

NB-IoT

LTE-M

GSM

inteli<sup>®</sup>  
LIGHT

STREET LIGHTING  
REMOTE MANAGEMENT



AWARENESS, CONTROL  
& OPTIMIZATION



ENERGY SAVINGS &  
IMPROVED SUSTAINABILITY



COMPATIBILITY &  
INTEROPERABILITY



CARRIER GRADE RELIABILITY  
AND WIDE AREA COVERAGE

*With more communication technologies being researched and implemented every day, inteliLIGHT® faces a new challenge: adapting permanently in order to remain as interoperable and flexible as possible. As we believe that carrier grade networks play an important role in secured and reliable city management communications, we have now integrated NB-IoT/LTE-M with our street lighting control solution.*

*Lorand Mozes  
CEO, Flashnet SRL*

**inteliLIGHT®** is a reliable remote street lighting management system that ensures that the right amount of light is provided where and when needed. By upgrading your existing street lighting infrastructure, you not only save money, but also transform the existing distribution level network into an intelligent infrastructure for the future.

**Narrow-Band IoT** (NB-IoT) is a narrowband RF communication technology specially designed for the Internet of Things (IoT). It connects devices more simply and efficiently on already established mobile networks, and handles small amounts of infrequent 2-way data, securely and reliably. The special focus of this standard is on very low power consumption, excellent penetration coverage and lower component costs, deployed in GSM and LTE regulated frequencies.

**LTE-M** is a low power wide area (LPWA) technology standard published by 3GPP. It supports IoT through lower device complexity and extended coverage, while allowing the reuse of the LTE installed base. Supported by all major mobile equipment, chipset and module manufacturers, LTE-M networks will co-exist with 2G, 3G, and 4G mobile networks and benefit from all the security and privacy features of carrier-grade networks.



### LOWER INVESTMENT

inteliLIGHT® NB-IoT/LTE-M controllers do not require any investment in communications infrastructure, nor the replacement of the current street lighting system. It uses existing GSM operator coverage and adapts to your existing luminaries, offering ON/OFF control for any streetlight or device up to 400W and dimming functions through 0-10 or DALI interfaces. In addition, inteliLIGHT® is perfectly tailored for ESCO or other innovative financing solutions and starts functioning right after the first controller is installed.



### HIGHER FLEXIBILITY

inteliLIGHT® is built to suit your particular needs. It uses an array of sensors and add-ons to accommodate your requirements and will integrate seamlessly along the existing electricity grid. It's not necessary to install it over the entire city at once, nor to have any continuity between the managed street lighting segments. The controllers can be efficiently installed even over unstructured electrical grids and are not influenced by difficult terrain. Your city is unique and we are ready to accept your challenge.



### FUTURE ORIENTED

With inteliLIGHT®, it is now easier than ever to integrate hardware and software from different suppliers, using different equipment and communication technologies into the same street lighting CMS (Central Management System). Also, it creates the possibility to integrate unrelated sensors and systems, leading to unique central management of combined utilities and smart city synergies.



### FASTER INSTALLATION

inteliLIGHT® is a reliable plug-and-play turnkey solution, supported by a proven simple 3-steps implementation process. The technical and compatibility assessment, system tailoring and pilot project implementation will be fluent and, after you validate the system's outcome, the actual deployment will be a smooth and user friendly process. The system becomes functional within days from equipment delivery and you can start controlling the connected lamps immediately.





