

LoRaWAN™ compliant

inteli[®]
LIGHT



STREET LIGHTING REMOTE MANAGEMENT

& SMART CITY IoT PLATFORM



AWARENESS, CONTROL
& OPTIMIZATION



ENERGY SAVINGS &
IMPROVED SUSTAINABILITY



COMPATIBILITY &
INTEROPERABILITY



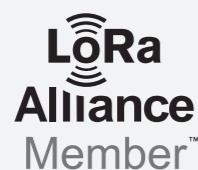
COST EFFICIENT &
FASTER INSTALLATION

Adapting inteliLIGHT® for LoRaWAN™ has challenged both our imagination and engineering capabilities. We needed to change our entire streetlight control paradigm in order to build the inteliLIGHT® LoRaWAN™ compatible controller and I believe it was worth it: to our knowledge, inteliLIGHT® is now the most affordable outdoor lighting management system on the market, scalable, easy to integrate with smart city systems and with an incredibly fast installation process.

*Lorand Mozes
CEO, Flashnet SRL*



14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il



FLASHNET is a proud sponsor member of LoRa Alliance™ since 2015, actively involved in the standardisation and certification process. We are actively promoting the LoRaWAN™ protocol as the leading open global standard for secure, carrier-grade IoT LPWA connectivity.

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.

LoRa™ is a long range, low power radio frequency communication technology that brings the Internet of Things concept a step closer to large scale adoption in terms of technical capabilities and cost effectiveness. Its outstanding features: low power, long range, high immunity and spread spectrum are surpassed only by the ease of interoperability and the careful design of its security features.

LoRaWAN™ is a Low Power Wide Area Network (LPWAN) specification. LoRaWAN™ targets key requirements of Internet of Things such as secure bi-directional communication, mobility and localization services. It provides seamless interoperability among smart things without the need of complex local installations and gives back the freedom to the user, developer and businesses, enabling the rollout of Internet of Things.



LOWER INVESTMENT

inteliLIGHT® does not require any changes to the current street lighting system, nor any civil works. It 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®'s LoRaWAN™ compatible solution 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. LoRaWAN™ compatible controllers can be efficiently installed regardless of the power supply configuration and are not influenced by difficult terrain. Your city is unique and we are ready to accept your challenge.



FUTURE ORIENTED

By using LoRaWAN™, inteliLIGHT® enables full interoperability between different network providers and equipment manufacturers. 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.



14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352

Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il

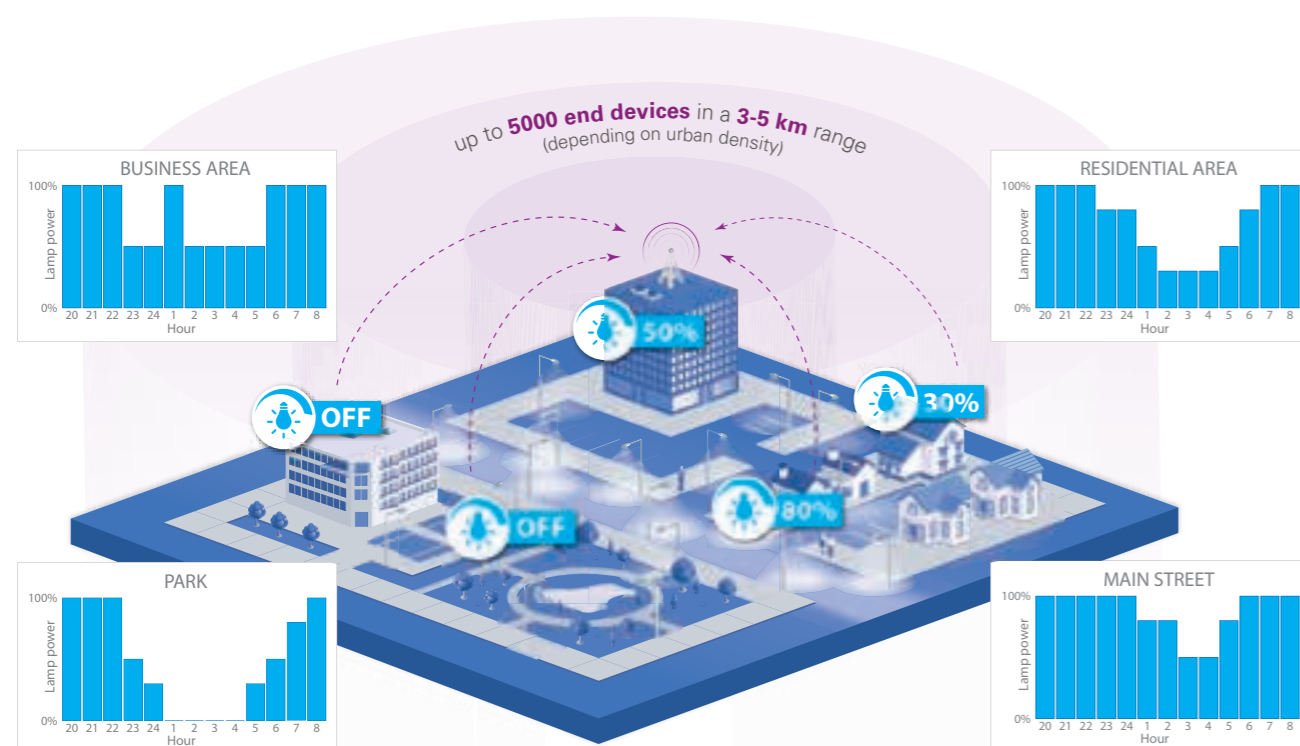
INTELLIGENT STREET LIGHTING

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 astrological 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 time-based traffic restriction barriers. The software allows individual or grouped control, manually or based on smart schedules.



