ewo

mastering the intelligence of light

connex—x

ewo

Intelligence of Light

Keeping you connected with connex—x

Light doesn't think, but it can react. Light can be equipped with intelligence that processes actions and responses in a matter of seconds. As part of the so-called Intelligence of Light, ewo has been responsible for the software and hardware that connects the luminaires to the Internet of Things since 2017: with the brand connexx, ewo combines all aspects of smart light management in-house and therefore, offers customers the ability to transform outdoor lighting anytime while enhancing safety and fostering a sense of community to create wellbeing at night.

Left: Nodexx integral - applicable for the most esthetically demanding projects, since the smart module is not visible from the outside.

Right: Nodexx external (top) and nodexx integral (bottom)

Round-the-clock support for your success

The connexx support team helps customers in all phases throughout the implementation of a smart system architecture:

Planning → Commissioning → Training → Creation of → Continuous
                                                lighting scenes   support

Our dedicated support team is here to handle every aspect of your lighting journey. From meticulous planning and seamless commissioning, to expert training and the creation of captivating lighting scenes, we've got you covered. Our support team is just a call away, ready to swiftly assist, detect faults and proactively address maintenance issues even before a citizen can report them, to ensure your smart lighting system operates flawlessly. Let us handle the complexities while you enjoy the brilliance of effortless lighting innovation.

Customized solutions for each individual project

At connexx, we pride ourselves on our exceptional expertise in delivering customized smart lighting projects tailored to meet your specific needs. Our team of highly skilled professionals offer a deep understanding of the latest advancements in smart lighting technology. We stay abreast of industry trends and continuously explore cutting-edge solutions to ensure that we provide you with the most efficient, sustainable, and aesthetically pleasing lighting options available.

- programmed or manuel ON-OFF switching
- color scences in RGBW
- harmonious color transitions
- smooth transitions from cold white to warm white
- integration of any sensors such as PIR ect.
- individual control of different light distriubutions in one luminaire head
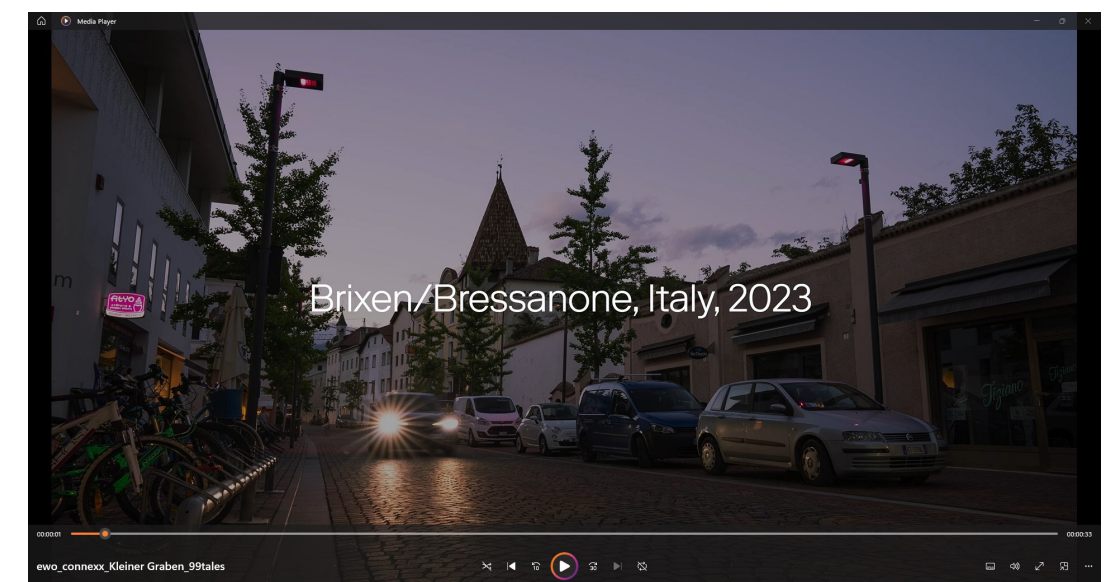
↘ Kleiner Graben, Brixen/Bressanone, Italy, 2023

The existing intelligent luminaires had Zhaga nodexx and LED strips added, through Leitfeld it was then possible to program dynamic color scenes.

Intelligent lighting system

① ⓪ ②

③ 🧭 ④

⑤
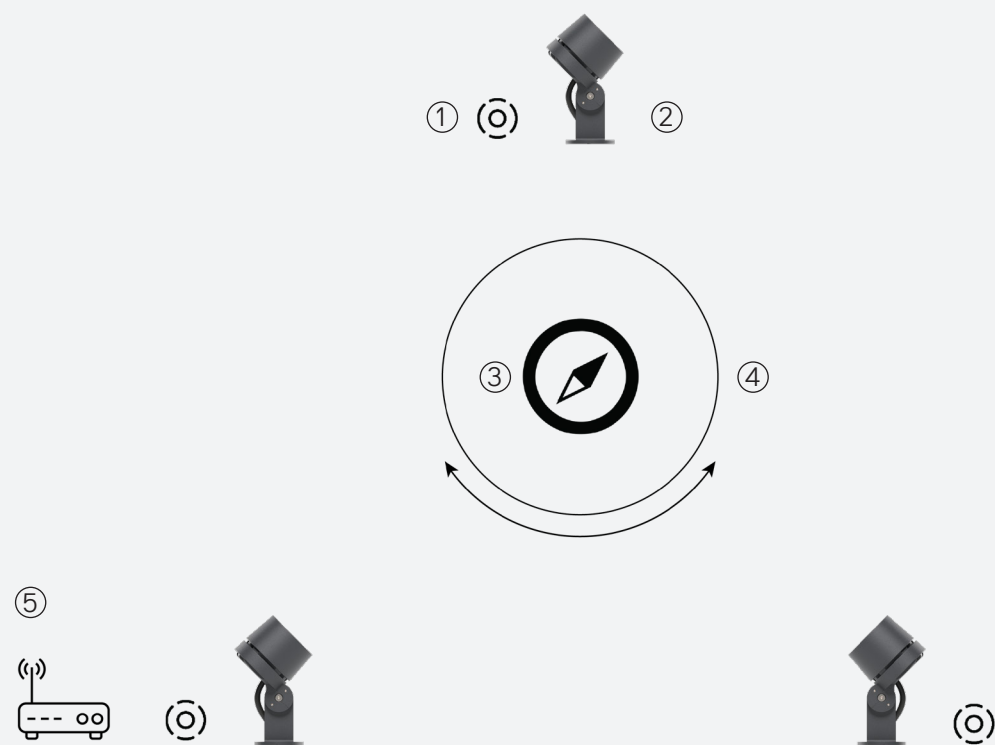
① Node - connects lumianire to system
② Spotlights - DALI driver controlled via node
③ Compass module
④ Windmill / compass module
⑤ Gateway - Connects to master node and to server
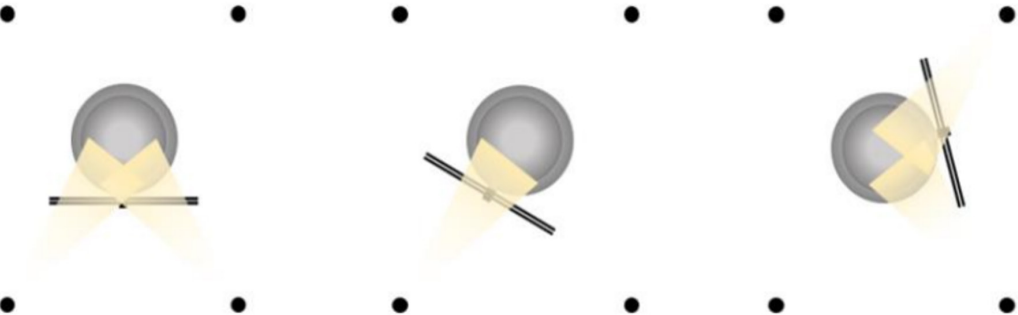
↘ Historical Windmill, Netherlands, 2023, Studio DL, Chameleon C165