## INTELLIGENT STREET LIGHTING

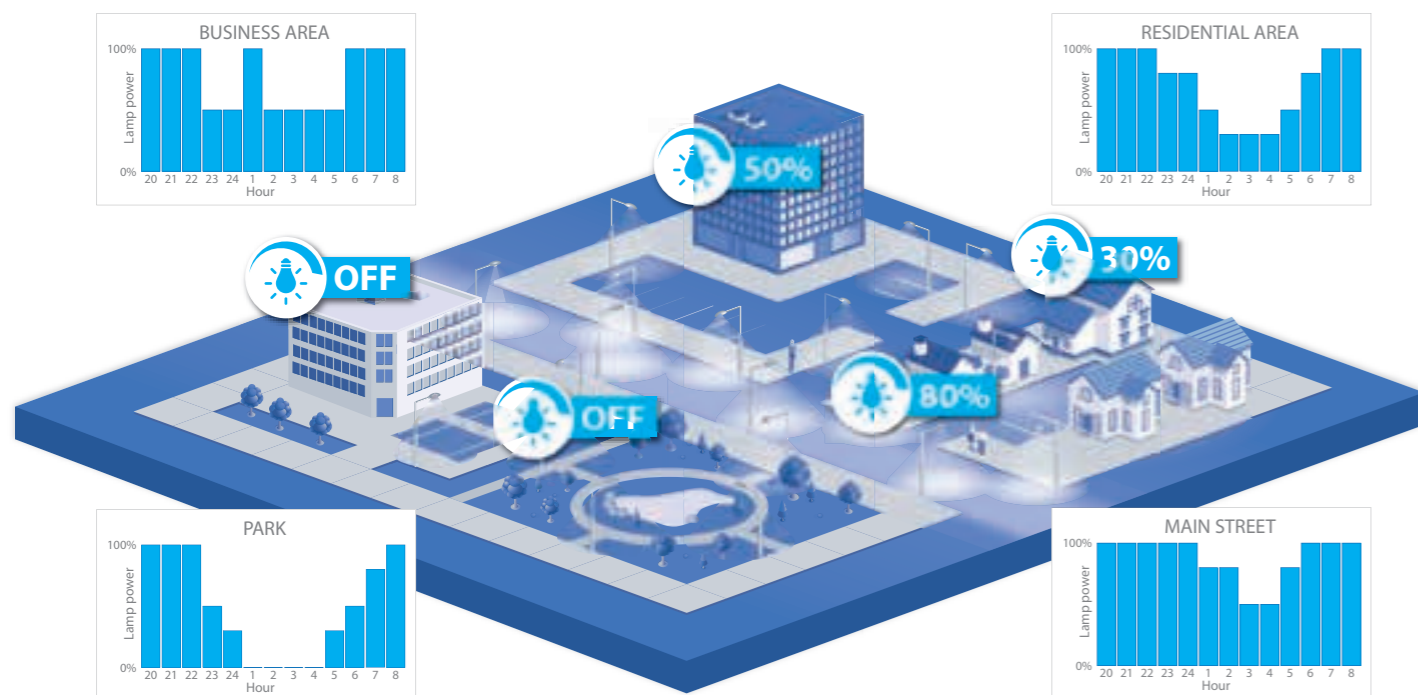
*Every evening, the street lights provide better traffic conditions, a safer pedestrian environment and can represent a great improvement to the city's architectural, touristic and commercial output.*





## INTELLIGENT STREET LIGHTING

inteliLIGHT® is a street lighting remote management system that enables automatic ON/OFF and dimming control of every street lighting fixture in the city. It provides in-depth grid awareness and real-time feedback of any change occurring along the grid. Through dimming and smart scheduling, the system can reduce the energy costs with up to 80% (with LED lamps). Real-time malfunction monitoring and maintenance optimization tools increase lighting service satisfaction and can further cut operational costs with up to 42%.



### GRID AWARENESS

inteliLIGHT® provides in-depth grid awareness and real-time feedback of any change occurring along the grid, together with detailed electrical parameters: Wh, VARh, V, W, A, VAR, PF and frequency. Raw data is transformed into actionable information through a system of advanced reports and automatic notifications.



### SMART SCHEDULING

Street lighting fixtures operate autonomously using smart scheduling algorithms based on astronomical calendar, photoelectric or motion detectors. Furthermore, in order to cover specific events or lighting requirements, the system supports time-limited scheduled overrides of the initial lighting program and even real-time operator commands.



### ON/OFF REMOTE CONTROL

Any kind of streetlight or connected device up to 400W can be controlled using inteliLIGHT®: lamps with electronic or electromagnetic ballasts, architectural lighting fixtures and even other unrelated devices. The software allows individual or grouped control, manually or based on smart schedules.



### DIMMING THE STREETLIGHTS

inteliLIGHT® controllers allow dimming for any LED streetlight using 0-10 or DALI control interface. Whenever pedestrian traffic decreases, dimming the lights is a way to reduce energy consumption and increase lamp lifetime. You will not only save money, but also reduce light pollution and CO<sub>2</sub> emissions.



### REPORTING & MAINTENANCE SCHEDULING

The inteliLIGHT® servers receive, prioritize and compile information from all over the lighting grid. inteliLIGHT® StreetLight Control Software offers advanced analytic tools, failure reporting, customizable maintenance planning and spare parts management tools to improve lighting uptime and street lighting overall satisfaction.