DIMMING THE STREETLIGHTS

inteliLIGHT® LoRaWAN™ compatible 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 CO₂ 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.



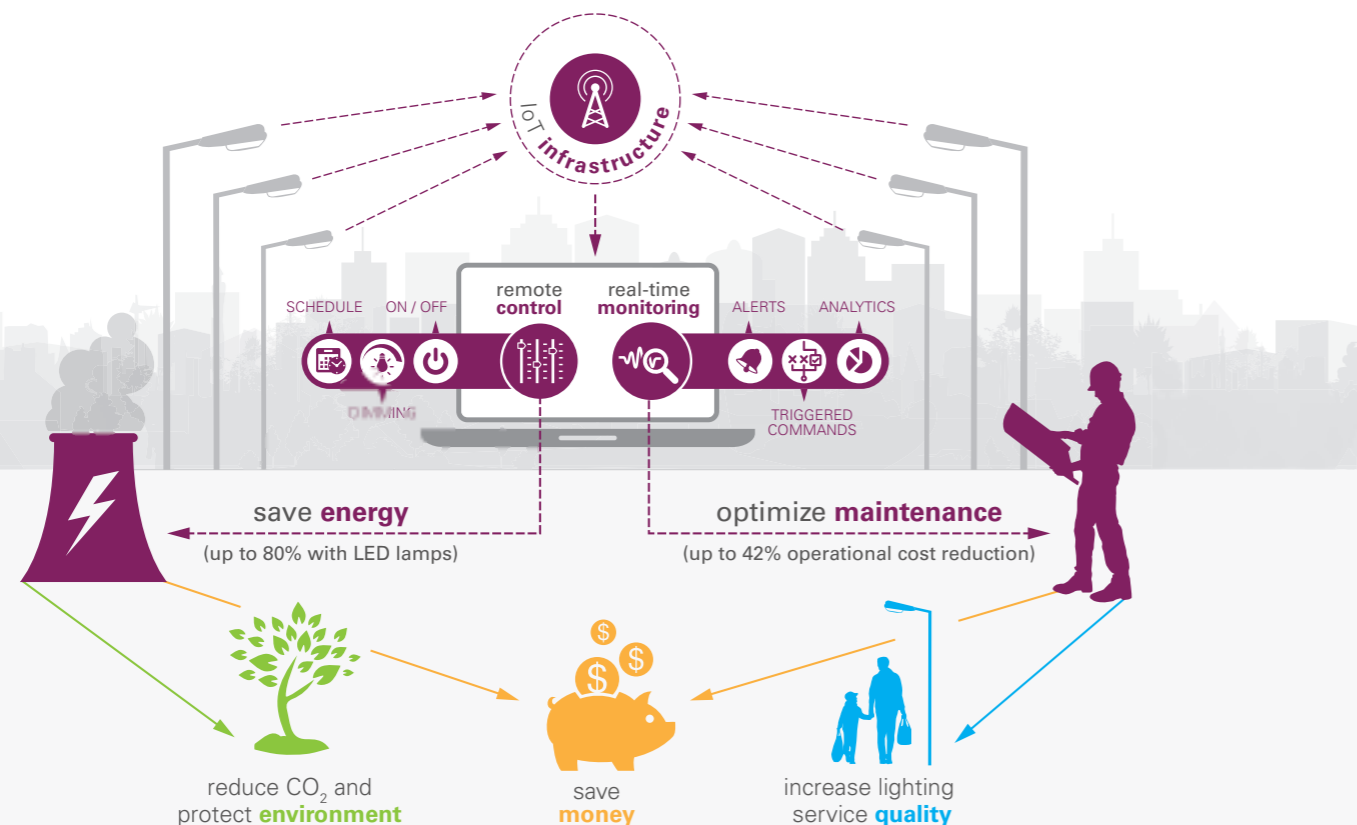
YOUR OWN IoT INFRASTRUCTURE

You can use an existing LoRaWAN™ compatible network provider or build your own RF infrastructure. Having your own LoRaWAN™ compatible infrastructure allows dedicated communications for the streetlight control, and also creates a framework for additional IoT applications.



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 LoRaWAN™ open communication standard allows unprecedented freedom of integration and implementation. The system is compatible with any LoRaWAN™ network provider or hardware manufacturer. Also, the system allows synergistic integration with other city systems through both northbound and southbound API connectivity.