Intelligent projectors react to the movement of the windmill and switch on alternately.
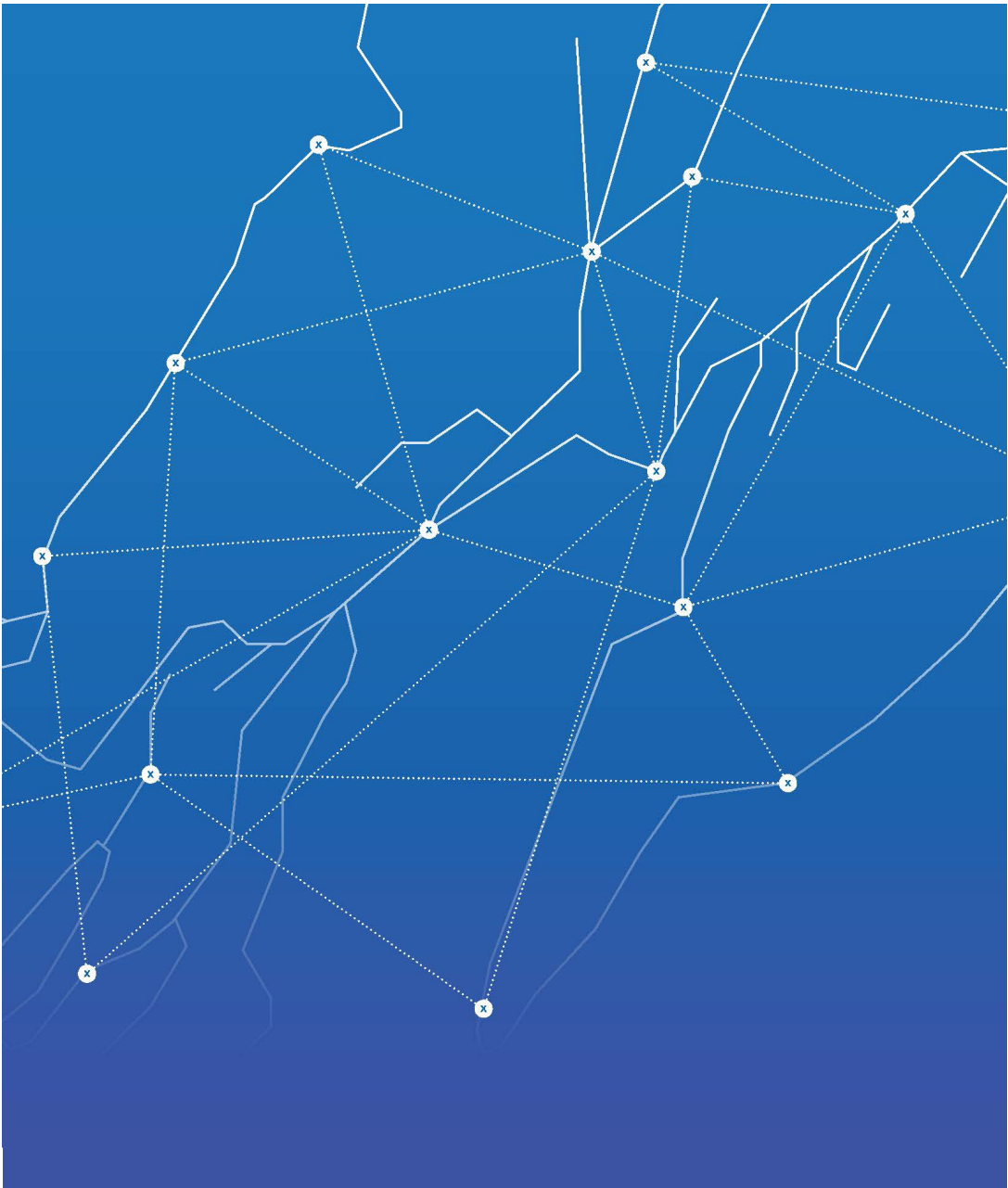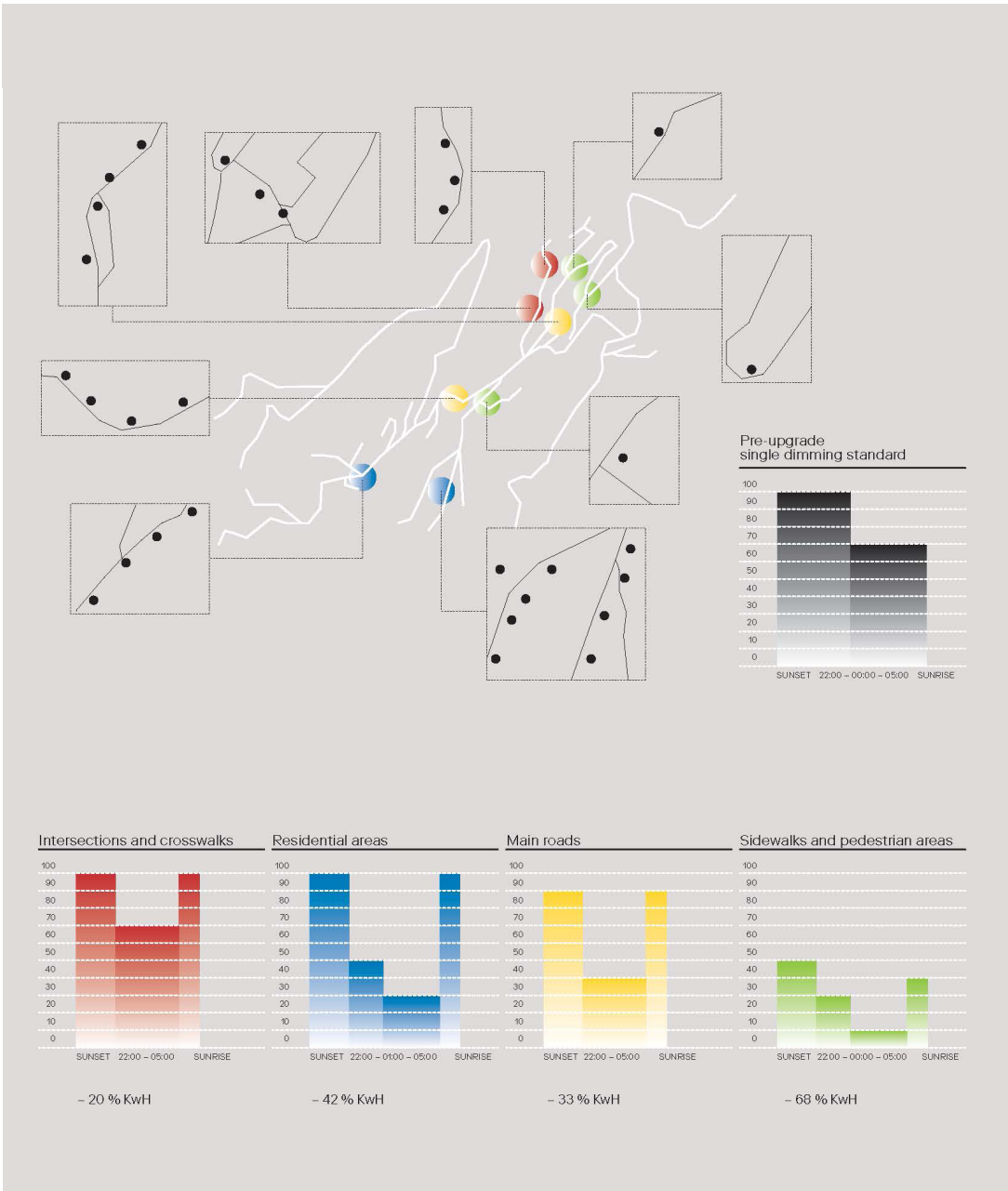
Saving energy through city light zoning

A key to lower energy consumption

Dimming is an excellent way to save money and electricity without sacrificing safety. It allows optimal management of resources, going on to dramatically cut both costs and consumption.

Pre-upgrade
single dimming standard

SUNSET 22:00 – 00:00 – 05:00 SUNRISE

Intersections and crosswalks	Residential areas	Main roads	Sidewalks and pedestrian areas

SUNSET 22:00 – 05:00 SUNRISE   SUNSET 22:00 – 01:00 – 05:00 SUNRISE   SUNSET 22:00 – 05:00 SUNRISE   SUNSET 22:00 – 00:00 – 05:00 SUNRISE

– 20 % KwH   – 42 % KwH   – 33 % KwH   – 68 % KwH

A functional lighting system was developed for Villanders to drastically minimize energy waste by up to 45 % and to reduce light pollution in accordance with local regulations. For pedestrian and residential areas, for instance, it was possible to introduce up to three different stages of dimming between 10 p.m. and system shutdown.

↘ Read the case study: https://www.ewo.com/gui/download/index.aspx?fileId=7309

Event lighting

We offer the possibility of grouping luminaires by manually managing and dimming the lighting. This allows squares, streets, and pathways to be lit in any desired or preferred pattern. In addition, software programming responds to changing needs, such as Christmas lighting or one-off events.

In Villanders, for example, relays have been installed to determine which Christmas lights can be connected. Via a grouping, luminaires can be specifically controlled during any required period.

"One of the features that convinced me instantly, was the possibility of attaching power sources at any point within the lighting system, which allows us to connect and manage other devices and systems – from temperature sensors all the way to Christmas lights.

An intelligent lighting system means you can use infrastructure in a way that reduces consumption and offers additional services to our citizens. And the positive reactions from the public have shown that opting for a smart concept was the right choice."

Walter Baumgartner, Mayor of Villandro

↘ Read the case study: https://www.ewo.com/gui/download/index.aspx?fileId=7309

Adaptive lighting – car parks

↘ Watch the video: https://www.ewo.com/news/dynamic-light-distributions

Light that adapts

Depending on the occupation in a car park, lighting can adapt and provide the light levels needed for any given moment in time.

By controlling separate LED modules in the same luminaire separately, color temperatures and light distributions can be adjusted to adapt to low or high occupancy. By connecting luminaires, modules in different zones can react to different impulses across the intelligent network.

Adaptive lighting – cycle paths
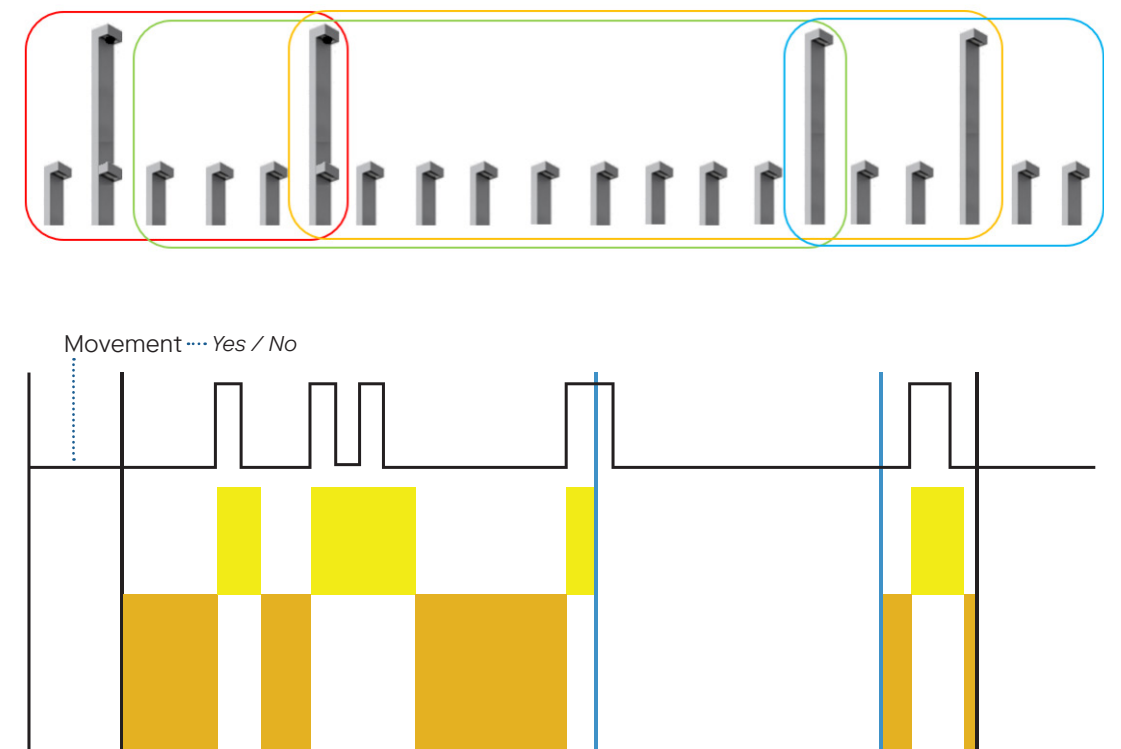
Light that follows

Intelligent light on a cycle path is a revolutionary technology that can enhance the safety of cyclists and save energy. The system works by using sensors to detect the presence of a cyclist and track their movement. As the cyclist approaches, the light automatically increases its intensity, providing a well-lit path and improving visibility for the cyclist and other road users.

Once the cyclist has passed, the light will gradually dim down again, conserving energy until the next cyclist approaches. This feature not only saves energy but also reduces light pollution and minimizes the impact on wildlife in the surrounding area, when using Amber LEDs during the low traffic times.

Outdoor lighting scenes

Adaptive lighting - delivering the ideal light. Always.

Smart lighting is a technology that allows lighting systems to adapt to different seasons, weather conditions, and occupancy levels. By setting up different lighting scenes, the system can automatically adjust the intensity, color, and direction of light to suit specific needs and create the desired atmosphere.

For instance, during winter, the lighting system can be programmed to produce a warmer, cozier light to combat the cold, while in summer, it can create a cooler, more refreshing atmosphere. The system can also adjust the light intensity based on occupancy levels, increasing or decreasing the light output in response.