### SECURED AND RELIABLE COMMUNICATIONS

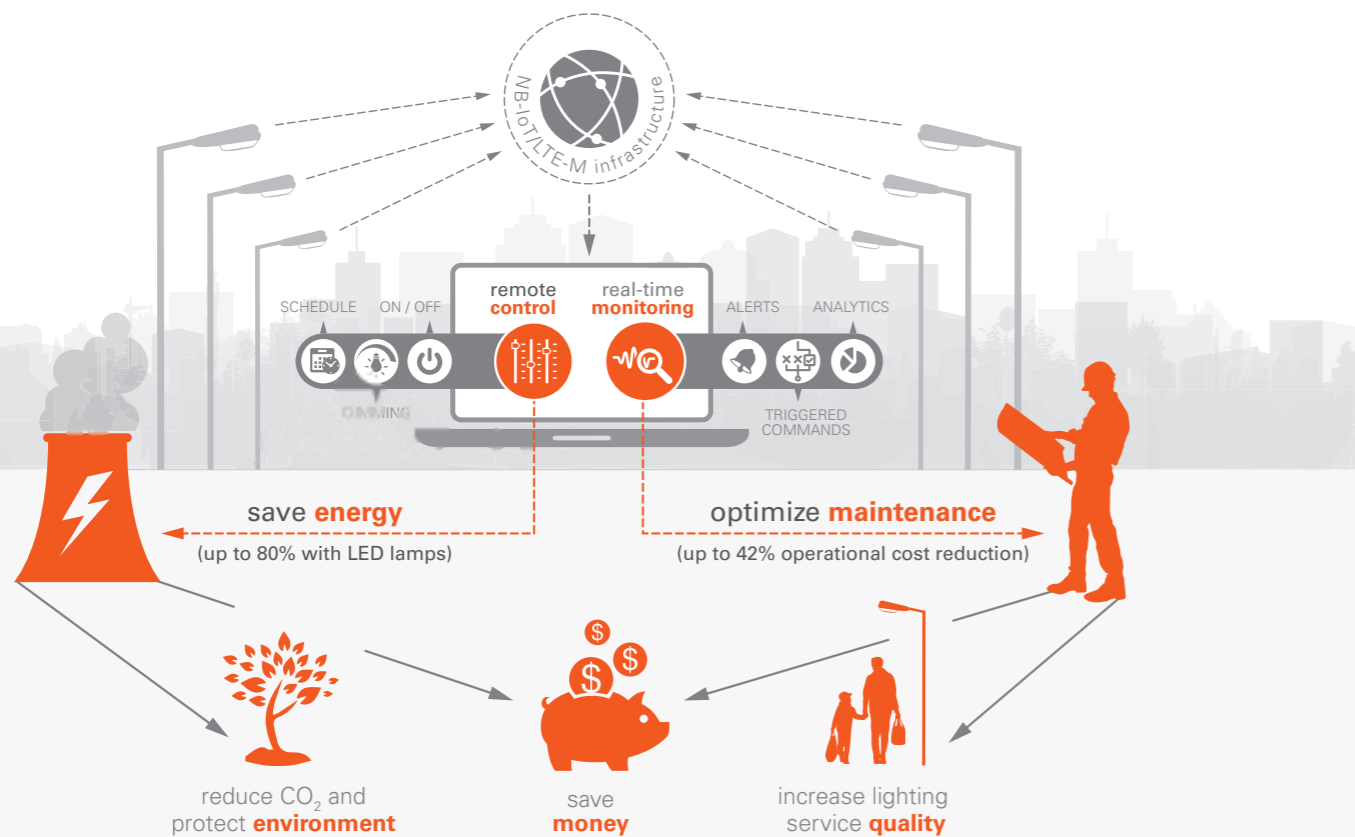
NB-IoT/LTE-M uses GSM operator coverage, allowing secured and reliable communications virtually anywhere and without any limitations concerning the number of devices. The entire system is completely scalable and the controllers can be connected in minutes after installation.





## STREET LIGHTING CONTROL BENEFITS

Street lighting control brings significant benefits to any city and community: from unprecedented awareness, control and efficiency to sustainability and smart integrations. Furthermore, inteliLIGHT® is a reliable open protocol solution that adds flexibility and an interoperability layer to the standard category benefits.



### VENDOR AGNOSTIC AND INTEROPERABLE

Using NB-IoT/LTE-M allows unprecedented fast installation. Also, the system allows synergistic integration with other city systems through both northbound and southbound API connectivity.



### SAVES MONEY FOR YOUR COMMUNITY

inteliLIGHT® can save money for your city. Energy costs are immediately reduced by up to 80% (with LED lamps) through intelligent ON/OFF switching, targeted progressive dimming and efficient energy management. Overall operational costs come down by up to 42% through detailed maintenance and preventive grid interventions based on system generated reports.



### INCREASES LIGHTING SERVICE QUALITY

With the street lighting system up and running at any time, inteliLIGHT® helps to avoid the risk of accidents due to lighting system malfunction. Most of the lighting problems are detected and addressed before the citizens even get the chance to notice them.



### MORE SUSTAINABLE CITIES AND CLEANER ENVIRONMENT

By reducing the energy consumption and therefore the amount of released CO<sub>2</sub>, inteliLIGHT® reduces the city's environmental impact and also helps meeting the increasingly demanding environmental norms. Furthermore, the light pollution affecting migrating birds and wildlife in general is significantly decreased.



