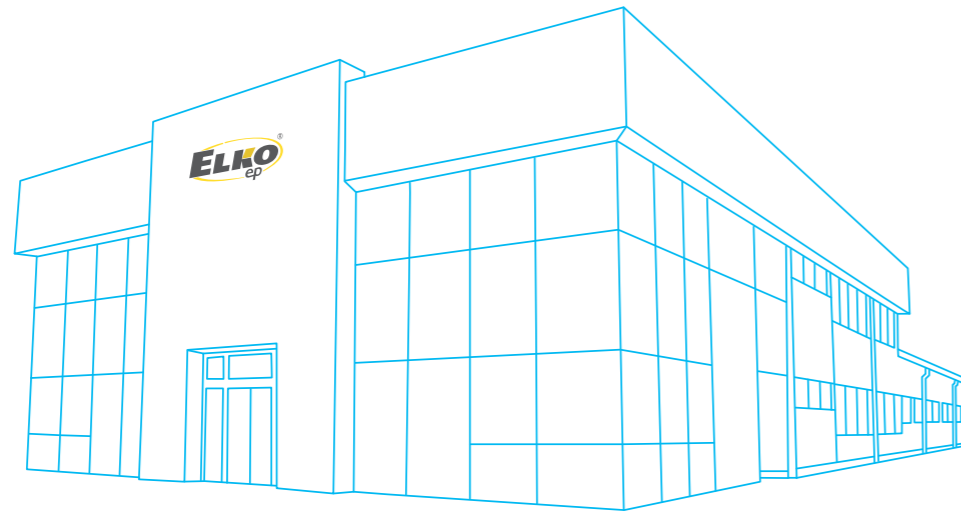# Smart Street Lighting

Economical and effective outdoor lighting solutions

LoRaTRANSMITTER

www.inels.com/ssl

iNELS®

ELKO EP, Holding

Millions of Relays, Thousands of satisfied Customers, Hundreds of local staff, Twenty Five Years of Research, Development and Production, Fifteen Foreign Branches, but just ONE Company, ELKO EP, an innovative Czech company, where R&D, Production, Logistics, Service and Support all take place in our expanding Headquarters in Holešov. We are mainly focused our very own systems designed for Hospitality, Health Care, Smart Cities and the Internet of Things (IoT).

ELKO EP employs nearly 240 people, exports to over 70 countries around the world and has 16 foreign branches. Czech company of the year 2012, Top 100 Czech Companies, Visionary of the Year 2015 and Global Exporter in 2016 are just a few of the awards received and we are not finished, we continually strive for innovation and development because we care.

iNELS Smart System Group

WIRELESS
electroinstallation (RF)

WIRED
electroinstallation (BUS)

HOSPITALITY
Hotel (GRMS)

HOTEL wireless
Retrofit (HRESK)

