inteli®
LIGHT


# smart + connected
street lighting

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Compatible with multiple IoT communication technologies. Integrated with major Smart City platforms. inteliLIGHT® redefines implementation efficiency and operating reliability, offering at the same time unprecedented flexibility for city managers.

TALQ · ENGIE livin' · NOKIA · ERICSSON · CISCO · OPEN TELEKOM CLOUD T-Systems · orange Live Objects · Actility

## cities are **growing** fast

We have become aware of the importance to save resources.

## and need to be **smarter**

All smart city systems need two essential resources to work, and intelligent street lighting provides them both:

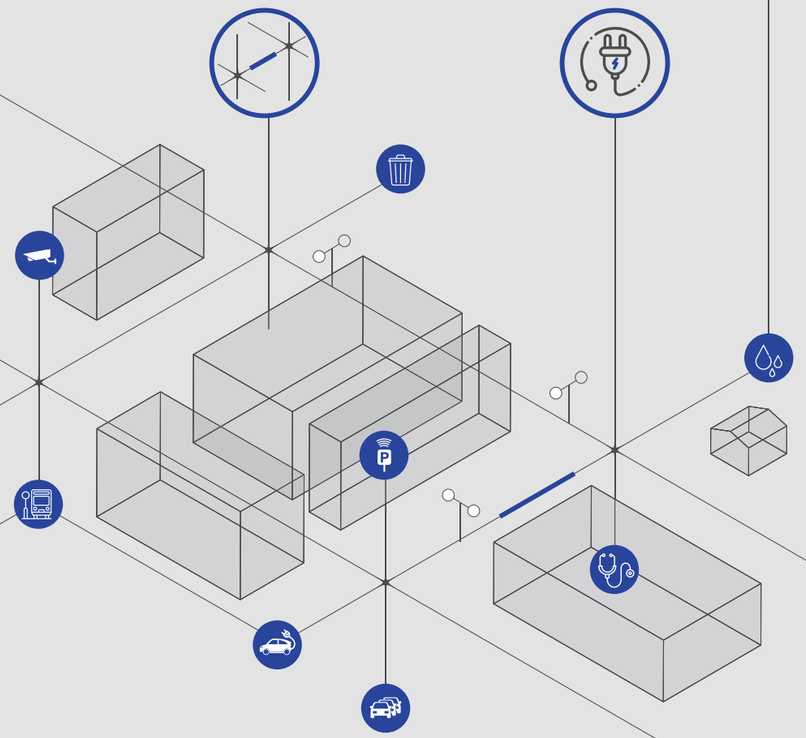
**Environmental**
concerns

**Budget**
constrains

**People**
expect more

**communication**
infrastructure

permanent
**power** supply



Things that have been in place for a hundred years are now just about to **change**

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# **intelligent** street lighting

## control

Let the street lighting operate autonomously, using preset algorithms based on astronomical calendar, light level sensors or motion detectors. You can add scheduled exceptions or manually control ON/OFF and dimming for either individual lamps, lamp segments or the entire grid.

## awareness

Gain full hardware, electrical and geographical awareness for the street lighting grid. inteliLIGHT® offers detailed electrical parameters for every lamp and feeder pillar, with real-time malfunction alerts and inventory control, all displayed on a user-friendly map overlay.

## optimization

Enjoy faster maintenance interventions and improved lighting policies. Advanced analytic report tools help you understand the trends and monitor energy loss. Also, malfunctions are reported in real time and the maintenance teams can be informed and deployed right away.

## integration

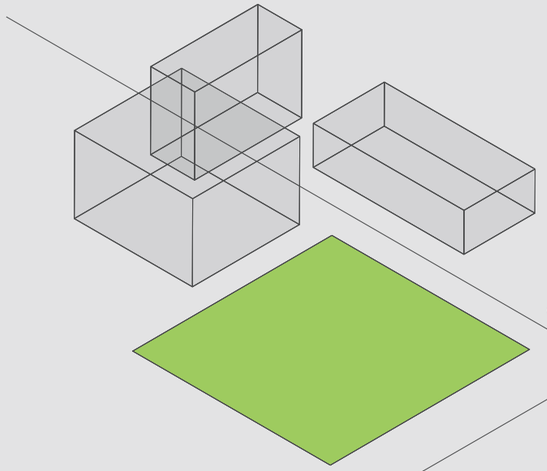
Control everything from one place. inteliLIGHT® allows subsequent management of compatible sensors and IoT applications. Furthermore, it integrates with other city systems and major smart city platforms through northbound and southbound API connectivity.