Subtle hardware design

As part of the so-called Intelligence of Light, ewo has been responsible for the software that connects the luminaires to the Internet of Things since 2017: with the brand connexx, ewo combines all aspects of smart light management in-house and thus offers the lighting competence for future innovations.
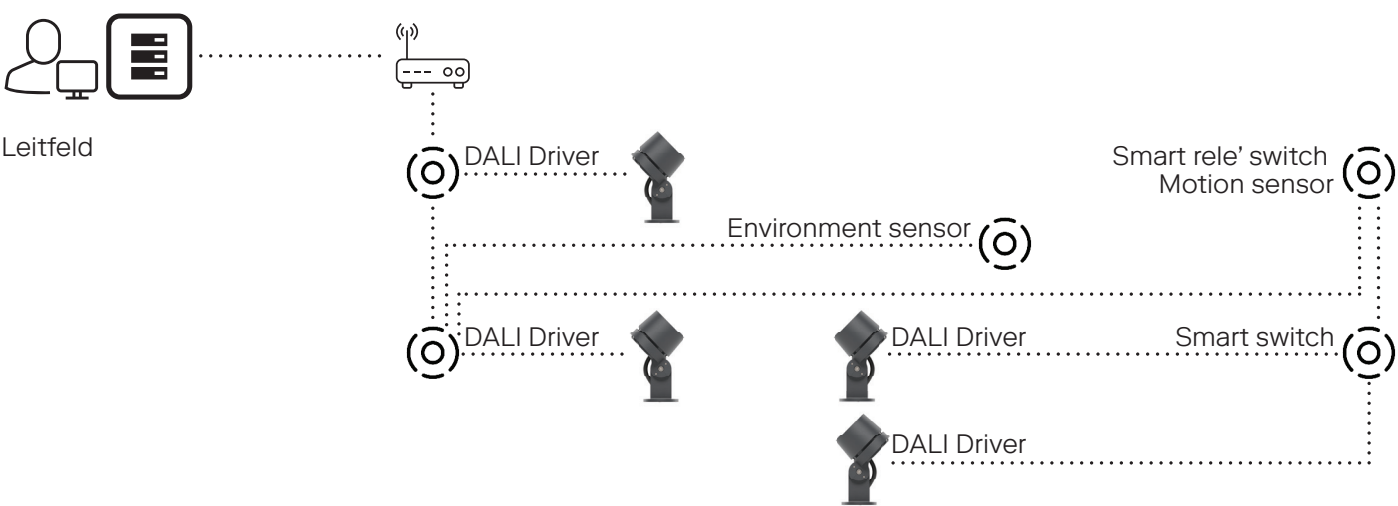

Conscious luminaires – Learning and adapting
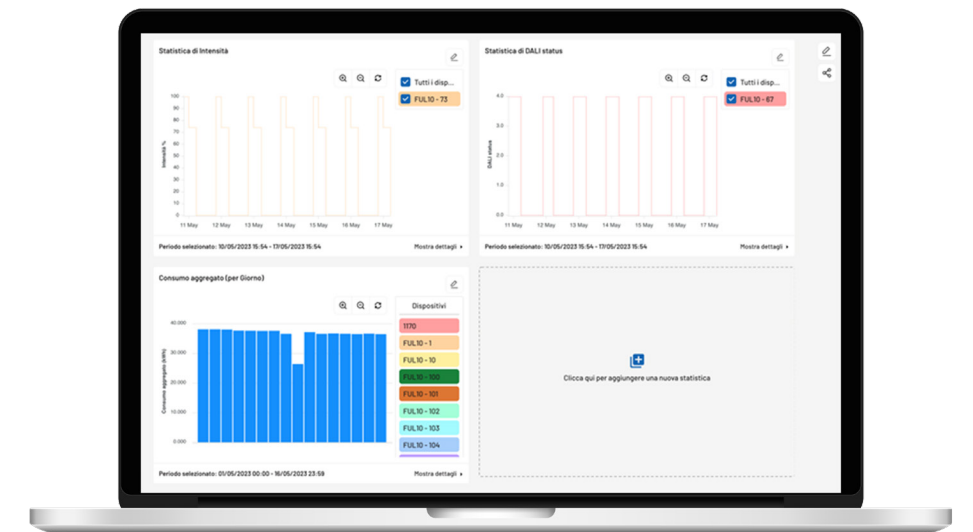

Self learning, intelligent systems

Intelligent lighting systems are designed to learn from the data they record and adapt over time to create the optimum illumination for a given environment. By collecting information on lighting usage, occupancy patterns, and energy consumption, these systems have the potential to make data-driven decisions that improve efficiency, reduce waste, and enhance the user experience.

Smart architecture

Cloud based

Standalone

Leitfeld

DALI Driver

Environment sensor

Smart rele' switch
Motion sensor

DALI Driver

Smart switch

DALI Driver

DALI Driver

Smart rele' switch
Motion sensor

DALI Driver

Smart switch

DALI Driver

↘ Real time status of the system and advanced lighting, manageable by the customer.
We provide full support including commissioning and training.

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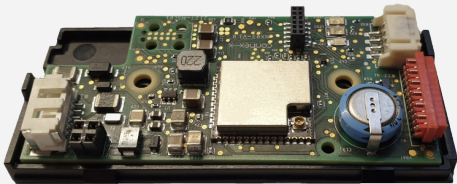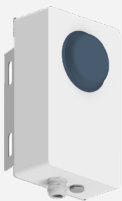# ewo
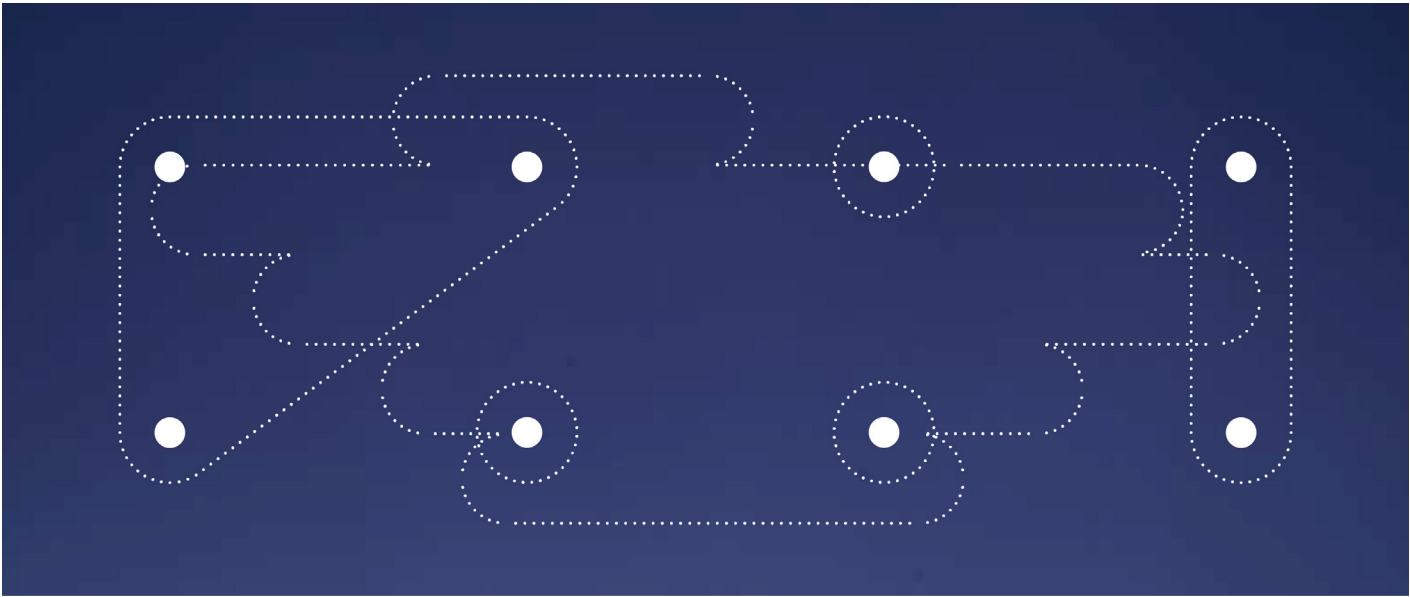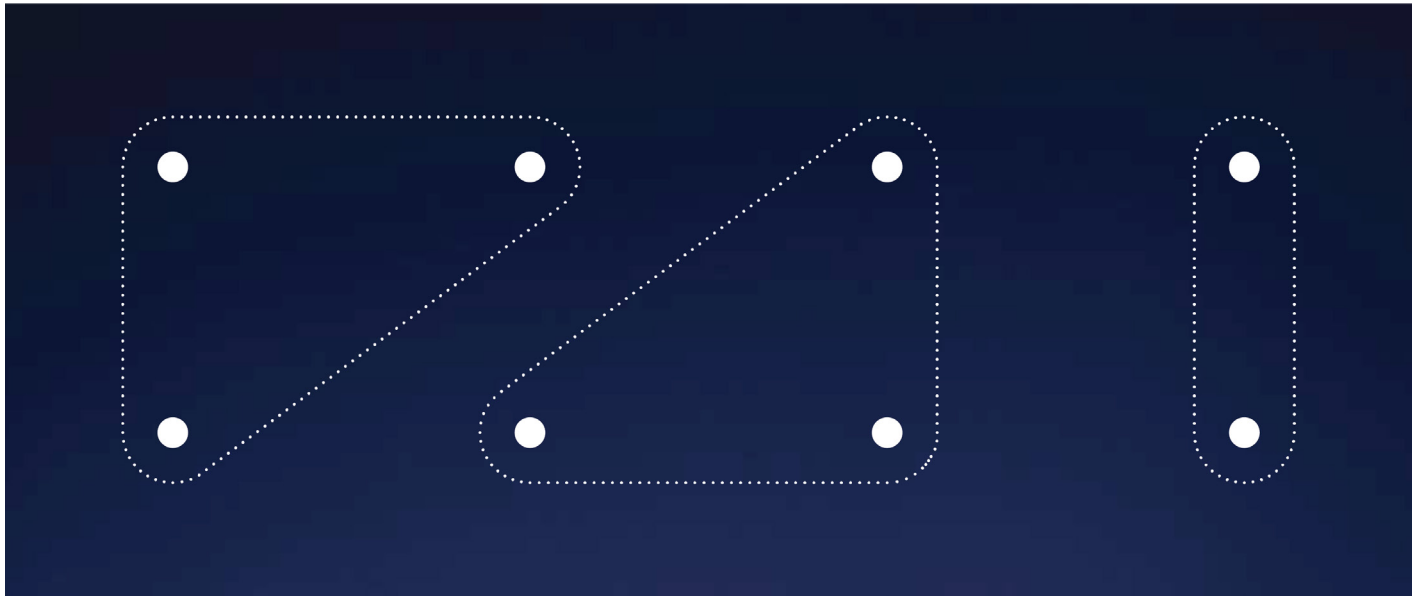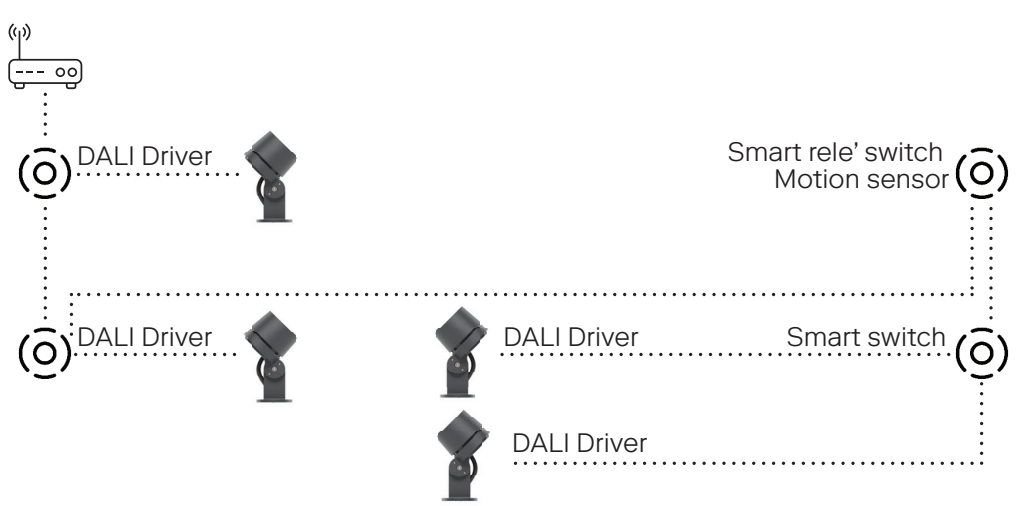
Nodexx