BUILDING
management system

iNELS Air
- IoT devices

LIGHTING
control

ENERGY
management

Multimedia
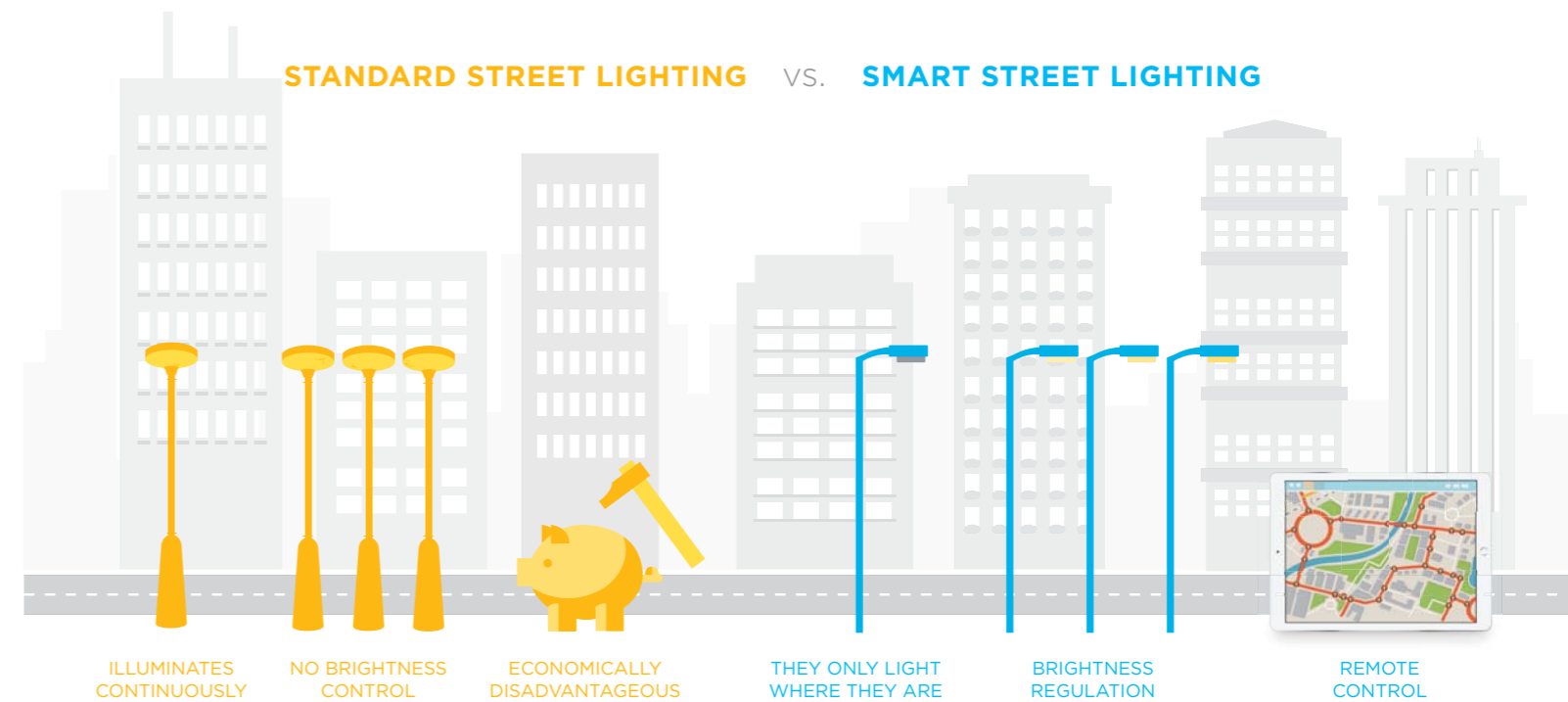
Lighting
sources

Public lighting

Public lighting is an essential component of the services for residents in any city or village. It helps facilitate people's movement and orientation and contributes to greater security. But what if the lamps in the streets could work a little differently? What if they could be much smarter?

Smart lighting by our design are not just meant to shine. He can think through the light. It can regulate the intensity of light based on the time of day, the ambient light and traffic density. In the event of a fault, it can transmit information required for repairs. Masts can serve as a conduit for additional sensors, detectors, weather stations, Wi-Fi signal transmitters, or security keys.
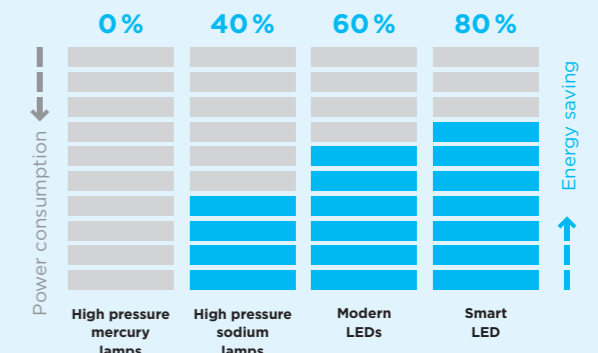
Smart Street Lighting by iNELS

WATCH THE VIDEO:

STANDARD STREET LIGHTING VS. **SMART STREET LIGHTING**

ILLUMINATES CONTINUOUSLY

NO BRIGHTNESS CONTROL

ECONOMICALLY DISADVANTAGEOUS

THEY ONLY LIGHT WHERE THEY ARE

BRIGHTNESS REGULATION

REMOTE CONTROL

Light sources and their costs

Basic information on light sources and the cost of their operation is provided by the following chart. It is quite clear from the point of view of long-term savings that the use of LED lights in combination with smart control is the most advantageous. We recommend individual control of individual lights.

| 0% | 40% | 60% | 80% |

High pressure mercury lamps | High pressure sodium lamps | Modern LEDs | Smart LED

Power consumption

Energy saving

Retrofit options

How can we deal with the renewal of public lighting? Let's describe the basic options and how much it will cost us. It is necessary to say that in the case of renewal of public lighting it is an investment for several decades. As in normal cases, the cheapest solution at the beginning is not usually so in the long-term.