SAVES MONEY FOR YOUR COMMUNITY

inteliLIGHT®'s LoRaWAN™ compatible solution 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 almost completely 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 CO₂, 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.



ADDITIONAL OPPORTUNITIES FOR THE COMMUNITY

The IoT platform uses sensors of all kinds to generate information streams, which by using open data systems can create a true effervescent smart city climate. Your city will become more competitive and attractive in the global competition for people and resources.



inteliLIGHT® BENEFITS POWERED BY LoRaWAN™

Suitable for both small cities and large metropolis, inteliLIGHT®'s LoRaWAN™ compatible solution is incredibly flexible and affordable, as it uses a simple and secure RF communication infrastructure to provide fast and cost-efficient streetlamp management. Furthermore, LoRaWAN™ is a standardized open communication protocol that helps cities to avoid being supplier-locked when purchasing control hardware and software.



INTEROPERABILITY

LoRaWAN™ certified devices and networks are fully interoperable. You can choose different hardware and network providers, or change your options at any time, according to your local availability and needs.



LOW PRICE

Simple network structure, long range, fewer gateways and overall inexpensive installation requirements create, to our knowledge, the most affordable streetlight control available.



FAST DEPLOYMENT

inteliLIGHT® LoRaWAN™ compatible controllers can be installed up to 5 km from the gateway, registered to an existing network provider and connected right away. You can install a device in a matter of minutes and start operating it using the dedicated application.



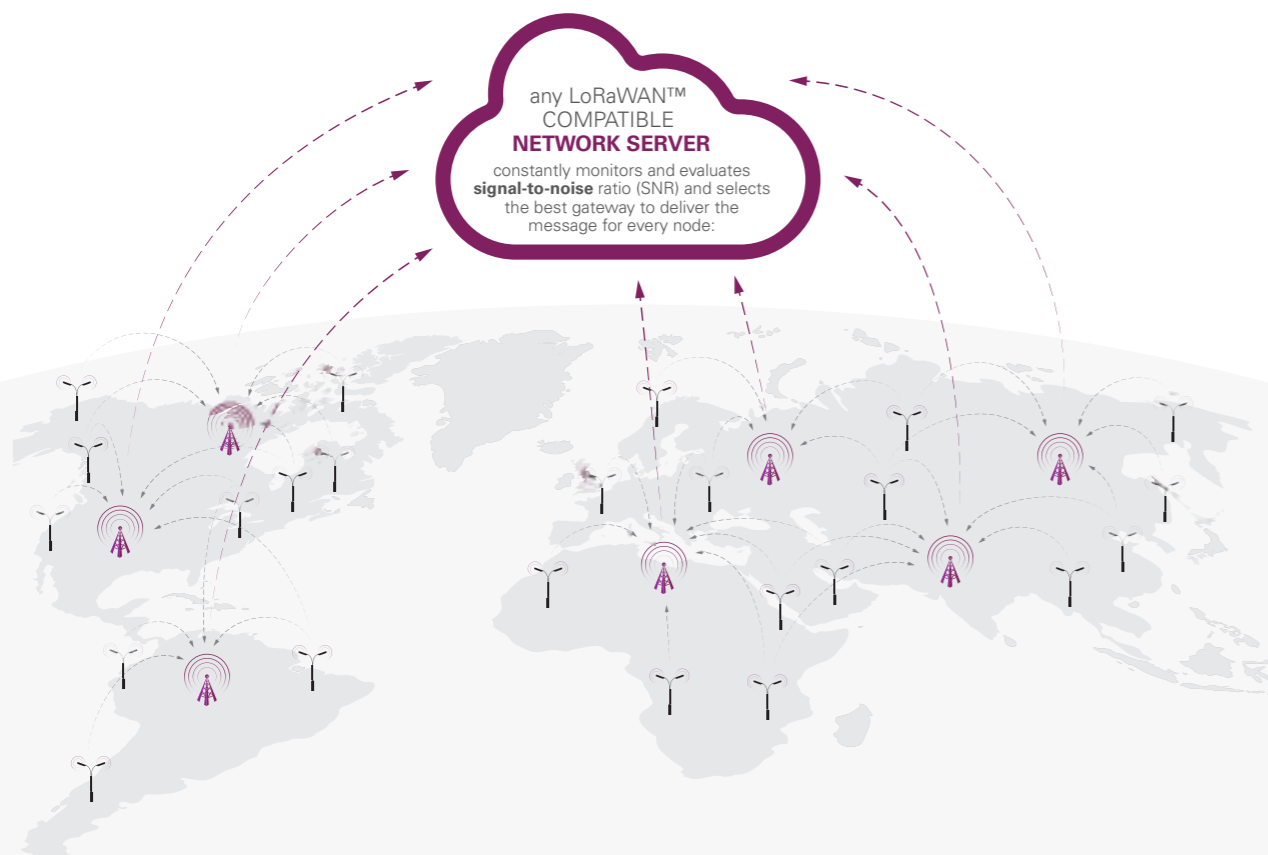
COMMUNICATION SECURITY

Use an existing public LoRaWAN™ compatible infrastructure or create your own, especially for sensitive applications (like street lighting control) or if you need an independent IoT platform. inteliLIGHT® uses AES 128-bit encryption keys and dedicated high-security memory microchips for encryption keys storage in order to ensure network and application security.



