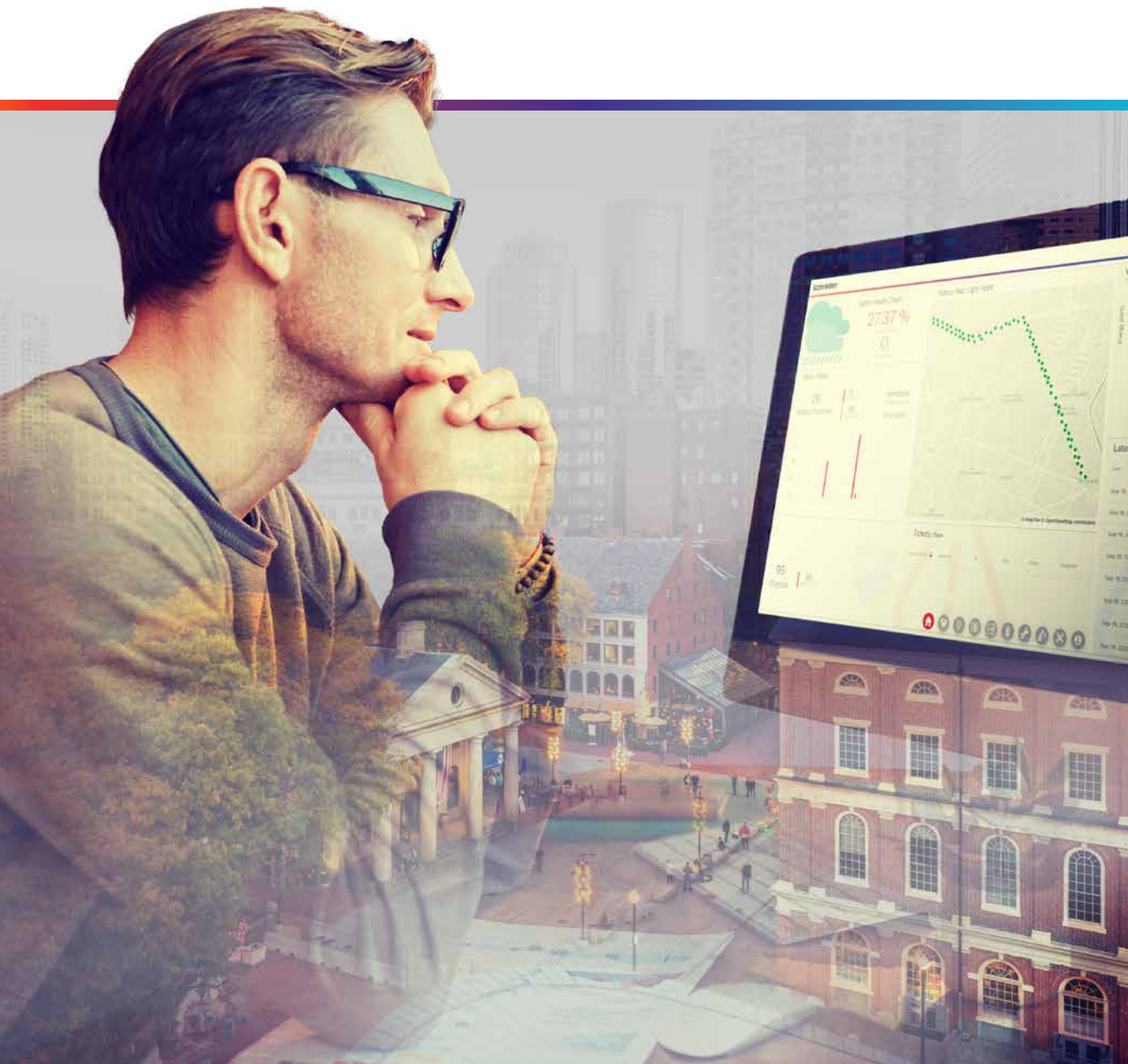


Schröder
Experts in lightability™



Your city
as smart as you want





“Schröder Hyperion builds on Schröder’s century-long experience, knowledge and engineering to support cities with a specialised portfolio of relevant smart city solutions.”

In addition, Schröder Hyperion works with partners across the world, to complement today’s products and create additional opportunities for cities.”

NICOLAS KEUTGEN

Chief Innovation Officer at Schröder

Innovation and inspiration for smarter cities

With Schröder Hyperion, Schröder shapes the evolution of smart cities.

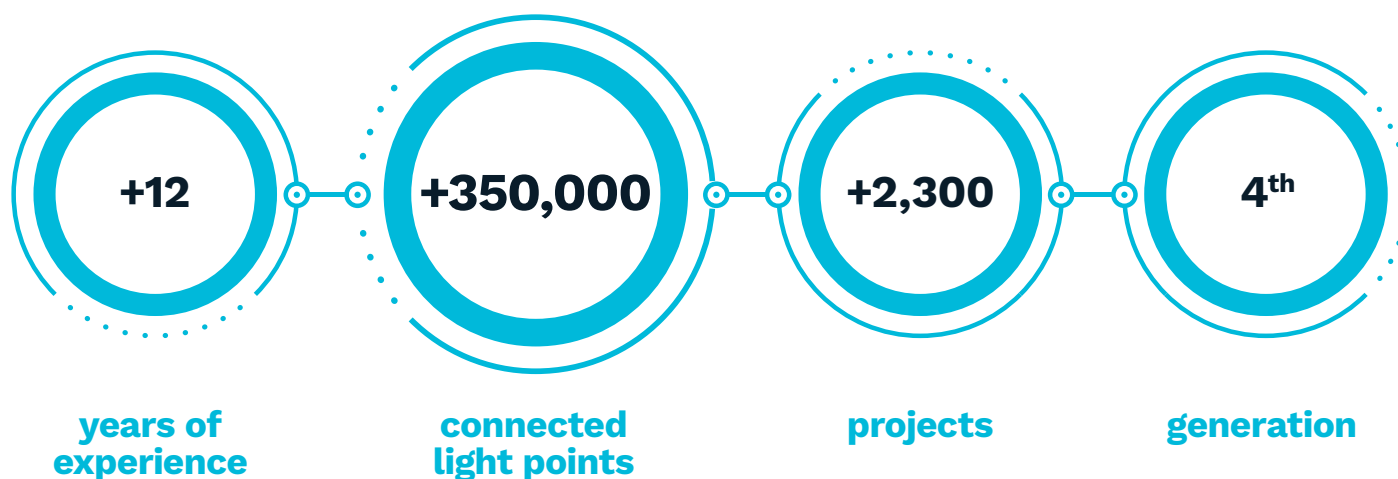
More than 60 experts in cloud computing, cybersecurity, machine learning, IoT and data analysis are working closely with customers to unlock the potential of urban infrastructures to address significant society challenges.