### IMPROVES MAINTENANCE EFFICIENCY

inteliLIGHT® StreetLight Control helps anticipating and avoiding faults through real time 24/7 grid monitoring. Furthermore, it provides accurate malfunction information to the technical department (detailed problem information, exact location) and helps eliminating street lighting network nightly 'blind' inspection.





## SYSTEM ARCHITECTURE

*inteliLIGHT® is a reliable, fail-proof, integrated street lighting remote management system that installs within days and needs minimal investments.*





## inteliLIGHT® NB-IoT/LTE-M SYSTEM ARCHITECTURE

Our hardware is more adaptable and smarter than ever. inteliLIGHT® controllers use NB-IoT/LTE-M RF technology to connect devices more simply and efficiently on already established mobile networks, handling securely and reliably small amounts of infrequent 2-way data.

inteliLIGHT® StreetLight Control software completes the hardware capabilities, offering full scalability for a virtually unlimited number of lamps and integrating all the processes and correlative functions needed for a state-of-the-art lighting management system.



### LAMP LEVEL

inteliLIGHT® controllers enable individual remote management of streetlight lamps with electronic ballast up to 400W. Besides basic ON/OFF switching and dimming functions, the controllers are capable of autonomous operation based on predefined schedules and even of adaptive lighting, if provided with optional sensors: light, motion etc. In addition, the detailed electrical parameters monitoring: power factor, active/ reactive/ apparent power, voltage, current, frequency, the controller uses advanced synchronization mechanisms to ensure an effective error reporting system.



### LIGHTING PANEL CONTROL AND MONITORING UNIT

Provides autonomous lighting panel operation and carries out measurements and analysis of different parameters in the street lighting grid (power factor, active/reactive/apparent power, voltage, current, frequency etc.) and periodically reports the load curves and energy consumption related information. All errors and malfunctions are reported in real time.



### NB-IoT/LTE-M RF COMMUNICATION

The communication between lamp controllers, monitoring units and the control software is performed via the NB-IoT/LTE-M technology. Specially designed for the Internet of Things, NB-IoT/LTE-M focuses on very low power consumption, excellent penetration coverage and lower component costs, deployed in GSM and LTE regulated frequencies. It allows very fast deployment of streetlight control systems, offering extended coverage and without actual limitations to the number of connected devices.



### SOFTWARE CONTROL LEVEL

inteliLIGHT® StreetLighting Control software allows the remote control of the street lighting system, 24/7 grid monitoring, maintenance scheduling and spare parts management. Compatible sensors can be integrated into the application, making it easier to analyze data. Furthermore, by using open data features, it can initiate synergistic interactions for the public interest.





## inteliLIGHT® NB-IoT/LTE-M COMPATIBLE LUMINAIRE CONTROLLERS

- › Enables **individual remote management** of streetlight lamps with electronic driver up to 400W (ON/ OFF/ Dimming).
- › **Autonomous operation** based on predefined schedules, light level sensor and adaptive lighting.
- › **Dedicated high-security memory** for encryption keys storage.
- › Wide range of **electrical parameters monitoring**: Wh, VARh, V, W, A, VAR, PF and frequency.
- › **Advanced data synchronization** and notification mechanism.
- › **Battery operated RTC**, protected against unforeseen grid faults.
- › **Over The Air (OTA)** firmware update.
- › **External infrared interface** for security keys transfer and local configuration.
- › **Digital input** for sensors and smart applications.
- › Designed **lifetime: 10+** years.
- › **Easy to install.**



**FRE-220-NEMA**  
› designed for 7pin NEMA socket street lamps (ANSI C136.41)  
› 76 x 96 mm (Ø x h)  
› IP66 rating



**FRE-24-ZHAGA**  
› designed for Zhaga (book 18) socket street lamps  
› 80 x 35 mm (Ø x h)  
› IP66 rating



**FRE-220-P INSIDE POLE**  
› designed to be installed directly into the lighting pole  
› 126 x 57 x 42 mm (L x W x h)  
› IP66 rating