# for the **community**

**increased safety through improved lighting service quality**
Street lighting acts as a crime deterrent and helps avoiding the risk of accidents. With inteliLIGHT®, street lighting malfunctions are detected and addressed before the citizens even get the chance to notice them.

**reduced energy and maintenance costs**
Up to 35% lower energy consumption with intelligent ON/OFF switching, progressive dimming and efficient energy management. Smart maintenance and proactive grid interventions lower costs with 42%.

**more sustainable cities and cleaner environment**
Reduced energy consumption means less CO2 and lower environmental impact in the context of increasingly demanding norms. Dimming also decreases light's negative impact on birds and wildlife.

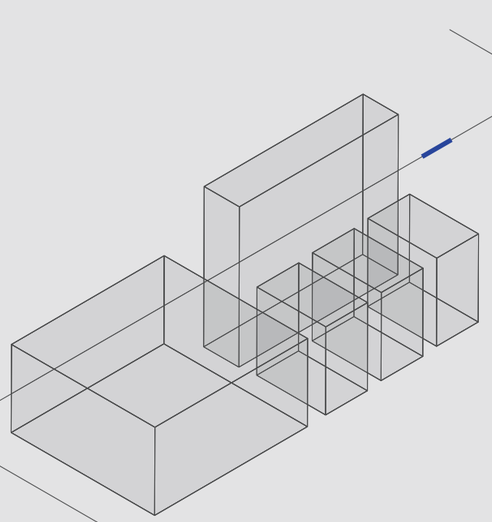


# for the **municipality**

**unprecedented options and open communication standards**
LonWorks® PLC, LoRaWAN™, NB-IoT, Sigfox, LTE-M, Wi-SUN. inteliLIGHT® uses any IoT open protocol communication technology or combines them to meet the project's needs. Flashnet's IoT Platform and TALQ compatibility make sure it's easy to integrate, even if you are already using lighting control hardware and/ or software from other providers.

**installation flexibility and multiple form factors**
Our controllers can upgrade existing lighting fixtures or can be embedded into new luminaries, to minimize the visual impact. Whether using wire connections or standard sockets (e.g. ZHAGA, NEMA), the actual deployment is almost plug-and-play.

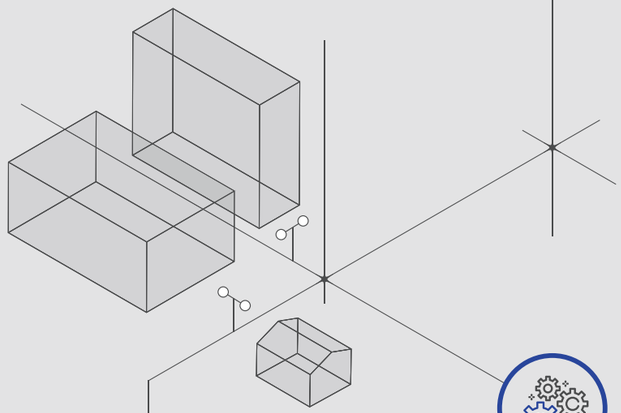
**integrated with major smart city platforms**
Keep planning for a synergistic smart city. inteliLIGHT® is already integrated with major citywide management platforms like ENGIE livin', Nokia, Ericsson, Cisco Kinetic for Cities or Telekom Cloud.



# we know each project is **unique**

## choose the lighting control that **fits you** best

Which communication technology fits best? Do you need a private communication infrastructure or can you use locally available public IoT communications? Our technical consultants will assist you to choose the appropriate system configuration and will work together with the lamp manufacturer or the lighting service provider to identify and implement specific controller customizations.



## **never** feel **supplier locked** again

Don't worry if you already have a streetlight control system in place, if you plan to work with multiple suppliers or if you already use smart city integrations. Our system uses open source communication technologies, allows northbound and southbound API connections and is already integrated with major smart city platforms.

