Smart Street Lighting

Economical and effective outdoor lighting solutions

LoRaTRANSMITTER

iNELS®

ELKO EP, Holding
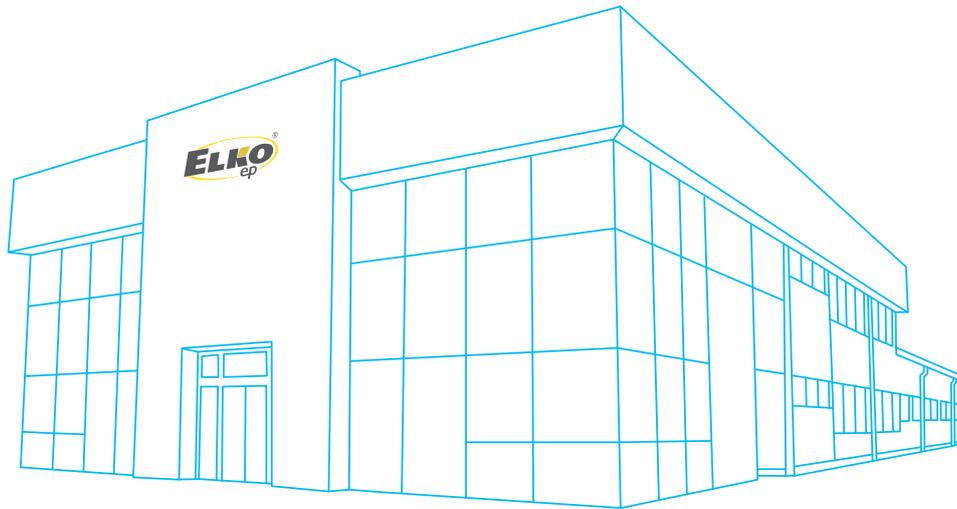
Millions of Relays, Thousands of satisfied Customers, Hundreds of local staff, Twenty Five Years of Research, Development and Production, Fifteen Foreign Branches, but just ONE Company, ELKO EP, an innovative Czech company, where R&D, Production, Logistics, Service and Support all take place in our expanding 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
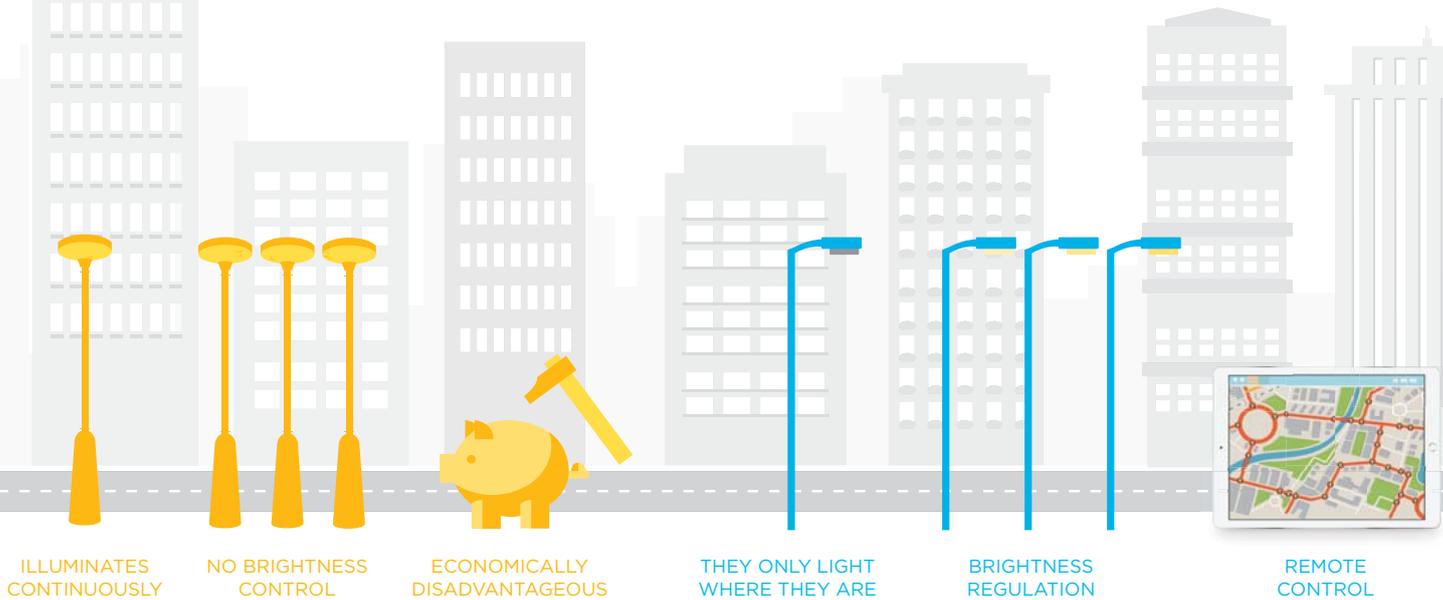
Light sources and their costs