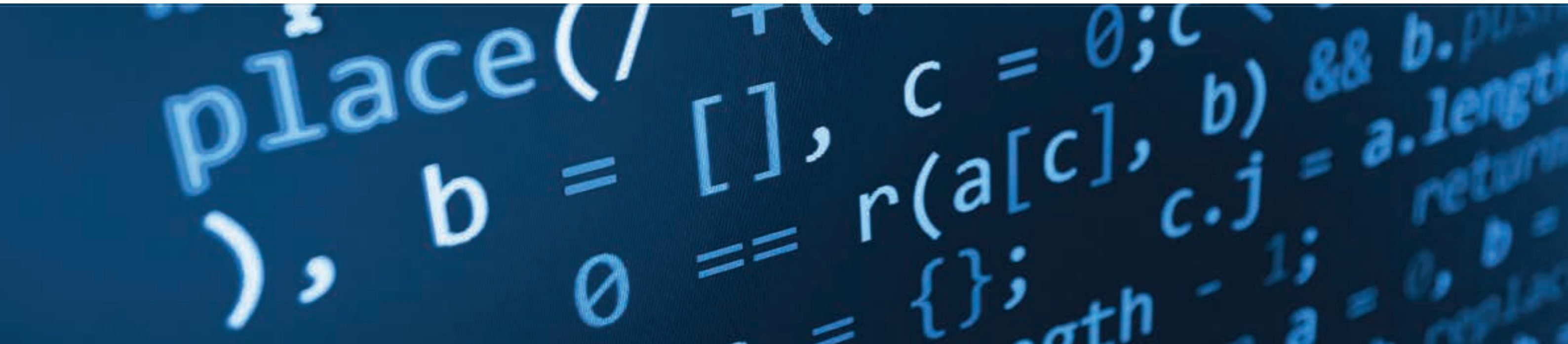
**FRE-220-M EMBEDDED**  
› designed to help manufacturers offer LoRaWAN™-ready smart lighting fixtures  
› 110 x 48 x 36 mm (L x W x h)  
› IP42 rating

## LIGHTING PANEL CONTROL & MONITORING UNIT

- › **Autonomous operation** based on predefined astronomical calendar and/or external light level sensor (digital INPUT).
- › **Remote real-time ON/OFF** control.
- › **Remote monitoring** of street lighting grid's parameters: per phase voltage, current, frequency, power factor, active/ reactive/ apparent power, daily active/ reactive energy consumption.
- › **Real-time reporting** of any malfunctions, errors or deviations from the set thresholds: under/over power, under/over voltage, phase failure.
- › **LCD** for displaying electrical parameters and device status.
- › **GPS** for exact location and time.
- › Maintenance switch for **local manual override** (AUTO/ON/OFF).
- › **Inputs**: 2 x Digital input.
- › **Output**: 1 x Dry contact relay output (230V, max 12A).
- › **Dimensions**: 138 x 90 x 47 mm (L x W x h).
- › **IP42** (optional IP67 external housing).



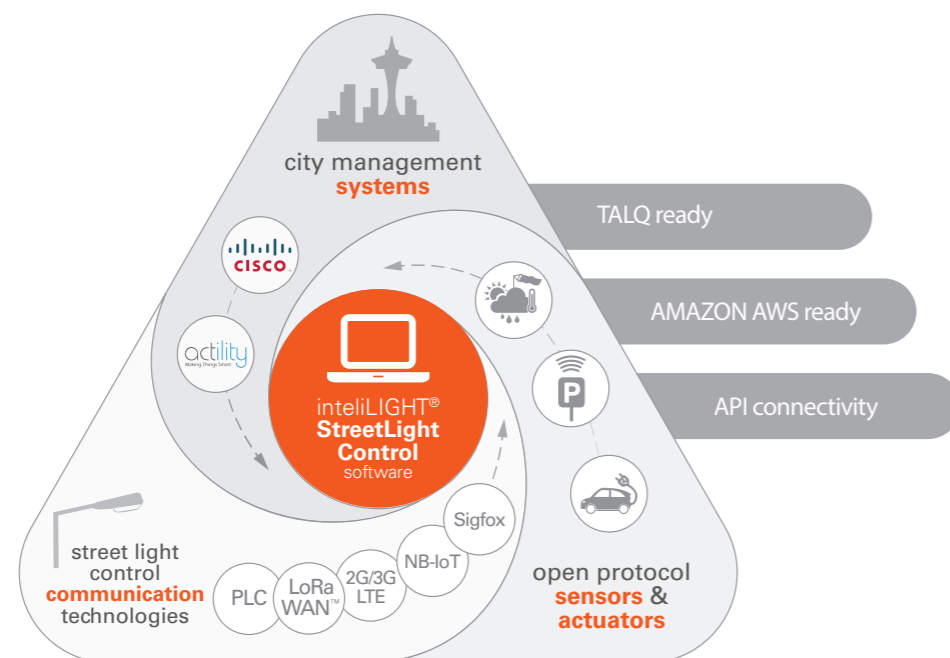




## inteliLIGHT® StreetLight Control SOFTWARE

Our experience with street lighting installations worldwide has taught us a lot about what we can ask from remote management software. We have identified the necessary software algorithms, processes and correlative functions needed for an integrated, state-of-the-art street lighting management software.

The software integrates perfectly with inteliLIGHT® controllers and communication devices and is also compatible with any other open-protocol hardware solution available on the market (third party end devices using PLC, LoRaWAN™ or GSM/GPRS).



inteliLIGHT® StreetLight Control software **integration** versatility



### SYNERGY

The inteliLIGHT® multifunctional software platform is designed to be easily integrated with multiple city systems and applications. It can function over different communication technologies, allows third-party hardware devices and offers dedicated APIs to connect to existing integrated city management platforms.