WORLDWIDE COMPATIBILITY

Combined with the new roaming protocols, the wide spectrum of radio frequencies (433MHz, 868MHz, 915MHz, 923MHz) ensure worldwide compatibility for LoRaWAN™ networks and applications.





SYSTEM ARCHITECTURE

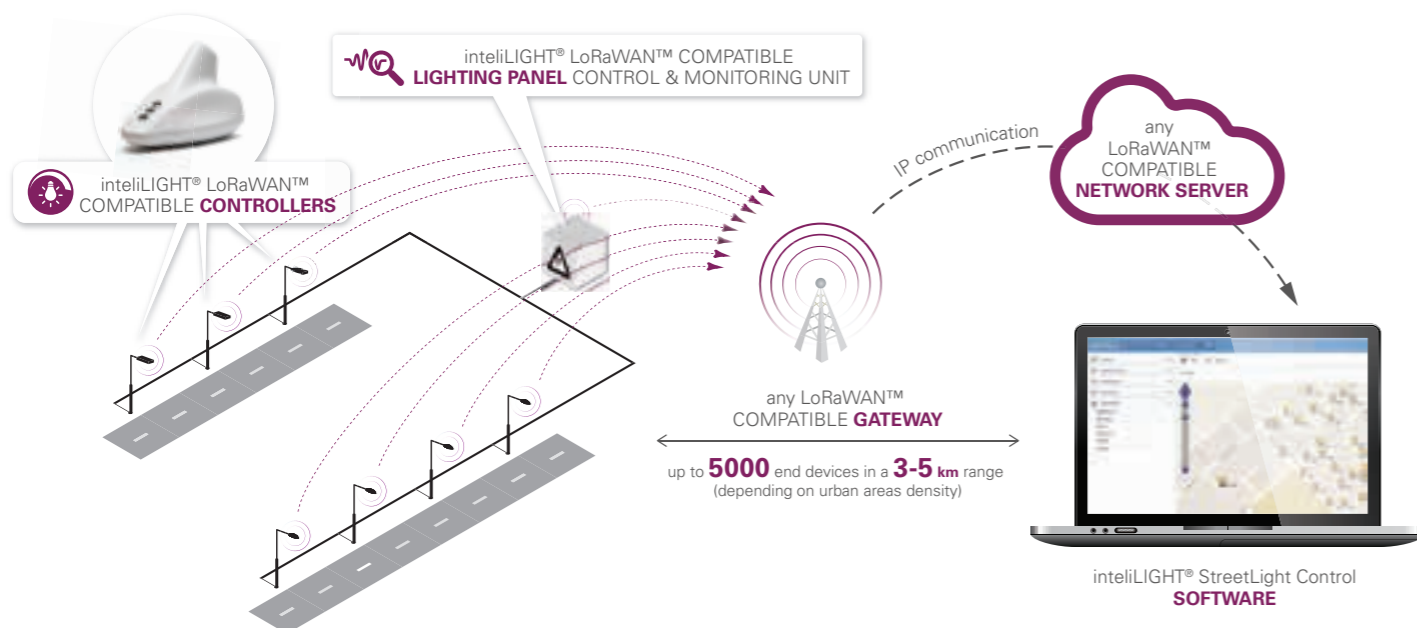
inteliLIGHT®'s LoRaWAN™ compatible solution is a reliable, fail-proof, integrated street lighting remote management system that installs within days and needs minimal investments.



inteliLIGHT® LoRaWAN™ COMPATIBLE ARCHITECTURE

Our hardware is more adaptable and smarter than ever. inteliLIGHT® controllers use LoRa™ long range, high immunity, spread spectrum RF communication technology and ensure fail-safe management of every lamp in the street lighting grid as well as a cost effective, bandwidth efficient platform for other SMART CITY applications.

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® LoRaWAN™ compatible 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.



LONG RANGE RF COMMUNICATION

The communication between lamp controllers, monitoring units and the control software is performed via the latest long range, low power RF technology developed and patented by Semtech under the LoRa™ trademark. This communication solution provides ultra-long range, spread spectrum communication and high interference immunity, while minimizing power consumption.



LoRaWAN™ COMPATIBLE NETWORK SERVER

The LoRaWAN™ compatible network server leaves nothing to chance, manages every element of the network (devices and gateways) for an optimal and failsafe operation. It provides integration with other applications and solutions, while securing and protecting the network integrity.



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. LoRaWAN™ 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® LoRaWAN™ COMPATIBLE CONTROLLERS

- › **Autonomous operation** based on predefined schedules and light level sensor.
- › Enables **individual remote management** of streetlight lamps with electronic ballast up to 400W.
- › **ON/OFF** control for any streetlight and **dimming** for LED streetlights.
- › **Bandwidth efficient** with minimal communication requirements.
- › **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.
- › **External infrared interface** for security keys transfer and local configuration.
- › **Over The Air** (OTA) firmware update.