Nodexx Zhaga

Nodexx Light

Smart lighitng accessories
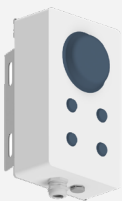
Smart rele switch / Range extender
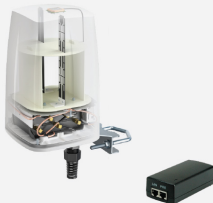
Sensors

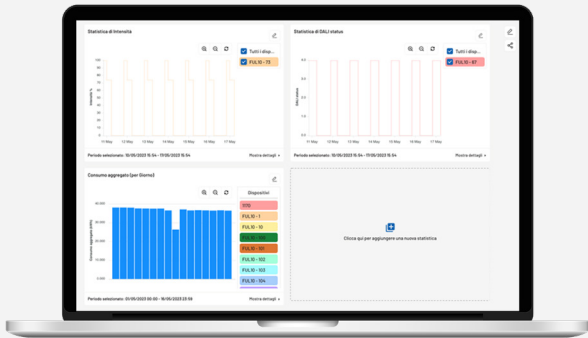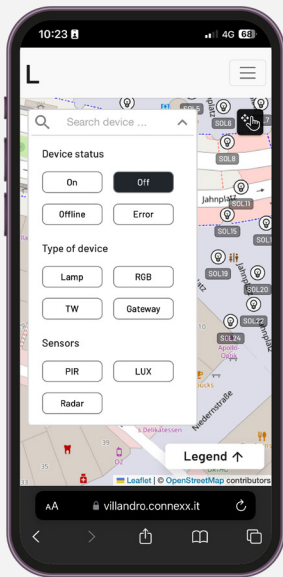*PIR sensor*

Radar Zhaga Node

Light sensor

Smart switch
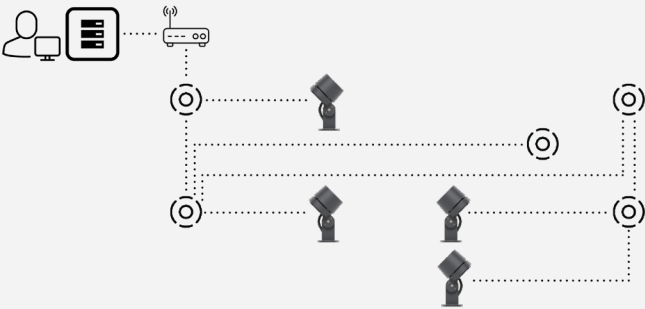
Gateway PoE

Gateway PoE
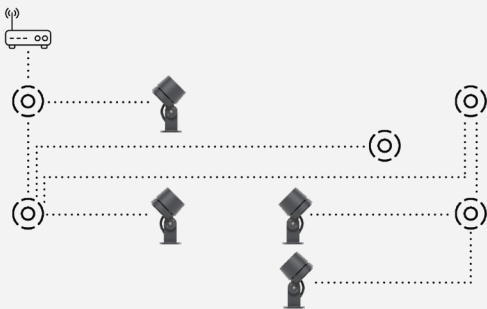
Leitfeld software

For desktop

For smartphone
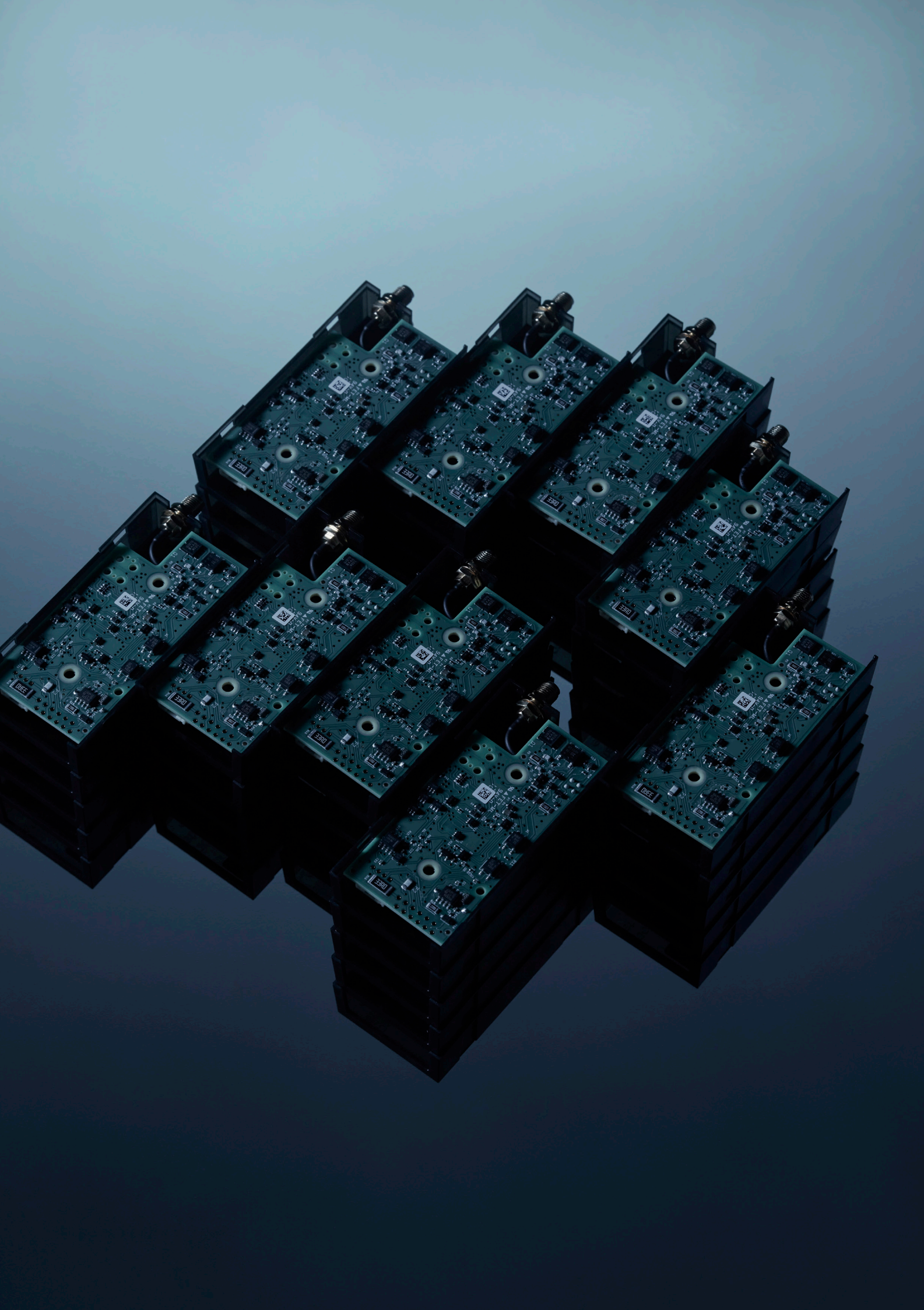
Architecture

Cloud based

Standalone
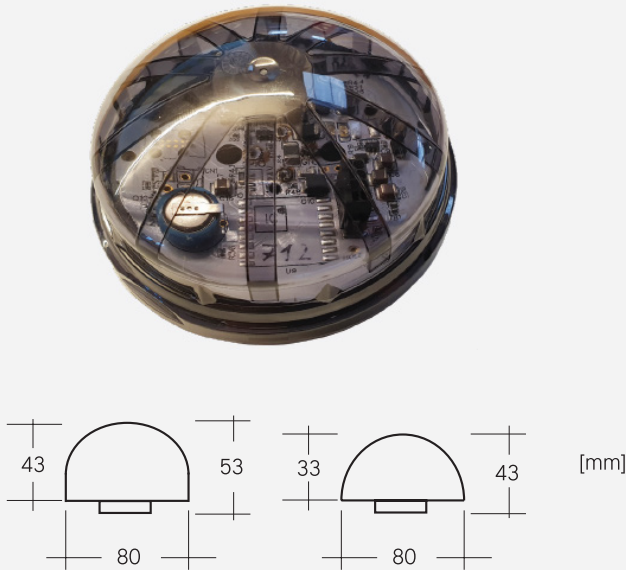
Keeping you connected with connex—x

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Hardware

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NX02 - Module

Features

- Manufactured and designed in accordance with industry standards
- Manual control of single light point or whole groups through Leitfeld software
- Individual dynamic light scenes and OTA (over the air) updates
- Standalone functionality for offline periods (emergency mode)
- Anomalies and DALI errors visible in the Leitfeld software

IEC CE ▣ IP66 IK09 WiFi

43   53   33   43   [mm]

80   80

Optional sensor

4 1 3 2   4 1 3 2

Digital port I/O

230 V / 50 Hz

SR - (S GND)
SR +
AUX (24 V)
LED - (BK)
LED + (RD)
EQUI
N (Neutral)
L

SR-Driver

[1]
230 V
50 Hz
24V DC

+ −
LED-Unit 1

Power supply unit [1] if a Driver-SR is not used!

Example

33   43   [mm]
80

43   53
80

LED Unit 1   Zhaga Book 18   Driver

Label	1 x for Nodexx
Label	1 x for Luminaire
Label	1 x for Pole
Label	1 x for Other

Technical Information

- Powered at 24Vdc
- Manages up to 16 DALI addresses
- DALI Type 8 support, D4i
- Integrated 3-Axis digital accelerometer
- Integrated temperature sensor
- Integrated supercapacitor powered RTC
- Low energy consumption of 35mA
- Standby power ≤ 1W
- Uses a wireless communication network with nodes organized in a dynamic mesh topology
- Failure rate < 10% for 60.000h of operation @ 50ºC

Mechanical Details

- Type of protection IP66
- Impact protection ≤ IK09
- Dimensions: Diameter 80mm x Height 40mm/ 50mm
- Weight: 70g

Connection

- Wi-Fi 802.11 b/g/n (802.11n up to 150 Mbps), 2.4GHz
- 1x Digital pin [4] on Zhaga socket which could be an input or an output

Add On

- Can power up to 10 DALI devices by mounting the DALI Power Supply Unit (DPSU) module.
- Optional lux meter for the twilight function.
- Without a connection, the "buffer battery" lasts two weeks. Time is restored when the gateway signal is detected.
- The label shows the data communicated to the supplier for programming / positioning
- Range extension: Add additional nodexx to extend your coverage
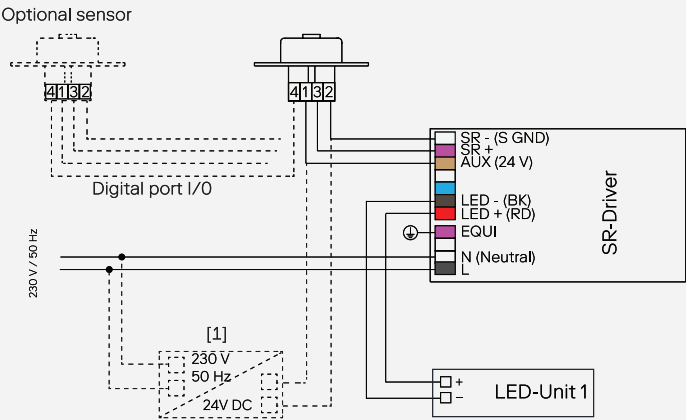
Standard

- Radio Equipment Directive 2014/53/EU
- EN 55032:2015/A11:2020;
- EN 55035:2017/A11:2020;
- ETSI EN 301 489-1 V2.2.3;
- ETSI EN 301 489-17 V3.2.4
- EN IEC 62311: 2020
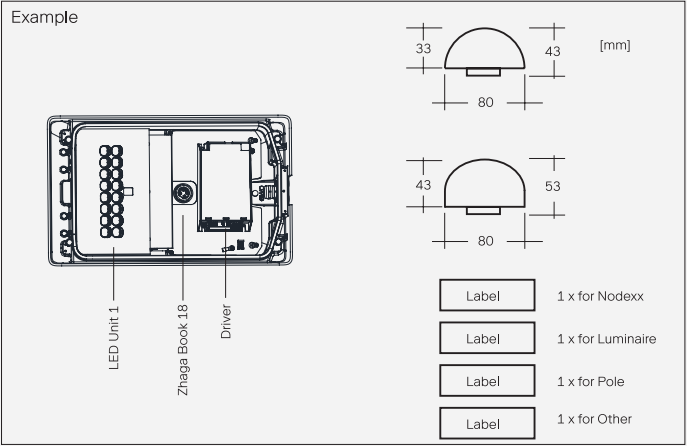- ETSI EN 300 328 V.2.2.2 clause 4.3.2.2, 4.3.2.9 & 4.3.2.10

Environmental requirements

- Operating temperature: from -20 to +60ºC
- Storage temperature: from -40 to +75ºC

Sustainability

- RoHS directive: 2011/65/EU
- Hazardous substances: Directive 2011/65/EU, as amended by Directive (EU) 2015/863 of March 2015
- REACH Directive 2006/1907/EC
- WEEE Directive 2002/96/EC05

Installation Requirements

- Clear line of sight between the light points
- The maximum reachable distances can be seen in the table below

If the communication module is installed, it takes control of the light unit. This must be considered as a reason for any subsequent fault.