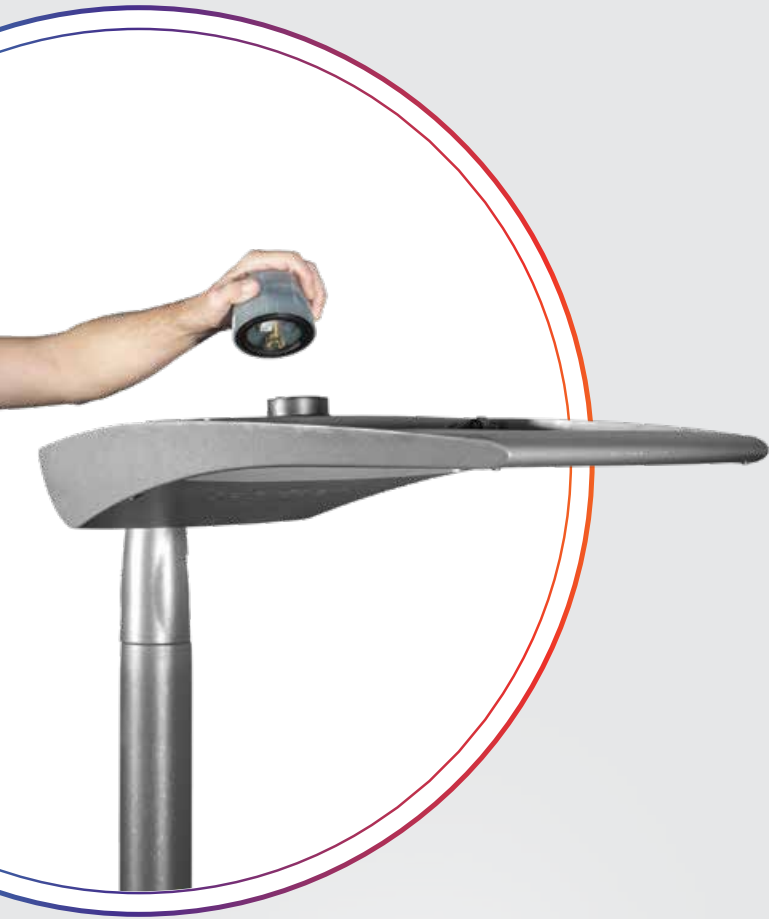
Located at Nova School of Business and Economics (Nova SBE) in Carcavelos (Lisbon region), a brand new university campus, Schröder Hyperion aims to plan urban spaces, repurpose existing infrastructure and develop luminaire-based digital systems.

Schröder Hyperion provides practical information, training and solutions, to facilitate the transition to smarter and more sustainable cities.

This centre of excellence is strategically based in the Lisbon area to take full advantage of the strong tech talent. The city boasts a remarkably high number of qualified engineers per capita and so Schröder Hyperion seeks to leverage the thriving international tech ecosystem through collaboration and the implementation of research initiatives.

Schröder **smart** and **connected** solutions





Why connect & control?

Artificial lighting has been part of the urban experience since ancient times. Over the years, technology has developed to deliver better performance. Now, control solutions bring a new layer of tangible benefits that maximises the return on investment.



SUPPORTING A VISION

- > Maximised energy savings and minimised carbon footprint
- > Easy adaptation for events/urban planning evolution
- > Accurate data for informed decisions
- > Ready for smart city applications: easy link with IoT urban devices



**POLITICAL
DECISION-
MAKERS**

EFFICIENT MANAGEMENT

- > Precise asset inventory
- > Direct failure reporting
- > Optimised service/maintenance planning
- > Improved cost tracking
- > Flexibility and scalability



**UTILITY
OPERATORS**



**CITY
TECHNICAL
SERVICES**

EASY DEPLOYMENT

- > Enhanced preparation and follow-up
- > Interface to work efficiently with cities and other stakeholders
- > Plug-and-play commissioning

CITIZENS



CITIES THEY LOVE TO LIVE IN

- > Safety, comfort and well-being without disruption
- > Less failure reporting
- > Feeling that resources are being well used
- > Sense of pride



Your journey first, then the right technology

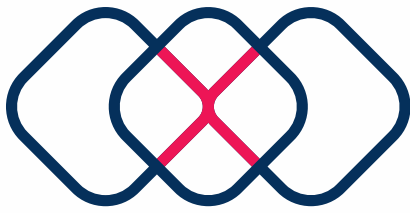
Becoming a smart city is not an objective in itself.

Cities need tailored solutions that enable them to go on a journey. It can't be about choosing a one size fits all solution. We start with understanding the uniqueness of your city, its pain points, and its opportunities.