FRE-220 RETROFITTING

- › designed for retrofitting existing street lamps
- › aesthetic design
- › tested in extreme weather conditions
- › easy to install

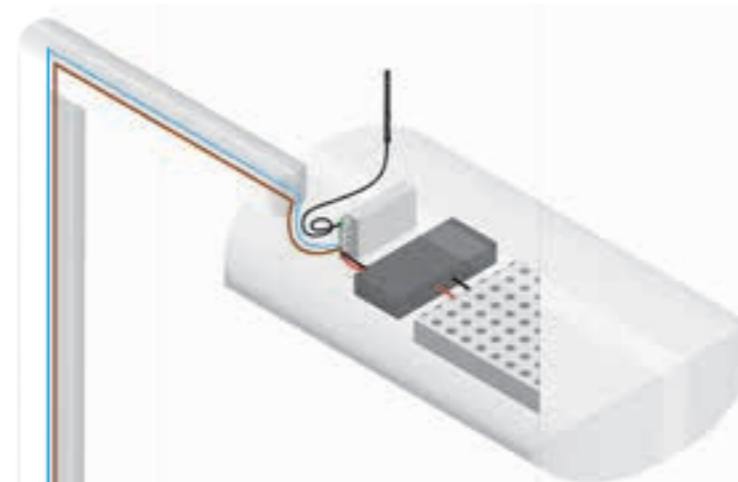


LoRaWAN™
Class C compliant
Class A compatible



FRE-220-NEMA RETROFITTING

- › designed for retrofitting existing street lamps with 7pin NEMA socket (ANSI C136.41)
- › aesthetic design
- › easier to install



FRE-220-M EMBEDDED

- › designed to help manufacturers offer LoRaWAN™-ready smart lighting fixtures
- › compact (110 x48 x36 mm)
- › compatible with most luminaire designs and 0-10/DALI LED drivers
- › digital input for sensors and smart applications
- › 10+ years average lifetime



LIGHTING PANEL CONTROL & MONITORING UNIT

- › **Autonomous operation** based on predefined schedules.
- › **Remote ON/OFF** control.
- › **Measures parameters** in street lighting grids: power factor, active/reactive/apparent power, voltage, current, frequency, daily active/reactive energy.
- › **Offers configuration options** for: current transformer ratio, voltage/power thresholds and daytime/nighttime consumption thresholds.
- › **Reports** any malfunctions and errors to the central server in real-time: under/over power, under/over voltage, phase failure.
- › **Inputs**: 2 x Digital input.
- › **Output**: 1 x Dry contact relay output.

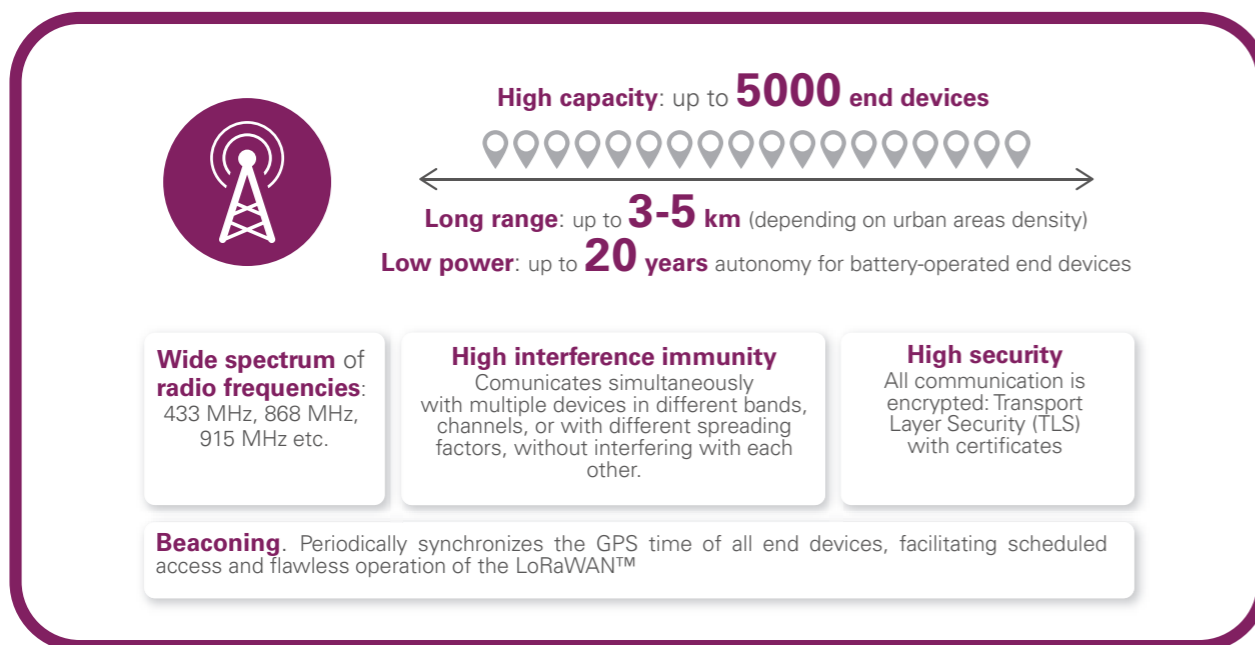
LoRaWAN™
Class C compliant
Class A compatible