For safety reasons, the smart module is pre-programmed with always-on lights.
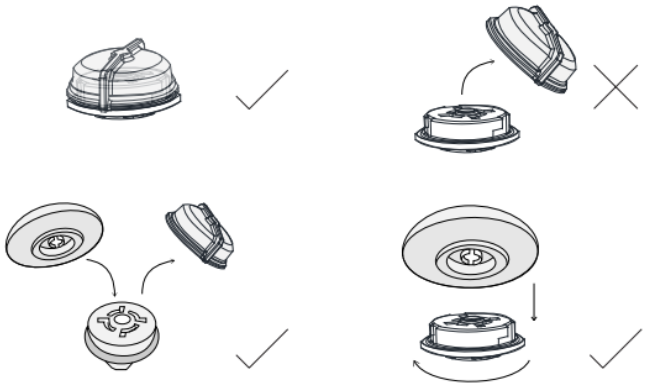
Series	Wi-fi Module	Dome	-	DALI PSU	-	Version
NX02 Nodexx Zhaga	E Standard antenna Distance between nodes <50m Distance from Gateway <30m	A Dome height 33 mm	0	D DALI PSU mounted 0 DALI PSU not mounted	0	0-99 DALI PSU mounted
NX02 Nodexx Zhaga	UE Over powered antenna Distance between nodes <100m Distance from Gateway <50m	B Dome height 43 mm	0	D DALI PSU mounted 0 DALI PSU not mounted	A	0÷99 Incremental value

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NX03 - Module

Features

- Manufactured and designed in accordance with industry standards
- Manual control of single light point or whole groups through Leitfeld software
- Individual dynamic light scenes and OTA (over the air) updates
- Standalone functionality for offline periods (emergency mode)
- Anomalies and DALI errors visible in the Leitfeld software

IEC CE ▣ WiFi

radio antenna

40 | 80 | mm
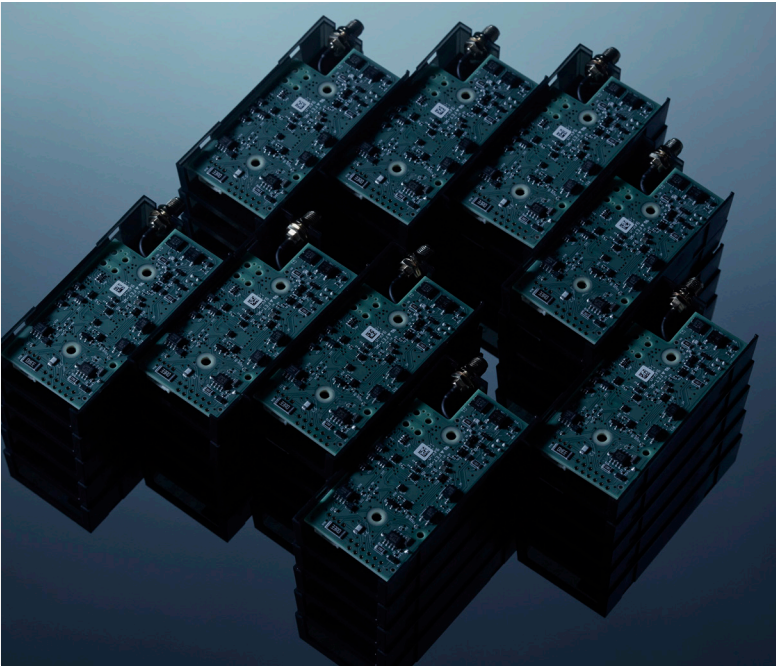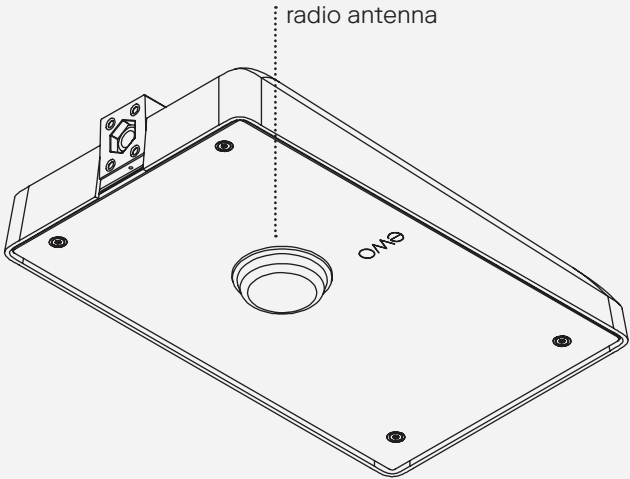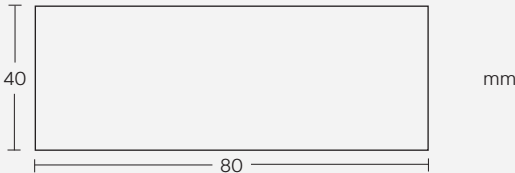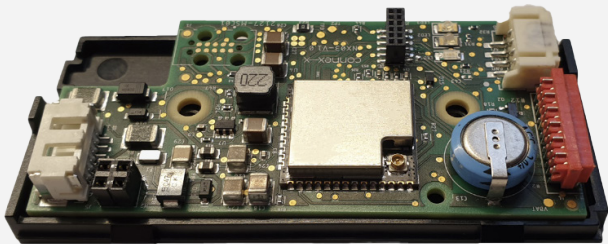
Technical Information

- Powered at 24Vdc
- Manages up to 16 DALI addresses
- DALI Type 8 support
- Integrated 3-Axis digital accelerometer
- Integrated temperature sensor
- Integrated supercapacitor powered RTC
- Low energy consumption of 35mA
- Standby power ≤ 1W
- Uses a wireless communication network with nodes organized in a dynamic mesh topology
- Failure rate < 10% for 60.000h of operation @ 50ºC

Standard

- Radio Equipment Directive 2014/53/EU
- EN 55032:2015/A11:2020;
- EN 55035:2017/A11:2020;
- ETSI EN 301 489-1 V2.2.3;
- ETSI EN 301 489-17 V3.2.4
- EN IEC 62311: 2020
- ETSI EN 300 328 V.2.2.2 clause 4.3.2.2, 4.3.2.9 & 4.3.2.10

Installation Requirements

- Clear view between the light point
- Maximum distance between light points: 100m
- Maximum distance to the connexx Gateway: 50m
- Specially developed antennas allow greater distances
- Product is also equipped with additional QR sticker. This QR Code must be stuck behind the luminaire pole maintenance door. This gives clear access for future maintenance.

If the communication module is installed, it takes control of the light unit. This must be considered as a reason for any subsequent fault.

For safety reasons, the smart module is pre-programmed with always-on lights.

Mechanical Details

- Type of protection IP20
- Dimensions: 80mm x 40mm x 18mm
- Weight: 40g
- Two screw hole 40mm from each other

Environmental requirements

- Operating temperature: from -20 to +60ºC
- Storage temperature: from -40 to +70ºC
- Relative humidity: <95% non-condensing

Add On

- Can power up to 10 DALI devices by mounting the DALI Power Supply Unit (DPSU) module.
- Connection
- Wi-Fi 802.11 b/g/n (802.11n up to 150 Mbps), 2.4GHz
- 1x Digital I/0
- 1 x Analog input
- 1 x Digital Input (0÷24V)
- I²C
- 1 x SPI
- 1 x Standard UART up to 921600
- +3.3V 250mA max protected output
- Range extension: Add additional nodexx to extend your coverage

Sustainability

- RoHS directive: 2011/65/EU
- Hazardous substances: Directive 2011/65/EU, as amended by Directive (EU) 2015/86 of March 2015
- REACH Directive 2006/1907/EC
- WEEE Directive 2002/96/EC05

Series	Wi-fi Module	-	-	DALI PSU	-	Version
NX03 nodexx Light	UE external antenna	0	0	D DALI PSU mounted	0	0-99 DALI PSU mounted
NX03 nodexx Light	UE external antenna	0	0	0 DALI PSU not mounted	0	0-99 incremental value

Keeping you connected with connex—x

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Range extender / Smart relay switch

60 · 200 · 120 · 105

CE ⊕ ▣
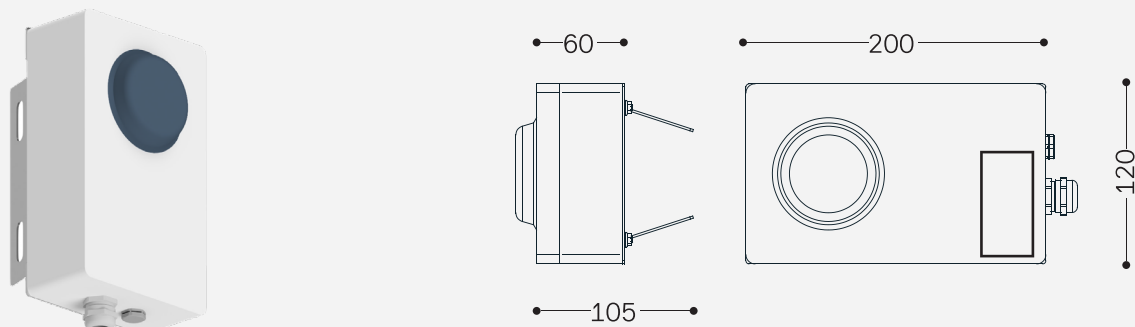
Range extender application

Range Extenders or Signal Boosters: These devices are used to extend the signal range and strengthen wireless communication between various components of the smart lighting system.