1 „Corn"

power driver + LED chip

• Replacement of old light sources (high pressure sodium) after LED lights called „Corn".

• Price of revitalization of one light point: **50 EUR***.

This solution is very simple and inexpensive but has one major drawback. Troublesome cooling reduces significantly the life and luminous efficacy of the LED light.
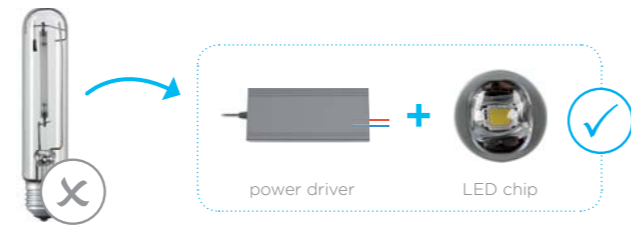
2 LED light source retrofit

• Replacement of a part of the luminaire with new ones (e.g. high pressure sodium lamps).

• The revitalization price of one light spot: **150 EUR***.

Again a relatively easy solution. The question remains, however, whether there is a suitable and especially high-quality retrofit for you. Here, too, we encounter troublesome cooling problems.

3 Replacement lighting fixture

• Replace old lights fixtures with new ones.

• The price of revitalization of one light spot:
  - high quality LED - **200 EUR***.

Complete replacement of the luminaires brings higher costs, but it will certainly pay off, ideally combining the replacement of luminaires with the installation of smart drivers.

4 Smart Street Lamp

Outdoor plug transmitter

• Complete replacement of public lighting including masts, wiring and lights.

• Price of revitalization of one light spot: **250 EUR***.

We recommend this option for installations older than 30 years. With new luminaires it is always wise to add smart control. We supply our modules directly in the luminaires or as an external device.
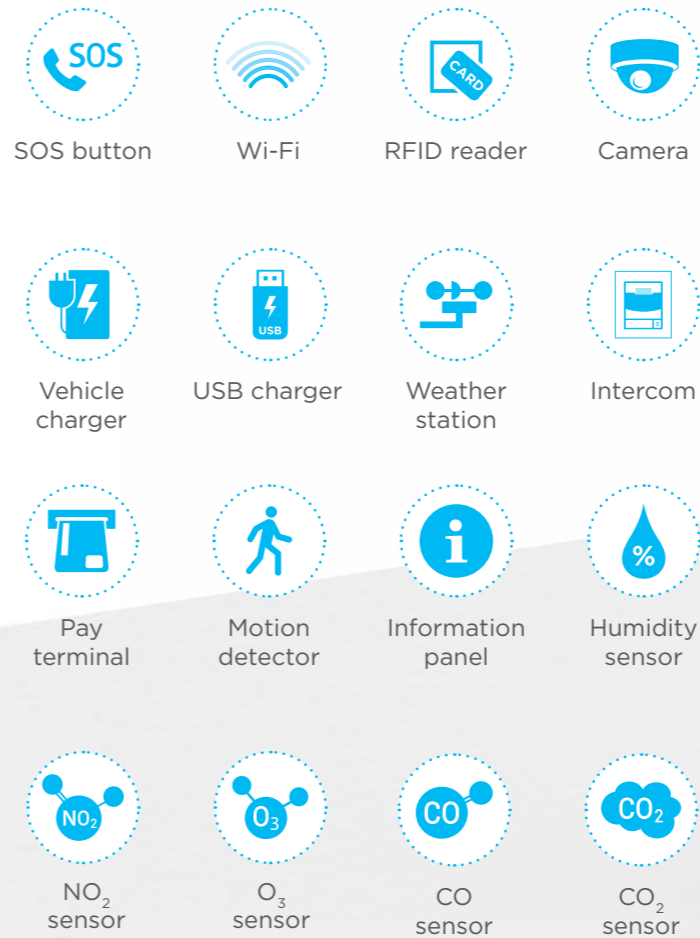
* The prices above not include: installation, column and accessories.