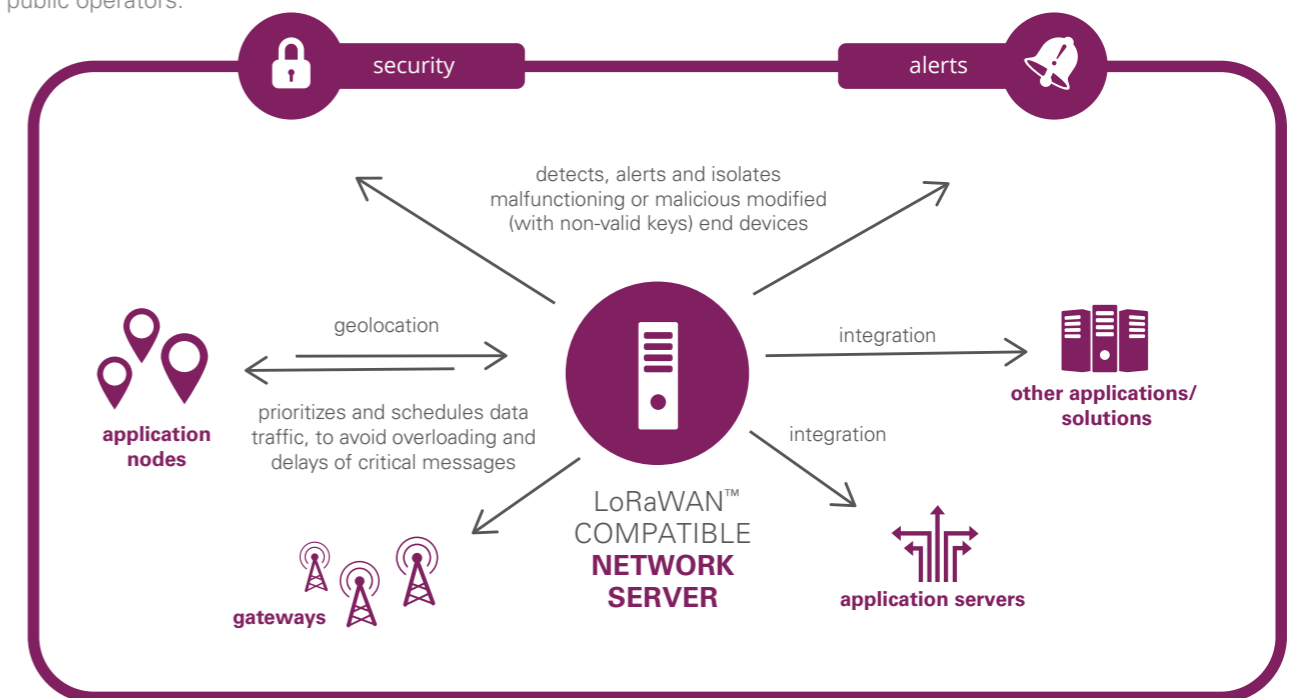
LoRaWAN™ COMPATIBLE GATEWAY

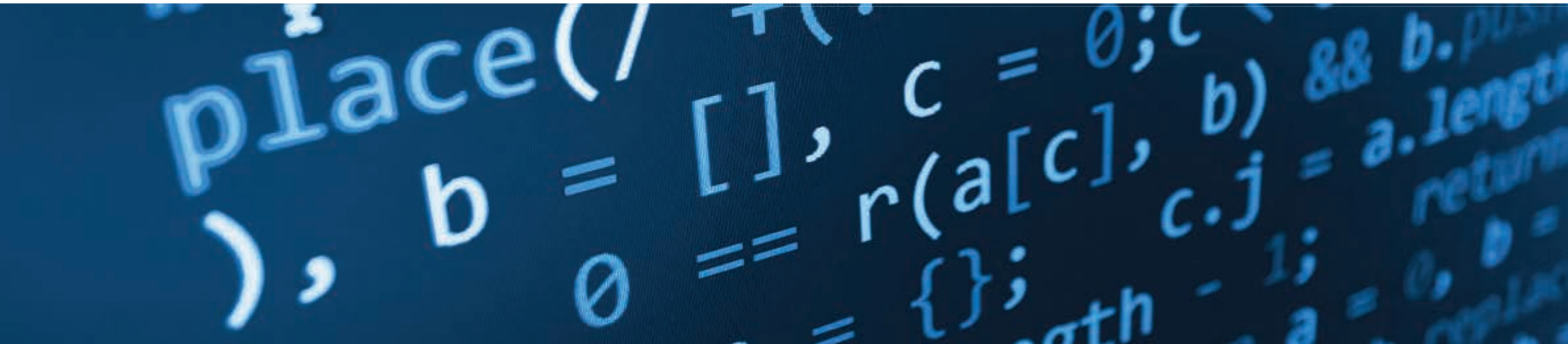
The central communication device for any LoRaWAN™ compatible network, the gateway provides radio link to any compatible nodes in range. There are several manufacturers of LoRaWAN™ compatible base stations and inteliLIGHT® is compatible with all the solutions available on the market.