## build a **smart city**

**smarter lighting for a smarter city**
The autonomous street lighting, continuous awareness, real-time malfunction alerts and dynamic ON/OFF/dimming control are some of the immediate smart city benefits.

**add smart applications to the "always on" lighting grid**
With inteliLIGHT®'s lamp-level control, the street light networks are continuously under power. There is a large number of sensors and IoT devices that can be supplied directly from the grid.

**build synergistic smart cities**
A real smart city is the one integrating all services, not managing them individually and inteliLIGHT® is already integrated with most smart city application suppliers.

## make sure everything **works**

**easy to install**
inteliLIGHT® is a reliable plug-and-play turnkey solution, supported by a proven simple 4-steps implementation process. The technical and compatibility assessment, system tailoring and pilot project implementation will be fluent and, after you validate the proposed solution, the actual deployment will be a smooth and user friendly process. The system becomes functional within days and you can start controlling the connected lamps immediately.

**impressive track record**
Our projects speak for themselves. Hundreds of thousands of lamp controllers and feeder pillar monitoring units installed in hundreds of projects on all continents prove inteliLIGHT®'s functionality and reliability.

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# system **architecture**

## **luminaire** controllers

Several available form factors: NEMA, ZHAGA and compact wired controllers to be embedded into lighting poles or into luminaries right from the production line.

**EMBEDDED** **ZHAGA** **NEMA**

inside
**POLE**

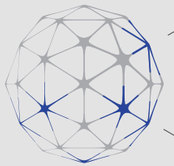
## **lighting panel** control & monitoring unit

Installed inside the feeder pillar, it is designed to provide autonomous operation for street lighting installations and to carry out three phase measurements and analysis of electrical parameters in street lighting grids.



private or public **communication** infrastructure

LoRaWAN · NB-IoT · LTE-M · sigfox · LonWorks · Wi-SUN · GSM



API for
**your own software**

inteliLIGHT® StreetLight Control **software**

smart city platform **integrations**

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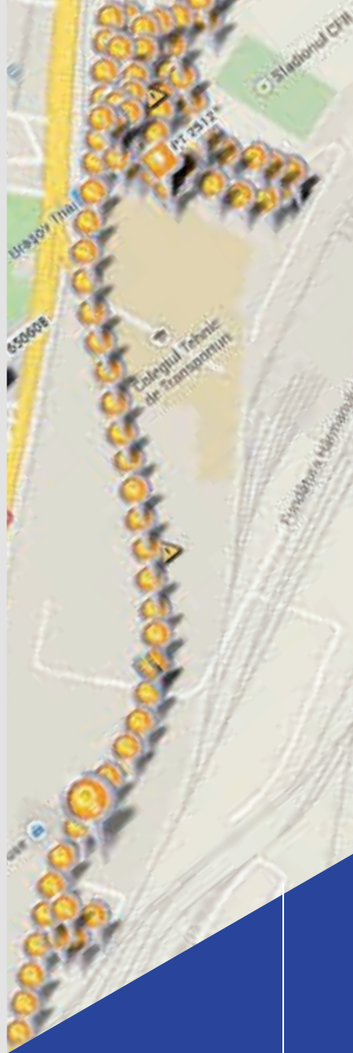

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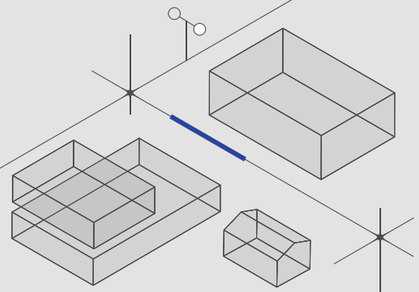
# **hardware** & form factors

Our controllers can upgrade existing lighting fixtures or can be embedded into new luminaries, minimizing the visual impact.

## **NEMA** socket

Plug-and-play upgrade for lamps with compatible 7-pin NEMA socket (ANSI C136.41).

› integrated light level sensor
› digital input
› 76 x 96 mm (Ø x h)
› IP66 rating



## **ZHAGA** socket

Plug-and-play upgrade for lamps with compatible ZHAGA (book18).

› 80 x 65 mm (Ø x h)
› IP66 rating

## **embedded**

Minimum impact on the lamp design, full management and feedback capabilities right from the lamp manufacturer.