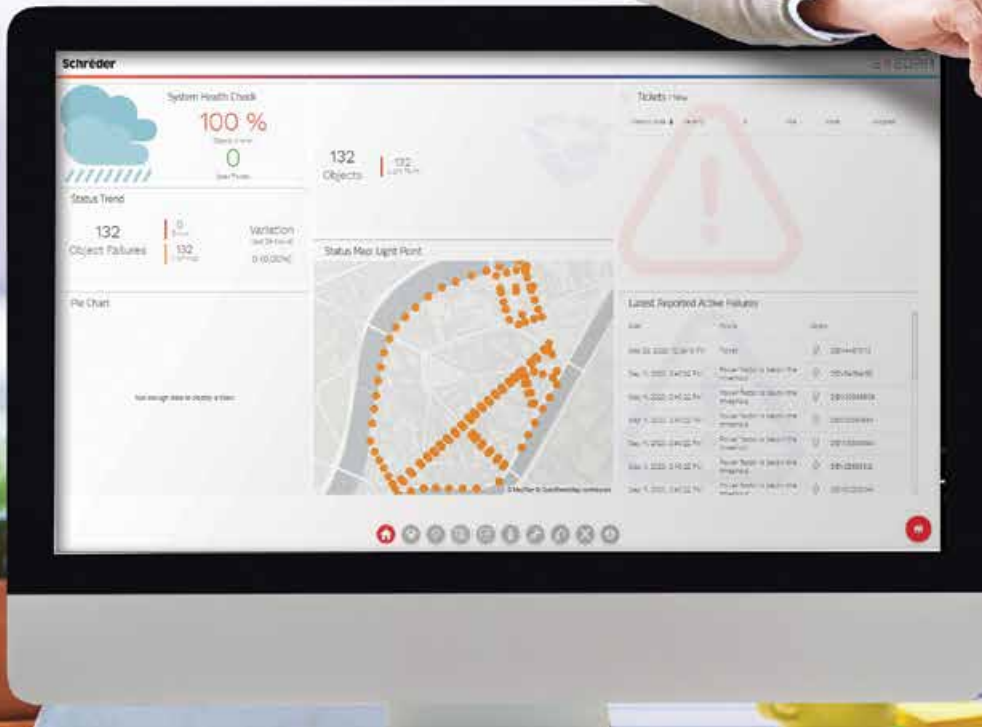
Schröder creates, advises, innovates and integrates lighting-based solutions. We support our customers all the way. We align value with your short- and mid-term targets while sustaining your long-term vision.

We want to understand how your city works in order to offer innovative approaches and new solutions with benefits beyond lighting. It is not about the technology – this is our skill and expertise – it is about figuring out what can be done to improve neighbourhoods and communities through deploying the right solutions in the right places.





EXEDRA



Leading city management platform

- Features
- Security
- User experience
- Scalability
- Services

SMART

Schröder EXEDRA Smart is the most advanced lighting management system on the market for controlling, monitoring and analysing streetlights in a user-friendly way. It is focused on smart lighting management and can integrate smart lighting applications such as the ability to adapt the colour of the light or build dynamic lighting scenarios through the use of PIR sensors or radars.

PRO

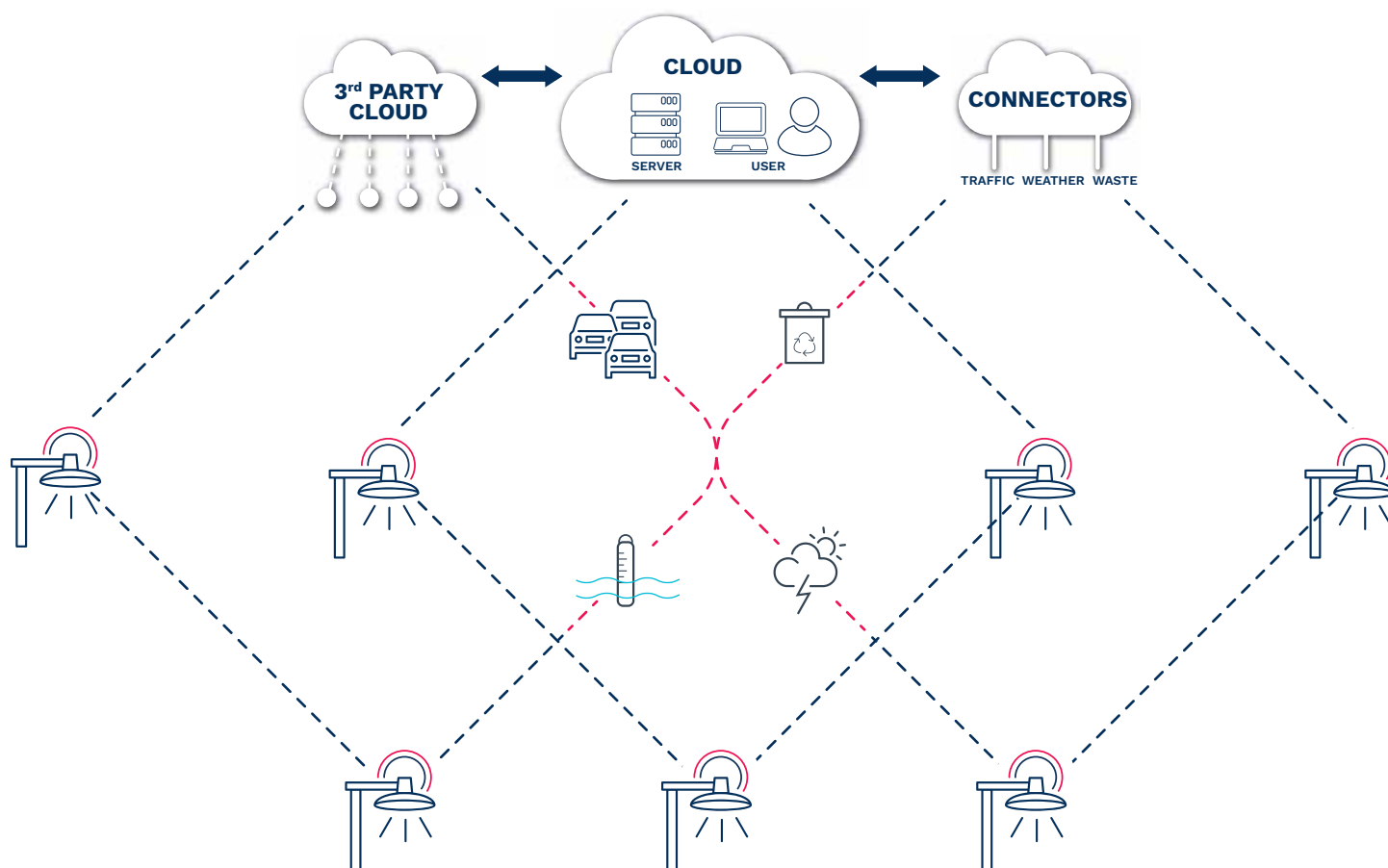
Schröder EXEDRA Pro is based on the Smart offering but provides a more tailored and flexible customer experience opening the way to smart city applications that go beyond lighting. It is designed for customers who are looking for the option of building additional value beyond illumination into their lighting backbone.