WiFi · WiFi · Range extender

Smart lighting system
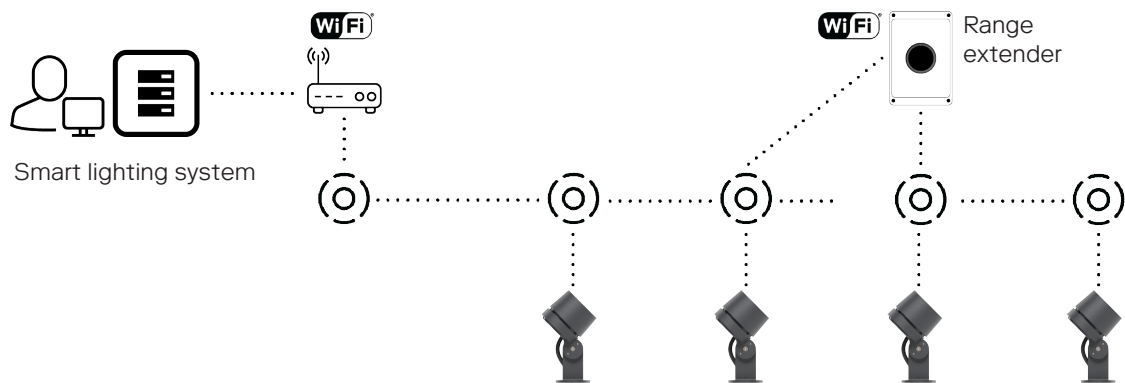
↘ Range extender to boost distances > 50m

WiFi · WiFi · Range extender

Smart lighting system
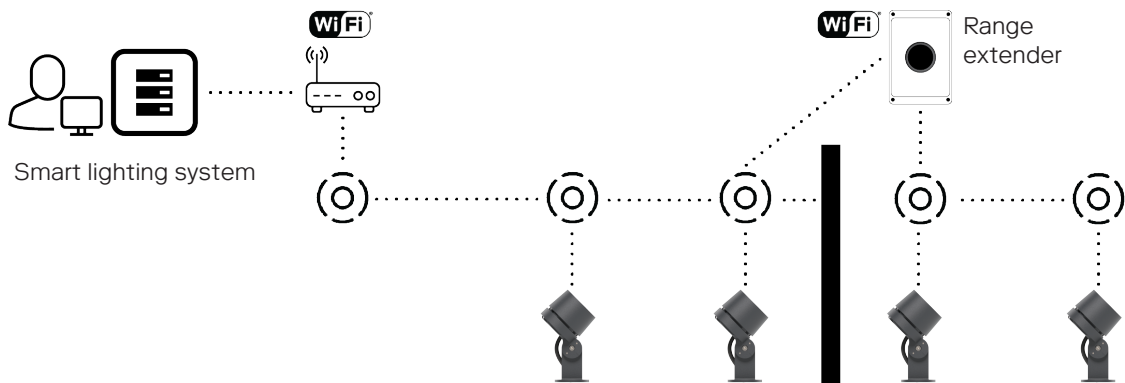
↘ Range extender overcomes signal blocking structures

Smart relay switch application

Smart relay switch is designed to integrate with the existing electrical infrastructure to control the power supply to multiple lights simultaneously

Smart lighting system

Group of non-smart luminaires

Smart relay switch

Keeping you connected with connex—x

ewo
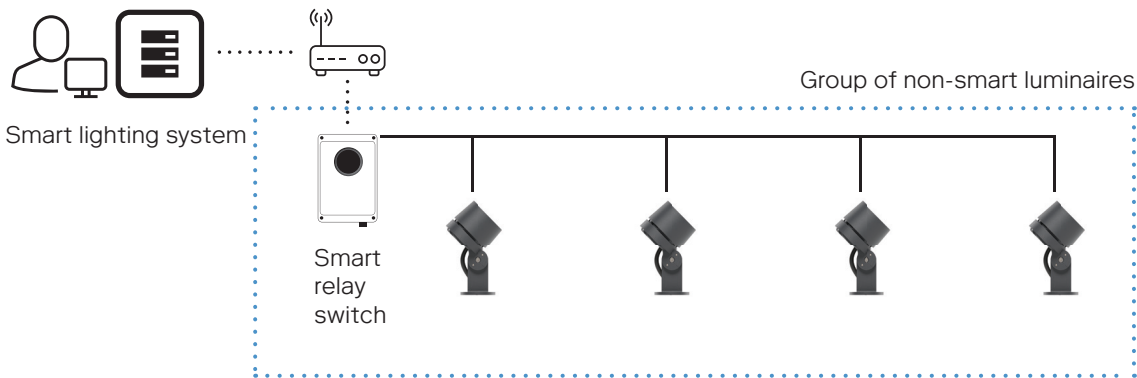
PIR sensor

Surface mount | Wall mount

Specifications

|	
Specified detection distance (surface mount)	up to 5m
	T>4º Object speed: 1m/s Object size: 700x250mm Crossing 2 detection zones
Specified detection distance (wall mount)	up to 12 m (1st step lens) up to 6 m (2nd step lens) up to 3 m (3rd step lens)
	T>4º Object speed: 1m/s Object size: 700x250mm Crossing 2 detection zones
Typical ceiling installation height	3m
	The sensitivity of passive infrared sensors is influenced by environmental conditions, so a performance evaluation test under representative conditions is recommended
Field of view	Surface mount: 106º x 97º Wall mount: 56º x 112º
Detection zones	64 (surface mount) 68 (wall mount)

## Zhaga Radar Node

▣ IP66   IK09

Specifications

System description	Radar based motion detection of pedestrians, bikes and vehicles with integrated dimming control and wireless connectivity.
Sensors	2 radar sensors, 24 GHz
Speed detection	Moving objects from 1 to 110km/h
Detection area	Pedestrian & bikes up to 25m, cars up to 70m, trucks & buses over 100m, in both directions
Mounting	Directly on the luminaire, at the downward-facing Zhaga-base (Book 18 Ed 2.)
Mounting height	Recommended light spot height: 3 to 8m
Horizontal alignment	0º tp +30º

Detection area
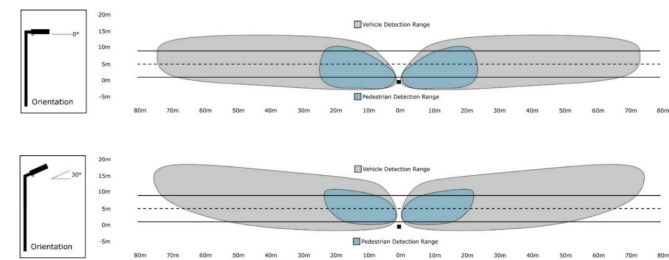
Light sensor
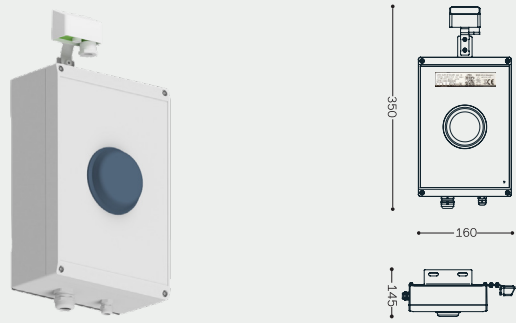
CE ⊕ IP65

Sensor application

When the light sensor detects that the natural light level falls below a certain threshold, indicating darkness or low light conditions, it sends a signal to the connected lighting fixtures to turn them on.

Smart switch
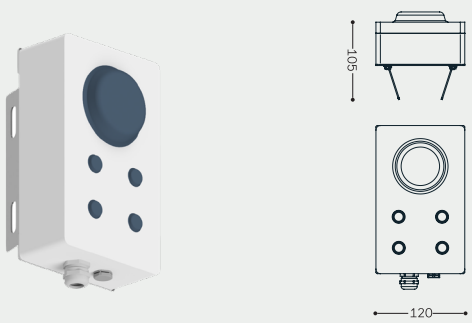
CE ⊕ ▣

Smart switch application

When a connected smart button is triggered, a specified scene is activated.