LoRaWAN™ COMPATIBLE NETWORK SERVER

The LoRaWAN™ compatible network server manages and prioritizes all the network elements, radio and information flow. Every inteliLIGHT® controller must be registered with a local network operator in order to be able to connect to the central management software. The inteliLIGHT® LoRaWAN™ compatible controller is already integrated with most LoRaWAN™ public operators.

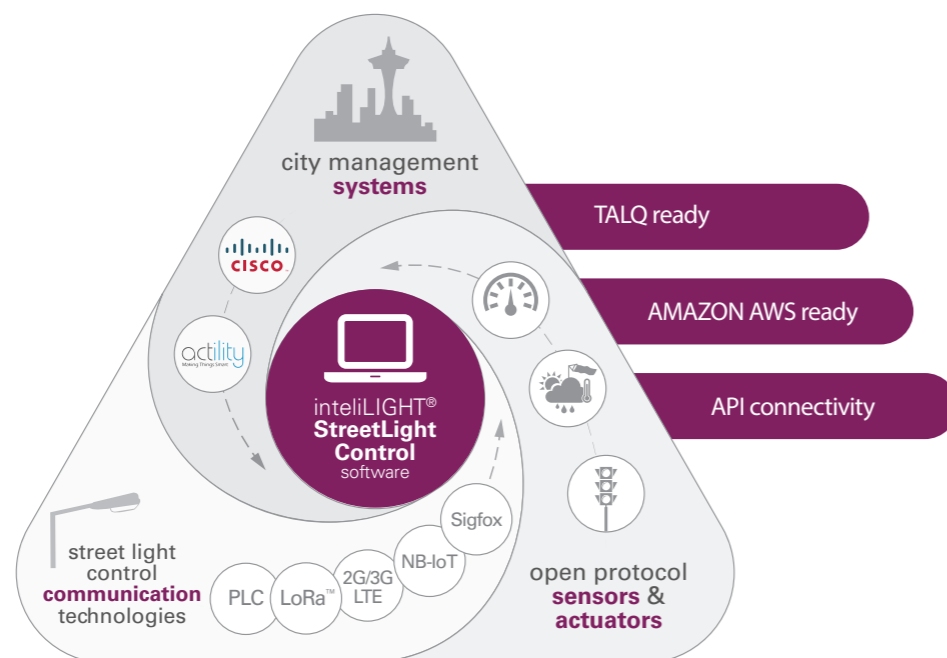




inteliLIGHT® StreetLight Control SOFTWARE

Our experience with street lighting installations worldwide has taught us a lot about what we can ask from a remote management software. We have identified the necessary software algorithms, processes and correlative functions needed for that 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™, 2G/3G/LTE, NB-IoT or Sigfox).



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.



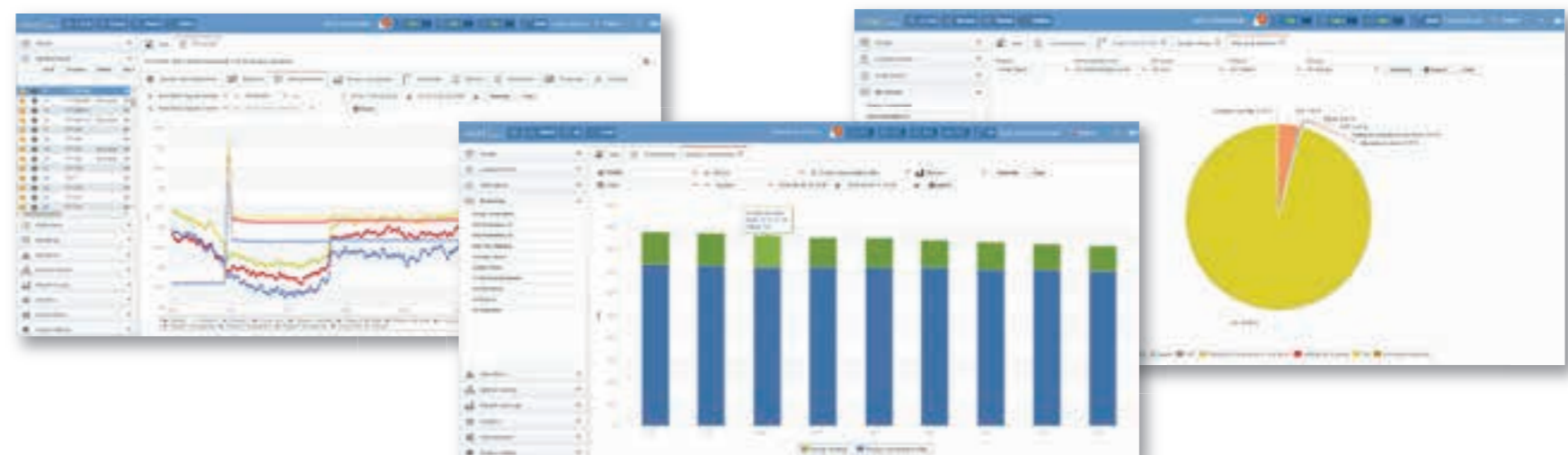
inteliLIGHT® StreetLight Control FUNCTIONALITIES