Standardisation to enable custom IoT solutions

The Schröder EXEDRA system architecture is designed to interact with other software and hardware solutions seamlessly. How is this possible? Unlike proprietary systems that prevent interoperability and generate vendor lock-in or expensive proprietary integrations, Schröder EXEDRA is **a whole solution based on open standards and protocols.**

Schröder plays a key role in driving standardisation with alliances and partners such as uCIFI, TalQ or D4i. Our joint commitment is to provide **solutions designed for vertical and horizontal IoT integration.** From the body (hardware) to the language (data model) and the intelligence (algorithms), the complete Schröder EXEDRA system relies on shared and open technologies.

This interoperable platform ensures that customers can connect existing or third-party systems/devices to Schröder EXEDRA and even means that we are open to work with our competitors.



EXEDRA

Our **ecosystem partners** for technology-agnostic solutions



The end of proprietary wireless communication networks for smart cities and utilities

The uCIFI Alliance is open to any industrial company, consulting firm, end-customer, public authority, utility and other entity who are committed to developing open non-proprietary solutions to unlock the smart city and smart energy markets.

uCIFI aims to define a unified data model for all smart city objects, based on the standardised OMA LwM2M data format. The uCIFI data model is suitable for implementation in any IoT network including LoRaWAN, NB-IoT, 802.15.4G wireless mesh networks as well as proprietary IoT networks.

www.ucifi.com



Interoperability of luminaires, sensors and/or communication nodes

The Zhaga consortium joined forces with the DiiA to produce a single Zhaga-D4i certification that combines the Zhaga Book 18 version 2 outdoor connectivity specifications with DiiA's D4i specifications for intra-luminaire DALI.

This certification covers all the critical features including mechanical fit, digital communication, data reporting and power requirements within a single luminaire, ensuring plug-and-play interoperability of luminaires (drivers) and peripherals such as connectivity nodes.

www.zhagastandard.org



The global smart city protocol

The TALQ Consortium aims to define a globally accepted smart city protocol for central management software to configure, control, command and monitor heterogeneous smart city device networks.

TALQ provides answers to the main challenges of building really smart cities including increasing safety and comfort for inhabitants, reducing energy consumption and CO₂ emissions worldwide and raising cost efficiency for operators managing a smart city.

www.talq-consortium.org



Open, flexible and secure cloud computing services

Microsoft Azure is an ever-expanding set of cloud services provided with the highest levels of trust, transparency, standards conformance and regulatory compliance.

Microsoft Azure offers the freedom to build, manage, and deploy applications on a massive, global network using customers' favorite tools and frameworks. It provides security from the ground up, backed by a team of experts, and proactive compliance trusted by enterprises, governments, and startups.

www.azure.microsoft.com



The sky
is the limit



A well-managed city never stops looking for opportunities to innovate.

The hard work of building a smart city is a journey, not a destination: there is always room for improvement. With EXEDRA, Schröder has developed a **futureproof platform** that integrates this constant need to address new challenges and to evolve with technology. We know that the best solutions are those built over time through **agility and openness**.

To stay up-to-date, Schröder has taken a **technology-agnostic** approach. What does this mean? We rely on open standards and protocols to design an architecture able to interact seamlessly with third-party software and hardware solutions. Smart cities should be platforms for innovation and so is Schröder EXEDRA.

Breaking the silos

In this siloed world, Schröder EXEDRA is an inclusive disruptive solution. The platform is designed to unlock complete interoperability, as it offers:

- ☑ **The ability to control devices (luminaires) from other brands**
- ☑ **The ability to manage controllers and to integrate sensors from other brands**
- ☑ **The ability to connect with third-party devices and platforms**

Schröder EXEDRA enables a partner ecosystem approach to provide endless solutions to cities.

Be part of the 18%!

Today, **82% of smart city initiatives fail due to a lack of maturity and openness**. EXEDRA, the 4th generation of Schröder connected solutions, is your passport to join the club of the 18% of achievers.



At the top of
your game



When it comes to user experience, Schröder EXEDRA delivers the most intuitive and comprehensive City Management System.

☑ Fully configurable dashboard



Customise your working environment: add, move, resize and organise widgets for each and every stakeholder's personal dashboard.

☑ Integrated inventory and device management



Retrieve, create, edit or delete luminaires, cabinet controllers, meters, electric cables, sensors and more.

☑ Device status and real-time insight/control



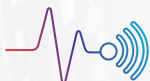
Stay connected to your network. Navigate on a map view to check key performance indicators and device statuses. And manage them when needed.

☑ Lighting schedules



Program your lighting. Create and edit your dimming profiles based on endless variables (calendar days, special occasions, season, etc.). Assign these rules to configurable groups of luminaires.

☑ Dynamic lighting



Maximise your benefits by associating sensors to groups of luminaires to trigger pre-defined lighting scenarios.

☑ Reports, alarms and data analytics



Anticipate and react in real-time. Configure warning messages, get useful insights using the reports. Take advantage of aggregated data to make informed decisions.

☑ Energy consumption management



Keep bills under control. Monitor, meter, compare. Schröder EXEDRA provides all the relevant features to help you improve energy efficiency.