› connectors
› digital input
› 110 x48 x36 mm (L x W x h)
› IP20 rating

## inside **pole**

Designed to be installed directly into the lighting pole, making it less visible from an aesthetic point of view and allowing easier access for maintenance teams.

› cable connected
› digital input
› 126 x 57 x 42 mm (L x W x h)
› IP66 rating


## **lighting panel** control and monitoring unit

Designed to control and monitor the street lighting grid at lighting panel level, can be a fail-safe mechanism for smart street lighting installations.

› GPS for exact location and time
› LCD for displaying electrical parameters and device status
› maintenance switch for local manual override
› three phase electric monitoring
› 2 x digital INPUT
› DIN RAIL mounting
› dimensions: 138 x 90 x 47 mm (L x W x h)
› IP20 (optional IP67 external housing)

# communication technology **agnostic**

LonWorks® PLC, LoRaWAN™, NB-IoT, Sigfox, Wi-SUN. We use any open protocol communication technology or combine them to meet the project's needs.


**LoRaWAN™** is a Low Power Wide Area Network (LPWAN) that provides bi-directional RF communication. It works over unlicensed radio frequencies and can be installed privately or used with an existing public service. In private installations, the initial cost is slightly higher, but there is no subsequent network monthly fee. One base station covers up to 5 km in low to medium density urban areas and up to 15 km line-of-sight in rural or remote area installations.

**Sigfox** is a radio/LPWAN IoT communication technology that provides low power, low data rate and low communication costs using the Ultra-Narrow Band (UNB) technology and unlicensed ISM radio bands. It is the communication of choice in projects only if there's already Sigfox coverage available, as it is only available as a public network.

**LonWorks®** (by Echelon) is a power-line communication technology that enables sending data over existing power cables. It provides reliable and secured data transmission at reasonable bitrates, being recommended in linear lighting grids. It is an excellent alternative for RF in tunnels and also when the radio bandwidth is crowded or prone to interference.

**Narrow-Band IoT** (NB-IoT) is an IoT narrowband RF communication technology provided by major telecom companies and uses the mobile network to connect. As any carrier-grade communication technology, it comes with increased security and uptime guarantees. Provides excellent penetration, so it can be used in high density urban areas. It cannot be operated privately so there is no initial investment, but will require a subscription.

**LTE-M** is a low power wide area (LPWA) IoT communications standard published by 3GPP. LTE-M networks co-exist with 2G, 3G, and 4G mobile networks and benefit from all the security and privacy features of carrier-grade networks. Provides excellent penetration, so it can be used in high density urban areas. It cannot be operated privately so there is no initial investment, but will require a subscription.

**Wi-SUN** (Wireless Smart Ubiquitous Network) is a wireless mesh communication technology based on the IEEE 802.15.4g standard, supporting long-distance transmission and low power consumption. Wi-SUN can be used for large-scale outdoor IoT wireless communication networks in a wide range of applications for Utilities, Smart Cities and IoT. Due to the mesh topology, its reliability improves as more devices participate in the network.

# inteliLIGHT® StreetLight Control **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, Wi-SUN or Sigfox).

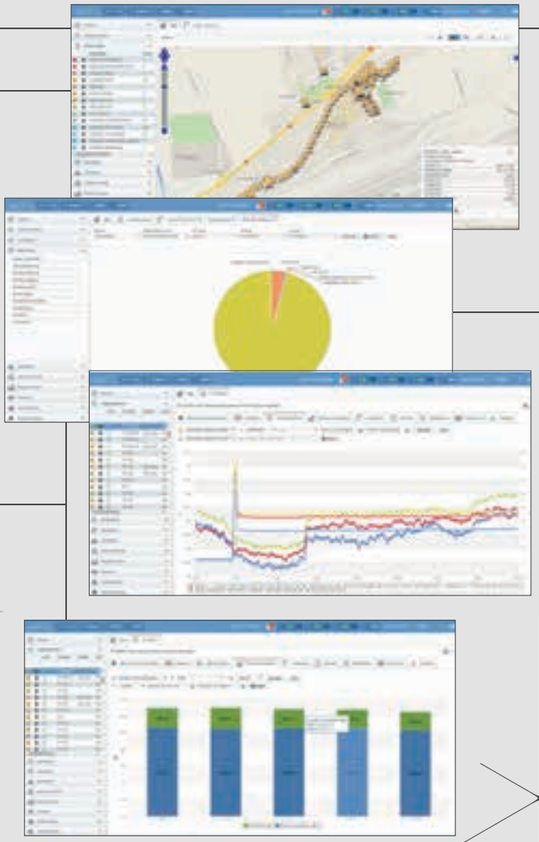
gain detailed street lighting awareness and control with a friendly **map overlay**