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

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 (PLC, LoRaWAN™, 2G/ 3G/ LTE, NB-IoT, Sigfox), 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 astrological 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





14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352

Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il

SMART CITY PLATFORM

A Smart City allows free information flow, makes sense of it, detects synergies and uses consumer oriented applications to improve sustainability and the quality of life.



SMART CITY IoT PLATFORM

Almost 6.5 billion Internet of Things devices were already connected by the end of 2015, 50 billion estimated to be connected by the end of 2020. In this context, LoRaWAN™ uses licensed free RF frequency ranges and is capable of connecting more than 20,000 devices in a range up to 15km (depending of line-of-sight availability and city density). Building local, regional and even worldwide IoT networks has never been easier and more cost-efficient.



DETECTION AND PERSONAL SAFETY

LoRaWAN™ has the ability to connect objects and people alike. From simple bicycle tracking applications to advanced medical monitoring and remote diagnostics, the technology allows long-range, battery operated devices to connect and send data for up to 10 years without battery replacement.



SMART CITIES AND COMMUNITIES

Unrestricted and vendor-free integration of sensors, actuators and applications is available with LoRaWAN™. Install any kind of compatible motes over existing infrastructure and use existing network servers and gateways to connect new applications, allowing synergistic integrations of different city services.



SMART METERING AND UTILITIES

Electricity, water and gas suppliers gain real-time awareness of the network's parameters, which can reduce repair times and maintenance costs by efficiently reacting to any malfunctions, tempering and other grid events. Automatic meter reading and customer invoicing and remote supply flow control while reducing grid losses will further decrease operational costs, bringing cheaper and better quality services to the end consumer.



AGRICULTURE AND ENVIRONMENT

Besides natural disaster monitoring (earthquake, flooding, avalanche or fire), you can aim for better process management, improved speed and increased efficiency in the agriculture. Real-time reading of meteorological data such as air temperature, humidity and CO₂ concentration, as well as soil ammonia concentration and pH levels. Furthermore, you can obtain detailed information regarding land irrigation or animal feeding and drinking-water flow, which can determine the best intervention at the right time for planting, harvesting or animal care.



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®'s LoRaWAN™ compatible solution is the most economical lamp-level street lighting remote management system 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.



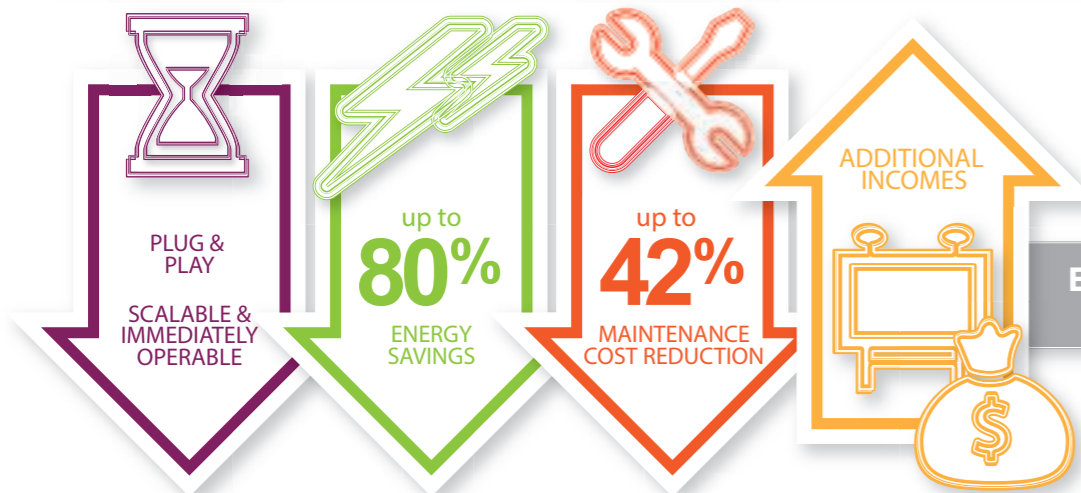
FINANCING & BUSSINES CASE

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.

FAST, ECONOMIC IMPLEMENTATION with SIGNIFICANT SAVINGS & INCOME POSSIBILITIES



ESCo financing COMPATIBLE



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



www.intelilIGHT.eu



FLASHNET



14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il