☑ Ticketing system



Organise field operations through a fully integrated ticketing system that will help you optimise your asset management and maintenance.

☑ Automation



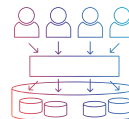
Take advantage of the Schröder EXEDRA automation centre to easily customise advanced sequences of automated actions based on the conditions and rules you have defined.

☑ User management



Distribute roles and rights to all stakeholders of projects according to their missions and responsibilities.

☑ Multi-tenant



Configure and manage different zones independently. Thanks to Schröder EXEDRA multi-tenant architecture, contractors, utilities or big cities are able to segregate areas.

☑ Application solution



Connect different types of hardware from various manufacturers to the EXEDRA UI. This applies to both light control and other applications: environmental monitoring, smart water, smart grid, smart parking, smart waste and more.



Simplicity is the
ultimate sophistication



📌 Auto-commissioning

Schröder EXEDRA is a **plug-and-play solution**. As a gateway-less system using the cellular network, an intelligent automated commissioning process recognises, verifies and retrieves the luminaire device data into the user interface.

📌 Auto-inventory

Schröder luminaire **data are retrieved automatically** and updated into the EXEDRA platform thanks to an RFID tag. For luminaires from other brands, asset data can also be injected in the platform via a CSV file.

📌 Dynamic lighting

The self-healing mesh between luminaire controllers enables **real-time adaptive lighting** to be configured directly via the user interface.

📌 Automation

Schröder EXEDRA integrates an automation engine. City managers can use this powerful tool to set custom routines and automated actions based on rules and conditions they define to **simplify operations and automate repetitive tasks**.

QUICK & EASY DEPLOYMENT





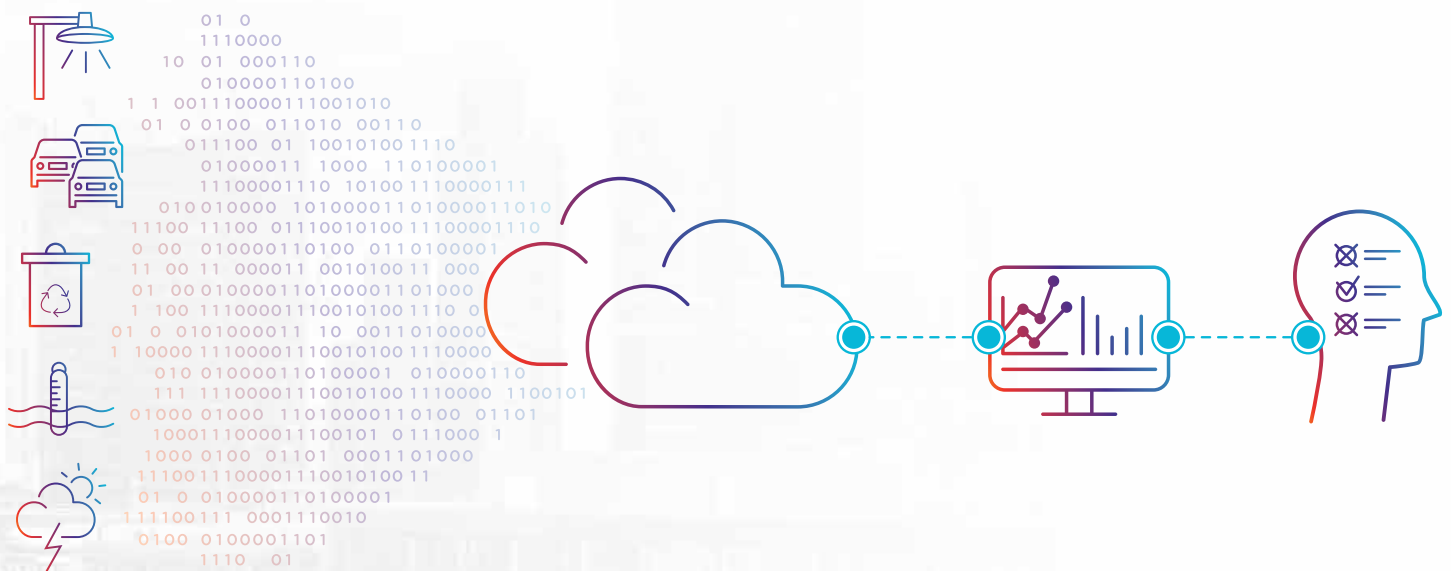
Great insights,
great decisions



If data were gold, it wouldn't mean you would have to become a miner. Schröder EXEDRA brings it to you with all the clarity you need to drive decisions and manage your city.

Schröder EXEDRA collects massive amounts of data from end devices, aggregating, analysing and intuitively displaying them to **help end-users take the right actions**. Schröder EXEDRA contributes to maintaining city infrastructures, to consistently provide safety, comfort and well-being to citizens.

Through advanced data analytics tools, presented both visually and in reports, Schröder EXEDRA is a **powerful tool for efficiency, rationalisation and decision making**. In the short term, it is about the direct financial and operational benefits. However long-term it is about great strategic decisions that will shape the future.