synergistic lighting control integration with your **preferred smart city platform**

connect several street lighting control **projects in one place**

power up and control **third party** sensors & actuators

integrate one or more **communication technologies**



use **reports** and **automations** to increase grid operating efficiency

# smart **integrations**

**inteliLIGHT®**
sensors & controllers

**FLASHNET IoT**
communication platform

**inteliLIGHT®**
software

**third party**
sensors &
controllers

**third party**
communication
infrastructure

**third party**
software
applications

major smart city
**platforms**

## TALQ smart city **protocol**

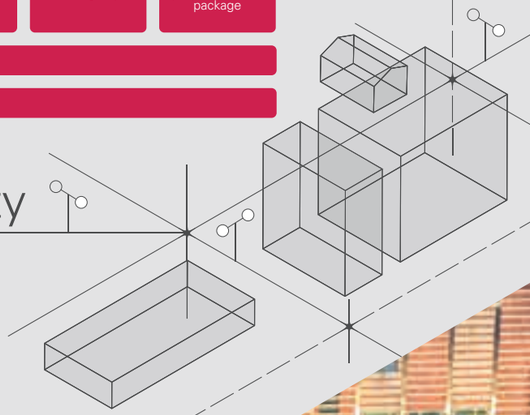
A global standard that provides a common language for smart city applications, enabling command and monitor of different types of connected devices through an easy-to-integrate protocol. TALQ defines the message types, data format, parameters and behaviour. Moreover, it provides secured access and associated data payloads to describe the devices, their functions and attributes.

| **Configuration** Device discovery, commissioning, service capabilities | **Data Collection** Eventing, periodic data collect, adhoc data collect, log config | **On-demand Read** Read of metering attributes and status | **Control & Override** Schedulers, control programs, calendars, commands, overrides | **Group Management** Create groups, update groups, delete groups | **Data Package** Firmware update, sending any proprietary data package |
|---|---|---|---|---|---|

**TLS Security**

**HTTP RESTful**

**smart** city



# project **steps**

InteliLIGHT® is a reliable plug-and-play turnkey solution, supported by a proven 4-steps implementation process. It doesn't mean that implementing InteliLIGHT® is simple, but we do most of the work. All you have to do is marked in **orange**, leave the rest to us!

1 You need a better and a greener city and you **contact us** to upgrade your street lighting grid.

2 We provide basic system information and the **start-up questionnaire**.

3 You send us all the relevant street lighting **infrastructure information** and details about your specific needs.

4 After the technical assessment, we present you the **technical solution**, the budget and deployment timeline.

5 **You evaluate** our proposal, then choose a functionality demonstration or a pilot project deployment.

6 We custom tailor inteliLIGHT® and we coordinate and manage system demonstrations.

7 **You validate** the demonstration outcome, we sign the agreement and start the actual implementation.

8 We coordinate the **project deployment** together with our local implementation partner.

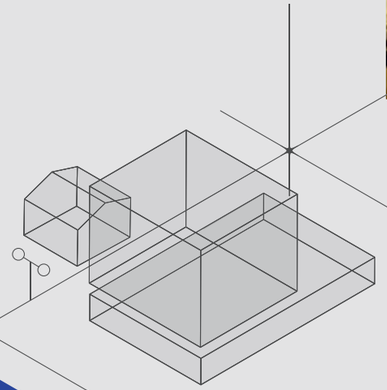
9 We organize all necessary user **training sessions** and system presentations to ensure successful system operation.

