent retrofit of sensors to control the light fittings self-sufficient *(see system components)* with motion detector, a standalone solution is also realizable
- RFL**OU**: with Zhaga socket at **top and bottom of the housing**. Thus it's possible to retrofit both, light management components and sensors *(see system components)*

In order to control the light fittings - after appropriate retrofitting of the light management components - the corresponding light management software as well as possibly further components are necessary *(see control components)*.



D4i™ Excluisively D4i control gear is being used in RFL luminaires from Schuch. All D4i Zhaga Book 18 certified controllers and D4i Zhaga Book 18 certified sensors available on the market can be used in combination with RFL luminaires from Schuch. Controllers and sensors which do not comply with the D4i standard can limit the functionality of the luminaires and components. Moreover, in individual cases, such non-certified components may cause damage to both the luminaires and the components.

## Advantages

- Implementation of a light management system is possible at any time
- Tool-free, quick and easy installation of the light management system components → simply screw off the socket cap and screw on the system component
- The use of standardised Zhaga Book 18 compliant sockets allows the later use of D4i or SR compliant light management controllers or motion sensors at any time
- In case of using the LIMAS light management system, LIMAS light fittings* and RFL light fittings (equipped with rfl limas HUB) can be combined easily

* Luminaire types with permanently installed radio antenna and light management controller (LMS versions)

**More than 3,400 SCHUCH light fittings of the 47 and 48 series with the light management system LIMAS have been installed in the city of Chur / Switzerland since 2015. As a browser-based solution with gateways, they are spread across the city, enabling light on demand and saving energy costs.**