	Simple replacement	Problem with cooling	Return on investment	Smart control
„Corn"	✓	✓	-	-
LED light source retrofit	o	✓	o	-
Replacing fixtures with LED	-	-	✓	-
Smart street lamp	-	-	✓	✓

Smart column

In every big city you will find thousands, sometimes tens of thousands of light masts under power. A dense network of public lighting masts can be used to mount sensors or security cameras. They can collect information about the numbers of people or vehicles. Reduce crime by installing security cameras. Inform people using electronic panels. Monitor and evaluate weather, air quality or noise levels. Light masts can spread Wi-Fi signals. Modern charging stations are now also found in the lighting system. The possibilities are practically unlimited.

Accessories

SOS button	Wi-Fi	RFID reader	Camera
Vehicle charger	USB charger	Weather station	Intercom
Pay terminal	Motion detector	Information panel	Humidity sensor
NO_2 sensor	O_3 sensor	CO sensor	CO_2 sensor

IoT controllers

In order for the lights to be truly „smart", it is necessary to equip them with a communication device (transmitter) and a corresponding power source (LED driver). For communication, we use wireless LoPAN networks, especially **LoRA** or **NB-IoT**, which provide **two-way** communication - so that the lights can be controlled and information retrieved from them. Consequently, one condition is the availability of a given network with sufficient signal at the point where the light sources are located. Signal quality can be measured with a special level gauge. We have several options of transmitters available. The function is the same, but it diff ers from one another in the implementation and installation method.

Retrofit module

Outdoor design for retrofi ts, placement externally on the body of the light, mast or base.

PLUG-IN (socket)

Receiver actuator in a special box with a bayonet connector for easy installation into lights equipped with this socket.

OEM (built-in)

PCB board for direct integration into the power supply board.

US

EU

Outdoor transmitter

AirSLC-100L
AirSLC-100Nb

- **Inputs:**
  - control 0 / 1-10 V voltage input
  - measuring range 10-2000 watts
- **Outputs:** 10 A switching contact
  - **Connection:** wire outlets
  - **Power supply:** 230 V AC
- **Dimensions:** - 182 x 62 x 34 with antenna
  - 96 x 62 x 34 without anetnna
  - **Gain:** + 2,14 dB
- **Communication:** LoRA 868Mhz
  - **Antenna:** součástí výrobku

Outdoor plug transmitter

AirSLC-100L/PLUG/EU (US)
AirSLC-100Nb/PLUG/EU (US)

- a standard that is common today especially in English speaking countries IP65
  - location on the light
- „hat" is according to the type of luminaire on the bottom or top
- you will fi nd a number of detectors and sensors in it

Built-in transmitter

LoRAWAN Modul OEM (OEM)

- **Connection:** soldering pins
- **Power supply:** 5-24VDC, after breaking source parts only stabilized 3V3 / 140mAh
  - **Dimensions:**
  - 19.5 x 46.1 (33.8)* x 4 mm with ULF connector
  - 19.5 x 57 (44.7)*x 7 mm with SMA connector
  - 19.5 x 46.1 (33,8)* x 21 mm with internal antenna
- * dimension after breaking the source section
  - **Gain:** + 2,12 dB
- **Communication:** LoRA 868Mhz
- **Antenna:** external ULF or SMA connector, internal bent parts of the product