### SAFETY

inteliLIGHT® is using the latest data encryption technology to ensure that information transfer and system operation cannot be affected by outside intervention. Safety is of most importance to us and we have researching and continuously upgrading the security of our software solution, eliminating all vulnerabilities.



### AVAILABILITY

inteliLIGHT® StreetLight Control software uses state of the art, stable and hassle-free cloud services. You can access inteliLIGHT® from any computer or mobile device, while having the guarantee that all the backup and security issues are being handled by our specialists. And, depending on your preferences, a full license acquisition instead of a SAAS license is also available.



### DATA WEALTH

Our software gathers large amount of data in high quality reports helping you to better analyze the field situation, generate more accurate management actions and thus improving your lighting system's performance.



### CUSTOMIZATION

Localization, additional features and reports and other particular requests can be integrated with inteliLIGHT® StreetLight Control. Your city is unique and we can customize the software to fully adapt to your local needs.



### FLEXIBILITY

Our software solution is designed to work with a multitude of technical solutions, regardless of the lamp or controller supplier and is open to future upgrades and extensions.





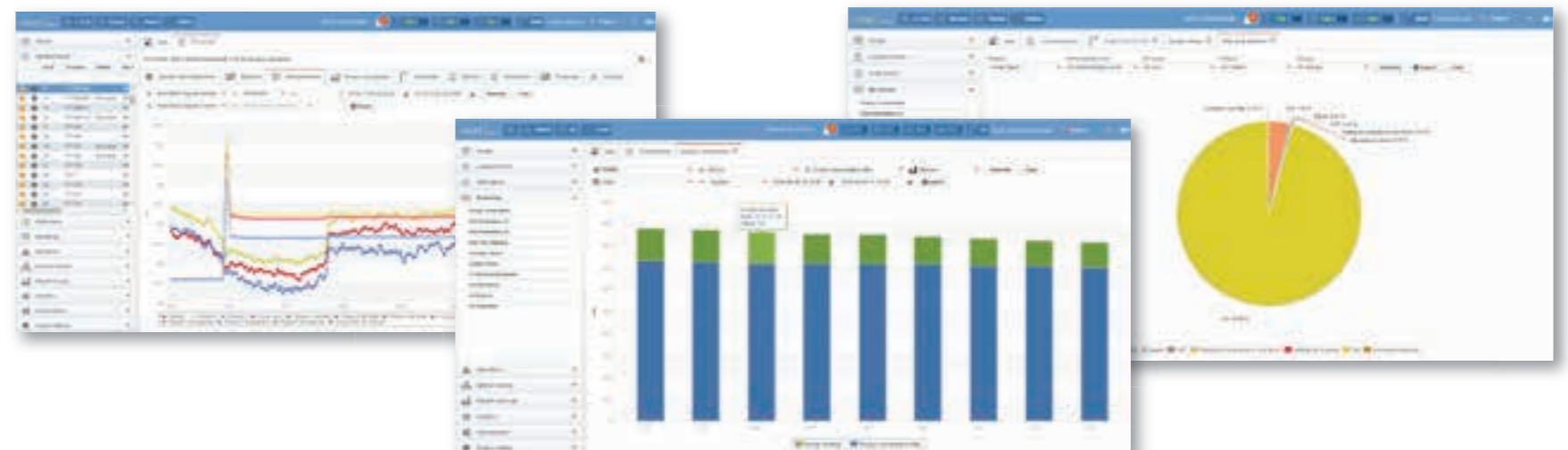
## inteliLIGHT® StreetLight Control FUNCTIONALITIES

Server or cloud based, with an advanced user management system, inteliLIGHT® StreetLight Control is designed to efficiently manage street lighting projects regardless of their size, up to a virtually unlimited number of lamp controllers in large urban agglomerations and even geographically unconnected metropolises.

Highly interactive and user friendly, inteliLIGHT® StreetLight Control provides powerful management and reporting tools: detailed lamp parameters, real time error reporting and advanced maintenance scheduling tools. In addition, grouping, filtering and updating can be performed through the bulk operations interface, making it easier to manage large number of lamps, groups of lamps, users or scheduled actions.

The software application is capable of managing different communication technologies (NB-IoT, LTE-M, , LoRa™, PLC, GSM/GPRS), being able to integrate street lighting control hardware solutions from different suppliers. Furthermore, the system can connect and control other open protocol sensors and actuators, thus transforming inteliLIGHT® infrastructure into a SMART CITY platform.