Benefits of data-driven decision making with Schröder EXEDRA



Reduced costs



Increased speed



Continuous improvement



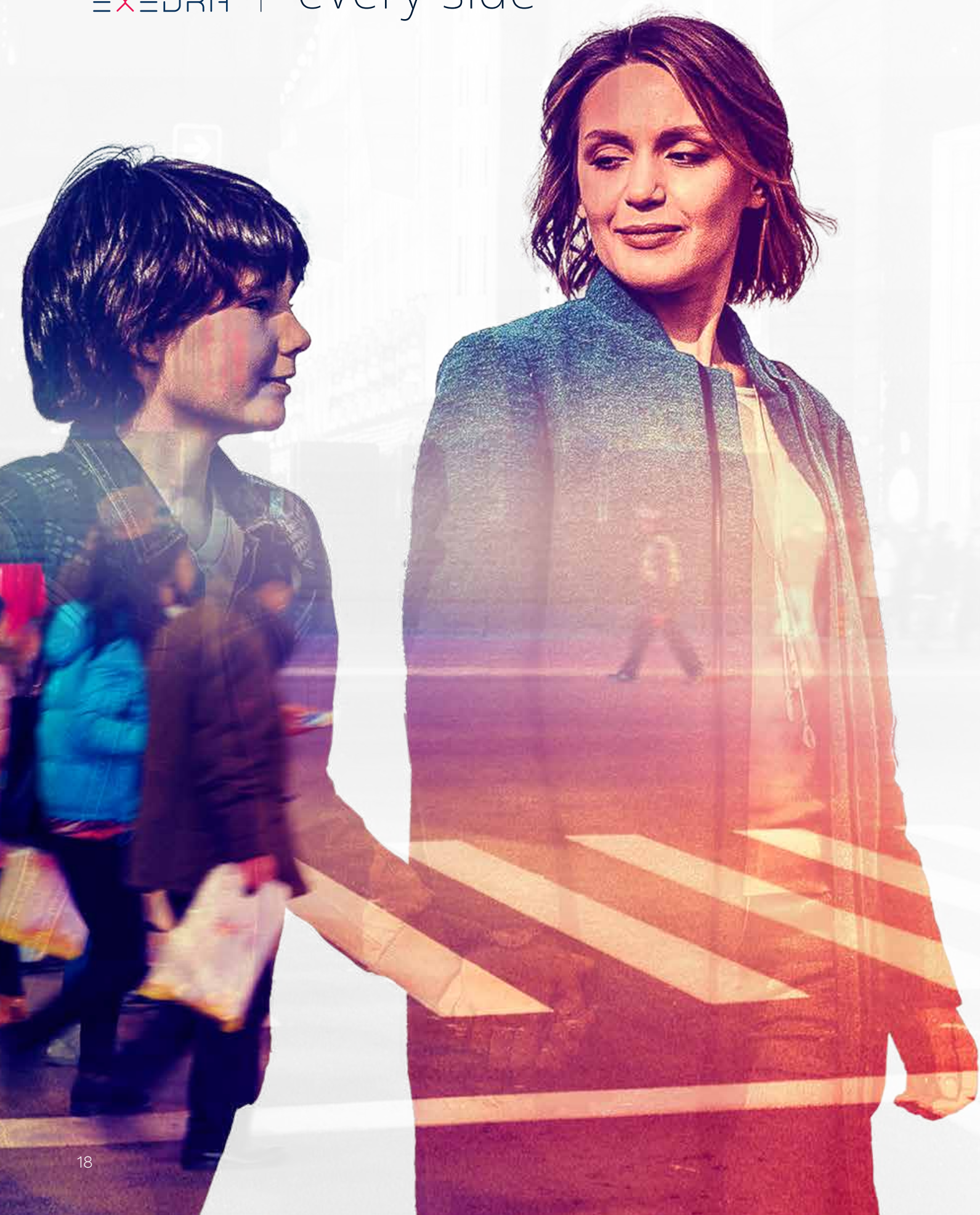
Collaborative decision-making



Better planning



Protected on
every side



Schröder EXEDRA provides state-of-the-art data security with encryption, hashing, tokenisation, and key management practices that protect data across the whole system and its associated services. Additionally, Schröder also implements tools to strengthen security further and meet international standards along with local customers' needs. You are safe with Schröder.

To address the security challenges, Schröder EXEDRA follows a multi-layered approach, where specific security measures are taken at device, communication and cloud levels. This security methodology provides **continuous analysis of security risk vectors and mitigation of threat** through security processes and mechanisms.

Schröder does not own your data but is responsible for it. Schröder undertakes all means to protect data from unauthorised access and

corruption throughout its lifecycle. Our data security strategy protects data across all platforms and services.

Schröder also implements tools to guarantee:

- ✓ **Data residency**
- ✓ **Data isolation**
- ✓ **Isolated identity**
- ✓ **Isolated access**
- ✓ **Isolated device management**
- ✓ **Isolated device metering**
- ✓ **Isolated performance analytics**

Schröder shares a mission with its customers to create cities people love to live in. This objective is embodied in an uncompromised approach through four pillars. Going all the way to achieve those four pillars has required investing in the development of smart solutions that go beyond lighting.

#whycompromise

Your character

Every city has a spirit, a soul which comes from its inhabitants, industries and ideas. Bespoke solutions flatter its unique identity and let urban streets tell their story. Schröder works with you to highlight your character.



Your community

Citizens need places and moments to take a deep breath and to refocus. Lunchtime yoga in the park, a stroll over the bridge after work, exploring the night market... The most spectacular cities come alive after dark, with special dates, events or moments. Schröder works with you to light your community.



CITIES PEOPLE LOVE TO LIVE IN

Your environment

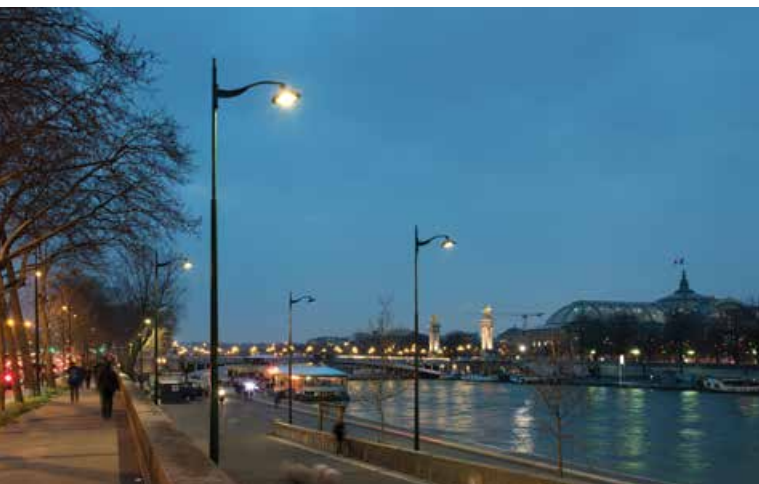
Flora, fauna and the stars in the night sky are all a vital part of the urban experience. Badly-targeted, intense, blue-toned lighting can disturb animals, insects, plants, and our sleep. We use our expertise to innovate and create sustaining, healthy conditions for us all. Schröder works with you to respect your environment.