Smart City Platform

We believe that each Smart city should have only one control platform. It allows not only the collection and evaluation of data, but also the control of all the elements of the smart city. That's why with our smart lighting, you'll also get a light control module.
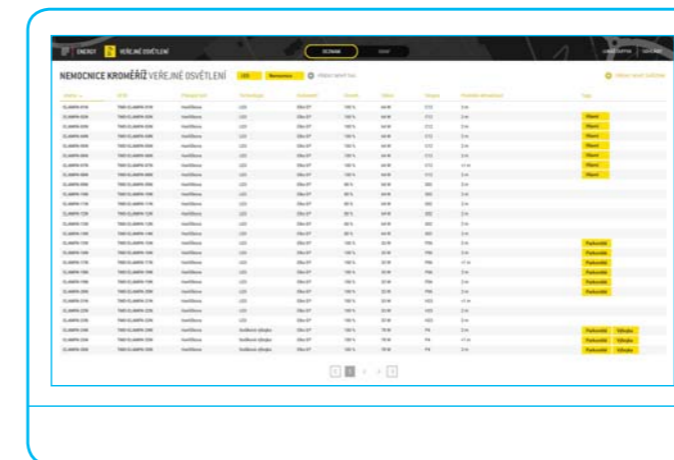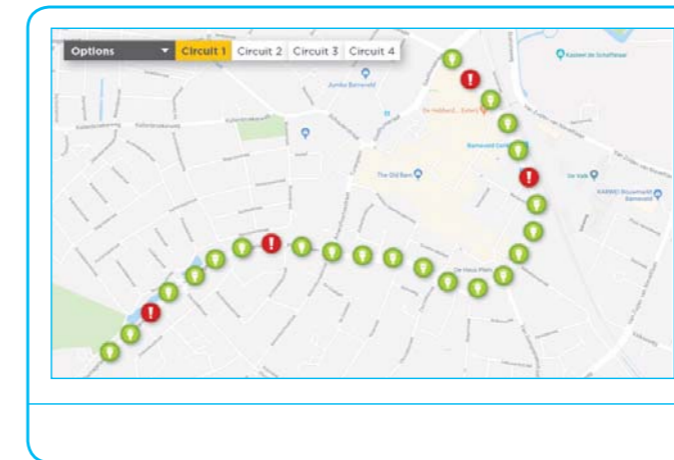
System cooperation:

- changes in intensity occurrences
- plan switching events occurrences
- adding / changing / removing the lamp occurrences
- emergency situations
- 3rd parties commands

Function:

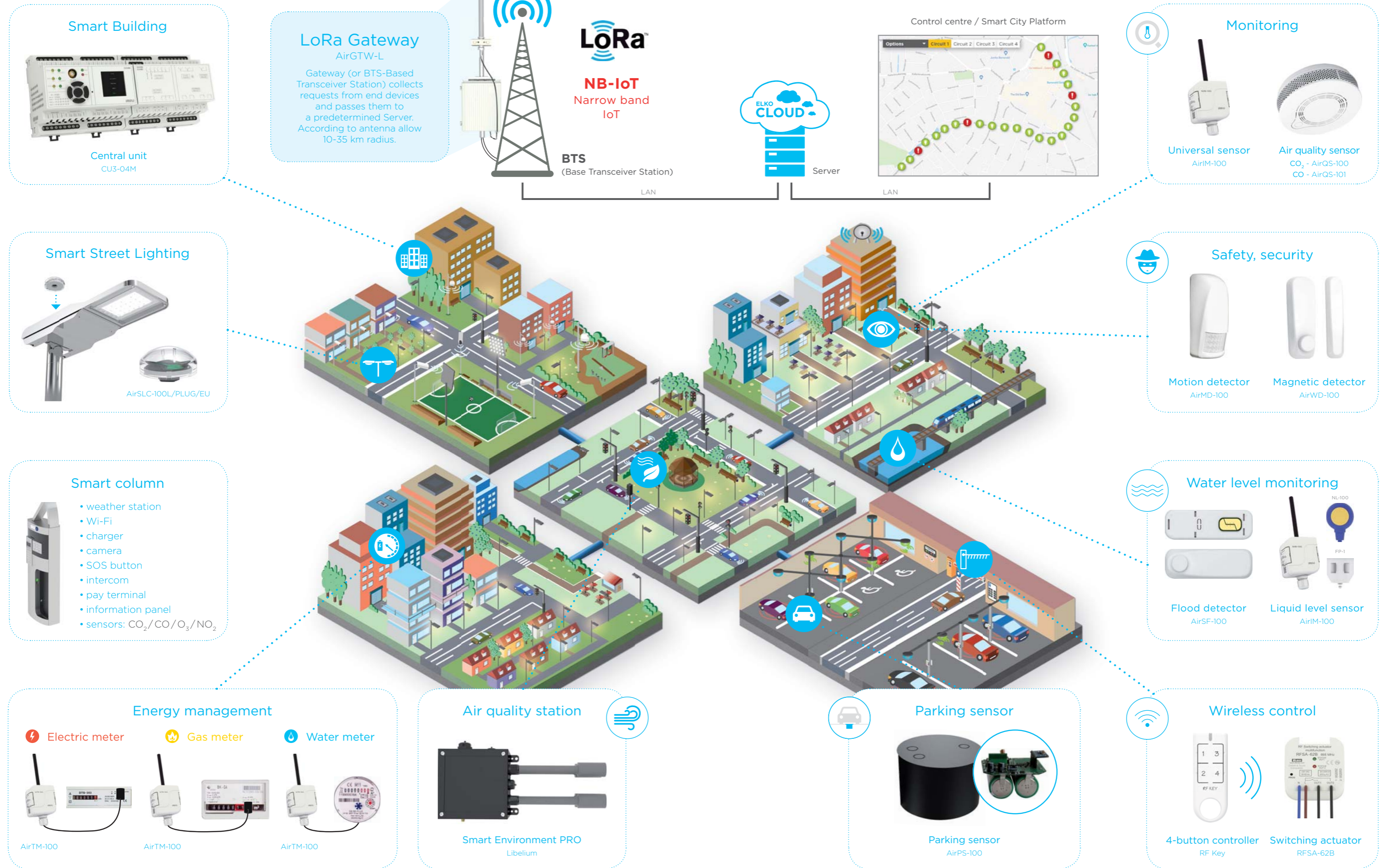- displayed on the map according to the light
- map view by technology
- monitoring according to operating status
- assignment to groups
- individual and group control
- smart scenarios
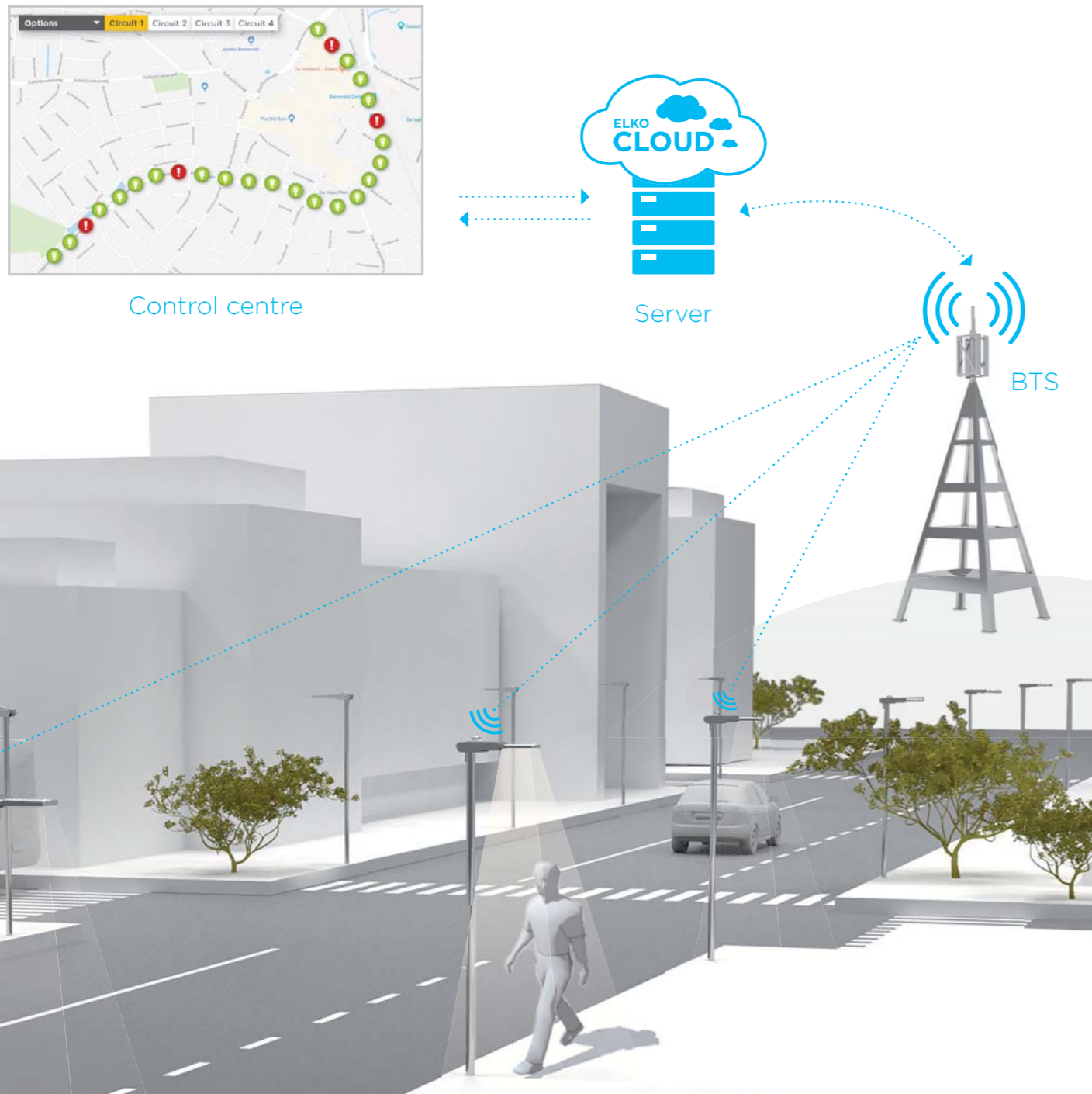- graphs and statistics according to lighting, consumption, lifetime