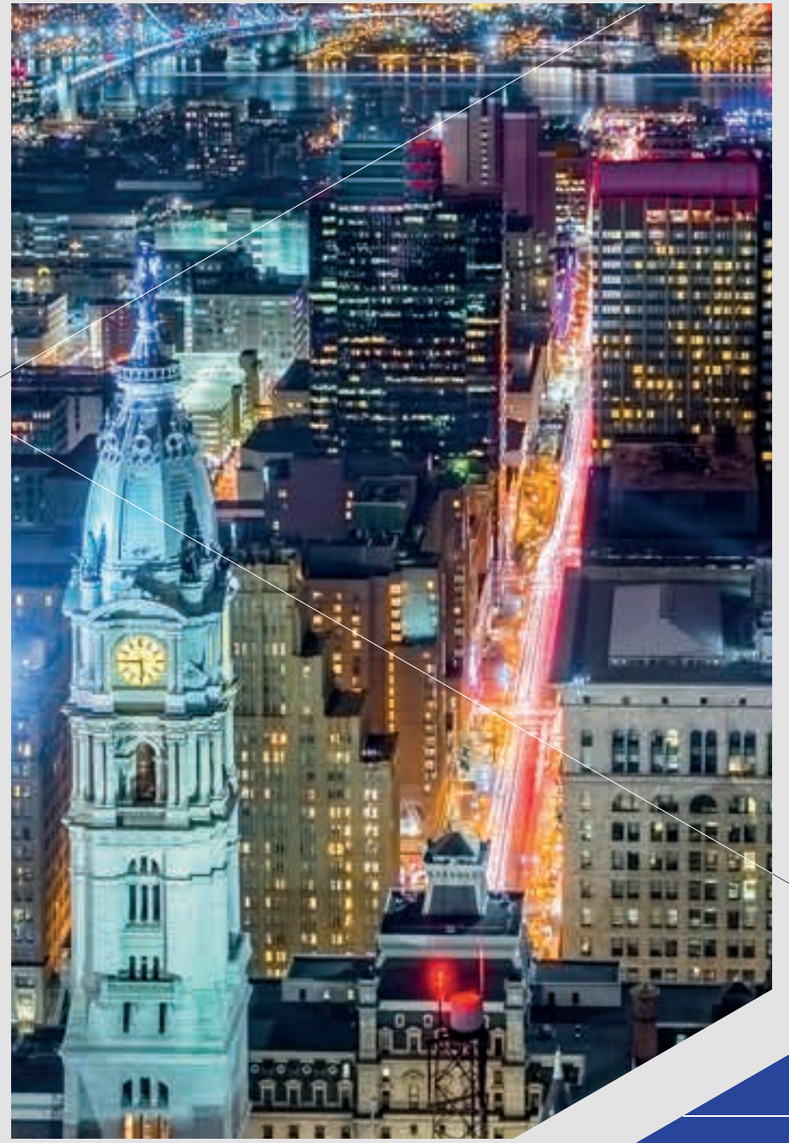
10 After the implementation, we provide 24/7 **technical support**.

# Efficient street lighting & custom sensor integration in **Mecca**

In one of the first large scale smart street lighting deployments in the Middle East, Mecca chose inteliLIGHT® PLC street lighting management solution with customized features: cable cut detection, pole door opening and pole impact sensors.

› Mecca, Saudi Arabia
› 2012
› LonWorks PLC
› 25 000 lighting fixtures
› 24% energy savings