Your future

For over a century, Schröder has been helping cities reduce their energy consumption and using durable materials. We're working with urban partners worldwide to create business models, systems and lighting solutions that ensure coming generations have bright horizons, too. Schröder works with you to secure your future.

Futureproofing the investment



Customer profile

Lighting manager wanting to connect the entire lighting scheme with a sustainable control solution.



Challenge

Connect remotely and take control of a lighting infrastructure built over years with disparate luminaires, controllers and CMS purchased from various providers.



Solution

Schröder EXEDRA reunifies the network thanks to its ability to control nodes plugged on Zhaga/NEMA sockets and luminaires from multiple manufacturers. With an API, EXEDRA can interact with third-party asset management systems to merge the whole scheme on a unique, modern, insightful and user-friendly platform.



Impact

Getting rid of a dead-end situation to start a new era with a technology-agnostic solution that secures the city's investment and cements freedom of choice for future assets.

Maximising the city branding



Customer profile

Local authorities eager to preserve their heritage and its attractiveness potential.



Challenge

Iconic places attract tourists, generate revenues for the local economy and contribute to the greatness of a city. But in the age of social media, a bad buzz can easily come from a photo of a neglected environment or sour posts about a disappointing urban experience. Keeping places in their best light is both a must and a challenge for a city.



Solution

Schröder EXEDRA not only provides real-time monitoring of connected urban assets such as luminaires, litter bins or public WiFi. Thanks to its automation centre, you can define conditional rules, set up alarms and automate ticketing to optimise on-site maintenance operations. All IoT devices using the same open standards for data and communication can seamlessly integrate the platform. And of course, in these iconic places, lighting can be adapted according to specific schedules to support special events.



Impact

Better than an expensive advertising campaign, happy visitors and tourists provide 100% free promotion of the city and its heritage jewels on social media, video services, blogs and other user-generated content and review platforms.



Creating **harmony** for the community



Customer profile

Local authorities looking for sustainable development of the community.



Challenge

Lovely squares and commercial streets attract residents and visitors to shops, bars and restaurants. People are keener to spend time outside at dusk. But an uncontrolled spread of nighttime activities can conflict with the residents' natural aspiration for quiet after bedtime.



Solution

Schröder EXEDRA empowers the lighting infrastructure to positively influence behaviour and to match the human body's natural cycles. When night falls and the squares and streets empty, the connected luminaires adapt the lighting level and colour temperature to decrease light disturbance for citizens living in that area, to adapt to their circadian rhythms, and thus ease the biological process of going to sleep. As all of this happens seamlessly, people are naturally encouraged to leave the area and go back home.



Impact

People live together in harmony: local economic activities can develop on good terms with local residents. Good practices reduce noise, crime, vandalism and other typical urban disturbances.



Maximising both savings and safety



Customer profile

Councillors for finance and security in a village.



Challenge

Keeping the budget under control while providing the highest safety to citizens in places with random night activity.



Solution

Schröder EXEDRA enables the creation of lighting scenarios including the most efficient dimming profiles and light-on-demand features based on sensor detection. The selection of sensor(s) to which the luminaires react and the associated configuration parameters (i.e. trigger activation delay, hold time) are easily assigned to luminaire controllers. The detection events generate useful data for decision-making regarding future investments and priorities.

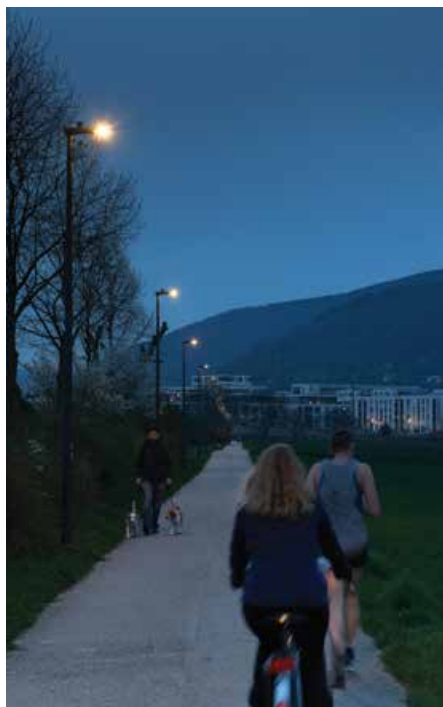


Impact

The savings on lighting expenditures free up budget for other areas. The village also minimises its carbon footprint. With lighting levels turned up upon detection, citizens enjoy a feeling of safety and well-being when they use critical areas such as pedestrian crossings, alleys or isolated bike paths.



Protecting wildlife



Customer profile

Local authorities caring for protected natural sites and fauna on their territory.



Challenge

Providing the necessary lighting to citizens while minimising disturbance for light-sensitive species and insects.