Light sensor
High / Low

Smart switch
On / Off

Movement
Yes / No

Dimmer
0% / 100%

Night | Day

ewo

Gateway

CE ⊕ ▣ IP66/20 WiFi

Outdoor Case

- Ingress protection IP67
- Dimensions 160 x 160 x 240 mm
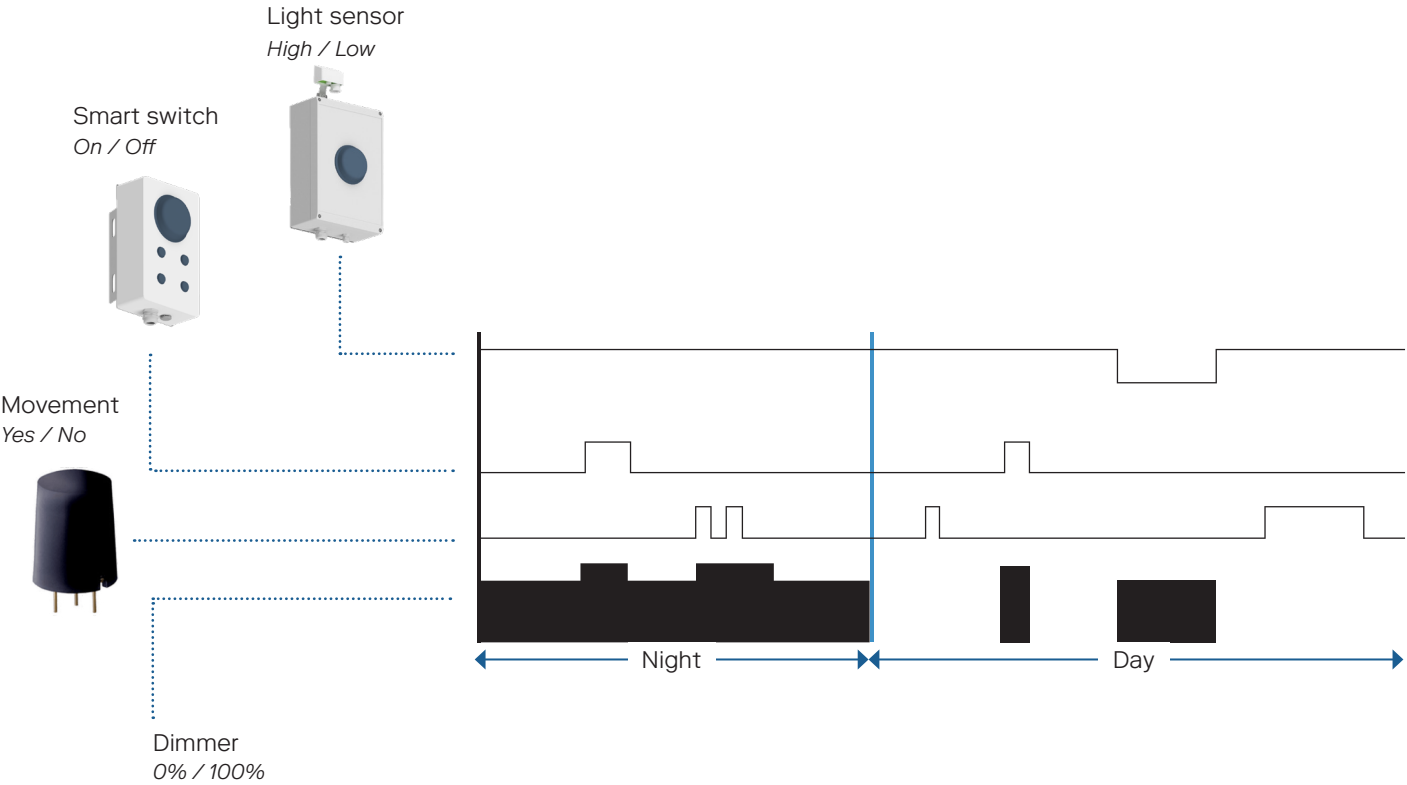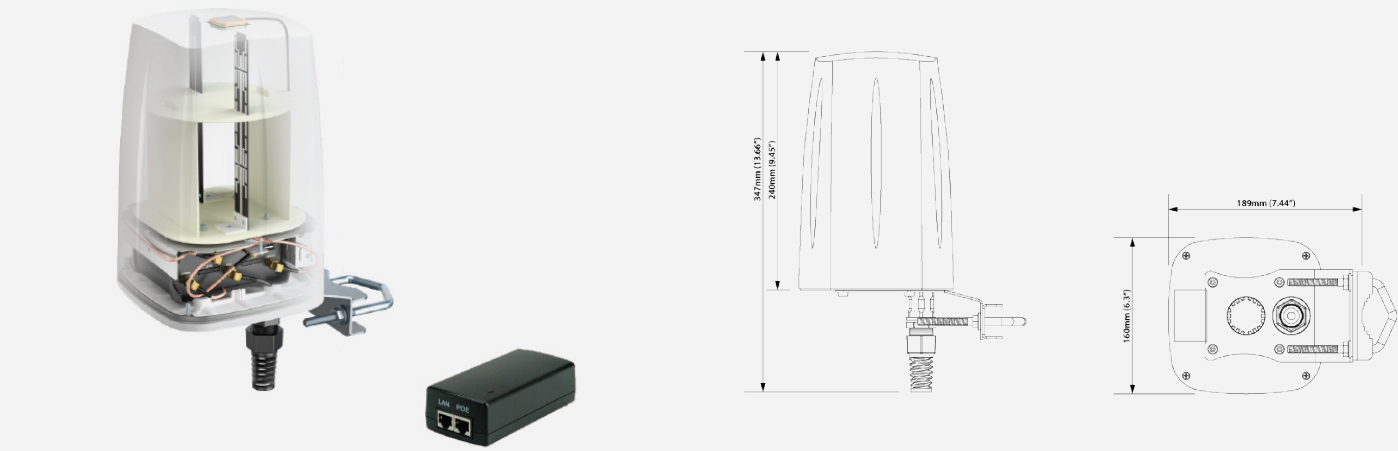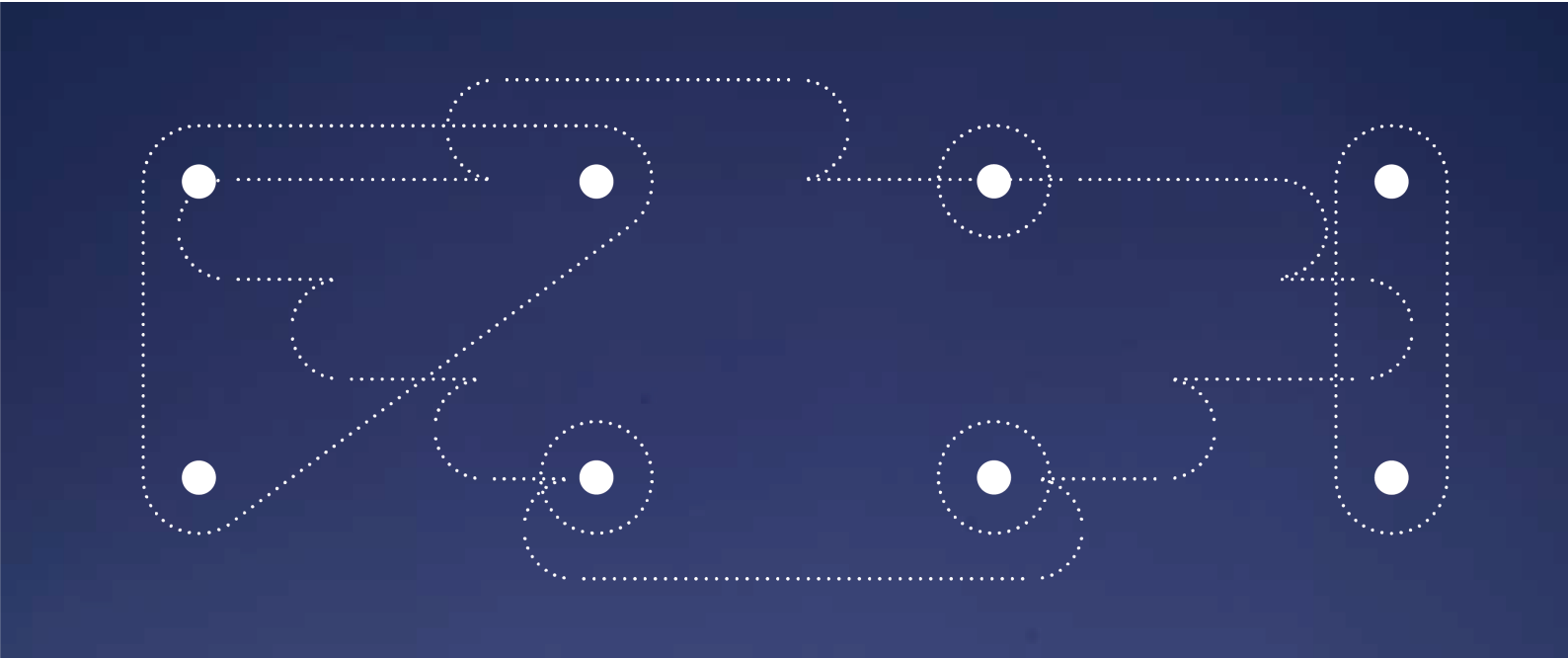- Weight 1.5 kg
- Operating temperature from -40ºC to 75ºC

PoE Injector 24V 1A 24W + power supply cable

- 24 V output
- Output power rating 1A (24W)
- Input voltage AC 100 ~ 240 V
- Input frequency 50 ~ 60 Hz
- Operating temperature 0 º C ~ + 40 º C
- Storage temperature -20 º C ~ + 85 º C

POE LAN Cable

- Standard cable length 5 m.
- Different length on request

Wall/Pole mounting 75ø mm. + screws/nuts

Important notes

- As these are sensitive electronic components, appropriate over-voltage protections should be provided
- The outdoor case has to be fixed on a wall or pole, with clear line of sight (max 50 m) to a luminaire, so as not to restrict communications signal (Depends on the Smart Module mounted on luminaire)
- Pre-wired POE cable length 5m
- Do not disconnect the pre-wired cable, as there is a risk it will affect water resistance
- Do not open the outdoor-case under any circumstances
- Use only genuine spare parts

Instructions

- Create a wired connection between Gateway and PoE.
- Apply the power supply, arrange an upstream overvoltage protection [1]!
- Distance between lamp post and Gateway max. 50 m! (without obstacles)
- The distance depends on the smart module mounted on the luminaire
- The data is shown on the technical sheet

⚠ IP20

[1]

Example

⚠ PoE ✓

Software

Manage your luminiares with our intuitive software "Leitfeld"

Leitfeld is an open IoT platform that can control and collect data from different nodes and sensors in order to react within seconds or to run analysis.

You can visualize a lighting system and set rules for different groups or individual luminaires, change their behaviour in real time for events or special occasions, and optimise power consumption.

It also allows the remote management of individual or groups of luminaires, smart scene set-up, and the integration of smart devices into the system.

Leitfeld is available for both desktop and mobile use and every customer using the system will be provided with their own log-in - with the system available through any browser. Once in use, Leitfeld provides a complete overview of your lighting network, detects faults and proactively addresses maintenance issues even before they can be reported.

Scene setting with Leitfeld

Harness the power of creativity as you effortlessly craft mesmerizing lighting scenes that transcend the ordinary. With our system's advanced capabilities, you can control RGBW, normal white, and tunable white lighting elements effortlessly. Create captivating ambiance, seamlessly transitioning between colors and shades, all at your fingertips. Experience the magic of slow, graceful scene transitions that rival traditional DMX systems. Step into a world where your outdoor lighting becomes an immersive masterpiece, limited only by your imagination

Leitfeld incorporates the 'Safety Response Mode' as an automatic feature embedded within each lighting pole, assuring a secure and well-illuminated environment at all times. By implementing the Safety Response Mode, every pole activates a predefined lighting configuration chosen by the user in response to issues such as loose connections or problems.

Rest assured that with our Safety Response Mode, your outdoor spaces will remain secure, well-lit, and prepared to handle any unexpected circumstances.

↘ Watch the scene creation tutorial
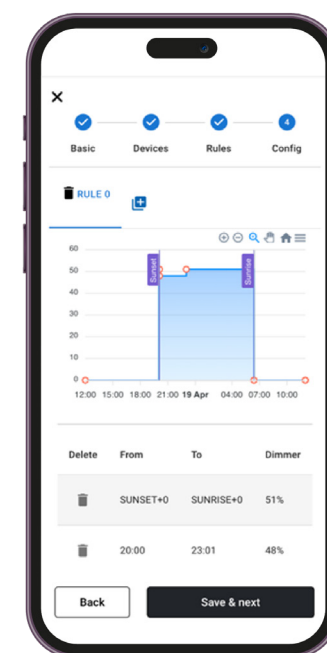
Asset management

Asset management refers to the comprehensive approach of managing and optimizing various lighting assets deployed within the infrastructure. These assets can include individual light fixtures with theirs components and sensors. The primary goal of asset management is to ensure the efficient operation, maintenance, and maximal lifecycle management of these assets to enhance their performance and longevity.
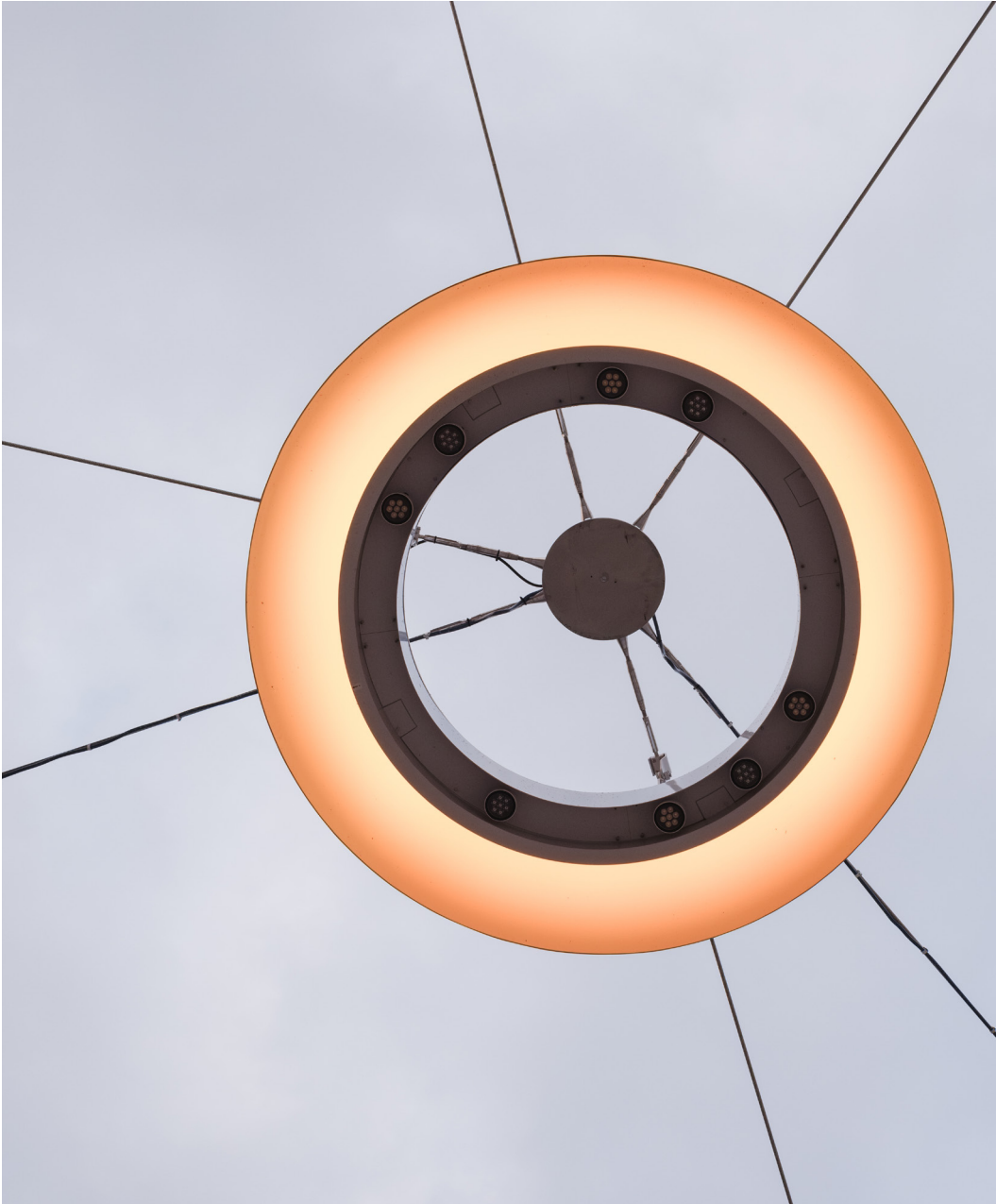
Lighting Analytics Dashboard