- › **SAAS** or one-time license solution
- › Stable, secure and **interoperable**
- › **Automatic** street lighting operation (ON/OFF and dimming control)
- › **Advanced scheduling** based on astronomical calendar or light/motion sensors
- › Predefined exceptions to the lighting schedule and **manual override**
- › Lamp and **grid monitoring**, real-time alerts, malfunctions management and triggered commands
- › Unlimited numbers of lamp layers and lamp grouping possibilities, **advanced filtering** and **bulk updating** actions
- › Smartphone **application support** for installation and commissioning
- › **Flexible map visualisation**, public or private map provider integration: ESRI GIS, Google maps, Open Streetmaps etc.
- › **Advanced user management**: privilege, area allocation and system management (including independent sub-systems)
- › **Advanced data analytics**, reporting tools and performance graphs, featuring detailed filtering capabilities (lamp runtime reports, energy savings reports, luminary status reports, etc.)
- › **Vendor agnostic**, compatible with different lamps and lamp controllers
- › **API**, available for open data integrations
- › **Multi-language** interface



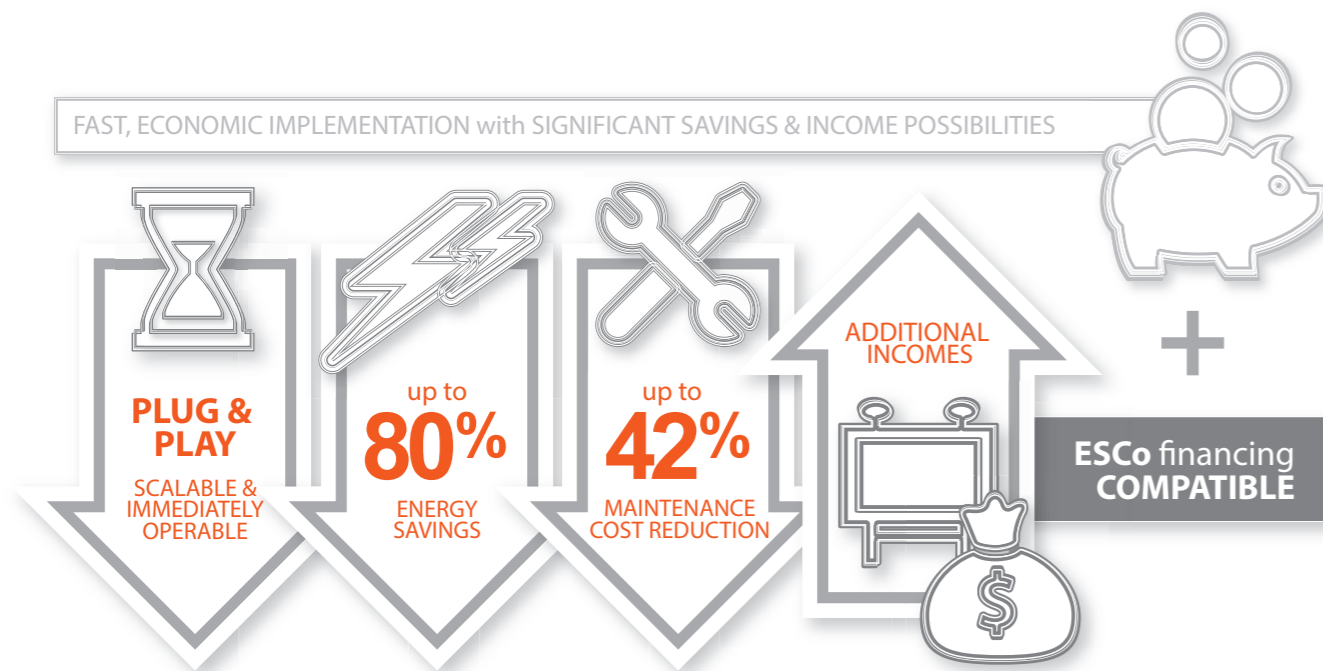




## FINANCIAL & BUSINESS CASE

We will help you build a solid business case to demonstrate how your city will benefit from installing inteliLIGHT®, both on short and long term. Almost immediate energy savings, easier maintenance, the possibility to implement smart services and overall increasing the quality of your lighting services will convince any stakeholders of the project.

In addition, we can assist you in finding the right financing solution. As we implemented several projects worldwide, we can present you with financing ideas that worked for inteliLIGHT® before, so you can choose the one that suits you best. And besides classic options, inteliLIGHT® is also perfectly tailored for ESCO innovative financing methods.



### IMPLEMENTATION

To our knowledge, inteliLIGHT® is the most economical lamp-level street lighting remote management solution available on the market as it is easy to implement, needs no additional investments to prepare the deployment and starts saving money right after the first lamp controller is installed.



### MAINTENANCE

inteliLIGHT® cuts maintenance costs and increases the overall quality of the street lighting service. You can save up to 42% of operational costs and up to 80% energy costs through this reliable, efficient and proactive remote control system of every street lighting fixture in your city.