# Festive mood around the City Hall in **Philadelphia**

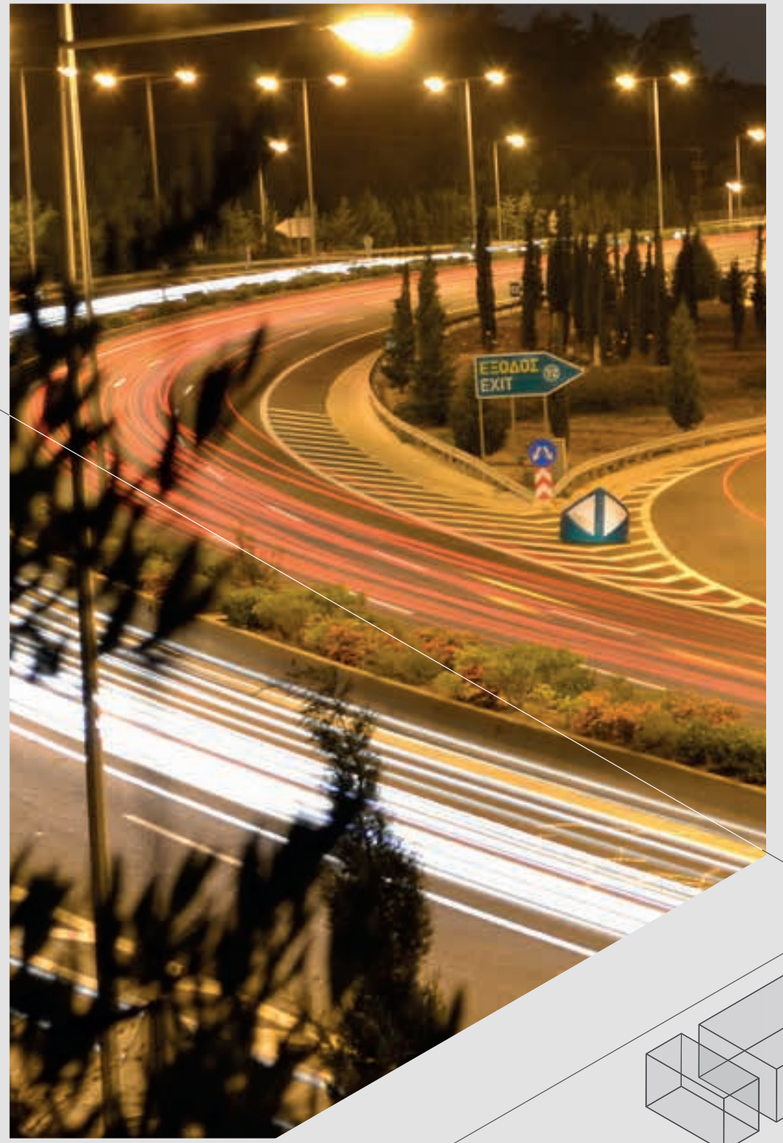
Committed to expand LoRaWAN™ coverage in the USA, Comcast's MachineQ chose inteliLIGHT® to remotely manage street lighting during the 2017 Christmas Village, close to Philadelphia's iconic City Hall.

› Philadelphia, USA
› 2017
› LoRaWAN™
› Directly connected to MachineQ network

# Zhaga socket, used for a large scale LoRaWAN™ deployment in **Brescia**, Northern Italy

The first large-scale Zhaga implementation installed 10.000 inteliLIGHT® LoRaWAN™ compatible street lighting controllers and 600 FRCM lighting cabinet controllers bringing modern street lighting benefits to this iconic city in Italy.

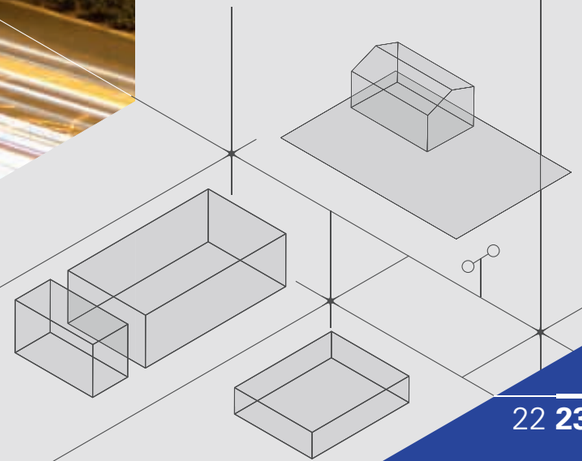
- Brescia, Italy
- 2019
- LoRaWAN™
- 10000 Zhaga controllers




# Seamless lighting using third party software for **A1 Highway** in **Greece**

Over 4300 LED street lighting fixtures, equipped with embedded smart controllers, were installed over a 300 km distance for a highway lighting project in Greece.