In the context of outdoor lighting, data statistics refer to the collection, analysis, and interpretation of various data points related to lighting systems and their operation. These statistics provide valuable insights into the performance, energy consumption, and usage patterns of outdoor lighting infrastructure. By analyzing these data statistics, stakeholders can make informed decisions, optimize operations, and drive efficiency improvements.
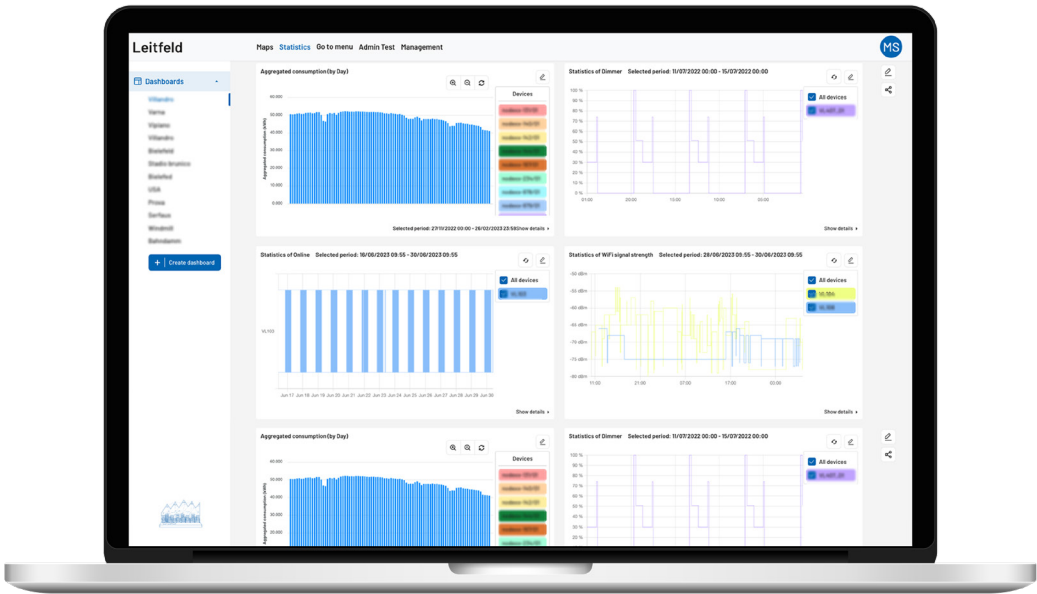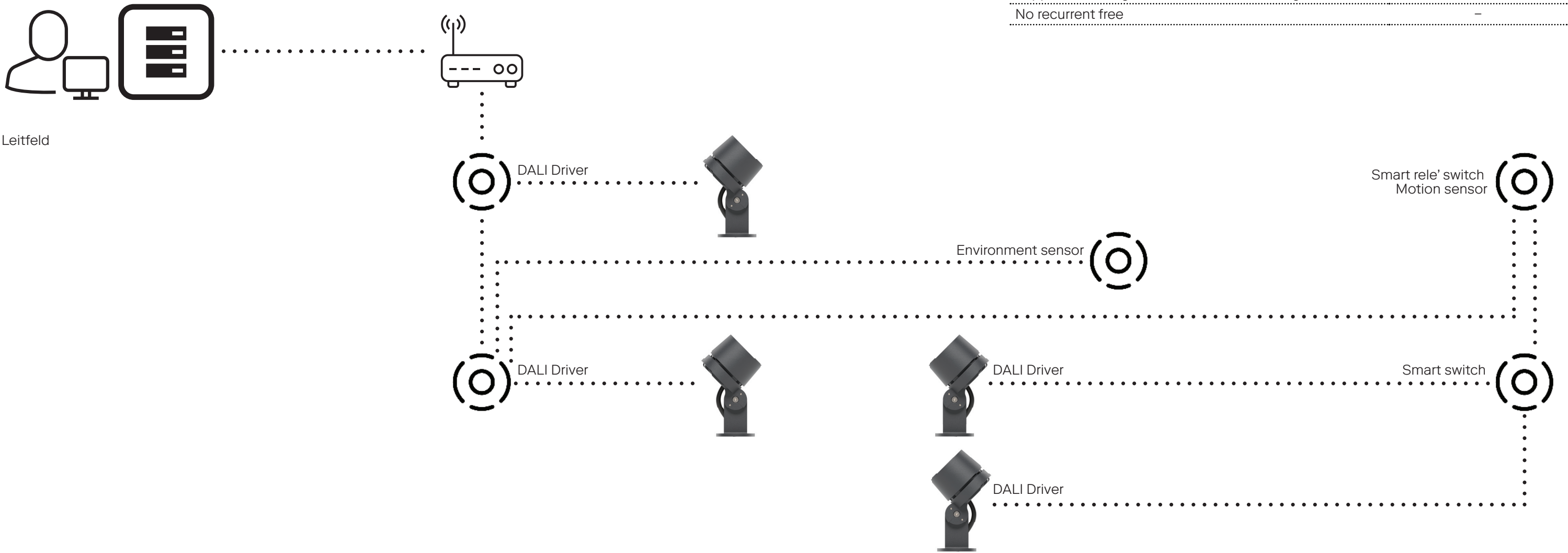
Ecosystem

Smart architecture
Cloud based

Our cloud solution allows the remote management of individual or groups of luminaires, smart scene set-up, and the integration of smart devices into the system
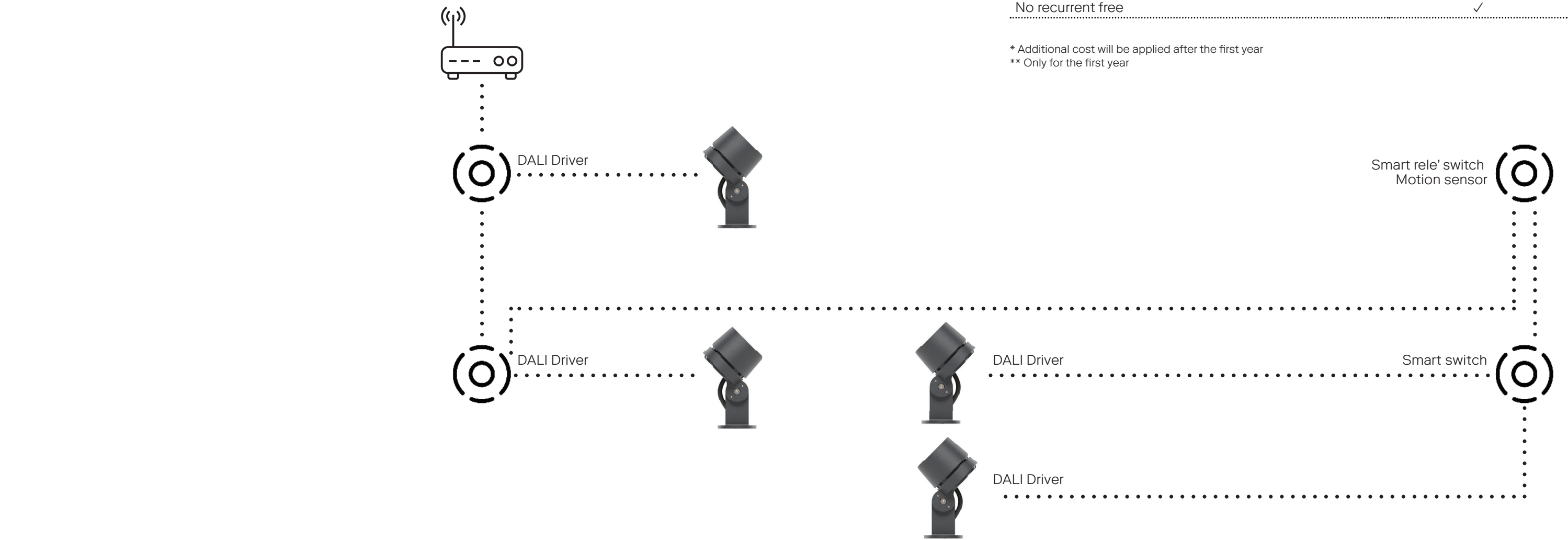
Features	Cloud based architecture
Remote management of advanced lighting scenes by the customer	✓
Remote management of basic lighitng scenes	✓
Lighting scene based on motion sensor and keypad	✓
Safety response mode	✓
Lighting analytics dashboard	✓
Asset management	✓
Sensor integration	✓
Yearly system support	✓
Real time status of the system controllable by the customer	✓
Errors and notifications	✓
Continuous monitoring by our support team	✓
Support + training included + commissioning	✓
No recurrent free	–

Leitfeld

DALI Driver

Smart rele' switch
Motion sensor

Environment sensor

DALI Driver

DALI Driver

Smart switch

DALI Driver

↘ The cloub based eco-system includes: Luminaires, DALI drivers, Sensors, Gateways, Leitfeld software

Smart architecture
Standalone

Our standalone solutions allow the user to maximise energy savings with preset scenes - a fit and forget intelligent solution.

Features	Standalone architecture
Remote management of advanced lighting scenes by the customer	–
Remote management of basic lighitng scenes	✓*
Lighting scene based on motion sensor and keypad	✓
Safety response mode	✓
Lighting analytics dashboard	–
Asset management	–
Sensor integration	–
Yearly system support	–
Real time status of the system controllable by the customer	–
Errors and notifications	–
Continuous monitoring by our support team	–
Support + training included + commissioning	✓**
No recurrent free	✓

* Additional cost will be applied after the first year
** Only for the first year

DALI Driver

DALI Driver

Smart rele' switch
Motion sensor

DALI Driver

Smart switch

DALI Driver

↘ The standalone eco-system includes: Luminaires, DALI drivers, Sensors

Ecosystem Features

Features	Cloud based architecture	Standalone architecture
Remote management of advanced lighting scenes by the customer	✓	–
Remote management of basic lighitng scenes	✓	✓*
Lighting scene based on motion sensor and keypad	✓	✓
Safety response mode	✓	✓
Lighting analytics dashboard	✓	–
Asset management	✓	–
Sensor integration	✓	–
Yearly system support	✓	–
Real time status of the system controllable by the customer	✓	–
Errors and notifications	✓	–
Continuous monitoring by our support team	✓	–
Support + training included + commissioning	✓	✓**
No recurrent free	–	✓

* Additional cost will be applied after the first year
** Only for the first year

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