Reporting:

- consumption reporting
- operation reporting (failure status, components malfunction)
- disorder reporting
- service state reporting

iNELS Smart City

Smart Building

Central unit
CU3-04M

LoRa Gateway
AirGTW-L

Gateway (or BTS-Based Transceiver Station) collects requests from end devices and passes them to a predetermined Server. According to antenna allow 10-35 km radius.

LoRa

NB-IoT
Narrow band IoT

ELKO CLOUD

Server

BTS
(Base Transceiver Station)

LAN   LAN

Control centre / Smart City Platform

Options | Circuit 1 | Circuit 2 | Circuit 3 | Circuit 4

Monitoring

Universal sensor
AirIM-100

Air quality sensor
CO_2 - AirQS-100
CO - AirQS-101

Smart Street Lighting

AirSLC-100L/PLUG/EU

Safety, security

Motion detector
AirMD-100

Magnetic detector
AirWD-100

Smart column

- weather station
- Wi-Fi
- charger
- camera
- SOS button
- intercom
- pay terminal
- information panel
- sensors: CO_2/CO/O_3/NO_2

Water level monitoring

NL-100

FP-1

Flood detector
AirSF-100

Liquid level sensor
AirIM-100

Energy management

⚡ Electric meter   🔥 Gas meter   💧 Water meter

AirTM-100   AirTM-100   AirTM-100

Air quality station

Smart Environment PRO
Libelium

Parking sensor

Parking sensor
AirPS-100

Wireless control

4-button controller
RF Key

Switching actuator
RFSA-62B

8   9

Principle of function

Control centre

Server

BTS

The main component of the infrastructure is the LoRA/NB-IoT network that provides connectivity for IoT devices in Smart City.

BTS (Base Transceiver Station) receives commands from the backend server and sends them wirelessly to the individual light actuators. They process and execute the command (ON/OFF or the desired brightness setting).

The actuators are also equipped with sensors that detect the ambient parameters or input activation and send this information via the BTS back to the server, which evaluates, displays and can trigger the appropriate action.

What opportunities can smart lighting bring you?