### ADDITIONAL INCOMES

The inteliLIGHT® platform not only saves you money, but it can become an income generator. Besides special applications (billboards, EV charging, sensor readings and many more), you increase the safety and happiness of the inhabitants, improve the touristic output and the overall business environment of your city.



### FINANCING & BUSSINES CASE

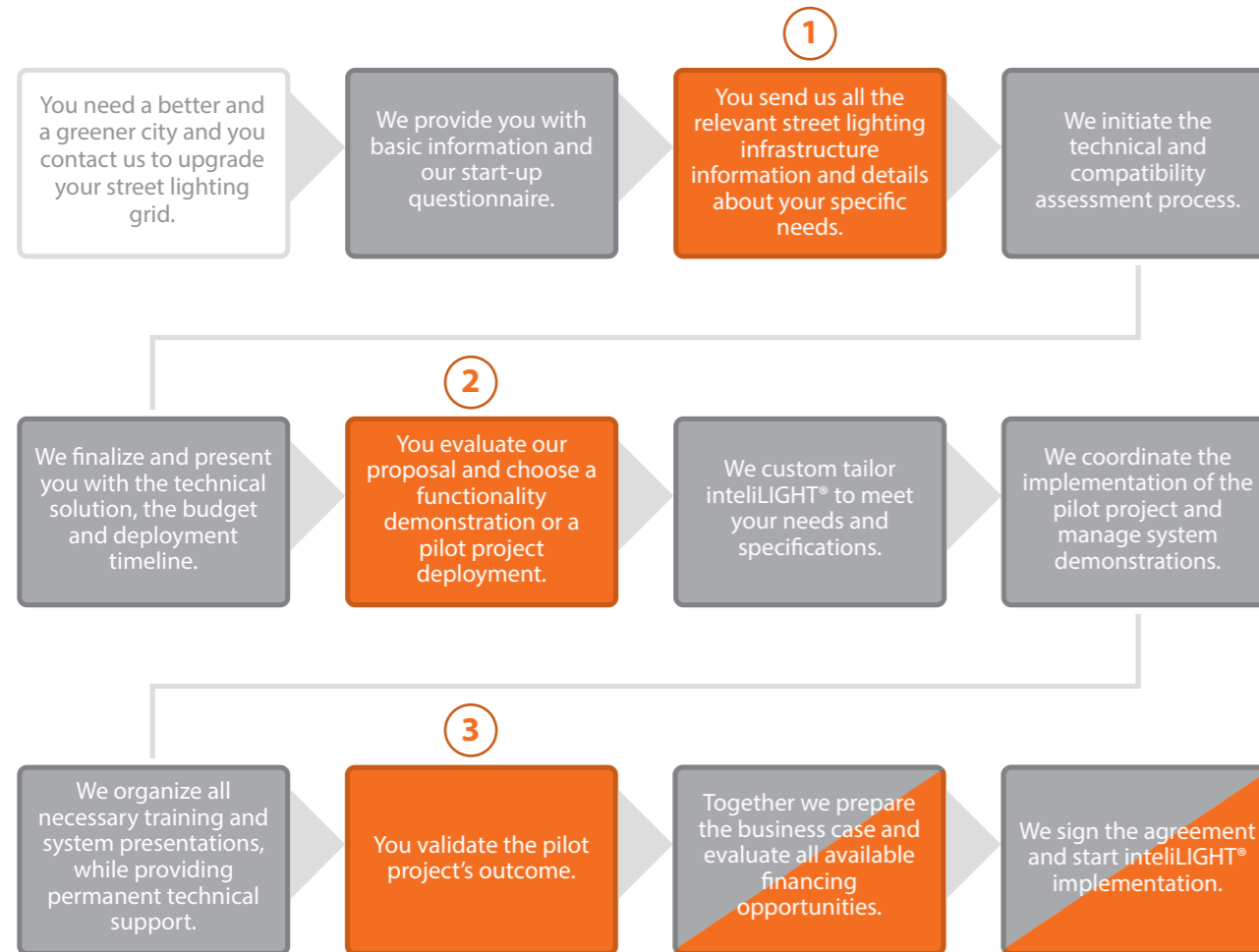
The business case will prove that inteliLIGHT®, through its energy savings and management improvements, is a green, future proof and sustainable solution. Also, inteliLIGHT® is perfectly tailored for ESCO or other innovative financing methods.



## PROJECT STEPS

inteliLIGHT® is a reliable plug-and-play turnkey solution, supported by a proven 3-steps implementation process. It doesn't mean that implementing inteliLIGHT® is simple, but we will be doing most of the work. All you have to do is colored in orange below, leave the rest to us!

Legend: What you need to do What we will do



USE THE QR CODE  
TO CALCULATE THE STREET LIGHTING  
SAVINGS FOR YOUR CITY



or access [www.inteliLIGHT.eu](http://www.inteliLIGHT.eu)





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