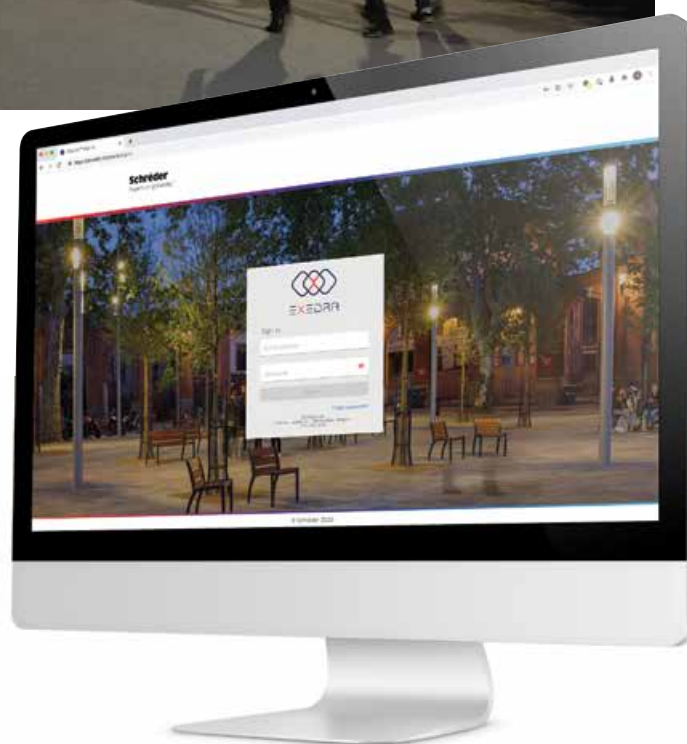
Solution

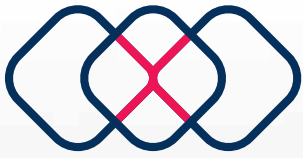
Schröder EXEDRA provides a flexible control solution that enables the creation of various clusters of luminaires programmed with specific scenarios for dimming and colour temperature changes. On installation, the system imports all information related to the luminaire configurations chosen after a careful lighting study. This asset inventory feature enables the implementation of solutions optimised from a design and control point of view.



Impact

The neighbourhood and the natural ecosystem coexist more harmoniously and create a sustainable community.





EXEDRA

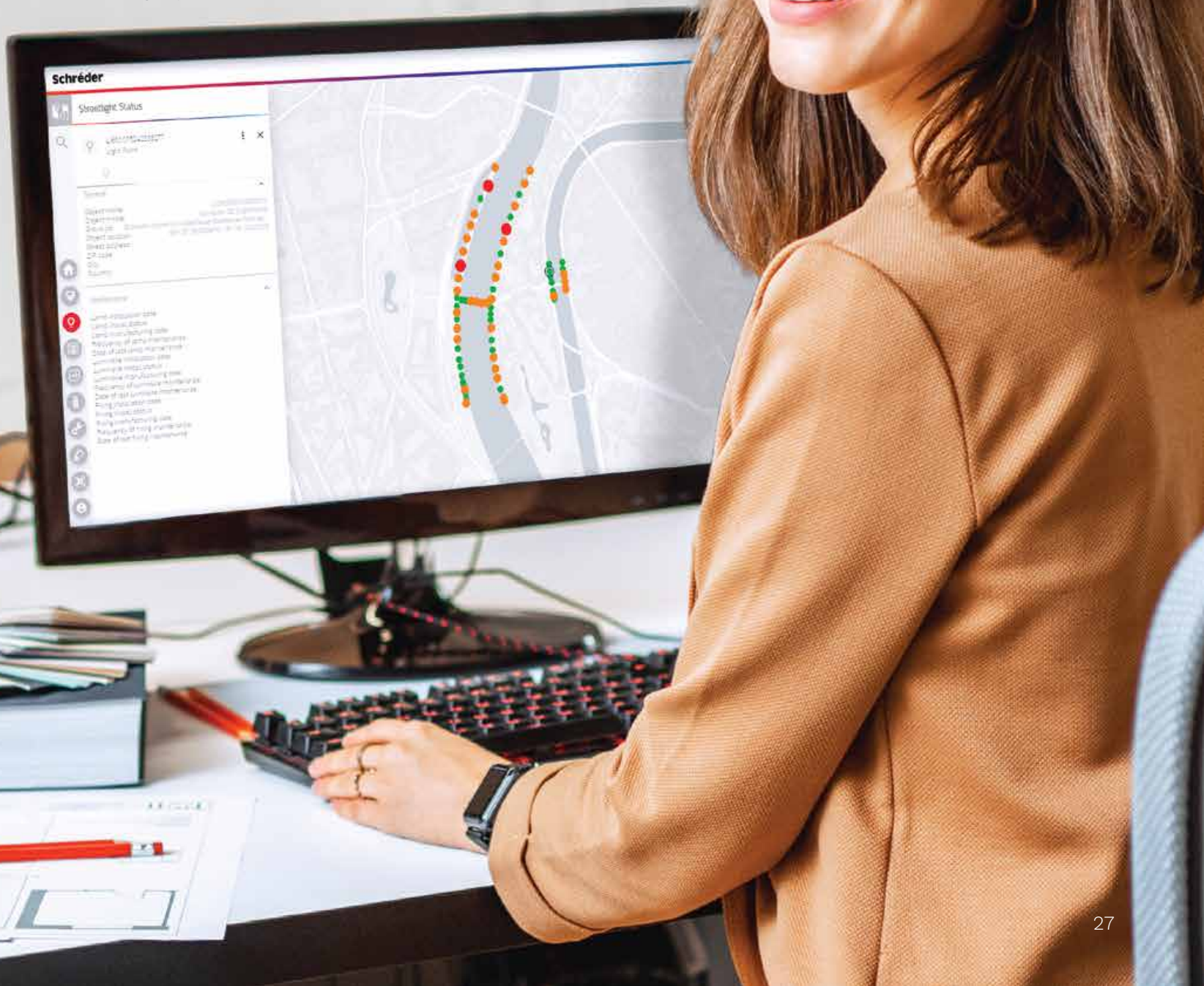
The X factor

We establish a trust-based collaboration with our customers and build open and durable relationships. The name EXEDRA embodies Schröder's noteworthy unique customer-centric approach.

There are plenty of control systems on the market, but Schröder EXEDRA has an X factor with our customers at the centre of our approach.

Schröder EXEDRA aims to leave you to choose what you put at the core of the system. Your needs are specific and, in that sense, Schröder EXEDRA opens up an infinite number of possibilities.

Schröder EXEDRA is about customer eXperience and eXceeding eXpectations!





Schröder

Experts in lightability™



www.schröder.com