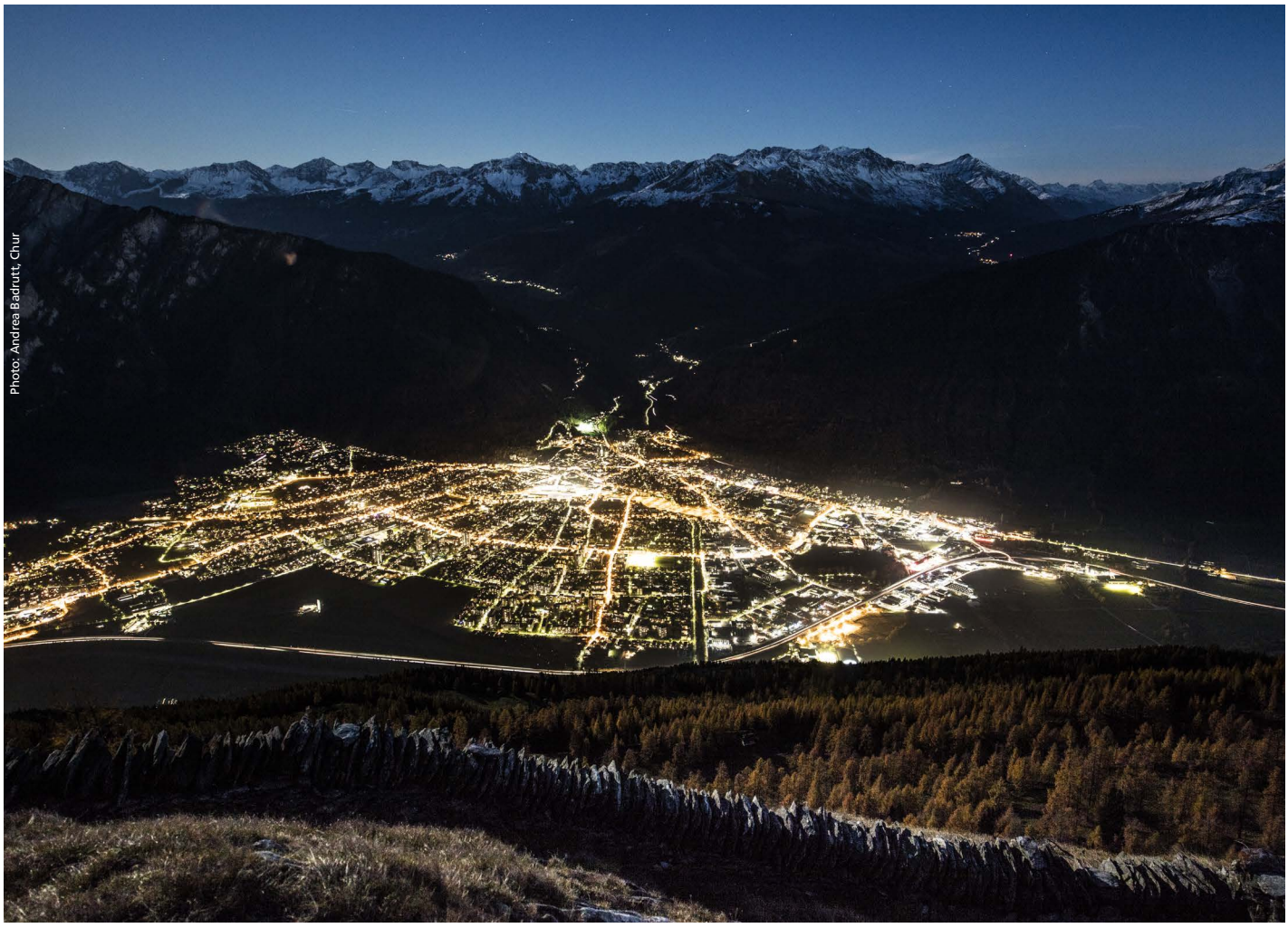


Photo: Andrea Badrutt, Chur

## Components for programming or connection to the cloud for RFL luminaires

| Art.-No. | Type | |
|---|---|---|
| **90545 0001** | **LIMAS Dongle USB** | Enables programming/setup of LIMAS components on site using software and Windows operating system |
| **90546 9010** | **RFL LIMAS HUB3 G2 GPS SIM** | Control element with photocell/twilight switch, GPS antenna and SIM card |

## System components for RFL luminaires

| Art.-No. | Type | | |
|---|---|---|---|
| **90546 9010** | **RFL LIMAS HUB3 G2 GPS SIM** | Radio control with GPS antenna (automatic position detection of the luminaire) and photocell (twilight switching) for radio networking of RFL luminaires (2.4 GHz Mesh-Net), with integrated SIM card for connecting a maximum of 128 neighbouring devices/HUBs to the cloud.<br><br>Enables remote programming/setup and monitoring of the system and is used for timing in the system (GPS) |  |
| **90546 9014** | **RFL LIMAS HUB3 G2** | Radio control with photocell (twilight switching) for networking RFL luminaires (2.4 GHz Mesh-Net) |  |
| **90546 9011** | **RFL LIMAS BM RAD HUB LPH max. 8m** | Radio control with integrated radar motion sensors for networking RFL luminaires (2.4 GHz Mesh-Net) |  |
| **90546 9012** | **RFL LIMAS BM RAD MA LPH max. 10m** | Radio control with integrated radar motion sensors for networking RFL luminaires (2.4 GHz Mesh-Net) for pole mounting |  |
| **90546 9000** | **RFL DS20 HUB 20lux ON/OFF** | Twilight switch for autonomous control of RFLO luminaires.<br><br>Cannot be combined with other system components |  |
| **90546 9004** | **RFL BM/DS IR HUB LPH max. 8m** | Infrared motion sensor - can only be used in conjunction with RFL LIMAS HUB3 G2 and RFL LIMAS HUB3 G2 GPS SIM |  |
| **90546 9006** | **RFL BM/DS IR HUB LPH max. 12m** | Infrared motion sensor/twilight switch can be used in standalone mode or in conjunction with RFL LIMAS HUB3 G2 and RFL LIMAS HUB3 G2 GPS SIM |  |

Other sensors, e.g. environmental sensors (fine dust, $CO_2$, weather station etc.) on request.

## Accessoiries

| Art.-No. | Type | |
|---|---|---|
| **Request** | **Sensorbox (SENSBOX)** | External box connected to the RFL luminaires via radio (2.4 GHz Mesh-Net) to accommodate various components |

## Operating modes

| | | Radio networking | Motion detection | Twilight switching | Time-based control | Programming | Connection to the cloud |
|---|---|---|---|---|---|---|---|
| 1 | RFL LIMAS HUB3 G2 GPS SIM | ✓ | ✗ | ✓ | ✓ | USB dongle / Cloud connection | ✓ |
| | + RFL BM/DS IR HUB LPH max. 8m | ✓ | ✓ | ✓ | ✓ | USB dongle / Cloud connection | ✓ |
| | + RFL BM/DS IR HUB LPH max. 12m | ✓ | ✓ | ✓ | ✓ | USB dongle / Cloud connection | ✓ |
| 2 | RFL LIMAS HUB3 G2 | ✓ | ✗ | ✓ | Optional with article ❶ | USB dongle | Optional with article ❶ |
| | + RFL BM/DS IR HUB LPH max. 8m | ✓ | ✓ | ✓ | Optional with article ❶ | USB dongle | Optional with article ❶ |
| | + RFL BM/DS IR HUB LPH max. 12m | ✓ | ✓ | ✓ | Optional with article ❶ | USB dongle | Optional with article ❶ |
| 3 | RFL LIMAS BM RAD HUB LPH max. 8m | ✓ | ✓ | Optional with article ❶ or ❷ | Optional with article ❶ | USB dongle | Optional with article ❶ |
| 4 | RFL LIMAS BM RAD MA LPH max. 10m | ✓ | ✓ | Optional with article ❶ or ❷ | Optional with article ❶ | USB dongle | Optional with article ❶ |
| 5 | RFL BM/DS IR HUB LPH max. 12m | ✗ | ✓ | ✓ | ✗ | App control | ✗ |
| 6 | RFL DS20 HUB 20lux ON/OFF * | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ |

USB dongle · Cloud connection · App control

* runs independently and cannot be combined with other components


# LIMAS Air

## Radio-based Light Management System for sports facilities

Whether small field facilities, sports fields or training grounds for football, hockey, tennis, etc., the powerful, energy-efficient and durable floodlights of the AREALO series offer you many possibilities. Our aim is to achieve the best possible result for your sports facility in terms of illuminance, uniformity and glare limitation, taking into account the requirements of DIN 12193. Among many other advantages, the extremely long service life of the AREALO of at least 100,000 hours is particularly remarkable. With an average of 300-500 operating hours per year, this is an investment for generations, maintenance-free and without regular lamp replacement, as is the case with conventional installations. With the use of the LIMAS Air light management system, maximum savings can also be achieved in terms of energy costs and $CO_2$ impact on the environment.

### Intelligent light control

Simply switching the floodlights of a sports facility on and off is neither efficient nor cost-saving and environmentally friendly. When converting to LED technology, the question of intelligent lighting control therefore arises. If one then takes into account the subsidies from the federal government within the framework of the municipal guidelines as well as the state sports associations and possibly the respective federal state, which can currently amount to up to 80% cumulatively at peak times, the decision should not be difficult.

### Dimming - The introduction to light control

The simplest solution is to dim the floodlights via DALI. Since the maximum illuminance is usually only required for matches and competitions, energy can be saved to a considerable extent by continuously dimming or switching on preset lighting levels during training. All that is required for this is an AREALO in DIMD version.

DALI 2

## Smart lighting control with LIMAS Air

With the LIMAS Air light management system, you can conveniently control your floodlighting system via radio, without additional wiring, and save a maximum of energy costs at the same time. The system is configured and controlled via a free app (Android or iOS) using a smartphone or tablet. Neither an internet connection nor a gateway is required for this. The luminous flux of each individual luminaire/mast unit can be controlled separately. In conjunction with push-buttons, the pre-programmed scenes can be called up easily and conveniently, for example match and competition mode, training, half-field lighting or goalkeeper training, etc.

Please contact us. We will be happy to show you the possibilities LIMAS Air offers and support you in planning, projecting and configuring your system.


## Control components

| Art.-No. | Type | | |
|---|---|---|---|
| **78512 0001** | **7850 1VBOX RFL Lite TRA** | Distribution box 1-fold for RFL LIMAS Air HUB TRI for 7850 12804SP DIMD as truss structure. Additionally RFL LIMAS Air HUB (90546 9013) is required (not included in delivery). |  |
| **78512 0002** | **7850 2VBOX RFL Lite TRA** | Distributor box 2-fold for RFL LIMAS Air HUB TRI for 7850 25604SP DIMD as truss structure. Additionally RFL LIMAS Air HUB (90546 9013) is required (not included in delivery). |  |
| **78512 0003** | **7850 3VBOX RFL Lite TRA** | Distribution box 3-fold for RFL LIMAS Air HUB TRI for 7850 38404SP DIMD as truss structure. Additionally RFL LIMAS Air HUB (90546 9013) is required (not included in delivery). |  |
| **78512 0010** | **7850 VBOX RFL Lite TRA** | Distributor box for RFL LIMAS Air HUB TRI for 7850 12804SP OV, 7850 25604SP OV, 7850 38404SP OV as truss structure. Additionally RFL LIMAS Air HUB (90546 9013) is required (not included in delivery). |  |
| **10183 0002** | **LIMAS Air SENSBOX** | Repeater/amplifier box for LIMAS Air light management systems. An RFL LIMAS Air HUB radio control unit (90546 9013) is also required (not included). |  |
| **90546 9013** | **RFL LIMAS Air HUB TRI** | Light management controller (2.4 GHz mesh network) with radio antenna and RFL base. |  |
| **90547 9009** | **LIMAS Air TAST INTER UP max 4 KONT** | Push-button interface for connecting up to 4 analogue push-buttons, mounting in flush-mounted box/ branch box. |  |
| **90547 9011** | **LIMAS Air TAST UP max 4 KONT** | Battery-free quadruple wireless pushbutton, pressing the pushbutton generates energy to supply the pushbutton electronics. |  |