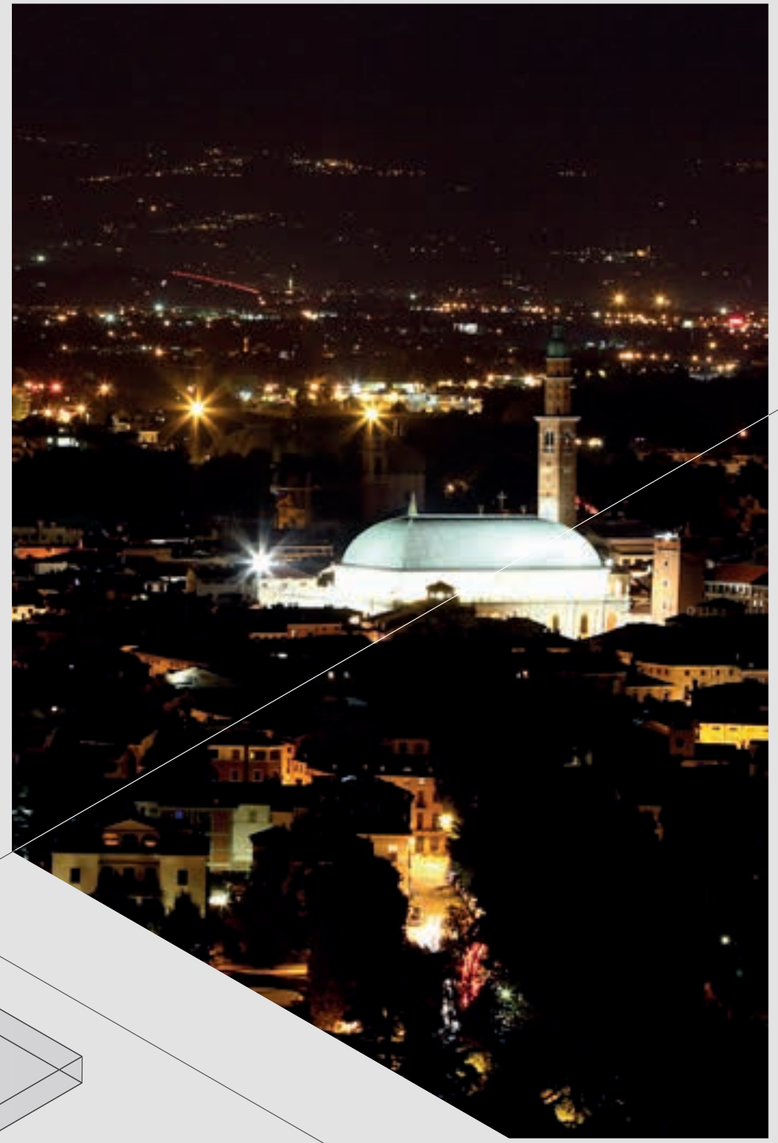
- A1 Highway, Greece
- 2018
- LoRaWAN™
- 4395 lighting fixtures
- Estimated 55% energy savings (with LED and dimming scenarios)
- estimated 850.000 Euro saved annually
- 5 years ROI



# Multiple communities efficiently managed from one place in **Vicenza**

In a single deployment, inteliLIGHT®'s StreetLight Control allows 9 different municipalities to manage their street lighting together, using advanced user management and the capacity to integrate multiple deployments.

› Vicenza, Italy
› 2017
› LoRaWAN™
› 1094 lighting fixtures
› 9 different municipalities



# Lighting efficiency and architectural value for **Dubai Water Canal**

How to provide smart management capabilities, while maintaining the architectural integrity for the award-winning street lighting design project of Dubai's newest touristic and commercial attraction? Install inteliLIGHT® embedded controllers inside the street lighting fixtures.

› Dubai, UAE
› 2016
› LonWorks PLC
› 775 lighting fixtures
› Award winning architectural lighting project

# EV Charging directly from the street lighting power grid in **Brasov**

Local conditions demanded the use of hybrid communications, while the city's unique vision required the installation and management of environmental sensors, parking sensors, CCTV cameras and a functioning EV Charging system powered directly from the street lighting grid.

- Brasov, Romania
- 2015
- multiple communication technologies: LonWorks PLC, LoRaWAN™ , GSM
- 12 000 lighting fixtures
- additional smart city services

# 10 smart city services use Sigfox to communicate and integrate in **Abu Dhabi**

Aiming for true smart city synergies: street lighting control, seamlessly integrated in a project with 10 other city services like asset tracking, air quality monitoring, smart parking, water metering and even palm tree weevil detection, all using Sigfox communications.

- Abu Dhabi, UAE
- 2018
- Sigfox
- integrated with 10 other city services