Automatic brightness intensity control according to ambient light and time

Lighting control based on the movement of persons/vehicles

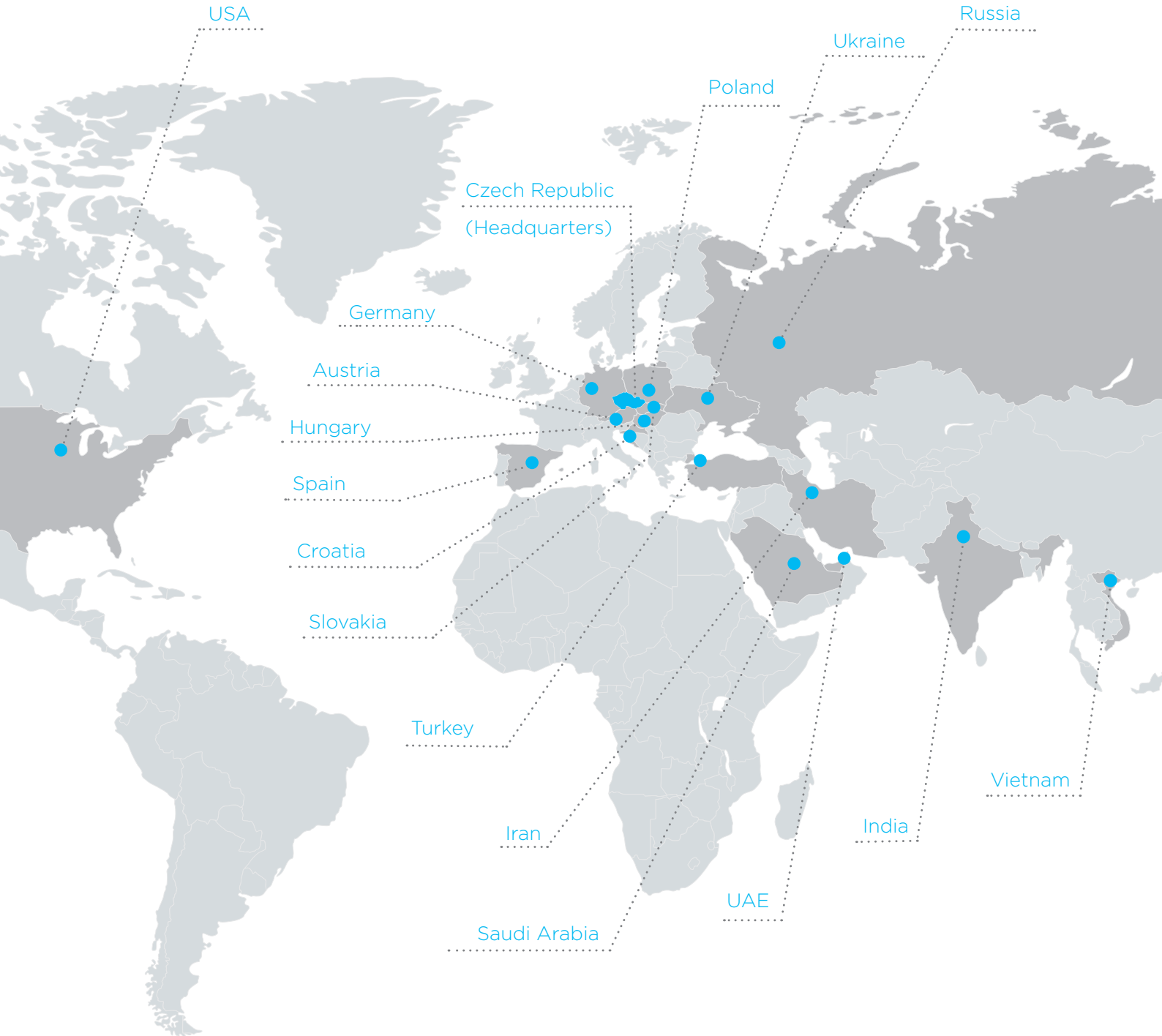Maximum brightness in emergency situations

Automatic failure messages

Remote management, operators desk

Light: 258

SERVICE

REPORT AN ISSUE

Savings   Flexibility   Comfort   Monitoring   Safety

ELKO EP Holding

USA

Russia

Ukraine

Poland

Czech Republic
(Headquarters)

Germany

Austria

Hungary

Spain

Croatia

Slovakia

Turkey

Iran

Vietnam

India

UAE

Saudi Arabia

www.elkoep.com