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 %

Power consumption

Energy saving

| High pressure sodium lamps | High pressure sodium lamps | Modern LEDs | Smart LED |
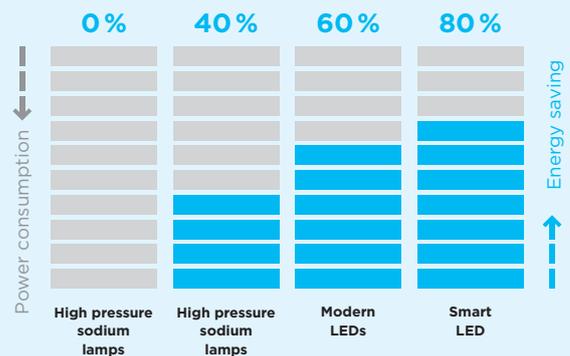
Retrofit options

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.
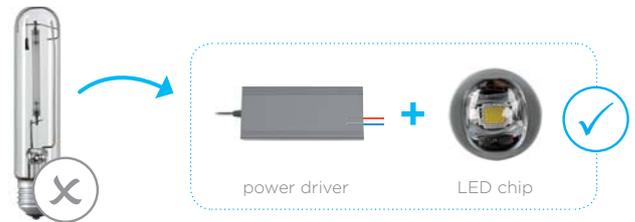
① „Corn"

- 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

power driver   LED chip

- 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	-	-	✓	✓

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 differs from one another in the implementation and installation method.

Retrofit module

Outdoor design for retrofits, 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 find 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

# Principle of function

Control centre
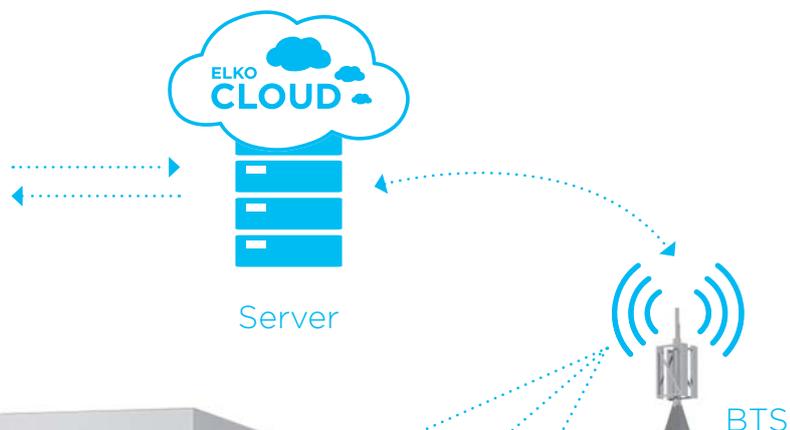
Server

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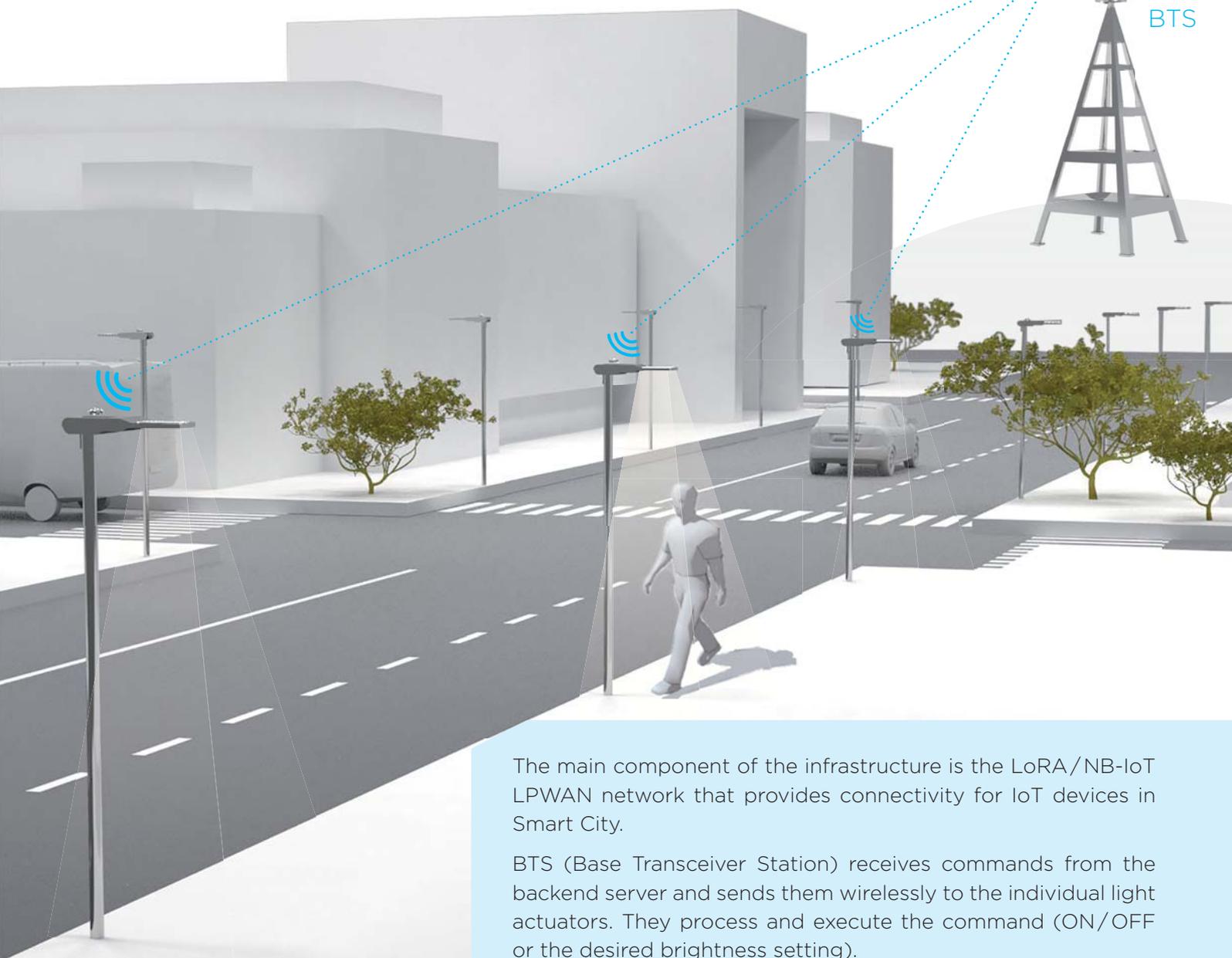
The main component of the infrastructure is the LoRA / NB-IoT LPWAN network that provides connectivity for IoT devices in Smart City.

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.

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.
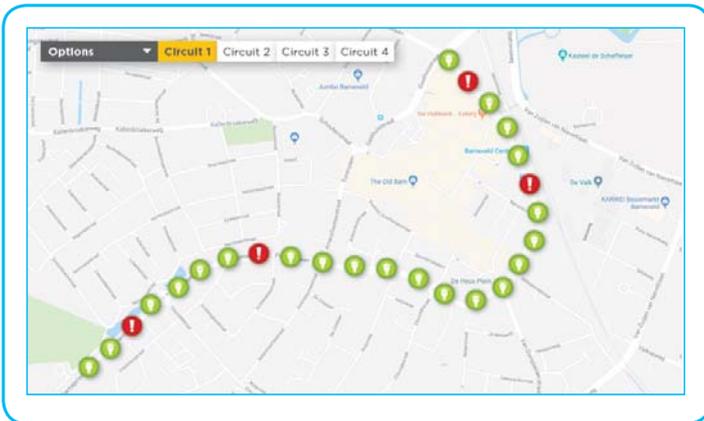
System cooperation:

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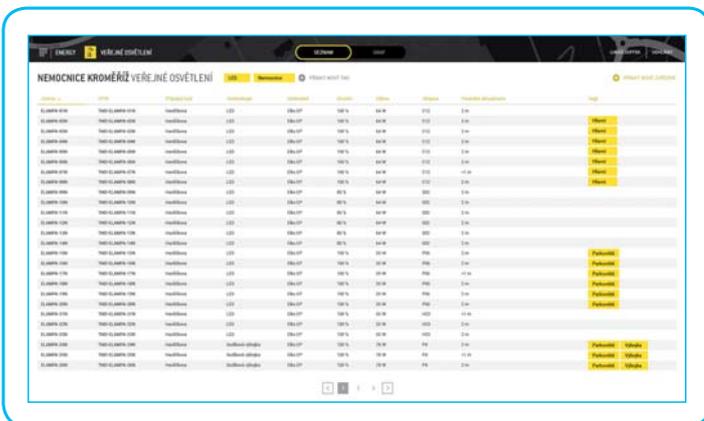
Function:

- 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

Smart column

In every big city you will fi nd 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.

Communication hotspot

Wi-Fi Hotspot

Status signaling

Camera

Speaker

Infopanel

Air quality sensor

Ultrasonic PIR

Touch panel

Wireless charging

SOS button

SOS

Socket 230V

22 kW

USB charger

USB

Socket 22 kW

230V

Car charging

Wi-Fi Hotspot

Connecting to the Internet becomes a public and an easily accessible property. Any Wi-Fi signal from our transmitter will flow through every smart pillar.

Speaker

Warnings, reports. With this built-in speaker you will never miss any important information.

Air quality sensor

Smart sensors are the basic means for collecting and evaluating information. This will greatly contribute to improving air quality in cities.

Wireless charging

Let you charge your mobile phone while you are waiting for a bus. The wireless charger will take care of everything.

SOS button

Are you in real trouble and need help? One push of this button will tell the rescue services that something is wrong.

Communication hotspot

This device receives signals from sensors that control public lighting. Increases efficiency and cost savings.

Status signaling

The smart pillar determines when it needs to be repaired. One of three colors indicates the status of the device.

Camera

The basis of security in each city is a system of security cameras that monitor the streets.

Infopanel

Do you want to get rid of unnecessary street signs? That's why we have a panel where you can place the name of the street on which the lamp is located.

Touch panel

Touch panel to find the information you need. It includes, for example, a clear map of the city.

USB charger

There is also a universal USB charger to connect to any device or appliance.

Socket 230V

The classic socket, as we know it, for moments when you just need a good dose of electricity.

Socket 22 kW

The 22kW charging station is also suitable for outdoor environments. It charges up to 10 times faster.

Car charging

The time of electric cars is knocking on the door. Charging ahead of the long journey has never been easier than with our iNELS pillar.

Ultrasonic PIR

The sensor built into the body of the pillar serves to detect the movement of people around you. This switches on the light only if it is really needed.

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

BTS
(Base Transceiver Station)

LAN

Smart Street Lighting

AirSLC-100L/PLUG/EU

Smart column

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

Energy management

⚡ Electric meter   🔥 Gas meter   💧 Water meter

AirTM-100   AirTM-100   AirTM-100

Air quality station

Smart Environment PRO
Libelium

Control centre / Smart City Platform

Server

LAN

ELKO CLOUD

Monitoring

Universal sensor
AirIM-100

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

Safety, security

Motion detector
AirMD-100

Magnetic detector
AirWD-100

Water level monitoring

NL-100

FP-1

Flood detector
AirSF-100

Liquid level sensor
AirIM-100

Parking sensor

Parking sensor
AirPS-100

Wireless control

RFSA-62B

4-button controller
RF Key

Switching actuator
RFSA-62B

ELKO EP Holding

USA

Russia

Ukraine

Poland

Czech Republic
(Headquarters)

Germany

Austria

Hungary

Spain

Croatia

Slovakia

Turkey

Iran

Saudi Arabia

UAE

India

Vietnam

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